



CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

STREAM INVENTORY REPORT

South Fork Big River

INTRODUCTION

A stream inventory was conducted from June 23 to July 23, 2015 on South Fork Big River. The survey began at the confluence with Big River and extended upstream 20.9 miles. Stream inventories and reports were also completed for six tributaries to South Fork Big River.

The South Fork Big River inventory was conducted in two parts: habitat inventory and biological inventory. The objective of the habitat inventory was to document the habitat available to anadromous salmonids in South Fork Big River. The objective of the biological inventory was to document the presence and distribution of juvenile salmonid species.

The objective of this report is to document the current habitat conditions and recommend options for the potential enhancement of habitat for 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 Fork Big River is a tributary to Big River, which drains to the Pacific Ocean. It is located in Mendocino County, California (Map 1). South Fork Big River's legal description at the confluence with Big River is T17N R15W S28. Its location is 39.2955 degrees north latitude and 123.5338 degrees west longitude, LLID number 1235326392956. South Fork Big River is a fourth order stream and has approximately 20.1 miles of blue line stream according to the USGS Comptche 7.5 minute quadrangle. South Fork Big River drains a watershed of approximately 54.5 square miles. Elevations range from about 190 feet at the mouth of the creek to 1,750 feet in the headwater areas. Mixed conifer forest and oak woodland dominate the watershed. The watershed is primarily privately owned, with some state park land, and is managed for timber production, rangeland, recreation and rural development. Vehicle access exists via Comptche-Ukiah Road/Orr Springs Road, east of Comptche.

METHODS

The habitat inventory conducted in South Fork Big River follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al, 1998). The Watershed Stewards Project (WSP) members and California Department of Fish and Wildlife (CDFW) personnel that conducted the inventory were trained in standardized habitat inventory methods by the CDFW. The 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

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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 Fork Big River to record measurements and observations. There are eleven components to the inventory form.

1. Flow:

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

2. Channel Type:

Channel typing is conducted according to the classification system developed and revised by David Rosgen (1994). This methodology is described in the *California Salmonid Stream Habitat Restoration Manual*. Channel typing is conducted simultaneously with habitat typing and follows a standard form to record measurements and observations. There are five measured parameters used to determine channel type: 1) water slope gradient, 2) entrenchment, 3) width/depth ratio, 4) substrate composition, and 5) sinuosity. Channel characteristics are measured using a 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". South Fork Big River habitat typing used standard basin level measurement criteria. These parameters require that the minimum length of a described habitat unit must be equal to or greater than the stream's mean wetted width. All measurements are in feet to the nearest tenth. Habitat characteristics are measured using a clinometer, hip chain, and stadia rod.

5. Embeddedness:

The depth of embeddedness of the cobbles in pool tail-out areas is measured by the percent of the cobble that is surrounded or buried by fine sediment. In South Fork Big River, embeddedness was ocularly estimated. The values were recorded using the following ranges: 0 - 25% (value 1), 26 - 50% (value 2), 51 - 75% (value 3) and 76 - 100% (value 4). Additionally, a value of 5 was assigned to tail-outs deemed unsuitable for spawning due to inappropriate substrate like bedrock, log sills, boulders or other considerations.

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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. 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 Fork Big 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. The shelter rating is then calculated by multiplying the qualitative shelter value by the percent of the unit covered. Thus, shelter ratings can range from 0-300 and are expressed as mean values by habitat types within a stream.

7. Substrate Composition:

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

8. Canopy:

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

9. Bank Composition and Vegetation:

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

10. Large Woody Debris Count:

Large woody debris (LWD) is an important component of fish habitat and an element in channel forming processes. In each habitat unit all pieces of LWD partially or entirely below the elevation of bankfull discharge are counted and recorded. The minimum size to be considered is twelve inches in diameter and six feet in length. The LWD count is presented by reach and is expressed as an average per 100 feet.

11. Average Bankfull Width:

Bankfull width can vary greatly in the course of a channel type stream reach. This is especially true in very long reaches. Bankfull width can be a factor in habitat components like canopy density, water temperature, and pool depths. Frequent measurements taken at riffle crests

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(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 South Fork Big River. In addition, underwater observations were made at 11 sites using techniques discussed in the *California Salmonid Stream Habitat Restoration Manual*.

DATA ANALYSIS

Data from the habitat inventory form are entered into Stream Habitat 2.0.18, a Visual Basic data entry program developed by Karen Wilson, Pacific States Marine Fisheries Commission in conjunction with the California Department of Fish and Wildlife. This program processes and summarizes the data, and produces the following ten tables:

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

Graphics are produced from the tables using Microsoft Excel. Graphics developed for South Fork Big River include:

- Riffle, Flatwater, Pool Habitat Types by Percent Occurrence
- Riffle, Flatwater, Pool Habitat Types by Total Length
- Total Habitat Types by Percent Occurrence
- Pool Types by Percent Occurrence
- Maximum Residual Depth in Pools
- Percent Embeddedness
- Mean Percent Cover Types in Pools
- Substrate Composition in Pool Tail-outs
- Mean Percent Canopy
- Dominant Bank Composition by Composition Type
- Dominant Bank Vegetation by Vegetation Type

HABITAT INVENTORY RESULTS

* ALL TABLES AND GRAPHS ARE LOCATED AT THE END OF THE REPORT *

The habitat inventory of June 23 to July 23, 2015 was conducted by T. Brown (WSP), J. Lee (WSP), M. Groff (CDFW), and J. Guczek, (WSP). The total length of the stream surveyed was 110,489 feet.

Stream flow was measured near the bottom of the survey reach with a Marsh-McBirney Model 2000 flowmeter at 0.8 cfs on July 14, 2015. Additionally, a flow station was established on South Fork Big River 3.6 miles upstream from the confluence with Big River. Flow was measured at the station seven times between May 26 and July 20, 2015. The results of these flow measurements are listed in Table A.

Table A. Results of South Fork Big River flow measurements; measured 3.6 miles upstream from the confluence with Big River.

Date	05/26/15	06/01/15	06/15/15	06/29/15	07/06/15	07/14/15	07/20/15
Flow (cfs)	2.4	2.1	0.7	0.5	0.4	0.6	0.3

South Fork Big River is an F3 channel type for 44,746 feet of the stream surveyed (Reach 1), an F4 channel type for 64,505 feet of the stream surveyed (Reach 2), and an A2 channel type for 1,238 feet of the stream surveyed (Reach 3). F3 channel types are entrenched meandering riffle/pool channels on low gradients with high width/depth ratios and cobble-dominant substrates. F4 channel types are entrenched meandering riffle/pool channels on low gradients with high width/depth ratios and gravel-dominant substrates. 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 58 to 74 degrees Fahrenheit. Air temperatures ranged from 60 to 90 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 39% flatwater units, 33% riffle units, 28% pool units, and 1% dry units (Graph 1). Based on total length of Level II habitat types there were 53% flatwater units, 31% pool units, 13% riffle units, 2% dry units, and 2% unsurveyed units (Graph 2).

Thirteen Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were mid-channel pool units, 23%; step run units, 20%; and low gradient riffle units, 18% (Graph 3). Based on percent total length, step run units made up 35%, mid-channel pool units 28%, and run units 15%.

A total of 245 pools were identified (Table 3). Main channel pools were the most frequently encountered at 84% (Graph 4), and comprised 89% of the total length of all pools (Table 3).

Table 4 is a summary of maximum residual pool depths by pool habitat types. Pool quality for salmonids increases with depth. One hundred forty-seven of the 245 pools (60%) had a residual depth of three feet or greater (Graph 5).

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The depth of cobble embeddedness was estimated at pool tail-outs. Of the 245 pool tail-outs measured, 85 had a value of 1 (34.7%); 106 had a value of 2 (43.3%); 30 had a value of 3 (12.2%); four had a value of 4 (1.6%); 20 had a value of 5 (8.2%) (Graph 6). On this scale, a value of 1 indicates the highest quality of spawning substrate. Additionally, a value of 5 was assigned to tail-outs deemed unsuitable for spawning due to inappropriate substrate such as bedrock, log sills, boulders, or other considerations.

A shelter rating was calculated for each habitat unit and expressed as a mean value for each habitat type within the survey using a scale of 0-300. Riffle habitat types had a mean shelter rating of 5, flatwater habitat types had a mean shelter rating of 4, and pool habitats had a mean shelter rating of 10 (Table 1). Of the pool types, the main channel pools had the highest mean shelter rating at 10. Scour pools had a mean shelter rating of 8 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Terrestrial vegetation is the dominant cover type in South Fork Big River. Graph 7 describes the pool cover in South Fork Big River. Boulders are the dominant pool cover type followed by terrestrial vegetation.

Table 6 summarizes the dominant substrate by habitat type. Graph 8 depicts the dominant substrate observed in pool tail-outs. Gravel was the dominant substrate observed in 61% of the pool tail-outs. Small cobble was the next most frequently observed dominant substrate type and occurred in 22% of the pool tail-outs.

The mean percent canopy density for the surveyed length of South Fork Big River was 89%. Eleven percent of the canopy was open. Of the canopy present, the mean percentages of hardwood and coniferous trees were 66% and 34%, respectively. Graph 9 describes the mean percent canopy in South Fork Big River.

For the stream reach surveyed, the mean percent right bank vegetated was 98%. The mean percent left bank vegetated was 99%. The dominant elements composing the structure of the stream banks consisted of 42% bedrock, 34% sand/silt/clay, 20% cobble/gravel, and 3% boulders (Graph 10). Hardwood trees were the dominant vegetation type observed in 68% of the units surveyed. Additionally, 21% of the units surveyed had coniferous trees as the dominant vegetation type, and 9% had brush as the dominant vegetation type (Graph 11).

BIOLOGICAL INVENTORY RESULTS

Survey teams conducted a snorkel survey at 11 sites for species composition and distribution in South Fork Big River from September 8 to September 9, 2015 (Table B). The sites were sampled by B. Starks and D. Lam (CDFW).

In Reach 1, which comprised the first 44,746 feet of stream, two sites were sampled. The reach sites yielded 55 young-of-the-year (YOY) steelhead trout (SH), 11 age 1+ SH, one age 2+ SH, 75 YOY coho salmon, approximately 450 stickleback and one adult steelhead.

In Reach 2, nine sites were sampled starting approximately 57,381 feet from the confluence with Big River and continuing upstream 41,222 feet. The reach sites yielded 103 YOY SH, six age 1+ SH, two age 2+ SH, 36 YOY coho salmon, approximately 144 stickleback and one sculpin.

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During the survey, the upstream-most observation of juvenile coho salmon occurred at 39.2310 degrees north latitude, 123.4606 degrees west longitude, approximately 13.4 miles upstream from the confluence with Big River.

Table B. Summary of results for a fish composition and distribution survey within South Fork Big River, 2015.

Date	Survey Site #	Habitat Unit #	Habitat Type	Approx. Dist. from mouth (ft.)	Steelhead Trout			Coho Salmon		Additional Aquatic Species Observed
					YOY	1+	2+	YOY	1+	
Reach 1: F3 Channel Type										
09/08/15	1	063	Pool	7,139	40	6	0	50	0	STB, SH
09/08/15	2	152	Pool	19,552	15	5	1	25	0	STB
Reach 2: F4 Channel Type										
09/08/15	3	442	Run	57,891	15	0	0	4	0	STB
09/09/15	4	528	Pool	69,713	4	1	0	15	0	
09/09/15	5	534	Pool	70,551	13	1	0	15	0	STB
09/09/15	6	537	Pool	70,701	9	0	0	2	0	STB
09/09/15	7	538	Pool	70,914	9	0	0	0	0	STB
09/09/15	8	539	Pool	71,141	25	0	2	0	0	STB
09/09/15	9	543	Pool	71,418	15	2	0	0	0	
09/09/15	10	757	Run	98,445	3	1	0	0	0	STB, SCP
09/09/15	11	759	Pool	98,603	10	1	0	0	0	STB

Species Abbreviations: SCP=Sculpin (Unidentified Species); STB=Stickleback (Unidentified Species)

DISCUSSION

South Fork Big River is an F3 channel type for the first 44,746 feet of stream surveyed, an F4 channel type for the next 64,505 feet, and an A2 channel type for the remaining 1,238 feet. The suitability of F3, F4 and A2 channel types for fish habitat improvement structures is as follows: F3 channels are good for bank-placed boulders, single and opposing wing-deflectors and fair for plunge weirs, boulder clusters, channel constrictors and log cover. F4 channels are good for bank-placed boulders and fair for plunge weirs, single and opposing wing-deflectors, channel constrictors, and log cover. A type channels are generally not suitable for fish habitat improvement projects.

The water temperatures recorded on the survey days June 23 to July 23, 2015 ranged from 58 to 74 degrees Fahrenheit. Air temperatures ranged from 60 to 90 degrees Fahrenheit. Temperatures below 64 degrees Fahrenheit are suitable for salmonids. High temperatures occurred near a section of South Fork Big River where hot springs enter and warm the stream. To make any further conclusions, temperatures need to be monitored throughout the warm summer months, and more extensive biological sampling needs to be conducted.

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Flatwater habitat types comprised 53% of the total length of this survey, riffles 13%, and pools 31%. One hundred forty-seven of the 245 (60%) pools had a maximum residual 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 residual 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.

One hundred ninety-one of the 245 pool tail-outs measured had embeddedness ratings of 1 or 2. Thirty-four of the pool tail-outs had embeddedness ratings of 3 or 4. Twenty 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.

Two hundred five of the 245 pool tail-outs measured had gravel or small cobble as the dominant substrate. This is generally considered good for spawning salmonids.

The mean shelter rating for pools is 10. The shelter rating in the flatwater habitats is 4. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by terrestrial vegetation in South Fork Big River. Boulders are the dominant cover type in pools followed by terrestrial vegetation. Log and root wad cover structures in the pool and flatwater habitats would enhance both summer and winter salmonid habitat. Log cover structures provide rearing fry with protection from predation, rest from water velocity, and also divide territorial units to reduce density related competition.

The mean percent canopy density for the stream was 89%. Reach 1 had a canopy density of 85%, Reach 2 had a canopy density of 92%, and Reach 3 had a canopy density of 96%. The percentage of right and left bank covered with vegetation was 98% and 99%, respectively.

RECOMMENDATIONS

South Fork Big River should be managed as an anadromous, natural production stream. Recommendations for potential habitat improvement activities are based on target habitat values suitable for salmonids in California's north coast streams. Considering the results from this stream habitat inventory, factors that affect salmonid productivity and CDFW's professional judgment, the following list prioritizes habitat improvement activities in South Fork Big River. Keep in mind, watershed and stream ecosystem processes, land use alterations, changes in land ownership, and other factors could potentially change the order of these recommendations or create the need to remove/add recommendations in the future.

- 1) Increase woody cover in the pools and flatwater habitat units. Most of the existing cover in the pools is from boulders. Adding high quality complexity with woody cover in the pools is desirable.
- 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 three to five years.

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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 Big River. The channel is an F3.
6118	0060.00	Dry left bank tributary.
8996	0084.00	Extensive green algae.
9238	0085.00	Extensive green algae.
12932	0107.00	Biggs Gulch (Tributary #01) enters on the right bank. It contributes less than 5% to South Fork Big River's flow. The water temperature of the tributary was 60 degrees Fahrenheit; the water temperature downstream and upstream of the confluence was 70 degrees Fahrenheit. For more information, see the 2015 Biggs Gulch Stream Habitat Inventory Report.
13021	0108.00	Extensive green algae.
14764	0118.00	Left bank seep.
15321	0122.00	Extensive green algae.
18309	0143.00	Tributary #02 enters on the left bank. The tributary is flowing, but goes subsurface on the gravel bar before connecting with South Fork Big River. The water temperature of the tributary was 55 degrees Fahrenheit; the water temperature downstream and upstream of the confluence was 63 degrees Fahrenheit. The slope of the tributary is approximately 6%. The L & M Road crosses the channel. The crossing is a 17' wide x 83' long x 13.5' high railcar bridge with log abutments. Boulder rip-rap lines each bank below the logs.
20452	0160.00	Tributary #03 enters on the left bank. The first 20 feet of the tributary were dry. The water temperature of the tributary was 56 degrees Fahrenheit; the water temperature downstream and upstream of the confluence was 66 degrees Fahrenheit. The slope of the tributary is 10-15%.
22120	0170.00	Tributary #04 enters on the left bank. It contributes approximately 1% to South Fork Big River's flow. The water temperature of the tributary was 56 degrees Fahrenheit; the water temperature downstream and upstream

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of the confluence was 65 degrees Fahrenheit. The slope of the tributary is approximately 30%.

22238	0171.00	Left bank seep.
27778	0204.00	Ramon Creek (Tributary #05) enters on the right bank. The first 10' feet of Ramon Creek were dry. The water temperature of the tributary was 60 degrees Fahrenheit; the water temperature downstream and upstream of the confluence was 66 degrees Fahrenheit. For more information, see the 2014 Ramon Creek Stream Habitat Inventory Report.
31364	0231.00	A landslide on the left bank measures approximately 80' high x 60' long.
36859	0272.00	Mettick Creek (Tributary #06) enters on the left bank. It contributes approximately 5% to South Fork Big River's flow. The water temperature of the tributary was 59 degrees Fahrenheit; the water temperature downstream of the confluence was 65 degrees Fahrenheit, and the water temperature upstream of the confluence was 62 degrees Fahrenheit. For more information, see the 2015 Mettick Creek Stream Habitat Inventory Report.
38039	0284.00	Anderson Creek (Tributary #07) enters on the left bank. It contributes approximately 5% to South Fork Big River's flow. The water temperature of the tributary was 55 degrees Fahrenheit, the water temperature downstream of the confluence was 60 degrees Fahrenheit, and the water temperature upstream of the confluence was 58 degrees Fahrenheit. For more information, see the 2015 Anderson Creek Stream Habitat Inventory Report.
38634	0292.00	Tributary #08 enters on the left bank. It contributes approximately 1% to South Fork Big River's flow. The water temperature of the tributary was 52 degrees Fahrenheit; the water temperature downstream and upstream of the confluence was 60 degrees Fahrenheit. The slope of the tributary is approximately 200% over the first 20 feet.
44746	0331.00	The channel changes from an F3 to an F4. A landslide on the right bank measures approximately 20' high x 30' long. Boardman Gulch (Tributary #09) enters on the right bank. Flow was subsurface over the first 3' feet. It contributes approximately 5% to South Fork Big River's flow. The water temperature of the tributary was 56 degrees Fahrenheit; the water temperature downstream and upstream of the confluence was 61 degrees Fahrenheit. For more information, see the 2015 Boardman Gulch Stream Habitat Inventory Report.
45821	0340.00	Halfway House Gulch (Tributary #10) enters on the left bank. It contributes approximately 5% to South Fork Big River's flow. The water temperature of the tributary was 52 degrees Fahrenheit, the water

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temperature downstream of the confluence was 61 degrees Fahrenheit, and the water temperature upstream of the confluence was 63 degrees Fahrenheit. For more information, see the 2015 Halfway House Gulch Stream Habitat Inventory Report.

46818	0351.00	Right bank seep.
55892	0428.00	Left bank seep.
56123	0431.00	Extensive green algae.
56399	0435.00	There is a 1.7' high plunge over boulders.
57924	0444.00	Tributary #11 enters on the right bank. The first 30 feet of the tributary were dry. The water temperature of the tributary was 59 degrees Fahrenheit; the water temperature downstream and upstream of the confluence was 65 degrees Fahrenheit. The slope of the tributary is approximately 8%. The culvert at the L & M Road crossing may be undersized.
58260	0446.00	Extensive green algae.
60327	0462.00	The L & M Road crosses the channel. The crossing is a 19' wide x 78' long x 16' high log stringer bridge with log abutments.
62563	0481.00	Extensive green algae.
63222	0486.00	This is a 730' long unsurveyed section.
64346	0491.00	Dry right bank tributary.
65105	0494.00	Wet ford.
65717	0500.00	Right bank seep. Old cable footbridge suspended over channel.
66022	0503.00	A private road crosses the channel. The crossing is an 8.4' wide x 85' long x 16' high railcar bridge.
68048	0520.00	Left bank seep. Tributary #12 enters on the left bank. Its flow was disconnected from South Fork Big River. The water temperature of the tributary was 57 degrees Fahrenheit, the water temperature downstream of the confluence was 64 degrees Fahrenheit, and the water temperature upstream of the confluence was 65 degrees Fahrenheit. The slope of the tributary is 15-20%.

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69084	0524.00	Orr Springs Road crosses the channel. The crossing is a 17' high metal bridge with concrete abutments (all concrete on the left bank and concrete on top of bedrock on the right bank).
69392	0526.00	Daugherty Creek (Tributary #13) enters on the left bank. It contributes approximately 10% to South Fork Big River's flow. The water temperature of the tributary was 63 degrees Fahrenheit, the water temperature downstream of the confluence was 65 degrees Fahrenheit, and the water temperature upstream of the confluence was 62 degrees Fahrenheit. For more information, see the 2014 Daugherty Creek Stream Habitat Inventory Report.
69491	0527.00	A private road crosses the channel. The crossing is a 21' high railcar bridge.
70676	0537.00	There is a 3.5' high plunge over bedrock.
70701	0538.00	There is a 2.5' high plunge over bedrock.
71295	0542.00	There is a 3' high plunge over bedrock.
71418	0544.00	Old wood and cable footbridge suspended across the channel, approximately 16' above the stream. A private road crosses the channel. The crossing is a 8' high wood and metal beam bridge.
72779	0550.00	A private road crosses the channel. The crossing is a 14' high wood and metal beam bridge.
73325	0555.00	Left bank seep.
73942	0561.00	A private road crosses the channel. The crossing is a 21' high wood bridge with a log abutment on the left bank side of the channel.
75008	0574.00	Tributary #14 enters on the right bank. It contributes approximately 2% to South Fork Big River's flow. The water temperature of the tributary was 58 degrees Fahrenheit, the water temperature downstream of the confluence was 62 degrees Fahrenheit, and the water temperature upstream of the confluence was 63 degrees Fahrenheit. There is an 8' high plunge from the culvert under Orr Springs Road with no pool below it and the substrate is dominated by bedrock.
76594	0590.00	A private road crosses the channel. The crossing is an 11' high wood and metal beam bridge.
76792	0591.00	This is a 800' long unsurveyed section.
78379	0598.00	Old cable and board footbridge suspended high above the channel.

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79084	0603.00	Johnson Creek (Tributary #15) enters on the right bank. It contributes approximately 2% to South Fork Big River's flow. The water temperature of the tributary was 64 degrees Fahrenheit, the water temperature downstream of the confluence was 66 degrees Fahrenheit, and the water temperature upstream of the confluence was 64 degrees Fahrenheit. The slope of the tributary is approximately 3%. There is a keyhole shaped culvert at the mouth; the top half of the culvert is curved corrugated metal, the bottom half is a concrete fish ladder. There was a short dry section immediately upstream of the culvert. Salmonids were observed in Johnson Creek.
80324	0615.00	1,060' long unsurveyed section.
81606	0618.00	Dry right bank tributary.
82509	0625.00	Dry left bank tributary. A private road crosses the channel. The crossing is an 11' high railcar bridge.
83891	0636.00	A private road crosses the channel. The crossing is an 18' high railcar bridge.
84105	0637.00	There is a 2' high plunge over bedrock.
84859	0645.00	Dry right bank tributary.
88060	0670.00	Tributary #16 enters on the right bank. It contributes approximately 1% to South Fork Big River's flow. The water temperature of the tributary was 57 degrees Fahrenheit; the water temperature downstream and upstream of the confluence was 63 degrees Fahrenheit. The slope of the tributary is approximately 10% and the culvert under Orr Springs Road is not passable by fish.
89055	0678.00	Dry left bank tributary.
89354	0682.00	Dark Gulch (Tributary #17) enters on the right bank. It contributes approximately 10% to South Fork Big River's flow. The water temperature of the tributary was 60 degrees Fahrenheit; the water temperature downstream and upstream of the confluence was 63 degrees Fahrenheit. For more information, see the 2014 Dark Gulch Stream Habitat Inventory Report.
90502	0695.00	Left bank seep.
91256	0703.00	Dry right bank tributary.
92378	0715.00	Tributary #18 enters on the left bank. It contributes approximately 3% to South Fork Big River's flow. The water temperature of the tributary was

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60 degrees Fahrenheit, the water temperature downstream of the confluence was 67 degrees Fahrenheit, and the water temperature upstream of the confluence was 63 degrees Fahrenheit. The slope of the tributary is approximately 20%.

93840	0726.00	Tributary #19 enters on the left bank. The first 15' of the tributary were dry. The water temperature of the tributary was 55 degrees Fahrenheit, the water temperature downstream of the confluence was 63 degrees Fahrenheit, and the water temperature upstream of the confluence was 62 degrees Fahrenheit. The slope of the tributary is 8-10%.
94071	0729.00	Dry right bank tributary.
94631	0735.00	A private road crosses the channel. The crossing is a 14' high railcar bridge with steel beam abutments.
97006	0751.00	Tributary #20 enters on the left bank. It contributes approximately 5% to South Fork Big River's flow. The water temperature of the tributary was 55 degrees Fahrenheit; the water temperature downstream and upstream of the confluence was 58 degrees Fahrenheit. The slope of the tributary is approximately 15% and there are two 4-5 foot high bedrock plunges at the mouth.
97628	0755.00	Montgomery Creek (Tributary #21) enters on the left bank. It contributes approximately 10% to South Fork Big River's flow. The water temperature of the tributary was 56 degrees Fahrenheit, the water temperature downstream of the confluence was 58 degrees Fahrenheit, and the water temperature upstream of the confluence was 60 degrees Fahrenheit. For more information, see the 2015 Montgomery Creek Stream Habitat Inventory Report.
97948	0757.00	Left bank seep. Orr Springs Road crosses the channel. The crossing is a 13' high concrete bridge with concrete abutments.
99443	0766.00	Orr Springs Road crosses the channel. The crossing is an 8' high concrete bridge with concrete abutments.
101310	0775.00	Extensive algae.
102418	0782.00	"Pruitt Creek" (Tributary #22) enters on the right bank. It contributes approximately 5% to South Fork Big River's flow. The water temperature of the tributary was 58 degrees Fahrenheit; the water temperature downstream and upstream of the confluence was 60 degrees Fahrenheit. For more information, see the 2014 "Pruitt Creek" Stream Habitat Inventory Report.
102889	0784.00	Western pond turtle observed.

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103953	0795.00	Orr Springs Road crosses the channel. The crossing is an 8' high steel and wood bridge.
104015	0797.00	Dry left bank tributary.
104352	0800.00	Most of the water is flowing underneath massive boulders in the channel. There is a 13.3 foot change in elevation over 90 feet through the boulders.
104709	0807.00	Tributary #23 enters on the right bank. The first 20 feet of the tributary were dry. The water temperature of the tributary was 60 degrees Fahrenheit; the water temperature downstream and upstream of the confluence was 63 degrees Fahrenheit. For more information, see the 2014 Unnamed Tributary to South Fork Big River Stream Habitat Inventory Report.
104936	0813.00	Orr Springs Road crosses the channel. The crossing is a 5' high concrete bridge.
105837	0828.00	Left bank seep.
105997	0831.00	Large landslide on the left bank measures approximately 200' long x 60' high and is contributing fine sediment (blue goo) to the channel.
106179	0834.00	High gradient riffle formed by bedrock rip-rap armoring the right bank below Orr Springs Road.
106213	0836.00	There is a 7.5' high plunge over bedrock and boulders.
106328	0841.00	Dry left bank tributary.
108342	0873.00	A private road crosses the channel. The crossing is a 6.5' high railcar bridge.
108545	0875.00	A private road crosses the channel. The crossing is a 9' high railcar bridge.
108918	0879.00	Water temperature was 85 degrees Fahrenheit and is being warmed by water from hot springs entering the stream.
108982	0880.00	A house is built 8' over the creek.
109059	0882.00	A wood footbridge crosses 8' over the channel.
109165	0883.00	A concrete footbridge crosses 8' over the channel.

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109251	0886.00	The channel changes from an F4 to an A2. Remnants of stone dam approximately 500' upstream from hot springs resort.
110088	0890.00	Tributary #24 enters on the left bank. The tributary was not flowing; it was just standing puddles. The water temperature of the tributary was 58 degrees Fahrenheit; the water temperature upstream of the confluence was 60 degrees Fahrenheit. The slope of the tributary is 2-4%.
110444	0891.00	There is a 6' high plunge over boulder and bedrock.
110456	0892.00	End of survey at approximately 22' high bedrock waterfall. The channel gets very steep over the 1,200 feet directly below the waterfall and the substrate is dominated by massive boulders. Fish were observed all the way to HU# 888. No fish were observed in the last two pools of the survey. The waterfall was dry, as was the majority of the last 1,200 feet of the survey. The slope over the last 1,200 feet of the survey averaged out to 6.3%. The slope of the last 300 feet of the survey was 11.3%.

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.

California Department of Fish and Wildlife

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]	

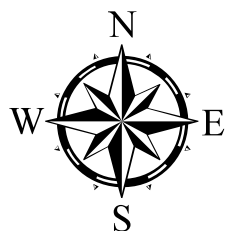
Start of Survey




Map 1
South Fork Big River
Big River Watershed
Comptche Quad, Mendocino County

Big River Watershed

End of Survey

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-  Reach 1: F3 Channel Type
-  Reach 2: F4 Channel Type
-  Reach 3: A2 Channel Type

0 0.75 1.5 3 Miles



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

Stream Name: South Fork Big River

LLID: 1235326392956

Drainage: Big River

Survey Dates: 6/23/2015 to 7/23/2015

Confluence Location: Quad: COMPTCHE

Legal Description: T17NR15WS28

Latitude: 39:17:44.0N

Longitude: 123:31:57.0

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating
5	0	DRY	0.6	379	1894	1.7									
348	34	FLATWATER	39.0	167	58104	52.6	14.0	0.8	1.3	2024	704194	1812	630594		4
2	0	NOSURVEY	0.2	930	1860	1.7									
245	245	POOL	27.5	141	34437	31.2	20.4	2.1	3.6	3053	748063	7436	1821788	6722	10
292	36	RIFFLE	32.7	49	14194	12.8	9.4	0.3	0.6	285	83308	95	27695		5
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)			Total Volume (cu.ft.)		
892	315				110489					1535566			2480078		

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: South Fork Big River

LLID: 1235326392956

Drainage: Big River

Survey Dates: 6/23/2015 to 7/23/2015

Confluence Location: Quad: COMPTCHE

Legal Description: T17NR15WS28

Latitude: 39:17:44.0N

Longitude: 123:31:57.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating	Mean Canopy (%)
164	21	LGR	18.4	52	8498	7.7	10	0.3	1.2	326	53407	102	16726		2	88
125	14	HGR	14.0	45	5566	5.0	8	0.3	0.9	205	25656	75	9369		5	90
3	1	BRS	0.3	43	130	0.1	14	0.4	1.2	559	1676	223	670		75	85
10	4	GLD	1.1	284	2838	2.6	24	1.2	2.4	6367	63670	7545	75451		0	94
158	16	RUN	17.7	106	16692	15.1	15	0.7	2	1500	236924	1010	159614		4	86
180	14	SRN	20.2	214	38574	34.9	10	0.8	1.8	1381	248660	1090	196274		4	90
206	206	MCP	23.1	148	30564	27.7	21	2.2	9.9	3271	673836	8195	1688159	7433	10	89
3	3	LSL	0.3	136	407	0.4	20	1.3	2.8	3024	9072	4848	14543	4258	17	94
4	4	LSR	0.4	120	482	0.4	22	1.5	3.8	2563	10252	4265	17062	3753	6	84
25	25	LSBk	2.8	97	2414	2.2	18	1.5	6.8	1852	46299	3541	88528	3052	9	84
5	5	LSBo	0.6	102	512	0.5	14	1.1	2.3	1505	7526	1945	9723	1613	2	95
2	2	PLP	0.2	29	58	0.1	19	3.5	5.4	539	1078	1887	3774	1864	10	96
5	0	DRY	0.6	379	1894	1.7										
2	0	NS	0.2	930	1860	1.7										

Total Units
892

Total Units Fully Measured
315

Total Length (ft.)
110489

Total Area (sq.ft.)
1378057

Total Volume (cu.ft.)
2279892

Table 3 - Summary of Pool Types

Stream Name: South Fork Big River

LLID: 1235326392956

Drainage: Big River

Survey Dates: 6/23/2015 to 7/23/2015

Confluence Location: Quad: COMPTCHE

Legal Description: T17NR15WS28

Latitude: 39:17:44.0N

Longitude: 123:31:57.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Residual Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Residual Pool Vol (cu.ft.)	Estimated Total Resid.Vol. (cu.ft.)	Mean Shelter Rating
206	206	MAIN	84	148	30564	89	20.9	2.2	3271	673836	7433	1531109	10
39	39	SCOUR	16	99	3873	11	18.1	1.5	1903	74227	2971	115888	8

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
245	245	34437	748063	1646997

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

Stream Name: South Fork Big River

LLID: 1235326392956

Drainage: Big River

Survey Dates: 6/23/2015 to 7/23/2015

Confluence Location: Quad: COMPTCHE

Legal Description: T17NR15WS28

Latitude: 39:17:44.0N

Longitude: 123:31:57.0W

Habitat Units	Habitat Type	Habitat Occurrence (%)	< 1 Foot Maximum Residual Depth	< 1 Foot Percent Occurrence	1 < 2 Feet Maximum Residual Depth	1 < 2 Feet Percent Occurrence	2 < 3 Feet Maximum Residual Depth	2 < 3 Feet Percent Occurrence	3 < 4 Feet Maximum Residual Depth	3 < 4 Feet Percent Occurrence	>= 4 Feet Maximum Residual Depth	>= 4 Feet Percent Occurrence
206	MCP	84	0	0	5	2	65	32	79	38	57	28
3	LSL	1	0	0	0	0	3	100	0	0	0	0
4	LSR	2	0	0	0	0	3	75	1	25	0	0
25	LSBk	10	0	0	5	20	12	48	5	20	3	12
5	LSBo	2	0	0	2	40	3	60	0	0	0	0
2	PLP	1	0	0	0	0	0	0	1	50	1	50

Total Units	Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1< 2 Foot Max Resid. Depth	Total 1< 2 Foot % Occurrence	Total 2< 3 Foot Max Resid. Depth	Total 2< 3 Foot % Occurrence	Total 3< 4 Foot Max Resid. Depth	Total 3< 4 Foot % Occurrence	Total >= 4 Foot Max Resid. Depth	Total >= 4 Foot % Occurrence
245	0	0	12	5	86	35	86	35	61	25

Mean Maximum Residual Pool Depth (ft.): 3.6

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: South Fork Big River

LLID: 1235326392956

Drainage: Big River

Survey Dates: 6/23/2015 to 7/23/2015

Dry Units: 5

Confluence Location: Quad: COMPTCHE

Legal Description: T17NR15WS28

Latitude: 39:17:44.0N

Longitude: 123:31:57.0W

Habitat Units	Units Fully Measured	Habitat Type	Mean % Undercut Banks	Mean % SWD	Mean % LWD	Mean % Root Mass	Mean % Terr. Vegetation	Mean % Aquatic Vegetation	Mean % White Water	Mean % Boulders	Mean % Bedrock Ledges
164	21	LGR	0	0	0	0	100	0	0	0	0
125	14	HGR	0	17	0	0	58	2	2	21	0
3	1	BRS	0	0	0	0	0	100	0	0	0
292	36	TOTAL RIFFLE	0	10	0	0	65	12	1	13	0
10	4	GLD	0	0	0	0	0	0	0	0	0
158	16	RUN	0	0	4	7	29	1	0	59	0
180	14	SRN	0	6	0	14	33	26	0	21	0
348	34	TOTAL FLAT	0	3	2	11	31	14	0	40	0
206	206	MCP	3	8	6	4	21	20	0	23	16
3	3	LSL	0	23	72	3	2	0	0	0	0
4	4	LSR	0	40	60	0	0	0	0	0	0
25	25	LSBk	4	0	8	4	24	6	0	29	24
5	5	LSBo	0	0	0	15	70	0	0	15	0
2	2	PLP	0	0	0	0	0	0	30	30	40
245	245	TOTAL POOL	3	7	8	4	21	17	0	23	16
2	0	NS									
892	315	TOTAL	1	4	4	2	13	9	0	12	7

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: South Fork Big River

LLID: 1235326392956

Drainage: Big River

Survey Dates: 6/23/2015 to 7/23/2015

Dry Units: 5

Confluence Location: Quad: COMPTCHE

Legal Description: T17NR15WS28

Latitude: 39:17:44.0N

Longitude: 123:31:57.0W

Habitat Units	Units Fully Measured	Habitat Type	% Total Silt/Clay Dominant	% Total Sand Dominant	% Total Gravel Dominant	% Total Small Cobble Dominant	% Total Large Cobble Dominant	% Total Boulder Dominant	% Total Bedrock Dominant
164	21	LGR	0	0	76	19	5	0	0
125	14	HGR	0	0	21	36	21	14	7
3	1	BRS	0	0	0	0	0	0	100
10	4	GLD	0	0	100	0	0	0	0
158	16	RUN	6	6	75	0	6	6	0
180	14	SRN	0	0	57	14	7	7	14
206	206	MCP	0	16	74	2	1	1	6
3	3	LSL	0	0	100	0	0	0	0
4	4	LSR	0	0	100	0	0	0	0
25	25	LSBk	0	12	64	4	8	0	12
5	5	LSBo	0	0	80	0	0	20	0
2	2	PLP	0	0	50	0	0	0	50

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: South Fork Big River

LLID: 1235326392956

Drainage: Big River

Survey Dates: 6/23/2015 to 7/23/2015

Confluence Location: Quad: COMPTCHE

Legal Description: T17NR15WS28

Latitude: 39:17:44.0N

Longitude: 123:31:57.0W

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
89	34	66	0	98	99

Note: Mean percent conifer and hardwood for the entire reach are means of canopy components from units with canopy values greater than zero.

Open units represent habitat units with zero canopy cover.

Table 8 - Fish Habitat Inventory Data Summary

Stream Name: South Fork Big River

LLID: 1235326392956

Drainage: Big River

Survey Dates: 6/23/2015 to 7/23/2015

Survey Length (ft.): 110489

Main Channel (ft.): 110489

Side Channel (ft.): 0

Confluence Location: Quad: COMPTCHE

Legal Description: T17NR15WS28

Latitude: 39:17:44.0N

Longitude: 123:31:57.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type: F3

Reach Length (ft.): 44746

Riffle/Flatwater Mean Width (ft.): 14.7

BFW:

Range (ft.): 30 to 103

Mean (ft.): 50

Std. Dev.: 14

Base Flow (cfs.): 0.6

Water (F): 59 - 72

Air (F): 60 - 90

Dry Channel (ft): 0

Canopy Density (%): 84.5

Coniferous Component (%): 33.0

Hardwood Component (%): 67.0

Dominant Bank Vegetation: Hardwood Trees

Vegetative Cover (%): 98.8

Dominant Shelter: Terrestrial Veg.

Dominant Bank Substrate Type: Bedrock

Occurrence of LWD (%): 4

LWD per 100 ft.:

Riffles: 0

Pools: 0

Flat: 0

Pool Tail Substrate (%): Silt/Clay: 0

Sand: 1

Gravel: 60

Sm Cobble: 27

Lg Cobble: 6

Boulder: 0

Bedrock: 5

Embeddedness Values (%): 1. 35.4

2. 45.8

3. 12.5

4. 1.0

5. 5.2

Pools by Stream Length (%): 36.4

Pool Frequency (%): 29.1

Residual Pool Depth (%):

< 2 Feet Deep: 0

2 to 2.9 Feet Deep: 31

3 to 3.9 Feet Deep: 40

>= 4 Feet Deep: 29

Mean Max Residual Pool Depth (ft.): 3.8

Mean Pool Shelter Rating: 13

STREAM REACH: 2

Channel Type: F4

Reach Length (ft.): 64505

Riffle/Flatwater Mean Width (ft.): 9.6

BFW:

Range (ft.): 20 to 50

Mean (ft.): 34

Std. Dev.: 7

Base Flow (cfs.): 0.6

Water (F): 58 - 74

Air (F): 60 - 88

Dry Channel (ft): 735

Canopy Density (%): 91.5

Coniferous Component (%): 35.5

Hardwood Component (%): 64.5

Dominant Bank Vegetation: Hardwood Trees

Vegetative Cover (%): 97.9

Dominant Shelter: Boulders

Dominant Bank Substrate Type: Sand/Silt/Clay

Occurrence of LWD (%): 3

LWD per 100 ft.:

Riffles: 0

Pools: 1

Flat: 1

Pool Tail Substrate (%): Silt/Clay: 0

Sand: 2

Gravel: 62

Sm Cobble: 20

Lg Cobble: 9

Boulder: 0

Bedrock: 8

Embeddedness Values (%): 1. 34.9

2. 41.8

3. 11.6

4. 2.1

5. 9.6

Pools by Stream Length (%): 28.0

Pool Frequency (%): 26.3

Residual Pool Depth (%):

< 2 Feet Deep: 8

2 to 2.9 Feet Deep: 38

3 to 3.9 Feet Deep: 32

>= 4 Feet Deep: 22

Mean Max Residual Pool Depth (ft.): 3.4

Mean Pool Shelter Rating: 8

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 3

Channel Type: A2	Canopy Density (%): 96.3	Pools by Stream Length (%): 4.5
Reach Length (ft.): 1238	Coniferous Component (%): 0.0	Pool Frequency (%): 42.9
Riffle/Flatwater Mean Width (ft.):	Hardwood Component (%): 100.0	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Brush	< 2 Feet Deep: 0
Range (ft.): 34 to 34	Vegetative Cover (%): 100.0	2 to 2.9 Feet Deep: 33
Mean (ft.): 34	Dominant Shelter: Small Woody Debris	3 to 3.9 Feet Deep: 33
Std. Dev.: 0	Dominant Bank Substrate Type: Bedrock	>= 4 Feet Deep: 33
Base Flow (cfs.): 0.6	Occurrence of LWD (%): 0	Mean Max Residual Pool Depth (ft.): 3.5
Water (F): 60 - 73 Air (F): 60 - 60	LWD per 100 ft.:	Mean Pool Shelter Rating: 23
Dry Channel (ft): 1159	Riffles: 0	
	Pools: 0	
	Flat:	
Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 67 Sm Cobble: 0 Lg Cobble: 0 Boulder: 0 Bedrock: 33		
Embeddedness Values (%): 1. 0.0 2. 33.3 3. 33.3 4. 0.0 5. 33.3		

Table 9 - Mean Percentage of Dominant Substrate and Vegetation

Stream Name: South Fork Big River

LLID: 1235326392956

Drainage: Big River

Survey Dates: 6/23/2015 to 7/23/2015

Confluence Location: Quad: COMPTCHE

Legal Description: T17NR15WS28

Latitude: 39:17:44.0N

Longitude: 123:31:57.0W

Mean Percentage of Dominant Stream Bank Substrate

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Bedrock	131	135	42.2
Boulder	12	9	3.3
Cobble / Gravel	68	59	20.2
Sand / Silt / Clay	104	112	34.3

Mean Percentage of Dominant Stream Bank Vegetation

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Grass	4	2	1.0
Brush	28	31	9.4
Hardwood Trees	220	209	68.1
Coniferous Trees	60	71	20.8
No Vegetation	3	2	0.8

Total Stream Cobble Embeddedness Values: 2

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

StreamName: South Fork Big River

LLID: 1235326392956

Drainage: Big River

Survey Dates: 6/23/2015 to 7/23/2015

Confluence Location: Quad: COMPTCHE

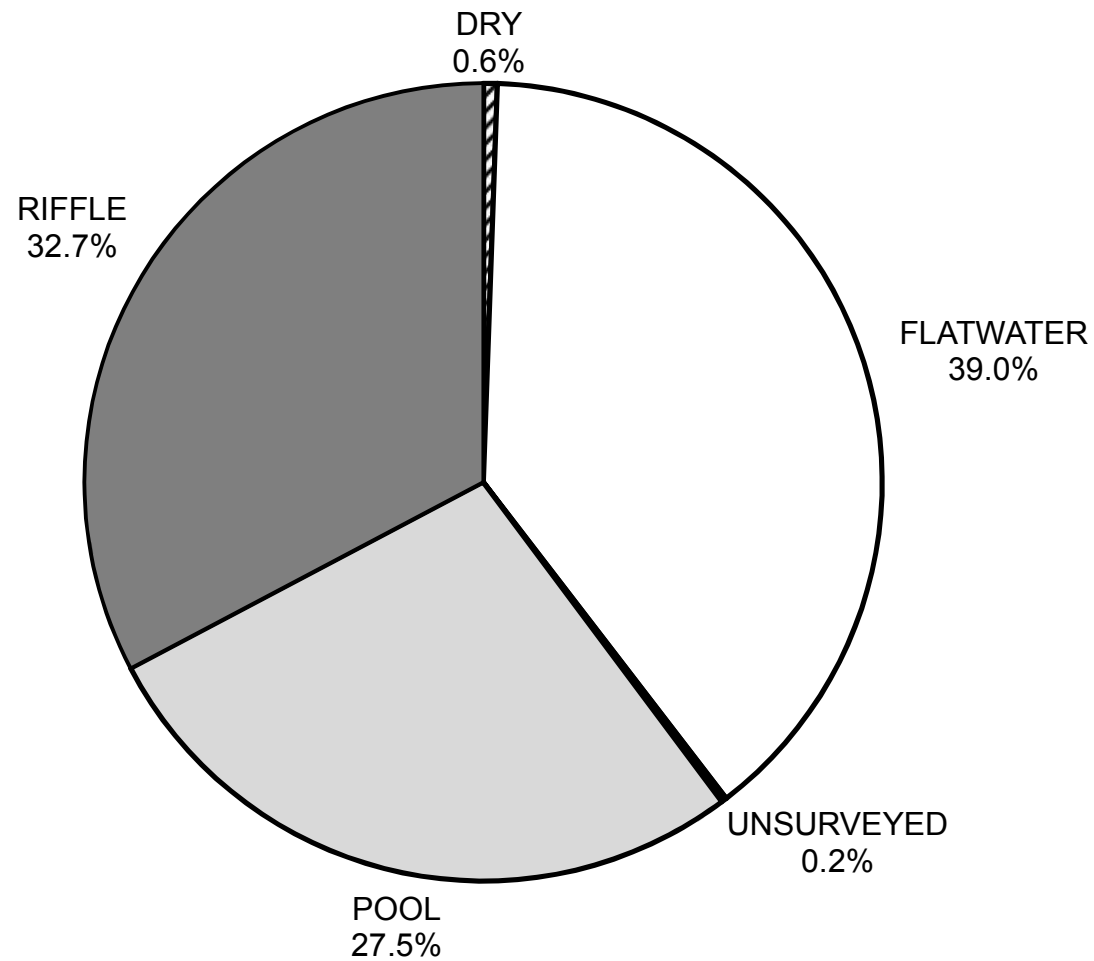
Legal Description: T17NR15WS28

Latitude: 39:17:44.0N

Longitude: 123:31:57.0W

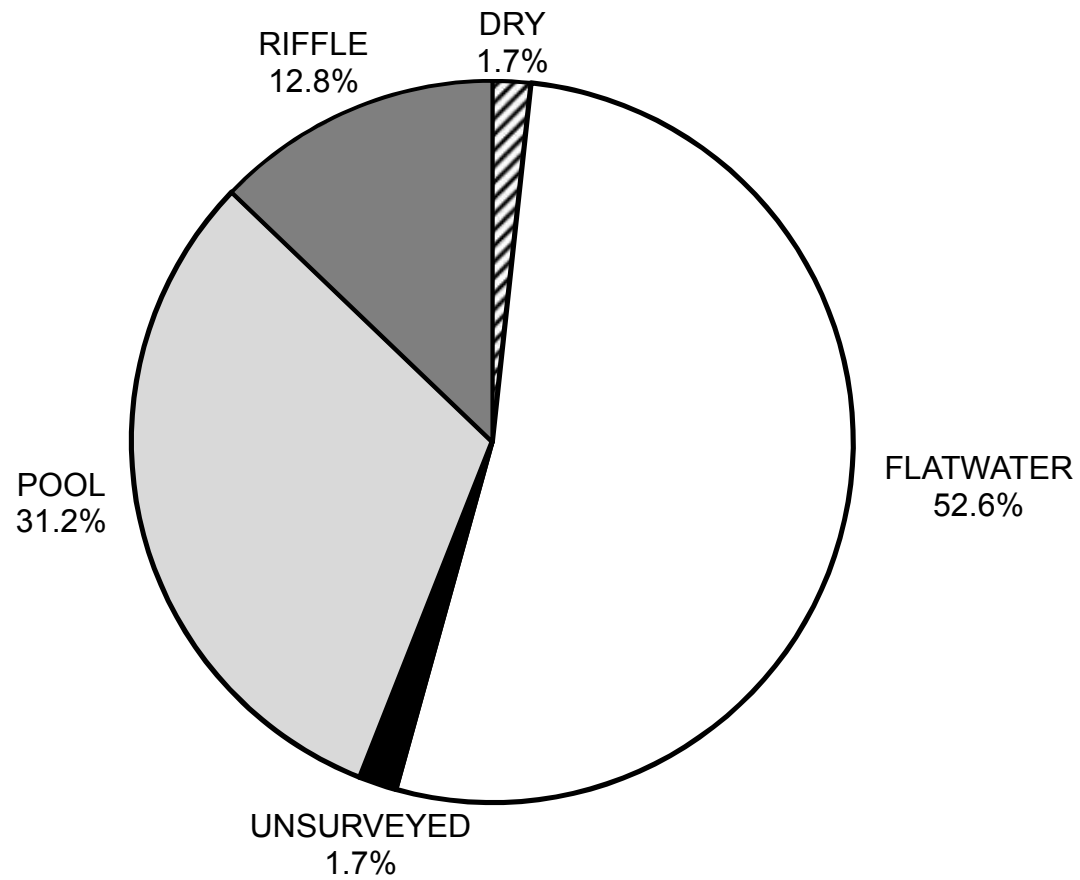
	Riffles	Flatwater	Pools
<hr/>			
UNDERCUT BANKS (%)	0	0	3
SMALL WOODY DEBRIS (%)	10	3	7
LARGE WOODY DEBRIS (%)	0	2	8
ROOT MASS (%)	0	11	4
TERRESTRIAL VEGETATION (%)	65	31	21
AQUATIC VEGETATION (%)	12	14	17
WHITEWATER (%)	1	0	0
BOULDERS (%)	13	40	23
BEDROCK LEDGES (%)	0	0	16

SOUTH FORK BIG RIVER 2015 HABITAT TYPES BY PERCENT OCCURRENCE



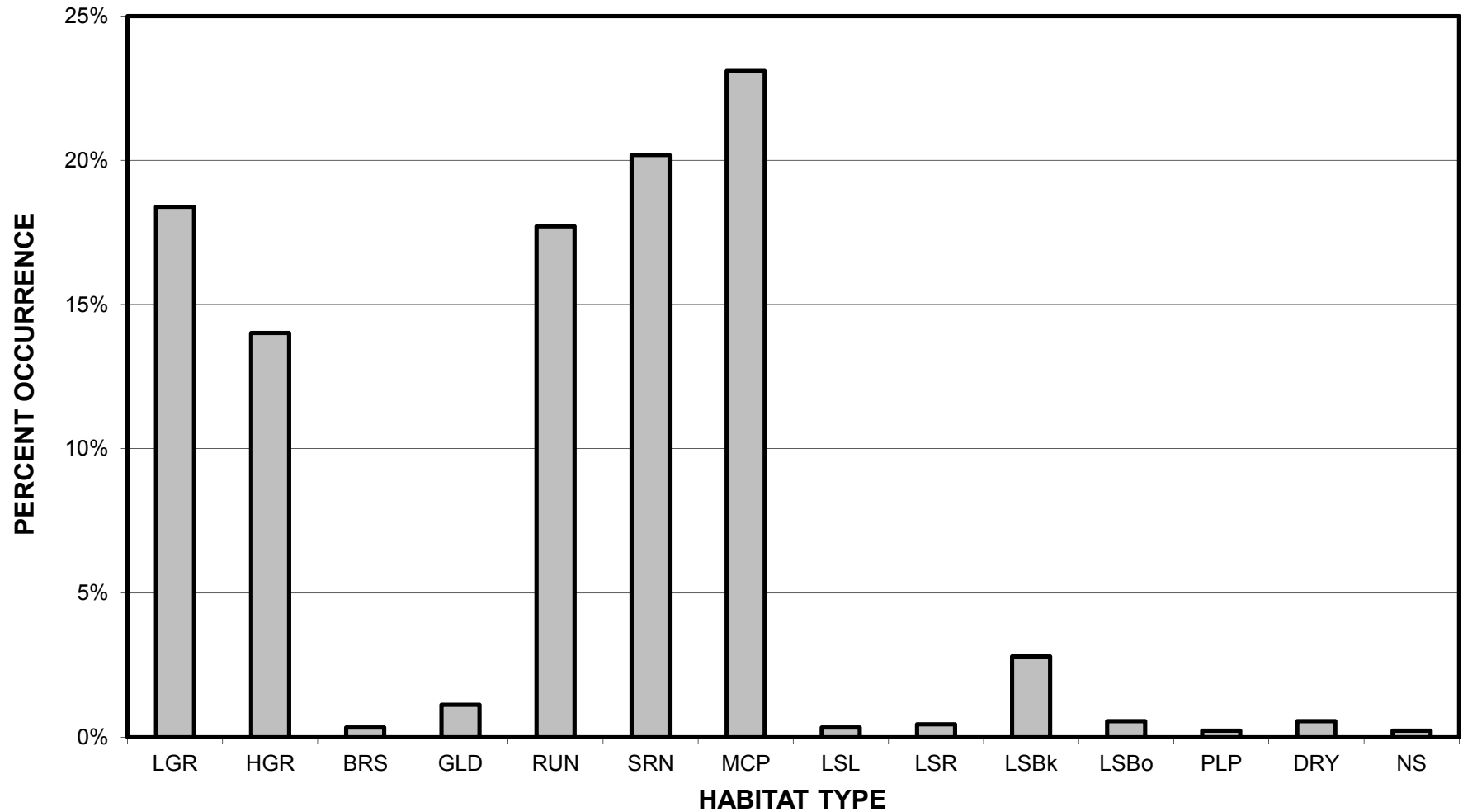
GRAPH 1

**SOUTH FORK BIG RIVER 2015
HABITAT TYPES BY PERCENT TOTAL LENGTH**



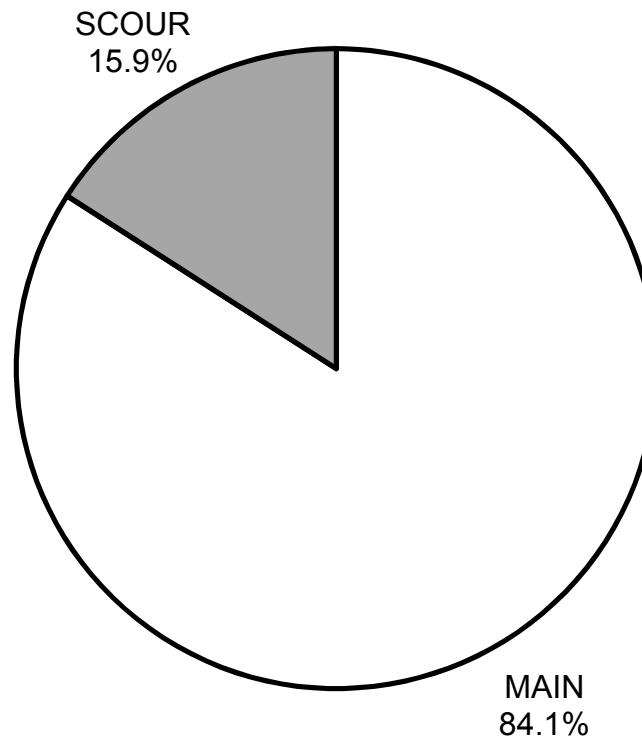
GRAPH 2

SOUTH FORK BIG RIVER 2015 **HABITAT TYPES BY PERCENT OCCURRENCE**



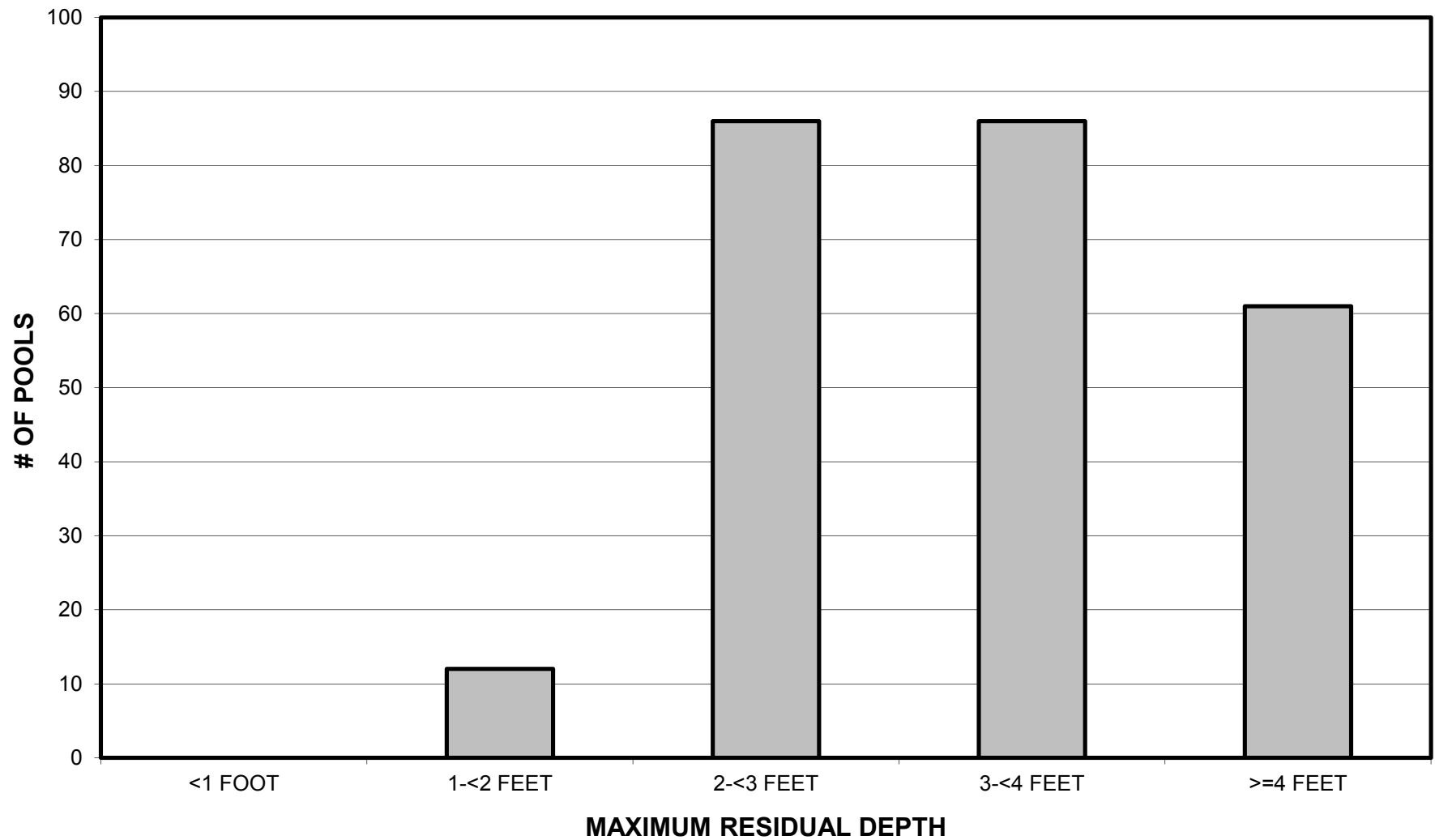
GRAPH 3

**SOUTH FORK BIG RIVER 2015
POOL TYPES BY PERCENT OCCURRENCE**



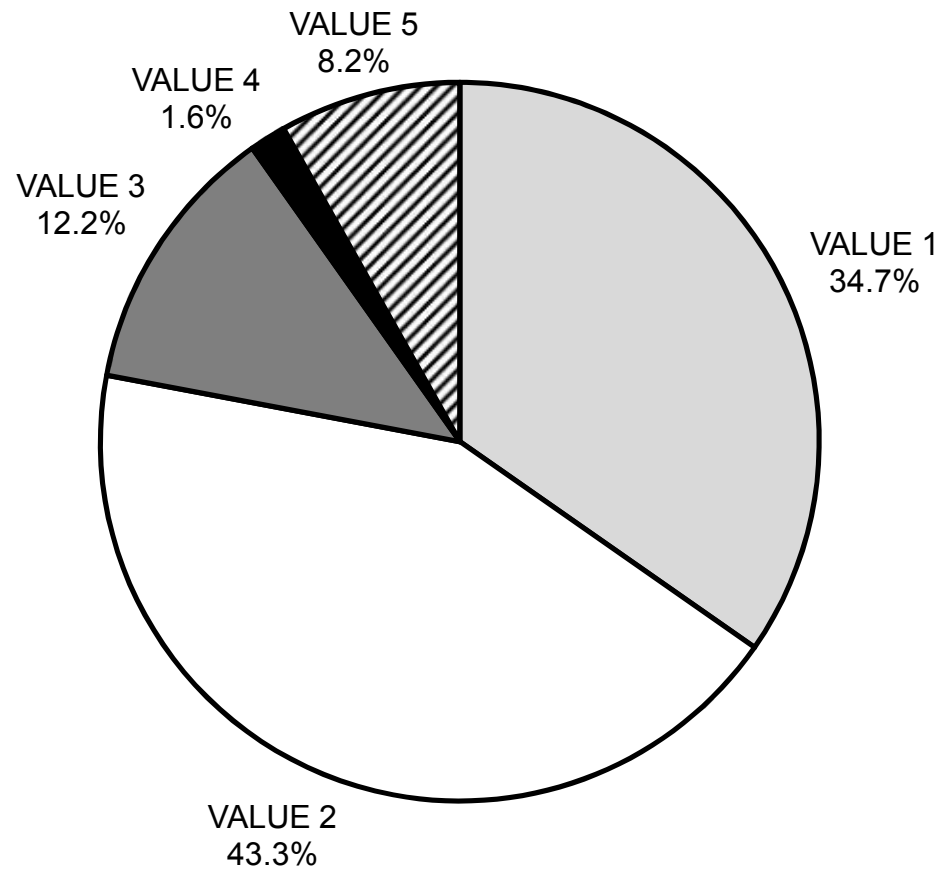
GRAPH 4

SOUTH FORK BIG RIVER 2015 MAXIMUM DEPTH IN POOLS



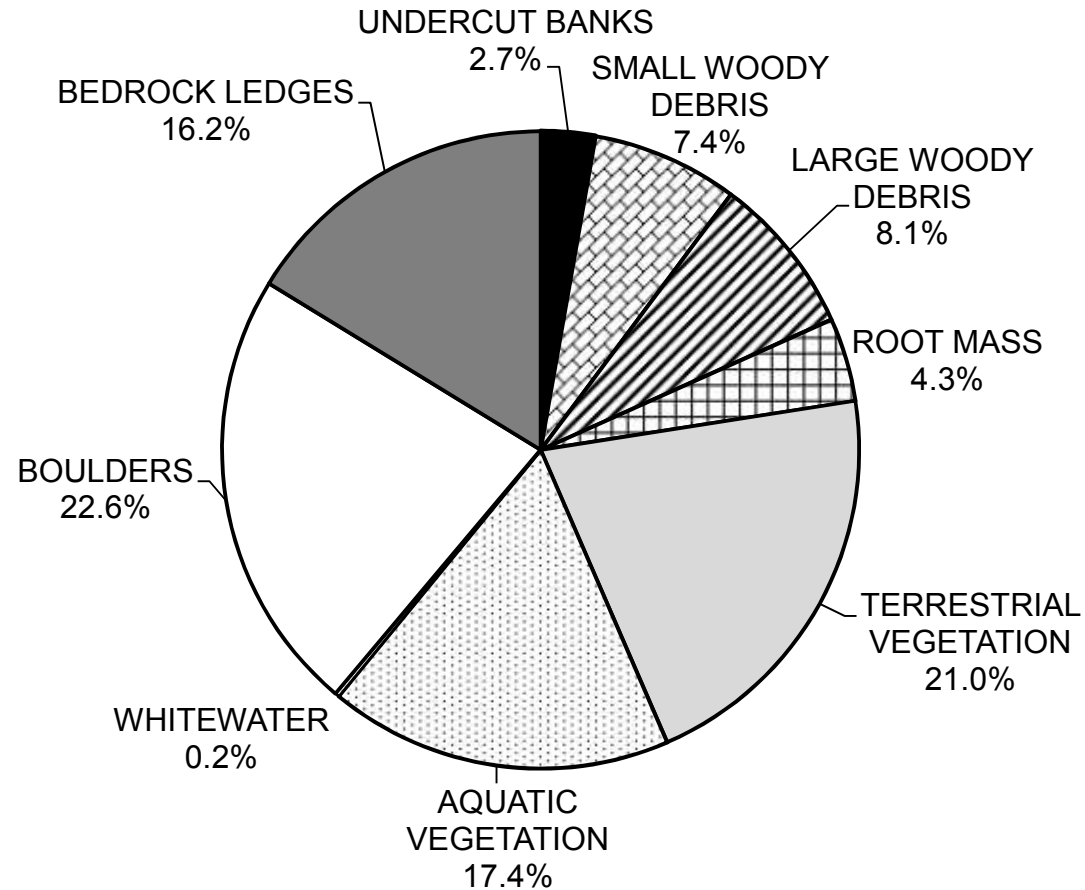
GRAPH 5

SOUTH FORK BIG RIVER 2015 PERCENT EMBEDDEDNESS



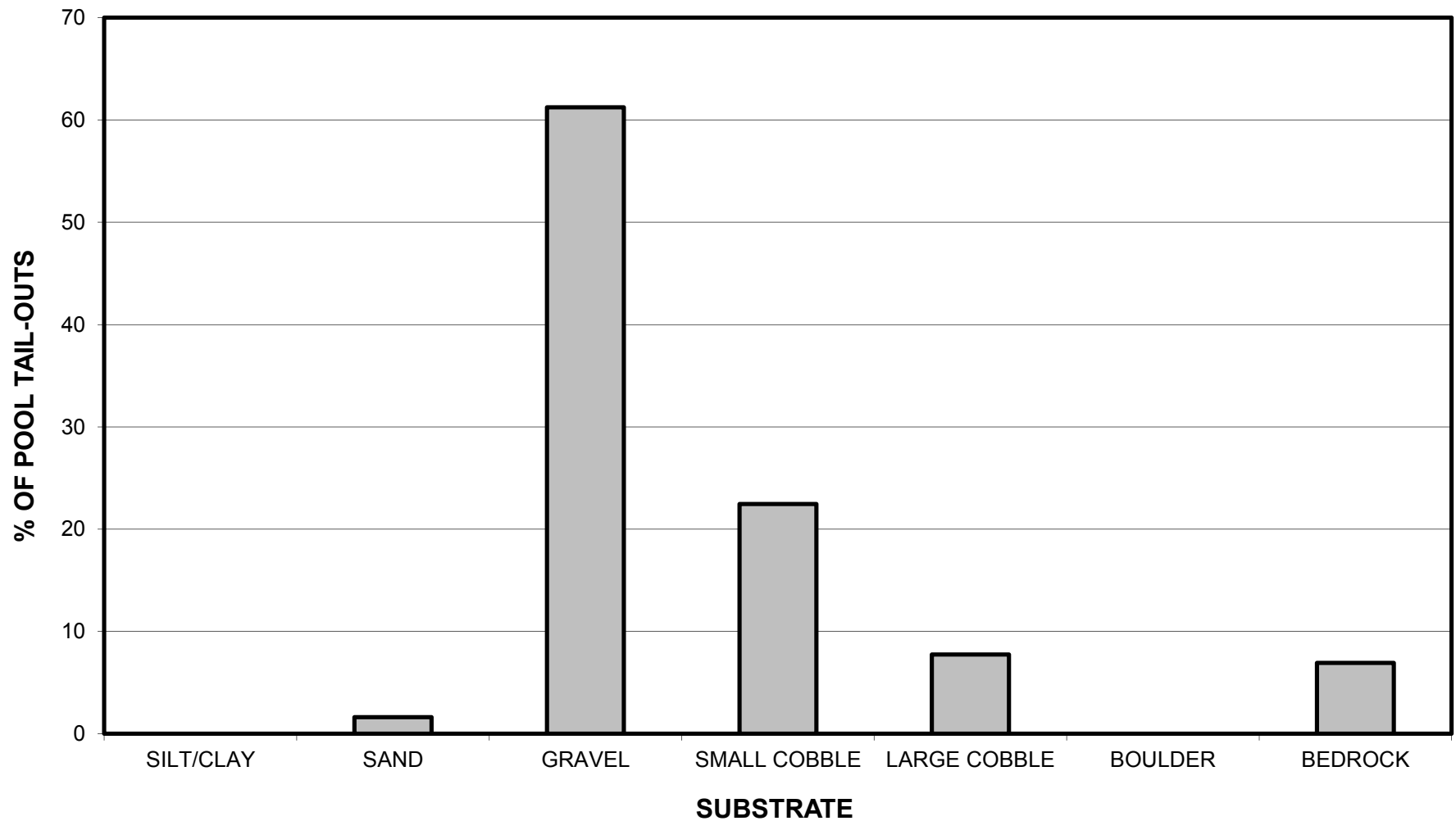
GRAPH 6

SOUTH FORK BIG RIVER 2015 MEAN PERCENT COVER TYPES IN POOLS



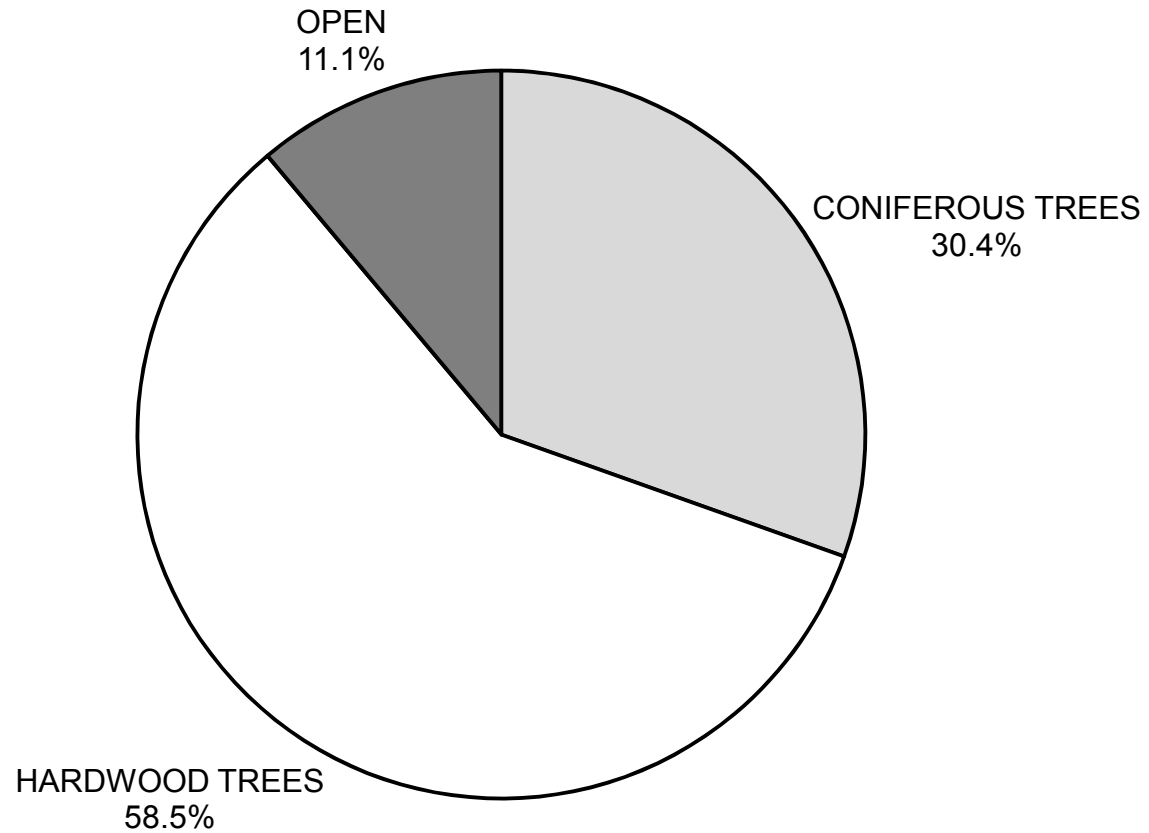
GRAPH 7

SOUTH FORK BIG RIVER 2015 SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



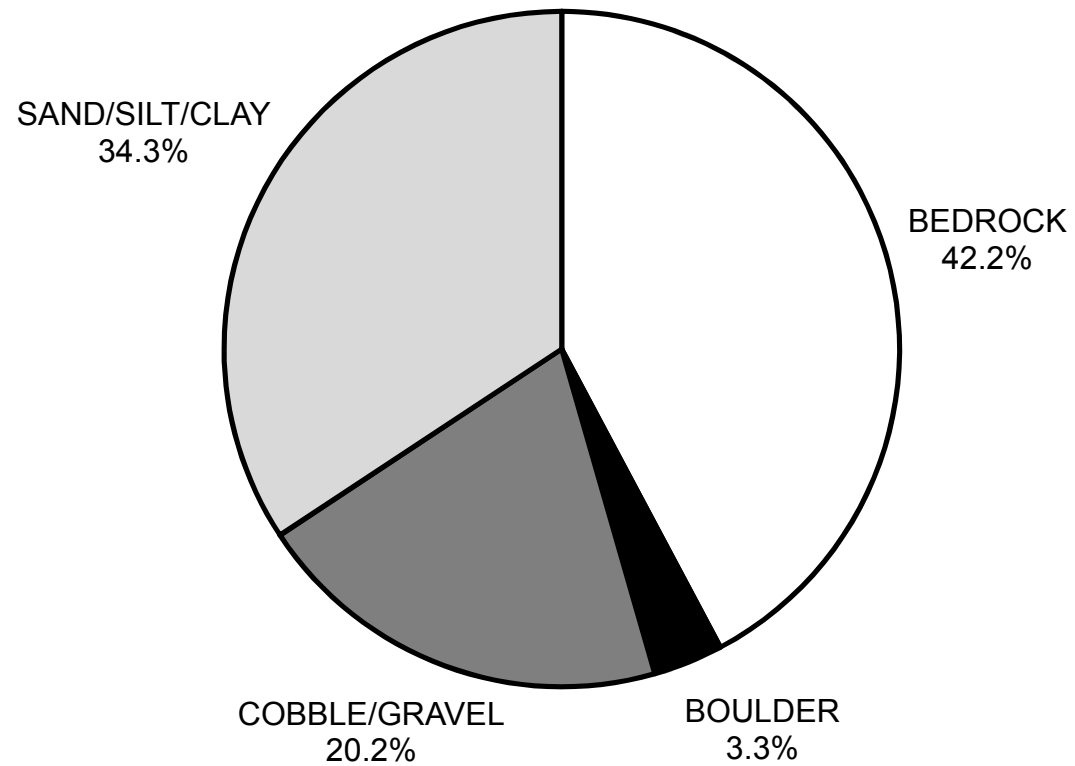
GRAPH 8

SOUTH FORK BIG RIVER 2015 MEAN PERCENT CANOPY

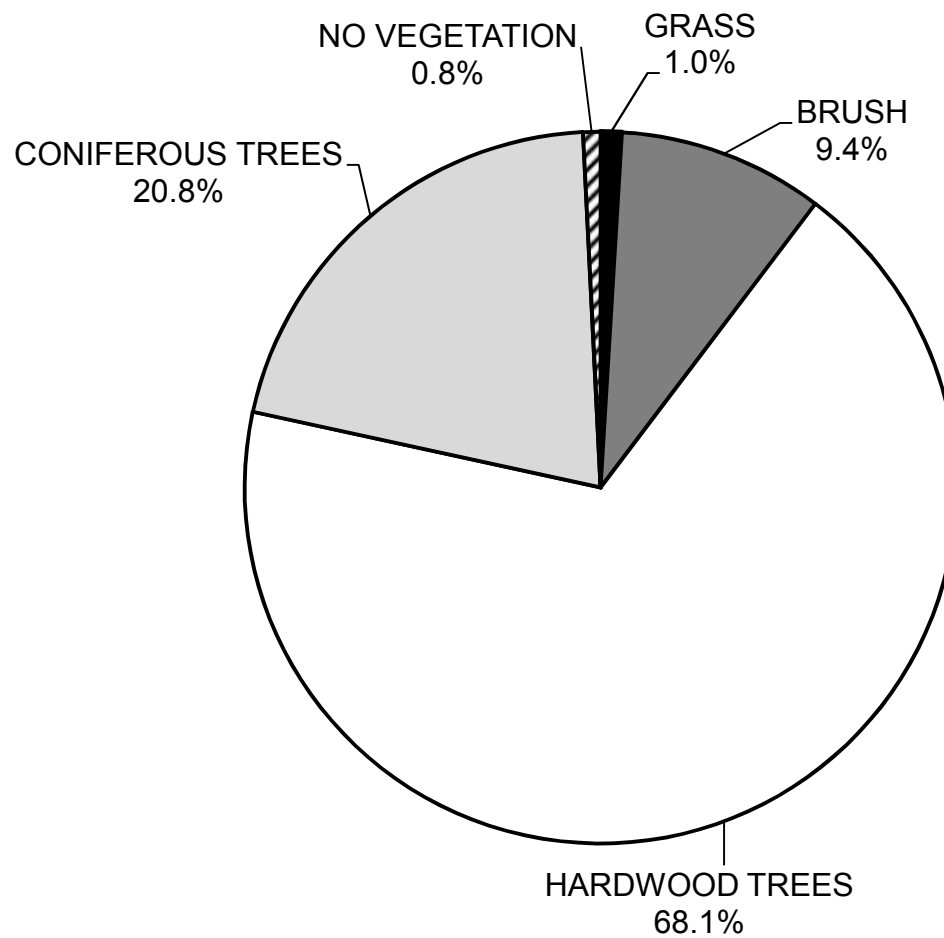


GRAPH 9

**SOUTH FORK BIG RIVER 2015
DOMINANT BANK COMPOSITION IN SURVEY REACH**



SOUTH FORK BIG RIVER 2015 DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11