

STREAM INVENTORY REPORT

Rohner Creek

INTRODUCTION

A stream inventory was conducted from August 3 to August 24, 2009 on Rohner Creek. The survey began at the confluence with Strongs Creek and extended upstream 3.6 miles.

The Rohner 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 Rohner Creek. The objective of the biological inventory was to document the presence and distribution of juvenile salmonid species.

The objective of this report is to document the current habitat conditions and recommend options for the potential enhancement of habitat for Chinook salmon, coho salmon, and steelhead trout. Recommendations for habitat improvement activities are based upon target habitat values suitable for salmonids in California's north coast streams.

WATERSHED OVERVIEW

Rohner Creek is a tributary to Strongs Creek, tributary to Eel River, which drains to the Pacific Ocean, located in Humboldt County, California (Map 1). Rohner Creek's legal description at the confluence with Strongs Creek is T02N R01 S03. Its location is 40.5902 north latitude and 124.1610 west longitude, LLID number 1241598405903. Rohner Creek is a first order stream and has approximately 4.0 miles of blue line stream according to the USGS Fortuna 7.5 minute quadrangle. Rohner Creek drains a watershed of approximately 3.1 square miles. Elevations range from about 20 feet at the mouth of the creek to 1,000 feet in the headwater areas. Redwood forest dominates the watershed. The watershed is entirely privately owned and is managed for urban development and timber production. Vehicle access exists via various Fortuna City road crossing. The upper watershed is accessible via private roads.

METHODS

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

SAMPLING STRATEGY

The inventory uses a method that samples approximately 10% of the habitat units within the survey reach. All habitat units included in the survey are classified according to habitat type and their lengths are measured. All pool units are measured for maximum depth, depth of pool tail

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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 Rohner 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". Rohner 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.

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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 Rohner Creek, embeddedness was ocularly estimated. The values were recorded using the following ranges: 0 - 25% (value 1), 26 - 50% (value 2), 51 - 75% (value 3) and 76 - 100% (value 4). Additionally, a value of 5 was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate like bedrock, log sills, boulders or other considerations.

6. Shelter Rating:

Instream shelter is composed of those elements within a stream channel that provide juvenile salmonids protection from predation, reduce water velocities so fish can rest and conserve energy, and allow separation of territorial units to reduce density related competition for prey. The shelter rating is calculated for each fully-described habitat unit by multiplying shelter value and percent cover. Using an overhead view, a quantitative estimate of the percentage of the habitat unit covered is made. All cover is then classified according to a list of nine cover types. In Rohner 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 densimeters as described in the *California Salmonid Stream Habitat Restoration Manual*. Canopy density relates to the amount of stream shaded from the sun. In Rohner 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 Rohner 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

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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 Rohner Creek. In addition, 17 sites were electrofished using a Smith-Root Model 12 electrofisher. These sampling techniques are discussed in the *California Salmonid Stream Habitat Restoration Manual*.

DATA ANALYSIS

Data from the habitat inventory form are entered into Stream Habitat 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

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- Fish Habitat Inventory Data Summary by Stream Reach (Table 8)
- Mean Percent Dominant Substrate / Dominant Vegetation Type for Entire Stream
- Mean Percent Shelter Cover Types for Entire Stream

Graphics are produced from the tables using Microsoft Excel. Graphics developed for Rohner 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 August 3 to August 24, 2009, was conducted by S. McSmith (DFG), and M. Groff and J. Ferreira (WSP). The total length of the stream surveyed was 19,173 feet.

Stream flow was too low to be measured on Rohner Creek.

Rohner Creek is an F6 channel type for 8,096 feet of the stream surveyed (Reach 1), an undetermined channel type for 725 feet of the stream that was not surveyed (Reach 2), an F6 channel type for 7,765 feet of the stream surveyed (Reach 3), and a G6 channel type for the 2,587 feet of the stream surveyed (Reach 4). F6 channel types are entrenched meandering riffle/pool channels on low gradients with high width/depth ratios, very stable with silt/clay-dominant substrates. G6 channels are entrenched “gully” step-pool channels on moderate gradients with low width /depth ratios, very stable with silt/clay-dominant substrates.

Water temperatures taken during the survey period ranged from 52 to 62 degrees Fahrenheit. Air temperatures ranged from 52 to 70 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 39% pool units, 26% flatwater units, 22% dry units, and 11% riffle units (Graph 1). Based on total length of Level II habitat types there were 31% pool units, 30% dry units, 25% flatwater units, and 8% riffle units (Graph 2).

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Thirteen Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were mid-channel pool units, 34%; dry units, 22%; and run units, 14% (Graph 3). Based on percent total length, dry units made up 30%, mid-channel pools units 26%, and step run units 14%.

A total of 156 pools were identified (Table 3). Main channel pools were the most frequently encountered at 93% (Graph 4), and comprised 95% 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. Sixty-four of the 156 pools (41%) had a residual depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 156 pool tail-outs measured, 9 had a value of 1 (5.7%); 35 had a value of 2 (22.3%); 9 had a value of 3 (5.7%); 34 had a value of 4 (22.3%); 69 had a value of 5 (43.9%) (Graph 6). On this scale, a value of 1 indicates the best spawning conditions and a value of 4 the worst. Additionally, a value of 5 was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate 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 25, flatwater habitat types had a mean shelter rating of 18, and pool habitats had a mean shelter rating of 18 (Table 1). Of the pool types, the scour pools had the highest mean shelter rating at 20. Main channel pools had a mean shelter rating of 18 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Large woody debris is the dominant cover type in Rohner Creek. Graph 7 describes the pool cover in Rohner Creek. Large 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 43% of the pool tail-outs. Silt/clay was the next most frequently observed dominant substrate type and occurred in 32% of the pool tail-outs.

The mean percent canopy density for the surveyed length of Rohner Creek was 93%. Seven percent of the canopy was open. Of the canopy present, the mean percentages of hardwood and coniferous trees were 62% and 38%, respectively. Graph 9 describes the mean percent canopy in Rohner Creek.

For the stream reach surveyed, the mean percent right bank vegetated was 96%. The mean percent left bank vegetated was 97%. The dominant elements composing the structure of the stream banks consisted of 91% sand/silt/clay, 8% bedrock, and 2% boulder (Graph 10). Deciduous trees were the dominant vegetation type observed in 41% of the units surveyed. Additionally, 32% of the units surveyed had coniferous trees as the dominant vegetation type and 25% of the units surveyed had brush (Graph 11).

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BIOLOGICAL INVENTORY RESULTS

Survey teams conducted an electrofishing survey at 17 sites for species composition and distribution in Rohner Creek on October 10, 2009. Water temperatures taken during the electrofishing period of 0822 to 1120 ranged from 52 to 50 degrees Fahrenheit. Air temperatures ranged from 56 to 57 degrees Fahrenheit. The sites were sampled by C. Ramsey, B. deWaard, S. McSmith and I. Mikus (DFG), and N. Talkington and R. Okey (WSP).

In reach 1, which comprised the first 8,096 feet of stream, seven sites were sampled. The reach sites yielded 1 young-of-the-year steelhead/rainbow trout (SH/RT), 6 age 1+ SH/RT, 28 three-spine stickleback, 1 California roach, and 4 ammocetes.

In reach 4, 10 sites were sampled starting approximately 8,831 from the confluence with Strongs Creek and continuing upstream 7,765 feet. The reach sites yielded 7 ammocetes and 11 salamanders.

The following chart displays the information yielded from these sites:

2009 Rohner Creek electrofishing observations.

Date	Survey Site #	Habitat Unit #	Habitat Type	Approx. Dist. from mouth (ft.)	SH/RT			Coho	
					YOY	1+	2+	YOY	1+
Reach 1: F6 Channel Type									
10/10/09	1	010	4.2	457	0	0	0	0	0
10/10/09	2	012	4.2	583	0	1	0	0	0
10/10/09	3	022	4.2	1,267	0	1	0	0	0
10/10/09	4	023	5.6	1,293	1	3	0	0	0
10/10/09	5	095	4.2	5,571	0	0	0	0	0
10/10/09	6	101	4.2	5,922	0	1	0	0	0
10/10/09	7	220	4.2	13,054	0	0	0	0	0
Reach 4: G6 Channel Type									
10/10/09	8	318	5.6	17,108	0	0	0	0	0
10/10/09	9	321	4.2	17,192	0	0	0	0	0
10/10/09	10	323	4.2	17,251	0	0	0	0	0
10/10/09	11	326	3.3	17,285	0	0	0	0	0
10/10/09	12	331	4.2	17,380	0	0	0	0	0
10/10/09	13	333	4.2	17,423	0	0	0	0	0
10/10/09	14	335	4.2	17,468	0	0	0	0	0
10/10/09	15	336	3.4	17,516	0	0	0	0	0

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10/10/09	16	337	4.2	17,564	0	0	0	0	0
10/10/09	17	341	4.2	17,597	0	0	0	0	0

DISCUSSION

Rohner Creek is an F6 channel type for the first 8,096 feet of stream surveyed, an undetermined channel type for the next 725 feet, an F6 channel type for the next 7,765 feet, and a G6 channel type for the remaining 2,587 feet. The suitability of F6 and G6 channel types for fish habitat improvement structures is as follows: F6 channel types are good for bank-placed boulders and fair for plunge weirs, boulder clusters, single and opposing wing-deflectors, and log cover. G6 channel types are good for bank-placed boulders and fair for plunge weirs, opposing wing-deflectors, and log cover.

The water temperatures recorded on the survey days August 3 to August 24, 2009 ranged from 52 to 62 degrees Fahrenheit. Air temperatures ranged from 52 to 70 degrees Fahrenheit. To make any conclusions, temperatures would need to be monitored throughout the warm summer months, and more extensive biological sampling would need to be conducted.

Flatwater habitat types comprised 25% of the total length of this survey, riffles 8%, and pools 31%. Sixty-four of the 156 (41%) 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.

Forty-four of the 156 pool tail-outs measured had embeddedness ratings of 1 or 2. Forty-three of the pool tail-outs had embeddedness ratings of 3 or 4. Sixty-nine 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. Sediment sources in Rohner Creek should be mapped and rated according to their potential sediment yields, and control measures should be taken.

Eighty-three of the 156 pool tail-outs measured had gravel or small cobble as the dominant substrate. Seventy-three of the 156 pool tail-outs had silt, sand, large cobble, boulders or bedrock as the dominant substrate. Suitable size spawning and quality substrate on Rohner Creek is limited to relatively few reaches. Projects should be designed at suitable sites to trap and sort spawning gravel.

The mean shelter rating for pools is 18. The shelter rating in the flatwater habitats is 18. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by large woody debris in Rohner Creek. Large 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

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structure provides rearing fry with protection from predation, rest from water velocity, and also divides territorial units to reduce density related competition.

The mean percent canopy density for the stream was 93%. Reach 1 had a canopy density of 89%, Reach 3 had a canopy density of 94%, and Reach 4 had a canopy density of 96%. In general, revegetation projects are considered when canopy density is less than 80%.

The percentage of right and left bank covered with vegetation was 96% and 97%, respectively. In areas of stream bank erosion or where bank vegetation is sparse, planting endemic species of coniferous and hardwood trees, in conjunction with bank stabilization, is recommended.

RECOMMENDATIONS

- 1) Rohner 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 large woody debris. Adding high quality complexity with woody cover in the pools is desirable.
- 4) Active and potential sediment sources related to the road system need to be identified, mapped, and treated according to their potential for sediment yield to the stream and its tributaries.
- 5) Suitable size spawning substrate on Rohner Creek is limited to relatively few reaches. Projects should be designed at suitable sites to trap and sort spawning gravel.

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 (#):	Comment:
0	0001.00	The survey began at the confluence with Strongs Creek. The channel type is F6. Flow is too low to be measured.
428	0010.00	Asphalt slabs in the channel.

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507	0012.00	Bridge #01 is a Dinsmore Drive, and is 21' high x 28' wide x 75' long. It is a concrete bridge.
603	0014.00	Bridge #02 is Highway 101, and is 18' high x 90' wide x 75' long. It is a concrete bridge.
1008	0018.00	A small woody debris (SWD) accumulation is 3' high x 15' long x 10' wide; it spans the channel and is collecting garbage.
1053	0019.00	Bridge #03 is an railroad bridge and is 11' high x 13' wide x 50' long. It is made of creosol timbers.
1141	0020.00	A culvert enters from the left bank.
1267	0023.00	There is a concrete plunge that is 1.5' high associated with the 12 th Street overpass.
1293	0024.00	The stream channel consists entirely of concrete.
1322	0025.00	Culvert #01 is the 12th Street overpass. It is concrete box culvert with three boxes. Each box is 6' tall x 10' wide x 80' long. The plunge height is 0.9', while the maximum depth within 5' of the outlet is 0.05'. The slope is 1% and the culvert is in good condition. Two storm drains enter from the right banks. One of them is the source of oily sheen.
1402	0026.00	The stream channel consists entirely of concrete.
1971	0031.00	Substrate is silt and mudstone (bedrock).
2563	0045.00	A culvert enters from the left bank; there is no flow.
2604	0046.00	Tributary #01 enters on the left bank. The flow contributes to less than 5% of the downstream flow. The temperature downstream of the tributary is 59 degrees Fahrenheit, the temperature of the tributary is 63 degrees Fahrenheit, and the temperature upstream of the confluence is 59 degrees Fahrenheit. Fish are not observed in the 15 feet of stream explored before the stream disappears into a culvert.
3077	0054.00	Substrate and banks consists of solid concrete.
3138	0055.00	Bridge #04 is an unnamed footbridge crosses the creek that is 10' high x 5' wide x 15' long. It's made of wood. The banks consist of concrete.
3228	0056.00	The channel is choked by a mat of grasses.

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3244	0057.00	Bridge #05 is an unnamed car bridge crosses the creek. It is 9.5' high x 22' wide x 20' long. It's is made of steel 'I' beams.
3329	0059.00	The left bank is armored with rock gabion baskets.
3357	0060.00	The right banks is armored with sandbags.
3482	0062.00	The right bank is armored with a rock gabion wall. Willows are constricting the channel and forcing flows against the left bank. In higher flows the stream is cutting into the left bank.
3665	0067.00	Tributary #02 enters from a culvert on the right bank. The flow is estimated to contribute less than 5% of the downstream flow. The temperature downstream of the tributary is 67 degrees Fahrenheit, the temperature of the tributary is 64 degrees Fahrenheit, and the temperature upstream of the confluence is 67 degrees Fahrenheit. The slope of the tributary is 1% and fish are not observed in the 15' explored though it does appear to be fish accessible for that distance. The left bank of Rohner Creek is armored with concrete slabs here.
3924	0072.00	Bridge #06 is an unnamed private road, and is 8.5' high x 13' wide x 30' long. It is arch culvert with concrete footings and a natural bottom. Bridge #07 is an unnamed private road, and is 7' high x 11' wide x 20' long. It is made of wood and appears to be unused.
4202	0073.00	The left bank is concrete.
4413	0076.00	The right bank is riprap.
4511	0078.00	Bridge #08 is 7' high x 11' wide x 20' long. The car bridge is made from steel 'I' beams.
4566	0079.00	The right bank is concrete.
4623	0080.00	Riprap occupies both banks intermittently with LWD bank armor.
4762	0081.00	The right bank is rip rapped.
4873	0083.00	Bridge #09 is 7' high x 15' wide x 24' long. This car bridge is made of wood timbers.
5123	0087.00	The left bank has a 12' of slab concrete armor.

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5201	0088.00	Bridge #10 is 6.5' high x 12' wide x 30' long. It is a single car bridge made of a rail car and timbers.
5397	0092.00	The left and right banks have been intermittently rip rapped.
5507	0094.00	There left bank is rip rapped.
5635	0098.00	Bridge #11 is 11' high x 155' wide x 12.5' long. Rohner Creek flows under the Fortuna Feed Store and Main Street. The best spawning substrate of the entire surveyed length is under this crossing.
5819	0099.00	The shelter is formed by concrete and boulders. The left and right banks are the concrete walls supporting the Main Street overpass.
6140	0106.00	The left bank has been rip rapped.
6442	0111.00	An English ivy wall crosses the creek forming a solid screen spanning the width of the channel.
6471	0112.00	Bridge #12 is a footbridge from Rohner Park and poses no threat to salmonid passage. It is 22.5' high x 4' wide x 70' long. It's made of timber and concrete.
7171	0124.00	There is a seep on the left bank. The 'boulder' shelter is asphalt and concrete.
7396	0127.00	There is a left bank seep.
7438	0128.00	Bridge #13 is a footbridge made of steel 'I' beams and wood. It is 20' high x 5' wide x 70' long.
7460	0129.00	There is a left bank seep.
7637	0133.00	The right bank is cut 25' high and is currently contributing sediment ranging in size from fines to gravel. This site is also being used as a dump from the road.
7649	0134.00	The left bank has a 15' high cut contributing fines to gravels.
7729	0136.00	The left bank seep mentioned over the last few habitat units has been consistent since 7460'.
8035	0141.00	There is a culvert entering from the left bank. It is currently dry.
8070	0142.00	The flow has gone subsurface under boulders placed beneath the bridge.

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8070	0142.00	Bridge #014 is a concrete car bridge. It is 13.5' high x 30' wide x 66' long.
8096	0143.00	Start Reach 2, channel type is undetermined due to lack of access.
8821	0144.00	Start Reach 3, the channel type is F6.
8849	0145.00	There is a slump on the left bank contributing fines to large cobble. It measures 12' high x 20' long. A rootwad and small woody debris are forcing the flow into the left bank.
9295	0153.00	The right bank is armored with cars on the banks consistently through habitat unit #0160.
9649	0160.00	The 'bedrock' in the shelter is in fact a jagged, rusted metal 5' x 5' x 5' cube.
9702	0162.00	LDA #01 contains 6 pieces of LWD and measures 2' high x 25' wide x 4' long. Water does not flow through though there are visible gaps. Retained sediment ranges from silt to cobble and measures 15' wide x 14' long x 1' deep.
9794	0164.00	The channel is choked with concrete slabs and a fallen alder.
9824	0165.00	An unknown fish was observed. This is the last observation of any fish in the survey.
9824	0165.00	Bridge #15 is a single car bridge made of steel 'I' beams and timbers. It is 14' high x 14' wide x 30' long. The right bank footing of the bridge is made of tires.
10019	0168.00	LDA #02 contains 3 pieces of LWD and measures 4' high x 19' wide x 25' long. Water does not flow through and there are no visible gaps. Retained sediment ranges from silt to cobble and measures 19' wide x 30' long x 2' deep. There are no fish upstream.
10115	0172.00	There are cars armoring the right bank.
10224	0176.00	There is a 2' plunge from boulders and concrete slabs up to a flat concrete stream channel beneath the bridge. The concrete channel under the bridge has four significant cracks and appears to be in need of repair. Bridge #16 is a car bridge that has concrete walls and footings with a timber driving surface. It is 7' high x 17' wide x 12' long.

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10268	0178.00	The right bank has concrete slab armor.
10340	0180.00	The right bank has cars and concrete for armor.
10399	0182.00	Bridge #017 is a car bridge made of concrete. It is 10' high x 11' wide x 17' long.
10743	0186.00	Bridge #18 is a concrete car bridge. It is 9' high x 16' wide x 20' long. The stream channel is concrete and the banks are concrete sandbags.
10996	0188.00	Bridge #019 car bridge made of steel 'I' beams and timbers. It is 8' high x 16' wide x 19' long.
11484	0190.00	Bridge #20 is a concrete car bridge. It is 8' high x 13' wide x 18' long.
12151	0202.00	LDA #03 contains 5 pieces of LWD and measures 6' high x 16' wide x 2' long. Water does not flow through and no visible gaps. Retained sediment ranges from silt to sand and measures 15' wide x 30' long x 2' deep.
12169	0203.00	LDA #04 is made of 13 pieces of LWD and measures 5.5' tall x 21' wide x 14' long. Water does not flow through it and there are no visible gaps. It is retaining sediment ranging in size from silt to sand and measures 10' wide, 40' long and 2' deep. There no fish upstream.
12875	0215.00	LDA #05 is made of 15 pieces of LWD and measures 5.5' tall x 14' wide x 16' long. Water does not flow through it and there are no visible gaps. It is retaining sediment ranging in size from silt to gravel and measures 14' wide x 30' long x 2' deep. There are no fish upstream.
12938	0217.00	The banks are currently void of vegetation.
13198	0226.00	LDA #06 is made of 12 pieces of LWD and measures 6' tall x 24' wide x 12' long. Water does not flow through it though there are visible gaps. It is retaining sediment ranging in size from silt to gravel and measures 12' wide x 40' long x 1' deep. There are no fish upstream.
13521	0230.00	LDA #07 is made of 3 pieces of LWD and measures 3' tall x 15' wide x 2' long. Water does not flow through it and there are no visible gaps. It is retaining sediment ranging in size from silt to gravel and measures 15' x wide x 40' long x 2' deep. There are no fish upstream.
13950	0238.00	LDA #08 is made of 1 piece of LWD and measures 5.5' tall x 13' wide x 4' long. Water does not flow through it and there are no visible gaps. It

Rohner Creek

		is retaining sediment ranging in size from silt to sand and measures 13' wide x 60' long x 3' deep. There are no fish upstream.
14220	0246.00	LDA #09 is made of 2 pieces of LWD and measures 5' tall x 24' wide x 7' long. Water does not flow through it and there are no visible gaps. It is retaining sediment ranging in size from silt to sand and measures 10' wide x 50' long x 2' deep. There are no fish upstream.
14565	0260.00	Tributary #03 enters on the right bank. The flow is contributing an estimated 50% of the downstream flow. The temperature downstream of the tributary is 55 degrees Fahrenheit, the temperature of the tributary is 55 degrees Fahrenheit, and the temperature upstream of the confluence is 56 degrees Fahrenheit. The slope of the tributary is 1% and fish are not observed in the 30' feet surveyed.
15191	0267.00	LDA #10 is made of 8 pieces of LWD and measures 4' tall x 20' wide x 25' long. Water does not flow through it though there are visible gaps. It's not retaining sediment. No fish are upstream.
15523	0274.00	LDA #11 is made of 9 pieces of LWD and measures 4' tall x 15' wide x 24' long. Water does not flow through it and there are no visible gaps. It is retaining sediment ranging in size from silt to gravel and measures 15' wide x 60' long x 2' deep. No fish are upstream.
15668	0280.00	LDA #12 is made of 3 pieces of LWD and measures 5' tall, 25' wide and 4' long. Water does not flow through it and there are no visible gaps. It is retaining sediment ranging in size from silt to sand and measures 15' wide x 40' long x 5' deep.
		LDA #13 is made of 11 pieces of LWD and measures 4.5' tall x 19' wide x 20' long. Water does not flow through it and there are no visible gaps. It is retaining sediment ranging in size from silt to gravel and measures 13' wide x 75' long x 4' deep. No fish are observed upstream.
15998	0284.00	LDA #14 is made of 11 pieces of LWD and measures 3.5' tall x 15' wide x 8' long. Water does not flow through it and there are no visible gaps. It is retaining sediment ranging in size from silt to sand and measures 14' wide x 13' long x 1' deep. No fish are upstream.
16246	0292.00	LDA #15 is made of 12 pieces of LWD and measures 7' tall x 20' wide x 35' long. Water does not flow through it and there are no visible gaps. It is retaining sediment ranging in size from silt to sand and measures 20' wide x 40' long x 5' deep. No fish are upstream.

Rohner Creek

16411	0295.00	The right bank is cut roughly 12' high x 10' long; resulting in a contribution of sediment ranging in size from silt to cobble.
16469	0297.00	For the next 88' the banks and stream are littered with fallen redwoods that have sprouted.
16488	0298.00	The canopy is 100% in this unit and consists entirely of fallen and sprouted redwoods.
16586	0301.00	Reach 4 begins and is a G6.
16614	0303.00	The right bank has an 8' high x 7' long cutbank. It is contributing sediment ranging in size from silt to sand.
16821	0312.00	There is a failed Humboldt crossing in this habitat unit.
16945	0317.00	There are 3 pieces of LWD in the stream laying parallel to the flow. On top of these logs are 2" x 8" planks laying perpendicular to the flow. The planks are 1.5' above the streambed. There is a deposit of silt on the tops of the planks.
17074	0318.00	LDA #16 is made of 5 pieces of LWD and measures 6' tall x 14' wide x 9' long. Water does not flow through it and there are no visible gaps. It is retaining sediment ranging in size from silt to gravel and measures 12' wide x 75' long x 4' deep. There are no fish upstream.
17307	0328.00	LDA #17 is made of 11 pieces of LWD and measures 6' tall x 14' wide x 25' long. Water does not flow through it and there are no visible gaps. It is retaining sediment ranging in size from silt to gravel and measures 10' wide x 30' long x 4' deep. There are no fish upstream.
17423	0334.00	LDA #18 is made of 9 pieces of LWD and measures 4.5' tall x 9' wide x 15' long. Water does not flow through it and there are no visible gaps. It is retaining sediment ranging in size from silt to sand and measures 7' wide x 40' long x 3' deep.
17588	0341.00	There is a 7' tall x 18' long cut on the right bank.
17606	0343.00	The pool tail out is a log and not sediment.
17651	0346.00	LDA #19 is made of 23 pieces of LWD and measures 8.5' tall x 18' wide x 43' long. Water does flow through visible gaps. It's not retaining sediment. The creek appears to be flowing 3.4' under the LDA.

Rohner Creek

17747	0349.00	Tributary #04 enters on the left bank. The flow contributes and estimated 1% of the downstream flow. The temperature downstream of the tributary is 54 degrees Fahrenheit, the temperature of the tributary is 53 degrees Fahrenheit, and the temperature upstream of the confluence is 53 degrees Fahrenheit. The slope of the tributary is 25% and are not observed in the 40' feet explored. The tributary is a 1' wide gully.
17834	0351.00	At the top of the unit, LWD form a pinch point creating a potential future LDA.
17927	0358.00	The canopy in this unit is a log.
17943	0360.00	LDA #20 is made of 14 pieces of LWD and measures 10' tall x 9' wide x 186' long. Water does flow through visible gaps. It is retaining sediment ranging in size from silt to sand and measures 3' wide, 50' long and 4' deep. The forest floor, on average is now 7' above the channel. The LDA has created a subterranean passage for Rohner Creek to flow through. A flag at the top of the unit declares this to be the Class I/Class II break.
18434	0376.00	LDA #21 is made of 15 pieces of LWD and measures 16' tall x 15' wide x 158' long. Water does not flow through it and there are no visible gaps. It is not retaining sediment. Living redwoods occupy the space from active channel to 15' above the water surface throughout the length of the LDA.
18592	0377.00	The creek disappears beneath 3 old growth logs.
18608	0378.00	We can periodically catch glimpses of the stream roughly 10' below us. It's not accessible to the crew. There appears to be a series of bedrock pools. There are 3 living redwoods laying lengthwise in the creek that are above the channel, blocking, covering and obstructing the channel.
18748	0383.00	The stream is not dry, it's under LWD.
18815	0387.00	The canopy in actually one old growth log.
18879	0390.00	The stream was unsurveyable due to LWD and bedrock; we could not follow the path of water. From the forest floor it appears there is no creek or stream channel at all; while in fact it is 9' below our feet.
18915	0391.00	LDA #22 is made of 19 pieces of LWD and measures 5' tall x 16 wide x 28' long. Water does not flow through it and there are no visible gaps. It is not retaining sediment. No fish are upstream.

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- 19131 0399.00 LDA #23 is made of 6 pieces of LWD and measures 4' tall x 13' wide x 19' long. Water does not flow through it and there are no visible gaps. It is retaining sediment ranging in size from silt to sand and measures 5' wide x 50' long x 2' deep. There are no fish upstream.
- 19160 0400.00 End of survey due to deteriorating habitat. All substrate referred to as bedrock throughout the survey is 'mudstone'. Visual observation 500' upstream shows the creek continuing to dwindle in size.

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.

Rohner 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: Rohner Creek

LLID: 1241598405903

Drainage: Eel River - Lower

Survey Dates: 8/3/2009 to 8/24/2009

Confluence Location: Quad: FORTUNA

Legal Description: T02NR01S03

Latitude: 40:35:25.0N

Longitude: 124:09:35.0

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
1	0	CULVERT	0.3	80	80	0.4									
89	0	DRY	22.3	65	5761	30.0									
102	24	FLATWATER	25.5	48	4874	25.4	5.7	0.6	1.0	210	21437	150	15311		18
8	0	NOSURVEY	2.0	119	954	5.0									
1	0	NOSURVEY_	0.3	16	16	0.1									
156	156	POOL	39.0	38	5931	30.9	8.6	1.1	2.0	353	55011	519	81001	469	18
43	10	RIFFLE	10.8	36	1557	8.1	6.7	0.2	0.5	120	5171	32	1364		25
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)		Total Volume (cu.ft.)			
400	190				19173					81619		97676			

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Rohner Creek

LLID: 1241598405903

Drainage: Eel River - Lower

Survey Dates: 8/3/2009 to 8/24/2009

Confluence Location: Quad: FORTUNA

Legal Description: T02NR01S03

Latitude: 40:35:25.0N

Longitude: 124:09:35.0W

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 (%)
38	6	LGR	9.5	35	1339	7.0	8	0.3	0.9	144	5483	42	1606		8	90
4	3	HGR	1.0	39	157	0.8	5	0.2	0.4	31	124	5	20		75	94
1	1	BRS	0.3	61	61	0.3	4	0.2	0.4	244	244	49	49		0	61
6	3	GLD	1.5	55	331	1.7	6	0.8	1.7	569	3416	582	3494		3	96
56	13	RUN	14.0	32	1785	9.3	6	0.5	1.6	100	5594	54	3009		15	92
40	8	SRN	10.0	69	2758	14.4	5	0.6	1.8	255	10187	145	5785		26	96
3	3	TRP	0.8	186	557	2.9	10	1.7	5.3	1932	5795	5172	15517	4719	12	94
138	138	MCP	34.5	35	4897	25.5	9	1.1	5	329	45351	446	61588	403	18	93
4	4	STP	1.0	39	157	0.8	8	0.8	2.2	302	1210	283	1131	249	31	95
2	2	LSBk	0.5	62	124	0.6	7	1.0	2.1	425	849	481	963	414	18	73
1	1	LSBo	0.3	42	42	0.2	8	0.6	1.2	319	319	255	255	192	20	69
8	8	PLP	2.0	19	154	0.8	9	1.1	3	186	1486	193	1547	183	21	93
89	0	DRY	22.3	65	5761	30.0										99
1	0	CUL	0.3	80	80	0.4										
8	0	NS	2.0	119	954	5.0										95
1	0	MAR	0.3	16	16	0.1										

Total Units
400

Total Units Fully Measured
190

Total Length (ft.)
19173

Total Area (sq.ft.)
80059

Total Volume (cu.ft.)
94964

Table 3 - Summary of Pool Types

Stream Name: Rohner Creek

LLID: 1241598405903

Drainage: Eel River - Lower

Survey Dates: 8/3/2009 to 8/24/2009

Confluence Location: Quad: FORTUNA

Legal Description: T02NR01S03

Latitude: 40:35:25.0N

Longitude: 124:09:35.0W

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
145	145	MAIN	93	39	5611	95	8.6	1.1	361	52356	488	70761	18
11	11	SCOUR	7	29	320	5	8.8	1.0	241	2655	225	2480	20

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
156	156	5931	55011	73241

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

Stream Name: Rohner Creek LLID: 1241598405903 Drainage: Eel River - Lower
 Survey Dates: 8/3/2009 to 8/24/2009
 Confluence Location: Quad: FORTUNA Legal Description: T02NR01S03 Latitude: 40:35:25.0N Longitude: 124:09:35.0W

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
3	TRP	2	0	0	1	33	1	33	0	0	1	33
138	MCP	88	4	3	78	57	40	29	13	9	3	2
4	STP	3	0	0	2	50	2	50	0	0	0	0
2	LSBk	1	0	0	0	0	2	100	0	0	0	0
1	LSBo	1	0	0	1	100	0	0	0	0	0	0
8	PLP	5	0	0	6	75	1	13	1	13	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
156	4	3	88	56	46	29	14	9	4	3

Mean Maximum Residual Pool Depth (ft.): 2

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Rohner Creek

LLID: 1241598405903

Drainage: Eel River - Lower

Survey Dates: 8/3/2009 to 8/24/2009

Dry Units: 89

Confluence Location: Quad: FORTUNA

Legal Description: T02NR01S03

Latitude: 40:35:25.0N

Longitude: 124:09:35.0W

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
38	7	LGR	0	0	0	0	25	0	0	75	0
4	3	HGR	0	0	0	0	0	0	0	100	0
1	1	BRS	0	0	0	0	0	0	0	0	0
43	11	TOTAL RIFFLE	0	0	0	0	14	0	0	86	0
6	3	GLD	0	0	0	0	100	0	0	0	0
56	13	RUN	0	19	71	0	10	0	0	0	0
40	8	SRN	10	41	37	0	8	0	0	4	0
102	24	TOTAL FLAT	4	27	51	0	17	0	0	2	0
3	3	TRP	53	20	8	15	5	0	0	0	0
138	138	MCP	24	16	32	9	11	1	0	7	1
4	4	STP	23	0	40	5	8	0	0	0	25
2	2	LSBk	48	0	25	23	0	0	0	5	0
1	1	LSBo	0	0	0	0	0	0	0	100	0
8	8	PLP	22	0	78	0	0	0	0	0	0
156	156	TOTAL POOL	24	14	34	9	10	1	0	7	2
1	0	CUL									
8	0	NS									
1	0	MAR									
400	191	TOTAL	21	15	33	8	11	1	0	10	1

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Rohner Creek

LLID: 1241598405903

Drainage: Eel River - Lower

Survey Dates: 8/3/2009 to 8/24/2009

Dry Units: 89

Confluence Location: Quad: FORTUNA

Legal Description: T02NR01S03

Latitude: 40:35:25.0N

Longitude: 124:09:35.0W

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
38	6	LGR	0	0	33	17	17	33	0
4	3	HGR	0	0	0	0	0	100	0
1	1	BRS	0	0	0	0	0	0	100
6	3	GLD	100	0	0	0	0	0	0
56	13	RUN	92	0	8	0	0	0	0
40	8	SRN	100	0	0	0	0	0	0
3	3	TRP	100	0	0	0	0	0	0
138	138	MCP	93	1	2	3	1	1	0
4	4	STP	75	0	0	0	0	0	25
2	2	LSBk	0	0	50	50	0	0	0
1	1	LSBo	0	0	0	0	0	100	0
8	8	PLP	75	0	13	0	13	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: Rohner Creek

LLID: 1241598405903

Drainage: Eel River - Lower

Survey Dates: 8/3/2009 to 8/24/2009

Confluence Location: Quad: FORTUNA

Legal Description: T02NR01S03

Latitude: 40:35:25.0N

Longitude: 124:09:35.0W

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
93	38	62	0	96	97

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: Rohner Creek LLID: 1241598405903 Drainage: Eel River - Lower
 Survey Dates: 8/3/2009 to 8/24/2009 Survey Length (ft.): 19173 Main Channel (ft.): 19173 Side Channel (ft.): 0
 Confluence Location: Quad: FORTUNA Legal Description: T02NR01S03 Latitude: 40:35:25.0N Longitude: 124:09:35.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type: F6	Canopy Density (%): 89.4	Pools by Stream Length (%): 41.9
Reach Length (ft.): 8096	Coniferous Component (%): 13.9	Pool Frequency (%): 42.3
Riffle/Flatwater Mean Width (ft.): 8.1	Hardwood Component (%): 86.1	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Hardwood Trees	< 2 Feet Deep: 65
Range (ft.): 9 to 18	Vegetative Cover (%): 95.1	2 to 2.9 Feet Deep: 27
Mean (ft.): 14	Dominant Shelter: Undercut Banks	3 to 3.9 Feet Deep: 7
Std. Dev.: 2	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 2
Base Flow (cfs.): 0.0	Occurrence of LWD (%): 3	Mean Max Residual Pool Depth (ft.): 1.9
Water (F): 58 - 62 Air (F): 56 - 68	LWD per 100 ft.:	Mean Pool Shelter Rating: 11
Dry Channel (ft): 26	Riffles: 0	
	Pools: 1	
	Flat: 1	
Pool Tail Substrate (%): Silt/Clay: 13 Sand: 5 Gravel: 52 Sm Cobble: 12 Lg Cobble: 5 Boulder: 7 Bedrock: 7		
Embeddedness Values (%): 1. 15.0 2. 50.0 3. 5.0 4. 5.0 5. 25.0		

STREAM REACH: 2

Channel Type: N/A	Canopy Density (%):	Pools by Stream Length (%): 0.0
Reach Length (ft.): 725	Coniferous Component (%):	Pool Frequency (%): 0.0
Riffle/Flatwater Mean Width (ft.):	Hardwood Component (%):	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation:	< 2 Feet Deep:
Range (ft.): 10 to 10	Vegetative Cover (%): 0.0	2 to 2.9 Feet Deep:
Mean (ft.): 10	Dominant Shelter:	3 to 3.9 Feet Deep:
Std. Dev.: 0	Dominant Bank Substrate Type:	>= 4 Feet Deep:
Base Flow (cfs.): 0.0	Occurrence of LWD (%):	Mean Max Residual Pool Depth (ft.):
Water (F): 61 - 61 Air (F): 68 - 68	LWD per 100 ft.:	Mean Pool Shelter Rating:
Dry Channel (ft): 0	Riffles:	
	Pools:	
	Flat:	
Pool Tail Substrate (%): Silt/Clay: Sand: Gravel: Sm Cobble: Lg Cobble: Boulder: Bedrock:		
Embeddedness Values (%): 1. 2. 3. 4. 5. 0.0		

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 3

Channel Type: F6	Canopy Density (%): 94.0	Pools by Stream Length (%): 23.5
Reach Length (ft.): 7765	Coniferous Component (%): 48.3	Pool Frequency (%): 39.5
Riffle/Flatwater Mean Width (ft.): 4.7	Hardwood Component (%): 51.7	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Coniferous Trees	< 2 Feet Deep: 48
Range (ft.): 5 to 16	Vegetative Cover (%): 96.4	2 to 2.9 Feet Deep: 34
Mean (ft.): 11	Dominant Shelter: Large Woody Debris	3 to 3.9 Feet Deep: 15
Std. Dev.: 3	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 3
Base Flow (cfs.): 0.0	Occurrence of LWD (%): 29	Mean Max Residual Pool Depth (ft.): 2.1
Water (F): 55 - 61 Air (F): 58 - 68	LWD per 100 ft.:	Mean Pool Shelter Rating: 15
Dry Channel (ft): 4730	Riffles: 2	
	Pools: 9	
	Flat: 5	
Pool Tail Substrate (%): Silt/Clay: 41 Sand: 5 Gravel: 43 Sm Cobble: 6 Lg Cobble: 2 Boulder: 0 Bedrock: 3		
Embeddedness Values (%): 1. 0.0 2. 7.9 3. 6.3 4. 33.3 5. 52.4		

STREAM REACH: 4

Channel Type: G6	Canopy Density (%): 96.5	Pools by Stream Length (%): 27.8
Reach Length (ft.): 2587	Coniferous Component (%): 58.2	Pool Frequency (%): 34.0
Riffle/Flatwater Mean Width (ft.): 4.2	Hardwood Component (%): 41.8	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Coniferous Trees	< 2 Feet Deep: 68
Range (ft.): 5 to 13	Vegetative Cover (%): 99.0	2 to 2.9 Feet Deep: 26
Mean (ft.): 9	Dominant Shelter: Large Woody Debris	3 to 3.9 Feet Deep: 3
Std. Dev.: 2	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 3
Base Flow (cfs.): 0.0	Occurrence of LWD (%): 54	Mean Max Residual Pool Depth (ft.): 1.9
Water (F): 52 - 54 Air (F): 52 - 70	LWD per 100 ft.:	Mean Pool Shelter Rating: 37
Dry Channel (ft): 1005	Riffles: 20	
	Pools: 18	
	Flat: 14	
Pool Tail Substrate (%): Silt/Clay: 50 Sand: 0 Gravel: 29 Sm Cobble: 12 Lg Cobble: 3 Boulder: 0 Bedrock: 6		
Embeddedness Values (%): 1. 0.0 2. 0.0 3. 5.9 4. 32.4 5. 61.8		

Table 9 - Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Rohner Creek

LLID: 1241598405903

Drainage: Eel River - Lower

Survey Dates: 8/3/2009 to 8/24/2009

Confluence Location: Quad: FORTUNA

Legal Description: T02NR01S03

Latitude: 40:35:25.0N

Longitude: 124:09:35.0W

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	15	15	7.9
Boulder	5	1	1.6
Cobble / Gravel	0	0	0.0
Sand / Silt / Clay	170	174	90.5

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	1	0.8
Brush	54	40	24.7
Hardwood Trees	72	83	40.8
Coniferous Trees	58	65	32.4
No Vegetation	4	1	1.3

Total Stream Cobble Embeddedness Values: 4

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

StreamName: Rohner Creek

LLID: 1241598405903

Drainage: Eel River - Lower

Survey Dates: 8/3/2009 to 8/24/2009

Confluence Location: Quad: FORTUNA

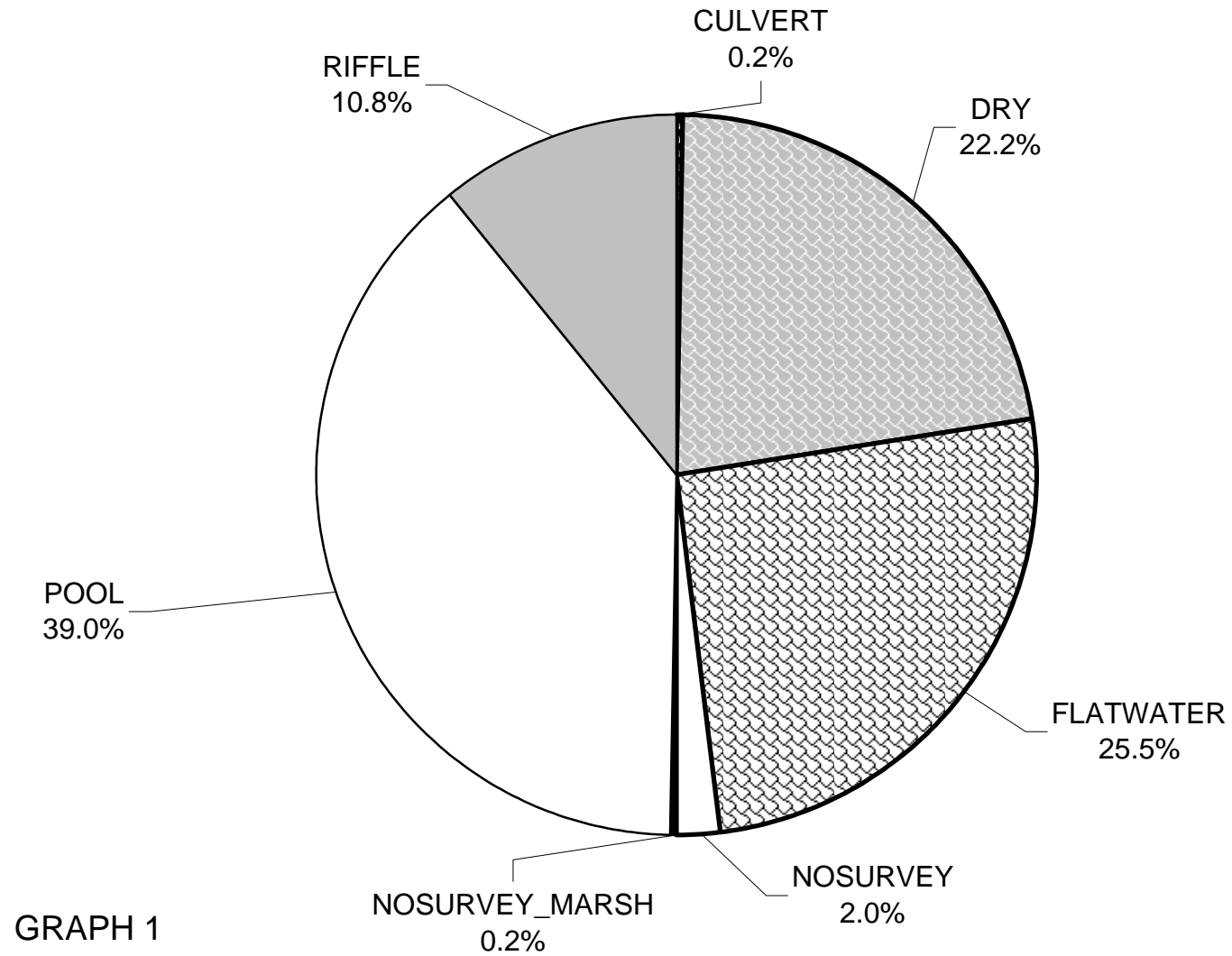
Legal Description: T02NR01S03

Latitude: 40:35:25.0N

Longitude: 124:09:35.0W

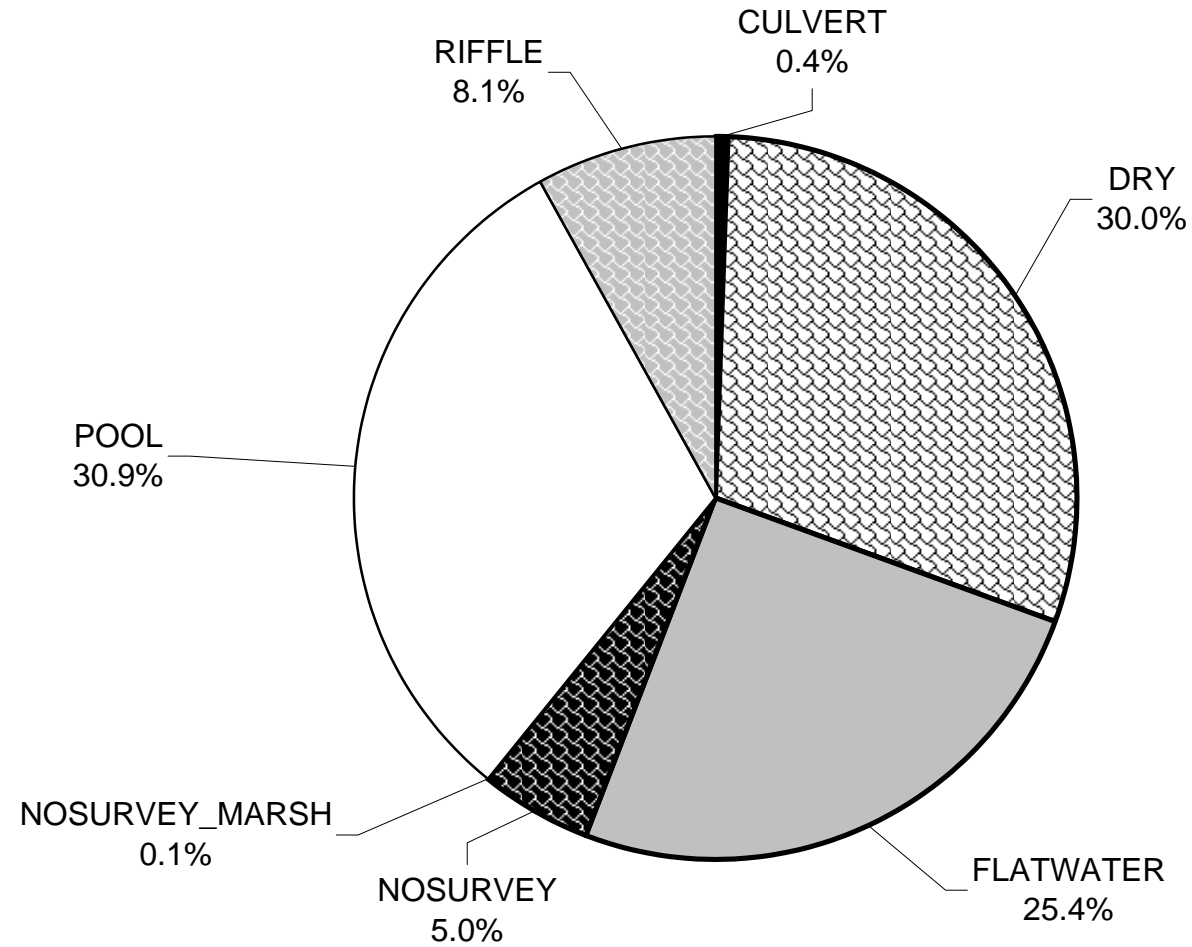
	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	4	24
SMALL WOODY DEBRIS (%)	0	27	14
LARGE WOODY DEBRIS (%)	0	51	34
ROOT MASS (%)	0	0	9
TERRESTRIAL VEGETATION (%)	14	17	10
AQUATIC VEGETATION (%)	0	0	1
WHITEWATER (%)	0	0	0
BOULDERS (%)	86	2	7
BEDROCK LEDGES (%)	0	0	2

ROHNER CREEK 2009 HABITAT TYPES BY PERCENT OCCURRENCE



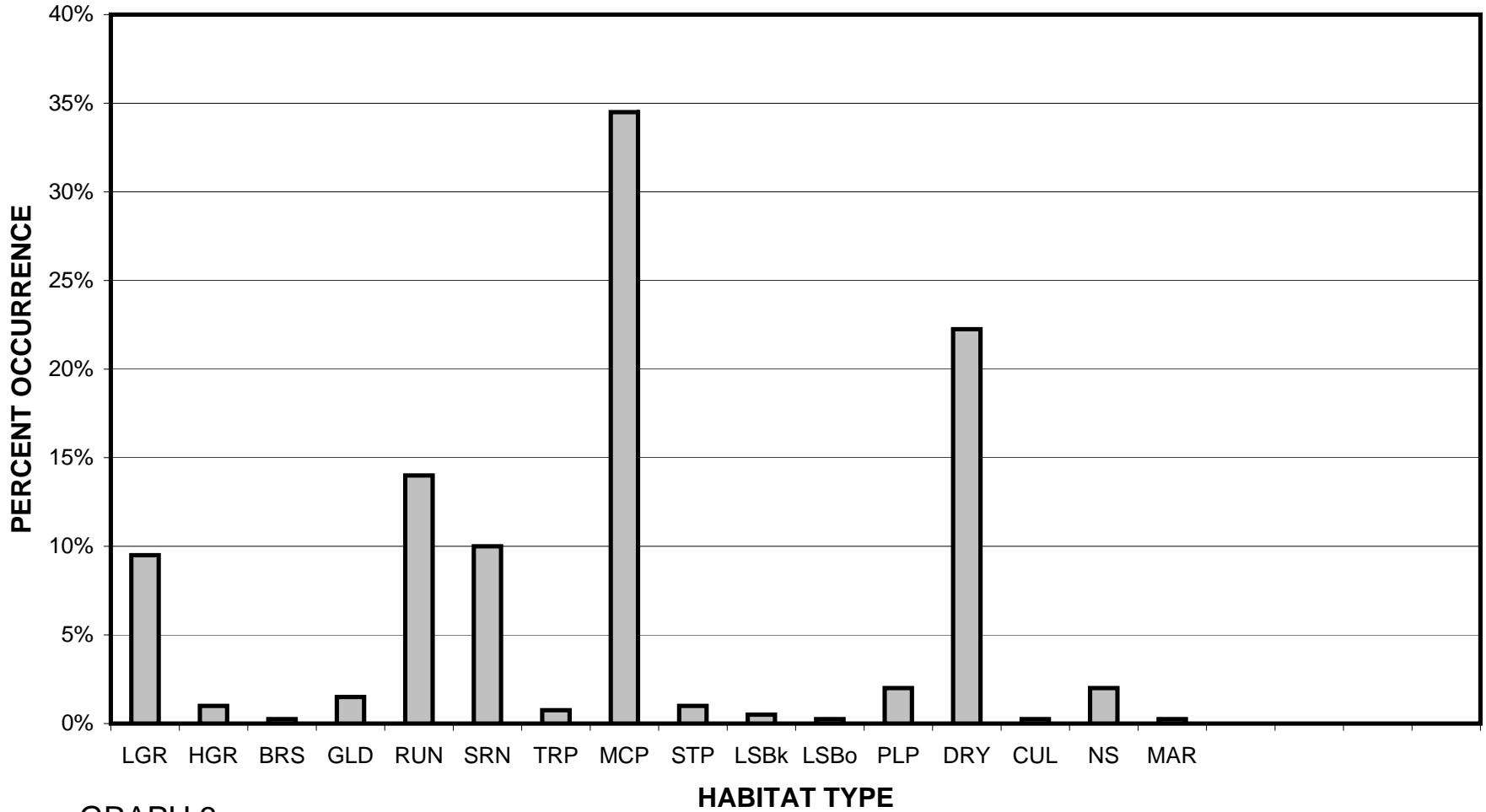
GRAPH 1

ROHNER CREEK 2009 HABITAT TYPES BY PERCENT TOTAL LENGTH



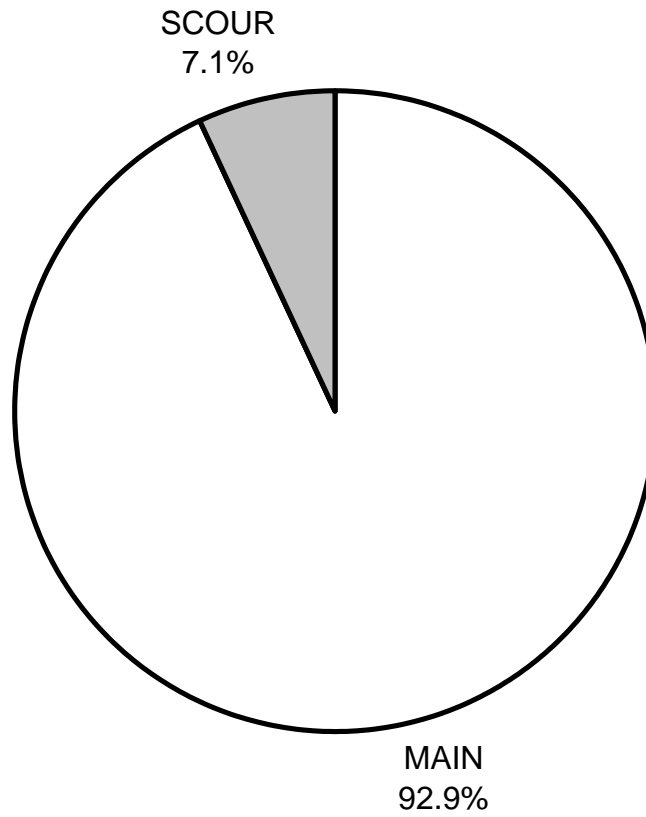
GRAPH 2

ROHNER CREEK 2009 HABITAT TYPES BY PERCENT OCCURRENCE



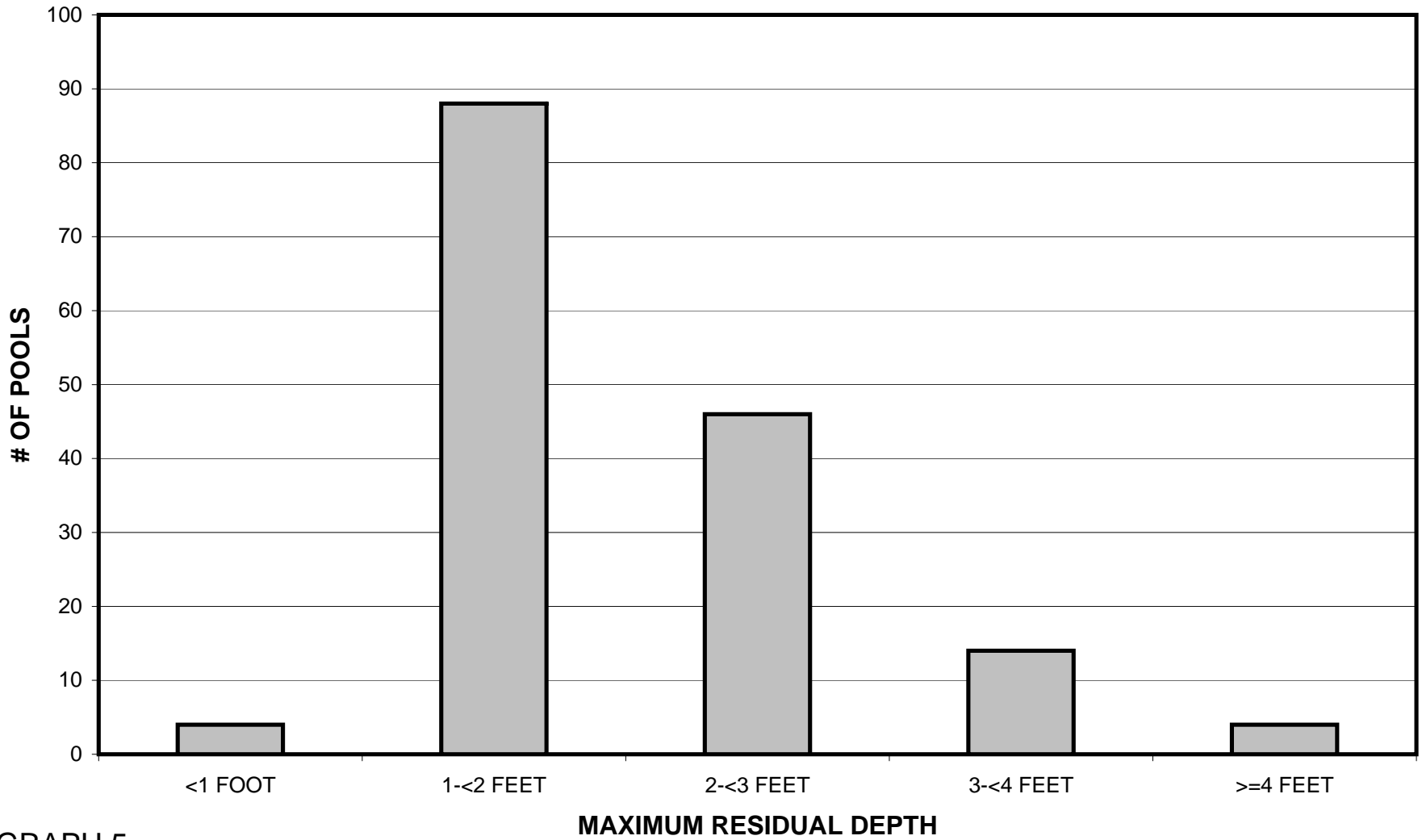
GRAPH 3

**ROHNER CREEK 2009
POOL TYPES BY PERCENT OCCURRENCE**



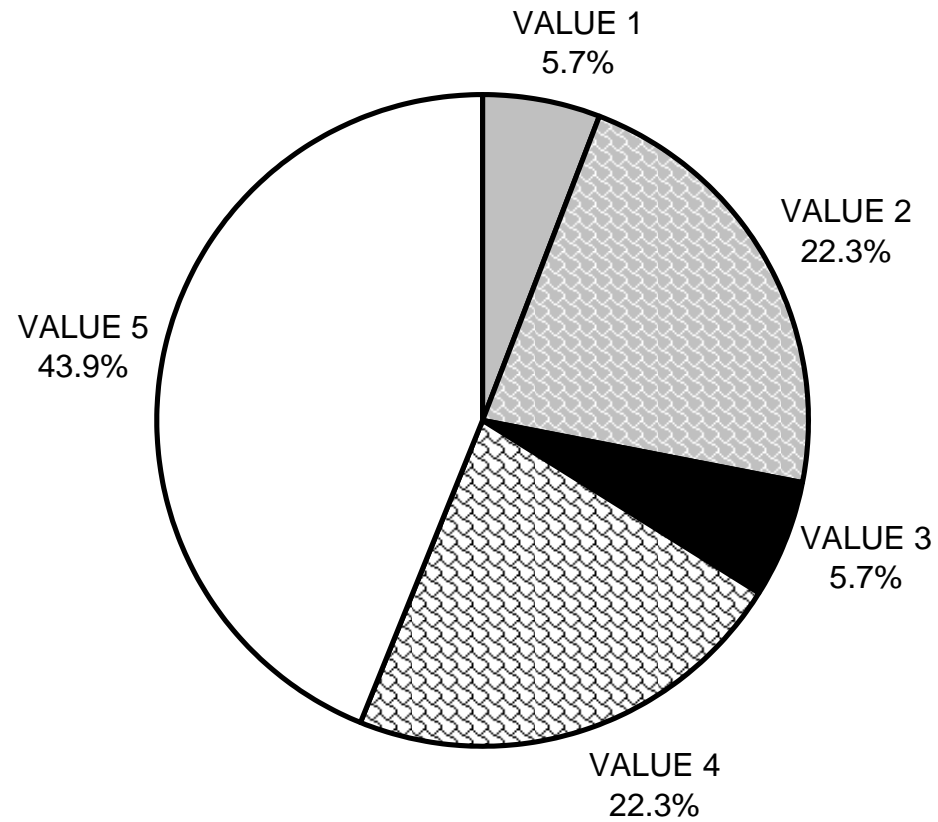
GRAPH 4

ROHNER CREEK 2009 MAXIMUM DEPTH IN POOLS



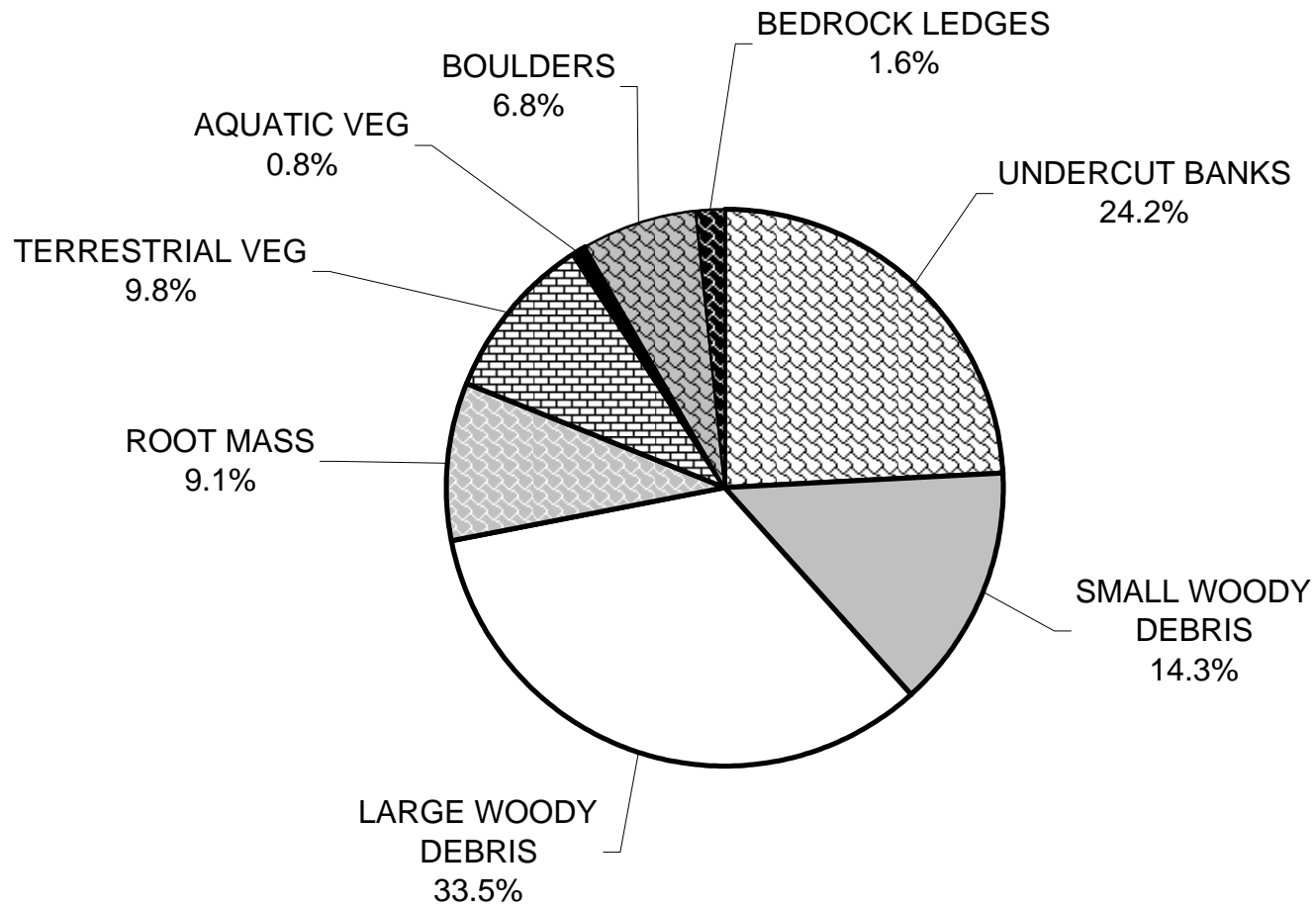
GRAPH 5

ROHNER CREEK 2009 PERCENT EMBEDDEDNESS



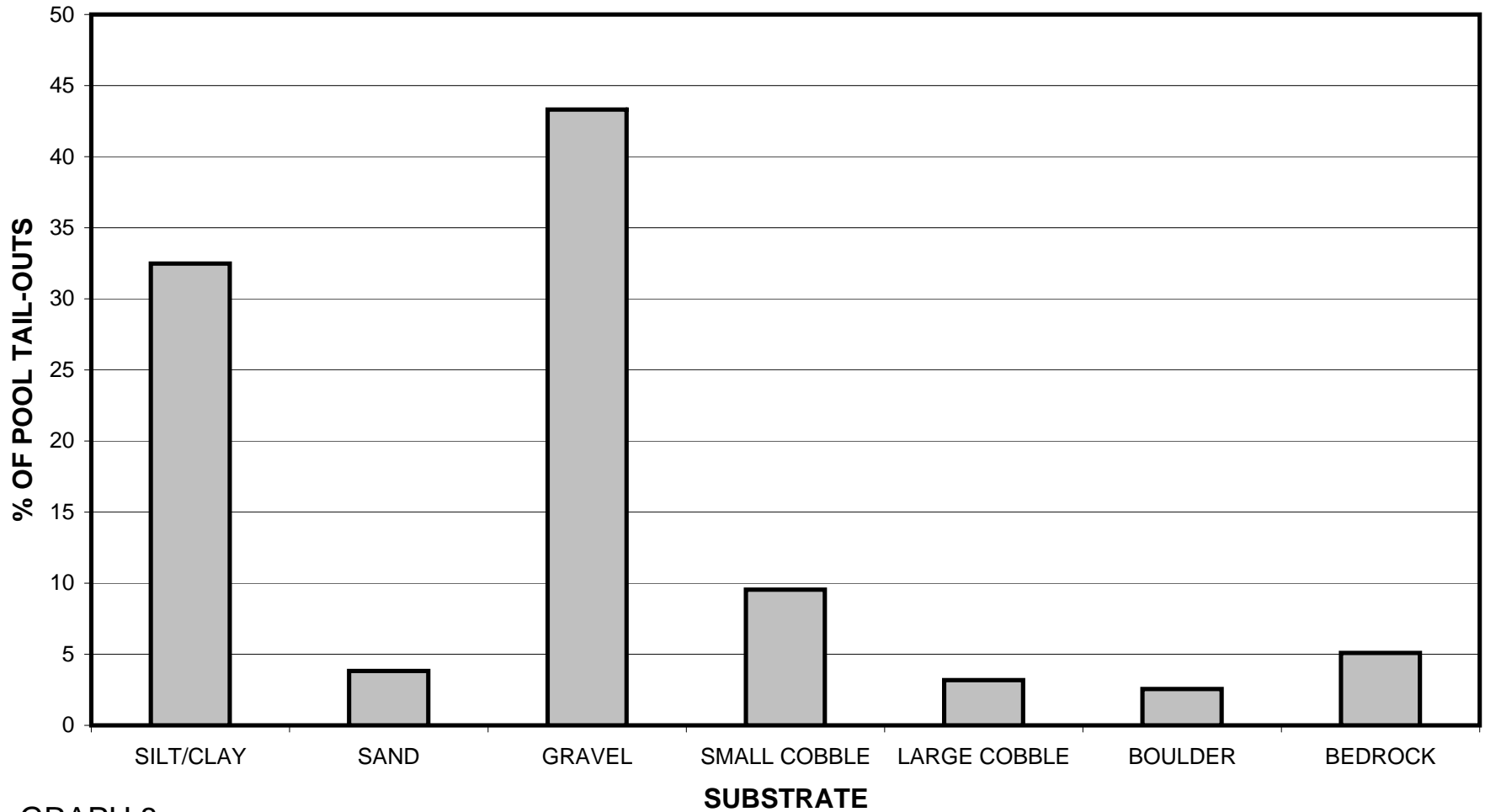
GRAPH 6

ROHNER CREEK 2009 MEAN PERCENT COVER TYPES IN POOLS



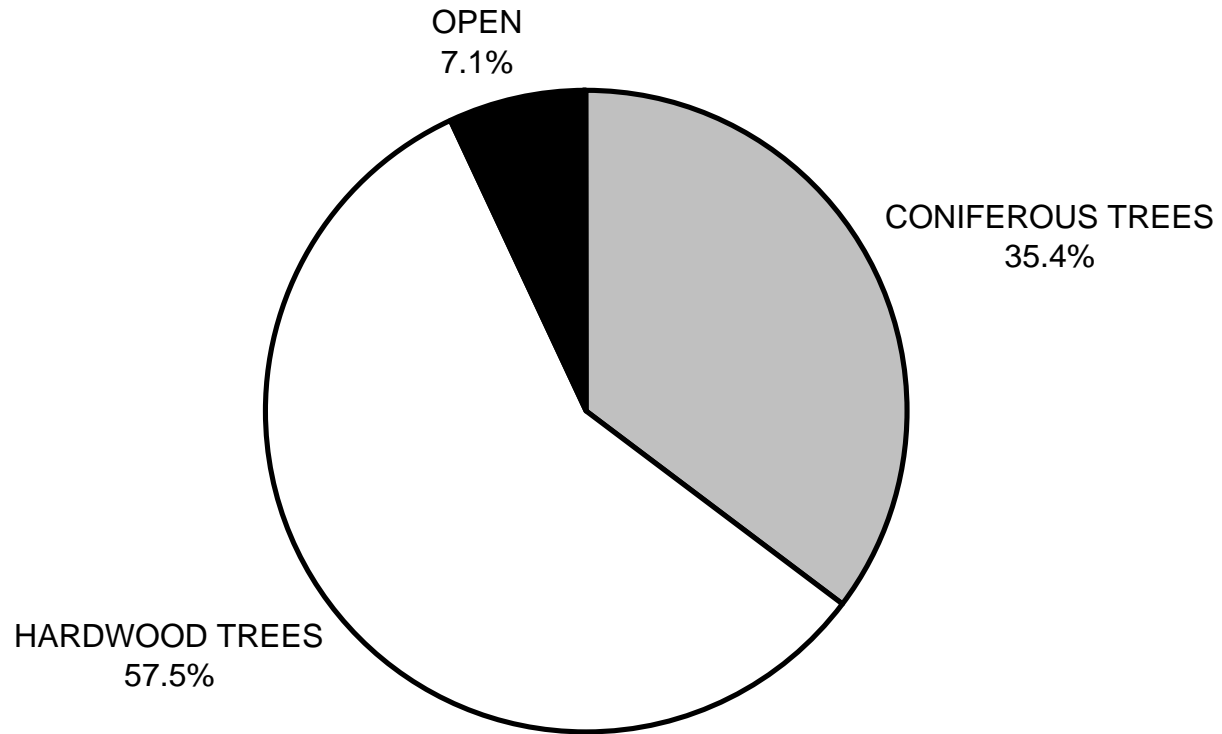
GRAPH 7

ROHNER CREEK 2009 SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



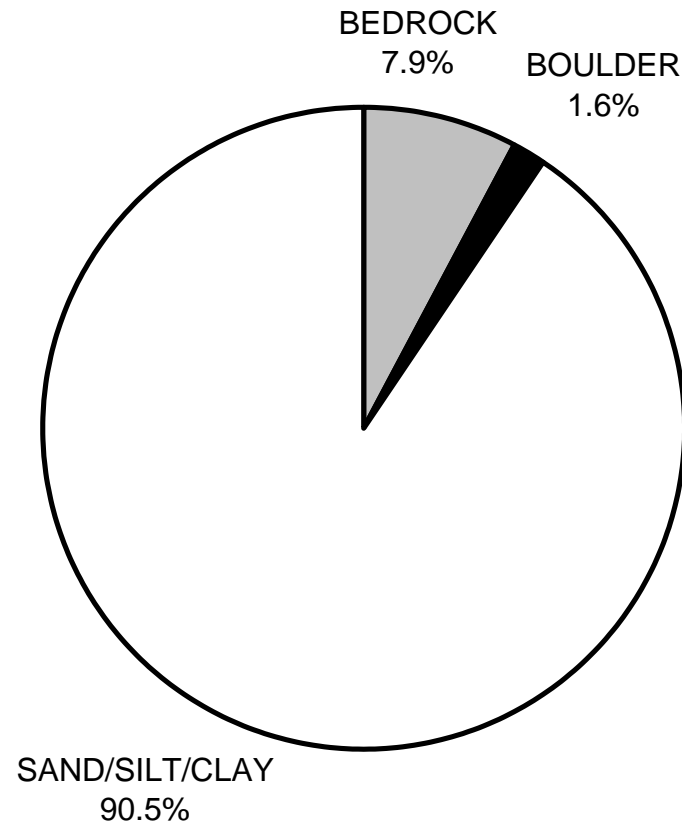
GRAPH 8

ROHNER CREEK 2009 MEAN PERCENT CANOPY



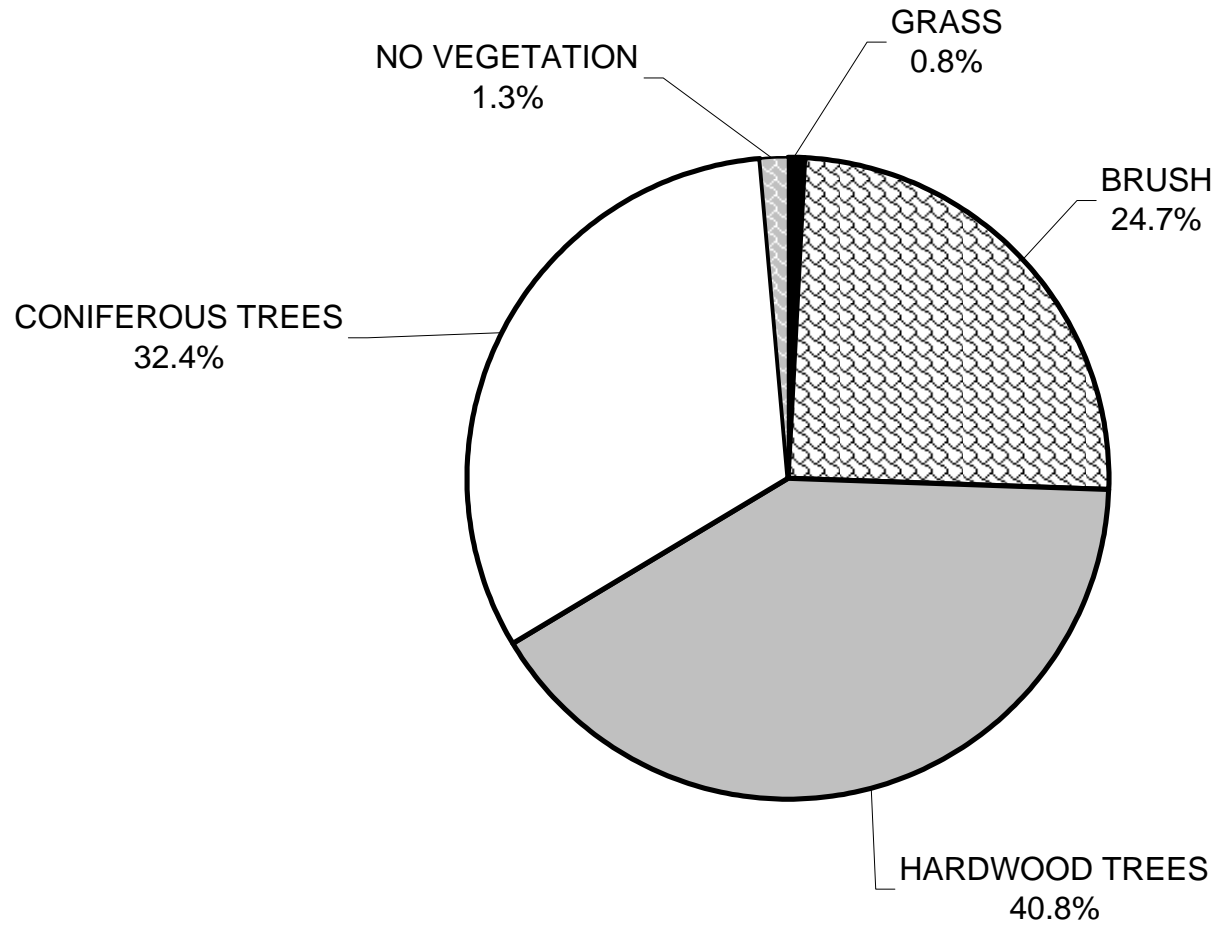
GRAPH 9

**ROHNER CREEK 2009
DOMINANT BANK COMPOSITION IN SURVEY REACH**



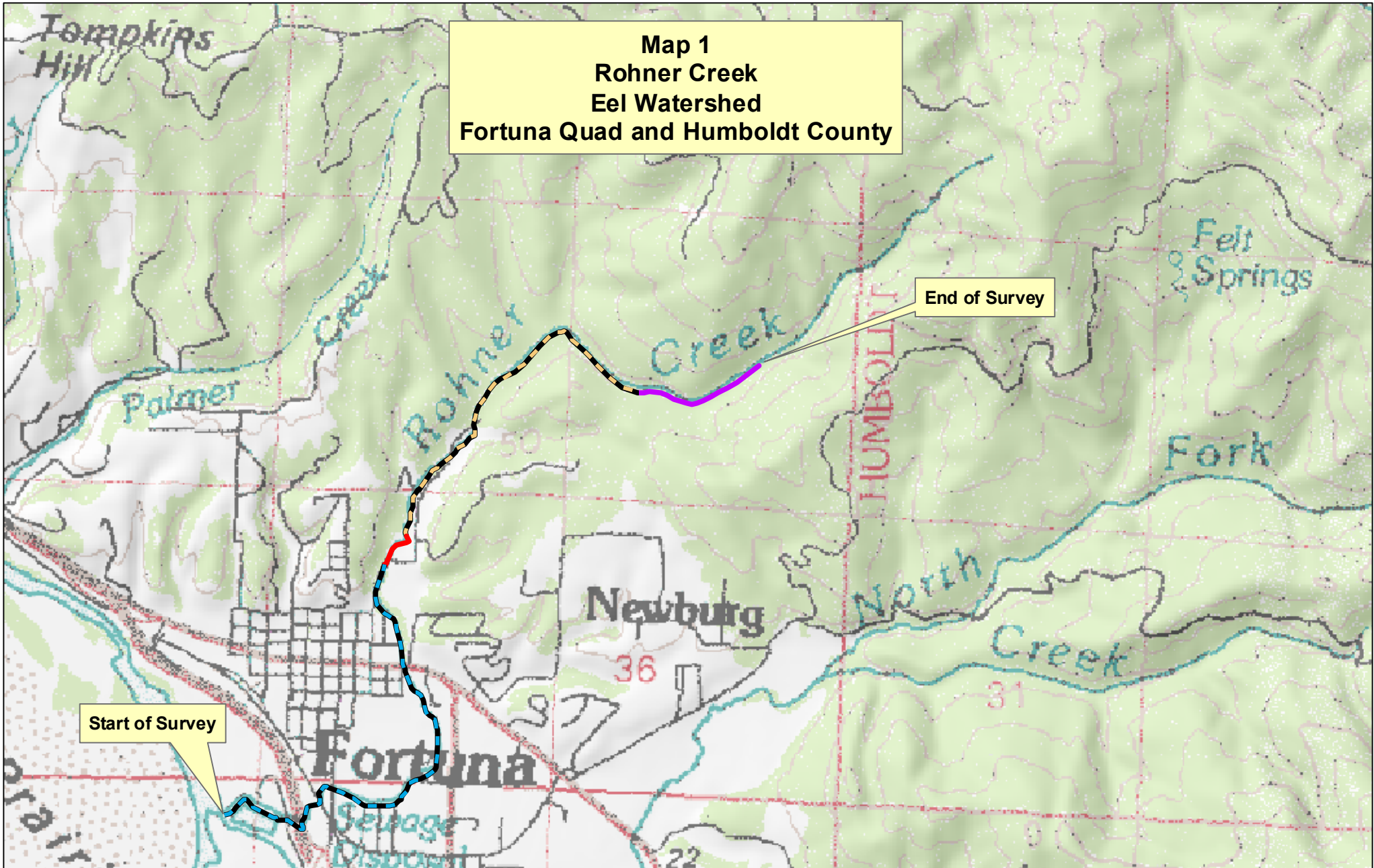
GRAPH 10

ROHNER CREEK 2009 DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11

**Map 1
Rohner Creek
Eel Watershed
Fortuna Quad and Humboldt County**



Start of Survey

End of Survey



Legend

- Reach 1, F6 Channel Type
- Reach 2, Not Surveyed
- Reach 3, F6 Channel Type
- Reach 4, G6 Channel Type

