STREAM INVENTORY REPORT

Bridge Creek

INTRODUCTION

A stream inventory was conducted from May 22 to June 6, 2012 on Bridge Creek. The survey began at the confluence with South Branch North Fork Navarro River and extended upstream 2.1 miles.

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

The objective of this report is to document the current habitat conditions and recommend options for the potential enhancement of habitat for 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

Bridge Creek is a tributary to South Branch North Fork Navarro River, tributary to North Fork Navarro River, tributary to Navarro River, which drains to the Pacific Ocean. It is located in Mendocino County, California (Map 1). Bridge Creek's legal description at the confluence with South Branch North Fork Navarro River is T15N R14W S19. Its location is 39.1501 degrees north latitude and 123.4375 degrees west longitude, LLID number 1234362391501. Bridge Creek is a first order stream and has approximately 1.7 miles of blue line stream according to the USGS Bailey Ridge 7.5 minute quadrangle. Bridge Creek drains a watershed of approximately 2.2 square miles. Elevations range from about 530 feet at the mouth of the creek to 1,350 feet in the headwater areas. Mixed conifer forest dominates the watershed. The watershed is entirely privately owned and is managed for timber production. Vehicle access exists via Masonite Industrial Road.

METHODS

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

Bridge Creek

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 Bridge Creek to record measurements and observations. There are eleven components to the inventory form.

1. Flow:

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

2. Channel Type:

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

3. Temperatures:

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

4. Habitat Type:

Habitat typing uses the 24 habitat classification types defined by McCain and others (1990). Habitat units are numbered sequentially and assigned a type identification number selected from a standard list of 24 habitat types. Dewatered units are labeled "dry". Bridge Creek habitat typing used standard basin level measurement criteria. These parameters require that the minimum length of a described habitat unit must be equal to or greater than the stream's mean

wetted width. All measurements are in feet to the nearest tenth. Habitat characteristics are measured using a clinometer, hip chain, and stadia rod.

5. Embeddedness:

The depth of embeddedness of the cobbles in pool tail-out areas is measured by the percent of the cobble that is surrounded or buried by fine sediment. In Bridge Creek, embeddedness was ocularly estimated. The values were recorded using the following ranges: 0 - 25% (value 1), 26 - 50% (value 2), 51 - 75% (value 3) and 76 - 100% (value 4). Additionally, a value of 5 was assigned to tail-outs deemed 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. The shelter rating is calculated for each fully-described habitat unit by multiplying shelter value and percent cover. Using an overhead view, a quantitative estimate of the percentage of the habitat unit covered is made. All cover is then classified according to a list of nine cover types. In Bridge Creek, a standard qualitative shelter value of 0 (none), 1 (low), 2 (medium), or 3 (high) was assigned according to the complexity of the cover. Thus, shelter ratings can range from 0-300 and are expressed as mean values by habitat types within a stream.

7. Substrate Composition:

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

8. Canopy:

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

9. Bank Composition and Vegetation:

Bank composition elements range from bedrock to bare soil. However, the stream banks are usually covered with grass, brush, or trees. These factors influence the ability of stream banks to withstand winter flows. In Bridge Creek, the dominant composition type and the dominant

vegetation type of both the right and left banks for each fully-described unit were selected from the habitat inventory form. Additionally, the percent of each bank covered by vegetation (including downed trees, logs, and rootwads) was estimated and recorded.

10. Large Woody Debris Count:

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

11. Average Bankfull Width:

Bankfull width can vary greatly in the course of a channel type stream reach. This is especially true in very long reaches. Bankfull width can be a factor in habitat components like canopy density, water temperature, and pool depths. Frequent measurements taken at riffle crests (velocity crossovers) are needed to accurately describe reach widths. At the first appropriate velocity crossover that occurs after the beginning of a new stream survey page (ten habitat units), bankfull width is measured and recorded in the appropriate header block of the page. These widths are presented as an average for the channel type reach.

BIOLOGICAL INVENTORY

Biological sampling during the stream inventory is used to determine fish species and their distribution in the stream. Fish presence was observed from the stream banks in Bridge Creek. In addition, underwater observations were made at 10 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 Game. This program processes and summarizes the data, and produces the following ten tables:

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

Bridge Creek

- 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 Bridge Creek include:

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

HABITAT INVENTORY RESULTS

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

The habitat inventory of May 22 to June 6, 2012 was conducted by M. Groff and I. Mikus (DFG). The total length of the stream surveyed was 10,849 feet.

Stream flow was measured near the bottom of the survey reach with a Marsh-McBirney Model 2000 flowmeter at 0.22 cfs on May 21, 2012.

Bridge Creek is an F4 channel type for 5,173 feet of the stream surveyed (Reach 1), a G4 channel type for 3,505 feet of the stream surveyed (Reach 2), and a B4 channel type for 2,171 feet of the stream surveyed (Reach 3). F4 channel types are entrenched meandering riffle/pool channels on low gradients with high width/depth ratios and gravel-dominant substrates. G4 channels are entrenched "gully" step-pool channels on moderate gradients with low width /depth ratios and gravel-dominant substrates. B4 channels are moderately entrenched, moderate gradient, riffle dominated channel with infrequently spaced pools, very stable plan and profile, stable banks and gravel-dominant substrates.

Water temperatures taken during the survey period ranged from 50 to 57 degrees Fahrenheit. Air temperatures ranged from 44 to 63 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 35% riffle units, 35% pool units, 28% flatwater units, 2% dry units, and 1% unsurveyed units (Graph 1). Based on total length of Level II habitat types there were 38% riffle units, 32% flatwater units, 26% pool units, and 3% dry units (Graph 2).

Bridge Creek

Thirteen Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were mid-channel pool units, 26%; high gradient riffle units, 18%; and run units, 18% (Graph 3). Based on percent total length, low gradient riffle units made up 23%, mid-channel pool units 21%, and step run units 19%.

A total of 130 pools were identified (Table 3). Main channel pools were the most frequently encountered at 78% (Graph 4), and comprised 80% 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. Twenty-five of the 130 pools (19%) had a residual depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 130 pool tail-outs measured, 57 had a value of 1 (43.8%); 57 had a value of 2 (43.8%); 14 had a value of 3 (10.8%); 1 had a value of 4 (0.8%); 1 had a value of 5 (0.8%) (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 1, flatwater habitat types had a mean shelter rating of 2, and pool habitats had a mean shelter rating of 9 (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 6. Backwater pools had a mean shelter rating of 5 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Small woody debris is the dominant cover type in Bridge Creek. Graph 7 describes the pool cover in Bridge Creek. Small woody debris is the dominant pool cover type followed by large woody debris.

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 85% of the pool tail-outs. Small cobble was the next most frequently observed dominant substrate type and occurred in 10% of the pool tail-outs.

The mean percent canopy density for the surveyed length of Bridge Creek was 92%. Eight percent of the canopy was open. Of the canopy present, the mean percentages of hardwood and coniferous trees were 56% and 44%, respectively. Graph 9 describes the mean percent canopy in Bridge Creek.

For the stream reach surveyed, the mean percent right bank vegetated was 98%. The mean percent left bank vegetated was 98%. The dominant elements composing the structure of the stream banks consisted of 84% sand/silt/clay, 12% cobble/gravel, 2% bedrock, and 2% boulders (Graph 10). Deciduous trees were the dominant vegetation type observed in 36% of the units surveyed. Additionally, 34% of the units surveyed had coniferous trees as the dominant vegetation type, and 28% had brush as the dominant vegetation type (Graph 11).

Bridge Creek

BIOLOGICAL INVENTORY RESULTS

Survey teams conducted a snorkel survey at 10 sites for species composition and distribution in Bridge Creek on August 1, 2012. The sites were sampled by I. Mikus and M. Groff (DFG).

In Reach 1, which comprised the first 5,173 feet of stream, 10 sites were sampled. The reach sites yielded 47 young-of-the-year steelhead/rainbow trout (SH/RT), and two age 1+ SH/RT.

The following chart displays the information yielded from these sites:

2012 Bridge Creek underwater observations.

Date	Survey Site #	Habitat Unit #	Habitat Type	Approx. Dist. from mouth (ft.)	SH/RT			Coho	
					YOY	1+	2+	YOY	1+
Reach 1: F4 Channel Type									
08/01/12	1	014	Pool	383	15	0	0	0	0
	2	016	Pool	413	2	0	0	0	0
	3	019	Pool	470	3	0	0	0	0
	4	023	Pool	545	7	1	0	0	0
	5	030	Pool	739	1	0	0	0	0
	6	036	Pool	985	1	1	0	0	0
	7	041	Pool	1084	4	0	0	0	0
	8	044	Pool	1125	4	0	0	0	0
	9	052	Pool	1342	7	0	0	0	0
	10	070	Pool	1746	3	0	0	0	0

DISCUSSION

Bridge Creek is an F4 channel type for the first 5,173 feet of stream surveyed, a G4 channel type for the next 3,505 feet, and a B4 channel type for the remaining 2,171 feet. The suitability of F4, G4, and B4 channel types for fish habitat improvement structures is as follows: F4 channel types are good for bank-placed boulders and fair for plunge weirs, single and opposing wing-deflectors, channel constrictors, and log cover. G4 channel types are good for bank-placed boulders and fair for plunge weirs, opposing wing-deflectors, and log cover. B4 channel types are excellent for low-stage plunge weirs, boulder clusters, bank placed boulders, single and opposing wing-deflectors, and log cover.

The water temperatures recorded on the survey days May 22 to June 6, 2012 ranged from 50 to 57 degrees Fahrenheit. Air temperatures ranged from 44 to 63 degrees Fahrenheit. This is a suitable 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 32% of the total length of this survey, riffles 38%, and pools 26%. Twenty-five of the 130 (19%) pools had a maximum residual depth greater than 2 feet. In general, pool enhancement projects are considered when primary pools comprise less than 40% of the length of total stream habitat. In first and second order streams, a primary pool is defined to have a maximum residual depth of at least two feet, occupy at least half the width of the low flow channel, and be as long as the low flow channel width. Installing large wood structures that will increase or deepen pool habitat is recommended.

One hundred fourteen of the 130 pool tail-outs measured had embeddedness ratings of 1 or 2. Fifteen of the pool tail-outs had embeddedness ratings of 3 or 4. One 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.

One hundred twenty-four of the 130 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 9. 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 Bridge Creek. Small woody debris is the dominant cover type in pools followed by large woody debris. 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 92%. Reach 1 had a canopy density of 92%, Reach 2 had a canopy density of 90%, and Reach 3 had a canopy density of 94%. In general, revegetation projects are considered when canopy density is less than 80%. The percentage of right and left bank covered with vegetation was 98% and 98%, respectively.

RECOMMENDATIONS

1) Bridge Creek should be managed as an anadromous, natural production stream.

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

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

Bridge Creek

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 South Branch North Fork Navarro River. The channel is an F4.
8	0002.00	There is a 2' high plunge over small woody debris accumulation.
413	0017.00	Masonite Road crosses the channel. The crossing is an 18' wide x 87' long railcar bridge approximately 26' high above the channel. Boulder rip-rap lines both banks below the bridge approximately 170' long x 6' high.
447	0019.00	There is a 1.7' high plunge over boulders.
511	0022.00	An erosion site on the right bank measures approximately 20' long x 6' high. It is contributing fine sediment to the channel.
851	0032.00	There is a 1.8' high plunge over large woody debris (LWD).
1471	0060.00	LWD accumulating in the channel at the site of an old road crossing.
1613	0065.00	Tributary #01 enters on the right bank. It contributes less than 5% to Bridge Creek's flow. The water temperature of the tributary was 54 degrees Fahrenheit; the water temperature downstream and upstream of the tributary was 54 degrees Fahrenheit. The slope of the tributary is approximately 5%. The tributary not accessible to salmonids.
1729	0070.00	Log debris accumulation (LDA) #01 contains four pieces of LWD and measures 5' high x 35' wide x 8' long. Water flows through the LDA and there are no visible gaps in it. Retained sediment ranges from silt to gravel and measures 10' wide x 60' long x 2.5' deep. There is a 3.5' high plunge over the LDA. Half of the water is flowing under a rootwad on the left bank. The rest of the water is flowing through the sediment and woody debris of the LDA. Fish are present above the LDA.
2499	0091.00	LDA #02 contains 10 pieces of LWD and measures 5' high x 30' wide x 10' long. Water flows through the LDA and there are visible gaps in it. Retained sediment ranges from silt to gravel and measures 5' wide x 30' long x 0.5' deep. Fish are present above the LDA.

Bridge Creek

2696	0097.00	Dry tributary on the right bank.
3474	0120.00	An erosion site on the left bank measures approximately 30' long x 12' high. It is contributing fine sediment to the channel.
4180	0141.00	LDA #03 contains one piece of LWD and measures 4' high x 17' wide x 4' long. Water flows through the LDA and there are no visible gaps in it. Retained sediment ranges from silt to gravel and measures 6' wide x 30' long x 1' deep. There is a 2' high plunge over the LDA. Fish are present above the LDA.
4389	0152.00	A logging road crosses the channel. The crossing is an 11' wide x 37' long x railcar bridge approximately 8' high above the channel. Boulder rip-rap lines both banks below the bridge approximately 15' long x 7' high.
4523	0156.00	Tributary #02 enters on the right bank. It contributes approximately 5% to Bridge Creek's flow. The water temperature of the tributary was 54 degrees Fahrenheit; the water temperature downstream and upstream of the tributary was 55 degrees Fahrenheit. The slope of the tributary is approximately 5%. The first 70' feet of the tributary are accessible to fish, but no fish were observed.
4655	0160.00	LDA #04 contains six pieces of LWD and measures 6' high x 25' wide x 5' long. Water does not flow through the LDA and there are no visible gaps in it. Retained sediment ranges from silt to gravel and measures 10' wide x 80' long x 2' deep. There is a 3' high plunge over the LDA. Fish are present above the LDA. An erosion site on the right bank measures approximately 20' long x 10' high. It is contributing fine sediment to the channel.
4941	0169.00	A 3.5' diameter redwood log lies across the channel. Small woody debris is accumulating on the upstream side of the log. The debris accumulation has the potential to become an LDA.
5173	0173.00	The channel changes from an F4 to a G4. An erosion site on the left bank measures approximately 20' long x 8' high. It is contributing fine sediment to the channel.
5455	0178.00	Dry tributary on the right bank.
5563	0183.00	LDA #05 contains 11 pieces of LWD and measures 6' high x 18' wide x 23' long. Water flows through the LDA and there are visible gaps in it. The LDA is not retaining sediment. Fish are present above the LDA. An erosion site on the right bank measures approximately 45' long x 6' high. It is contributing fine sediment to the channel.

Bridge Creek

5674	0188.00	LDA #06 contains eight pieces of LWD and measures 4' high x 17' wide x 7' long. Water flows through the LDA and there are visible gaps in it. The LDA is not retaining sediment. Fish are present above the LDA.
5753	0192.00	There is a 1.2' high plunge over LWD.
6158	0208.00	LDA #07 contains 10 pieces of LWD and measures 5' high x 30' wide x 20' long. Water flows through the LDA and there are visible gaps in it. The LDA is not retaining sediment. No fish were observed above the LDA.
6314	0213.00	Dry tributary on the right bank.
6543	0224.00	There is a 1.3' high plunge over boulders and woody debris.
6769	0230.00	There is a 1' high plunge over woody debris. LWD accumulating on the right bank and within the channel. The wood is collecting on a root wad in the channel.
6839	0233.00	Left bank seep.
6851	0235.00	Woody debris is accumulating on the left bank and within channel.
6891	0238.00	LDA #08 contains seven pieces of LWD and measures 4' high x 21' wide x 7' long. Water flows through the LDA and there are visible gaps in it. Retained sediment ranges from silt to small cobble and measures 12' wide x 40' long x 1.5' deep. There is a 2' high plunge over the LDA.
6905	0239.00	Left bank seep.
7016	0242.00	LDA #09 contains eight pieces of LWD and measures 7' high x 11' wide x 20' long. Water does not flow through the LDA; the channel is dry for 10 feet above it. There are visible gaps in the LDA. Retained sediment ranges from silt to gravel and measures 10' wide x 100' long x 4' deep. There are two plunges over the LDA; the first plunge is 2.5' high, the second plunge is 3.5' high plunge.
7172	0249.00	LDA #10 contains six pieces of LWD and measures 5' high x 31' wide x 4' long. Water flows through the LDA and there are no visible gaps in it. Retained sediment ranges from silt to gravel and measures 14' wide x 14' long x 1.5' deep. The right bank is eroding around redwood rootwad. The erosion site measures approximately 20' long x 4' high. It is contributing fine sediment to the channel.
7189	0250.00	Left bank seep.

Bridge Creek

7368	0252.00	An erosion site on the left bank measures approximately 20' long x 12' high. It is contributing fine sediment to the channel.
7612	0263.00	LDA #11 contains eight pieces of LWD and measures 6' high x 45' wide x 11' long. Water flows through the LDA and there are visible gaps in it. Retained sediment ranges from silt to gravel and measures 5' wide x 20' long x 1' deep. There is a 2' high plunge over the LDA. An erosion site on the left bank measures approximately 15' long x 6' high. It is contributing fine sediment to the channel.
7944	0275.00	Left bank seep.
7974	0276.00	There is a 3' high plunge over woody debris. An erosion site on the right bank measures approximately 20' long x 6' high. It is contributing fine sediment to the channel.
7994	0277.00	There is a 1.5' high plunge over LWD.
8164	0285.00	There is a 2.5' high plunge over an old Humboldt crossing.
8222	0287.00	LDA #12 contains 13 pieces of LWD and measures 5' high x 26' wide x 22' long. Water does not flow through the LDA; the channel is dry for 35' above it. There are visible gaps in it. Retained sediment ranges from silt to gravel and measures 10' wide x 100' long x 3' deep. There is a 4' change in elevation through the LDA.
8558	0298.00	There is a 0.4' high plunge over LWD.
8678	0306.00	The channel changes from a G4 to a B4. The creek channel is wide and full of deposited sediment ranging in size from silt to gravel. The channel if full of horsetails and most of the flow is subterranean. This lasts for approximately 100 feet.
9549	0323.00	The left bank is eroding around a rootwad. The erosion site measures approximately 25' long x 5' high. It is contributing fine sediment to the channel.
9631	0327.00	LDA #13 contains 10 pieces of LWD and measures 4' high x 30' wide x 26' long. Water does not flow through the LDA; the channel is dry for 13' through it. There are visible gaps in the LDA. Retained sediment ranges from silt to gravel and measures 12' wide x 40' long x 1.5' deep. An erosion site on the left bank measures approximately 50' long x 8' high. It is contributing sediment ranging in size from silt to gravel to the channel.

Bridge Creek

9701	0329.00	Tributary #03 enters on the left bank. It contributes approximately 30% to Bridge Creek's flow. The water temperature of the tributary was 55 degrees Fahrenheit, the water temperature downstream of the tributary was 55 degrees Fahrenheit, and the water temperature upstream of the confluence was 57 degrees Fahrenheit. The slope of the tributary is approximately 6%. The tributary not accessible to salmonids; only the first 50' feet of the channel have water and there is a barrier approximately 150' upstream from the mouth.
9890	0334.00	Right bank seep.
10425	0358.00	Dry tributary on the right bank.
10679	0368.00	An erosion site on the left bank measures approximately 6' long x 8' high. It is contributing fine sediment to the channel.
10841	0377.00	LDA #14 contains four pieces of LWD and measures 4.5' high x 15' wide x 3' long. Water does not flow through the LDA; the channel is dry for approximately 300 feet above it. There are no visible gaps in the LDA. Retained sediment ranges from silt to large cobble and measures 10' wide x 30' long x 2' deep. There is a 3' high plunge over the LDA. End of survey due to diminished habitat. Visual observation approximately 1,000 feet upstream from the end of survey point was conducted. The channel is mostly dry. Areas with flow have few pools; the pools are short and shallow. There are multiple LDA's with 3-5' high plunges that are possible barriers to salmonids. No fish observed since approximately HU#200.

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.

Bridge Creek

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: Bridge Creek LLID: 1234362391501 Drainage: Navarro River

Survey Dates: 5/22/2012 to 6/6/2012

Confluence Location: Quad: BAILEY RIDGE Legal Description: T15NR14WS20 Latitude: 39:09:00.0N Longitude: 123:26:10.0

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
9	0	DRY	2.4	33	294	2.7									
106	15	FLATWATER	28.1	33	3518	32.4	4.6	0.3	0.7	119	12580	38	4031		2
2	0	NOSURVEY	0.5	10	19	0.2									
130	130	POOL	34.5	22	2848	26.3	7.7	0.7	1.5	160	20736	144	18766	122	9
130	24	RIFFLE	34.5	32	4170	38.4	5.6	0.1	0.5	151	19690	21	2713		1

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
377	169	10849	53006	25510

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Bridge Creek LLID: 1234362391501 Drainage: Navarro River

Survey Dates: 5/22/2012 to 6/6/2012

Confluence Location: Quad: BAILEY RIDGE Legal Description: T15NR14WS20 Latitude: 39:09:00.0N Longitude: 123:26:10.0W

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 (%)
61	14	LGR	16.2	41	2518	23.2	5	0.1	0.8	172	10502	23	1375		1	95
69	10	HGR	18.3	24	1652	15.2	6	0.2	0.9	122	8452	19	1279		2	95
66	10	RUN	17.5	22	1428	13.2	5	0.3	0.9	89	5863	28	1817		1	92
40	5	SRN	10.6	52	2090	19.3	4	0.3	0.9	178	7135	59	2360		3	93
99	99	MCP	26.3	23	2250	20.7	8	0.7	2.8	163	16089	140	13899	117	10	93
2	2	STP	0.5	18	37	0.3	14	0.6	1.6	227	455	150	301	128	10	63
1	1	CRP	0.3	24	24	0.2	7	0.7	2	168	168	134	134	118	0	81
6	6	LSL	1.6	23	139	1.3	7	0.6	2.1	152	911	112	671	96	6	92
1	1	LSR	0.3	28	28	0.3	7	0.4	1.4	196	196	98	98	78	0	93
3	3	LSBk	0.8	42	126	1.2	5	0.4	1.4	200	601	104	313	80	2	98
17	17	PLP	4.5	14	236	2.2	8	1.0	4	132	2239	194	3295	178	8	81
1	1	DPL	0.3	8	8	0.1	13	0.6	1.5	78	78	55	55	47	5	98
9	0	DRY	2.4	33	294	2.7										
2	0	NS	0.5	10	19	0.2										

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
377	169	10849	52687	25597

Table 3 - Summary of Pool Types

Stream Name: Bridge Creek LLID: 1234362391501 Drainage: Navarro River

Survey Dates: 5/22/2012 to 6/6/2012

Confluence Location: Quad: BAILEY RIDGE Legal Description: T15NR14WS20 Latitude: 39:09:00.0N Longitude: 123:26:10.0W

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
101	101	MAIN	78	23	2287	80	7.6	0.7	164	16544	117	11816	10
28	28	SCOUR	22	20	553	19	7.6	0.8	147	4114	144	4037	6
1	1	BACKWATER	1	8	8	0	13.0	0.6	78	78	47	47	5

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
130	130	2848	20736	15900

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

Stream Name: Bridge Creek LLID: 1234362391501 Drainage: Navarro River

Survey Dates: 5/22/2012 to 6/6/2012

Confluence Location: Quad: BAILEY RIDGE Legal Description: T15NR14WS20 Latitude: 39:09:00.0N Longitude: 123:26:10.0W

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
99	MCP	76	7	7	76	77	16	16	0	0	0	0
2	STP	2	0	0	2	100	0	0	0	0	0	0
1	CRP	1	0	0	0	0	1	100	0	0	0	0
6	LSL	5	0	0	5	83	1	17	0	0	0	0
1	LSR	1	0	0	1	100	0	0	0	0	0	0
3	LSBk	2	1	33	2	67	0	0	0	0	0	0
17	PLP	13	0	0	10	59	6	35	0	0	1	6
1	DPL	1	0	0	1	100	0	0	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
130	8	6	97	75	24	18	0	0	1	1

Mean Maximum Residual Pool Depth (ft.): 1.5

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Bridge Creek LLID: 1234362391501 Drainage: Navarro River

Survey Dates: 5/22/2012 to 6/6/2012 Dry Units: 9

Confluence Location: Quad: BAILEY RIDGE Legal Description: T15NR14WS20 Latitude: 39:09:00.0N Longitude: 123:26:10.0W

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
61	14	LGR	0	0	100	0	0	0	0	0	0
69	10	HGR	0	25	25	0	50	0	0	0	0
130	24	TOTAL RIFFLE	0	17	50	0	33	0	0	0	0
66	10	RUN	75	25	0	0	0	0	0	0	0
40	5	SRN	0	0	50	0	50	0	0	0	0
106	15	TOTAL FLAT	38	12	25	0	25	0	0	0	0
99	99	MCP	23	45	28	2	0	0	0	2	0
2	2	STP	0	25	25	0	0	5	0	45	0
1	1	CRP	0	0	0	0	0	0	0	0	0
6	6	LSL	16	6	62	4	0	0	0	12	0
1	1	LSR	0	0	0	0	0	0	0	0	0
3	3	LSBk	100	0	0	0	0	0	0	0	0
17	17	PLP	15	13	14	20	2	4	17	16	0
1	1	DPL	100	0	0	0	0	0	0	0	0
130	130	TOTAL POOL	22	36	27	5	1	1	3	6	0
2	0	NS									
377	169	TOTAL	22	34	27	5	3	1	3	6	0

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Bridge Creek LLID: 1234362391501 Drainage: Navarro River

Survey Dates: 5/22/2012 to 6/6/2012 Dry Units: 9

Confluence Location: Quad: BAILEY RIDGE Legal Description: T15NR14WS20 Latitude: 39:09:00.0N Longitude: 123:26:10.0W

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
61	14	LGR	0	0	100	0	0	0	0
69	10	HGR	0	0	90	10	0	0	0
66	10	RUN	0	0	100	0	0	0	0
40	5	SRN	0	0	100	0	0	0	0
99	99	MCP	1	0	97	1	1	0	0
2	2	STP	0	0	50	50	0	0	0
1	1	CRP	0	0	100	0	0	0	0
6	6	LSL	0	0	100	0	0	0	0
1	1	LSR	0	0	100	0	0	0	0
3	3	LSBk	0	0	100	0	0	0	0
17	17	PLP	6	0	82	6	0	6	0
1	1	DPL	0	0	100	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: Bridge Creek LLID: 1234362391501 Drainage: Navarro River

Survey Dates: 5/22/2012 to 6/6/2012

Confluence Location: Quad: BAILEY RIDGE Legal Description: T15NR14WS20 Latitude: 39:09:00.0N Longitude: 123:26:10.0W

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
92	44	56	0	98	98

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: Bridge Creek LLID: 1234362391501 Drainage: Navarro River

Survey Dates: 5/22/2012 to 6/6/2012 Survey Length (ft.): 10849 Main Channel (ft.): 10849 Side Channel (ft.): 0

Confluence Location: Quad: BAILEY RIDGE Legal Description: T15NR14WS20 Latitude: 39:09:00.0N Longitude: 123:26:10.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type: F4
Reach Length (ft.): 5173
Riffle/Flatwater Mean Width (ft.): 5.9
BFW:
Range (ft.): 10 to 26
Mean (ft.): 15
Std. Dev.: 4
Base Flow (cfs.): 0.2
Water (F): 54 - 56 Air (F): 56 - 63
Dry Channel (ft): 0

Canopy Density (%): 91.9
Coniferous Component (%): 41.3
Hardwood Component (%): 58.7
Dominant Bank Vegetation: Hardwood Trees
Vegetative Cover (%): 98.4
Dominant Shelter: Small Woody Debris
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 17
LWD per 100 ft.:
Riffles: 1
Pools: 8
Flat: 1

Pools by Stream Length (%): 37.5
Pool Frequency (%): 43.0
Residual Pool Depth (%):
< 2 Feet Deep: 81
2 to 2.9 Feet Deep: 18
3 to 3.9 Feet Deep: 0
>= 4 Feet Deep: 1
Mean Max Residual Pool Depth (ft.): 1.5
Mean Pool Shelter Rating: 8

Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 88 Sm Cobble: 8 Lg Cobble: 0 Boulder: 4 Bedrock: 0

Embeddedness Values (%): 1. 43.2 2. 44.6 3. 12.2 4. 0.0 5. 0.0

STREAM REACH: 2

Channel Type: G4
Reach Length (ft.): 3505
Riffle/Flatwater Mean Width (ft.): 5.2
BFW:
Range (ft.): 10 to 29
Mean (ft.): 16
Std. Dev.: 5
Base Flow (cfs.): 0.2
Water (F): 50 - 56 Air (F): 44 - 62
Dry Channel (ft): 45

Canopy Density (%): 90.1
Coniferous Component (%): 49.1
Hardwood Component (%): 50.9
Dominant Bank Vegetation: Coniferous Trees
Vegetative Cover (%): 97.3
Dominant Shelter: Small Woody Debris
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 16
LWD per 100 ft.:
Riffles: 4
Pools: 15
Flat: 6

Pools by Stream Length (%): 21.2
Pool Frequency (%): 32.3
Residual Pool Depth (%):
< 2 Feet Deep: 81
2 to 2.9 Feet Deep: 19
3 to 3.9 Feet Deep: 0
>= 4 Feet Deep: 0
Mean Max Residual Pool Depth (ft.): 1.6
Mean Pool Shelter Rating: 10

Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 79 Sm Cobble: 14 Lg Cobble: 5 Boulder: 2 Bedrock: 0

Embeddedness Values (%): 1. 39.5 2. 46.5 3. 11.6 4. 2.3 5. 0.0

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 3

Channel Type: B4
Reach Length (ft.): 2171
Riffle/Flatwater Mean Width (ft.): 4.5
BFW:
Range (ft.): 9 to 29
Mean (ft.): 14
Std. Dev.: 6
Base Flow (cfs.): 0.2
Water (F): 53 - 57 Air (F): 54 - 62
Dry Channel (ft): 249

Canopy Density (%): 93.7
Coniferous Component (%): 39.1
Hardwood Component (%): 60.9
Dominant Bank Vegetation: Hardwood Trees
Vegetative Cover (%): 98.6
Dominant Shelter: Small Woody Debris
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 11
LWD per 100 ft.:
Riffles: 4
Pools: 13
Flat: 5

Pools by Stream Length (%): 7.7
Pool Frequency (%): 18.1
Residual Pool Depth (%):
< 2 Feet Deep: 77
2 to 2.9 Feet Deep: 23
3 to 3.9 Feet Deep: 0
>= 4 Feet Deep: 0
Mean Max Residual Pool Depth (ft.): 1.4
Mean Pool Shelter Rating: 16

Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 92 Sm Cobble: 8 Lg Cobble: 0 Boulder: 0 Bedrock: 0
Embeddedness Values (%): 1. 61.5 2. 30.8 3. 0.0 4. 0.0 5. 7.7

Table 9 - Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Bridge Creek LLID: 1234362391501 Drainage: Navarro River

Survey Dates: 5/22/2012 to 6/6/2012

Confluence Location: Quad: BAILEY RIDGE Legal Description: T15NR14WS20 Latitude: 39:09:00.0N Longitude: 123:26:10.0W

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	4	3	2.1
Boulder	4	4	2.4
Cobble / Gravel	20	19	11.5
Sand / Silt / Clay	141	143	84.0

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	3	5	2.4
Brush	52	41	27.5
Hardwood Trees	59	64	36.4
Coniferous Trees	55	59	33.7
No Vegetation	0	0	0.0

Total Stream Cobble Embeddedness Values: 2

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

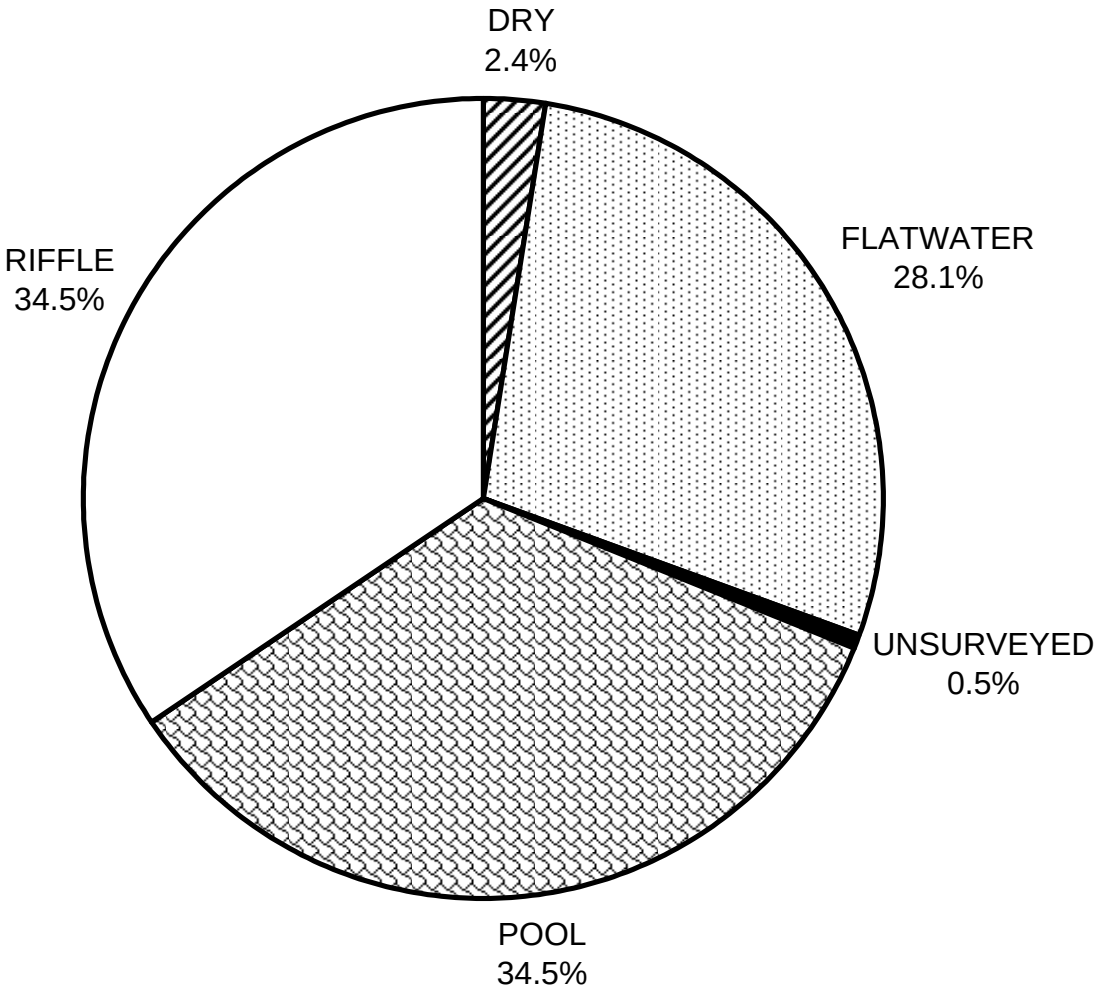
StreamName: Bridge Creek LLID: 1234362391501 Drainage: Navarro River

Survey Dates: 5/22/2012 to 6/6/2012

Confluence Location: Quad: BAILEY RIDGE Legal Description: T15NR14WS20 Latitude: 39:09:00.0N Longitude: 123:26:10.0W

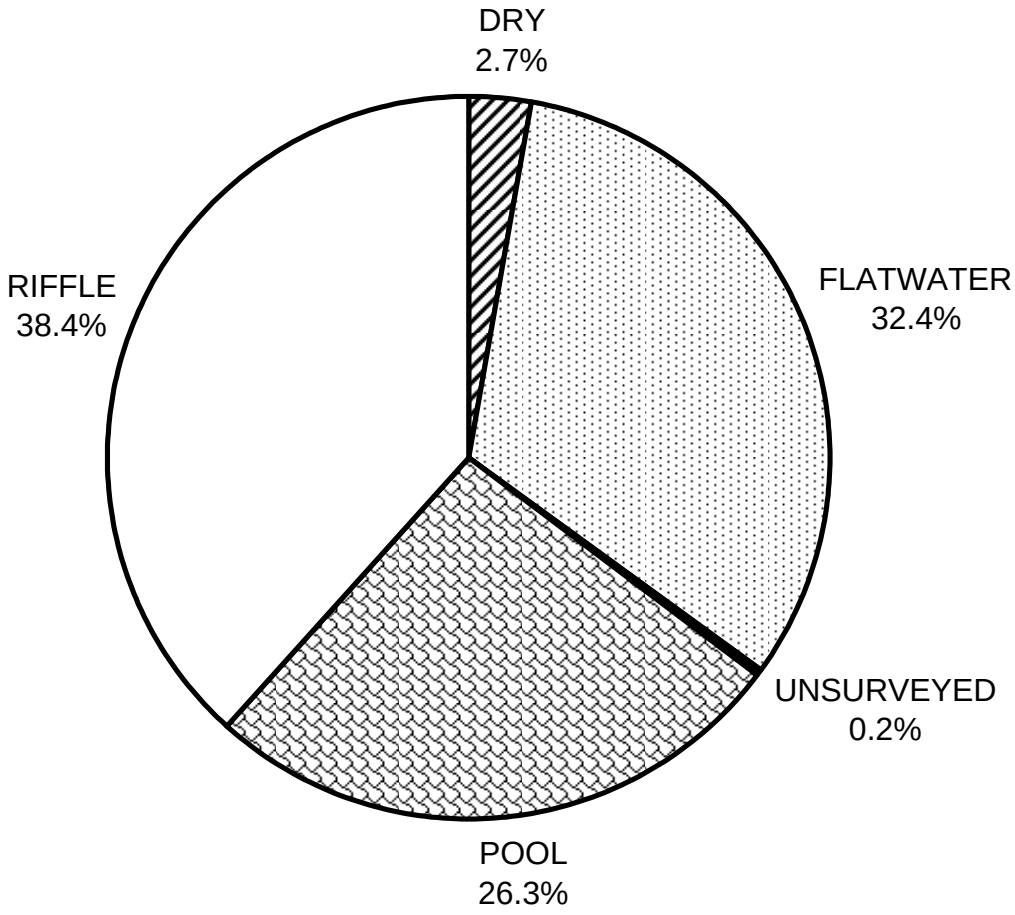
	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	38	22
SMALL WOODY DEBRIS (%)	17	12	36
LARGE WOODY DEBRIS (%)	50	25	27
ROOT MASS (%)	0	0	5
TERRESTRIAL VEGETATION (%)	33	25	1
AQUATIC VEGETATION (%)	0	0	1
WHITEWATER (%)	0	0	3
BOULDERS (%)	0	0	6
BEDROCK LEDGES (%)	0	0	0

BRIDGE CREEK 2012
HABITAT TYPES BY PERCENT OCCURRENCE



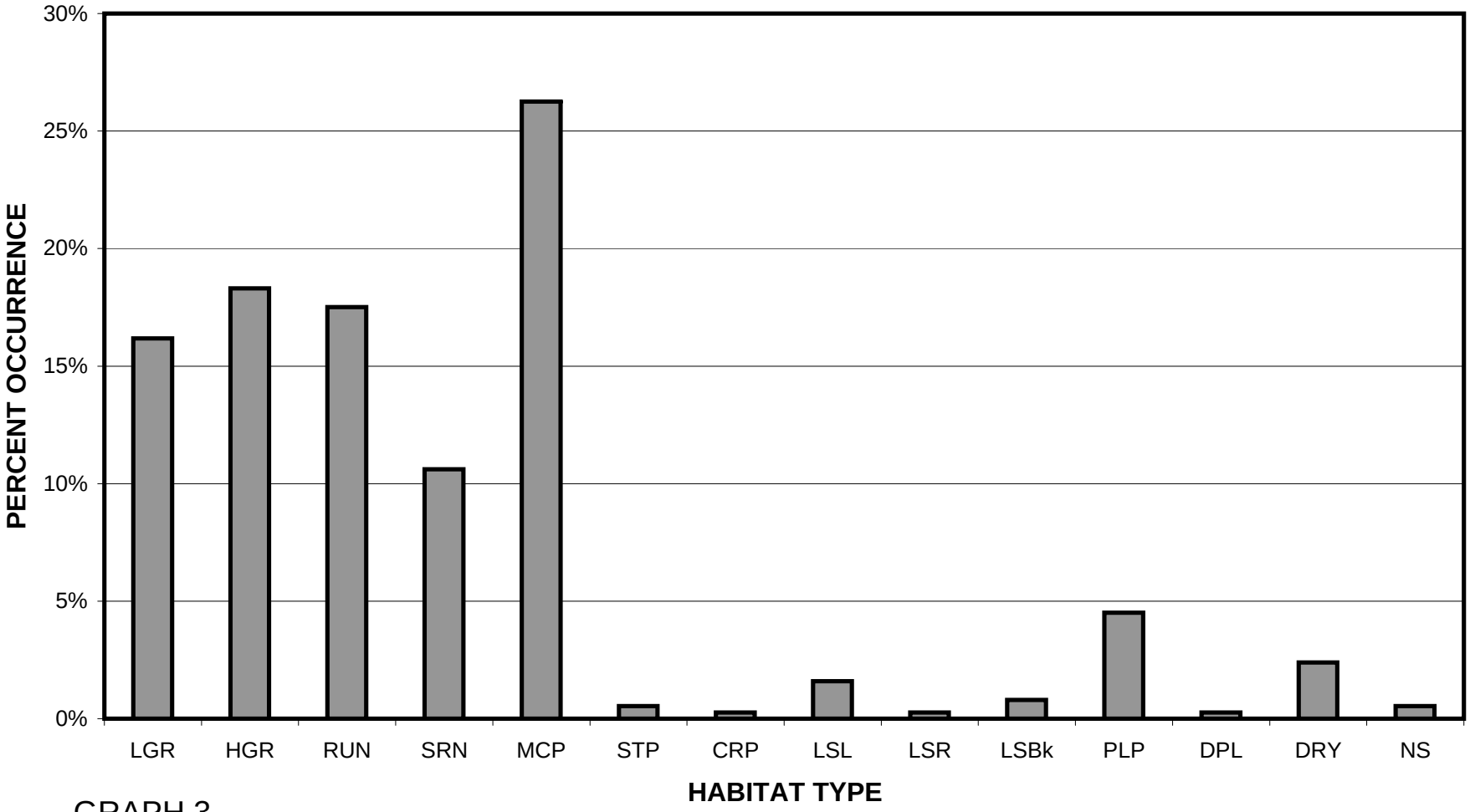
GRAPH 1

BRIDGE CREEK 2012
HABITAT TYPES BY PERCENT TOTAL LENGTH



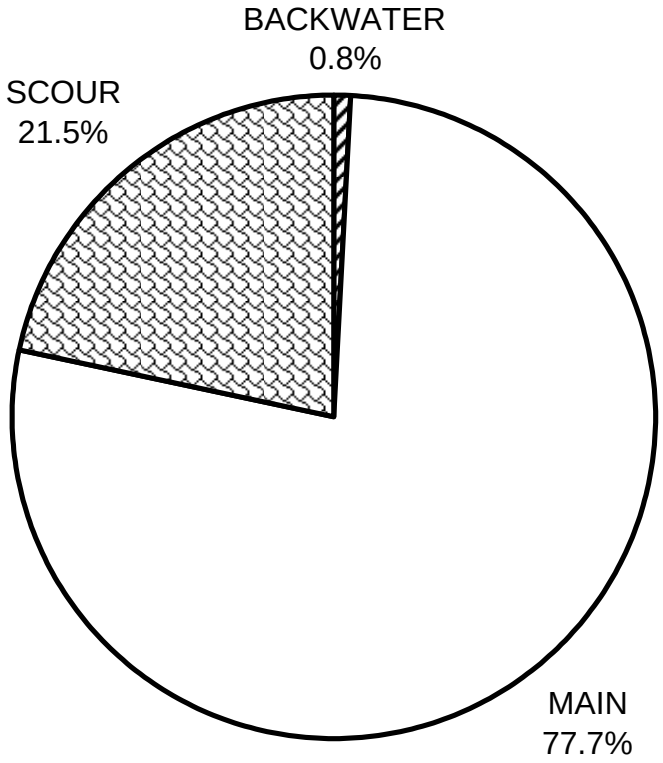
GRAPH 2

BRIDGE CREEK 2012
HABITAT TYPES BY PERCENT OCCURRENCE



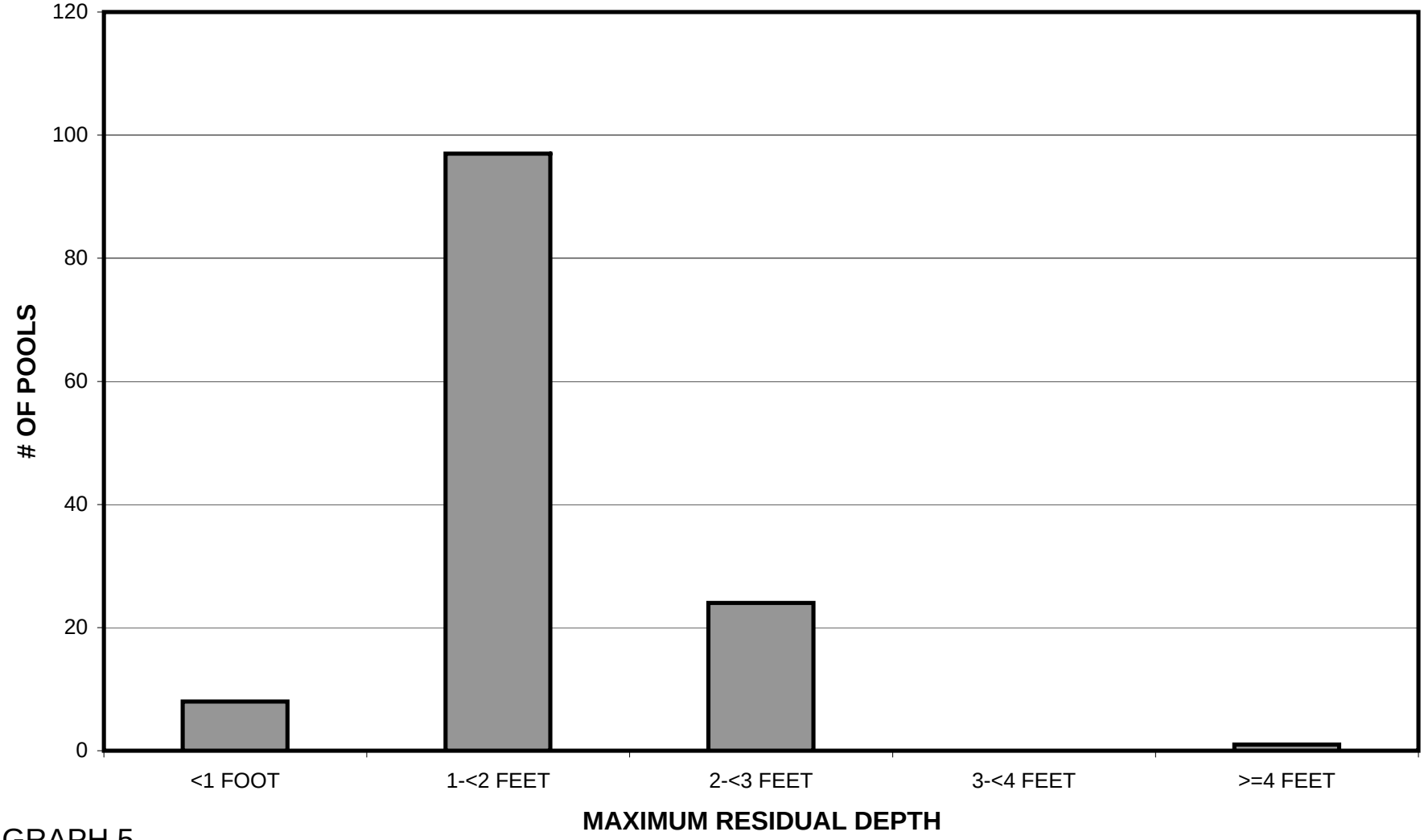
GRAPH 3

BRIDGE CREEK 2012
POOL TYPES BY PERCENT OCCURRENCE



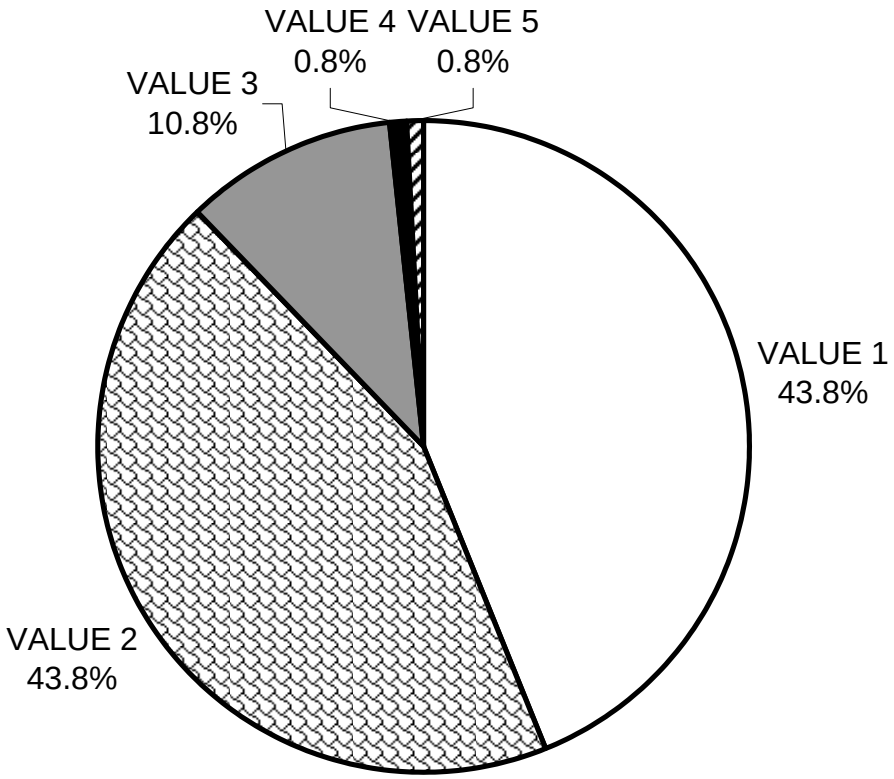
GRAPH 4

BRIDGE CREEK 2012
MAXIMUM DEPTH IN POOLS



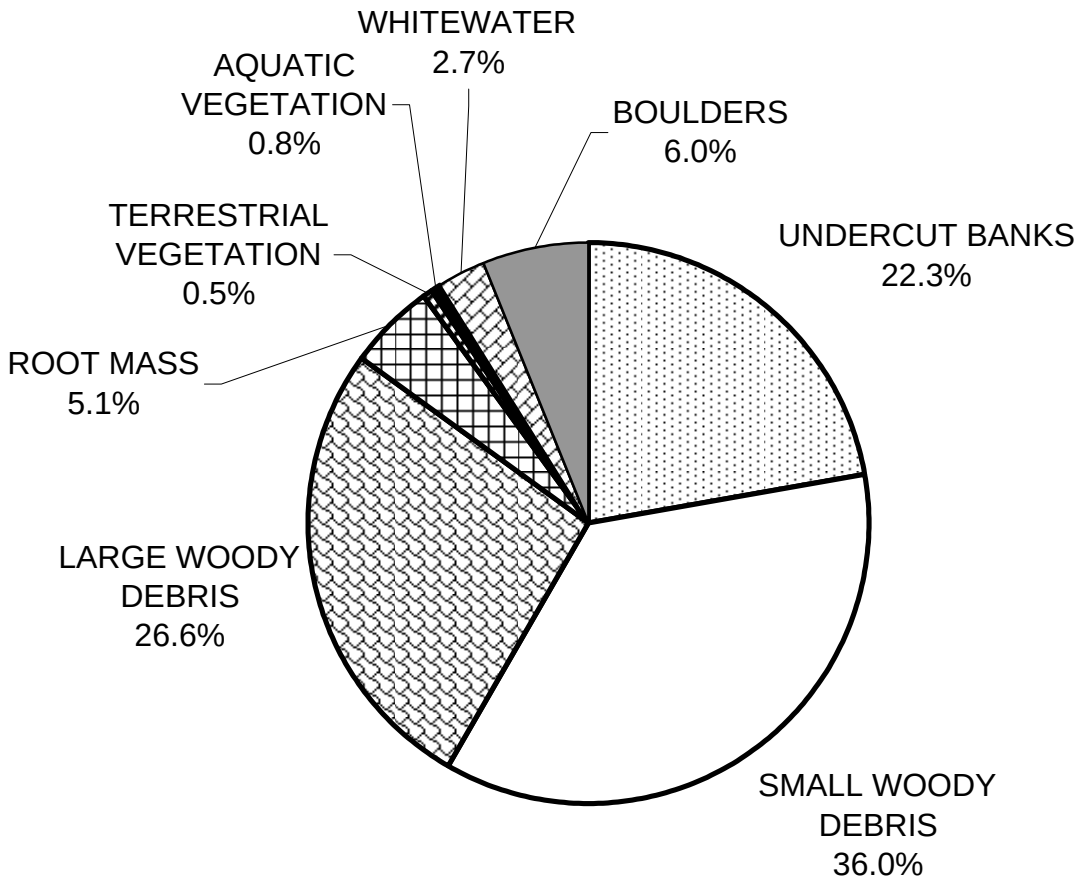
GRAPH 5

BRIDGE CREEK 2012
PERCENT EMBEDDEDNESS



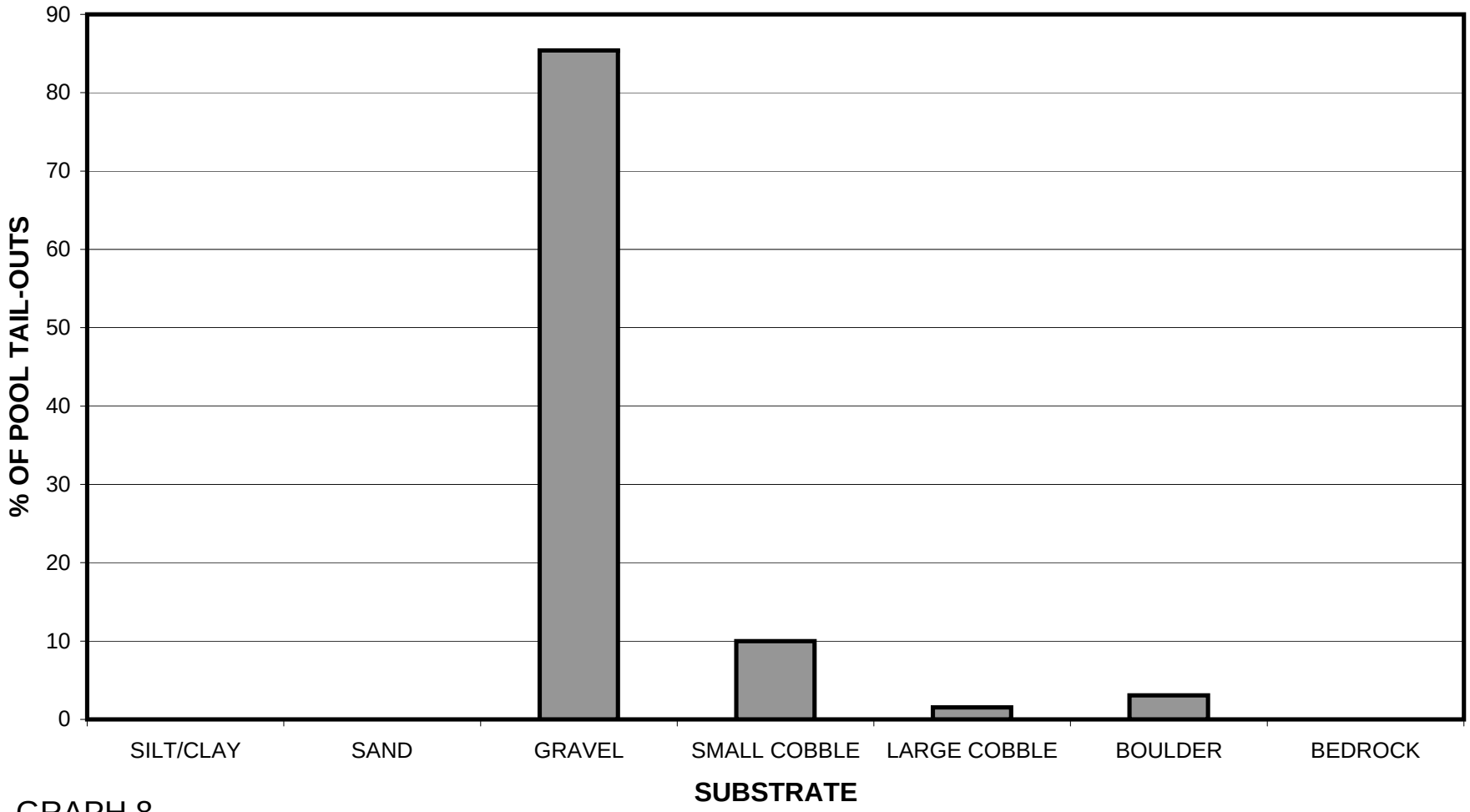
GRAPH 6

BRIDGE CREEK 2012
MEAN PERCENT COVER TYPES IN POOLS



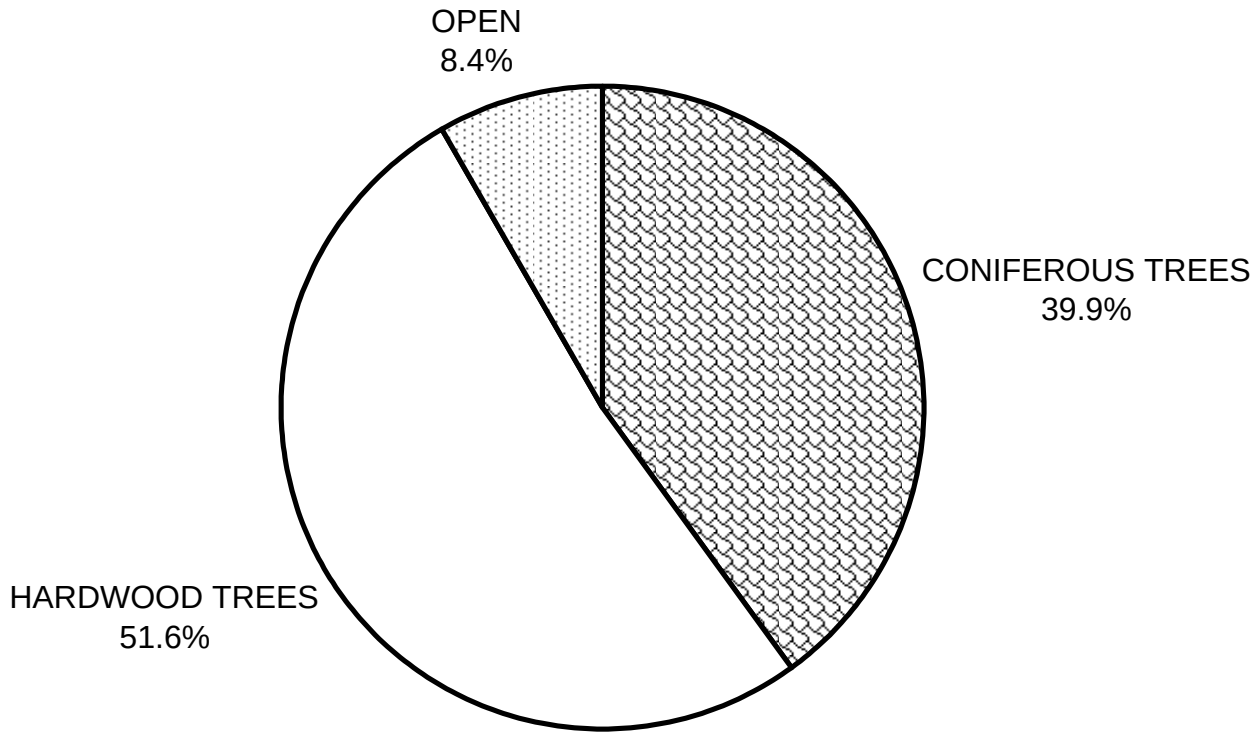
GRAPH 7

BRIDGE CREEK 2012
SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



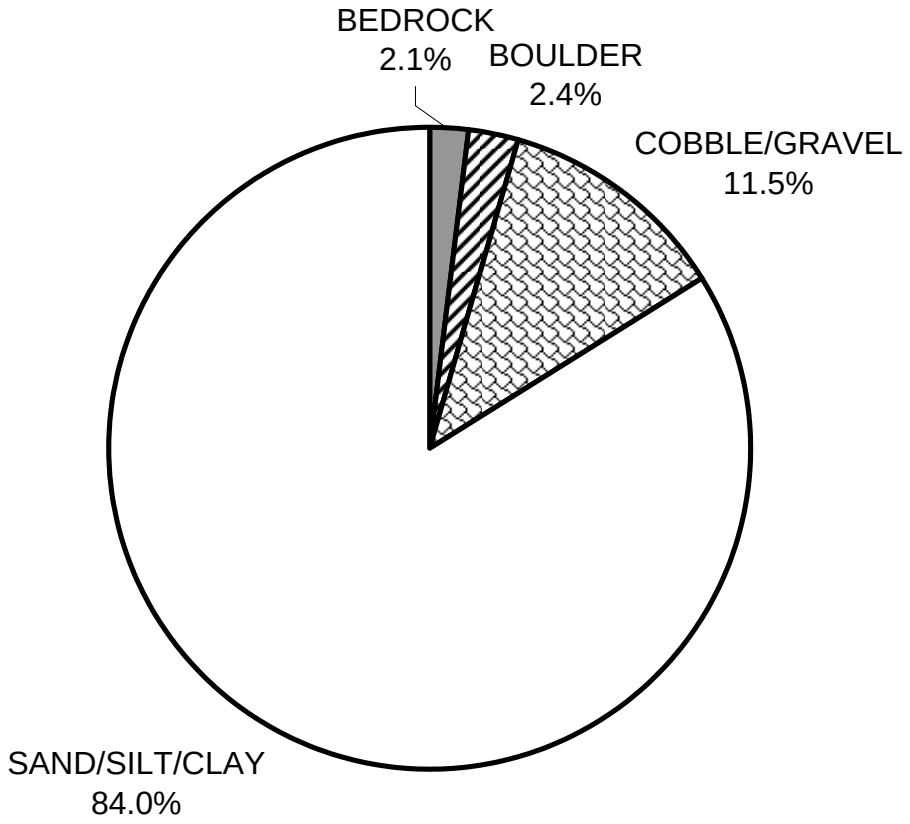
GRAPH 8

BRIDGE CREEK 2012
MEAN PERCENT CANOPY



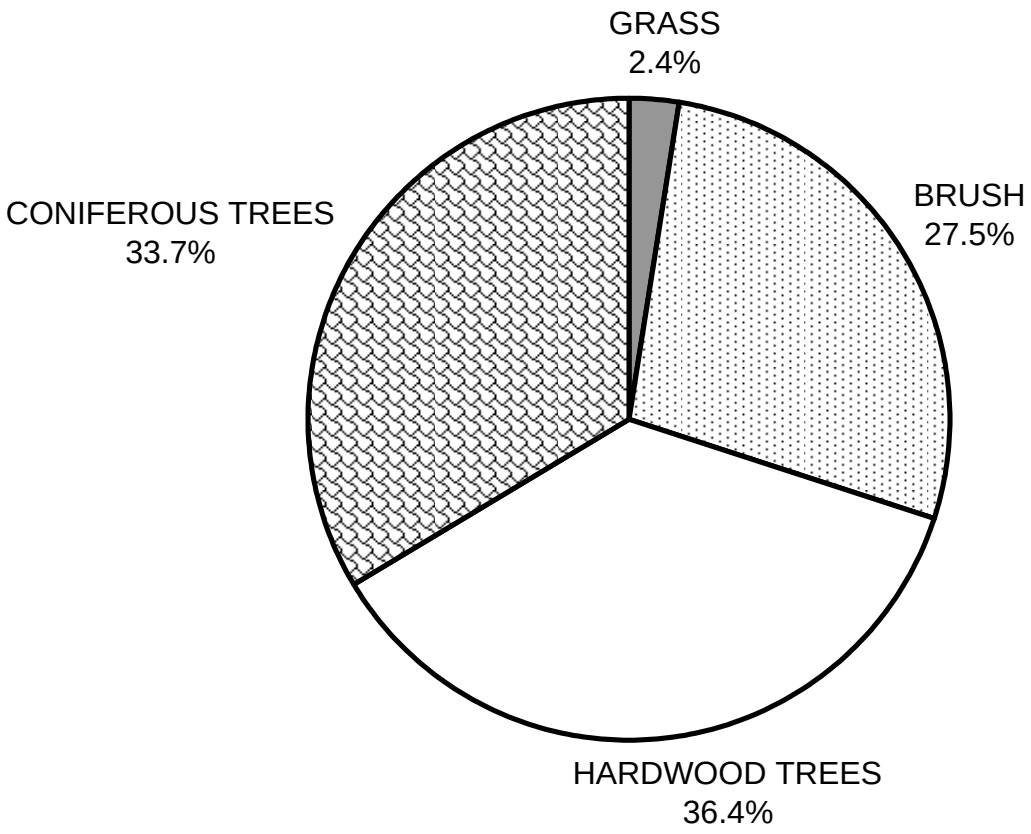
GRAPH 9

BRIDGE CREEK 2012
DOMINANT BANK COMPOSITION IN SURVEY REACH

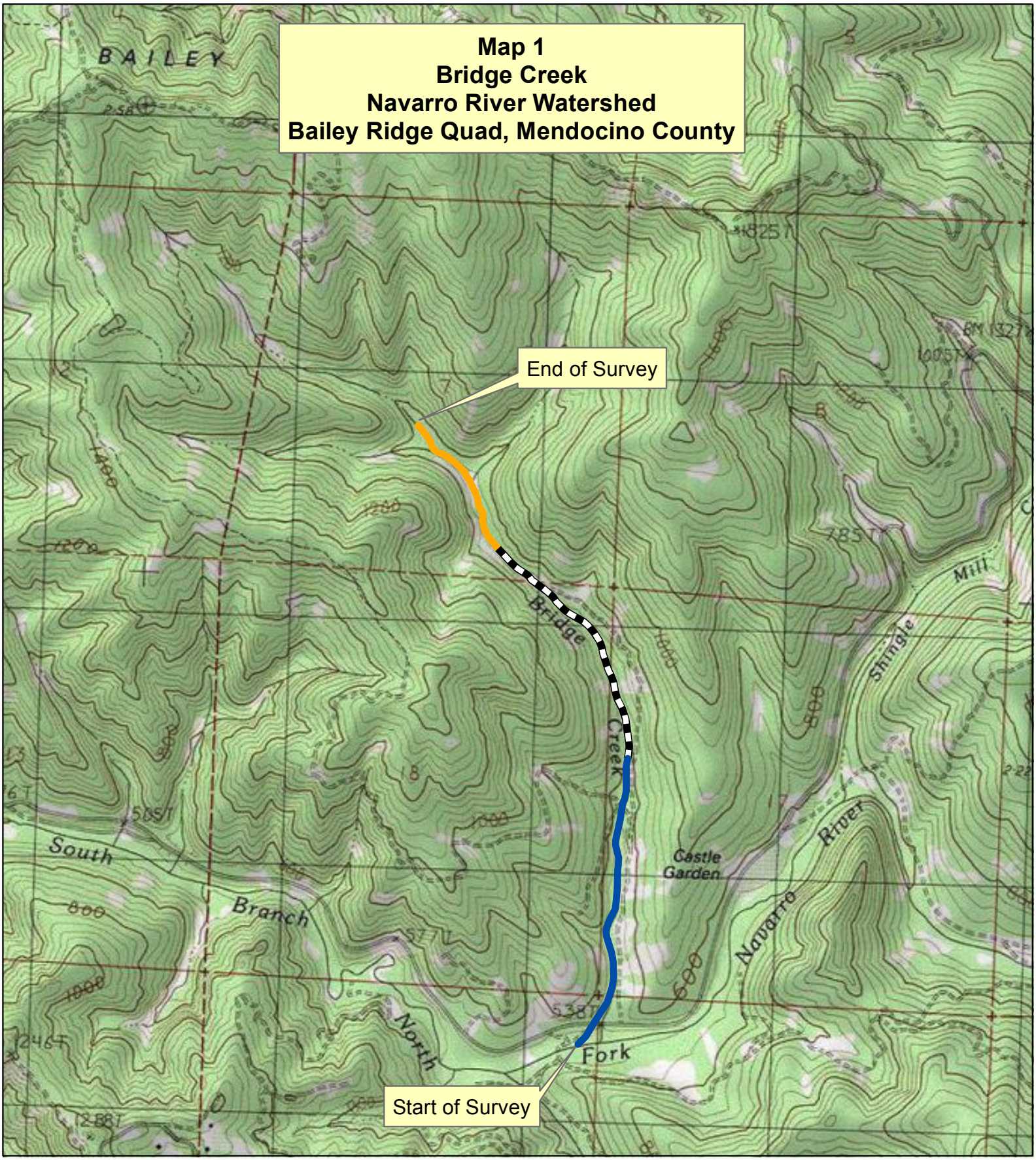


GRAPH 10

BRIDGE CREEK 2012
DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11


Map 1
Bridge Creek
Navarro River Watershed
Bailey Ridge Quad, Mendocino County
End of Survey
Start of Survey
BAILEY
Bridge
Creek
South
Branch
North
Fork
Castle
Garden
Navarro
River
Shingle
Mill
N
S
E
W
Reach 1, F4 Channel Type
Reach 2, G4 Channel Type
Reach 3, B4 Channel Type
0
2,500 Feet
CALIFORNIA
DEPARTMENT OF
FISH &
WILDLIFE