
APPENDICES

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APPENDIX A: SALMON SPAWNER SURVEYS

CALIFORNIA SALMONID STREAM HABITAT RESTORATION MANUAL
FISH SAMPLING METHODS IV-7
California Dept. of Fish & Game

Salmon spawner surveys (also called salmon carcass surveys) are stream bank or above-water surveys. Surveyors usually walk along the stream bank and record the number of spawned salmon carcasses, redds, and live adults. This information is useful to:

- Determine if adults are returning to and spawning within a stream reach or basin area;
- Determine which species or races are utilizing the sample area;
- Determine relative abundance and distribution of carcasses, redds or live fish within a sample area;
- Recover and record marked fish for mark studies;
- Identify preferred spawning habitat area.

Stream flow conditions can alter the timing and distribution of spawning activity from one year to the next. For annual *comparison of data it is recommended that weekly surveys be conducted throughout the entire potential time range of spawning activity.

Descriptions of spawning distribution within a basin should not rely on carcass counts conducted only during the assumed week of peak spawning. Spawner distribution within a stream system may be different for early versus late spawners.

The typical method for conducting spawner surveys is to walk along the stream bank or wade in the stream counting and recording all carcasses, redds and live fish observed. Carcasses are examined to determine species, sex, and/or missing fins. The fork lengths (FL) of fish are measured from the tip of the snout to middle of the tail to the nearest centimeter (cm). Counted carcasses are either cut in half or marked with a hog ring to eliminate being counted in subsequent surveys. With prior DFG approval, the heads of carcasses with missing adipose (Ad) fins, will be removed and retained for coded-wire-tag (CWT) extraction by DFG. All data is recorded on the Daily Salmon Spawning Stock Survey Field Form as indicated below.

Tools and Supplies Needed

- Thermometer
- Gaff hook, handle marked. in centimeters
- Waders with non-slip soles
- Pencils
- Waterproof field record form
- Waterproof ID tags_ for fish heads (Figure 11)
- Plastic "Ziploc" bags for fish heads
- Machete – and file or hog-ring-pliers and hog rings
- Vest or day pack'
- Polarized glasses
- Stream map to indicate location of spawning activity
- Drinking water and food

Instructions for Completing Daily Salmon Spawning. Stock Survey Field Form

- 1) **Stream** - Print the stream name.
- 2) **T-R-S** - Enter the township, section and range from the USGS quadrangle.
- 3) **Lat** - Latitude of the confluence of the stream determined from a 7.5-minute USGS quadrangle.

- 4) **Long** - Longitude of the confluence of the stream determined from a 7.5-minute USGS quadrangle.
- 5) **Quad** - Name of the USGS 7.5-minute quadrangle containing the confluence of the stream.
- 6) **Drainage** - Print the drainage name.
- 7) **County** - Enter the county in which the stream. is located
- 8) **Starting location** - Enter the starting point of the survey; for example, the confluence with another stream, a highway mileage marker, a bridge, etc.
- 9) **Lat and Long of the starting location** - Taken from a 7.5-minutes USGS quadrangle.
- 10) **Ending Location** - Enter the ending point of the survey; for example, the confluence with another stream, a highway mileage marker, a bridge, etc.
- 11) **Lat and Long of the ending location** - Taken from the 7.5-minute USGS quadrangle.
- 12) **Feet/miles surveyed** - Determine the distance of the survey using a map measurement device and a 7.5-minute USGS quadrangle. If the distance surveyed was measured using a hip chain, enter the distance in feet.
- 13) **Date of survey** - Enter the day's date: nm/dd/yy.
- 14) **Weather,-** Make a check mark to indicate weather conditions: clear, overcast, rain. If weather conditions change during the survey, note this in the remarks section at the end of the page.
- 15) **Water clarity** -Estimate water clarity at the beginning of the survey. If water clarity changes during the survey, note this in the remarks section at the end of the page.
- 16) **Water temperature** -Water temperature is taken in degrees Fahrenheit at the beginning of the survey.
- 17) **Air temperature** - Air temperature is to be taken in degrees Fahrenheit- at the beginning of the survey.
- 18) **Time** - Time when temperatures were taken.
- 19) **Crew** - Enter the names of the persons doing the survey.
- 20) **Number of live fish observed** - Enter the number of live chinook adults, chinook jacks (< 55 cm FL), coho, and steelhead observed. Identification of live fish can be very difficult. If positive identification is not possible, record the fish as an unknown.
- 21) **Number of carcasses examined** - Identify all carcasses to species and sex. Measure fork length in centimeters and record on the form. Examine all carcasses for adipose fin clips or any other fin clip. Mark all the carcasses using hog rings or cut carcasses in half after examination.
- 22) **Tag number of adipose-clipped fish and snout recoveries** - All carcasses must be examined for adipose fin clips. If the adipose fin is missing, the carcass may contain a CWT and the snout must be cut off and retained. Remove the snout by cutting across the head in the vicinity of the eyes; cut straight down from the eyes through the upper jaw and into the mouth cavity. Remove the snout in one piece. If unsure of the removal procedure; take the entire head. It is important not to lose the tag due to an improper cut. The project name, the recovery location, the species, length and sex of the fish, date and other relevant information must be recorded on a tag and wired to the snout. The project name will be recorded on the tag for later reference. The snout or head must be frozen in a zip-lock bag and taken to DFG, where the coded-wire tags will be excised and decoded. Snouts must be individually bagged.
- 23) **Other fin clips observed** - Record any fin clips observed other than adipose fins.
- 24) **Number of skeletons observed** - Any fish that cannot be measured, or any identifiable parts of fish found are considered skeletons.- If it is possible to identify the species, record it appropriately; if not, record it as unknown.
- 25) **Number of redds observed** - Record the number and location of observed redds. This can be difficult in areas of heavy spawning due to multiple redds and superimposition of redds.
- 26) **Remarks** - Add any, information discovered during the. survey such as barriers, landslides, etc. Include any information necessary to clarify other entries on the field form.

Salmon CWT Recovery Tag

Tag No.

Project

Location:

Lat

Long

Species

Race Fall Win Spr

Sex M F U

Recovery

method

Date

APPENDIX B: SPAWNING GRAVEL PERMEABILITY

NAPA RIVER WATERSHED LIMITING FACTORS ANALYSIS

APPENDIX 8: PERMEABILITY

Stillwater Sciences

To determine the quality of streambed gravels for salmonid egg incubation and larval (alevin) rearing, substrate permeability was measured using a modified Mark IV standpipe (Terhune 1958, Barnard and McBain 1994). Gravels at potential spawning sites were mixed to a depth of 0.95 feet to simulate mixing and sorting conditions that would occur during redd construction by a spawning salmonid (see Kondolf and Wolman 1993 for more information on this topic).

The standpipe used was 46.5 inches (118 cm) long, with a 1.0 inch (2.5 cm) inside diameter and a 1.25 inch (3.8 cm) outside diameter. The standpipe had a 2.75 inch-long band of perforations and was driven into the substrate so that the band of perforations extended in depth from approximately 0.64 to 0.86 feet below the bed surface. To reduce the potential for water 'slippage' down the pipe, the standpipe was held, but not forced in any direction, during the driving process.

Permeability was measured by using a Thomas vacuum pump (Model 107CDC20, powered by a 12-volt rechargeable battery) to siphon water out of the standpipe to maintain the water level inside the standpipe exactly one-inch lower than the surrounding water. By measuring the volume of water siphoned out of the standpipe over a measured time interval, it was thus possible to determine the recharge rate of the water level in the standpipe under a standard one-inch pressure head. At each spawning patch assessed, the standpipe was driven in twice and at least five consecutive permeability measurements were taken.

The recharge rate (units of volume per time) data measured in the field were converted into permeability (units of length per time) using an empirically derived rating table (Barnard and McBain 1994) and adjusted with a correction factor that accounts for temperature related changes in water viscosity that can affect permeability results (Barnard and McBain 1994).



Spawning gravel is manually cleaned to a depth of ~ 0.95 feet prior to driving in the standpipe to simulate the cleaning effect of redd construction.



Standpipe driven into the bed of the Napa River

APPENDIX C: HABITAT TYPING

CALIFORNIA SALMONID STREAM HABITAT RESTORATION MANUAL

California Dept. of Fish & Game

METHODS

Habitat inventories follow the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al, 1998). The field crews that conducted the inventory were trained in standardized habitat inventory methods by the California Department of Fish and Game (DFG). Habitat inventories are conducted by a two-person team.

SAMPLING STRATEGY

The inventory uses a method that samples approximately 10% of the habitat units within the surveyed length. All habitat units included in the survey are classified according to habitat type and their lengths are measured. Habitat unit types encountered for the first time are further 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.

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. Since quantity and quality of pool habitat has been identified as a critical factor affecting salmonid populations in California streams, every third pool encountered is fully 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*. 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. When not feasible due to low flow or budgetary constraints, flow is visually categorized as low, moderate, or high.

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 a minimum of 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". Napa River basin habitat typing used standard basin level measurement criteria. These parameters require that the minimum length of a described habitat unit must be equal to or greater than the stream's mean wetted width. All measurements are in feet to the nearest tenth. Habitat characteristics are measured using a clinometer, hip chain, and stadia rod.

5. Embeddedness:

The depth of embeddedness of the cobbles in pool tail-out areas is measured by the percent of the cobble that is surrounded or buried by fine sediment. In the survey, embeddedness is visually 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. 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 visually 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 fully measured 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. 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 roughly categorized 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. The dominant composition type and the dominant vegetation type of both the right and left banks for each fully-described unit were selected from the habitat inventory form. Additionally, the percent of each bank covered by vegetation (including downed trees, logs, and rootwads) was estimated and recorded.

10. Large Woody Debris Count:

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

11. Average Bankfull Width:

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

DATA ANALYSIS

Data from the habitat inventory form are entered into Stream Habitat 2.0.3, a Visual Basic data entry program developed by Karen Wilson, Pacific States Marine Fisheries Commission in conjunction with the California Department of Fish and Game. This program processes and summarizes the data, and produces the following ten tables:

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

- Mean Percent Shelter Cover Types for Entire Stream

The following graphics are produced from the tables using Microsoft Excel:

- 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

APPENDIX D: STREAM MONITORING METHODS

Water Quality Monitoring Program Site Selection

Site selection is coordinated between a member of the Napa County Resource Conservation District (RCD) staff and the volunteer monitor. The monitor may select a tributary or a reach of the Napa River in which he or she has interest, or may take on a site which is recommended by the RCD. All sites must be evaluated by a qualified RCD staff member to ensure it is appropriate for the protocols and safe.

Once a general region for the monitoring site has been designated, the volunteer monitor and a RCD staff member go to the region and determine an appropriate location for the water quality monitoring. The preferred location for the testing is in a run habitat. A run is characterized by swiftly flowing reaches with little surface agitation and no major flow obstructions. If a run is not available, a site may be chosen in a glide habitat, or just upstream or downstream of a pool. However, during the dry season, as sites dry up, testing typically occurs in the nearest residual pool.

Water Quality Monitoring Program Physical Site Assessment

A physical site assessment must be carried out at every site within the guidelines laid out in the RCD Site Survey Field Data Sheet. The vegetation portion of the survey is fairly detailed, and requires good riparian plant identification skills. It is important to ensure that the plant species have been correctly identified. Therefore, this survey must be conducted with direct guidance from a qualified RCD staff member.

Water Quality Monitoring Program Sample Collection

Sample timing can have a large effect on results and must therefore be considered prior to sampling. The time of day when water quality samples are collected will influence water temperature, dissolved oxygen, and pH levels. For example, samples collected early in the morning will generally have lower temperatures and higher dissolved oxygen levels. Stream sampling should occur in mid-afternoon, which typically represents the most stressful period for coldwater organisms. Other habitats (e.g. ponds, marshes, etc.) may have different periods of maximum environmental stress. Whenever possible, water quality sampling should be conducted during the same approximate time (± 2 hours) for consistency, regardless of the time of day.

Water Quality Monitoring ***SAFETY SHEET***

General:

1. Always let someone else know where you are, when you intend to return, and what to do if you don't come back at the appointed time.
2. Bring a field partner whenever possible.
3. Never cross private property without the permission of the landowner.
4. Watch for irate dogs, wildlife (snakes) and insects such as ticks, hornets, and wasps.
5. Carry a first aid kit and make sure someone knows how to use it.
6. Watch for poison oak, stinging nettle, and other types of vegetation that may cause rashes and irritation.
7. Never drink the water in the stream. Bring your own water from home.
8. Don't walk on unstable streambanks. Disturbing these banks can accelerate erosion and may prove dangerous if a bank collapses.
9. Be very careful not to disturb streamside vegetation.
10. Be very careful when monitoring if the stream is flowing swiftly, and do not attempt to wade into or across it under these conditions.
11. If at any time you feel uncomfortable about the condition of the stream or your surroundings, stop monitoring and leave the site.

When Using Chemicals:

1. Wear goggles (safety glasses) and gloves when handling chemicals.
2. Know your equipment, sampling instructions, and procedures before beginning.
3. Know the chemicals you are using and their hazards (see safety data sheets in kit).
4. Avoid contact between chemical reagents and skin, eye, nose, and mouth. Never use your fingers to stopper a sample bottle when shaking a solution.
5. Do not eat or drink while monitoring. Wash hands thoroughly before contact with eyes, food, or mouth.
6. Thoroughly rinse test tubes with de-ionized water after each test; dry hands and outside of tube.
7. Tightly close all reagent containers after use; check for correct cap.
8. Wipe up spills when they occur.
9. **Do not pour used chemicals or samples onto the ground or into the creek!** Place all solutions and used chemicals in a container and give to your field leader.

*Water Quality Monitoring
Equipment List*

All Parameters:

- Latex gloves
- Rubber boots
- Wide-mouth bottle for waste liquids
- Data sheet, pen, and clipboard

Conductivity

- Conductivity meter
- Conductivity standard solution
- Clear plastic cup

Dissolved Oxygen and Temperature

- LaMotte Dissolved Oxygen kit
- Sampling apparatus (where applicable)
- Bottle of Ivory Clear for cleaning
- Distilled water
- Towel
- Safety glasses
- Thermometer (LaMotte 1066)
- Bottle brush

pH

- Litmus paper kit
- Clean cup to hold water during testing

Other

- Sample bottle with label for lab sample (if needed)

NAPA COUNTY RESOURCE CONSERVATION DISTRICT

Napa River Watershed Monitoring

Water Quality Monitoring Parameter

Temperature

Importance: Water temperature affects levels of dissolved oxygen, and is used to determine the percent saturation of dissolved oxygen. Many fish and aquatic organisms need a specific temperature range to survive. This protocol should be done in conjunction with the dissolved oxygen and conductivity tests.

Materials:

- Thermometer (Lamotte 1066)
- Data sheet, pen, and clipboard
- Dissolved Oxygen and Conductivity protocols and equipment

Procedure:

Air Temperature

1. Place the dry thermometer in the shade at the sampling site for three to five minutes. Read air temperature in degrees Celsius and record on Water Quality Monitoring Field Data Sheet.

Water Temperature

1. Place the thermometer in the stream at the same location that the sample was taken for dissolved oxygen. Keep submerged for at least three minutes.
2. Record the reading in Celsius under the “Water Testing” section of the Water Quality Monitoring Field Data Sheet.
3. Check your results against previous and historic results (if available) and acceptable ranges. Repeat the procedure if the reading is outside of the acceptable range or extremely different from typical results at that site.
4. If the procedure is repeated and the temperature reading is still outside the acceptable range, contact the RCD at (707) 252-4188.

The typical range for water temperature is approximately 2 – 23 C.

5. The thermometer should always be stored vertically in the plastic graduated cylinder that is part of the dissolved oxygen test kit.

NAPA COUNTY RESOURCE CONSERVATION DISTRICT

Napa River Watershed Monitoring

Water Quality Monitoring Parameter
Dissolved Oxygen

Importance:

Dissolved oxygen is critical for fish and other aquatic species' survival in lakes, ponds and streams. Water with consistently high dissolved oxygen, 90% saturation or more, can support a greater diversity of aquatic organisms. Dissolved oxygen data, in conjunction with biological inventories and other water quality data, can be used to determine the capacity of the stream to support fish and other aquatic species. Low levels of dissolved oxygen may signal the presence of pollution in the water and indicate the need for further investigation.

Protocol**Summary:**

1. Take a sample of creek water using the bottle provided in the LaMotte test kit.
2. Using the titration method described below, and determine the amount of dissolved oxygen in milligrams per liter in the sample.
3. Determine the percent saturation of oxygen using the chart provided, correlating water temperature (*see Temperature protocol*) with the results for dissolved oxygen.

Materials

- | | |
|--|---|
| <input type="checkbox"/> LaMotte Dissolved Oxygen kit | <input type="checkbox"/> Distilled water bottle |
| <input type="checkbox"/> Sampling apparatus (where applicable) | <input type="checkbox"/> Towel |
| <input type="checkbox"/> Wide-mouthed bottle labeled "waste" | <input type="checkbox"/> Safety glasses |
| <input type="checkbox"/> Bottle of Ivory Clear for cleaning | <input type="checkbox"/> Thermometer |
| <input type="checkbox"/> Rubber boots | |

Important: *Always wear gloves and safety glasses as you conduct this test. Wash hands afterwards.*

<i>Dissolved Oxygen Protocol (continued)</i>
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Procedure:**Collecting the Sample**

1. The sample should be taken from the reach of the creek determined during the site selection process, in the **main flow** of the stream. Avoid excessively turbulent or still water, and avoid areas near bridges or other structures that impede water flow (unless you have specifically targeted these conditions for comparison sampling).

Note: Do not disturb the bottom of the stream upstream of the sampling site. Disturbances can affect the accuracy of results.

2. Rinse the sampling bottle at least once using the stream water.
3. Collect the sample at least 1" below the water surface and at least 1" above the stream bed. During low flow periods, sample from a pool and obtain the cleanest sample possible. Note the stream conditions on the data sheet in the comments section.
4. Hold the bottle upside down and immerse in the stream to collect the sample. Slowly invert the bottle underwater allowing air bubbles to escape.
5. Check the sample for air bubbles, gently tapping the side of the bottle to release any remaining bubbles.

Note: Air bubbles trapped in the bottle will artificially elevate the results.

6. Immediately cap the bottle. Hold the bottle by the capped end, so that your hand will not warm up the sample.

Note: Dissolved oxygen is extremely sensitive to temperature. If the sample warms up during processing, oxygen will be released from the sample affecting the results.

Important: The remainder of the dissolved oxygen procedure involves using the five chemical solutions in the kit. These solutions are called reagents, and should be handled with care.

- When adding reagents to the water sample, be sure to hold the reagent bottle vertically while squeezing the drops.
- The tip of the reagent bottle should be 1/2" above the sample.
- **NEVER** allow the reagent bottle tip to touch the water sample because this will contaminate the reagent.
- A small amount of liquid from the sample bottle will be displaced and flow over the top as the reagents are added. The reagents will sink, so this will **not** affect results.

<i>Dissolved Oxygen Protocol (Continued)</i>
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Fixing (stabilizing) the Sample

1. Remove cap from the sample bottle and **add 8 drops of Manganous Sulfate** (pinkish solution) holding the bottle of solution vertically upside down as you add the drops (see illustration).
2. **Add 8 drops of Alkaline Potassium Iodide Azide**. Make sure to hold the reagent bottle vertically while adding drops.
3. Immediately **cap the sample** and invert the dissolved oxygen bottle gently to mix.
4. **Allow the precipitate (cloudy substance) to settle** below the shoulder of the bottle - 1-5 minutes.
5. **Add 8 drops of Sulfuric Acid** (be especially careful with this chemical). Cap bottle and shake vigorously until the dark brown crystals dissolve. A clear yellow color will appear. The sample is now “fixed” or stabilized and can be exposed to the atmosphere and temperature changes without changing the results.

Titrating the Sample

1. **Measure 20 ml** of the fixed sample (yellow liquid) into the graduated cylinder, being careful to check the measurement on a flat surface, with your eye at the level of the liquid. Transfer the liquid to the glass cylinder and cover the cylinder with the plastic cap.
2. Insert the titrator syringe into the hole at the mouth of the Sodium Thiosulfate bottle (with the plunger pressed down to the tip). Turn the bottle upside-down, and pull the plunger gently, **filling the titrator** syringe until the tip of the plunger lines up with the zero mark (see illustration). *Important: If there are any air bubbles in the titrator syringe as you begin to fill it, force them out by depressing the plunger back to the tip, then proceed to fill the titrator to the zero mark.*
3. **Add 8 drops Starch Indicator** to the solution and swirl the solution until it is a uniform blue/black color. Cap the glass cylinder.
4. **Insert the titrator into the hole in the cap** of the glass cylinder. By slowly pressing the plunger, add drops to the solution. Swirl solution after each addition.
5. **Continue adding drops** one at a time. As the color approaches pale blue, depress the plunger very slowly, allowing only 1/2 drop at a time. Continue until the liquid instantly turns colorless. Be sure to swirl thoroughly after each drop.

Note: Although color changes will occur where the drop first contacts the sample, the drop must be dispersed throughout the sample. The entire solution will turn clear and

remain that way for 1-2 minutes when the process for the entire sample solution is at the end point.

<i>Dissolved Oxygen Protocol (Continued)</i>
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NOTE: If the plunger tip reaches the bottom line of the titrator before endpoint color change, record the volume already used (probably 10 ppm or 10 drops). Then fill the titrator to the “7” line (adding 3 units of the sodium thiosulfate) using the small titrator tip attachment to extract the sodium thiosulfate (so that the titrator tip does not contaminate the reagent). Continue adding drops to the sample until the process is complete.

6. The correct result is the number at the point where the plunger tip meets the scale on the titrator (*if the titrator was refilled, add the first 10 ppm to the last reading to reflect the total amount of reagent dispensed*). Each minor division on the scale equals 0.2 milligrams per liter (mg/l). One mg/l = one ppm (part per million).
Record the test results in mg/L on the data sheet.
7. If your results are unusual or outside the acceptable ranges for dissolved oxygen, collect a new sample and repeat the above procedure. If the second set of results is still outside the acceptable ranges or normal range for the site, call the RCD at (707) 252-4188.

**Generally accepted ranges for dissolved oxygen are:
8 – 12 mg/L in the summer and 5 – 11 mg/L in the winter.**

Determining Percent Saturation

The percent saturation of oxygen in a sample of water depends on the water temperature. The colder the water, the more oxygen it can hold. [*For example, a sample with 10 mg/L of dissolved oxygen at 10 C will have a lower saturation (87%) than a sample with 10 mg/L dissolved oxygen at 15 C (97%).*]

1. To calculate percent saturation, you will need the results of the dissolved oxygen test, the temperature of the water, and the “Level of Dissolved Oxygen” chart (see next page).
2. Using a straight edge or a piece of paper, draw a straight line between the water temperature (at the top of the chart) and the dissolved oxygen value (at the bottom of the chart).
3. Note the value on the % Saturation line (sloping line in the middle) that your line crosses. **Record this value on your data sheet as the % saturation.**

NAPA COUNTY RESOURCE CONSERVATION DISTRICT
Napa River Watershed Monitoring

*Parameter: Water Quality Monitoring
Conductivity/Total Dissolved Solids*

Description: Conductivity is the ability of water to conduct an electrical current. Dissolved ions (dissolved salts) in the water are conductors. By determining the flow of electricity through a water sample, we can detect the amount of dissolved ions in that sample. The conductivity sensor measures the electrical current (carried by the dissolved ions) flowing between two electrodes. A sample with a higher conductivity reading would have more dissolved ions, and vice versa.

Importance: The information gathered will create baseline data about the Napa River watershed and help to determine trends. If conductivity levels are high, it might signal the need for further investigation of additional water quality parameters.

Protocol Summary:

1. First **calibrate** the meter (before testing the water).
2. Immerse the meter's electrodes into the water sample. Only immerse to the brown line - **the meter is not waterproof**.
3. Record the number on the display.

Materials:

- Conductivity meter
- Eight batteries (#675, hearing aid): four in the meter and 4 extra
- Small screwdriver, attached to meter
- Conductivity standard solution
- Clear plastic cup
- Latex gloves
- Wide-mouth bottle for waste liquids
- Data sheet, pen, and clipboard

<i>Conductivity Protocol (Continued)</i>
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Procedure

Calibration of Instrument

Important: **The conductivity meter MUST be calibrated before EACH use!**

1. Pour a small amount of conductivity standard (about 1/4 inch) into the clear plastic cup.
2. Remove the cap from the end of the meter, place the meter in the cup so that the electrodes are immersed in the liquid, and press the button on the face of the meter to turn it on.
3. Swirl liquid once gently and wait until the numbers on the display stabilize.
4. **MAKE SURE** you know the numerical value of your conductivity standard.
5. If the display does not read the correct number for the standard you are using, use the small screwdriver to turn the screw on the back of the meter. Adjust the meter, keeping the electrodes immersed in the standard solution and watching the display as it adjusts. It is correctly calibrated when it stabilizes at the same number as your conductivity standard.

Note: the meter only shows increments of 10 (for example: you will not see a # like 447)

Taking the Conductivity Reading

1. Dip meter into creek (if the creek is flowing swiftly see * below). Be sure not to immerse above the brown line. **THE METER IS NOT WATERPROOF.**
2. Swirl the sample once gently, then wait until the reading has stabilized. Record the number in the meter's display screen on the data sheet.
3. **Switch off meter** and replace cap. Batteries run down very quickly.
4. Check results against historical and recent results, and acceptable ranges. Repeat calibration and testing if the results are inconsistent or unusual. If results of the second testing are still unusual, call the RCD at (707) 252-4188

* When the stream is flowing swiftly, collect a sample from the main flow of the stream. The sample should be collected below the surface of the water, but above the stream bottom. Proceed to test the conductivity IMMEDIATELY from the gathered sample.

Note: Be sure to have extra batteries. You can not take a reading without them.

Acceptable ranges for Conductivity are 100 – 1000 uS/cm.

NAPA COUNTY RESOURCE CONSERVATION DISTRICT
Napa River Watershed Monitoring

Water Quality Monitoring Parameter
pH

Importance: pH is a measure of how acidic or basic (alkaline) the water is. As the pH decreases, water becomes more acidic, and as the pH increases, water becomes more basic. Fish and other aquatic life can tolerate only a limited pH range.

Materials

- Litmus paper kit
- Clean cup to hold water during testing

Procedure

1. Collect a sample of water in a clean cup from the main flow of the stream.
2. Tear off a small piece of the pH paper from the **lower range side** and dip it briefly into the water sample.
3. Match the color of the paper with the colors on the chart from the **SAME SIDE** (lower range side) of the pH kit.
4. If there is a close match in color, write the number under that color on your data sheet.
5. **If the match in color is a 6.0**, you MUST flip the kit over and tear a small piece of pH paper from the **higher range side** of the kit and repeat the above procedure using the color chart on the higher range side of the kit.

Acceptable ranges for pH are approximately from 6.0 – 9.0

APPENDIX D: HABITAT TYPING RESULTS TABLES

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat**Stream Name:** Bale Slough**LLID:** 1224124384645**Drainage:** Napa River**Survey** 8/5/2004 to 8/5/2004**Confluence Location: Quad:** RUTHERFORD**Legal Description:** T000R000S00**Latitude:** 38:27:52.0N**Longitude:** 122:24:45.0

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
2	0	CULVERT	5.6	24	48	2.7									
14	0	DRY	38.9	72	1007	56.2									
2	1	FLATWATER	5.6	36	71	4.0	3.0	0.2	0.4	29	59	6	12		35
12	5	POOL	33.3	14	164	9.2	4.7	0.6	0.9	52	625	33	399	32	35
6	1	RIFFLE	16.7	84	502	28.0	1.0	0.1	0.2	7	43	1	4		
Total Units	Total Units Fully Measured				Total Length (ft.)						Total Area (sq.ft.)		Total Volume (cu.ft.)		
36	7				1792						727		415		

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Bale Slough

LLID: 1224124384645 **Drainage:** Napa River

Survey 8/5/2004 to 8/5/2004

Confluence Location: Quad: RUTHERFORD

Legal Description: T000R000S00

Latitude: 38:27:52.0N

Longitude: 122:24:45.0

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	Mean Canopy (%)
6	1	HGR	16.7	84	502	28.0	1.0	0.1	0.2	7	43	1	4			100
2	1	GLD	5.6	36	71	4.0	3.0	0.2	0.4	29	59	6	12		35	96
12	5	MCP	33.3	14	164	9.2	5.0	0.6	1.4	52	625	33	399	32	35	99
14	0	DRY	38.9	72	1007	56.2										
2	0	CUL	5.6	24	48	2.7										
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)			Total Volume (cu.ft.)			
36	7				1792					727			415			

Table 3 - Summary of Pools**Stream Name:** Bale Slough**LLID:** 1224124384645**Drainage:** Napa River**Survey** 8/5/2004 to 8/5/2004**Confluence Location: Quad:** RUTHERFORD**Legal Description:** T000R000S00**Latitude:** 38:27:52.0N**Longitude:** 122:24:45.0

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
12	5	MAIN	100	14	164	100	4.7	0.6	52	625	32	389	35
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)		Total Volume (cu.ft.)	
12	5				164					625		389	

Table 4 - Summary of Maximum Residual Pool Depths

Stream Name: Bale Slough		LLID: 1224124384645						Drainage: Napa River					
Survey 8/5/2004 to 8/5/2004		Confluence Location: Quad: RUTHERFORD						Legal Description: T000R000S00		Latitude: 38:27:52.0N		Longitude: 122:24:45.0	
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	
5	MCP	100	3	60	2	40	0	0	0	0	0	0	
Total Units			Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1 < 2 Feet Max Resid. Depth	Total 1 < 2 Feet % Occurrence	Total 2 < 3 Feet Max Resid. Depth	Total 2 < 3 Feet % Occurrence	Total 3 < 4 Feet Max Resid. Depth	Total 3 < 4 Feet % Occurrence	Total >= 4 Feet Max Resid. Depth	Total >= 4 Feet % Occurrence	
5			3	60	2	40	0	0	0	0	0	0	
Mean Maximum Residual Pool Depth (ft.):			1										

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Bale Slough		LLID: 1224124384645						Drainage: Napa River					
Survey 8/5/2004 to 8/5/2004		Confluence Location: Quad: RUTHERFORD						Legal Description: T000R000S00		Latitude: 38:27:52.0N		Longitude: 122:24:45.0	
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		
6	0	HGR											
2	1	GLD	0	0	0	0	0	0	0	100	0		
12	3	MCP	0	0	0	20	23	0	0	57	0		
2	0	CUL											

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name:		Bale Slough		LLID:		1224124384645		Drainage:		Napa River	
Survey		8/5/2004 to 8/5/2004		Confluence Location: Quad:		RUTHERFORD		Legal Description:		T000R000S00	
Latitude:		38:27:52.0N		Longitude:		122:24:45.0		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									
6	1	HGR	0	0	0	100	0	0	0	0	0
2	1	GLD	0	0	100	0	0	0	0	0	0
12	5	MCP	0	100	0	0	0	0	0	0	0
2	0	CUL	0	0	0	0	0	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Survey

Stream Name:		Bale Slough		LLID:		1224124384645		Drainage:		Napa River	
Survey		8/5/2004 to 8/5/2004		Confluence Location: Quad:		RUTHERFORD		Legal Description:		T000R000S00	
Latitude:		38:27:52.0N		Longitude:		122:24:45.0		Habitat Units		Mean Percent Conifer	
Mean Percent Hardwood		Mean Percent Open Units		Mean Right Bank % Cover		Mean Left Bank % Cover					
99	85	15	0	31	58						

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	Bale Slough	LLID: 1224124384645	Drainage	Napa River
Survey Dates:	8/5/2004 to 8/5/2004	Survey Length (ft.): 1792	Main Channel (ft.): 1792	Side Channel (ft.): 0
Confluence Location:	Quad RUTHERFORD	Legal	T000R000S00	Latitude: 38:27:52.0N Longitude: 122:24:45.0

Summary of Fish Habitat Elements by Stream Reach**STREAM REACH: 1**

Channel Type:	B4	Canopy Density (%):	99.0	Pools by Stream Length	9.2
Reach Length (ft.):	1792	Coniferous Component (%):	84.6	Pool Frequency (%):	33.3
Riffle/Flatwater Mean Width (ft.):	2.0	Hardwood Component	15.4	Residual Pool Depth (%):	
BFW:		Dominant Bank	Brush	< 2 Feet Deep:	100.0
Range (ft.):	13.80 to 13.80	Vegetative Cover (%):	44.6	2 to 2.9 Feet Deep:	0.0
Mean (ft.):	13.8	Dominant	Boulders	3 to 3.9 Feet Deep:	0.0
Std. Dev.:	7.500076948385	Dominant Bank Substrate	Sand/Silt/Clay	>= 4 Feet Deep:	0.0
Base Flow (cfs):	0	Occurrence of LWD (%):	0.0	Mean Max Residual Pool Depth	0.88
Water (F):	60 - 62	Air (F):	70 - 78	LWD per 100 ft.:	
Dry Channel (ft.):	1007	Riffles:		Mean Pool Shelter	35
		Pools:			
		Flat:			
Pool Tail Substrate (%):	Silt/Clay: 0.0	Sand: 0.0	Gravel: 60.0	Sm Cobble: 40.0	Lg Cobble: 0.0
				Boulder: 0.0	Bedrock: 0.0

Table 9 -Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Bale Slough **LLID:** 1224124384645 **Drainage:** Napa River
Survey: 8/5/2004 to 8/5/2004
Confluence Location: Quad: RUTHERFORD **Legal Description:** T000R000S00 **Latitude:** 38:27:52.0N **Longitude:** 122:24:45.0

Mean Percentage of Dominant Stream Bank

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Bedrock	0	0	0.0
Boulder	1	1	14.3
Cobble/Gravel	2	2	28.6
Sand/Silt/Clay	4	4	57.1

Mean Percentage of Dominant Stream Bank

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage
Grass	0	0	0.0
Brush	2	5	50.0
Hardwood	0	0	0.0
Coniferous	5	2	50.0
No Vegetation	0	0	0.0

Total Stream Cobble Embeddedness 0

Table 10 - Mean Percent of Shelter Cover Types for Entire Survey**Stream Name:** Bale Slough**LLID:** 1224124384645**Drainage:** Napa River**Survey** 8/5/2004 to 8/5/2004**Confluence Location: Quad:** RUTHERFORD**Legal Description:** T000R000S00**Latitude:** 38:27:52.0N**Longitude:** 122:24:45.0

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)		0	0
SMALL WOODY DEBRIS (%)		0	0
LARGE WOODY DEBRIS (%)		0	0
ROOT MASS (%)		0	20
TERRESTRIAL VEGETATION (%)		0	23
AQUATIC VEGETATION (%)		0	0
WHITEWATER (%)		0	0
BOULDERS (%)		100	57
BEDROCK LEDGES (%)			

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat**Stream Name:** Bell Creek**LLID:** 1224919385353**Drainage:** Napa River**Survey** 5/25/2004 to 6/9/2004**Confluence Location: Quad:** ST. HELENA**Legal Description:** T000R000S00**Latitude:** 38:32:07.0N**Longitude:** 122:29:31.0

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	0.6	41	41	0.4									
2	0	DRY	1.3	598	1197	13.0									
43	7	FLATWATER	26.9	53	2294	24.9	9.4	0.6	0.8	373	16040	218	9378		23
1	0	NOSURVEY	0.6	1	1	0.0									
65	27	POOL	40.6	51	3286	35.7	13.3	1.1	2.0	762	49508	1343	87275	957	77
48	5	RIFFLE	30.0	50	2377	25.8	7.9	0.3	0.4	295	14183	106	5105		29
Total Units	Total Units Fully Measured				Total Length (ft.)						Total Area (sq.ft.)		Total Volume (cu.ft.)		
160	39				9196						79731		101758		

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name:		Bell Creek								LLID:		1224919385353		Drainage:				Napa River	
Survey		5/25/2004 to 6/9/2004								Latitude:		38:32:07.0N		Longitude:				122:29:31.0	
Confluence Location:		Quad: ST. HELENA								Legal Description:		T000R000S00							
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	Mean Canopy (%)			
48	5	LGR	30.0	50	2377	25.8	8.0	0.3	0.6	295	14183	106	5105		29	80			
36	5	GLD	22.5	57	2037	22.1	10.0	0.6	1.0	462	16623	276	9935		29	90			
7	2	RUN	4.4	37	257	2.8	6.0	0.5	1.0	151	1058	73	514		13	88			
37	15	MCP	23.1	53	1957	21.3	12.0	1.0	5.8	764	28263	1323	48936	973	87	83			
1	0	STP	0.6	59	59	0.6										91			
2	2	CRP	1.3	56	111	1.2	19.0	2.3	3.6	1038	2076	2865	5729	2387	128	91			
5	2	LSL	3.1	62	309	3.4	10.0	0.9	2.0	430	2150	688	3439	444	90	92			
8	3	LSR	5.0	44	348	3.8	14.0	1.0	3.0	724	5789	1398	11187	865	77	85			
1	1	LSBk	0.6	35	35	0.4	12.0	1.2	1.8	420	420	714	714	504	5	91			
5	1	LSBo	3.1	51	253	2.8	18.0	1.3	2.0	1692	8460	2707	13536	2200	70	85			
3	2	PLP	1.9	47	142	1.5	20.0	0.3	1.6	872	2616	789	2366	95	20	95			
1	0	BPB	0.6	26	26	0.3										100			
1	1	BPR	0.6	18	18	0.2	8.0	0.6	1.3	144	144	115	115	86	10	92			
1	0	BPL	0.6	28	28	0.3													
2	0	DRY	1.3	598	1197	13.0										6			
1	0	CUL	0.6	41	41	0.4													
1	0	NS	0.6	1	1	0.0													
Total Units	Total Units Fully Measured					Total Length (ft.)					Total Area (sq.ft.)					Total Volume (cu.ft.)			
160	39					9196					81782					101576			

Table 3 - Summary of Pools**Stream Name:** Bell Creek**LLID:** 1224919385353**Drainage:** Napa River**Survey** 5/25/2004 to 6/9/2004**Confluence Location: Quad:** ST. HELENA**Legal Description:** T000R000S00**Latitude:** 38:32:07.0N**Longitude:** 122:29:31.0

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
38	15	MAIN	58	53	2016	61	12.1	1.0	764	29027	973	36965	87
24	11	SCOUR	37	50	1198	36	15.3	1.1	815	19556	1014	24329	71
3	1	BACKWATER	5	24	72	2	8.0	0.6	144	432	86	259	10
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)		Total Volume (cu.ft.)	
65	27				3286					49015		61553	

Table 4 - Summary of Maximum Residual Pool Depths**Stream Name:** Bell Creek**LLID:** 1224919385353**Drainage:** Napa River**Survey** 5/25/2004 to 6/9/2004**Confluence Location: Quad:** ST. HELENA**Legal Description:** T000R000S00**Latitude:** 38:32:07.0N**Longitude:** 122:29:31.0

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
15	MCP	56	3	20	6	40	3	20	1	7	2	13
3	LSR	11	0	0	1	33	1	33	1	33	0	0
2	PLP	7	1	50	1	50	0	0	0	0	0	0
2	CRP	7	0	0	0	0	1	50	1	50	0	0
1	BPR	4	0	0	1	100	0	0	0	0	0	0
1	LSBk	4	0	0	1	100	0	0	0	0	0	0
2	LSL	7	0	0	1	50	1	50	0	0	0	0
0	BPL	0	0	0	0	0	0	0	0	0	0	0
1	LSBo	4	0	0	0	0	1	100	0	0	0	0
0	BPB	0	0	0	0	0	0	0	0	0	0	0
0	STP	0	0	0	0	0	0	0	0	0	0	0

Table 5 - Summary of Mean Percent Cover By Habitat Type**Stream Name:** Bell Creek**LLID:** 1224919385353**Drainage:** Napa River**Survey** 5/25/2004 to 6/9/2004**Confluence Location: Quad:** ST. HELENA**Legal Description:** T000R000S00**Latitude:** 38:32:07.0N**Longitude:** 122:29:31.0

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
48	4	LGR	0	0	0	0	88	0	0	13	0
36	5	GLD	0	2	0	18	66	0	0	10	4
7	3	RUN	17	2	0	7	50	0	2	23	0
37	15	MCP	12	7	4	27	39	1	0	9	0
1	0	STP									
2	2	CRP	8	18	8	8	18	0	0	43	0
5	2	LSL	5	13	25	13	40	0	0	0	5
8	3	LSR	45	8	0	22	22	0	0	3	0
1	1	LSBk	0	0	0	0	100	0	0	0	0
5	1	LSBo	0	0	0	10	40	0	0	50	0
3	2	PLP	0	3	0	5	45	0	48	0	0
1	0	BPB									
1	1	BPR	0	0	0	100	0	0	0	0	0
1	0	BPL									
1	0	CUL									
1	0	NS									

Table 6 - Summary of Dominant Substrates By Habitat Type**Stream Name:** Bell Creek**LLID:** 1224919385353**Drainage:** Napa River**Survey** 5/25/2004 to 6/9/2004**Confluence Location: Quad:** ST. HELENA**Legal Description:** T000R000S00**Latitude:** 38:32:07.0N**Longitude:** 122:29:31.0

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
48	5	LGR	0	0	20	60	20	0	0
36	5	GLD	0	0	40	60	0	0	0
7	3	RUN	0	33	33	33	0	0	0
37	15	MCP	27	27	27	20	0	0	0
1	0	STP	0	0	0	0	0	0	0
2	2	CRP	50	50	0	0	0	0	0
5	2	LSL	0	50	50	0	0	0	0
8	3	LSR	0	33	67	0	0	0	0
1	1	LSBk	0	0	100	0	0	0	0
5	1	LSBo	0	0	0	100	0	0	0
3	2	PLP	0	50	50	0	0	0	0
1	0	BPB	0	0	0	0	0	0	0
1	1	BPR	0	0	100	0	0	0	0
1	0	BPL	0	0	0	0	0	0	0
1	0	CUL	0	0	0	0	0	0	0
1	0	NS	0	0	0	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Survey**Stream Name:** Bell Creek**LLID:** 1224919385353**Drainage:** Napa River**Survey** 5/25/2004 to 6/9/2004**Confluence Location: Quad:** ST. HELENA**Legal Description:** T000R000S00**Latitude:** 38:32:07.0N**Longitude:** 122:29:31.0

Habitat Units	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
84	18	79	0	87	78

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 Bell Creek LLID: 1224919385353 Drainage Napa River
 Survey Dates: 5/25/2004 to 6/9/2004 Survey Length (ft.): 9195.5 Main Channel (ft.): 9177.5 Side Channel (ft.): 18
 Confluence Location: Quad ST. HELENA Legal T000R000S00 Latitude: 38:32:07.0N Longitude: 122:29:31.0

Summary of Fish Habitat Elements By Stream Reach**STREAM REACH: 1**

Channel Type: F4	Canopy Density (%): 83.8	Pools by Stream Length	34.7
Reach Length (ft.): 698	Coniferous Component (%): 13.0	Pool Frequency (%):	28.6
Riffle/Flatwater Mean Width (ft.): 7.5	Hardwood Component 87.0	Residual Pool Depth (%):	
BFW:	Dominant Bank Brush	< 2 Feet Deep:	75.0
Range (ft.): 14 to 28	Vegetative Cover (%): 73.4	2 to 2.9 Feet Deep:	25.0
Mean (ft.): 20	Dominant Terrestrial Veg.	3 to 3.9 Feet Deep:	0.0
Std. Dev.: 6.928203230275	Dominant Bank Substrate Sand/Silt/Clay	>= 4 Feet Deep:	0.0
Base Flow (cfs):	Occurrence of LWD (%): 0.0	Mean Max Residual Pool Depth	1.11
Water (F): 0 - 59 Air (F): 0 - 67	LWD per 100 ft.:	Mean Pool Shelter	51
Dry Channel (ft.): 0	Riffles: 0		
	Pools: 1		
	Flat: 0		
Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 40.0 Sm Cobble: 40.0 Lg Cobble: 20.0 Boulder: 0.0 Bedrock: 0.0			
Embeddedness Values	1. 0.0 2. 40.0 3. 60.0 4. 0.0 5. 0.0		

BELL CREEK

STREAM REACH: 2

Channel Type: F4	Canopy Density (%): 85.9	Pools by Stream Length	58.8
Reach Length (ft.): 1274	Coniferous Component (%): 16.1	Pool Frequency (%):	55.2
Riffle/Flatwater Mean Width (ft.):	Hardwood Component 83.9	Residual Pool Depth (%):	
BFW:	Dominant Bank Brush	< 2 Feet Deep:	37.5
Range (ft.): 14 to 24.10	Vegetative Cover (%): 83.3	2 to 2.9 Feet Deep:	25.0
Mean (ft.): 18.08620689655	Dominant Terrestrial Veg.	3 to 3.9 Feet Deep:	12.5
Std. Dev.: 4.103129515292	Dominant Bank Substrate Sand/Silt/Clay	>= 4 Feet Deep:	25.0
Base Flow (cfs): 0	Occurrence of LWD (%): 2.8	Mean Max Residual Pool Depth	2.88
Water (F): 59 - 59 Air (F): 61 - 67	LWD per 100 ft.:	Mean Pool Shelter	84
Dry Channel (ft.): 0	Riffles: 0		
	Pools: 0		
	Flat: 0		
Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 88.9 Sm Cobble: 11.1 Lg Cobble: 0.0 Boulder 0.0 Bedrock: 0.0			
Embeddedness Values 1. 0.0 2. 100.0 3. 0.0 4. 0.0 5. 0.0			

STREAM REACH: 3

Channel Type: B3	Canopy Density (%): 78.0	Pools by Stream Length	49.7
Reach Length (ft.): 1368	Coniferous Component (%): 13.2	Pool Frequency (%):	48.1
Riffle/Flatwater Mean Width (ft.): 14.0	Hardwood Component 86.8	Residual Pool Depth (%):	
BFW:	Dominant Bank Brush	< 2 Feet Deep:	60.0
Range (ft.): 25.70 to 25.70	Vegetative Cover (%): 88.3	2 to 2.9 Feet Deep:	40.0
Mean (ft.): 25.7	Dominant Terrestrial Veg.	3 to 3.9 Feet Deep:	0.0
Std. Dev.: 8.290243491693	Dominant Bank Substrate Sand/Silt/Clay	>= 4 Feet Deep:	0.0
Base Flow (cfs):	Occurrence of LWD (%): 13.3	Mean Max Residual Pool Depth	1.74
Water (F): 0 - 59 Air (F): 62 - 67	LWD per 100 ft.:	Mean Pool Shelter	96
Dry Channel (ft.): 0	Riffles: 0		
	Pools: 1		
	Flat: 0		
Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 60.0 Sm Cobble: 40.0 Lg Cobble: 0.0 Boulder 0.0 Bedrock: 0.0			
Embeddedness Values 1. 20.0 2. 80.0 3. 0.0 4. 0.0 5. 0.0			

BELL CREEK

STREAM REACH: 4

Channel Type: F4	Canopy Density (%): 85.7	Pools by Stream Length	26.4
Reach Length (ft.): 3946	Coniferous Component (%): 24.8	Pool Frequency (%):	38.3
Riffle/Flatwater Mean Width (ft.): 9.8	Hardwood Component	75.2	Residual Pool Depth (%):
BFW:	Dominant Bank	Brush	< 2 Feet Deep: 42.9
Range (ft.): 37.40 to 37.40	Vegetative Cover (%): 83.1		2 to 2.9 Feet Deep: 28.6
Mean (ft.): 37.4	Dominant	Terrestrial Veg.	3 to 3.9 Feet Deep: 28.6
Std. Dev.: 2.947989075074	Dominant Bank Substrate	Cobble/Gravel	>= 4 Feet Deep: 0.0
Base Flow (cfs): 0	Occurrence of LWD (%): 1.7	Mean Max Residual Pool Depth	2.02
Water (F): 56 - 60	Air (F): 59 - 81	LWD per 100 ft.:	Mean Pool Shelter
Dry Channel (ft.): 1197		Riffles: 0	81
		Pools: 0	
		Flat: 0	
Pool Tail Substrate (%): Silt/Clay: 0.0	Sand: 0.0	Gravel: 0.0	Sm Cobble: 100.0
	Lg Cobble: 0.0	Boulder: 0.0	Bedrock: 0.0
Embeddedness Values	1. 12.5	2. 87.5	3. 0.0
	4. 0.0	5. 0.0	

STREAM REACH: 5

Channel Type: F4	Canopy Density (%): 86.4	Pools by Stream Length	29.8
Reach Length (ft.): 1891.5	Coniferous Component (%): 17.5	Pool Frequency (%):	33.3
Riffle/Flatwater Mean Width (ft.): 6.0	Hardwood Component	82.5	Residual Pool Depth (%):
BFW:	Dominant Bank	Brush	< 2 Feet Deep: 100.0
Range (ft.): 37.40 to 37.40	Vegetative Cover (%): 85.0		2 to 2.9 Feet Deep: 0.0
Mean (ft.): 37.4	Dominant	Terrestrial Veg.	3 to 3.9 Feet Deep: 0.0
Std. Dev.: 1.026262408387	Dominant Bank Substrate	Sand/Silt/Clay	>= 4 Feet Deep: 0.0
Base Flow (cfs): 0	Occurrence of LWD (%): 0.0	Mean Max Residual Pool Depth	0.9
Water (F): 57 - 60	Air (F): 59 - 68	LWD per 100 ft.:	Mean Pool Shelter
Dry Channel (ft.): 0		Riffles:	57
		Pools:	
		Flat:	
Pool Tail Substrate (%): Silt/Clay: 66.7	Sand: 0.0	Gravel: 0.0	Sm Cobble: 0.0
	Lg Cobble: 33.3	Boulder: 0.0	Bedrock: 0.0
Embeddedness Values	1. 100.0	2. 0.0	3. 0.0
	4. 0.0	5. 0.0	

Table 9 -Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Bell Creek **LLID:** 1224919385353 **Drainage:** Napa River
Survey: 5/25/2004 to 6/9/2004
Confluence Location: Quad: ST. HELENA **Legal Description:** T000R000S00 **Latitude:** 38:32:07.0N **Longitude:** 122:29:31.0

Mean Percentage of Dominant Stream Bank

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Bedrock	0	1	1.3
Boulder	0	0	0.0
Cobble/Gravel	15	13	35.0
Sand/Silt/Clay	25	26	63.8

Mean Percentage of Dominant Stream Bank

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage
Grass	1	3	5.0
Brush	28	24	65.0
Hardwood	10	11	26.3
Coniferous	1	1	2.5
No Vegetation	0	1	1.3

Total Stream Cobble Embeddedness 2

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

Stream Name: Bell Creek **LLID:** 1224919385353 **Drainage:** Napa River
Survey: 5/25/2004 to 6/9/2004
Confluence Location: Quad: ST. HELENA **Legal Description:** T000R000S00 **Latitude:** 38:32:07.0N **Longitude:** 122:29:31.0

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	6	13
SMALL WOODY DEBRIS (%)	0	2	7
LARGE WOODY DEBRIS (%)	0	0	5
ROOT MASS (%)	0	14	23
TERRESTRIAL VEGETATION (%)	88	60	37
AQUATIC VEGETATION (%)	0	0	1
WHITEWATER (%)	0	1	4
BOULDERS (%)	13	15	11
BEDROCK LEDGES (%)	0	3	0

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat**Stream Name:** Cañon Creek**LLID:** 1224919385353**Drainage:** Napa River**Survey** 7/1/2004 to 7/1/2004**Confluence Location: Quad:** ST. HELENA**Legal Description:** T000R000S00**Latitude:** 38:32:07.0N**Longitude:** 122:29:31.0

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
3	1	FLATWATER	12.0	51	152	13.8	7.0	0.6	1.0	177	532	106	319		15
10	3	POOL	40.0	46	465	42.2	10.3	0.9	1.9	436	4356	743	7429	561	37
12	1	RIFFLE	48.0	40	484	44.0	7.0	0.2	0.4	117	1399	23	280		30
Total Units	Total Units Fully Measured				Total Length (ft.)						Total Area (sq.ft.)		Total Volume (cu.ft.)		
25	5				1101						6287		8028		

Table 2 - Summary of Habitat Types and Measured Parameters**Stream Name:** Cañon Creek**LLID:** 1224919385353**Drainage:** Napa River**Survey** 7/1/2004 to 7/1/2004**Confluence Location: Quad:** ST. HELENA**Legal Description:** T000R000S00**Latitude:** 38:32:07.0N**Longitude:** 122:29:31.0

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	Mean Canopy (%)
11	1	LGR	44.0	41	455	41.3	7.0	0.2	0.4	117	1282	23	256		30	98
1	0	CAS	4.0	29	29	2.6										85
3	1	GLD	12.0	51	152	13.8	7.0	0.6	1.0	177	532	106	319		15	65
7	2	MCP	28.0	41	285	25.9	12.0	1.1	2.7	566	3962	1027	7189	797	35	97
1	0	LSL	4.0	33	33	3.0										88
2	1	LSR	8.0	74	147	13.4	8.0	0.5	1.3	175	350	175	350	87	40	100
Total Units	Total Units Fully Measured				Total Length (ft.)						Total Area (sq.ft.)		Total Volume (cu.ft.)			
25	5				1101						6126		8114			

Table 3 - Summary of Pools

Stream Name: Cañon Creek **LLID:** 1224919385353 **Drainage:** Napa River
Survey: 7/1/2004 to 7/1/2004
Confluence Location: Quad: ST. HELENA **Legal Description:** T000R000S00 **Latitude:** 38:32:07.0N **Longitude:** 122:29:31.0

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
7	2	MAIN	70	41	285	61	11.5	1.1	566	3962	797	5580	35
3	1	SCOUR	30	60	180	39	8.0	0.5	175	524	87	262	40
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)		Total Volume (cu.ft.)	
10	3				465					4486		5843	

Table 4 - Summary of Maximum Residual Pool Depths

Stream Name: Cañon Creek

LLID: 1224919385353

Drainage: Napa River

Survey 7/1/2004 to 7/1/2004

Confluence Location: Quad: ST. HELENA

Legal Description: T000R000S00

Latitude: 38:32:07.0N

Longitude: 122:29:31.0

Habitat Units	Habitat Type	Habitat Occurrence (%)	< 1 Foot Maximum Residual Depth	< 1 Foot Percent Occurrence	1 < 2 Feet Maximum Residual Depth	1 < 2 Feet Percent Occurrence	2 < 3 Feet Maximum Residual Depth	2 < 3 Feet Percent Occurrence	3 < 4 Feet Maximum Residual Depth	3 < 4 Feet Percent Occurrence	>= 4 Feet Maximum Residual Depth	>= 4 Feet Percent Occurrence
1	LSR	33	0	0	1	100	0	0	0	0	0	0
0	LSL	0	0	0	0	0	0	0	0	0	0	0
2	MCP	67	0	0	1	50	1	50	0	0	0	0
Total Units			Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1 < 2 Feet Max Resid. Depth	Total 1 < 2 Feet % Occurrence	Total 2 < 3 Feet Max Resid. Depth	Total 2 < 3 Feet % Occurrence	Total 3 < 4 Feet Max Resid. Depth	Total 3 < 4 Feet % Occurrence	Total >= 4 Feet Max Resid. Depth	Total >= 4 Feet % Occurrence
3			0	0	2	67	1	33	0	0	0	0
Mean Maximum Residual Pool Depth (ft.):			2									

Table 5 - Summary of Mean Percent Cover By Habitat Types**Stream Name:** Cañon Creek**LLID:** 1224919385353**Drainage:** Napa River**Survey** 7/1/2004 to 7/1/2004**Confluence Location: Quad:** ST. HELENA**Legal Description:** T000R000S00**Latitude:** 38:32:07.0N**Longitude:** 122:29:31.0

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
11	1	LGR	0	15	0	0	55	0	0	30	0
1	0	CAS									
3	1	GLD	0	0	0	0	10	0	0	90	0
7	2	MCP	50	10	0	25	15	0	0	0	0
1	0	LSL									
2	1	LSR	20	0	0	40	30	0	0	10	0

Table 6 - Summary of Dominant Substrates By Habitat Types

Stream Name: Cañon Creek **LLID:** 1224919385353 **Drainage:** Napa River

Survey: 7/1/2004 to 7/1/2004

Confluence Location: Quad: ST. HELENA **Legal Description:** T000R000S00 **Latitude:** 38:32:07.0N **Longitude:** 122:29:31.0

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
11	1	LGR	0	0	100	0	0	0	0
1	0	CAS	0	0	0	0	0	0	0
3	1	GLD	0	100	0	0	0	0	0
7	2	MCP	0	50	50	0	0	0	0
1	0	LSL	0	0	0	0	0	0	0
2	1	LSR	0	100	0	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Survey

Stream Name: Cañon Creek **LLID:** 1224919385353 **Drainage:** Napa River

Survey: 7/1/2004 to 7/1/2004

Confluence Location: Quad: ST. HELENA **Legal Description:** T000R000S00 **Latitude:** 38:32:07.0N **Longitude:** 122:29:31.0

Habitat Units	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
90	16	84	0	45	28

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	Cañon Creek	LLID: 1224919385353	Drainage	Napa River
Survey Dates:	7/1/2004 to 7/1/2004	Survey Length (ft.): 1101	Main Channel (ft.): 1101	Side Channel (ft.): 0
Confluence Location:	Quad ST. HELENA	Legal	T000R000S00	Latitude: 38:32:07.0N Longitude: 122:29:31.0

Summary of Fish Habitat Elements By Stream**STREAM REACH: 1**

Channel Type:	F4	Canopy Density (%):	90.4	Pools by Stream Length	42.2		
Reach Length (ft.):	1101	Coniferous Component (%):	15.8	Pool Frequency (%):	40.0		
Riffle/Flatwater Mean Width (ft.):	7.0	Hardwood Component	84.2	Residual Pool Depth (%):			
BFW:		Dominant Bank	Hardwood Trees	< 2 Feet Deep:	66.7		
Range (ft.):	15.60 to 15.60	Vegetative Cover (%):	36.5	2 to 2.9 Feet Deep:	33.3		
Mean (ft.):	15.6	Dominant	Boulders	3 to 3.9 Feet Deep:	0.0		
Std. Dev.:	4.902328543110	Dominant Bank Substrate	Sand/Silt/Clay	>= 4 Feet Deep:	0.0		
Base Flow (cfs):	0	Occurrence of LWD (%):	0.0	Mean Max Residual Pool Depth	1.86		
Water (F):	59 - 59	Air (F):	64 - 64	LWD per 100 ft.:			
Dry Channel (ft.):	0	Riffles:		Mean Pool Shelter	37		
		Pools:					
		Flat:					
Pool Tail Substrate (%):	Silt/Clay: 0.0	Sand: 0.0	Gravel: 33.3	Sm Cobble: 33.3	Lg Cobble: 33.3	Boulder: 0.0	Bedrock: 0.0
Embeddedness Values	1. 33.3	2. 66.7	3. 0.0	4. 0.0	5. 0.0		

Table 9 -Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Cañon Creek **LLID:** 1224919385353 **Drainage:** Napa River
Survey: 7/1/2004 to 7/1/2004
Confluence Location: Quad: ST. HELENA **Legal Description:** T000R000S00 **Latitude:** 38:32:07.0N **Longitude:** 122:29:31.0

Mean Percentage of Dominant Stream Bank

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Bedrock	0	0	0.0
Boulder	0	1	10.0
Cobble/Gravel	1	0	10.0
Sand/Silt/Clay	4	4	80.0

Mean Percentage of Dominant Stream Bank

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage
Grass	0	0	0.0
Brush	2	2	40.0
Hardwood	3	3	60.0
Coniferous	0	0	0.0
No Vegetation	0	0	0.0

Total Stream Cobble Embeddedness 2

Table 10 - Mean Percent of Shelter Cover Types For Entire Survey**Stream Name:** Cañon Creek**LLID:** 1224919385353**Drainage:** Napa River**Survey** 7/1/2004 to 7/1/2004**Confluence Location: Quad:** ST. HELENA**Legal Description:** T000R000S00**Latitude:** 38:32:07.0N**Longitude:** 122:29:31.0

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	0	40
SMALL WOODY DEBRIS (%)	15	0	7
LARGE WOODY DEBRIS (%)	0	0	0
ROOT MASS (%)	0	0	30
TERRESTRIAL VEGETATION (%)	55	10	20
AQUATIC VEGETATION (%)	0	0	0
WHITEWATER (%)	0	0	0
BOULDERS (%)	30	90	3
BEDROCK LEDGES (%)	0	0	0

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

Stream Name: Conn Creek

LLID: 1223524384197

Drainage: Napa River

Survey 8/6/2004 to 8/10/2004

Confluence Location: Quad: ST. HELENA

Legal Description: T000R000S00

Latitude: 38:25:11.0N

Longitude: 122:21:09.0

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
20	0	DRY	29.4	1353	27054	80.3									
8	1	FLATWATER	11.8	129	1033	3.1	18.0	0.8	1.1	1193	9547	955	7638		15
27	9	POOL	39.7	190	5139	15.3	17.0	1.0	2.2	2263	61102	3176	85740	3055	19
13	1	RIFFLE	19.1	34	447	1.3	19.0	0.2	0.4	167	2174	33	435		
Total Units	Total Units Fully Measured				Total Length (ft.)						Total Area (sq.ft.)		Total Volume (cu.ft.)		
68	11				33673						72823		93812		

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Conn Creek

LLID: 1223524384197

Drainage: Napa River

Survey 8/6/2004 to 8/10/2004

Confluence Location: Quad: ST. HELENA

Legal Description: T000R000S00

Latitude: 38:25:11.0N

Longitude: 122:21:09.0

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	Mean Canopy (%)
13	1	LGR	19.1	34	447	1.3	19.0	0.2	0.4	167	2174	33	435			12
8	1	GLD	11.8	129	1033	3.1	18.0	0.8	1.1	1193	9547	955	7638		15	57
27	9	MCP	39.7	190	5139	15.3	17.0	1.0	4.1	2263	61102	3176	85740	3055	19	37
20	0	DRY	29.4	1353	27054	80.3										47
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)			Total Volume (cu.ft.)			
68	11				33673					72823			93812			

Table 3 - Summary of Pools**Stream Name:** Conn Creek**LLID:** 1223524384197**Drainage:** Napa River**Survey** 8/6/2004 to 8/10/2004**Confluence Location: Quad:** ST. HELENA**Legal Description:** T000R000S00**Latitude:** 38:25:11.0N**Longitude:** 122:21:09.0

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
27	9	MAIN	100	190	5139	100	17.0	1.0	2263	61102	3055	82496	19
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)		Total Volume (cu.ft.)	
27	9				5139					61102		82496	

Table 4 - Summary of Maximum Residual Pool Depths

Stream Name: Conn Creek			LLID: 1223524384197					Drainage: Napa River				
Survey 8/6/2004 to 8/10/2004												
Confluence Location: Quad: ST. HELENA			Legal Description: T000R000S00					Latitude: 38:25:11.0N		Longitude: 122:21:09.0		
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
9	MCP	100	2	22	2	22	1	11	3	33	1	11
Total Units			Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1 < 2 Feet Max Resid. Depth	Total 1 < 2 Feet % Occurrence	Total 2 < 3 Feet Max Resid. Depth	Total 2 < 3 Feet % Occurrence	Total 3 < 4 Feet Max Resid. Depth	Total 3 < 4 Feet % Occurrence	Total >= 4 Feet Max Resid. Depth	Total >= 4 Feet % Occurrence
9			2	22	2	22	1	11	3	33	1	11
Mean Maximum Residual Pool Depth (ft.):			2									

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Conn Creek			LLID: 1223524384197					Drainage: Napa River				
Survey 8/6/2004 to 8/10/2004												
Confluence Location: Quad: ST. HELENA			Legal Description: T000R000S00					Latitude: 38:25:11.0N		Longitude: 122:21:09.0		
Habitat Units	Units 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	
13	0	LGR										
8	1	GLD	0	0	0	0	10	0	0	90	0	
27	7	MCP	2	4	0	21	36	12	0	24	0	

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Conn Creek				LLID: 1223524384197				Drainage: Napa River	
Survey 8/6/2004 to 8/10/2004									
Confluence Location: Quad: ST. HELENA				Legal Description: T000R000S00		Latitude: 38:25:11.0N		Longitude: 122:21:09.0	
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
13	1	LGR	0	0	100	0	0	0	0
8	1	GLD	0	100	0	0	0	0	0
27	9	MCP	22	56	11	11	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Survey

Stream Name: Conn Creek				LLID: 1223524384197		Drainage: Napa River			
Survey 8/6/2004 to 8/10/2004									
Confluence Location: Quad: ST. HELENA				Legal Description: T000R000S00		Latitude: 38:25:11.0N		Longitude: 122:21:09.0	
Habitat Units	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover				
39	10	90	8	56	74				

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 Conn Creek LLID: 1223524384197 Drainage Napa River
 Survey Dates: 8/6/2004 to 8/10/2004 Survey Length (ft.): 33673 Main Channel (ft.): 33673 Side Channel (ft.): 0
 Confluence Location: Quad ST. HELENA Legal T000R000S00 Latitude: 38:25:11.0N Longitude: 122:21:09.0

STREAM REACH: 1

Channel Type: F4	Canopy Density (%): 39.5	Pools by Stream Length	9.3
Reach Length (ft.): 29453	Coniferous Component (%): 2.5	Pool Frequency (%):	48.5
Riffle/Flatwater Mean Width (ft.):	Hardwood Component 97.5	Residual Pool Depth (%):	
BFW:	Dominant Bank Brush	< 2 Feet Deep:	20.0
Range (ft.): 30 to 30	Vegetative Cover (%): 72.5	2 to 2.9 Feet Deep:	20.0
Mean (ft.): 30	Dominant Terrestrial Veg.	3 to 3.9 Feet Deep:	60.0
Std. Dev.: 0	Dominant Bank Substrate Sand/Silt/Clay	>= 4 Feet Deep:	0.0
Base Flow (cfs): 0	Occurrence of LWD (%): 0.0	Mean Max Residual Pool Depth	2.58
Water (F): 61 - 70 Air (F): 77 - 82	LWD per 100 ft.:	Mean Pool Shelter	17
Dry Channel (ft.): 26721	Riffles:		
	Pools:		
	Flat:		
Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 50.0 Sm Cobble: 50.0 Lg Cobble: 0.0 Boulder 0.0 Bedrock: 0.0			
Embeddedness Values	1. 0.0 2. 100.0 3. 0.0 4. 0.0 5. 0.0		

STREAM REACH: 2

Channel Type: F3	Canopy Density (%): 39.4	Pools by Stream Length	57.0
Reach Length (ft.): 4220	Coniferous Component (%): 16.7	Pool Frequency (%):	31.4
Riffle/Flatwater Mean Width (ft.): 18.5	Hardwood Component 83.3	Residual Pool Depth (%):	
BFW:	Dominant Bank Hardwood Trees	< 2 Feet Deep:	75.0
Range (ft.): 80 to 80	Vegetative Cover (%): 58.8	2 to 2.9 Feet Deep:	0.0
Mean (ft.): 80	Dominant Boulders	3 to 3.9 Feet Deep:	0.0
Std. Dev.: 0	Dominant Bank Substrate Boulder	>= 4 Feet Deep:	25.0
Base Flow (cfs): 0	Occurrence of LWD (%): 0.0	Mean Max Residual Pool Depth	1.8
Water (F): 66 - 73 Air (F): 75 - 82	LWD per 100 ft.:	Mean Pool Shelter	21
Dry Channel (ft.): 333			
Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 25.0 Sm Cobble: 50.0 Lg Cobble: 25.0 Boulder 0.0 Bedrock: 0.0			
Embeddedness Values	1. 100.0 2. 0.0 3. 0.0 4. 0.0 5. 0.0		

Table 9 -Mean Percentage of Dominant Substrate and Vegetation**Stream Name:** Conn Creek**LLID:** 1223524384197**Drainage:** Napa River**Survey** 8/6/2004 to 8/10/2004**Confluence Location: Quad:** ST. HELENA**Legal Description:** T000R000S00**Latitude:** 38:25:11.0N**Longitude:** 122:21:09.0**Mean Percentage of Dominant Stream Bank**

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Bedrock	0	0	0.0
Boulder	3	2	22.7
Cobble/Gravel	1	4	22.7
Sand/Silt/Clay	7	5	54.5

Mean Percentage of Dominant Stream Bank

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage
Grass	0	0	0.0
Brush	4	5	40.9
Hardwood	7	6	59.1
Coniferous	0	0	0.0
No Vegetation	0	0	0.0

Total Stream Cobble Embeddedness 2

Table 10 - Mean Percent of Shelter Cover Types For Entire Survey**Stream Name:** Conn Creek**LLID:** 1223524384197**Drainage:** Napa River**Survey** 8/6/2004 to 8/10/2004**Confluence Location: Quad:** ST. HELENA**Legal Description:** T000R000S00**Latitude:** 38:25:11.0N**Longitude:** 122:21:09.0

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)		0	2
SMALL WOODY DEBRIS (%)		0	4
LARGE WOODY DEBRIS (%)		0	0
ROOT MASS (%)		0	21
TERRESTRIAL VEGETATION (%)		10	36
AQUATIC VEGETATION (%)		0	12
WHITEWATER (%)		0	0
BOULDERS (%)		90	24
BEDROCK LEDGES (%)		0	0

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat**Stream Name:** Montgomery Creek**LLID:** 1224393384060**Drainage:** Napa River**Survey** 8/25/2004 to 8/25/2004**Confluence Location: Quad:** RUTHERFORD**Legal Description:** T07NR05WS32**Latitude:** 38:24:22.0N**Longitude:** 122:26:21.0

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
17	0	DRY	45.9	249	4239	93.0									
3	1	FLATWATER	8.1	40	121	2.7	4.0	0.2	0.5	104	312	21	62		20
17	7	POOL	45.9	12	199	4.4	4.9	0.5	0.9	72	1219	52	887	52	20
Total Units	Total Units Fully Measured				Total Length (ft.)						Total Area (sq.ft.)		Total Volume (cu.ft.)		
37	8				4559						1531		949		

Table 2 - Summary of Habitat Types and Measured Parameters**Stream Name:** Montgomery Creek**LLID:** 1224393384060**Drainage:** Napa River**Survey** 8/25/2004 to 8/25/2004**Confluence Location: Quad:** RUTHERFORD**Legal Description:** T07NR05WS32**Latitude:** 38:24:22.0N**Longitude:** 122:26:21.0

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	Mean Canopy (%)
3	1	SRN	8.1	40	121	2.7	4.0	0.2	0.5	104	312	21	62		20	100
15	6	MCP	40.5	10	153	3.4	5.0	0.5	2.6	56	835	44	661	44	19	98
2	1	STP	5.4	23	46	1.0	6.0	0.6	1.4	168	336	101	202	101	25	98
17	0	DRY	45.9	249	4239	93.0										92
Total Units	Total Units Fully Measured				Total Length (ft.)						Total Area (sq.ft.)		Total Volume (cu.ft.)			
37	8				4559						1483		925			

Table 3 - Summary of Pools

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
17	7		MAIN	100	12	199	100	4.9	0.5	72	1219	52	887	20
Total Units	Total Units Fully Measured					Total Length (ft.)					Total Area (sq.ft.)		Total Volume (cu.ft.)	
17	7					199					1219		887	

Table 4 - Summary of Maximum Residual Pool Depths

Stream Name: Montgomery Creek		LLID: 1224393384060		Drainage: Napa River								
Survey 8/25/2004 to 8/25/2004												
Confluence Location: Quad: RUTHERFORD		Legal Description: T07NR05WS32		Latitude: 38:24:22.0N		Longitude: 122:26:21.0						
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
6	MCP	86	4	67	1	17	1	17	0	0	0	0
1	STP	14	0	0	1	100	0	0	0	0	0	0
Total Units			Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1 < 2 Feet Max Resid. Depth	Total 1 < 2 Feet % Occurrence	Total 2 < 3 Feet Max Resid. Depth	Total 2 < 3 Feet % Occurrence	Total 3 < 4 Feet Max Resid. Depth	Total 3 < 4 Feet % Occurrence	Total >= 4 Feet Max Resid. Depth	Total >= 4 Feet % Occurrence
7			4	57	2	29	1	14	0	0	0	0
Mean Maximum Residual Pool Depth (ft.):			1									

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Montgomery Creek		LLID: 1224393384060		Drainage: Napa River							
Survey 8/25/2004 to 8/25/2004											
Confluence Location: Quad: RUTHERFORD		Legal Description: T07NR05WS32		Latitude: 38:24:22.0N		Longitude: 122:26:21.0					
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
3	1	SRN	0	0	0	0	0	0	0	100	0
15	5	MCP	0	0	0	0	0	0	0	84	16
2	1	STP	0	0	0	0	0	0	0	100	0

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Montgomery Creek **LLID:** 1224393384060 **Drainage:** Napa River

Survey: 8/25/2004 to 8/25/2004

Confluence Location: Quad: RUTHERFORD **Legal Description:** T07NR05WS32 **Latitude:** 38:24:22.0N **Longitude:** 122:26:21.0

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
3	1	SRN	0	0	0	0	0	100	0
15	6	MCP	17	50	0	0	0	33	0
2	1	STP	0	100	0	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Survey

Stream Name: Montgomery Creek **LLID:** 1224393384060 **Drainage:** Napa River

Survey: 8/25/2004 to 8/25/2004

Confluence Location: Quad: RUTHERFORD **Legal Description:** T07NR05WS32 **Latitude:** 38:24:22.0N **Longitude:** 122:26:21.0

Habitat Units	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
97	60	40	0	65	69

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 Montgomery Creek LLID: 1224393384060 Drainage Napa River
 Survey Dates: 8/25/2004 to 8/25/2004 Survey Length (ft.): 4559 Main Channel (ft.): 4559 Side Channel (ft.): 0
 Confluence Location: Quad RUTHERFORD Legal T07NR05WS32 Latitude: 38:24:22.0N Longitude: 122:26:21.0

Summary of Fish Habitat Elements By Stream

STREAM REACH: 1

Channel Type: B3	Canopy Density (%): 97.4	Pools by Stream Length	4.4
Reach Length (ft.): 4559	Coniferous Component (%): 60.0	Pool Frequency (%):	45.9
Riffle/Flatwater Mean Width (ft.): 4.0	Hardwood Component	Residual Pool Depth (%):	
BFW:	Dominant Bank	Hardwood Trees	< 2 Feet Deep: 85.7
Range (ft.): to	Vegetative Cover (%): 67.2		2 to 2.9 Feet Deep: 14.3
Mean (ft.):	Dominant	Boulders	3 to 3.9 Feet Deep: 0.0
Std. Dev.:	Dominant Bank Substrate	Boulder	>= 4 Feet Deep: 0.0
Base Flow (cfs): 0	Occurrence of LWD (%): 0.0	Mean Max Residual Pool Depth	0.94
Water (F): 58 - 63 Air (F): 73 - 81	LWD per 100 ft.:	Mean Pool Shelter	20
Dry Channel (ft.): 4239	Riffles:		
	Pools:		
	Flat:		
Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 14.3 Gravel: 14.3 Sm Cobble: 14.3 Lg Cobble: 14.3 Boulder 42.9 Bedrock: 0.0			
Embeddedness Values	1. 40.0	2. 40.0	3. 0.0 4. 0.0 5. 20.0

Table 9 -Mean Percentage of Dominant Substrate and Vegetation**Stream Name:** Montgomery Creek**LLID:** 1224393384060**Drainage:** Napa River**Survey** 8/25/2004 to 8/25/2004**Confluence Location: Quad:** RUTHERFORD**Legal Description:** T07NR05WS32**Latitude:** 38:24:22.0N**Longitude:** 122:26:21.0**Mean Percentage of Dominant Stream Bank**

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Bedrock	2	0	12.5
Boulder	4	5	56.3
Cobble/Gravel	2	2	25.0
Sand/Silt/Clay	0	1	6.3

Mean Percentage of Dominant Stream Bank

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage
Grass	0	1	6.3
Brush	1	1	12.5
Hardwood	5	2	43.8
Coniferous	2	4	37.5
No Vegetation	0	0	0.0

Total Stream Cobble Embeddedness 2

Table 10 - Mean Percent of Shelter Cover Types For Entire Survey**Stream Name:** Montgomery Creek**LLID:** 1224393384060**Drainage:** Napa River**Survey** 8/25/2004 to 8/25/2004**Confluence Location: Quad:** RUTHERFORD**Legal Description:** T07NR05WS32**Latitude:** 38:24:22.0N**Longitude:** 122:26:21.0

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)		0	0
SMALL WOODY DEBRIS (%)		0	0
LARGE WOODY DEBRIS (%)		0	0
ROOT MASS (%)		0	0
TERRESTRIAL VEGETATION (%)		0	0
AQUATIC VEGETATION (%)		0	0
WHITEWATER (%)		0	0
BOULDERS (%)		100	87
BEDROCK LEDGES (%)		0	13

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat**Stream Name:** Napa River**LLID:** 1222457380787**Drainage:** Napa River**Survey** 7/6/2004 to 8/2/2004**Confluence Location: Quad:** DETERT RESERVOIR**Legal Description:** T000R000S00**Latitude:** 38:04:43.0N**Longitude:** 122:14:45.0

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
20	0	DRY	4.7	90	1791	2.5									
79	4	FLATWATER	18.5	164	12935	18.2	14.0	0.7	1.8	2050	161978	1578	93502		35
172	55	POOL	40.2	297	51115	72.1	18.6	1.2	2.7	4382	753670	7977	1347171	6103	57
157	10	RIFFLE	36.7	32	5101	7.2	8.1	0.4	0.8	274	42950	134	21057		49
Total Units	Total Units Fully Measured				Total Length (ft.)						Total Area (sq.ft.)		Total Volume (cu.ft.)		
428	69				70942						958598		1461730		

Table 2 - Summary of Habitat Types and Measured Parameters**Stream Name:** Napa River**LLID:** 1222457380787**Drainage:** Napa River**Survey** 7/6/2004 to 8/2/2004**Confluence Location: Quad:** DETERT RESERVOIR**Legal Description:** T000R000S00**Latitude:** 38:04:43.0N**Longitude:** 122:14:45.0

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	Mean Canopy (%)
156	10	LGR	36.4	32	5066	7.1	8.0	0.4	1.8	274	42676	134	20923		49	62
1	0	HGR	0.2	35	35	0.0										
63	3	GLD	14.7	184	11569	16.3	16.0	0.8	2.1	2194	138243	1801	75629		37	59
15	1	RUN	3.5	87	1298	1.8	8.0	0.7	1.6	1618	24276	1133	16993		30	62
1	0	SRN	0.2	68	68	0.1										55
146	45	MCP	34.1	314	45813	64.6	18.0	1.2	5.6	4440	648173	8067	1151592	6339	53	56
6	3	LSL	1.4	171	1025	1.4	18.0	0.1	2.0	3465	20788	2734	16406	543	85	55
5	1	LSR	1.2	85	425	0.6	23.0	0.3	1.8	2806	14030	2806	14030	842	105	39
15	6	LSBo	3.5	257	3852	5.4	24.0	1.7	4.8	4670	70050	10805	162075	8029	65	43
20	0	DRY	4.7	90	1791	2.5										65
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)			Total Volume (cu.ft.)			
428	69				70942					958236			1457648			

Table 3 - Summary of Pools**Stream Name:** Napa River**LLID:** 1222457380787**Drainage:** Napa River**Survey** 7/6/2004 to 8/2/2004**Confluence Location: Quad:** DETERT RESERVOIR**Legal Description:** T000R000S00**Latitude:** 38:04:43.0N**Longitude:** 122:14:45.0

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
146	45	MAIN	85	314	45813	90	17.8	1.2	4440	648173	6339	904879	53
26	10	SCOUR	15	204	5302	10	22.3	1.1	4122	107172	5065	131679	75
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)		Total Volume (cu.ft.)	
172	55				51115					755345		1036558	

Table 4 - Summary of Maximum Residual Pool Depths

Stream Name: Napa River **LLID:** 1222457380787 **Drainage:** Napa River
Survey: 7/6/2004 to 8/2/2004
Confluence Location: **Quad:** DETERT RESERVOIR **Legal Description:** T000R000S00 **Latitude:** 38:04:43.0N **Longitude:** 122:14:45.0

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
45	MCP	82	2	4	8	18	17	38	12	27	6	13
6	LSBo	11	0	0	1	17	1	17	3	50	1	17
3	LSL	5	0	0	2	67	1	33	0	0	0	0
1	LSR	2	0	0	1	100	0	0	0	0	0	0
Total Units			Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1 < 2 Feet Max Resid. Depth	Total 1 < 2 Feet % Occurrence	Total 2 < 3 Feet Max Resid. Depth	Total 2 < 3 Feet % Occurrence	Total 3 < 4 Feet Max Resid. Depth	Total 3 < 4 Feet % Occurrence	Total >= 4 Feet Max Resid. Depth	Total >= 4 Feet % Occurrence
55			2	4	12	22	19	35	15	27	7	13
Mean Maximum Residual Pool Depth (ft.):			3									

Table 5 - Summary of Mean Percent Cover By Habitat Type**Stream Name:** Napa River**LLID:** 1222457380787**Drainage:** Napa River**Survey** 7/6/2004 to 8/2/2004**Confluence Location:** Quad: DETERT RESERVOIR**Legal Description:** T000R000S00**Latitude:** 38:04:43.0N**Longitude:** 122:14:45.0

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
156	4	LGR	0	0	26	11	39	14	4	6	0
1	0	HGR									
63	3	GLD	0	15	15	18	47	0	5	0	0
15	1	RUN	0	0	10	20	70	0	0	0	0
1	0	SRN									
146	44	MCP	1	15	5	19	40	13	2	5	0
6	3	LSL	0	15	25	13	25	20	2	0	0
5	1	LSR	10	15	15	25	25	0	10	0	0
15	6	LSBo	0	3	0	13	42	8	3	31	0

Table 6 - Summary of Dominant Substrates By Habitat Type**Stream Name:** Napa River**LLID:** 1222457380787**Drainage:** Napa River**Survey** 7/6/2004 to 8/2/2004**Confluence Location: Quad:** DETERT RESERVOIR**Legal Description:** T000R000S00**Latitude:** 38:04:43.0N**Longitude:** 122:14:45.0

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
156	10	LGR	0	0	60	30	0	0	10
1	0	HGR	0	0	0	0	0	0	0
63	3	GLD	0	67	33	0	0	0	0
15	1	RUN	0	0	0	0	0	0	100
1	0	SRN	0	0	0	0	0	0	0
146	45	MCP	2	67	27	2	0	0	2
6	3	LSL	0	100	0	0	0	0	0
5	1	LSR	0	100	0	0	0	0	0
15	6	LSBo	0	83	0	0	0	0	17

Table 7 - Summary of Mean Percent Canopy for Entire Survey**Stream Name:** Napa River**LLID:** 1222457380787**Drainage:** Napa River**Survey** 7/6/2004 to 8/2/2004**Confluence Location: Quad:** DETERT RESERVOIR **Legal Description:** T000R000S00**Latitude:** 38:04:43.0N**Longitude:** 122:14:45.0

Habitat Units	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
57	10	90	1	81	84

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 Napa River LLID: 1222457380787 Drainage Napa River
 Survey Dates: 7/6/2004 to 8/2/2004 Survey Length (ft.): 70942 Main Channel (ft.): 70852 Side Channel (ft.): 90
 Confluence Location: Quad DETERT Legal T000R000S00 Latitude: 38:04:43.0N Longitude: 122:14:45.0

STREAM REACH: 1

Channel Type:	Canopy Density (%): 55.2	Pools by Stream Length	75.2
Reach Length (ft.): 4484	Coniferous Component (%): 24.0	Pool Frequency (%):	47.4
Riffle/Flatwater Mean Width (ft.): 10.3	Hardwood Component 76.0	Residual Pool Depth (%):	
BFW:	Dominant Bank Brush	< 2 Feet Deep:	66.7
Range (ft.): 64.40 to 64.40	Vegetative Cover (%): 83.6	2 to 2.9 Feet Deep:	33.3
Mean (ft.): 64.4	Dominant Terrestrial Veg.	3 to 3.9 Feet Deep:	0.0
Std. Dev.: 1.498801083243	Dominant Bank Substrate Sand/Silt/Clay	>= 4 Feet Deep:	0.0
Base Flow (cfs): 0	Occurrence of LWD (%): 12.9	Mean Max Residual Pool Depth	2
Water (F): 68 - 70 Air (F): 79 - 81	LWD per 100 ft.:	Mean Pool Shelter	65
Dry Channel (ft.): 0	Riffles: 1		
	Pools: 0		
	Flat: 0		
Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 100. Sm Cobble: 0.0 Lg Cobble: 0.0 Boulder 0.0 Bedrock: 0.0			
Embeddedness Values	1. 100.0 2. 0.0 3. 0.0 4. 0.0 5. 0.0		

STREAM REACH: 2

Channel Type: F4	Canopy Density (%): 73.9	Pools by Stream Length	87.1
Reach Length (ft.): 3468	Coniferous Component (%): 20.0	Pool Frequency (%):	45.0
Riffle/Flatwater Mean Width (ft.): 11.0	Hardwood Component 80.0	Residual Pool Depth (%):	
BFW:	Dominant Bank Brush	< 2 Feet Deep:	0.0
Range (ft.): 72.40 to 74.40	Vegetative Cover (%): 68.3	2 to 2.9 Feet Deep:	50.0
Mean (ft.): 72.515	Dominant Terrestrial Veg.	3 to 3.9 Feet Deep:	50.0
Std. Dev.: 0.433906671992	Dominant Bank Substrate Cobble/Gravel	>= 4 Feet Deep:	0.0
Base Flow (cfs): 0	Occurrence of LWD (%): 8.3	Mean Max Residual Pool Depth	2.85
Water (F): 66 - 66 Air (F): 60 - 60	LWD per 100 ft.:	Mean Pool Shelter	50
Dry Channel (ft.): 0	Riffles: 0		
	Pools: 0		
	Flat: 0		
Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 100. Sm Cobble: 0.0 Lg Cobble: 0.0 Boulder 0.0 Bedrock: 0.0			
Embeddedness Values	1. 0.0 2. 100.0 3. 0.0 4. 0.0 5. 0.0		

NAPA RIVER

STREAM REACH: 3

Channel Type: F4	Canopy Density (%): 57.2	Pools by Stream Length	67.7			
Reach Length (ft.): 17078	Coniferous Component (%): 7.2	Pool Frequency (%):	37.5			
Riffle/Flatwater Mean Width (ft.): 10.8	Hardwood Component	92.8	Residual Pool Depth (%):			
BFW:	Dominant Bank	Brush	< 2 Feet Deep:	28.6		
Range (ft.): 62.5 to 75.5	Vegetative Cover (%): 84.1		2 to 2.9 Feet Deep:	28.6		
Mean (ft.): 62.61607142857	Dominant	Terrestrial Veg.	3 to 3.9 Feet Deep:	28.6		
Std. Dev.: 1.222888382027	Dominant Bank Substrate	Sand/Silt/Clay	>= 4 Feet Deep:	14.3		
Base Flow (cfs): 0	Occurrence of LWD (%): 11.0	Mean Max Residual Pool Depth	2.74			
Water (F): 64 - 70	Air (F): 61 - 81	LWD per 100 ft.:	Mean Pool Shelter	65		
Dry Channel (ft.): 0	Riffles:	0				
	Pools:	0				
	Flat:	0				
Pool Tail Substrate (%): Silt/Clay: 0.0	Sand: 0.0	Gravel: 85.7	Sm Cobble: 14.3	Lg Cobble: 0.0	Boulder: 0.0	Bedrock: 0.0
Embeddedness Values	1. 45.5	2. 54.5	3. 0.0	4. 0.0	5. 0.0	

STREAM REACH: 4

Channel Type: F4	Canopy Density (%): 52.6	Pools by Stream Length	64.1			
Reach Length (ft.): 16992	Coniferous Component (%): 7.9	Pool Frequency (%):	36.7			
Riffle/Flatwater Mean Width (ft.): 11.0	Hardwood Component	92.1	Residual Pool Depth (%):			
BFW:	Dominant Bank	Hardwood Trees	< 2 Feet Deep:	8.3		
Range (ft.): 75.5 to 75.5	Vegetative Cover (%): 84.4		2 to 2.9 Feet Deep:	41.7		
Mean (ft.): 75.5	Dominant	Terrestrial Veg.	3 to 3.9 Feet Deep:	33.3		
Std. Dev.: 0	Dominant Bank Substrate	Sand/Silt/Clay	>= 4 Feet Deep:	16.7		
Base Flow (cfs): 0	Occurrence of LWD (%): 8.1	Mean Max Residual Pool Depth	3.00			
Water (F): 66 - 75	Air (F): 70 - 93	LWD per 100 ft.:	Mean Pool Shelter	54		
Dry Channel (ft.): 0	Riffles:	0				
	Pools:	0				
	Flat:	0				
Pool Tail Substrate (%): Silt/Clay: 0.0	Sand: 0.0	Gravel: 91.7	Sm Cobble: 8.3	Lg Cobble: 0.0	Boulder: 0.0	Bedrock: 0.0
Embeddedness Values	1. 72.7	2. 18.2	3. 9.1	4. 0.0	5. 0.0	

NAPA RIVER

STREAM REACH: 5

Channel Type: F4	Canopy Density (%): 54.5	Pools by Stream Length	72.0
Reach Length (ft.): 15794	Coniferous Component (%): 8.4	Pool Frequency (%):	42.2
Riffle/Flatwater Mean Width (ft.):	Hardwood Component	Residual Pool Depth (%):	
BFW:	Dominant Bank	Hardwood Trees	< 2 Feet Deep: 30.8
Range (ft.): 83.90 to 83.90	Vegetative Cover (%): 79.6		2 to 2.9 Feet Deep: 30.8
Mean (ft.): 83.899999999999	Dominant	Terrestrial Veg.	3 to 3.9 Feet Deep: 23.1
Std. Dev.: 1.370570323899	Dominant Bank Substrate	Sand/Silt/Clay	>= 4 Feet Deep: 15.4
Base Flow (cfs): 0	Occurrence of LWD (%): 0.0	Mean Max Residual Pool Depth	2.54
Water (F): 68 - 76	Air (F): 67 - 86	LWD per 100 ft.:	Mean Pool Shelter
Dry Channel (ft.): 1589		Riffles:	61
		Pools:	
		Flat:	
Pool Tail Substrate (%):	Silt/Clay: 18.8	Sand: 6.3	Gravel: 25.0
Embeddedness Values	1. 36.4	2. 63.6	3. 0.0
		4. 0.0	5. 0.0
		Sm Cobble: 31.3	Lg Cobble: 6.3
		Boulder: 0.0	Bedrock: 12.5

STREAM REACH: 6

Channel Type: E4	Canopy Density (%): 62.2	Pools by Stream Length	83.3
Reach Length (ft.): 13036	Coniferous Component (%): 9.0	Pool Frequency (%):	43.6
Riffle/Flatwater Mean Width (ft.): 4.8	Hardwood Component	Residual Pool Depth (%):	
BFW:	Dominant Bank	Hardwood Trees	< 2 Feet Deep: 27.3
Range (ft.): 43.79 to 43.79	Vegetative Cover (%): 82.3		2 to 2.9 Feet Deep: 36.4
Mean (ft.): 43.800000000000	Dominant	Terrestrial Veg.	3 to 3.9 Feet Deep: 27.3
Std. Dev.: 5.647912693085	Dominant Bank Substrate	Sand/Silt/Clay	>= 4 Feet Deep: 9.1
Base Flow (cfs): 0	Occurrence of LWD (%): 3.0	Mean Max Residual Pool Depth	2.5
Water (F): 66 - 78	Air (F): 65 - 81	LWD per 100 ft.:	Mean Pool Shelter
Dry Channel (ft.): 202		Riffles:	0
		Pools:	0
		Flat:	0
Pool Tail Substrate (%):	Silt/Clay: 0.0	Sand: 0.0	Gravel: 54.5
Embeddedness Values	1. 30.0	2. 40.0	3. 10.0
		4. 10.0	5. 10.0
		Sm Cobble: 36.4	Lg Cobble: 0.0
		Boulder: 0.0	Bedrock: 9.1

Table 9 -Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Napa River **LLID:** 1222457380787 **Drainage:** Napa River
Survey: 7/6/2004 to 8/2/2004
Confluence Location: Quad: DETERT RESERVOIR **Legal Description:** T000R000S00 **Latitude:** 38:04:43.0N **Longitude:** 122:14:45.0

Mean Percentage of Dominant Stream Bank

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Bedrock	2	2	2.9
Boulder	2	0	1.4
Cobble/Gravel	24	22	33.3
Sand/Silt/Clay	41	44	61.6

Mean Percentage of Dominant Stream Bank

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage
Grass	0	0	0.0
Brush	32	27	42.8
Hardwood	37	41	56.5
Coniferous	0	1	0.7
No Vegetation	0	0	0.0

Total Stream Cobble Embeddedness 2

Table 10 - Mean Percent of Shelter Cover Types For Entire Survey**Stream Name:** Napa River**LLID:** 1222457380787**Drainage:** Napa River**Survey** 7/6/2004 to 8/2/2004**Confluence Location: Quad:** DETERT RESERVOIR**Legal Description:** T000R000S00**Latitude:** 38:04:43.0N**Longitude:** 122:14:45.0

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	0	1
SMALL WOODY DEBRIS (%)	0	11	14
LARGE WOODY DEBRIS (%)	26	14	6
ROOT MASS (%)	11	19	18
TERRESTRIAL VEGETATION (%)	39	53	39
AQUATIC VEGETATION (%)	14	0	13
WHITEWATER (%)	4	4	3
BOULDERS (%)	6	0	7
BEDROCK LEDGES (%)	0	0	0

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat**Stream Name:** Rector Creek**LLID:** 1223699384288**Drainage:** Napa River**Survey** 5/19/2003 to 5/23/2003**Confluence Location: Quad:** YOUNTVILLE**Legal Description:** T000R000S00**Latitude:** 38:25:44.0N**Longitude:** 122:22:12.0

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
8	0	DRY	8.5	226	1811	21.1									
28	3	FLATWATER	29.8	85	2372	27.7	26.5	0.8	1.7	3091	86557	2465	69033		15
25	24	POOL	26.6	80	2000	23.3	19.0	1.5	2.9	1646	41160	3465	83017	2935	71
33	5	RIFFLE	35.1	72	2384	27.8	18.3	0.4	0.7	550	18147	190	6275		25
Total Units	Total Units Fully Measured				Total Length (ft.)						Total Area (sq.ft.)		Total Volume (cu.ft.)		
94	32				8567						145865		158325		

Table 2 - Summary of Habitat Types and Measured Parameters**Stream Name:** Rector Creek**LLID:** 1223699384288**Drainage:** Napa River**Survey** 5/19/2003 to 5/23/2003**Confluence Location: Quad:** YOUNTVILLE**Legal Description:** T000R000S00**Latitude:** 38:25:44.0N**Longitude:** 122:22:12.0

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	Mean Canopy (%)
33	5	LGR	35.1	72	2384	27.8	18.0	0.4	1.0	550	18147	190	6275		25	50
28	3	GLD	29.8	85	2372	27.7	26.0	0.8	1.8	3091	86557	2465	69033		15	35
12	12	MCP	12.8	89	1071	12.5	20.0	1.8	6.0	1874	22485	4006	44070	3335	77	64
1	1	CCP	1.1	73	73	0.9	25.0	0.7	1.8	1825	1825	1643	1643	1278	60	34
1	1	LSL	1.1	65	65	0.8	28.0	1.7	3.7	1820	1820	3640	3640	3094	80	85
8	7	LSR	8.5	67	535	6.2	17.0	1.2	3.4	967	7734	1751	14009	1195	71	74
1	1	LSBo	1.1	16	16	0.2	5.0	0.4	1.1	16	16	6	6	6	10	
1	1	PLP	1.1	40	40	0.5	5.0	0.8	1.5	200	200	160	160	160	10	39
1	1	SCP	1.1	200	200	2.3	40.0	2.8	4.2	6400	6400	17920	17920	17920	120	0
8	0	DRY	8.5	226	1811	21.1										
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)			Total Volume (cu.ft.)			
94	32				8567					145185			156756			

Table 3 - Summary of Pools**Stream Name:** Rector Creek**LLID:** 1223699384288**Drainage:** Napa River**Survey** 5/19/2003 to 5/23/2003**Confluence Location: Quad:** YOUNTVILLE**Legal Description:** T000R000S00**Latitude:** 38:25:44.0N**Longitude:** 122:22:12.0

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
13	13	MAIN	52	88	1144	57	20.2	1.7	1870	24310	3164	37964	75
11	10	SCOUR	44	60	656	33	15.4	1.1	880	9684	1162	12787	61
1	1	BACKWATER	4	200	200	10	40.0	2.8	6400	6400	17920	17920	120
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)		Total Volume (cu.ft.)	
25	24				2000					40394		68671	

Table 4 - Summary of Maximum Residual Pool Depths

Stream Name: Rector Creek **LLID:** 1223699384288 **Drainage:** Napa River
Survey: 5/19/2003 to 5/23/2003
Confluence Location: Quad: YOUNTVILLE **Legal Description:** T000R000S00 **Latitude:** 38:25:44.0N **Longitude:** 122:22:12.0

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
8	LSR	33	0	0	2	25	5	63	1	13	0	0
11	MCP	46	0	0	2	18	1	9	4	36	4	36
1	LSL	4	0	0	0	0	0	0	1	100	0	0
1	SCP	4	0	0	0	0	0	0	0	0	1	100
1	CCP	4	0	0	1	100	0	0	0	0	0	0
1	LSBo	4	0	0	1	100	0	0	0	0	0	0
1	PLP	4	0	0	1	100	0	0	0	0	0	0
Total Units			Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1 < 2 Feet Max Resid. Depth	Total 1 < 2 Feet % Occurrence	Total 2 < 3 Feet Max Resid. Depth	Total 2 < 3 Feet % Occurrence	Total 3 < 4 Feet Max Resid. Depth	Total 3 < 4 Feet % Occurrence	Total >= 4 Feet Max Resid. Depth	Total >= 4 Feet % Occurrence
24			0	0	7	29	6	25	6	25	5	21
Mean Maximum Residual Pool Depth (ft.):			3									

Table 5 - Summary of Mean Percent Cover By Habitat Type**Stream Name:** Rector Creek**LLID:** 1223699384288**Drainage:** Napa River**Survey** 5/19/2003 to 5/23/2003**Confluence Location: Quad:** YOUNTVILLE**Legal Description:** T000R000S00**Latitude:** 38:25:44.0N**Longitude:** 122:22:12.0

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
33	4	LGR	0	0	0	0	18	30	0	53	0
28	2	GLD	0	0	0	0	0	100	0	0	0
12	12	MCP	3	13	15	30	25	12	0	3	0
1	1	CCP	0	20	0	70	10	0	0	0	0
1	1	LSL	30	30	0	30	0	10	0	0	0
8	8	LSR	4	11	13	35	18	19	0	1	0
1	1	LSBo	0	0	0	0	0	0	0	0	100
1	1	PLP	0	0	0	0	0	0	0	100	0
1	1	SCP	0	0	0	0	20	80	0	0	0

Table 6 - Summary of Dominant Substrates By Habitat Type**Stream Name:** Rector Creek**LLID:** 1223699384288**Drainage:** Napa River**Survey** 5/19/2003 to 5/23/2003**Confluence Location: Quad:** YOUNTVILLE**Legal Description:** T000R000S00**Latitude:** 38:25:44.0N**Longitude:** 122:22:12.0

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
33	5	LGR	0	0	20	40	20	20	0
28	3	GLD	0	33	33	33	0	0	0
12	12	MCP	0	33	8	50	8	0	0
1	1	CCP	0	0	100	0	0	0	0
1	1	LSL	0	100	0	0	0	0	0
8	8	LSR	0	13	0	88	0	0	0
1	1	LSBo	0	0	0	100	0	0	0
1	1	PLP	0	0	0	0	0	0	100
1	1	SCP	100	0	0	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Survey**Stream Name:** Rector Creek**LLID:** 1223699384288**Drainage:** Napa River**Survey** 5/19/2003 to 5/23/2003**Confluence Location: Quad:** YOUNTVILLE**Legal Description:** T000R000S00**Latitude:** 38:25:44.0N**Longitude:** 122:22:12.0

Habitat Units	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
54	25	75	15	78	52

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 Rector Creek LLID: 1223699384288 Drainage Napa River
 Survey Dates: 5/19/2003 to 5/23/2003 Survey Length (ft.): 8567 Main Channel (ft.): 8215 Side Channel (ft.): 352
 Confluence Location: Quad YOUNTVILLE Legal T000R000S00 Latitude: 38:25:44.0N Longitude: 122:22:12.0

STREAM REACH: 1

Channel Type: F4	Canopy Density (%): 81.4	Pools by Stream Length	42.5
Reach Length (ft.): 1900	Coniferous Component (%): 28.9	Pool Frequency (%):	35.1
Riffle/Flatwater Mean Width (ft.): 17.3	Hardwood Component 71.1	Residual Pool Depth (%):	
BFW:	Dominant Bank Hardwood Trees	< 2 Feet Deep:	23.1
Range (ft.): 28 to 36.29	Vegetative Cover (%): 72.8	2 to 2.9 Feet Deep:	23.1
Mean (ft.): 36.07567567567	Dominant Root masses	3 to 3.9 Feet Deep:	30.8
Std. Dev.: 1.345945945945	Dominant Bank Substrate Cobble/Gravel	>= 4 Feet Deep:	23.1
Base Flow (cfs): 0	Occurrence of LWD (%): 8.8	Mean Max Residual Pool Depth	3.1
Water (F): 59 - 70 Air (F): 73 - 85	LWD per 100 ft.:	Mean Pool Shelter	77
Dry Channel (ft.): 16	Riffles:		
	Pools:		
	Flat:		
Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 23.1 Sm Cobble: 76.9 Lg Cobble: 0.0 Boulder 0.0 Bedrock: 0.0			
Embeddedness Values	1. 53.8 2. 46.2 3. 0.0 4. 0.0 5. 0.0		

STREAM REACH: 2

Channel Type: D3	Canopy Density (%): 31.6	Pools by Stream Length	23.9
Reach Length (ft.): 4195	Coniferous Component (%): 11.7	Pool Frequency (%):	20.5
Riffle/Flatwater Mean Width (ft.): 30.7	Hardwood Component 88.3	Residual Pool Depth (%):	
BFW:	Dominant Bank Hardwood Trees	< 2 Feet Deep:	12.5
Range (ft.): 83 to 83	Vegetative Cover (%): 58.6	2 to 2.9 Feet Deep:	37.5
Mean (ft.): 83	Dominant Aquatic Vegetation	3 to 3.9 Feet Deep:	25.0
Std. Dev.: 0	Dominant Bank Substrate Cobble/Gravel	>= 4 Feet Deep:	25.0
Base Flow (cfs): 0	Occurrence of LWD (%): 10.8	Mean Max Residual Pool Depth	3.125
Water (F): 63 - 70 Air (F): 74 - 86	LWD per 100 ft.:	Mean Pool Shelter	77
Dry Channel (ft.): 227	Riffles:		
	Pools:		
	Flat:		
Pool Tail Substrate (%): Silt/Clay: 12.5 Sand: 25.0 Gravel: 0.0 Sm Cobble: 12.5 Lg Cobble: 50.0 Boulder 0.0 Bedrock: 0.0			
Embeddedness Values	1. 12.5 2. 50.0 3. 25.0 4. 12.5 5. 0.0		

RECTOR CREEK

STREAM REACH: 3

Channel Type: F3	Canopy Density (%): 25.4	Pools by Stream Length: 5.8
Reach Length (ft.): 2120	Coniferous Component (%): 50.0	Pool Frequency (%): 23.1
Riffle/Flatwater Mean Width (ft.): 10.0	Hardwood Component: 50.0	Residual Pool Depth (%):
BFW:	Dominant Bank: Hardwood Trees	< 2 Feet Deep: 100.0
Range (ft.): 83 to 83	Vegetative Cover (%): 45.8	2 to 2.9 Feet Deep: 0.0
Mean (ft.): 83	Dominant: Boulders	3 to 3.9 Feet Deep: 0.0
Std. Dev.: 0	Dominant Bank Substrate: Boulder	>= 4 Feet Deep: 0.0
Base Flow (cfs):	Occurrence of LWD (%): 0.0	Mean Max Residual Pool Depth: 1.46
Water (F): 0 - 71	Air (F): 0 - 79	LWD per 100 ft.:
Dry Channel (ft.): 1568	Riffles:	Pools:
	Flat:	
Pool Tail Substrate (%):	Silt/Clay: 0.0	Sand: 0.0
Embeddedness Values	1. 0.0	2. 100.0
	3. 0.0	4. 0.0
	5. 0.0	
	Gravel: 66.7	Sm Cobble: 0.0
	Lg Cobble: 33.3	Boulder: 0.0
	Bedrock: 0.0	

Table 9 -Mean Percentage of Dominant Substrate and Vegetation**Stream Name:** Rector Creek**LLID:** 1223699384288**Drainage:** Napa River**Survey** 5/19/2003 to 5/23/2003**Confluence Location: Quad:** YOUNTVILLE**Legal Description:** T000R000S00**Latitude:** 38:25:44.0N**Longitude:** 122:22:12.0**Mean Percentage of Dominant Stream Bank**

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Bedrock	0	1	1.6
Boulder	1	2	4.8
Cobble/Gravel	16	19	56.5
Sand/Silt/Clay	14	9	37.1

Mean Percentage of Dominant Stream Bank

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage
Grass	4	13	27.4
Brush	4	0	6.5
Hardwood	22	16	61.3
Coniferous	1	1	3.2
No Vegetation	0	1	1.6

Total Stream Cobble Embeddedness 2

Table 10 - Mean Percent of Shelter Cover Types For Entire Survey**Stream Name:** Rector Creek**LLID:** 1223699384288**Drainage:** Napa River**Survey** 5/19/2003 to 5/23/2003**Confluence Location: Quad:** YOUNTVILLE**Legal Description:** T000R000S00**Latitude:** 38:25:44.0N**Longitude:** 122:22:12.0

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	0	4
SMALL WOODY DEBRIS (%)	0	0	12
LARGE WOODY DEBRIS (%)	0	0	11
ROOT MASS (%)	0	0	29
TERRESTRIAL VEGETATION (%)	18	0	19
AQUATIC VEGETATION (%)	30	100	15
WHITEWATER (%)	0	0	0
BOULDERS (%)	53	0	6
BEDROCK LEDGES (%)	0	0	4

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat**Stream Name:** Soda Creek**LLID:** 1222898383528**Drainage:** Napa River**Survey** 8/31/2004 to 8/31/2004**Confluence Location: Quad:** YOUNTVILLE**Legal Description:** T000R000S00**Latitude:** 38:21:10.0N**Longitude:** 122:17:23.

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
34	0	DRY	46.6	144	4913	75.9									
2	0	FLATWATER	2.7	86	171	2.6									
37	12	POOL	50.7	38	1388	21.4	7.5	0.7	1.4	318	11749	338	12492	338	51
Total Units	Total Units Fully Measured				Total Length (ft.)						Total Area (sq.ft.)		Total Volume (cu.ft.)		
73	12				6472						11749		12492		

Table 2 - Summary of Habitat Types and Measured Parameters**Stream Name:** Soda Creek**LLID:** 1222898383528**Drainage:** Napa River**Survey** 8/31/2004 to 8/31/2004**Confluence Location: Quad:** YOUNTVILLE**Legal Description:** T000R000S00**Latitude:** 38:21:10.0N**Longitude:** 122:17:23.0

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	Mean Canopy (%)
2	0	SRN	2.7	86	171	2.6										94
30	10	MCP	41.1	29	869	13.4	7.0	0.6	1.8	267	8000	198	5926	198	50	86
7	2	STP	9.6	74	519	8.0	10.0	1.3	4.2	572	4004	1038	7266	1038	55	90
34	0	DRY	46.6	144	4913	75.9										83
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)			Total Volume (cu.ft.)			
73	12				6472					12004			13192			

Table 3 - Summary of Pools

Stream Name: Soda Creek **LLID:** 1222898383528 **Drainage:** Napa River
Survey 8/31/2004 to 8/31/2004

Confluence Location: Quad: YOUNTVILLE **Legal Description:** T000R000S00 **Latitude:** 38:21:10.0N **Longitude:** 122:17:23.0

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
37	12	MAIN	100	38	1388	100	7.5	0.7	318	11749	338	12492	51
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)		Total Volume (cu.ft.)	
37	12				1388					11749		12492	

Table 4 - Summary of Maximum Residual Pool Depths

Stream Name:		Soda Creek						LLID:		1222898383528		Drainage:		Napa River	
Survey		8/31/2004 to 8/31/2004						Latitude:		38:21:10.0N		Longitude:		122:17:23.0	
Confluence Location:		Quad:		Legal Description:						Latitude:		Longitude:			
		YOUNTVILLE		T000R000S00						38:21:10.0N		122:17:23.0			
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			
10	MCP	83	4	40	6	60	0	0	0	0	0	0			
2	STP	17	1	50	0	0	0	0	0	0	1	50			
Total Units			Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1 < 2 Feet Max Resid. Depth	Total 1 < 2 Feet % Occurrence	Total 2 < 3 Feet Max Resid. Depth	Total 2 < 3 Feet % Occurrence	Total 3 < 4 Feet Max Resid. Depth	Total 3 < 4 Feet % Occurrence	Total >= 4 Feet Max Resid. Depth	Total >= 4 Feet % Occurrence			
12			5	42	6	50	0	0	0	0	1	8			
Mean Maximum Residual Pool Depth (ft.):			1												

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name:		Soda Creek						LLID:		1222898383528		Drainage:		Napa River	
Survey		8/31/2004 to 8/31/2004						Latitude:		38:21:10.0N		Longitude:		122:17:23.0	
Confluence Location:		Quad:		Legal Description:						Latitude:		Longitude:			
		YOUNTVILLE		T000R000S00						38:21:10.0N		122:17:23.0			
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				
2	0	SRN													
30	10	MCP	2	9	0	5	16	9	0	59	0				
7	2	STP	10	10	0	10	5	0	0	65	0				

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Soda Creek **LLID:** 1222898383528 **Drainage:** Napa River

Survey 8/31/2004 to 8/31/2004

Confluence Location: Quad: YOUNTVILLE **Legal Description:** T000R000S00 **Latitude:** 38:21:10.0N **Longitude:** 122:17:23.0

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
2	0	SRN	0	0	0	0	0	0	0
30	10	MCP	10	20	30	0	0	0	40
7	2	STP	0	0	0	0	50	50	0

Table 7 - Summary of Mean Percent Canopy for Entire Survey

Stream Name: Soda Creek **LLID:** 1222898383528 **Drainage:** Napa River

Survey 8/31/2004 to 8/31/2004

Confluence Location: Quad: YOUNTVILLE **Legal Description:** T000R000S00 **Latitude:** 38:21:10.0N **Longitude:** 122:17:23.0

Habitat Units	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
86	27	73	0	83	94

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 Soda Creek LLID: 1222898383528 Drainage Napa River
 Survey Dates: 8/31/2004 to 8/31/2004 Survey Length (ft.): 6472 Main Channel (ft.): 6472 Side Channel (ft.): 0
 Confluence Location: Quad YOUNTVILLE Legal T000R000S00 Latitude: 38:21:10.0N Longitude: 122:17:23.0

STREAM REACH: 1

Channel Type: B1 Canopy Density (%): 94.0 Pools by Stream Length 5.9
 Reach Length (ft.): 2598 Coniferous Component (%): 28.9 Pool Frequency (%): 50.0
 Riffle/Flatwater Mean Width (ft.): Hardwood Component 71.1 Residual Pool Depth (%):
 BFW: Dominant Bank Brush < 2 Feet Deep: 100.0
 Range (ft.): to Vegetative Cover (%): 94.2 2 to 2.9 Feet Deep: 0.0
 Mean (ft.): Dominant Boulders 3 to 3.9 Feet Deep: 0.0
 Std. Dev.: Dominant Bank Substrate Boulder >= 4 Feet Deep: 0.0
 Base Flow (cfs): 0 Occurrence of LWD (%): 0.0 Mean Max Residual Pool Depth 0.66
 Water (F): 58 - 64 Air (F): 65 - 66 LWD per 100 ft.: Mean Pool Shelter 27
 Dry Channel (ft.): 2444 Riffles:
 Pools: 1
 Flat:
 Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 0.0 Sm Cobble: 25.0 Lg Cobble: 25.0 Boulder 50.0 Bedrock: 0.0
 Embeddedness Values 1. 25.0 2. 75.0 3. 0.0 4. 0.0 5. 0.0

STREAM REACH: 2

Channel Type: C3 Canopy Density (%): 77.5 Pools by Stream Length 37.3
 Reach Length (ft.): 1490 Coniferous Component (%): 28.7 Pool Frequency (%): 48.4
 Riffle/Flatwater Mean Width (ft.): Hardwood Component 71.3 Residual Pool Depth (%):
 BFW: Dominant Bank Hardwood Trees < 2 Feet Deep: 83.3
 Range (ft.): to Vegetative Cover (%): 86.3 2 to 2.9 Feet Deep: 0.0
 Mean (ft.): Dominant Boulders 3 to 3.9 Feet Deep: 0.0
 Std. Dev.: Dominant Bank Substrate Bedrock >= 4 Feet Deep: 16.7
 Base Flow (cfs): 0 Occurrence of LWD (%): 0.0 Mean Max Residual Pool Depth 1.98
 Water (F): 61 - 64 Air (F): 66 - 73 LWD per 100 ft.: Mean Pool Shelter 68
 Dry Channel (ft.): 852 Riffles:
 Pools:
 Flat:
 Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 37.5 Sm Cobble: 0.0 Lg Cobble: 0.0 Boulder 37.5 Bedrock: 25.0
 Embeddedness Values 1. 12.5 2. 62.5 3. 0.0 4. 0.0 5. 25.0

SODA CREEK

STREAM REACH: 3

Channel Type: B3	Canopy Density (%): 94.0	Pools by Stream Length: 28.4
Reach Length (ft.): 2384	Coniferous Component (%): 21.3	Pool Frequency (%): 54.2
Riffle/Flatwater Mean Width (ft.):	Hardwood Component: 78.8	Residual Pool Depth (%):
BFW:	Dominant Bank: Brush	< 2 Feet Deep: 100.0
Range (ft.): to	Vegetative Cover (%): 88.3	2 to 2.9 Feet Deep: 0.0
Mean (ft.):	Dominant: Boulders	3 to 3.9 Feet Deep: 0.0
Std. Dev.:	Dominant Bank Substrate: Boulder	>= 4 Feet Deep: 0.0
Base Flow (cfs): 0	Occurrence of LWD (%): 0.0	Mean Max Residual Pool Depth: 1
Water (F): 61 - 68 Air (F): 73 - 81	LWD per 100 ft.:	Mean Pool Shelter: 42
Dry Channel (ft.): 1617	Riffles:	
	Pools:	
	Flat:	
Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 33.3 Sm Cobble: 66.7 Lg Cobble: 0.0 Boulder: 0.0 Bedrock: 0.0		
Embeddedness Values 1. 66.7 2. 33.3 3. 0.0 4. 0.0 5. 0.0		

Table 9 -Mean Percentage of Dominant Substrate and Vegetation**Stream Name:** Soda Creek**LLID:** 1222898383528**Drainage:** Napa River**Survey** 8/31/2004 to 8/31/2004**Confluence Location: Quad:** YOUNTVILLE**Legal Description:** T000R000S00**Latitude:** 38:21:10.0N**Longitude:** 122:17:23.0**Mean Percentage of Dominant Stream Bank**

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Bedrock	7	3	41.7
Boulder	4	7	45.8
Cobble/Gravel	1	1	8.3
Sand/Silt/Clay	0	1	4.2

Mean Percentage of Dominant Stream Bank

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage
Grass	2	0	8.3
Brush	5	6	45.8
Hardwood	5	6	45.8
Coniferous	0	0	0.0
No Vegetation	0	0	0.0

Total Stream Cobble Embeddedness 2

Table 10 - Mean Percent of Shelter Cover Types For Entire Survey**Stream Name:** Soda Creek**LLID:** 1222898383528**Drainage:** Napa River**Survey** 8/31/2004 to 8/31/2004**Confluence Location: Quad:** YOUNTVILLE**Legal Description:** T000R000S00**Latitude:** 38:21:10.0N**Longitude:** 122:17:23.0

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)			3
SMALL WOODY DEBRIS (%)			9
LARGE WOODY DEBRIS (%)			0
ROOT MASS (%)			6
TERRESTRIAL VEGETATION (%)			14
AQUATIC VEGETATION (%)			8
WHITEWATER (%)			0
BOULDERS (%)			60
BEDROCK LEDGES (%)			0

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

Stream Name: Wing Canyon Creek **LLID:** 1224081383889 **Drainage:** Napa River
Survey 9/22/2004 to 10/1/2004
Confluence Location: Quad: RUTHERFORD **Legal Description:** T06NR05WS04 **Latitude:** 38:23:20.0N **Longitude:** 122:24:29.0

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
16	0	DRY	16.0	55	878	21.9									
18	3	FLATWATER	18.0	63	1137	28.4	5.0	0.4	0.9	251	4524	95	1712		43
42	14	POOL	42.0	25	1060	26.5	6.2	0.6	1.1	145	6110	113	4760	93	48
24	3	RIFFLE	24.0	39	931	23.2	2.2	0.3	0.6	81	1944	24	574		23
Total Units	Total Units Fully Measured				Total Length (ft.)						Total Area (sq.ft.)		Total Volume (cu.ft.)		
100	20				4006						12578		7046		

Table 2 - Summary of Habitat Types and Measured Parameters**Stream Name:** Wing Canyon Creek**LLID:** 1224081383889**Drainage:** Napa River**Survey** 9/22/2004 to 10/1/2004**Confluence Location: Quad:** RUTHERFORD**Legal Description:** T06NR05WS04**Latitude:** 38:23:20.0N**Longitude:** 122:24:29.0

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	Mean Canopy (%)
2	1	LGR	2.0	70	141	3.5	3.0	0.3	0.8	186	372	56	112		60	97
21	2	HGR	21.0	35	741	18.5	2.0	0.3	0.5	29	599	8	167		5	98
1	0	BRS	1.0	49	49	1.2										
5	1	GLD	5.0	27	133	3.3	6.0	0.3	0.7	162	810	49	243			97
13	2	SRN	13.0	77	1004	25.1	4.0	0.4	1.1	296	3848	118	1539		43	98
29	10	MCP	29.0	18	516	12.9	6.0	0.5	1.8	122	3534	89	2590	71	38	97
12	3	STP	12.0	44	530	13.2	6.0	0.7	1.3	240	2880	195	2342	166	63	91
1	1	LSBo	1.0	14	14	0.3	7.0	0.9	2.0	98	98	108	108	88	100	100
16	0	DRY	16.0	55	878	21.9										95
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)			Total Volume (cu.ft.)			
100	20				4006					12141			7101			

Table 3 - Summary of Pools**Stream Name:** Wing Canyon Creek**LLID:** 1224081383889**Drainage:** Napa River**Survey** 9/22/2004 to 10/1/2004**Confluence Location: Quad:** RUTHERFORD**Legal Description:** T06NR05WS04**Latitude:** 38:23:20.0N**Longitude:** 122:24:29.0

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
41	13	MAIN	98	26	1046	99	6.2	0.6	149	6115	93	3825	44
1	1	SCOUR	2	14	14	1	7.0	0.9	98	98	88	88	100
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)		Total Volume (cu.ft.)	
42	14				1060					6213		3913	

Table 4 - Summary of Maximum Residual Pool Depths

Stream Name: Wing Canyon Creek **LLID:** 1224081383889 **Drainage:** Napa River
Survey: 9/22/2004 to 10/1/2004
Confluence Location: Quad: RUTHERFORD **Legal Description:** T06NR05WS04 **Latitude:** 38:23:20.0N **Longitude:** 122:24:29.0

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
10	MCP	71	5	50	5	50	0	0	0	0	0	0
1	LSBo	7	0	0	0	0	1	100	0	0	0	0
3	STP	21	1	33	2	67	0	0	0	0	0	0
Total Units			Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1 < 2 Feet Max Resid. Depth	Total 1 < 2 Feet % Occurrence	Total 2 < 3 Feet Max Resid. Depth	Total 2 < 3 Feet % Occurrence	Total 3 < 4 Feet Max Resid. Depth	Total 3 < 4 Feet % Occurrence	Total >= 4 Feet Max Resid. Depth	Total >= 4 Feet % Occurrence
14			6	43	7	50	1	7	0	0	0	0
Mean Maximum Residual Pool Depth (ft.):			1									

Table 5 - Summary of Mean Percent Cover By Habitat Type**Stream Name:** Wing Canyon Creek**LLID:** 1224081383889**Drainage:** Napa River**Survey** 9/22/2004 to 10/1/2004**Confluence Location: Quad:** RUTHERFORD**Legal Description:** T06NR05WS04**Latitude:** 38:23:20.0N**Longitude:** 122:24:29.0

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
2	1	LGR	0	0	30	20	0	0	0	50	0
21	2	HGR	0	0	0	0	0	0	0	50	0
1	0	BRS									
5	0	GLD									
13	2	SRN	20	0	0	0	0	0	0	80	0
29	9	MCP	7	2	20	2	0	0	2	67	0
12	3	STP	13	5	8	0	0	0	0	73	0
1	1	LSBo	80	0	0	0	0	0	0	20	0

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name:		Wing Canyon Creek		LLID:		1224081383889		Drainage:		Napa River	
Survey		9/22/2004 to 10/1/2004		Confluence Location: Quad:		RUTHERFORD		Legal Description:		T06NR05WS04	
Latitude:		38:23:20.0N		Longitude:		122:24:29.0		Latitude:		38:23:20.0N	
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		
2	1	LGR	0	0	0	0	0	100	0		
21	2	HGR	0	0	0	0	0	100	0		
1	0	BRS	0	0	0	0	0	0	0		
5	1	GLD	0	0	100	0	0	0	0		
13	2	SRN	0	0	0	0	50	50	0		
29	9	MCP	11	33	22	11	11	0	11		
12	3	STP	0	0	0	0	33	33	33		
1	1	LSBo	0	0	100	0	0	0	0		

Table 7 - Summary of Mean Percent Canopy for Entire Survey

Stream Name:		Wing Canyon Creek		LLID:		1224081383889		Drainage:		Napa River	
Survey		9/22/2004 to 10/1/2004		Confluence Location: Quad:		RUTHERFORD		Legal Description:		T06NR05WS04	
Latitude:		38:23:20.0N		Longitude:		122:24:29.0		Latitude:		38:23:20.0N	
Habitat Units	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover						
96	85	15	0	75	78						

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 Wing Canyon Creek LLID: 1224081383889 Drainage Napa River
 Survey Dates: 9/22/2004 to 10/1/2004 Survey Length (ft.): 4006 Main Channel (ft.): 4006 Side Channel (ft.): 0
 Confluence Location: Quad RUTHERFORD Legal T06NR05WS04 Latitude: 38:23:20.0N Longitude: 122:24:29.0

STREAM REACH: 1

Channel Type: A4	Canopy Density (%): 97.5	Pools by Stream Length	33.0
Reach Length (ft.): 1169	Coniferous Component (%): 89.4	Pool Frequency (%):	45.5
Riffle/Flatwater Mean Width (ft.): 3.5	Hardwood Component 10.6	Residual Pool Depth (%):	
BFW:	Dominant Bank Coniferous Trees	< 2 Feet Deep:	83.3
Range (ft.): 12.5 to 16.29	Vegetative Cover (%): 70.5	2 to 2.9 Feet Deep:	16.7
Mean (ft.): 13.94848484848	Dominant Boulders	3 to 3.9 Feet Deep:	0.0
Std. Dev.: 1.675151953690	Dominant Bank Substrate Sand/Silt/Clay	>= 4 Feet Deep:	0.0
Base Flow (cfs): 0	Occurrence of LWD (%): 4.0	Mean Max Residual Pool Depth	1.41
Water (F): 54 - 55 Air (F): 71 - 73	LWD per 100 ft.:	Mean Pool Shelter	45
Dry Channel (ft.): 0	Riffles: 1		
	Pools: 0		
	Flat: 0		
Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 62.5 Sm Cobble: 37.5 Lg Cobble: 0.0 Boulder 0.0 Bedrock: 0.0			
Embeddedness Values	1. 2. 3. 4. 5. 0.0		

STREAM REACH: 2

Channel Type: A2	Canopy Density (%): 95.0	Pools by Stream Length	23.8
Reach Length (ft.): 2837	Coniferous Component (%): 81.7	Pool Frequency (%):	40.3
Riffle/Flatwater Mean Width (ft.): 4.0	Hardwood Component 18.3	Residual Pool Depth (%):	
BFW:	Dominant Bank Coniferous Trees	< 2 Feet Deep:	100.0
Range (ft.): 13 to 13	Vegetative Cover (%): 83.1	2 to 2.9 Feet Deep:	0.0
Mean (ft.): 13	Dominant Boulders	3 to 3.9 Feet Deep:	0.0
Std. Dev.: 0	Dominant Bank Substrate Sand/Silt/Clay	>= 4 Feet Deep:	0.0
Base Flow (cfs): 0	Occurrence of LWD (%): 24.4	Mean Max Residual Pool Depth	0.86
Water (F): 54 - 57 Air (F): 55 - 75	LWD per 100 ft.:	Mean Pool Shelter	51
Dry Channel (ft.): 878	Riffles: 0		
	Pools: 1		
	Flat: 0		
Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 50.0 Sm Cobble: 50.0 Lg Cobble: 0.0 Boulder 0.0 Bedrock: 0.0			
Embeddedness Values	1. 50.0 2. 50.0 3. 0.0 4. 0.0 5. 0.0		

Table 9 -Mean Percentage of Dominant Substrate and Vegetation**Stream Name:** Wing Canyon Creek**LLID:** 1224081383889**Drainage:** Napa River**Survey** 9/22/2004 to 10/1/2004**Confluence Location: Quad:** RUTHERFORD**Legal Description:** T06NR05WS04**Latitude:** 38:23:20.0N**Longitude:** 122:24:29.0**Mean Percentage of Dominant Stream Bank**

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Bedrock	7	2	22.5
Boulder	2	5	17.5
Cobble/Gravel	1	5	15.0
Sand/Silt/Clay	10	8	45.0

Mean Percentage of Dominant Stream Bank

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage
Grass	0	0	0.0
Brush	5	2	17.5
Hardwood	5	3	20.0
Coniferous	10	15	62.5
No Vegetation	0	0	0.0

Total Stream Cobble Embeddedness 2

Table 10 - Mean Percent of Shelter Cover Types For Entire Survey**Stream Name:** Wing Canyon Creek**LLID:** 1224081383889**Drainage:** Napa River**Survey** 9/22/2004 to 10/1/2004**Confluence Location: Quad:** RUTHERFORD**Legal Description:** T06NR05WS04**Latitude:** 38:23:20.0N**Longitude:** 122:24:29.0

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	20	14
SMALL WOODY DEBRIS (%)	0	0	3
LARGE WOODY DEBRIS (%)	10	0	16
ROOT MASS (%)	7	0	2
TERRESTRIAL VEGETATION (%)	0	0	0
AQUATIC VEGETATION (%)	0	0	0
WHITEWATER (%)	0	0	2
BOULDERS (%)	50	80	65
BEDROCK LEDGES (%)	0	0	0

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat**Stream Name:** York Creek**LLID:** 1224747385220**Drainage:** Napa River**Survey** 9/3/2003 to 9/24/2003**Confluence Location: Quad:** CALISTOGA**Legal Description:** T000R000S00**Latitude:** 38:31:19.0N**Longitude:** 122:28:29.0

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
3	0	DRY	0.6	620	1859	7.6									
126	14	FLATWATER	26.9	52	6539	26.9	8.5	0.5	0.9	454	57182	209	26388		26
1	0	NOSURVEY	0.2	1003	1003	4.1									
157	62	POOL	33.5	32	4951	20.4	8.5	0.6	1.4	304	47723	351	55080	261	58
181	19	RIFFLE	38.7	55	9962	41.0	7.6	0.3	0.6	462	83612	129	23356		12
Total Units	Total Units Fully Measured				Total Length (ft.)						Total Area (sq.ft.)		Total Volume (cu.ft.)		
468	95				24314						188517		104824		

Table 2 - Summary of Habitat Types and Measured Parameters**Stream Name:** York Creek**LLID:** 1224747385220**Drainage:** Napa River**Survey** 9/3/2003 to 9/24/2003**Confluence Location: Quad:** CALISTOGA**Legal Description:** T000R000S00**Latitude:** 38:31:19.0N**Longitude:** 122:28:29.0

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	Mean Canopy (%)
77	8	LGR	16.5	56	4312	17.7	8.0	0.2	0.7	625	48096	148	11407		10	96
102	11	HGR	21.8	55	5589	23.0	7.0	0.3	0.7	344	35051	115	11745		13	97
2	0	BRS	0.4	30	61	0.3										
80	7	GLD	17.1	38	3061	12.6	9.0	0.5	1.8	439	35103	233	18657		31	88
46	7	SRN	9.8	76	3478	14.3	8.0	0.4	1.0	469	21567	186	8540		20	98
81	23	MCP	17.3	32	2616	10.8	9.0	0.7	3.8	378	30624	518	41930	436	40	90
17	9	STP	3.6	54	923	3.8	8.0	0.5	1.7	378	6431	294	4998	193	44	94
1	1	CRP	0.2	47	47	0.2	11.0	0.9	1.6	517	517	1034	1034	465	50	20
5	1	LSL	1.1	19	96	0.4	7.0	0.4	1.2	105	525	74	368	42	150	100
23	13	LSR	4.9	25	579	2.4	8.0	0.4	7.6	213	4888	197	4528	135	102	99
14	8	LSBk	3.0	29	403	1.7	8.0	0.3	1.8	239	3351	191	2671	60	44	97
3	1	LSBo	0.6	21	64	0.3	7.0	0.4	1.0	63	189	44	132	25	100	100
13	6	PLP	2.8	17	223	0.9	11.0	0.9	3.0	231	2997	327	4251	260	62	99
3	0	DRY	0.6	620	1859	7.6										
1	0	NS	0.2	1003	1003	4.1										
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)			Total Volume (cu.ft.)			
468	95				24314					189339			110261			

Table 3 - Summary of Pools**Stream Name:** York Creek**LLID:** 1224747385220**Drainage:** Napa River**Survey** 9/3/2003 to 9/24/2003**Confluence Location: Quad:** CALISTOGA**Legal Description:** T000R000S00**Latitude:** 38:31:19.0N**Longitude:** 122:28:29.0

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
98	32	MAIN	62	36	3539	71	8.5	0.6	378	37058	366	34717	41
59	30	SCOUR	38	24	1412	29	8.5	0.5	225	13266	145	7991	78
Total Units	Total Units Fully Measured				Total Length (ft.)					Total Area (sq.ft.)		Total Volume (cu.ft.)	
157	62				4951					50324		42707	

Table 4 - Summary of Maximum Residual Pool Depths

Stream Name: York Creek **LLID:** 1224747385220 **Drainage:** Napa River
Survey: 9/3/2003 to 9/24/2003
Confluence Location: Quad: CALISTOGA **Legal Description:** T000R000S00 **Latitude:** 38:31:19.0N **Longitude:** 122:28:29.0

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
23	MCP	37	9	39	8	35	5	22	1	4	0	0
9	STP	15	1	11	8	89	0	0	0	0	0	0
8	LSBk	13	3	38	5	63	0	0	0	0	0	0
1	LSBo	2	0	0	1	100	0	0	0	0	0	0
13	LSR	21	6	46	4	31	2	15	0	0	1	8
1	CRP	2	0	0	1	100	0	0	0	0	0	0
6	PLP	10	1	17	3	50	1	17	1	17	0	0
1	LSL	2	0	0	1	100	0	0	0	0	0	0
Total Units			Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1 < 2 Feet Max Resid. Depth	Total 1 < 2 Feet % Occurrence	Total 2 < 3 Feet Max Resid. Depth	Total 2 < 3 Feet % Occurrence	Total 3 < 4 Feet Max Resid. Depth	Total 3 < 4 Feet % Occurrence	Total >= 4 Feet Max Resid. Depth	Total >= 4 Feet % Occurrence
62			20	32	31	50	8	13	2	3	1	2
Mean Maximum Residual Pool Depth (ft.):			1									

Table 5 - Summary of Mean Percent Cover By Habitat Type**Stream Name:** York Creek**LLID:** 1224747385220**Drainage:** Napa River**Survey** 9/3/2003 to 9/24/2003**Confluence Location: Quad:** CALISTOGA**Legal Description:** T000R000S00**Latitude:** 38:31:19.0N**Longitude:** 122:28:29.0

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
77	1	LGR	0	0	0	0	0	0	50	50	0
102	6	HGR	0	8	0	0	2	0	15	75	0
2	0	BRS									
80	7	GLD	14	0	1	17	11	17	0	39	0
46	7	SRN	1	10	0	9	6	0	6	69	0
81	22	MCP	13	4	5	21	5	0	7	40	4
17	9	STP	7	3	2	13	0	2	14	52	7
1	1	CRP	0	20	0	0	50	0	0	30	0
5	1	LSL	10	20	50	10	10	0	0	0	0
23	11	LSR	23	15	18	25	3	1	0	14	3
14	7	LSBk	6	9	1	14	10	0	0	27	33
3	1	LSBo	0	0	0	30	20	0	0	50	0
13	6	PLP	15	20	5	22	2	0	8	8	20
1	0	NS									

Table 6 - Summary of Dominant Substrates By Habitat Type**Stream Name:** York Creek**LLID:** 1224747385220**Drainage:** Napa River**Survey** 9/3/2003 to 9/24/2003**Confluence Location: Quad:** CALISTOGA**Legal Description:** T000R000S00**Latitude:** 38:31:19.0N**Longitude:** 122:28:29.0

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
77	8	LGR	0	0	25	25	50	0	0
102	11	HGR	0	9	9	45	9	18	9
2	0	BRS	0	0	0	0	0	0	0
80	6	GLD	0	67	0	33	0	0	0
46	7	SRN	0	0	29	43	29	0	0
81	23	MCP	9	52	4	4	17	4	9
17	9	STP	0	56	0	0	33	0	11
1	1	CRP	0	100	0	0	0	0	0
5	1	LSL	0	0	100	0	0	0	0
23	13	LSR	0	38	23	8	31	0	0
14	8	LSBk	0	63	0	13	25	0	0
3	1	LSBo	0	100	0	0	0	0	0
13	6	PLP	0	33	17	0	33	0	17
1	0	NS	0	0	0	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Survey

Stream Name: York Creek

LLID: 1224747385220

Drainage: Napa River

Survey 9/3/2003 to 9/24/2003

Confluence Location: Quad: CALISTOGA

Legal Description: T000R000S00

Latitude: 38:31:19.0N

Longitude: 122:28:29.0

Habitat Units	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
94	54	46	0	71	73

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 York Creek LLID: 1224747385220 Drainage Napa River
 Survey Dates: 9/3/2003 to 9/24/2003 Survey Length (ft.): 24314 Main Channel (ft.): 24314 Side Channel (ft.): 0
 Confluence Location: Quad CALISTOGA Legal T000R000S00 Latitude: 38:31:19.0N Longitude: 122:28:29.0

STREAM REACH: 1

Channel Type: F3	Canopy Density (%): 81.8	Pools by Stream Length	17.9
Reach Length (ft.): 5759	Coniferous Component (%): 43.1	Pool Frequency (%):	27.0
Riffle/Flatwater Mean Width (ft.): 8.3	Hardwood Component	Residual Pool Depth (%):	
BFW:	Dominant Bank	< 2 Feet Deep:	70.0
Range (ft.): 14.60 to 14.60	Vegetative Cover (%): 67.5	2 to 2.9 Feet Deep:	20.0
Mean (ft.): 14.6	Dominant Root masses	3 to 3.9 Feet Deep:	10.0
Std. Dev.: 1.587445452866	Dominant Bank Substrate	>= 4 Feet Deep:	0.0
Base Flow (cfs): 0	Occurrence of LWD (%): 4.6	Mean Max Residual Pool Depth	1.53
Water (F): 64 - 71 Air (F): 79 - 88	LWD per 100 ft.:	Mean Pool Shelter	45
Dry Channel (ft.): 1859	Riffles: 0		
	Pools: 0		
	Flat: 0		
Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 20.0 Gravel: 0.0 Sm Cobble: 20.0 Lg Cobble: 40.0 Boulder: 20.0 Bedrock: 0.0			
Embeddedness Values	1. 37.5 2. 12.5 3. 50.0 4. 0.0 5. 0.0		

STREAM REACH: 2

Channel Type: B3	Canopy Density (%): 89.4	Pools by Stream Length	31.5
Reach Length (ft.): 3051	Coniferous Component (%): 38.7	Pool Frequency (%):	36.8
Riffle/Flatwater Mean Width (ft.): 8.8	Hardwood Component	Residual Pool Depth (%):	
BFW:	Dominant Bank	< 2 Feet Deep:	77.8
Range (ft.): 14.89 to 14.89	Vegetative Cover (%): 74.8	2 to 2.9 Feet Deep:	22.2
Mean (ft.): 14.9	Dominant Boulders	3 to 3.9 Feet Deep:	0.0
Std. Dev.: 1.511464564618	Dominant Bank Substrate	>= 4 Feet Deep:	0.0
Base Flow (cfs): 0	Occurrence of LWD (%): 13.1	Mean Max Residual Pool Depth	1.52
Water (F): 63 - 64 Air (F): 66 - 81	LWD per 100 ft.:	Mean Pool Shelter	72
Dry Channel (ft.): 0	Riffles:		
	Pools:		
	Flat:		
Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 25.0 Gravel: 0.0 Sm Cobble: 16.7 Lg Cobble: 50.0 Boulder: 8.3 Bedrock: 0.0			
Embeddedness Values	1. 45.5 2. 36.4 3. 18.2 4. 0.0 5. 0.0		

YORK CREEK

STREAM REACH: 3

Channel Type: F3	Canopy Density (%): 98.2	Pools by Stream Length	21.1
Reach Length (ft.): 2101	Coniferous Component (%): 30.8	Pool Frequency (%):	27.7
Riffle/Flatwater Mean Width (ft.): 7.7	Hardwood Component	69.2	Residual Pool Depth (%):
BFW:	Dominant Bank	Hardwood Trees	< 2 Feet Deep: 85.7
Range (ft.): 17.29 to 17.29	Vegetative Cover (%): 57.8		2 to 2.9 Feet Deep: 14.3
Mean (ft.): 17.3	Dominant	Root masses	3 to 3.9 Feet Deep: 0.0
Std. Dev.: 1.232174084986	Dominant Bank Substrate	Cobble/Gravel	>= 4 Feet Deep: 0.0
Base Flow (cfs): 0	Occurrence of LWD (%): 3.0	Mean Max Residual Pool Depth	1.34
Water (F): 62 - 63	Air (F): 72 - 81	LWD per 100 ft.:	Mean Pool Shelter
Dry Channel (ft.): 0		Riffles:	70
		Pools:	
		Flat:	
Pool Tail Substrate (%): Silt/Clay: 0.0	Sand: 28.6	Gravel: 0.0	Sm Cobble: 28.6
	Lg Cobble: 28.6	Boulder: 14.3	Bedrock: 0.0
Embeddedness Values	1. 0.0	2. 60.0	3. 40.0
	4. 0.0	5. 0.0	

STREAM REACH: 4

Channel Type: B3	Canopy Density (%): 98.3	Pools by Stream Length	20.0
Reach Length (ft.): 5373	Coniferous Component (%): 53.9	Pool Frequency (%):	34.5
Riffle/Flatwater Mean Width (ft.): 8.1	Hardwood Component	46.1	Residual Pool Depth (%):
BFW:	Dominant Bank	Brush	< 2 Feet Deep: 84.6
Range (ft.): 13.19 to 13.19	Vegetative Cover (%): 64.2		2 to 2.9 Feet Deep: 7.7
Mean (ft.): 13.2	Dominant	Boulders	3 to 3.9 Feet Deep: 7.7
Std. Dev.: 2.854400743546	Dominant Bank Substrate	Cobble/Gravel	>= 4 Feet Deep: 0.0
Base Flow (cfs): 0	Occurrence of LWD (%): 3.2	Mean Max Residual Pool Depth	1.3
Water (F): 61 - 64	Air (F): 70 - 82	LWD per 100 ft.:	Mean Pool Shelter
Dry Channel (ft.): 0		Riffles:	52
		Pools:	
		Flat:	
Pool Tail Substrate (%): Silt/Clay: 0.0	Sand: 0.0	Gravel: 30.8	Sm Cobble: 7.7
	Lg Cobble: 23.1	Boulder: 30.8	Bedrock: 7.7
Embeddedness Values	1. 38.5	2. 46.2	3. 15.4
	4. 0.0	5. 0.0	

YORK CREEK

STREAM REACH: 5

Channel Type: B3	Canopy Density (%): 96.9	Pools by Stream Length	19.0				
Reach Length (ft.): 5273	Coniferous Component (%): 69.7	Pool Frequency (%):	35.3				
Riffle/Flatwater Mean Width (ft.): 7.2	Hardwood Component	30.3	Residual Pool Depth (%):				
BFW:	Dominant Bank	Coniferous Trees	< 2 Feet Deep: 86.7				
Range (ft.): 17 to 17	Vegetative Cover (%): 82.9		2 to 2.9 Feet Deep: 6.7				
Mean (ft.): 17	Dominant	Boulders	3 to 3.9 Feet Deep: 0.0				
Std. Dev.: 0	Dominant Bank Substrate	Cobble/Gravel	>= 4 Feet Deep: 6.7				
Base Flow (cfs):	Occurrence of LWD (%): 2.9	Mean Max Residual Pool Depth	1.64				
Water (F): 0 - 61	Air (F): 0 - 72	LWD per 100 ft.:	Mean Pool Shelter				
Dry Channel (ft.): 0		Riffles:	67				
		Pools:					
		Flat:					
Pool Tail Substrate (%):	Silt/Clay: 0.0	Sand: 6.3	Gravel: 25.0	Sm Cobble: 37.5	Lg Cobble: 18.8	Boulder: 6.3	Bedrock: 6.3
Embeddedness Values	1. 37.5	2. 50.0	3. 6.3	4. 6.3	5. 0.0		

STREAM REACH: 6

Channel Type: F3	Canopy Density (%): 97.4	Pools by Stream Length	16.1				
Reach Length (ft.): 2757	Coniferous Component (%): 72.6	Pool Frequency (%):	36.4				
Riffle/Flatwater Mean Width (ft.): 7.5	Hardwood Component	27.4	Residual Pool Depth (%):				
BFW:	Dominant Bank	Coniferous Trees	< 2 Feet Deep: 87.5				
Range (ft.): 16.10 to 16.10	Vegetative Cover (%): 82.5		2 to 2.9 Feet Deep: 12.5				
Mean (ft.): 16.1	Dominant	Boulders	3 to 3.9 Feet Deep: 0.0				
Std. Dev.: 1.098079960293	Dominant Bank Substrate	Cobble/Gravel	>= 4 Feet Deep: 0.0				
Base Flow (cfs):	Occurrence of LWD (%): 6.4	Mean Max Residual Pool Depth	1.125				
Water (F): 0 - 61	Air (F): 66 - 73	LWD per 100 ft.:	Mean Pool Shelter				
Dry Channel (ft.): 0		Riffles:	39				
		Pools:					
		Flat:					
Pool Tail Substrate (%):	Silt/Clay: 0.0	Sand: 0.0	Gravel: 25.0	Sm Cobble: 0.0	Lg Cobble: 62.5	Boulder: 0.0	Bedrock: 12.5
Embeddedness Values	1. 75.0	2. 25.0	3. 0.0	4. 0.0	5. 0.0		

Table 9 -Mean Percentage of Dominant Substrate and Vegetation

Stream Name: York Creek **LLID:** 1224747385220 **Drainage:** Napa River
Survey: 9/3/2003 to 9/24/2003
Confluence Location: Quad: CALISTOGA **Legal Description:** T000R000S00 **Latitude:** 38:31:19.0N **Longitude:** 122:28:29.0

Mean Percentage of Dominant Stream Bank

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Bedrock	18	10	15.1
Boulder	13	10	12.4
Cobble/Gravel	40	55	51.1
Sand/Silt/Clay	22	17	21.0

Mean Percentage of Dominant Stream Bank

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage
Grass	4	3	3.8
Brush	43	41	45.2
Hardwood	25	27	28.0
Coniferous	17	18	18.8
No Vegetation	4	4	4.3

Total Stream Cobble Embeddedness 2

Table 10 - Mean Percent of Shelter Cover Types For Entire Survey**Stream Name:** York Creek**LLID:** 1224747385220**Drainage:** Napa River**Survey** 9/3/2003 to 9/24/2003**Confluence Location: Quad:** CALISTOGA**Legal Description:** T000R000S00**Latitude:** 38:31:19.0N**Longitude:** 122:28:29.0

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	8	13
SMALL WOODY DEBRIS (%)	7	5	9
LARGE WOODY DEBRIS (%)	0	1	7
ROOT MASS (%)	0	13	19
TERRESTRIAL VEGETATION (%)	1	9	5
AQUATIC VEGETATION (%)	0	9	1
WHITEWATER (%)	20	3	6
BOULDERS (%)	71	54	31
BEDROCK LEDGES (%)	0	0	9