Stream Inventory Report

Finley Creek

Salmon Creek Watershed
Sonoma County, California

Survey: Summer 2002
Final Report: September, 2004

California Department of Fish and Game
Central Coast Region
Watershed Restoration Program

2003

CALIFORNIA DEPARTMENT OF FISH AND GAME
STREAM INVENTORY REPORT
Finley Creek

INTRODUCTION

A stream inventory was conducted during the summer of 2002 on Finley Creek, a tributary to Salmon Creek in the Salmon Creek watershed, southern Sonoma County. The inventory was conducted in two parts: habitat inventory and biological inventory. The objective of the habitat inventory was to document the amount and condition of available habitat to fish, and other aquatic species with an emphasis on anadromous salmonids in Finley Creek.

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

WATERSHED OVERVIEW

Finley Creek is located in Sonoma County, California and is a tributary to Salmon Creek. The legal description at the confluence with Salmon Creek is T06N R11W Section Bodega. Its location is 38.3601553°N latitude and 123.0176093°W longitude. Year round vehicle access exists from Salmon Creek Road via Bodega Highway near the town of Bodega.

Finley Creek and its tributaries drain a basin of approximately 2.86 square miles. Finley Creek is a maximum 1st order stream and has approximately 3.27 miles of blue line or dashed blue line stream, according to the USGS Bodega Head 7.5 minute quadrangles. Finley Creek has 8 minor unnamed tributaries, which were not surveyed but their locations were noted. Elevations range from about 197’ at the mouth of the creek to 224’ in the headwaters. Grasslands, mixed hardwood, and coniferous forests dominate the watershed. The watershed is primarily privately owned and is managed for rangeland and recreation. Development is rural residential.

Salmonid fish species historically present include coho salmon (*Oncorhynchus kisutch)* and steelhead trout*(Oncorhynchus mykiss)*. Salmonid fish species currently present include steelhead trout*(Oncorhynchus mykiss)* which is listed as threatened on the

federal endangered species list.

METHODS

The habitat inventory conducted in Finley 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) field crew that conducted the inventory was trained in standardized habitat inventory methods by DFG. This inventory was conducted by 2 person teams and was supervised by DFG's North Bay Watershed Restoration Planner, Gail Seymour.

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 Finley Creek to record measurements and observations. There are nine components to the inventory form: flow, channel type, temperatures, habitat type, embeddedness, shelter rating, substrate composition, canopy, and bank composition.

1. Flow:

Flow is measured in cubic feet per second (cfs) at the bottom of the stream survey reach using standard flow measuring equipment, if available. In some cases flows are estimated. Flows were also measured or estimated at major tributary confluences.

2. Channel Type:

Channel typing is conducted according to the classification system developed and revised by David Rosgen (1985 rev. 1994). This methodology is described in the California Salmonid Stream Habitat Restoration Manual. Channel typing is conducted

simultaneously with habitat typing and follows a standard form to record measurements and observations. There are five measured parameters used to determine channel type: 1) water slope gradient, 2) entrenchment, 3) width/depth ratio, 4) substrate composition, and 5) sinuosity. Channel characteristics are measured using a clinometer, hand level, hip chain, tape measure, and a stadia rod.

3. Temperatures:

Water and air temperatures, and time, are measured by crew members with hand held thermometers and recorded at each tenth unit typed. Temperatures are measured in Fahrenheit at the middle of the habitat unit and within one foot of the water surface.

4. Habitat Type:

Habitat typing uses the 24 habitat classification types defined by McCain and others (1988). Habitat units are numbered sequentially and assigned a type identification number selected from a standard list of 24 habitat types. Dewatered units are labeled dry. Finley 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 were in feet to the nearest tenth. All measurements are in feet to the nearest tenth. Habitat characteristics are measured using a hip chain, and stadia rod.

5. Embeddedness:

The depth of embeddedness of the cobbles in pool tail-out reaches is measured by the percent of the cobble that is surrounded or buried by fine sediment. In Finley Creek, embeddedness was visually estimated. The values were recorded using the following ranges: 0 - 25% (value 1), 26 - 50% (value 2), 51 - 75% (value 3), 76 - 100% (value 4). Additionally, a rating of "not suitable" (value 5) was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate particle size, having a bedrock tail-out, or other considerations.

6. Shelter Rating:

Instream shelter is composed of those elements within a stream channel that provide salmonids protection from predation, reduce water velocities so fish can rest and conserve energy, and allow separation of territorial units to reduce density related competition. Using an overhead view, a quantitative estimate of

the percentage of the habitat unit covered is made. All shelter is then classified according to a list of nine shelter types. In Finley Creek, a standard qualitative shelter value of 0 (none), 1 (low), 2 (medium), or 3 (high) was assigned according to the complexity of the shelter. The shelter rating is calculated for each habitat unit by multiplying shelter value and percent covered. Thus, shelter ratings can range from 0-300, and are expressed as mean values by habitat types within a stream.

7. Substrate Composition:

Substrate composition ranges from silt/clay sized particles to boulders and bedrock elements. In all fully measured habitat units, dominant and sub-dominant substrate elements were visually estimated using a list of seven size classes which are defined in the California Salmonid Stream Habitat Restoration Manual.

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 Finley Creek, an estimate of the percentage of the habitat unit covered by canopy was made from the top 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 visually into percentages of evergreen or deciduous trees.

9. Bank Composition and Vegetation:

Bank composition elements range from bedrock to bare soil. However, the stream banks are usually covered with grass, brush, or trees. These factors influence the ability of stream banks to withstand winter flows. In Finley Creek, the dominant composition type and the dominant vegetation type of both the right and left banks for each fully measured 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.

BIOLOGICAL INVENTORY

Biological sampling during stream inventory is used to determine fish species and their distribution in the stream. Biological inventory is conducted using one or more of three basic methods: 1) stream bank observation, 2) underwater observation, 3) electro fishing. These sampling techniques are discussed in the California

Salmonid Stream Habitat Restoration Manual.

BIOLOGICAL INVENTORY

Biological sampling during stream inventory is used to determine fish species and their distribution in the stream. Biological inventory is conducted using one or more of four basic methods: 1) stream bank observation, 2) underwater observation, 3) electro fishing, or 4) seine netting. Methods 1-3 are discussed in the California Salmonid Stream Habitat Restoration Manual. Seine netting is a fish capture technique that involves the use of a one meter square net attached to dowels on two parallel sides. The surveyor pushes the seine through the habitat unit to catch aquatic organisms. At the end of the unit the surveyor scoops up the seine and places all captured organisms in a bucket partially filled with stream water for holding. The water is aerated with a bubbler to maintain dissolved oxygen levels and minimize stress on the organisms. All fish, amphibians, and reptiles in the holding bucket are identified to species, counted and returned to the steam. Data is recorded on an electrofishing field form. Seine netting is used to confirm the presence of a species, particularly salmon and steelhead, and is not intended to quantify a population estimate.

IMPACT INVENTORY & ANALYSIS

Problems such as migration barriers, streambed erosion, poor water quality or temperatures are noted in the comments and landmarks section. In some cases measurements are taken, an analysis of what caused the problem is made and restoration potential and alternatives are recommended.

DATA ANALYSIS

Data from the habitat inventory form are entered into Habitat for data storage and analysis. Habitat is a Visual Basic extension to Microsoft Access, developed by Zebulon Young, University of California, Berkeley. This program processes and summarizes the data, and produces the following tables and appendices:

- Summary of riffle, flatwater, and pool habitat types
- Summary of habitat types and measured parameters
- Summary of pool types
- Summary of maximum pool depths by pool habitat types
- Summary of shelter by habitat types
- Summary of dominant substrates by habitat types

- Summary of fish habitat elements by stream reach

Graphics are produced from the tables using Microsoft Excel. Graphics developed for Finley Creek include:

- Level II habitat types by % occurrence
- Level II habitat types by % total length
- Level IV habitat types by % occurrence
- Level I pool habitat types by % occurrence
- Maximum depth in pools
- Percent embeddedness estimated in pool tail-outs
- Mean percent cover types in pools
- Substrate composition in pool tail-outs
- Mean percent canopy
- Dominant bank composition in survey reach
- Dominant bank vegetation in survey reach

HISTORICAL STREAM SURVEYS:

The Department of Fish and Game has not conducted previous surveys of Finley Creek.

HABITAT INVENTORY RESULTS FOR FINLEY CREEK

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

The habitat inventory of Finley Creek (Sonoma County), 6/28/2002 - 7/22/2003, was conducted by D. Mitchel, J. Presnell and L. Earthman with supervision and analysis by California Department of Fish and Game (DFG). The survey began at the confluence with Salmon Creek and extended up Finley Creek to the end of anadromous fish passage at a rock falls. The total length of stream surveyed was 16,209 feet, with an additional 153 feet of side channel.

Flows were not measured on Finley Creek. Very little flow was observed throughout the creek during this low rainfall year.

The surveyed section of Finley Creek has 4 reaches with 4 distinct channel types: from the mouth to 10,777 feet an **F4**, 10,777 feet to 14,368 feet (3,591 feet) an **F3**, 14,368 feet to 15,672 feet (1,304 feet) a **B3** and 15,672 feet to 16,208 feet (536 feet) an **A2**.

F4 channel types are entrenched meandering riffle/pool channels on low gradients (<2%) with a high width/depth ratio and a predominantly gravel substrate. F3 is cobble dominated substrate.

B3 channel types are moderately entrenched, moderate gradient (2-4%), riffle dominated channels, with infrequently spaced pools, a very stable plan and profile, stable banks and have a predominantly cobble substrate.

A2 channel types are steep (4-10%), narrow, cascading, step-pool streams with a high energy/debris transport associated with depositional soils and a predominantly boulder substrate.

Water temperatures on the survey days ranged from 54°F to 63°F. Air temperatures ranged from 55°F to 73°F.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of ***occurrence*** there were 44.8% Flatwater units, 41.6% Pool units, 10.4% Dry units and 3.2% Riffle units (Graph 1). Based on total ***length*** there were 67.3% Flatwater units, 18.5% Pool units, 11.7% Dry units and 2.5% Riffle units (Graph 2).

Two hundred twenty one habitat units were measured and 23% were completely sampled. Fifteen Level IV habitat types were identified. The data is summarized in Table 2. The most frequent habitat types by percent ***occurrence*** were Run at 29%, Mid-Channel Pool at 13%, Lateral Scour Pool - Root Wad Enhanced at 12%, Dry at 10%, Step Run at 10%, Corner Pool at 7%, Glide at 6%, Low Gradient Riffle at 3%, Lateral Scour Pool - Log Enhanced at 3%, Plunge Pool at 2%, Lateral Scour Pool - Boulder Formed at 1%, Lateral Scour Pool - Bedrock Formed at 1%, and Step Pool at 1%. (Graph 3). By percent total ***length***, Run at 44%, Step Run at 18%, Dry at 12%, Mid-Channel Pool at 6%, Lateral Scour Pool - Root Wad Enhanced at 5%, Glide at 5%, Corner Pool at 3%, Low Gradient Riffle at 2%, Lateral Scour Pool - Log Enhanced at 1%, Lateral Scour Pool - Bedrock Formed at 1%, Lateral Scour Pool - Boulder Formed at 1%, and Step Pool at 1%.

Ninety two pools were identified (Table 3). Mid-Channel Pool pools were most often encountered at 13% of all habitat types Table 2), and comprised 34% of the total length of pools.

Table 4 is a summary of maximum pool depths by pool habitat types. Pool quality for salmonids increases with depth. Twenty six of the 90 pools (28%) had a depth of two feet or greater (Graph 5). These deeper pools comprised 5% of the total length of stream habitat.

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. Flatwater units rated 4 and Pools rated 21 (Table 1). Of the pool types, Backwater Pool - Root Wad Formed rated 80, Corner Pool rated 35, Plunge Pool rated 49, Lateral Scour Pool - Log Enhanced rated 42, Lateral Scour Pool - Boulder Formed rated 28, Lateral Scour Pool - Root Wad Enhanced rated 18, Step Pool rated 15, Mid-Channel Pool rated 6 and Lateral Scour Pool - Bedrock Formed rated 3 (Table 2).

Table 5 summarizes fish shelter by habitat type. By percent area, the dominant pool shelter types were Large Wood at 25%, Small Wood at 24%, Undercut Banks at 17%, Boulders at 17%, Root Mass at 13%, Bedrock at 2%, and Terrestrial Vegetation at 2%. Graph 7 describes the pool shelter in Finley Creek.

Table 6 summarizes the dominant substrate by habitat type. In five of seven Low-Gradient Riffles completely surveyed, the dominant substrate was: Small Cobble in three riffles and Gravel in two riffles (Graph 8).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 88 pool tail-outs measured, 15 had a value of 1 (17%), 41 had a value of 2 (48%), 25 had a value of 3 (28%) and 5 had a value of 4 (6%). Riffles rated a 5 (unsuitable substrate type for spawning). On this scale, a value of one is best for fisheries. Gravel was the dominant substrate observed at pool tail-outs (Graph 8). Graph 6 describes percent embeddedness by reach. No mechanical gravel sampling was conducted in 2002 surveys due to inadequate staffing levels.

The mean percent canopy density for the stream reach surveyed was 77%. The mean percentages of deciduous and evergreen trees were 86% and 14%, respectively. Graph 9 describes the canopy for the entire survey and Table 7 describes mean percent vegetative canopy cover for the entire surveyed stream.

For the entire stream reach surveyed, the mean percent right bank vegetated was 29% and the mean percent left bank vegetated was 29% (Table 7). For the habitat units measured, the dominant vegetation types for the stream banks were: 65% Deciduous Trees, 16% Brush, 12% Grass, 5% Evergreen Trees and 2% Bare Soil (Graph 11). The dominant substrate for the stream banks were: 72% Silt, Clay & Sand, 17% Cobble & Gravel, 7% Bedrock and 3% Boulder (Graph 10).

BIOLOGICAL INVENTORY

JUVENILE SURVEYS:

The Department of Fish and Game has conducted previous biological inventories of Finley Creek and there are no records of hatchery releases or fish rescues in the Salmon Creek watershed. A biological inventory was not conducted in 2002, although during the stream habitat inventory, surveyors observed many juvenile steelhead as well as stickleback, roach, and sculpin. Other species observed during the stream habitat survey included rough-skinned newts, frogs, snakes, and Pacific giant salamander.

Historic Biological Surveys Summaries

In September, 2001, DFG staff, Morgan Knechtle and crew conducted a biological survey in a lower, middle, and upper reach of Finley Creek. The focus was to determine coho salmon presence/absence. The creek was split into three reaches and ten pools per reach were electrofished using DFG's "10 Pool" protocol.

Species Observed in Historical and Recent Surveys

YEARS	SPECIES	SOURCE	NATIVE/ INTRODUCED
2001	STEELHEAD TROUT *(Oncorhynchus mykiss)*	DFG	N
2001	SCULPIN OR COTTOIDS *(Cottus sp.)*	DFG	N
2001	CALIFORNIA OR VENUS ROACH *(Hesperoleucus symmetricus)*	DFG	N
2001	THREESPINE STICKLEBACK (Gasterosteus aculeatus williamsoni)	DFG	N

DISCUSSION FOR FINLEY CREEK

Finley Creek (So. Sonoma) has 4 reaches: from the mouth to 10,777 feet an **F4**, 10,777 feet to 14,368 feet (3,591 feet) an **F3**, 14,368 feet to 15,672 feet (1,304 feet) a **B3** and 15,672 feet to 16,208 feet (536 feet) an **A2**.

There are 10,777 feet of channel type **F4** in Reach 1. According

to the DFG Salmonid Stream Habitat Restoration Manual, F4 channel types are good for bank-placed boulders and fair for low-stage weirs, single and opposing wing-deflectors, channel constrictors and log cover. Many site specific projects can be designed within this channel type, especially to increase pool frequency, volume and shelter. Any work considered will require careful design, placement, and construction that must include protection for any unstable banks.

There are 3,591 feet of channel type **F3** in Reach 2. According to the DFG Salmonid Stream Habitat Restoration Manual, F3 channel types are good for bank-placed boulders as well as single and opposing wing-deflectors. They are fair for low-stage weirs, boulder clusters, channel constrictors and log cover. Many site specific projects can be designed within this channel type, especially to increase pool frequency, volume and shelter. Any work considered will require careful design, placement, and construction that must include protection for any unstable banks.

There are 1,304 feet of channel type **B3** in Reach 3. B3/4 channel types are excellent for low-stage plunge weirs, boulder clusters, bank placed boulders, single and opposing wing-deflectors and log cover. They are also good for medium-stage plunge weirs. These channel types have suitable gradients and the stable stream banks that are necessary for the installation of instream structures designed to increase pool habitat, trap spawning gravels, and provide protective shelter for fish. Many site specific projects can be designed within this channel type, especially to increase pool frequency, volume and shelter.

There are 536 feet of channel type **A2** in Reach 4. The high energy, steep gradient A2 channel types have stable stream banks and poor gravel retention capabilities and are generally not suitable for instream enhancement structures.

The water temperatures recorded on the survey days 6/28/2002 - 7/22/2003 ranged from 54°F to 63°F. Air temperatures ranged from 55°F to 73°F. The warmest water temperatures were recorded in Reach 1.

This temperature regime is favorable to salmonids. Although temperatures appeared to be favorable for salmonids, temperatures need to be monitored for a longer period of time through the critical summer months, with more extensive biological sampling conducted.

Pools comprised 19% of the total length of this survey. In first and second order streams a primary pool is defined to have a

maximum 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. In Finley Creek (So. Sonoma), the pools are relatively shallow with 28% having a maximum depth of at least two feet. These pools comprised 5% of the total length of stream habitat. In coastal coho and steelhead streams, it is generally desirable to have primary pools comprise approximately 50% of total habitat length.

The mean shelter rating for pools was 25%. A pool shelter rating of approximately 80% is desirable. The relatively small amount of pool shelter that now exists is being provided primarily by Large Wood at 25%, Small Wood at 24%, Undercut Banks at 17%, Boulders at 17%, Root Mass at 13%, Bedrock at 2%, and Terrestrial Vegetation at 2%. Log and root wad cover in the pool and flatwater habitats would improve both summer and winter salmonid habitat. Log cover provides rearing fry with protection from predation, rest from water velocity, and also divides territorial units to reduce density related competition.

Five of the five low gradient riffles measured (100%) had either gravel or small cobble as the dominant substrate. This is generally considered good for spawning salmonids.

Thirty-four percent of the pool tail-outs measured had embeddedness ratings of either 3 or 4. Only 16% had a rating of 1. Cobble embeddedness measured to be 25% or less (a rating of 1) is considered best for the needs of salmon and steelhead. In a reach comparison, Reaches 1 and 2 had the best ratings (fair) and Reaches 3 and 4 had the poorest ratings (poor and very poor, respectively.

The higher the percent of fine sediment, the lower the probability that eggs will survive to hatch. This is due to the reduced quantity of oxygenated water able to percolate through the gravel, or because of fine sediment capping the redd and preventing fry emergence. In Finley Creek all 4 reaches should be mapped and rated according to their potential sediment yields, and control measures taken.

The mean percent canopy for the survey was 78%. This is good, since 80 percent is generally considered desirable, however, the riparian buffer is thin or nearly absent in areas with livestock. Riparian removal caused by intensive grazing within the riparian corridor will lead to less stream canopy and channel incision causing bank erosion and higher water temperatures.

Note that Reach 3 had a canopy of 64%, the lowest of all 4

reaches. There are significant bank erosion problems, far fewer juvenile steelhead observed in this reach, and high gravel embeddedness. This reach as well as other areas with bank erosion could benefit from bio-technical re-vegetation techniques using native species.

GENERAL MANAGEMENT RECOMMENDATIONS

Finley Creek should be managed as an anadromous, natural production stream.

Winter storms often bring down large trees and other woody debris into the stream, which increases the number and quality of pools. This woody debris, if left undisturbed, will provide fish shelter and rearing habitat, and offset channel incision. [Include, if applicable] Signs of recent and historic tree and log removal were evident in the active channel during our survey?. Efforts to increase flood protection or improve fish access in the short run, have led to long term problems in the system. Landowners should be sensitive about the natural and positive role woody debris plays in the system, and encouraged not to remove woody debris from the stream, except under extreme buildup and only under guidance by a fishery professional.

PRIORITY FISHERY ENHANCEMENT OPPORTUNITIES

1) Rearing conditions throughout the creek appear inadequate at this time due to low flow. Pools were disconnected due to lack of flow. Low instream flow should be addressed by increasing riparian protection and restoration, sediment control, and employing best management practices that encourage permeability and infiltration.

2) There are at least five sections (Reach 1) where the stream is being impacted from livestock in the riparian zone. Livestock in streams generally inhibit the growth of new trees, exacerbate erosion, and reduce summertime survival of juvenile fish by defecating in the water. Alternatives to limit cattle access, control erosion and increase canopy should be explored with the landowner, and developed if possible.

3) Where feasible, design and engineer pool enhancement structures to increase the number of pools throughout the creek particularly in the upper reaches. This must be done where the banks are stable (Reach 3) or in conjunction with stream bank armor to prevent erosion (Reaches 1 and 2).

4) Where feasible, increase woody cover in the pool and flatwater habitat units along the entire stream. Adding high quality complexity with larger woody cover is desirable. Combination cover/scour structure with boulders and woody debris would be effective in many flatwater and pool locations throughout the creek. This must be done where the banks are stable (Reach 3) or in conjunction with stream bank armor to prevent erosion (Reaches 1 and 2). In some areas the material is at hand.

5) Map sources of upslope and in-channel erosion, and prioritize them according to present and potential sediment yield. Identified sites should then be treated to reduce the amount of fine sediments entering the stream. Near-stream riparian planting along any portion of the stream should be encouraged to provide bank stability and a buffering against agricultural, grazing and urban runoff.

6) In Finley Creek, active and potential sediment sources related to the road system need to be mapped and treated according to their potential for sediment yield to the stream and its tributaries.

7) Increase the canopy on Finley Creek by planting willow, alder, redwood, and Douglas fir along the stream where shade canopy is not at acceptable levels (portions of Reach 1 and 3). The non-anadromous reach above the survey section should be assessed for planting and treated as well, since water temperatures throughout are affected from upstream. In many cases, planting will need to be coordinated to follow bank stabilization or upslope erosion control projects.

8) Reaches 1 and 2 would benefit from the utilization of bio-technical vegetative techniques to re-establish floodplain benches and a defined low flow channel. This would discourage lateral migration of the base flow channel and decrease bank erosion.

9) Conduct gravel sampling. Results of future sampling may indicate the need for structures which decrease channel incision, recruit and sort spawning gravel, and expand redd distribution in the stream.

COMMENTS AND LANDMARKS

The following landmarks and possible problem sites were noted. All locations (footage) are approximate and taken from the beginning of the survey.

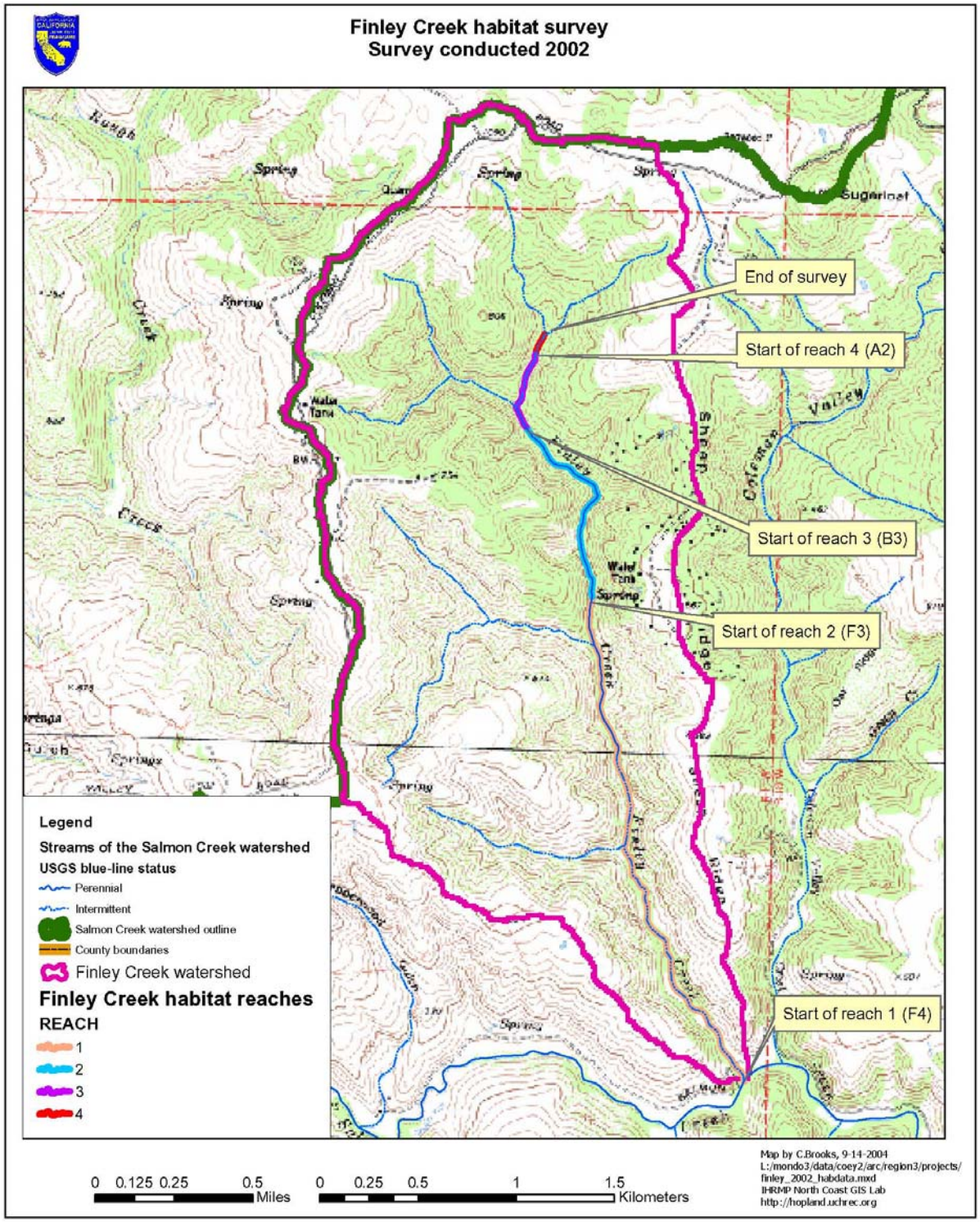
Location (feet)	Notes
32	Confluence with Salmon Creek; 50 Young of the year salmonids
67	Eroded right bank 20'x20';
166	Short riffle; 60' of left bank eroding
181	sharp bend; eroded right bank;
251	Eroding left bank; 175 Young of the year salmonids
485	LWD downstream of bridge. REDD just upstream of bridge. 150 Young of the year salmonids and 1+ salmonids
599	Fenced on right bank; 20 Young of the year and 5 1+ salmonids
624	Fenced on left bank
1,137	Mass wasting 25'x25' section of left bank on meander
1,166	At road and gate rip-rap enhanced pool; 5 1+ and 10 Young of the year salmonids
1,215	Rip-rap protecting field; LWD above bank;
1,509	Water temp 18 degrees C
1,526	right bank erosion from road. right bank erosion 15' x 10'. 70 Young of the year salmonids
1,641	livestock access
1,758	Large rootwad; good canopy on left bank
2,119	livestock access
2,208	left bank 6" PVC pipe extending out of 4' high eroded bank at the end of this habitat unit
2,494	Unpaved utility road runs along left bank
2,604	left bank 1'culvert under road and 5' up the bank—down cutting bank
2,754	20'x 15' eroding left bank below road and on curve of channel
3,041	LSP @ 64' approx 1.3' deep. 50 Young of the year salmonids
3,113	livestock access
3,143	U shaped bend in channel. Fence on right bank
3,263	livestock access
3,442	left bank 50' x 40' eroded area. 150 Young of the year salmonids
3,625	left bank erosion on 8' tall bank
3,908	Eroded right bank; LWD 30" diameter x 7' on left bank; fallen alder on left bank; root mass on right bank
4,080	3 1+ salmonids; LWD 20" diameter x 25'
4,214	LWD on right bank
4,355	Erosion 45' x 10'; REDD at 38' into the unit
4,598	left bank 30' x 4' eroding bank
5,013	LWD in channel 20" diameter x 7'; LWD on left bank 22" diameter x 20"; 50 Young of the year
5,093	right bank erosion; right bank road w/ fence
5,181	150 Young of the year salmonids and some 1+ salmonids; unit is on corner bend. Erosion 100' x 10' on right bank
5,343	right bank 4' undercut bank; 3 LWD approx. 14" diameter x 15'; 50 Young of the year salmonids
5,619	Dry Tributary at 75.5' into unit fenced 25' up; Erosion around bay laurels; LWD left bank 30" diameter x 40'
5,701	Road on left bank

Location (feet)	Notes
5,811	fence down on right bank -- livestock access
5,849	LWD 25" diameter x 15"
5,892	Road along left bank;
6,186	2' diameter culvert on left bank 85' into unit; 150 yoy salmonids
6,259	right bank erosion and down cutting
6,388	100 Young of the year salmonids; 3 1+ salmonids; Erosion on left bank 50' x 8'
6,578	Major erosion 198' x 12"; DRY from 114' - 128'
6,706	Dry for 2' at start of unit; erosion 60' x 12' on left bank'; dry gully 100" on right bank
7,069	LWD at 180' into unit 25" diameter x 10'
7,223	DRY 35' - 75' into unit; side pool 8'x 3'x1.3' no fish
7,275	16 Young of the year salmonids; livestock crossing
7,457	LWD 25" x 40' deciduous; 45' x 3' erosion on left bank; no fish; First 1.5' DRY; 12' - 21' DRY; field on left bank
7,558	Possible REDD at 38'
7,933	Fence at 29' across creek; 25' x 10' left bank erosion at 40' at 114' dry Tributary right bank; possible REDD at 300'
8,164	Wet gully at 16' into unit
8,441	50 Young of the year salmonids; road on left bank fence falling down at 130' into unit
8,623	Possible REDDs at 5' and 6'
9,040	LWD at 45' into unit on right bank, 24" in diameter x 12'; LWD at 175' into un it on right bank, 24" x 10'; LWD at 267' into unit on left bank
9,136	LWD at 1' into unit on right bank, 25" x 10'
9,199	Firs on right bank 100 ' back from creek
9,238	LWD on right bank, 20" x 6'
9,286	Corner erosion 50' x 15'
9,308	Spring on left bank; 20 Young of the year salmonids
9,352	Erosion on left bank, 25' x 12'
9,492	Wet Tributary at 27' into unit; LWD at 42' into main creek on right bank, 30" x 15', 50' up Tributary 4 1+ salmonids;
9,657	erosion on right bank, 25' x 2'
9,804	Erosion on right bank, 100'x10'; 50 Young of the year salmonids
10,367	LWD on left bank 25"x50';
10,572	Pool at 40' into unit, 4'x3'x1.2'; spring at 102' into unit on left bank
10,777	at 35', 39',44', and 117' into unit, possible REDDs; Erosive left bank; CHANNEL TYPE CHANGE TO F3
11,050	Pool at 30' into unit, 5'x4'x1'; possible REDD at 45'
11,214	From this unit, there is LWD throughout the Finley Creek; possible redd;1+ salmonids; dry gully at 123' into unit
11,239	LWD on right bank, 20" diameter x 15 ' fir
11,360	Possible REDD at 25' into unit; left bank erosion, 15' x 8'; corner erosion on right bank 15' - 25'
11,720	Railroad tracks at 57' into unit; cable at 70' into unit; 20 Young of the year salmonids
12,374	Boulder on right bank; Redwood LWD
12,573	Pool 50' into unit, 3'x2'x1.3'; Possible REDD at 199'
12,607	1 2+ salmonids; 15 Young of the year salmonids

Location (feet)	Notes
12,795	200 Young of the year salmonids
12,840	5 LWD across channel
12,923	3 Young of the year salmonids; Dry Tributary on left bank at 14' into unit
14,352	LWD 30" diameter x 15'; fence on left bank; minor erosion, 15'x4' on right bank
14,398	Channel change from F3 to B3
14,655	Dry Tributary at 4' into unit on right bank; LWD 15" diameter x 10'
14,758	Pampas Grass; 10 Young of the year salmonids, Last bank observation of salmonids
14,979	Bedrock right bank 1' x 40'
15,013	No Fish
15,237	No Fish
15,449	Erosion on right bank 44'x3'
15,616	Large boulders
15,673	LWD across channel
15,740	No Fish. Channel change from B3 to A2
16,036	Dry Tributary at 80' into unit on left bank; Scour erosion on left bank 20'x2'
16,209	Dry Tributary on right bank at 103' into unit; Dry Tributary A++ channel type on right bank at 127' into unit; END OF ANADROMY - Fish barriers - END OF SURVEY

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.


Finley Creek habitat survey
Survey conducted 2002
End of survey
Start of reach 4 (A2)
Start of reach 3 (B3)
Start of reach 2 (F3)
Start of reach 1 (F4)
Legend
Streams of the Salmon Creek watershed
USGS blue-line status
Perennial
Intermittent
Salmon Creek watershed outline
County boundaries
Finley Creek watershed
Finley Creek habitat reaches
REACH
1
2
3
4
0 0.125 0.25 0.5 Miles
0 0.25 0.5 1 1.5 Kilometers
Map by C.Brooks, 9-14-2004
L:/mondo3/data/coey2/arc/region3/projects/finley_2002_habdata.mxd
IHRMP North Coast GIS Lab
http://hopland.uchrec.org

LEVEL III and LEVEL IV HABITAT TYPE KEY:

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

Finley Creek Drainage: Salmon Creek

Table 1 - SUMMARY OF RIFFLE, FLATWATER, AND POOL HABITAT TYPES Survey Dates: 06/28/02 to 07/05/02

Confluence Location: QUAD: Bodega Head LEGAL DESCRIPTION: 1230173383604 LATITUDE: 38.36015′ LONGITUDE: 123.01760′

HABITAT UNITS	UNITS FULLY MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	MEAN LENGTH (ft.)	TOTAL LENGTH (ft.)	PERCENT TOTAL LENGTH	MEAN WIDTH (ft.)	MEAN 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
7	1	RIFFLE	3	58	408	2	8.3	0.2	186	1305	37	261	0	0
99	7	FLATWATER	45	111	11008	67	4.1	0.3	378	37449	153	15107	0	4
92	42	POOL	42	33	3035	19	6.9	0.9	218	20072	211	19446	187	21
23	0	DRY	10	83	1911	12	0.0	0.0	0	0	0	0	0	0

TOTAL UNITS	TOTAL UNITS	TOTAL LENGTH (ft.)	TOTAL AREA (sq. ft.)	TOTAL VOL. (cu. ft.)
221	50	16362	58826	34814

Finley Creek — Drainage: Salmon Creek

Table 2 - SUMMARY OF HABITAT TYPES AND MEASURED PARAMETERS — Survey Dates: 06/28/02 to 07/05/02

Confluence Location: QUAD: Bodega Head LEGAL DESCRIPTION:1230173383604 LATITUDE: 38.36015′ LONGITUDE: 123.01760′

HABITAT UNITS #	UNITS FULLY MEASURED	HABITAT TYPE	HABITAT OCCURRENCE %	MEAN LENGTH ft.	TOTAL LENGTH ft.	TOTAL LENGTH %	MEAN WIDTH ft.	MEAN DEPTH ft.	MAXIMUM DEPTH ft.	MEAN AREA sq.ft.	TOTAL AREA EST. sq.ft.	MEAN VOLUME cu.ft.	TOTAL VOLUME EST. cu.ft.	MEAN RESIDUAL POOL VOL cu.ft.	MEAN SHELTER RATING	MEAN CANOPY %
7	1	LGR	3	58	408	2	8	0.2	0.5	186	1305	37	261	0	0	74
13	1	GLD	6	64	830	5	5	0.4	1.0	359	4673	147	1907	0	5	61
64	4	RUN	29	112	7171	44	4	0.3	1.9	436	27895	185	11861	0	3	80
22	2	SRN	10	137	3007	18	4	0.3	1.2	227	4997	73	1598	0	5	84
28	12	MCP	13	37	1041	6	7	0.9	2.8	262	7342	250	6986	218	6	79
1	1	CCP	0	54	54	0	8	1.1	2.0	434	434	477	477	434	0	90
2	2	STP	1	43	85	1	7	0.7	1.4	133	266	94	189	0	15	88
15	5	CRP	7	28	413	3	7	1.0	4.0	190	2847	173	2595	143	35	65
7	5	LSL	3	30	212	1	6	1.0	3.0	208	1453	247	1728	249	42	79
27	9	LSR	12	33	889	5	6	0.9	2.3	185	4998	167	4507	132	18	78
3	2	LSBk	1	38	115	1	7	1.2	2.2	284	852	347	1040	305	3	91
3	2	LSBo	1	38	115	1	8	0.8	1.5	317	950	281	842	224	28	85
5	3	PLP	2	15	77	0	13	1.1	2.8	156	782	198	988	185	49	89
1	1	BPR	0	33	33	0	9	0.8	2.8	297	297	238	238	208	80	85
23	0	DRY	10	83	1911	12	0	0.0	0.0	0	0	0	0	0	0	53

TOTAL UNITS	TOTAL UNITS	LENGTH (ft.)	AREA (sq.ft)	TOTAL VOL. (cu.ft)
221	50	16362	59091	35217

Finley Creek — Drainage: Salmon Creek

Table 3 - SUMMARY OF POOL TYPES — Survey Dates: 06/28/02 to 07/05/02

Confluence Location: QUAD: Bodega Head LEGAL DESCRIPTION:1230173383604 LATITUDE: 38.36015′ LONGITUDE: 123.01760′

HABITAT UNITS	UNITS FULLY MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	MEAN LENGTH (ft.)	TOTAL LENGTH (ft.)	PERCENT TOTAL LENGTH	MEAN WIDTH (ft.)	MEAN DEPTH (ft.)	MEAN AREA (sq.ft.)	TOTAL AREA EST. (sq.ft.)	MEAN VOLUME (cu.ft.)	TOTAL VOLUME EST. (cu.ft.)	MEAN RESIDUAL POOL VOL. (cu.ft.)	MEAN SHELTER RATING
31	15	MAIN	34	38	1181	39	6.7	0.9	259	8026	246	7636	228	6
60	26	SCOUR	65	30	1821	60	6.9	0.9	198	11893	195	11698	168	27
1	1	BACKWATER	1	33	33	1	9.0	0.8	297	297	238	238	208	80

TOTAL UNITS	TOTAL UNITS	TOTAL LENGTH (ft.)	TOTAL AREA (sq.ft.)	TOTAL VOL. (cu.ft.)
92	42	3035	20215	19572

Finley Creek — Drainage: Salmon Creek

Table 4 - SUMMARY OF MAXIMUM POOL DEPTHS BY POOL HABITAT TYPES — Survey Dates: 06/28/02 to 07/05/02

Confluence Location: QUAD: Bodega Head LEGAL DESCRIPTION:1230173383604 LATITUDE: 38.36015′ LONGITUDE: 123.01760′

UNITS MAX DPTH MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	<1 FOOT MAXIMUM DEPTH	<1 FOOT PERCENT OCCURRENCE	1-<2 FT. MAXIMUM DEPTH	1-<2 FOOT PERCENT OCCURRENCE	2-<3 FT. MAXIMUM DEPTH	2-<3 FOOT PERCENT OCCURRENCE	3-<4 FT. MAXIMUM DEPTH	3-<4 FOOT PERCENT OCCURRENCE	>=4 FEET MAXIMUM DEPTH	>=4 FEET PERCENT OCCURRENCE
28	MCP	30	1	4	19	68	8	29	0	0	0	0
1	CCP	1	0	0	0	0	1	100	0	0	0	0
2	STP	2	0	0	2	100	0	0	0	0	0	0
14	CRP	15	0	0	9	64	3	21	1	7	1	7
7	LSL	8	1	14	3	43	2	29	1	14	0	0
26	LSR	28	0	0	21	81	5	19	0	0	0	0
3	LSBk	3	0	0	2	67	1	33	0	0	0	0
3	LSBo	3	0	0	3	100	0	0	0	0	0	0
5	PLP	5	0	0	3	60	2	40	0	0	0	0
1	BPR	1	0	0	0	0	1	100	0	0	0	0

TOTAL UNITS
90

Finley Creek — Drainage: Salmon Creek

Table 5 - Summary of Shelter by Habitat Type — Survey Dates: 06/28/02 to 07/05/02

Confluence Location: QUAD: Bodega Head LEGAL DESCRIPTION: 1230173383604 LATITUDE: 38.36015′ LONGITUDE: 123.01760′

UNITS MEASURED	UNITS SHELTER MEASURED	HABITAT TYPE	% TOTAL UNDERCUT BANKS	% TOTAL SWD	% TOTAL LWD	% TOTAL ROOT MASS	% TOTAL TERR. VEGETATION	% TOTAL AQUATIC VEGETATION	% TOTAL WHITE WATER	% TOTAL BOULDERS	% TOTAL BEDROCK LEDGES
7	1	LGR	0	0	0	0	0	0	0	0	0
13	1	GLD	0	30	0	60	10	0	0	0	0
64	4	RUN	0	0	7	0	0	0	0	93	0
22	2	SRN	0	21	7	0	0	0	0	72	0
28	28	MCP	37	5	17	13	0	0	0	26	2
1	1	CCP	0	0	0	0	0	0	0	0	0
2	2	STP	0	0	29	0	0	0	0	71	0
15	13	CRP	6	44	26	7	5	0	0	12	0
7	7	LSL	7	27	64	2	0	0	0	0	0
27	25	LSR	36	20	8	33	2	0	0	0	0
3	3	LSBk	11	13	0	9	6	0	0	22	40
3	3	LSBo	0	3	9	0	0	0	0	88	0
5	5	PLP	2	31	20	0	2	0	0	26	19
1	1	BPR	20	25	25	20	5	0	0	5	0
23	0	DRY	0	0	0	0	0	0	0	0	0
ALL HABITAT TYPES 221	96		16	24	24	13	2	0	0	19	2
POOLS ONLY 92	88		17	24	25	13	2	0	0	17	2

Finley Creek | Drainage: Salmon Creek

Table 6 - SUMMARY OF DOMINANT SUBSTRATES BY HABITAT TYPE | Survey Dates: 06/28/02 to 07/05/02

Confluence Location: QUAD: Bodega Head LEGAL DESCRIPTION:1230173383604 LATITUDE: 38.36015′ LONGITUDE: 123.01760′

TOTAL HABITAT UNITS	UNITS SUBSTRATE MEASURED	HABITAT TYPE	% TOTAL SILT/CLAY DOMINANT	% TOTAL SAND DOMINANT	% TOTAL GRAVEL DOMINANT	% TOTAL SM COBBLE DOMINANT	% TOTAL LG COBBLE DOMINANT	% TOTAL BOULDER DOMINANT	% TOTAL BEDROCK DOMINANT
7	5	LGR	0	0	40	60	0	0	0
13	4	GLD	0	25	75	0	0	0	0
64	17	RUN	12	0	59	29	0	0	0
22	7	SRN	0	14	29	29	14	0	14
28	17	MCP	6	59	29	6	0	0	0
1	1	CCP	0	100	0	0	0	0	0
2	2	STP	0	100	0	0	0	0	0
15	9	CRP	33	22	44	0	0	0	0
7	7	LSL	0	71	14	14	0	0	0
27	15	LSR	13	60	20	7	7	0	0
3	3	LSBk	0	100	0	0	0	0	0
3	2	LSBo	50	0	50	0	0	0	0
5	5	PLP	0	80	20	0	0	0	0
1	1	BPR	0	0	100	0	0	0	0
23	3	DRY	0	0	0	100	0	0	0

Finley Creek (So. Sonoma County)

Table 7. Summary of Mean Percent Vegetative Cover for Entire Stream

Mean Percent Canopy	Mean Percent Evergreen	Mean Percent Deciduous	Mean Right bank % Cover	Mean Left Bank % Cover
76.66	14.07	85.93	29.04	29.43

Table 8. Finley Creek (So. Sonoma County)

Mean Percentage of Dominant Substrate

Dominant Class of Substrate	Number Units Right Bank	Number Units Left Bank	Percent Total Units
Bedrock	3	9	6.74
Boulder	2	3	2.81
Cobble/Gravel	15	15	16.85
Silt/clay	69	60	72.47

Mean Percentage of Dominant Vegetation

Dominant Class of Vegetation	Number Units Right Bank	Number Units Left Bank	Percent Total Units
Grass	8	13	11.93
Brush	15	14	16.48
Deciduous Trees	60	55	65.34
Evergreen Trees	3	5	4.55
No Vegetation	2	1	1.70

Table 9 - FISH HABITAT INVENTORY DATA SUMMARY

STREAM NAME: Finley Creek (So. Sonoma)
SAMPLE 06/28/2002 to 07/22/2003
SURVEY LENGTH:
MAIN 16208.59 ft. SIDE CHANNEL: 152.9 ft.
LOCATION OF STREAM MOUTH:
USGS Quad Map: Bodega Head Latitude: 38.360'N
Legal Description: T06N R11W Bodega Longitude: 123.017'W

SUMMARY OF FISH HABITAT ELEMENTS BY STREAM REACH

STREAM REACH 01 (Units 1-154)

Channel Type: F4	Mean Canopy Density: 73 %
Main Channel: 10777 ft.	Evergreen: 8 %
Side Channel Length: 153 ft.	Deciduous: 92 %
Riffle/Flatwater Mean Width: 4.8 ft.	Pools by Stream: 24 %
Pool Mean Depth: 0.9 ft.	Pools >=2 ft. Deep: 30 %
Base Flow: not measured	Pools >=3 ft. Deep: 4 %
Water: 54-63°F Air: 55-73°F	Mean Pool Shelter: 26
Dom. Bank Veg.: Deciduous Trees	Dom. Shelter: Root Masses
Bank Vegetative Cover: 27 %	LOD Pool Shelter: 41 %
Dom. Bank Substrate: Silt/Clay/Sand	Dry Channel: 910 ft.

Embeddedness Value: 1. 19% 2. 50% 3. 28% 4. 3% 5. 0%

STREAM REACH 02 (Units 155-201)

Channel Type: F3	Mean Canopy Density: 92 %
Main Channel: 3591 ft.	Evergreen: 25 %
Side Channel Length: 0 ft.	Deciduous: 75 %
Riffle/Flatwater Mean Width: 4.0 ft.	Pools by Stream: 16 %
Pool Mean Depth: 0.9 ft.	Pools >=2 ft. Deep: 22 %
Base Flow: not measured	Pools >=3 ft. Deep: 0 %
Water: 54-59°F Air: 63-68°F	Mean Pool Shelter: 25
Dom. Bank Veg.: Deciduous Trees	Dom. Shelter: Boulders
Bank Vegetative Cover: 36 %	LOD Pool Shelter: 30 %
Dom. Bank Substrate: Silt/Clay/Sand	Dry Channel: 614 ft.

Embeddedness Value: 1. 12% 2. 53% 3. 29% 4. 6% 5. 0%

STREAM REACH 03 (Units 202-215)

Channel Type: B3	Mean Canopy Density: 64 %
Main Channel: 1304 ft.	Evergreen: 31 %
Side Channel Length: 0 ft.	Deciduous: 69 %
Riffle/Flatwater Mean Width: 3.0 ft.	Pools by Stream: 8 %
Pool Mean Depth: 1.0 ft.	Pools >=2 ft. Deep: 0 %
Base Flow: not measured	Pools >=3 ft. Deep: 0 %
Water: 54-57°F Air: 64-64°F	Mean Pool Shelter: 10
Dom. Bank Veg.: Deciduous Trees	Dom. Shelter: Large Woody Debris
Bank Vegetative Cover: 46 %	LOD Pool Shelter: 57 %

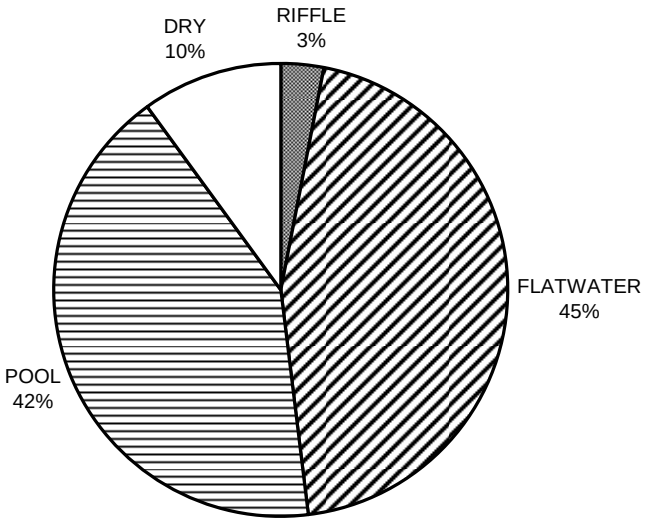
Dom. Bank Substrate: Silt/Clay/Sand Dry Channel: 313 ft.
Embeddedness Value: 1. 0% 2. 0% 3. 67% 4. 33% 5. 0%

STREAM REACH 04 (Units 216-219)

Channel Type: A2	Mean Canopy Density: 90 %
Main Channel: 536 ft.	Evergreen: 77 %
Side Channel Length: 0 ft.	Deciduous: 23 %
Riffle/Flatwater Mean Width: 3.0 ft.	Pools by Stream: 15 %
Pool Mean Depth: 1.0 ft.	Pools >=2 ft. Deep: 50 %
Base Flow: not measured	Pools >=3 ft. Deep: 0 %
Water: 57-59°F Air: 64-64°F	Mean Pool Shelter: 28
Dom. Bank Veg.: Deciduous Trees	Dom. Shelter: Boulders
Bank Vegetative Cover: 35 %	LOD Pool Shelter: 0 %
Dom. Bank Substrate: Boulder	Dry Channel: 0 ft.

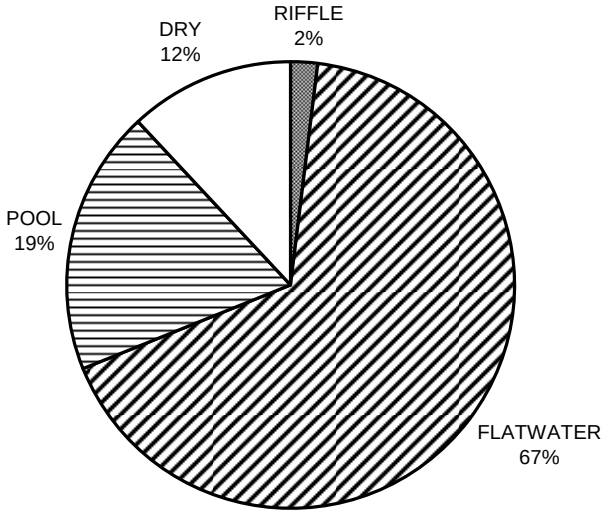
Embeddedness Value: 1. 0% 2. 0% 3. 0% 4. 100 % 5. 0 %

FINLEY CREEK
HABITAT TYPES BY PERCENT OCCURRENCE



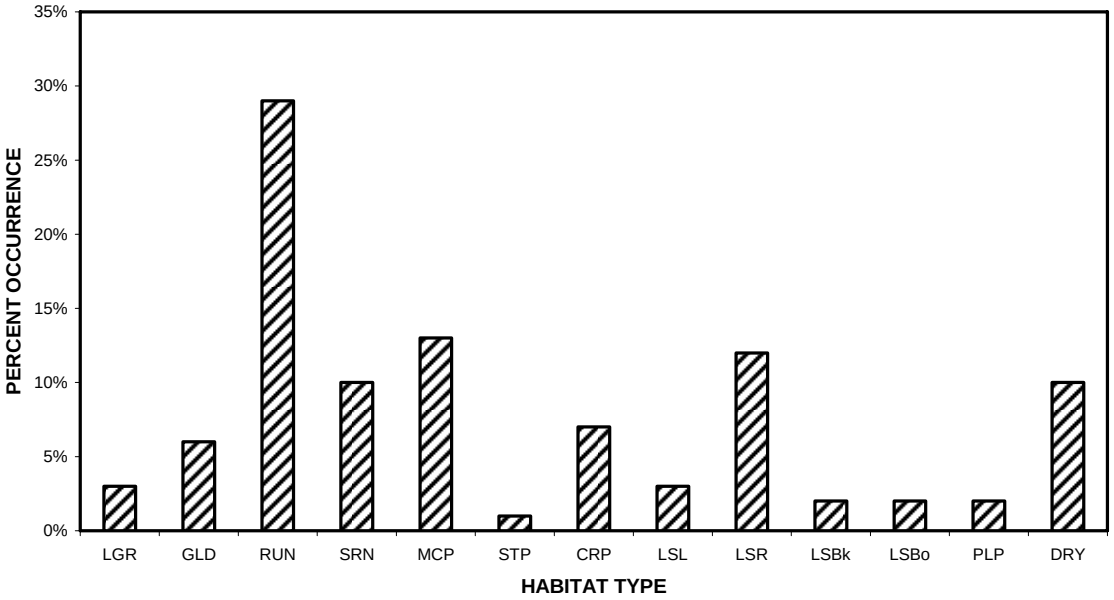
GRAPH 1. Level II habitat types by percent occurrence.

FINLEY CREEK
HABITAT TYPES BY PERCENT TOTAL LENGTH



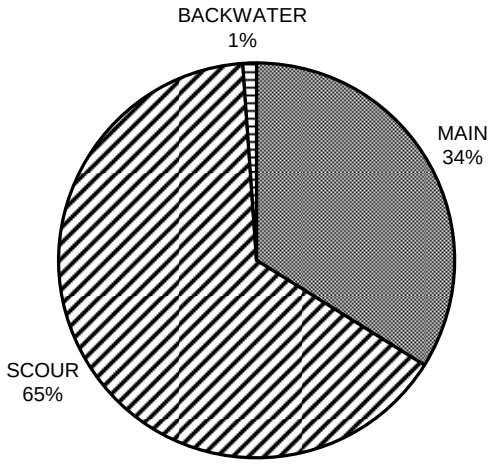
GRAPH 2. Level II habitat types by percent total length.

FINLEY CREEK
HABITAT UNIT TYPES BY PERCENT OCCURRENCE

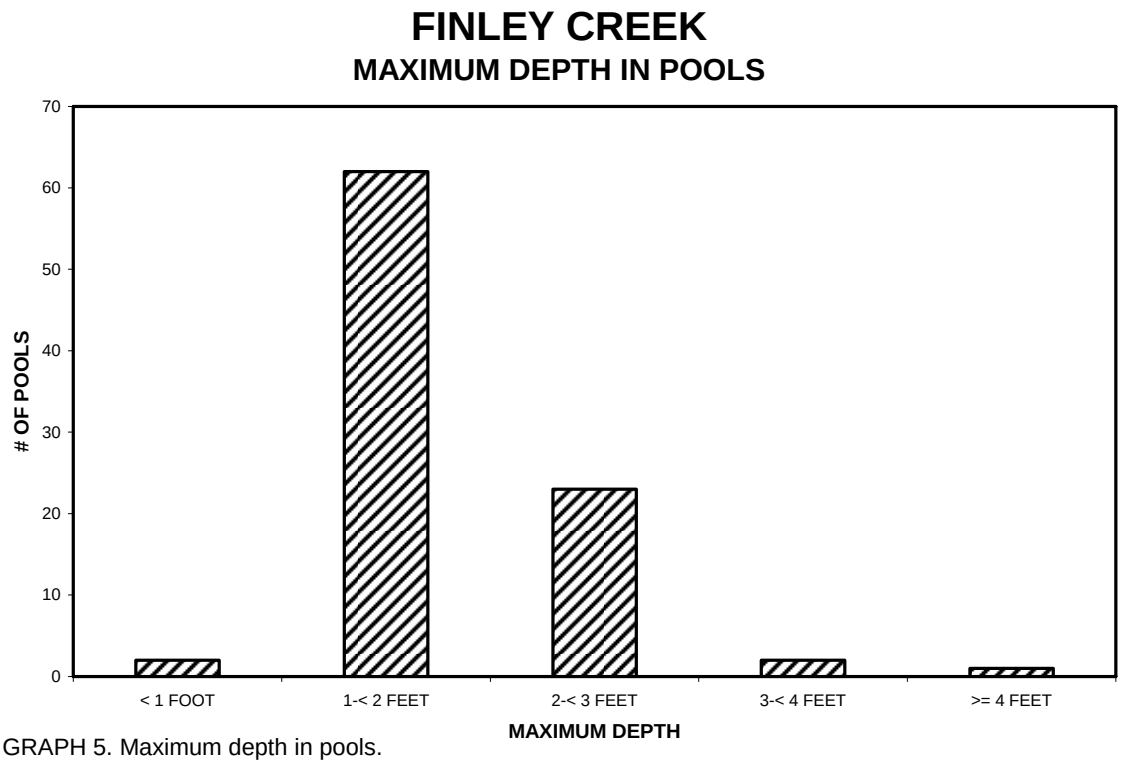


GRAPH 3. Level IV habitat unit types by percent occurrence.

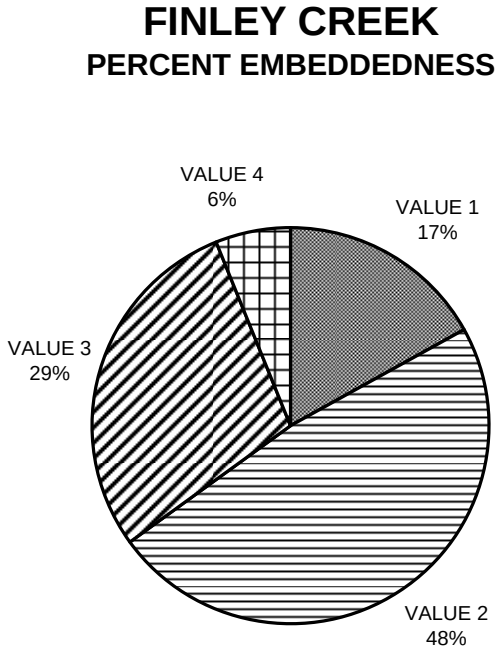
FINLEY CREEK
POOL HABITAT TYPES BY PERCENT OCCURRENCE



GRAPH 4. Level I pool habitat types by percent occurrence.

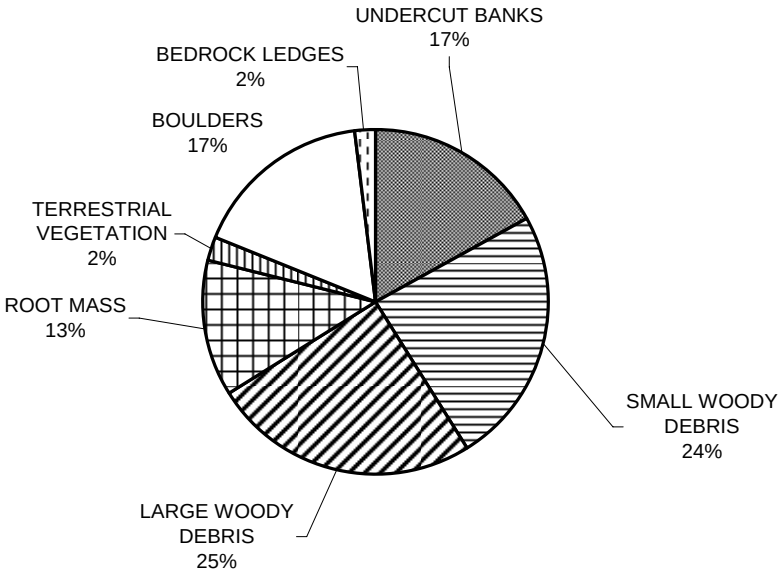


GRAPH 5. Maximum depth in pools.



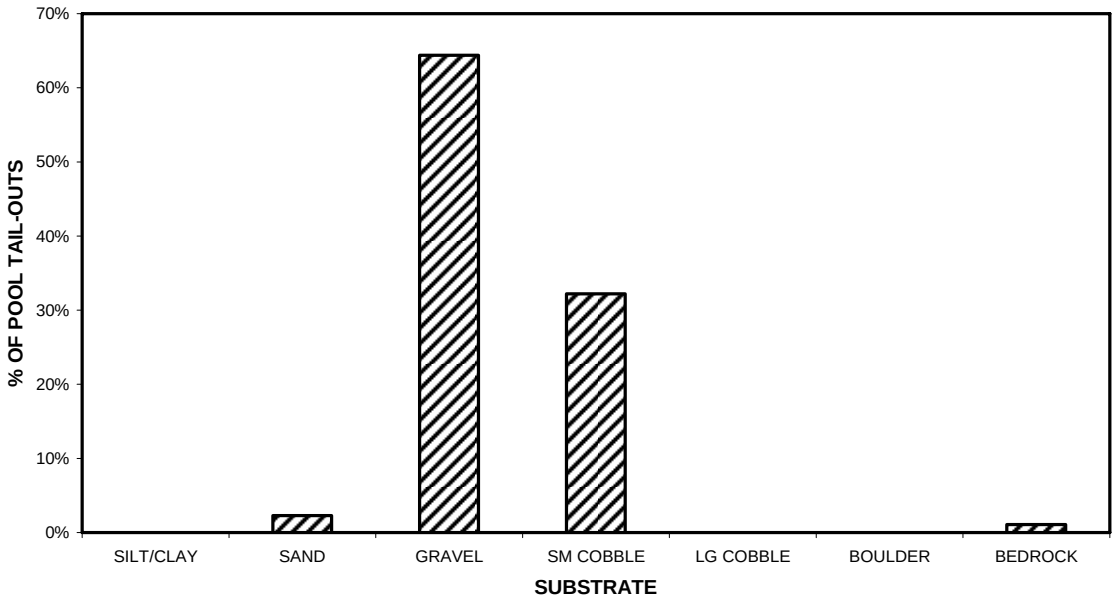
GRAPH 6. Percent embeddedness estimated at pool tail-outs.

FINLEY CREEK
MEAN PERCENT COVER TYPES IN POOLS



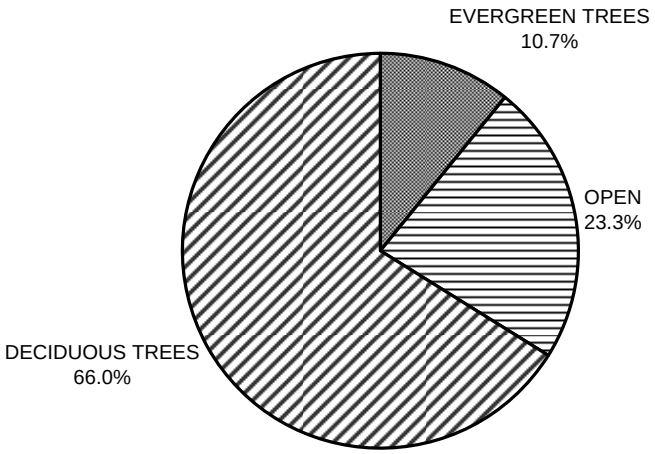
GRAPH 7. Mean percent cover types in pools.

FINLEY CREEK
SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



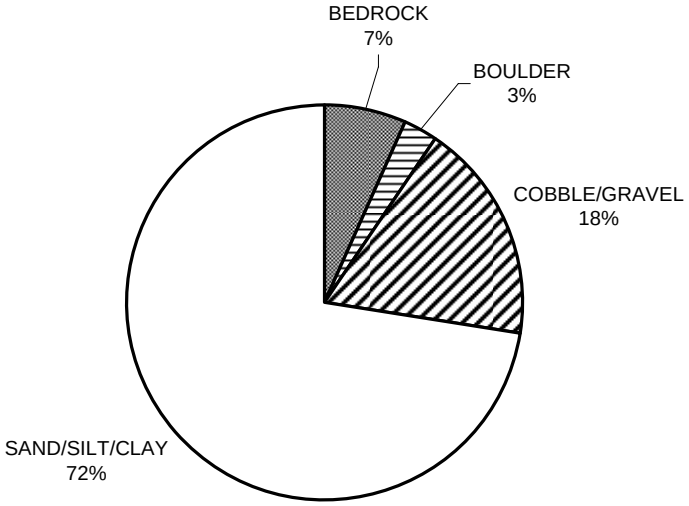
GRAPH 8. Substrate composition in pool tail-outs.

FINLEY CREEK
MEAN PERCENT CANOPY



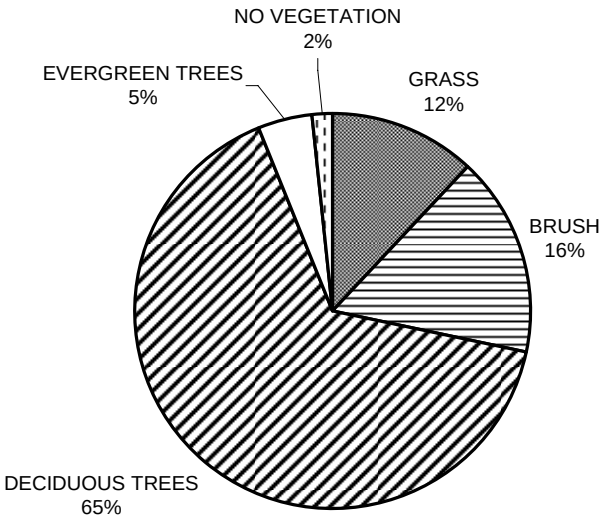
GRAPH 9. Mean percent canopy.

FINLEY CREEK
DOMINANT BANK COMPOSITION IN SURVEY REACH



GRAPH 10. Dominant bank composition in survey reach.

FINLEY CREEK
DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11. Dominant bank vegetation in survey reach.