CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

STREAM INVENTORY REPORT

Noyo River

INTRODUCTION

A stream inventory was conducted over two surveys seasons on Noyo River, September 23, 2015 to October 28, 2015 and June 28, 2016 to September 13, 2016. The survey began at the confluence with the Pacific Ocean and extended upstream 34 miles. Stream inventories and reports were also completed for four tributaries to Noyo River.

The Noyo River inventory was conducted in two parts: habitat inventory and biological inventory. The objective of the habitat inventory was to document the habitat available to anadromous salmonids in Noyo River. The objective of the biological inventory was to document the presence and distribution of juvenile salmonid species.

The objective of this report is to document the current habitat conditions and recommend options for the potential enhancement of habitat for Chinook salmon, 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.

WATERSHED OVERVIEW

Noyo River drains to the Pacific Ocean, located in Mendocino County, California (Map 1). Noyo River's legal description at the confluence with the Pacific Ocean is T18N R18W S13. Its location is 39.4276° north latitude and -123.8095° west longitude, LLID number 1238090394278. Noyo River is a fourth order stream and has approximately 34 miles of blue line stream according to the USGS Noyo Hill 7.5 minute quadrangle. Noyo River drains a watershed of approximately 113.8 square miles. Elevations range from 0 feet at the mouth of the river to 1,600 feet in the headwater areas. Mixed conifer forest dominates the watershed. The watershed is primarily privately owned and is managed as timberland with some private residences. Vehicle access exists via Highway 1 in Fort Bragg and at multiple access roads off of Highway 20.

METHODS

The habitat inventory conducted in Noyo River follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al. 1998). The California Department of Fish and Wildlife (CDFW) personnel and Watershed Stewards Project/AmeriCorps (WSP) members that conducted the inventory were trained in standardized habitat inventory methods by the CDFW. 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 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. Surveyors also take photos to document general habitat conditions (Appendix II).

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 Noyo River 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:

Water and air temperatures are measured and recorded at every tenth habitat unit using a hand-held thermometer. Both temperatures are taken in degrees Fahrenheit and the time of the measurement is also recorded. Air temperatures are recorded within one foot of the water surface, while water temperatures are recorded (where possible) in flowing water within the habitat unit.

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". Noyo River 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.

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 Noyo River, 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 not suitable 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 Noyo River, 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 densiometers as described in the *California Salmonid Stream Habitat Restoration Manual*. Canopy density relates to the amount of stream shaded from the sun. In Noyo River, 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 Noyo River, 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.

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.

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 Noyo River. In addition, underwater mask and snorkel observations were made at 10 sites using techniques discussed in the *California Salmonid Stream Habitat Restoration Manual*.

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 Wildlife. 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 Noyo River include:

- Riffle, Flatwater, Pool Habitat Types by Percent Occurrence
- 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 IN APPENDIX I *

The habitat inventory of September 23, 2015 to October 28, 2015 and June 28, 2016 to September 13, 2016, was conducted by Brian Starks, David Lam, Kalyn Bocast, Isaac Mikus, (CDFW), Nicole Bejar, Alejandra Camacho, Ryan Bernstein, and Amidia Fredrick (WSP). The total length of the stream surveyed was 159,399 feet with an additional 3,549 feet of side channel.

Stream flow was measured near the bottom of the survey reach with a Marsh-McBirney Model 2000 flowmeter at 1.98 cfs on October 8, 2015.

Noyo River is an F4 channel type for 65,050 feet of the stream surveyed (Reach 1), an F2 channel type for 42,616 feet of the stream surveyed (Reach 2), an F3 channel type for 48,385 feet of the stream surveyed (Reach 3), an F4 channel type for 5,310 feet of the stream surveyed (Reach 4), and a B4 channel type for 1,587 feet of the stream surveyed (Reach 5). F4 channel types are entrenched meandering riffle/pool channels on low gradients with high width/depth ratios and gravel-dominant substrates. F2 channel types are characterized as having entrenched meandering riffle/pool channels on low gradients with high width/depth ratios and boulder-dominant substrates. F3 channel types are entrenched meandering riffle/pool channels on low gradients with high width/depth ratios and cobble-dominant substrates. B4 channels are moderately entrenched, moderate gradient, riffle dominated channel with infrequently spaced pools, very stable plan and profile, stable banks and gravel-dominant substrates.

Water temperatures taken during the survey period ranged from 54° to 65° Fahrenheit. Air temperatures ranged from 46° to 84° Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 41% pool units, 28% riffle units, 26% flatwater units, and 5% dry units (Graph 1). Based on total length of Level II habitat types there were 57% pool units, 26% flat-water units, 9% riffle units, 5% no-survey units, and 2% dry units (Graph 2).

Twenty-two level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were mid-channel pool units, 32%; low gradient riffle units, 23%; run units, 17% (Graph 3). Based on percent total length, mid-channel pool units made up 48%, run units 15%, and step run units 10%.

A total of 682 pools were identified (Table 3). Main channel pools were the most frequently encountered at 79% (Graph 4), and comprised 85% of the total length of all pools (Table 3).

Table 4 is a summary of maximum residual pool depths by pool habitat types. Pool quality for salmonids increases with depth. Three hundred twenty-six of the 681 pools (48%) had a residual depth of three feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 683 pool tail-outs measured, 230 had a value of 1 (33.7%); 279 had a value of 2 (40.8%); 109 had a value of 3 (16%); 4 had a value of 4 (0.6%); 61 had a value of 5 (8.9%) (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 such as bedrock, log sills, boulders, or other considerations.

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 2, flatwater habitat types had a mean shelter rating of 2, and pool habitats had a mean shelter rating of 15 (Table 1). Of the pool types, the backwater pools had the highest mean shelter rating of 22. Scour pools had a mean shelter rating of 16 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Large woody debris is the dominant cover type in Noyo River. Graph 7 describes the pool cover in Noyo River. 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 the dominant substrate observed in 65% of pool tail-outs. Small cobble was the next most frequently observed substrate and was observed in 18% of pool tail-outs.

The mean percent canopy density for the surveyed length of Noyo River was 88%. Twelve percent of the canopy was open. Of the canopy present, the mean percentages of hardwood and coniferous trees were 63% and 37%, respectively. Graph 9 describes the mean percent canopy in Noyo River.

For the stream reach surveyed, the mean percent right bank vegetated was 98%. The mean percent left bank vegetated was 97%. The dominant elements composing the structure of the stream banks consisted of 52% sand/silt/clay, 28% cobble/gravel, 15% bedrock, and 4% boulder (Graph 10). Deciduous trees were the dominant vegetation type observed in 62% of the units surveyed. Additionally, 28% of the units surveyed had coniferous trees as the dominant vegetation type, and 8% had brush as the dominant vegetation type (Graph 11).

BIOLOGICAL INVENTORY RESULTS

Survey teams conducted a snorkel survey at 10 sites for species composition and distribution in Noyo River on September 15 and 20, 2016. Water temperatures taken during the underwater observation period of 1000 to 1438 ranged from 52° to 55° Fahrenheit. The sites were sampled by Brian Starks, Chad Moura, Maddelyn Harden, and Matt Rice (CDFW).

In Reach 4, 10 sites were sampled starting approximately from the confluence with Burbeck Creek and continuing upstream 2,676 feet. The reach sites yielded 52 young-of-the-year (YOY) steelhead/rainbow trout (SH/RT), 3 age 1+ SH/RT, 19 YOY coho, 1 age 1+ coho, 1 YOY chinook, and 7 sculpin.

During the survey, the upstream-most observation of juvenile coho salmon occurred at 39.4236° north latitude and -123.4360° west longitude, approximately 157,077 feet upstream from the start of the survey. The upstream-most observation of juvenile steelhead occurred at 39.4212° north latitude, -123.4343° west longitude, approximately 158,674 feet from the start of the survey.

Table A. Summary of results for a fish composition and distribution survey within Noyo River, 2016.

Date	Survey Site #	Habitat Unit #	Habitat Type	Approx. Dist. from mouth (ft.)	Steelhead Trout			Coho Salmon		Additional Aquatic Species Observed
					YOY	1+	2+	YOY	1+	
Reach 1: F4 Channel Type										
9/15/16	1	1454	Pool	154,082	5	1	0	9	1	1 YOY CHIN
9/20/16	2	1504	Pool	156,758	8	1	0	6	0	
9/20/16	3	1505	Pool	156,790	1	0	0	2	0	
9/20/16	4	1507	Pool	156,930	14	0	0	0	0	
9/20/16	5	1511	Pool	157,077	3	0	0	2	0	1 SCP
9/20/16	6	1530	Pool	157,863	4	0	0	0	0	3 SCP
9/20/16	7	1537	Pool	158,227	8	0	0	0	0	3 SCP
9/15/16	8	1545	Pool	158,559	2	1	0	0	0	
9/15/16	9	1549	Pool	158,674	7	0	0	0	0	
9/15/16	10	1561	Pool	158,864	0	0	0	0	0	

Species Abbreviations: CHIN=Chinook Salmon; SCP=Sculpin

DISCUSSION

Noyo River is an F4 channel type for the first 65,050 feet of stream surveyed, an F2 channel type for the next 42,616 feet, an F3 channel type for the next 48,385 feet, an F4 channel type for the next 5,310 feet and a B4 channel type for the remaining 1,587 feet. The suitability of F4, F2, F3, and B4 channel types for fish habitat improvement structures is as follows: F4 channel types are good for bank-placed boulders and fair for plunge weirs, single and opposing wing-deflectors, channel constrictors, and log cover. F2 channel types are fair for plunge weirs, single and opposing wing-deflectors, and log cover. F3 channel types are good for bank-placed boulders, single and opposing wing-deflectors and fair for plunge weirs, boulder clusters, channel constrictors and log cover. B4 channel types are excellent for low-stage plunge weirs, boulder clusters, bank placed boulders, single and opposing wing-deflectors, and log cover.

The water temperatures recorded on the survey days September 23, 2015 to September 13, 2016,

ranged from 54° to 65° Fahrenheit. Air temperatures ranged from 46° to 84° Fahrenheit. This is a suitable water temperature range for salmonids. However, 60° Fahrenheit, if sustained, is near the threshold stress level for salmonids. To make any further conclusions, temperatures need to be monitored throughout the warm summer months, and more extensive biological sampling needs to be conducted.

Flatwater habitat types comprised 26% of the total length of this survey, riffles 9%, and pools 57%. Three hundred twenty-six of the 681 (48%) pools had a maximum residual depth greater than three feet. In general, pool enhancement projects are considered when primary pools comprise less than 40% of the length of total stream habitat. In third and fourth order streams, a primary pool is defined to have a maximum residual depth of at least three 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.

Five hundred nine of the 683 pool tail-outs measured had embeddedness ratings of 1 or 2. One hundred thirteen of the pool tail-outs had embeddedness ratings of 3 or 4. Sixty-one 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 Noyo River should be mapped and rated according to their potential sediment yields, and control measures should be taken.

Five hundred fifty-eight of the 669 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 is 15. The shelter rating in the flatwater habitats is 2. 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 Noyo River. 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 structures provide rearing fry with protection from predation, rest from water velocity, and also divide territorial units to reduce density related competition.

The mean percent canopy density for the stream was 88%. Reach 1 had a canopy density of 82%, Reach 2 had a canopy density of 81%, Reach 3 had a canopy density of 92%, Reach 4 had a canopy density of 96%, and Reach 5 had a canopy density of 96%. The percentage of right and left bank covered with vegetation was 98%and 97%, respectively.

RECOMMENDATIONS

Noyo River should be managed as an anadromous, natural production stream. Recommendations for potential habitat improvement activities are based on target habitat values suitable for salmonids in California's north coast streams. Considering the results from this stream habitat inventory, factors that affect salmonid productivity and CDFW's professional judgment, the following list prioritizes habitat improvement activities in Noyo River. Keep in mind, watershed and stream ecosystem processes, land use alterations, changes in land ownership, and other factors could potentially change the order of these recommendations or

create the need to remove/add recommendations in the future.

1) Increase woody cover in the pools and flatwater habitat units. Most of the existing cover in the pools is from large woody debris. Adding high quality complexity with woody cover in the pools is desirable.

2) 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.

3) The limited water temperature data available suggest that maximum temperatures are above 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.

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 approximately 50’ upstream of water pump. This is the approximate end of tidal influence. Channel type is an F4. Channel type cross-section location is at Habitat Unit (HU) #71.
274	0004.00	Observed vigorous bubbling on right hand side of the bank. There is a possibility that the bubbling may be occurring due to a water pump.
1495	0013.00	Bridge #1 is the crossing for the California Western Railroad, and is 31' high x 18' wide x 260' long. It is a train bridge made of steel and wood and is not a barrier to salmonids.
2157	0014.00	There is active erosion on the right bank. Cause of erosion is railroad close to right side of channel.
2789	0019.00	Tributary #1 (unnamed) enters on the left bank. The water temperature of the tributary was 56 degrees Fahrenheit, the water temperature downstream of the confluence was 57 degrees Fahrenheit, and the water temperature upstream of the confluence was 59 degrees Fahrenheit. The slope of the tributary is estimated to be nearly vertical. The tributary is not accessible to salmonids due to a series of waterfalls causing near vertical slope around 30' from the mouth. Fish were not observed in the tributary.

5483	0036.00	Tributary on the right bank. Tributary was recorded as dry.
7339	0049.00	Freshwater mussels observed.
8993	0061.00	Hayshed Gulch enters on the left bank. The water temperature of the tributary was 54 degrees Fahrenheit, the water temperature downstream of the confluence was 56 degrees Fahrenheit, and the water temperature upstream of the confluence was 57 degrees Fahrenheit. The slope of the tributary is not recorded. The tributary is accessible to salmonids. For more information, see 2015 habitat inventory report for Hayshed Gulch.
11204	0074.00	Young-of-the-year (YOY) salmonids observed.
12434	0081.00	Rail road tracks within 20’ of bank full.
14021	0090.00	South Fork Noyo enters on the left bank. The water temperature of the tributary was 57 degrees Fahrenheit, the water temperature downstream of the confluence was 57 degrees Fahrenheit, and the water temperature upstream of the confluence was 58 degrees Fahrenheit. The slope of the tributary is not measured. The tributary is accessible to salmonid. For more information, see 2010 habitat inventory report for South Fork Noyo.
15672	0105.00	Possible channel change. Hypothesis based on observance of more flood plain.
15705	0106.00	The right-hand bank tributary is dry.
16545	0112.00	Log debris accumulation (LDA) #1 is 5' high x 27' wide x 11' long and contains 2 pieces of large woody debris (LWD). Water flows through the LDA and there are no visible gaps in it. Sediment is being retained in the approximate dimensions of 20' wide x 15' long x 1' deep. The sediment ranges in size from sand to small cobble. High flows may bypass the LDA, which is backed up against support pillar of Bridge #2, blocking main channel which could easily blow out. Fish were observed above the LDA. Bridge #2 is the crossing for California Western Railroad, and is 22' high x 10' wide x 195' long. It is a railroad bridge (made of steel and wood) and is not a barrier to salmonids. Wooden support pillar seems to be weakening and falling off. LDA in front of pillar may be compromising its integrity.
16643	0113.00	Backwater unit connected to run.

17469	0124.00	Right bank erosion is 15’ high x 20’ long and is contributing sand.
17744	0125.00	The right-bank tributary is dry.
18136	0128.00	Railroad within 20’ of river.
19552	0138.00	Backwater pool formed by mostly dry side channel. Algae is contributing most of the shelter.
19616	0139.00	Erosion on right bank is 30’ high x 40’ long.
22554	0155.00	Bridge #3 is the crossing for California Western Railroad, and is 29’ high x 11’ wide x 131’ long. It is a railroad bridge (made of steel and wood) and is not a barrier to salmonids. An approximately 50' backwater pool is formed by bridge pillar.
22939	0157.00	Right bank landslide is 60’ long x 15’ high. Fallen trees creating high flow side channel even with end of backwater pool.
23028	0158.00	Right bank landslide 60’ long x 15’ high. Fallen trees creating high flow side channel even with end of backwater pool.
24767	0169.00	Left bank seep.
25374	0172.00	Right bank seep.
26785	0181.00	Right bank beach at property. Extremely steep. Dry left bank tributary but can hear water higher up. Probably water fall in winter.
27598	0185.00	Left bank erosion is 130’ long x 15’ high and is active.
28197	0189.00	Bridge #4 is the crossing for an unnamed road, and is 23' high x 12' wide x 123' long. It is an automobile bridge (made of steel and concrete) and is not a barrier to salmonids.
29651	0199.00	Left bank tributary is dry.
30850	0203.00	Redd flags from spawner season at the top of riffle.
32103	0206.02	Dry right bank tributary with two clogged, degraded culverts 40’ up the bank.

32961	0212.00	Backwater pool included in unit. Bridge #5 is the crossing for California Western Railroad, and is 22.2' high x 12' wide x 150' long. It is a railroad bridge (made of steel, wood, and concrete) and is not a barrier to salmonids.
33218	0214.00	Little North Fork Noyo River enters on the right bank. The water temperature of the tributary was 55 degrees Fahrenheit, the water temperature downstream of the confluence was 57 degrees Fahrenheit, and the water temperature upstream of the confluence was 58 degrees Fahrenheit. The slope of the tributary is not measured. The tributary is accessible to salmonids. See 2010 habitat inventory report for Little North Fork Noyo.
36162	0232.00	House on cliff above right bank.
36455	0234.00	Bridge #6 is the crossing for California Western Railroad, and is 20.7' high x 12' wide x 160' long. It is a railroad bridge (made of steel, wood, and concrete) and is not a barrier to salmonids.
36685	0237.00	House on right bank.
37197	0239.00	Dry left bank tributary.
37362	0241.00	Bridge #7 is the crossing for California Western Railroad, and is 20.4' high x 12' wide x 150' long. It is a railroad bridge (made of steel and wood) and is not a barrier to salmonids.
37697	0245.00	Right bank erosion is 80’ long x 20’ high.
38013	0247.00	Bedrock is concrete. Bridge #8 is the crossing for California western Railroad, and is 21.7' high x 9' wide x 115' long. It is a railroad bridge (made of steel, wood, and concrete) and is not a barrier to salmonids.
38748	0254.00	Dry left bank tributary.
39415	0257.00	Pile of wood towards top of post. Dry left bank tributary, dam at culvert approximately 100’ upstream.
39990	0264.00	Tributary #5 (unnamed) enters on the left bank. The water temperature of the tributary was 55 degrees Fahrenheit, the water temperature downstream of the confluence was 56 degrees Fahrenheit, and the water temperature upstream of the confluence was 56 degrees Fahrenheit. The slope of the tributary is estimated 15%. The tributary is not accessible to salmonids due to dryness at mouth. Tributary is extremely steep with 5'

		plunge and several 3' plunges leading to a 10' high perched culvert about 250' upstream. Fish were not observed in the tributary.
42876	0288.00	Tributary #6 enters on the left bank. The water temperature of the tributary was 55 degrees Fahrenheit, the water temperature downstream of the confluence was 57 degrees Fahrenheit, and the water temperature upstream of the confluence was 57 degrees Fahrenheit. The slope of the tributary is estimated 8%. The tributary is not accessible to salmonids due to extremely steep slope and narrow channel with a 5' LDA upstream 200'. Fish were not observed in the tributary
44747	0304.00	Tributary #7 enters on the left bank. The water temperature of the tributary was 55 degrees Fahrenheit, the water temperature downstream of the confluence was 57 degrees Fahrenheit, and the water temperature upstream of the confluence was 57 degrees Fahrenheit. The slope of the tributary is estimated 15%. The tributary is not accessible to salmonids due to extremely steep and narrow channel that is very clogged with debris. Fish were not observed in the tributary.
45064	0307.00	Bridge #9 is the crossing for California Western Railroad, and is 21.7' high x 9' wide x 115' long. It is a railroad bridge (made of steel, wood, and concrete) and is not a barrier to salmonids.
45617	0307.01	Channel becomes braided for a few hundred feet.
47156	0321.00	Dry right bank tributary.
47598	0322.00	Right bank landslide is 25’ high x 30’ long.
47652	0323.00	Bridge #10 is the crossing for a California Western Railroad, and is 27' high x 12' wide x 120' long. It is a railroad bridge (made of steel, wood, and concrete) and is not a barrier to salmonids.
48824	0329.00	Channel changes into a narrow, less entrenched channel.
48867	0330.00	Channel changes and becomes narrower and less entrenched.
49196	0332.00	Tributary #8 enters on the right bank. The water temperature of the tributary was 55 degrees Fahrenheit, the water temperature downstream of the confluence was 56 degrees Fahrenheit, and the water temperature upstream of the confluence was 57 degrees Fahrenheit. The slope of the tributary is estimated 15%. The tributary is not accessible to salmonids due to extremely steep gradient with several plunges and with a 6' diameter perched culvert 40' up. Fish were not observed in the tributary.

50536	0341.00	Dry tributary on right bank.
52596	0355.00	Dry right bank tributary as well as dry left bank tributary.
53898	0363.00	Tributary #9 enters on the left bank. The water temperature of the tributary was 52 degrees Fahrenheit, the water temperature downstream of the confluence was 56 degrees Fahrenheit, and the water temperature upstream of the confluence was 57 degrees Fahrenheit. The slope of the tributary is estimated 40%. The tributary is not accessible to salmonids due to the well over 20% grade which is almost straight up. Fish were not observed in the tributary. Tributary #10 enters on the left bank. It contributes to approximately <5% of Noyo River's flow. The water temperature of the tributary was 55 degrees Fahrenheit, the water temperature downstream of the confluence was 57 degrees Fahrenheit, and the water temperature upstream of the confluence was 57 degrees Fahrenheit. The slope of the tributary is estimated 30%. The tributary is not accessible to salmonids due to well over 20% steep and narrow. Fish were not observed in the tributary.
62952	0435.00	Channel type changes to a F2 at Habitat Unit (HU) # 434. Channel type cross-section location is at HU#456.
63654	0441.00	First unit of left bank main channel.
63694	0442.00	Increase in gradient and shift to boulder substrate.
64227	0450.00	End of side channel. Tributary #11 enters on the left bank. The water temperature of the tributary was 55 degrees Fahrenheit, the water temperature downstream of the confluence was 55 degrees Fahrenheit, and the water temperature upstream of the confluence was 55 degrees Fahrenheit. The slope of the tributary is estimated 15%. The tributary is not accessible to salmonids due to extremely steep grade with multiple 3'+ drops onto boulders about 30' upstream. Whole stream is choked with boulders. Fish were not observed in the tributary.
66450	0466.00	Bridge #11 is the crossing for California Western Railroad, and is 30' high x 12' wide x 182' long. It is a railroad bridge (made of steel, wood, and concrete) and is not a barrier to salmonids.
66512	0467.00	Tributary #12 enters on the right bank. The water temperature of the tributary was 56 degrees Fahrenheit, the water temperature downstream of the confluence was 55 degrees Fahrenheit, and the water temperature upstream of the confluence was 55 degrees Fahrenheit. The slope of the

		tributary is estimated 12%. The tributary is not accessible to salmonids as it is extremely steep with multiple plunges onto boulders, with at least one plunge being around 7 to 8' high. After plunges, it looks nice above the first 200' with good gravel substrate. Fish were not observed in the tributary.
66615	0468.00	Bridge #12 is the crossing for California Western Railroad, and is 34' high x 12' wide x 240' long. It is a railroad bridge (made of steel, wood, concrete) and is not a barrier to salmonids.
67287	0471.00	Long boulder towards left bank with a flatwater and riffle ahead.
69348	0486.00	Right bank seep.
71383	0494.00	Tributary #13 enters on the left bank. The water temperature of the tributary was 56 degrees Fahrenheit, the water temperature downstream of the confluence was 56 degrees Fahrenheit, and the water temperature upstream of the confluence was 56 degrees Fahrenheit. The slope of the tributary is estimated 8%. The tributary is accessible to salmonids as tributary is fairly steep, but has no significant barriers and thus is possibly useable by trout. Fish were not observed in the tributary.
73930	0507.00	End of 2015 surveys season just below an old concrete dam. Pool will be the first unit next season. The river bends just above the dam with a massive pool. Right next to Camp Noyo.
74004	0508.00	Start of 2016 survey season. Since last survey in October 2015, metal fish ladder added to assist fish down constructed swimming hole. Fish ladder is 3' wide x 13' long. Pools in fish ladder are 2' deep. Pool predominately on left bank, but water is shallower on right bank accounting for large percentage exposed substrate value. Water on right bank goes dry when water level goes down (observed from 10/2015 survey). There is a 4' plunge over wooden structure and then 2' plunge over concrete. Fish ladder has a 20% slope overall.
74028	0509.00	Tail crest of ladder. Bridge #13 is the crossing for an unnamed road, and is 20' high x 2.5' wide x 115' long. It is a footbridge (made of wood) and is not a barrier to salmonids. Part of Camp Noyo, suspended above the Noyo River. Tributary #14 enters on the left bank. The water temperature of the tributary was 54 degrees Fahrenheit, the water temperature downstream of the confluence was 60 degrees Fahrenheit, and the water temperature upstream of the confluence was 62 degrees Fahrenheit. The slope of the tributary is estimated 45%. The tributary is not accessible to salmonids

		due to extreme slope with a gully like appearance with LWD debris laying over the channel. Fish were observed at the confluence of the tributary. Not flagged because it is in Camp Noyo.
		Tributary #15 enters on the left bank. The water temperature of the tributary was 55 degrees Fahrenheit, the water temperature downstream of the confluence was 62 degrees Fahrenheit, and the water temperature upstream of the confluence was 62 degrees Fahrenheit. The slope of the tributary is estimated 5%. The tributary is accessible to salmonids as 75' upstream there is a 4' plunge and then a 5' plunge onto mostly bedrock substrate, but still may be accessible to fish. Fish were not observed in the tributary. Tributary is not flagged due to being in the middle of Camp Noyo and therefore flagging would be too visible to public.
75303	0512.00	Tributary #16 enters on the right bank. The water temperature of the tributary was 55 degrees Fahrenheit, the water temperature downstream of the confluence was 62 degrees Fahrenheit, and the water temperature upstream of the confluence was 62 degrees Fahrenheit. The slope of the tributary is estimated 40%. The tributary is not accessible to salmonids due to the steep incline. Fish were not observed in the tributary. Trib #16 is near railroad. There is an 8' plunge from culvert. Too steep to access river.
79144	0524.00	Tributary #17 enters on the right bank. The water temperature of the tributary was 54 degrees Fahrenheit, the water temperature downstream of the confluence was 59 degrees Fahrenheit, and the water temperature upstream of the confluence was 60 degrees Fahrenheit. The slope of the tributary is estimated 20%. The tributary is not accessible to salmonids due to extreme slope. Fish were not observed in the tributary. The 20% slope goes for the first 20' and then goes through culvert with steep bedrock bottom. At 60' upstream there is a 6' plunge into a 4' deep pool. Flattens out after first 100' which looks like good fish habitat.
79811	0530.00	Lamprey redds and carcasses observed.
81800	0543.00	Freshwater mussel.
82611	0548.00	Tributary #18 enters on the right bank. The water temperature of the tributary was 56 degrees Fahrenheit, the water temperature downstream of the confluence was 59 degrees Fahrenheit, and the water temperature upstream of the confluence was 59 degrees Fahrenheit. The slope of the tributary is estimated 20%. The tributary is not accessible to salmonids due to the water trickling underground into the Noyo around the 20% slope for the first 30'. Fish were not observed in the tributary. In high

		flows, fish still could not use this tributary due to highly entrenched gully and over 10% slope. Right bank seepage.
83865	0556.00	Duffy Gulch enters on the right bank. The water temperature of the tributary was 54 degrees Fahrenheit, the water temperature downstream of the confluence was 59 degrees Fahrenheit, and the water temperature upstream of the confluence was 59 degrees Fahrenheit. The slope of the tributary is 15%. See the 2015 Duffy Gulch stream habitat report. Tributary #20 enters on the left bank. The water temperature of the tributary was 54 degrees Fahrenheit, the water temperature downstream of the confluence was 59 degrees Fahrenheit, and the water temperature upstream of the confluence was 59 degrees Fahrenheit. The slope of the tributary is 30%. The tributary is not accessible to salmonids due to the extreme slope of 30%. Water is trickling over boulders in highly entrenched channels with swd lying across channel. Fish were not observed in the tributary.
85299	0567.00	Tributary #21 enters on the right bank through a wooden flat bottomed culvert. The water temperature of the tributary was 55 degrees Fahrenheit, the water temperature downstream of the confluence was 61 degrees Fahrenheit, and the water temperature upstream of the confluence was 61 degrees Fahrenheit. The slope of the tributary is estimated 5%. The tributary is not accessible to salmonids due to gradual incline for the first 50' and then a 12' plunge from culvert into a 2' deep pool which is 11' wide by 18' long. Fish were not observed in the tributary.
86748	0573.00	Bridge #14 is the crossing for the Skunk Train railroad (B 1857), and is 41' high x 10' wide x 328' long. It is a train bridge (made of wood) and is not a barrier to salmonids.
87395	0576.00	Tributary #22 enters on the right bank. The water temperature of the tributary was 55 degrees Fahrenheit, the water temperature downstream of the confluence was 58 degrees Fahrenheit, and the water temperature upstream of the confluence was 58 degrees Fahrenheit. The slope of the tributary is estimated 25%. The tributary is not accessible to salmonids due to high gradient riffle for first 50' then step runs for next 100'. The step runs continue on as incline increases with boulders and debris and lying in channel. Fish were not observed in the tributary.
88466	0589.00	There are approximately 15 lamprey redds at the tail crest of this pool.

89450	0600.00	Tributary #23 enters on the left bank. The water temperature of the tributary was 54 degrees Fahrenheit, the water temperature downstream of the confluence was 58 degrees Fahrenheit, and the water temperature upstream of the confluence was 58 degrees Fahrenheit. The slope of the tributary is 80%. The tributary is not accessible to salmonids due to a 7' cascade/waterfall into a 2' deep pool which then turns into a high gradient riffle for 20' then 3' plunge into a very steep and bouldery. Fish were not observed in the tributary.
91195	0615.00	Bridge #15 is the crossing for the Skunk Train Railroad and was not measured due to unsafe conditions because of the train. It is a train bridge (made of wood) and is not a barrier to salmonids.
92320	0625.00	Tributary #24 enters on the left bank. The water temperature of the tributary was not measured due to the tributary being dry. The slope of the tributary is estimated 45%. The tributary is not accessible to salmonids due to extremely steep entrenchment of the tributary with debris lying in channel, possibly creating a barrier. Fish were not observed in the tributary.
92845	0628.00	Tributary #25 enters on the left bank. The water temperature of the tributary was 55 degrees Fahrenheit, the water temperature downstream of the confluence was 59 degrees Fahrenheit, and the water temperature upstream of the confluence was 61 degrees Fahrenheit. The slope of the tributary is 20%. The tributary is accessible to salmonids due to high gradient riffle for first 30' then a 3' plunge and 30' high gradient riffle into a LWD lying in the channel, restricting flow. Slope gradually increases and channel becomes more entrenched but still may be good fish habitat. Fish were not observed in the tributary.
93682	0633.00	Bridge #16 is the crossing for an unnamed road, and is 37' high x 4' wide x 156' long. It is a footbridge (made of wood) and is not a barrier to salmonids.
94041	0635.00	Mesh spanning width of channel in beginning of unit. Holes in mesh big enough for juveniles to swim through, however 50-100 salmonids were gathered directly downstream of mesh.
94451	0637.00	Bridge #15 is the crossing for a Road 1000, and is 24' high x 14' wide x 108' long. It is an automobile bridge (made of wood) and is not a barrier to salmonids.
95770	0646.00	Tributary #26 enters on the right bank. The water temperature of the tributary was 54 degrees Fahrenheit, the water temperature downstream

		of the confluence was 59 degrees Fahrenheit, and the water temperature upstream of the confluence was 59 degrees Fahrenheit. The slope of the tributary is <5%. The tributary is accessible to salmonids. Currently it is disconnected from main stem by gravel bar, but in high flows, tributary would be accessible to fish. SWD laying in channel towards beginning, but channel clears up and has a <5% slope with entrenched channel disconnected by 50'. Unknown fish were observed in the tributary.
97238	0651.00	Tributary #27 enters on the left bank. The water temperature of the tributary was 55 degrees Fahrenheit, the water temperature downstream of the confluence was 58 degrees Fahrenheit, and the water temperature upstream of the confluence was 58 degrees Fahrenheit. The slope of the tributary is estimated 40%. The tributary is not accessible to salmonids due to 40% slope cascade over boulders and rubble for first 100' and then 5' root wad blocking channel and creating a barrier. Water slowly seeping through the root wad. Fish were not observed in the tributary.
99039	0661.00	Tributary #28 enters on the left bank. The water temperature of the tributary was 55 degrees Fahrenheit, the water temperature downstream of the confluence was 57 degrees Fahrenheit, and the water temperature upstream of the confluence was 58 degrees Fahrenheit. The slope of the tributary is estimated 15%. The tributary is not accessible to salmonids due to the first 20' giving way to a high gradient riffle then a 50' step run. A LWD is lodged in the channel causing water behind it to trickle through a 6' drop from the top of the LWD to the bottom of the channel, creating a possible fish barrier. Fish were not observed in the tributary.
100040	0668.00	Tributary #29 enters on the left bank. The water temperature of the tributary was too dry to measure, the water temperature downstream of the confluence was 58 degrees Fahrenheit, and the water temperature upstream of the confluence was 58 degrees Fahrenheit. The slope of the tributary is estimated 45%. The tributary is not accessible to salmonids due to the very steep gully like tributary. It is 1' wide and mainly composed of cobble. Fish were not observed in the tributary.
100119	0670.00	Tributary #30 enters on the right bank. The water temperature of the tributary was 55 degrees Fahrenheit, the water temperature downstream of the confluence was 58 degrees Fahrenheit, and the water temperature upstream of the confluence was 58 degrees Fahrenheit. The slope of the tributary is estimated 35%. The tributary is not accessible to salmonids due to being a very steep gully like tributary. It is 1' wide and mainly comprised of silt and boulders. Boulders and debris lie in the channel and act as a barrier to fish. Fish were not observed in the tributary.

100486	0671.00	Tributary #31 enters on the left bank. The water temperature of the tributary was not measured due to no flow, the water temperature downstream of the confluence was 58 degrees Fahrenheit, and the water temperature upstream of the confluence was 58 degrees Fahrenheit. The slope of the tributary is estimated 45%. The tributary is not accessible to salmonids due to extreme slope and shallow gully like tributary that is <1' wide.
102817	0690.00	Tributary #32 enters on the left bank. The water temperature of the tributary was 53 degrees Fahrenheit, the water temperature downstream of the confluence was 55 degrees Fahrenheit, and the water temperature upstream of the confluence was 57 degrees Fahrenheit. The slope of the tributary is estimated 5%. The tributary is accessible to salmonids due to high gradient riffle, the first 100' has clear passage through the channel which then turns into step runs and riffles for the next 100'. There is a very gradual slope, mostly flat with clear passage for fish. Fish were not observed in the tributary.
103138	0693.00	Tributary #33 enters on the right bank. The water temperature of the tributary was 57 degrees Fahrenheit, the water temperature downstream of the confluence was 58 degrees Fahrenheit, and the water temperature upstream of the confluence was 60 degrees Fahrenheit. The slope of the tributary is estimated 40%. The tributary is not accessible to salmonids due to extremely steep, shallow gully like tributary. Ferns and grass growing in channel, no access for fish. Tributary is 1' wide. Fish were not observed in the tributary.
104412	0704.00	Human constructed boulder fence at top of the riffle.
104466	0705.00	North Fork Noyo enters on the right bank. The water temperature of the tributary was 57 degrees Fahrenheit, the water temperature downstream of the confluence was 58 degrees Fahrenheit, and the water temperature upstream of the confluence was 60 degrees Fahrenheit. The slope of the tributary is estimated <5%. The tributary is accessible to salmonids due to runs and riffles for first 200' with wide unobstructed channel with easy access for fish. Fish were not observed in the tributary. Gravel beach occurs on right bank. Channel type changes to a F3 at HU # 704. Channel type cross-section location is at Hum #705.
105444	0719.00	Bridge #18 is the crossing for the Skunk train railroad (B 21 43), and is 32' high x 10' wide x 183' long. It is a train bridge (made of wood) and is not a barrier to salmonids.

106412	0727.00	Bridge #19 is the ford crossing for an unnamed road, and is 10' wide x 33' long. It is not a barrier to salmonids. People appear to be driving through the river. Salmonids present in area.
106806	0731.00	Tributary #35 enters on the left bank. The water temperature of the tributary was not measured due to tributary being dry, the water temperature downstream of the confluence was 61 degrees Fahrenheit, and the water temperature upstream of the confluence was 61 degrees Fahrenheit. The slope of the tributary is estimated 80%. The tributary is not accessible to salmonids due to extremely steep bedrock wall for 25' up. Water seeping down bedrock tributary has no scour. Fish were not observed in the tributary.
106979	0733.00	Bridge #20 is the crossing for the Skunk Train Railroad (B 21 74), and is 39' high x 10' wide x 119' long. It is a train bridge (made of wood) and is not a barrier to salmonids. HU starts with a 10' riffle.
107508	0738.00	Tributary #36 enters on the left bank. The water temperature of the tributary was not measured because it was dry, the water temperature downstream of the confluence was 58 degrees Fahrenheit, and the water temperature upstream of the confluence was 58 degrees Fahrenheit. The slope of the tributary is estimated 45%. The tributary is not accessible to salmonids due to extremely steep slope. Tributary is subsurface and under root wads and debris. Fish were not observed in the tributary.
107810	0740.00	Tributary #37 enters on the left bank. The water temperature of the tributary was 54 degrees Fahrenheit, the water temperature downstream of the confluence was 58 degrees Fahrenheit, and the water temperature upstream of the confluence was 58 degrees Fahrenheit. The slope of the tributary is estimated 35%. The tributary is not accessible to salmonids due to the first 40' leading to a high gradient riffle, then a 5' plunge and another 6' plunge with an LWD lying in the channel above 6' plunge possible barrier for salmonids. Fish were not observed in the tributary.
109054	0749.00	Tributary #38 enters on the left bank. The water temperature of the tributary was 56 degrees Fahrenheit, the water temperature downstream of the confluence was 60 degrees Fahrenheit, and the water temperature upstream of the confluence was 60 degrees Fahrenheit. The slope of the tributary is estimated 60%. The tributary is not accessible to salmonids due to 9' plunge over bedrock wall into 0.5' run. Probably a waterfall in high flow, during survey tributary is trickling down wall. Top of bedrock wall is very steep incline with debris lying in channel. Fish were not observed in the tributary.

109404	0757.00	Bridge #21 is the crossing for the Skunk Train Railroad, and was not measured due to danger of railcars. It is a train bridge (made of wood) and is not a barrier to salmonids.
111205	0774.00	Bridge #22 is the crossing for the Skunk Train Railroad, and was not measured due to danger of railroad tracks. It is a train bridge (made of wood) and is not a barrier to salmonids.
111565	0778.00	Unsurveyable due to aggressive barking dogs. Cuts through land where there was no permission from landowners. Property where there was access had a garden with fence blocking access to Noyo, therefore it went unsurveyed.
117265	0787.00	Bridge #23 is the crossing for an unnamed road near Big Stump Tree Farm, and is 20' high x 6.5' wide x 56' long. It is a train bridge (made of wood) and is not a barrier to salmonids.
118607	0801.00	Tributary #39 enters on the right bank. The water temperature of the tributary was not measured because it was dry, the water temperature downstream of the confluence was 66 degrees Fahrenheit, and the water temperature upstream of the confluence was 66 degrees Fahrenheit. The slope of the tributary is estimated 66%. The tributary is not accessible to salmonids due to it being a very entrenched gully like trib with steep slope debris lying in dry channel. Fish were not observed in the tributary.
119010	0803.00	Tributary #40 enters on the left bank. The water temperature of the tributary was 61 degrees Fahrenheit, the water temperature downstream of the confluence was 64 degrees Fahrenheit, and the water temperature upstream of the confluence was 65 degrees Fahrenheit. The slope of the tributary is <5%. The tributary is accessible to salmonids due to very gradual slope and clear channel way with step runs and riffles. Fish were not observed in the tributary.
119679	0818.00	There is a decommissioned road/ford on the left bank, where it is starting to form a gully. It is not in use and is not a barrier to salmonids.
119868	0819.00	There is a decommissioned road/ford that continues from the previous unit and appears on the right bank within this unit.
119957	0821.00	Bridge #24 is the crossing for an unnamed road, and is 15' high x 10' wide x 48' long. It is an automobile bridge (made of wood) and is not a barrier to salmonids.

122222	0851.00	Bridge #25 is the crossing for an unnamed road, and is 22' high x 12' wide x 66' long. It is a automobile bridge (made of wood) and is not a barrier to salmonids.
123128	0864.00	Bedrock dominated from here until HU # 868.
123542	0870.00	Olds Creek enters on the left bank. See the 2013 Olds Creek stream habitat report. The water temperature of the tributary was 63 degrees Fahrenheit, the water temperature downstream of the confluence was 68 degrees Fahrenheit, and the water temperature upstream of the confluence was 67 degrees Fahrenheit. The slope of the tributary is estimated <5%. The tributary is accessible to salmonids due to step runs and riffles. Fish were observed in the tributary.
123707	0871.00	Bridge #26 is the crossing for Irmulco Road and was not measured due to sporadically crossing vehicles. It is an automobile bridge (made of wood) and is not a barrier to salmonids.
123979	0877.00	Bedrock is the main substrate.
124152	0880.00	Erosion on right bank measuring 30' long.
125067	0895.00	Bridge #27 is the crossing for Redwood Meadows Road, and is 15' high x 11' wide x 89' long. It is an automobile bridge (made of wood) and is not a barrier to salmonids.
125886	0907.01	Start of side channel. Sediment built up on left bank.
127626	0936.00	Three redwoods fell into channel and lifted root wad causing bare sediment on right bank.
128927	0954.00	Redwood Creek enters on the right bank. See Redwood Creek stream habitat report. The water temperature of the tributary was 64 degrees Fahrenheit, the water temperature downstream of the confluence was 64 degrees Fahrenheit, and the water temperature upstream of the confluence was 64 degrees Fahrenheit. The slope of the tributary is <5%. The tributary is accessible to salmonids due to first 100' runs and riffles through a clear channel passage. Fish were observed in the tributary.
129011	0955.00	Bridge #28 is the crossing for Redwood Creek Rd, and is 12' high x 14' wide x 72' long. It is an automobile bridge (made of wood) and is not a barrier to salmonids.
129644	0963.00	Erosion on left bank fairly consistent throughout the stretch of Noyo that parallels Shake City Road.

129918	0969.00	Erosion on left bank measures 13' high x 161' long. High algae growth in pool.
131659	0999.00	Erosion on the left bank is 80' long x 8' high.
134088	1049.00	From this point on the river is drying up and many pools are more like puddles in between dry units.
134663	1056.00	Erosion on left bank is 13' high x 13' long x and 2' wide.
135284	1069.00	Log jam with a lot of SWD piled over LWD.
135734	1079.00	Tributary #44 enters on the right bank. The water temperature of the tributary was not measured because there was no flow, the water temperature downstream of the confluence was 60 degrees Fahrenheit, and the water temperature upstream of the confluence was 60 degrees Fahrenheit. The slope of the tributary is estimated 5%. The tributary is not accessible to salmonids due to being very entrenched tributary over grown with blackberries blocking the channel. Same 5% slope for 200'. Fish were not observed in the tributary. Sand bar on the left bank. blocking the channel. Same 5% slope for 200'.
135904	1081.00	Bridge #29 is the crossing for an unnamed road logging road near Shake City Rd, and is 9.3' high x 11.5' wide x 69' long. It is an automobile bridge (made of metal) and is not a barrier to salmonids.
137160	1106.00	Tributary #45 (Gulch Creek) enters on the right bank. The water temperature of the tributary was not measured because it was dry, the water temperature downstream of the confluence was 60 degrees Fahrenheit, and the water temperature upstream of the confluence was 60 degrees Fahrenheit. The slope of the tributary is estimated 5%. The tributary is not accessible to salmonids due to horsetails growing in channel for first 100'. Tributary looks like it's been dry for the majority of rainy season. Turns into a gulch at 200' with grasses growing in substrate with LWD lying in channel. Fish were not observed in the tributary.
137535	1113.00	Log jam with SWD piled up along right bank.
137699	1117.00	Erosion of left bank is 12' high and about 2' long.
137765	1119.00	Erosion on left bank.
138138	1125.00	Erosion on left bank.

141830	1212.00	Erosion on left bank for approximately 100' x 15' high.
142904	1237.00	Erosion on the left bank.
143755	1254.00	McMullen Creek enters on right bank. See the 2013 McMullen Creek stream habitat inventory report. The water temperature of the tributary was 58 degrees Fahrenheit, the water temperature downstream of the confluence was 58 degrees Fahrenheit, and the water temperature upstream of the confluence was 56 degrees Fahrenheit. The slope of the tributary is estimated <5%. The tributary is accessible to salmonids due to very low slope with clear passage in the channel. Creek has dry spots and pools for 388' and then comes to a culvert where salmonids were spotted inside of it as well as in the pools. Fish were observed in the tributary.
144200	1266.00	Bridge #30 is the crossing for an unnamed road, and is 10.5' high x 11.7' wide x 46' long. It is an automobile bridge (made of wood) and is not a barrier to salmonids.
144365	1268.00	Erosion on left bank.
144613	1277.00	Log accumulation in this HU.
145998	1308.00	Bridge #31 is the crossing for an unnamed road, and is 14' high x 9' wide x 92' long. It is an automobile bridge (made of metal) and is not a barrier to salmonids.
146158	1312.00	Erosion on right bank.
146678	1324.00	Erosion on left bank.
146703	1325.00	Erosion on left bank.
148236	1362.00	Tributary #47. The water temperature of the tributary was not measured, the water temperature downstream of the confluence was 60 degrees Fahrenheit, and the water temperature upstream of the confluence was 60 degrees Fahrenheit. The slope of the tributary is estimated 10%. The tributary is accessible to salmonids due to summer time dryness. During winter, there might be a clear entrenched channel with little debris in channel. Fish were not observed in the tributary.
150424	1408.00	Bridge #32 is the crossing for an unnamed road, and is 10' high x 13.5' wide x 62' long. It is an automobile bridge (made of wood) and is not a barrier to salmonids. Not shown on GPS.

151384	1425.00	Erosion on left bank that is 11' high x 50' long.
151739	1433.00	LDA #2 contains 1 piece of LWD and measures 3' high x 35' wide x 3' long. Water flows through the LDA and there are no visible gaps in it. Retained sediment ranges from sand to boulders and measures 26' wide x 12' long x 1' deep. Fish were observed above the LDA. There is a 2' plunge over the LWD into a 2.3' deep pool.
152181	1448.00	Burbeck Creek enters on the right bank. The water temperature of the tributary was 57 degrees Fahrenheit, the water temperature downstream of the confluence was 57 degrees Fahrenheit, and the water temperature upstream of the confluence was 57 degrees Fahrenheit. The slope of the tributary is estimated 5%. The tributary is accessible to salmonids, adults can easily swim up the creek in winter and juveniles can still swim down in summer flow. Clear channel besides where CCC has installed LWD. Fish were observed in the tributary.
152502	1454.00	Channel type changes to a F4 at HU #1453. Channel type cross-section location is at HU #1458.
152617	1456.00	Ford on both banks with natural stream bed.
153183	1465.00	Erosion on left bank.
154184	1481.00	Erosion on left bank with a 1+ salmonid observed. A log accumulation is present.
154670	1494.00	LDA #3 is 5.5' high x 42' wide x 15' long and contains 13 pieces of LWD. Water flows through the LDA and there are no visible gaps in it. Sediment is being retained in the approximate dimensions of 36' wide x 14' long x 1.3' deep. The sediment ranges in size from sand to large cobble. Fish were observed above the LDA.
155149	1504.00	Tributary #49 enters on the right bank. The water temperature of the tributary was not measured due to being dry, the water temperature downstream of the confluence was 60 degrees Fahrenheit, and the water temperature upstream of the confluence was 60 degrees Fahrenheit. The slope of the tributary is estimated 40%. The tributary is accessible to salmonids as steelhead could still jump up tributary during high flow, but it is very steep and entrenched. There is debris lying in the channel as well as ferns growing in it. Fish were not observed in the tributary.
156055	1522.00	Erosion on left bank with hardwood trees lying in channel.

156946	1543.00	Dry tributary on left bank.
157064	1547.00	LDA #4 is 5' high x 16' wide x 8' long and contains 1 pieces of LWD. Water does not flows through the LDA and there are no visible gaps in it. Sediment is being retained in the approximate dimensions of 11' wide x 21' long x 3' deep. The sediment ranges in size from sand to large cobble. The LDA is a possible barrier to juvenile salmonids as water flows subsurface once it hits the LDA so juveniles cannot swim down. Adults can jump over LDA in high flows. Fish were observed above the LDA.
157437	1566.00	LDA #5 is 5' high x 16' wide x 12' long and contains 4 pieces of LWD. Water flows through the LDA and there are no visible gaps in it. Sediment is being retained in the approximate dimensions of 12' wide x 11' long x 1' deep. The sediment ranges in size from silt to boulders. The LDA is a possible barrier to juvenile salmonids as water flows underground so juveniles cannot swim downstream. Fish were observed above the LDA. 7' plunge over LDA into a 0.5' pool.
157744	1577.00	Silt is primary substrate significantly different than before.
157812	1578.00	Channel type changes to a B4 at HU #1577. Channel type cross-section location is at HU #1577.
157822	1579.00	YOY salmonid observed.
157844	1580.00	LDA #6 is 5' high x 23' wide x 4' long and contains 5 pieces of LWD. Water does not flow through the LDA and there are no visible gaps in it. Sediment is being retained in the approximate dimensions of 19' wide x 18' long x 3' deep. The sediment ranges in size from silt to gravel. The LDA is a possible barrier to juvenile salmonids as water flows subsurface from top of LDA to bottom so juveniles can't swim down. Adults can jump up in high flows. A single LWD >20' spans across channel width. Fish were observed above the LDA.
158275	1597.00	LDA #7 is 4' high, 14' wide x 4' long x contains 5 pieces of LWD. Water does not flow through the LDA and there are no visible gaps in it. Sediment is being retained in the approximate dimensions of 15.5' wide x 14' long x 1' deep. The sediment ranges in size from silt to gravel. The LDA is a possible barrier to juvenile salmonids as the creek bed is dry above the LDA so juveniles won't be swimming downstream. Adults can jump over LDA in high flows. Fish were not observed above the LDA.

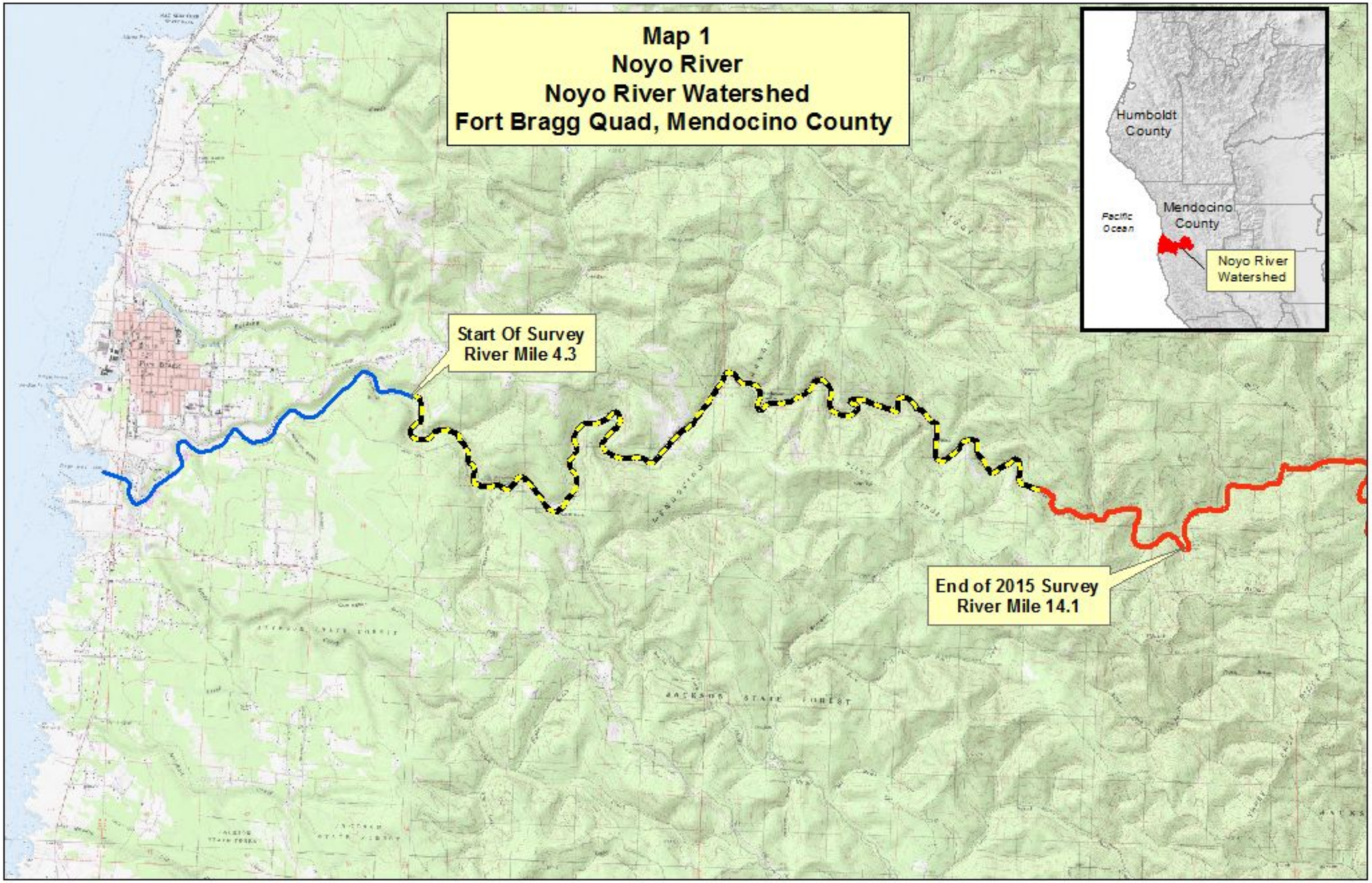
158740	1605.00	There is a 4.5' plunge over a culvert into 4.5' pool.
158830	1606.00	Culvert #1 is California Western Railroad and is 8.7' high x 8.7' wide x 140' long. It is composed of one culvert, and is made of CMP. The culvert's diameter is 8.7', its plunge height is 4.5', and it has a maximum depth of 5.7' within 5' of the outlet. The slope is 2%, and its condition is poor as it is rusted along bottom. It is a possible barrier to juvenile and adult salmonids, as the 4.5' plunge is an end to anadromy. Flow is running along bottom, no debris blocking channel in the culvert. CMP composes the bottom.
159205	1612.00	End of Survey because of very steep cascade and consecutive 7' plunges with no big pools for salmonids to rest in Ended 100' up very steep cascade area. Stream appears to continue as steep cascade becomes more entrenched. Tributary #50 enters on the left bank. The water temperature of the tributary was 52 degrees Fahrenheit, the water temperature downstream of the confluence was 54 degrees Fahrenheit, and the water temperature upstream of the confluence was 55 degrees Fahrenheit. The slope of the tributary is estimated 30%. Fish were not observed in the tributary.

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.

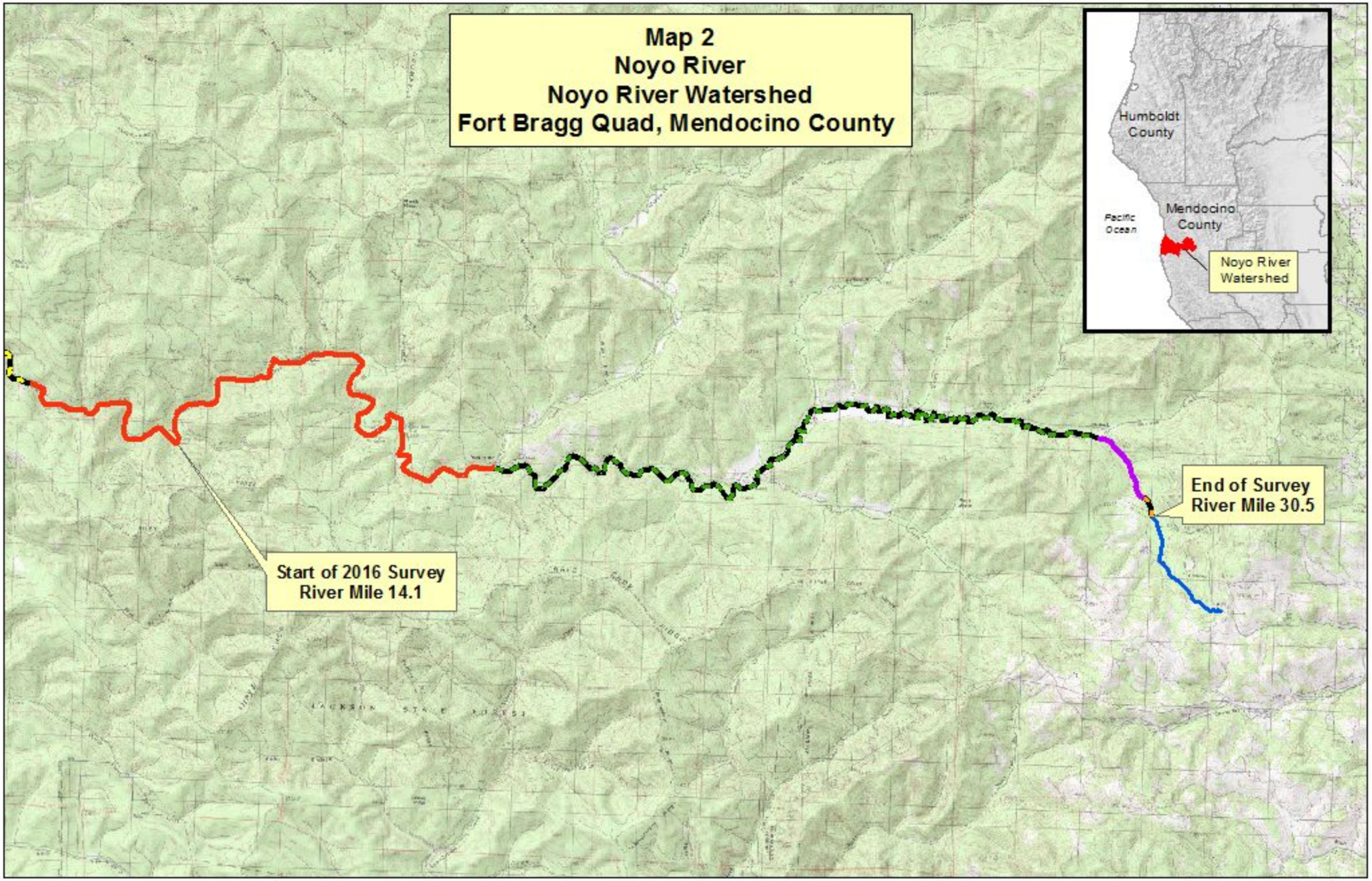
LEVEL III and LEVEL IV HABITAT TYPES

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]	



*River Mile indicates distance from confluence with the Pacific Ocean

Coordinate System: NAD 1983 California Teale Albers
Data Sources: CDFW, USGS, Cal Water 2.21, CDF 24k



*River Mile indicates distance from confluence with the Pacific Ocean

Coordinate System: NAD 1983 California Teale Albers
Data Sources: CDFW, USGS, Cal Water 2.21, CDF 24k

APPENDIX I

TABLES AND GRAPHS

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

Stream Name: Noyo River LLID: 1238090394278 Drainage: Noyo River

Survey Dates: 9/23/2015 to 9/13/2016

Confluence Location: Quad: NOYO HILL Legal Description: T18NR18WS13 Latitude: 39:25:40.0N Longitude: 123:48:32.0

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
1	0	CULVERT	0.1	140	140	0.1									
77	2	DRY	4.6	49	3755	2.3	15.0	0.0							0
437	51	FLATWATER	26.3	99	43102	26.5	16.9	0.6	1.3	2796	1221916	2611	1140836		2
3	0	NOSURVEY	0.2	2711	8132	5.0									
682	681	POOL	41.0	136	93065	57.1	22.4	1.4	3.2	4014	2737317	9161	6247693	8012	15
464	48	RIFFLE	27.9	32	14754	9.1	13.8	0.3	0.8	435	201948	179	83263		2

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
1664	782	162948	4161180	7471792

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Noyo River LLID: 1238090394278 Drainage: Noyo River

Survey Dates: 9/23/2015 to 9/13/2016

Confluence Location: Quad: NOYO HILL Legal Description: T18NR18WS13 Latitude: 39:25:40.0N Longitude: 123:48:32.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	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 Canopy (%)
390	38	LGR	23.4	33	12730	7.8	14	0.3	7	511	199393	209	81416		2	89
71	9	HGR	4.3	25	1788	1.1	13	0.4	2.2	134	9484	67	4751		0	91
3	1	CAS	0.2	79	236	0.1	18	0.3	0.7	261	783	78	235		0	100
4	1	POW	0.2	152	608	0.4	17	1.0	2.4	2414	9656	2414	9656		0	74
4	2	GLD	0.2	264	1056	0.6	37	1.3	3	9291	37164	15608	62431		5	89
286	25	RUN	17.2	86	24535	15.1	16	0.6	2.7	2362	675610	2016	576600		2	88
141	22	SRN	8.5	119	16794	10.3	16	0.5	2.2	2807	395779	2196	309632		3	85
2	1	EDW	0.1	54	109	0.1	21	1.0	2.5	798	1596	798	1596		5	97
2	1	TRP	0.1	184	367	0.2	32	1.7	3.7	8768	17536	17536	35072	14906	0	74
535	535	MCP	32.2	146	78327	48.1	22	1.5	12.6	4360	2332729	10031	5366743	8826	14	89
4	4	CCP	0.2	108	431	0.3	23	1.5	5.7	3335	13341	7262	29048	6453	6	88
26	26	CRP	1.6	87	2251	1.4	16	0.8	7.8	1827	47492	3031	78806	2549	9	88
28	28	LSL	1.7	82	2299	1.4	22	1.1	6.6	2070	57963	3482	97501	3019	26	89
12	12	LSR	0.7	66	793	0.5	22	1.2	5.2	1504	18043	2651	31815	2383	52	90
45	45	LSBk	2.7	152	6849	4.2	28	1.8	7.5	4889	219992	12479	561573	10464	3	84
10	10	LSBo	0.6	80	798	0.5	24	1.2	4.8	1979	19791	3871	38714	2936	17	84
6	6	PLP	0.4	31	187	0.1	17	1.3	5.1	563	3376	893	5359	840	34	95
9	9	SCP	0.5	61	549	0.3	14	0.9	4	789	7100	807	7266	711	22	91
2	2	BPB	0.1	28	55	0.0	10	0.8	1.9	274	548	235	471	214	10	99
1	1	BPR	0.1	65	65	0.0	25	0.4	2.7	1625	1625	1625	1625	650	20	99
2	2	BPL	0.1	47	94	0.1	22	0.5	1.9	1267	2534	1038	2075	428	40	98
77	2	DRY	4.6	49	3755	2.3	15	0.0		0	0				0	90
1	0	CUL	0.1	140	140	0.1										
3	0	NS	0.2	2711	8132	5.0										

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
1664	782	162948	4071535	7302384

Table 3 - Summary of Pool Types

Stream Name: Noyo River LLID: 1238090394278 Drainage: Noyo River

Survey Dates: 9/23/2015 to 9/13/2016

Confluence Location: Quad: NOYO HILL Legal Description: T18NR18WS13 Latitude: 39:25:40.0N Longitude: 123:48:32.0W

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
541	540	MAIN	79	146	79125	85	22.4	1.5	4361	2359200	8820	4771649	14
127	127	SCOUR	19	104	13177	14	22.9	1.3	2887	366658	5391	684720	16
14	14	BACKWATER	2	55	763	1	15.1	0.8	843	11807	595	8332	23

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
682	681	93065	2737664	5464700

Table 4 - Summary of Maximum Residual Pool Depths By Pool Habitat Types

Stream Name: Noyo River LLID: 1238090394278 Drainage: Noyo River

Survey Dates: 9/23/2015 to 9/13/2016

Confluence Location: Quad: NOYO HILL Legal Description: T18NR18WS13 Latitude: 39:25:40.0N Longitude: 123:48:32.0W

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
1	TRP	0	0	0	0	0	0	0	1	100	0	0
535	MCP	79	15	3	118	22	137	26	102	19	163	30
4	CCP	1	0	0	1	25	1	25	1	25	1	25
26	CRP	4	0	0	18	69	5	19	1	4	2	8
28	LSL	4	0	0	7	25	12	43	5	18	4	14
12	LSR	2	0	0	3	25	1	8	5	42	3	25
45	LSBk	7	0	0	7	16	8	18	11	24	19	42
10	LSBo	1	0	0	2	20	4	40	2	20	2	20
6	PLP	1	0	0	2	33	2	33	0	0	2	33
9	SCP	1	0	0	5	56	2	22	1	11	1	11

Total Units	Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1< 2 Foot Max Resid. Depth	Total 1< 2 Foot % Occurrence	Total 2< 3 Foot Max Resid. Depth	Total 2< 3 Foot % Occurrence	Total 3< 4 Foot Max Resid. Depth	Total 3< 4 Foot % Occurrence	Total >= 4 Foot Max Resid. Depth	Total >= 4 Foot % Occurrence
681	15	2	167	25	173	25	129	19	197	29

Mean Maximum Residual Pool Depth (ft.): 3.2

Stream Name: Noyo River LLID: 1238090394278 Drainage: Noyo River

Survey Dates: 9/23/2015 to 9/13/2016

Confluence Location: Quad: NOYO HILL Legal Description: T18NR18WS13 Latitude: 39:25:40.0N Longitude: 123:48:32.0W

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
2	BPB	0	0	0	2	100	0	0	0	0	0	0
1	BPR	0	0	0	0	0	1	100	0	0	0	0
2	BPL	0	0	0	2	100	0	0	0	0	0	0

Total Units	Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1< 2 Foot Max Resid. Depth	Total 1< 2 Foot % Occurrence	Total 2< 3 Foot Max Resid. Depth	Total 2< 3 Foot % Occurrence	Total 3< 4 Foot Max Resid. Depth	Total 3< 4 Foot % Occurrence	Total >= 4 Foot Max Resid. Depth	Total >= 4 Foot % Occurrence
681	15	2	167	25	173	25	129	19	197	29

Mean Maximum Residual Pool Depth (ft.): 3.2

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Noyo River LLID: 1238090394278 Drainage: Noyo River

Survey Dates: 9/23/2015 to 9/13/2016 Dry Units: 77

Confluence Location: Quad: NOYO HILL Legal Description: T18NR18WS13 Latitude: 39:25:40.0N Longitude: 123:48:32.0W

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
390	38	LGR	0	0	0	0	100	0	0	0	0
71	10	HGR	0	0	0	0	0	0	0	0	0
3	1	CAS	0	0	0	0	0	0	0	0	0
464	49	**TOTAL RIFFLE**	0	0	0	0	100	0	0	0	0
4	1	POW	0	0	0	0	0	0	0	0	0
4	2	GLD	0	59	16	0	25	0	0	0	0
286	24	RUN	21	8	57	0	14	0	0	0	0
141	22	SRN	0	48	0	0	52	0	0	0	0
2	1	EDW	0	100	0	0	0	0	0	0	0
437	50	**TOTAL FLAT**	5	41	18	0	36	0	0	0	0
2	1	TRP	0	0	0	0	0	0	0	0	0
535	531	MCP	15	21	32	10	11	1	0	8	1
4	4	CCP	0	58	12	0	30	0	0	0	0
26	26	CRP	44	16	10	22	6	2	0	0	0
28	28	LSL	3	26	55	5	5	1	0	3	0
12	12	LSR	9	21	61	6	2	0	0	1	0
45	45	LSBk	10	32	21	3	10	0	0	21	3
10	10	LSBo	5	6	10	0	7	0	0	72	0
6	6	PLP	13	10	28	6	2	0	4	37	0
9	9	SCP	28	36	13	6	0	12	0	5	0
2	2	BPB	0	0	0	0	0	0	0	100	0
1	1	BPR	0	10	90	0	0	0	0	0	0
2	2	BPL	15	10	25	10	0	40	0	0	0
682	677	**TOTAL POOL**	16	20	32	10	10	2	0	9	1
1	0	CUL	0	0	0	0	0	0	0	0	0
3	0	NS	0	0	0	0	0	0	0	0	0
1664	778	**TOTAL**	16	21	32	10	11	1	0	7	2

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Noyo River LLID: 1238090394278 Drainage: Noyo River

Survey Dates: 9/23/2015 to 9/13/2016 Dry Units: 77

Confluence Location: Quad: NOYO HILL Legal Description: T18NR18WS13 Latitude: 39:25:40.0N Longitude: 123:48:32.0W

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
390	38	LGR	0	0	53	21	24	3	0
71	9	HGR	0	0	11	0	33	44	11
3	1	CAS	0	0	0	0	0	100	0
4	1	POW	0	0	0	100	0	0	0
4	2	GLD	0	50	0	50	0	0	0
286	25	RUN	0	12	44	12	24	4	4
141	22	SRN	0	5	32	23	9	32	0
2	1	EDW	0	0	100	0	0	0	0
2	1	TRP	0	0	0	0	0	0	100
535	535	MCP	4	11	56	12	7	4	6
4	4	CCP	25	0	50	25	0	0	0
26	26	CRP	4	4	69	15	8	0	0
28	28	LSL	0	11	71	11	7	0	0
12	12	LSR	8	0	67	8	17	0	0
45	45	LSBk	0	9	47	31	0	0	13
10	10	LSBo	0	10	10	0	20	60	0
6	6	PLP	33	17	33	0	0	17	0
9	9	SCP	0	44	33	0	22	0	0
2	2	BPB	0	50	0	0	0	50	0
1	1	BPR	0	0	0	0	100	0	0
2	2	BPL	0	0	100	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: Noyo River LLID: 1238090394278 Drainage: Noyo River

Survey Dates: 9/23/2015 to 9/13/2016

Confluence Location: Quad: NOYO HILL Legal Description: T18NR18WS13 Latitude: 39:25:40.0N Longitude: 123:48:32.0W

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
88	37	63	0	98	97

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: Noyo River LLID: 1238090394278 Drainage: Noyo River

Survey Dates: 9/23/2015 to 9/13/2016 Survey Length (ft.): 162948 Main Channel (ft.): 159399 Side Channel (ft.): 3549

Confluence Location: Quad: NOYO HILL Legal Description: T18NR18WS13 Latitude: 39:25:40.0N Longitude: 123:48:32.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type: F4
Reach Length (ft.): 63008
Riffle/Flatwater Mean Width (ft.): 19.3
BFW:
Range (ft.): 3 to 90
Mean (ft.): 56
Std. Dev.: 13
Base Flow (cfs.): 2.0
Water (F): 55 - 60 Air (F): 46 - 69
Dry Channel (ft): 832

Canopy Density (%): 82.8
Coniferous Component (%): 30.7
Hardwood Component (%): 69.3
Dominant Bank Vegetation: Hardwood Trees
Vegetative Cover (%): 93.8
Dominant Shelter: Terrestrial Veg.
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 16
LWD per 100 ft.:
Riffles: 0
Pools: 1
Flat: 1

Pools by Stream Length (%): 62.0
Pool Frequency (%): 39.7
Residual Pool Depth (%):
< 2 Feet Deep: 7
2 to 2.9 Feet Deep: 15
3 to 3.9 Feet Deep: 23
>= 4 Feet Deep: 55
Mean Max Residual Pool Depth (ft.): 4.1
Mean Pool Shelter Rating: 14

Pool Tail Substrate (%): Silt/Clay: 0 Sand: 2 Gravel: 85 Sm Cobble: 11 Lg Cobble: 1 Boulder: 0 Bedrock: 0

Embeddedness Values (%): 1. 55.7 2. 36.8 3. 5.4 4. 1.1 5. 1.1

STREAM REACH: 2

Channel Type: F2
Reach Length (ft.): 41480
Riffle/Flatwater Mean Width (ft.): 20.1
BFW:
Range (ft.): 23 to 73
Mean (ft.): 49
Std. Dev.: 14
Base Flow (cfs.): 2.0
Water (F): 55 - 62 Air (F): 53 - 74
Dry Channel (ft): 231

Canopy Density (%): 81.2
Coniferous Component (%): 46.0
Hardwood Component (%): 54.0
Dominant Bank Vegetation: Hardwood Trees
Vegetative Cover (%): 99.4
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Bedrock
Occurrence of LWD (%): 12
LWD per 100 ft.:
Riffles: 0
Pools: 1
Flat: 0

Pools by Stream Length (%): 56.3
Pool Frequency (%): 37.7
Residual Pool Depth (%):
< 2 Feet Deep: 8
2 to 2.9 Feet Deep: 24
3 to 3.9 Feet Deep: 20
>= 4 Feet Deep: 48
Mean Max Residual Pool Depth (ft.): 4.2
Mean Pool Shelter Rating: 6

Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 66 Sm Cobble: 15 Lg Cobble: 2 Boulder: 7 Bedrock: 10

Embeddedness Values (%): 1. 38.3 2. 36.4 3. 8.4 4. 0.0 5. 16.8

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 3

Channel Type: F3
Reach Length (ft.): 48014
Riffle/Flatwater Mean Width (ft.): 9.9
BFW:
Range (ft.): 14 to 45
Mean (ft.): 26
Std. Dev.: 6
Base Flow (cfs.): 2.0
Water (F): 54 - 65 Air (F): 52 - 84
Dry Channel (ft): 2537

Canopy Density (%): 92.6
Coniferous Component (%): 33.8
Hardwood Component (%): 66.2
Dominant Bank Vegetation: Hardwood Trees
Vegetative Cover (%): 98.8
Dominant Shelter: Large Woody Debris
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 25
LWD per 100 ft.:
Riffles: 0
Pools: 2
Flat: 0

Pools by Stream Length (%): 54.3
Pool Frequency (%): 43.6
Residual Pool Depth (%):
< 2 Feet Deep: 38
2 to 2.9 Feet Deep: 32
3 to 3.9 Feet Deep: 19
>= 4 Feet Deep: 12
Mean Max Residual Pool Depth (ft.): 2.5
Mean Pool Shelter Rating: 17

Pool Tail Substrate (%): Silt/Clay: 0 Sand: 1 Gravel: 59 Sm Cobble: 21 Lg Cobble: 12 Boulder: 0 Bedrock: 7
Embeddedness Values (%): 1. 20.6 2. 44.8 3. 24.5 4. 0.6 5. 9.4

STREAM REACH: 4

Channel Type: F4
Reach Length (ft.): 5310
Riffle/Flatwater Mean Width (ft.): 10.9
BFW:
Range (ft.): 14 to 26
Mean (ft.): 19
Std. Dev.: 3
Base Flow (cfs.): 2.0
Water (F): 56 - 60 Air (F): 60 - 74
Dry Channel (ft): 0

Canopy Density (%): 96.7
Coniferous Component (%): 52.4
Hardwood Component (%): 47.6
Dominant Bank Vegetation: Coniferous Trees
Vegetative Cover (%): 99.4
Dominant Shelter: Large Woody Debris
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 21
LWD per 100 ft.:
Riffles: 4
Pools: 5
Flat: 2

Pools by Stream Length (%): 39.6
Pool Frequency (%): 41.1
Residual Pool Depth (%):
< 2 Feet Deep: 57
2 to 2.9 Feet Deep: 31
3 to 3.9 Feet Deep: 6
>= 4 Feet Deep: 6
Mean Max Residual Pool Depth (ft.): 2.1
Mean Pool Shelter Rating: 19

Pool Tail Substrate (%): Silt/Clay: 8 Sand: 0 Gravel: 35 Sm Cobble: 31 Lg Cobble: 10 Boulder: 14 Bedrock: 2
Embeddedness Values (%): 1. 31.4 2. 35.3 3. 17.6 4. 0.0 5. 15.7

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 5

Channel Type: B4
Reach Length (ft.): 1587
Riffle/Flatwater Mean Width (ft.): 8.5
BFW:
Range (ft.): 18 to 31
Mean (ft.): 25
Std. Dev.: 5
Base Flow (cfs.): 2.0
Water (F): 56 - 60 Air (F): 53 - 74
Dry Channel (ft): 155

Canopy Density (%): 96.3
Coniferous Component (%): 83.5
Hardwood Component (%): 16.5
Dominant Bank Vegetation: Coniferous Trees
Vegetative Cover (%): 100.0
Dominant Shelter: Large Woody Debris
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 25
LWD per 100 ft.:
Riffles: 1
Pools: 5
Flat: 1

Pools by Stream Length (%): 25.2
Pool Frequency (%): 28.6
Residual Pool Depth (%):
< 2 Feet Deep: 70
2 to 2.9 Feet Deep: 10
3 to 3.9 Feet Deep: 10
>= 4 Feet Deep: 10
Mean Max Residual Pool Depth (ft.): 2.2
Mean Pool Shelter Rating: 17

Pool Tail Substrate (%): Silt/Clay: 10 Sand: 0 Gravel: 80 Sm Cobble: 0 Lg Cobble: 0 Boulder: 10 Bedrock: 0
Embeddedness Values (%): 1. 20.0 2. 60.0 3. 0.0 4. 0.0 5. 20.0

Table 9 - Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Noyo River LLID: 1238090394278 Drainage: Noyo River

Survey Dates: 9/23/2015 to 9/13/2016

Confluence Location: Quad: NOYO HILL Legal Description: T18NR18WS13 Latitude: 39:25:40.0N Longitude: 123:48:32.0W

Mean Percentage of Dominant Stream Bank Substrate

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Bedrock	98	144	15.5
Boulder	25	32	3.6
Cobble / Gravel	244	200	28.4
Sand / Silt / Clay	415	404	52.4

Mean Percentage of Dominant Stream Bank Vegetation

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Grass	11	4	1.0
Brush	71	61	8.4
Hardwood Trees	505	463	61.9
Coniferous Trees	186	247	27.7
No Vegetation	9	5	0.9

Total Stream Cobble Embeddedness Values: 2

Table 10 - Mean Percent of Shelter Cover Types For Entire Stream

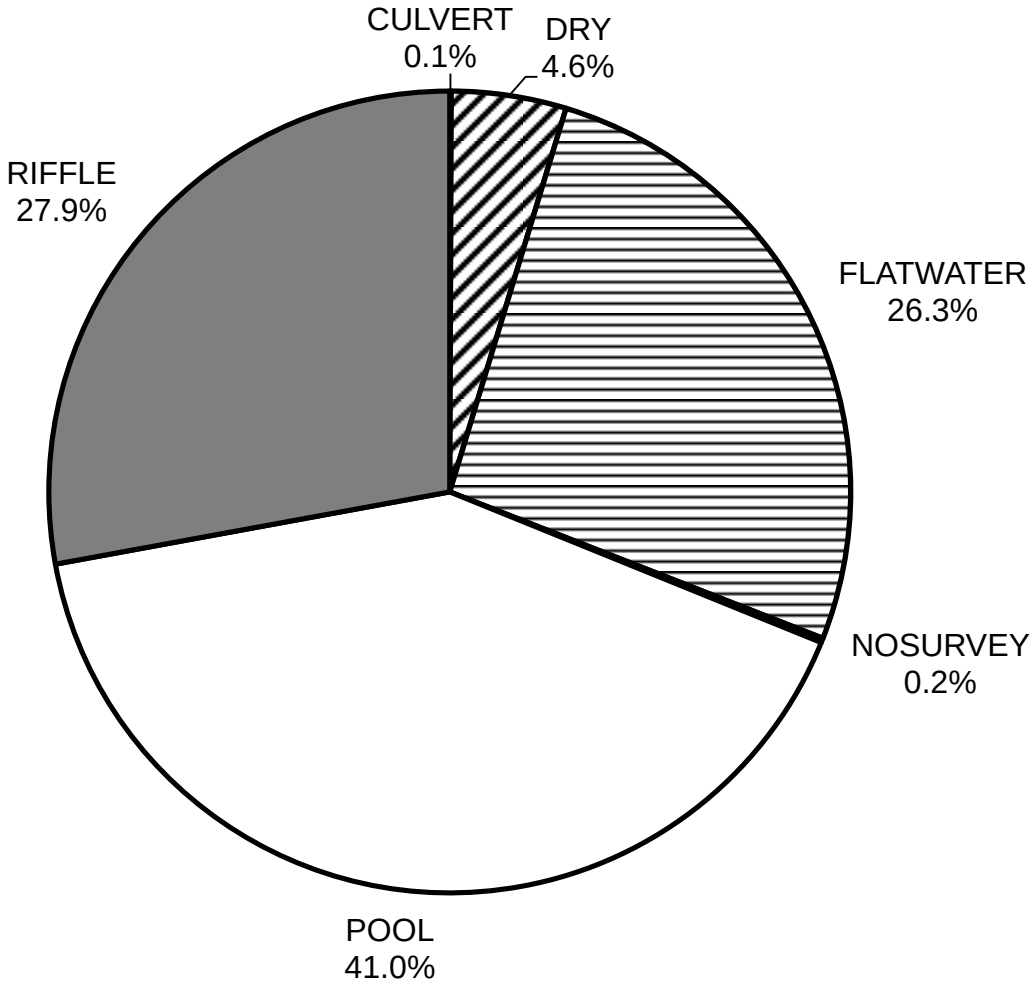
Stream Name: Noyo River | LLID: 1238090394278 | Drainage: Noyo River

Survey Dates: 9/23/2015 to 9/13/2016

Confluence Location: Quad: NOYO HILL | Legal Description: T18NR18WS13 | Latitude: 39:25:40.0N | Longitude: 123:48:32.0W

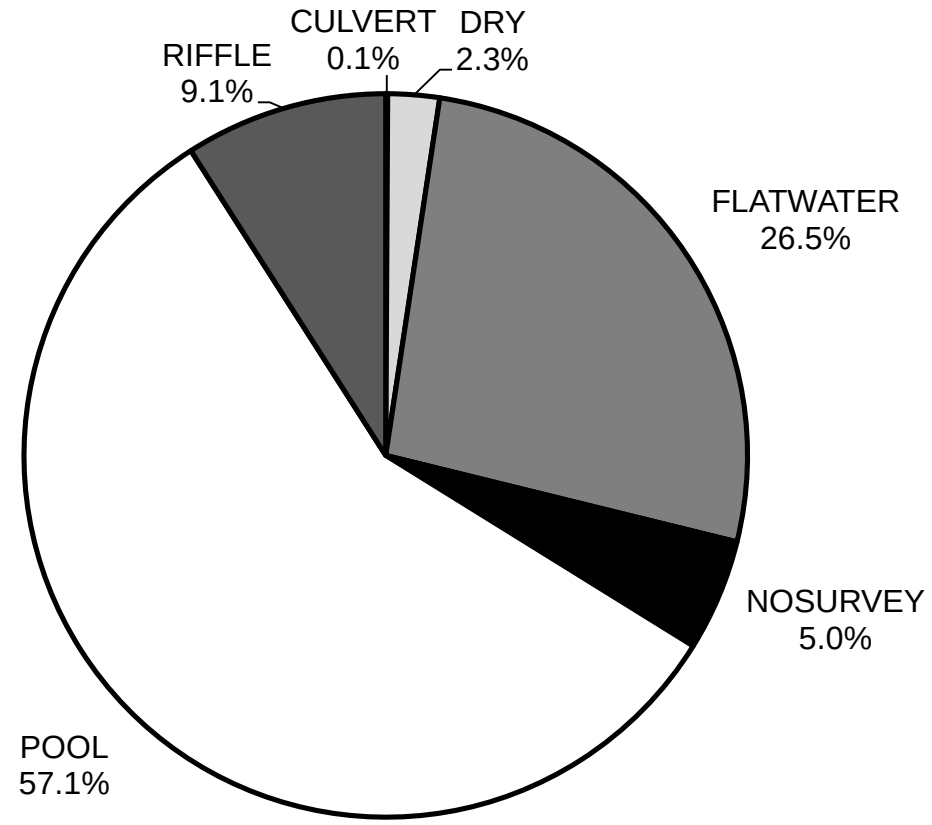
	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	5	16
SMALL WOODY DEBRIS (%)	0	41	20
LARGE WOODY DEBRIS (%)	0	18	32
ROOT MASS (%)	0	0	10
TERRESTRIAL VEGETATION (%)	100	36	10
AQUATIC VEGETATION (%)	0	0	2
WHITEWATER (%)	0	0	0
BOULDERS (%)	0	0	9
BEDROCK LEDGES (%)	0	0	1

NOYO RIVER 2015
HABITAT TYPES BY PERCENT OCCURRENCE



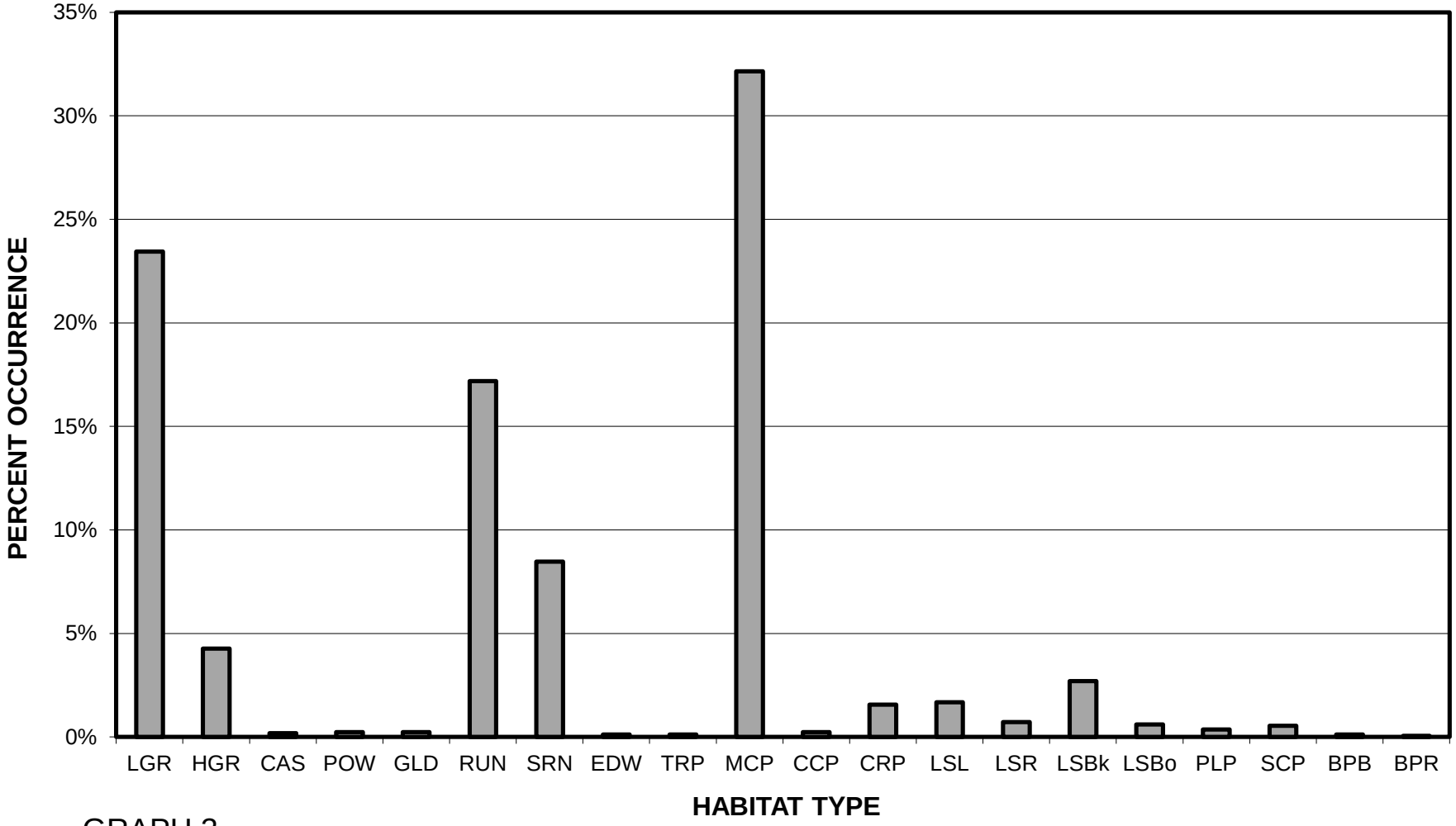
GRAPH 1

NOYO RIVER 2015
HABITAT TYPES BY PERCENT TOTAL LENGTH



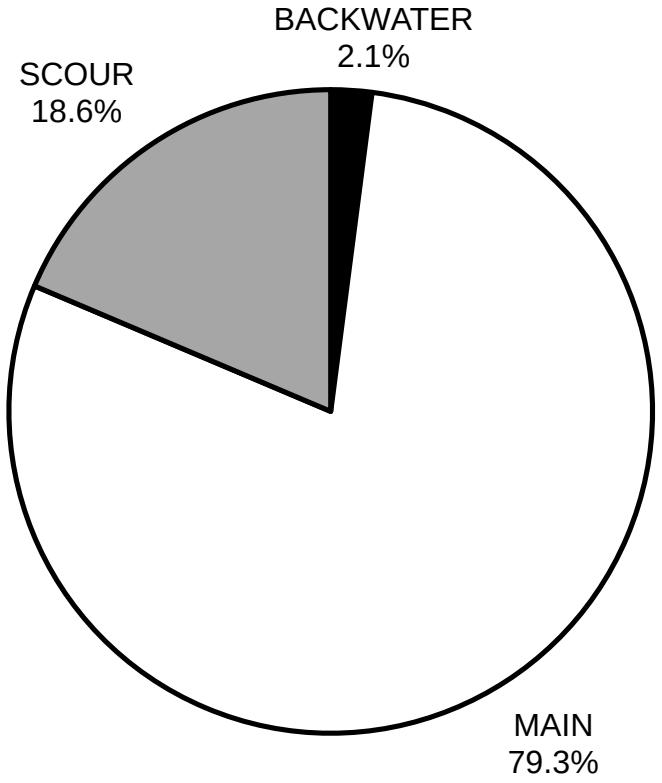
GRAPH 2

NOYO RIVER 2015
HABITAT TYPES BY PERCENT OCCURRENCE



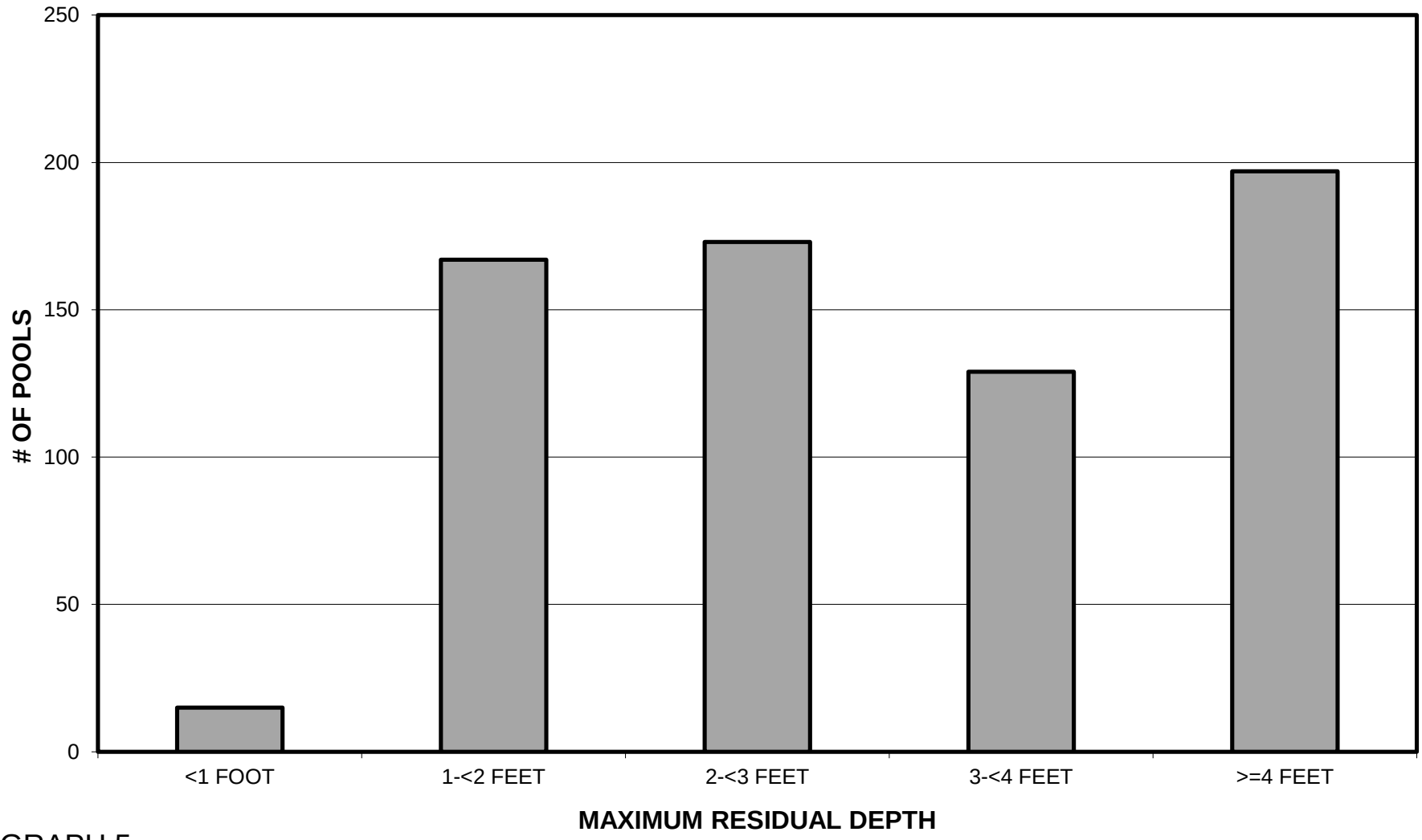
GRAPH 3

NOYO RIVER 2015
POOL TYPES BY PERCENT OCCURRENCE



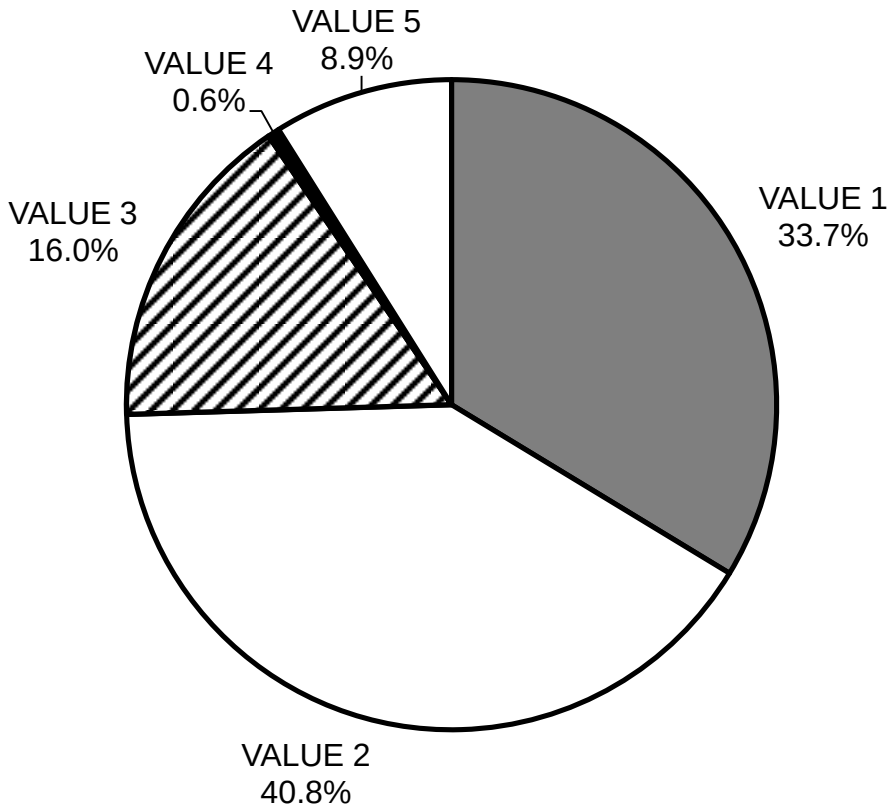
GRAPH 4

NOYO RIVER 2015
MAXIMUM DEPTH IN POOLS



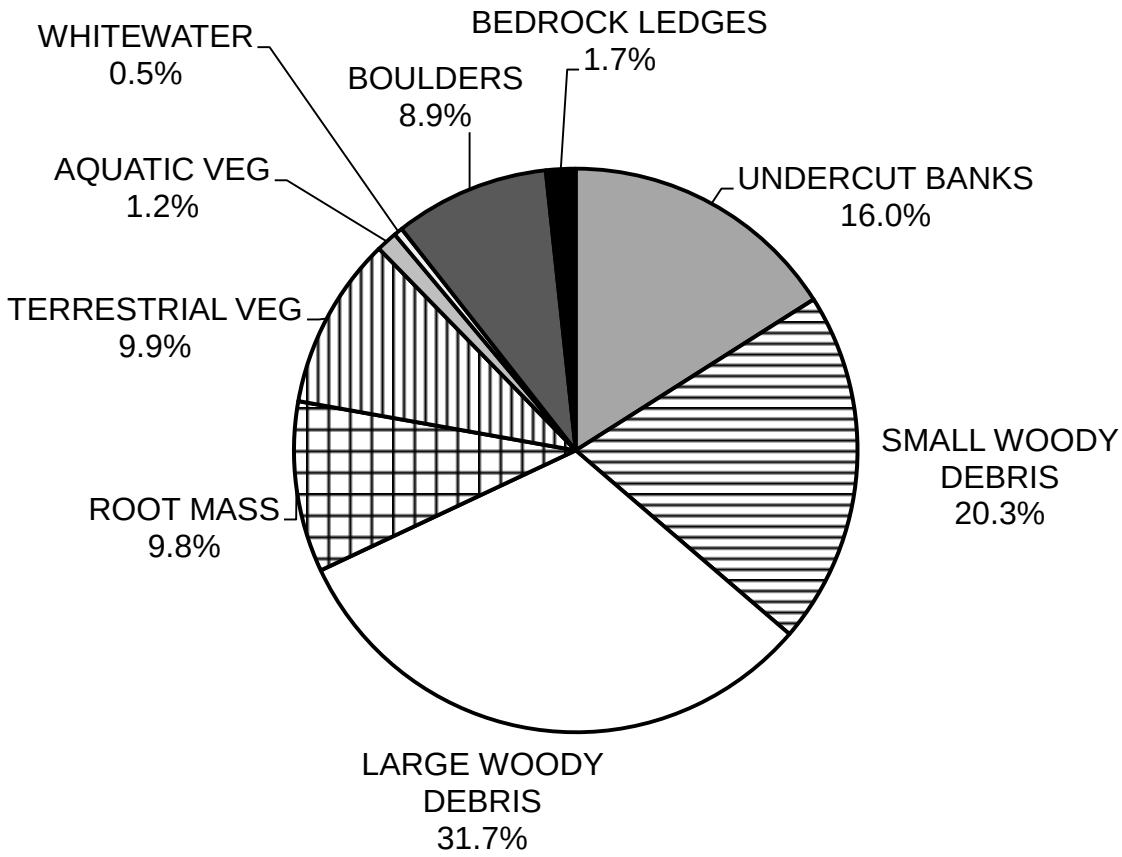
GRAPH 5

NOYO RIVER 2015
PERCENT EMBEDDEDNESS



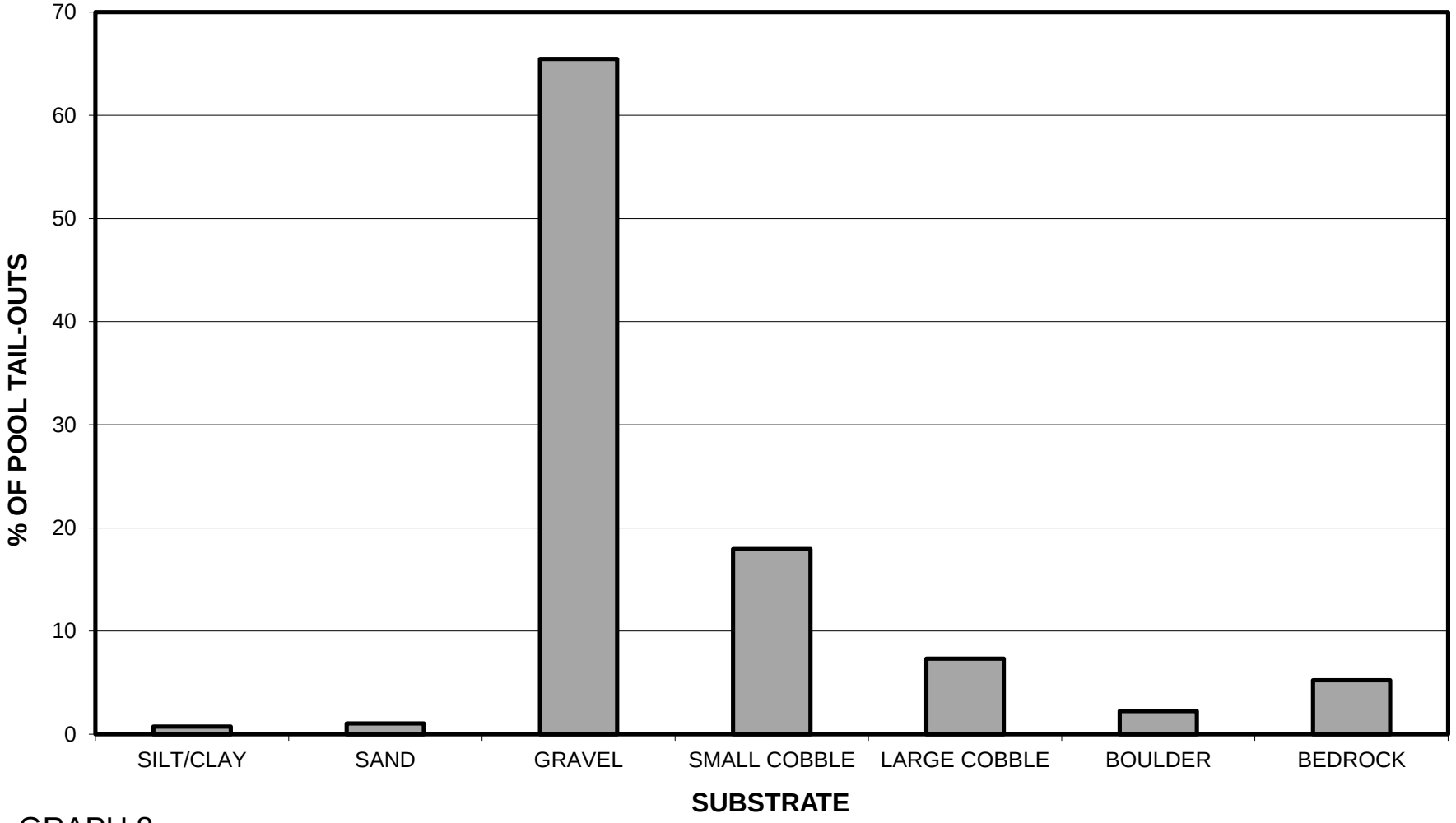
GRAPH 6

NOYO RIVER 2015
MEAN PERCENT COVER TYPES IN POOLS



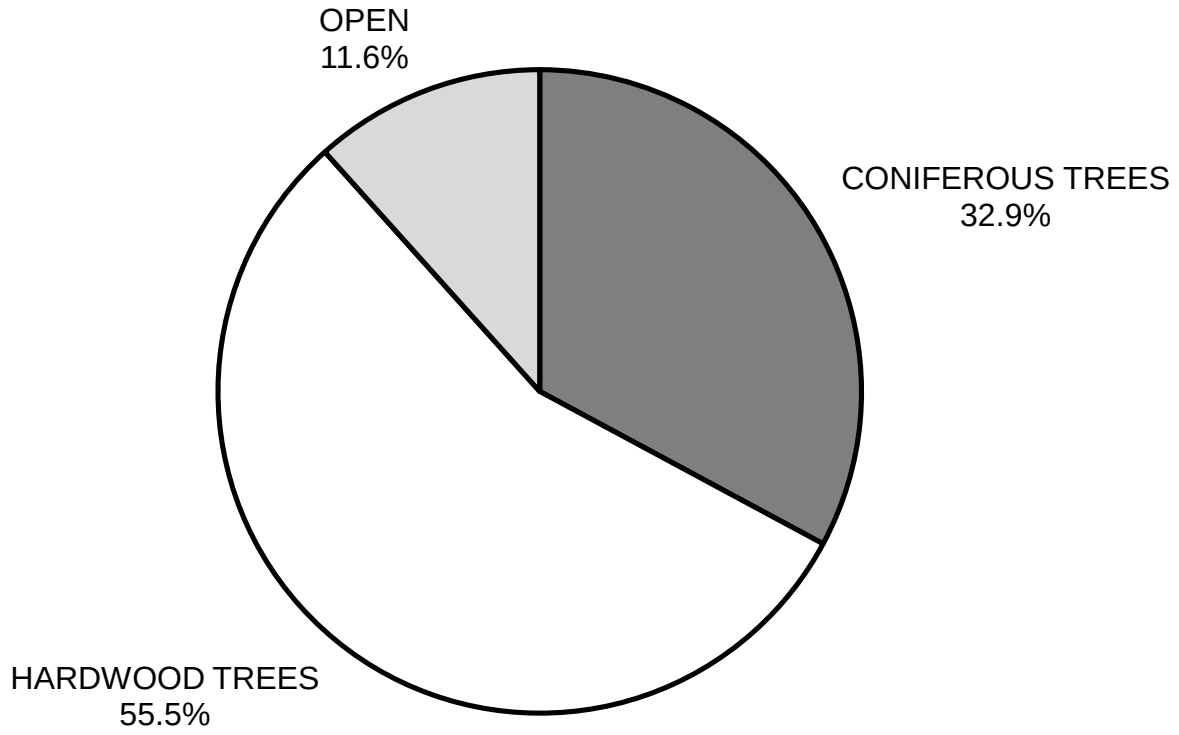
GRAPH 7

NOYO RIVER 2015
SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



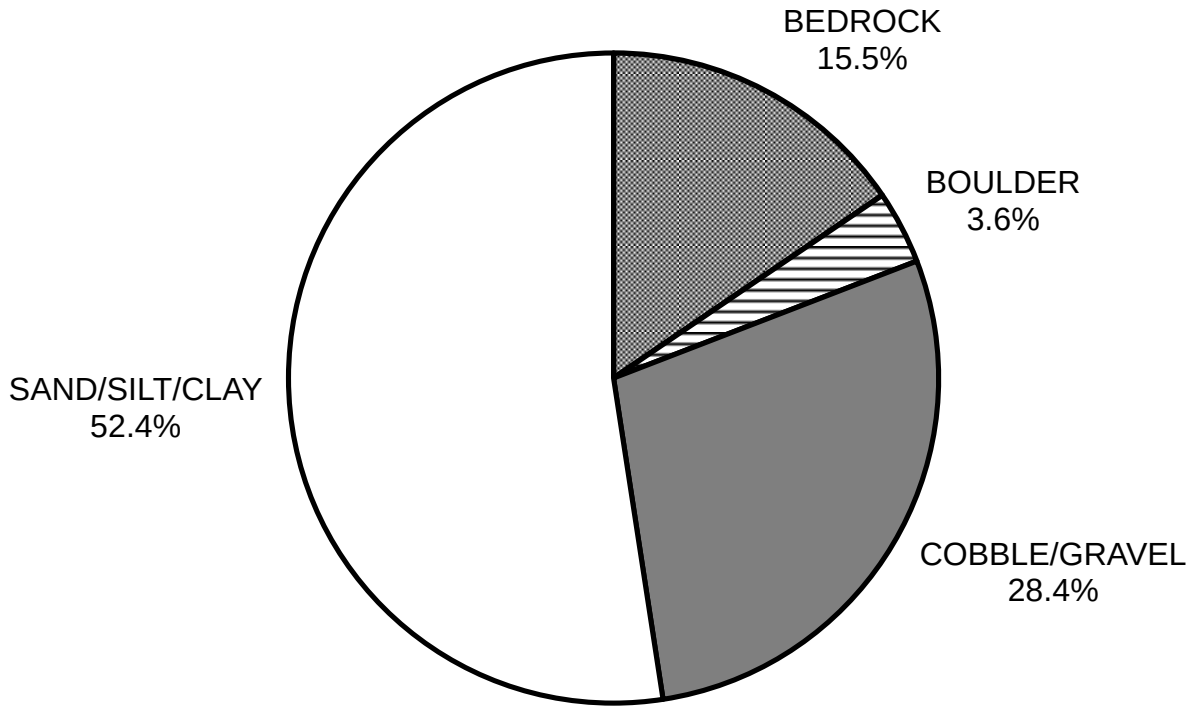
GRAPH 8

NOYO RIVER 2015
MEAN PERCENT CANOPY



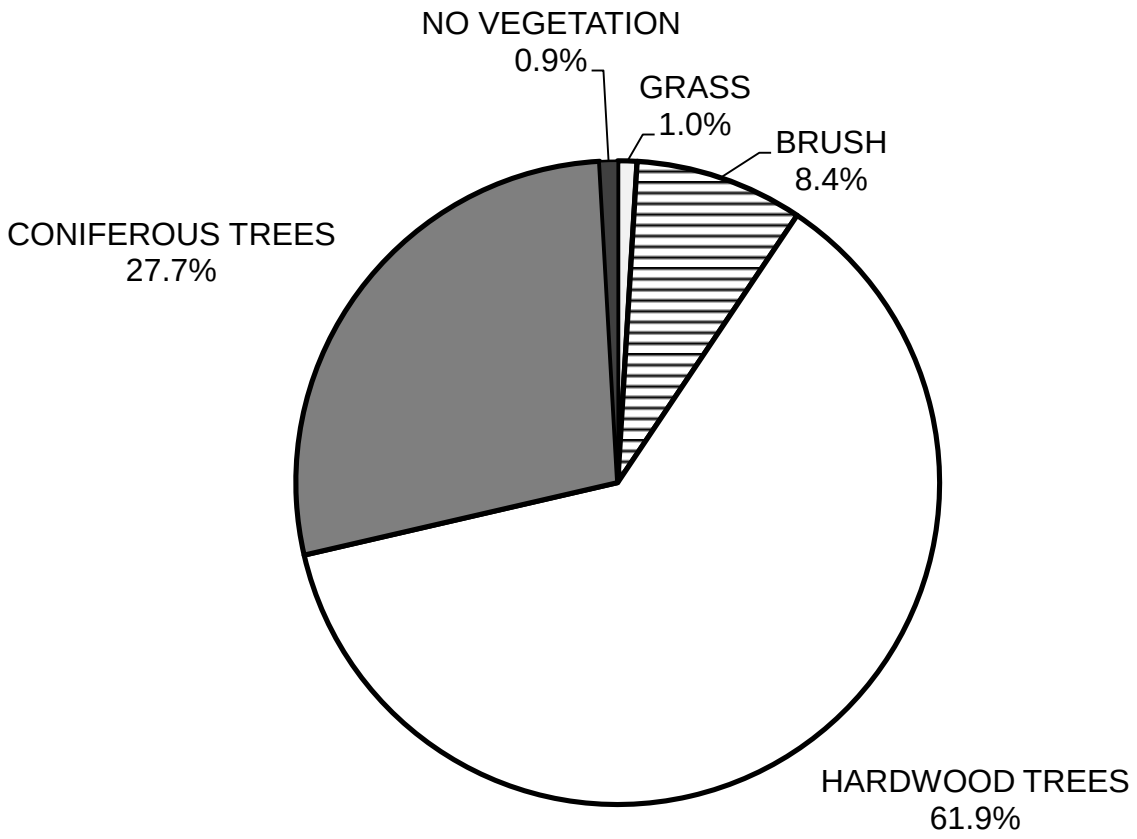
GRAPH 9

NOYO RIVER 2015
DOMINANT BANK COMPOSITION IN SURVEY REACH



GRAPH 10

NOYO RIVER 2015
DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11

APPENDIX II

STREAM INVENTORY PHOTOS

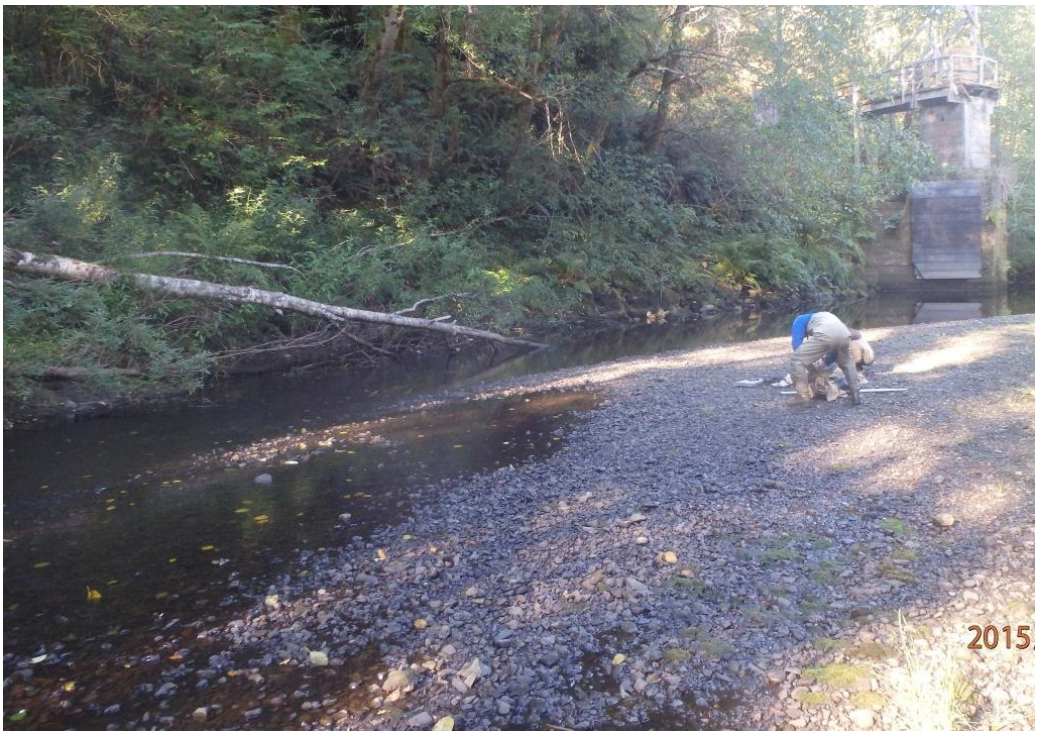


Photo 1: Start of survey (SOS) at the Matson water pump. Dave Lam and Kalyn Bocast pictured (Photo taken 9/23/15).

Photo 2: Active erosion site at habitat unit #185, 27,725' upstream of SOS. Dave Lam pictured (Photo taken 10/6/15).

Photo 3: Extensive pool at habitat unit #410, 61,198' upstream of SOS. Nicole Bejar, Emily Moloney, and Alejandra Camacho pictured. (Photo taken 10/21/15)

Photo 4: End of 2015 survey at temporary dam site at Camp Noyo, habitat unit 506-507, 74,450' upstream of SOS (Photo taken 10-28-15).

Photo 5: Erosion site at habitat unit #968, 131,640’ upstream of SOS. Nicole Bejar pictured (Photo taken 8/2/16).

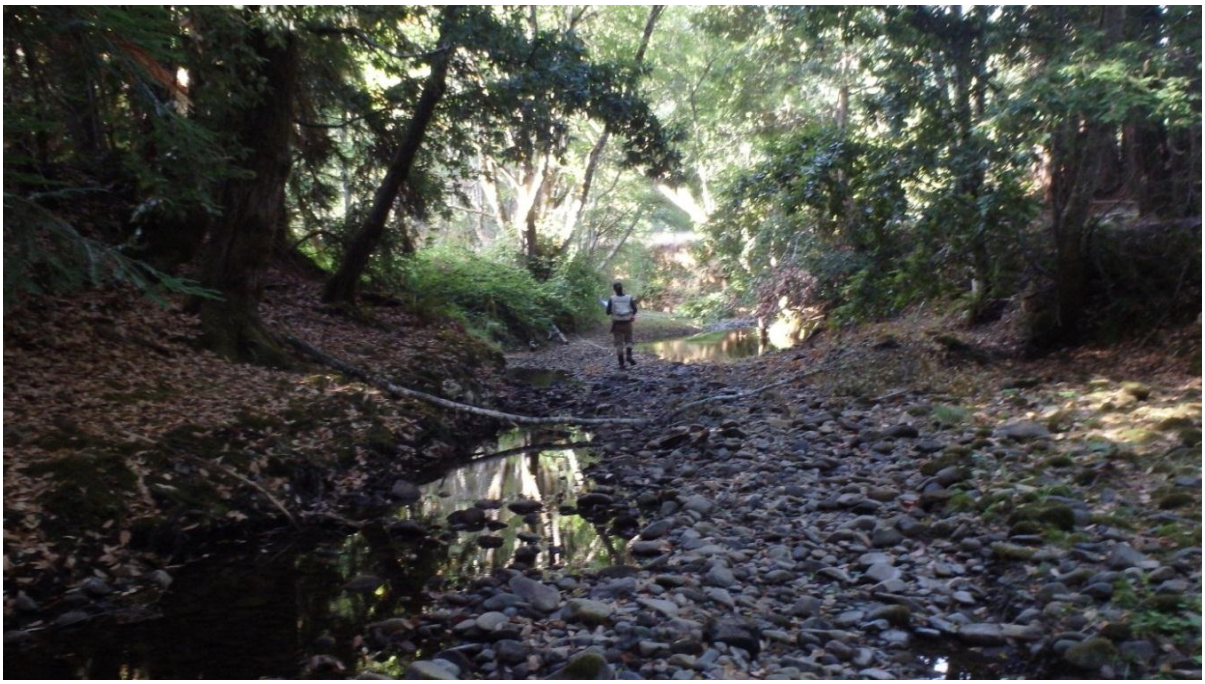


Photo 6: Low water conditions at habitat unit #1053, 136,154’ upstream of SOS. Nicole Bejar pictured. (Photo taken 8/24/16)

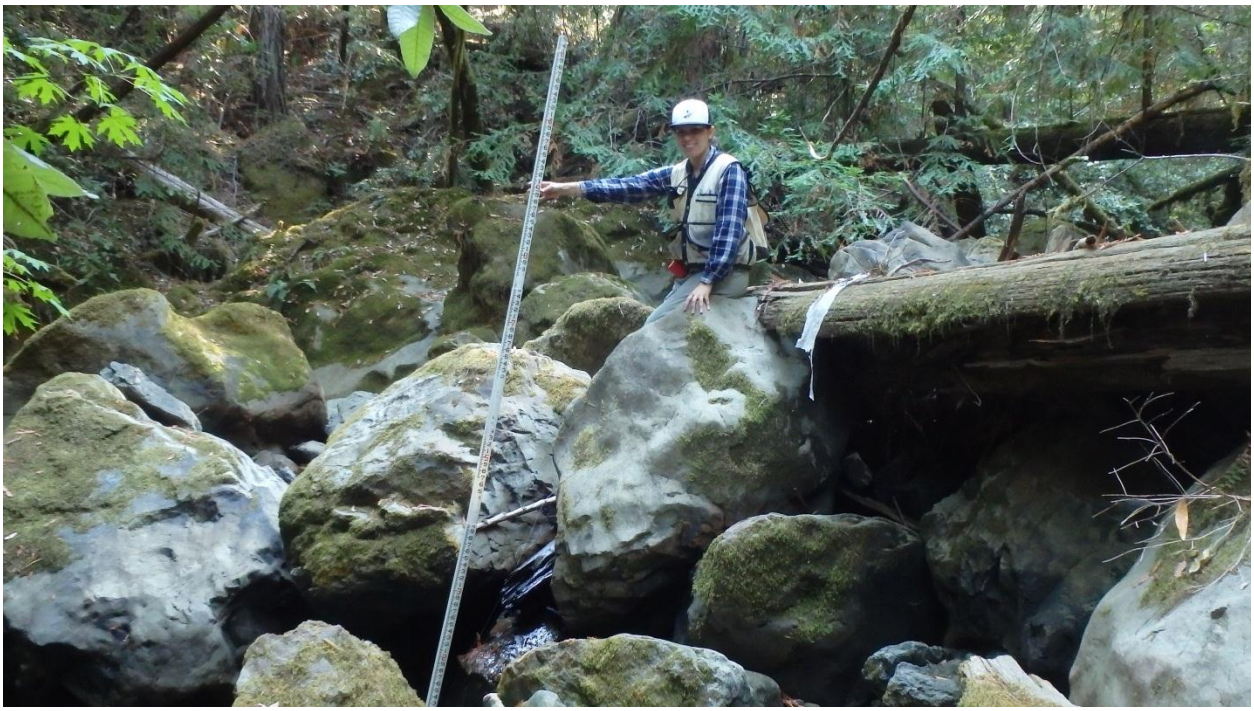


Photo 7: Boulder cascade at habitat unit # 1553, 158,778’ upstream of SOS. Nicole Bejar pictured. (Photo taken 9/8/16)

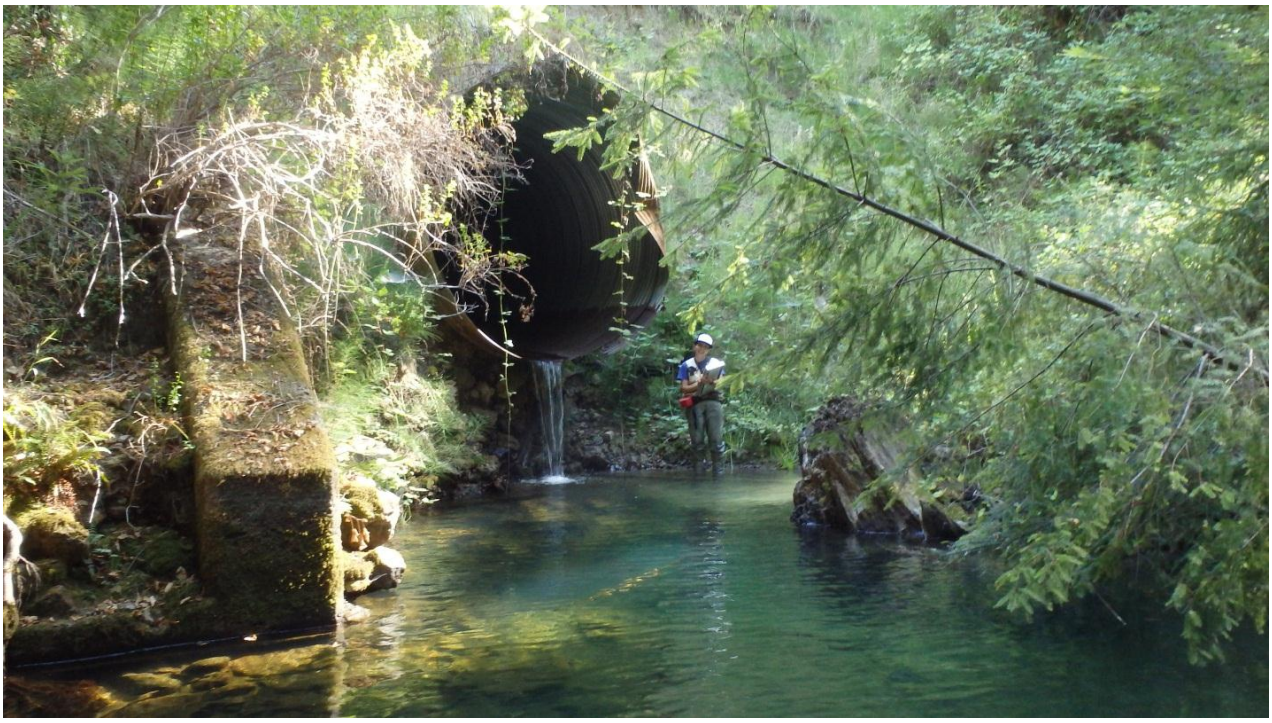


Photo 8: Culvert and probable end of anadromy at habitat unit #1605, 160,495’ upstream of SOS. Nicole Bejar pictured. (Photo taken 9/12/16)

Photo 9: End of survey at habitat unit #1611, 160,924’ upstream of SOS due to steep boulder cascade. Nicole Bejar pictured. (Photo taken 9/13/16)