California Department of Fish and Game

STREAM INVENTORY REPORT

Purrington Creek

Report Revised April 14, 2006

Report Completed 2000

Assessment Completed 1994

INTRODUCTION

A stream inventory was conducted during the summer of 1994 on Purrington Creek to assess habitat conditions for anadromous salmonids. 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 Purrington Creek. The objective of the biological inventory was to document the salmonid and other aquatic species present and their distribution. After analysis of historical information and data gathered recently, stream restoration and enhancement recommendations are presented.

WATERSHED OVERVIEW

Purrington Creek is tributary to Green Valley Creek, tributary to the Russian River, located in Sonoma County, California (Figure 1). Purrington Creek's legal description at the confluence with Green Valley Creek is T 07N R 09W S 19. Its location is 38°26'14" N. latitude and 122°53'20" W. longitude. Purrington Creek is a first order stream and has approximately 3.3 miles of blue line stream, according to the USGS Camp Meeker 7.5 minute quadrangle. Purrington Creek drains a watershed of approximately 3.7 square miles. Summer base runoff is approximately 0.05 cfs at the mouth. Elevations range from about 110 feet at the mouth of the creek to 700 feet in the headwater areas. Vehicle access to Purrington exists via Graton Rd off Highway 116 near the town of Sebastopol. Foot access is available from Graton Road via several bridge crossings on Graton Rd. The entire stream runs through private property.

The headwaters of Purrington Creek are located in a steep, narrow canyon that widens into a narrow valley. Vegetation in the watershed includes redwood, maple, alder, bay and oak, with apple orchards and vineyard primarily in the lower drainage area. The stream flows southwest to northeast draining an area of 3 square miles. The stream channel is deeply incised throughout, and has fair canopy cover. An important tributary to Purrington Creek is an unnamed eastern tributary (commonly referred to as Sturgeon Creek) which provides limited spawning and rearing habitat and enters Purrington at 1 mile upstream from the mouth.

Purrington Creek is an important tributary to Green Valley Creek by contributing summer flow, and as spawning/nursery habitat for coho

salmon and steelhead trout. A detailed description of the Green Valley Creek watershed is available in the parent stream report.

STREAM SURVEYS:

One DFG stream habitat survey has been conducted, in July 1969, covering the entire stream. A summary of that general survey description follows:

> Stream gradient is steep at the headwaters and moderate in downstream sections (overall gradient approximately 200'/mile). Flow at proposed damsite (½ mile upstream of confluence with Green Valley Creek) was measured as 0.45 c.f.s., water temp 63 degrees, and air temp 73 degrees. Evidence of past higher flows indicate 8' from stream bottom due to suspended debris in streamside vegetation. Streambed bottom was composed of mud, clay and silt, with fine gravel 15%, course gravel 10%, fine rubble 10%, course rubble 10%, boulders 15%, sand 10%, and hardpan of 15%. Pools generally had bottoms of silt or rubble with boulder edges, or were dug into hardpan with sand bottoms. Shelter for fish primarily consists of a vegetative canopy, boulders and log jams. Suitable spawning areas for coho and steelhead are found in approximately 10% of stream.

Many log jams and barriers were observed with several noted as potential problems. Falls and chutes in the headwaters form the upper fish limit. There were six temporary diversion dams observed in the stream, ranging from 3' to 5' in height. A 4' dam prevented any downstream smolt migration because of a screen covering the outlet. Seventeen diversions were also observed for domestic and agriculture use. Most diversions were noted as year-round, while a few for summer irrigation only. There were three springs observed, all approximately 2 miles upstream of confluence with Green Valley Creek, with some seepage observed at various locations.

Improvements observed included some rock retaining walls where stream was in close proximity to private residences. Recommendations for management of Purrington Creek were that of steelhead and coho salmon habitat, with the proposed removal of log jams.

A fish improvement project was implemented on Purrington Creek in June 1986, upstream of the confluence with Green Valley Creek. The intent was to clear/remove two debris jams to benefit fish passage, and to open five miles of stream. Severe bank erosion had occurred bringing down large alder trees in to creek.

At the time of the survey Purrington Creek was estimated to support runs of coho salmon and steelhead, and provide good nursery habitat with year-round flow, though the small quantity of spawning gravel available appeared to be a limiting factor to fish production.

METHODS

The recent habitat inventory conducted in Purrington Creek follows the methodology presented in the California Salmonid Stream Habitat Restoration Manual (Flosi and Reynolds, 1991). The California Conservation Corps (CCC) seasonal Technical Advisors that conducted the inventory were trained in standardized habitat inventory methods by the California Department of Fish and Game (DFG) and CCC in May 1994. This inventory was conducted by a two person team, under the supervision of Bob Coey DFG's Russian River Basin Planner.

HABITAT INVENTORY COMPONENTS

A standardized habitat inventory form has been developed for use in California stream surveys and can be found in the California Salmonid Stream Habitat Restoration Manual. This form was used in Purrington Creek to record measurements and observations. There are nine components to the inventory form.

1. Flow:

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

2. Channel Type:

Channel typing is conducted according to the classification system developed by David Rosgen (1985). 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 four measured parameters used to determine channel type: 1) water slope gradient, 2) channel confinement, 3) width/depth ratio, 4) substrate composition.

3. Temperatures:

Water and air temperatures, and time taken, are measured by crew members with handheld 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 Ryan Tempmentors which log temperature every two hours, 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. Dewatered units are labeled "dry". Purrington 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. Channel dimensions were measured using hip chains, range finders, tape measures, and stadia rods. Unit measurements included mean length, mean width, mean depth, and maximum depth. Pool tail crest depth at each pool unit was measured in the thalweg. All measurements were taken 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 Purrington 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).

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

7. Substrate Composition:

Substrate composition ranges from silt/clay sized particles to boulders and bedrock elements. In all habitat units, dominant and sub-dominant substrate elements were visually estimated using a list of seven size classes. Mechanical substrate sampling is also conducted to quantify the percentage of fine sediment within spawning gravels.

8. Canopy:

Stream canopy is estimated using handheld spherical densiometers and is a measure of the water surface shaded during periods of high sun. In Purrington Creek, an estimate of the percentage of the habitat unit covered by canopy was made from the center of each

unit. The area of canopy was further analyzed to estimate its percentages of coniferous or deciduous trees, and the results recorded.

9. Bank Composition:

Bank composition elements range from bedrock to bare soil. However, the stream banks are usually covered with grass, brush, or trees. These factors influence the ability of stream banks to withstand winter flows. In Purrington Creek, the dominant composition type in both the right and left banks was selected from a list of eight options on the habitat inventory form. Additionally, the percent of each bank covered by vegetation was estimated and recorded.

BIOLOGICAL INVENTORY

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

DATA ANALYSIS

Data from the habitat inventory form are entered into Habitat Runtime, a dBASE 4.1 data entry program developed by the California Department of Fish and Game (DFG). This program also processes and summarizes the data.

The Habitat Runtime program produces the following tables:

- Riffle, flatwater, and pool habitat types
- Habitat types and measured parameters
- Pool types
- Maximum pool depths by habitat types
- Dominant substrates by habitat types
- Mean percent shelter by habitat types

Graphics are produced from the tables using Lotus 1,2,3. Graphics developed for Purrington Creek include:

- Riffle, flatwater, pool habitats by percent occurrence
- Total habitat types by percent occurrence
- Pool types by percent occurrence

HABITAT INVENTORY RESULTS

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

The habitat inventory of August 8 through November 18, 1994, was conducted by Technical Advisors under the direction of DFG. The total length of the stream surveyed was 19,559 feet.

Flow was measured at the bottom of the survey reach with a Marsh-McBirney Model 2000 flowmeter at 0.05 cfs on Aug. 20, 1994. Water temperatures measured during the survey period (August 8 to November 18, 1994) by crew members with handheld thermometers ranged from 50 to 66 degrees Fahrenheit. Air temperatures ranged from 50 to 82 degrees Fahrenheit.

Purrington Creek (Figure 1) is a G1 channel type for the first 15,072 feet of stream reach surveyed (from the mouth to 500 feet above the second Graton Rd bridge). G1 channels are entrenched "gully" step-pool channels with low width/depth ratio on low to moderate gradients. The rest is a B2 channel type (Figure 1). They are usually stable because of the bedrock controlled channel, and this is a moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools dominated by boulder substrate.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. By percent **occurrence**, RIFFLES made up 24%, FLATWATER types 35%, and POOLS 40% (Graph 1). FLATWATER habitat types made up 46% of the total survey **length**, RIFFLES 25%, and POOLS 28%. One percent of the survey length was DRY.

TWENTY Level IV habitat types were identified. The data are summarized in Table 2. The most frequent habitat types by percent **occurrence** were RUNS, 22%; LOW GRADIENT RIFFLES, 19%; GLIDES, 12%; and MID-CHANNEL POOLS, 10% (Graph 2). By percent total **length**, RUNS made up 35%, LOW GRADIENT RIFFLES 19%, and GLIDES 10%.

ONE HUNDRED AND THIRTY-SIX (136) POOLS were identified (Table 3). SCOUR POOLS were most often encountered at 64%, and comprised 46% of the total length of pools (Graph 3).

Table 4 is a summary of maximum pool depths by pool habitat types. Depth is an indicator of pool quality. FIFTY TWO of the 136 pools (38%) had a depth of two feet or greater.

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 136 pool tail-outs measured, 51% of the pools in Reach 1 had a embeddedness rating of 4; in Reach 2, 45% were rated a 2. On this scale, a value of one is the best for fisheries.

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. POOL habitat types had the highest shelter rating

at 18. FLATWATER and RIFFLE habitats followed with a rating of 6 for both (Table 1). Of the POOL types, the SCOUR POOLS had the highest mean shelter rating at 23, and BACKWATER POOLS rated 22 (Table 3).

Table 5 summarizes mean percent cover by habitat type. BOULDERS and UNDERCUT BANKS are the dominant cover type in Purrington Creek and are EXTENSIVE. LARGE AND SMALL WOODY DEBRIS are lacking in nearly all habitat types.

Table 6 summarizes the dominant substrate by habitat type. GRAVEL was the dominant substrate observed in 55 of the 64 low gradient riffles (86%).

Only TEN percent of the survey reach lacked shade canopy. Of the 90% of the stream covered with canopy, 82% was composed of deciduous trees (mainly willow, alder and bay), and 18% was composed of evergreen and coniferous trees (oaks, redwood and fir).

Table 2 summarizes the mean percentage of the right and left stream banks covered with vegetation by habitat type. For the stream reach surveyed, the mean percent right bank vegetated was 75%. The mean percent left bank vegetated was 77% (Appendix B). The dominant elements composing the structure of the stream banks consisted of 37% silt/clay, 31% cobble/gravel, 21% bedrock, and 10% boulders. Additionally, 82% of the banks were covered with deciduous trees, and 10% with coniferous trees, including downed trees, logs, and root wads (Appendix C).

Appendix A summarizes the creek by channel type for evaluation of data by reach.

BIOLOGICAL INVENTORY

HISTORICAL INFORMATION

Historical records reflect steelhead fingerlings were transferred into Green Valley Creek during a 1970 fish rescue operation from Dutch Bill Creek (tributary to the Russian River). In 1984, Green Valley and Atascadero Creeks (tributary to Green Valley) were stocked by Warm Springs Hatchery, Table 1.

Table 1. Summary of fish hatchery-stocking/transfers/rescues

YEAR	SPECIES	SOURCE	#	SIZE
1970	SH	DUTCH BILL CRK	1,170	FING
1984	SH	WARM SPRINGS	15,400	FING
1984*	SH	WARM SPRINGS	15,400	FING

WARM SPRINGS = Warm Springs Hatchery (Geyserville)
SHD = Steelhead
1984* = Steelhead planted in Atascadero Creek

JUVENILE SURVEYS:

A DFG stream survey was conducted in July, 1969, covering the entire stream. A summary of that general survey description follows:

> Fish species observed included steelhead, at an average of 70-80 fish per 100' of stream (overall), with 50-60 per 100' in upstream 1/3 of creek; 90-100 per 100' in the middle 1/3 of creek; and 60-70 per 100' in the downstream 1/3. Coho salmon averaged 70-80 fish per 100' of creek (overall), with 15-20 per 100' in the upstream 1/3 of creek; 80-100 per 100' in the middle 1/3; and 60-70 per 100' in 1/3 downstream. Sticklebacks averaged 5-10 per 100' of creek (overall), and were confined to the downstream 2/3 of the creek. Aquatic insects were observed including caddisfly larvae, mayfly larvae, and beetles at a rate of approximately 4 per 6" rock. Algae present in stream ranged from being common to rare. Some fishing activity was noted.

In August, 1992, Bill Cox, Department of Fish and Game, conducted an exploratory electro-fishing survey on Purrington Creek to determine general character of fish population. The survey was done at two sites on the upper reach of the stream, approximately 0.5 and 0.8 miles west of the intersection of Graton road and Green Hill Road.

The lower survey site was described as:

> moderately deep "V" shaped canyon, incised into serpentine bedrock. The stream cascades down a 8% slope through a series of shallow (1'-2') pools. Stream width ranges from 2'-5' and the streambed is boulder/bedrock with boulders embedded in fine, sandy gravel. Fish cover is abundant, provided primarily by boulders. The stream was well shaded by high banks and thick alder, bay, douglas fir woodland. A total of 38 juvenile steelhead were collected in approximately 100' of stream, by a single quick pass of the electro-fisher. Fish observed at the lower site were exclusively juvenile steelhead, mostly 0+ with a few 1+. A few larval pacific giant salamanders and crayfish were also observed.

The upper site was described as:

> just upstream of the above site in a "U" shaped canyon, with a broad terrace on the north side and steep slope on the south. Stream slope was 3%, and mostly a shallow run with a few pools of 1' depth. Stream width ranges from 2'-3', and

streambed is gravel with some sand and some boulders outcrops. The gravel was 0.5"-0.75" diameter, suitable for spawning, making the site an important spawning habitat for the better nursery habitat downstream. Fish cover was limited at this site and comprised of one undercut rootwad, over-hanging ivy, and a small undercut of poured concrete bank protection near bridge. The stream is well shaded by bay woodland. A total of 14 fish were collected in approximately 100' of stream, exclusively juvenile steelhead, mostly 0+ and 1+, with one 2+ or possible resident. Larval pacific giant salamanders and crayfish were also observed. Several landowners in the upper survey area reported a sudden die-out of crayfish in the vicinity, in May 1992, possibly due to a failed septic tank or from chemical dumping. No pollution of the creek was observed on this survey however.

RECENT INFORMATION

JUVENILE SURVEYS:

On Purrington Creek at various locations from the mouth to the headwaters single pass electrofishing was conducted. A summary of historical and recent data collected appears in the table below.

Summary of Salmonids found in Juvenile Surveys

YEAR	SPECIES	SOURCE	
1969	SHD,SS	DFG	
1992	SHD	DFG	
1994	SHD,SS	DFG	

SHD = Steelhead SS = Coho (Silver) Salmon

On 11/18/94, on the lower reach, observations began at habitat unit #1 of Purrington Creek. Between habitat unit #1 and #20, Sculpin, sixteen 0+ Steelhead, and two 1+ Steelhead were observed. Above the first private car bridge and seasonal dam,(between habitat unit #073 and #094), twelve 0+ Steelhead, one 1+ Steelhead, four 0+ Coho, Sculpin and Stickleback were observed. Also noted was that the flashboard dam was down.

On 11/07/94, on the upper reach of Purrington creek, electrofishing was conducted below and above a small log jam which is above the Graton road bridge, at habitat unit number 302. A total of nine 0+ Steelhead were observed. At unit number 303 a total of five 0+ Steelhead and one 1+ Steelhead were observed. Above the log jam three 0+ Steelhead and three 1+ Steelhead were observed. The jam is retaining significant amounts of gravel however it does not appear to be a barrier at this time. Garbage was observed in the

creek and many paint and film processing buckets were found on the banks which had been dumped from Graton Road. This material would be spilled into the creek during rainfall events.

Electrofishing was continued on the first eastern unnamed tributary to Purrington Creek (commonly known as Sturgeon Creek) on 11/21/94. The inventory covered the creek 100' below the Green Hill road culvert and 100' above the culvert. Single pass electrofishing was the method used.

Below the culvert, one 1+ Steelhead, sculpin and crayfish were observed. Above the culvert Sculpin and two 1+ Steelhead were observed. The culvert appears to be impassable at high flows due to high energy.

ADULT SURVEYS:

A carcass/spawning survey was conducted February 8, 1995 on Purrington Creek. Our survey crew consisted of John Fort and Ken Mogan (AmeriCorp members). The survey began at the Graton Road bridge and continued downstream to the confluence of Green Valley Creek. Flow was estimated as 22 cfs. No carcass, redds or fish were observed on this survey. 100' below the Graton bridge a debris jam of both small and large woody debris (4'-7'H X 10'-15'W X 30'-40'L) was observed. The jam did not appear to be a barrier to migration. The gravel quality was visually estimated as fair.

DISCUSSION

In general, Reach 1 of Purrington Creek has poor spawning habitat but fair rearing habitat. Reach 2 has both fair spawning and rearing habitat.

The G1 channel type of Reach 1 is rated as fair for log cover, but poor for boulder clusters or bank cover. The B2 channel type of Reach 2 is rated as excellent for low and medium-stage plunge weirs, single and opposing wing deflectors, and bank cover.

The water temperatures recorded on the survey days August 8 to November 18, 1994 ranged from 50° F to 66° F. Air temperatures ranged from 50° F to 82° F. This is a fairly good water temperature regime for salmonids, although these warmer temperatures, are above the optimum levels. The warmer water and air temperatures were recorded in the lower sections of the survey reach. Our electrofishing samples found steelhead more frequently in the cooler, shadier sample sites, and coho exclusively there. Activities to increase canopy (especially in Reach 1) should be encouraged.

Flatwater habitat types comprised 46% of the total **length** of this

survey, riffles 25%, and pools 28%. One percent of the survey reach was dry. The pools are relatively shallow with only 52 of the 136 pools (38%) having a maximum depth greater than 2 feet. 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 coastal coho and steelhead streams, it is generally desirable to have primary pools comprise approximately 50% of total habitat. Therefore, installing structures that will increase pool habitat is recommended for locations where their installation will not jeopardize unstable stream banks, or subject the structures to high stream energy, cause streambank erosion, or conflict with possible modification of the log debris accumulations (LDA's) in the stream.

The LDA's in the system serve an important function in retaining gravels, thus reducing channel incision, and in metering sediment and gravels out slowly during storm events to be used downstream by spawners. Normally LDA's do not prevent fish access, as fish can pass through, over or under (when LDA's float) during storm events. Modifications to the LDA's should only be done under extreme buildup when necessary to increase flood capacity, prevent bank erosion, or improving fish access. Metering gravels out to downstream reaches that will trap the gravel for future spawning use is desirable. If LDA modification becomes necessary, other gravel retention and sorting structures could be developed from the excess debris.

SEVENTY THREE PERCENT of the pool tail-outs measured in Reach 1 had embeddedness ratings of 3 or 4. FIFTY FIVE PERCENT of the pool tail-outs measured in Reach 2 had embeddedness ratings of 1 OR 2. Cobble embeddedness measured to be 25% or less, a rating of 1, is considered best for the needs of salmon and steelhead. In Reach 1 of Purrington Creek, sediment sources should be mapped and rated according to their potential sediment yields, and control measures taken.

Streamwide, the mean shelter rating for pools was LOW with a rating of 18 and flatwater habitats was even lower (6). A pool shelter rating of approximately 100 is desirable. Reach 1 had a shelter value of 17 while Reach 2 was only slightly better at 25. The relatively SMALL amount of cover that now exists is being provided primarily by TERRESTRIAL VEGETATION in Reach 1 and BOULDERS in Reach 2. Additionally, UNDERCUT BANKS and ROOT MASS contribute a small amount. The occurrence of large woody debris overall is extremely small (5% in Reach 1 and 1% in Reach 2). LOG AND ROOT WAD cover structures in the pool and flatwater habitats are needed to improve both summer and winter salmonid habitat in both reaches. Log cover structure provides rearing fry with protection from predation, rest from water velocity, and also divides territorial units to reduce density related competition. These structures also provide cover for spawning adults when streams clear between

storms.

FIFTY-FIVE of the 64 low gradient riffles had GRAVEL as the dominant substrate. This is generally considered good for spawning salmonids. However, embeddedness ratings were high in Reach 1, indicating poor spawning habitat in this low gradient reach. Scouring flow created by introduction of large woody debris and initiating bank protection measures where needed would improve spawning conditions in Reach 1.

The mean percent canopy for the stream was 90%. This is an excellent percentage of canopy, since 80 percent is generally considered optimum in these north coast streams. However, in Reach 1, where stream bank erosion exists, planting endemic species of coniferous and deciduous trees, in conjunction with bank stabilization, is recommended.

Biological surveys were conducted to document fish distribution and are not necessarily representative of population information. Steelhead were documented consistently during each past survey year and coho only intermittently. This is likely because physiological and environmental requirements for coho are more stringent than for steelhead. Overall, very few fish were observed during the 1994 surveys. However, the surveys were conducted late in the year when many fish may have outmigrated already. The 1995 spring surveys on Green Valley Creek documented many 0+ fish indicating successful spawning. However, few 1+ fish were observed indicating poor rearing conditions the year before or poor holding-over conditions in general. Similar or better fish production is predicted for Purrington Creek since habitat conditions here are considerably better. In addition, steelhead were observed upstream of the survey area indicating a point for the end of anadromy higher up in the system than was previously noted. Habitat conditions upstream of our survey reach are marginal, however.

SUMMARY

Steelhead were documented consistently during each past survey year and coho only intermittently. This is likely because physiological and environmental requirements for coho are more stringent than for steelhead.

In general, Reach 1 of Purrington Creek has poor spawning habitat but fair rearing habitat. Riffle habitat exists but gravel embeddedness values are high due to eroding stream crossings and streambank erosion. Canopy is excellent in most areas although consists mostly of smaller vegetation types, thus stream temperatures are sub-optimal due to lack of mature riparian canopy in most areas. Some deep pool habitat exists although instream shelter values are low. The G1 channel type of Reach 1 is rated as fair for log cover, but poor for boulder clusters or bank cover.

Reach 2 has both fair spawning and rearing habitat. Gravel embeddedness values are lower, less stream bank erosion is prevalent (although some very unstable areas exist adjacent to the county road system) and the gravel substrate is more suitable for spawning. More shelter components exist (mainly boulders) although pool depths are less due to the lack of woody debris in this higher gradient reach. The B2 channel type of Reach 2 is rated as excellent for low and medium-stage plunge weirs, single and opposing wing deflectors, and bank cover. Many opportunities exist for various restoration alternatives in both of these reaches.

GENERAL RECOMMENDATIONS

Purrington 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.

SPECIFIC FISHERY ENHANCEMENT RECOMMENDATIONS

1) Where feasible, increase woody cover in the pool and flatwater habitat units along the entire stream. In Reach 1 most of the existing cover is from rootmass and undercut banks. Adding combination cover/scour structures and high quality complexity with larger woody cover is desirable.

2) For sources of upslope and in-channel erosion, utilize biotechnical approaches. In many cases, planting will need to be coordinated to follow bank stabilization or upslope erosion control projects.

3) Spawning gravels on Purrington Creek are available in both reaches, however, only reach 2 is suitable for spawning. Projects should be designed at suitable sites to encourage scour and sort spawning gravels in order to improve embeddedness conditions in Reach 1.

4) Where feasible, design and engineer pool enhancement structures to increase the number of pools and the shelter within. This must be done where the banks are stable or in

conjunction with stream bank armor to prevent erosion.

5) Domestic garbage along the creek should be cleaned up and existing illegal dump sites along the road should be posted so that toxic substances do not enter the creek. These dump sites appear to be routinely visited.

RESTORATION IMPLEMENTED

1) The winter 1995 storms brought down many large trees and other woody debris into the stream, which increased the number and quality of pools since the date of this survey. This woody debris, if left undisturbed, will provide fish cover and rearing habitat, and offset channel incision. Many signs of recent and historic tree and log removal were evident in the active channel during our survey. Misguided efforts to increase flood protection or improve fish access in the short run, have led to long term problems in the system. Landowners should be educated 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.

2) Where feasible, increase woody cover in the pool and flatwater habitat units along the entire stream. In Reach 2 combination cover/scour structures constructed with boulders and woody debris would be effective in many flatwater and pool locations. 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.

3) Several stream crossings exist in Reach 1. These crossings should be improved to eliminate active soil erosion and runoff.

4) For sources of upslope and in-channel erosion, utilize biotechnical approaches. In many cases, planting will need to be coordinated to follow bank stabilization or upslope erosion control projects (Reach 1 completed).

Stream Length	**LANDMARK, PROBLEM OR OBSERVATION NOTED**
27	CONFLUENCE W\GREEN VALLEY CR. ********** UNIT #1
265	TRAIL ACCESS, RT BANK.
350	TIRES IN CREEK.
377	RIPRAP RT BANK.
462	LOTS OF ALDERS, TIRES.
537	2 POOLS SEPARATED BY LOG JAM/SWD. TRASH AND SCUMMY WATER
582	ERODING RT BK
617	LARGE ROOT WAD IN POOL
654	POOLS SEPARATED BY SHORT RIFFLE

722 ROAD CROSSING THROUGH CREEK PRODUCING SILTATION
*** UNIT 016
850 1+ FISH
1044 GULLY/LFT BANK FULL OF OLD TIRES, 75+ APPLIANCES (EROSION CONTROL STRUCTURE)
1329 LOG JAMS BETWEEN 024 AND 025, 5' ACROSS WATER RUNS UNDERGROUND. FIRST BRIDGE AT GRATON RD AT TOP OF UNIT 25.LOG JAM STORING SOME GRAVEL, KEEP WATCH 1-2'. ELEV. LARGER IN PAST?. ********* UNIT #025
1339 SPRING SEEPING WATER FROM STEEP LFT BANK.
1357 BRIDGE SILL.NO DOWN-CUTTING. ********** UNIT #026
1656 Riprap.
1672 Riprap.
1687 Trail left bank,low erosion potential.
1789 CEMENT BLOCKS IN STREAMBED PROVIDING SOME HABITAT.
2000 SCOUR ON LFT BK. DOWN CUTTING OBSERVED THROUGH THIS REACH. LWD HAS BEEN CUT OUT THROUGH HERE.
2018 RIFFLE BETWEEN POOLS SCOUR ON RT BK
2165 GULLY ON RT BK
2398 LOG JAM. STORING GRAVEL AND 4 FT HIGH IN PAST. MAY NEED EROSION CONTROL MAINTENANCE DOWN STREAM ON RT. BANK.******** UNIT #049
2415 WOODY DEBRIS ACROSS CREEK;16 FT LONG;11 FT WIDE. OBSTRUCTS FLOW ON RT BK
2426 SUBSTRATE IS HARD CLAY
2459 TRASH ON LFT BK
2536 HARDENED CLAY BANKS 4 FT ABOVE WETTED CHANNEL.
2571 AT FIRST PRIVATE CAR BRIDGE: FLASH-BOARD DAM 5 FT HI; NO DOWN CUTTING AT SILL. ***** UNIT #066
2671 UNACCESSIBLE REACH BEHIND DAMMED LENGTH ESTIMATED
2821 HEAVY VEGETATION THROUGH CK, TREE BLOCKING CK
3100 5.4 (BEDROCK) =HARD CLAY PAN.
3245 SLASH ON BANK AND IN CK - CLEARED TO EDGE OF LEFT BANK.
3261 SLASH DUMPED OVER BANK AND INTO CRK, NO LIVE VEGETATION ON LT BANK ********** UNIT #083

Stream Length **LANDMARK, PROBLEM OR OBSERVATION NOTED**

3279 DEAD VEGETATION LFT BK
3418 SMALL GULLY RT BK
3485 RT BK ROAD CROSSING INTO CK-GRAVEL/DIRT IN CK SILTATION POTENTIAL********* UNIT # UNIT #089
3506 RT AND LT BANKS-DIRT ROAD THROUGH CREEK
3524 ROAD INTO CK, LT BK DIRT.********** UNIT # 090
3708 LOG/DEBRIS JAM AT START OF UNIT
3835 METAL DEBRIS UPPER LT BK
4401 Right bank eroding severely 40' long/20' HIGH. ******** UNIT 109
4532 Left bank bare of vegetation. **** UNIT #114
5185 SPRING (?) ON LEFT BANK.
5441 CEMENT RIPRAP IN WETTED CHANNEL CAUSING

ACCUMULATION OF GRAVEL UPSTREAM. GRADIENT CHNG OF 1 FT.

5733 LOG JAM 4' HIGH, AGGRADING UPSTREAM GRAVEL 10' LONG, 1' GRADIENT CHANGE.

5871 DEAD TREES/DEBRIS DOWN LFT BANK.

7562 SEVERELY ERODED LFT BANK;DEBRIS; PARTIAL LOG JAM.

7692 PARTIAL LOG/DEBRIS JAM. ERODED RT BANK. TRIB RT BANK.********** UNIT #142

8497 GULLY.

8527 LEFT BANK EROSION.

8583 POOLS DIVIDED BY EXPOSED SUBSTRATE.

8639 POOLS DIVIDED BY EXPOSED SUBSTRATE.

8650 LFT BANK GULLY.

8855 LFT BANK EROSION/RIP-RAP.

8873 RT BANK EROSION.

8895 RT BANK EROSION.

8909 RT BANK EROSION.

9659 RT BANK EROSION, SHARP BEND IN CREEK.

9708 SEVERELY ERODED LFT BANK, COLLAPSED CEMENT DAM/LOG JAM, 2+GRAVEL DEPOSITION UPSTREAM.********** UNIT 159

9762 LFT BANK EROSION.

10078 WOODEN RETAINING WALL LFT BANK.

10133 GRADIENT CHANGE.

10193 LFT BANK SECURED BY WOODEN BOARDS.

10266 RT BANK ERODING 20' HIGH.

10395 LFT BANK EROSION, NO VEGETATION.

10540 LFT BANK ERODING, NO VEGETATION.

10691 LFT BANK NO VEGETATION, ERODING.

10715 CHANNEL NARROWS RT BANK,EROSION.

10897 RT BANK ERODED.

10983 TRIB ON RT BANK (STUGEON CREEK), 6' WIDE WETTED CHANNEL. *** UNIT 185.

11115 SMALL GULLY RT BANK.

11346 TRIB ON RT BANK,DRY;2' WIDE AT CHANNEL.

11370 RT BANK STEEP ERODED 15' HIGH.

Stream Length **LANDMARK, PROBLEM OR OBSERVATION NOTED**

11410 BEDROCK ONLY.

11727 LFT BANK TERRACED/ERODED.

11768 ARTIFICIAL DAM (GRAVEL/SAND) CROSSING STREAM.

11800 LFT BANK WETTED TRIB 6' AT WETTED CHANNEL. ******** UNIT #207

11849 RT BANK ERODING, STEEP, LITTLE VEGETATION.

12014 RT BANK REINFORCED WITH CHICKEN WIRE.

12414 RT BANK FLOWING TRIB. ********** UNIT #221

12549 SOLID CLAY BOTTOM IN STEP POOL.

12578 CEMENT BRACES AND RIP-RAP BOTH SIDES OF CREEK. SECOND GRATON RD BRIDGE******UNIT #223

12705 ERODING LFT BANK. TRIB LFT BANK COMING FROM FLUME.

12987 GRAVEL/COBBLE DAM.

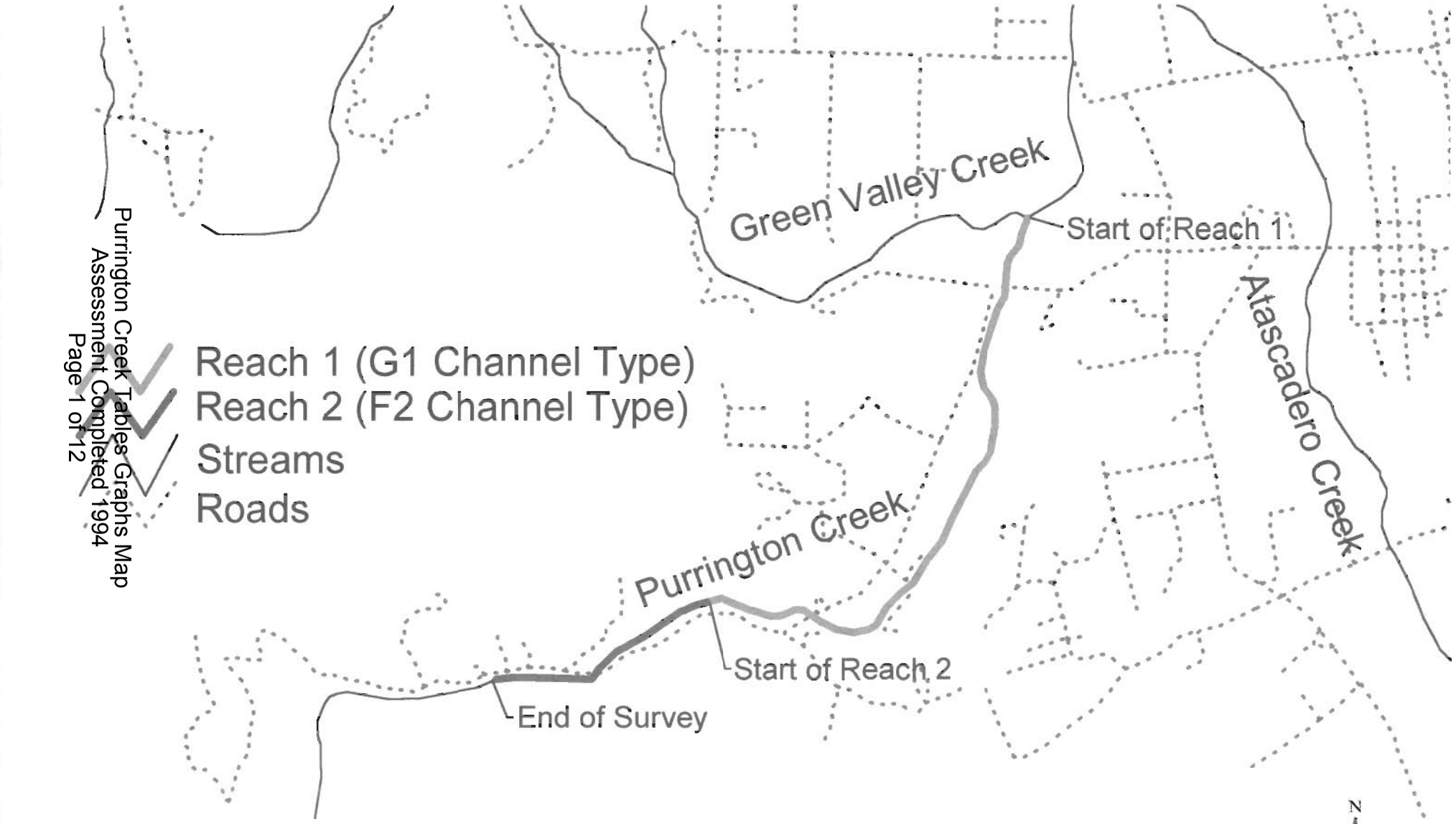
13021 SMALL BOULDER/GRAVEL DAM, NATURAL AND ADDED TO. SEEPAGE FROM LFT BANK.

13081 ERODING RT BANK.
13118 ERODING RT BANK.
13204 CEMENT SILL ERODED.
13259 ERODING LFT BANK. WOODEN DAM.********** UNIT 241
13457 SCOUR AROUND BANK. ROOTS HOLDING BANK TOGETHER.
13474 LFT BANK ERODED.
13500 CLAY ON LFT BANK ACTING AS BEDROCK.
13667 LFT BANK COLLAPSED, STEEP.
13864 EROSION ON RT BANK.
14049 RT BANK ERODED VERTICALLY. ********** UNIT 256
14479 GREATER THAN 4% GRADE IN CREEK.
14544 LFT BANK ERODED, NO VEGETATION.
14636 GULLY ON RT BANK, LOGGING ROAD.
14751 RT BANK DRAINAGE PIPE.
14763 ENTRENCHED BOULDER SUBSTRATE GRADIENT. CHANNEL TYPE CHANGE*********UNIT #271
14819 SERIOUSLY ERODING LFT BANK.********** UNIT #272
14997 DRY SIDE CHANNEL LFT BANK.
15240 LARGE BOULDERS.
15571 ERODING LFT BANK.
15798 LFT BANK TWO CARS SIDE-BY-SIDE.
16082 RT BANK ERODING.
16223 3' ROCK DAM PASSING GRAVEL. ********** UNIT 304
16257 0+ SHD ABOVE DAM.
16348 GARBAGE IN STREAM UP TO ROAD.
16737 GARBAGE DUMPED UP TO ROAD (GRATON ROAD) ******* UNIT 307
16829 PRIVATE CAR BRIDGE.
17358 THIRD GRATON RD CROSSING
BOX CULVERT, 9.5' X 11' X 59' - PASSING GRAVEL,
1' DOWNCUTTING AT SILL.****** UNIT #325
17477 TRIBUTARY ON RT BANK.********** UNIT #327
17641 PRIVATE BOX/CULVERT 5' X 7' X 14', PASSING GRAVEL/BOULDERS AT SILL.

Stream Length **LANDMARK, PROBLEM OR OBSERVATION NOTED**

17718 SPAWNING AREA.
17740 CHANNEL TYPE MEASURED.
17871 EVIDENCE OF FLOOD CONTROL- SAWED STUMPS ON BANK.
18188 GOOD SPAWNING HABITAT/ NEEDS MORE ONSTREAM COVER. ****** UNIT #339
18336 PRIVATE BOX CULVERT 11' X 11' X 14'. TRIBUTARY RT BANK.
18711 TRIBUTARY LFT BANK. *****UNIT 343
18762 RIP-RAP RIFFLE, 0+.
19062 LITTLE WATER, ADULTS SPAWNING HERE IN PAST (LANDOWNER). **END OF SURVEY - INTERMITTENT** *****UNIT 345

Purrington Creek



Purrington Creek Tables Graphs Map
Assessment Completed 1994
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Inland Fisheries Division
Department of Fish and Game
September 10, 1996

PURRINGTON CREEK

Drainage: GREEN VALLEY CREEK, TRIBUTARY TO RUSSIAN RIVER

Table 1 - SUMMARY OF RIFFLE, FLATWATER, AND POOL HABITAT TYPES

Survey Dates: 11/07/94, 11/08/94

Confluence Location: QUAD: CMP MEEKER LEGAL DESCRIPTION: T07NR09WS19 LATITUDE: 38°26'14" LONGITUDE: 122°53'20"

UNITS MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	MEAN LENGTH (ft.)	TOTAL LENGTH (ft.)	PERCENT TOTAL LENGTH	MEAN WIDTH (ft.)	MEAN DEPTH (ft.)	MEAN AREA (sq.ft.)	TOTAL AREA (sq.ft.)	MEAN VOLUME (cu.ft.)	TOTAL VOLUME (cu.ft)	MEAN RESIDUAL POOL VOL (cu.ft.)	MEAN SHELTER RATING
81	RIFFLE	24	61	4950	25	6.7	0.3	276	22362	92	7442	0	6
119	FLATWATER	35	75	8977	46	8.6	0.5	1125	133885	484	57631	3	6
136	POOL	40	40	5455	28	12.6	1.1	1088	148012	2744	373139	2486	18
4	DRY	1	45	178	1	0.0	0.0	0	0	0	0	0	0

TOTAL UNITS	TOTAL LENGTH (ft.)	TOTAL AREA (sq. ft.)	TOTAL VOL. (cu. ft.)
340	19559	304258	438212

PURRINGTON CREEK

Drainage: GREEN VALLEY CREEK, TRIBUTARY TO RUSSIAN RIVER

Table 2 = SUMMARY OF HABITAT TYPES AND MEASURED PARAMETERS

Survey Dates: 11/07/94, 11/08/94

Confluence Location: QUAD: CMP MEEKER LEGAL DESCRIPTION: T07NR09WS19 LATITUDE: 38°26'14" LONGITUDE: 122°53'20"

UNITS MEASURED	HABITAT TYPE	HABITAT OCCURRENCE	MEAN LENGTH	TOTAL LENGTH	TOTAL LENGTH	MEAN WIDTH	MEAN DEPTH	MAXIMUM DEPTH	MEAN AREA	TOTAL AREA	MEAN VOLUME	TOTAL VOLUME	MEAN RESIDUAL POOL VOL	MEAN SHELTER RATING	MEAN RT. BANK VEGETATED	MEAN LT. BANK VEGETATED	MEAN CANOPY
#		%	ft.	ft.	%	ft.	ft.	ft.	sq.ft.	sq.ft.	cu.ft.	cu.ft.	cu.ft.		%	%	%
64	LGR	19	58	3708	19	6	0.2	1.5	258	16524	75	4816	0	6	70	75	92
16	MGR	5	77	1231	6	8	0.8	1.7	362	5786	164	2620	0	5	72	58	88
1	BRS	0	11	11	0	8	0.1	0.6	53	53	5	5	0	0	40	60	80
40	GLD	12	48	1921	10	9	0.6	20.0	451	18031	345	13791	8	6	77	83	87
76	RUN	22	91	6897	35	8	0.4	1.5	1514	115031	571	43358	0	6	78	80	92
3	SRN	1	53	159	1	6	0.5	1.3	274	822	161	482	0	7	73	77	97
4	TRP	1	146	585	3	21	1.4	3.8	5917	23669	4467	17867	530	5	70	63	90
33	MCP	10	47	1559	8	18	1.2	22.0	2158	71227	8561	282523	8255	7	69	72	90
3	STP	1	35	106	1	7	0.9	3.0	163	488	168	503	156	8	87	73	93
14	CRP	4	43	604	3	14	1.0	2.6	1896	26542	1895	26530	1691	21	70	81	80
14	LSL	4	24	340	2	10	0.9	2.5	255	3573	246	3450	204	34	85	80	91
31	LSR	9	28	878	4	9	1.0	3.3	249	7710	247	7671	215	28	81	81	91
12	LSBk	4	29	348	2	7	1.2	4.0	219	2629	319	3829	290	7	76	75	91
12	LSBo	4	21	246	1	15	0.9	2.6	298	3572	331	3974	296	15	73	80	93
4	PLP	1	25	100	1	10	1.1	1.5	231	925	259	1035	140	24	65	90	70
1	SCP	0	20	20	0	4	0.5	0.9	80	80	40	40	40	0	60	10	100
1	BPB	0	26	26	0	7	1.2	2.4	182	182	218	218	182	40	100	100	80
1	BPR	0	33	33	0	15	2.3	3.0	495	495	1139	1139	1089	90	50	30	90
5	DPL	2	102	510	3	13	1.9	6.8	1153	6919	4060	24360	3491	11	77	77	95
4	DRY	1	45	178	1	0	0.0	0.0	0	0	0	0	0	0	78	83	91

TOTAL UNITS	LENGTH (ft.)	AREA (sq.ft)	TOTAL VOL. (cu.ft)
340	19559	304258	438212

PURRINGTON CREEK

Drainage: GREEN VALLEY CREEK, TRIBUTARY TO RUSSIAN RIVER

Table 3 - SUMMARY OF POOL TYPES

Survey Dates: 11/07/94, 11/08/94

Confluence Location: QUAD: CMP MEEKER LEGAL DESCRIPTION: T07NR09WS19 LATITUDE: 38°26'14" LONGITUDE: 122°53'20"

UNITS MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	MEAN LENGTH (ft.)	TOTAL LENGTH (ft.)	PERCENT TOTAL LENGTH	MEAN WIDTH (ft.)	MEAN DEPTH (ft.)	MEAN AREA (sq.ft.)	TOTAL AREA (sq.ft.)	MEAN VOLUME (cu.ft.)	TOTAL VOLUME (cu.ft)	MEAN RESIDUAL POOL VOL. (cu.ft.)	MEAN SHELTER RATING
40	MAIN	29	56	2250	41	17.1	1.2	2385	95384	7522	300894	6875	7
87	SCOUR	64	29	2516	46	10.6	1.0	517	44951	534	46490	469	23
9	BACKWATER	7	77	689	13	11.4	1.7	853	7676	2862	25756	2473	22

TOTAL MEASURED	TOTAL LENGTH (ft.)	TOTAL AREA (sq.ft.)	TOTAL VOL. (cu.ft.)
136	5455	148012	373139

PURRINGTON CREEK

Drainage: GREEN VALLEY CREEK, TRIBUTARY TO RUSSIAN RIVER

Table 4 · SUMMARY OF MAXIMUM POOL DEPTHS BY POOL HABITAT TYPES

Survey Dates: 11/07/94, 11/08/94

Confluence Location: QUAD: CMP MEEKER LEGAL DESCRIPTION: T07NR09WS19 LATITUDE: 38°26'14" LONGITUDE: 122°53'20"

UNITS MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	<1 FOOT MAXIMUM DEPTH	<1 FOOT PERCENT OCCURRENCE	1-<2 FT. MAXIMUM DEPTH	1-<2 FOOT PERCENT OCCURRENCE	2-<3 FT. MAXIMUM DEPTH	2-<3 FOOT PERCENT OCCURRENCE	3-<4 FT. MAXIMUM DEPTH	3-<4 FOOT PERCENT OCCURRENCE	>=4 FEET MAXIMUM DEPTH	>=4 FEET PERCENT OCCURRENCE
4	TRP	3	0	0	1	25	2	50	1	25	0	0
33	MCP	24	1	3	22	67	8	24	1	3	1	3
3	STP	2	0	0	2	67	0	0	1	33	0	0
14	CRP	10	0	0	9	64	5	36	0	0	0	0
14	LSL	10	0	0	12	86	2	14	0	0	0	0
31	LSR	23	0	0	16	52	14	45	1	3	0	0
12	LSBk	9	0	0	6	50	4	33	1	8	1	8
12	LSBo	9	0	0	8	67	4	33	0	0	0	0
4	PLP	3	0	0	4	100	0	0	0	0	0	0
1	SCP	1	1	100	0	0	0	0	0	0	0	0
1	BPB	1	0	0	0	0	1	100	0	0	0	0
1	BPR	1	0	0	0	0	0	0	1	100	0	0
6	DPL	4	0	0	2	33	1	17	0	0	3	50

TOTAL UNITS 96

PURRINGTON CREEK

Drainage: GREEN VALLEY CREEK, TRIBUTARY TO RUSSIAN RIVER

Table 5 - SUMMARY OF MEAN PERCENT COVER BY HABITAT TYPE

Survey Dates: 11/07/94, 11/08/94

Confluence Location: QUAD: CMP MEEKER LEGAL DESCRIPTION: T07NR09WS19 LATITUDE: 38°26'14" LONGITUDE: 122°53'20"

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
64	LGR	1	3	1	1	8	0	0	5	0
16	HGR	6	1	0	3	0	0	0	31	0
1	BRS	0	0	0	0	0	0	0	0	0
10	GLD	13	2	3	0	17	0	0	3	0
76	RUN	9	5	3	1	18	1	1	4	1
3	SRN	0	0	17	0	0	0	0	17	0
4	TRP	0	0	0	0	0	0	0	0	75
33	MCP	15	1	3	2	6	0	0	22	2
3	STP	33	0	0	0	0	0	0	33	0
14	CRP	20	9	9	7	11	0	0	1	0
14	LSL	12	14	39	1	11	1	0	0	0
21	LSR	43	5	1	25	6	0	0	0	0
12	LSBk	36	0	6	0	17	0	0	0	8
12	LSBo	20	3	8	5	8	0	0	31	0
4	PLP	50	0	0	0	15	0	3	33	0
1	SCP	0	0	0	0	0	0	0	0	0
1	BPB	0	0	0	0	0	0	0	100	0
1	BPR	0	30	0	70	0	0	0	0	0
6	DPL	3	2	0	15	30	0	0	17	0
4	DRY	0	0	0	0	0	0	0	0	0
		261			130				297	

PURRINGTON CREEK

Drainage: GREEN VALLEY CREEK, TRIBUTARY TO RUSSIAN RIVER

Table 6 - SUMMARY OF DOMINANT SUBSTRATES BY HABITAT TYPE

Survey Dates: 11/07/94, 11/08/94

Confluence Location: QUAD: CMP MEEKER LEGAL DESCRIPTION: T07NR09WS19 LATITUDE: 38°26'14" LONGITUDE: 122°53'20"

UNITS MEASURED	HABITAT TYPE	# UNITS SILT/CLAY DOMINANT	% TOTAL SILT/CLAY DOMINANT	# UNITS SAND DOMINANT	% TOTAL SAND DOMINANT	# UNITS GRAVEL DOMINANT	% TOTAL GRAVEL DOMINANT	# UNITS SM COBBLE DOMINANT	% TOTAL SM COBBLE DOMINANT	# UNITS LG COBBLE DOMINANT	% TOTAL LG COBBLE DOMINANT	# UNITS BOULDER DOMINANT	% TOTAL BOULDER DOMINANT	# UNITS BEDROCK DOMINANT	% TOTAL BEDROCK DOMINANT
64	LGR	1	2	0	0	55	86	2	3	2	3	2	3	2	3
16	HGR	0	0	0	0	10	63	0	0	0	0	6	38	0	0
1	BRS	0	0	0	0	0	0	0	0	0	0	0	0	1	100
4	GLD	9	23	15	38	15	38	0	0	0	0	0	0	0	0
7	RUN	7	9	10	13	54	71	4	5	0	0	0	0	1	1
1	SRN	0	0	0	0	1	33	0	0	0	0	1	33	0	0
1	TRP	0	0	0	0	1	25	0	0	0	0	0	0	3	75
3	MCP	3	9	20	61	9	27	0	0	0	0	1	3	0	0
1	STP	1	33	0	0	1	33	0	0	0	0	1	33	0	0
1	CRP	1	7	7	50	6	43	0	0	0	0	0	0	0	0
1	LSL	3	21	4	29	7	50	0	0	0	0	0	0	0	0
1	LSR	3	10	23	74	5	16	0	0	0	0	0	0	0	0
1	LSBk	6	50	5	42	1	8	0	0	0	0	0	0	0	0
1	LSBo	1	8	6	50	4	33	1	8	0	0	0	0	0	0
1	PLP	0	0	1	25	3	75	0	0	0	0	0	0	0	0
1	SCP	0	0	1	100	0	0	0	0	0	0	0	0	0	0
1	BPB	1	100	0	0	0	0	0	0	0	0	0	0	0	0
1	BPR	0	0	1	100	0	0	0	0	0	0	0	0	0	0
6	DPL	1	17	0	0	5	83	0	0	0	0	0	0	0	0
4	DRY	0	0	0	0	4	100	0	0	0	0	0	0	0	0

APPENDIX A.

FISH HABITAT INVENTORY DATA SUMMARY

STREAM NAME: PURRINGTON CREEK
SAMPLE DATES: 11/07/94, 11/08/94
STREAM LENGTH: 19371 ft.
LOCATION OF STREAM MOUTH:
USGS Quad Map: CMP MEEKER — Latitude: 38°26'14"
Legal Description: T07NR09WS19 — Longitude: 122°53'20"

SUMMARY OF FISH HABITAT ELEMENTS BY STREAM REACH

STREAM REACH 01

Channel Type: G1 — Canopy Density: 90%
Channel Length: 15072 ft. — Coniferous Component: 5%
Flowing Water Mean Width: 8 ft. — Deciduous Component: 95%
Flowing Water Mean Depth: 0.4 ft. — Pools by Stream Length: 33%
Base Flow: 0.1 cfs — Pools >=3 ft.deep: 10%
Water: 56 - 66 °F Air: 58 - 82 °F — Mean Pool Shelter Rtn: 17
Dom. Bank Veg.: Deciduous Trees — Dom. Shelter: Terrestrial Vegetation
Vegetative Cover: 80% — Occurrence of LOD: 5%
Dom. Bank Substrate: No Data — Dry Channel: 0%
Embeddness Value: 1. 1% 2. 27% 3. 22% 4. 51%

STREAM REACH 02

Channel Type: F2 — Canopy Density: 91%
Channel Length: 4299 ft. — Coniferous Component: 29%
Flowing Water Mean Width: 7 ft. — Deciduous Component: 67%
Flowing Water Mean Depth: 0.4 ft. — Pools by Stream Length: 11%
Base Flow: 0.1 cfs — Pools >=3 ft.deep: 0%
Water: 50 - 58 °F Air: 50 - 72 °F — Mean Pool Shelter Rtn: 25
Dom. Bank Veg.: Deciduous Trees — Dom. Shelter: Boulders
Vegetative Cover: 61% — Occurrence of LOD: 1%
Dom. Bank Substrate: No Data — Dry Channel: 2%
Embeddness Value: 1. 9% 2. 45% 3. 27% 4. 18%

APPENDIX B.

Mean Percentage of Dominant Substrate

Dominant Class of Substrate	Number Units Right Bank	Number Units Left Bank	Total Mean Percent
Bedrock	75	66	20.74
Boulder	34	37	10.44
Cobble/Gravel	101	110	31.03
Silt/clay	130	127	37.79

Mean Percentage of Dominant Vegetation

Dominant Class of Vegetation	Number Units Right Bank	Number Units Left Bank	Total Mean Percent
Grass	2	5	1.03
Brush	17	18	5.15
Decid. Trees	273	282	81.62
Conif. Trees	42	27	10.15
No Vegetation	0	0	0

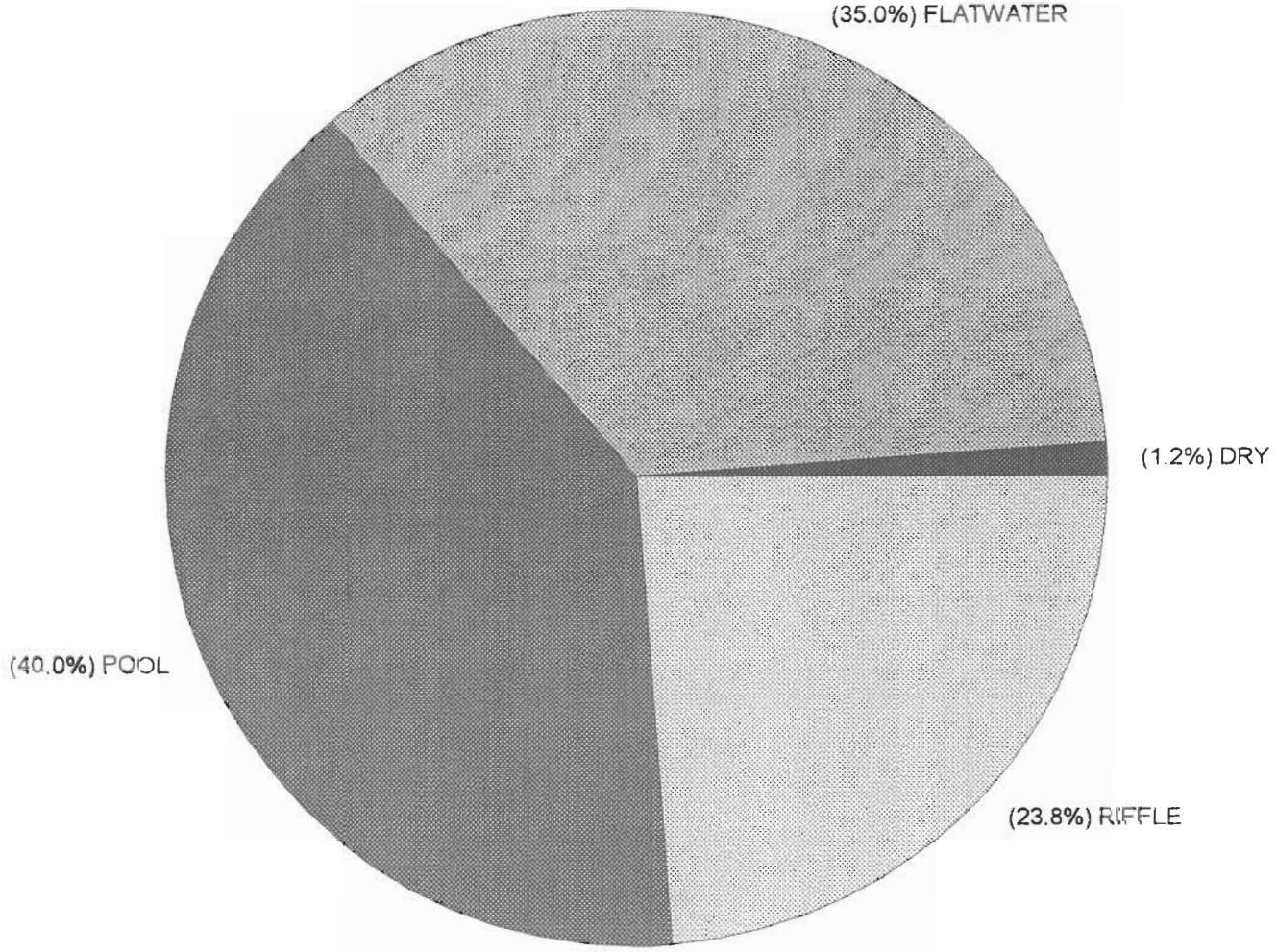
APPENDIX C.

Summary of Mean Percent Vegetative Cover for Entire Stream

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Decidous	Mean Right bank % Cover	Mean Left Bank % Cover
90.18	10.47	88.38	74.64	77.09

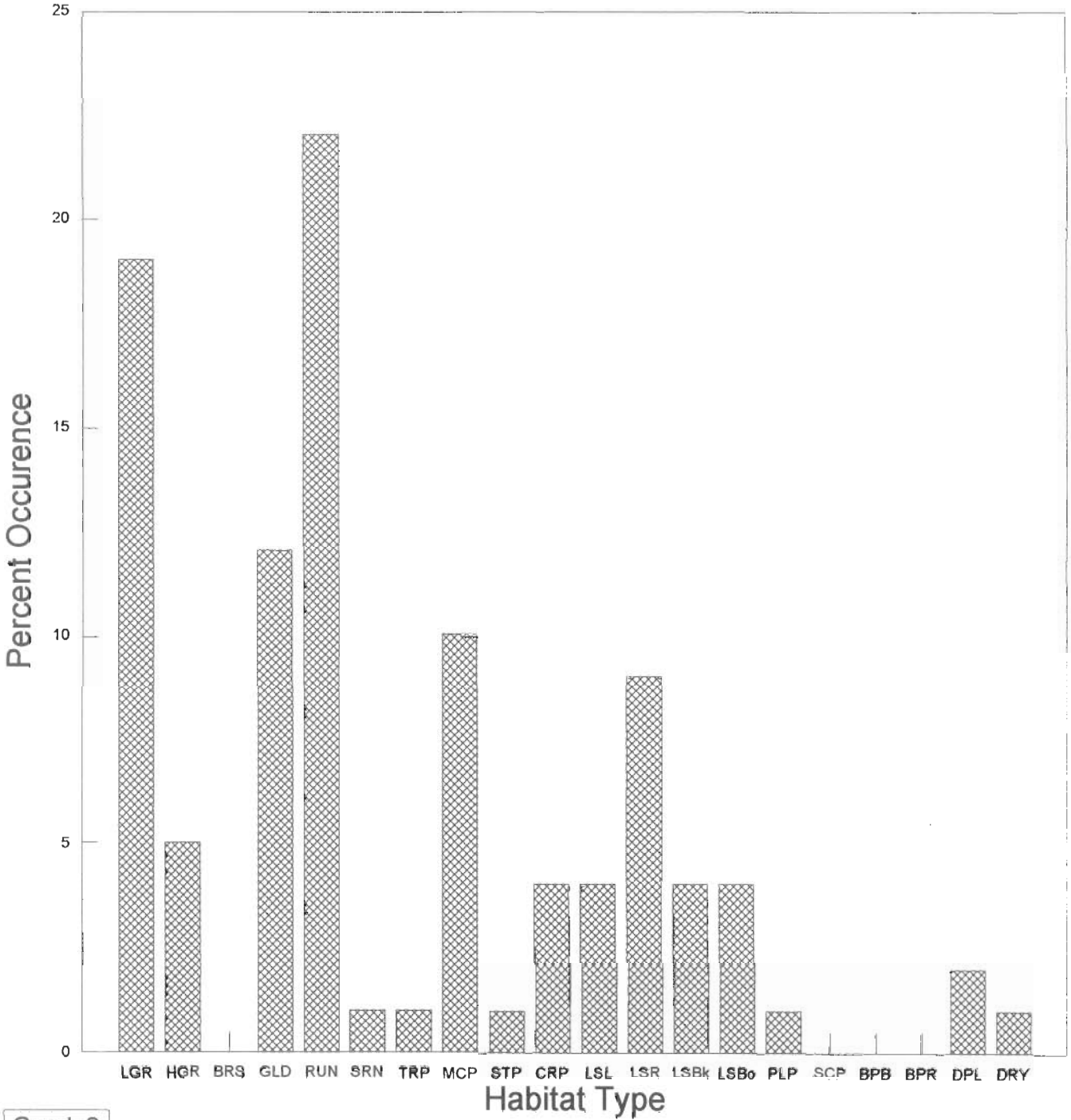
LEVEL 2 HABITAT TYPES BY % OCCURENCE

PURRINGTON CREEK



GRAPH 1

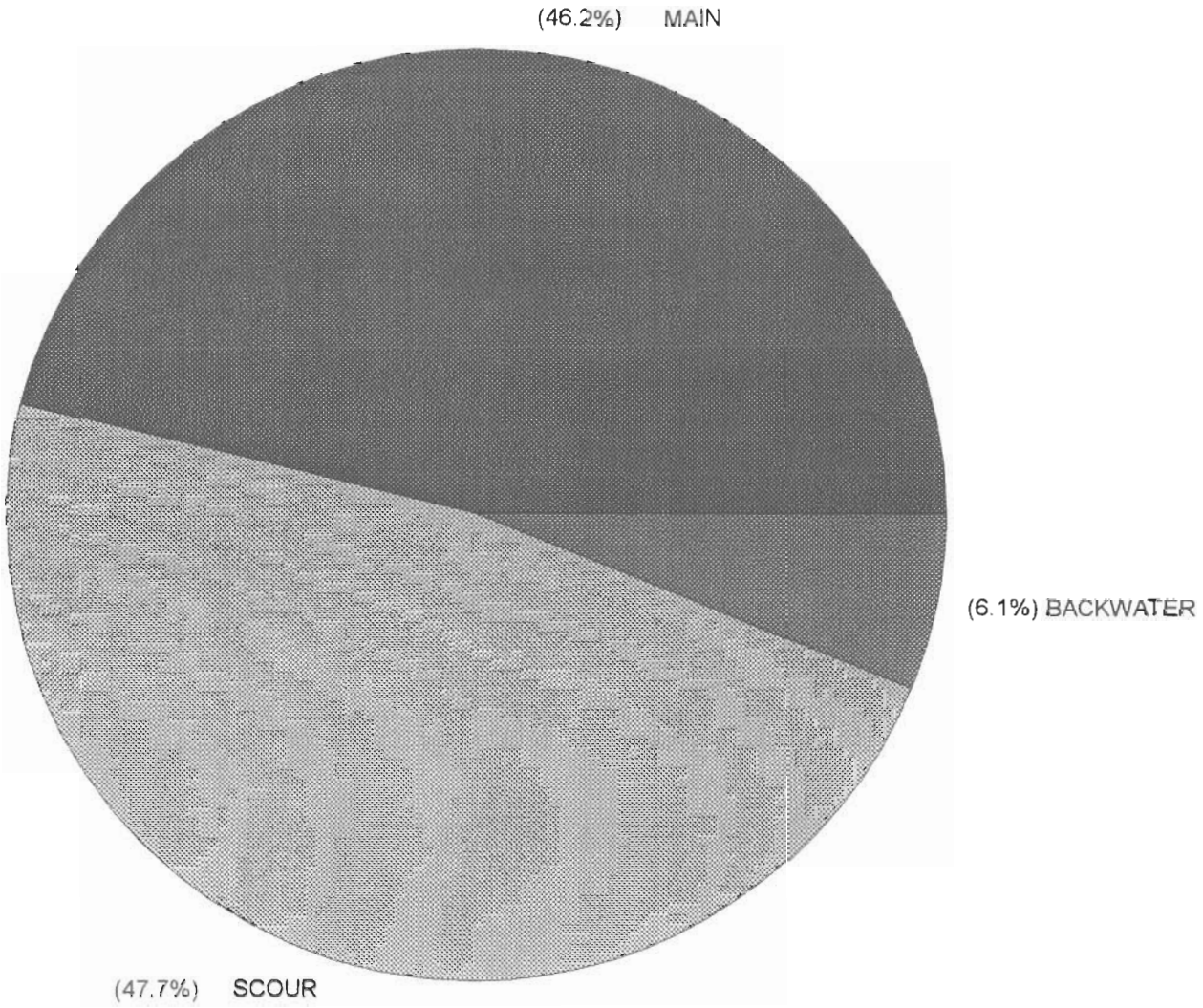
Purrington Creek
Level IV Habitat Types by Percent Occurrence



Graph 2

POOL HABITAT TYPES BY % OCCURENCE

PURRINGTON CREEK



GRAPH 3