



## CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

### STREAM INVENTORY REPORT

#### Unnamed Tributary #8 to Noyo River

#### INTRODUCTION

A stream inventory was conducted from July 7 to July 12, 2016 on an Unnamed Tributary #8 to Noyo River, commonly known as, and herein after referred to as Unnamed Tributary #8 to Noyo River. The survey began at the confluence with Noyo River and extended upstream 0.7 miles.

The Unnamed Tributary #8 to 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 Unnamed Tributary #8 to 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 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

Unnamed Tributary #8 to Noyo River flows to Noyo River, which drains to the Pacific Ocean, located in Mendocino County, California (Map 1). Unnamed Tributary #8 to Noyo River's legal description at the confluence with Noyo River is T18N R17W S12. Its location is 39.433° north latitude and 123.707° west longitude, LLID number 1237072394330. Unnamed Tributary #8 to Noyo River is a first order stream and has approximately 0.8 miles of blue line stream according to the USGS Noyo Hill 7.5 minute quadrangle. Unnamed Tributary #8 to Noyo River drains a watershed of approximately 0.5 square miles. Elevations range from about 27 feet at the mouth of the creek to 500 feet in the headwater areas. Mixed conifer forest dominates the watershed. The watershed is entirely privately owned and is managed for timber production. Vehicle access exists via Company Ranch road in Fort Bragg.

#### METHODS

The habitat inventory conducted in Unnamed Tributary #8 to Noyo River follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al. 1998). The Watershed Stewards Project/AmeriCorps (WSP) members that conducted the inventory were trained in standardized habitat inventory methods by the California Department of Fish and Wildlife (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.

### 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 Unnamed Tributary #8 to 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". Unnamed Tributary #8 to 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 Unnamed Tributary #8 to 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 Unnamed Tributary #8 to 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 densimeters as described in the *California Salmonid Stream Habitat Restoration Manual*. Canopy density relates to the amount of stream shaded from the sun. In Unnamed Tributary #8 to 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 Unnamed Tributary #8 to 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 Unnamed Tributary #8 to Noyo River. In addition, underwater mask and snorkel observations were made at five 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 Unnamed Tributary #8 to 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 July 7 to July 12, 2016 was conducted by Ryan Bernstein and Amidia Frederick (WSP). The total length of the stream surveyed was 3,850 feet.

Stream flow was not measured on Unnamed Tributary #8 to Noyo River.

Unnamed Tributary #8 to Noyo River is an E4 channel type for 3,850 feet of the stream surveyed. E4 channels are low gradient, meandering riffle/pool streams with low width/depth ratios and little deposition. They are very efficient and stable with a high meander width ratio and gravel-dominant substrates.

Water temperatures taken during the survey period ranged from 54° to 63° Fahrenheit. Air temperatures ranged from 54° to 69° Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 52% pool units, 47% dry units, and 1% flatwater units (Graph 1). Based on total length of Level II habitat types there were 73% dry units, 24% pool units, and 3% flatwater units (Graph 2).

Three Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were mid-channel pool units, 52%; dry units, 47%; and run units, 1% (Graph 3). Based on percent total length, dry units made up 73%, mid-channel pools 24%, and run units 3%.

A total of 40 pools were identified (Table 3). Main channel pools were the most frequently encountered at 100% (Graph 4), and comprised 100% 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. Ten of the 39 pools (26%) had a residual depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 39 pool tail-outs measured, 4 had a value of 1 (10.3%); 9 had a value of 2 (23.1%); 11 had a value of 3 (28.2%); 1 had a value of 4 (2.6%); 14 had a value of 5 (35.9%) (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. Flatwater habitat types had a mean shelter rating of 0, and pool habitats had a mean shelter rating of 10 (Table 1). Of the pool types, the main channel pools had a mean shelter rating of 10.

Table 5 summarizes mean percent cover by habitat type. Small woody debris is the dominant cover type in Unnamed Tributary #8 to Noyo River. Graph 7 describes the pool cover in

Unnamed Tributary #8 to Noyo River. Small woody debris is the dominant pool cover type followed by undercut banks.

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 in 62% of the tail-outs. Silt/clay was the next most frequently observed substrate and occurred in 22% of the pool tail-outs.

The mean percent canopy density for the surveyed length of Unnamed Tributary #8 to Noyo River was 98%. Two percent of the canopy was open. Of the canopy present, the mean percentages of hardwood and coniferous trees were 36% and 64%, respectively. Graph 9 describes the mean percent canopy in Unnamed Tributary #8 to Noyo River.

For the stream reach surveyed, the mean percent right bank vegetated was 100%. The mean percent left bank vegetated was 100%. The dominant elements composing the structure of the stream banks consisted of 100% sand/silt/clay (Graph 10). Coniferous trees were the dominant vegetation type observed in 62% of the units surveyed. Additionally, 36% of the units surveyed had deciduous trees as the dominant vegetation type, and 1% had grass as the dominant vegetation type (Graph 11).

### BIOLOGICAL INVENTORY RESULTS

Survey teams conducted a mask and snorkel survey at five sites for species composition and distribution in Unnamed Tributary #8 to Noyo River on August 13, 2016. Water temperature take during the beginning of the snorkeling period at 1415 was 53° Fahrenheit. Air temperature was 71° Fahrenheit. The sites were sampled by Brian Starks and Kaydee Boozel (CDFW).

The survey yielded 1 young-of-the-year (YOY) steelhead/rainbow trout (SH/RT), and 27 YOY coho.

During the survey, the upstream-most observation of juvenile coho salmon and steelhead trout occurred at 39.4322° north latitude and -123.6991° west longitude, approximately 3,592 feet upstream from the confluence with Noyo River.

Table A. Summary of results for a fish composition and distribution survey within Unnamed Tributary #8 to Noyo River, August, 13, 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+	
E4 Channel Type										
08/13/16	1	4	Pool	1711	0	0	0	3	0	0
	2	25	Pool	2466	0	0	0	0	0	0
	3	37	Pool	3002	0	0	0	16	0	0
	4	63	Pool	3424	0	0	0	3	0	0
	5	69	Pool	3592	1	0	0	5	0	0

## DISCUSSION

Unnamed Tributary #8 to Noyo River is an E4 channel type for the first 3,850 feet of stream surveyed. The suitability of E4 channel types for fish habitat improvement structures is as follows: E4 channel types are good for bank-placed boulders and fair for opposing wing-deflectors.

The water temperatures recorded on the survey days July 11 to July 12, 2016 ranged from 54° to 63° Fahrenheit. Air temperatures ranged from 54° to 69° 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 3% of the total length of this survey, riffles 0%, and pools 24%. Ten of the 39 (26%) pools had a maximum residual depth greater than two 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.

Thirteen of the 39 pool tail-outs measured had embeddedness ratings of 1 or 2. Twelve of the pool tail-outs had embeddedness ratings of 3 or 4. Fourteen 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 Unnamed Tributary #8 to Noyo River should be mapped and rated according to their potential sediment yields, and control measures should be taken.

Twenty-three of the 37 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 10. The shelter rating in the flatwater habitats is 0. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by small woody debris in Unnamed Tributary #8 to Noyo River. Small woody debris is the dominant cover type in pools followed by undercut banks. 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 98%. The percentage of right and left bank covered with vegetation was 100% and 100%, respectively.

## RECOMMENDATIONS

Unnamed Tributary #8 to 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 Unnamed Tributary #8 to 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 small 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 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.

#### 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 at confluence with Noyo River. Channel type is an E4. Young-of-the-year (YOY) present. Dry left bank tributary.
1504	0003.00	Culvert #1 is Company Ranch Road, and is 5' high x 13' wide x 60' long. It is composed of one culvert, and is made of redwood logs. The culvert has no plunge and it has a maximum depth of 0.4' within 5' of the outlet. The slope is 1.25%, and its condition is good. It is not a possible barrier to juvenile and adult salmonids.
1824	0015.00	Unnamed ATV road fords creek and is not a barrier to salmonids.
2287	0021.00	YOY present in two small shallow pools.
3824	0077.00	End of survey due to an 8' plunge upstream of pool and over 1000' of dry creek above it.

#### 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 }

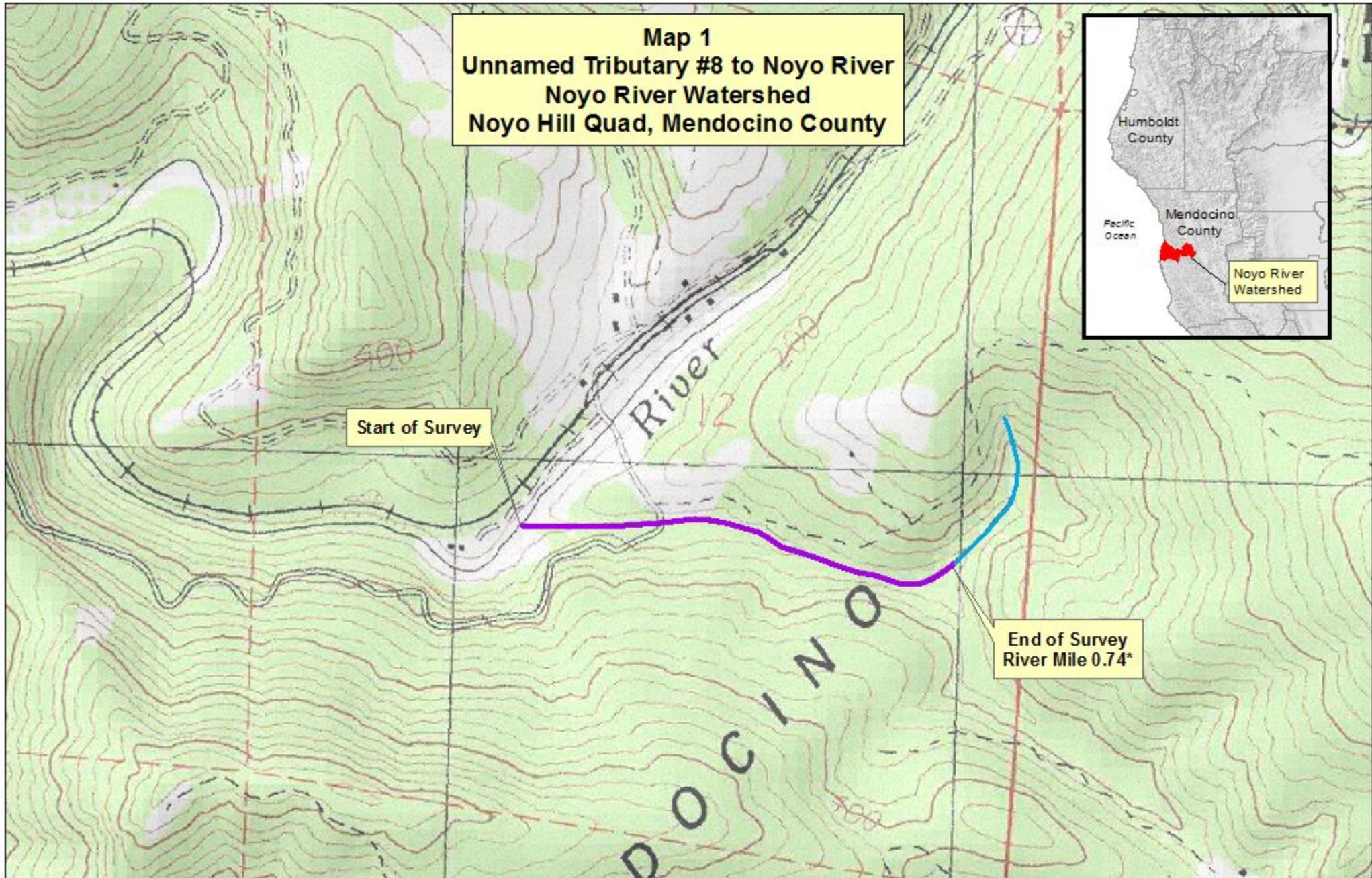
## BACKWATER POOLS

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}

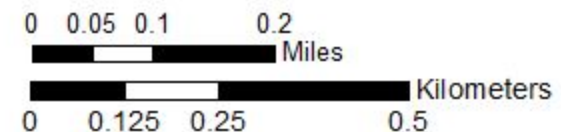
ADDITIONAL UNIT DESIGNATIONS

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

**Map 1**  
**Unnamed Tributary #8 to Noyo River**  
**Noyo River Watershed**  
**Noyo Hill Quad, Mendocino County**



- Reach 1: E4 Channel Type
- Unnamed Tributary #8 to Noyo River



# **APPENDIX I**

## **TABLES AND GRAPHS**



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

Stream Name: 1237072394330				LLID: 1237072394330				Drainage: Noyo River							
Survey Dates: 7/11/2016 to 7/12/2016															
Confluence Location:		Quad: NOYO HILL		Legal Description: T18NR17WS12		Latitude: 39:25:59.0N		Longitude: 123:42:26.0							
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
36	3	DRY	46.8	78	2817	73.2	5.7	0.0		3449	124152				0
1	1	FLATWATER	1.3	97	97	2.5	8.0	0.2	0.4	776	776	155	155		0
40	39	POOL	51.9	23	936	24.3	5.0	0.9	1.5	125	4999	138	5503	138	10
Total Units	Total Units Fully Measured			Total Length (ft.)						Total Area (sq.ft.)			Total Volume (cu.ft.)		
77	43			3850						129927			5658		

**Table 2 - Summary of Habitat Types and Measured Parameters**

Stream Name: 1237072394330

LLID: 1237072394330

Drainage: Noyo River

Survey Dates: 7/11/2016 to 7/12/2016

Confluence Location: Quad: NOYO HILL

Legal Description: T18NR17WS12

Latitude: 39:25:59.0N

Longitude: 123:42:26.0W

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 (%)
1	1	RUN	1.3	97	97	2.5	8	0.2	0.4	776	776	155	155		0	98
40	39	MCP	51.9	23	936	24.3	5	0.9	3.1	125	4999	138	5503	138	10	98
36	3	DRY	46.8	78	2817	73.2	6	0.0		3449	124152				0	96

Total Units  
77

Total Units Fully Measured  
43

Total Length (ft.)  
3850

Total Area (sq.ft.)  
129927

Total Volume (cu.ft.)  
5658

Stream Name:	1237072394330	LLID:	1237072394330	Drainage:	Noyo River
Survey Dates:	7/11/2016 to 7/12/2016				
Confluence Location:	Quad: NOYO HILL	Legal Description:	T18NR17WS12	Latitude:	39:25:59.0N
				Longitude:	123:42:26.0W

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
40	39	MAIN	100	23	936	100	5.0	0.9	125	4999	138	5503	10

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
40	39	936	4999	5503

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

Stream Name: 1237072394330

LLID: 1237072394330

Drainage: Noyo River

Survey Dates: 7/11/2016 to 7/12/2016

Confluence Location: Quad: NOYO HILL

Legal Description: T18NR17WS12

Latitude: 39:25:59.0N

Longitude: 123:42:26.0W

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
39	MCP	100	7	18	22	56	9	23	1	3	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
39	7	18	22	56	9	23	1	3	0	0

Mean Maximum Residual Pool Depth (ft.): 1.5

**Table 5 - Summary of Mean Percent Cover By Habitat Type**

Stream Name: Noyo Tributary #8

LLID: 1237072394330

Drainage: Noyo River

Survey Dates: 7/11/2016 to 7/12/2016

Dry Units: 36

Confluence Location: Quad: NOYO HILL Legal Description: T18NR17WS12 Latitude: 39:25:59.0N Longitude: 123:42:26.0W

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
1	1	RUN	0	0	0	0	0	0	0	0	0
1	1	<b>TOTAL FLAT</b>	0	0	0	0	0	0	0	0	0
40	39	MCP	39	57	4	0	0	0	0	0	0
40	39	<b>TOTAL POOL</b>	39	57	4	0	0	0	0	0	0
77	43	<b>TOTAL</b>	39	57	4	0	0	0	0	0	0



Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: 1237072394330

LLID: 1237072394330

Drainage: Noyo River

Survey Dates: 7/11/2016 to 7/12/2016

Dry Units: 36

Confluence Location: Quad: NOYO HILL

Legal Description: T18NR17WS12

Latitude: 39:25:59.0N

Longitude: 123:42:26.0W

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
1	1	RUN	0	0	100	0	0	0	0
40	40	MCP	78	0	23	0	0	0	0

**Table 7 - Summary of Mean Percent Canopy for Entire Stream**

Stream Name: 1237072394330

LLID: 1237072394330

Drainage: Noyo River

Survey Dates: 7/11/2016 to 7/12/2016

Confluence Location: Quad: NOYO HILL

Legal Description: T18NR17WS12

Latitude: 39:25:59.0N

Longitude: 123:42:26.0W

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
98	64	36	0	100	100

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.

Stream Name: 1237072394330	LLID: 1237072394330	Drainage: Noyo River
Survey Dates: 7/11/2016 to 7/12/2016	Survey Length (ft.): 3850	Main Channel (ft.): 3850
		Side Channel (ft.): 0
Confluence Location: Quad: NOYO HILL	Legal Description: T18NR17WS12	Latitude: 39:25:59.0N
		Longitude: 123:42:26.0W

<b>STREAM REACH: 1</b>										
Channel Type:	E4					Canopy Density (%):	98.3		Pools by Stream Length (%):	24.3
Reach Length (ft.):	3850					Coniferous Component (%):	63.8		Pool Frequency (%):	51.9
Riffle/Flatwater Mean Width (ft.):	8.0					Hardwood Component (%):	36.3		Residual Pool Depth (%):	
BFW:						Dominant Bank Vegetation:	Coniferous Trees		< 2 Feet Deep:	74
Range (ft.):	5	to	8			Vegetative Cover (%):	100.0		2 to 2.9 Feet Deep:	23
Mean (ft.):	6					Dominant Shelter:	Small Woody Debris		3 to 3.9 Feet Deep:	3
Std. Dev.:	1					Dominant Bank Substrate Type:	Sand/Silt/Clay		>= 4 Feet Deep:	0
Base Flow (cfs.):	0.0					Occurrence of LWD (%):	2		Mean Max Residual Pool Depth (ft.):	1.5
Water (F):	54 - 63	Air (F):	54 - 69			LWD per 100 ft.:			Mean Pool Shelter Rating:	10
Dry Channel (ft):	2817					Riffles:				
						Pools:	3			
						Flat:	0			
Pool Tail Substrate (%):	Silt/Clay: 22	Sand: 16	Gravel: 62	Sm Cobble: 0	Lg Cobble: 0	Boulder: 0	Bedrock: 0			
Embeddedness Values (%):	1. 10.3	2. 23.1	3. 28.2	4. 2.6	5. 35.9					

**Table 9 - Mean Percentage of Dominant Substrate and Vegetation**

Stream Name: 1237072394330

LLID: 1237072394330

Drainage: Noyo River

Survey Dates: 7/11/2016 to 7/12/2016

Confluence Location: Quad: NOYO HILL

Legal Description: T18NR17WS12

Latitude: 39:25:59.0N

Longitude: 123:42:26.0W

**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	0	0	0.0
Boulder	0	0	0.0
Cobble / Gravel	0	0	0.0
Sand / Silt / Clay	44	44	100.0

**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	1	0	1.1
Brush	0	0	0.0
Hardwood Trees	18	14	36.4
Coniferous Trees	25	30	62.5
No Vegetation	0	0	0.0

**Total Stream Cobble Embeddedness Values:** 3

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

Stream Name: Noyo Tributary #8

LLID: 1237072394330

Drainage: Noyo River

Survey Dates: 7/11/2016 to 7/12/2016

Confluence Location: Quad: NOYO HILL

Legal Description: T18NR17WS12

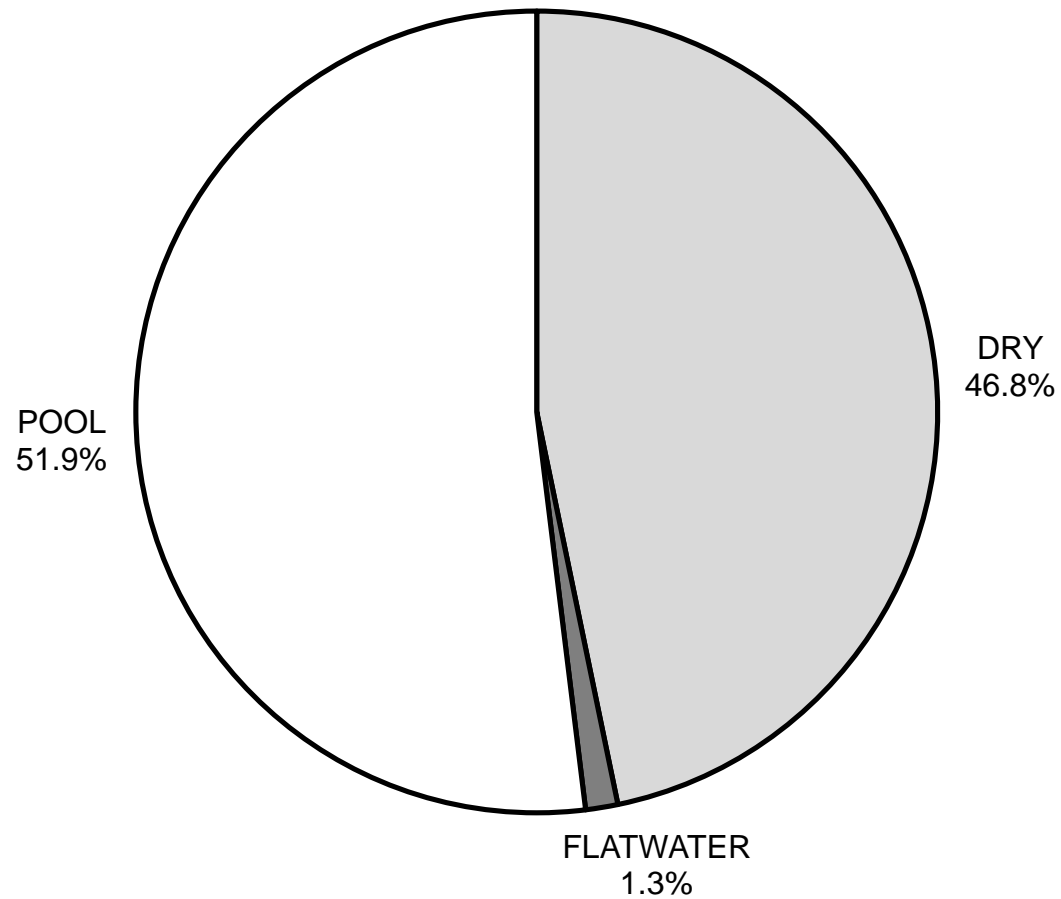
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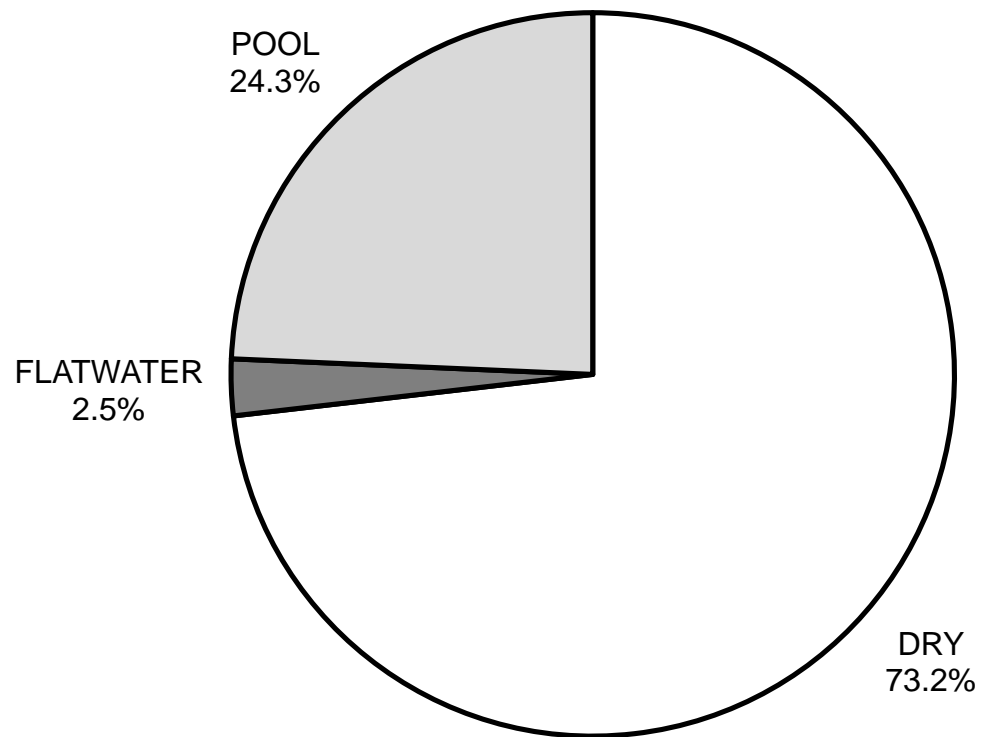
	<b>Riffles</b>	<b>Flatwater</b>	<b>Pools</b>
UNDERCUT BANKS (%)	0	0	39
SMALL WOODY DEBRIS (%)	0	0	57
LARGE WOODY DEBRIS (%)	0	0	4
ROOT MASS (%)	0	0	0
TERRESTRIAL VEGETATION (%)	0	0	0
AQUATIC VEGETATION (%)	0	0	0
WHITEWATER (%)	0	0	0
BOULDERS (%)	0	0	0
BEDROCK LEDGES (%)	0	0	0

**UNNAMED TRIB TO NOYO RIVER 2016  
HABITAT TYPES BY PERCENT OCCURRENCE**



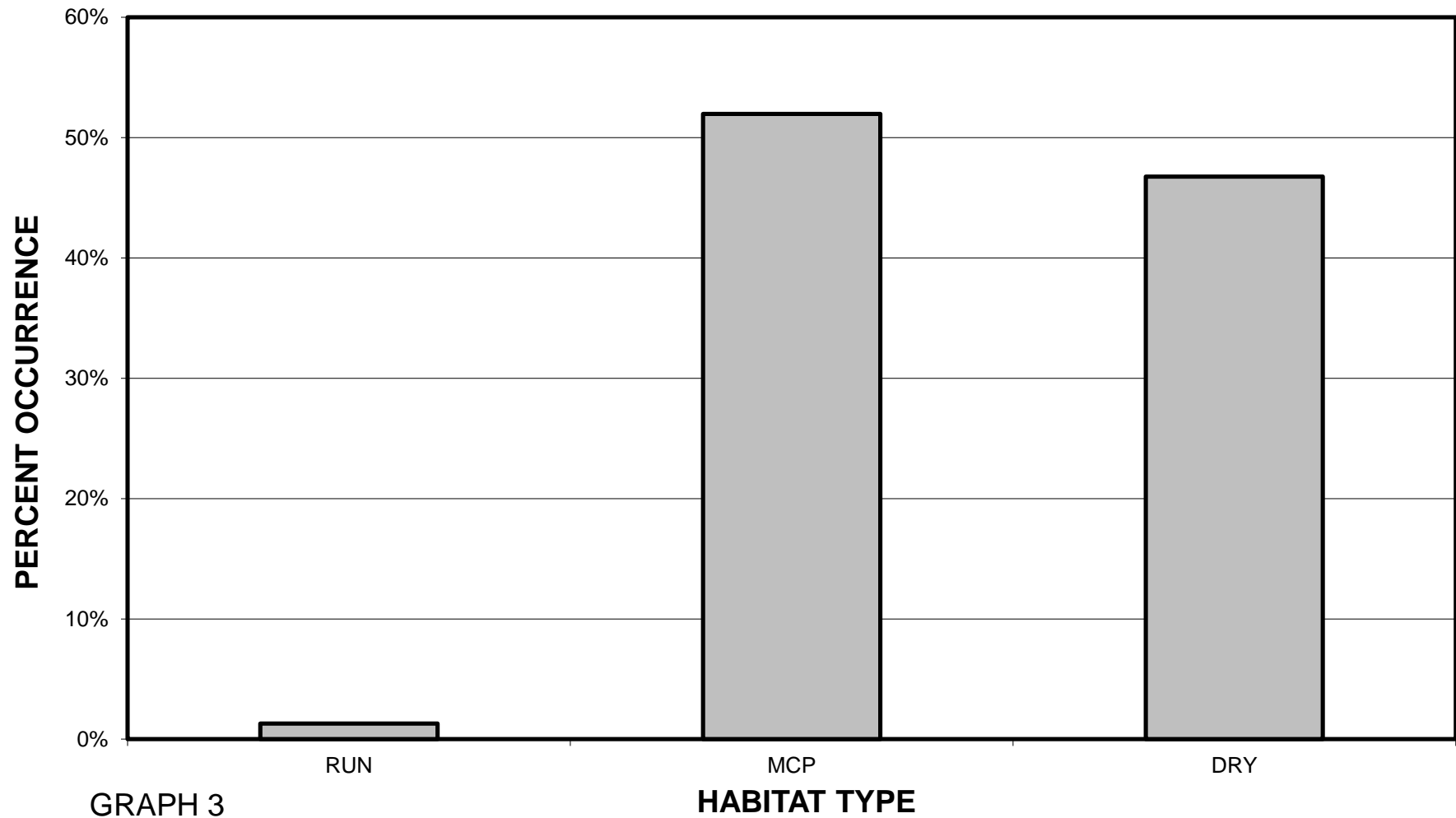
GRAPH 1

**UNNAMED TRIB TO NOYO RIVER 2016  
HABITAT TYPES BY PERCENT TOTAL LENGTH**



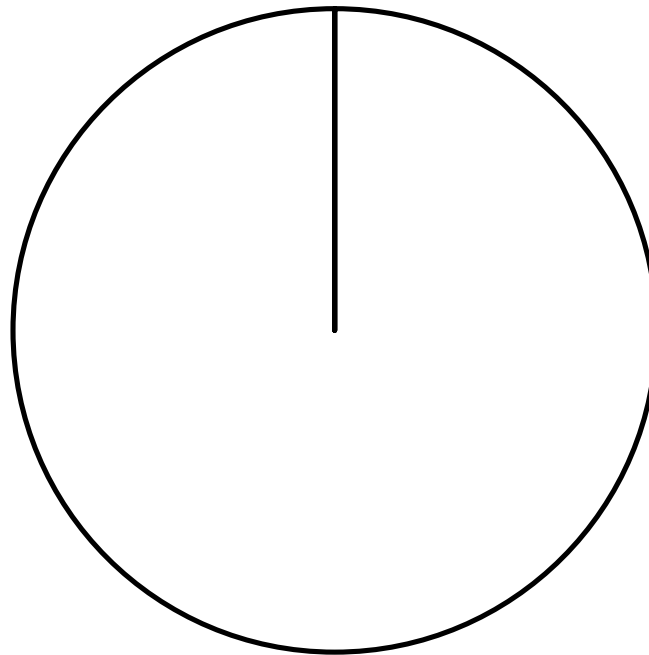
GRAPH 2

**UNNAMED TRIB TO NOYO RIVER 2016  
HABITAT TYPES BY PERCENT OCCURRENCE**





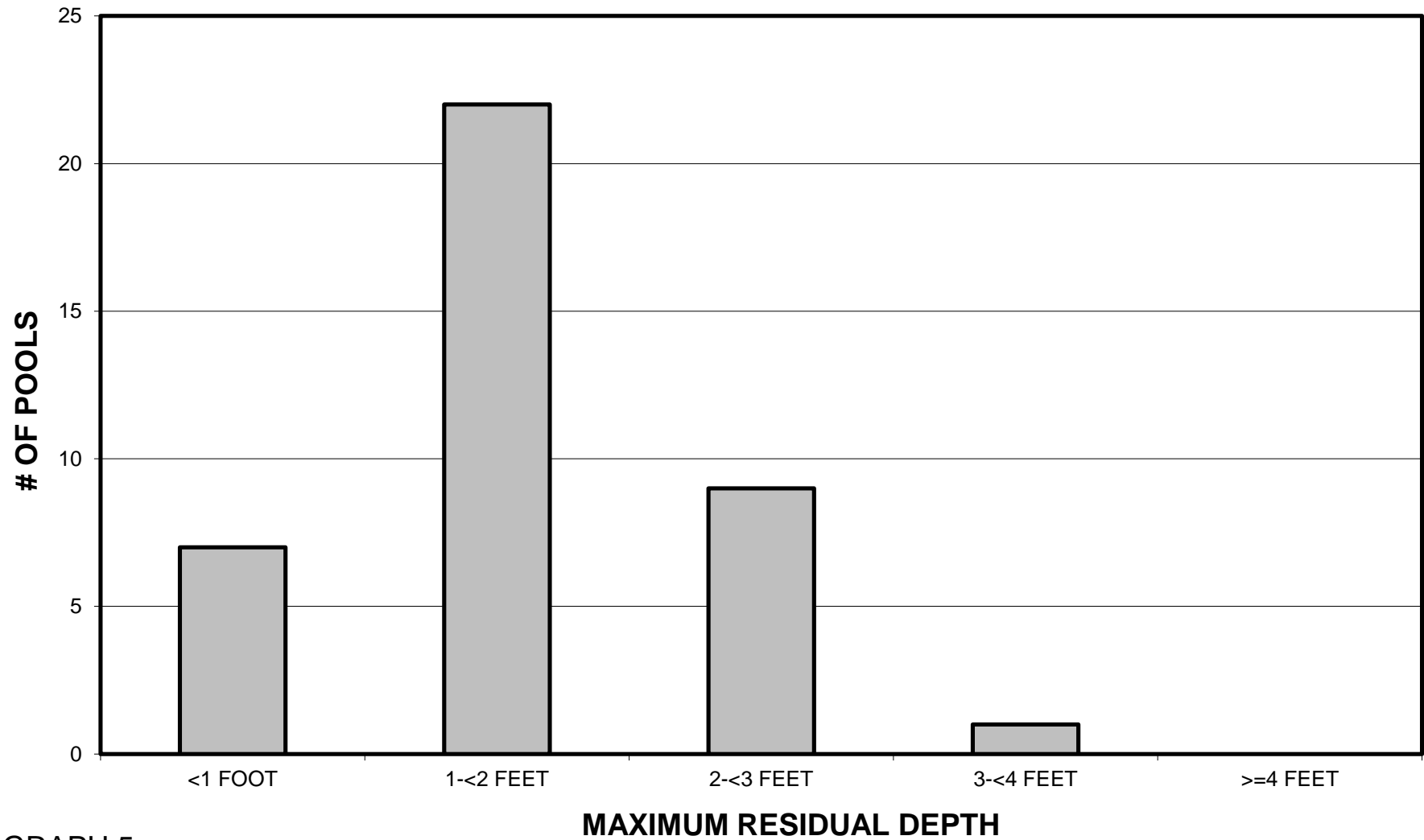
**UNNAMED TRIB TO NOYO RIVER 2016  
POOL TYPES BY PERCENT OCCURRENCE**



MAIN  
100.0%

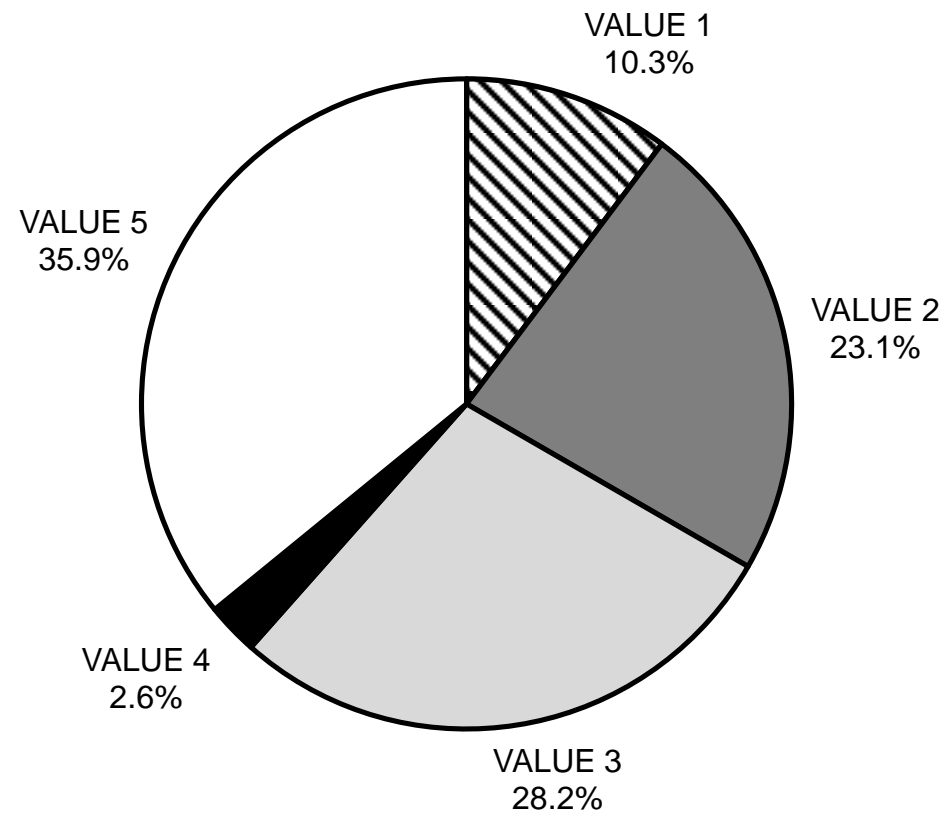
GRAPH 4

**UNNAMED TRIB TO NOYO RIVER 2016**  
**MAXIMUM DEPTH IN POOLS**



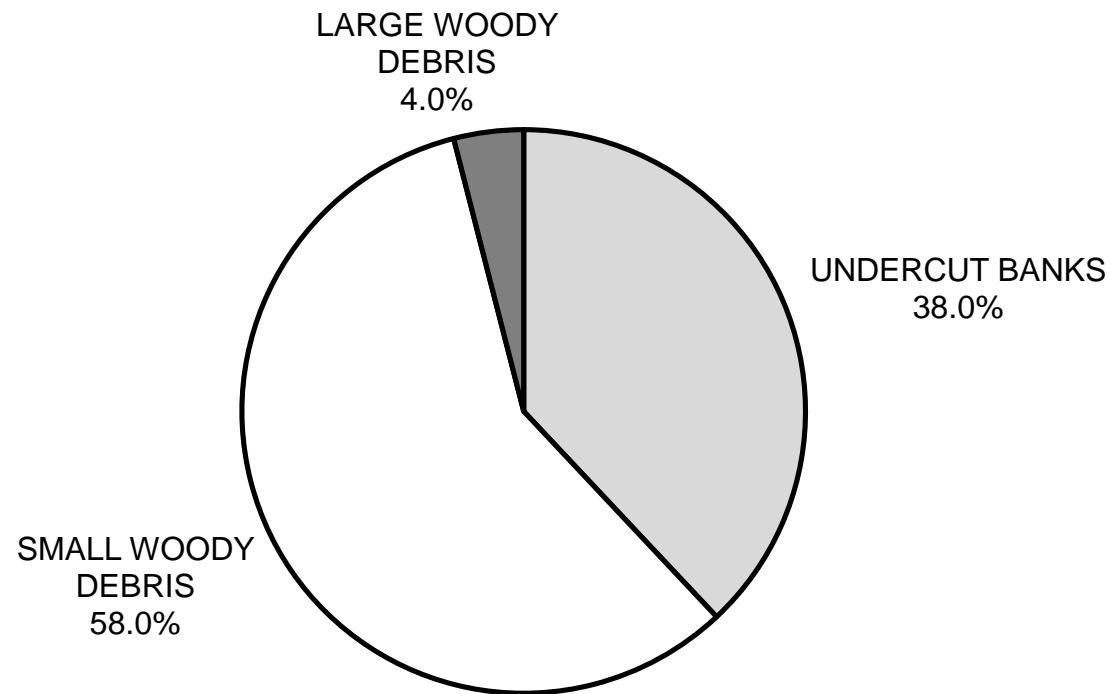
GRAPH 5

# UNNAMED TRIB TO NOYO RIVER 2016 PERCENT EMBEDDEDNESS



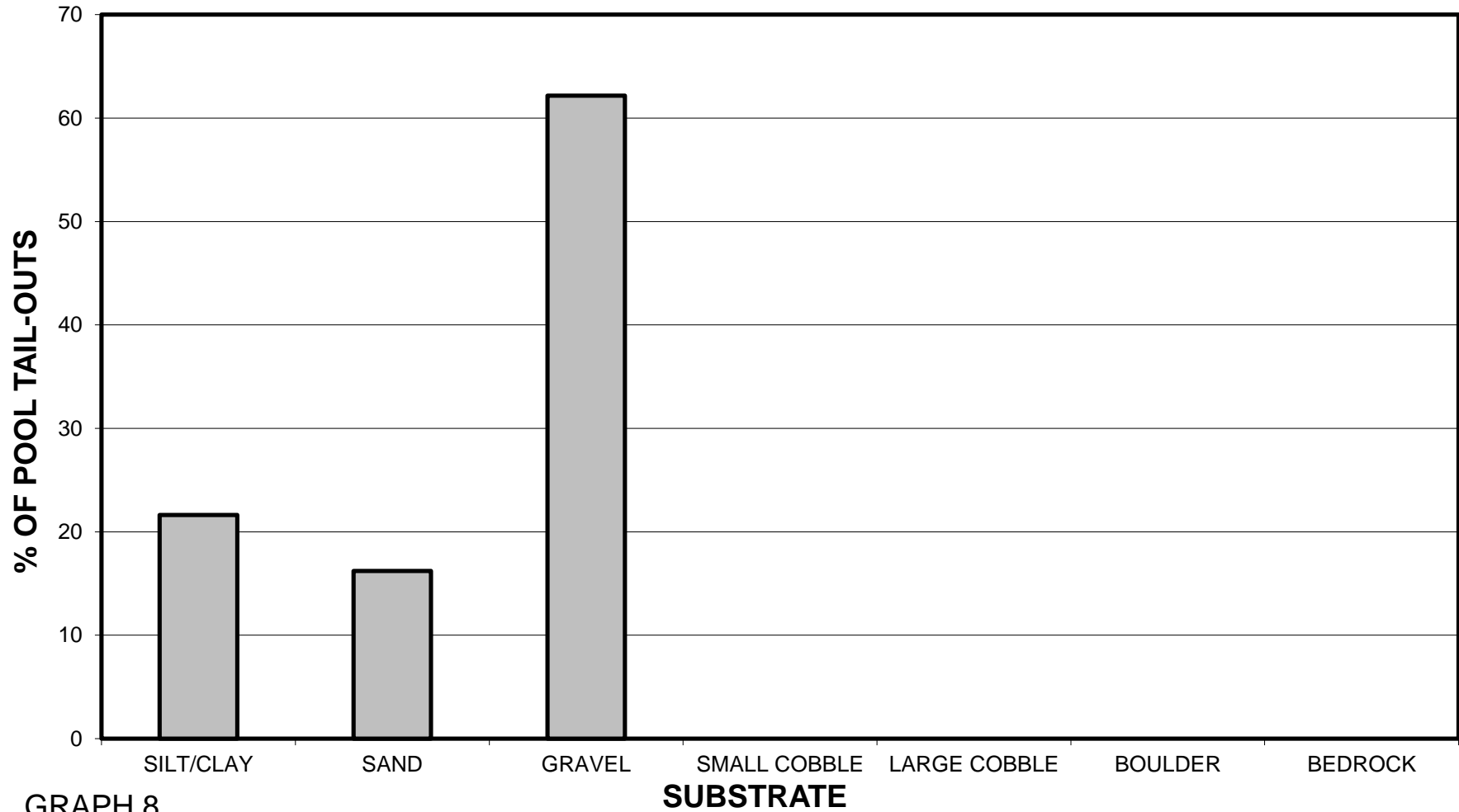
GRAPH 6

**UNNAMED TRIB TO NOYO RIVER 2016  
MEAN PERCENT COVER TYPES IN POOLS**



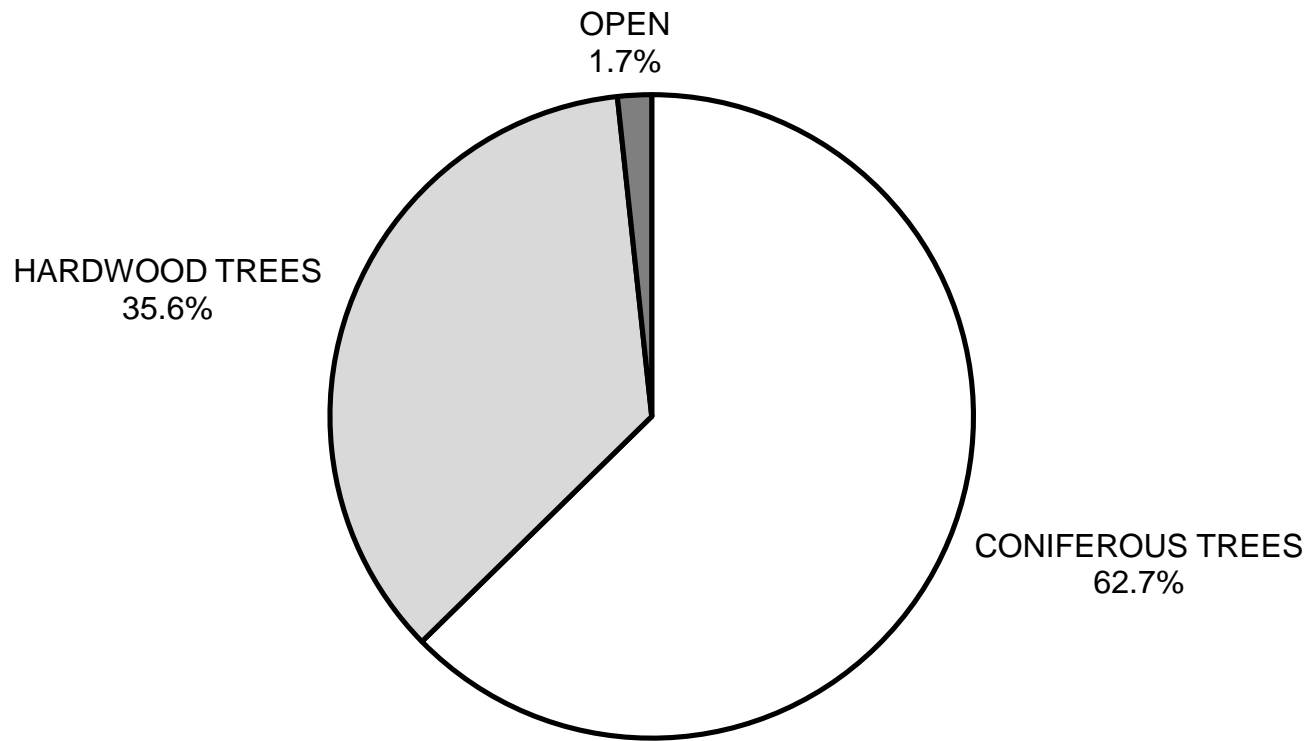
GRAPH 7

**UNNAMED TRIB TO NOYO RIVER 2016  
SUBSTRATE COMPOSITION IN POOL TAIL-OUTS**



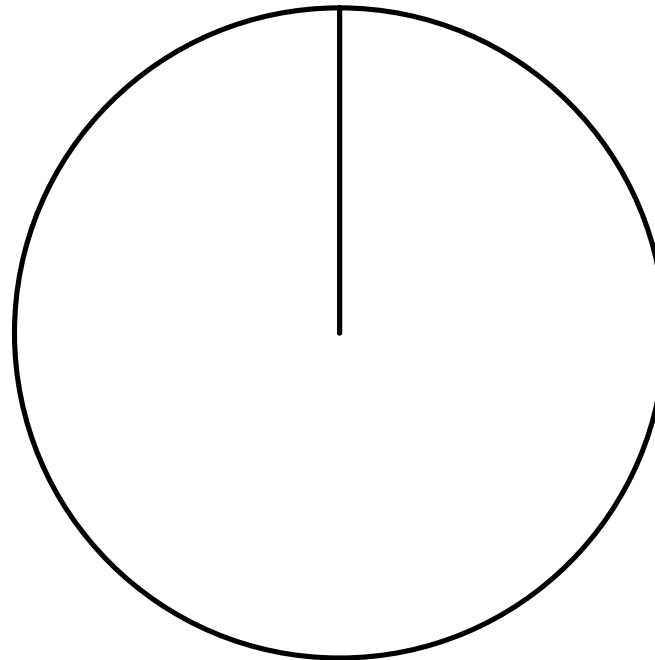
**GRAPH 8**

**UNNAMED TRIB TO NOYO RIVER 2016  
MEAN PERCENT CANOPY**



GRAPH 9

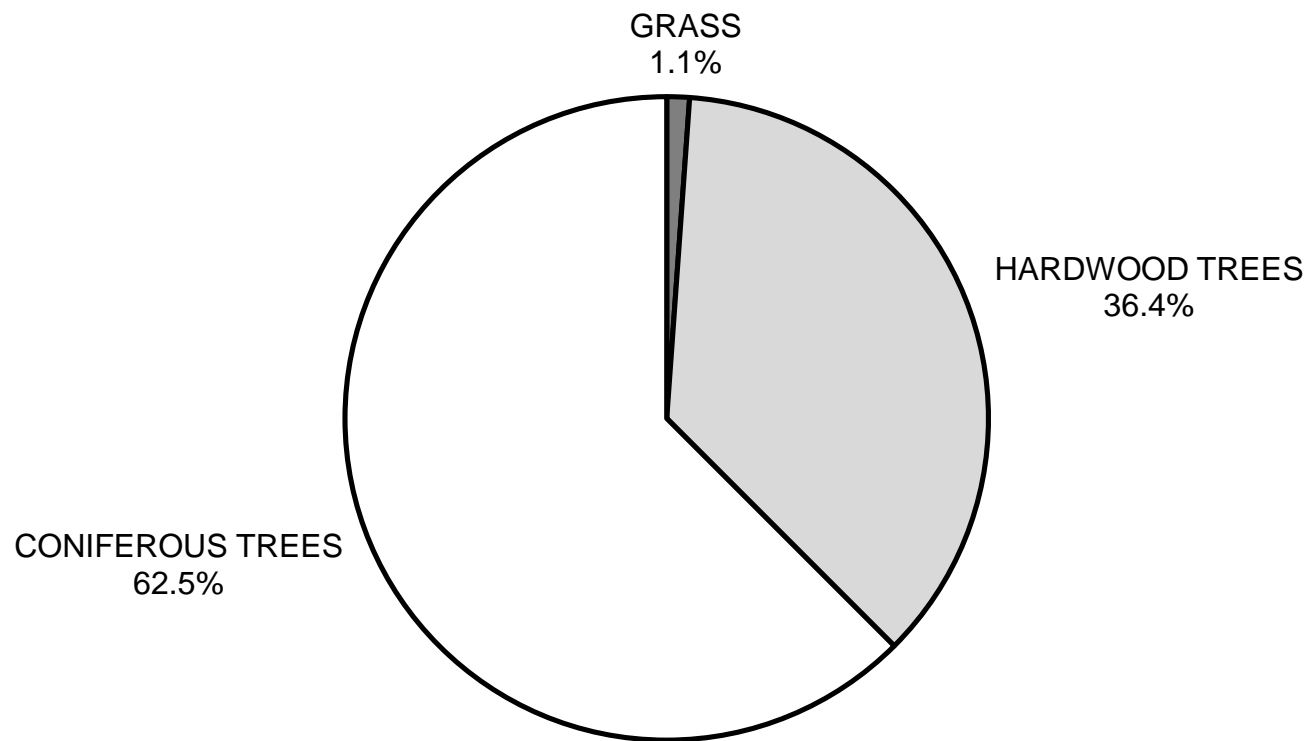
**UNNAMED TRIB TO NOYO RIVER 2016  
DOMINANT BANK COMPOSITION IN SURVEY REACH**



SAND/SILT/CLAY  
100.0%

GRAPH 10

**UNNAMED TRIB TO NOYO RIVER 2016  
DOMINANT BANK VEGETATION IN SURVEY REACH**



GRAPH 11