STREAM INVENTORY REPORT
Little Sproul Creek

INTRODUCTION

A stream inventory was conducted during July 2004 n Little Sproul Creek. The survey began at the confluence with Sproul Creek and extended upstream 2.5 miles. A stream inventory and subsection to this report was also completed for one tributary to Little Sproul Creek.

The Little Sproul 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 Little Sproul 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

Little Sproul Creek is a tributary to Sproul Creek, a tributary to South Fork Eel River, a tributary to Pacific Ocean, located in Humboldt County, California (Map 1). Little Sproul Creek's legal description at the confluence with Sproul Creek is T04S R03E S34. Its location is (40:04:03.0N) and (123:50:05.0W), with a LLID number of 1238348400675. Little Sproul Creek is a 1st order stream and has approximately 1.83 miles of blue line stream according to the USGS Garberville 7.5 minute quadrangle. Little Sproul Creek drains a watershed of approximately 3.87 square miles. Elevations range from about 353 feet at the mouth of the creek to 564 feet in the headwater areas. Redwood/mixed hardwood forest dominates the watershed. The watershed is entirely privately owned and is managed for timber production/rangeland/recreation. Vehicle access to the mouth exists via Sproul Creek Road.

METHODS

The habitat inventory conducted in Little Sproul Creek follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al, 1998). The California Conservation Corps (CCC) Technical Advisors 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 Little Sproul 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". Little Sproul 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 Little Sproul Creek, embeddedness was ocularly estimated. The values were recorded using the following ranges: 0 - 25% (value 1), 26 - 50% (value 2), 51 - 75% (value 3) and 76 - 100% (value 4). Additionally, a value of 5 was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate like bedrock, log sills, boulders or other considerations.

6. Shelter Rating:

Instream shelter is composed of those elements within a stream channel that provide juvenile salmonids protection from predation, reduce water velocities so fish can rest and conserve energy, and allow separation of territorial units to reduce density related competition for prey. The shelter rating is calculated for each fully-described habitat unit by multiplying shelter value and percent cover. Using an overhead view, a quantitative estimate of the percentage of the habitat unit covered is made. All cover is then classified according to a list of nine cover types. In Little Sproul 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 Little Sproul 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 Little Sproul 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. A snorkel survey was conducted on nine sites in Little Sproul Creek. In addition, six 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 Stream Habitat 1.0.49, 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 Little Sproul 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 7/7/2004 to 7/20/2004 was conducted by Lindsay Selvaggio and Corby Hines (CCC). The total length of the stream surveyed was 13,073 feet with an additional 509 feet of side channel.

Stream flow was measured 94' from the mouth with a Marsh-McBirney Model 2000 flowmeter at 0.1 cfs on 7/7/04.

Little Sproul Creek is a B3 channel type for 10,018 feet of the stream surveyed (Reach 1) and an A2 channel type for the remaining 3,055 feet of the stream surveyed (Reach 2). B3 channel types are moderately entrenched, with moderate gradient, riffle dominated channel with infrequently spaced pools, and cobble dominated substrate. A2 channels are steep, narrow, cascading, step-pool, high energy debris transporting channels associated with depositional soils, and boulder dominant substrates.

Water temperatures taken during the survey period ranged from 60 to 69 degrees Fahrenheit. Air temperatures ranged from 59 to 78 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 49% flatwater units, 24% riffle units, 23% pool units, and 5% dry units (Graph 1). Based on total length of Level II habitat types there were 68% flatwater units, 14% riffle units, 13% pool units, and 4% dry units (Graph 2).

Eleven Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were 28% step run units, 21% run units, and 16% low gradient riffle units (Graph 3). Based on percent total length, 51% were step run units, 17% run units, and 8% were mid-channel pool units. A total of 60 pools were identified (Table 3). Main channel pools were the most frequently encountered, at 67%, and comprised 65% 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. Thirty-one of the 60 pools (52%) had a residual depth of two feet or greater (Graph 5). Four of the 60 pools (7%) had a residual depth of three feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 60 pool tail-outs measured, 2 had a value of 1 (3.3%); 48 had a value of 2 (80%); 6 had a value of 3 (10%); 4 had a value of 5 (6.7%)(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 unsuited for spawning due to inappropriate substrate like bedrock, log sills, boulders, etc.

A shelter rating was calculated for each habitat unit and expressed as a mean value for each habitat type within the survey using a scale of 0-300. Riffle habitat types had a mean shelter rating of 16, flatwater habitat types had a mean shelter rating of 34, and pool habitats had a mean shelter rating of 56 (Table 1). Of the pool types, the main channel pools had a mean shelter rating of 60, scour pools had a mean shelter rating of 50, backwater pools had a mean shelter rating of 20 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Boulders are the dominant cover types in Little Sproul Creek. Graph 7 describes the pool cover in Little Sproul Creek. Boulders are 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. Small cobble was observed in 32% of pool tail-outs and gravel was observed in 30% of pool tail-outs.

The mean percent canopy density for the surveyed length of Little Sproul Creek was 93%. The mean percentages of hardwood and coniferous trees were 84% and 16%, respectively. Seven percent of the canopy was open. Graph 9 describes the mean percent canopy in Little Sproul Creek.

For the stream reach surveyed, the mean percent right bank vegetated was 63%. The mean percent left bank vegetated was 62%. The dominant elements composing the structure of the stream banks consisted of 56% cobble/gravel and 25% sand/silt/clay (Graph 10). Hardwood trees were the dominant vegetation type observed in 58% of the units surveyed. Additionally, 19% of the units surveyed had brush as the dominant vegetation type, and 16% had coniferous trees as the dominant vegetation (Graph 11).

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BIOLOGICAL INVENTORY RESULTS

Electrofishing and snorkel surveys were conducted on fifteen sites for species composition and distribution in Little Sproul Creek on July 27, 2004. Water temperatures ranged from 62 to 68 degrees Fahrenheit. Air temperatures ranged from 68 to 78 degrees Fahrenheit. Electrofishing fishing sites on reach one were sampled by Trevor Tollefson (DFG) and Lindsay Selvaggio; snorkel sites on reach two were conducted by Allan Renger (DFG) and Corby Hines.

In reach one, six sites were sampled between habitat units 008 and 120, a distance of 5,543 feet, approximately 5,931 feet from the confluence with Sproul Creek. The reach sites yielded 22 young-of-the-year steelhead, 8 age 1+ and 1 age 2+. Seven young-of-the-year coho were observed.

In reach two, five sites were sampled between habitat unit 208 and 225, a distance of 1,095 feet, approximately 11,527 feet from the confluence with Sproul Creek. The reach sites yielded 28 young-of-the-year steelhead, 5 age 1+ and 6 age 2+. Fifteen young-of-the-year coho were observed.

Four sites were sampled upstream of the last habitat unit surveyed (247). The sites yielded 3 young-of-the-year steelhead and 2 age 1+.

The following chart displays the information yielded from these sites:

2004 LITTLE SPROUL CREEK e-fish/dive observations.

Date	Site #	Hab. Unit #	Hab. Type	Approx. Dist. from mouth (ft.)	Coho		Steelhead		
					YOY	1+	YOY	1+	2+
Reach 1 e-fish B3 Channel Type									
07/27/04	1	008	5.6	388	0	0	5	1	0
07/27/04	2	029	4.2	1308	1	0	5	2	0
07/27/04	3	053	4.2	2741	0	0	6	2	0
07/27/04	4	074	4.2	3833	1	0	0	0	0
07/27/04	5	096	4.2	4725	5	0	2	3	1
07/27/04	6	120	3.4	5931	0	0	4	0	0
Reach 2 snorkel survey A2 Channel Type									
07/27/04	1	208	4.2	10432	0	0	3	1	0

2004 LITTLE SPROUL CREEK e-fish/dive observations.

Date	Site #	Hab. Unit #	Hab. Type	Approx. Dist. from mouth (ft.)	Coho		Steelhead		
					YOY	1+	YOY	1+	2+
07/27/04	2	212	4.2	10746	0	0	1	0	6
07/27/04	3	219	4.2	11122	10	0	10	4	0
07/27/04	4	223	5.4	11548	0	0	4	0	0
07/27/04	5	225	4.2	11508	5	0	10	0	0
Upstream of habitat survey end snorkel									
07/27/04	6	N/A	pool	N/A	0	0	3	1	0
07/27/04	7	N/A	pool	N/A	0	0	0	1	0
07/27/04	8	N/A	pool	N/A	0	0	0	0	0
07/27/04	9	N/A	pool	N/A	0	0	0	0	0

DISCUSSION

Little Sproul Creek is a B3 channel type for the first 10,018 feet of stream surveyed and an A2 channel type for the remaining 3,055 feet. The suitability of B3 and A2 channel types for fish habitat improvement structures is as follows: B3 channel types are excellent for plunge weirs; boulder clusters and bank placed boulders; single and opposing wing-deflectors; log cover. A2 channel types are generally not suitable for habitat improvement structures.

The water temperatures recorded on the survey days 7/7/2004 to 7/20/2004, ranged from 60 to 69 degrees Fahrenheit. Air temperatures ranged from 59 to 78 degrees Fahrenheit. This is a good water temperature for juvenile 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 68% of the total length of this survey, riffles 14%, and pools 13%. The pools are relatively deep, with 31 of the 60 (52%) pools having a maximum residual depth greater than 2 feet. In general, pool enhancement projects are considered when primary pools comprise less than 40% of the length of total stream habitat. In first and second order streams, a primary pool is defined to have a maximum residual depth of at least two feet, occupy at least half the width of the low flow channel, and be as long as the low-flow channel width. Installing structures that will increase or deepen pool habitat is recommended.

Fifty of the 60 pool tail-outs measured had embeddedness ratings of 1 or 2. Six of the pool tail-outs had embeddedness ratings of 3 or 4. Four 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.

Thirty-seven of the 60 pool tail-outs measured had gravel or small cobble as the dominant substrate. This is generally considered good for spawning salmonids.

The mean shelter rating for pools was 56. The shelter rating in the flatwater habitats was 34. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by boulders in Little Sproul Creek. Boulders are the dominant cover type in pools followed by small woody debris. Log and root wad cover structures in the pool and flatwater habitats would enhance both summer and winter salmonid habitat. Log cover structure provides rearing fry with protection from predation, rest from water velocity, and also divides territorial units to reduce density related competition.

The mean percent canopy density for the stream was 93%. Reach 1 had a canopy density of 93% and reach 2 had a canopy density of 91%. In general, revegetation projects are considered when canopy density is less than 80%.

The percentage of right and left bank covered with vegetation was at 63% and 62%, 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) Little Sproul 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) In the B3 channel type (reach 1) design and engineer pool enhancement structures to increase the number of pools. This must be done where the banks are stable or in conjunction with stream bank armor to prevent erosion.

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

5) Inventory and map sources of stream bank erosion and prioritize them according to present and potential sediment yield. Identified sites should then be treated to reduce the amount of fine sediments entering the stream.

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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 the confluence with Sproul Creek. Channel type is a B3.
388	0008.00	Electrofishing site #1
729	0017.00	Bank erosion 124' long x 20' high x 15' wide.
863	0020.00	1+ salmonid observed
1,308	0029.00	Electrofishing site #2
1,438	0033.00	Right bank tributary.
2,002	0042.00	Three pieces of large wood accumulating large amount of small woody debris.
2741	0053.00	Electrofishing site #3
2,839	0057.00	Human-made dam with wood and concrete used in the past as a water source for a hatchery.
3,089	0062.00	BFW and Channel type measurements taken.
3,515	0070.00	Right bank tributary.
3833	0074.00	Electrofishing site #4
3,988	0079.00	Left bank tributary.
4,630	0094.00	Right bank erosion 80' long x35' high x 20' deep.
4725	0096.00	Electrofishing site #5
4,757	0097.00	Right bank tributary.
5,417	0111.00	Left bank tributary.

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Position (ft.)	Habitat Unit #	Comments:
5931	0120.00	Electrofishing site #6
6,031	0121.00	Log debris accumulation (LDA) 30' long x 12' wide x 6' high.
6,121	0125.00	Left bank erosion 41' long x 32' high x 10' deep.
6,430	0133.00	Right bank tributary.
6,567	0134.00	Fish habitat improvement structure
6,642	0136.00	Fish habitat improvement structure
7,328	0144.01	Right bank erosion 70' long x 40' high x 15' deep.
7,770	0152.00	Right bank tributary.
8,036	0157.00	Left bank tributary.
8,676	0170.00	Left bank erosion 150' long x 40' high x 15' deep
9,245	0182.00	Left bank erosion 160' long x 20' high x 10' deep
9,351	0185.00	Right bank erosion 25' long x 15' high x 15' deep.
9,725	0193.00	Right bank tributary.
9,794	0194.00	Right bank tributary, with more flow than the mainstem (see sub-section report)
10,018	0198.00	Channel type changes to A2
10,180	0204.00	LDA 10' long x 28' wide x 5' high.
10,299	0207.00	BFW and channel type measurements taken.
10,432	0208.00	Snorkel survey site #1
10,484	0210.00	LDA associated with a left bank landslide 120' long x 30' high x 15' deep.
10,746	0212.00	Left bank erosion 35' long x 30' high x 10' deep. Snorkel survey site #2
10,762	0213.00	Left bank tributary.
11,054	0218.00	Left bank erosion 25' long x 30' high x 7' deep.
111,22	0219.00	Snorkel survey #3

Position (ft.)	Habitat Unit #	Comments:
11,155	0220.00	Left bank tributary
11,367	0222.00	Left bank erosion 25' long x 20' high x 15' deep.
11,458	0223.00	Right bank erosion 32' long x 27' high x 15' deep. Snorkel survey #4
11,508	0225.00	Snorkel survey #5
11,579	0228.00	Right bank erosion 18' long x 25' high x 15' deep.
11,641	0229.00	Right bank tributary.
12,228	0236.00	Left bank erosion 25' long x 35' high x 15' deep.
12,253	0237.00	Channel clogged with small woody debris.
12,347	0239.00	Left bank tributary.
12,347	0239.00	Right bank erosion 60' long x 25' high x 16' deep.
12,603	0241.00	Recent landslide on both banks. Right bank 400' long x 40' high x 20' deep. Left bank 60 long x 20 high x 10 deep. Extreme amount of sediment deposited in stream channel. Possible fish passage barrier.
12,808	0244.00	Small woody debris accumulating sediment burying stream channel. Possible barrier to fish
13,073	0247.00	End of survey due to time and access constraints. One 1+ salmonid observed <500' above end of survey stranded in small pool.

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]	