STREAM INVENTORY REPORT

South Branch North Fork Navarro River

INTRODUCTION

A stream inventory was conducted during the summer of 1995 on South Branch North Fork Navarro River beginning at the upstream end of the seasonal impoundment at the confluence of the South Branch North Fork and North Fork Navarro Rivers. The 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 South Branch North Fork Navarro River. The objective of the biological inventory was to document the presence and distribution of juvenile salmonid species. There is no known record of adult spawning surveys having been conducted on South Branch North Fork Navarro River.

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

South Branch North Fork Navarro River is tributary to the North Fork Navarro River, tributary to the Navarro River, located in Mendocino County, California (Figure 1). South Branch North Fork Navarro River's legal description at the confluence with the Navarro River is T15N R15W S07. Its location is 39°10′17″ north latitude and 123°33′35″ west longitude. South Branch North Fork Navarro River is a third order stream and has approximately 27.6 total miles of blue line stream according to the USGS Navarro, Bailey Ridge, Orrs Springs, Philo, and Boonville 7.5 minute quadrangles. South Branch North Fork Navarro River drains a watershed of approximately 30.0 square miles. Summer base runoff is approximately 2 cubic feet per second (cfs) at the mouth. Elevations range from about 110 feet at the mouth of the creek to 3000 feet in the headwater areas. Redwood and Douglas fir forest dominates the watershed. The watershed is privately owned and is managed for timber production. Vehicle access exists via private roads.

METHODS

The habitat inventory conducted in South Branch North Fork Navarro River follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi and Reynolds, 1991 rev. 1994). 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). South Branch North Fork Navarro River personnel were trained in May, 1995, by Gary Flosi. 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 (Hopelain, 1994). 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. Habitat unit types encountered for the first time are further 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 South Branch North Fork Navarro River 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 standard flow measuring equipment, if available. In some cases flows are estimated.

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.

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". South Branch North Fork Navarro 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. Channel dimensions were measured using hip chains, range

finders, tape measures, and stadia rods. All units were measured for mean length; additionally, the first occurrence of each unit type and a randomly selected 10% subset of all units were sampled for all features on the sampling form (*Sampling Levels for Fish Habitat Inventory*, Hopelain, 1995). Pool tail crest depth at each pool unit was measured in the thalweg. All measurements were in feet to the nearest tenth.

5. Embeddedness:

The depth of embeddedness of the cobbles in pool tail-out reaches is measured by the percent of the cobble that is surrounded or buried by fine sediment. In South Branch North Fork Navarro 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), 76 - 100% (value 4). Additionally, a rating of "not suitable" (NS) was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate particle size, having 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 South Branch North Fork Navarro 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.

8. Canopy:

Stream canopy density was estimated using modified handheld spherical densiometers as described in the *California Salmonid Stream Habitat Restoration Manual*, 1994. Canopy density relates to the amount of stream shaded from the sun. In South Branch North Fork Navarro 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 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 South Branch North Fork Navarro River, the dominant composition type (options 1-4) and the dominant vegetation type (options 5-9) 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 was estimated and recorded.

BIOLOGICAL INVENTORY

Biological sampling during stream inventory is used to determine fish species and their distribution in the stream. In South Branch North Fork Navarro River fish presence was observed from the stream banks, and six sites were electrofished using one 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 Lotus 1,2,3. Graphics developed for South Branch North Fork Navarro River 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
- Percent canopy
- Bank composition by composition type
- Bank vegetation by vegetation type

HABITAT INVENTORY RESULTS

The habitat inventory of August 2-23, 1995, was conducted by Bettina Chimarios and Shelley Dunn (WSP/AmeriCorps). The total length of the stream surveyed was 93,918 feet with an additional 1,511 feet of side channel.

Flow was measured at the bottom of the survey reach with a Marsh-McBirney Model 2000 flowmeter at 1.7 cfs on August 23, 1995.

South Branch North Fork Navarro River is a B3 channel type for the first 56,976 feet of stream reach surveyed, an F2 channel type for the next 6,113 feet, and an F3 channel type for the remaining 30,829 feet. B3 channels are moderately entrenched, moderate-gradient, riffle-dominant channels with infrequently spaced pools, stable banks, and cobble-dominant substrates. F-type channels are entrenched, meandering, riffle/pool channels on low gradients with high width/depth ratios. F3 channels have cobble-dominant substrates and F2 channels have boulder-dominant substrates.

Water temperatures ranged from 59 to 73 degrees Fahrenheit. Air temperatures ranged from 56 to 96 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 45% pool units, 39% flatwater units, and 15% riffle units (Graph 1). Based on total length of Level II habitat types there were 53% flatwater units, 39% pool units, and 8% riffle units (Graph 2).

Nineteen Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were mid-channel pools, 35%; step runs, 25%; and low-gradient riffles, 14% (Graph 3). Based on percent total length, step runs made up 39%, mid-channel pools 32%, and glides 9%.

A total of 638 pools were identified (Table 3). Main channel pools were most frequently encountered at 77% and comprised 83% of the total length of all pools (Graph 4).

Table 4 is a summary of maximum pool depths by pool habitat types. Depth is an indicator of pool quality. Two hundred twenty-two of the 638 pools (35%) had a depth of three feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 631 pool tail-outs measured, 77 had a value of 1 (12%); 221 had a value of 2 (35%); 199 had a value of 3 (32%); and 134 had a value of 4 (21%) (Graph 6). On this scale, a value of 1 indicates the highest quality of spawning substrate.

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. Pool habitat types had a mean shelter rating of 35, and flatwater habitats had a mean shelter rating of 16 (Table 1). Of the pool types,

the main channel pools had the highest mean shelter rating at 37. Scour pools had a mean shelter rating of 32 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Terrestrial vegetation is the dominant cover type in South Branch North Fork Navarro River. Large and small woody debris are lacking in nearly all habitat types. Graph 7 describes the pool cover in South Branch North Fork Navarro River.

Table 6 summarizes the dominant substrate by habitat type. Small cobble was the dominant substrate observed in 14 of the 23 low-gradient riffles measured (61%). Large cobble was the next most frequently observed dominant substrate type and occurred in 26% of the low-gradient riffles (Graph 8).

The mean percent canopy density for the stream reach surveyed was 85%. The mean percentages of deciduous and coniferous trees were 51% and 49%, respectively. Graph 9 describes the canopy in South Branch North Fork Navarro River.

For the stream reach surveyed, the mean percent right bank vegetated was 75%. The mean percent left bank vegetated was 77%. The dominant elements composing the structure of the stream banks consisted of 9.8% bedrock, 6.5% boulder, 49.4% cobble/gravel, and 33.3% sand/silt/clay (Graph 10). Deciduous trees were the dominant vegetation type observed in 50% of the units surveyed. Additionally, 10% of the units surveyed had coniferous trees as the dominant vegetation, including down trees, logs, and root wads (Graph 11).

BIOLOGICAL INVENTORY RESULTS

Six sites were electro-fished on July 20 and August 23, 1995, in South Branch North Fork Navarro River. The sites were sampled by Gary Flosi (DFG), Chris Coyle (CCC), and Bettina Chimarios, Shelly Dunn, and Kyle Young (WSP/AmeriCorps).

The first site sampled included habitat units 102-105, a series of pools and runs approximately 7,242 feet from the seasonal impoundment. This site had an area of 1,521 sq ft and a volume of 1,065 cu ft. The site yielded twelve young-of-the-year steelhead, eighteen western roach, two prickly sculpin, and one crayfish.

The second site was habitat unit 559, a mid-channel pool located approximately 45,366 feet above the impoundment. This site had an area of 790 sq ft and a volume of 632 cu ft. The site yielded twelve young-of-the-year steelhead, eight western roach, two three-spine stickleback, and one crayfish.

The third site sampled included habitat units 808 and 809, a low-gradient riffle and mid-channel pool located approximately 63,151 feet above the impoundment. The site had an area of 837 sq ft and a volume of 586 cu ft. The site yielded twenty-five young-of-the-year steelhead, two 1+ steelhead, two western roach, and one crayfish.

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The fourth site sampled included habitat units 1046-1048, a scour pool, riffle, and mid-channel pool located approximately 77,472 feet above the impoundment. The site had an area of 1,100 sq ft. The site yielded fifteen young-of-the-year steelhead, two 1+ steelhead, three western roach, one Pacific giant salamander, and one yellow-legged frog.

The fifth site sampled included habitat units 1119 and 1120, a mid-channel pool and step run located approximately 82,904 feet above the impoundment. The site had an area of 594 sq ft and a volume of 475 cu ft. The site yielded twenty-four young-of-the-year steelhead, two 1+ steelhead, and eight western roach.

The sixth site sampled included habitat units 1236-1238, a scour pool, riffle, and mid-channel pool located approximately 89,578 feet above the impoundment. The site had an area of 500 sq ft. The site yielded sixteen young-of-the-year steelhead, five 1+ steelhead, one 2+ steelhead, two yellow-legged frogs, one rough-skinned newt, and one crayfish.

Steelhead were also observed upstream of the sixth site through the end of the surveyed reach.

DISCUSSION

South Branch North Fork Navarro River is a B3 channel type for the first 56,976 feet of stream surveyed, an F2 channel type for the next 6,113 feet, and an F3 channel type for the remaining 30,829 feet. The suitability of B3 channel types for fish habitat improvement structures is as follows: excellent for low-stage plunge weirs, boulder clusters, bank-placed boulders, single and opposing wing deflectors, and log cover; and good for medium-stage plunge weirs. F2 channels are considered: fair for low-stage weirs, single and opposing wing deflectors, and log cover; and poor for medium-stage weirs. F3 channels are considered: good for bank-placed boulders and single and opposing wing deflectors; fair for low-stage weirs, boulder clusters, channel constrictors, and log cover; and poor for medium-stage weirs.

The water temperatures recorded on the survey days August 2-23, 1995, ranged from 59 to 73 degrees Fahrenheit. Air temperatures ranged from 56 to 96 degrees Fahrenheit. This is a poor water temperature range for salmonids. Seventy-three degrees Fahrenheit, if sustained, is above the threshold stress level for coho. 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 53% of the total length of this survey, riffles 8%, and pools 39%. The pools are relatively shallow, with only 222 of the 638 (35%) pools having a maximum depth greater than 3 feet. In general, pool enhancement projects are considered when primary pools comprise less than 40% of the length of total stream habitat. In third 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. Installing structures that will increase or deepen pool habitat is recommended for locations where their installation will not be threatened by high stream energy.

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Three hundred thirty-three of the 631 pool tail-outs measured had embeddedness ratings of 3 or 4. Only 77 had a 1 rating. Cobble embeddedness measured to be 25% or less, a rating of 1, is considered to indicate good quality spawning substrate for salmon and steelhead. In South Branch North Fork Navarro River, sediment sources should be mapped and rated according to their potential sediment yields, and control measures should be taken.

The mean shelter rating for pools was low with a rating of 35. The shelter rating in the flatwater habitats was lower at 16. A pool shelter rating of approximately 100 is desirable. The relatively small amount of cover that now exists is being provided primarily by terrestrial vegetation in all habitat types. Additionally, boulders contribute a small amount. Log and root wad cover structures in the pool and flatwater habitats are needed to improve 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.

Seventeen of the 23 low gradient riffles measured had gravel or small cobble as the dominant substrate. This is generally considered good for spawning salmonids.

The mean percent canopy density for the stream was 85%. This is a relatively high percentage of canopy. In general, revegetation projects are considered when canopy density is less than 80%, although in the South Branch North Fork Navarro River, due to the high water temperatures, additional planting may be necessary. The reaches of South Branch North Fork Navarro River above the stream reach surveyed, as well as the upper reaches of its tributaries, should also be inventoried for canopy, since any elevated water temperatures in those reaches will also adversely affect temperatures in South Branch North Fork Navarro River.

The percentages of right and left bank covered by vegetation were moderate at 75% and 77%, 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) South Branch North Fork Navarro River should be managed as an anadromous, natural production stream.

2) The limited water temperature data available suggest that maximum temperatures are above the acceptable range for juvenile salmonids. To establish more complete and meaningful temperature regime information, 24-hour monitoring during the July and August temperature extreme period should be performed for 3 to 5 years.

3) Increase woody cover in the pool and flatwater habitat units. Most of the existing cover is from terrestrial vegetation. Adding high quality complexity with woody cover is desirable and in some areas the material is locally available. In particular, large wood should be placed in a manner to increase backwater areas to produce winter hold over habitat.

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.

5) Inventory and map sources of stream bank erosion and prioritize them according to present and potential sediment yield. Identified sites, like the site at 4,846', should then be treated to reduce the amount of fine sediments entering the stream.

6) Where feasible, design and engineer pool enhancement structures to increase the number and the depth of pools. This must be done where the banks are stable or in conjunction with stream bank armor to prevent erosion.

7) Increase the canopy on South Branch North Fork Navarro River by planting willow, alder, redwood, and Douglas fir along the stream where shade canopy is not at acceptable levels. In many cases, planting will need to be coordinated to follow bank stabilization or upslope erosion control projects.

PROBLEM SITES 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 upstream end of seasonal impoundment at confluence of South Branch North Fork and North Fork Navarro Rivers. Channel type is B3.
427'	LDA 4' high x 45' wide x 3' long. Not a barrier (NB).
513'	LDA 7' high x 55' wide x 10' long. NB.
4846'	Left bank erosion 15' high x 24' long.
8098'	Left bank erosion 65' high x 200' long.
8211'	LDA 5' high x 40' wide x 10' long.
10913'	LDA 8' high x 60' wide x 45' long.
11926'	Left bank erosion 20' high x 14' long.
11940'	LDA 9' high x 65' wide x 190' long.

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11963' Right bank erosion 70' high x 100' long.

14907' Right bank tributary.

15388' Right bank erosion 18' high x 35' long.

16583' Left bank tributary.

18710' Left bank tributary.

18771' Left bank tributary.

21315' Left bank erosion 60' high x 30' long.

21796' Right bank LDA 9' high x 10' wide x 8' long.

22857' Right bank tributary.

29478' LDA 4' high x 10' wide x 10' long.

34610' Left bank tributary.

37086' Bridge 15' long x 30' wide x 8' clearance.

38228' Right bank erosion 70' high x 60' long.

39117' Left bank tributary.

41868' Left bank tributary.

42269' Bridge 15' long x 35' wide x 15' clearance.

44627' Bailey Creek enters right bank.

48444' Left bank tributary.

48968' Left bank tributary.

53280' Left bank erosion 10' high x 15' long.

55402' Dry left bank tributary.

56399' Bear Creek enters left bank.

57100' Bridge 15' long x 30' wide x 14' clearance.

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57300' Bridge Creek enters right bank.

59628' LDA 4' high x 6' wide x 10' long. NB.

62212' LDA 6' high x 30' wide x 40' long. NB.

63077' Left bank LDA 9' high x 10' wide x 12' long.

63151' Shingle Mill Creek enters right bank.

66213' LDA 10' high x 50' wide x 10' long.

68552' Road crossing.

68759' McCarvey Creek enters right bank.

69331' LDA 7' high x 7' wide x 20' long.

69464' LDA 8' high x 15' wide x 35' long.

69984' Left bank erosion 70' high x 55' long.

70048' LDA 7' high x 30' wide x 10' long.

71456' Left bank LDA 9' high x 30' wide x 25' long.

72017' Left bank LDA 12' high x 30' wide x 30' long.

74078' LDA 8' high x 65' wide x 40' long. Right bank erosion 40' high x 35' long.

77190' Left bank tributary.

77282' Left bank 2' diameter culvert.

77307' Bridge (Malcolm's Bridge) 16' long x 30' wide x 12' clearance.

80409' Left bank tributary.

81137' Road crossing.

82827' Bridge 10' long x 40' wide x 9' clearance.

82966' Left bank seep.

83468' Rose Creek enters left bank.

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84174' LDA 10' high x 10' wide x 35' long.

84472' Low Gap Creek enters right bank.

85455' LDA 20' high x 20' wide x 10' long.

85485' Bridge 30' long x 20' wide x 7' clearance.

85878' LDA 9' high x 20' wide x 40' long retaining gravel. Possible barrier.

86000' Bank LDA 6' high x 30' wide x 10' long.

86385' LDA 8' high x 20' wide x 30' long retaining gravel. Possible barrier.

86487' LDA 9' high x 25' wide x 40' long. Possible barrier.

87568' LDA 10' high x 30' wide x 45' long retaining gravel. Possible barrier.

88080' Left bank seep.

91060' LDA 8' high x 14' wide x 11' long. Possible barrier.

91208' LDA 15' high x 60' wide x 40' long. Possible barrier.

91621' Left bank tributary.

91628' LDA 10' high x 30' wide x 20' long retaining sand and gravel.

91806' LDA 7' high x 20' wide x 20' long. Possible barrier.

92231' LDA 8' high x 15' wide x 10' long retaining gravel.

92782' LDA 10' high x 30' wide x 12' long retaining gravel. Possible barrier.

93101' Embedded 3' diameter log across channel retaining gravel 3' deep and causing 5' jump.

93715' Last noted observation of steelhead presence.

93918' End of survey. No access permission given for stream above this point.

REFERENCES

Flosi, G., and F. Reynolds. 1994. California salmonid stream habitat restoration manual, 2nd edition. California Department of Fish and Game, Sacramento, California.

Hopelain, J. 1995. Sampling levels for fish habitat inventory, unpublished manuscript. California Department of Fish and Game, Inland Fisheries Division, Sacramento, California.

LEVEL III and LEVEL IV HABITAT TYPE KEY

HABITAT TYPE	LETTER	NUMBER
RIFFLE		
Low Gradient Riffle	[LGR]	1.1
High Gradient Riffle	[HGR]	1.2
CASCADE		
Cascade	[CAS]	2.1
Bedrock Sheet	[BRS]	2.2
FLATWATER		
Pocket Water	[POW]	3.1
Glide	[GLD]	3.2
Run	[RUN]	3.3
Step Run	[SRN]	3.4
Edgewater	[EDW]	3.5
MAIN CHANNEL POOLS		
Trench Pool	[TRP]	4.1
Mid-Channel Pool	[MCP]	4.2
Channel Confluence Pool	[CCP]	4.3
Step Pool	[STP]	4.4
SCOUR POOLS		
Corner Pool	[CRP]	5.1
Lateral Scour Pool - Log Enhanced	[LSL]	5.2
Lateral Scour Pool - Root Wad Enhanced	[LSR]	5.3
Lateral Scour Pool - Bedrock Formed	[LSBk]	5.4
Lateral Scour Pool - Boulder Formed	[LSBo]	5.5
Plunge Pool	[PLP]	5.6
BACKWATER POOLS		
Secondary Channel Pool	[SCP]	6.1
Backwater Pool - Boulder Formed	[BPB]	6.2
Backwater Pool - Root Wad Formed	[BPR]	6.3
Backwater Pool - Log Formed	[BPL]	6.4
Dammed Pool	[DPL]	6.5