STREAM INVENTORY REPORT

South Fork Albion River

INTRODUCTION

A stream inventory was conducted from September 23 to October 8, 2013 on the South Fork Albion River. The survey began at the confluence with the Albion River and extended upstream 6.8 miles.

The South Fork Albion 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 Albion 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 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

The South Fork Albion River is a tributary to the Albion River, which drains to the Pacific Ocean. It is located in Mendocino County, California (Map 1). The South Fork Albion River's legal description at the confluence with the Albion River is T16N R16W S17. Its location is 39.2538 degrees north latitude and 123.6738 degrees west longitude, LLID number 1236738392538. The South Fork Albion River is a first order stream and has approximately one mile of blue line stream according to the USGS Mathison Peak 7.5 minute quadrangle. The South Fork Albion River drains a watershed of approximately nine square miles. Elevations range from about 20 feet at the mouth of the creek to 700 feet in the headwater areas. Mixed conifer forest dominates the watershed. The watershed is entirely privately owned and is managed for timber production and rural development. Vehicle access exists via a private logging road off of Comptche-Ukiah Road, west of Comptche, CA.

METHODS

The habitat inventory conducted in the South Fork Albion River follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al, 1998). The California Department of Fish and Wildlife (CDFW) personnel that conducted the inventory were trained in standardized habitat inventory methods by the CDFW. This inventory was conducted by a two-person team.

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SAMPLING STRATEGY

The inventory uses a method that samples approximately 10% of the habitat units within the survey reach. All habitat units included in the survey are classified according to habitat type and their lengths are measured. All pool units are measured for maximum depth, depth of pool tail crest (measured in the thalweg), dominant substrate composing the pool tail crest, and embeddedness. Habitat unit types encountered for the first time are measured for all the parameters and characteristics on the field form. Additionally, from the ten habitat units on each field form page, one is randomly selected for complete measurement.

HABITAT INVENTORY COMPONENTS

A standardized habitat inventory form has been developed for use in California stream surveys and can be found in the *California Salmonid Stream Habitat Restoration Manual*. This form was used in the South Fork Albion 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 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". The South Fork Albion 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 the South Fork Albion 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 not suitable 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. Using an overhead view, a quantitative estimate of the percentage of the habitat unit covered is made. All cover is classified according to a list of nine cover types. In the South Fork Albion 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 for each fully-described habitat unit by multiplying shelter value and percent 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 the South Fork Albion 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 the South Fork Albion 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 (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 the South Fork Albion River. In addition, underwater observations were made at twelve 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 2.0.19, 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)

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- 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 the South Fork Albion 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 September 23 to October 8, 2013 was conducted by M. Groff and I. Mikus (CDFW). The total length of the stream surveyed was 35,918 feet.

Stream flow was not measured on the South Fork Albion River.

The South Fork Albion River is an F3 channel type for 13,576 feet of the stream surveyed (Reach 1), a C4 channel type for 2,554 feet of the stream surveyed (Reach 2), an unknown channel type for 1,800 feet of the stream surveyed (Reach 3), a C6 channel type for 7,630 feet of the stream surveyed (Reach 4), an E4 channel type for 3,939 feet of the stream surveyed (Reach 5), an F1 channel type for 2,240 feet of the stream surveyed (Reach 6), and an F4 channel type for 4,179 feet of the stream surveyed (Reach 7). F3 channel types are entrenched meandering riffle/pool channels on low gradients with high width/depth ratios and cobble-dominant substrates. C4 channels are meandering point-bar, riffle/pool, alluvial channels with broad well defined floodplain on low gradients and gravel-dominant substrates. C6 channels are meandering point-bar, riffle/pool, alluvial channels with broad well defined floodplain on low gradients and silt-dominant substrates. E4 channels are low gradient, meandering riffle/pool streams with low width/depth ratios and little deposition. They are very efficient and stable with a high meander width ratio and gravel-dominant substrates. F1 channel types are entrenched meandering riffle/pool channels on low gradients with high width/depth ratios, very stable with bedrock-dominant substrates. F4 channel types are entrenched meandering riffle/pool channels on low gradients with high width/depth ratios and gravel-dominant substrates.

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Water temperatures taken during the survey period ranged from 49 to 60 degrees Fahrenheit. Air temperatures ranged from 42 to 71 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 33% pool units, 30% flatwater units, 24% dry units, 13% riffle units, and 1% unsurveyed marsh units (Graph 1). Based on total length of Level II habitat types there were 38% pool units, 24% flatwater units, 20% dry units, 10% unsurveyed marsh units, and 9% riffle units (Graph 2).

Eighteen Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were mid-channel pool units, 29%; run units, 24%; and dry units, 24% (Graph 3). Based on percent total length, mid-channel pool units made up 35%, dry units 20%; and run units 16%.

A total of 231 pools were identified (Table 3). Main channel pools were the most frequently encountered at 88% (Graph 4), and comprised 92% 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 twenty-eight of the 231 pools (55%) had a residual depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 231 pool tail-outs measured, 98 had a value of 1 (42%); 58 had a value of 2 (25%); 19 had a value of 3 (8%); 12 had a value of 4 (5%); 44 had a value of 5 (19%) (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 not suitable 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 0, flatwater habitat types had a mean shelter rating of 2, and pool habitats had a mean shelter rating of 8 (Table 1). Of the pool types, the backwater pools had the highest mean shelter rating at 9. Both main channel pools and scour pools had a mean shelter rating of 8 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Small woody debris is the dominant cover type in the South Fork Albion River. Graph 7 describes the pool cover in the South Fork Albion River. Small woody debris is the dominant pool cover type followed by undercut banks.

Table 6 summarizes the dominant substrate by habitat type. Graph 8 depicts the dominant substrate observed in pool tail-outs. Gravel was the dominant substrate observed in 59% of the pool tail-outs. Silt/clay and bedrock were the next most frequently observed dominant substrate types; each occurred in 13% of the pool tail-outs measured.

The mean percent canopy density for the surveyed length of the South Fork Albion River was 95%. Five percent of the canopy was open. Of the canopy present, the mean percentages of hardwood and coniferous trees were 36% and 64%, respectively. Graph 9 describes the mean percent canopy in South Fork Albion River.

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For the stream reach surveyed, the mean percent right bank vegetated was 99%. The mean percent left bank vegetated was 99%. The dominant elements composing the structure of the stream banks consisted of 85% sand/silt/clay, 6% cobble/gravel, 5% bedrock, and 3% boulders (Graph 10). Coniferous trees were the dominant vegetation type observed in 53% of the units surveyed. Additionally, 32% of the units surveyed had deciduous trees as the dominant vegetation type, and 14% had brush as the dominant vegetation type (Graph 11).

BIOLOGICAL INVENTORY RESULTS

Survey teams conducted a snorkel survey at 12 sites for species composition and distribution in the South Fork Albion River on October 9, 2013. The sites were sampled by I. Mikus and M. Groff (CDFW).

In Reach 1, which comprised the first 13,576 feet of stream, two sites were sampled. The reach sites yielded six young-of-the-year (YOY) steelhead/rainbow trout (SH/RT), and 11 YOY coho salmon.

In Reach 2, one site was sampled starting approximately 13,900 feet from the confluence with the Albion River and continuing upstream 14 feet. The reach site yielded 13 YOY coho salmon, and one age 1+ coho salmon.

In Reach 4, two sites were sampled starting approximately 23,719 feet from the confluence with the Albion River and continuing upstream 80 feet. The reach sites yielded four YOY coho salmon.

In Reach 5, one site was sampled starting approximately 28,838 feet from the confluence with the Albion River and continuing upstream 38 feet. The reach site yielded 17 YOY coho salmon.

In Reach 6, one site was sampled starting approximately 31,032 feet from the confluence with the Albion River and continuing upstream 57 feet. The reach site yielded one YOY SH/RT and 17 YOY coho salmon.

In Reach 7, five sites were sampled starting approximately 34,224 feet from the confluence with the Albion River and continuing upstream 419 feet. The reach sites yielded one YOY coho salmon.

The following chart displays the information yielded from these sites:

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2013 South Fork Albion River underwater observations.

Date	Survey Site #	Habitat Unit #	Habitat Type	Approx. Dist. from mouth (ft.)	SH/RT			Coho	
					YOY	1+	2+	YOY	1+
Reach 1: F3 Channel Type									
10/09/13	1	005	Pool	200	5	0	0	1	0
	2	229	Pool	13,455	1	0	0	10	0
Reach 2: C4 Channel Type									
	3	238	Run	13,914	0	0	0	13	1
Reach 4: C6 Channel Type									
	4	373	Run	23,757	0	0	0	2	0
	5	374	Pool	23,799	0	0	0	3	0
Reach 5: E4 Channel Type									
	6	489	Pool	28,876	0	0	0	17	0
Reach 6: F1 Channel Type									
	7	541	Pool	31,089	1	0	0	17	0
Reach 7: F4 Channel Type									
	8	636	Pool	34,239	0	0	0	1	0
	9	648	Run	34,365	0	0	0	0	0
	10	655	Pool	34,526	0	0	0	0	0
	11	657	Run	34,545	0	0	0	0	0
	12	659	Pool	34,643	0	0	0	0	0

DISCUSSION

The South Fork Albion River is an F3 channel type for the first 13,576 feet of stream surveyed, a C4 channel type for the next 2,554 feet, an unknown channel type for the next 1,800 feet, a C6 channel type for the next 7,630 feet, an E4 channel type for the next 3,939 feet, an F1 channel type for the next 2,240 feet, and an F4 channel type for the remaining 4,179 feet. The suitability of F3, C4, C6, E4, F1 and F4 channel types for fish habitat improvement structures is as follows: F3 channel types are good for bank-placed boulders, single and opposing wing-deflectors and fair for plunge weirs, boulder clusters, channel constrictors and log cover. C4 channel types are good for bank placed boulders and fair for plunge weirs, single and opposing wing-deflectors, channel constrictors, and log cover. C6 channel types are good for bank-placed boulders and log cover and fair for plunge weirs. E4 channel types are good for bank-placed boulders and fair for opposing wing-deflectors. F1 channel types are good for bank-placed boulders and fair for single wing-deflectors and log cover. F4 channel types are good for bank-placed boulders and fair for plunge weirs, single and opposing wing-deflectors, channel constrictors, and log cover.

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The water temperatures recorded on the survey days September 23 to October 8, 2013 ranged from 49 to 60 degrees Fahrenheit. Air temperatures ranged from 42 to 71 degrees Fahrenheit. This is a good water temperature range for salmonids. To make any further conclusions, temperatures need to be monitored throughout the warm summer months, and more extensive biological sampling needs to be conducted.

Flatwater habitat types comprised 24% of the total length of this survey, riffles 9%, and pools 38%. One hundred twenty-eight of the 231 (55%) pools had a maximum residual depth greater than two 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.

One hundred fifty-six of the 231 pool tail-outs measured had embeddedness ratings of 1 or 2. Thirty-one of the pool tail-outs had embeddedness ratings of 3 or 4. Forty-four of the pool tail-outs had a rating of 5, which is considered not suitable for spawning. Cobble embeddedness measured to be 25% or less, a rating of 1, is considered to indicate good quality spawning substrate for salmon and steelhead. Sediment sources in the South Fork Albion River should be mapped and rated according to their potential sediment yields, and control measures should be taken.

One hundred forty-nine of the 231 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 8. The shelter rating in the flatwater habitats is 2. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by small woody debris in the South Fork Albion River. Small woody debris is the dominant cover type in pools followed by undercut banks. Log and root wad cover structures in the pool and flatwater habitats would enhance both summer and winter salmonid habitat. Log cover 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 95%. Reach 1 had a canopy density of 94%, Reach 2 had a canopy density of 94%, Reach 4 had a canopy density of 95%, Reach 5 had a canopy density of 96%, Reach 6 had a canopy density of 97%, and Reach 7 had a canopy density of 97%. The percentage of right and left bank covered with vegetation was 99% and 99%, respectively.

RECOMMENDATIONS

1) South Fork Albion River should be managed as an anadromous, natural production stream.

2) The limited water temperature data available suggest that maximum temperatures are within the acceptable range for juvenile salmonids. To establish more complete and

meaningful temperature regime information, 24-hour monitoring during the July and August temperature extreme period should be performed for 3 to 5 years.

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

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 the Albion River.
212	0007.00	Migrant trap site.
937	0021.00	The left bank is eroding around a root wad. The root wad is associated with an instream habitat structure. The erosion site measures approximately 30' long x 6' high, and is contributing fine sediment to the stream channel.
982	0022.00	Dry tributary on the left bank.
1249	0028.00	A logging road crosses over this unit. The crossing is a 12.5’ high x 18’ wide x 88’ long bridge. The banks below the bridge are reinforced with corrugated metal sheets and rip-rap. The rip-rap extends approximately 100' along the right bank and 60' along the left bank. The bridge is associated with a stream gauge.
1572	0031.00	A four foot diameter redwood tree collapsed into the channel from the left bank and is accumulating woody debris and sediment on the left bank. Currently 3/4 of the stream channel is blocked. The down tree has been sawn through, but is wedged against its rootwad. There is left bank erosion downstream of the tree; it measures approximately 75' long x 9' high and is contributing fine sediment to the stream channel.
3729	0062.00	There is a 1.4’ high plunge over a boulder weir. Water is trickling through the sediment retained by the weir.
4016	0066.00	Water is seeping out of the left bank.
4339	0072.00	There is a boulder weir with two rootwads attached. Water is currently trickling through the retained sediment.

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5242	0085.00	Anderson Gulch (Tributary #01) enters from the left bank. Its flow is contributing approximately 10% of the South Fork Albion River's flow. The water temperature of Anderson Gulch was 57 degrees Fahrenheit; the water temperature of the South Fork Albion River upstream and downstream of the confluence was 57 degrees Fahrenheit. The tributary flows through a culvert with a slope over 2%; the tributary itself has a slope over 4%. The tributary is accessible to salmonids, but no fish were observed.
6393	0102.00	Gunari Gulch enters from the right bank. It is currently dry.
6492	0104.00	A logging road crosses the channel. The crossing is a 10’ high x 14’ wide x 60’ long railcar bridge with a wood beam surface. Both banks are lined with rip-rap measuring approximately 8' high x 30-35' long.
6771	0107.00	The stream is eroding under tree roots on the right bank. The erosion site measures approximately 40' long x 5' high and is contributing fine sediment to the creek channel.
6939	0109.00	Mack Gulch (Tributary #02) enters from the left bank. Mack Gulch is not flowing; it is approximately 80% dry with standing water only. The average width of Mack Gulch's channel is 6' and it has a slope of approximately 4%. No fish were observed in the tributary.
8202	0132.00	The stream is trickling under a boulder that is perched on bedrock which spans the channel.
8269	0135.00	Dry tributary on the left bank.
9351	0154.00	Woody debris is accumulating in the channel across this pool. Most of the mass is small woody debris (SWD).
10002	0166.00	Norden Gulch (Tributary #03) enters from the right bank. It is not flowing and is standing water only. The water temperature of Norden Gulch was 54 degrees Fahrenheit; the water temperature of the South Fork Albion River upstream and downstream was 54 degrees Fahrenheit. For more information, see the 2011 Norden Gulch Stream Habitat Inventory Report.
10581	0179.00	Woody debris is accumulating in the middle of this pool. The right bank is eroding upstream of the debris accumulation. The erosion site measures approximately 50' long x 10' high and is contributing silt, sand and gravel to the stream channel.
11670	0199.00	Dry tributary on the left bank.

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12039	0205.00	Tributary #04 enters from the left bank. The tributary is dry for the first 80' and consists of isolated wet areas. The temperature of the tributary was 54 degrees Fahrenheit; the water temperature of the South Fork Albion River was 56 degrees Fahrenheit both upstream and downstream of the tributary. Approximately 200' upstream from the mouth, the tributary has a 5.5' high plunge over roots. Below the barrier the slope is approximately 4%, above the barrier it is approximately 8%.
13329	0225.00	Coho are trapped in this unit. The unit is shallow and the creek is dry above and below it.
13499	0231.00	Log debris accumulation (LDA) #01 measures approximately 7' high x 26' wide x 15' long and contains nine pieces of large woody debris (LWD). Water flows through the LDA and there are no visible gaps in it. The LDA is retaining a volume of silt and sand measuring 10' wide x 60' long x 2.5’ deep. There is a boulder on the left bank that is constricting the channel where the woody debris is accumulating. A tree on the right bank has fallen into the creek and has live growth on it; it is also contributing to the constriction of the channel, and thus the formation of the LDA. The left bank is eroding around the boulder; the erosion site measures 50' long x 7' high and is contributing fine sediment to the stream channel.
13576	0233.00	The channel type changes from an F3 to a C4.
13914	0239.00	SWD is accumulating in the channel. The debris accumulation measures approximately 5' high x 7' long x 30' wide.
14361	0242.00	Coho are trapped in this isolated puddle.
14385	0243.00	Water seeping out of the left bank.
14722	0248.00	LDA #02 measures approximately 8' high x 48' wide x 20' long. It contains over 20 pieces of LWD. Water is not flowing through the LDA; the channel is dry above it. There are visible gaps in the LDA. An erosion site on the left bank just downstream of the LDA measures approximately 30' long x 10' high and is contributing fine sediment to the creek channel.
14735	0249.00	Little North Fork Albion River (Tributary #05) enters from the right bank. At least the first 500' are dry except for two puddles under the bridge. In one of the puddles three juvenile coho are trapped. For more information, see the 2011 Little North Fork Albion River Stream Habitat Inventory Report.
15587	0271.00	Yesterday it rained over an inch. The South Fork Albion River is noticeably higher and murkier.

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15882	0276.00	The creek has become marshy.
16130	0280.00	The creek is marshy, and the stream channel is overgrown with thick brush, including poison oak. Due to the brush and the marsh the creek was not surveyed for approximately 1,800 feet. In the unsurveyed section there was a road crossing. The crossing is a 13’ wide x 3.6' high x 52’ long railcar bridge with a wood beam surface. Boulder rip-rap lines both banks below the bridge.
17930	0281.00	The creek is still marshy with a wide bankfull width, and lots of marsh associated grass. The floodplain seems to be smaller than it was downstream from this unit. The channel type is a C6.
18521	0289.00	This unit was not surveyed due to thick marsh grass completely obscuring the creek.
18921	0291.00	The creek channel is still marshy.
19262	0297.00	This section of creek is marshy and too overgrown with willow to survey.
19884	0309.00	The creek channel is no longer marshy and the marsh grass has gone away.
20643	0326.00	The stream channel has become marshy again, there is no clearly defined main channel, and the creek is interspersed with dry sections.
20768	0330.00	The stream was not surveyed for 1,130 feet due to marsh.
22704	0347.00	LDA #03 measures 7’ high x 20’ wide x 45’ long and contains over 30 pieces of LWD. Currently water is not flowing through the LDA; the channel is dry above it. There are visible gaps in the LDA.
22987	0353.00	Dry tributary on the right bank.
23335	0363.00	Dry tributary on the left bank.
23491	0367.00	Dry tributary on the right bank.
24096	0385.00	LDA #04 measures 4’ high x 16’ wide x 28’ long and contains eight pieces of LWD. Water does not flow through the LDA; the channel is dry above it. There are no visible gaps in the LDA.
24337	0394.00	Coho trapped in a shallow puddle.
25147	0414.00	A logging road crosses the channel. The crossing is a 14' wide x 6' high x 54' long bridge.

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25213	0416.00	Not surveyed due to marsh.
25560	0417.00	The channel type is now E4.
25597	0419.00	A logging road crosses the channel. The crossing is a 14' wide x 4.7' high x 48' long bridge.
26543	0428.00	LDA #05 measures 5' high x 28' wide x 7' long and contains eight pieces of LWD. Water does not flow through the LDA; the channel is dry above it. The LDA has visible gaps in it. Retained sediment ranges in size from silt to gravel and measures approximately 20' wide x 40' long x 1' deep.
26868	0435.00	There are two or more coho in this isolated puddle.
27271	0450.00	LDA #06 measures 6' high x 25' wide x 9' long and contains five pieces of LWD. Water does not flow through the LDA; the channel is dry above it. There are no visible gaps in the LDA. Retained sediment ranges in size from silt to gravel and measures 20' wide x 50' long x 2.5' deep. There is a 4' high plunge over the LDA.
27917	0465.00	A logging road crosses the channel. The crossing is a 9.3' wide x 5.5' high x 65' long bridge. This bridge has concrete abutments and boulder rip-rap lines the right bank below it. The rip-rap measures approximately 60' long x 3' high.
28979	0491.00	Dry tributaries on the left bank and the right bank.
29499	0503.00	The channel type changes from an E4 to an F1.
29524	0504.00	There is a 2.5' high plunge over bedrock. There is a dry tributary on the left bank.
29722	0507.00	Dry tributary on the right bank.
29939	0513.00	There is a concrete dam measuring 18’ wide x 2.7' high x 1' long. It has a notch which the water is flowing through; the notch creates a 1.7' high plunge. The dam is bordered on each side by bedrock.
29957	0514.00	This section of stream contains a 1.7' high plunge and a 1.5' high plunge, both over bedrock.
30766	0533.00	High gradient riffle made up of bedrock.
30846	0535.00	Bull Team Gulch (Tributary #06) enters from the right bank. It contributes to approximately 5% of the South Fork Albion River's flow. The water temperature of the tributary was 50 degrees Fahrenheit; the

		water temperature of the South Fork Albion River both upstream and downstream of the tributary was 49 degrees degrees Fahrenheit. For more information see the 2012 Bull Team Gulch Stream Habitat Inventory Report. This unit is an all bedrock low gradient riffle.
30885	0537.00	This low gradient riffle is flowing over bedrock.
31089	0542.00	This high gradient riffle is made up of bedrock.
31718	0557.00	LDA #07 measures approximately 5' high x 25' wide x 15' long and contains three pieces of LWD. Water does not flow through the LDA; the channel is dry above it. There are visible gaps in the LDA. Retained sediment ranges in size from silt to gravel and measures 5' wide x 10' long x 2' deep.
31739	0558.00	The channel type changes from an F1 to an F4.
32234	0572.00	LDA #08 measures approximately 7' high x 40' wide x 8' long and contains 13 pieces of LWD. Water does not flow through the LDA; the channel is dry above. There are no visible gaps in the LDA. Retained sediment ranges in size from silt to gravel and measures 15' wide x 100' long x 3' deep. There is a 4' high plunge over the LDA.
32683	0587.00	A woody debris accumulation on the left bank is blocking half of the channel. The accumulation has a large redwood tree in the middle of it. There is clear passage on the right side.
32955	0598.00	This unit is composed of bedrock.
32995	0600.00	This unit is made up of bedrock.
33866	0624.00	This unit is a bedrock low gradient riffle.
34001	0628.00	This unit is a bedrock low gradient riffle.
34093	0631.00	This unit is a bedrock low gradient riffle.
34175	0634.00	A logging road crosses the channel. The crossing is a 16' wide x 11' high x 40' long bridge. Below the bridge there is boulder rip-rap on both banks, measuring approximately 35' long x 6' high. There is bare soil between the top of the rip-rap and the bottom of the bridge.
34224	0636.00	Winery Gulch (Tributary #07) enters from the right bank. The water temperature of Winery Gulch was 51 degrees Fahrenheit; the water temperature of the South Fork Albion River upstream and downstream of Winery Gulch was 51 degrees Fahrenheit. For more information see the 2012 Winery Gulch Stream Habitat Inventory Report. The pool at

		the confluence of Winery Gulch and the South Fork Albion River has a coho in it; this fish was the last fish observed during this survey.
34262	0640.00	There is a 3' high plunge at the top of this unit. The plunge is over wood, roots and sediment. Above the plunge the channel is dry.
34659	0661.00	A logging road crosses the channel. The crossing is a 16' wide x 6.7' high x 29’ wide bridge.
35387	0689.00	An erosion site on the right bank measures approximately 40' long x10' high and is contributing fine sediment to the stream channel. There is a 3' high plunge over roots.
35494	0695.00	There is a 2.7' high plunge over sediment.
35579	0700.00	There is a 3.3' high plunge over woody debris.
35908	0710.00	End of survey at Mendocino Redwood Company property line. No fish were observed above the Winery Gulch confluence. Above the Winery Gulch confluence the creek is intermittently dry.

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.

South Fork Albion River

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]	

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

Stream Name: South Fork Albion River LLID: 1236738392538 Drainage: Albion River

Survey Dates: 9/23/2013 to 10/8/2013

Confluence Location: Quad: MATHISON PEAK Legal Description: T16NR16WS17 Latitude: 39:15:14.0N Longitude: 123:40:26.0W

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
169	0	DRY	23.8	41	6990	21.7									
213	33	FLATWATER	30.0	41	8749	27.1	4.9	0.4	0.8	218	46357	96	20357		2
2	0	NO_SURVEY	0.3	22	44										
5	0	MARSH	0.7	725	3623										
231	231	POOL	32.5	58	13476	41.8	10.6	1.2	2.3	685	158132	1046	241533	993	8
90	16	RIFFLE	12.7	34	3036	9.4	3.2	0.1	0.3	73	6549	8	747		0

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
710	280	35918	211038	262636

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: South Fork Albion River LLID: 1236738392538 Drainage: Albion River

Survey Dates: 9/23/2013 to 10/8/2013

Confluence Location: Quad: MATHISON PEAK Legal Description: T16NR16WS17 Latitude: 39:15:14.0N Longitude: 123:40:26.0W

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 (%)
84	14	LGR	11.8	35	2928	9.1	3	0.1	0.9	80	6727	9	756		0	96
5	1	HGR	0.7	17	87	0.3	3	0.2	0.9	24	122	5	24		0	97
1	1	BRS	0.1	21	21	0.1	1	0.1	0.3	19	19	2	2		0	92
173	26	RUN	24.4	32	5563	17.2	5	0.4	1.4	165	28534	71	12212		2	96
40	7	SRN	5.6	80	3186	9.9	6	0.4	1.3	413	16535	188	7534		4	95
202	202	MCP	28.5	62	12433	38.6	11	1.3	8.5	727	146921	1132	228682	1077	8	95
1	1	CCP	0.1	15	15	0.0	5	0.7	1.1	75	75	60	60	53	5	100
2	2	CRP	0.3	23	46	0.1	6	1.1	2.1	154	308	198	395	198	3	94
5	5	LSL	0.7	36	182	0.6	12	0.9	2.8	479	2395	552	2759	512	16	96
6	6	LSR	0.8	32	194	0.6	7	0.6	1.7	246	1475	171	1025	157	5	97
6	6	LSBk	0.8	62	369	1.1	10	0.9	3.1	683	4096	693	4160	616	4	94
1	1	LSBo	0.1	21	21	0.1	8	0.9	1.9	168	168	151	151	151	5	88
4	4	PLP	0.6	16	63	0.2	9	1.8	3.8	165	660	377	1507	364	14	93
1	1	SCP	0.1	81	81	0.3	12	1.3	2	972	972	1361	1361	1264	20	99
1	1	BPB	0.1	44	44	0.1	17	1.0	2.3	711	711	853	853	711	0	88
1	1	BPR	0.1	10	10	0.0	12	0.6	1.5	96	96	67	67	58	10	98
1	1	DPL	0.1	18	18	0.1	15	1.9	2.9	257	257	513	513	487	5	97
169	0	DRY	23.8	41	6990	21.7										96
2	0	NO_SUR	0.3	22	44											
5	0	MARSH	0.7	725	3623											

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
710	280	35918	210068	262062

Table 3 - Summary of Pool Types

Stream Name: South Fork Albion River LLID: 1236738392538 Drainage: Albion River

Survey Dates: 9/23/2013 to 10/8/2013

Confluence Location: Quad: MATHISON PEAK Legal Description: T16NR16WS17 Latitude: 39:15:14.0N Longitude: 123:40:26.0W

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
203	203	MAIN	88	61	12448	92	10.7	1.2	724	146996	1072	217702	8
24	24	SCOUR	10	36	875	6	9.1	1.0	379	9101	383	9200	8
4	4	BACKWATER	2	38	153	1	14.0	1.2	509	2035	630	2519	9

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
231	231	13476	158132	229421

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

Stream Name: South Fork Albion River LLID: 1236738392538 Drainage: Albion River

Survey Dates: 9/23/2013 to 10/8/2013

Confluence Location: Quad: MATHISON PEAK Legal Description: T16NR16WS17 Latitude: 39:15:14.0N Longitude: 123:40:26.0W

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
202	MCP	87	1	0	84	42	75	37	25	12	17	8
1	CCP	0	0	0	1	100	0	0	0	0	0	0
2	CRP	1	0	0	1	50	1	50	0	0	0	0
5	LSL	2	0	0	3	60	2	40	0	0	0	0
6	LSR	3	0	0	6	100	0	0	0	0	0	0
6	LSBk	3	0	0	3	50	2	33	1	17	0	0
1	LSBo	0	0	0	1	100	0	0	0	0	0	0
4	PLP	2	0	0	1	25	1	25	2	50	0	0
1	SCP	0	0	0	0	0	1	100	0	0	0	0
1	BPB	0	0	0	0	0	1	100	0	0	0	0

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
231	1	0	101	44	84	36	28	12	17	7

Mean Maximum Residual Pool Depth (ft.): 2.3

Stream Name: South Fork Albion River LLID: 1236738392538 Drainage: Albion River

Survey Dates: 9/23/2013 to 10/8/2013

Confluence Location: Quad: MATHISON PEAK Legal Description: T16NR16WS17 Latitude: 39:15:14.0N Longitude: 123:40:26.0W

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
1	BPR	0	0	0	1	100	0	0	0	0	0	0
1	DPL	0	0	0	0	0	1	100	0	0	0	0

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
231	1	0	101	44	84	36	28	12	17	7

Mean Maximum Residual Pool Depth (ft.): 2.3

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: South Fork Albion River LLID: 1236738392538 Drainage: Albion River

Survey Dates: 9/23/2013 to 10/8/2013 Dry Units: 169

Confluence Location: Quad: MATHISON PEAK Legal Description: T16NR16WS17 Latitude: 39:15:14.0N Longitude: 123:40:26.0W

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
84	14	LGR	0	0	0	0	0	0	0	0	0
5	1	HGR	0	0	0	0	0	0	0	0	0
1	1	BRS	0	0	0	0	0	0	0	0	0
90	16	TOTAL RIFFLE	0	0	0	0	0	0	0	0	0
173	26	RUN	0	62	14	0	0	0	0	24	0
40	7	SRN	5	0	50	0	0	35	0	10	0
213	33	TOTAL FLAT	1	44	24	0	0	10	0	20	0
202	202	MCP	27	36	22	1	3	2	0	7	2
1	1	CCP	90	0	0	0	0	0	0	10	0
2	2	CRP	0	100	0	0	0	0	0	0	0
5	5	LSL	2	42	56	0	0	0	0	0	0
6	6	LSR	37	33	27	3	0	0	0	0	0
6	6	LSBk	23	7	7	0	0	27	0	3	33
1	1	LSBo	0	0	0	0	0	0	0	100	0
4	4	PLP	18	80	0	2	0	0	0	0	0
1	1	SCP	0	10	20	0	70	0	0	0	0
1	1	BPB	0	0	0	0	0	0	0	0	0
1	1	BPR	0	50	50	0	0	0	0	0	0
1	1	DPL	0	0	0	0	0	0	0	100	0
231	231	TOTAL POOL	25	36	22	1	3	2	0	8	2
2	0	NS									
5	0	MAR									
710	280	TOTAL	24	37	22	1	3	2	0	8	2

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: South Fork Albion River LLID: 1236738392538 Drainage: Albion River

Survey Dates: 9/23/2013 to 10/8/2013 Dry Units: 169

Confluence Location: Quad: MATHISON PEAK Legal Description: T16NR16WS17 Latitude: 39:15:14.0N Longitude: 123:40:26.0W

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
84	14	LGR	0	0	71	7	7	0	14
5	1	HGR	0	0	0	0	0	0	100
1	1	BRS	0	0	0	0	0	0	100
173	26	RUN	19	0	73	4	0	0	4
40	7	SRN	0	0	86	0	0	0	14
202	202	MCP	22	1	68	0	1	0	7
1	1	CCP	0	0	100	0	0	0	0
2	2	CRP	50	0	50	0	0	0	0
5	5	LSL	0	0	100	0	0	0	0
6	6	LSR	0	0	100	0	0	0	0
6	6	LSBk	0	0	83	0	0	0	17
1	1	LSBo	0	0	0	0	0	100	0
4	4	PLP	25	0	50	0	0	0	25
1	1	SCP	100	0	0	0	0	0	0
1	1	BPB	0	0	100	0	0	0	0
1	1	BPR	0	0	100	0	0	0	0
1	1	DPL	0	0	0	0	0	0	100

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: South Fork Albion River LLID: 1236738392538 Drainage: Albion River

Survey Dates: 9/23/2013 to 10/8/2013

Confluence Location: Quad: MATHISON PEAK Legal Description: T16NR16WS17 Latitude: 39:15:14.0N Longitude: 123:40:26.0W

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
95	64	36	0	99	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 Albion River LLID: 1236738392538 Drainage: Albion River

Survey Dates: 9/23/2013 to 10/8/2013 Survey Length (ft.): 35918 Main Channel (ft.): 35918 Side Channel (ft.): 0

Confluence Location: Quad: MATHISON PEAK Legal Description: T16NR16WS17 Latitude: 39:15:14.0N Longitude: 123:40:26.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type: F3
Reach Length (ft.): 13576
Riffle/Flatwater Mean Width (ft.): 5.6
BFW:
Range (ft.): 3 to 43
Mean (ft.): 26
Std. Dev.: 6
Base Flow (cfs.): 0.0
Water (F): 54 - 60 Air (F): 47 - 71
Dry Channel (ft): 1156

Canopy Density (%): 94.0
Coniferous Component (%): 61.6
Hardwood Component (%): 38.4
Dominant Bank Vegetation: Coniferous Trees
Vegetative Cover (%): 99.0
Dominant Shelter: Large Woody Debris
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 18
LWD per 100 ft.:
Riffles: 0
Pools: 3
Flat: 1

Pools by Stream Length (%): 37.8
Pool Frequency (%): 30.2
Residual Pool Depth (%):
< 2 Feet Deep: 31
2 to 2.9 Feet Deep: 41
3 to 3.9 Feet Deep: 20
>= 4 Feet Deep: 7
Mean Max Residual Pool Depth (ft.): 2.5
Mean Pool Shelter Rating: 11

Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 53 Sm Cobble: 16 Lg Cobble: 20 Boulder: 3 Bedrock: 9

Embeddedness Values (%): 1. 65.7 2. 28.6 3. 0.0 4. 0.0 5. 5.7

STREAM REACH: 2

Channel Type: C4
Reach Length (ft.): 2554
Riffle/Flatwater Mean Width (ft.): 4.8
BFW:
Range (ft.): 18 to 85
Mean (ft.): 39
Std. Dev.: 23
Base Flow (cfs.): 0.0
Water (F): 56 - 57 Air (F): 55 - 60
Dry Channel (ft): 1117

Canopy Density (%): 93.5
Coniferous Component (%): 68.8
Hardwood Component (%): 31.2
Dominant Bank Vegetation: Coniferous Trees
Vegetative Cover (%): 98.1
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 7
LWD per 100 ft.:
Riffles: 4
Pools: 6
Flat: 4

Pools by Stream Length (%): 31.8
Pool Frequency (%): 27.7
Residual Pool Depth (%):
< 2 Feet Deep: 54
2 to 2.9 Feet Deep: 38
3 to 3.9 Feet Deep: 0
>= 4 Feet Deep: 8
Mean Max Residual Pool Depth (ft.): 2.1
Mean Pool Shelter Rating: 7

Pool Tail Substrate (%): Silt/Clay: 15 Sand: 0 Gravel: 31 Sm Cobble: 0 Lg Cobble: 31 Boulder: 23 Bedrock: 0

Embeddedness Values (%): 1. 53.8 2. 23.1 3. 0.0 4. 0.0 5. 23.1

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 3

Channel Type: NA
Reach Length (ft.): 1800
Riffle/Flatwater Mean Width (ft.):
BFW:
Range (ft.): 85 to 85
Mean (ft.): 85
Std. Dev.: 0
Base Flow (cfs.): 0.0
Water (F): 57 - 57 Air (F): 60 - 60
Dry Channel (ft): 0

Canopy Density (%):
Coniferous Component (%):
Hardwood Component (%):
Dominant Bank Vegetation:
Vegetative Cover (%): 0.0
Dominant Shelter:
Dominant Bank Substrate Type:
Occurrence of LWD (%):
LWD per 100 ft.:
Riffles:
Pools:
Flat:

Pools by Stream Length (%): 0.0
Pool Frequency (%): 0.0
Residual Pool Depth (%):
< 2 Feet Deep:
2 to 2.9 Feet Deep:
3 to 3.9 Feet Deep:
>= 4 Feet Deep:
Mean Max Residual Pool Depth (ft.):
Mean Pool Shelter Rating:

Pool Tail Substrate (%): Silt/Clay: Sand: Gravel: Sm Cobble: Lg Cobble: Boulder: Bedrock:
Embeddedness Values (%): 1. 2. 3. 4. 5. 0.0

STREAM REACH: 4

Channel Type: C6
Reach Length (ft.): 7630
Riffle/Flatwater Mean Width (ft.): 4.3
BFW:
Range (ft.): 17 to 60
Mean (ft.): 27
Std. Dev.: 13
Base Flow (cfs.): 0.0
Water (F): 50 - 54 Air (F): 42 - 59
Dry Channel (ft): 1438

Canopy Density (%): 94.5
Coniferous Component (%): 58.3
Hardwood Component (%): 41.7
Dominant Bank Vegetation: Coniferous Trees
Vegetative Cover (%): 100.0
Dominant Shelter: Small Woody Debris
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 11
LWD per 100 ft.:
Riffles: 5
Pools: 3
Flat: 5

Pools by Stream Length (%): 44.0
Pool Frequency (%): 39.7
Residual Pool Depth (%):
< 2 Feet Deep: 44
2 to 2.9 Feet Deep: 37
3 to 3.9 Feet Deep: 9
>= 4 Feet Deep: 9
Mean Max Residual Pool Depth (ft.): 2.4
Mean Pool Shelter Rating: 9

Pool Tail Substrate (%): Silt/Clay: 43 Sand: 0 Gravel: 56 Sm Cobble: 2 Lg Cobble: 0 Boulder: 0 Bedrock: 0
Embeddedness Values (%): 1. 7.4 2. 18.5 3. 20.4 4. 20.4 5. 33.3

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 5

Channel Type: E4
Reach Length (ft.): 3939
Riffle/Flatwater Mean Width (ft.): 3.3
BFW:
Range (ft.): 12 to 21
Mean (ft.): 17
Std. Dev.: 3
Base Flow (cfs.): 0.0
Water (F): 49 - 55 Air (F): 52 - 60
Dry Channel (ft): 2027

Canopy Density (%): 96.2
Coniferous Component (%): 54.2
Hardwood Component (%): 45.8
Dominant Bank Vegetation: Coniferous Trees
Vegetative Cover (%): 99.9
Dominant Shelter: Undercut Banks
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 7
LWD per 100 ft.:
Riffles: 2
Pools: 2
Flat: 2

Pools by Stream Length (%): 30.2
Pool Frequency (%): 27.9
Residual Pool Depth (%):
< 2 Feet Deep: 46
2 to 2.9 Feet Deep: 33
3 to 3.9 Feet Deep: 13
>= 4 Feet Deep: 8
Mean Max Residual Pool Depth (ft.): 2.2
Mean Pool Shelter Rating: 6

Pool Tail Substrate (%): Silt/Clay: 4 Sand: 0 Gravel: 96 Sm Cobble: 0 Lg Cobble: 0 Boulder: 0 Bedrock: 0
Embeddedness Values (%): 1. 58.3 2. 33.3 3. 8.3 4. 0.0 5. 0.0

STREAM REACH: 6

Channel Type: F1
Reach Length (ft.): 2240
Riffle/Flatwater Mean Width (ft.): 3.8
BFW:
Range (ft.): 12 to 21
Mean (ft.): 16
Std. Dev.: 4
Base Flow (cfs.): 0.0
Water (F): 49 - 52 Air (F): 43 - 60
Dry Channel (ft): 39

Canopy Density (%): 97.4
Coniferous Component (%): 58.3
Hardwood Component (%): 41.7
Dominant Bank Vegetation: Coniferous Trees
Vegetative Cover (%): 99.8
Dominant Shelter: Undercut Banks
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 4
LWD per 100 ft.:
Riffles: 2
Pools: 1
Flat: 1

Pools by Stream Length (%): 67.4
Pool Frequency (%): 49.1
Residual Pool Depth (%):
< 2 Feet Deep: 37
2 to 2.9 Feet Deep: 48
3 to 3.9 Feet Deep: 4
>= 4 Feet Deep: 11
Mean Max Residual Pool Depth (ft.): 2.5
Mean Pool Shelter Rating: 4

Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 44 Sm Cobble: 0 Lg Cobble: 0 Boulder: 0 Bedrock: 56
Embeddedness Values (%): 1. 33.3 2. 14.8 3. 7.4 4. 0.0 5. 44.4

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 7

Channel Type: F4
Reach Length (ft.): 4179
Riffle/Flatwater Mean Width (ft.): 2.6
BFW:
Range (ft.): 6 to 15
Mean (ft.): 10
Std. Dev.: 3
Base Flow (cfs.): 0.0
Water (F): 49 - 52 Air (F): 47 - 57
Dry Channel (ft): 1213

Canopy Density (%): 97.0
Coniferous Component (%): 79.6
Hardwood Component (%): 20.4
Dominant Bank Vegetation: Coniferous Trees
Vegetative Cover (%): 97.0
Dominant Shelter: Undercut Banks
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 12
LWD per 100 ft.:
Riffles: 2
Pools: 4
Flat: 1

Pools by Stream Length (%): 35.2
Pool Frequency (%): 28.1
Residual Pool Depth (%):
< 2 Feet Deep: 65
2 to 2.9 Feet Deep: 21
3 to 3.9 Feet Deep: 12
>= 4 Feet Deep: 2
Mean Max Residual Pool Depth (ft.): 1.9
Mean Pool Shelter Rating: 6

Pool Tail Substrate (%): Silt/Clay: 7 Sand: 0 Gravel: 72 Sm Cobble: 0 Lg Cobble: 2 Boulder: 0 Bedrock: 19

Embeddedness Values (%): 1. 41.9 2. 30.2 3. 9.3 4. 2.3 5. 16.3

Table 9 - Mean Percentage of Dominant Substrate and Vegetation

Stream Name: South Fork Albion River LLID: 1236738392538 Drainage: Albion River

Survey Dates: 9/23/2013 to 10/8/2013

Confluence Location: Quad: MATHISON PEAK Legal Description: T16NR16WS17 Latitude: 39:15:14.0N Longitude: 123:40:26.0W

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	19	11	5.4
Boulder	7	12	3.4
Cobble / Gravel	19	17	6.4
Sand / Silt / Clay	235	240	84.8

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	2	2	0.7
Brush	34	42	13.6
Hardwood Trees	97	82	32.0
Coniferous Trees	145	154	53.4
No Vegetation	2	0	0.4

Total Stream Cobble Embeddedness Values: 2

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

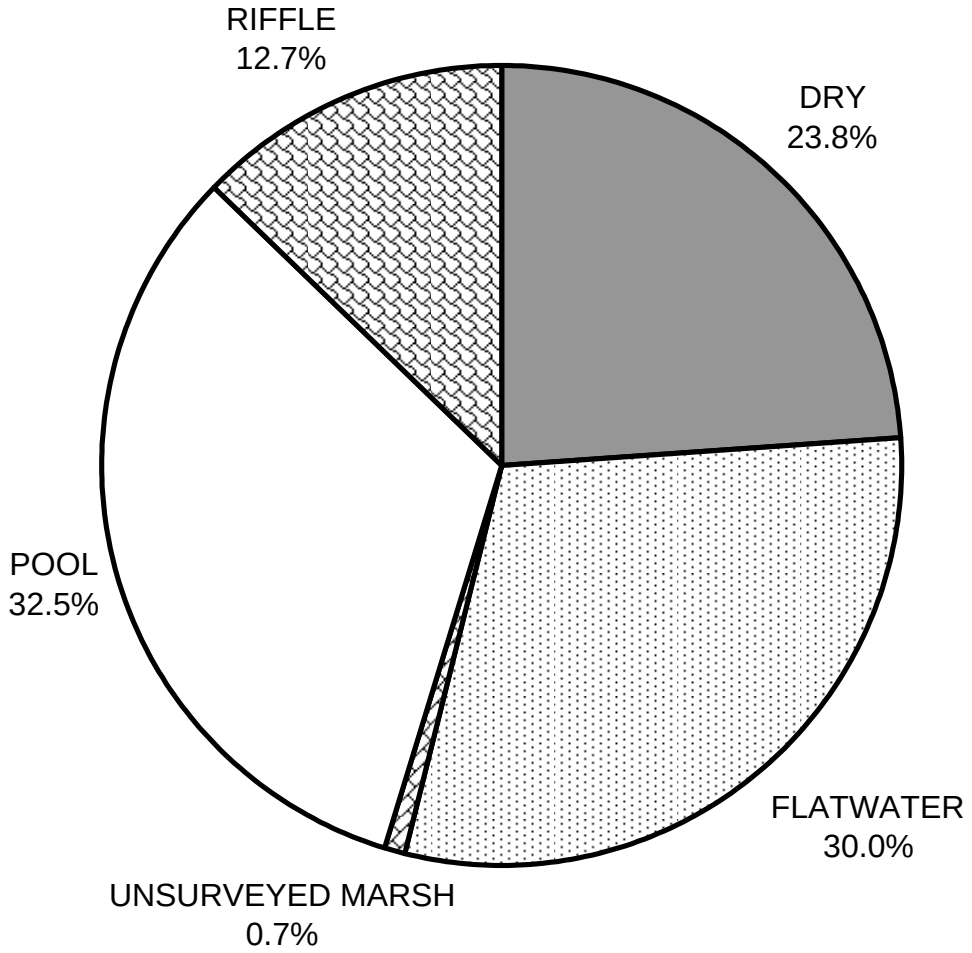
StreamName: South Fork Albion River LLID: 1236738392538 Drainage: Albion River

Survey Dates: 9/23/2013 to 10/8/2013

Confluence Location: Quad: MATHISON PEAK Legal Description: T16NR16WS17 Latitude: 39:15:14.0N Longitude: 123:40:26.0W

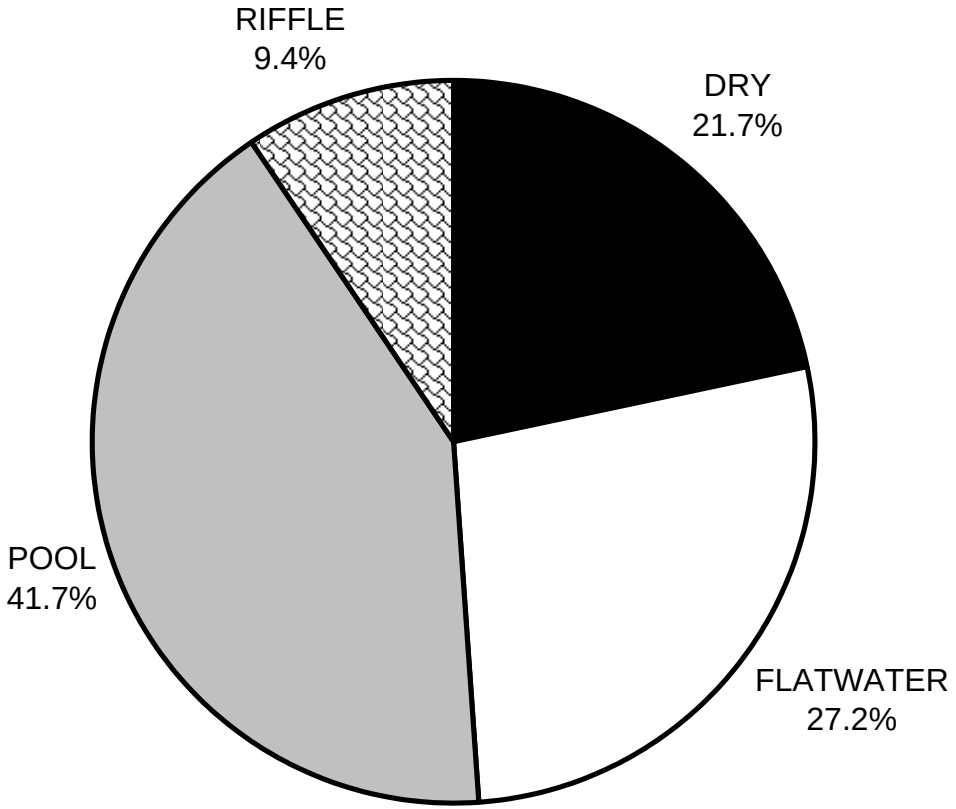
	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	1	25
SMALL WOODY DEBRIS (%)	0	44	36
LARGE WOODY DEBRIS (%)	0	24	22
ROOT MASS (%)	0	0	1
TERRESTRIAL VEGETATION (%)	0	0	3
AQUATIC VEGETATION (%)	0	10	2
WHITEWATER (%)	0	0	0
BOULDERS (%)	0	20	8
BEDROCK LEDGES (%)	0	0	2

SOUTH FORK ALBION RIVER 2013
HABITAT TYPES BY PERCENT OCCURRENCE



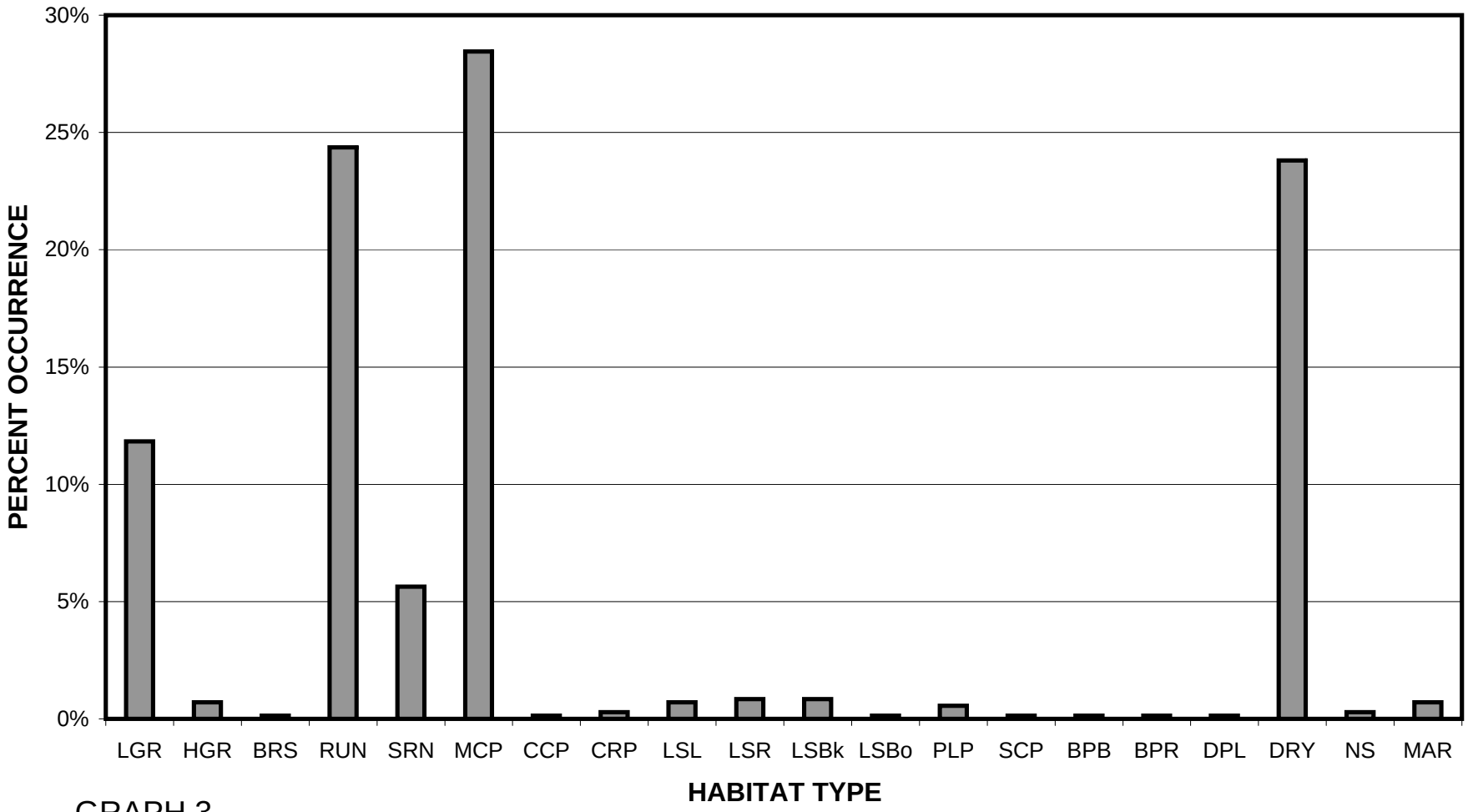
GRAPH 1

SOUTH FORK ALBION RIVER 2013
HABITAT TYPES BY PERCENT TOTAL LENGTH



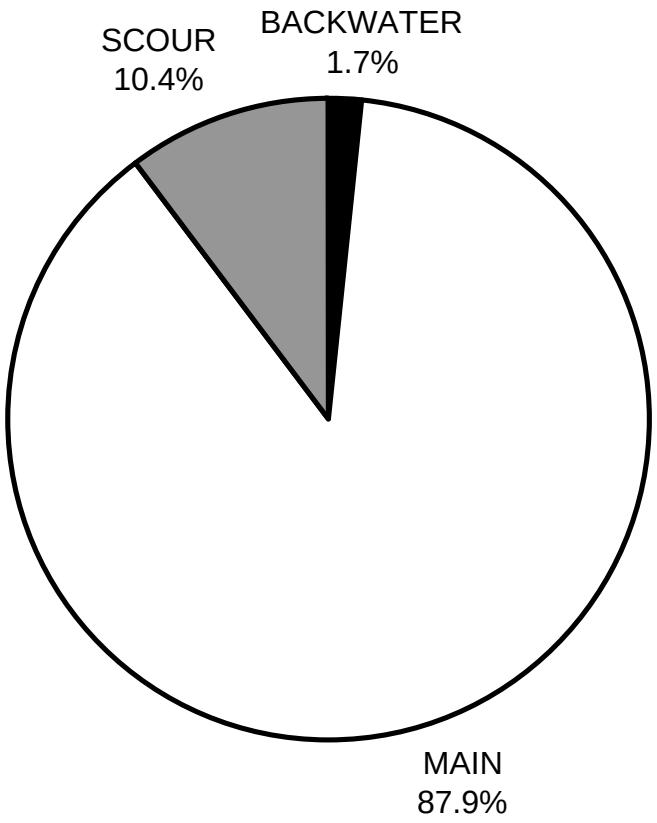
GRAPH 2

SOUTH FORK ALBION RIVER 2013
HABITAT TYPES BY PERCENT OCCURRENCE



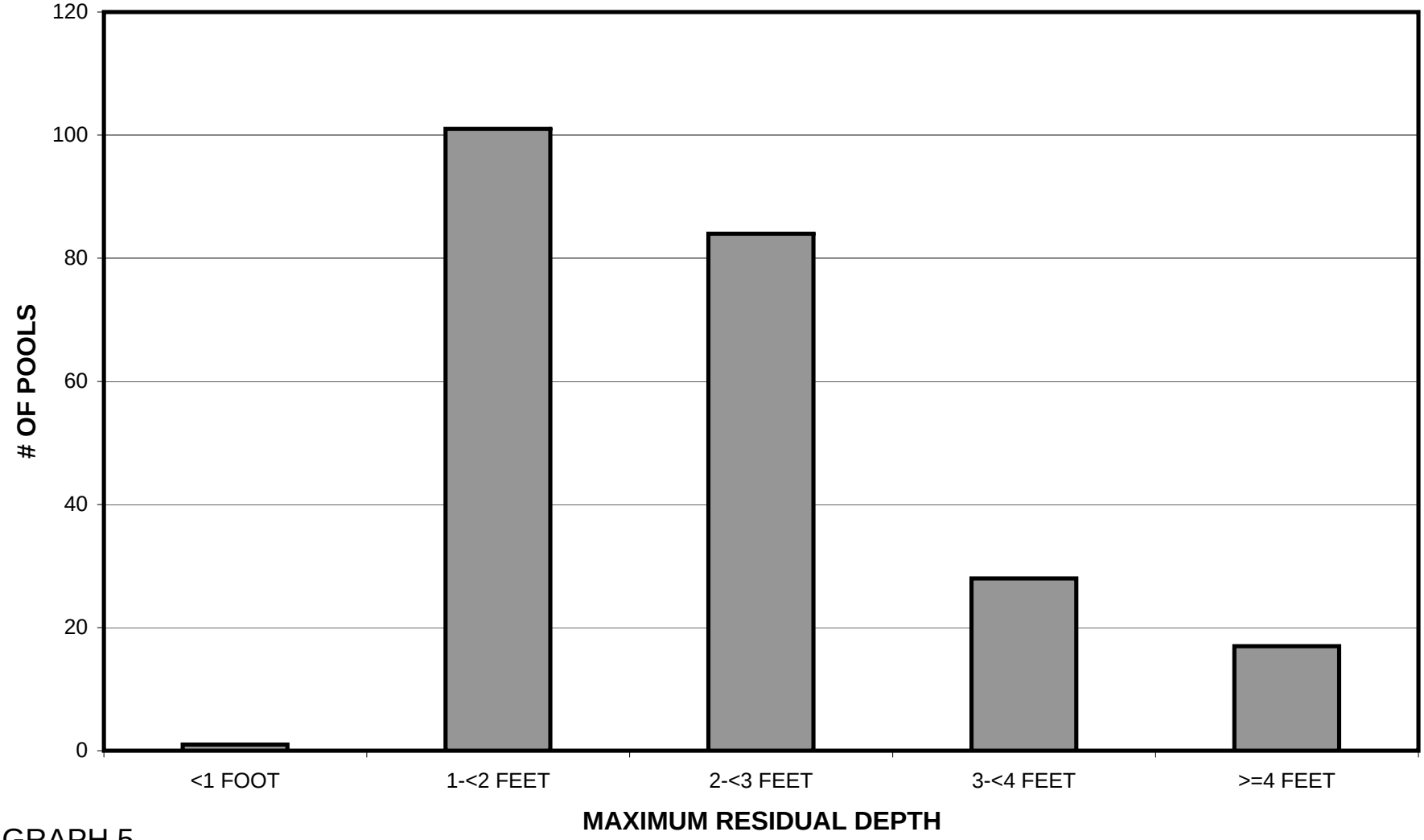
GRAPH 3

SOUTH FORK ALBION RIVER 2013
POOL TYPES BY PERCENT OCCURRENCE



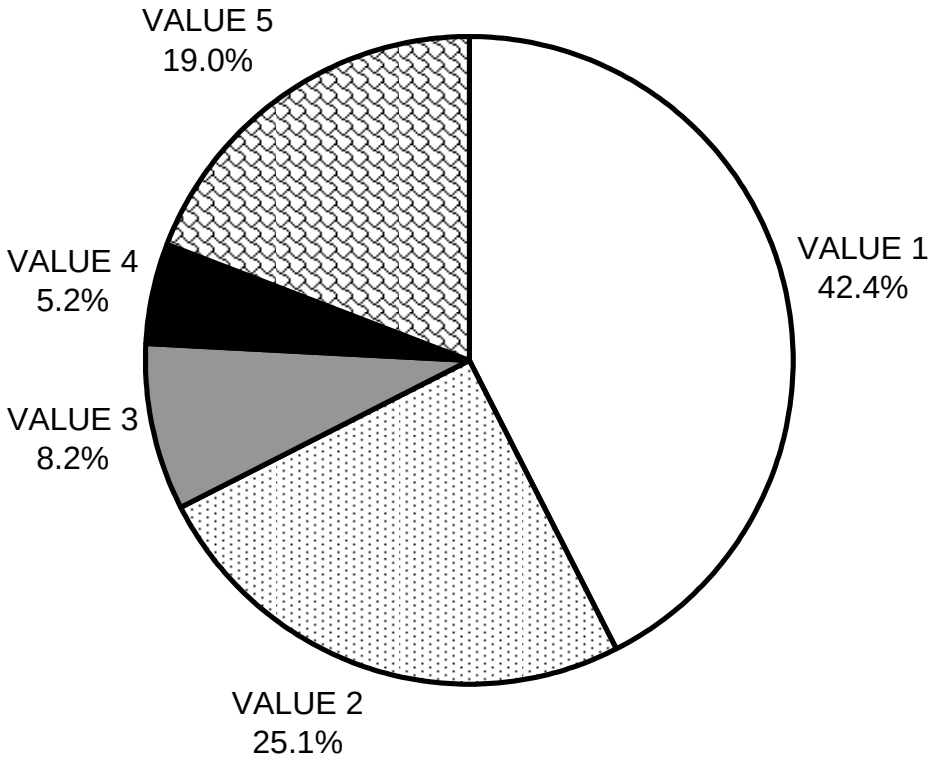
GRAPH 4

SOUTH FORK ALBION RIVER 2013
MAXIMUM DEPTH IN POOLS



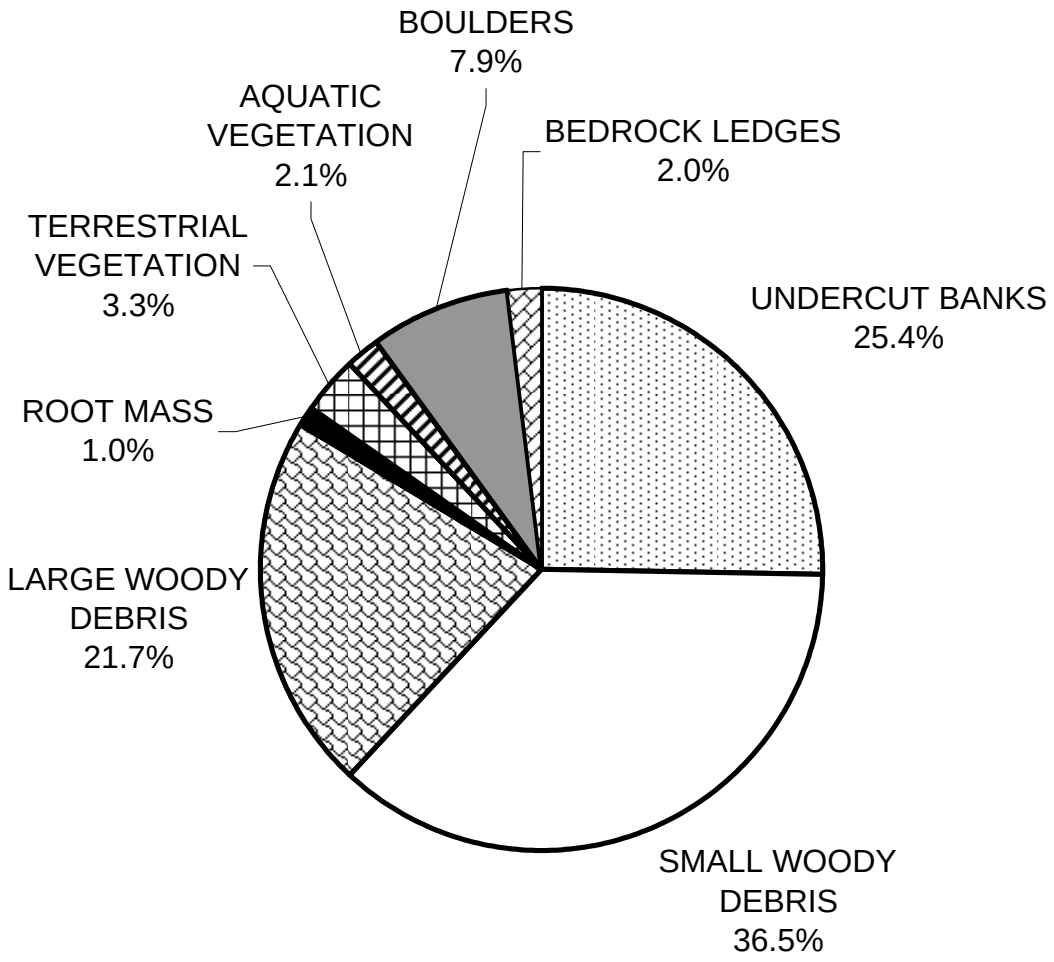
GRAPH 5

SOUTH FORK ALBION RIVER 2013
PERCENT EMBEDDEDNESS



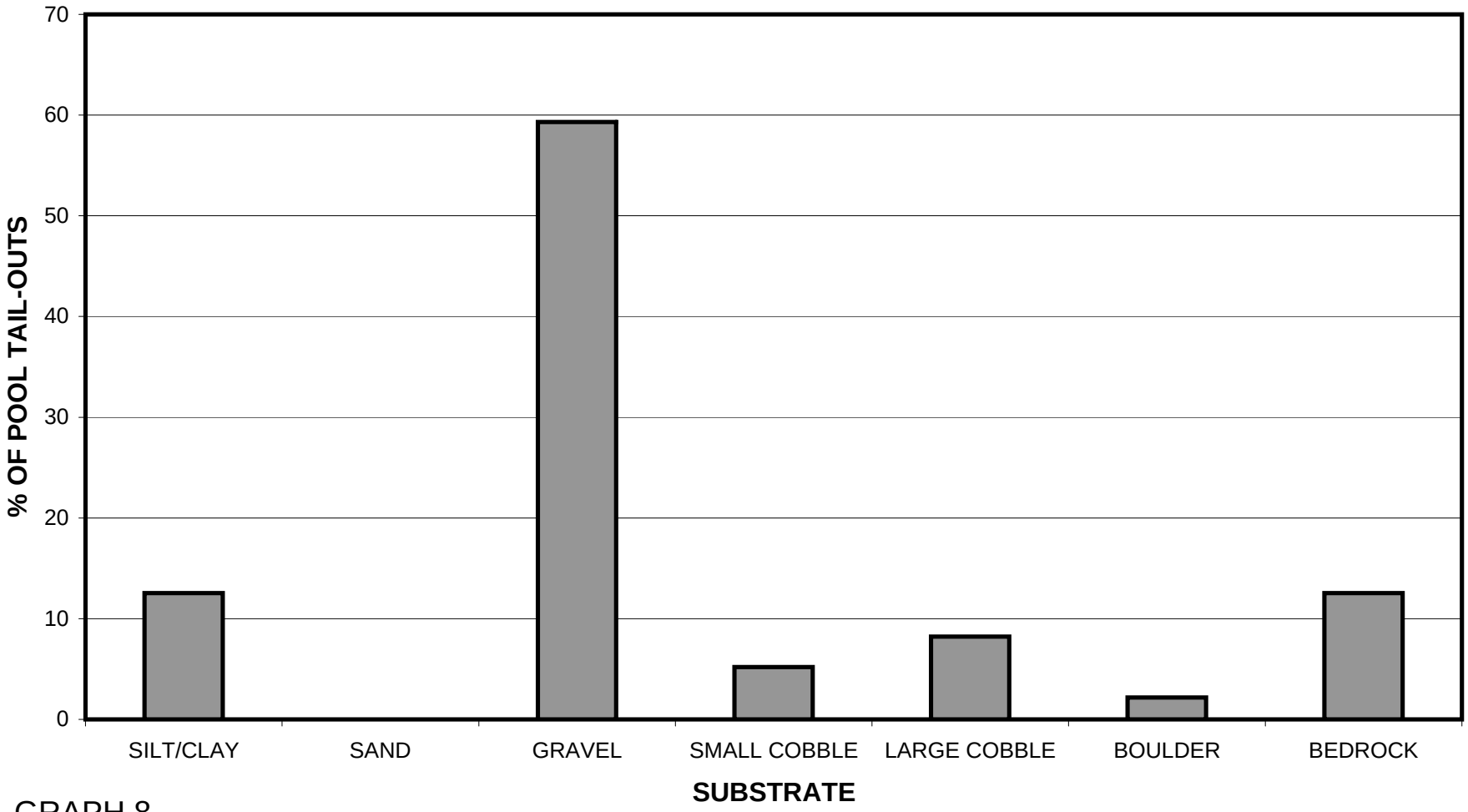
GRAPH 6

SOUTH FORK ALBION RIVER 2013
MEAN PERCENT COVER TYPES IN POOLS



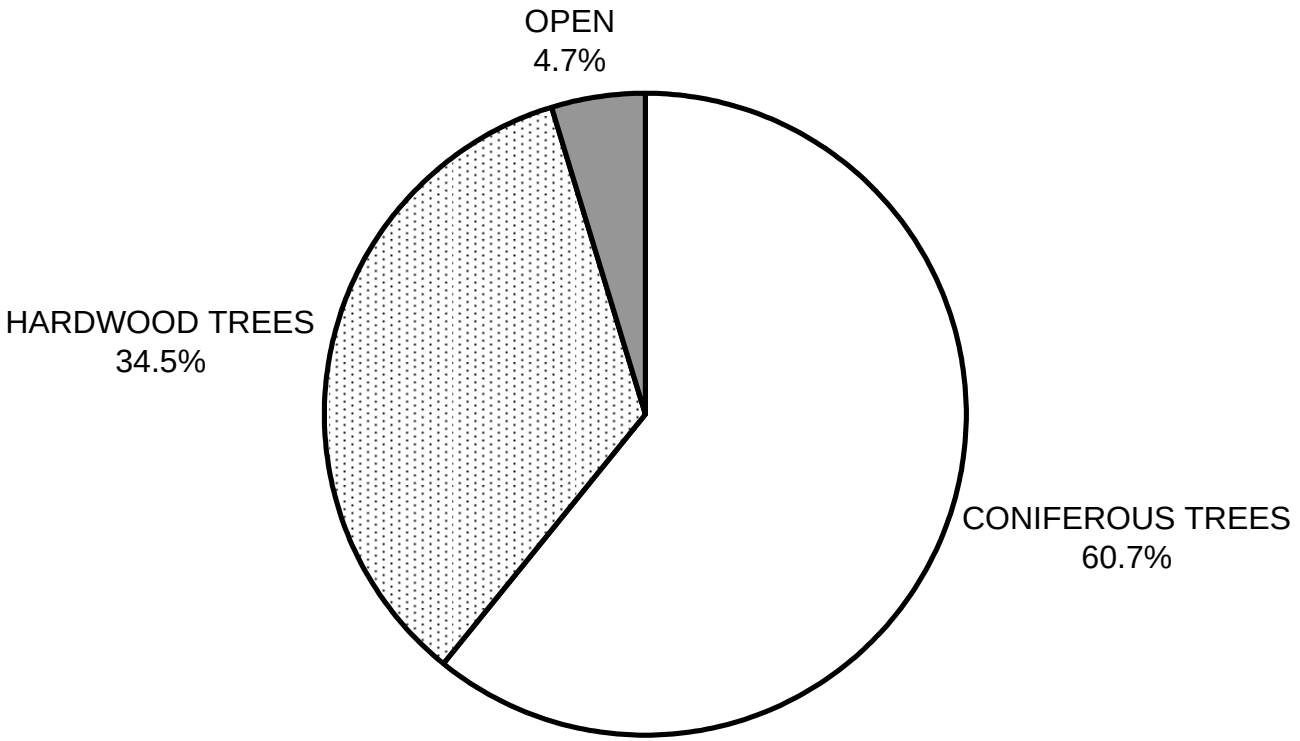
GRAPH 7

SOUTH FORK ALBION RIVER 2013
SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



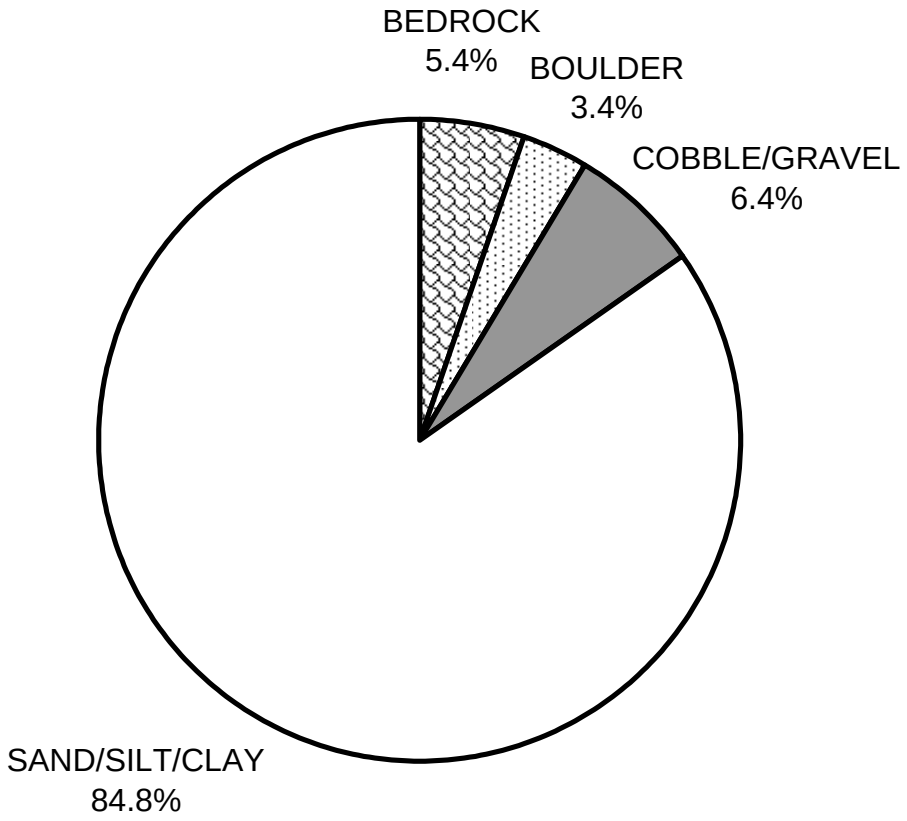
GRAPH 8

SOUTH FORK ALBION RIVER 2013
MEAN PERCENT CANOPY



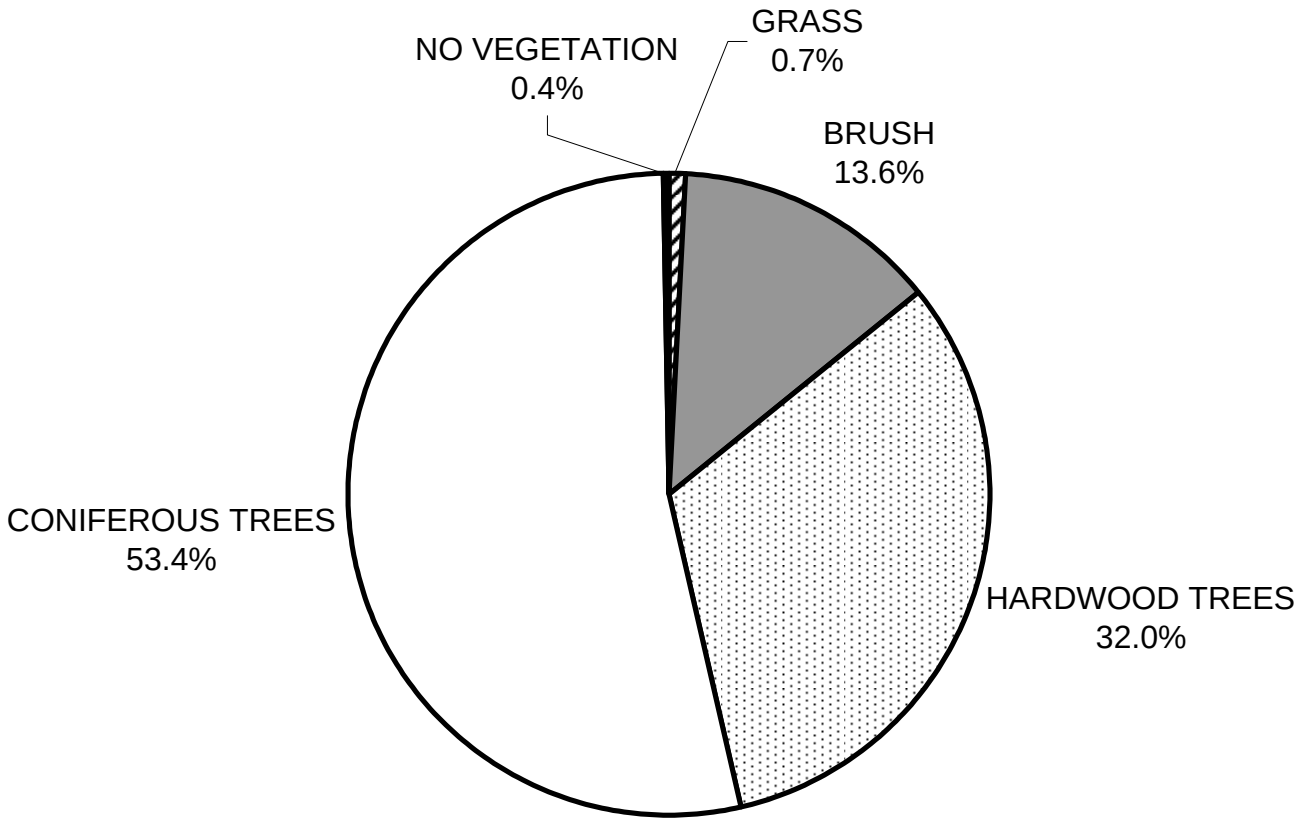
GRAPH 9

SOUTH FORK ALBION RIVER 2013
DOMINANT BANK COMPOSITION IN SURVEY REACH

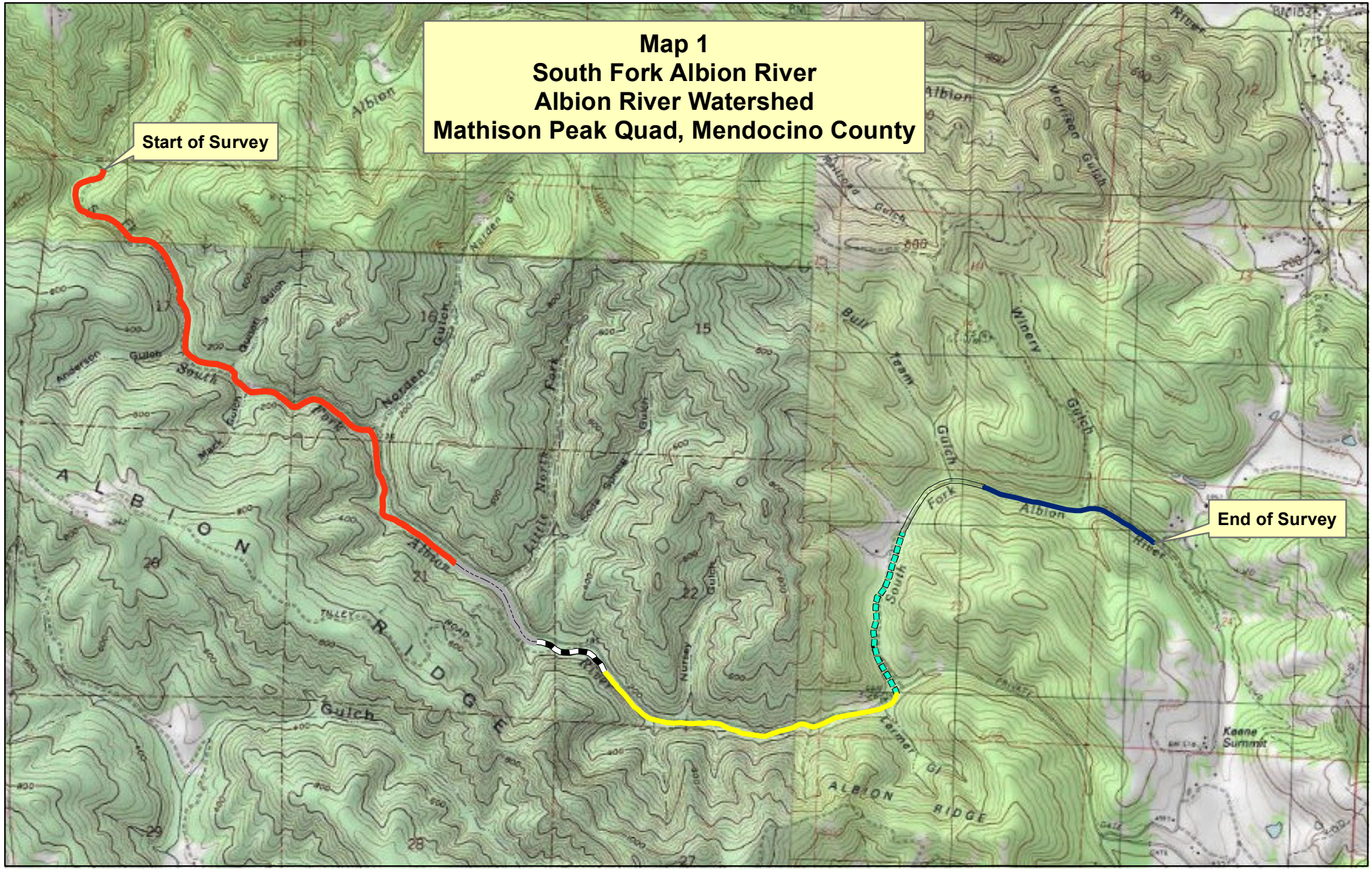


GRAPH 10

SOUTH FORK ALBION RIVER 2013
DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11


Map 1
South Fork Albion River
Albion River Watershed
Mathison Peak Quad, Mendocino County
Start of Survey
End of Survey
Albion
Albion River
South Fork Albion River
Little North Fork Albion River
Norden Gulch
Anderson Gulch
Queen Gulch
Bull Team Gulch
Wintery Gulch
Morrison Gulch
Railroad Gulch
Nursery
Farmer Gl
Keene Summit
ALBION RIDGE
TYLEY ROAD
PROJECT
N
S
E
W
Reach 1, Channel Type F3
Reach 2, Channel Type C4
Reach 3, Channel Type N/A
Reach 4, Channel Type C6
Reach 5, Channel Type E4
Reach 6, Channel Type F1
Reach 7, Channel Type F4
0
2,500
5,000 Feet
CALIFORNIA
DEPARTMENT OF
FISH & WILDLIFE