SNOQUALMIE WATERSHED
STREAM HABITAT RECONNAISSANCE REPORT

FINAL REPORT October 2004

King County
Department of Natural Resources and Parks
Water and Land Resources Division

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Snoqualmie Watershed Stream Habitat Reconnaissance Report

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ABBREVIATIONS AND ACRONYMS

APD	Agricultural Production District
C	Celsius
DNRP	Department of Natural Resources and Parks
ESA	Endangered Species Act
F	Fahrenheit
FPD	Forest Production District
LB	left bank
LWD	large woody debris
OHW	ordinary high water
RB	right bank
RM	river mile
WLRD	Water and Land Resources Division
WRIA	Water Resources Inventory Area

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Many King County colleagues contributed to the success of the project and to the writing of this report. Gino Lucchetti and former colleague Karen Fevold provided valuable input in developing the project scope. Melissa Boles and Karen Fevold performed the Stossel Creek streamwalk. James Schroeder and Kerry Thrasher developed the contract with the Tulalip Tribes. Ken Rauscher produced the maps that were used for the field work, Constance Carlson and Todd Klinka produced the report maps, and Laurel Preston produced the report cover. Gino Lucchetti, Kate O'Laughlin, and James Schroeder reviewed the drafts of this report and Tom Ventur formatted the final report.

INTRODUCTION

This report summarizes and interprets information collected in the field in the summer of 2002 about habitat conditions for and presence/relative distribution of multiple species of salmonids and other aquatic biota in 14 rivers and streams in the Snoqualmie Watershed between the King-Snohomish County line and Snoqualmie Falls. This information was collected by King County Water and Land Resources Division (WLRD) staff and members of the Tulalip Tribes.

Until recently, there has been a paucity of information about habitat conditions in Snoqualmie Watershed rivers and streams. In the summers of 2000 and 2001, King County WLRD staff performed an inventory of riparian and in-stream habitat conditions in the Lower Snoqualmie River mainstem downstream of the Tokul Creek confluence (River Mile 38) to the King-Snohomish County line (River Mile 6). This work included the beginning of a qualitative habitat inventory on Griffin Creek and the Raging and Tolt Rivers. Parameters that were evaluated for the qualitative inventory included general habitat condition, bank condition, channel width and depth, maturity and type of riparian vegetation, density of large woody debris (LWD), dominant substrate type, presence of pools and riffles, observed species of fish and wildlife, composition of benthic community, and location of side channels, wetlands, channel modifications, culverts, bank hardening, discharge pipes, and anthropogenic debris. In the summer of 2002, this qualitative habitat inventory was continued in these three waterbodies as well as six others that are also direct tributaries to the mainstem Snoqualmie River and five tributaries to these tributaries. Adjacent land use, stream flow, stream gradient, and water temperature were evaluated in addition to the parameters that were evaluated in 2001.

Information from this report is intended to provide a qualitative overview of existing habitat conditions for fish and other aquatic biota in Snoqualmie Watershed rivers and streams and will be used to guide further, more quantitative surveys if necessary, as well as habitat and aquatic resources management decisions in the watershed. WLRD staff will evaluate relative habitat condition, existing or potential land use issues, and potential opportunities for aquatic habitat protection and restoration actions in the Snoqualmie Watershed. The information will be shared with members of the WRIA 7 Technical Committee and will be used to inform the WRIA 7 salmon conservation and recovery plan. Furthermore, the information will provide a baseline for evaluating general trends in habitat quality over time and for adaptive management and monitoring as habitat protection and restoration actions are implemented in the Snoqualmie Watershed.

METHODS

The following rivers and streams (Map 1) were inventoried from July 10 to September 26 of 2002. River miles were selected based on the presence of anadromous salmonids and on accessibility by foot. The total distance covered was 59.6 miles.

- Cherry Creek, River Mile (RM) 0.0-5.0
- Margaret Creek, RM 0.0-1.0
- Ames Lake Creek, RM 0.0-3.9
- Harris Creek, RM 0.0-6.6
- Tolt River, RM 0.0-5.9, 7.5-7.9
- Stossel Creek, RM 0.0-5.0
- Langlois Creek, RM 0.0-1.1
- Griffin Creek, RM 0.0-3.0
- Patterson Creek, RM 0.0-10.1
- Canyon Creek, RM 0.0-2.0
- Raging River, RM 0.0-11.0
- Deep Creek, RM 0.0-1.2
- Lake Creek, RM 0.0-2.0
- Tokul Creek, RM 0.0-1.4

Two-person field teams walked each river or stream in an upstream direction and took notes and photographs approximately every 0.1 mile. Before actual recording of written information began, the teams received training in King County field protocols, including a practice session in the field. This project was modeled after stream reconnaissance surveys conducted by King County in the mid 1980s in all King County watersheds and streamwalks conducted by King County in the early 1990s in the Cedar River Basin. The following habitat features and biota were evaluated qualitatively:

- Riparian vegetation – estimated width, maturity, and density, dominant type (trees, shrubs, grasses), and major species
- LWD – estimated density
- Substrate type – visual estimate of dominant and subdominant types (cobble, gravel, sand or silt)
- Bank hardening and erosion – presence, type (revetment, levee), and whether bank armoring leads to erosion issues directly downstream from or across the stream from armored bank
- Large pools – tally, association with LWD, quality (depth and cover), and the rough location of especially large, high quality pools
- Salmonids and other finfish – presence, major species, life history stages, relative abundance, location of partial and complete barriers to migration, whether each barrier is natural or human-caused;
- Wildlife (mammals, birds, reptiles, amphibians) – presence and major species
- Mussel beds – presence

- Benthic macroinvertebrates – presence, major species, and relative abundance
- Adjacent land use, e.g., forest, agricultural, rural residential, urban residential or commercial
- Stream flow estimate
- Stream width (wetted and bankfull) and stream depth
- Stream gradient changes
- Water temperature, cold water spring inputs
- Stream tributaries, side channels, back channels, springs, seeps, wetlands, and culverts – locations, whether these features are used/accessible by fish or if they could be reconnected to allow for use and what, if any, land use impacts are occurring.
- Presence of discharge pipes, anthropogenic debris, diversion pumps, weirs, and pilings

For each reach/segment of each waterbody, the field team wrote a general description of habitat condition and biological use/value (good, fair or poor), obvious habitat problems or concerns, and opportunity and/or need for a habitat protection or restoration project. Reaches were selected for consistency of adjacent land use and river morphology.

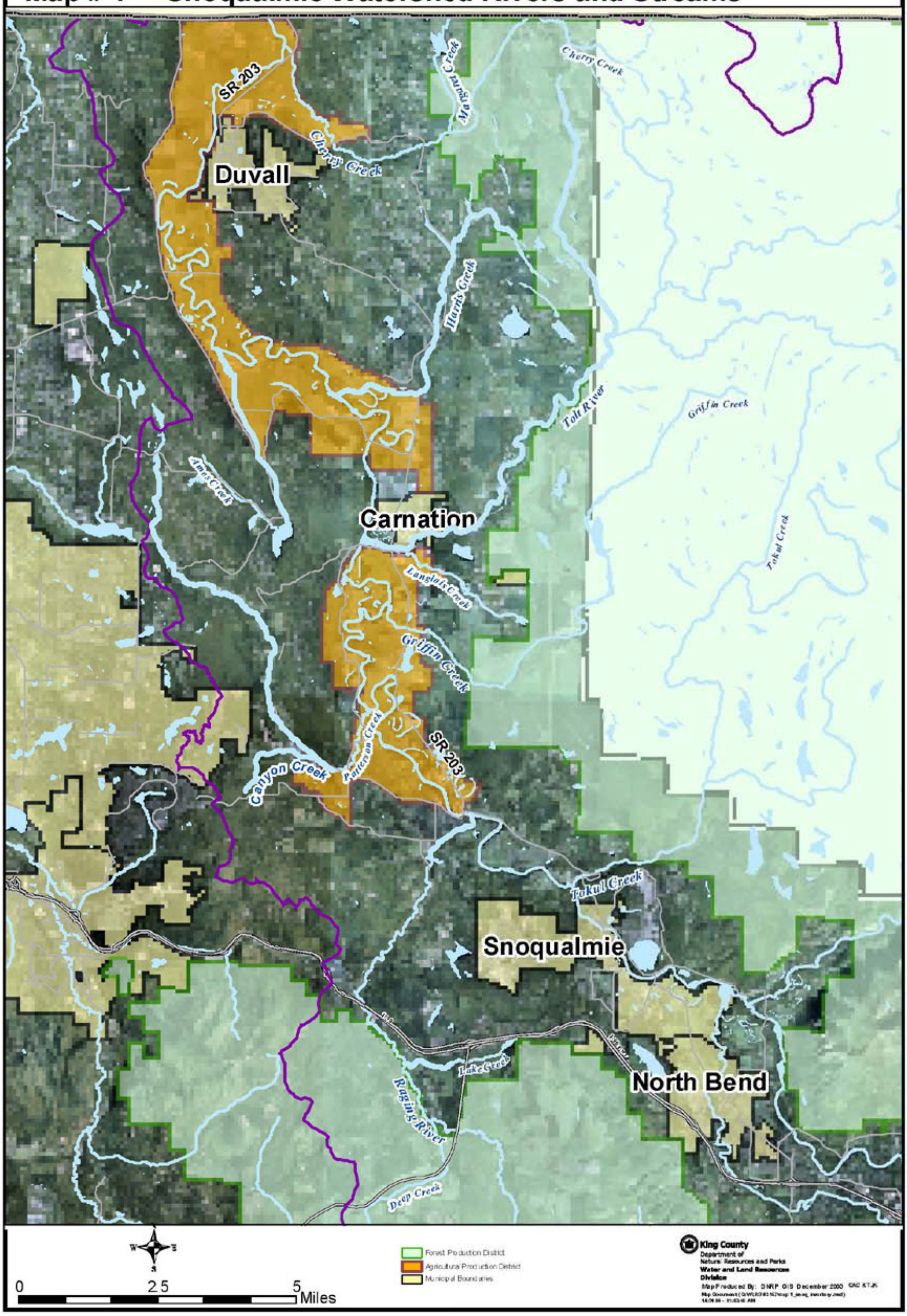
A reach was rated as "good" for habitat quality if a combination of the following habitat conditions was present, along with presence of salmon, other fish, and other aquatic species (mussels, crawfish, and benthic invertebrates such as caddisflies and mayflies that are associated with good water quality in rivers and streams).

- Mature and/or dense riparian vegetation.
- Mostly Pacific Northwest native species of trees and shrubs.
- Abundant LWD, i.e., 2–4 pieces per channel width greater than 20 m wide, >0.5 piece per channel width 10–20 m wide, and >0.3 piece per channel width <10 m wide (WDFW and Western Washington Treaty Tribes, 1997 and WFPB, 1997).
- Channel not confined by levees.
- Little or no bank hardening (revetments).
- Little or no bank erosion/little or no delivery of fine sediments to waterbody.
- Water temperature = 10°C–13.9°C which is the ideal range for salmon rearing (Bjornn and Reiser, 1991).
- Absence of fish passage problems.

A reach was rated as "poor" for habitat quality if a combination of the inverse habitat conditions was present and there was a paucity of salmon and other aquatic species.

- Immature and/or sparse riparian vegetation.
- Mostly non-native species of trees and shrubs.
- Dearth of LWD.
- Channel confined by levees.
- Extensive bank hardening.
- Extensive bank erosion and fine sedimentation.
- Water temperature $\geq$14°C.

- Presence of fish passage problems.

Reaches that displayed some “good” and some “poor” habitat conditions were rated as “fair” for overall habitat quality. Field notes were then summarized and analyzed for this report.

Map # 1 Snoqualmie Watershed Rivers and Streams