STOSSEL CREEK (RM 0–5.0), JULY 24, 30–31, AUGUST 28, AND SEPTEMBER 11, 2002

OVERVIEW:

Stossel Creek (Map 6) is a tributary to the North Fork Tolt River and flows alternately through broad wetlands and slightly steeper wooded reaches. Overall, Stossel Creek is a very productive system rich with several species of fish, invertebrates, birds, and wildlife. The wetland reaches are characterized by slow water in broad channels, with frequent beaver dams. Freshwater mussels are so abundant in the wooded reaches of Stossel Creek that the stream bottom appears in places to be paved with them (see reach descriptions for more details). Trees lining the banks of Stossel Creek are predominantly hemlock, cedar, big leaf maple, and alder.

The wooded reaches of Stossel Creek contained freshwater mussel (*Margeratifera falcata)* populations that covered the wetted width of the creek, prohibiting continuous access of the creek by foot. The wetland sections of Stossel Creek contained thick brush that also prohibited continuous access of the creek by foot. Therefore, the LWD and pool data collected was incomplete. Habitat and overall stream quality data were collected by spot checks of the creek where access was possible.

RM 0.0–0.8, HIGH GRADIENT FORESTED REACH

Reach Overview:

LWD: 7 pieces (partial count), pools N/A

This most downstream reach of Stossel Creek is confined in a wooded valley with a bankfull width of about 30 feet (Photo ST1). The water temperature was 11°C (51.8°F) at 2:00 PM on September 11, 2002. The gradient fluctuated between 3 to 15%, with a few boulder cascades and a bedrock falls where a fish ladder had been built into the LB. Sediment in this reach was gravel and cobble with embedded fines. LWD was abundant, as were freshwater mussels and coho. Crawfish, sculpins, and at least two species of frogs (one species was rusty gold with black bands coming down from its eyes, and the other species was spotted with light green stripes) were observed, as well as evidence of deer and otter use. The riparian tree canopy was composed of alder, big leaf maple, cedar, and hemlock. The riparian shrubs included Pacific ninebark, salmonberry, fern, vine maple, devils club, twinberry, horsetail, red huckleberry, blueberry, and rush. Reed canary grass and Himalayan blackberry occurred in isolated patches in this reach.

Site-Specific Observations:

A fish ladder was built into the LB around a steep boulder reach at RM 0.3. It was unclear how old this fish ladder was, who installed it, or if it worked (Photo ST2). Mussels were found in especially high densities at RM 0.7.

RM 0.8–1.9, WETLAND COMPLEX

Reach Overview:

LWD: 6 pieces (partial count), pools N/A

A large wetland complex existed between RM 0.8–1.9. This wetland had the most pronounced assemblage of invasive plants in Stossel Creek, with some patches of nightshade, Himalayan and evergreen blackberry, and a lot of reed canary grass. Below the Swan Loop Road crossing at RM 1.2, the creek was 6 to 8 feet wide and dark with dissolved organic carbons (Photo ST3). There was evidence of beaver activity. Freshwater mussels and many fish were present including coho fry and other fish that were 30–60 mm in length with deeply forked tails and big bellies. These fish may have been redside shiners.

Site-Specific Observations:

The Swan Loop Road crossing had two culverts across the Stossel Creek valley. The larger of the two was gated and resembled the snow plow on a train. Freshwater sponges were observed below these culverts. The valley upstream of the Swan Loop Road crossing was characterized as a "sea of spirea" turning into a "sea of cattails." The LB riparian vegetation along the edge of this valley was excellent with dense 40- to 50-year-old conifers, and alder, big leaf maple and willow. The RB riparian vegetation was sparse, but mature.

A large lake between RM 1.5 and 1.8 had been dammed by an abandoned logging road that stretches north-south along the base of the lake (Photos ST4-5). The current outlet of the lake was located in a bedrock outcrop on the RB side of the valley. An enormous logjam was built up at the outlet of the lake. Mussels, crawfish, and green freshwater sponges were observed near the outlet. The lake appeared to be very productive with ducks, jumping fish (unidentified species), and many midges, dragonflies and damselflies. There was a lot of wood in the lake, including submerged old growth stumps. All of the wood was debris from logging operations, and appeared to be very old.

A thin wedge of wetland valley above the lake at RM 1.85 was overgrown with reed canary grass (Photo ST6). This was the upper extent of Himalayan blackberry in Stossel Creek.

RM 1.9–2.0, FORESTED REACH

Reach Overview:

LWD: 17 pieces (partial count), pools N/A

This was a steep wooded reach below a culvert and road crossing at RM 2.0 (Photo ST7). Mussels were present here, but were less abundant than in the reach from RM 2.5–3 (see description below). For 100 feet below the road crossing, the stream tumbled down a boulder cascade overgrown with salmonberry, willow, Pacific ninebark, and dogwood. Below the cascade, the riparian shrubs were cascara, fern, nettle, Pacific ninebark, and rush. Wetted width was 8–12 feet.

RM 2.0–2.5, NARROW WETLAND VALLEY

Reach Overview:

LWD: 34 pieces (partial count), pools N/A

Between RM 2.0 and 2.5, Stossel Creek flowed through a sparsely vegetated, 100–foot wide wetland valley that did not have standing water throughout. Many coho salmon were observed, as well as a few mussels. Deer tracks were frequent and beaver modifications were abundant. Otter tracks were observed near a pile of crawfish remains, and some unidentified paw prints were photographed (Photo ST8). Valley plants were mostly rush, cattails and grasses, with some spirea, willow, alder, cascara, vernacular buttercup, salmonberry, and an invasive-looking daisy. Two large bedrock outcrops occurred between RM 2.2–2.3.

RM 2.5–3.0, MUSSEL HOT BED

Reach Overview:

LWD: 30 pieces (partial count), pools N/A

This is a non-wetland, wooded reach of Stossel Creek that was described as a "mussel hot bed" because there was a ubiquitous and dense population of mussels (Photos ST9–10). Some of the mussels were located in riffles.

The riparian canopy was comprised of 30-year-old conifers on both banks. The shrubs were mostly native with small patches of reed canary grass, Himalayan blackberry, and evergreen blackberries. Songbirds, red-tailed hawk, beaver activity, and many fish (coho salmon, threespine stickleback, and possibly whitefish and dace) were observed. The channel wetted width was 3–4 meters, and the bankfull width was 25–30 meters.

RM 3.0–4.1, NARROW WETLAND VALLEY

Reach Overview:

LWD: 29 pieces (partial count), pools N/A

In this reach, Stossel Creek flowed through a narrow wetland valley with standing water. The valley was 200–500 feet wide with dense growth of spirea (Photo ST11). Localized swampy regions had skunk cabbage, fern, and rush (Photo ST12). The riparian vegetation on both banks was sparse but mature. Several valley-spanning beaver dams had created large pools. Coho and trout were observed in these pools. One blown-out beaver dam had bear tracks that appeared to belong to an adult and a juvenile (Photo ST13), and other tracks that may have belonged to a cougar.

Site-Specific Observations:

A huge rock in the creek at RM 3.5 might be a glacial erratic (Photo ST14). The stream wrapped around it and was not very deep, indicating that the stream had little scour power at this location. Otter scat on top of the rock was composed almost entirely of crawfish shells.

RM 4.1–4.7, FORESTED REACH

Reach Overview:

LWD: N/A, pools N/A

This was a densely wooded area with a gradient of 1–3%. Otter scat and deer tracks were observed throughout this reach, and coho were observed near the road crossing at RM 4.4 (Photo ST15). Riparian trees were dense and mature. The shrubs were all native, with only a few patches of reed canary grass and nightshade near the road crossing. The dominant shrubs were salmonberry, twinberry, devils club, and salal. Mussels were not observed in this wooded area.

RM 4.7–5.0, WETLAND COMPLEX WITH BOG

Reach Overview:

LWD: N/A, pools N/A

This reach was a broad wetland, about 350 feet wide, with a lake that was approximately 500 feet long and 200 feet wide. The valley had ankle deep water throughout. Bog laurel and labrador tea grew densely at the edges of the valley. Grasses and spirea grew in this valley. The channel was approximately 4 feet deep with very steep banks and meanders. Some duckweed grew in the channel. Songbirds, kingfishers, and midges were present, and there was evidence of otter and deer use of this valley.

The riparian vegetation was dense and mature, composed of hemlock, cedar, vine maple, and alder, with about 40% conifers. There were two large beaver dams at the southern extent of the valley.

A bog at the north end of the lake consisted of labrador tea with mosses. Cattails grew all around the lake, and yellow pond lilies grew on the south and east ends of the lake. The lake bottom was at least 4 feet deep. Small fish, likely redside shiners, were very abundant in the lake. They swim in very high densities in the shallow waters.

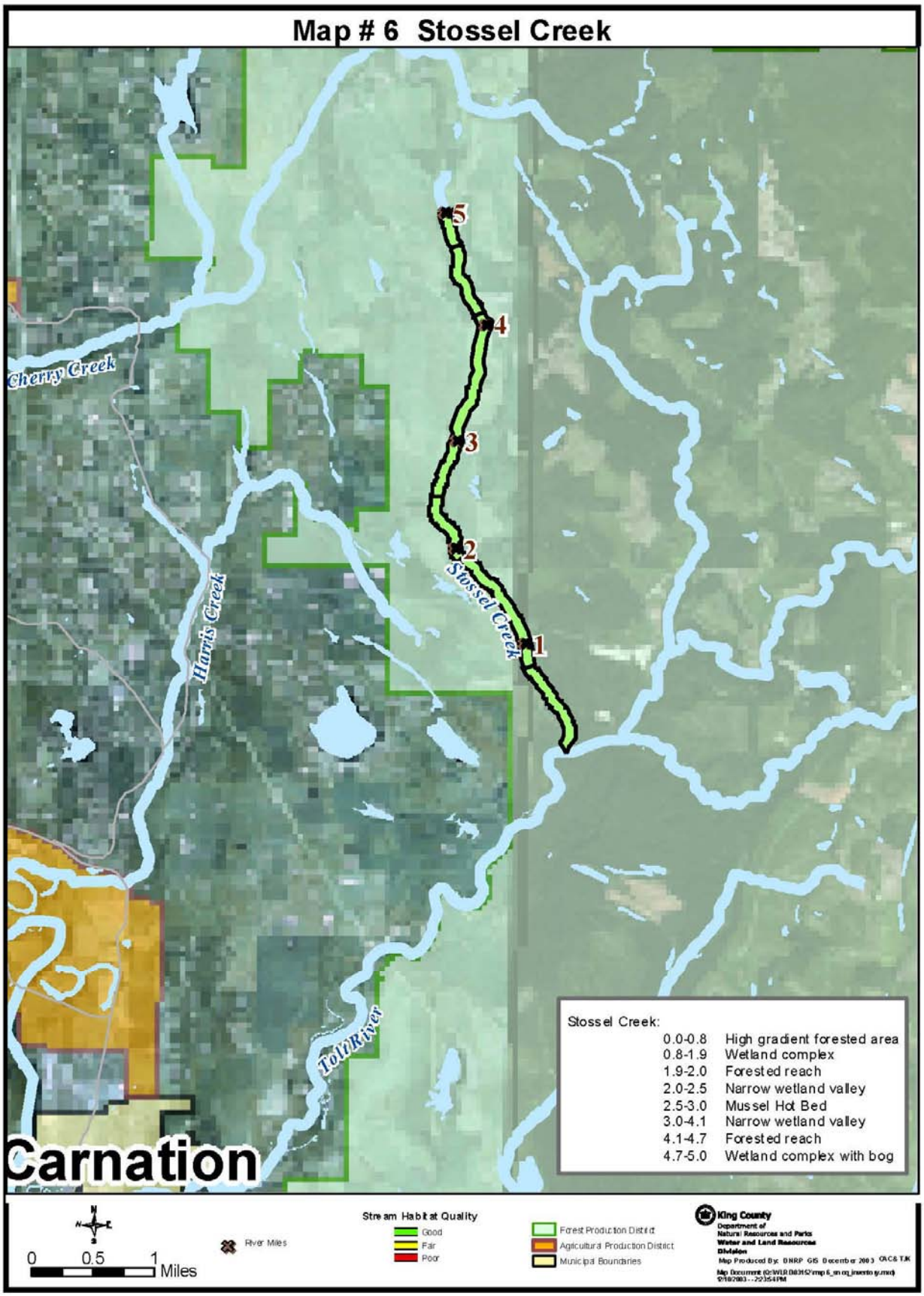

Map # 6 Stossel Creek
Cherry Creek
Harris Creek
Stossel Creek
Tolt River
Carnation
5
4
3
2
1
Stossel Creek:
0.0-0.8 High gradient forested area
0.8-1.9 Wetland complex
1.9-2.0 Forested reach
2.0-2.5 Narrow wetland valley
2.5-3.0 Mussel Hot Bed
3.0-4.1 Narrow wetland valley
4.1-4.7 Forested reach
4.7-5.0 Wetland complex with bog
0 0.5 1 Miles
River Miles
Stream Habitat Quality
Good
Fair
Poor
Forest Production District
Agricultural Production District
Municipal Boundaries
King County
Department of Natural Resources and Parks
Water and Land Resources Division

Photo ST1. RM 0.5.

Photo ST2. Fish ladder at RM .03.

Photo ST3. Swan Lake Road crossing, RM 1.2.

Photo ST4. Lake at RM 1.6, looking downstream.

Photo ST5. Lake at RM 1.6, looking upstream.

Photo ST6. Wetland valley with reed canary grass.

Photo ST7. Culvert at RM 2.0

Photo ST8. Unidentified paw prints.

Photo ST9. Wooded reach with dense freshwater mussels

Photo ST10. Freshwater mussels

Photo ST11. Wetland valley with Spirea

Photo ST12. Freshwater mussel and wetland vegetation

Photo ST13. Bear tracks at RM 3.6

Photo ST14. Boulder in channel, RM 3.5

Photo ST15. Road crossing at RM 4.4

LANGLOIS CREEK (RM 0.0–2.2), AUGUST 12, 2002

OVERVIEW:

Langlois Creek (Map 7) drains a small area between the Tolt River and Griffin Creek, entering the Snoqualmie River at Snoqualmie RM 25.6. Langlois Creek might have drained directly into the Tolt River at one time, but is now cut off by levees along the lower Tolt. The creek flows through some rural residential land in its headwaters and mostly agricultural production district land downstream of RM 2.0. In general, the creek has a dearth of riparian vegetation and an excess of fine sediments.

Stream flow is ephemeral and partially subsurface during the summer. Wetlands located at RM 2.2 appeared stagnant and no fish were observed. There was no flowing water between these wetlands and the creek at RM 1.1. Therefore, the only reach of Langlois Creek that could be walked was the Snoqualmie River floodplain reach between the mouth of the creek and RM 1.1.

RM 0.0–1.1, SNOQUALMIE RIVER FLOODPLAIN

Reach Overview:

LWD: N/A, pools N/A

Langlois Creek had a very low gradient as it flowed across the Snoqualmie River floodplain. The substrate was composed of sand and fine silt, and the wetted width varied between 1.5 feet and 50 feet in places where the stream flowed across small wetlands. The riparian vegetation for the lowest 100 feet of the creek, where the creek flowed through the Snoqualmie River's riparian zone, was composed of reed canary grass with a canopy of alder, maple, and cottonwood. Aside from some evidence of beaver activity (see details in Site-Specific Observations), neither wildlife nor salmonid use were observed.

Upstream of the Snoqualmie River riparian zone, the riparian vegetation for Langlois Creek was mostly reed canary grass with very sparse trees. Upstream of SR 203, Langlois Creek entered a broad and deep wetland area that may have been a remnant channel of another river (Photo LA2).

From RM 0.7–1.0, there was some riparian canopy composed of maple, alder, and cottonwood, but the riparian vegetation remained predominantly reed canary grass and blackberry. Native plant re-vegetation of the streambanks throughout the reach could contribute to better winter rearing habitat for salmonids.

Site-Specific Observations:

A beaver dam was photographed at RM 0.1 (Photo LA1), and another collection of debris at RM 0.4 may have been created by beavers as well.

A small road crosses Langlois Creek at RM 0.4; SR 203 crosses at RM 0.6 where the blackberry and reed canary grass are particularly dense. There are two driveway crossings at RM 0.7. At RM 0.9, NE 24th Street crosses Langlois Creek but the culvert was not located. A deep, ponded area (Photo LA3) upstream of this road crossing was filled with threespine stickleback. A broad wetland continued upstream of this pond (Photo LA4).

At RM 1.1, Langlois Creek's flow became subsurface and therefore could not be followed any further (Photo LA5). Across this farm field, there was a dry streambed with 20-foot-tall blackberry bushes.

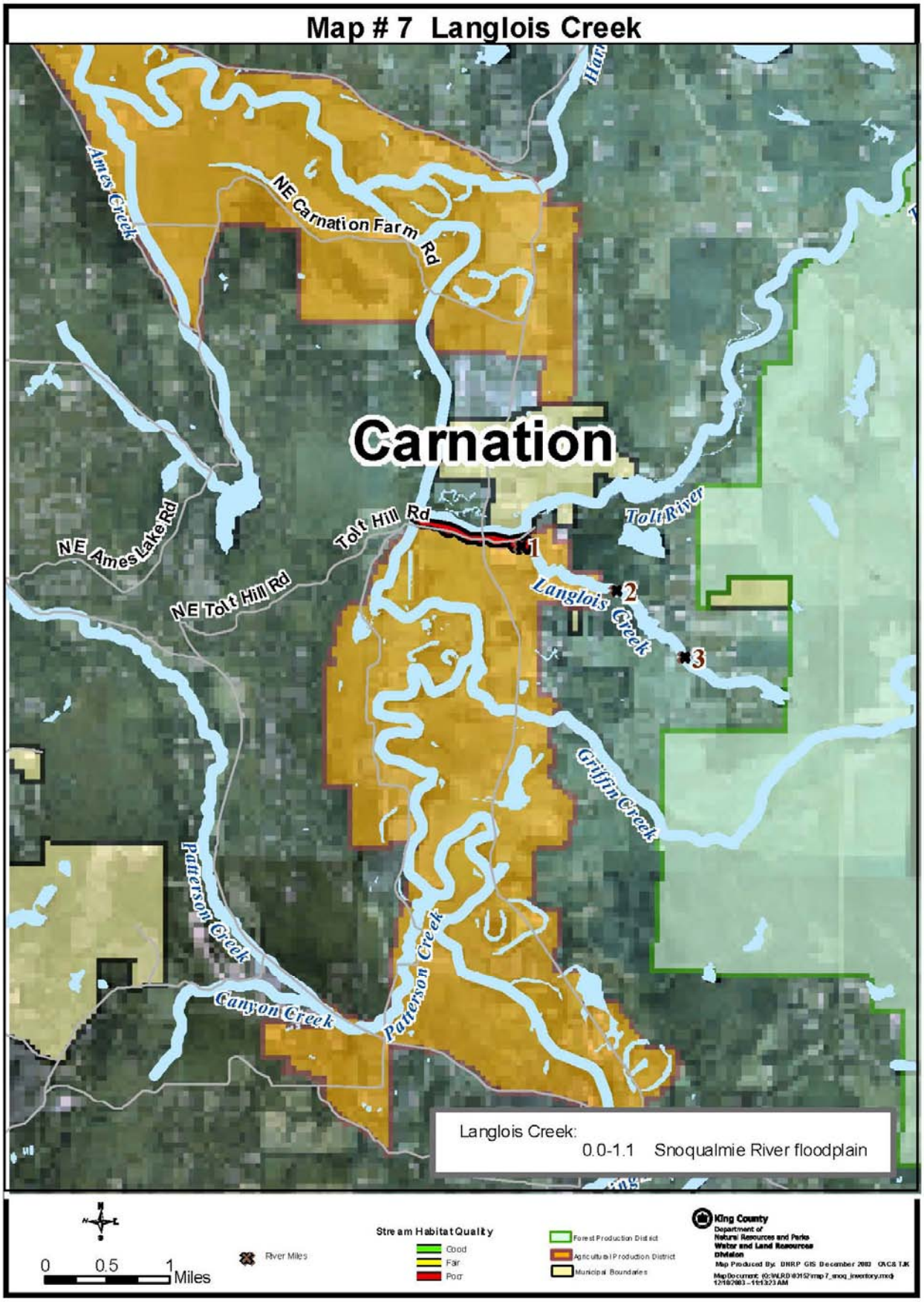

Map # 7 Langlois Creek
Carnation
Ames Creek
NE Carnation Farm Rd
NE Ames Lake Rd
Tolt Hill Rd
NE Tolt Hill Rd
Tolt River
Langlois Creek
Griffin Creek
Patterson Creek
Canyon Creek
1
2
3
Langlois Creek:
0.0-1.1 Snoqualmie River floodplain
0 0.5 1 Miles
River Miles
Stream Habitat Quality
Good
Fair
Poor
Forest Production District
Agricultural Production District
Municipal Boundaries
King County
Department of
Natural Resources and Parks
Water and Land Resources
Division
Map Produced By: DNRP GIS December 2003 CAC & TJK

Photo LA1. Beaver dam near mouth of Langlois Creek.

Photo LA2. Wetland area at RM 0.6.

Photo LA3. Deep section with reed canary grass.

Photo LA4. Wetland area at RM 0.9.

Photo LA5. Where's the creek? RM 1.0

GRIFFIN CREEK (RM 0.0–3.0), JULY 10 AND SEPTEMBER 23–24, 2002

OVERVIEW:

Griffin Creek (Map 8) is a tributary to the Snoqualmie River, flowing into the Snoqualmie at RM 26.5. The headwaters of Griffin Creek and most of its watershed are in the Forest Production District. There are many wetlands associated with the headwaters, which may account for the creek's having the largest escapement of coho salmon of all tributary watersheds in WRIA 7. Some rural residential development in the lower few river miles, coupled with agricultural practices near the mouth, create the primary detriments to habitat in Griffin Creek. Logging practices in the headwaters result in a dearth of LWD and an overabundance of fine sediments, while sparse riparian buffers may not be adequately shading the creek in the forested areas.

RM 0.0–0.7, SNOQUALMIE RIVER FLOODPLAIN

Reach Overview:

LWD: 6 pieces, 4 pools

A 500 square foot pond was backed up behind the Snoqualmie River's natural levee at the mouth of Griffin Creek. This pond offered rearing habitat and refuge from high flows in the Snoqualmie River, and was filled with juvenile coho salmon and other undetermined species of fish. Although there were some rushes growing around this ponded area, the riparian vegetation was grazed to the soil by horses that had full access to the pond.

Between the pond and the SR 203 crossing (RM 0.7), Griffin Creek meandered across the floodplain. The riparian vegetation consisted of blackberries and an occasional mature tree. The wetted width was about 8 feet with a 20- to 30-foot OHW. The gradient was about 0.5%, and the substrate was pebble and gravel with a lot of fines. The streambed morphology was riffle/glide for most of this reach with only a few pools. Juvenile coho were observed throughout this reach.

Site-Specific Observations:

A small beaver dam was found at RM 0.3. A large pool was found at RM 0.5. Some LWD that was placed in a King County project at RM 0.6 had been washed downstream to several other locations. That project site included the planting of many immature native shrubs and trees.

RM 0.7–3.0, RURAL RESIDENTIAL DEVELOPMENT

Reach Overview:

LWD: 125 pieces, 24 pools

The stream gradient was 1% at the SR 203 crossing, then increased to 2% with occasional boulder runs up to 8%. The wetted width was 15 feet with a 30 foot OHW.

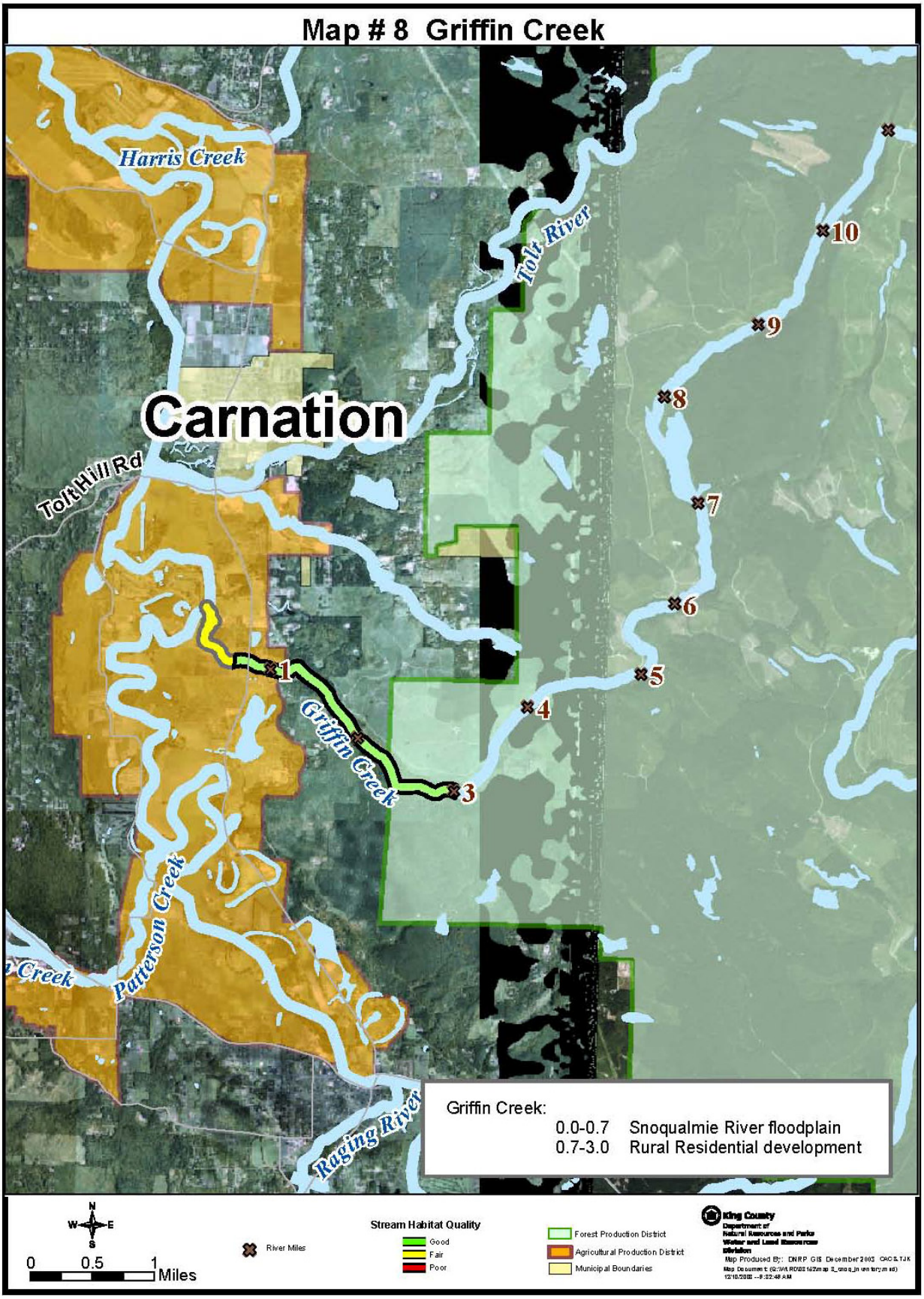
The substrate was gravel and pebble for half of this reach, and gravel and boulder for the other half (Photo GR1) with embedded fine sediments throughout. Additionally, the substrate was covered in algae for most of this reach. The channel morphology was riffle/glide with many pools, some of which were forced by LWD (Photo GR2). It appeared that several LWD placement projects had been implemented in this reach (Photo GR3); the wood in these projects comprised almost all of the LWD that was found

The riparian canopy was moderately dense from RM 0.7–1.5 and dense from RM 1.5–3.0. The canopy was composed of 70% alders and 30% conifers. The shrubs were mostly salmonberry and vine maple, with about 15% of the banks either mowed to the stream edge for a lawn or covered in blackberry, knotweed, or butterfly bush.

Juvenile coho were observed throughout this reach, along with occasional sculpin and crawfish. Caddisflies were abundant throughout, and mayflies were seen in many locations. Deer tracks were observed in several locations. Residents of the area said that they have seen cougar and bear in Griffin Creek.

Site-Specific Observations:

Although there were homes along Griffin Creek through this whole reach, the banks were hardened with riprap along only RM 0.8 – 0.9. The water temperature of 15°C (59°F) at RM 0.8 on July 10, 2002 exceeded the optimal range for salmonid rearing (Bjornn and Reiser, 1991)


Map # 8 Griffin Creek
Harris Creek
Tolt River
Carnation
Tolt Hill Rd
Griffin Creek
Patterson Creek
Raging River
1
2
3
4
5
6
7
8
9
10
Griffin Creek:
0.0-0.7 Snoqualmie River floodplain
0.7-3.0 Rural Residential development
N
W
E
S
0 0.5 1 Miles
River Miles
Stream Habitat Quality
Good
Fair
Poor
Forest Production District
Agricultural Production District
Municipal Boundaries
King County
Department of Natural Resources and Parks
Water and Land Resources Division
Map Produced By: DNRP GIS December 2003 CAC & TJK

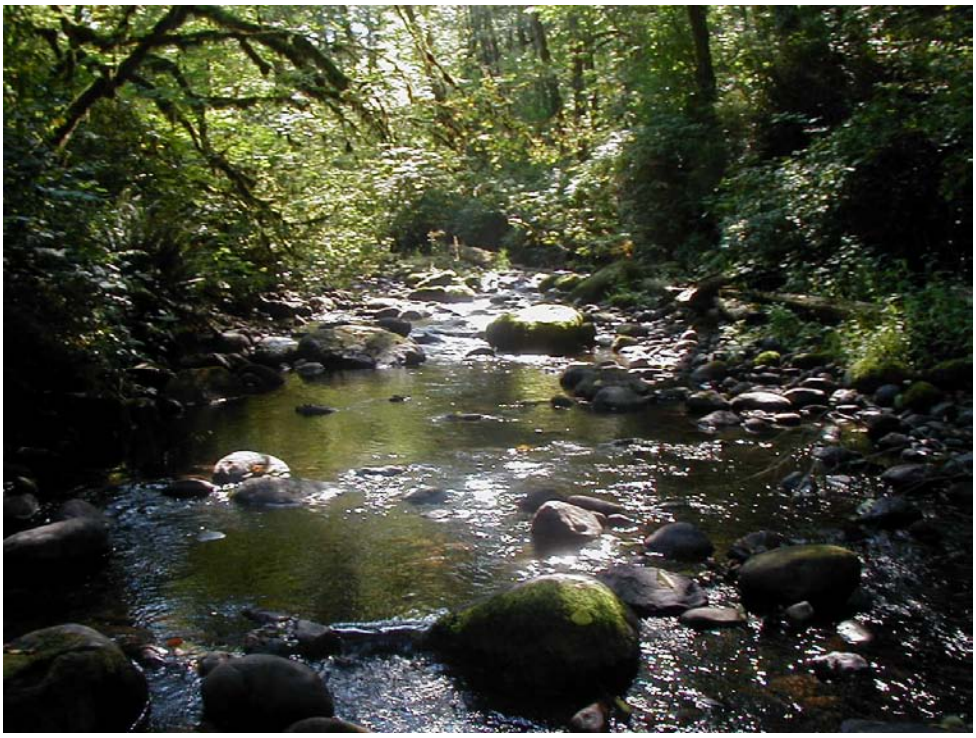


Photo GR1. Wooded reach with boulder substrate, RM 2.2.

Photo GR2. Pool at RM 2.4.

Photo GR3. Engineered LWD jam at RM 2.7.