

STREAM INVENTORY REPORT

Hayworth Creek

INTRODUCTION

A stream inventory was conducted during the summer of 1999 on Hayworth Creek and an unnamed tributary to Hayworth Creek. The survey began at the confluence with the North Fork Noyo River and extended upstream 6.2 miles. Stream inventory reports were also completed for the following tributaries to Hayworth Creek: North Fork of Hayworth Creek, Panther Gulch and Soda Creek.

The Hayworth Creek 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 Hayworth Creek. 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

Hayworth Creek is a tributary to the North Fork Noyo River, a tributary to the Noyo River, located in Mendocino County, California (Map 1). Hayworth Creek's legal description at the confluence with the North Fork Noyo River is T19N R15W S33. Its location is 39°27'37" north latitude and 123°31'27" west longitude. Hayworth Creek is a 3rd order stream and has approximately 8.3 miles of blue line stream according to the USGS Northspur, Longvale, Sherwood Peak, and Burbeck 7.5 minute quadrangles. Hayworth Creek drains a watershed of approximately 11.2 square miles. Elevations range from about 770 feet at the mouth of the creek to 2,040 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 Highway 20 to the Irmulco Road. The Irmulco Road is located approximately six miles west of Willits.

METHODS

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

Hayworth Creek

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 Hayworth Creek to record measurements and observations. There are nine components to the inventory form.

1. Flow:

Flow is measured in cubic feet per second (cfs) at 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 (1985 rev. 1994). This methodology is described in the *California Salmonid Stream Habitat Restoration Manual*. Channel typing is conducted simultaneously with habitat typing and follows a standard form to record measurements and observations. There are five measured parameters used to determine channel type: 1) water slope gradient, 2) entrenchment, 3) width/depth ratio, 4) substrate composition, and 5) sinuosity. Channel characteristics are measured using a clinometer, hand level, hip chain, tape measure, and a stadia rod.

3. Temperatures:

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

4. Habitat Type:

Habitat typing uses the 24 habitat classification types defined by McCain and others (1988). 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". Hayworth Creek habitat typing used standard basin level measurement criteria. These parameters require that the minimum length of a described habitat unit must be equal to or greater than the stream's mean wetted width. All measurements are in feet to the nearest tenth. Habitat characteristics were

Hayworth Creek

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 Hayworth Creek, embeddedness was ocularly estimated. The values were recorded using the following ranges: 0 - 25% (value 1), 26 - 50% (value 2), 51 - 75% (value 3) and 76 - 100% (value 4). Additionally, a value of 5 was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate particle size, a bedrock tail-out, or other considerations.

6. Shelter Rating:

Instream shelter is composed of those elements within a stream channel that provide 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. 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 Hayworth Creek, a standard qualitative shelter value of 0 (none), 1 (low), 2 (medium), or 3 (high) was assigned according to the complexity of the cover. Thus, shelter ratings can range from 0-300 and are expressed as mean values by habitat types within a stream.

7. Substrate Composition:

Substrate composition ranges from silt/clay sized particles to boulder and bedrock elements. In all fully-described habitat units, dominant and sub-dominant substrate 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 Hayworth Creek, an estimate of the percentage of the habitat unit covered by canopy was made from the center of approximately every third unit in addition to every fully-described unit, giving an approximate 30% sub-sample. In addition, the area of canopy was estimated ocularly into percentages of coniferous or deciduous 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 Hayworth Creek, the dominant composition type and the dominant vegetation type of both the right and left banks for each fully-described unit were selected from the habitat inventory form. Additionally, the percent of each bank covered by vegetation

Hayworth Creek

(including downed trees, logs, and rootwads) was estimated and recorded.

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 Hayworth Creek. In addition, thirteen sites were electrofished using a Smith-Root Model 12 electrofisher. These sampling techniques are discussed in the *California Salmonid Stream Habitat Restoration Manual*.

DATA ANALYSIS

Data from the habitat inventory form are entered into Habitat, a dBASE 4.2 data entry program developed by Tim Curtis, Inland Fisheries Division, California Department of Fish and Game. This program processes and summarizes the data, and produces the following six tables:

- Riffle, flatwater, and pool habitat types
- Habitat types and measured parameters
- Pool types
- Maximum pool depths by habitat types
- Dominant substrates by habitat types
- Mean percent shelter by habitat types

Graphics are produced from the tables using Quattro Pro. Graphics developed for Hayworth Creek include:

- Riffle, flatwater, pool habitats by percent occurrence
- Riffle, flatwater, pool habitats by total length
- Total habitat types by percent occurrence
- Pool types by percent occurrence
- Total pools by maximum depths
- Embeddedness
- Pool cover by cover type
- Dominant substrate in low gradient riffles
- Mean percent canopy
- Bank composition by composition type
- Bank vegetation by vegetation type

HABITAT INVENTORY RESULTS

The habitat inventory of June 30, July 1, 6-9, and 13, 1999 was conducted by Ethan Jankowski and Toni Beaumont (WSP/AmeriCorps). The total length of the stream surveyed was 32,561 feet with an additional 417 feet of side channel.

Hayworth Creek

Stream flow was measured at the beginning of the survey reach with a Marsh-McBirney Model 2000 flowmeter at 2.12 cfs on July 8, 1999. Stream flow was measured again 19,698 feet upstream of the start of the survey at 1.36 cfs on July 8, 1999.

Hayworth Creek is a B3 channel type for the first 25,608 feet of the stream surveyed. B3 channels are moderately entrenched, riffle dominated channels on moderate gradients with infrequently spaced pools, very stable plan and profile, stable banks and cobble-dominant substrates. Hayworth Creek is an E3 channel type for the remaining 6,953 feet of the stream surveyed. E3 channels are low gradient, very efficient and stable, meandering riffle/pool streams with a low width to depth ratio. These are cobble channels with little deposition and a high meander width ratio.

Water temperatures taken during the survey period ranged from 56 to 66 degrees Fahrenheit. Air temperatures ranged from 57 to 89 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 19% riffle units, 23% flatwater units, and 58% pool units (Graph 1). Based on total length of Level II habitat types there were 28% riffle units, 37% flatwater units, and 35% pool units (Graph 2).

Fourteen Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were mid-channel pools, 22%; lateral scour pools - bedrock formed, 20%; and runs, 19% (Graph 3). Based on percent total length, runs made up 32%, low-gradient riffles 19%, and mid-channel pools 15%.

A total of 191 pools were identified (Table 3). Scour pools were the most frequently encountered, at 61%, and comprised 55% of the total length of all pools (Graph 4).

Table 4 is a summary of maximum pool depths by pool habitat types. Pool quality for salmonids increases with depth. Seventy-seven of the 191 pools (40%) had a depth of three feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 190 pool tail-outs measured, none had a value of 1; 74 had a value of 2 (38.9%); 85 had a value of 3 (44.7%); 21 had a value of 4 (11.0%); and 10 had a value of 5 (5.3%) (Graph 6). On this scale, a value of 1 indicates the highest quality of spawning substrate. The dominant substrate composition was bedrock for the 10 pool tail-outs that had an embeddedness value of 5.

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 15, flatwater habitat types had a mean shelter rating of 11, and pool habitats had a mean shelter rating of 25 (Table 1). Of the pool types, the scour pools had the highest mean shelter rating at 29, main channel pools had a mean shelter rating of 20, and backwater pools had a mean shelter rating of 3 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Boulders are the dominant cover type in Hayworth Creek followed by terrestrial vegetation. Graph 7 describes the pool cover in

Hayworth Creek

Hayworth Creek. Large woody debris is the dominant pool cover type followed by bedrock ledges.

Table 6 summarizes the dominant substrate by habitat type. Graph 8 depicts the dominant substrate observed in pool tail-outs. Small cobble was the dominant substrate observed in 33% of pool tail-outs while large cobble was the next most frequently observed substrate type, at 21%.

The mean percent canopy density for the surveyed length of Hayworth Creek was 88%. The mean percentages of deciduous and coniferous trees were 49% and 51%, respectively. Graph 9 describes the mean percent canopy in Hayworth Creek.

For the surveyed length of Hayworth Creek, the mean percent right bank vegetated was 77%. The mean percent left bank vegetated was 71%. The dominant elements composing the structure of the stream banks consisted of 40.7% bedrock, 3.7% boulder, 42.6% cobble/gravel, and 13.0% sand/silt/clay (Graph 10). Brush and deciduous trees were the dominant vegetation types observed in 32% of the units surveyed each. Additionally, 21.3% of the units surveyed had coniferous trees as the dominant vegetation type, and 10.2% had grass as the dominant vegetation (Graph 11).

BIOLOGICAL INVENTORY RESULTS

Thirteen sites were electrofished for species composition and distribution in Hayworth Creek. Sites 1 through 5 were sampled September 2, 1999 while sites 6 through 13 were sampled October 20, 1999. Water temperatures taken during the electrofishing period of 11:30am to 12:30pm on September 2nd ranged from 54 to 55 degrees Fahrenheit. Air temperatures ranged from 59 to 64 degrees Fahrenheit. Water temperatures taken during the electrofishing period of 9:20am and 10:15am on October 20th ranged from 48 to 49 degrees Fahrenheit. Air temperature was 44 degrees Fahrenheit. The sites were sampled by Michelle Gilroy (DFG), Randy Turner (CCC), and Ethan Jankowski (WSP/AmeriCorps).

The first site sampled included habitat unit 21, a mid-channel pool with bedrock banks located approximately 1,683 feet from the start of the survey. The site yielded 1 young-of-the-year steelhead.

The second site included habitat unit 22, a mid-channel pool located approximately 1,740 feet above the start of the survey. The site yielded 6 young-of-the-year steelhead.

The third site sampled included habitat unit 31, a lateral scour pool - bedrock formed located approximately 2,672 feet above the start of the survey. The site yielded 1 young-of-the-year and 1 one-plus age class steelhead.

The fourth site sampled included habitat unit 38, a lateral scour pool - bedrock formed located approximately 3,212 feet above the start of the survey. The site yielded 4 young-of-the-year steelhead.

The fifth site sampled included habitat unit 39, a mid-channel pool located approximately 3,268 feet above the start of the survey. The site yielded 1 young-of-the-year steelhead.

Hayworth Creek

The sixth site sampled included habitat unit 222, a lateral scour pool - root wad enhanced, with log cover, located approximately 22,130 feet above the start of the survey. The site yielded 1 two-plus age class steelhead.

The seventh site sampled included habitat unit 224, a lateral scour pool - bedrock formed, located approximately 22,253 feet above the start of the survey. The site yielded 2 one-plus age class steelhead and 1 sculpin.

The eighth site sampled included habitat unit 228, a mid-channel pool with log cover, located 22,662 feet above the start of the survey. The site yielded 2 young-of-the-year, 1 one-plus, and 1 two-plus age class steelhead.

The ninth site sampled included habitat unit 230, a lateral scour pool - root wad enhanced, located approximately 22,713 feet above the start of the survey. The site yielded 2 one-plus and 1 two-plus age class steelhead, and 2 sculpin.

The tenth site sampled included habitat unit 232, a lateral scour pool - root wad enhanced, located approximately 23,164 feet above the start of the survey. The site yielded 1 young-of-the-year and 1 one-plus age class steelhead.

The eleventh site sampled included habitat unit 233, a lateral scour pool - root wad enhanced, located approximately 23,221 feet above the start of the survey. The site yielded 1 one-plus steelhead. This site was not completely electrofished due to pool depth.

The twelfth site sampled included habitat unit 235, a lateral scour pool - root wad enhanced, located approximately 23,384 feet above the start of the survey. The site yielded 1 one-plus, 1 two-plus age class steelhead and 2 sculpin.

The thirteenth site sampled included habitat unit 237, a lateral scour pool - root wad enhanced, located approximately 23,765 feet above the start of the survey. The site yielded 1 one-plus and 1 two-plus age class steelhead.

The following chart displays the information yielded from these sites:

Date	Site #	Approx. Dist. from start(ft.)	Hab. Unit #	Hab. Type	Reach #	Channel type	Steelhead		
							YOY	1+	2+
09/02/99	1	1,683	21	MCP	1	B3	1	0	0
09/02/99	2	1,740	22	MCP	1	B3	6	0	0
09/02/99	3	2,672	31	LSBk	1	B3	1	1	0
09/02/99	4	3,212	38	LSBk	1	B3	4	0	0
09/02/99	5	3,268	39	MCP	1	B3	1	0	0
10/20/99	6	22,130	222	LSR	1	B3	0	0	1
10/20/99	7	22,253	224	LSBk	1	B3	0	2	0

Hayworth Creek

Date	Site #	Approx. Dist. from start(ft.)	Hab. Unit #	Hab. Type	Reach #	Channel type	Steelhead		
							YOY	1+	2+
10/20/99	8	22,665	228	MCP	1	B3	2	1	1
10/20/99	9	22,713	230	LSR	1	B3	0	2	1
10/20/99	10	23,164	232	LSR	1	B3	1	1	0
10/20/99	11*	23,221	233	LSR	1	B3	0	1	0
10/20/99	12	23,384	235	LSR	1	B3	0	1	1
10/20/99	13	23,765	237	LSR	1	B3	0	1	1

*This site was not completely electrofished due to pool depth.

DISCUSSION

Hayworth Creek is a B3 channel type for the first 25,608 feet of stream surveyed and an E3 channel type for the remaining 6,953 feet. The suitability of B3 channel types for fish habitat improvement structures is as follows: excellent for bank-placed boulders; good for log cover; poor for plunge weirs, single and opposing wing-deflectors, and boulder clusters. The suitability of E3 channel types for fish habitat improvement structures is as follows: good for bank-placed boulders; fair for opposing wing-deflectors; poor for plunge weirs, boulder and single wing deflectors.

The water temperatures recorded on the survey days of June 30, July 1, 6-9, and 13, 1999 ranged from 56 to 66 degrees Fahrenheit. Air temperatures ranged from 57 to 89 degrees Fahrenheit. This is an acceptable water temperature range for salmonids. To make any further conclusions, temperatures would need to be monitored throughout the warm summer months, and more extensive biological sampling would need to be conducted.

Flatwater habitat types comprised 37% of the total length of this survey, riffles 28%, and pools 35%. Seventy-seven out of the 191 (40%) pools had a maximum 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 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.

None of the 190 pool tail-outs measured had an embeddedness rating of 1, seventy-four had a rating of 2, eighty-five had a rating of 3, twenty-one had a rating of 4, and ten of the pool tail-outs had a rating of 5, which is considered unsuitable for spawning. The pool tail-outs valued at 5 were dominated by bedrock substrate. 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 Hayworth Creek should be mapped and rated according to their potential sediment yields, and control measures should be taken.

Ninety-two of the 190 pool tail-outs had gravel and small cobble as the dominant substrate, and ninety-seven of the tail-outs had large cobble, boulders, or bedrock as the dominant substrate.

Hayworth Creek

The mean shelter rating for pools was 25. A pool shelter rating of approximately 100 is desirable. The shelter rating in the riffle habitats was 15. The flatwater habitats had a mean shelter rating of 11. The cover that now exists is being provided primarily by boulders and terrestrial vegetation in the riffle and flatwater habitat types. Large woody debris and bedrock ledges, followed by terrestrial vegetation and root masses were the dominant cover types in pools. Log and root wad cover structure in the pool and flatwater habitats would enhance both summer and winter salmonid habitat. Log cover structure provides rearing fry with protection from predation, rest from water velocity, and also divides territorial units to reduce density related competition.

The mean percent canopy density for the stream was 88%. Reach 1 had a canopy density of 88% while Reach 2 had a canopy density of 89%. In general, revegetation projects are considered when canopy density is less than 80%.

The percentage of right and left bank covered with vegetation was 77% and 71%, respectively. In areas of stream bank erosion or where bank vegetation is not at acceptable levels, planting endemic species of coniferous and deciduous trees, in conjunction with bank stabilization, is recommended.

RECOMMENDATIONS

- 1) Hayworth Creek should be managed as an anadromous, natural production stream.
- 2) The limited water temperature data available suggest that maximum temperatures are within the acceptable range for juvenile salmonids. To establish more complete and meaningful temperature regime information, 24-hour monitoring during the July and August extreme temperature period should be performed for 3 to 5 years.
- 3) Increase the large wood component instream. High quality complexity with woody cover is desirable.
- 4) 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.

Hayworth Creek

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.):	Comments:
0'	Begin survey at the confluence with the North Fork Noyo River. Channel type is B3.
1,683'	Electrofishing site #1.
1,740'	Electrofishing site #2.
2,672'	Electrofishing site #3.
3,212'	Electrofishing site #4.
3,268'	Electrofishing site #5.
4,891'	Panther Gulch enters from right bank, 56 degrees Fahrenheit water temperature, fish observed. See Panther Gulch report.
9,677'	Log debris accumulation, 10' long x 20' wide x 8' high.
10,241'	Bridge, 10' long x 25' wide x 8' high.
10,424'	Road ends at creek along left bank.
14,463'	The North Fork of Hayworth Creek enters from right bank. See North Fork Hayworth Creek report.
15,327'	Four foot plunge.
15,364'	Four foot plunge.
15,388'	Two foot plunge.
18,077'	Downed tree over channel, not retaining sediment.
19,618'	Downed tree over channel, not retaining gravel.
19,723'	Tributary enters from right bank, 55 degrees Fahrenheit water temperature.
19,747'	Flow measured to be 1.36 cubic feet per second on July 8, 1999.

Hayworth Creek

20,336'	Large woody debris retaining gravel and forming 7 foot plunge.
20,877'	Log debris accumulation forming 10 foot plunge, not retaining sediment. Two sets of 4 foot plunges.
21,035'	Log debris accumulation, 20 feet long x 20 feet wide x 7 feet high.
21,851'	Soda Creek, low gradient, 57 degrees Fahrenheit water temperature, enters from left bank. Soda Creek culvert is 40 feet long and 4 feet wide. See Soda Creek report.
22,130'	Electrofishing site # 6.
22,159'	Log debris accumulation, 10 feet long x 15 feet wide x 6 feet high, not retaining sediment.
22,253'	Electrofishing site #7.
22,281'	Stream crossing.
22,665'	Electrofishing site #8.
22,713'	Electrofishing site #9.
23,164'	Electrofishing site #10.
23,221'	Electrofishing site #11.
23,384'	Electrofishing site #12.
23,765'	Electrofishing site #13.
23,794'	Log debris accumulation on left bank, not retaining sediment.
25,227'	Log debris accumulation, 15 feet long x 15 feet wide x 6 feet high, not retaining sediment.
25,467'	Old road crossing.
25,548'	Unnamed tributary enters from right bank, 57 degrees Fahrenheit water temperature, see tributary subsection report. Channel type changes to E3.
26,237'	Tributary enters from left bank, 57 degrees Fahrenheit water temperature, low stream flow.
27,581'	Three foot plunge.

Hayworth Creek

- 27,643' Three foot plunge.
- 28,202' Six wood pieces in channel cabled together causing plunge and retaining sediment.
- 28,719' Tributary enters from left bank, low flow, high gradient, 61 degrees Fahrenheit water temperature.
- 29,922' Tributary G enters from left bank, high gradient, 60 degree Fahrenheit water temperature.
- 30,461' Log debris accumulation, 20 feet long x 20 feet wide x 5 feet high, retaining sediment.
- 30,465' Right bank failure, 50 feet long x 20 feet high, contributing trees and gravel.
- 30,799' Log debris accumulation, 20 feet long x 6 feet wide x 8 feet high, retaining sediment.
- 30,902' Log debris accumulation, 15 feet long x 15 feet wide x 4 feet high, retaining sediment.
- 31,433' Log debris accumulation, 12 feet long x 15 feet wide x 8 feet long, retaining sediment.
- 31,855' Rock slide on right bank, 30 feet high x 30 feet wide.
- 32,342' Tributary enters from left bank, high gradient, 67 degrees Fahrenheit water temperature.
- 32,500' Dry tributary enters from right bank.
- 32,561' End of survey. Channel gradient increases.

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.

Hayworth Creek

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]	

Hayworth Creek

Hayworth Creek, trib to NF Noyo

