STREAM INVENTORY REPORT

Redwood Creek

INTRODUCTION

A stream inventory was conducted in the summer of 2003 on Redwood Creek. The survey began at the confluence with Hollow Tree Creek and extended upstream approximately 2 miles. Stream inventories and reports were also completed for one tributary to Redwood Creek.

The Redwood 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 Redwood 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 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

Redwood Creek is a tributary to Hollow Tree Creek, a tributary to South Fork Eel River, a tributary to the Eel River, a tributary to the Pacific Ocean, located in Mendocino County, California (Map 1). Redwood Creek's legal description at the confluence with Hollow Tree Creek is T22N R17W S09. Its location is 39° 46' 43" north latitude and 123° 45' 8" west longitude. Redwood Creek is a second order stream and has approximately 3.6 miles of blue line stream according to the USGS Hales Grove 7.5 minute quadrangle. Redwood Creek drains a watershed of approximately 3.4 square miles. Elevations range from about 1,150 feet at the mouth of the creek to 1,650 feet in the headwater areas. Redwood, Douglas fir and mixed hardwood forest dominates the watershed. The watershed is entirely privately owned and is managed for timber production. Vehicle access exists via the Westside Road off Highway 1 at Hales Grove.

METHODS

The habitat inventory conducted in Redwood 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.

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. All pools except step-pools are fully sampled.

HABITAT INVENTORY COMPONENTS

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

1. Flow:

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

2. Channel Type:

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

3. Temperatures:

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

4. Habitat Type:

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

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 Redwood 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 such as bedrock, log sills, boulders 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 Redwood Creek, a standard qualitative shelter value of 0 (none), 1 (low), 2 (medium), or 3 (high) was assigned according to the complexity of the cover. Thus, shelter ratings can range from 0-300 and are expressed as mean values by habitat types within a stream.

7. Substrate Composition:

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

8. Canopy:

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

9. Bank Composition and Vegetation:

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

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 Redwood Creek. In addition, a snorkel survey was conducted and four sites were sampled. These sampling techniques are discussed in the *California Salmonid Stream Habitat Restoration Manual*.

DATA ANALYSIS

Data from the habitat inventory form are entered into Stream Habitat 1.0.35, a Visual Basic data entry program developed by Karen Wilson, Pacific States Marine Fisheries Commission in conjunction with the California Department of Fish and Game. This program processes and summarizes the data, and produces the following ten tables:

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

Graphics are produced from the tables using Microsoft Excel. Graphics developed for Redwood Creek 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 AT THE END OF THE REPORT *

The habitat inventory of 06/24/03 to 07/01/03, was conducted by Elizabeth Pope, Kevin Lucey and Shauna Bradshaw (WSP). The total length of the stream surveyed in the habitat inventory was 10,526 feet.

Stream flow was measured 1,296 feet upstream from the confluence with Hollow Tree Creek with a Marsh-McBirney Model 2000 flowmeter at 1.79 cfs on 06/26/03.

Redwood Creek is a G5 channel type for 3,263 feet of the stream surveyed (Reach 1), an F3 channel type for the next 4,700 feet of the stream surveyed (Reach 2), a G4 channel type for the next 909 feet of the stream surveyed (Reach 3), and a B4 channel type for the final 1,654 feet of the stream surveyed (Reach 4). G5 channels are entrenched “gully” step-pool channels on moderate gradients with low width /depth ratios with sand dominant substrates. F3 channels are entrenched, meandering, riffle/pool channels on low gradients with high width/depth ratios and cobble-dominant substrates. G4 channels are entrenched “gully” step-pool channels on moderate gradients with low width /depth ratios with gravel dominant substrates. B4 channels are moderately entrenched riffle dominated channels with infrequently spaced pools, very stable plan and profile, stable banks on moderate gradients with low width /depth ratios and gravel dominant substrates.

Water temperatures taken during the survey period ranged from 54 to 58 degrees Fahrenheit. Air temperatures ranged from 60 to 72 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 38% pool units, 34% riffle units and 28% flatwater units (Graph 1).

Based on total length of Level II habitat types there were 55% pool units, 25% flatwater units and 20% riffle units (Graph 2).

Nine Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were 35% mid-channel pool units, 32% low gradient riffle units, 27% run units (Graph 3). Based on percent total length, 50% mid-channel pool units, 20% low gradient riffle units, 22% run units,

A total of 89 pools were identified (Table 3). Main channel pools were the most frequently encountered, at 99%, and comprised 99% of the total length of all pools (Graph 4).

Table 4 is a summary of maximum residual pool depths by pool habitat types. Pool quality for salmonids increases with depth. Sixty-seven of the 89 pools (75%) had a residual depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 89 pool tail-outs measured, 2 had a value of 1 (2.2%); 26 had a value of 2 (29.2%); 38 had a value of 3 (42.7%); 14 had a value of 4 (15.7%); 9 had a value of 5 (10.1%) (Graph 6). On this scale, a value of 1 indicates the best spawning conditions. Additionally, a value of 5 was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate, this includes, bedrock, log sills and boulders.

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 23, flatwater habitat types had a mean shelter rating of 10 , and pool habitats had a mean shelter rating of 31 (Table 1). Of the pool types, the main channel pools had a mean shelter rating of 31, scour pools had a mean shelter rating of 40 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Small woody debris is the dominant cover types in Redwood Creek. Graph 7 describes the pool cover in Redwood Creek. 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 observed in 55% of pool tail-outs and small cobble was observed in 20% of pool tail-outs.

The mean percent canopy density for the surveyed length of Redwood Creek was 90%. The mean percentages of hardwood and coniferous trees were 60% and 40%, respectively. None of the units measured were completely open. Graph 9 describes the mean percent canopy in Redwood Creek.

For the stream reach surveyed, the mean percent right bank vegetated was 61%. The mean percent left bank vegetated was 64%. The dominant elements composing the structure of the stream banks consisted 100% of sand/silt/clay, (Graph 10). Hardwood trees were the dominant vegetation type observed in 89% of the units surveyed. Additionally, 10% of the units surveyed had grass as the dominant vegetation type (Graph 11).

BIOLOGICAL INVENTORY RESULTS

Four sites were snorkel surveyed for species composition and distribution in Redwood Creek on August 11, 2003. Water temperature taken during the survey period was 57 degrees Fahrenheit. The sites were sampled by Janelle Breton (CCC) and Trevor Tollefson (DFG).

In reach one, two sites were sampled between habitat units 5 and 7, approximately 300 feet from the confluence with Redwood Creek. The reach sites yielded 6 young-of-year steelhead/rainbow trout (SH/RT), 20 young-of-year coho salmon and three age 1+ coho.

In reach two, one site was sampled, habitat unit number 54, approximately 2,780 from the confluence with Hollow Tree Creek. The reach site yielded three age 1+ SH/RT and 54 young-of-year coho.

In reach three, one site above the end of the habitat type assessment survey was sampled approximately 15,000 feet from the confluence with Hollow Tree Creek. The reach sites yielded three young-of-year SH/RT and eleven young-of-year coho.

The following chart displays the information yielded from these sites:

Redwood Creek 2003 - Underwater observations

Date	Site Number	Habitat Unit	Habitat Type	Aprox. Dist from mouth (ft)	Coho		SH/RT	
					YOY	1+	YOY	1+
Reach 1- G5 Channel Type								
8/11/2004	1	5	4.4	225	8	2	3	0
8/11/2004	2	7	4.2	301	12	1	3	0
Reach 2- F3 Channel Type								
8/11/2004	3	54	4.2	2,780	54	0	0	3
Upstream of the end of 2003 Habitat Assessment Survey								
8/11/2004	4	N/A	4.2	15,000	11	0	3	0

DISCUSSION

Redwood Creek is a G5 channel type for the first 3,263 feet of the stream surveyed (Reach 1); a F3 channel type for the next 4,700 feet of the stream surveyed (Reach 2), a G4 channel type for the next 909 feet of the stream surveyed (Reach 3), and a B4 channel type for the final 1,654 feet of the stream surveyed (Reach 4). The suitability of G4 and G5 channel types for fish habitat improvement structures is good for bank-placed boulders, fair for plunge weirs, opposing wing-deflectors and log cover and poor for boulder clusters and single wing-deflectors. 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, single and opposing wing-deflectors and log over.

The water temperatures recorded on the survey days 6/24/03 to 7/1/2003, ranged from 54 to 58 degrees Fahrenheit. Air temperatures ranged from 60 to 72 degrees Fahrenheit. These water temperatures are good for anadromous fish. 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 25% of the total length of this survey, riffles 20%, and pools 55%. The pools are relatively deep with 67 of the 89 (75%) pools having a maximum residual depth greater than 2 feet. In general, pool enhancement projects are considered when primary pools comprise less than 40% of the length of total stream habitat. In first and second order streams, a primary pool is defined to have a maximum residual depth of at least two feet, occupy at least half the width of the low flow channel, and be as long as the low flow channel width.

Twenty-eight of the 89 pool tail-outs measured had embeddedness ratings of 1 or 2. Fifty-two of the pool tail-outs had embeddedness ratings of 3 or 4. Nine 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 Redwood Creek should be mapped and rated according to their potential sediment yields, and control measures should be taken.

Sixty-five of the 87 pool tail-outs measured had gravel or small cobble as the dominant substrate. This is good for spawning salmonids.

The mean shelter rating for pools was 31. The shelter rating in the flatwater habitats was 10. 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 Redwood Creek. 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 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 90%. Reach 1 and 2 both had a canopy density of 92%, Reach 3 had a canopy density of 89% and Reach 4 had a canopy density of 87%. In general, revegetation projects are considered when canopy density is less than 80%.

The percentage of right and left bank covered with vegetation was 61% and 64%, respectively. In areas of stream bank erosion or where bank vegetation is sparse, planting endemic species of coniferous and hardwood trees, in conjunction with bank stabilization, is recommended.

RECOMMENDATIONS

1) Redwood 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 temperature extreme period should be performed for 3 to 5 years.

3) Increase woody cover in the pools and flatwater habitat units. Most of the existing cover is from small woody debris. Adding 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.

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	Redwood Creek habitat assessment survey began at the confluence with Hollow Tree Creek.
227	0005.00	Snorkel survey site #1.
227	0005.00	Two CCC structures
291	0006.00	Bedrock falls with a 5.4 ft cascade. Fish observed above.
301	0007.00	Snorkel survey site #2. CCC structure at top of unit
374	0009.00	CCC structure (#470 7/15/99)
816	0017.00	Right bank failure, 15'Lx 25'H x 3D, contributing large cobble and large woody debris.
899	0018.00	CCC structure
973	0020.00	Log debris accumulation (LDA) 6' H x 22'W x 25'L, with 4 pieces large wood, retaining sediment, 6'W x 2'L x 3'D. Sediment size is small cobble. Not a barrier to salmonids. LDA retained by two CCC structures.
1000	0021.00	CCC structure holding small woody debris
1100	0023.00	CCC structure
1296	0027.00	Main haul road access.
1321	0028.00	CCC structure with LDA, 10'w x 20'L x 8'H.
1321	0028.00	Rocked road with cut bank within 30 ft of the stream
1923	0039.00	Bridge (20'W x 17'H x 35'L) Westside Road Bridge.
2108	0043.00	CCC structure (2/25/92)
2403	0048.00	Two CCC structures
2630	0052.00	Channel type change from G5 to F3.
2630	0052.00	Three CCC structures
2780	0054.00	Three CCC structures
2780	0054.00	Snorkel survey site #3.
3183	0060.00	CCC structure

Position (ft.)	Habitat Unit #	Comments:
3183	0060.00	Right bank tributary #1- South Fork Redwood Creek - Water temperature of South Fork Redwood Creek was 56 F. The water temperature of Redwood Creek upstream and downstream of South Fork Redwood was 58 F and 56 F, respectively.
3497	0064.00	Stream becomes intermittent. YOY observed in isolated pools.
3497	0064.00	LDA, 8' H x 10'W x 30'L, 13 pieces large wood, retaining sediment, 8'W x 12'L x 4'D.
3515	0065.00	There is no defined channel, water seems to flow over forest floor. The channel, is severely constricted.
3655	0070.00	CCC structure
3655	0070.00	LDA, 7'H x 13'W x 32 'L, composed of 3 pieces of large wood. LDA retains small woody debris and sediment, 1'W x 2'L x 1'D.
3967	0076.00	LDA, 8'H x 23'H x 39'L, composed of 10 pieces of large wood
4129	0078.00	CCC structure #4130 (6/24/99)
4512	0082.00	CCC structure
4654	0086.00	Left bank failure, 30'H x 2'D x 115'L.
4654	0086.00	LDA, 10'H x 20'W x 26'L, composed of 10 pieces of large wood. Fish observed upstream.
5561	0110.00	Left bank tributary #2- Water temperature of the tributary was 57 F. The water temperature of Redwood Creek both above and below the tributary was 57 F. Gradient of the tributary measured at 35%.
5702	0117.00	Cascade 2.5’ high.
6360	0125.00	CCC Site 6,410’.
6430	0128.00	CCC Site 6,500', August 1999
6660	0133.00	Left bank failure, 30'L x 20'H x 3' D.
6954	0138.00	Flag: "E- fishing (10/28/91)"
7032	0140.00	LDA, 12'H x 20'w x 45' L, composed of five pieces of large wood, retaining gravel.
7252	0143.00	LDA, 8'H x 22'W x 34'L, composed of six pieces of large wood.
7725	0153.00	LDA, 7'H x 18'w x 15'L, composed of six pieces of large wood. Retaining sediment, 2'W x 3'L x 1'D. Fish observed upstream of LDA.
7897	0159.00	LDA, 15'H x 20'W x 13'L, composed of two pieces of large wood. Retaining silt, 2' W x 4'L x 1'D. Fish observed above LDA.
7963	0161.00	Channel type change
8425	0178.00	Right bank spring enters
8437	0179.00	Left bank spring enters
8527	0182.00	LDA, 7'H x 12'W x 7'L, composed of five pieces of large wood, not retaining sediment. Fish observed above LDA
8662	0186.00	Right bank spring enters
8802	0188.00	Channel type change to B4
8940	0192.00	LDA, 5'H x 12'W x 14'L, composed of six pieces of large wood. Retaining sediment, 5'W x 7'L x 1'D. Sediment size is sand/ silt. Fish observed above the LDA.

Position (ft.)	Habitat Unit #	Comments:
9049	0195.00	LDA, 20'H x 14'W x 128'L, composed of 24 pieces of large wood. Retaining silt, 2'Wx 6'L x 1'D. Salmonids observed above LDA.
9238	0201.00	Road parallels close to creek
9318	0204.00	LDA, 25'H x 15'W x 20'L, composed of eight pieces of large wood, retaining silt. Salmonids observed above.
9431	0205.00	Right bank failure, 2'H x 1'D x 20'L.
9805	0219.00	CCC structure
10000	0224.00	LDA, 30'H x 20'W x 12'L, not retaining sediment.
10526	0237.00	End of survey. Stream goes underground due to a large accumulation of soil with mature trees growing where the channel would be. During the biological survey, this was determined not to be the end of anadromous fish habitat.
15000	N/A	Snorkel survey site #4.

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]	