TOLT RIVER WATERSHED ANALYSIS

FISH HABITAT ASSESSMENT MODULE

The following report summarizes the results of th fish habitat assessment module conducted in the Tolt River watershed. All products, including forms and maps, have been reviewed by fish module participants and comments from interested parties have been incorporated.

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Date

Prepared for Weyerhaeuser Company

In accordance with
Standard Methodology for Conducting Watershed Analysis
Chapter 222-22 WAC. Version 1.10
Washington Forest Practice Act Board Manual

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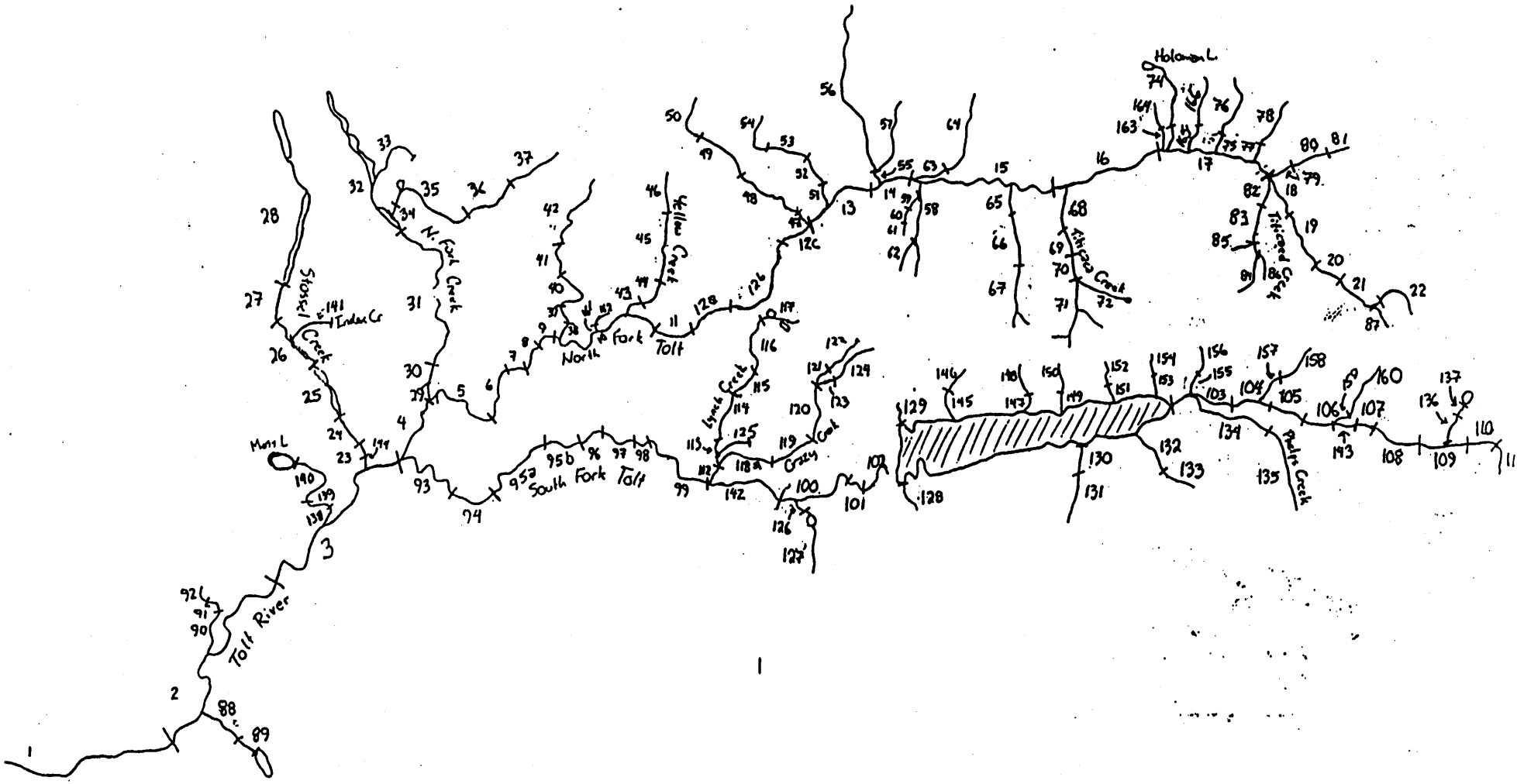
Tolt River Watershed

Response Segments



TOLT WATERSHED ANALYSIS

Fish Module Summary Report

The fish resource assessment team (listed below) worked between early January and mid March 1993 to gather pertinent historical information and conduct stream surveys. A wealth of published and unpublished reports covering a variety of topics related to the fish resources of the Tolt were available (see bibliography). Streamflow levels were favorable enough to permit foot surveys in most areas of the basin. Snow prevented road access above Titicaca Creek in the North Fork, and above the reservoir in the South Fork. A helicopter was used to reach segments 17, 18, 103, 134, and 135 in these headwater areas. One large storm event that occurred in January permitted observations of stream conditions during bankfull flows.

Fish Module Team Members

Name	Affiliation
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Kurt Beardslee	Washington Trout
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METHODS and SOURCES OF INFORMATION

Data for the Tolt Watershed Analysis Fish Habitat Module were collected in three stages. First the channel team identified stream segments based on channel gradient and confinement (Table 1). This information was used to rate the fish habitat potential for spawning, summer rearing and winter rearing in accordance with criteria provided in version 1.1 of the Watershed Analysis Manual (worksheet ff-5). Supplemental information was obtained through a literature review and interviews with biologists from the Washington Dept. of Fisheries (WDF), Seattle City Light (SCL), Seattle Water Department (SWD), King County Surface Water Management (SWM), the Tulalip Tribes (T), and Weyerhaeuser (W). Washington Trout (WT) members provided considerable information from their experience in the basin. These data were summarized on worksheets ff-1 and ff-2. The module team then met and selected segments which they felt needed field verification. Initially, sites were chosen mainly to fill gaps in the database. Later, more sites were visited to investigate situations identified by the channel team. During field visits the team verified the gradient/confinement classification for the segment and then surveyed all or part of the segment to identify existing or potential habitat problems relative to four life history stages: (1) Upstream migration of spawning adults or instream movements of fish at other life stages, (2) spawning and incubation, (3) summer rearing, and (4) winter rearing. The types of data gathered are listed on the field sheet (form ff-2). These data were transferred to form ff-3. In segments where the fish team determined the default habitat potentials should be modified, this was explained and documented on form ff-4. The segments visited by members of the fish and channel team are listed in Table 2.

Fish distribution information for the various species and races of salmonids was obtained through WARIS and observations by local biologists and Washington Trout members. The most recent version of the Washington Dept. of Natural Resources (DNR) hydrology database was used to

identify fish-bearing streams. Other data were from 1992 DNR fish surveys in tributaries to Stossel and North Fork Creeks.

No detailed, quantitative measurements of habitat parameters were made during this assessment. Fine sediments in spawning gravels were not measured because of the likely presence of live coho eggs in the gravels. Pool area was not measured because a fair amount of existing information was available and because the observations of the fish team were generally confirmed by the channel team and others during synthesis.

RESULTS

Species Composition and Distribution

Historically, 14 fish species have been observed in the Tolt River basin (Williams et al. 1975, Stober et al. 1983). Native salmonids include steelhead (*Oncorhynchus mykiss*), cutthroat (*O. clarki*), coho (*O. kisutch*), chinook (*O. tshawytscha*), chum (*O. keta*), pink (*O. gorbuscha*), sockeye (*O. nerka*), mountain whitefish (*Prosopium williamsoni*), and possibly bull trout (*Salvelinus confluentus*). Non native eastern brook trout (*S. fontinalis*) have also been reported (Stober et al. 1983). Non salmonids include torrent sculpin (*Cottus rhotheus*), longnose dace (*Rhynichthys cataractae*), redside shiner (*Richardsonius balteatus*), and brook lamprey (*Lampetra richardsoni*; Washington Rivers Information System database 1992).

The known distribution of salmonids in the Tolt basin is displayed on the fish habitat basemap (map F-1). This map shows only fish-bearing streams. In general, salmon and whitefish are thought to penetrate no farther upstream than the canyon sections of the North and South Forks (segments 6 and 95-96, respectively). However, recent surveys by the Tulalip Tribes identified what are believed to be coho redds in the S. Fork above the canyon. Steelhead occur upstream as far as the natural anadromous barriers in both the N. Fork (segment 9) and S. Fork (segment 101). Some question remains as to the extent of overlap between summer and winter steelhead races. In the N. fork, winter steelhead are thought to ascend only slightly beyond the limit of salmon distribution. In the S. Fork, the canyon section may function today, or may have functioned in the past, to separate summer and winter steelhead races. It has been speculated that this barrier was eliminated after the S. Fork reservoir altered the flow regime. This hypothesis is being investigated by the City of Seattle. Above the anadromous barrier on the north fork, the Tolt is the domain of resident rainbow (Nawa 1992) and possibly cutthroat and bulltrout. The presence of bulltrout is based on an observation by Larry Kerr, past WDW regional fish biologist for the Tolt area, who remembers capturing a bulltrout in the vicinity of the confluence of Titicaca Cr. and the N. Fork mainstem. No further reports of bulltrout have been made. Above the anadromous barrier on the south fork, in North Fork Creek, and in Lynch Creek above the Pipeline Rd., resident cutthroat are the dominant, if not exclusive, salmonid species. Besides brook lampreys, no information on the distribution of non-salmonids was available.

Fish Resource Summaries

The following summaries contain information on other aspects of the salmonid fish resources in the Tolt basin besides habitat conditions. They include information on management history, life history characteristics, and population data. They are intended to provide a portrait of the past, present, and potential future of populations of each species as context for interpreting the habitat assessments that follow. They are also included for consideration in the effectiveness monitoring component of Watershed Analysis. Note that for many species population trends cannot be accurately established with the available data.

Salmon Resource Description
Historically, five species of salmon have been observed in the Tolt River Basin. Currently, summer/fall chinook and coho are the most prevalent species. Pink salmon were abundant in some years prior to the 1960s, while chum and sockeye are observed occasionally during mainstem and S. Fk. Tolt surveys. Chinook and pink salmon spawning occurs primarily in September and October, coho from mid-November through February (usually in tributaries and mainstem side channels), and chum in November and December. Little is known about the sockeye that are observed; they may be strays from other systems, an artifact of kokanee (landlocked sockeye) production in adjacent lake systems, or a race of sockeye that do not rear in a lake system. Coho juveniles reside in the Tolt Basin for one year after emerging from the gravel, chinook juveniles reside for three to six months before migrating seaward, and pink and chum juveniles leave freshwater immediately after emerging from the incubation gravel.

Salmon Management
Since the early 1970s, all salmon species have been managed on a natural production basis in the Snohomish River Basin (which includes the Tolt sub-basin). Natural production management relies on the productive capacity of existing habitat, not fish culture facilities, to provide harvestable numbers of fish and the escapement (spawners) for future fish production. Fish escapement goals for the basin are, in part, based on estimated available production area (habitat) for the various species. Sport and commercial salmon harvest is actively managed to achieve escapement goals. Snohomish Basin fish are harvested in the ocean, the Strait of Juan de Fuca, Puget Sound, Snohomish estuary, and in freshwater. Escapement goals for the Snohomish Basin are: summer/fall chinook = 5,250; coho = 70,000; pink = 120,000; and chum = 28,000 for even numbered years, 10,200 for odd years. Spawner escapement to the Tolt River contributes to meeting these Basin goals. Habitat management objectives for this basin are no net loss of salmon habitat or its production capacity.

Hatchery Releases in Tolt
Hatchery salmon were released into the Tolt Basin from 1950 to 1973 (Table 3). Chinook and coho from Issaquah, Skykomish, Green River, and Samish hatcheries were released in the mainstem Tolt, the South Fork on occasion, and in Stossel Creek. The chinook were released on but three occasions, as unfed fry, probably representing excess production at the hatchery. Coho fry, fingerlings, and yearlings (predominantly fingerlings) were released in Stossel Creek and the mainstem. For the last 20 years, all salmon produced in the Tolt were from natural production.

Spawning Ground Surveys
Various portions of the Tolt River and Stossel Creek have been surveyed regularly for spawning chinook and coho since the early 1950s. Currently, there are two established spawning survey index reaches in the Tolt Basin, one for chinook on the mainstem Tolt (RM 0-6.0) and the other for coho on the East Fork of Stossel Creek (RM 0.0-0.3; also referred to in this assessment as "Index Creek"). Langlois Creek, once a tributary to the Tolt, also has a coho index reach. In addition, the Seattle Water Dept. began funding salmon surveys on the lower 8.2 miles of the South Fork Tolt in 1992. Index reaches were established to assist managers in determining if escapement goals are being met.

<u>Chinook</u> Historical chinook surveys were generally downstream of the North/South Fork confluence (RM 8.8) and included aerial, boat, and foot surveys. In some cases, only redds (salmon nests) were counted and during others, only fish enumerated, making data comparison somewhat difficult. In the late 1970s and throughout the 1980s, only aerial surveys of the lower 2 miles were conducted, providing limited information for the Tolt.

Tolt River chinook survey data has been reduced to a **peak count** fish/mile or redd/mile statistic in (Table 4) to provide a standard for comparison. Peak fish/mile counts ranged from 0 to over 60, the highest counts recorded in the 1950s. Contemporary counts range from 3.8-

7.2 fish/mile. The peak redd/mile counts range from 0 to over 30, but have generally been below 10 for the last 20 years of record. The records indicates a general downward tread in chinook in the Tolt Basin. The entire chinook survey record is provided in Table 5.

Coho We have a 40-year period of record for coho in the East Fork Stossel Creek (WRIA 07.0301), with fish/mile counts ranging from 0 to 1,995 (Table 4). Peak counts were generally in the 200-500 fish/mile range, except since 1987. With the exception of 1989, peak counts have been less than 25 in recent years. The occasional low count likely corresponded to years when access to the index area was blocked by beaver dams. The entire drainage is highly developed by beaver. It is not clear what has been impacting escapement for the last 6 years. This year, upstream passage appears to have been hindered by a high gradient reach at about RM 0.3. In 1989, adult passage was identified as a problem in the same reach and minor modifications (with hand equipment) to the channel were made, resulting good escapement to the index. The entire coho survey record is provided in Table 6.

Pink salmon were consistently observed in the Tolt mainstem during odd-numbered years through 1959. Peak fish/mile counts ranged from 0-313 (Table 4). A few pink salmon are occasionally observed during chinook surveys, but they are not enumerated.

Chum and Sockeye Chum are occasionally observed during chinook foot or raft surveys. In 1991, three chum were observed spawning in the South Fork. Sockeye have been consistently reported in the Tolt for many years. Little is known of their life history.

Steelhead Resource Description

Summer-run steelhead are thought to enter the Tolt system as early as the first of July, with the bulk of the fish entering in late August-early September (observations recorded by Stephen Conroy, angler and WA Trout member, in letter to R. Pfeiffer—see Pfeiffer 1990). Apparently, few fish hold in the mainstem, and instead move upstream to hold in the upper river (K. Beardslee, WA Trout, pers. comm.). Spawning occurs between March and June, with the peak in May (WDW spawner survey database). No discrimination is made between summer- and winter-run spawners during these surveys. Fry emerge between April and September (Stober et al. 1983). Juveniles remain in freshwater for approximately 2 years before seaward migration, and then spend 1-3 years at sea (Stober et al. 1983). Most fish return at an estimated average weight of 7 lbs, with a range between 2 and 14 lbs (Stephen Conroy, angler and WA Trout member, in letter to R. Pfeiffer—see Pfeiffer 1990).

Winter-run steelhead in the Tolt are less well described. Stream entry probably begins in December (R. Pfeiffer, WDW, pers. comm.). Spawning locations and timing may overlap summer steelhead where the two races co-occur. Scale samples from winter steelhead collected during angler surveys in 1981 (Stober et al. 1983) suggested that most winter steelhead return to freshwater after two summers at sea, whereas summer fish tended to remain afield for a third ocean growing season.

Steelhead Management

A variety of fishing regulations have been imposed on the Tolt River system for the past 48 years. The mainstem below the forks has generally been open to fishing for all months except for March-May (Pfeiffer 1990, his Appendix Table 6). Within this period, specific regulations have been in effect for summer (between June or July and sometime in November) and winter (typically December to March) seasons. Gear restrictions and daily catch limits probably fluctuated over the years, but no attempt was made to collect this information.

In the anadromous portions of the forks, regulations have been more restrictive. Complete closures were in effect between 1945 and 1975 (Pfeiffer 1990, his Appendix Table 6). From 1976-1991 the forks were opened to fishing under the same general regulations as the mainstem.

In 1992, in light of evidence of a decline in abundance of native summer steelhead gathered by Washington Trout, and with pressure from anglers, the Wildlife Department responded by re-closing the forks (Pfeiffer 1990). Today, the anadromous zones of both forks and their tributaries remain closed upstream of the USGS station on the mainstem. Wild steelhead release regulations are also presently in effect on the mainstem from June 1 to October 31 to protect summer-run adults en route to the forks.

Hatchery Releases in the Tolt
Hatchery-reared summer steelhead juveniles have been released into the Tolt system since 1959 (Pfeiffer 1990). These stocks originated from the Skamania and Skykomish hatcheries (Pfeiffer 1990). Prior to 1970, the only fish planted were fry and fingerlings introduced into Lynch Lake . The lake was chemically treated to remove all fish in 1958, and over the next decade, approximatedly 40,000 summer-run fry or fingerlings were stocked in hopes of producing smolts. Repeated failures eventually led to abortion of this project in 1968 (Pfeiffer 1990, his Appendix Tables 5 & 6). A naturally occurring parasite (Uzmann and Douglas 1966) was identified as a prominent source of mortality of these stocked fish. Apparently, native resident cutthroat presently survive in Lynch Lake despite the presence of this parasite (Pfeiffer 1990, his Appendix Table 6; Paul Olson, SWD, pers. comm.). After 1969, an average of approximately 23,000 smolts (range 0-50, 578) were released annually into the Tolt . No information on locations where the smolts were released was obtained during this assessment. Hatchery plants of summer-run fish were terminated altogether after 1989. Hatchery adults returning in 1993 should be the last fish from these direct introductions.

Hatchery winter-run fish from the Chambers Creek stock have been introduced into the Tolt since 1961 (Pfeiffer 1990, his Appendix Table 2). Approximately 24,000 smolts were released each year. Again, the release locations are not known. Winter-run hatchery fish continue to be released today.

Spawning Ground Surveys
The Washington Dept. of Wildlife has conducted spawner surveys in the Tolt since the early 1970s (Pfeiffer 1990, WDW unpublished databases). Fixed wing aircraft or helicopters were used prior to 1981, and foot surveys were used afterward. Surveys are conducted for all mainstem, and nearly all tributary spawnable habitat, from March 1 through mid-June. Surveys apparently do not extend upstream above segment 5 (based on rivermiles reported in WDW database). Total (summer- and winter-run) redd densities observed from 1982-1991 for the mainstem and from 1985-1991 for both forks are shown in Table 7. There were 19 redds per mile on average in the mainstem (range 4-32), 42 per mile (range 26-64) in the North Fork, and 14 per mile (range 6-17) in the South Fork. Densities fluctuated somewhat, but were fairly stable across years. According to WDW estimates for seeding levels, adequate seeding was achieved in 7 of 10 years in the mainstem, but was only achieved once in the N. Fork in 1991, and never in the S. Fork.

Trends In Adult Returns
Almost no historical run-size information is available for the Tolt's wild steelhead populations. Anecdotal information from various WDW biologists and from anglers was well summarized by Pfeiffer (1990). These accounts paint a blurry and sometimes conflicting picture of the historical size of native summer steelhead runs. Pfeiffer (1990) used WDW's habitat-based methodology to estimate that approximately 569 summer-run fish were once present (Lynch Creek system not included). No estimate of the historical winter-run population is available.

Available data suggest the Tolt's wild summer-run steelhead population is declining Snorkel surveys of the complete anadromous zone since 1989 (Washington Trout, unpublished data), coupled with redd counts and sport catch data (Pfeiffer 1990), reveal a general decline in abundance of summer populations. Sport catch data for wild winter-run fish suggests this

population has also declined since the 1986-87 return year (Table 8). However, this decline in winter-run populations has been a coastwide phenomena (Cooper and Johnson 1992).

Resident Trout Resource Description
Little is known about the resident fish populations inhabiting the Tolt system. Numerous large >15") cutthroat were observed during snorkel surveys in the N. F. canyon downstream of Yellow Creek (K. Beardslee, Wash. Trout, pers. comm.). Congleton et al. (1977) reported results on the size and age structure of cutthroat in the S. Fork reservoir.

Resident Trout Management
In the resident fish zones of the two forks, the Wildlife Department's standard trout season of June 1-October 31 has been in effect since 1955 (Pfeiffer 1990, his Appendix Table 6). These areas were closed prior to 1954. Current regulations require catch and release fishing with artificial flies or lures and single barbless hooks (WDW fishing regulations pamphlet 1992). The reservoir itself has always been closed to fishing.

Hatchery Releases in the Tolt
The stocking history for resident fish in the Tolt, if any, is not known. This information may be available but was not gathered during this assessment. Anecdotal information suggested rainbow trout were stocked in the North Fork resident zone at some time in the past (K. Beardslee, WA Trout, pers. comm.).

Habitat Assessments

This section describes current and potential future problem situations identified during the fish habitat assessment of the Tolt basin. The information is organized according to logical "pieces" of the basin that were pertinent to the species and life history stages addressed. Uncertainties and the overall confidence in conclusions drawn for each life history stage are discussed. During synthesis these problems and vulnerabilities were discussed relative to specific indicator areas, and within these areas the impacts to existing fish habitat from changes in inputs of coarse sediment, fine sediment, peak flows, LOD and riparian shade were identified. This information is incorporated into the resource assessment and causal mechanism reports (see *synthesis* section).

UPSTREAM MIGRATION

Current Problem Areas

There are several important blockages to upstream migration identified in the Tolt watershed. On the south fork, a natural waterfall forms a total barrier in segment 102 downstream of the reservoir dam (see fish distribution map F-1). On the north fork there is another natural waterfall forming a total passage barrier in segment 9. There is a potential flow barrier to salmon and winter steelhead in the south fork canyon (segments 95b-96). This barrier has not been confirmed and is currently being studied by the City of Seattle. Another hypothesized flow barrier to winter steelhead is formed by a series of cascades and low falls near the upstream end of segment 6 on the north fork. A bedrock chute near the bottom of segment 6 functions as a barrier to whitefish and salmon. Segment 29 at the entrance to North Fork Creek contains a natural waterfall that prevents anadromous fish from entering this tributary.

In Stossel Creek a high gradient cascade in segment 23 is considered a partial barrier to upstream migration. Segments 25 and 26 contain beaver dams that form partial barriers. Other beaver dams also have the potential to cause additional blocks to upstream migration.

The outlet to Spook Lake, where it flows across the mainstem floodplain below segment 88, has a debris blockage created by material deposited from a beaver dam blowout upstream.

A collapsed stringer bridge in segment 112 on Lynch creek functioned as a total upstream barrier until storm events in 1990 scoured the bed beneath the bridge allowing passage. This stringer bridge has the potential to block passage and should be removed. At present, perched culverts on the pipeline road crossings of Lynch and Crazy creeks block upstream passage. A beaver dam on the outlet to Lynch Lake is likely to be a passage barrier. Also, the shotgun culvert in segment 115 was nearly fully plugged.

Aggradation in the lower part of segment 64 on Dry Creek is filling a culvert and may become a block to upstream movement of resident cutthroat trout. Resident trout may also be blocked from entering segment 55 from the north fork due to serious aggradation from large cobbles and boulders which causes most of the flow to go sub-surface.

The culvert at the Yellow Creek road crossing in segment 43 is perched and prevents upstream movement of resident trout.

In the mainstem Tolt a lack of holding pools due to filling by coarse sediment has been identified as a concern.

Uncertainties

Adult chinook and pink salmon are known to move upstream in response to increased flows. During synthesis it was hypothesized that the reduction in freshet flows due to water retention by the dam on the south fork of the Tolt may be causing a delay or decrease in upstream migration by chinook and pink salmon. However, this relationship has not been clearly documented or quantified, and the unregulated north fork and the area below the south fork dam still contribute to freshet flows in the mainstem.

Key Vulnerabilities

Holding pools are important resting and staging areas for adult salmon migrating upstream. There must be adequate pools for fish to use en-route to upstream spawning areas. Adult salmonid spawners are vulnerable to further loss of pools through filling with coarse sediments.

Because of the limited number of holding areas and the relatively easy public access to them via the road network in the basin, adult salmonids are vulnerable to illegal harvest. Summer steelhead are particularly susceptible to this threat because of their prolonged freshwater residence prior to spawning.

Because many of the blockages were related to forest management (e.g., culverts, old bridges and debris) a mechanism to identify and remove existing and new management-related blockages would be a helpful means of reducing or eliminating these problems in the Tolt.

Confidence

The fish habitat team visited all of the barriers identified in this assessment. Confidence is good that most of the major existing and potential barriers to anadromous fish and related habitat vulnerabilities have been identified. Improved fish distribution information would improve confidence that barriers to resident fish movement have been found.

SPAWNING HABITAT

Current Problem Areas

The levees along the mainstem channel have focused flows unnaturally. In addition, coarse sediments from upstream sources have aggraded the area. These effects have resulted in a situation where flows mobilize and eliminate spawning gravels from most of the channel except along the margins. Redds built in these areas are subject to dewatering if flows drop after spawning. Also, because the aggraded substrate is unstable, redds may be subject to scour or obliteration during flow events that otherwise would pose no threat to the incubating eggs.

Historical gravel mining operations near the mouth in segment 1 may have had a dramatic negative effect on spawning success of pinks and chums, and other mainstem spawners in those years.

The outlets to Spook and Angel Lake have been scoured to bedrock by dam break floods caused by beaver dam blowouts.

In Crazy Creek, segments 119-124 have been contaminated with high percentages of fines from landslides in the headwaters.

Limited amounts of spawning gravels for resident trout were observed in Phelps Creek (segments 134,135) above the reservoir, and in the wetted channel in aggraded segments 12a, 13, 15, 17, and 55.

Spawning habitat quantity sufficient to support historical numbers of all salmonid species using the south fork below the reservoir may be limited, owing to a combination of (1) reduced upstream inputs from interception by the reservoir, (2) limited sources within the area below the reservoir, and (3) lack of LOD to retain what is available.

Uncertainties

The hypothesized mechanism for the observed lack of spawning gravels in the levied reach of the mainstem (segment 1) needs to be verified.

The suspected lack of adequate amounts of spawning gravel in the south fork above the reservoir needs to be confirmed. No information on fish spawning locations is available. The tributaries that enter the reservoir directly may provide some spawning habitat for resident trout at their mouths, but this has not been established. The delta area may also be used for spawning. However, rising water levels coincident with reservoir filling may submerge any redds constructed in this area and cause reduced spawning success.

Spawning habitat may be limited in the resident trout portion of the north fork, but this has not been established. The entire North and South Fork Tolt main channels lack in-channel LOD (see riparian summary) which functions to retain spawning gravels. Portions of the north fork above the anadromous barrier were visited by the fish team who observed very large substrate and a lack of spawning gravels. Pockets of spawning gravels may exist but there has been no work to verify this and the team assumed spawning habitat was limited.

The potential lack of spawning habitat in the south fork below the reservoir has also not been established. The hypothesized net export of spawning gravels may be offset by reduced transport capacity of the S. F. channel caused by the reservoirs effect on reducing peak flows.

For the resident trout portion of the north fork, the vulnerability to peak flows increases greatly if fall-spawning bulltrout are present. There has been one isolated report of bull trout occurring in

the north fork. Further work needs to be done to verify if bull trout are present in the Tolt system. Also, if fall-spawning salmon are introduced into Lynch Creek, or if they are found to occur in the south fork between the canyon and the anadromous barrier, vulnerability to peak flows would become a concern.

Key Vulnerabilities

In general, lack of spawning gravels is not commonly limiting to salmonids in Pacific Northwest streams. However, spawning gravels are smaller than most of the substrate materials input into the Tolt system and are more likely to be washed downstream. LOD and other hydraulic controls function to retain these smaller gravels and create pockets of spawning substrate. The overall lack of LOD in the main Tolt system may be reducing the potential spawning habitat. In the lower mainstem, where gradients are naturally more moderate, levees prevent the force of floodflows from spreading across the floodplain and this causes unusual potential for loss of gravels in these areas. These situations heighten the vulnerability to loss of spawning gravels.

In some areas, fine sediments may potentially limit the production of salmonids. Low gradient depositional areas in Stossel Creek, Lynch Creek, and mainstem side channels or portions of tributaries that flow across the mainstem floodplain are the most vulnerable to contamination by fines.

Peak flows which scour gravels may disturb or destroy redds. After spawning, redds contain eggs or alevins and are vulnerable to scour for different periods depending on the species. Coho redds are generally vulnerable from mid-November to late April, chinook from mid-September to early March, steelhead from early december to June (summer-runs from mid-April to June), pinks from September to March, resident trout from April to June, and bull trout redds, if present, would be vulnerable from September to March. Moderations of peak flows on the south fork due to dam operations has reduced vulnerabilities to peak flow in the south fork.

Specific areas of vulnerability include, Stossel creek which has good habitat but is sensitive to its free-flowing (spawning) reaches being inundated by beaver ponds. There is evidence of fines accumulating in segment 141. Lynch Creek currently has good spawning substrate but the low gradient segments (segments 114, 115) would not recover quickly from a large input of fines. Low gradient depositional segments elsewhere in the basin are the most sensitive to fines.

The outlet stream to Moss Lake is vulnerable to the same type of dam-break flood as occurred in Spook and Angel Lake outlets. Also, if beavers build dams near to the slope break at the upstream boundary of segment 23, a similar catastrophic event could occur if the dams ever fail.

Confidence

The mainstem has been extensively studied by King County. During Watershed Analysis the fish team was able to visit segments 1, 2 &3 and confidence is good that the habitat has been properly evaluated in this analysis.

The south fork below the reservoir has been extensively studied by Ebasco (1992), spawning gravel availability and condition has been well documented and confidence in the habitat rating is good.

A Stossel Creek tributary has been used as an index area for coho by WDF for over 40 years. The mainstem and south fork of the Tolt are indicator areas for chinook. In addition, Dry Creek, Lynch Creek and Crazy Creek were all visited by the fish team. Confidence is good for the habitat ratings on the low gradient indicator areas and these creeks.

Portions of the north fork Canyon were visited by the fish team and confidence is fair for the spawning habitat rating given to this reach. No spawning habitat information is available for North Fork Creek, and this tributary was not visited, so confidence in the habitat ratings is low.

The remainder of the indicator areas are above the anadromous barriers and less research has been done on the availability and condition of resident trout spawning habitat in these areas. The habitat ratings were generally based on the default calls which are designed to be conservative, but there was little field verification and confidence is low.

SUMMER REARING

Problem Areas

The fish team visited all segments on the mainstem and felt pool habitat is limited in this area. Field Reconnassiance also found most of the north fork above segment 11, Crazy Creek, Phelps Creek, segment 103 and depositional fans at the mouths of tributaries to the north fork (especially segments 55, 63, and 64 have limited pool habitat.

Surveys by Washington Trout have observed low juvenile populations and limited pool habitat in the south fork between segment 142 and 100, and below the canyon (segments 93-94). Pool habitat is also limited in segments 97-99 but data from Washington trout and WDW suggest there are high densities of juvenile steelhead. The large cobble and boulder substrate appears to provide pocket pools suitable for juvenile rearing.

Side channel habitat for winter rearing of juvenile salmon is limited in much of the system, especially the south fork and in the levied sections of segments 1 and 2 in the mainstem.

Uncertainties

Temperature has not been closely monitored in the basin, and there are several areas that have potential temperature problems (see riparian assessment results). Pool habitat in most of Stossel Creek is plentiful, however summer temperatures in beaver pond reaches may be a problem and should be monitored. The rearing habitat in Lynch Creek (segments 114-116) is excellent although the influence of Lynch lake on temperature is unclear. Finally dam releases can impact water temperatures immediately below the dam. The downstream extent of this influence is uncertain and impacts are thought to diminish within a short distance below the dam. Monitoring would help to resolve some of these uncertainties.

Research sponsored by the Seattle Water Dept. indicated the reservoir provides good rearing habitat for +1 and older cutthroat (Congleton et al. 1977). The status of rearing habitat for underyearlings in the basin above the dam is uncertain.

Key Vulnerabilities

Pools throughout the system are vulnerable to filling with coarse and fine sediments.

LOD is critical to pool development and is extremely limited in most of the basin.

Rearing fish may be particularly vulnerable to high temperature in the mainstem, parts of Stossel Creek, North Fork Creek, Lynch Creek below Lynch Lake, north bank tributaries to the lower North Fork and below the south fork dam. Monitoring would help clarify whether problems presently exist.

Confidence

Generally, where the fish team visited segments, the confidence in summer rearing condition ratings is good. Elsewhere, confidence is somewhat lower, and we relied on the fairly conservative default rating system. Our confidence was lowest when rating potential and existing conditions for rearing habitat in the entire North Fork Creek drainage, Yellow Creek, the north bank tributaries to the reservoir (potentially fish-bearing), segments 58, 65, 132 and Titicaed Creek.

The methodology does not adequately address the use of pocket pools by rearing juvenile steelhead. Observed high fish densities contradicts the rating of poor habitat conditions based on the percentage pool habitat measured by EBASCO (1992) Until this type of habitat can be better quantified, the confidence in rating present relative to potential rearing habitat conditions for steelhead is low. However, this does not affect the high confidence in the call on the vulnerability of the habitat to coarse sediment deposition.

WINTER REARING

Problem Areas

There are limited side channels and off channel rearing areas (e.g., ponds, spring-fed creeks, low gradient tributaries, etc.) that provide refuge, especially for coho, during winter high flows in the mainstem and elsewhere in the basin. Pool forming, in-channel LOD is also limited in the basin.

Gasketting of cobbles by fine sediments has degraded winter rearing habitat for steelhead and cutthroat in segment 4 of the north fork. The north fork above the anadromous barrier has cobble habitat but limited off-channel refuge. There are no side channels.

Uncertainties

Salmon (especially coho) off-channel winter habitat below the south fork canyon (segments 93 & 94) is limited to a few backwater areas and side channels. Some side channels surveyed by the channel team appeared be aggraded and may not carry enough water during winter to provide rearing habitat.

Where clean cobble habitat occurs, if the streambed is unstable from aggradation, these areas may be prone to movement which would reduce the functionality for winter habitat.

Reduction of flushing flows in the south fork may have reduced the availability of side channel habitat. The same reduction of flows may have reduced the need for winter refuge. The interrelationships between these factors and the relative impact on winter rearing habitat conditions are currently unclear.

Key Vulnerabilities

The key vulnerability of winter rearing habitat is loss of refuge from high winter flows. The filling of pools with coarse and fine sediments, and the aggradation and blockage of side channels reduce available refuge areas. LOD functioning to form deep pools also provides refuge, but is in short supply in the basin.

Specific problem areas in the basin include the levied reaches of the mainstem, where the channel is aggraded, pools have filled, and concentrated flows are are likely to scour the streambed between the levees.

The lower reach of Lynch Creek (lower section of segment 112) may be an important winter rearing area for fish from the south fork. This area is sensitive to filling of pools with coarse and fine sediments. The gorge above the trestle in Lynch Cr. (segment 116) is deeply incised and may be sensitive to failure. If this occurs and the materials are not trapped in the low gradient depositional segments downstream, they could impact segment 112 with coarse and fine sediments.

Confidence

Confidence is lower for evauations of the habitat conditions at this life history stage due to a lack of definitive criteria on what constitutes winter rearing habitat. Despite some knowledge gaps, we know that lack of side channels or off-channel areas in salmon streams is a strong indicator of an absence of winter habitat. Resident trout and steelhead are known to burrow into the substrate during cold weather, and so they are sensitive to (1) blocked access to the interstitial spaces between cobbles, or (2) being pulverized if they are in the gravel when the bed becomes mobile. The fish team visited most of the segments used by salmon, and witnessed first hand the lack of off-channel rearing areas and the condition of cobble habitat, so the confidence on calls on existing conditions for these areas is good. The same is true for the south fork below the reservoir. Confidence is lower for the resident fish zone because reconnaissance was limited.

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Table 1. List of stream response segments for the Tolt River Watershed. Confinement codes are: UC = unconfined, LC = loosely confined, MC = moderately confined, and TC= tightly confined. See channel module section of Watershed Analysis Manual for definitions and details.

STREAM	SEG. #	GRADIENT (%)	CONFINEMENT
Tolt R. mainstem	1	<1	UC
Tolt R. mainstem	2	<1	LC
Tolt R. mainstem	3	1-2	TC
North Fk. Tolt	4	2-4	TC
North Fk. Tolt	5	1-2	TC
North Fk. Tolt	6	2-4	TC
North Fk. Tolt	7	1-2	TC
North Fk. Tolt	8	4-6	TC
North Fk. Tolt	9	6-17	TC
North Fk. Tolt	10	2-4	TC
North Fk. Tolt	11	1-2	TC
North Fk. Tolt	12	<1	MC
North Fk. Tolt	13	<1	LC
North Fk. Tolt	14	1-2	TC
North Fk. Tolt	15	1-2	MC
North Fk. Tolt	16	2-4	MC
North Fk. Tolt	17	1-2	LC
North Fk. Tolt	18	2-4	TC
North Fk. Tolt	19	2-4	MC
North Fk. Tolt	20	4-6	TC
North Fk. Tolt	21	6-17	TC
North Fk. Tolt	22	>17	TC
Stossel Creek	23	4-6	TC
Stossel Creek	24	1-2	TC
Stossel Creek	25	<1	UC
Stossel Creek	26	1-2	MC
Stossel Creek	27	1-2	TC
Stossel Creek	28	<1	LC
North Fork Creek	29	6-17	TC
North Fork Creek	30	1-2	TC
North Fork Creek	31	1-2	MC
North Fork Creek	32	<1	MC
North Fork Creek	33	4-6	TC
N1 - N. Fk. Cr trib	34	6-17	TC
N1 - N. Fk. Cr trib	35	2-4	MC
N1 - N. Fk. Cr trib	36	6-17	TC
N1 - N. Fk. Cr trib	37	>17	TC
N2 - N. Fk. Cr trib	38	6-17	TC
N2 - N. Fk. Cr trib	39	1-2	TC
N2 - N. Fk. Cr trib	40	2-4	MC
N2 - N. Fk. Cr trib	41	4-6	TC
N2 - N. Fk. Cr trib	42	>17	TC
Yellow Creek	43	6-17	TC
Yellow Creek	44	4-6	TC
Yellow Creek	45	6-17	TC
Yellow Creek	46	4-6	MC

Table 1, continued

N3 - N. Fk. Cr trib	47	6-17	TC
N3 - N. Fk. Cr trib	48	>17	TC
N3 - N. Fk. Cr trib	49	2-4	TC
N3 - N. Fk. Cr trib	50	1-2	TC
N4 - N. Fk. Cr trib	51	6-17	TC
N4 - N. Fk. Cr trib	52	>17	TC
N4 - N. Fk. Cr trib	53	6-17	TC
N4 - N. Fk. Cr trib	54	2-4	MC
N5 - N. Fk. Cr trib	55	1-2	MC
N5 - N. Fk. Cr trib	56	4-6	TC
N6 - N5 trib	57	4-6	TC
N7 - N. Fk. Cr trib	58	>17	TC
N8 - N6 trib	59	>17	TC
N8 - N6 trib	60	6-17	TC
N8 - N6 trib	61	>17	TC
N9 - N6 trib	62	>17	TC
Dry Creek	63	1-2	LC
Dry Creek	64	1-2	MC
N10 - N. Fk. Tolt trib	65	4-6	MC
N10 - N. Fk. Tolt trib	66	6-17	TC
N10 - N. Fk. Tolt trib	67	>17	TC
Titicaca Creek	68	6-17	TC
Titicaca Creek	69	2-4	MC
Titicaca Creek	70	6-17	TC
Titicaca Creek	71	>17	TC
Titicaca Creek	72	>17	TC
Holoman Creek	73	4-6	MC
Holoman Creek	74	>17	TC
N11 - N. Fk. Tolt trib	75	6-17	MC
N11 - N. Fk. Tolt trib	76	>17	TC
N12 - N. Fk. Tolt trib	77	6-17	MC
N12 - N. Fk. Tolt trib	78	>17	TC
N13 - N. Fk. Tolt trib	79	6-17	MC
N13 - N. Fk. Tolt trib	80	>17	TC
N13 - N. Fk. Tolt trib	81	6-17	TC
Titicaed Creek	82	6-17	TC
Titicaed Creek	83	2-4	TC
Titicaed Creek	84	>17	TC
N14 - Titicaed trib	85	>17	TC
N15 - Titicaed trib	86	>17	TC
N16 - TN. Fk. Tolt trib	87	6-17	TC
M1 - mainstem trib	88	6-17	TC
M1 - mainstem trib	89	2-4	MC
M2 - mainstem trib	90	<1	LC
M2 - mainstem trib	91	6-17	MC
M2 - mainstem trib	92	>17	TC
South Fk. Tolt	93	1-2	MC
South Fk. Tolt	94	2-4	MC
South Fk. Tolt	95	2-4	TC
South Fk. Tolt	96	6-17	TC
South Fk. Tolt	97	1-2	MC
South Fk. Tolt	98	2-4	TC
South Fk. Tolt	99	1-2	MC

Table 1, continued

South Fk. Tolt	100	2-4	TC
South Fk. Tolt	101	4-6	TC
South Fk. Tolt	102	2-4	MC
South Fk. Tolt	103	1-2	LC
South Fk. Tolt	104	2-4	MC
South Fk. Tolt	105	1-2	MC
South Fk. Tolt	106	2-4	MC
South Fk. Tolt	107	6-17	TC
South Fk. Tolt	108	4-6	MC
South Fk. Tolt	109	<1	LC
South Fk. Tolt	110	4-6	MC
South Fk. Tolt	111	>17	TC
Lynch Creek	112	4-6	TC
Lynch Creek	113	1-2	MC
Lynch Creek	114	<1	UC
Lynch Creek	115	1-2	TC
Lynch Creek	116	<1	UC
Lynch Creek	117	1-2	MC
S1 - Lynch Cr trib	118	2-4	TC
S1 - Lynch Cr trib	119	<1	LC
S1 - Lynch Cr trib	120	1-2	MC
S1 - Lynch Cr trib	121	2-4	MC
S1 - Lynch Cr trib	122	>17	TC
S2 - S1 trib	123	2-4	MC
S2 - S1 trib	124	>17	TC
S3 - Lynch Cr trib	125	1-2	MC
S4 - S. Fk. trib	126	>17	TC
S4 - S. Fk. trib	127	1-2	LC
S5 - reservoir trib	128	6-17	TC
S6 - reservoir trib	129	6-17	TC
S7 - reservoir trib	130	6-17	MC
S7 - reservoir trib	131	>17	TC
S8 - reservoir trib	132	4-6	MC
S8 - reservoir trib	133	6-17	TC
Phelps Creek	134	1-2	MC
Phelps Creek	135	2-4	MC
S9 - S. Fk. trib	136	>17	TC
S9 - S. Fk. trib	137	6-17	TC
Moss Creek	138	1-2	LC
Moss Creek	139	4-6	TC
Moss Creek	140	1-2	MC
Index Creek	141	1-2	MC
South Fk. Tolt	142	1-2	MC
South Fk. Tolt	143	2-4	MC
Stossel Creek	144	2-4	MC
S10 - reservoir trib	145	>17	TC
S10 - reservoir trib	146	6-17	TC
S11 - reservoir trib	147	6-17	TC
S11 - reservoir trib	148	>17	TC
S12 - reservoir trib	149	6-17	TC
S12 - reservoir trib	150	>17	TC
S13 - reservoir trib	151	6-17	TC
S13 - reservoir trib	152	>17	TC

Table 1, continued

S14 - reservoir trib	153	6-17	TC
S14 - reservoir trib	154	>17	TC
S15 - South Fk. trib	155	6-17	TC
S15 - South Fk. trib	156	>17	TC
S16 - South Fk. trib	157	2-4	MC
S16 - South Fk. trib	158	>17	TC
S17 - South Fk. trib	159	2-4	MC
S17 - South Fk. trib	160	>17	TC
N17 - North Fk. trib	161	>17	TC
N17 - North Fk. trib	162	4-6	MC
N18 - North Fk. trib	163	4-6	MC
N18 - North Fk. trib	164	>17	TC
N19 - North Fk. trib	165	4-6	MC
N19 - North Fk. trib	166	>17	TC

Table 2. Summary of segments visited by fish or channel team members during or prior to the Tolt Watershed Analysis.

Indicator Area	Total # of segments in area	Segments visited by Fish Team	Segments visited by Channel Team	Segments Previously visited (dates)
Mainstem Tolt	3	1,2,3	1,3	1,2,3
North Fork Canyon	8	4,5		4,5,7,8,9,10,11
North Fork Braided Reaches	4	12b,15,17	15	13
Moderate Gradient Chutes	5	12a,18	5,6,11	12a,16
Low Gradient Tributaries, without Beaver	14	30,88,90, 103,141	103,141	
Low Gradient Tributaries, with Beaver	12	23,24,25,26,27,28,138, 144		
North Fork above Titicaed	4			19,20
Steep tributaries draining convergent topography	28	68	68	
Moderate gradient North Fork tributaries	16	55,56		
South Fork below Reservoir	11	93,94,97,98,99,100	94,95,100	93,95,96, 100,101,142
South Fork Reservoir and tributaries	36		134	
Dry Creek	2	63,64	63,64	
Lynch Creek & Crazy Creek	14	112,113,114,115,116, 117,119,120,121,123	119,122,124	112,113

Table 3. Summary of hatchery releases of salmon in the Tolt River watershed, 1950-1973. Data from Washington Dept. of Fisheries files.

HATCHERY	BROOD	SPECIES	CLASS	STOCK	NUMBER RELEASED	POUNDS RELEASED
ISSAQUAH	50	COHO	YEARLING	ISSAQUAH	39,927	945
	51	COHO	YEARLING	ISSAQUAH	42,521	671
	52	COHO	FINGERLING	ISSAQUAH	40,005	889
	53	COHO	FINGERLING	GREEN RIVER	75,650	1,513
	54	COHO	FINGERLING	ISSAQUAH	65,172	1,051
	55	COHO	FINGERLING	SAMISH	29,955	405
	TOTAL				293,230	5,474
GREEN RIVER	56	FALL CHIN	UNFED-FRY	GREEN RIVER	750,000	750
	TOTAL				750,000	750
ISSAQUAH	56	COHO	FINGERLING	GREEN RIVER	60,069	1,077
	57	COHO	FINGERLING	ISSAQUAH	11,070	190
	59	FALL CHIN	FINGERLING	ISSAQUAH	304,160	687
	58	COHO	FINGERLING	SKYKOMISH	38,982	684
	58	COHO	FINGERLING	GREEN RIVER	20,864	326
	59	COHO	FINGERLING	SKYKOMISH	102,886	1,791
	TOTAL				538,031	4,755
GREEN RIVER	60	COHO	FINGERLING	SKYKOMISH	102,720	107
	TOTAL				102,720	107
ISSAQUAH	63	COHO	FINGERLING	ISSAQUAH	161,450	4,765
	63	COHO	YEARLING	ISSAQUAH	18,772	494
	64	COHO	FINGERLING	ISSAQUAH	87,108	3,111
	67	COHO	UNFED-FRY	ISSAQUAH	152,520	123
	69	COHO	UNFED-FRY	ISSAQUAH	90,916	68
	TOTAL				510,766	8,561
SKYKOMISH	70	FALL CHIN	UNFED-FRY	SKYKOMISH	161,000	169
	TOTAL				161,000	169
ISSAQUAH	69	COHO	YEARLING	GREEN RIVER	33,000	1,500
	70	COHO	YEARLING	ISSAQUAH	31,500	1,500
	TOTAL				64,500	3,000
GREEN RIVER	73	FALL CHIN	UNFED-FRY	ISSAQUAH	450,000	450
	TOTAL				450,000	450

Table 4. Summary of spawning ground surveys for chinook and coho salmon in the Tolt River watershed, 1945-1992. The summary is based on yearly peak counts (from Washington Dept. of Fisheries files).

TOLT RIVER SPAWNER SURVEY SUMMARY
BASED ON YEARLY PEAK COUNTS

	CHINOOK			COHO		PINK
Date	RM	Fish/Mi	Redd/Mi	RM	Fish/Mi	Fish/Mi
1945						313.3
1947	0-1.1	1.8				
1949						0
1952	0-1.1	60.9		0-0.2	1995	
1953	0.6-3.1	21.8		0-0.2	100	608
1954	0-3.0	61.6	6.7			
1955	0.6-2.5	51.5		0-0.2	200	4.2
1956	0-8.8	47.1	5.3	0-0.2	190	
1957	0-1.6	54.3	30.6	0-0.2	190	120.6
1958	0-3.1	5.4	0	0-0.2	350	
1959				0-0.2	445	45
1960	0-8.8		2.4	0-0.2	230	
1961				0-0.2	0	
1962	0-8.8		0	0-0.2	550	
1963				0-0.2	60	
1964	0-4.1	9.0	2.8	0-0.2	330	
1965	0-1.1	2.7		0-0.2	0	
1966				0-0.2	740	
1967	0-6.0		0	0-0.2	145	
1968				0-0.2	5	
1969				0-0.2	0	
1970				0-0.2	215	
1971	0-8.8		3.1	0-0.2	50	
1972	0-8.8		1.0	0-0.2	125	

Table 4. Summary of spawning ground surveys for chinook and coho salmon in the Tolt River watershed, 1945-1992. The summary is based on yearly peak counts (from Washington Dept. of Fisheries files).

(continued)

	CHINOOK			COHO		PINK
Date	RM	Fish/Mi	Redd/Mi	RM	Fish/Mi	Fish/Mi
1973	0-5.5		1.9	0-0.2	75	
1974	0-6.0		4.3	0-0.2	185	
1975	0-6.0		1.3	0-0.2	85	
1976	0-8.4		0	0-0.2	545	
1977	0-2.0		8	0-0.3	390	
1978	0-2.0		7	0-0.2	110	
1979	0-2.0		2	0-0.3	753	
1980	0-2.0		2	0-0.3	590	
1981	0-2.0		1	0-0.3	216	
1982	0-2.0		2.5	0-0.3	230	
1983	0-2.0		5.5	0-0.3	280	
1984	0-2.0		4.0	0-0.5	150	
1985	0-2.0		6.0	0-0.5	196	
1986	0-2.2		5.5	0-0.5	360	
1987	0-2.2		1.8	0-0.5	0	
1988				0-0.5	16	
1989	0-8.8	5.7	12.4	0-0.5	376	
1990	0-5.7	7.2	3.5	0-0.5	22	
1991	0-6.0	3.8	4.8	0-0.5	16	
1992	0-6.1	4.2	4.8			

SALMON SPAWNING GROUND DATA RETRIEVAL

1) Sig. spawning may occur in late Oct when no survey info
2) actual surveys not good indicator of trend - not frequent enough
3) gravel clean - did not show redds well

WRIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1 2 3	AGCY	CODE
SNOHOMISH RIVER BASIN																			
TOLT R. CONT. AS N.F. TOLT R. @ R.M. 8.81																			
07	0291	47/10/07	0.0	1.1	1.1	FALL	2	0	2	1.8	1			SUPP	FOOT	3 4 0 0	22		
07	0291	52/10/30	0.0	1.1	1.1	FALL	16	51	67	60.9	1			SUPP	FOOT	4 0 0 0	22		
07	0291	53/09/23	0.0	1.1	1.1	SUMM	17	7	24	21.8	1			SUPP	FOOT		20		
07	0291	53/10/07	0.6	3.1	2.5	FALL	179	6	185	74.0	1			SUPP	BOAT	3 0 0 0	20		
07	0291	54/09/30	0.0	3.0	3.0	SUMM	168	17	185	61.7	1			SUPP	BOAT		20 61		
07	0291	54/10/02	0.0	8.8	8.8	FALL	NC	NC	NC	0.0	1		59	SUPP	AERO		20 61		
07	0291	54/10/08	0.0	3.0	3.0	FALL	83	86	169	56.3	1			SUPP	BOAT		23 60 61		
07	0291	55/10/17	0.6	2.5	1.9	FALL	84	14	98	51.6	1			SUPP	BOAT	3 0 0 0	26		
07	0291	56/10/05	0.0	3.1	3.1	FALL	143	3	146	47.1	1			SUPP	BOAT	4 0 0 0	20 61		
07	0291	56/10/05	0.0	8.8	8.8	FALL	NC	NC	NC	0.0	1		42	SUPP	AERO		20 61		
07	0291	57/10/08	0.0	8.8	8.8	FALL	NC	NC	NC	0.0	1		269	SUPP	AERO		61		
07	0291	57/10/09	0.0	1.6	1.6	FALL	79	8	87	54.4	1			SUPP	BOAT	3 0 0 0	20		
07	0291	58/10/14	0.0	3.1	3.1	FALL	16	1	17	5.5	1			SUPP	BOAT	4 0 0 0	22		
07	0291	58/10/17	0.0	8.8	8.8	FALL	NC	NC	NC	0.0	1		0	SUPP	AERO				
07	0291	60/10/18	0.0	8.8	8.8	FALL	NC	NC	NC	0.0	1		21	SUPP	AERO		60		
07	0291	62/10/16	0.0	8.8	8.8	FALL	NC	NC	NC	0.0	1		0	SUPP	AERO				
07	0291	64/10/13			0.0	FALL	NC	NC	NC	0.0	1		25	SUPP	AERO		60		
07	0291	64/10/20	0.0	1.1	1.1	FALL	8	8	16	14.5	1			SUPP	FOOT		21		
07	0291	64/10/20	1.1	4.1	3.0	FALL	4	17	21	7.0	1			SUPP	BOAT		21 60		
07	0291	65/10/27	0.0	1.1	1.1	FALL	1	2	3	2.7	1			SUPP	FOOT	3 0 0 0	22 60		
07	0291	67/10/17	0.0	6.0	6.0	FALL	NC	NC	NC	0.0	1			SUPP	AERO	3 0 0 0	60		
07	0291	71/10/11	0.0	8.8	8.8	FALL	NC	NC	NC	0.0	1		27	SUPP	AERO	3 0 0 0	20		
07	0291	71/10/18		0.0	0.0	FALL	0	0	0	0.0	1	99		SPOT	FOOT		23 60		
07	0291	72/10/06	0.0	8.8	8.8	FALL	NC	NC	NC	0.0	1	50	9	SUPP	AERO		20		
07	0291	73/10/16	0.0	5.4	5.4	FALL	NC	NC	NC	0.0	1	80	10	SUPP	AERO				
07	0291	74/09/11	0.0	6.0	6.0	FALL	NC	NC	NC	0.0	1	75	1	INDX	AERO		20 33		
07	0291	74/10/30	0.0	6.0	6.0	FALL	NC	NC	NC	0.0	1	85	26	INDX	HELI		23 33 61		

Table 5. Complete record of spawner surveys for chinook salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files).

SALMON SPAWNING GROUND DATA RETRIEVAL

Table 5. Complete record of spawner surveys for chinook salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files). (continued)

WRIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1 2 3	AGCY	CODE
TOLT R. CONT. AS N.F. TOLT R. @ R.M. 8.81																(CONTD)			
07	0291	74/10/30	6.0	8.7	2.7	FALL	NC	NC	NC	0.0	1	80	0	SUPP	HELI		23 33		
07	0291	75/09/23	0.0	6.0	6.0	FALL	NC	NC	NC	0.0	1	99	0	INDX	AERO		20		
07	0291	75/10/14	0.0	6.0	6.0	FALL	NC	NC	NC	0.0	1	95	8	INDX	AERO		20 61		
07	0291	75/10/24	0.0	6.0	6.0	FALL	NC	NC	NC	0.0	1	50	0	INDX	AERO		23		
07	0291	76/10/07	0.0	6.0	6.0	FALL	NC	NC	NC	0.0	1			INDX	AERO		22 60		
07	0291	76/10/21	0.0	6.0	6.0	FALL	NC	NC	NC	0.0	1	99	0	INDX	AERO		22 61		
07	0291	76/10/21	0.0	8.4	8.4	FALL	NC	NC	NC	0.0	1	70	0	SUPP	AERO		22 61		
07	0291	76/10/21	6.0	8.8	2.8	FALL	NC	NC	NC	0.0	1	70	0	SUPP	AERO		22 61		
07	0291	76/10/29	0.0	6.0	6.0	FALL	NC	NC	NC	0.0	1	0		INDX	AERO		25 60		
07	0291	77/10/07	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	95	1	INDX	AERO		20 60		
07	0291	77/10/14	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90		INDX	AERO		20 60		
07	0291	77/10/21	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90		INDX	AERO		20 60		
07	0291	77/10/28	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	95	16	INDX	AERO		20 60		
07	0291	78/09/12	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	95		INDX	AERO		20 60 61		
07	0291	78/09/19	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	95		INDX	AERO		20		
07	0291	78/09/28	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	25		INDX	AERO		23 60		
07	0291	78/10/08	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90		INDX	AERO		23		
07	0291	78/10/11	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90		INDX	AERO		23		
07	0291	78/10/19	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	1	INDX	AERO		20		
07	0291	78/10/31	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	14	INDX	AERO		20		
07	0291	79/09/12	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	95		INDX	AERO		20		
07	0291	79/09/26	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	0	INDX	AERO		20		
07	0291	79/10/03	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	0	INDX	AERO		20		
07	0291	79/10/10	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	1	INDX	AERO		20		
07	0291	79/10/25	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	4	INDX	AERO		20 60		
07	0291	80/09/10	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	0	INDX	AERO		20		
07	0291	80/09/17	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	0	INDX	AERO		20		
07	0291	80/09/26	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	0	INDX	AERO		20		
07	0291	80/10/02	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	0	INDX	AERO		20		
07	0291	80/10/08	0.0	6.0	6.0	FALL	NC	NC	NC	0.0	1	90	0	INDX	AERO		20 33 60		
07	0291	80/10/15	0.0	6.0	6.0	FALL	NC	NC	NC	0.0	1	90	0	INDX	AERO		20 60		
07	0291	80/10/24	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	3	INDX	AERO		20		
07	0291	80/10/29	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	4	INDX	AERO		20		
07	0291	80/11/05	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	2	INDX	AERO		20		
07	0291	81/09/30	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	0	INDX	AERO		20		
07	0291	81/10/12	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	0	INDX	AERO		20		
07	0291	81/10/20	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	0	INDX	AERO		20		
07	0291	81/10/29	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	1	INDX	AERO		20		

SALMON SPAWNING GROUND DATA RETRIEVAL

Table 5. Complete record of spawner surveys for chinook salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files). (continued)

WRIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1	2	3	AGCY	CODE
TOLT R. CONT. AS N.F. TOLT R. @ R.M. 8.81																(CONTD)					
07	0291	81/11/04	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	1	INDX	AERO		20				
07	0291	81/11/10	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	2	INDX	AERO		20				
07	0291	81/11/25	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	2	INDX	AERO		20				
07	0291	82/09/21	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	1	INDX	AERO		20				
07	0291	82/10/04	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	2	INDX	AERO		20				
07	0291	82/10/14	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	4	INDX	AERO		20				
07	0291	82/10/19	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	5	INDX	AERO		20				
07	0291	82/11/02	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	85	2	INDX	AERO		20				
07	0291	82/11/08	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	3	INDX	AERO		20				
07	0291	83/09/14	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	0	INDX	AERO		20				
07	0291	83/09/21	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	1	INDX	AERO		20				
07	0291	83/09/28	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	3	INDX	AERO		20				
07	0291	83/10/05	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	6	INDX	AERO		20				
07	0291	83/10/13	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	11	INDX	AERO		20				
07	0291	83/10/26	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	5	INDX	AERO		20				
07	0291	84/09/12	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	95	0	INDX	AERO		20				
07	0291	84/09/26	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	95	0	INDX	AERO		20				
07	0291	84/10/04	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	95	6	INDX	AERO		20				
07	0291	84/10/17	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	8	INDX	AERO		20				
07	0291	85/09/17	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	95	0	INDX	AERO		20				
07	0291	85/09/24	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	95	4	INDX	AERO		20				
07	0291	85/10/01	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	95	9	INDX	AERO		20				
07	0291	85/10/08	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1	90	12	INDX	AERO		20	60			
07	0291	85/10/15	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1			INDX	AERO		38	39			
07	0291	85/10/22	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1			INDX	AERO		28	39			
07	0291	85/10/29	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1			INDX	AERO		28	39			
07	0291	85/11/05	0.0	2.0	2.0	FALL	NC	NC	NC	0.0	1			INDX	AERO		38	39			
07	0291	86/09/16	0.0	2.2	2.2	FALL			NC	0.0	1	95	0	INDX	AERO						
07	0291	86/10/07	0.0	2.2	2.2	FALL			NC	0.0	1	99	3	INDX	AERO						
07	0291	86/10/14	0.0	2.2	2.2	FALL			NC	0.0	1	90	6	INDX	AERO						
07	0291	86/10/24	0.0	2.2	2.2	FALL			NC	0.0	1	99	12	INDX	AERO						
07	0291	86/11/10	0.0	2.2	2.2	FALL			NC	0.0	1	99	1	INDX	AERO						
07	0291	87/09/15	0.0	2.2	2.2	FALL	NC	NC	NC	0.0	1	99	0	INDX	AERO		20				
07	0291	87/09/22	0.0	2.2	2.2	FALL	NC	NC	NC	0.0	1	99	0	INDX	AERO		20				
07	0291	87/09/29	0.0	2.2	2.2	FALL	NC	NC	NC	0.0	1	90	0	INDX	AERO	3 0 0 0	20				
07	0291	87/10/06	0.0	2.2	2.2	FALL	NC	NC	NC	0.0	1	99	0	INDX	AERO		20				
07	0291	87/10/12	0.0	2.2	2.2	FALL	NC	NC	NC	0.0	1	90	0	INDX	AERO		20				
07	0291	87/10/16	0.0	2.2	2.2	FALL	NC	NC	NC	0.0	1	90	0	INDX	AERO		20				
07	0291	87/10/24	0.0	2.2	2.2	FALL	NC	NC	NC	0.0	1	90	4	INDX	AERO		20				

SALMON SPAWNING GROUND DATA RETRIEVAL

Table 5. Complete record of spawner surveys for chinook salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files). (continued)

WRIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1 2 3	AGCY	CODE
TOLT R. CONT. AS N.F. TOLT R. @ R.M. 8.81																(CONTD)			
07	0291	87/11/02	0.0	2.2	2.2	FALL	NC	NC	NC	0.0	1	90	4	INDX	AERO		20		
07	0291	89/09/22	0.0	2.0	2.0	CHIN	NC	NC	NC	0.0	1	90	2	INDX	AERO		20		
07	0291	89/09/28	0.0	2.0	2.0	CHIN	NC	NC	NC	0.0	1	90	2	INDX	AERO		20		
07	0291	89/10/02	0.0	2.0	2.0	CHIN	NC	NC	NC	0.0	1	85	0	INDX	AERO		20		
07	0291	89/10/05	0.0	2.0	2.0	CHIN	NC	NC	NC	0.0	1	90	2	INDX	AERO		20		
07	0291	89/10/16	0.0	2.0	2.0	CHIN	NC	NC	NC	0.0	1	80	8	INDX	AERO		20		
07	0291	89/10/25	0.0	2.8	2.8	FALL	16	4	20	7.1	1	70	41	SUPP	FOOT		24		
07	0291	89/10/25	2.8	5.7	2.9	FALL	24	1	25	8.6	1	60	37	SUPP	FOOT		23		
07	0291	89/10/25	5.7	8.8	3.1	FALL	3	2	5	1.6	1	60	31	SUPP	FOOT		23 33		
									50				109						
07	0291	90/09/19	0.0	6.0	6.0	CHIN	NC	NC	NC	0.0	1	95	0	INDX	AERO		20		
07	0291	90/09/26	0.0	6.0	6.0	CHIN	NC	NC	NC	0.0	1	90	4	INDX	AERO				
07	0291	90/10/05	0.0	6.0	6.0	CHIN	NC	NC	NC	0.0	1			INDX	AERO		28 39		
07	0291	90/10/10	0.0	6.0	6.0	CHIN	NC	NC	NC	0.0	1			INDX	AERO		28 39		
07	0291	90/10/24	0.0	5.7	5.7	CHIN	37	4	41	7.2	1	63	20	SUPP	RAFT		26 33 60		
07	0291	91/10/24	0.0	6.0	6.0	CHIN	17	6	23	3.8	1	60	29	SUPP	RAFT		21 32 60		
07	0291	92/09/16	0.0	6.0	6.0	CHIN	NC	NC	NC	0.0	1	85	0	SUPP	AERO		57		
07	0291	92/09/23	0.0	6.0	6.0	CHIN	NC	NC	NC	0.0	1	75	0	SUPP	AERO		60 57		
07	0291	92/10/01	0.0	6.0	6.0	CHIN	NC	NC	NC	0.0	1	50	0	SUPP	AERO		20		
07	0291	92/10/07	0.0	6.0	6.0	CHIN	NC	NC	NC	0.0	1	70	0	SUPP	AERO				
07	0291	92/10/13	0.0	6.1	6.1	CHIN	21	5	26	4.3	1	75	29	SUPP	RAFT		23 32		
07	0291	92/10/14	0.0	6.0	6.0	CHIN	NC	NC	NC	0.0	1	80	14	INDX	AERO				
SOUTH FORK TOLT RIVER (LB)																			
07	0302	86/10/06	0.2	2.7	2.5	FALL	22	1	23	9.2	1	60	16	SUPP	FOOT		23 33 60		
07	0302	86/10/06	2.5	4.0	1.5	FALL	0	0	0	0.0	1	95	7	SUPP	SHIM	6 0 0 0	12 23 60	Cowan	
07	0302	91/09/26	0.0	1.6	1.6	SUMM	0	0	0	0.0	1	40	0	SUPP	FOOT		11 23 60	31	
07	0302	91/10/17	0.0	1.6	1.6	SUMM	3	1	4	2.5	1	35	5	SUPP	FOOT		23 31 60	31	
07	0302	91/10/17	3.3	6.8	3.5	SUMM	0	0	0	0.0	1	45	0	SUPP	FOOT	6 0 0 0	23 32 60	31	
07	0302	91/10/18	6.8	8.2	1.4	SUMM	0	0	0	0.0	1	45	0	SUPP	FOOT		23 32 60	31	
07	0302	91/10/28	0.0	1.6	1.6	SUMM	0	0	0	0.0	1	30	3	SUPP	FOOT		23 34 60	31	
07	0302	91/10/28	3.3	6.8	3.5	SUMM	0	0	0	0.0	1	35	0	SUPP	FOOT	6 0 0 0	23 31 60	31	
07	0302	91/10/29	6.8	8.2	1.4	SUMM	0	0	0	0.0	1	35	0	SUPP	FOOT		23 60	31	
GRIFFIN CREEK (RB)																			
07	0364	45/10/25		0.0	0.0	FALL	2	0	2	0.0	1			SPOT		3 4 0 0	60 65		
07	0364	46/10/01	0.7	0.9	0.2	FALL	0	0	0	0.0	1			SUPP	FOOT		20		
07	0364	49/09/15	0.0	0.7	0.7	SUMM	0	0	0	0.0	1			SUPP	FOOT				
07	0364	51/10/26	0.0	0.7	0.7	FALL	4	0	4	5.7	1			SUPP	FOOT	3 4 0 0			

SALMON SPAWNING GROUND DATA RETRIEVAL

Table 6. Complete record of spawner surveys for coho salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files).

WRIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1	2	3	AGCY	CODE
SNOHOMISH RIVER BASIN																					
TOLT R. CONT. AS N.F. TOLT R. @ R.M. 8.81																					
07	0291	47/10/07	0.0	1.1	1.1	COHO	10	0	10	9.1	4			SUPP	FOOT	1 3 0 0	22				
07	0291	52/10/30	0.0	1.1	1.1	COHO	0	1	1	0.9	4			SUPP	FOOT	1 0 0 0	22				
07	0291	56/10/05	0.0	3.1	3.1	COHO	5	0	5	1.6	4			SUPP	BOAT	1 0 0 0	20				
07	0291	58/10/14	0.0	3.1	3.1	COHO	1	0	1	0.3	4			SUPP	BOAT	1 0 0 0	22				
07	0291	76/12/02	0.6	8.3	7.7	COHO	0	0	0	0.0	4			SUPP	FOOT		21	60			
07	0291	76/12/03	9.0	9.7	0.7	COHO	0	0	0	0.0	4	90		SUPP	FOOT		20	60			
07	0291	76/12/03	9.7	10.8	1.1	COHO	0	0	0	0.0	4	80		SUPP	FOOT		20	60			
07	0291	76/12/10	8.8	9.0	0.2	COHO	0	0	0	0.0	4			SUPP	FOOT		24	30	60		
07	0291	76/12/10	9.2	10.8	1.6	COHO	0	0	0	0.0	4	50		SUPP	FOOT		23	60			
07	0291	76/12/21	9.7	11.0	1.3	COHO	2	0	2	1.5	4	50		SUPP	FOOT		20	60			
07	0291	77/01/10	9.7	11.0	1.3	COHO	0	0	0	0.0	4	40		SUPP	FOOT		23	60	64		
LANGLOIS CREEK (LB) Lower Tolt																					
07	0292	77/01/13	1.5	1.8	0.3	COHO	28	25	53	176.7	4	80		SUPP	FOOT		23	60			
07	0292	77/01/14	0.0	0.6	0.6	COHO	0	2	2	3.3	4	10		SUPP	FOOT		22	60			
07	0292	77/01/14	0.6	1.0	0.4	COHO	2	2	4	10.0	4	30		SUPP	FOOT		24	60			
07	0292	77/01/14	1.0	1.4	0.4	COHO	2	2	4	10.0	4	5		SUPP	FOOT		23	60			
07	0292	77/01/20	0.6	1.0	0.4	COHO	1	2	3	7.5	4	40		SUPP	FOOT		24	60			
07	0292	77/01/20	1.5	1.8	0.3	COHO	85	20	105	350.0	4	80		SUPP	FOOT		24	52	60		
07	0292	77/01/24	1.5	1.8	0.3	COHO	81	35	116	386.7	4	70		SUPP	FOOT		21	53	60		
07	0292	77/01/28	1.5	1.8	0.3	COHO	72	51	123	410.0	4	80		SUPP	FOOT		20	60			
07	0292	77/01/31	1.5	1.8	0.3	COHO	44	96	140	466.7	4	85		SUPP	FOOT		20	34	60		
07	0292	77/02/04	1.5	1.8	0.3	COHO	15	132	147	490.0	4	75		SUPP	FOOT		20	60	68		
07	0292	77/02/08	1.0	1.6	0.6	COHO	4	101	105	175.0	4	75		SUPP	FOOT		20	60			
07	0292	77/02/08	1.6	1.8	0.2	COHO	0	24	24	120.0	4	90		SUPP	FOOT		20	60			
07	0292	77/02/11	0.0	0.6	0.6	COHO	0	1	1	1.7	4	10		SUPP	FOOT		20	60			
07	0292	77/02/15	1.3	1.6	0.3	COHO	0	110	110	366.7	4	95		SUPP	FOOT		20	60			
07	0292	77/02/15	1.6	1.8	0.2	COHO	0	22	22	110.0	4	90		SUPP	FOOT		20	60			
07	0292	77/11/03	0.6	1.0	0.4	COHO	0	0	0	0.0	4	80		SUPP	FOOT		20				
07	0292	77/11/03	1.0	1.2	0.2	COHO	0	0	0	0.0	4	60		SUPP	FOOT		25	31	60		
07	0292	77/11/03	1.4	1.8	0.4	COHO	0	0	0	0.0	4	90		SUPP	FOOT		20	60			
07	0292	77/11/10	0.0	0.6	0.6	COHO	0	0	0	0.0	4			SUPP	FOOT		20	60			
07	0292	77/11/10	0.6	1.2	0.6	COHO	0	0	0	0.0	4	90		SUPP	FOOT		20	31	60		
07	0292	77/11/18	0.6	1.0	0.4	COHO	0	0	0	0.0	4	60		SUPP	FOOT		23	60			
07	0292	77/11/18	1.6	1.7	0.1	COHO	0	0	0	0.0	4	60		SUPP	FOOT		23	60			
07	0292	77/11/28	0.6	1.1	0.5	COHO	0	0	0	0.0	4	50		SUPP	FOOT		27				
07	0292	77/12/09	0.6	1.2	0.6	COHO	0	1	1	1.7	4	50		SUPP	FOOT		23	30	60		
07	0292	77/12/09	1.4	1.8	0.4	COHO	0	0	0	0.0	4	90		SUPP	FOOT		23	60			

SALMON SPAWNING GROUND DATA RETRIEVAL

Table 6. Complete record of spawner surveys for coho salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files). (Continued)

WRIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1 2 3	AGCY	CODE
																(CONTD)			
LANGLOIS CREEK (LB)																			
07	0292	77/12/10	1.0	0.0	0.0	COHO	0	0	0	0.0	4	20		SPOT	FOOT		60		
07	0292	77/12/10	1.7	1.8	0.1	COHO	0	0	0	0.0	4	80		SUPP	FOOT		23 60		
07	0292	77/12/21	0.6	1.2	0.6	COHO	3	0	3	5.0	4	65		SUPP	FOOT		24 60		
07	0292	77/12/21	1.3	1.8	0.5	COHO	140	2	142	284.0	4	95		SUPP	FOOT		23 60		
07	0292	77/12/29	0.6	1.2	0.6	COHO	2	2	4	6.7	4	90		SUPP	FOOT		20 60		
07	0292	77/12/29	1.4	1.8	0.4	COHO	52	54	106	265.0	4	95		SUPP	FOOT		20 60		
07	0292	77/12/29	1.8	1.9	0.1	COHO	0	0	0	0.0	4	80		SUPP	FOOT		20 60		
07	0292	78/01/09	0.6	1.2	0.6	COHO	0	2	2	3.3	4	95		SUPP	FOOT		23 60 75		
07	0292	78/01/09	1.3	2.0	0.7	COHO	12	77	89	127.1	4	85		SUPP	FOOT		24		
07	0292	78/01/17	1.3	1.8	0.5	COHO	0	3	3	6.0	4	95		SUPP	FOOT		20 60 75		
07	0292	78/12/18	1.7	1.8	0.1	COHO	1	0	1	10.0	4	95	2	SUPP	FOOT		20 60		
07	0292	78/12/27	1.7	1.8	0.1	COHO	0	2	2	20.0	4	60		SUPP	FOOT		20 60		
07	0292	79/02/14	1.3	0.0	0.0	COHO	10	0	10	0.0	4	95		SPOT	FOOT		23 60		
07	0292	80/12/22	1.1	1.4	0.3	COHO	113	16	129	430.0	4	80		SUPP	FOOT		20 60		
07	0292	81/01/02	1.1	1.4	0.3	COHO	104	60	164	546.7	4	90		SUPP	FOOT		20		
07	0292	81/10/28	1.3	0.0	0.0	COHO	0	0	0	0.0	4	75		SPOT	FOOT		24 31 71		
07	0292	81/11/05	0.9	1.3	0.4	COHO	0	0	0	0.0	4	99		INDX	FOOT		20		
07	0292	81/11/11	0.9	1.3	0.4	COHO	0	0	0	0.0	4	90		INDX	FOOT		20 33 34		
07	0292	81/11/18	0.9	1.3	0.4	COHO	0	0	0	0.0	4	80		INDX	FOOT		23		
07	0292	81/11/30	0.9	1.3	0.4	COHO	0	0	0	0.0	4	85	1	INDX	FOOT		20		
07	0292	81/12/07	1.1	1.3	0.2	COHO	11	0	11	55.0	4	40		INDX	FOOT		00 25		
07	0292	81/12/09	0.9	1.3	0.4	COHO	27	0	27	67.5	4	75		INDX	FOOT		24		
07	0292	81/12/17	0.9	1.3	0.4	COHO	36	0	36	90.0	4	75		INDX	FOOT		24		
07	0292	81/12/21	0.9	1.3	0.4	COHO	23	3	26	65.0	4	75		INDX	FOOT		23 33		
07	0292	81/12/29	0.9	1.3	0.4	COHO	18	4	22	55.0	4	85		INDX	FOOT		20		
07	0292	82/01/07	0.9	1.3	0.4	COHO	2	7	9	22.5	4	85		INDX	FOOT		20		
07	0292	82/10/28	0.9	1.3	0.4	COHO	0	0	0	0.0	4	90	0	INDX	FOOT		20		
07	0292	82/11/05	0.9	1.3	0.4	COHO	0	0	0	0.0	4	80	0	INDX	FOOT		21		
07	0292	82/11/12	0.9	1.3	0.4	COHO	0	0	0	0.0	4	85	0	INDX	FOOT		20 30		
07	0292	82/11/19	0.9	1.3	0.4	COHO	0	0	0	0.0	4	80	0	INDX	FOOT		24		
07	0292	82/11/26	0.9	1.3	0.4	COHO	0	0	0	0.0	4	80	0	INDX	FOOT		20		
07	0292	82/12/07	0.9	1.3	0.4	COHO	42	0	42	105.0	4	70	12	INDX	FOOT		24		
07	0292	82/12/13	0.9	1.3	0.4	COHO	28	0	28	70.0	4	75	20	INDX	FOOT		24		
07	0292	82/12/20	0.9	1.3	0.4	COHO	51	6	57	142.5	4	80	34	INDX	FOOT		23		
07	0292	82/12/30	0.9	1.3	0.4	COHO	7	1	8	20.0	4	90	20	INDX	FOOT		20		
07	0292	83/01/04	0.9	1.3	0.4	COHO	1	5	6	15.0	4	70	7	INDX	FOOT		24		
07	0292	83/01/14	0.9	1.3	0.4	COHO	27	1	28	70.0	4	75		INDX	FOOT		23		
07	0292	83/01/20	0.9	1.3	0.4	COHO	8	10	18	45.0	4	80		INDX	FOOT		20 61		
07	0292	83/01/31	0.9	1.3	0.4	COHO	0	5	5	12.5	4	90		INDX	FOOT		20 60		
07	0292	83/11/03	0.9	1.3	0.4	COHO	0	0	0	0.0	4	60		INDX	FOOT		24		

SALMON SPAWNING GROUND DATA RETRIEVAL

Table 6. Complete record of spawner surveys for coho salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files). (cont'd)

WRIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1	2	3	AGCY	CODE
LANGLOIS CREEK (LB)																(CONTD)					
07	0292	83/11/11	0.9	1.3	0.4	COHO	0	0	0	0.0	4	85		INDX	FOOT		20				
07	0292	83/11/18	0.9	1.3	0.4	COHO	7	0	7	17.5	4	75		INDX	FOOT		27	31			
07	0292	83/11/29	0.9	1.3	0.4	COHO	3	0	3	7.5	4	85		INDX	FOOT		20				
07	0292	83/12/06	0.9	1.3	0.4	COHO	1	0	1	2.5	4	90		INDX	FOOT		20				
07	0292	83/12/13	0.9	1.3	0.4	COHO	6	0	6	15.0	4	90		INDX	FOOT		23				
07	0292	83/12/20	0.9	1.3	0.4	COHO	0	2	2	5.0	4	90		INDX	FOOT		20				
07	0292	83/12/29	0.9	1.3	0.4	COHO	0	0	0	0.0	4	80		INDX	FOOT		20				
07	0292	84/01/05	0.9	1.3	0.4	COHO	36	0	36	90.0	4	70		INDX	FOOT		24				
07	0292	84/01/12	0.9	1.3	0.4	COHO	34	3	37	92.5	4	90		INDX	FOOT		20				
07	0292	84/01/18	0.9	1.3	0.4	COHO	14	2	16	40.0	4	90		INDX	FOOT		20				
07	0292	84/01/25	0.9	1.3	0.4	COHO	8	4	12	30.0	4	70		INDX	FOOT		24				
07	0292	84/10/10	0.9	1.3	0.4	COHO	0	0	0	0.0	4	99		INDX	FOOT		20				
07	0292	84/11/15	0.9	1.3	0.4	COHO	0	0	0	0.0	4	85		INDX	FOOT		20				
07	0292	84/11/23	0.9	1.3	0.4	COHO	0	0	0	0.0	4	75		INDX	FOOT		20				
07	0292	84/11/30	0.9	1.3	0.4	COHO	0	0	0	0.0	4	90		INDX	FOOT		20				
07	0292	84/12/07	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT		20				
07	0292	84/12/14	0.9	1.3	0.4	COHO	0	0	0	0.0	4	90		INDX	FOOT		20				
07	0292	84/12/21	0.9	1.3	0.4	COHO	0	0	0	0.0	4	90		INDX	FOOT		20	30			
07	0292	84/12/29	0.9	1.3	0.4	COHO	0	0	0	0.0	4	90		INDX	FOOT		20				
07	0292	85/01/08	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT		20				
07	0292	85/02/27	0.9	1.3	0.4	COHO	3	0	3	7.5	4	90	0	INDX	FOOT		20				
07	0292	85/10/28	0.9	1.3	0.4	COHO	0	0	0	0.0	4	90		INDX	FOOT		23				
07	0292	85/11/05	0.9	1.3	0.4	COHO	0	0	0	0.0	4	80		INDX	FOOT		23				
07	0292	85/11/14	0.9	1.3	0.4	COHO	0	0	0	0.0	4	90		INDX	FOOT		20				
07	0292	85/11/21	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT		20				
07	0292	85/12/04	0.9	1.3	0.4	COHO	0	0	0	0.0	4	80		INDX	FOOT		24				
07	0292	85/12/11	0.9	1.3	0.4	COHO	0	0	0	0.0	4	90		INDX	FOOT		23				
07	0292	85/12/18	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT		20				
07	0292	85/12/27	0.9	1.3	0.4	COHO	0	0	0	0.0	4	90		INDX	FOOT		20				
07	0292	86/01/06	0.9	1.3	0.4	COHO	0	0	0	0.0	4	85		INDX	FOOT		23				
07	0292	86/01/13	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT		20				
07	0292	86/01/21	0.9	1.3	0.4	COHO	45	0	45	112.5	4	80		INDX	FOOT		27				
07	0292	86/01/28	0.9	1.3	0.4	COHO	24	2	26	65.0	4	85		INDX	FOOT		23				
07	0292	86/02/04	0.9	1.3	0.4	COHO	1	25	26	65.0	4	95		INDX	FOOT		23				
07	0292	86/11/03	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT		20				
07	0292	86/11/10	0.9	1.3	0.4	COHO	0	0	0	0.0	4	90		INDX	FOOT		20				
07	0292	86/11/18	0.9	1.3	0.4	COHO	0	0	0	0.0	4	85		INDX	FOOT		23				
07	0292	86/11/30	0.9	1.3	0.4	COHO	26	0	26	65.0	4	90		INDX	FOOT		23	60	61		
07	0292	86/12/04	0.9	1.3	0.4	COHO	14	2	16	40.0	4	90		INDX	FOOT		20		61		
07	0292	86/12/11	0.9	1.3	0.4	COHO	2	8	10	25.0	4	95		INDX	FOOT		20	61			
07	0292	86/12/18	0.9	1.3	0.4	COHO	1	6	7	17.5	4	95		INDX	FOOT		20	60			
07	0292	86/12/29	0.9	1.3	0.4	COHO	3	4	7	17.5	4	85		INDX	FOOT		27	34	61		

SALMON SPAWNING GROUND DATA RETRIEVAL

Table 6. Complete record of spawner surveys for coho salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files).

(cont)

WRIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1	2	3	AGCY	CODE
LANGLOIS CREEK (LB)																(CONTD)					
07	0292	87/01/08	0.9	1.3	0.4	COHO	55	2	57	142.5	4	90		INDX	FOOT		23	61			
07	0292	87/01/15	0.9	1.3	0.4	COHO	36	9	45	112.5	4	90		INDX	FOOT		20	61			
07	0292	87/01/22	0.9	1.3	0.4	COHO	0	10	10	25.0	4	90		INDX	FOOT		20	60			
07	0292	87/11/05	0.9		0.0	COHO	0	0	0	0.0	4	95		SPOT	FOOT			57	60		
07	0292	87/11/19	0.9	1.0	0.1	COHO	0	0	0	0.0	4	95		INDX	FOOT			57	60		
07	0292	87/11/25	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT		20	57			
07	0292	87/12/03	0.9	1.3	0.4	COHO	0	0	0	0.0	4	90		INDX	FOOT		24				
07	0292	87/12/10	0.9	1.3	0.4	COHO	7	0	7	17.5	4	95		INDX	FOOT		20				
07	0292	87/12/17	0.9	1.3	0.4	COHO	3	1	4	10.0	4	95		INDX	FOOT		20				
07	0292	87/12/24	0.9	1.3	0.4	COHO	3	1	4	10.0	4	95		INDX	FOOT		20	61			
07	0292	87/12/31	0.9	1.3	0.4	COHO	3	0	3	7.5	4	95		INDX	FOOT		20				
07	0292	88/01/06	0.9	1.3	0.4	COHO	1	1	2	5.0	4	95		INDX	FOOT		20	61			
07	0292	88/01/21	0.9	1.3	0.4	COHO	1	1	2	5.0	4	90		INDX	FOOT		20	33			
07	0292	88/11/02	0.9	1.3	0.4	COHO	0	0	0	0.0	4	90		INDX	FOOT			20	60		
07	0292	88/11/09	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT				20		
07	0292	88/11/16	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT				20		
07	0292	88/11/23	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT				23		
07	0292	88/12/02	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT				20		
07	0292	88/12/09	0.9	1.3	0.4	COHO	4	0	4	10.0	4	95		INDX	FOOT			20	60		
07	0292	88/12/19	0.9	1.3	0.4	COHO	8	6	14	35.0	4	95		INDX	FOOT		20	52	60		
07	0292	88/12/27	0.9	1.3	0.4	COHO	4	1	5	12.5	4	95		INDX	FOOT				20		
07	0292	89/01/04	0.9	1.3	0.4	COHO	37	5	42	105.0	4	95		INDX	FOOT			23	60		
07	0292	89/01/18	0.9	1.3	0.4	COHO	7	9	16	40.0	4	95		INDX	FOOT			23	61		
07	0292	89/01/25	0.9	1.3	0.4	COHO	0	9	9	22.5	4	90		INDX	FOOT		20				
07	0292	89/10/30	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT				20		
07	0292	89/11/06	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT				20		
07	0292	89/11/13	0.9	1.3	0.4	COHO	20	0	20	50.0	4	95		INDX	FOOT			23	61		
07	0292	89/11/20	0.9	1.3	0.4	COHO	1	0	1	2.5	4	95		INDX	FOOT			20	60		
07	0292	89/11/29	0.9	1.3	0.4	COHO	1	1	2	5.0	4	95		INDX	FOOT			20	61		
07	0292	89/12/06	1.3		0.0	COHO	0	0	0	0.0	4	20		SPOT	FOOT		28	39			
07	0292	89/12/08	1.8	1.9	0.1	COHO	17	0	17	170.0	4	90		SUPP	FOOT		23	60			
07	0292	89/12/11	0.9	1.3	0.4	COHO	47	2	49	122.5	4	70		INDX	FOOT			24	31		
07	0292	89/12/22	0.9	1.3	0.4	COHO	10	9	19	47.5	4	95		INDX	FOOT				20		
07	0292	90/01/03	0.9	1.3	0.4	COHO	2	10	12	30.0	4	95		INDX	FOOT			20	61		
07	0292	90/01/13	0.9	1.3	0.4	COHO	9	11	20	50.0	4	85		INDX	FOOT			26	60		
07	0292	90/01/22	0.9	1.3	0.4	COHO	0	8	8	20.0	4	95		INDX	FOOT			20	60		
07	0292	90/11/02	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT			20	60		
07	0292	90/11/08	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT				20		
07	0292	90/11/15	0.9	1.3	0.4	COHO	2	0	2	5.0	4	95		INDX	FOOT			20	61		
07	0292	90/11/21	0.9	1.3	0.4	COHO	1	0	1	2.5	4	95		INDX	FOOT			20	61		
07	0292	90/11/29	0.9	1.3	0.4	COHO	3	0	3	7.5	4	90		INDX	FOOT			23	60		

SALMON SPAWNING GROUND DATA RETRIEVAL

Table 6. Complete record of spawner surveys for coho salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files). (Cont'd)

WRIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1	2	3	AGCY	CODE
LANGLOIS CREEK (LB)																(CONTD)					
07	0292	90/12/12	0.9	1.3	0.4	COHO	2	0	2	5.0	4	95		INDX	FOOT			20	61		
07	0292	90/12/24	0.9	1.3	0.4	COHO	0	0	0	0.0	4	60		INDX	FOOT			20	37		
07	0292	91/01/04	0.9	1.3	0.4	COHO	0	0	0	0.0	4	90		INDX	FOOT				20		
07	0292	91/11/04	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT			20	60		
07	0292	91/11/12	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT				20		
07	0292	91/11/20	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT			61	20		
07	0292	91/11/26	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT				20		
07	0292	91/12/04	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT			20	60		
07	0292	91/12/11	0.9	1.3	0.4	COHO	19	3	22	55.0	4	90		INDX	FOOT			61	24		
07	0292	91/12/18	0.9	1.3	0.4	COHO	11	2	13	32.5	4	95		INDX	FOOT			61	20		
07	0292	91/12/26	0.9	1.3	0.4	COHO	3	0	3	7.5	4	95		INDX	FOOT			20	60		
07	0292	92/01/02	0.9	1.3	0.4	COHO	0	2	2	5.0	4	95		INDX	FOOT				20		
07	0292	92/01/10	0.9	1.3	0.4	COHO	0	0	0	0.0	4	95		INDX	FOOT				20		
UNKNOWN																					
07	0292,	30/13/19	0.0	1.3	1.3	COHO	0	5	5	3.8	4	90		INDX	FOOT		20	60			
UNNAMED TRIBUTARY (R.B. TRIB. TO TOLT. R. SIDE CHANNEL @ 2.8)																					
07	0292B	76/12/08	0.0	0.9	0.9	COHO	1	0	1	1.1	4	90		SUPP	FOOT		20	60			
07	0292B	76/12/15	0.0	0.9	0.9	COHO	0	0	0	0.0	4	90		SUPP	FOOT		20	60			
07	0292B	76/12/21	0.0	0.9	0.9	COHO	1	1	2	2.2	4	90		SUPP	FOOT		20	60			
07	0292B	77/01/04	0.0	0.9	0.9	COHO	0	0	0	0.0	4	80		SUPP	FOOT		20				
07	0292B	77/01/10	0.0	0.9	0.9	COHO	0	0	0	0.0	4	80		SUPP	FOOT		20	37			
07	0292B	77/01/20	0.0	0.9	0.9	COHO	0	0	0	0.0	4	95		SUPP	FOOT		20				
07	0292B	77/01/24	0.0	0.9	0.9	COHO	0	0	0	0.0	4	95		SUPP	FOOT		20				
07	0292B	77/02/02	0.0	0.9	0.9	COHO	0	0	0	0.0	4	99		SUPP	FOOT		20	60			
07	0292B	77/11/03	0.0	0.9	0.9	COHO	0	0	0	0.0	4	99		SUPP	FOOT		20	33	60		
07	0292B	77/11/04	0.0	0.0	0.0	COHO	0	0	0	0.0	4	99		SPOT	FOOT		23				
07	0292B	77/11/10	0.0	0.9	0.9	COHO	0	0	0	0.0	4	75		SUPP	FOOT		21	60			
07	0292B	77/12/05	0.0	0.9	0.9	COHO	0	0	0	0.0	4	50		SUPP	FOOT		25	60			
07	0292B	77/12/09	0.0	0.9	0.9	COHO	1	0	1	1.1	4	50		SUPP	FOOT		22	60			
07	0292B	78/01/12	0.0	0.9	0.9	COHO	0	0	0	0.0	4	85		SUPP	FOOT		23				
07	0292B	78/01/17	0.0	0.9	0.9	COHO	0	0	0	0.0	4	95		SUPP	FOOT		23				
UNNAMED TRIBUTARY (R.B. TRIB. TO TOLT. R. SIDE CHANNEL @ 2.5)																					
07	0292C	77/02/02	0.0	0.2	0.2	COHO	0	0	0	0.0	4	99		SUPP	FOOT		20	60			
UNNAMED TRIBUTARY (R.B. TRIB. TO TOLT. R. SIDE CHANNEL @ 3.4)																					
07	0292D	76/12/08	0.0	0.5	0.5	COHO	5	1	6	12.0	4	75		SUPP	FOOT		20	30	60		
07	0292D	76/12/15	0.0	0.5	0.5	COHO	2	1	3	6.0	4	99		SUPP	FOOT	2 0 0 0	20	60			
07	0292D	76/12/21	0.0	0.5	0.5	COHO	4	0	4	8.0	4	95		SUPP	FOOT	2 0 0 0	20				
07	0292D	77/01/04	0.0	0.5	0.5	COHO	3	2	NC	0.0	4	20		SUPP	FOOT		22				
07	0292D	77/01/04	0.0	0.5	0.5	COHO	3	2	5	10.0	4	20		SUPP	FOOT		22				

SALMON SPAWNING GROUND DATA RETRIEVAL

Table 6. Complete record of spawner surveys for coho salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files).

(cont'd.)

WRIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1 2 3	AGCY	CODE
UNNAMED TRIBUTARY (R.B. TRIB. TO TOLT. R. SIDE CHANNEL @ 3.4)																(CONTD)			
07	0292D	77/01/10	0.0	0.5	0.5	COHO	7	1	8	16.0	4	80		SUPP	FOOT		20 33 60		
07	0292D	77/01/20	0.0	0.5	0.5	COHO	5	1	6	12.0	4	65		SUPP	FOOT		24		
07	0292D	77/01/24	0.0	0.5	0.5	COHO	6	0	6	12.0	4	65		SUPP	FOOT		20		
07	0292D	77/01/31	0.0	0.5	0.5	COHO	4	1	5	10.0	4	85		SUPP	FOOT		20 34 60		
07	0292D	77/02/02	0.0	0.5	0.5	COHO	9	1	10	20.0	4	95		SUPP	FOOT		20 60		
07	0292D	77/02/08	0.0	0.5	0.5	COHO	4	3	7	14.0	4	75		SUPP	FOOT		20 60		
07	0292D	77/11/03	0.0	0.5	0.5	COHO	7	0	7	14.0	4	80		SUPP	FOOT		20 60		
07	0292D	77/11/04	0.0	0.0	0.0	COHO	0	0	0	0.0	4	99		SPOT	FOOT		23		
07	0292D	77/11/10	0.0	0.5	0.5	COHO	5	0	5	10.0	4	60		SUPP	FOOT		25 60		
07	0292D	77/12/05	0.3	0.5	0.2	COHO	2	0	2	10.0	4	10		SUPP	FOOT		25 60		
07	0292D	77/12/09	0.0	0.5	0.5	COHO	16	1	17	34.0	4	20		SUPP	FOOT		24 38 60		
07	0292D	78/01/12	0.0	0.5	0.5	COHO	34	0	34	68.0	4	60		SUPP	FOOT		38 60		
07	0292D	78/01/17	0.0	0.5	0.5	COHO	33	3	36	72.0	4	95		SUPP	FOOT		20 60		
07	0292D	78/01/23	0.0	0.5	0.5	COHO	13	7	20	40.0	4	90		SUPP	FOOT		20 60 75		
UNNAMED TRIBUTARY (R.B. TRIB. TO .0292D)																			
07	0292E	77/01/20	0.0	0.3	0.3	COHO	8	0	8	26.7	4	90		SUPP	FOOT		20 60		
07	0292E	77/01/24	0.0	0.3	0.3	COHO	3	0	3	10.0	4	85		SUPP	FOOT		20 60		
07	0292E	77/01/31	0.0	0.3	0.3	COHO	1	0	1	3.3	4	90		SUPP	FOOT		20 60		
07	0292E	77/11/03	0.0	0.3	0.3	COHO	2	0	2	6.7	4	90		SUPP	FOOT		20 60		
07	0292E	77/11/10	0.0	0.3	0.3	COHO	0	0	0	0.0	4	90		SUPP	FOOT		23 60		
07	0292E	77/12/05	0.0	0.3	0.3	COHO	1	0	1	3.3	4	95		SUPP	FOOT		23 60		
07	0292E	77/12/10	0.0	0.3	0.3	COHO	0	0	0	0.0	4	99		SUPP	FOOT		57 60		
07	0292E	78/01/12	0.0	0.0	0.0	COHO	0	0	0	0.0	4	99		SPOT	FOOT		57		
07	0292E	78/01/17	0.0	0.3	0.3	COHO	0	0	0	0.0	4	99		SUPP	FOOT		20 60		
07	0292E	78/01/23	0.0	0.0	0.0	COHO	0	0	0	0.0	4	99		SPOT	FOOT		57		
UNNAMED TRIBUTARY (LB)																			
07	0293	80/12/17	1.1	1.4	0.3	COHO	108	7	115	383.3	4	85		SUPP	FOOT		20		
UNNAMED TRIBUTARY (RB)																			
07	0294	76/12/10	0.0	0.7	0.7	COHO	2	0	2	2.9	4	95		SUPP	FOOT		20 60		
07	0294	76/12/15	0.0	0.3	0.3	COHO	5	0	5	16.7	4	99		SUPP	FOOT		20 60		
07	0294	76/12/21	0.0	0.3	0.3	COHO	1	0	1	3.3	4	99		SUPP	FOOT		20		
07	0294	77/01/04	0.0	0.3	0.3	COHO	11	0	11	36.7	4	90		SUPP	FOOT		20		
07	0294	77/01/10	0.0	0.3	0.3	COHO	6	2	8	26.7	4	80		SUPP	FOOT		20		
07	0294	77/01/20	0.0	0.3	0.3	COHO	16	1	17	56.7	4	80		SUPP	FOOT		24 60		
07	0294	77/01/24	0.0	0.3	0.3	COHO	12	2	14	46.7	4	80		SUPP	FOOT		20 60		
07	0294	77/01/31	0.0	0.3	0.3	COHO	8	1	9	30.0	4	85		SUPP	FOOT		20 60		
07	0294	77/02/02	0.0	0.7	0.7	COHO	13	4	17	24.3	4	90		SUPP	FOOT		20 60		
07	0294	77/02/08	0.0	0.7	0.7	COHO	11	9	20	28.6	4	90		SUPP	FOOT		20 60 68		
07	0294	77/02/15	0.0	0.7	0.7	COHO	6	7	13	18.6	4	90		SUPP	FOOT		20 60		
07	0294	77/11/03	0.0	0.2	0.2	COHO	0	0	0	0.0	4	99		SUPP	FOOT		20 48 60		

SALMON SPAWNING GROUND DATA RETRIEVAL

Table 6. Complete record of spawner surveys for coho salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files). (cont.)

WRIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1 2 3	AGCY	CODE
UNNAMED TRIBUTARY (RB)																(CONTD)			
07	0294	77/11/04	0.0	0.0	0.0	COHO	0	0	0	0.0	4	99		SPOT	FOOT		23		
07	0294	77/12/09	0.0	0.0	0.0	COHO	0	0	0	0.0	4	99		SPOT	FOOT		57		
07	0294	78/01/12	0.0	0.8	0.8	COHO	21	1	22	27.5	4	85		SUPP	FOOT		24 48 60		
07	0294	78/01/17	0.0	0.8	0.8	COHO	16	4	20	25.0	4	95		SUPP	FOOT		23		
07	0294	78/01/23	0.0	0.8	0.8	COHO	15	6	21	26.3	4	85		SUPP	FOOT		23		
UNNAMED TRIBUTARY (RB)																			
07	0298	76/12/02	0.0	0.2	0.2	COHO	0	0	0	0.0	4	99		SUPP	FOOT		20 30 60		
STOSSEL CREEK (RB)																			
07	0300	44/11/13	0.0	1.5	1.5	COHO	250	0	250	166.7	4			SUPP	FOOT		60 65		
07	0300	56/11/29	0.0	1.5	1.5	COHO	51	2	53	35.3	4			SUPP	FOOT		60		
07	0300	56/12/17	0.0	1.5	1.5	COHO	123	7	130	86.7	4			SUPP	FOOT		60		
07	0300	56/12/27	0.0	1.5	1.5	COHO	32	49	81	54.0	4			SUPP	FOOT		60		
07	0300	76/12/02	0.0	0.4	0.4	COHO	2	5	7	17.5	4	95		SUPP	FOOT		20 60		
07	0300	76/12/02	0.4	0.9	0.5	COHO	0	0	0	0.0	4	50		SUPP	FOOT		20 60		
07	0300	76/12/09	0.0	0.4	0.4	COHO	68	4	72	180.0	4	90		SUPP	FOOT		20 60		
07	0300	76/12/15	0.0	0.4	0.4	COHO	25	4	29	72.5	4	75		SUPP	FOOT		20 60		
07	0300	76/12/21	0.0	0.4	0.4	COHO	37	3	40	100.0	4	80		SUPP	FOOT		20 60		
07	0300	76/12/28	0.0	0.4	0.4	COHO	94	3	97	242.5	4	60		SUPP	FOOT		24 60		
07	0300	76/12/28	0.4	0.9	0.5	COHO	30	0	30	60.0	4	25		SUPP	FOOT		23 60		
07	0300	76/12/30	0.0	0.9	0.9	COHO	204	4	208	231.1	4	60		SUPP	FOOT		24 30 60		
07	0300	77/01/04	0.0	0.4	0.4	COHO	79	3	82	205.0	4	80		SUPP	FOOT		20 60		
07	0300	77/01/04	0.4	0.9	0.5	COHO	9	0	9	18.0	4	50		SUPP	FOOT		20 60		
07	0300	77/01/04	1.4	1.6	0.2	COHO	3	1	4	20.0	4	60		SUPP	FOOT		24 42 60		
07	0300	77/01/10	0.0	0.4	0.4	COHO	40	4	44	110.0	4	80		SUPP	FOOT		20 37 60		
07	0300	77/01/10	0.4	0.9	0.5	COHO	2	1	3	6.0	4	50		SUPP	FOOT		20 37 60		
07	0300	77/01/10	1.4	1.6	0.2	COHO	4	4	8	40.0	4	80		SUPP	FOOT		20 37 60		
07	0300	77/01/14	0.0	0.4	0.4	COHO	45	10	55	137.5	4	50		SUPP	FOOT		21 52 60		
07	0300	77/01/14	0.4	0.9	0.5	COHO	5	2	7	14.0	4	60		SUPP	FOOT		21 60		
07	0300	77/01/14	1.4	1.6	0.2	COHO	7	2	9	45.0	4	65		SUPP	FOOT		20 60		
07	0300	77/01/14	2.4	3.2	0.8	COHO	0	0	0	0.0	4	50		SUPP	FOOT		23 60		
07	0300	77/01/18	0.0	0.4	0.4	COHO	27	1	28	70.0	4	25		SUPP	FOOT		27 60		
07	0300	77/01/18	0.0	1.4	1.4	COHO	12	2	14	10.0	4	60		SUPP	FOOT		27 60		
07	0300	77/01/18	0.4	0.9	0.5	COHO	7	0	7	14.0	4	10		SUPP	FOOT		27 60		
07	0300	77/01/18	1.9	0.0	0.0	COHO	3	1	4	0.0	4	50		SPOT	FOOT		27 42 60		
07	0300	77/01/21	1.4	1.6	0.2	COHO	24	13	37	185.0	4	60		SUPP	FOOT		23 53 60		
07	0300	77/01/25	0.0	0.4	0.4	COHO	33	3	36	90.0	4	70		SUPP	FOOT		23 52 60		
07	0300	77/01/25	0.4	0.9	0.5	COHO	2	2	4	8.0	4	60		SUPP	FOOT		23 60		
07	0300	77/01/25	1.4	1.6	0.2	COHO	17	32	49	245.0	4	50		SUPP	FOOT		21 60		
07	0300	77/01/25	1.8	1.9	0.1	COHO	54	19	73	730.0	4	50		SUPP	FOOT		20 60 68		
07	0300	77/01/25	1.9	2.2	0.3	COHO	40	7	47	156.7	4	65		SUPP	FOOT		20 60		
07	0300	77/01/28	0.0	0.4	0.4	COHO	30	2	32	80.0	4	75		SUPP	FOOT		20 60		

SALMON SPAWNING GROUND DATA RETRIEVAL

Table 6. Complete record of spawner surveys for coho salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files). (cont)

WRIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1 2 3	AGCY	CODE
																(CONTD)			
STOSSEL CREEK (RB)																			
07	0300	77/01/28	1.4	1.6	0.2	COHO	10	42	52	260.0	4	65		SUPP	FOOT		20 60		
07	0300	77/01/28	1.8	1.9	0.1	COHO	53	20	73	730.0	4	85		SUPP	FOOT		20 60		
07	0300	77/01/28	1.9	2.2	0.3	COHO	34	0	34	113.3	4	75		SUPP	FOOT		20 60		
07	0300	77/02/02	0.0	0.4	0.4	COHO	21	2	23	57.5	4	80		SUPP	FOOT		20 60		
07	0300	77/02/02	1.4	1.6	0.2	COHO	10	50	60	300.0	4	60		SUPP	FOOT		20 60		
07	0300	77/02/02	1.8	1.9	0.1	COHO	27	40	67	670.0	4	70		SUPP	FOOT		20 60		
07	0300	77/02/02	1.9	2.2	0.3	COHO	41	2	43	143.3	4	85		SUPP	FOOT		20 60		
07	0300	77/02/04	0.0	0.4	0.4	COHO	17	5	22	55.0	4	70		SUPP	FOOT		20 52 60		
07	0300	77/02/04	1.4	1.6	0.2	COHO	15	44	59	295.0	4	59		SUPP	FOOT		20 60		
07	0300	77/02/04	1.8	1.9	0.1	COHO	41	48	89	890.0	4	83		SUPP	FOOT		20 60		
07	0300	77/02/04	2.1	0.0	0.0	COHO	20	0	20	0.0	4	90		SPOT	FOOT		20 60 65		
07	0300	77/02/07	0.0	0.8	0.8	COHO	14	20	34	42.5	4	80		SUPP	FOOT		20 60		
07	0300	77/02/07	1.4	1.6	0.2	COHO	8	57	65	325.0	4	90		SUPP	FOOT		20 60		
07	0300	77/02/07	1.8	2.2	0.4	COHO	69	62	131	327.5	4	70		SUPP	FOOT		20 60		
07	0300	77/02/11	0.0	0.8	0.8	COHO	13	12	25	31.3	4	75		SUPP	FOOT		20 60		
07	0300	77/02/11	1.4	1.6	0.2	COHO	9	67	76	380.0	4	80		SUPP	FOOT		20 60		
07	0300	77/02/11	1.8	2.2	0.4	COHO	63	82	145	362.5	4	80		SUPP	FOOT		20 60		
07	0300	77/02/15	0.0	0.8	0.8	COHO	5	4	9	11.3	4	90		SUPP	FOOT		20 60		
07	0300	77/02/15	1.4	1.6	0.2	COHO	1	64	65	325.0	4	65			FOOT		20 60		
07	0300	77/02/15	1.8	2.2	0.4	COHO	39	87	126	315.0	4	70		SUPP	FOOT		20 60		
07	0300	77/02/23	0.0	0.9	0.9	COHO	2	2	4	4.4	4	85		SUPP	FOOT		23 60		
07	0300	77/02/23	1.4	1.6	0.2	COHO	0	44	44	220.0	4	90		SUPP	FOOT		23 60		
07	0300	77/02/23	1.8	2.2	0.4	COHO	5	85	90	225.0	4	90		SUPP	FOOT		23 60		
07	0300	77/11/02	0.0	0.8	0.8	COHO	21	0	21	26.3	4	60		SUPP	FOOT		24 47 60		
07	0300	77/11/02	1.4	1.6	0.2	COHO	0	0	0	0.0	4	99		SUPP	FOOT		20 48 60		
07	0300	77/11/02	1.8	1.9	0.1	COHO	0	0	0	0.0	4	99		SUPP	FOOT		20 45 60		
07	0300	77/11/09	0.0	0.8	0.8	COHO	47	0	47	58.8	4	80		SUPP	FOOT		23 60		
07	0300	77/11/09	1.4	1.9	0.5	COHO	0	0	0	0.0	4	85		SUPP	FOOT		23 48 60		
07	0300	77/11/17	0.0	0.8	0.8	COHO	114	2	116	145.0	4	75		SUPP	FOOT		21 32 60		
07	0300	77/11/17	1.4	1.6	0.2	COHO	0	0	0	0.0	4	99		SUPP	FOOT		20 60		
07	0300	77/11/30	0.0	0.8	0.8	COHO	80	9	89	111.3	4	65		SUPP	FOOT		24 60		
07	0300	77/11/30	1.4	1.9	0.5	COHO	51	3	54	108.0	4	70		SUPP	FOOT		24 60		
07	0300	77/12/09	0.0	0.8	0.8	COHO	76	8	84	105.0	4	60		SUPP	FOOT		23		
07	0300	77/12/09	1.2	2.0	0.8	COHO	30	1	31	38.8	4	80		SUPP	FOOT		24 60		
07	0300	77/12/22	0.0	0.8	0.8	COHO	42	25	67	83.8	4	75		SUPP	FOOT		23 60		
07	0300	77/12/22	1.8	3.8	2.0	COHO	28	11	39	19.5	4	25		SUPP	FOOT		24		
07	0300	77/12/23	3.8	4.3	0.5	COHO	7	0	7	14.0	4	70		SUPP	FOOT		20		
07	0300	77/12/23	4.3	4.5	0.2	COHO	15	1	16	80.0	4	99		SUPP	FOOT		20 60		
07	0300	77/12/30	0.0	0.8	0.8	COHO	9	34	43	53.8	4	85		SUPP	FOOT	6 0 0 0	23		
07	0300	77/12/30	1.4	1.9	0.5	COHO	9	21	30	60.0	4	70		SUPP	FOOT		20 60 75		
07	0300	78/01/06	0.0	0.8	0.8	COHO	6	18	24	30.0	4	60		SUPP	FOOT		24		
07	0300	78/01/06	1.4	3.4	2.0	COHO	16	56	72	36.0	4	75		SUPP	FOOT		23 60 75		
07	0300	78/01/09	3.4	3.8	0.4	COHO	1	6	7	17.5	4	75		SUPP	FOOT		23 60		
07	0300	78/01/09	3.9	4.5	0.6	COHO	0	1	1	1.7	4	85		SUPP	FOOT		23		

SALMON SPAWNING GROUND DATA RETRIEVAL

Table 6. (cont.) Complete record of spawner surveys for coho salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files).

WRIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1 2 3	AGCY	CODE
STOSSEL CREEK (RB)																(CONTD)			
07	0300	78/01/16	0.0	0.8	0.8	COHO	10	10	20	25.0	4	85		SUPP	FOOT		23 60 75		
07	0300	78/01/16	1.8	3.5	1.7	COHO	7	37	44	25.9	4	75		SUPP	FOOT		24		
07	0300	78/01/23	0.0	0.8	0.8	COHO	3	9	12	15.0	4	85		SUPP	FOOT		23		
07	0300	78/01/23	1.4	3.4	2.0	COHO	0	9	9	4.5	4	85		SUPP	FOOT		20 60 75		
07	0300	82/12/17	1.8	0.0	0.0	COHO	5	0	5	0.0	4	75		SPOT	FOOT		23 60		
UNNAMED TRIBUTARY (L.B. TRIB. TO STOSSEL CR. ENTERS @ R.M. 1.21)																			
07	0300A	77/02/11	0.0	0.1	0.1	COHO	0	32	32	320.0	4	95		SUPP	FOOT		20 60		
07	0300A	77/02/15	0.0	0.1	0.1	COHO	0	28	28	280.0	4	95		SUPP	FOOT		20 60		
07	0300A	77/12/09	0.0	0.1	0.1	COHO	9	0	9	90.0	4	95		SUPP	FOOT		23		
07	0300A	77/12/22	0.0	0.1	0.1	COHO	11	1	12	120.0	4	99		SUPP	FOOT		20 60		
07	0300A	78/01/06	0.0	0.1	0.1	COHO	2	35	37	370.0	4	99		SUPP	FOOT		23 60 75		
07	0300A	78/01/16	0.0	0.1	0.1	COHO	0	6	6	60.0	4	99		SUPP	FOOT		23 60 75		
07	0300A	78/01/23	0.0	0.1	0.1	COHO	0	0	0	0.0	4	99		SUPP	FOOT		20 60 75		
* UNNAMED TRIBUTARY (R.B. TRIB. TO STOSSEL CR. ENTERS @ R.M. 1.4) now trashed																			
07	0300B	77/01/25	0.0	0.1	0.1	COHO	4	0	4	40.0	4	80		SUPP	FOOT		20 60		
07	0300B	77/01/28	0.0	0.1	0.1	COHO	5	0	5	50.0	4	85		SUPP	FOOT		20 60		
07	0300B	77/02/02	0.0	0.1	0.1	COHO	1	3	4	40.0	4	90		SUPP	FOOT		20 60		
07	0300B	77/02/04	0.0	0.1	0.1	COHO	0	4	4	40.0	4	95		SUPP	FOOT		20 60		
07	0300B	77/02/07	0.0	0.1	0.1	COHO	0	4	4	40.0	4	95		SUPP	FOOT		20 60		
07	0300B	77/02/11	0.0	0.1	0.1	COHO	0	4	4	40.0	4	99		SUPP	FOOT		20 60		
07	0300B	77/02/15	0.0	0.1	0.1	COHO	0	2	2	20.0	4	75		SUPP	FOOT		20 60		
07	0300B	77/11/02	0.0	0.1	0.1	COHO	0	0	0	0.0	4	99		SUPP	FOOT		20 60		
07	0300B	77/11/17	0.0	0.1	0.1	COHO	0	0	0	0.0	4	99		SUPP	FOOT		20 60		
07	0300B	77/11/30	0.0	0.2	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT		24		
07	0300B	77/12/09	0.0	0.1	0.1	COHO	0	0	0	0.0	4	95		SUPP	FOOT		23 60		
07	0300B	77/12/22	0.0	0.1	0.1	COHO	0	0	0	0.0	4	99		SUPP	FOOT		57		
UNNAMED TRIBUTARY (LB) Index																			
07	0301	52/12/15	0.0	0.2	0.2	COHO	367	32	399	1995.0	4			INDX	FOOT		60		
07	0301	53/01/12	0.0	0.2	0.2	COHO	13	7	20	100.0	4			INDX	FOOT		20		
07	0301	55/01/03	0.0	0.2	0.2	COHO	4	36	40	200.0	4			INDX	FOOT		20		
07	0301	56/01/12	0.0	0.2	0.2	COHO	9	29	38	190.0	4			INDX	FOOT		20 60		
07	0301	57/12/14	0.0	0.2	0.2	COHO	0	38	38	190.0	4			INDX	FOOT		20		
07	0301	58/12/16	0.0	0.2	0.2	COHO	64	6	70	350.0	4			INDX	FOOT		20		
07	0301	59/12/07	0.0	0.2	0.2	COHO	26	46	72	360.0	4			INDX	FOOT		20		

SALMON SPAWNING GROUND DATA RETRIEVAL

Table 6. Complete record of spawner surveys for coho salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files).

HRIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1 2 3	AGCY	CODE
UNNAMED TRIBUTARY (LB)																	(CONTD)		
07	0301	59/12/21	0.0	0.2	0.2	COHO	38	51	89	445.0	4			INDX	FOOT		20		
07	0301	60/11/29	0.0	0.2	0.2	COHO	35	11	46	230.0	4			INDX	FOOT		20		
07	0301	61/12/11	0.0	0.2	0.2	COHO	0	0	0	0.0	4			INDX	FOOT		20 60		
07	0301	62/12/12	0.0	0.2	0.2	COHO	8	102	110	550.0	4			INDX	FOOT		20 60		
07	0301	63/12/06	0.0	0.2	0.2	COHO	3	1	4	20.0	4			INDX	FOOT		20		
07	0301	63/12/30	0.0	0.2	0.2	COHO	8	4	12	60.0	4			INDX	FOOT		20		
07	0301	64/12/07	0.0	0.2	0.2	COHO	60	6	66	330.0	4			INDX	FOOT		20		
07	0301	65/12/14	0.0	0.2	0.2	COHO	0	0	0	0.0	4			INDX	FOOT		20 60		
07	0301	66/12/21	0.0	0.2	0.2	COHO	84	64	148	740.0	4			INDX	FOOT		20		
07	0301	67/12/19	0.0	0.2	0.2	COHO	0	0	0	0.0	4			INDX	FOOT		54		
07	0301	68/01/03	0.0	0.2	0.2	COHO	19	10	29	145.0	4			INDX	FOOT		20		
07	0301	68/12/12	0.0	0.2	0.2	COHO	1	0	1	5.0	4			INDX	FOOT		20		
07	0301	68/12/20	0.0	0.2	0.2	COHO	0	0	0	0.0	4			INDX	FOOT		20		
07	0301	69/01/02	0.0	0.2	0.2	COHO	0	0	0	0.0	4			INDX	FOOT				
07	0301	69/12/17	0.0	0.2	0.2	COHO	0	0	0	0.0	4	99		INDX	FOOT		20		
07	0301	70/11/19	0.0	0.2	0.2	COHO	0	0	0	0.0	4	99		INDX	FOOT		20		
07	0301	70/12/22	0.0	0.2	0.2	COHO	29	17	43	215.0	4	99		INDX	FOOT		20		
07	0301	71/12/02	0.0	0.2	0.2	COHO	6	4	10	50.0	4	99		INDX	FOOT		20		
07	0301	71/12/22	0.0	0.2	0.2	COHO	1	2	3	15.0	4	99		INDX	FOOT		20		
07	0301	72/12/07	0.0	0.0	0.0	COHO	0	0	0	0.0	4			SPOT	FOOT		20 60		
07	0301	72/12/20	0.0	0.2	0.2	COHO	0	0	0	0.0	4	99		INDX	FOOT		26		
07	0301	73/01/02	0.0	0.2	0.2	COHO	23	2	25	125.0	4	99		INDX	FOOT		20		
07	0301	73/12/06	0.0	0.2	0.2	COHO	12	3	15	75.0	4			INDX	FOOT				
07	0301	74/11/25	0.0	0.2	0.2	COHO	21	1	22	110.0	4	70		INDX	FOOT		20		
07	0301	74/12/10	0.0	0.2	0.2	COHO	6	23	29	145.0	4	95		INDX	FOOT		20 60		
07	0301	75/01/02	0.0	0.2	0.2	COHO	10	27	37	185.0	4	99		INDX	FOOT		26		
07	0301	75/11/19	0.0	0.2	0.2	COHO	1	0	1	5.0	4	99		INDX	FOOT		30		
07	0301	75/11/25	0.0	0.2	0.2	COHO	1	0	1	5.0	4	90		INDX	FOOT		27 31 61		
07	0301	75/12/10	0.0	0.2	0.2	COHO	17	0	17	85.0	4	99		INDX	FOOT		61 23		

SALMON SPAWNING GROUND DATA RETRIEVAL

Table 6. Complete record of spawner surveys for coho salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files).

HRIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1	2	3	AGCY	CODE
UNNAMED TRIBUTARY (LB)																(CONTD)					
07	0301	75/12/23	0.0	0.2	0.2	COHO	0	4	4	20.0	4	99		INDX	FOOT						
07	0301	76/11/09	0.0	0.2	0.2	COHO	0	0	0	0.0	4	95		INDX	FOOT		21	57	60		
07	0301	76/11/22	0.0	0.2	0.2	COHO	0	0	0	0.0	4	99		INDX	FOOT		20	60			
07	0301	76/12/02	0.0	0.2	0.2	COHO	0	0	0	0.0	4	99		INDX	FOOT		20	30	60		
07	0301	76/12/08	0.0	0.2	0.2	COHO	0	0	0	0.0	4	99		INDX	FOOT		20				
07	0301	76/12/15	0.0	0.2	0.2	COHO	0	0	0	0.0	4	99		INDX	FOOT		20	60			
07	0301	76/12/21	0.0	0.2	0.2	COHO	0	0	0	0.0	4	99		INDX	FOOT		20				
07	0301	76/12/27	0.0	0.2	0.2	COHO	12	0	12	60.0	4	60		INDX	FOOT		23	30			
07	0301	77/01/04	0.0	0.2	0.2	COHO	45	2	47	235.0	4	90		INDX	FOOT		20				
07	0301	77/01/07	0.0	0.2	0.2	COHO	32	2	34	170.0	4	80		INDX	FOOT		20	60			
07	0301	77/01/10	0.0	0.2	0.2	COHO	30	8	38	190.0	4	95		INDX	FOOT		20	37	60		
07	0301	77/01/14	0.0	0.2	0.2	COHO	37	16	53	265.0	4	85		INDX	FOOT		23	60			
07	0301	77/01/18	0.0	0.2	0.2	COHO	27	18	45	225.0	4	70		INDX	FOOT		27	34	60		
07	0301	77/01/21	0.0	0.2	0.2	COHO	68	41	109	545.0	4	80		INDX	FOOT		23	60			
07	0301	77/01/25	0.0	0.2	0.2	COHO	32	53	85	425.0	4	90		INDX	FOOT		20	60			
07	0301	77/01/28	0.0	0.2	0.2	COHO	20	55	75	375.0	4	85		INDX	FOOT		20	60			
07	0301	77/02/02	0.0	0.2	0.2	COHO	12	64	76	380.0	4	85		INDX	FOOT		20	60			
07	0301	77/02/04	0.0	0.2	0.2	COHO	1	72	73	365.0	4	90		INDX	FOOT		20	60			
07	0301	77/02/07	0.0	0.2	0.2	COHO	0	68	68	340.0	4	90		INDX	FOOT		20	60			
07	0301	77/02/11	0.0	0.2	0.2	COHO	0	76	76	380.0	4	95		INDX	FOOT		20	60			
07	0301	77/02/15	0.0	0.2	0.2	COHO	0	66	66	330.0	4	95		INDX	FOOT		20	60			
07	0301	77/02/23	0.0	0.2	0.2	COHO	0	47	47	235.0	4	90		SUPP	FOOT		20	60			
07	0301	77/11/02	0.0	0.1	0.1	COHO	0	0	0	0.0	4	99		INDX	FOOT		20	45	60		
07	0301	77/11/09	0.0	0.2	0.2	COHO	0	0	0	0.0	4	99		INDX	FOOT		23				
07	0301	77/11/17	0.0	0.1	0.1	COHO	0	0	0	0.0	4	99		INDX	FOOT		20	60			
07	0301	77/11/30	0.0	0.2	0.2	COHO	3	0	3	15.0	4	80		SUPP	FOOT		24	60			
07	0301	77/12/09	0.0	0.3	0.3	COHO	96	21	117	390.0	4	85		INDX	FOOT		23	60			
07	0301	77/12/22	0.0	0.3	0.3	COHO	53	33	86	286.7	4	90		INDX	FOOT		23	60			
07	0301	77/12/30	0.0	0.3	0.3	COHO	2	40	42	140.0	4	90		INDX	FOOT		20	60	75		
07	0301	78/01/06	0.0	0.3	0.3	COHO	0	57	57	190.0	4	95		SUPP	FOOT		20				
07	0301	78/01/16	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT		20	60	75		
07	0301	78/01/23	0.0	0.1	0.1	COHO	0	0	0	0.0	4	99		INDX	FOOT		20	60	75		
07	0301	78/11/17	0.0	0.2	0.2	COHO	10	0	10	50.0	4	90		INDX	FOOT		20				
07	0301	78/11/30	0.0	0.2	0.2	COHO	1	0	1	5.0	4	85		INDX	FOOT		20				
07	0301	78/12/08	0.0	0.2	0.2	COHO	22	0	22	110.0	4	95		INDX	FOOT		20				
07	0301	78/12/14	0.0	0.2	0.2	COHO	19	0	19	95.0	4	95		INDX	FOOT		20				
07	0301	78/12/28	0.0	0.2	0.2	COHO	6	4	10	50.0	4	90		INDX	FOOT		20	60			
07	0301	79/10/30	0.0	0.3	0.3	COHO	0	0	0	0.0	4	99	0	INDX	FOOT		11	20			
07	0301	79/12/10	0.0	0.3	0.3	COHO	10	0	10	33.3	4	90		INDX	FOOT		24				
07	0301	79/12/27	0.0	0.3	0.3	COHO	181	45	226	753.3	4	90		INDX	FOOT		20				
07	0301	80/11/19	0.0	0.3	0.3	COHO	27	3	30	100.0	4	80		INDX	FOOT		20				

SALMON SPAWNING GROUND DATA RETRIEVAL

WRIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1 2 3	AGCY	COD E
	UNNAMED TRIBUTARY (LB)															(CONTD)			
07	0301	80/11/25	0.0	0.3	0.3	COHO	78	10	88	293.3	4	80		INDX	FOOT		24		
07	0301	80/12/03	0.0	0.3	0.3	COHO	102	17	119	396.7	4	70		INDX	FOOT		24		
07	0301	80/12/10	0.0	0.3	0.3	COHO	87	44	131	436.7	4	90		INDX	FOOT		20 60		
07	0301	80/12/17	0.0	0.3	0.3	COHO	91	86	177	590.0	4	90		INDX	FOOT		20		
07	0301	80/12/22	0.0	0.3	0.3	COHO	70	81	151	503.3	4	95		INDX	FOOT		20		
07	0301	80/12/22	0.3	0.5	0.2	COHO	8	14	22	110.0	4	95		SUPP	FOOT		20 60		
07	0301	81/01/02	0.0	0.3	0.3	COHO	81	78	159	530.0	4	90		INDX	FOOT		20		
07	0301	81/10/21	0.0	0.3	0.3	COHO	0	0	0	0.0	4	75		INDX	FOOT		20		
07	0301	81/11/05	0.0	0.3	0.3	COHO	0	0	0	0.0	4	99		INDX	FOOT		20		
07	0301	81/11/12	0.0	0.3	0.3	COHO	2	0	2	6.7	4	95		INDX	FOOT		20		
07	0301	81/11/19	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT		20		
07	0301	81/12/01	0.0	0.3	0.3	COHO	0	0	0	0.0	4	90		INDX	FOOT		20		
07	0301	81/12/08	0.0	0.3	0.3	COHO	62	3	65	216.7	4	90		INDX	FOOT		20 60		
07	0301	81/12/15	0.0	0.3	0.3	COHO	27	3	30	100.0	4	90		INDX	FOOT		23 60		
07	0301	81/12/22	0.0	0.3	0.3	COHO	31	7	38	126.7	4	90		INDX	FOOT		20		
07	0301	81/12/30	0.0	0.3	0.3	COHO	12	7	19	63.3	4	95		INDX	FOOT		20 60		
07	0301	82/01/07	0.0	0.3	0.3	COHO	0	3	3	10.0	4	50		INDX	FOOT		20 37 60		
07	0301	82/11/04	0.0	0.3	0.3	COHO	0	0	0	0.0	4	70	0	INDX	FOOT		21 31		
07	0301	82/11/11	0.0	0.3	0.3	COHO	0	0	0	0.0	4	90	0	INDX	FOOT		20		
07	0301	82/11/18	0.0	0.3	0.3	COHO	0	0	0	0.0	4	75		INDX	FOOT		24		
07	0301	82/11/25	0.0	0.3	0.3	COHO	0	0	0	0.0	4	85	0	INDX	FOOT		20		
07	0301	82/12/02	0.0	0.3	0.3	COHO	0	0	0	0.0	4	90	0	INDX	FOOT		20		
07	0301	82/12/09	0.0	0.3	0.3	COHO	0	0	0	0.0	4	85	0	INDX	FOOT		20		
07	0301	82/12/17	0.0	0.3	0.3	COHO	11	0	11	36.7	4	90		INDX	FOOT		23		
07	0301	82/12/29	0.0	0.3	0.3	COHO	1	0	1	3.3	4	90	7	INDX	FOOT		20		
07	0301	83/01/11	0.0	0.3	0.3	COHO	69	0	69	230.0	4	85	18	INDX	FOOT		21 33		
07	0301	83/01/20	0.0	0.3	0.3	COHO	6	25	31	103.3	4	95		INDX	FOOT		20 60 61		
07	0301	83/01/31	0.0	0.3	0.3	COHO	0	21	21	70.0	4	95		INDX	FOOT		20 60		
07	0301	83/11/07	0.0	0.3	0.3	COHO	1	0	1	3.3	4	90		INDX	FOOT		23		
07	0301	83/11/07	0.3	0.5	0.2	COHO	4	0	4	20.0	4	95		SUPP	FOOT		23		
07	0301	83/11/14	0.0	0.3	0.3	COHO	9	0	9	30.0	4	85		INDX	FOOT		23		
07	0301	83/11/14	0.3	0.5	0.2	COHO	6	0	6	30.0	4	85		SUPP	FOOT		23		
07	0301	83/11/22	0.0	0.3	0.3	COHO	84	4	88	293.3	4	75		INDX	FOOT		26		
07	0301	83/11/22	0.3	0.5	0.2	COHO	52	1	52	260.0	4	80		SUPP	FOOT		26		
07	0301	83/12/01	0.0	0.3	0.3	COHO	19	12	31	103.3	4	95		INDX	FOOT		20		
07	0301	83/12/01	0.3	0.5	0.2	COHO	0	3	3	15.0	4	95		SUPP	FOOT		20		
07	0301	83/12/08	0.0	0.3	0.3	COHO	11	18	29	96.7	4	85		INDX	FOOT		23		
07	0301	83/12/08	0.3	0.5	0.2	COHO	0	3	3	15.0	4	85		SUPP	FOOT		23		
07	0301	83/12/15	0.0	0.3	0.3	COHO	85	17	102	340.0	4	85		INDX	FOOT		23		
07	0301	83/12/15	0.3	0.5	0.2	COHO	22	3	25	125.0	4	85		SUPP	FOOT		23		
07	0301	83/12/22	0.0	0.0	0.0	COHO	0	0	0	0.0	4	10		SPOT	FOOT		20 36 60		
07	0301	83/12/22	0.3	0.0	0.0	COHO	0	0	0	0.0	4	10		SPOT	FOOT		20 36 60		

SALMON SPAWNING GROUND DATA RETRIEVAL

Table 6. Complete record of spawner surveys for coho salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files).

WRIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1	2	3	AGCY	CODE
UNNAMED TRIBUTARY (LB)																(CONTD)					
07	0301	83/12/30	0.0	0.0	0.0	COHO	0	0	0	0.0	4	0		SPOT	FOOT		20	36	60		
07	0301	83/12/30	0.3	0.0	0.0	COHO	0	0	0	0.0	4	0		SPOT	FOOT		20	36	60		
07	0301	84/01/05	0.0	0.3	0.3	COHO	58	22	80	266.7	4	70		INDX	FOOT		24				
07	0301	84/01/05	0.3	0.5	0.2	COHO	18	4	22	110.0	4	70		SUPP	FOOT		24				
07	0301	84/01/13	0.0	0.3	0.3	COHO	80	12	92	306.7	4	95		INDX	FOOT		20				
07	0301	84/01/13	0.3	0.5	0.2	COHO	9	0	9	45.0	4	95		SUPP	FOOT		20				
07	0301	84/01/19	0.0	0.3	0.3	COHO	19	18	37	123.3	4	80		INDX	FOOT		20	37			
07	0301	84/01/19	0.3	0.5	0.2	COHO	4	1	5	25.0	4	95		SUPP	FOOT		20				
07	0301	84/01/25	0.0	0.3	0.3	COHO	3	19	22	73.3	4	50		INDX	FOOT		25				
07	0301	84/01/25	0.3	0.5	0.2	COHO	1	3	4	20.0	4	50		SUPP	FOOT		25				
07	0301	84/11/08	0.0	0.3	0.3	COHO	0	0	0	0.0	4	90		INDX	FOOT		20				
07	0301	84/11/08	0.3	0.5	0.2	COHO	0	0	0	0.0	4	90		SUPP	FOOT		20				
07	0301	84/11/16	0.0	0.3	0.3	COHO	7	0	7	23.3	4	90		INDX	FOOT		20				
07	0301	84/11/16	0.3	0.5	0.2	COHO	11	0	11	55.0	4	90		SUPP	FOOT		20				
07	0301	84/11/26	0.0	0.3	0.3	COHO	6	2	8	26.7	4	90		INDX	FOOT		20				
07	0301	84/11/26	0.3	0.5	0.2	COHO	6	0	6	30.0	4	90		SUPP	FOOT		20				
07	0301	84/12/03	0.0	0.3	0.3	COHO	18	2	20	66.7	4	95		INDX	FOOT		20				
07	0301	84/12/03	0.3	0.5	0.2	COHO	44	0	44	220.0	4	95		SUPP	FOOT		20				
07	0301	84/12/10	0.0	0.3	0.3	COHO	16	0	16	53.3	4	95		INDX	FOOT		20				
07	0301	84/12/10	0.3	0.5	0.2	COHO	35	0	35	175.0	4	95		SUPP	FOOT		20				
07	0301	84/12/17	0.0	0.3	0.3	COHO	19	3	22	73.3	4	90		INDX	FOOT		23	35	60		
07	0301	84/12/17	0.3	0.5	0.2	COHO	51	2	53	265.0	4	90		SUPP	FOOT		23	35			
07	0301	84/12/26	0.0	0.3	0.3	COHO	19	11	30	100.0	4	95		INDX	FOOT		20				
07	0301	84/12/26	0.3	0.5	0.2	COHO	57	1	58	290.0	4	95		SUPP	FOOT		20				
07	0301	85/01/02	0.0	0.3	0.3	COHO	20	9	29	96.7	4	95		INDX	FOOT		20				
07	0301	85/01/02	0.3	0.5	0.2	COHO	20	5	25	125.0	4	95		SUPP	FOOT		20				
07	0301	85/01/10	0.0	0.3	0.3	COHO	14	9	23	76.7	4	95		INDX	FOOT		20				
07	0301	85/01/10	0.3	0.5	0.2	COHO	3	7	10	50.0	4	95		SUPP	FOOT		20				
07	0301	85/01/17	0.0	0.3	0.3	COHO	2	16	18	60.0	4	95		INDX	FOOT		20				
07	0301	85/01/17	0.3	0.5	0.2	COHO	0	1	1	5.0	4	95		SUPP	FOOT		20				
07	0301	85/10/30	0.0	0.3	0.3	COHO	0	0	0	0.0	4	65		INDX	FOOT		23	60			
07	0301	85/11/06	0.0	0.3	0.3	COHO	0	0	0	0.0	4	85		INDX	FOOT		23				
07	0301	85/11/15	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT		20				
07	0301	85/12/05	0.0	0.3	0.3	COHO	0	0	0	0.0	4	25		INDX	FOOT		20	37			
07	0301	85/12/05	0.3	0.5	0.2	COHO	0	0	0	0.0	4	85		SUPP	FOOT		20				
07	0301	85/12/12	0.0	0.3	0.3	COHO	0	0	0	0.0	4	85		INDX	FOOT		20				
07	0301	85/12/12	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT		20				
07	0301	85/12/19	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT		20				
07	0301	85/12/19	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT		20				
07	0301	85/12/30	0.0	0.3	0.3	COHO	0	0	0	0.0	4	90		INDX	FOOT		20	55			
07	0301	85/12/30	0.3	0.5	0.2	COHO	0	0	0	0.0	4	75		SUPP	FOOT		20				
07	0301	86/01/07	0.0	0.3	0.3	COHO	0	0	0	0.0	4	90		INDX	FOOT		23				
07	0301	86/01/07	0.3	0.5	0.2	COHO	0	0	0	0.0	4	90		SUPP	FOOT		23				

SALMON SPAWNING GROUND DATA RETRIEVAL

Table 6. Complete record of spawner surveys for coho salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files).

HRIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1 2 3	AGCY	CODE
UNNAMED TRIBUTARY (LB)																	(CONTD)		
07	0301	86/01/14	0.0	0.3	0.3	COHO	0	1	1	3.3	4	95		INDX	FOOT		20		
07	0301	86/01/14	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT		20		
07	0301	86/01/22	0.0	0.3	0.3	COHO	80	0	80	266.7	4	95		INDX	FOOT		23		
07	0301	86/01/22	0.3	0.5	0.2	COHO	18	0	18	90.0	4	90		SUPP	FOOT		23		
07	0301	86/01/29	0.0	0.3	0.3	COHO	69	10	79	263.3	4	95		INDX	FOOT		20		
07	0301	86/01/29	0.3	0.5	0.2	COHO	15	0	15	75.0	4	95		SUPP	FOOT		23		
07	0301	86/02/05	0.0	0.3	0.3	COHO	7	41	48	160.0	4	95		INDX	FOOT		23		
07	0301	86/02/05	0.3	0.5	0.2	COHO	0	3	3	15.0	4	95		SUPP	FOOT		23		
07	0301	86/02/12	0.0	0.3	0.3	COHO	2	38	40	133.3	4	95		INDX	FOOT		20		
07	0301	86/10/31	0.0	0.3	0.3	COHO	0	0	0	0.0	4	90		INDX	FOOT		20		
07	0301	86/10/31	0.3	0.5	0.2	COHO	0	0	0	0.0	4	90		SUPP	FOOT		20		
07	0301	86/11/07	0.0	0.3	0.3	COHO	0	0	0	0.0	4	75		INDX	FOOT		28 60		
07	0301	86/11/07	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT		20		
07	0301	86/11/17	0.0	0.3	0.3	COHO	2	0	2	6.7	4	85		INDX	FOOT		23		
07	0301	86/11/17	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT		24		
07	0301	86/11/29	0.0	0.3	0.3	COHO	128	1	129	430.0	4	90		INDX	FOOT		23 60		
07	0301	86/11/29	0.3	0.5	0.2	COHO	41	0	41	205.0	4	90		SUPP	FOOT		23		
07	0301	86/12/05	0.0	0.3	0.3	COHO	43	56	99	330.0	4	95		INDX	FOOT		20 60		
07	0301	86/12/05	0.3	0.5	0.2	COHO	13	1	14	70.0	4	90		SUPP	FOOT		20 60		
07	0301	86/12/12	0.0	0.3	0.3	COHO	4	79	83	276.7	4	95		INDX	FOOT		20 60		
07	0301	86/12/12	0.3	0.5	0.2	COHO	0	6	6	30.0	4	95		SUPP	FOOT		20 60		
07	0301	86/12/19	0.0	0.3	0.3	COHO	3	73	76	253.3	4	95		INDX	FOOT		20 60		
07	0301	86/12/19	0.3	0.5	0.2	COHO	0	5	5	25.0	4	95		SUPP	FOOT		20 60		
07	0301	86/12/31	0.0	0.3	0.3	COHO	97	71	168	560.0	4	80		INDX	FOOT		27		
07	0301	86/12/31	0.3	0.5	0.2	COHO	20	2	22	110.0	4	80		SUPP	FOOT		26		
07	0301	87/01/09	0.0	0.3	0.3	COHO	55	38	93	310.0	4	95		INDX	FOOT		20 60		
07	0301	87/01/09	0.3	0.5	0.2	COHO	3	5	8	40.0	4	95		SUPP	FOOT		20 60		
07	0301	87/01/16	0.0	0.3	0.3	COHO	44	53	97	323.3	4	95		INDX	FOOT		20 60		
07	0301	87/01/16	0.3	0.5	0.2	COHO	0	2	2	10.0	4	95		SUPP	FOOT		20 60		
07	0301	87/01/23	0.0	0.3	0.3	COHO	0	79	79	263.3	4	95		INDX	FOOT		20 60		
07	0301	87/01/23	0.3	0.5	0.2	COHO	0	1	1	5.0	4	95		SUPP	FOOT		20 60		
07	0301	87/11/03	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT		54 60		
07	0301	87/11/17	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT		57 60		
07	0301	87/11/17	0.3	0.4	0.1	COHO	0	0	0	0.0	4	95		SUPP	FOOT		54 57 60		
07	0301	87/11/23	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT		20 57 60		
07	0301	87/11/23	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT		20 57 60		
07	0301	87/12/01	0.0	0.3	0.3	COHO	0	0	0	0.0	4	60		INDX	FOOT		22		
07	0301	87/12/01	0.3	0.5	0.2	COHO	0	0	0	0.0	4	60		SUPP	FOOT		22		
07	0301	87/12/08	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT		20		
07	0301	87/12/08	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT		20		
07	0301	87/12/15	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT		20 57		
07	0301	87/12/15	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT		20 57		
07	0301	87/12/22	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT		20 57		

SALMON SPAWNING GROUND DATA RETRIEVAL

Table 6. Complete record of spawner surveys for coho salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files).

RIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1	2	3	AGCY	CODE
	UNNAMED TRIBUTARY (LB)																				
07	0301	87/12/22	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT	(CONTD)					
07	0301	87/12/29	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT		20	57			
07	0301	87/12/29	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT		20				
07	0301	88/01/05	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT		20				
07	0301	88/01/05	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT		20	57			
07	0301	88/01/21	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT		20	57			
07	0301	88/01/21	0.3	0.4	0.1	COHO	0	0	0	0.0	4	95		SUPP	FOOT		20				
07	0301	88/11/01	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT		20	48	60		
07	0301	88/11/01	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT			20	57		
07	0301	88/11/08	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT				20		
07	0301	88/11/08	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				20		
07	0301	88/11/15	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT				20		
07	0301	88/11/15	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				20		
07	0301	88/11/22	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT				23		
07	0301	88/11/22	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				23		
07	0301	88/12/01	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT				20		
07	0301	88/12/01	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				20		
07	0301	88/12/08	0.0	0.3	0.3	COHO	1	0	1	3.3	4	95		INDX	FOOT				20		
07	0301	88/12/08	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				20		
07	0301	88/12/16	0.0	0.3	0.3	COHO	0	1	1	3.3	4	95		INDX	FOOT				20		
07	0301	88/12/16	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				20		
07	0301	88/12/23	0.0	0.3	0.3	COHO	0	1	1	3.3	4	95		INDX	FOOT				20		
07	0301	88/12/23	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				20		
07	0301	89/01/03	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT				23		
07	0301	89/01/03	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				23		
07	0301	89/01/09	0.0	0.3	0.3	COHO	2	0	2	6.7	4	70		INDX	FOOT				27		
07	0301	89/01/09	0.3	0.5	0.2	COHO	0	0	0	0.0	4	75		SUPP	FOOT				27		
07	0301	89/01/12	0.0	0.3	0.3	COHO	6	0	6	20.0	4	95		INDX	FOOT				26		
07	0301	89/01/12	0.3	0.5	0.2	COHO	2	0	2	10.0	4	95		SUPP	FOOT				26		
07	0301	89/01/19	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT				23		
07	0301	89/01/19	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				23		
07	0301	89/01/25	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT		20				
07	0301	89/01/25	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT		20				
07	0301	89/11/03	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT		20	57	60		
07	0301	89/11/03	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT			20	57		
07	0301	89/11/10	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT			20	57		
07	0301	89/11/10	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT			20	57		
07	0301	89/11/17	0.0	0.3	0.3	COHO	5	1	6	20.0	4	95		INDX	FOOT				20		
07	0301	89/11/17	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				20		
07	0301	89/11/27	0.0	0.3	0.3	COHO	63	7	70	233.3	4	95		INDX	FOOT				23		
07	0301	89/11/27	0.3	0.5	0.2	COHO	2	0	2	10.0	4	95		SUPP	FOOT				23		
07	0301	89/12/04	0.1		0.0	COHO	0	0	0	0.0	4	30		SPOT	FOOT		28	39			
07	0301	89/12/06	0.0	0.3	0.3	COHO	112	15	127	423.3	4	90		INDX	FOOT				27		

SALMON SPAWNING GROUND DATA RETRIEVAL

Table 6. Complete record of spawner surveys for coho salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files).

RIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1	2	3	AGCY	CODE
	UNNAMED	TRIBUTARY	(LB)													(CONTD)					
07	0301	89/12/06	0.3	0.5	0.2	COHO	61	0	61	305.0	4	90		SUPP	FOOT				27		
07	0301	89/12/14	0.0	0.3	0.3	COHO	97	30	127	423.3	4	95		INDX	FOOT				20		
07	0301	89/12/14	0.3	0.5	0.2	COHO	29	4	33	165.0	4	95		SUPP	FOOT				20		
07	0301	89/12/21	0.0	0.3	0.3	COHO	13	115	128	426.7	4	95		INDX	FOOT				20		
07	0301	89/12/21	0.3	0.5	0.2	COHO	0	7	7	35.0	4	95		SUPP	FOOT				20		
07	0301	89/12/29	0.0	0.3	0.3	COHO	1	104	105	350.0	4	95		INDX	FOOT				20		
07	0301	89/12/29	0.3	0.5	0.2	COHO	0	5	5	25.0	4	95		SUPP	FOOT				20		
07	0301	90/01/12	0.0	0.3	0.3	COHO	16	47	63	210.0	4	90		INDX	FOOT				27		
07	0301	90/01/12	0.3	0.5	0.2	COHO	6	2	8	40.0	4	90		SUPP	FOOT				27		
07	0301	90/01/22	0.0	0.3	0.3	COHO	0	67	67	223.3	4	95		INDX	FOOT				20		
07	0301	90/01/22	0.3	0.5	0.2	COHO	0	8	8	40.0	4	95		SUPP	FOOT				20		
07	0301	90/10/30	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT				20		
07	0301	90/10/30	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				20		
07	0301	90/11/06	0.0	0.3	0.3	COHO	3	0	3	10.0	4	95		INDX	FOOT				20		
07	0301	90/11/06	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				20		
07	0301	90/11/12	0.0	0.3	0.3	COHO	10	1	11	36.7	4	95		INDX	FOOT				20		
07	0301	90/11/12	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				20		
07	0301	90/11/20	0.0	0.3	0.3	COHO	3	0	3	10.0	4	95		INDX	FOOT				20		
07	0301	90/11/20	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				20		
07	0301	90/11/28	0.0	0.3	0.3	COHO	0	1	1	3.3	4	95		INDX	FOOT				23		
07	0301	90/11/28	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				23		
07	0301	90/12/07	0.0	0.3	0.3	COHO	4	0	4	13.3	4	95		INDX	FOOT				20		
07	0301	90/12/07	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				20		
07	0301	90/12/14	0.0	0.3	0.3	COHO	0	2	2	6.7	4	95		INDX	FOOT				20		
07	0301	90/12/14	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				20		
07	0301	90/12/26	0.0	0.3	0.3	COHO	0	0	0	0.0	4	55		INDX	FOOT		20	37	60		
07	0301	90/12/26	0.3	0.5	0.2	COHO	0	0	0	0.0	4	55		SUPP	FOOT		20	37	60		
07	0301	91/01/07	0.0	0.3	0.3	COHO	0	0	0	0.0	4	90		INDX	FOOT			20	37		
07	0301	91/01/07	0.3	0.5	0.2	COHO	0	0	0	0.0	4	90		SUPP	FOOT			20	37		
07	0301	91/01/14	0.0	0.3	0.3	COHO	0	0	0	0.0	4	75		INDX	FOOT		23				
07	0301	91/01/14	0.3	0.5	0.2	COHO	0	0	0	0.0	4	75		SUPP	FOOT		23				
07	0301	91/10/31	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT		20	57	60		
07	0301	91/10/31	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT		20	57	60		
07	0301	91/11/07	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT			20	57		
07	0301	91/11/07	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT			20	57		
07	0301	91/11/15	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT				20		
07	0301	91/11/15	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				20		
07	0301	91/11/22	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT				20		
07	0301	91/11/22	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				20		
07	0301	91/11/29	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT				20		
07	0301	91/11/29	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				20		
07	0301	91/12/06	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT				20		
07	0301	91/12/06	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				20		

SALMON SPAWNING GROUND DATA RETRIEVAL

Table 6. Complete record of spawner surveys for coho salmon in the Tolt River watershed, 1947-1992 (from Washington Dept. of Fisheries files).

WRIA NO.	STRM NO.	DATE YR MO DY	RIVER MILE LOW END	RIVER MILE UPPER END	LNGTH	SPEC NAME	LIVE COUNT	DEAD COUNT	TOTAL COUNT	FISH PER MILE	SPECIES CODE	PER CENT SEEN	REDD COUNT	TYPE COUNT	TYPE SURVEY	OTHER SPECIES SEEN	COMMENTS 1	2	3	AGCY	CODE
UNNAMED TRIBUTARY (LB)																(CONTD)					
07	0301	91/12/13	0.0	0.3	0.3	COHO	8	0	8	26.7	4	90		INDX	FOOT				20		
07	0301	91/12/13	0.3	0.5	0.2	COHO	0	0	0	0.0	4	90		SUPP	FOOT			38	21		
07	0301	91/12/20	0.0	0.3	0.3	COHO	1	0	1	3.3	4	80		INDX	FOOT				20		
07	0301	91/12/20	0.3	0.5	0.2	COHO	0	0	0	0.0	4	80		SUPP	FOOT				21		
07	0301	91/12/30	0.0	0.3	0.3	COHO	0	1	1	3.3	4	95		INDX	FOOT				20		
07	0301	91/12/30	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				20		
07	0301	92/01/06	0.0	0.3	0.3	COHO	0	0	0	0.0	4	95		INDX	FOOT				20		
07	0301	92/01/06	0.3	0.5	0.2	COHO	0	0	0	0.0	4	95		SUPP	FOOT				20		
SOUTH FORK TOLT RIVER (LB)																					
07	0302	76/12/09	0.0	4.2	4.2	COHO	0	0	0	0.0	4	0		SUPP	FOOT		24	60			
07	0302	76/12/09	4.2	8.4	4.2	COHO	0	0	0	0.0	4			SUPP	FOOT		22	60			
07	0302	91/11/06	6.8	8.2	1.4	COHO	0	0	0	0.0	4	35	0	SUPP	FOOT	6 0 0 0	23	60		31	
07	0302	91/11/09	5.3		0.0	COHO	NC	NC	NC	0.0	4			SPOT			28	60		31	
07	0302	91/11/14	5.3	8.2	2.9	COHO	0	0	0	0.0	4	35	0	SUPP	FOOT	6 0 0 0	23	32	60	31	
07	0302	91/11/15	0.0	1.6	1.6	COHO	11	1	12	7.5	4	35	8	SUPP	FOOT	2 0 0 0	23	60		31	
07	0302	91/12/02	3.3	5.3	2.0	COHO	0	0	0	0.0	4	15	0	SUPP	FOOT		28	32	60	31	
07	0302	91/12/02	6.8	8.2	1.4	COHO	0	0	0	0.0	4	35	0	SUPP	FOOT		26	00	60	31	
07	0302	91/12/03	0.0	1.6	1.6	COHO	4	1	5	3.1	4	20	17	SUPP	FOOT		26	32	60	31	
NORTH FORK CREEK (RB)																					
07	0329	76/12/03	0.0	0.2	0.2	COHO	0	0	0	0.0	4	90		SUPP	FOOT		20	60			
GRIFFIN CREEK (RB)																					
07	0364	44/12/14	0.7	1.2	0.5	COHO	4	1	5	10.0	4			SUPP	FOOT						
07	0364	45/10/25		0.0	0.0	COHO	250	0	250	0.0	4			SPOT		1 3 0 0	60	65			
07	0364	45/10/25	0.5	0.0	0.0	COHO	0	5	5	0.0	4			SPOT	FOOT	3 0 0 0	60	65			
07	0364	46/12/24	0.7	0.9	0.2	COHO	0	3	3	15.0	4			SUPP	FOOT		20	60			
07	0364	51/10/23	0.7	0.0	0.0	COHO	60	0	60	0.0	4			SPOT	FOOT	3 0 0 0	60	65			
07	0364	51/10/26	0.0	0.7	0.7	COHO	9	0	9	12.9	4			SUPP	FOOT	1 3 0 0					
07	0364	51/11/23	0.0	0.7	0.7	COHO	23	7	30	42.9	4			SUPP	FOOT	1 3 0 0					
07	0364	51/12/07	0.0	0.7	0.7	COHO	21	4	25	35.7	4			SUPP	FOOT		60				
07	0364	52/12/08	0.0	0.7	0.7	COHO	737	129	866	1237.1	4			SUPP	FOOT		60				
07	0364	52/12/24	0.0	0.7	0.7	COHO	328	408	736	1051.4	4			SUPP	FOOT		60				
07	0364	53/10/16	0.0	0.7	0.7	COHO	0	1	1	1.4	4			SUPP	FOOT	3 0 0 0	20	60			
07	0364	55/11/21	0.0	0.7	0.7	COHO	24	1	25	35.7	4			SUPP	FOOT	1 0 0 0	20	60			
07	0364	55/12/09	0.0	0.7	0.7	COHO	0	4	4	5.7	4			SUPP	FOOT		26				
07	0364	56/11/29	0.0	0.7	0.7	COHO	0	1	1	1.4	4			SUPP	FOOT		60				

Table 7. Steelhead redd densities (redds/mi) in the Tolt River watershed (from Pfeiffer 1990).

Table M. Steelhead redd densities (redds/mi) in the Tolt River.

Year	Mainstem /a	North Fork /b	South Fork /c
1982	9.9		
1983	32.5		
1984	18.4		
1985	3.8	30.7	15.4
1986	27.3	25.7	15.8
1987	24.9	44.3	17.2
1988	17.5	45.7	6.3
1989	24.1	42.9	16.2
1990	9.6		
1991	21.9	64.3	10.1
Means:	19.0	42.3	13.5

Note: Densities are for redds tallied in surveyed spawnable reaches, only.

/a Adequately seeded at an evenly-distributed 17 redds/mile.

/b Adequately seeded at an evenly-distributed 58 redds/mile; difficult to accomplish since much of the rearing habitat is ABOVE the spawning areas.

/c About 22 redds/mile will adequately seed.

Table 8. Summary of steelhead sport catch data for the Snoqualmie and Tolt Rivers, 1986-1990 (from Pfeiffer 1990).

Table H. Wild and hatchery steelhead catches in the Snoqualmie and Tolt Rivers, 1986-1990.

	SNOQUALMIE RIVER				TOLT RIVER			
	Winter-runs		Summer-runs		Winter-runs		Summer-runs	
Year	Hatchery	Wild	Hatchery	Wild	Hatchery	Wild	Hatchery	Wild
1986-87	1807	163	514	284	329	66	126	82
1987-88	2920	767	528	99	234	64	143	60
1988-89	930	328	1779	158	200	39	413	88
1989-90	1530	336	413	57	322	37	70	29
1990-91	1417	227			209	15		

Worksheet ff-1. Habitat condition rating for spawning gravel fines and pool habitat conditions

River Basin: Snohomish (WRIA–07)

Date: 2/9/93

Page: 1 of 5

WAU: Tolt River

Analyst: K. Bauersfeld

Stream Segment	Habitat Parameter	Parameter Statistic(a)	Parameter Value	Inventory Date	Data Source(b)	Condition Rating
1	Fine Sed.	% Fines	10-12%	1981-82	Stober et al. (1983) – Range of means	G
	Fine Sed.	% Fines	6.5%	1976	Pfeiffer (1990) – Single value	G
2	Fine Sed.	% Fines	7-9%	1981-82	Stober et al. (1983)	G
3	Fine Sed.	% Fines	13-16	1981-82	Stober et al. (1983)	F
	Pools	%	20:80	1993	Pess – field recon – visual est., not meas.	P
4	Fine Sed.	% Fines	6-10%	1981-82	Stober et al. (1983)	G
	Pools	P:R Ratio	1:1	1988	Seattle Water Dept.	F
5	Pools	P:R Ratio	1:1	1988	Seattle Water Dept.	F
10	Pools	%	80%	1988	Seattle Water Dept.	G
13	Pools	%	"Few"	11/24/87	Seattle Water Dept. – braiding, shallow, "few pools," possible barrier, at low flows, to cutthroat	P
15	Pools	%	10:90	1993	Pess et al. – channel team field reconnaissance	P
17	Pools	%	20:80	1991 1993	Light – field recon.	P

Comments:

(a) Statistic = mean ($\bar{x}$), range, standard deviation (SD), variance (S^2), single value
(b) Data source should include document citation, plus page, table/figure and station number where data was obtained.

Worksheet ff-1. Habitat condition rating for spawning gravel fines and pool habitat conditions

River Basin: Snohomish (WRIA–07) Date: 2/9/93 Page: 2 of 5

WAU: Tolt River Analyst: K. Bauersfeld

Stream Segment	Habitat Parameter	Parameter Statistic[a]	Parameter Value	Inventory Date	Data Source[b]	Condition Rating
18	Pools	%	10:90	1993	Pess et al. – channel team field reconnaissance	P
19	Pools	%	20:80	1992	Nawa 1992	P
20	Pools	%	20:80	1992	Nawa 1992	P
55	Pools	%	<10	1993	Fish team field recon. – few pools – subsurface flow	P
56	Pools	%	35-49	1993	Fish team field recon. – few pools – subsurface flow	F
24	Pools	%	>50%	1993	Fish team	G
25	Pools	%	>50	1993	Fish team	G
26	Pools	%	>50	1993	Fish team	G
28	Pools	%	>50	1993	Fish team	G

Comments:

(a) Statistic = mean ($\bar{x}$), range, standard deviation (SD), variance (S^2), single value
(b) Data source should include document citation, plus page, table/figure and station number where data was obtained.

Worksheet ff-1. Habitat condition rating for spawning gravel fines and pool habitat conditions

River Basin: Snohomish (WRIA–07)

Date: 2/9/93

WAU: Tolt River

Analyst: R. McIntosh

Stream Segment	Habitat Parameter	Parameter Statistic(a)	Parameter Value	Inventory Date	Data Source(b)	Condition Rating
63	Pools	%	20:80	1993	Pess et al. – channel team field reconnaissance	P
	Fine Sed.		–		Abundant surface fines	P
64	Pools	%	20:80	1993	Pess et al. – channel team field reconnaissance	P
	Fine Sed.		–		Abundant	
68	Pools	%	40:60		Pess et al. – channel team field reconnaissance	F
90	Pools	%	>50%	1993	Fish team	G
	Fine Sed.	%	Surface Fines			P
93	% Fines	Means	10-13%	1981	Stober et al. (1983)	F-G
	% Fines	Single Value	15.1%	1976	Pfeiffer (1990	F
	% Fines		8.5%	1991	Ebasco (1992)	G
94	Pools	%	40:60	1993	Pess et al. – channel team field reconnaissance	F
95	Fines Sed.	%	7-11%	1981	Stober et al. (1983)	G
	Fines Sed.	%	12.6%	1992	Ebasco (1992)	F
	Pools	%	25%	1991	Ebasco (1992)	
96	Pools	%	25%	1991	Ebasco (1992)	P

Comments:

(a) Statistic = mean ($\bar{x}$), range, standard deviation (SD), variance (S^2), single value
(b) Data source should include document citation, plus page, table/figure and station number where data was obtained.

Worksheet ff-1. Habitat condition rating for spawning gravel fines and pool habitat conditions

River Basin: Snohomish (WRIA–07) Date: 2/9/93 Page: 4 of 5

WAU: Tolt River Analyst: R. McIntosh

Stream Segment	Habitat Parameter	Parameter Statistic(a)	Parameter Value	Inventory Date	Data Source(b)	Condition Rating
97	Pools	%	25%	1991	Ebasco (1992)	P
98	Pools	%	25%	1991	Ebasco (1992)	P
99	Pools	%	25%	1991	Ebasco (1992)	P
100	Fines Sed.	Single Value	42.6%	1976	Pfeiffer (1990)	P
		Means	11.7%	1991	Ebasco (1992)	G
	Pools	%	25	1991	Ebasco (1992)	
101	Fine Sed.	% <.85 mm	6-10	1981	Stober et al. (1983)	G
102	Fine Sed.	% <.85 mm	14	1976	Pfeiffer (1990)	F
103	Pools	%	<30	1993	Fish team recon.	P
112	Pools	%	35-50	1993	Fish team recon.	F
113	Pools	%	35-50	1993	Fish team recon.	F
114	Pools	%	35-50	1993		F
115	Pools	%	>50	1993		G

Comments:

(a) Statistic = mean ($\bar{x}$), range, standard deviation (SD), variance (S^2), single value
(b) Data source should include document citation, plus page, table/figure and station number where data was obtained.

Worksheet ff-1. Habitat condition rating for spawning gravel fines and pool habitat conditions

River Basin: Snohomish (WRIA–07)

Date: 2/9/93

WAU: Tolt River

Analyst: R. McIntosh

Stream Segment	Habitat Parameter	Parameter Statistic(a)	Parameter Value	Inventory Date	Data Source(b)	Condition Rating
116	Pools	%	>50	1993		G
117	Pools	%	>50	1993		G
119	Pools	%	>50	1993	Pess and channel team	G
120	Pools	%	<10	2/93	Fish team only – 2 pools in 100 m	P
120	Fine Sed.	%		2/93	Fish team – abundant surface fines observed	P
120	Pools	%				
121	Pools Fine Sed.	% Vis.	<30% Abundant	1993	Channel team Channel team	
134	Pools	<30%		1993	Fish team	P
135	Pools	<30%		1993	Fish team	P
141	Fine Sed. Pools	%	35-50	2/93 2/93	Fish team field reconnaissance Fish team field reconnaissance	F→P F
144	Pools	%	>50	2/93	Fish team	G

Comments:

(a) Statistic = mean ($\bar{x}$), range, standard deviation (SD), variance (S^2), single value
(b) Data source should include document citation, plus page, table/figure and station number where data was obtained.

Worksheet ff-2. Description of Habitat Concerns and Potential Modifications
(Supplemental Information)

River Basin: Snohomish (WRIA – 07) Date: 2/9/93 Page: 3 of 3

WAU: Tolt River Analyst: Light/Bauersfeld/McIntosh

Stream Segment	Species	Life History Phase	Habitat Concern	Description and Apparent Cause	Production Potential Rating
Lynch Lake (114-115)	Steelhead, Cutthroat	Adult	Disease	Natural disease problem in Lynch Lake.	
SF	All	All	Temperature	Reservoir causes documented temperature increase in South Fork – though equilibrium with those in NF is reached by confluence. Pronounced difference in September and October. May affect spawning and incubation.	
1,2,3	Salmon	Adult	Holding	Possible lack of adult holding pools in mainstem below confluence.	
				• Identify concerns other than percentage of pools and percentage of fine sediments that could affect habitat conditions. • Identify channel characteristics that could modify production potential.	

Worksheet ff-2. Description of Habitat Concerns and Potential Modifications
(Supplemental Information)

River Basin: Snohomish (WRIA – 07)

Date: 2/9/93

WAU: Tolt River

Analyst: Light/Bauersfeld/McIntosh

Stream Segment	Species	Life History Phase	Habitat Concern	Description and Apparent Cause	Production Potential Rating
1 2	Chinook	Spawning	Scour Flow	Noted gravel movement/scour during Chinook incubation period – loss of appropriate size spawning material downstream. Low flows since (dam construction) may not in 1963 stimulate upstream migration of salmon.	
1 2	Chinook	Spawning	Temperature	Early ('50s) temperatures recorded during spawning of 49-55°F – need to check current temperatures.	
144	Coho Pinks	Spawning	Low Flow	Noted low flows inhibiting passage <u>into</u> Stossel Creek.	
5	Chinook	Spawning	Egg poaching	Noted carcasses without eggs in this reach – documented problem of poaching throughout.	
6 95/96	Steelhead Winter/Summer Coho	Rearing Spawning	Migration/ access	Altered flow regime in S.F. may have affected function of potential flow barriers – barriers may or may not be barriers to all species – historical vs. current migration patterns – competition issue for summer and winter steelhead. • Identify concerns other than percentage of pools and percentage of fine sediments that could affect habitat conditions. • Identify channel characteristics that could modify production potential.	

Worksheet ff-2. Description of Habitat Concerns and Potential Modifications
(Supplemental Information)

River Basin: Snohomish (WRIA – 07) Date: 2/9/93 Page: 2 of 3

WAU: Tolt River Analyst: Light/Bauersfeld/McIntosh

Stream Segment	Species	Life History Phase	Habitat Concern	Description and Apparent Cause	Production Potential Rating
144	All	Upstream Migration	Migration barriers	Noted increase in beaver activity (lack of control through trapping, etc.)	
23 24 25 26 27 28	w/Steelhead Coho Cutthroat			Beaver dams may become barriers to migration from partial blockage thought to have been fixed in 1986.	
All Forks	Steelhead	Adult	Poaching		
	All All of S. Fork below dam	All	Substrate & aquifer	Slurry of bentonite released during reservoir construction in mid-60s – affected spawning – sealed river bottom for awhile.	
1	Coho, Steelhead, Cutthroat	All	Rerouting of channel	Langlois Creek was rerouted to mainstem Snoqualmie when Tolt was diked.	
Both Forks	Steelhead	Juvenile	Disease	Noted fungus/lesions on juvenile steelhead.	
				• Identify concerns other than percentage of pools and percentage of fine sediments that could affect habitat conditions. • Identify channel characteristics that could modify production potential.	

Worksheet ff-3. Description of Habitat Concerns and Potential Modifications
(Field Reconnaissance Survey)

River Basin: Snohomish (WRIA – 07)

Date: 2/9/93

WAU: Tolt River

Analyst: Light/Bauersfeld/McIntosh

Stream Segment	Species	Life History Phase	Habitat Concern	Description and Apparent Cause	Production Potential Rating
1	Coho Chinook	Rearing	Lack of pool habitat	Little pool habitat = little rearing potential for anadromous species – lower 2 km ≅ 18% pools during winter base flow condition. Nice side channel – coho/chum and Chinook spawning – good rearing, over winter.	–
112 113 114	Steelhead and resident trout Non-anadromous	Rearing Spawning	Pool habitat substrate	Fair – old Stringer bridge was blocking fish migration. May become blockage again if it stays. Fair – sediment concern. Perched culverts at pipeline road blocks all upstream migration. Blow-off at pipeline concern – may cause erosion if large amounts of water released.	–
115 116 117	Non-anadromous Trout	Rearing Spawning	Pool habitat substrate	Good – good LOD presently, not much recruitment, beaver dams. Good Beaver dam at outlet to Lynch Lake may be a barrier. Fish barrier on 2/24/93 – 2-3 M high.	
118 119 120	Non-anadromous Trout	Upstream migration spawning	Fines barrier	Fines at beaver dam/bridge at upstream end – may be blockage to passage. Pond is storing fines	–
23	Coho Steelhead	Adult migration	Barrier	Migration delay/partial barrier – lots of fish below, few above.	–

- Identify concerns other than percentage of pools and percentage of fine sediments that could affect habitat conditions.
- Identify channel characteristics that could modify production potential.

Worksheet ff-3. Description of Habitat Concerns and Potential Modifications
(Field Reconnaissance Survey)

River Basin: Snohomish (WRIA – 07) Date: 2/9/93 Page: 2 of 5

WAU: Tolt River Analyst: Light/Bauersfeld/McIntosh

Stream Segment	Species	Life History Phase	Habitat Concern	Description and Apparent Cause	Production Potential Rating
144	Coho Steelhead	Adult	Spawning Incubation	Fines from mainstem overbank flow – backing up and dropping out in segment. Barrier may cause fish to overspawn lower area – saw loose dead eggs – abundant pools.	–
24	Coho Steelhead	Adult	Spawning	Somewhat compacted – some evidence of previous spawning – good potential rearing.	–
25	Coho Steelhead	Adult	Spawning	No problem at lower beaver dams through this segment – good rearing potential. Potential delay at lower end of pond – debris.	
121 123	Resident Cutthroat	All	Spawning Rearing	Abundant surface fines Lack of pools.	
141	Coho Trout	Adult	Spawning Rearing	Lots of fine sediment recently dropped out in lower index area – few pools. This is a spawning area, not rearing – based on size and flow – rearing = F, not G and sediment load. Lots of beaver activity noted removing recruiting trees – bank stability, etc. Lots of human activity (car bodies, shooting, etc.).	–
26	Coho Trout	Adult	Spawning	Sediment/fines cause spawning to be fair.	

- Identify concerns other than percentage of pools and percentage of fine sediments that could affect habitat conditions.
- Identify channel characteristics that could modify production potential.

Worksheet ff-3. Description of Habitat Concerns and Potential Modifications
(Field Reconnaissance Survey)

River Basin: Snohomish (WRIA – 07)

Date: 2/9/93

WAU: Tolt River

Analyst: Light/Bauersfeld/McIntosh

Stream Segment	Species	Life History Phase	Habitat Concern	Description and Apparent Cause	Production Potential Rating
26	Coho Trout	Adult	Spawning	Sediment/fines create fair spawning conditions.	–
90	Coho	Adult	Spawning Rearing	Fines in gravel reduce this to a fair/poor spawning potential. Good	–
63 64	Resident Trout	All	No Water in Channel	Field recon. found aggregation of coarse and fine sediments – no flow during winter normal flow period following high water. Possible passage barrier and road culvert (first crossing) – culvert is almost filled with material.	
43	Resident Trout	Upstream Migration	Barrier	Yellow creek culvert at mainline road crossing is perched and prevents fish passage.	
				• Identify concerns other than percentage of pools and percentage of fine sediments that could affect habitat conditions. • Identify channel characteristics that could modify production potential.	

Worksheet ff-3. Description of Habitat Concerns and Potential Modifications
(Field Reconnaissance Survey)

River Basin: Snohomish (WRIA – 07) Date: 2/9/93 Page: 4 of 5

WAU: Tolt River Analyst: Light/Bauersfeld/McIntosh

Stream Segment	Species	Life History Phase	Habitat Concern	Description and Apparent Cause	Production Potential Rating
88	Coho (not Chinook)	Upstream Migration	Spawning	• Old mainstem side channel now serves as lower end of Spook Lake outlet. Upstream end is blocked from current main channel by beaver dam and gravel from mainstem Tolt. • Recent dam break flood caused by beaver dam failure in segment (89?) has deposited coarse and fine sediment to salmon reach causing potential decreased spawning success. Dam fines in gravels, perched redds on aggregated debris fan dewatering. • Side channel probably doesn't function for summer rearing except upstream of Spook Creek confluence where beaver ponds form good summer and winter rearing habitat.	
138 Moss Lake Trib.	All Salmon	All		Poor flow conditions (low). Silty, oil sheen and poor habitat conditions for all salmonids – good connection to Tolt mainstem but even in winter not good habitat.	
103 S.F. above Res.	Resident Trout		All	Low % pools, ltd. available gravels for spawning? Fair winter rearing – do they spawn on delta.	
134 135	Resident Trout		All	Low % pools, ltd. available gravels for spawning? Fair winter rearing – do they spawn on delta. • Identify concerns other than percentage of pools and percentage of fine sediments that could affect habitat conditions. • Identify channel characteristics that could modify production potential.	

Worksheet ff-3. Description of Habitat Concerns and Potential Modifications
(Field Reconnaissance Survey)

River Basin: Snohomish (WRIA – 07)

Date: 2/9/93 Page: 5 of 5

Analyst: Light/Bauersfeld/McIntosh

WAU: Tolt River

Stream Segment	Species	Life History Phase	Habitat Concern	Description and Apparent Cause	Production Potential Rating
18	Resident Trout	All	–	Managed section has poor pools, <30% pools in old growth section too.	
19	Resident Trout	All	–		
55	Resident Trout		All	Debris torrent in upper 55 or lower 56 scoured or buried spawning gravels. • Aggraded – good flow at top, but water goes subsurface. • Poor pools (17%?) field recon. Lower channel recruited rearing to protect bridge. • Boulder/bedrock pools with lots of LOD, good spawning gravels. Poor pools.	
12b 13 15 17	Resident Trout		Spawning	Spawning sized materials generally lacking in wetted perimeter of mainstem Tolt – braided reaches.	

- Identify concerns other than percentage of pools and percentage of fine sediments that could affect habitat conditions.
- Identify channel characteristics that could modify production potential.

Worksheet ff-4. Evaluation of Production Potential Ratings

(Use only for segments where production potential modifications occur.)

River Basin: Snohomish (WRIA – 07)

Date: 2/9/93 Page: 1 of 1

WAU: Tolt River

Analyst: Light/Bauersfeld/McIntosh

Stream Segment	Ratings Based On: Map-Based Gradient/ Confinement	Ratings Based On: Supplemental Information	Ratings Based On: Field Reconnaissance	Final Rating	Reason for Modification
95	SF, RF, WP		SF, RF, WF	SF, RF, WF	Based on large, deep pools in S.F. canyon providing refuge during high flows.
96	SP, RP, WP		SP, RF, WF	SP, RF, WF	Same as above (pool habitat).
25	SG, RG, WG		SP, RG, WG	SP, RG, WG	Beaver ~~dams~~ ponds inundate spawning areas. • Reduces potential to poor.
10	SF, RF, WP		SF, RG, WF	SG, RG, WF	Nature of channel and large stream combine to create very large, deep pools that are excellent summer rearing areas for resident cutthroat. Depth of pools provides water refuge.
41	SF, RF, WP		SG, RF, WP	SG, RF, WP	Field recon. showed excellent spawning habitat in tailouts of pools in segment 56. All of these other segments fit into same segment cluster, so observations in segment 56 are being extrapolated to others.
46	SF, RG, WF		SG, RG, WF	SG, RG, WF	
49	SF, RF, WP		SG, RF, WP	SG, RF, WP	
56	SF, RF, WP		SG, RF, WP	SG, RF, WP	
57	SF, RF, WP		SG, RF, WP	SG, RF, WP	

WATERSHED ANALYSIS—FISH HABITAT ASSESSMENT

Worksheet ff-5. Summary of habitat vulnerability calls based on habitat potential and existing habitat condition ratings.

River Basin: Snohomish (WRIA—07)

Date: 2/9/93 Page 1 of 15

Analyst: K. Bauersfeld

WAU: Tolt

Segment Number	Habitat Potential			Existing Habitat Condition Ratings		Habitat Vulnerability				
	Spawning	Summer Rearing	Winter Rearing	Percent Fines	Percent Pools	Fine Sediment	Coarse Sediment	Peak Flow*	LOD	Temp**
1	G	G	G	G	P◊	M	H	H	H	H
2	G	G	G	G		M	H	H	H	H
3	G	G	F	F		H	H	H	H	H
4	F	F	P	G	F	L	M	M	M	M
5	G	G	F		F	H	H	H	H	H
6	F	F	P			M	M	M	M	M
7	G	G	F			H	H	H	H	H
8	F	F	P			M	M	M	M	M
9	P	P	P			L	L	L	L	L
10	F	G	F		G	M	M	M	L	H

* Always use the spawning habitat potential to get the default habitat vulnerability call for peak flow.
** Always use the summer rearing habitat potential to get the default habitat vulnerability call for temperature.

G = good
F = fair
P = poor

H = high
M = moderate
L = low

◊ = Field Reconnaissance

WATERSHED ANALYSIS—FISH HABITAT ASSESSMENT

Worksheet ff-5. Summary of habitat vulnerability calls based on habitat potential and existing habitat condition ratings.

River Basin: Snohomish (WRIA—07) Date: 2/9/93 Page 2 of 15

WAU: Tolt Analyst: K. Bauersfeld

Segment Number	Habitat Potential			Existing Habitat Condition Ratings				Habitat Vulnerability				
	Spawning	Summer Rearing	Winter Rearing		Percent Fines	Percent Pools		Fine Sediment	Coarse Sediment	Peak Flow*	LOD	Temp**
11	G	G	G					H	H	H	H	H
12	G	G	G			P	◊	H	H	H	H	H
13	G	G	G			P		H	H	H	H	H
14	G	G	F					H	H	H	H	H
15	G	G	G			P	◊	H	H	H	H	H
16	G	G	F					H	H	H	H	H
17	G	G	G			P	◊	H	H	H	H	H
18	F	F	P			P	◊	M	H	M	M	M
19	G	G	F			P	◊	H	H	H	H	H
20	F	F	P			P		M	M	M	M	M

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WATERSHED ANALYSIS—FISH HABITAT ASSESSMENT

Worksheet ff-5. Summary of habitat vulnerability calls based on habitat potential and existing habitat condition ratings.

River Basin: Snohomish (WRIA—07)

Date: 2/9/93 Page 3 of 15

WAU: Tolt

Analyst: K. Bauersfeld

Segment Number	Habitat Potential			Existing Habitat Condition Ratings				Habitat Vulnerability				
	Spawning	Summer Rearing	Winter Rearing		Percent Fines	Percent Pools		Fine Sediment	Coarse Sediment	Peak Flow*	LOD	Temp**
21	NOT	FISH	BEARING					NOT	FISH	BEARING		
22	NOT	FISH	BEARING					NOT	FISH	BEARING		
23	P	P	P					L	L	L	L	L
24	G	G	F			G	◊	H	M	H	M	H
25	P	G	G			G	◊	L	M	L	M	H
26	G	G	G			G	◊	H	M	H	H	H
27	G	G	F					H	H	H	H	H
28	G	G	G			G	◊	H	M	H	M	H
29	P	P	P					L	L	L	L	L
30	G	G	F					H	H	H	H	H

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WATERSHED ANALYSIS—FISH HABITAT ASSESSMENT

Worksheet ff-5. Summary of habitat vulnerability calls based on habitat potential and existing habitat condition ratings.

River Basin: Snohomish (WRIA—07) Date: 2/9/93 Page 4 of 15

WAU: Tolt Analyst: K. Bauersfeld

Segment Number	Habitat Potential			Existing Habitat Condition Ratings				Habitat Vulnerability				
	Spawning	Summer Rearing	Winter Rearing		Percent Fines	Percent Pools		Fine Sediment	Coarse Sediment	Peak Flow*	LOD	Temp**
31	G	G	G					H	H	H	H	H
32	G	G	G					H	H	H	H	H
33	P	P	P					L	L	L	L	L
34	P	P	P					L	L	L	L	L
35	G	G	F					H	H	H	H	H
36	NOT	FISH	BEARING					NOT	FISH	BEARING		
37	NOT	FISH	BEARING					NOT	FISH	BEARING		
38	P	P	P					L	L	L	L	L
39	G	G	F					H	H	H	H	H
40	G	G	F					H	H	H	H	H

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WATERSHED ANALYSIS—FISH HABITAT ASSESSMENT

Worksheet ff-5. Summary of habitat vulnerability calls based on habitat potential and existing habitat condition ratings.

River Basin: Snohomish (WRIA—07)

Date: 2/9/93 Page 5 of 15

Analyst: K. Bauersfeld

WAU: Tolt

Segment Number	Habitat Potential			Existing Habitat Condition Ratings			Habitat Vulnerability				
	Spawning	Summer Rearing	Winter Rearing		Percent Fines	Percent Pools	Fine Sediment	Coarse Sediment	Peak Flow*	LOD	Temp**
41	G	F	P				H	M	H	M	M
42	NOT	FISH	BEARING				NOT	FISH	BEARING		
43	P	P	P				L	L	L	L	L
44	F	F	P				M	M	M	M	M
45	P	P	P				L	L	L	L	L
46	G	G	F				H	H	H	H	H
47	P	P	P				L	L	L	L	L
48	P	P	P				L	L	L	L	L
49	G	F	P				H	M	H	M	M
50	NOT	FISH	BEARING				NOT	FISH	BEARING		

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WATERSHED ANALYSIS—FISH HABITAT ASSESSMENT

Worksheet ff-5. Summary of habitat vulnerability calls based on habitat potential and existing habitat condition ratings.

River Basin: Snohomish (WRIA—07) Date: 2/9/93 Page 6 of 15

WAU: Tolt Analyst: R. McIntosh

Segment Number	Habitat Potential			Existing Habitat Condition Ratings				Habitat Vulnerability				
	Spawning	Summer Rearing	Winter Rearing		Percent Fines	Percent Pools		Fine Sediment	Coarse Sediment	Peak Flow*	LOD	Temp**
51	P	P	P					L	L	L	L	L
52	P	P	P					L	L	L	L	L
53	P	P	P					L	L	L	L	L
54	G	G	F					H	H	H	H	H
55	G	G	G			P	◊	H	H	H	H	H
56	G	F	P			F	◊	H	M	H	M	M
57	G	F	P				see note	H	M	H	M	M
58	P	P	P					L	L	L	L	L
59	P	P	P					L	L	L	L	L
60	NOT	FISH	BEARING					NOT	FISH	BEARING		

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Note: This segment was identified as non fish-bearing on the DNR water type map, but appears to be accessible and suitable to support fish. Fish presence should be confirmed.

WATERSHED ANALYSIS—FISH HABITAT ASSESSMENT

Worksheet ff-5. Summary of habitat vulnerability calls based on habitat potential and existing habitat condition ratings.

Date: 2/9/93 Page 7 of 15

River Basin: Snohomish (WRIA—07)

Analyst: R. McIntosh

WAU: Tolt

Segment Number	Habitat Potential			Existing Habitat Condition Ratings				Habitat Vulnerability				
	Spawning	Summer Rearing	Winter Rearing		Percent Fines	Percent Pools		Fine Sediment	Coarse Sediment	Peak Flow*	LOD	Temp**
61	NOT	FISH	BEARING					NOT	FISH	BEARING		
62	NOT	FISH	BEARING					NOT	FISH	BEARING		
63	G	G	G		P	P	◊	H	H	H	H	H
64	G	G	G		P	P	◊	H	H	H	H	H
65	F	G	F					M	H	M	H	H
66	P	P	P					L	L	L	L	L
67	NOT	FISH	BEARING					NOT	FISH	BEARING		
68	P	P	P			F	◊	L	L	L	L	L
69	NOT	FISH	BEARING					NOT	FISH	BEARING		
70	NOT	FISH	BEARING					NOT	FISH	BEARING		

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WATERSHED ANALYSIS—FISH HABITAT ASSESSMENT

Worksheet ff-5. Summary of habitat vulnerability calls based on habitat potential and existing habitat condition ratings.

River Basin: Snohomish (WRIA—07) Date: 2/9/93 Page 8 of 15

WAU: Tolt Analyst: R. McIntosh

Segment Number	Habitat Potential			Existing Habitat Condition Ratings				Habitat Vulnerability				
	Spawning	Summer Rearing	Winter Rearing		Percent Fines	Percent Pools		Fine Sediment	Coarse Sediment	Peak Flow*	LOD	Temp**
71	NOT	FISH	BEARING					NOT	FISH	BEARING		
72	NOT	FISH	BEARING					NOT	FISH	BEARING		
73	NOT	FISH	BEARING					NOT	FISH	BEARING		
74	NOT	FISH	BEARING					NOT	FISH	BEARING		
75	F	F	P					M	M	M	M	M
76	NOT	FISH	BEARING					NOT	FISH	BEARING		
77	NOT	FISH	BEARING					NOT	FISH	BEARING		
78	NOT	FISH	BEARING					NOT	FISH	BEARING		
79	NOT	FISH	BEARING					NOT	FISH	BEARING		
80	NOT	FISH	BEARING					NOT	FISH	BEARING		

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WATERSHED ANALYSIS—FISH HABITAT ASSESSMENT

Worksheet ff-5. Summary of habitat vulnerability calls based on habitat potential and existing habitat condition ratings.

River Basin: Snohomish (WRIA—07)

Date: 2/9/93 Page 9 of 15

Analyst: R. McIntosh

WAU: Tolt

Segment Number	Habitat Potential			Existing Habitat Condition Ratings				Habitat Vulnerability				
	Spawning	Summer Rearing	Winter Rearing		Percent Fines	Percent Pools		Fine Sediment	Coarse Sediment	Peak Flow*	LOD	Temp**
81	NOT	FISH	BEARING					NOT	FISH	BEARING		
82	P	P	P					L	L	L	L	L
83	F	F	P					M	M	M	M	M
84	NOT	FISH	BEARING					NOT	FISH	BEARING		
85	NOT	FISH	BEARING					NOT	FISH	BEARING		
86	NOT	FISH	BEARING					NOT	FISH	BEARING		
87	NOT	FISH	BEARING					NOT	FISH	BEARING		
88	P	P	P					L	L	L	L	L
89	G	G	F					H	H	H	H	H
90	G	G	G		P	G	◊	H	H	H	H	H

* Always use the spawning habitat potential to get the default habitat vulnerability call for peak flow.
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WATERSHED ANALYSIS—FISH HABITAT ASSESSMENT

Worksheet ff-5. Summary of habitat vulnerability calls based on habitat potential and existing habitat condition ratings.

River Basin: Snohomish (WRIA—07) Date: 2/9/93 Page 10 of 15

WAU: Tolt Analyst: R. McIntosh

Segment Number	Habitat Potential			Existing Habitat Condition Ratings				Habitat Vulnerability				
	Spawning	Summer Rearing	Winter Rearing		Percent Fines	Percent Pools		Fine Sediment	Coarse Sediment	Peak Flow*	LOD	Temp**
91	P	P	P					L	L	L	L	L
92	NOT	FISH	BEARING					NOT	FISH	BEARING		
93	G	G	G		G			M	H	H	H	H
94	G	G	F			F	◊	H	H	H	H	H
95	F	F	F		F	P		M	H	M	H	M
96	P	F	F			P		L	H	L	H	M
97	G	G	G			P		H	H	H	H	H
98	F	F	P			P		M	M	M	M	M
99	G	G	G			P		H	H	H	H	H
100	F	F	P		G	P		L	H	M	H	M

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WATERSHED ANALYSIS—FISH HABITAT ASSESSMENT

Worksheet ff-5. Summary of habitat vulnerability calls based on habitat potential and existing habitat condition ratings.

River Basin: Snohomish (WRIA—07)

Date: 2/9/93 Page 11 of 15

Analyst: J. Light

WAU: Tolt

Segment Number	Habitat Potential			Existing Habitat Condition Ratings				Habitat Vulnerability				
	Spawning	Summer Rearing	Winter Rearing		Percent Fines	Percent Pools		Fine Sediment	Coarse Sediment	Peak Flow*	LOD	Temp**
101	F	F	P		G			L	M	M	M	M
102	G	G	F		F			H	H	H	H	H
103	G	G	G			P	◊	H	H	H	H	H
104	G	G	F					H	H	H	H	H
105	G	G	G					H	H	H	H	H
106	G	G	F					H	H	H	H	H
107	P	P	P					L	L	L	L	L
108	F	G	F					M	H	M	H	H
109	G	G	G					H	H	H	H	H
110	NOT	FISH	BEARING					NOT	FISH	BEARING		

* Always use the spawning habitat potential to get the default habitat vulnerability call for peak flow.
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WATERSHED ANALYSIS—FISH HABITAT ASSESSMENT

Worksheet ff-5. Summary of habitat vulnerability calls based on habitat potential and existing habitat condition ratings.

River Basin: Snohomish (WRIA—07) Date: 2/9/93 Page 12 of 15

WAU: Tolt Analyst: J. Light

Segment Number	Habitat Potential			Existing Habitat Condition Ratings				Habitat Vulnerability				
	Spawning	Summer Rearing	Winter Rearing		Percent Fines	Percent Pools		Fine Sediment	Coarse Sediment	Peak Flow*	LOD	Temp**
111	NOT	FISH	BEARING					NOT	FISH	BEARING		
112	F	F	F		F^X	F	◊	M	M	M	M	M
113	G	G	G		F^X	F	◊	H	H	H	H	H
114	G	G	G		F^X	F	◊	H	H	H	H	H
115	G	G	F			G	◊	H	M	H	M	H
116	G	G	G			G	◊	H	M	H	M	H
117	G	G	G			G	◊	H	M	H	M	H
118	F	F	P					M	M	M	M	M
119	G	G	G		P^X	G	◊	H	M	H	M	H
120	G	G	G		P^X	P	◊	H	H	H	H	H

* Always use the spawning habitat potential to get the default habitat vulnerability call for peak flow.
** Always use the summer rearing habitat potential to get the default habitat vulnerability call for temperature.

G = good
F = fair
P = poor

H = high
M = moderate
L = low

◊ = Field Reconnaissance
X = Surface fines abundant

WATERSHED ANALYSIS—FISH HABITAT ASSESSMENT

Worksheet ff-5. Summary of habitat vulnerability calls based on habitat potential and existing habitat condition ratings.

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Analyst: J. Light

WAU: Tolt

Segment Number	Habitat Potential			Existing Habitat Condition Ratings				Habitat Vulnerability				
	Spawning	Summer Rearing	Winter Rearing		Percent Fines	Percent Pools		Fine Sediment	Coarse Sediment	Peak Flow*	LOD	Temp**
121	G	G	F		PX	P	◊	H	H	H	H	H
122	NOT	FISH	BEARING					NOT	FISH	BEARING		
123	G	G	F		PX	P	◊	H	H	H	H	H
124	NOT	FISH	BEARING					NOT	FISH	BEARING		
125	G	G	G					H	H	H	H	H
126	P	P	P					L	L	L	L	L
127	G	G	G					H	H	H	H	H
128	P	P	P					L	L	L	L	L
129	P	P	P					L	L	L	L	L
130	F	F	P					M	M	M	M	M

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WATERSHED ANALYSIS—FISH HABITAT ASSESSMENT

Worksheet ff-5. **Summary of habitat vulnerability calls based on habitat potential and existing habitat condition ratings.**

River Basin: Snohomish (WRIA—07)

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WAU: Tolt

Analyst: J. Light

Segment Number	Habitat Potential			Existing Habitat Condition Ratings				Habitat Vulnerability				
	Spawning	Summer Rearing	Winter Rearing		Percent Fines	Percent Pools		Fine Sediment	Coarse Sediment	Peak Flow*	LOD	Temp**
131	P	P	P					L	L	L	L	L
132	F	G	F					M	H	M	H	H
133	NOT	FISH	BEARING					NOT	FISH	BEARING		
134	G	G	G			P	◊	H	H	H	H	H
135	G	G	F			P	◊	H	H	H	H	H
136	NOT	FISH	BEARING					NOT	FISH	BEARING		
137	NOT	FISH	BEARING					NOT	FISH	BEARING		
138	G	G	G					H	H	H	H	H
139	NOT	FISH	BEARING					NOT	FISH	BEARING		
140	NOT	FISH	BEARING					NOT	FISH	BEARING		

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WATERSHED ANALYSIS—FISH HABITAT ASSESSMENT

Worksheet ff-5. Summary of habitat vulnerability calls based on habitat potential and existing habitat condition ratings.

River Basin: Snohomish (WRIA—07)

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WAU: Tolt

Analyst: J. Light

Segment Number	Habitat Potential			Existing Habitat Condition Ratings				Habitat Vulnerability				
	Spawning	Summer Rearing	Winter Rearing		Percent Fines	Percent Pools		Fine Sediment	Coarse Sediment	Peak Flow*	LOD	Temp**
141	G	G	G		F→P	F	◊	H	H	H	H	H
142	G	G	G					H	H	H	H	H
143	G	G	F					H	H	H	H	H
144	G	G	F			G	◊	H	M	H	M	H
145-160	NOT	FISH	BEARING					NOT	FISH	BEARING		
161	P	P	P		FISH PRESENCE			L	L	L	L	L
162	F	G	F		NEEDS TO BE			M	H	M	H	H
163	F	G	F		CONFIRMED			M	H	M	H	H
164	NOT	FISH	BEARING					NOT	FISH	BEARING		
166	NOT	FISH	BEARING					NOT	FISH	BEARING		

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