CALIFORNIA DEPARTMENT OF FISH AND GAME
STREAM INVENTORY REPORT

York Creek

Report Revised April 14, 2006
Report Completed 2005
Assessment Completed 2001

INTRODUCTION

A stream inventory was conducted during the summer of 2001 on York Creek. The inventory was conducted in two parts: habitat inventory and biological inventory. The objective of the habitat inventory was to document the amount and condition of available habitat to fish and other aquatic species with an emphasis on anadromous salmonids in York Creek. The objective of the biological inventory was to document the presence and distribution of salmonids and other aquatic species.

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

WATERSHED OVERVIEW

York Creek is a tributary of the west fork of the Russian River, located in Mendocino County, California (see York Creek map, Appendix A). The legal description at the confluence with the Russian River is T16, R12 S33, in the Yokaya Rancheria. Its location is 39.203213705419 N. latitude and 123.201182567535 W. longitude, LLID: 1232011392032. Year round vehicle access exists from Highway 101 to N. State St. in Calpella.

York Creek and its tributaries drain a basin of approximately 11.55 square miles. York Creek is a fourth order stream and has approximately 8.9 miles of intermittent stream, according to the USGS Ukiah and Orrs Springs 7.5 minute quadrangles. There are no major tributaries in this system, despite the high number of small, unnamed ones. Summer flow was measured as approximately 0.063cfs. It was taken directly below the North State Street Bridge near the mouth of York Creek, on August 10, 2001. Elevations range from about 620 feet at the mouth of the creek to 2566 feet in the headwaters. Oak woodland forest dominates the watershed, but the riparian zone is dominated by willow, bay laurel and alder. There are also zones of grassland, mixed evergreen and manzanita throughout the upper watershed. The watershed is owned entirely by private landowners. The mouth of this creek is in an urban setting. The lower York Creek watershed is managed for vineyard development, cattle grazing and rural housing. The low-mid watershed includes grasslands, but is dominated by oak and deciduous woodland. The upper half of the watershed is managed for open forest land and is dominated by oak and deciduous woodland, with some mixed conifers dispersed throughout. There are no sensitive plants listed from the CNPS Inventory and DFG's Natural Diversity Database within the York Creek watershed.

METHODS

The habitat inventory conducted in York Creek follows the methodology presented in the California Salmonid Stream Habitat Restoration Manual (Flosi et al. 1998). The AmeriCorps Volunteers that conducted the inventory were trained in standardized habitat inventory methods by the California Department of Fish and Game (DFG). This inventory was conducted by a two-person team and was supervised by Bob Coey, Russian River Basin Planner (DFG).

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 (1998). This form was used in York Creek to record measurements and observations. There are nine components to the inventory form: flow, channel type, temperatures, habitat type, embeddedness, shelter rating, substrate composition, canopy, and bank composition.

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

2. Channel Type:
Channel typing is conducted according to the classification system developed and revised by David Rosgen (1985 rev. 1994). This methodology is described in the California Salmonid Stream Habitat Restoration Manual (1998). 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.

3. Temperatures:
Water and air temperatures, and time, are measured by crew members with hand-held thermometers and recorded at each tenth unit typed. Temperatures are measured in Fahrenheit at the middle of the habitat unit and within one foot of the water surface. Temperatures are also recorded using remote temperature recorders which log temperature at set intervals, 24 hours/day.

4. Habitat Type:
Habitat typing uses the 24 habitat classification types defined by McCain and others (1988). Habitat units are numbered sequentially and assigned a type identification number selected from a standard list of 24 habitat types. De-watered units are labeled "DRY". York Creek habitat typing used standard basin level measurement criteria. These parameters require that the minimum length of a described habitat unit must be equal to or greater than the stream's mean wetted width. All unit lengths were measured. The first occurrence of each unit type and a randomly selected 10% subset of all units were completely sampled (Length, Mean Width, Mean Depth, Maximum Depth and Pool Tail Crest Depth). All measurements are in feet to the nearest tenth.

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

6. Shelter Rating:
Instream shelter is composed of those elements within a stream channel that provide salmonids protection from predation, reduce water velocities so fish can rest and conserve energy, and allow separation of territorial units to reduce density related competition. Using an overhead view, a quantitative estimate of the percentage of the habitat unit covered is made. All shelter is then classified according to a list of nine shelter types. In York Creek, a standard qualitative shelter value of 0 (none), 1 (low), 2 (medium), or 3 (high) was assigned according to the complexity of the shelter. The shelter rating is calculated for each habitat unit by multiplying shelter value and percent covered. Thus, shelter ratings can range from 0-300, and are expressed as mean values by habitat types within a stream.

7. Substrate Composition:
In all fully measured habitat units, dominant and sub-dominant substrate elements are visually estimated using a list of seven size classes: Silt/Clay, Sand, Gravel, Small Cobble, Large Cobble, Boulder, and Bedrock.

8. Canopy:
Stream canopy density is estimated using modified handheld spherical densiometers as described in the California Salmonid Stream Habitat Restoration Manual (1998). Canopy density relates to the amount of stream shaded from the sun. In York Creek, an estimate of the percentage of the habitat unit covered by canopy was made from the center of approximately every third unit in addition to every fully-described unit, giving an approximate 30% sub-sample. Finally, the total canopy over each habitat unit is visually divided into evergreen and deciduous, and the estimated percentages are recorded.

9. Bank Composition and Vegetation:
Banks may be composed primarily of (1) Bedrock, (2) Boulders, (3) Cobble/Gravel, or (4) Silt/Clay/Sand, and may be covered predominantly with (5) Grass, (6) Brush, (7) Deciduous Trees, (8) Coniferous Trees, or (9) No Vegetation at all. These factors influence the ability of stream banks to withstand winter flows. For each fully measured habitat unit in York Creek, the dominant Bank Composition Type and Vegetation Type of both the right and left banks were chosen from the options above. Additionally, the percentage of vegetal coverage was estimated and recorded for each bank.

BIOLOGICAL INVENTORY

Biological sampling during stream inventory is used to determine fish species present and their distribution in the stream. Biological inventory is conducted using one or more of three basic methods: 1) stream bank observation, 2) underwater observation, and 3) electro-fishing. These sampling techniques are discussed in the California Salmonid Stream Habitat Restoration Manual (1998).

DATA ANALYSIS

Data from the habitat inventory form are entered into Habitat, a dBASE IV data entry program developed by CDFG. This program processes and summarizes the data, and produces the following tables and appendices:

- 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

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

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

HISTORICAL STREAM SURVEYS:

The Department of Fish and Game conducted a stream survey on York Creek in March 1966. It was surveyed on foot from the mouth to the North State Street Bridge and by automobile for about

2 miles west of highway 101. The south branch was observed, the north was not. It was noted that there was good spawning habitat but poor rearing conditions. Average width was 15' (5-25'), average depth was 8" (3"-4'). Flow was 21.82 cfs 3/4 mile from mouth. Substrate was composed of 60% gravel, 30% cobble, and 15% sand and silt. Pools were 1-2' deep, 2-4' wide, and 10-20'long. Here were some undercut banks and fallen trees, but shelter was scarce. There are falls 3.5 mi. from the mouth and is a barrier to fish migration. There was grazing by cows and horses on the lower York property.

HABITAT INVENTORY RESULTS

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

The habitat inventory of York Creek, August 1, 2001 - August 27, 2001, was conducted by J. Willing and D. Mitchel with supervision and analysis by California Department of Fish and Game (DFG). The survey began at the confluence with the Russian River and extended up York Creek to a series of steep, long bedrock sheets. The total length of stream surveyed was 36,921 feet, with an additional 214 feet of side channel.

A flow of 0.063 cfs was measured on August 10, 2001 at habitat unit 014, 900' above survey start, just downstream of North State Street Bridge, with a Marsh-McBirney Model 2000 flow meter.

This section of York Creek has ten reaches with six distinct channel types: from the mouth to 2380 feet a C4, 3119 feet a C3, 9761 feet a F3, 3354 feet a D2, 4813 feet a F3, 298 feet a A2, 10367 feet a F3, 177 feet a B3, 2116 feet a F3 and 536 feet a A2.

C4 channel types are low gradient (<2%), meandering, point-bar, riffle/pool, alluvial channels with a broad, well defined floodplain and a predominantly gravel substrate.

C3 channel types are low gradient (<2%), meandering, point-bar, riffle/pool, alluvial channels with a broad, well defined floodplain and a predominantly cobble substrate.

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

D2 channel types are multiple channels with longitudinal and transverse bars. They have a very wide low gradient (<2%) channel with eroding banks and a predominantly boulder substrate.

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

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

Water temperatures on survey dates August1, 2001-August 27, 2001 ranged from 60ºF to 70ºF. Air temperatures ranged from 74ºF to 98ºF.

Summer temperatures were also measured using remote temperature recorders placed in pools (see Temperature Summary graphs at end of report). A recorder in Reach Two, approximately 7500' from the mouth logged temperatures every two hours from July 4, 2001 - July 21, 2001, before run dried up. The highest temperature recorded was 68ºF in July and the lowest was 57ºF, also in July. The mean of the daily highs was 66.8ºF for the month of July.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of *occurrence* there were 35.9% Flatwater units, 33.2% Dry units, 27.3% Pool units and 3.6% Riffle units. Based on total *length* there were 84.0% Dry units, 9.6% Flatwater units, 5.8% Pool units and 0.7% Riffle units (Graph 1).

There were 220 habitat units measured and 25% were completely sampled. Fourteen Level IV habitat types were identified. The data is summarized in Table 2. The most frequent habitat types by percent *occurrence* were Dry at 33%, Run at 25%, Mid-Channel Pool at 15%, Glide at 8% and Lateral Scour Pool - Boulder Formed at 6% (Graph 2). By percent total *length*, Dry at 84%, Run at 6%, Mid-Channel Pool at 3% and Glide at 2%.

Sixty pools were identified (Table 3). Mid-Channel Pool pools were most often encountered at 15% (Table 2), and comprised 59% of the total length of pools (Table 3).

Table 4 is a summary of maximum pool depths by pool habitat types. Pool quality for salmonids increases with depth.

Twenty-four of the 60 pools (40%) had a depth of two feet or greater (Table 4, Graph 4). These deeper pools comprised 55% of the total length of stream habitat.

A shelter rating was calculated for each habitat unit and expressed as a mean value for each habitat type within the survey using a scale of 0-300. Flatwater units rated 7 and Pools rated 10 (Table 2). Of the pool types, Lateral Scour Pool - Root Wad Enhanced rated 22, Plunge Pool rated 20, Mid-Channel Pool rated 10, Lateral Scour Pool - Boulder Formed rated 7, Secondary Channel Pool rated 5, Lateral Scour Pool - Bedrock Formed rated 5 and Backwater Pool - Log Formed rated 5 (Table 2).

Table 5 summarizes fish shelter by habitat type. By percent area, the dominant pool shelter types were Root Mass at 26%, Boulders at 26%, Undercut Banks at 19% and Terrestrial Vegetation.

Table 6 summarizes the dominant substrate by habitat type. In the three Low-Gradient Riffles surveyed, the dominant substrate was: Small Cobble in one riffle and Boulders in one riffle (Graph 6).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 58 pool tail-outs measured, eight had a value of 1 (14%), 29 had a value of 2 (50%), 20 had a value of 3 (34%) and one had a value of 4 (2%). Riffles rated a 5 (unsuitable substrate type for spawning). On this scale, a value of 1 is best for fisheries. Gravel was the dominant substrate observed at pool tail-outs.

The mean percent canopy density for the stream reach surveyed was 28%. The mean percentages of deciduous and evergreen trees were 57% and 35%, respectively. Graph 8 describes the canopy for the entire survey.

For the entire stream reach surveyed, the mean percent right bank vegetated was 31% and the mean percent left bank vegetated was 30%. For the habitat units measured, the dominant vegetation types for the stream banks were: 54% Deciduous Trees, 14% Brush, 12% Evergreen Trees, 11% Grass and 9% Bare Soil (Graph 11). The dominant substrate for the stream banks were: 43% Boulder, 33% Silt, Clay & Sand, 14% Cobble & Gravel and 10% Bedrock (Graph 10).

BIOLOGICAL INVENTORY

JUVENILE SURVEYS:

York Creek is habitat for both steelhead and coho salmon, with 3.5 miles of spawnable habitat. In the 1966 survey data, it was noted that local residents had reported both steelhead and coho salmon. Suckers had also been seen. Stoneflies and mayflies were abundant.

Species observed in 2001 by DFG crew included lamprey, crawfish, roach and stickleback.

In late October 22 and October 25, 2001, a biological inventory was conducted in York Creek to document the fish species composition and distribution at several locations. Each site was single-pass electro-fished using one Smith Root Model 12 electro-fisher. Fish from each site were counted by species and returned to the stream. A random sample of fish were selected from each reach, however only tissues from salmonids were taken for genetic analysis. Air temperatures ranged from to 62° to 73°F and water temperatures ranged from 50° to 58°F.

The inventory of Site 1 started at habitat unit #011, the first habitat unit downstream of the North State Street Bridge and ended approximately 591 feet upstream. In runs, pool and riffle habitats, no steelhead were found. At least 40 roach, at least 48 Sacramento suckerfish, at least 42 three spine stickleback, at least eight crawfish and at least 20 lamprey were observed.

The inventory of Site 2 started at habitat unit #248, approximately 23,600 feet from the mouth, about 50 feet from the downstream property line and ended approximately 481 feet upstream. In pool, run and glide habitats, at least 13 steelhead (from young of year to one plus year old) were observed along with at least 12 roach. Amphibians include at least six newts, at least 13 pacific giant salamanders, at least 30 yellow-legged frogs and at least eight pacific tree frogs.

The inventory of Site 3 started at habitat unit #316, approximately 700 feet upstream of the confluence with Cheyenne Creek and ended approximately 546 feet upstream. In pool, riffle and run habitats, no steelhead were found. Roach is the only identifiable fish found and at least 24 of those were observed. Amphibians include at least yellow-legged frogs, newts and pacific giant salamanders.

During the habitat inventory, no salmonids were observed upstream of unit #251, 23,650 feet above the confluence with the Russian River, where a boulder 12 feet high appears to impede further passage. *Oncorhynchus mykiss* were not observed above this boulder. Only a few fish species were observed above this site.

A summary of historical and recent data collected appears in the table below.

Table 1. Species Observed in Historical and Recent Surveys

YEARS	SPECIES	SOURCE	Native/Introduced
1966/2001	Steelhead	landowners and DFG	N
2001	Roach	DFG	N
2001	Sacramento Sucker	DFG	N
2001	Three-spine Stickleback	DFG	N
2001	Pacific Giant Salamander	DFG	N
2001	Crayfish	DFG	N
2001	California Newt	DFG	N
2001	Yellow-legged Frog	DFG	N
2001	Pacific Tree Frog	DFG	N
2001	Lamprey	DFG	N
1966/1988	Coho Salmon	Local Landowners(1966)/ Brown and Moyle 1988	N

Historical records reflect that steelhead fingerlings were rescued/transferred from York Creek on various occasions between 1949 and 1966 (Table 1).

Table 1. Summary of fish rescues/transfers from York Creek

YEAR	RELEASE LOCATION	SPECIES	#	SIZE
1949	Russian River	SH	N/A	FING
1950	Russian River	SH	N/A	FING
1955	Russian River	SH	28,193	FING
1956	Russian River	SH	16,672	FING
1958	Redwood Valley Creek	SH	200	FING
1958	Reeves Canyon Creek	SH	5,368	FING
1958	Russian River	SH	3,000	FING
1959	Russian River	SH	14,260	FING
1959	Reeves Canyon Creek	SH	4960	FING
1960	Reeves Canyon Creek	SH	27,782	FING
1960	Russian River	SH	19,079	FING
1961	Russian River	SH	17,074	FING
1962	Russian River	SH	18,240	FING

Table 1. Summary of fish rescues/transfers from York Creek				
YEAR	**RELEASE LOCATION**	**SPECIES**	**#**	**SIZE**
1962	Reeves Canyon Creek	SH	6,720	FING
1963	Russian River	SH	4,036	FING
1964	Russian River	SH	15,060	FING
1965	Russian River	SH	1,830	FING
1966	Russian River	SH	576	FING

FING = fingerling
SH = Steelhead

ADULT SURVEYS:

No spawner/carcass surveys were conducted on York Creek.

DISCUSSION

York Creek has ten reaches: 2380 feet of C4, 3119 feet of C3, 9761 feet of F3, 3354 feet of D2, 4813 feet of F3, 298 feet of A2, 10367 feet of F3, 177 feet of B3, 2116 feet of F3 and 536 feet of A2.

According to the DFG Salmonid Stream Habitat Restoration Manual, C4 channel types are good for bank-placed boulders and log cover. They are fair for low-stage weirs, single and opposing wing-deflectors, channel constrictors and log cover.

C3 channel types are excellent for bank-placed boulders and good for low-stage weirs, boulder clusters, single and opposing wing deflectors and log cover. They are fair for medium-stage weirs.

F3 channel types are good for bank-placed boulders as well as single and opposing wing-deflectors. They are fair for low-stage weirs, boulder clusters, channel constrictors and log cover. Many site specific projects can be designed within this channel type, especially to increase pool frequency, volume and shelter. Any work considered will require careful design, placement, and construction that must include protection for any unstable banks.

D3 channel types are fair for bank-placed boulders, single and opposing wing-deflectors and channel constrictors. They are poor for low and medium-stage weirs, boulder clusters and log cover.

The high energy, steep gradient A2 channel types have stable stream banks and poor gravel retention capabilities and are generally not suitable for instream enhancement structures.

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

The water temperatures recorded on the survey days August 1, 2001 - August 27, 2001 ranged from 60ºF to 70ºF. Air temperatures ranged from 74ºF to 98ºF. The warmest water temperatures were recorded in Reach 6. These temperatures, if sustained, are above the threshold stress level (65ºF) for salmonids.

Summer temperatures measured using remote temperature recorders placed in pools ranged from 57º to 68ºF for Reach #2, the only reach monitored.

The Temperature Summary graph shows that for much of July the lower watershed exhibited temperatures above the optimal for salmonids.

Pools comprised 6% of the total length of this survey. In first and second order streams a primary pool is defined to have a maximum depth of at least two feet, occupy at least half the width of the low flow channel, and be as long as the low flow channel width. In York Creek, the pools are relatively shallow with 40% having a maximum depth of at least two feet. These pools comprised 55% of the total length of stream habitat. In coastal coho and steelhead streams, it is generally desirable to have primary pools comprise approximately 50% of total habitat length.

The mean shelter rating for pools was 10. However, a pool shelter rating of approximately 80 is desirable. The relatively small/moderate/large amount of pool shelter that now exists is being provided primarily by Root Mass at 26%, Boulders at 26%, Undercut Banks at 19% and Terrestrial Vegetation at 14%. Log and root wad cover in the pool and flatwater habitats would improve both summer and winter salmonid habitat. Log cover provides rearing fry with protection from predation, rest from water velocity, and also divides territorial units to reduce density related competition.

One of the two low gradient riffles measured (50%) had either gravel or small cobble as the dominant substrate. This is generally considered good for spawning salmonids.

Thirty six percent of the pool tail-outs measured had embeddedness ratings of either 3 or 4. Only 10% had a rating of 1. Cobble embeddedness measured to be 25% or less (a rating of 1) is considered best for the needs of salmon and steelhead.

The higher the percent of fine sediment, the lower the probability that eggs will survive to hatch. This is due to the reduced quantity of oxygenated water able to percolate through the gravel, or because of fine sediment capping the redd and preventing fry emergence.

The mean percent canopy for the survey was 28%. This is a very low percentage of canopy, since 80 percent is generally considered desirable. This low percentage applies to the lower reaches of the creek. The upper reaches have considerably greater canopy, although this better canopy has little value for salmonids, since these upper reaches are above the last point at which salmonids were observed, which is above the first bedrock sheet. Cooler water temperatures are desirable in York Creek. Elevated water temperatures could be reduced by increasing stream canopy. The large trees required for adequate stream canopy would also eventually provide a long term source of large woody debris needed for instream shelter and bank stability.

GENERAL MANAGEMENT RECOMMENDATIONS

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

Winter storms often bring down large trees and other woody debris into the stream, which increases the number and quality of pools. This woody debris, if left undisturbed, will provide fish shelter and rearing habitat, and offset channel incision. Landowners should be sensitive about the natural and positive role woody debris plays in the system, and encouraged not to remove woody debris from the stream, except under extreme buildup and only under guidance by a fishery professional.

PRIORITY FISHERY ENHANCEMENT OPPORTUNITIES

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

2. Increase the canopy on York Creek by planting willow, alder, redwood, and Douglas fir along the stream where shade canopy is not at acceptable levels. The reach above the survey section should be assessed for planting and treated as well, since water temperatures throughout are effected from upstream. In many cases, planting will need to be coordinated to follow bank stabilization or upslope erosion control projects.

3. Where feasible, increase woody cover in the pool and flatwater habitat units along the entire stream. Most of the existing shelter is from vegetation and undercut banks. Adding

high quality complexity with larger woody cover is desirable. Combination cover/scour structures constructed with boulders and woody debris would be effective in many flatwater and pool locations in the upper reaches. This must be done where the banks are stable or in conjunction with stream bank armor to prevent erosion. In some areas the material is at hand.

4. Where feasible, design and engineer pool enhancement structures to increase the number of pools in the upper reaches. This must be done where the banks are stable or in conjunction with stream bank armor to prevent erosion.

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

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

COMMENTS AND LANDMARKS

The following landmarks and possible problem sites were noted. All distances are approximate and taken from the beginning of the survey reach.

York Creek

Position (ft.)	Habitat Unit #	Comments:
0	0001.00	Channel Type C4
90	0002.00	YOY
230	0004.00	6 inch fish
616	0011.00	Right bank pipe releasing water in right bank.
835	0014.00	Two bridges, see forms.

1008	0017.00	5 inch, two year salmonid.
1049	0018.00	Dam, see form.
1180	0020.00	WP: 39 12' 11.3" W 123 12' 12.1"
1938	0030.00	WP:39 12' 12.5" 123 12' 21.8"
2046	0031.00	20 feet to bridge.
2380	0037.00	Channel type change. 1606 wet road.
5499	0040.00	Impassable brush. Channel type change.
7735	0042.00	345' channel change. F3 675' channel change. 531' cable crossing
10669	0043.00	1093' channel change. 1210' left bank rip rap. 1224' small pool pump in water or pump out. Lots of fish.
10723	0044.00	1400' three small slides. Too small for units. Road left bank. Lots of fish.
10746	0045.00	1845' channel change 2935' old torn down bridge left bank. Wet road crossing.
10953	0046.00	Wet road crossing.
10976	0047.00	Five inch fish. Lots of fish.
11273	0049.00	Lots of fish. Clay acting as bedrock.
11638	0051.00	Leeches in pool.
11778	0054.00	230 feet to wet road. 370 feet fence across river. Not a fish barrier.

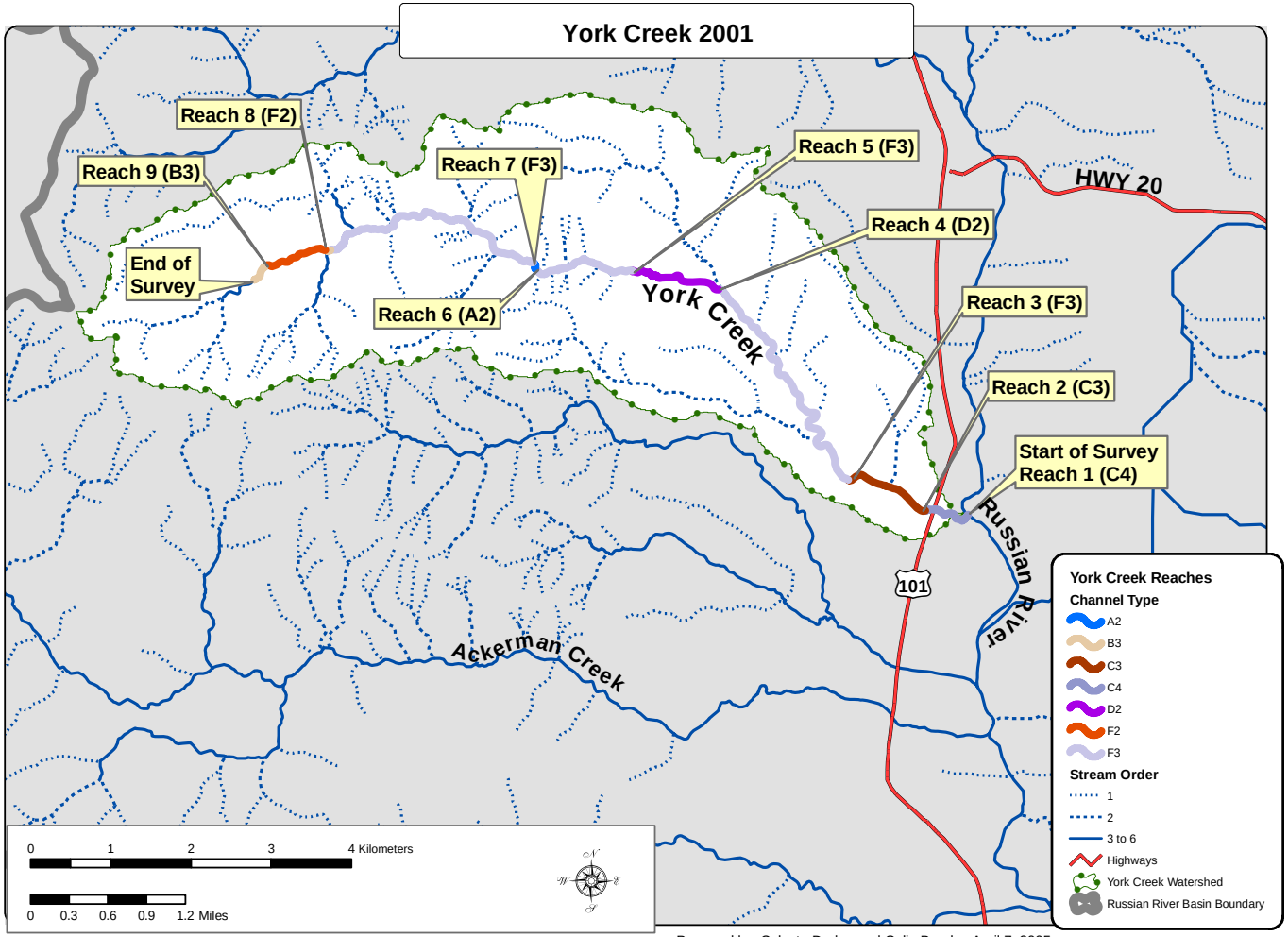
12210	0055.00	Small fish; Not salmonid
12402	0057.00	Dead trees. 39 13' 17.7" 123 13' 48.4"
12959	0060.00	Left bank at 900' culvert coming from gully, not in creek. 18 inch drop from culvert to ground.
14969	0062.00	At 153' an 8" culvert drops into a pool. Fork at 216'. 39 13'40.8" 123 14'18.2"
15260	0065.00	At 945' channel type change. 1557' lots of boulders. Not a fish barrier.
17496	0066.00	1800 feet channel change.
17647	0066.01	Lots of fish. No definite salmonids.
17647	0067.00	Lots of fish, possible 4 inch salmonid. Boulder forming pool.
17685	0068.00	Right bank spring.
17746	0069.00	3 inch fish.
17778	0071.00	WP: 39 13'43.5" 123 14'52.9"
17832	0072.00	YOY
17864	0073.00	Lots of YOY, possible salmonids.
17919	0075.00	Very cool water.
18602	0081.00	WP: 39 13'44.8" 123 15'03.0"
18614	0082.00	Channel type change F3, 220 feet. 900 ft channel change.
20223	0085.00	YOY

20272	0086.00	Channel change. 39 13'48" 123 15'23.7"
20524	0087.00	Large erosion on both banks; 10-20 foot boulders blocking stream
21568	0088.00	Salmonids-YOY
22036	0092.00	5" fish/lots of fish/water not cool enough for salmonids
22288	0095.00	LB dry trib at 621 feet/39`13'42.5"/123`15'48.5"
23006	0099.00	9 newts/ leeches/6' fish/salamanders
23381	0104.00	YOY!!!
23427	0105.01	WP: 39`13'45.0"/123`15'53.9"(NO WP); CHANNEL TYPE CHANGE TO A2
23524	0109.00	WP: 39`13'45.8"/123`15'53.3"(NO WP);NEXT HAB. UNIT IN SEQUENCE IS HU#244 due to access and the need to survey in reverse order, also due to access and timing, therefore the Habitat Units goes as follows: HU#109--->HU#244. There are no Hab. Units between 109+244.
23551	0244.00	This is the habitat unit directly following HU#109. The numbers are out of sequence due to access and timing problems. There are no Hab. Units between 109+244
23631	0249.00	Salmonids/frogs/newts/small non-salmonids
23650	0250.00	WP: 39`13'48"/123`15'52.9"(NO WP)/salmonids, frogs and newts, small non-salmonids
23677	0251.00	12' jump with a pool over 5' deep; Lots of salmonids of all ages and sizes up to 3+/salamanders/frogs/newts/small non-salmonids
23725	0252.00	Channel Change to F3
23972	0260.00	WP: 39`13'47.9"/123`15'57.9"(NO WP)
23990	0261.00	Channel type shifts between F3, B3 and A2 throughout this long stretch, but the channels are not long enough to keep changing back and forth, so we changed channel types only

		when clearly apparent and obviously long enough. There is evidence of cattle in the creek and there is a lot of erosion and land slides in this stretch.
27189	0264.00	Salmonids and non-salmonids
27201	0265.00	CHANNEL TYPE Changes between F3, B3 & A2/3 so often, that we left it at F3. We could just have easily left it at A3 or B3, since it vacillates between these types for a long distance.
27212	0266.00	7' jump -Bedrock Sheet above Plunge Pool
27411	0270.00	WP: 39`14'3.3"/123`16'36.6"
28371	0280.00	WP: 39`14'5.4"/123`16'48.7"
29354	0290.00	WP: 39`14'3.9"/123`16'53.7"
29627	0297.00	LB Dry Trib
29654	0298.00	DRY TRIB RB-39`13'59.7"/123`17'12.1"(NO WP)
31958	0300.00	90' Rock Weir
32642	0302.00	Trib LB(Cheyenne Creek)
32770	0303.00	Non-Salmonid Fish present
32990	0307.00	Non-Salmonids
33147	0309.00	WP: 39`13'54.4"/123`17'31.9"
33233	0312.00	LB Gully
33462	0319.00	WP: 39`13'58.8"/123`17'33.9"
33627	0323.00	DRY TRIB RB

33665	0324.00	No salmonids
33837	0328.00	WP: 39`13'49.5"/123`17'36.4"(WP 015)
34092	0338.00	Channel Change to B3; 39`13'50.2"/123`17'39.9"(WP 016)
34233	0341.00	RB WET TRIB 62 deg. F
34260	0342.00	Huge Boulders @ 522'; Possible fish @ 1204' and dry trib LB; Channel Type changes back and forth between B3, F3 & A3, but F3 is most dominant, closely followed by A3, which will soon be the dominant channel type
36385	0344.00	F3 channel type changes in this HU and B3 begins as dominant channel type. Dry Trib RB and LB; 158' Dry Trib LB;
36911	0345.00	Channel Type changes to A3 and remains A3 as far as we can see, above the series of 3 jumps that ends this survey. 13' jump; next jump is 99' past first jump and 11' jump with no good pool and 3rd jump is 10' jump. The last two jumps have no good jump pools. Also, according to John Hensley, there is no water and subsequently no fish past these A2 channel types. END OF SURVEY due to three consecutive jumps. END OF SURVEY

APPENDIX A: MAP



L:\mondo3\data\stream-maps\YorkCreek2001.mxd

Prepared by: Celeste Dodge and Colin Brooks, April 7, 2005

APPENDIX B TABLES

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

Stream Name: York Creek

LLID: 1232011392032

Drainage: Russian River - Upper

Survey Dates: 8/1/2001 to 8/27/2001

Confluence Location: Quad: ORRS SPRINGS Legal Description: T16NR13WS21 Latitude: 39:12:12.0N Longitude: 123:12:04.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating
73	0	DRY	33.2	427	31181.1	84.0									
79	19	FLATWATER	35.9	45	3568	9.6	5.5	0.7	1.2	216	17050	138	10361		7
60	54	POOL	27.3	36	2138	5.8	7.9	1.1	1.7	350	21026	822	49323	595	10
8	4	RIFFLE	3.6	31	248	0.7	7.0	0.4	0.5	27	218	8	65		

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
220	77	37135.1	38293	59749

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: York Creek LLID: 1232011392032 Drainage: Russian River - Upper

Survey Dates: 8/1/2001 to 8/27/2001

Confluence Location: Quad: ORRS SPRINGS Legal Description: T16NR13WS21 Latitude: 39:12:12.0N Longitude: 123:12:04.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating	Mean Canopy (%)
3	2	LGR	1.4	50	149	0.4	12	0.2	0.4	41	122	8	24			50
4	1	HGR	1.8	22	90	0.2	2	0.2	0.3	10	38	2	8			58
1	1	BRS	0.5	9	9	0.0	2	0.8	1	18	18	14	14			10
17	5	GLD	7.7	49	836	2.3	7	1.6	1.5	293	4988	260	4412		5	49
55	10	RUN	25.0	41	2259	6.1	4	0.4	6	187	10297	114	5657		7	41
7	4	SRN	3.2	68	473	1.3	8	0.3	0.9	190	1332	41	290		10	55
34	30	MCP	15.5	37	1257	3.4	9	1.0	4.9	437	14843	1156	39302	829	10	48
3	3	LSR	1.4	30	91	0.2	9	0.5	1.6	278	835	202	606	147	22	78
4	4	LSBk	1.8	37	147	0.4	5	0.7	2.3	195	778	203	813	158	5	56
13	11	LSBo	5.9	35	452	1.2	8	1.7	3.3	270	3506	549	7134	376	7	44
3	3	PLP	1.4	23	69	0.2	3	1.1	3.8	58	175	107	320	89	20	37
2	2	SCP	0.9	45	90	0.2	9	2.1	3.8	441	882	892	1784	839	5	28
1	1	BPL	0.5	32	32	0.1	7	0.6	1.4	190	190	152	152	114	5	60
73	0	DRY	33.2	427	31181	84.0										26

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
220	77	37135.1	38005	60517

Table 3 - Summary of Pool Types

Stream Name: York Creek LLID: 1232011392032 Drainage: Russian River - Upper

Survey Dates: 8/1/2001 to 8/27/2001

Confluence Location: Quad: ORRS SPRINGS Legal Description: T16NR13WS21 Latitude: 39:12:12.0N Longitude: 123:12:04.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Residual Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Residual Pool Vol (cu.ft.)	Estimated Total Resid.Vol. (cu.ft.)	Mean Shelter Rating
34	30	MAIN	57	37	1257	59	8.7	1.0	437	14843	829	28189	10
23	21	SCOUR	38	33	759	36	6.7	1.3	226	5207	261	5993	10
3	3	BACKWATER	5	41	122	6	8.3	1.6	357	1072	597	1792	5

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
60	54	2138	21122	35974

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

Stream Name: York Creek

LLID: 1232011392032

Drainage: Russian River - Upper

Survey Dates: 8/1/2001 to 8/27/2001

Confluence Location: Quad: ORRS SPRINGS Legal Description: T16NR13WS21 Latitude: 39:12:12.0N Longitude: 123:12:04.0W

Habitat Units	Habitat Type	Habitat Occurrence (%)	< 1 Foot Maximum Residual Depth	< 1 Foot Percent Occurrence	1 < 2 Feet Maximum Residual Depth	1 < 2 Feet Percent Occurrence	2 < 3 Feet Maximum Residual Depth	2 < 3 Feet Percent Occurrence	3 < 4 Feet Maximum Residual Depth	3 < 4 Feet Percent Occurrence	>= 4 Feet Maximum Residual Depth	>= 4 Feet Percent Occurrence
33	MCP	56	6	18	22	67	1	3	3	9	1	3
3	LSR	5	0	0	3	100	0	0	0	0	0	0
4	LSBk	7	0	0	2	50	2	50	0	0	0	0
13	LSBo	22	2	15	8	62	2	15	1	8	0	0
3	PLP	5	1	33	1	33	0	0	1	33	0	0
2	SCP	3	0	0	0	0	1	50	1	50	0	0
1	BPL	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 Foot Max Resid. Depth	Total 1< 2 Foot % Occurrence	Total 2< 3 Foot Max Resid. Depth	Total 2< 3 Foot % Occurrence	Total 3< 4 Foot Max Resid. Depth	Total 3< 4 Foot % Occurrence	Total >= 4 Foot Max Resid. Depth	Total >= 4 Foot % Occurrence
59	9	15	37	63	6	10	6	10	1	2

Mean Maximum Residual Pool Depth (ft.): 1.7

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: York Creek LLID: 1232011392032 Drainage: Russian River - Upper

Survey Dates: 8/1/2001 to 8/27/2001 Dry Units: 73

Confluence Location: Quad: ORRS SPRINGS Legal Description: T16NR13WS21 Latitude: 39:12:12.0N Longitude: 123:12:04.0W

Habitat Units	Units Fully Measured	Habitat Type	Mean % Undercut Banks	Mean % SWD	Mean % LWD	Mean % Root Mass	Mean % Terr. Vegetation	Mean % Aquatic Vegetation	Mean % White Water	Mean % Boulders	Mean % Bedrock Ledges
3	0	LGR									
4	0	HGR									
1	0	BRS									
8	0	TOTAL RIFFLE									
17	1	GLD	0	0	0	0	100	0	0	0	0
55	3	RUN	0	0	0	0	33	0	0	67	0
7	1	SRN	0	0	0	0	100	0	0	0	0
79	5	TOTAL FLAT	0	0	0	0	60	0	0	40	0
34	22	MCP	16	0	0	10	12	0	0	60	0
3	3	LSR	30	0	0	43	20	0	0	7	0
4	3	LSBk	58	0	0	0	0	0	0	8	33
13	9	LSBo	14	0	3	19	3	0	0	61	0
3	1	PLP	50	0	0	0	0	0	0	50	0
2	2	SCP	15	0	0	0	50	0	0	35	0
1	1	BPL	0	0	0	0	0	0	0	100	0
60	41	TOTAL POOL	20	0	1	13	11	0	0	52	2
220	46	TOTAL	18	0	1	12	16	0	0	51	2

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: York Creek

LLID: 1232011392032

Drainage: Russian River - Upper

Survey Dates: 8/1/2001 to 8/27/2001

Dry Units: 73

Confluence Location: Quad: ORRS SPRINGS

Legal Description: T16NR13WS21

Latitude: 39:12:12.0N

Longitude: 123:12:04.0W

Habitat Units	Units Fully Measured	Habitat Type	% Total Silt/Clay Dominant	% Total Sand Dominant	% Total Gravel Dominant	% Total Small Cobble Dominant	% Total Large Cobble Dominant	% Total Boulder Dominant	% Total Bedrock Dominant
3	2	LGR	0	0	0	50	0	50	0
4	1	HGR	0	0	0	0	100	0	0
1	1	BRS	0	0	0	0	0	0	100
17	5	GLD	20	20	40	0	0	20	0
55	10	RUN	30	10	0	20	0	30	10
7	4	SRN	0	0	25	0	0	75	0
34	10	MCP	10	10	30	10	10	30	0
3	2	LSR	50	0	0	0	50	0	0
4	4	LSBk	50	0	0	0	25	25	0
13	8	LSBo	38	13	13	0	13	25	0
3	3	PLP	0	0	67	0	0	33	0
2	2	SCP	100	0	0	0	0	0	0
1	1	BPL	0	0	100	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: York Creek LLID: 1232011392032 Drainage: Russian River - Upper

Survey Dates: 8/1/2001 to 8/27/2001

Confluence Location: Quad: ORRS SPRINGS Legal Description: T16NR13WS21 Latitude: 39:12:12.0N Longitude: 123:12:04.0W

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
41	34	66	6	25	23

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 9 - Mean Percentage of Dominant Substrate and Vegetation

Stream Name: York Creek LLID: 1232011392032 Drainage: Russian River - Upper

Survey Dates: 8/1/2001 to 8/27/2001

Confluence Location: Quad: ORRS SPRINGS Legal Description: T16NR13WS21 Latitude: 39:12:12.0N Longitude: 123:12:04.0W

Mean Percentage of Dominant Stream Bank Substrate

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Bedrock	5	6	9.8
Boulder	21	27	42.9
Cobble / Gravel	10	6	14.3
Sand / Silt / Clay	20	17	33.0

Mean Percentage of Dominant Stream Bank Vegetation

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Grass	7	5	10.7
Brush	8	8	14.3
Hardwood Trees	31	29	53.6
Coniferous Trees	4	9	11.6
No Vegetation	5	5	8.9

Total Stream Cobble Embeddedness Values: 2

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

StreamName: York Creek LLID: 1232011392032 Drainage: Russian River - Upper

Survey Dates: 8/1/2001 to 8/27/2001

Confluence Location: Quad: ORRS SPRINGS Legal Description: T16NR13WS21 Latitude: 39:12:12.0N Longitude: 123:12:04.0W

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)		0	20
SMALL WOODY DEBRIS (%)		0	0
LARGE WOODY DEBRIS (%)		0	1
ROOT MASS (%)		0	13
TERRESTRIAL VEGETATION (%)		60	11
AQUATIC VEGETATION (%)		0	0
WHITEWATER (%)		0	0
BOULDERS (%)		40	52
BEDROCK LEDGES (%)		0	2

Appendix C: Fish Habitat Inventory Data Summary

Stream Name: York Creek LLID: 1232011392032 Drainage: Russian River -
Survey Dates: 8/1/2001 to 8/27/2001 Survey Length (ft.): 37135. Main Channel (ft.): 36921 Side Channel (ft.): 214.1
Confluence Location: Quad: ORRS SPRINGS Legal Description: T16NR13WS21 Latitude: 39:12:12.0N Longitude: 123:12:04.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type: C4
Reach Length (ft.): 2380
Riffle/Flatwater Mean Width (ft.): 8.2
BFW:
Range (ft.): to
Mean (ft.):
Std. Dev.:
Base Flow (cfs): 0
Water (F): 63 - 70 Air (F): 82 - 88
Dry Channel (ft.): 262

Canopy Density (%): 48.0
Coniferous Component (%): 5.3
Hardwood Component (%): 94.7
Dominant Bank Vegetation: Hardwood Trees
Vegetative Cover (%): 45.3
Dominant Shelter: Terrestrial Veg.
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 0.0
LWD per 100 ft.:
Riffles:
Pools:
Flat:

Pools by Stream Length (%): 29.0
Pool Frequency (%): 27.8
Residual Pool Depth (%):
< 2 Feet Deep: 40.0
2 to 2.9 Feet Deep: 10.0
3 to 3.9 Feet Deep: 40.0
>= 4 Feet Deep: 10.0
Mean Max Residual Pool Depth (ft.): 2.61
Mean Pool Shelter Rating: 12

Pool Tail Substrate (%): Silt/Clay: 12.5 Sand: 0.0 Gravel: 75.0 Sm Cobble: 12.5 Lg Cobble: 0.0 Boulder: 0.0 Bedrock: 0.0
Embeddedness Values (%): 1. 10.0 2. 50.0 3. 30.0 4. 10.0 5. 0.0

STREAM REACH: 2

Channel Type: C3
Reach Length (ft.): 3119
Riffle/Flatwater Mean Width (ft.): 10.0
BFW:
Range (ft.): to
Mean (ft.):
Std. Dev.:
Base Flow (cfs): 0
Water (F): 68 - 68 Air (F): 84 - 92
Dry Channel (ft.): 3092

Canopy Density (%): 40.0
Coniferous Component (%): 13.3
Hardwood Component (%): 86.7
Dominant Bank Vegetation: Hardwood Trees
Vegetative Cover (%): 70.0
Dominant Shelter:
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 0.0
LWD per 100 ft.:
Riffles:
Pools:
Flat:

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

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

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 3

Channel Type: F3
Reach Length (ft.): 9761
Riffle/Flatwater Mean Width (ft.): 4.3
BFW:
Range (ft.): to
Mean (ft.):
Std. Dev.:
Base Flow (cfs): 0
Water (F): 66 - 70 Air (F): 92 - 95
Dry Channel (ft.): 9207

Canopy Density (%): 27.7
Coniferous Component (%): 35.0
Hardwood Component (%): 65.0
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 20.7
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 0.0
LWD per 100 ft.:
Riffles:
Pools:
Flat:

Pools by Stream Length (%): 2.3
Pool Frequency (%): 20.0
Residual Pool Depth (%):
< 2 Feet Deep: 40.0
2 to 2.9 Feet Deep: 60.0
3 to 3.9 Feet Deep: 0.0
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 1.96
Mean Pool Shelter Rating: 5

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 80.0 Sm Cobble: 20.0 Lg Cobble: 0.0 Boulder: 0.0 Bedrock: 0.0
Embeddedness Values (%): 1. 0.0 2. 40.0 3. 60.0 4. 0.0 5. 0.0

STREAM REACH: 4

Channel Type: D2
Reach Length (ft.): 3354
Riffle/Flatwater Mean Width (ft.): 10.7
BFW:
Range (ft.): to
Mean (ft.):
Std. Dev.:
Base Flow (cfs): 0
Water (F): 66 - 66 Air (F): 92 - 92
Dry Channel (ft.): 3004

Canopy Density (%): 29.5
Coniferous Component (%): 18.8
Hardwood Component (%): 81.3
Dominant Bank Vegetation: Hardwood Trees
Vegetative Cover (%): 13.0
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Boulder
Occurrence of LWD (%): 0.0
LWD per 100 ft.:
Riffles:
Pools:
Flat:

Pools by Stream Length (%): 3.0
Pool Frequency (%): 23.5
Residual Pool Depth (%):
< 2 Feet Deep: 100.0
2 to 2.9 Feet Deep: 0.0
3 to 3.9 Feet Deep: 0.0
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 1.375
Mean Pool Shelter Rating: 11

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 33.3 Gravel: 66.7 Sm Cobble: 0.0 Lg Cobble: 0.0 Boulder: 0.0 Bedrock: 0.0
Embeddedness Values (%): 1. 0.0 2. 50.0 3. 50.0 4. 0.0 5. 0.0

STREAM REACH: 5

Channel Type: F3
Reach Length (ft.): 4813
Riffle/Flatwater Mean Width (ft.): 5.5
BFW:
Range (ft.): to
Mean (ft.):
Std. Dev.:
Base Flow (cfs): 0
Water (F): 63 - 68 Air (F): 92 - 96
Dry Channel (ft.): 4489

Canopy Density (%): 29.6
Coniferous Component (%): 35.0
Hardwood Component (%): 65.0
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 13.8
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Boulder
Occurrence of LWD (%): 3.1
LWD per 100 ft.:
Riffles:
Pools:
Flat:

Pools by Stream Length (%): 4.7
Pool Frequency (%): 33.3
Residual Pool Depth (%):
< 2 Feet Deep: 100.0
2 to 2.9 Feet Deep: 0.0
3 to 3.9 Feet Deep: 0.0
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 1.1
Mean Pool Shelter Rating: 9

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 0.0 Sm Cobble: 0.0 Lg Cobble: 100. Boulder: 0.0 Bedrock: 0.0
Embeddedness Values (%): 1. 12.5 2. 37.5 3. 50.0 4. 0.0 5. 0.0

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 6

Channel Type: A2
Reach Length (ft.): 298
Riffle/Flatwater Mean Width (ft.):
BFW:
Range (ft.): to
Mean (ft.):
Std. Dev.:
Base Flow (cfs): 0
Water (F): 65 - 70 Air (F): 85 - 98
Dry Channel (ft.): 115

Canopy Density (%): 32.9
Coniferous Component (%): 21.4
Hardwood Component (%): 78.6
Dominant Bank Vegetation: Hardwood Trees
Vegetative Cover (%): 10.0
Dominant Shelter: Root masses
Dominant Bank Substrate Type: Boulder
Occurrence of LWD (%): 0.0
LWD per 100 ft.:
Riffles:
Pools:
Flat:

Pools by Stream Length (%): 28.2
Pool Frequency (%): 25.0
Residual Pool Depth (%):
< 2 Feet Deep: 66.7
2 to 2.9 Feet Deep: 0.0
3 to 3.9 Feet Deep: 33.3
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 2.06
Mean Pool Shelter Rating: 35

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 0.0 Sm Cobble: 0.0 Lg Cobble: 0.0 Boulder: 100. Bedrock: 0.0
Embeddedness Values (%): 1. 33.3 2. 66.7 3. 0.0 4. 0.0 5. 0.0

STREAM REACH: 7

Channel Type: F3
Reach Length (ft.): 10367
Riffle/Flatwater Mean Width (ft.): 2.2
BFW:
Range (ft.): to
Mean (ft.):
Std. Dev.:
Base Flow (cfs): 0
Water (F): 60 - 68 Air (F): 74 - 88
Dry Channel (ft.): 8338

Canopy Density (%): 46.2
Coniferous Component (%): 48.3
Hardwood Component (%): 51.7
Dominant Bank Vegetation: Hardwood Trees
Vegetative Cover (%): 22.3
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Boulder
Occurrence of LWD (%): 0.0
LWD per 100 ft.:
Riffles:
Pools:
Flat:

Pools by Stream Length (%): 6.5
Pool Frequency (%): 27.9
Residual Pool Depth (%):
< 2 Feet Deep: 87.5
2 to 2.9 Feet Deep: 8.3
3 to 3.9 Feet Deep: 4.2
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 1.54
Mean Pool Shelter Rating: 6

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 0.0 Sm Cobble: 50.0 Lg Cobble: 50.0 Boulder: 0.0 Bedrock: 0.0
Embeddedness Values (%): 1. 13.0 2. 52.2 3. 34.8 4. 0.0 5. 0.0

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 8

Channel Type: B3
Reach Length (ft.): 168
Riffle/Flatwater Mean Width (ft.):
BFW:
Range (ft.): to
Mean (ft.):
Std. Dev.:
Base Flow (cfs): 0
Water (F): 61 - 61 Air (F): 86 - 88
Dry Channel (ft.): 0

Canopy Density (%): 50.0
Coniferous Component (%): 70.0
Hardwood Component (%): 30.0
Dominant Bank Vegetation:
Vegetative Cover (%): 0.0
Dominant Shelter: Undercut Banks
Dominant Bank Substrate Type:
Occurrence of LWD (%): 0.0
LWD per 100 ft.:
Riffles:
Pools:
Flat:

Pools by Stream Length (%): 28.0
Pool Frequency (%): 25.0
Residual Pool Depth (%):
< 2 Feet Deep: 100.0
2 to 2.9 Feet Deep: 0.0
3 to 3.9 Feet Deep: 0.0
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 1.6
Mean Pool Shelter Rating: 5

Pool Tail Substrate (%): Silt/Clay: Sand: Gravel: Sm Cobble: Lg Cobble: Boulder: Bedrock:
Embeddedness Values (%): 1. 0.0 2. 100.0 3. 0.0 4. 0.0 5. 0.0

STREAM REACH: 9

Channel Type: F2
Reach Length (ft.): 2116
Riffle/Flatwater Mean Width (ft.):
BFW:
Range (ft.): to
Mean (ft.):
Std. Dev.:
Base Flow (cfs): 0
Water (F): 61 - 61 Air (F): 86 - 86
Dry Channel (ft.): 2116

Canopy Density (%): 50.0
Coniferous Component (%): 80.0
Hardwood Component (%): 20.0
Dominant Bank Vegetation:
Vegetative Cover (%): 0.0
Dominant Shelter:
Dominant Bank Substrate Type:
Occurrence of LWD (%):
LWD per 100 ft.:
Riffles:
Pools:
Flat:

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

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

STREAM REACH: 10

Channel Type: B3
Reach Length (ft.): 545
Riffle/Flatwater Mean Width (ft.): 2.0
BFW:
Range (ft.): to
Mean (ft.):
Std. Dev.:
Base Flow (cfs): 0
Water (F): 61 - 61 Air (F): 86 - 86
Dry Channel (ft.): 526

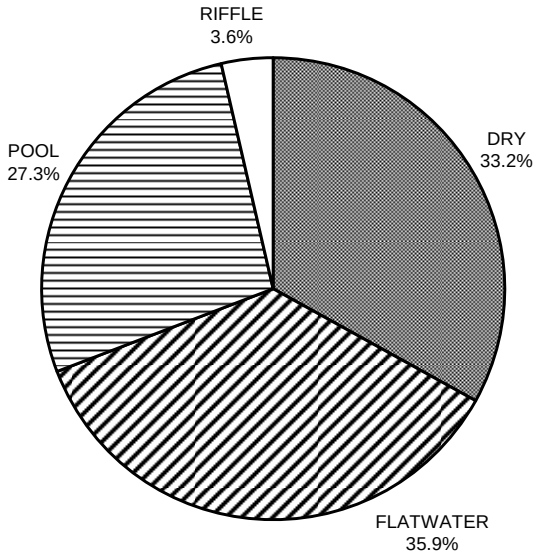
Canopy Density (%): 60.0
Coniferous Component (%): 65.0
Hardwood Component (%): 35.0
Dominant Bank Vegetation: Coniferous Trees
Vegetative Cover (%): 8.3
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Boulder
Occurrence of LWD (%): 0.0
LWD per 100 ft.:
Riffles:
Pools:
Flat:

Pools by Stream Length (%): 1.8
Pool Frequency (%): 33.3
Residual Pool Depth (%):
< 2 Feet Deep: 100.0
2 to 2.9 Feet Deep: 0.0
3 to 3.9 Feet Deep: 0.0
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 0.8
Mean Pool Shelter Rating:

Pool Tail Substrate (%): Silt/Clay: Sand: Gravel: Sm Cobble: Lg Cobble: Boulder: Bedrock:
Embeddedness Values (%): 1. 0.0 2. 100.0 3. 0.0 4. 0.0 5. 0.0

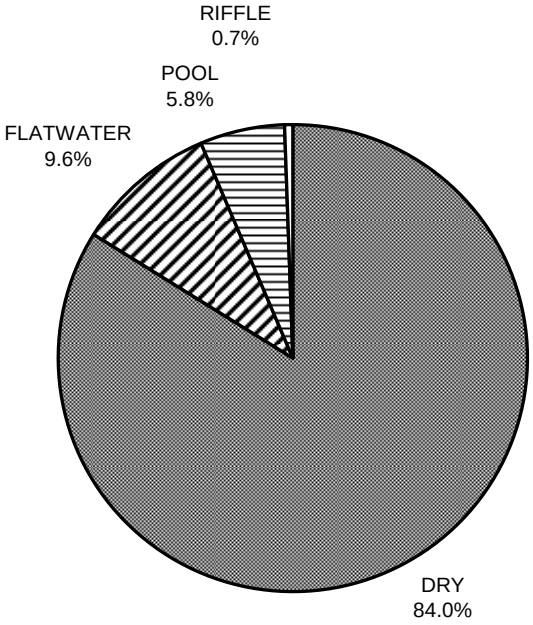
APPENDIX D GRAPHS

YORK CREEK 2001
HABITAT TYPES BY PERCENT OCCURRENCE



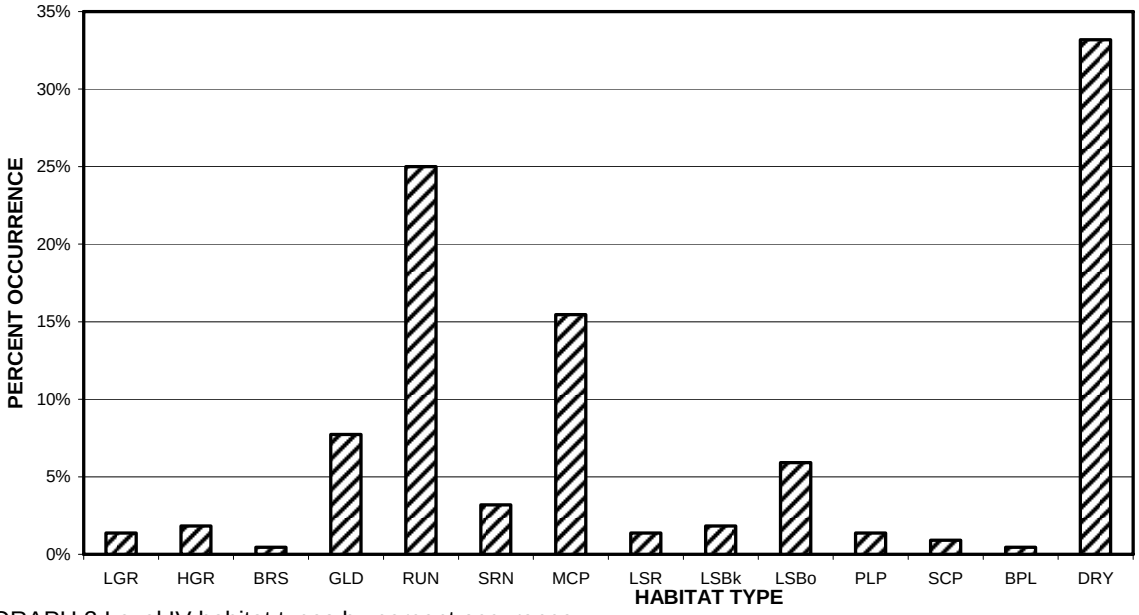
GRAPH 1 Level II habitat types by percent occurence

YORK CREEK 2001
HABITAT TYPES BY PERCENT TOTAL LENGTH



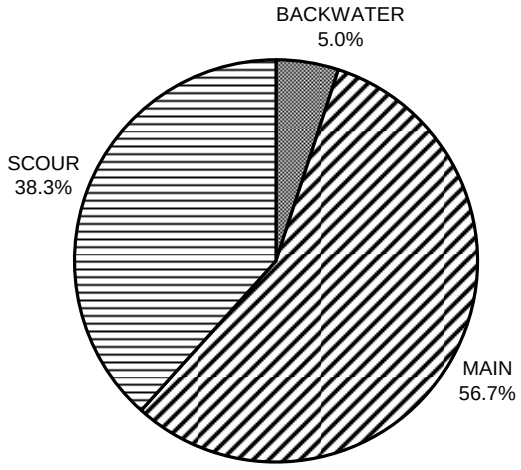
GRAPH 2 Level II habitat types by percent total length

YORK CREEK 2001
HABITAT TYPES BY PERCENT OCCURRENCE



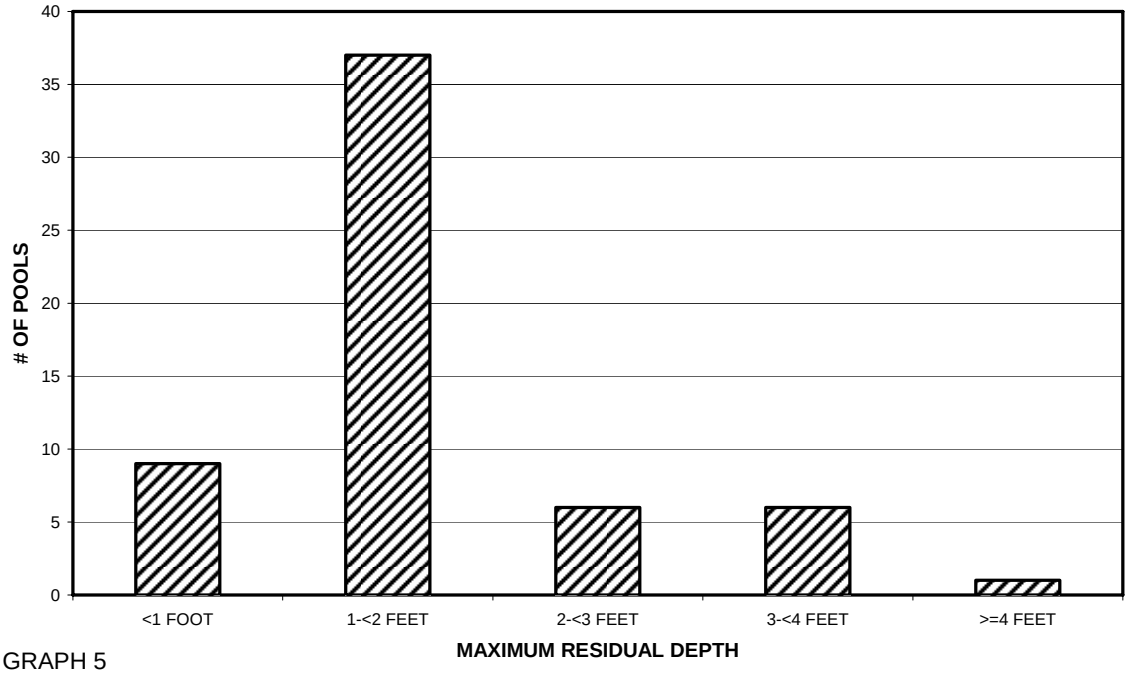
GRAPH 3 Level IV habitat types by percent occurence

YORK CREEK 2001
POOL TYPES BY PERCENT OCCURRENCE



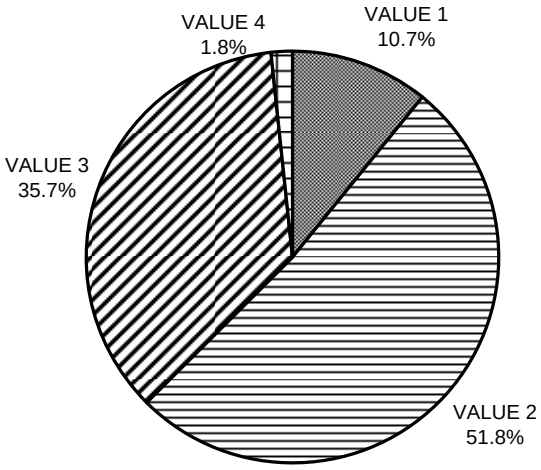
GRAPH 4 Level I pool types by percent occurence

YORK CREEK 2001
MAXIMUM DEPTH IN POOLS



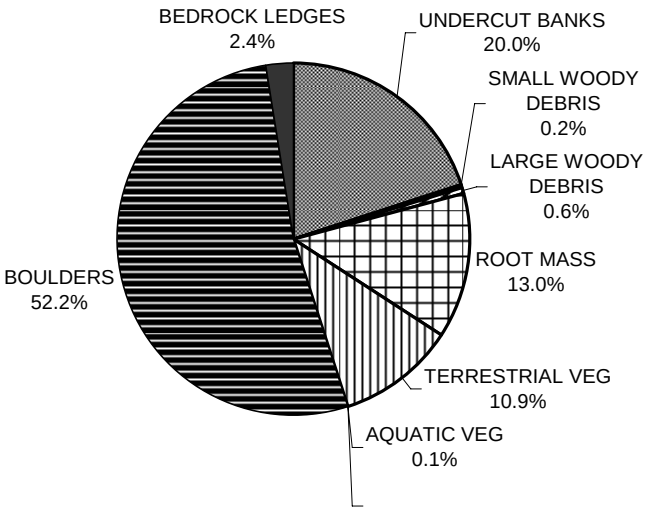
GRAPH 5

YORK CREEK 2001
PERCENT EMBEDDEDNESS



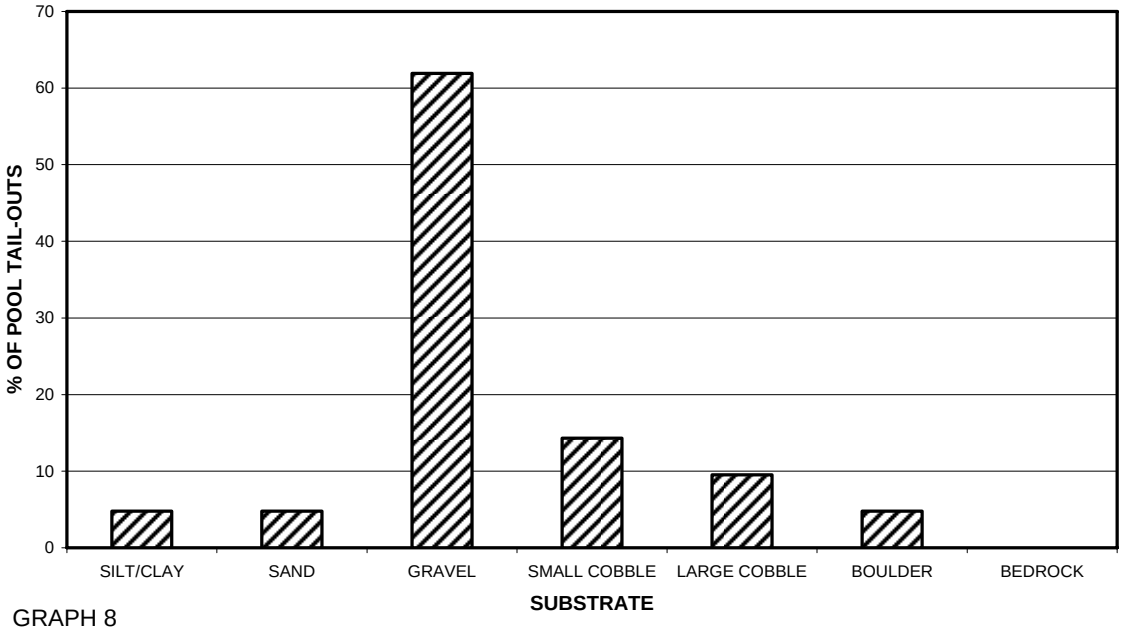
GRAPH 6

YORK CREEK 2001
MEAN PERCENT COVER TYPES IN POOLS



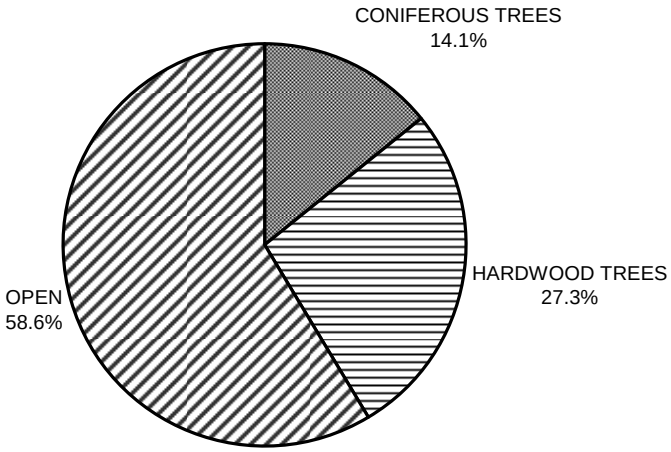
GRAPH 7

YORK CREEK 2001
SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



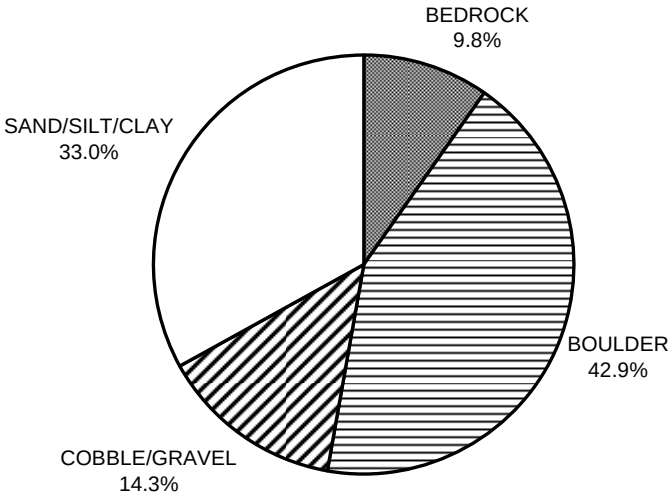
GRAPH 8

YORK CREEK 2001
MEAN PERCENT CANOPY



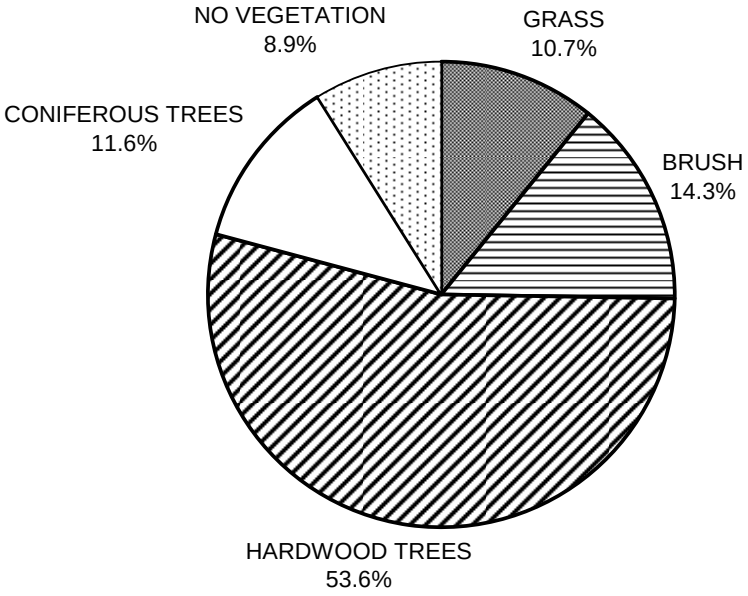
GRAPH 9

YORK CREEK 2001
DOMINANT BANK COMPOSITION



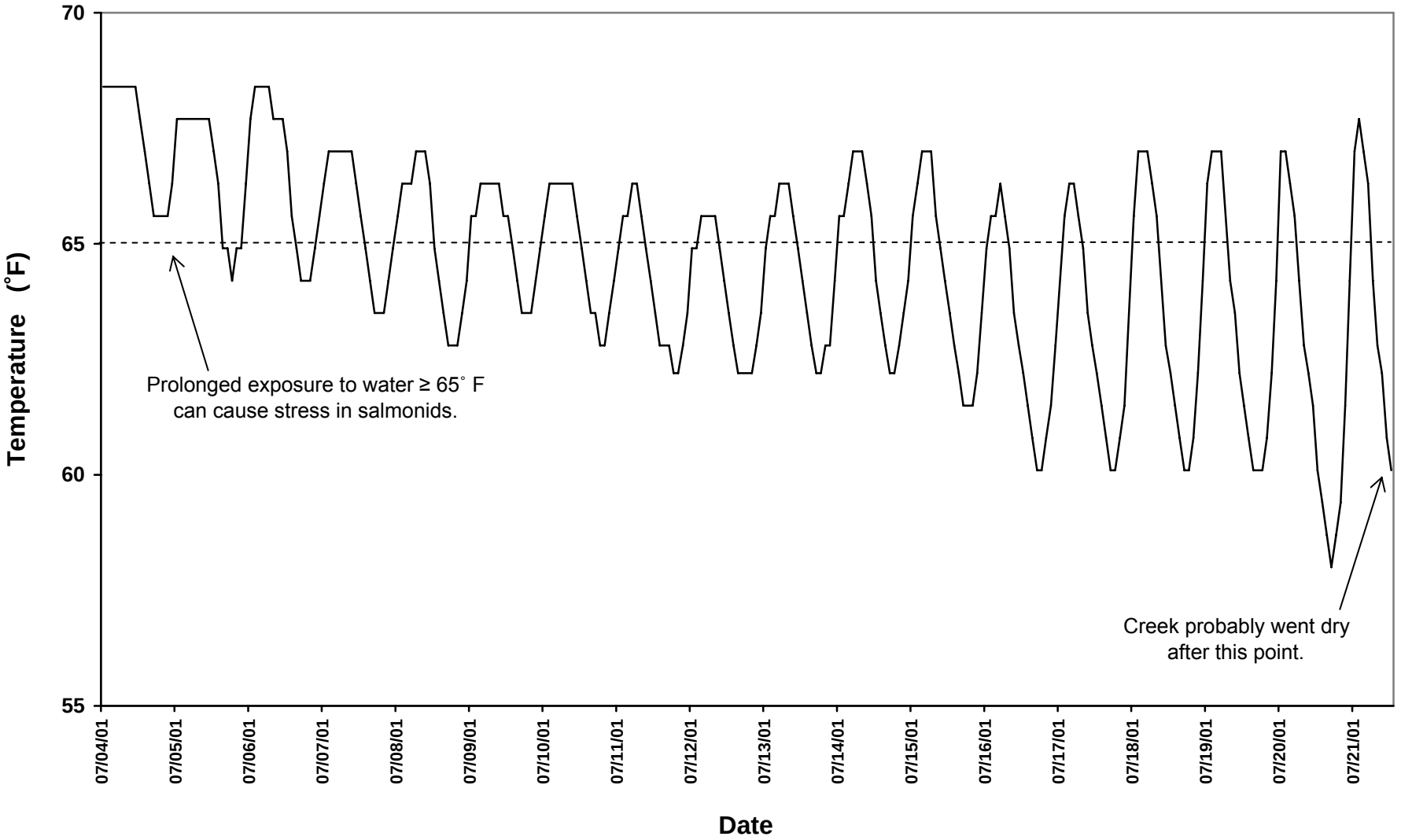
GRAPH 10

YORK CREEK 2001
DOMINANT BANK VEGETATION



GRAPH 11

York Creek Water Temperatures



Watershed Hydroid **455** York Creek

Hydrologic Sub-Areas covered by the watershed:

Name:	LLId: (1:24k)	County:	Tributary to	Russian River
York Creek	1232011392032	Mendocino	Tributary to	
			Tributary to	

Location: **T:** 16N **R:** 12W **S:** 33 **Latitude:** 39.2032137054194 **Longitude** 123.201182567535

Hydrologic Boundary Delineation: Watershed boundaries were delineated using the Watershed Point tool in ArcHydro, running under ArcMap 8.3 (ArcInfo version). A 1:24k stream network was "burned" into the underlying DEM to enforce hydrologic routing.

Aerial Photos (Source): For Mendocino County watersheds, 1993 USGS DOQQs are available in the Teale Albers, NAD27 projection. For Sonoma County watersheds, 2000 County-created orthophotos in the State Plane, NAD83 projection are also available.

Stream Order: 4 **Total Length:** 8.97 Miles 14.44 Km

Note: Stream order is by Strahler method, recorded in CDF-NCWAP "nchydro1" 1:24k streams layer.

Note: Length is for the USGS blue-line 1:24,000 stream.

Drainage Area: 2994 Hectares; 7397 Acres; 11.55 sq. mi.

Elevations: Mouth: 620 feet; Headwaters: 2566 feet

Note: Headwaters elevation is the highest elevation found in the watershed.

Lakes in Watershed: Number: 0 Surface area: 0 sq. mi.

Note: Source for lakes data is the USGS-DFG 1:100k lakes layer "lakes.shp"

Fish Species (as indicated by historical salmonid streams layer created by Bob Coey): Coho,Steelhead

Ownership, for the watershed, in acres (and % of total watershed):

Federal:	State:	Local:	Private:
0.0 acres	0.0	0.0	7397.2
0.00 %	0.00 %	0.00 %	100.00 %

Note: Source for owneship data is 2002 DFG-CCR "ccr_public_lands.shp" GIS layer.

Major Land Uses in the Watershed, in acres (and % of total watershed)

Mixed hardwood/conifer:	Hardwood:	Conifer:	Agriculture:	Urban:
376.21 acres	3728.65	41.69	230.27	0.46
5.1 %	50.4 %	0.6 %	3.1 %	0.1 %

Shrub:	Herbaceous:	Barren/rock:	Water:
65.79	2800.46	84.32	65.32
0.9 %	37.9 %	1.1 %	0.9 %

Note: Land use areas were calculated using the 1994 CDF-USFS "Calveg" GIS layer.

Watershed HydroId **455** York Creek

USGS 7.5' Topographic Quads completely or partially in the watershed:

Quad Name	USGS Code
UKIAH	39123B2
ORRS SPRINGS	39123B3

Endangered/Threatened/Sensitive Species: (California Natural Diversity Database, May 5, 2003 version)

Hydrologic Sub-Areas covered by the watershed

Hydrologic Sub-Area Name:	ID code (RBUAS)	Hydrologic Area Name	% of watershed in this HSA
Ukiah	111431	Upper Russian River	99.81
Forsythe Creek	111433	Upper Russian River	0.19