UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
7600 Sand Point Way N. E., Bldg. 1
Seattle, WA 98115

FEB 0 3 2011

MEMORANDUM FOR: F/NWR – Bob Turner

FROM: F/NWR2 – Peter Dygert

SUBJECT: Report on Task H from the 2010 Lower Columbia Chinook Harvest Biological Opinion

The 2010 biological opinion (opinion) on the Effects of the Pacific Coast Salmon Plan on Lower Columbia River (LCR) Chinook applied to proposed fisheries in 2010 and 2011 (NMFS 2010a). The opinion set the total exploitation rate limit on LCR tule Chinook in 2010 at 38%; the exploitation rate limit for 2011 was set at 36%, but may increase to 37% if certain tasks are completed that reduce uncertainties related to recovery. The opinion included a list of tasks designed to accelerate recovery by identifying and promoting actions that will benefit LCR tule Chinook populations. If the tasks are completed satisfactorily, NMFS will clarify through it 2011 preseason guidance to the Pacific Fishery Management Council that the total exploitation rate limit in 2011 is 37% rather than 36%. Tasks A through H are listed in the conservation recommendations section of the opinion. Task H read as follows:

> Review and update existing escapement estimate time series for selected primary tule populations with particular attention to estimates of hatchery contribution. The report should also describe current escapement monitoring programs and how they are designed to address key uncertainties.

This memo responds to Task H.

The circumstances and proposed solutions related to escapement estimates differ in Washington and Oregon. The responses described below are therefore state specific.

Washington

The Washington Department of Fish and Wildlife (WDFW) provided a memo describing how tule escapement estimation procedures evolved over time and a process and time line for updating prior estimates of escapement and hatchery contributions (Rawding 2010, Attachment 1). During the 1940's and 1950's and through the mid 1990's management objectives and sampling procedures evolved. Resources available for escapement monitoring during that time were often limiting. Although there is a relatively long time series of escapement information for many of the Washington populations, the nature and quality of the data is limited by these past circumstances. Escapement estimates were most often based on peak counts taken in conveniently located index areas. Once the hatchery marking programs began an effort was made to sample for hatchery fraction, but the ability to expand those estimates to the population level was limited by low mark rates, low sampling rates, and the fact that sampling tended to be in

index areas that were located near hatchery facilities that were not necessarily representative of other parts of the basin.

There has been more emphasis placed on monitoring programs and our understanding of the status of the tule populations since the decline of LCR tules in the mid-1990's and their subsequent ESA listing in 1999. The resources needed for improved monitoring have increased gradually in recent years as priorities and our understanding of the importance of LCR tule Chinook evolved.

In 2006 and 2007 the Lower Columbia River tule Chinook Working Group (Work Group) developed population level risk assessments that were used to inform ESA section 7 consultations on harvest action affecting LCR tule Chinook. The Work Group project included a significant effort to review and update escapement data for the Washington populations used in the analysis. The review focused on the Coweeman, Grays, and East Fork Lewis populations in particular. The review included use of available information to refine estimates of total escapement, hatchery fraction, and age composition. The Work Group report (Ford et al. 2007) provided estimates of escapement through 2005 for ten tule populations in Washington and the Clatskanie population in Oregon. Estimates for more recent years have been added to the time series, but these estimates still provide the basis for consultations and the recent five year LCR Chinook status review.

WDFW concluded that further efforts to improve the escapement estimates for all populations was best accomplished through a more systematic and comprehensive project that is described in the Rawding memo (2010, Attachment 1). The project involves development of four related data bases, reanalysis of all mark-recapture data, and development of population specific expansion factors and hatchery fractions. The work is scheduled to occur in 2011 with a final report expected in September 2011 that will include updates to past LCR tule Chinook escapement and hatchery fraction estimates. The data base development and retrospective review also provide the basis for improved monitoring and escapement estimation in the future.

Oregon

There are nine LCR tule populations in Oregon. Three are designated as low risk, "primary" populations through recovery planning including the Clatskanie, Scappoose, and Hood[1] (ODFW 2010). Other populations are designated as "contributing" or "stabilizing" and would be managed at higher risk.

Spawning survey methods used in Oregon in the past are similar to those used in Washington. The surveys were designed to assess status by providing estimates of peak counts in selected index areas. The location of the index areas evolved over time along with priorities and available resources. Surveys for LCR tule Chinook are currently conducted in 10 index areas in three drainages including 1) Youngs Bay, 2) the area between Astoria and Clatskanie which includes

[1] It is considered "unlikely" in the Oregon Recovery Plan that the Hood population will achieve its desired status as a primary population.

the Big Creek and Clatskanie populations, and 3) the Sandy River (Takata 2008, Attachment 2). There are four index areas in Youngs Bay and three in the Big Creek drainage. (The attached maps (Attachments 3 through 6) along with the Takata (2008) report provide geographical context.) Both of these populations are heavily influenced by their proximity to hatchery production facilities and are expected to remain so. There are two index areas for the Clatskanie population, one in the Clatskanie River and the other in Plympton Creek. However, as discussed below, Plympton Creek is at the west end of the population boundary and is heavily influenced by fish returning to the nearby Big Creek Hatchery. Spawning surveys in the Sandy and Hood rivers, and other tule production areas have been sporadic and do not provide consistent time series estimates (Takata 2008). As a consequence, the best data set for Oregon tule populations was that for the Clatskanie, and even there the contribution of hatchery fish was unknown, but presumed to be high.

Nonetheless, absent better information, the Clatskanie data were used extensively during recovery planning and in subsequent risk assessments (ODFW 2010, Ford et al. 2007, NWFSC 2010). Until recently, there were no spawner survey data for the neighboring Scappoose which is another key primary tule Chinook population in Oregon. Absent better information, the Clatskanie time series was used in recent analyses to represent circumstances in the Scappoose (e.g., NWFSC 2010). Task H was designed in part to review the Clatskanie escapement estimates because of its importance as a primary population in Oregon, and more generally to report what is being done to improve our understanding of the status of the Clatskanie and other key tule populations in Oregon.

A description of the Clatskanie spawning escapement data and methods used to develop it are included in Appendix C of Oregon's Lower Columbia Recovery Plan (ODFW 2010). The same data set has been used in recent biological opinions and related analyses, and is used in NOAA Fisheries' most recent status review of ESA listed salmon and steelhead. Because of prior reliance on the Clatskanie data set, it is useful to go through some of the details of the Appendix C of the Recovery Plan as there are some errors in the description of methods and results.

The index area in the Clatskanie River is in a 2.0 mile (3.2 km) section downstream from the mouth of Keystone Creek (Takata 2008). Estimates of peak count are available back to 1952. The data set reported by ODFW goes from 1974 to 2006 (ODFW 2010). Annual peak spawner counts in the 2.0 mile index area are converted to a spawners/km, and then converted to a season count/km by multiplying by 1.7. ODFW (2010) reports that the season count/km is expanded to total spawners for the populations by multiplying by 16 km representing the total amount of spawning habitat, a value that is reported in Maher et al. (2005). However, the actual value used in the computation was 36.8 km (Chilcote pers. comm.). A spread sheet that shows the details of the computations and matches the results reported in Appendix C of the Recovery Plan is attached (Attachment 7).

If the peak count value in the index area for any particular year was less than five, it was adjusted, generally using an average of the neighboring years (ODFW 2010, Attachment 7). The thinking at the time was that peak counts less than five seemed implausible since those broods

frequently produced relative large returns. In retrospect, a different judgment might be made as to how to treat those low index counts, but that judgment now has the benefit of hindsight. Of the 33 years in the 1974 to 2006 time series, 11 were adjusted because index counts were less than five (Attachment 7).

Finally, there was a computational error in the Clatskanie spawner estimates for 2004 to 2006. The reported values were 401, 370, and 212, respectively. The corrected values are 252, 233, and 97 (Attachment 7).

ODFW (2010) also described their efforts to estimate the proportion of hatchery fish in the spawning escapement. The data related to hatchery abundance is limiting so the results are highly uncertain. Based on the available information, ODFW concluded that the proportion of hatchery fish on the spawning grounds was at least 0.90 in the Clatskanie and was likely similar in most other LCR tule production areas in Oregon. The age composition of Clatskanie tule Chinook was assumed to be fixed and was based on the average age composition of Big Creek Hatchery fish.

Plympton Creek is located at the west end of the Clatskanie population boundary. Index counts have occurred in Plympton Creek since 1970. The index area is 1.7 miles long extending from the river mouth to a falls barrier. Index counts in Plympton Creek have been hundreds or thousands per year compared to the single or double digit counts observed in the Clatskanie River index area (Takata 2008). Plympton Creek is proximate to the Big Creek Hatchery and it is reasonable to assume that fish returning to Plympton Creek are primarily strays from the hatchery. Redd counts in Plympton Creek are relatively consistent and average about 50 per year regardless of the number of spawners (Takata 2008) suggesting that spawning habitat in Plympton Creek is limiting. Habitat quality is less than ideal for spawning so it seems unlikely that there is significant natural production in Plympton Creek (K. Melcher, ODFW, pers. comm.). Two points are worth making with respect to Plympton Creek. First, observations of coded-wire-tag recoveries used to estimate the proportion of hatchery spawners for the Claskanie are almost entirely from Plympton Creek. It is possible that stray rates in the Clatskanie River itself are different from those observed in Plympton Creek. Observations in the Clatskanie index area are too sparse to help resolve this uncertainty. Estimates of the proportion of hatchery fish in the Clatskanie River are therefore of particular importance. Second, it is apparent that returns to Plympton Creek are not representative of those returning to Clatskanie River. As described below, ODFW has initiated an alternative spawner survey method designed to improve status estimates for the populations. It will be necessary to consider how to use observations in Plympton Creek and whether they should be included in estimates of population-wide abundance in the Clatskanie.

Because of the limitations of past survey methods and the need for improved population status information, ODFW initiated survey methods which used the Environmental Monitoring and Assessment Program (EMAP) approach to sampling design. The monitoring approach was originally developed and applied to Oregon coastal coho populations, and was extended to cover LCR coho populations beginning in 2002 (Suring et al. 2006). The EMAP uses a sample design

called a Generalized Random Tessellation Stratified design (GRTS) to achieve a spatially-balanced point distribution that is nonetheless random (Stevens 2002). The GRTS design was subsequently used for LCR Chinook populations as well. The first year of spawner surveys under GRTS-based surveys were conducted in 2009. Oregon's recovery plan includes several actions that are designed to improve understanding of the quantity and composition LCR tule Chinook spawners, among others. Actions 43-Trib, 44-Trib, 55-Trib, 57-Trib, and 58-Trib from the Recovery Plan pertain to escapement monitoring (ODFW 2010). Implementation of the GRTS-based survey program is ODFW's programmatic response to address the need for improved monitoring. The recovery plan calls for monitoring population status for the next several years using the improved methods, and then taking adaptive action depending of the results.

It is useful to update the peak count estimates that have been developed since 2006 and provide preliminary results from the 2009 GRTS surveys. As with recent years, peak counts continue to be low in the Clatskanie and relatively high in Plympton Creek. These values are reported in updated tables comparable to those in Takata (2008).

	Peak Spawning Ground Counts	
	Clatskanie River (2.0 miles)	**Plympton Creek (1.7 miles)**
2007	**0**	**265**
2008	**2**	**652**
2009	**4**	**-**

If the standard methods are used to expand the peak counts to total spawners in the Clatskanie, estimates would be 0, 39, and 78 for 2007 through 2009. These presume that the peak count estimates are not "adjusted" as they were in Appendix C (ODFW 2010).

Spawner surveys on the Scappoose were conducted for the first time on four different dates at two locations in 2008. Returns to the Scappoose are of interest because it too is a primary LCR tule population. A total of three live adult Chinook were observed during the surveys (Murtagh, T., ODFW, pers. comm.).

GRTS surveys were conducted in 2009 on both the Scappoose and Clatskanie rivers. On the Scappoose and Clatskanie, 34% and 36% of the available habitat was surveyed, respectively (Weeber 2010). No live adults were observed during six surveys on the Scappoose in 2009. The total number of adults observed on the Clatskanie was 463, but all but five were observed in Plympton Creek. The length of the survey area on Plympton Creek was 0.48 miles compared to 1.7 miles used in the prior index surveys. There were four survey areas in the Clatskanie River and its tributaries with a combined length of 4.22 miles compared to the on index area of 2.0 miles in the prior surveys. These results from the index and GRTS surveys are therefore not directly comparable, although they do give the same qualitative result. The impression left by recent observations in the Scappoose and Clatskanie is that spawning is quite limited. A few more years of observations will be needed to confirm the impression left by these recent surveys.

There are some technical problems yet to be solved before the GRTS survey results can be expanded to estimates of total, population specific escapement. These include consideration of how to deal with time gaps that may occur in successive surveys, assumptions about spawner residence time, and the proportion of all spawners observed during a survey (Weeber, M., ODFW, pers comm.). Another problem unique to the Clatskanie population is how to deal with observation in Plympton Creek which are seemingly not representative of what is going on elsewhere in the Clatskanie population area.

References

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Attachment 1

August 5, 2010
To: Sara Laborde
From: Dan Rawding
Subject: Updating Tule Escapements per Tule BiOP tasks

Background

The WDFW monitoring program for Tule fall Chinook salmon has passed through three distinctive phases. The first phase occurred from the 1940's through the 1950's, which consisted of stream surveys to document Chinook salmon presence in index reaches or spot checks. The second phase occurred in conjunction with the Mitchell Act hatchery program to evaluate hatcheries. This was initiated with fin marking in the 1950's and the use of the Coded-Wire-Tag (CWT) in the 1970's to determine ocean and inriver harvest in mix stock fisheries and evaluation of the hatchery program. During this time, natural origin and hatchery Tule fall Chinook were managed as an aggregate, call "Lower River Hatchery". Limited resources were used to develop a single peak count expansion factor to expand a count conducted at or near the peak of spawning activity into population estimates for selected populations. For other populations, the expansion factor was based on professional opinion for counts conducted at or near the believed peak in spawning. Competing priorities of fisheries and hatchery sampling often resulted in fewer resources for escapement sampling. The goal was to sample 5% of the natural spawning population for the presence of CWT. Sampling sections were not randomly chosen but identified based on access and in the vicinity of the hatchery to achieve the goal with the limited resources available. During this period the majority of sampling was funded through the Bonneville Power Administration (BPA) through the CWT Recovery program, state resources, and with local utilities such as PacifiCorps and Tacoma Public Utilities in the Lewis and Cowlitz Rivers, respectively.

After a decline in Tule abundance in the mid-1990 and subsequent listing of this population for protection under ESA in the late 1990's, WDFW has put forth considerable effort developing Viable Salmonid Population (VSP) monitoring programs to improve adult and juvenile abundance, diversity, and spatial structure. Additional resources have been made available for this effort through the re-allocation of Mitchell Act Research Monitoring and Evaluation (RME) and Salmon Recovery Funding Board (SRFB) funding. Recently (2009-10), we received additional funding for expanded tag recoveries of Chinook and coho salmon fisheries and escapement through BPA, from the Pacific Coast Salmon Recovery Fund (PCSRF) to address VSP Tule Chinook monitoring gaps, from the CWTIT to address sampling designs for Chinook CWT recovery, and through PNAMP to address Tule distribution, database development, and standardization.

The purpose of this memo is to provide the timeline to meet one of the tasks of the Tule Chinook Harvest BiOP, which is "NMFS will receive reports from the WDFW and ODFW that review and update existing escapement estimate time series for selected primary Tule populations with particular attention to estimates of hatchery contribution". We are simultaneously working on two aspects of Tule Chinook monitoring including: 1)

the development of a VSP monitoring program to meet the NOAA monitoring guidance from the present (2010) and into the future, and 2) the correction of historic VSP time series estimates. The remainder of this memo addresses the task and timelines for correction of historic time series.

Task to Correct Historic VSP Time Series

- Finalize Tule Chinook species distribution model. WDFW Tule Chinook spawning ground surveys have not always covered the entire spatial range of Tule Fall Chinook spawning. Therefore, WDFW has developed a model to predict the distribution of Tule spawning based on field sampling to determine the upper extent of spawning and environmental attributes derived from GIS using logistic regression. These model results will be used to develop future sampling designs and examine coverage rates for previous surveys.

- Enter all Tule Chinook data into four standardized WDFW databases, which have been developed: The spawning ground survey (SGS) database stores adult count information collected during spatial surveys. It has the count information to estimate abundance using Area-Under-the-Curve (AUC) or Peak Count Expansion (PCE) methods. This database is updated through 2009. The second database that has been developed is the Age and Scales (A&S) database. This database stores biological information collected during surveys such as sex, length, egg retention, fin marks, CWT presence, and sample rates for CWT. This database is mostly updated. The third database WDFW is developing is a mark-recapture database. The purpose of this database is to store the data collected as part of mark-recapture experiments, which is above and beyond the information needs in SGS or A&S. This database is updated for more recent estimates after 2000 but need to be updated with pre-2000 estimates. The final database is the smolt database to store Tule outmigrant information from the Grays, Mill, Abernathy, Germany, and Coweeman watersheds. There is a proposed template for this database but previous collected data is currently stored on Excel spreadsheets, and is not entered into the new database.

- With the data standardized in the above databases, all Tule Chinook salmon abundance estimate will be re-analyzed. This process will include development of adult mark-recapture estimates with variance for all sampled populations using the Jolly-Seber or Petersen estimators. Analysis will include assumption testing for unbiased estimates. There are approximately 40 mark-recapture estimates to be analyzed or re-analyzed.

- Concurrent with mark-recapture data collection observation of live fish, carcasses, and sometimes redd counts were made. A method to provide escapement estimates in year without mark-recapture is to develop adjustment, correction or expansion factors for count expansion, observer efficiency, residence time. and redds per female or fish for specific populations. Where multiple annual factors

exist, a single combined expansion factors will be developed using all previous surveys. Therefore, we expect to develop expansion factors for populations that have mark-recapture estimates and the application of population specific expansion factors to individual populations will provide a time series of abundance estimates. With new abundance estimates requires updating sample rate used for CWT expansion in RMIS.

- Previous expansion of CWT tag rate to develop the proportion of hatchery spawners (pHOS) was developed for the LRH aggregate. It is likely that these methods, which include the use of "adult tag rate" were appropriate for aggregate management are not appropriate for estimates of individual population estimates of pHOS. Therefore, we need to query RMIS to develop a juvenile tagging rate for all LCR Chinook populations. Using this information with updated sampling information, pHOS can now be estimated for the escapement time series developed in the above step. New methods will also be developed for estimating pHOS after the mass marking of Tules was initiated in 2005.

- A final report on VSP monitoring is scheduled for the fall 2011.

Proposed Timeline for Correct Historic VSP Time Series

Task No.	Tule Task Descriptions to update abundance and pHOS	Completion Date
1	Complete Tule Chinook Salmon Distribution Model	Oct 2010
1	Complete database development & entry for spawning ground survey database (SGS), Age and Scales (A&S), Weir/Mark Recapture (MR) through 2010 spawning year	Jan 2011
2	Re-analyze historical mark-recapture data to estimate abundance and variance.	Apr 2011
3	Develop expansion factors for peak count expansion, observer efficiency, residence time, and redds per female or fish for each population, apply expansion factors to develop a time series estimate of abundance, and correct sampling expansion rates in RMIS	Jul 2011
4	Query RMIS to develop a juvenile tagging rate for each Tule hatchery release by brood year. Pre-mass mark period use mark sampled fish from SGS, A&S, and juvenile tag rate to estimate pHOS for each Tule population. After mass marking (2005) use ratio of marked and unmarked adults to calculate the pHOS, with assumptions about missed mass mark clip rate	Aug 2011
5	Final Report on Tule Fall Chinook abundance, diversity (pHOS, Age, etc), & spatial structure.	Sep 2011

Please contact me if you have any questions!

Attachment 2

Oregon Lower Columbia River Fall and Winter Chinook Spawning Ground Surveys, 1952-2008

Focus on 2008

Tanna T. Takata

Oregon Department of Fish and Wildlife
Columbia River Management

December 2008

INTRODUCTION

Spawning ground surveys are a fundamental tool of the Oregon Department of Fish and Wildlife that aid in the development of run reconstructions, forecasts and harvest management plans. Fall chinook *(Oncorhynchus tshawytscha)* spawner abundance and escapement have been assessed in the lower tributaries of the Columbia River since 1948 (Figure 1). Initially, five Oregon tributaries were surveyed to evaluate the status of fall chinook stocks, which include tules, select area brights (SABs), and late wilds. In 1950, Gordon and Trout creeks (Sandy River tributaries) were added to the program to evaluate the only known wild winter chinook stock found in the lower Columbia River (Hirose, 1982). In subsequent years, some survey units were eliminated while others were added in an effort to increase coded-wire tag (CWT) recoveries and document straying of hatchery fall chinook (Hirose, 1985). Surveys for winter chinook were discontinued after 2004.

Currently, ten surveys are conducted annually from late September through early November to assess the status of tule, late wild, and SAB fall chinook stocks within three distinct drainages of the lower Columbia River: (1) Youngs Bay, (2) Columbia River between Astoria and Clatskanie, and (3) the Sandy River. Descriptions and lengths of all of these surveys can be found in Table 1. The main objectives of the surveys are to ascertain escapement levels, trends, and distributions of naturally spawning fall chinook (Fennell, 1992).

METHODS

Surveys were conducted to capture the peak spawning period of the three individual fall chinook stocks found within the lower Columbia River tributaries. The peak spawning period for the tule stock typically runs from September through mid-October, SABs spawn from late September through November, and the late wild stocks spawn from mid-October through November.

All surveys were conducted on foot with the exception of the mainstem Sandy River. Prior to 1984, redds in the Sandy River were primarily counted from an airplane. Since 1984, fish and redd counts on the Sandy River have been made annually by drift boat, jet sled, and on foot.

Data collected during spawning ground surveys include counts of live fish, carcasses, and redds, as well as biological data from recoverable salmon carcasses. All recoverable carcasses were mark sampled for fin-clips to distinguish tules from SABs and to recover CWTs. Carcasses with adipose fin-clips were scanned with a CWT wand detector. Snouts were removed from all carcasses that tested positive for a CWT. The snouts were taken to the Clackamas lab for CWT recovery and decoding and the data were transferred to the ODFW information system for inclusion in the Pacific States Marine Fisheries Commission (PSMFC) CWT mark recovery database. Carcasses with left ventral fin-

clips were assumed to be SABs, which have been LV-clipped since the 1994 brood (1995 releases). Additionally, biological data such as fork length, sex, and scales were collected from a random sample of carcasses. Scale samples were collected from the key scale area (Nicholas and Van Dyke, 1982) unless that area was compromised. Surveyors cut the tails off all carcasses examined for marks to prevent re-sampling in subsequent surveys. Surveyors also documented survey conditions such as weather, stream flow and clarity.

Spawning ground survey data were then utilized to estimate escapement levels and to aid in the determination of age, sex, and stock composition, as well as length frequency. The data were also used to help forecast future run sizes. Escapement numbers are generated using a one-time peak count of fish (live and dead) or redds observed. For a majority of the lower Columbia River tributaries, the escapement numbers are calculated using an expansion factor of 1.7x applied to the peak fish counts. For the Sandy River, an expansion factor of 2.5x is applied to the peak redd count. The size of the Sandy River does not lend itself to the use of peak fish counts to estimate escapement. Both live fish and carcasses are not as easily observed in the Sandy as they are in smaller streams. In addition, carcasses in large rivers are subject to wash-out during high water conditions. Smaller streams tend to hold on to carcasses in high water due to the greater complexity of the stream habitat and lower overall flows. Redd counts are considered to be a more accurate measure for escapement estimates in larger systems, such as the Sandy or Clackamas. Age composition is determined from scale aging, while stock composition is derived from coded-wire tag and fin-clip data. Sampling and counting procedures were consistent with methods used in previous years.

2008 RESULTS

Youngs Bay

During 2008, a total of 9.8 miles of stream were surveyed during the month of October in the Youngs Bay drainage. The surveyed streams included the North and South forks of the Klaskanine River, the Lewis and Clark River, and Youngs River (Table 1). Surveys on the four tributaries yielded a combined peak count total of 357 fish and 135 redds observed (Table 2). The number of fish observed was 114% of the ten-year average (1998-2007) of 312 fish, and the number of redds observed was 171% of the ten-year average of 79 redds. The observed fish/mile average of 36 was 113% of the ten-year average of 32. The estimated escapement for the Youngs Bay tributaries totaled 607 Chinook (Table 10).

Out of 107 mark sampled fish, eight were adipose and left ventral fin-clipped and had their snouts removed (Table 7a). The Clackamas CWT lab results showed that one snout did not have a CWT, and the remaining seven were Cole Rivers stock (Select Area Brights) from the North and South Fork Klaskanine Hatcheries and the CEDC Youngs Bay net pens (Table 8a).

The North Fork Klaskanine River coded-wire tag and scale analyses concluded that 100% of the spawners were SABs with an age composition of 54% four-year olds, 44% three-year olds, and 1% each of five and two-year olds (Tables 8a & 9a).

The South Fork Klaskanine River fin-clip and scale analyses concluded that 100% of the spawners were SABs with an age composition of 40% each three and four-year olds, and 20% two-year olds (Tables 7a & 9a).

The Lewis and Clark River fin-clip, coded-wire tag, and scale analyses concluded that 100% of the spawners were SABs with an age composition of 50% four-year olds, 38% three-year olds, and 12% two-year olds (Tables 7a, 8a, & 9a).

The Youngs River fin-clip, coded-wire tag, and scale analyses concluded that 100% of the spawners were SABs with an age composition of 50% three-year olds and 50% four-year olds (Tables 7a, 8a, & 9a).

Astoria to Clatskanie

During 2008, a total of 13.2 miles of stream were surveyed from late September through mid October in the lower Columbia River tributaries between Astoria and Clatskanie. The surveyed streams included portions of the Clatskanie River, Gnat Creek, Bear Creek, Big Creek, and Plympton Creek (Table 1). Surveys of these five tributaries produced a combined peak count total of 3,522 fish and 186 redds observed (Table 3). The number of fish observed was 69% of the ten-year average (1998-2007) of 5,139 fish and the number of redds observed was 76% of the ten-year average of 246. The observed fish/mile average of 267 was 69% of the ten-year average of 389. The estimated escapement for the Astoria to Clatskanie tributaries totaled 5,987 Chinook (Table 10).

Out of 946 mark-sampled fish, seven out of 18 adipose fin-clipped fish tested wand positive for CWTs and had their snouts removed. One of the seven snouts did not have a coded-wire tag (Tables 7a & 7b). The Clackamas CWT lab results showed that five of the remaining CWTs were Big Creek tules while the sixth was a stray from the Elochoman River in Washington (Table 8b).

On the Clatskanie River and Gnat creek, bio-samples were not available to estimate stock and age compositions.

On Big Creek the CWT lab results showed that 100% of the spawners were tules with an age composition of 64% four-year olds, 29% three-year olds, 5% two-year olds, and 2% five-year olds (Table 8b & 9b).

The Plympton Creek fin-clip and scale analyses concluded that 100% of the spawners were tules with an age composition of 66% four-year olds, 29% three-year olds, 3% two-year olds, and 2% five-year olds (Table 9b).

Sandy River

Early tules

During 2008, no surveys were conducted during the peak spawning period on the mainstem Sandy River to document the naturally-spawning early tules; therefore, escapement for the early tule run was estimated based on the 2006 - 2007 Washougal and Sandy River hatchery return ratios (Table 10). Based on this calculation the estimated early tule escapement on the mainstem Sandy River was 246 fish (Table 10).

Late wilds

During 2008, three surveys were conducted on the mainstem Sandy River from late October through early-November to document the peak of the late spawning wild chinook run. The peak spawning period for this run produced a peak count of 376 fish and 244 redds (Table 10). The number of fish observed was 105% of the ten-year average (1998-2007) of 357 fish and the number of redds observed was 101% of the ten-year average of 241. The estimated escapement for the late wild fall chinook run was 610 fish (Table 10).

Three of the 156 mark sampled fish were missing their adipose fins; however, all three were wand negative and did not have their snouts removed for CWT analysis (Table 8c). The age composition of the late wild fall chinook run showed that 61% were four-year olds, 24% five-year olds, 13% three-year olds, 1% two-year olds, and 1% six-year olds (Table 9c).

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Table 1. Oregon Lower Columbia River Fall and Winter Chinook Spawning Ground Survey Descriptions.

YOUNGS BAY

Stream		Survey Description	Mileage a/
N. Fk. Klaskanine River		Hatchery to tidewater.	1.5
S. Fk. Klaskanine River		CEDC rearing ponds to tidewater.	3.5
Youngs River		Falls to tidewater.	0.3
Lewis & Clark River		Crown Zellerbach bridge to tidewater. (on Weyerhauser property)	4.5
			9.8

ASTORIA TO CLATSKANIE

Stream		Survey Description	Mileage a/
Clatskanie River		Mouth of Keystone Cr. to tidewater.	2.0
Gnat Creek		Falls to tidewater	3.5
Bear Creek		Falls to tidewater.	3.0
Big Creek		Hatchery to tidewater.	3.0
Plympton Creek		Falls to tidewater.	1.7
			13.2

SANDY RIVER

Stream		Survey Description	Mileage a/
Sandy River		Mouth of Gordon Cr. to Lewis & Clark Ramp.	10.0
		(Flights - Mouth to Marmot Dam)	(30.0)
Gordon Creek (Winter Chinook)	b/	Mouth to old weir site.	0.2
Trout Creek (Winter Chinook)	b/	Mouth upstream 0.2 miles.	0.2
			10.4

LOWER CLACKAMAS

Stream		Survey Description	Mileage a/
Clackamas River	b/	Mouth to Barton Park	10.8

GORGE AND HOOD RIVER

Stream		Survey Description	Mileage a/
Bridal Veil Creek	b/	Mouth to the falls.	0.4
Wahkeena Creek	b/	Mouth to the falls.	0.3
Multnomah Creek	b/	Mouth to the falls (excluding the lake).	0.2
Oneonta Creek	b/	Mouth to the old highway.	0.2
Horsetail Creek	b/	Mouth to the old highway.	0.5
Hood River	b/	Mouth upstream 1.5 miles.	1.5

a/ Source: Field data forms and files of ODFW spawning ground surveys, Columbia River Management.
b/ Surveys no longer conducted out of the ODFW Clackamas Office.

Table 2: Peak Spawning Ground Counts of Fall Chinook in Tributaries of Youngs Bay, 1952-08. a/

	Lewis & Clark R. b/ (4.5 miles)		Youngs River (0.3 miles)		South Fork Klaskanine R. (3.5 miles)		North Fork Klaskanine R. (1.5 miles)		Youngs Bay Total		Total (9.8 miles)
Year	Fish	Redds	Fish	Redds	Fish	Redds	Fish	Redds	Fish	Redds	Fish/Mile
1952	6	--	64	--	--	--	25	--	95	--	15.1
1953	1	--	34	--	--	--	30	--	65	--	10.3
1954	2	--	2	--	--	--	0	--	4	--	0.6
1955	1	--	7	--	--	--	12	--	20	--	3.2
1956	1	--	27	--	--	--	0	--	28	--	4.4
1957	1	--	11	--	--	--	5	--	17	--	2.7
1958	6	--	4	--	--	--	37	--	47	--	7.5
1959	2	--	10	--	--	--	82	--	94	--	14.9
1960	4	--	12	--	--	--	218	--	234	--	37.1
1961	1	--	26	--	--	--	119	--	146	--	23.2
1962	--	--	--	--	--	--	--	--	--	--	--
1963	7	6	20	10	--	--	--	--	27	16	5.6
1964	7	5	2	10	--	--	147	88	156	103	24.8
1965	0	1	0	1	--	--	173	23	173	25	27.5
1966	19	15	3	4	--	--	181	41	203	60	32.2
1967	10	7	6	6	--	8 c/	20	10	36	31	5.7
1968	9	3	0	2	18	--	35	16	62	21	6.3
1969	0	1	0	0	--	--	42	16	42	17	6.7
1970	0	2	0	0	--	--	5	3	5	5	0.8
1971	--	--	--	--	--	--	--	--	--	--	--
1972	1	3	3	8	--	--	28	13	32	24	5.1
1973	0	0	0	0	--	--	12	18	12	18	1.9
1974	0	0	4	2	--	--	82	16	86	18 d/	13.7
1975	3	6	3	4	--	--	23	8	29	18 e/	4.6
1976	2	1	5	5	--	--	4	11	11	17	1.7
1977	0	2	0	0	--	--	5	12	5	14	0.8
1978	1	2	0	0	--	--	28	20	29	22	4.6
1979	8	3	0	0	--	--	31	11	39	14	6.2
1980	15	9 f/	27	5	2	3	58	11	102	28	10.4
1981	104	10 g/	11	14	--	--	22	16	137	40	21.7
1982	59	58 f/	--	--	--	--	3	0	62	58	10.7
1983	231	280	1	0	23	34	30	24	285	338	29.1
1984	139	175	12	12	60	53	19	6	230	246	23.5
1985	111	157	3	5	21	34	9	--	144	196	14.7
1986	161	157	13	23	76	87	2	8	252	275	25.7
1987	640	96	--	--	158	9	--	--	798	105	99.8
1988	394	135	167	15	126	46	11	2	698	198	71.2
1989	149	47	51	16	30	16	30	10	260	89	26.5
1990	100	53	10	3	36	2	4	0	150	150 h/	15.3
1991	20	3	11	3	18	2	13	14	62	22 i/	6.3
1992 j/	0	0	0	0	0	0	0	0	0	0	0.0
1993 j/	0	0	0	0	0	0	0	0	0	0	0.0
1994	0	0 k/	11	4 k/	0	0 k/	0	0	11	4 k/	1.1
1995	--	--	0	0	1	0	0	0	1	0	0.2
1996	1	1	0	0	0	0	1	0	2	1	0.2
1997	--	--	15	5	32	20	31	22	78	47	14.7
1998	6	4	5	5	4	7	4	7	19	23	1.9
1999	4	3	9	10	4	3	12	12	29	28	3.0
2000	0	0	42	21	1	6	204	62	247	89	25.2
2001	3	14	53	32	8	57	102	32	166	135	16.9
2002	8	2	--	--	0	0	403	2	411	4	43.3
2003 l/	121	48	33	36	132	105 m/	297	0	583	189	59.5
2004 o/	22	5	16	5 n/	20	6	592	4	650	20	66.3
2005	53	19	2	1	20	3	247	50	322	73	32.8
2006 p/	131	42 q/	24	6 r/	34	11 s/	155	26	344	85	35.1
2007 t/	56	36 u/	62	31 v/	87	45 w/	140	32	345	144	35.2
2008 x/	**90**	**55 y/**	**63**	**17 z/**	**54**	**28 aa/**	**150**	**35**	**357**	**135**	**36.4**
10 yr avg	**40**	**17**	**25**	**15**	**31**	**24**	**216**	**23**	**312**	**79**	**31.9**

a/ Source: Field data forms and files of ODFW spawning ground surveys, Columbia River Management.
b/ Prior to 1980, surveys were from tidewater upstream 1.0 miles.
c/ Surveyed from tidewater upstream 0.3 miles.
d/ 1 redds counted below tidewater.
e/ Does not include 8 fish and 7 redds counted below tidewater.
f/ Surveyed from tidewater upstream 2.0 miles.
g/ Surveyed from tidewater upstream 1.5 miles.
h/ Does not include 16 fish and 4 redds counted below tidewater.
i/ Does not include 4 fish counted below tidewater.
j/ Low water years.
k/ Survey was conducted in the third week of October, which is past the peak spawning period for tule fall chinook.
l/ Total includes one jack.
m/ Total includes five jacks.
n/ Total includes one jack.
o/ Total includes two jacks.
p/ Includes 22 jacks
q/ Includes 3 jacks
r/ Includes 11 jacks
s/ Includes 12 jacks
t/ Includes 3 jacks.
u/ Includes 8 jacks.
v/ Includes 37 jacks.
w/ Includes 43 jacks.
X/ Includes 9 jacks.
y/ Includes 4 jacks.
z/ Includes 3 jacks.
aa/ Includes 4 jacks.
(--) No surveys conducted

Table 3: Peak Spawning Ground Counts of Fall Chinook in Oregon Tributaries of the Lower Columbia River between Astoria and Clatskanie, 1952-08. a/

	Bear Creek (3.0 miles)		Big Creek (3.0 miles)		Gnat Creek (3.5 miles)		Plympton Creek (1.7 miles)		Clatskanie River (2.0 miles)		Astoria to Clat. Total		Total Miles 13.2
Year	Fish	Redds	Fish	Redds	Fish	Redds	Fish	Redds	Fish	Redds	Fish	Redds	Fish/Mile
1952	--	--	--	--	--	--	--	--	26	--	26	--	13
1953	--	--	--	--	--	--	--	--	2	--	2	--	1
1954	--	--	--	--	--	--	--	--	0	--	0	--	0.0
1955	--	--	--	--	--	--	--	--	1	--	1	--	0.5
1956	--	--	--	--	--	--	--	--	18	--	18	--	9.0
1957	--	--	--	--	--	--	--	--	1	--	1	--	0.5
1958	--	--	--	--	--	--	--	--	0	--	0	--	0.0
1959	--	--	--	--	--	--	--	--	2	--	2	--	1.0
1960	--	--	--	--	--	--	--	--	0	--	0	--	0.0
1961	--	--	--	--	--	--	--	--	0	--	0	--	0.0
1962	--	--	--	--	--	--	--	--	--	--	--	--	--
1963	--	--	--	--	--	--	--	--	45	21	45	21	22.5
1964	--	--	--	--	--	--	--	--	26	21	26	21	13.0
1965	--	--	--	--	--	--	--	--	0	0	0	0	0.0
1966	--	--	--	--	--	--	--	--	62	29	62	29	31.0
1967	--	--	--	--	--	--	--	--	9	5	9	5	4.5
1968	--	--	--	--	--	--	38	40	0	0	38	40	10.3
1969	--	--	--	--	--	--	--	--	3	10	3	10	1.5
1970	--	--	7,277	492	573	42	680	28	8	2	8,538	564	837.1
1971	--	--	1,754	189	89	55	393	21	--	--	2,236	265	272.7
1972	--	--	1,712	377	1,102	189	688	89	--	--	3,502	655	427.1
1973	--	--	861	288	63	32	353	55	6	13	1,283	388	125.8
1974	--	--	590	182	13	15	87	10	8	7	698	214	68.4
1975	--	--	952	145	71	43	242	9	21	15	1,286	212	126.1
1976	--	--	510	110	35	21	656	3	4	15	1,205	149	118.1
1977	--	--	288	214	50	49	538	49	2	7	878	319	86.1
1978	--	--	1,997	138	22	14	885	17	4	2	2,908	171	285.1
1979	--	--	264	90	31	15	216	23	17	16	528	144	51.8
1980	--	--	258	88 b/	52	31	59	17	27	26	396	162	38.8
1981	--	--	437	119	25	3	237	21	17	20	716	163	70.2
1982	--	--	1,980	254	100	38	2,205	24	54	37	4,339	353	425.4
1983	439	78	1,081	381	19	8	851	48 b/	17	13	2,407	528	182.3
1984	647	103	1,270	256	18	23	355	19	1	3	2,291	404	173.6
1985	548	112	2,385	350	21	6	1,040	59	9	13	4,003	540	303.3
1986	207	66	1,455	408	41	20	290	22	17	13	2,010	529	152.3
1987	229	12	1,369	267	302	8	2,799	11	40	5	4,739	303	359.0
1988	463	47	1,428	187	176	37	1,861	20	23	57	3,951	348	299.3
1989	0	0 c/	1,149	103	99	3	952	9	33	32	2,233	147	169.2
1990	81	42	880	80	76	8	882	17 d/	9	14	1,928	161	146.1
1991	145	20	536	125	37	27	380	4 e/	1	4	1,099	180	83.3
1992 f/	1	0	497	100	42	25	772	14	0	0	1,312	139	99.4
1993 f/	3	3	1,027	198	10	3	268	27	0	1	1,308	232	99.1
1994	5	2	1,295	182	15	7	2,649	46 g/	7	4	3,971	241	300.8
1995	0	0	1,116	52	38	5	1,132	31	10	5	2,296	93	173.9
1996	202	52	700	83	43	12	401	42	55	7	1,401	196	106.1
1997	95	36	477	103	34	7	589	52	8	5	1,203	203	91.1
1998	41	2	276	64	16	4	340	70	11	12	684	152	51.8
1999	2	2	435	83	36	11	664	42	12	10	1,149	148	87.1
2000	0	0	740	137	4	2	681	40	0	0	1,425	179	107.9
2001	77	22	4,309	140	3	1	2,299	61	0	1	6,688	225	506.7
2002	21	0	6,870	192	72	5	5,924	40	46	22	12,933	259	979.8
2003	85	0	11,361	116	66	11 h/	5,537	15	56	34	17,105	176	1,295.8
2004 i/	61	10 j/	3,522	396 i/	2	11	2,981	102	1	6	6,567	525	497.5
2005 k/	7	1 l/	2,493	465	16	4	1,541	51	12	16	4,069	537	308.3
2006	0	10	92	60	0	1 m/	230	21	4	9	326	101	24.7
2007	0	0 n/	179	86	0	0 o/	265	71	0	0	444	157	33.6
2008	**60**	**23 p/**	**2,807**	**91**	**1**	**3 q/**	**652**	**69**	**2**	**0**	**3,522**	**186**	**266.8**
10 yr avg	**29**	**8**	**3,028**	**174**	**22**	**5**	**2,640**	**61**	**14**	**11**	**5,139**	**246**	**389.3**

Surveys are one time peak counts.

a/ Source: Field data forms and files of ODFW spawning ground surveys, Columbia River Management.
b/ Redd count estimated.
c/ Poor passage conditions at the mouth of Bear Creek, low flows.
d/ Includes 559 adults trapped for tule brood stock supplementation program prior to the survey.
e/ Includes 155 adults trapped for tule brood stock supplementation program prior to the survey.
f/ Low water year.
g/ Includes 930 adults trapped for tule brood stock supplementation program prior to the survey.
h/ Total includes 7 jacks.
i/ Not surveyed due to carcass placement. Peak fish counts for Bear & Gnat Creek were derived by comparing Big Creek peak counts from (2001-2003) vs. Bear & Gnat Creek peaks from (2001-2003) and taking the 3-year average peak % and multiplying it by the 2004 Big Creek Peak.
j/ Total includes 9 jacks.
k/ Includes 1 jack.
l/ Includes 2 jacks.
m/ Includes 1 jack.
n/ Includes 4 jacks.
o/ Includes 16 jacks.
p/ Includes 1 jack.
q/ Includes 2 jacks.
(--) No surveys conducted

Table 4. Peak Spawning Ground Counts for Fall and Winter Chinook in Trout Crk, Gordon Crk, Sandy River and Clackamas River, 1952-08. a/

	Trout Creek (0.2 mile)			Gordon Creek b/ (0.2 mile)			Sandy River c/ (10.0 miles) Fall Chinook						Clackamas River z/ (10.8 miles) Fall Chinook	
	Winter Chinook			Winter Chinook			Late Wild			Early Tule			Early Tule	
Year	Fish	Redds		Fish	Redds		Fish	Redds		Fish	Redds		Fish	Redds
1952	--	--		115	--	f/	F	200		--	--		--	--
1953	--	--		17	20	g/	--	--		--	--		--	--
1954	--	--		--	--		F	240	h/	--	--		--	--
1955	--	--		--	--		--	--		--	--		--	--
1956	0	0		4	30	d/	F	270		--	--		--	--
1957	1	0		7	14	d/	--	--		--	--		--	--
1958	27	--		--	--		F	43		--	--		--	--
1959	--	--		--	--		--	--		--	--		--	--
1960	--	--		--	--		--	--		--	--		--	--
1961	--	--		--	--		--	--		--	--		--	--
1962	--	--		--	--		--	--		--	--		--	--
1963	--	--		--	--		27	25	i/	--	--		--	--
1964	--	--		--	--		66	66	j/	--	--		--	--
1965	--	--		--	--		--	--		--	--		--	--
1966	--	--		--	--		--	--		--	--		--	--
1967	50	11		--	--		--	--		--	--		--	--
1968	--	--		--	--		75	56	k/	--	--		--	--
1969	19	7		--	--		23	39	k/	--	--		--	--
1970	41	32		--	--		--	--		--	--		--	--
1971	19	8		5	5	g/	F	7	l/	--	--		--	--
1972	25	19		6	3		F	80		--	--		--	--
1973	1	5		8	7		--	--		--	--		--	--
1974	0	0		1	6		F	170		--	--		--	--
1975	27	11	m/	4	3		--	--		--	--		--	--
1976	0	0	m/	3	14		F	117	n/	--	--		--	--
1977	18	4		3	8		--	--		--	--		--	--
1978	15	1	m/	1	4		--	--		--	--		--	--
1979	22	7		7	5		--	--		--	--		--	--
1980	26	17	m/	6	11		F	62		--	--		--	--
1981	2	0		1	4		--	--		--	--		--	--
1982	--	--		--	--		F	1	o/	--	--		--	--
1983	2	0		0	0		F	3	p/	--	--		--	--
1984	0	0		4	4		302	320		--	--		--	--
1985	--	--		--	--		244	201		--	--		--	--
1986	--	--		--	--		343	274		--	--		--	--
1987	--	--		--	--		1,491	882		--	--		--	--
1988	--	--		--	--		1,489	670		980	828		--	--
1989	0	0		1	0		1,315	824		186	133		--	--
1990	1	2	q/	--	--		90	--	r/	--	--		--	--
1991	1	0	s/	4	0	s/	252	283		--	--		--	--
1992	t/ 0	0		9	0		581	403		--	--		--	--
1993	t/ 0	0	u/	0	0	u/	657	552		168	168		--	--
1994	--	--	v/	--	--	v/	788	233	w/	28	16		--	--
1995	7	--		3	--		415	422		--	--	x/	--	--
1996	4	--		3	--		574	204		79	62		--	--
1997	0	0	y/	2	1		1,125	813		215	89		--	--
1998	--	--		--	--		413	313		71	45		80	57
1999	--	--		--	--		191	182		90	78		8	5
2000	--	--		--	--		53	35		--	--	aa/	21	14
2001	--	--		--	--		434	338		171	81		19	1
2002	--	--		--	--		864	526		62	59		6	1
2003	0	0		0	0		332	82		104	9	bb/	--	--
2004	0	0		0	0		281	243		106	145	bb/	--	--
2005	--	--		--	--	cc/	385	171	cc/	68	5	bb/	--	--
2006	--	--		--	--	dd/	516	452	ee/	139	68	bb/	--	--
2007	--	--		--	--		102	71		--	--	bb/	--	--
2008	--	--		--	--	**ff/**	**376**	**244**		--	--		--	--

- Footnotes for Table 4 are on the following page.

Table 4. Footnotes

a/ Source: Field data forms and files of ODFW spawning ground surveys, Columbia River Management. Surveys are as described in Table 1, unless otherwise noted.
b/ Gordon and Trout Cr. runs historically spawned from late December through January. Gordon and Trout Cr. surveys are made more than once and peak counts are used.
c/ Prior to 1984 the Sandy River was primarily flown for redd counts. These flights are denoted by an "F" in the Fish column. These surveys have been done by driftboat, jet sled, and on foot for fish and redd counts since 1984. The Sandy River has two runs of fall chinook, the early tule and the late wild. The early tule run is primarily composed of hatchery strays and is not always present. This run was first surveyed in 1988.
d/ Surveyed from the mouth upstream 0.5 mile.
f/ Surveyed from the mouth upstream 1.5 miles. Large number of jacks (98).
g/ Surveyed from the mouth upstream 1.0 mile.
h/ Surveyed from the mouth to 1.0 mile upstream of Dodge Park, 18.8 miles.
i/ Surveyed from the mouth to Buck Cr., 12.7 miles.
j/ Surveyed from the Troutdale Bridge to Buck Cr., 9.4 miles.
k/ Surveyed from Gordon Cr. to Dabney Park, 7.0 miles.
l/ Surveyed from the mouth to Cedar Cr., 21.8 miles.
m/ Survey includes the area from the mouth of Gordon Cr. to the mouth of Trout Cr., an additional 0.3 mile.
n/ Surveyed from the mouth to Revenue Bridge, 24.0 miles.
o/ Surveyed from the mouth to Bull Run R., 18.5 miles.
p/ Surveyed for late wild stock redds on 01-16-84 from the I-84 Bridge to Revenue Bridge, 21.5 miles.
q/ Fish observed on 11-15-90. Surveyed from the mouth upstream 1.0 mile.
r/ River was high and muddy; therefore live fish and redds could not be counted.
s/ Fish observed on 11-27-91 in Gordon Cr. and 12-03-91 in Trout Cr.
t/ Low water years.
u/ Late surveys conducted only once on 01-29-94.
v/ Surveys conducted on 11-11-94 in Gordon and Trout Cr. counted 30 and 38 fish, respectively. Spawners most likely stray wild fall chinook stock rather than remnant wild winter chinook stock.
w/ Peak survey for late wild stock was made one week earlier than normal due to poor weather conditions.
x/ Surveys were completed too late in the year for tule counts. The majority of the fish observed on the earliest survey were live, but from 8 carcasses that were sampled, age composition indicates the fish were late wilds.
y/ During the winter of 1997-98, a beaver dam at the confluence of Gordon and Trout creeks blocked fish passage into Trout Creek.
z/ Clackamas River data only available since 1998. Prior surveys were performed but data is not available.
aa/ Early tule surveys were not performed due to poor water conditions resulting from an upstream landslide.
bb/ Surveys are now conducted under the direction of ODFW Corvallis Research.
cc/ High turbid water conditions.
dd/ Includes 1 jack
ee/ Includes 2 jacks
ff/ Includes 1 jack
(--) No surveys conducted

Table 5. Peak Spawning Ground Counts of Fall Chinook in the Mainstem of the Hood River, 1952-08. a/

Year	Fish	Redds	b/
1952	142	--	
1953	15	--	
1954	--	--	
1955	9	--	
1956	3	--	
1957	12	--	
1958	77	--	
1959	76	--	
1960	11	--	
1961	1	--	
1962	--	--	
1963	1	--	
1964	0	0	
1965-1981	--	--	
1982	5	--	c/
1983-1990	--	--	
1991	4	4	d/
1992-**2008**	--	--	

a/ Source: Field data forms and files of ODFW spawning ground surveys, Columbia River Management. Surveys are one time peak counts and as described in Table 1, unless otherwise noted.

b/ Redd counts were not recorded for most years because of poor visibility.

c/ Surveyed from the mouth upstream 2.5 miles.

d/ Surveyed from the mouth upstream 1.5 miles. Several surveys were made and peak counts are recorded.

(--) No surveys conducted

Table 6. Peak Spawning Ground Counts of Fall Chinook in Gorge Area Tributaries of the Lower Columbia River, 1952-08. a/

	Oneonta Creek (0.2 mile)		Horsetail Creek (0.5 mile)		Wahkeena Creek (0.3 mile)		Multnomah Creek (0.2 mile)		Bridal Veil Creek (0.4 mile)	
Year	Fish	Redds	Fish	Redds	Fish	Redds	Fish	Redds	Fish	Redds
1952	11	--	0	0	0	0 c/	2	-- d/	--	--
1953-1954	--	--	--	--	--	--	--	--	--	--
1955	0	0	0	0	0	0	0	4	--	--
1956	1	1	--	--	--	--	--	--	--	--
1957	0	0	--	--	--	--	0	0 b/	--	--
1958-1960	--	--	--	--	--	--	--	--	--	--
1961	0	0	0	0	0	0	0	0 b/	0	0
1962-1964	--	--	--	--	--	--	--	--	--	--
1965	0	0	0	0	--	--	0	0 b/	0	0
1966-1971	--	--	--	--	--	--	--	--	--	--
1972	2	4	26	40	0	0	16	12	0	0
1973-2002	--	--	--	--	--	--	--	--	--	--
2003-2004	0	0	0	0	0	0	0	0	e/	--
2005-2008	e/	--	e/	--	e/	--	e/	--	e/	--

a/ Source: Field data forms and files of ODFW spawning ground surveys, Columbia River Management. Surveys are one time peak counts and as described in Table 1, unless otherwise noted.
b/ Surveyed from the falls to Benson Lake, 0.1 mile.
c/ Surveyed from the mouth to the old highway, 0.2 mile.
d/ Surveyed from the mouth to the highway culvert, 0.1 mile.
e/ No surveys conducted
(--) No surveys conducted

Section 6

Youngs Bay

Overarching Strategies

Tributary Habitat

- identify, prioritize, and protect existing high quality/functioning habitat
- identify, prioritize, and restore existing degraded habitat

Harvest

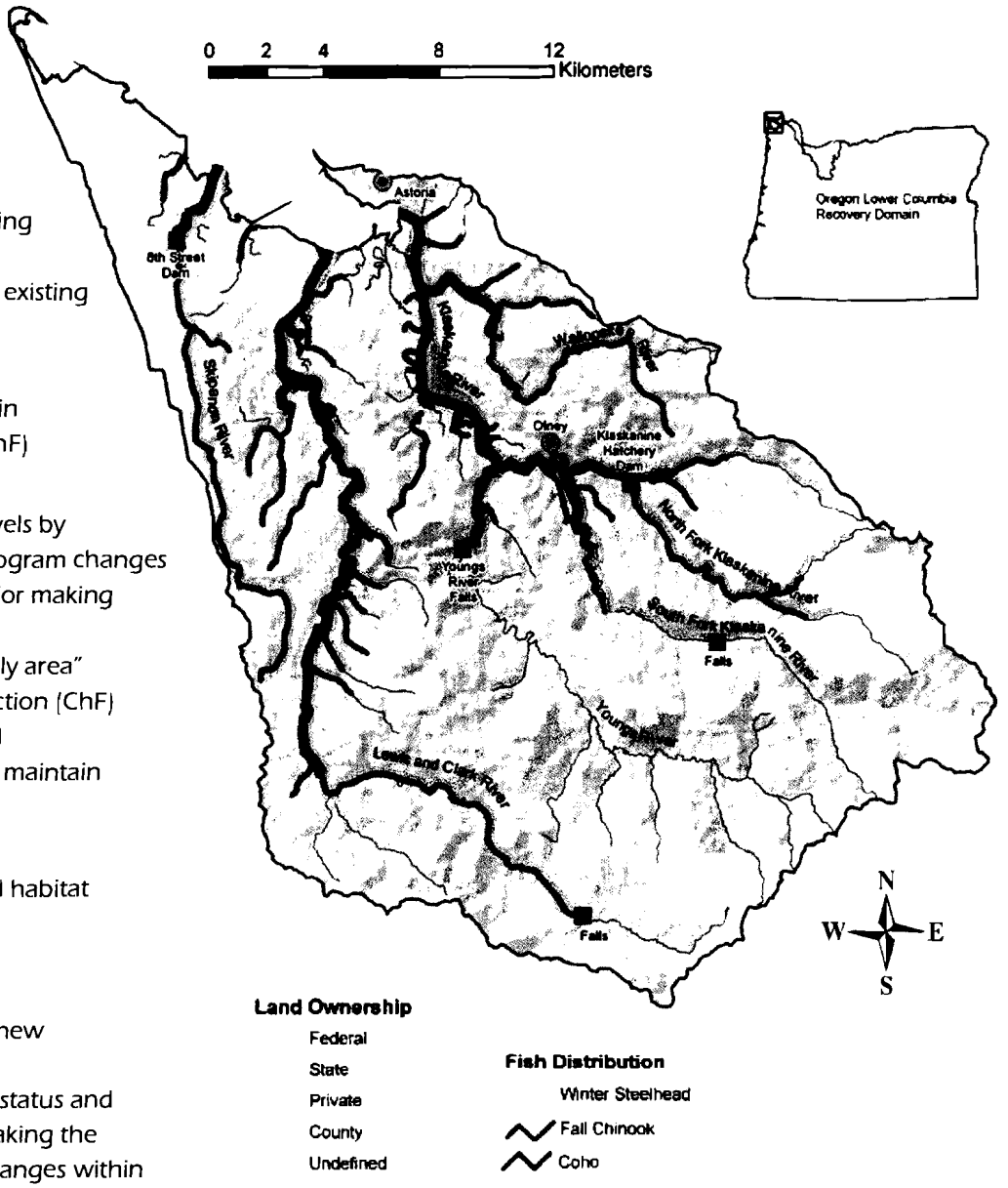
- maintain harvest opportunity in terminal/SAFE areas (coho, ChF)

Hatchery

- reduce stray rates to target levels by identifying source, making program changes (reduce, eliminate, shift), and/or making operation changes
- maintain exisitng "wild fish-only area"
- determine need for reintroduction (ChF)
- mark all hatchery fish released
- accept higher hatchery risk to maintain terminal/SAFE fisheries

RME

- monitor harvest, hatchery and habitat impacts
- monitor wild populations
- address critical uncertainties
- adaptively manage based on new information
- understand wild populations' status and hatchery influence prior to making the limited hatchery or harvest changes within OR-WA regional control (ChF)



Species	Extinction Risk		Confidence
	Current Status	Delisting Desired Status	
Coho	Very High	Very High	Exceed
Fall Chinook	High	High	Exceed
Winter Steelhead *	Very Low	Very Low	Achieve
Chum	Very High	Very High	---

* Youngs Bay winter steelhead are not part of the Lower Columbia River Steelhead DPS and are not listed under the federal ESA.

Section 6

Big Creek

Overarching Strategies

Tributary Habitat

- identify, prioritize, and protect existing high quality/ functioning habitat
- identify, prioritize, and restore existing degraded habitat

Harvest

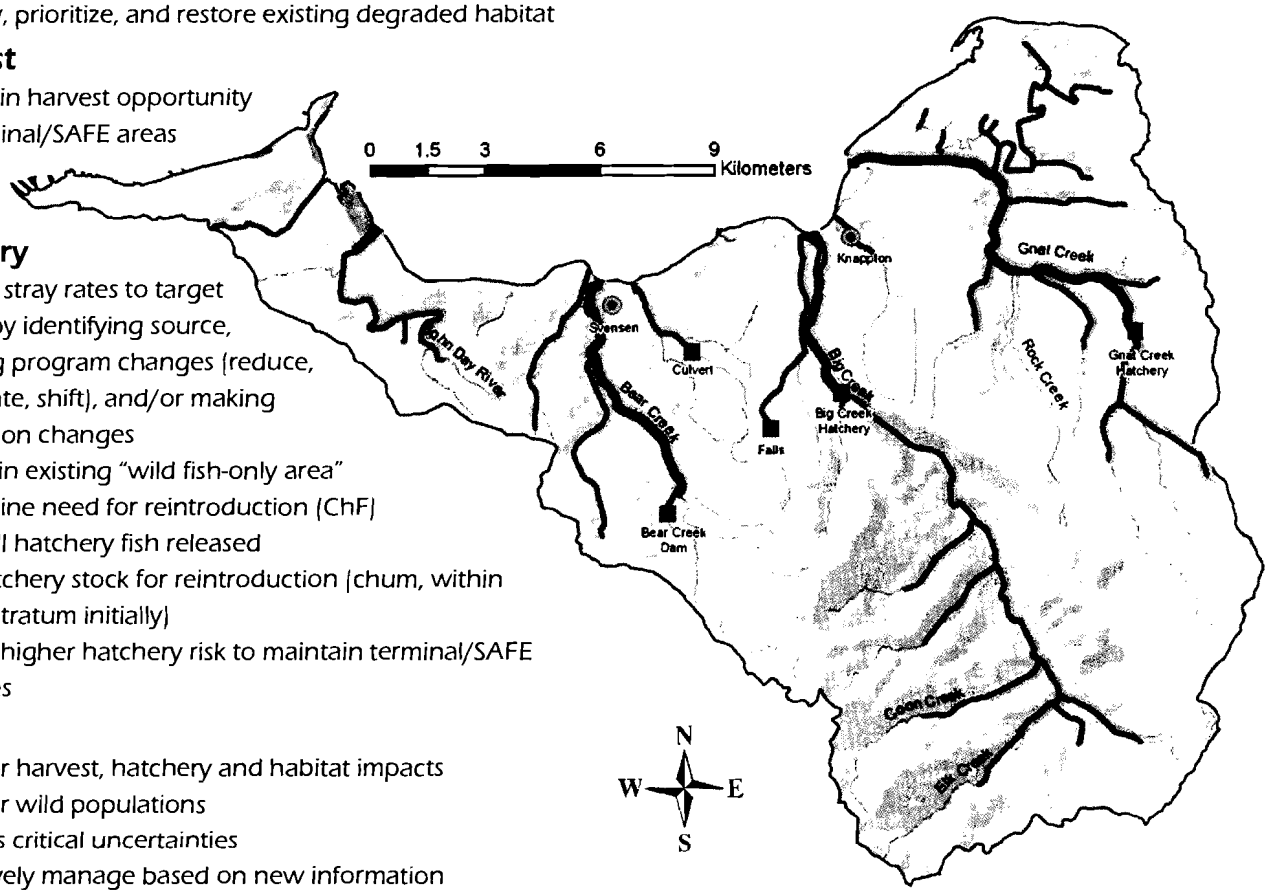
- maintain harvest opportunity in terminal/SAFE areas (coho, ChF)

Hatchery

- reduce stray rates to target levels by identifying source, making program changes (reduce, eliminate, shift), and/or making operation changes
- maintain existing "wild fish-only area"
- determine need for reintroduction (ChF)
- mark all hatchery fish released
- use hatchery stock for reintroduction (chum, within Coast stratum initially)
- accept higher hatchery risk to maintain terminal/SAFE fisheries

RME

- monitor harvest, hatchery and habitat impacts
- monitor wild populations
- address critical uncertainties
- adaptively manage based on new information
- understand wild populations' status and hatchery influence prior to making the limited hatchery or harvest changes within OR-WA regional control (ChF)



Species	Extinction Risk		Confidence
	Current Status	Delisting Desired Status	
Coho	Very High	Very High	Exceed
Fall Chinook	Very High	High	Achieve
Winter Steelhead *	Low	Very Low	Achieve
Chum	Very High	Very High	---

* Big Creek winter steelhead are not part of the Lower Columbia River Steelhead DPS and are not listed under the federal ESA.

Section 6

Clatskanie

Overarching Strategies

Tributary Habitat

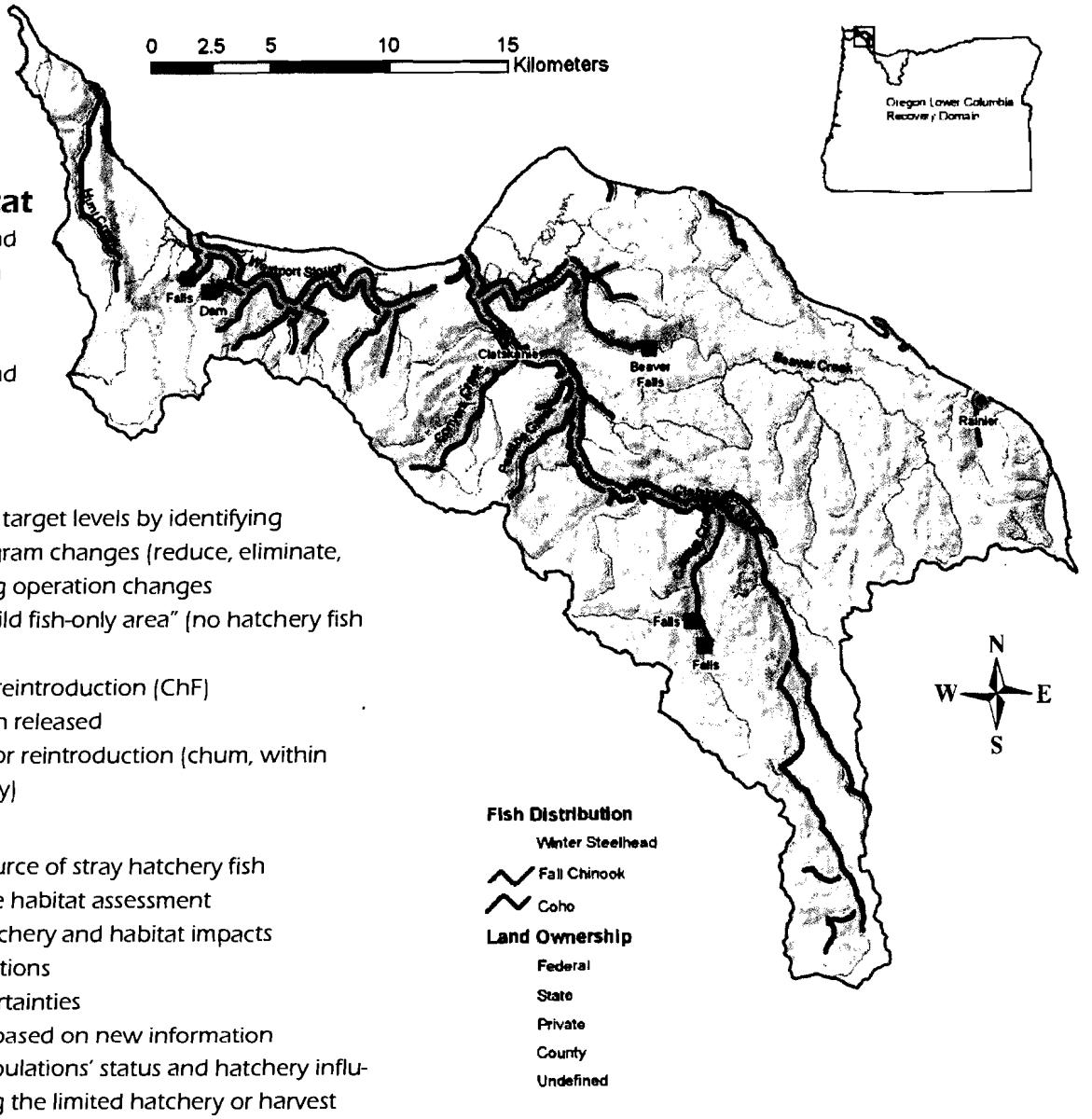
- identify, prioritize, and protect existing high quality/functioning habitat
- identify, prioritize, and restore existing degraded habitat

Hatchery

- reduce stray rates to target levels by identifying source, making program changes (reduce, eliminate, shift), and/or making operation changes
- maintain existing "wild fish-only area" (no hatchery fish stocked)
- determine need for reintroduction (ChF)
- mark all hatchery fish released
- use hatchery stock for reintroduction (chum, within Coast stratum initially)

RME

- identify level and source of stray hatchery fish
- complete reach-scale habitat assessment
- monitor harvest, hatchery and habitat impacts
- monitor wild populations
- address critical uncertainties
- adaptively manage based on new information
- understand wild populations' status and hatchery influence prior to making the limited hatchery or harvest changes within OR-WA regional control (ChF)



Species	Extinction Risk		Confidence
	Current Status	Delisting Desired Status	
Coho	High	Very Low	Achieve
Fall Chinook	Very High	Low	Exceed
Winter Steelhead *	Very Low	Very Low	Achieve
Chum	Very High	Low	---

* Clatskanie winter steelhead are not part of the Lower Columbia River Steelhead DPS and are not listed under the federal ESA.

Section 6

Scappoose

Overarching Strategies

Tributary Habitat

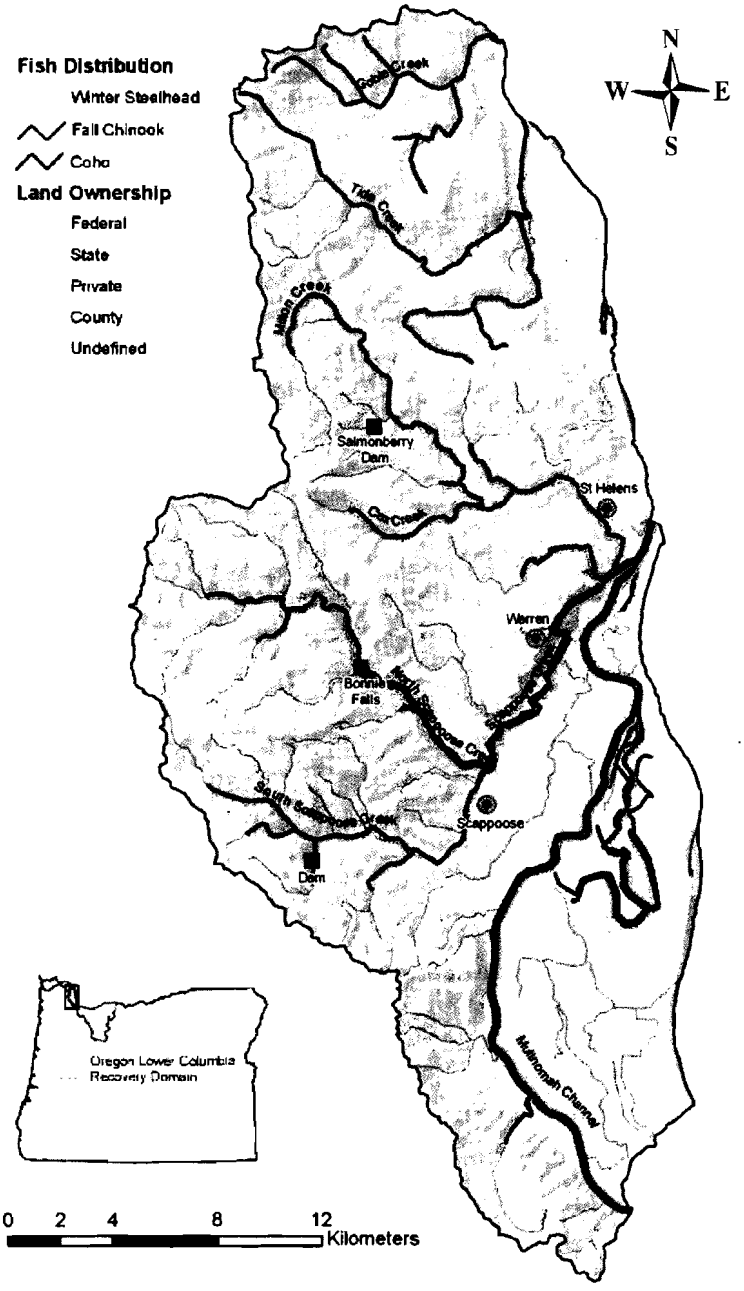
- identify, prioritize, and protect existing high quality/functioning habitat
- identify, prioritize, and restore existing degraded habitat

Hatchery

- reduce stray rates to target levels by identifying source, making program changes (reduce, eliminate, shift), and/or making operation changes
- maintain existing "wild fish-only area" (no hatchery fish stocked)
- determine need for reintroduction (ChF)
- mark all hatchery fish released
- use hatchery stock for reintroduction (chum, within Coast stratum initially)

RME

- identify level and source of stray hatchery fish
- complete reach-scale habitat assessment
- monitor harvest, hatchery and habitat impacts
- monitor wild populations
- address critical uncertainties
- adaptively manage based on new information
- understand wild populations' status and hatchery influence prior to making the limited hatchery or harvest changes within OR-WA regional control (ChF)



Species	Extinction Risk		Confidence
	Current Status	Delisting Desired Status	
Coho	Moderate	Very Low	Exceed
Fall Chinook	High	Low	Exceed
Winter Steelhead *	Very Low	Very Low	Achieve
Chum	Very High	Low	---

* Scappoose winter steelhead are not part of the Lower Columbia River Steelhead DPS and are not listed under the federal ESA.

This was updated with new #s PLUS the correction factor error
March 23, 2010

Clatskanie Fall Chinook

Run Year	Peak Counts of Spawners in 2 miles	adjusted peak counts w/ all > 5	Equival Km	Spwnr/km	Conversion Peak Count to Season	Total Spawners/km
1973	6	6	3.22	1.86	1.7	3.2
1974	8	8	3.22	2.49	1.7	4.2
1975	21	21	3.22	6.52	1.7	11.1
1976	4	18.25	3.22	5.67	1.7	9.6
1977	2	18.25	3.22	5.67	1.7	9.6
1978	4	18.25	3.22	5.67	1.7	9.6
1979	17	17	3.22	5.28	1.7	9.0
1980	27	27	3.22	8.39	1.7	14.3
1981	17	17	3.22	5.28	1.7	9.0
1982	54	54	3.22	16.78	1.7	28.5
1983	17	17	3.22	5.28	1.7	9.0
1984	1	13.00	3.22	4.04	1.7	6.9
1985	9	9	3.22	2.80	1.7	4.8
1986	17	17	3.22	5.28	1.7	9.0
1987	40	40	3.22	12.43	1.7	21.1
1988	23	23	3.22	7.15	1.7	12.1
1989	33	33	3.22	10.25	1.7	17.4
1990	9	9	3.22	2.80	1.7	4.8
1991	1	14.75	3.22	4.58	1.7	7.8
1992	0	14.75	3.22	4.58	1.7	7.8
1993	0	14.75	3.22	4.58	1.7	7.8
1994	7	7	3.22	2.17	1.7	3.7
1995	10	10	3.22	3.11	1.7	5.3
1996	55	55	3.22	17.09	1.7	29.0
1997	8	8	3.22	2.49	1.7	4.2
1998	11	11	3.22	3.42	1.7	5.8
1999	12	12	3.22	3.73	1.7	6.3
2000	0	31.25	3.22	9.71	1.7	16.5
2001	0	31.25	3.22	9.71	1.7	16.5
2002	46	46	3.22	14.29	1.7	24.3
2003	56	56	3.22	17.40	1.7	29.6
2004	1	13.00	3.22	4.04	[illegible]	6.9
2005	12	12	3.22	3.73	[illegible]	6.3
2006	4	[illegible]	3.22	1.55	[illegible]	2.6
2007	0	[illegible]	3.22	1.55	1.7	2.6
2008	2	[illegible]	3.22	1.55	1.7	2.6
2009	4	[illegible]	3.22	1.55	1.7	2.6
						5.0
2004			These are the multipliers		2.7	
2005			that caused the mistake		2.7	
2006					3.7	

[redacted]

Peter,
So Column B is the raw data as I got it from the Columbia River field folks

Column C is the result of manipulation of the raw data (in Column B) and consists of changing peak values of less than 5 to a new number. My thinking at the time (and not sure I would use it now) was that peak counts less than 5 did not seem plausible and were assumed to be erroneous. For example, there were several large peak counts that came from brood years when the peak was 0 and 1 - an unlikely possibility.

So my method of making this 'adjustment' was either averaging the years before and years after to estimate the < 5 peak count data years value (you can look at the formula in the pink cells to see exactly which cells went into the average).
In the cases where there were no 'after' years to average (2006 onward) I just used an assumed peak count of 5.
As I said above, I am not sure I would take this approach again if doing it today..... but it is what I landed on for the LCR plan analysis.

I also included the 'mistake' conversion count multiplier (rows 50 to 52) which I subsequently corrected and shared with you this spring.

Let me know if you need more.

Mark

[redacted]