

Lower Columbia River Conservation and Recovery Plan for Oregon Populations of Salmon and Steelhead

**Annual Report
January 2013-December 2013**



**Oregon Department of Fish
and Wildlife**

Table of Contents

Abbreviations and Acronyms3

Introduction4

Current Status5

Desired Status5

Status of Monitoring Biological Recovery Salmon and Steelhead Populations.....6

Establishment of Specific Measurable Criteria7

Measurable Criteria and the Early Warning Indicator System.....8

Oregon’s Chum Recovery Strategy13

Oregon’s Lower Columbia River Population Fact Sheets15

Youngs Bay.....16

Big Creek21

Clatskanie26

Scappoose30

Clackamas34

Sandy42

Lower Gorge51

Upper Gorge55

Hood57

Implementation Coordination63

Adaptive Management Recommendations64

References and Endnotes66

Cover Photo: Columbia River Near Lindsey State Park
Photo: ODOT

Electronic versions of this annual progress report and the Conservation and Recovery Plan for Oregon Salmon and Steelhead Populations in the Lower Columbia River are available on the Oregon Department of Fish and Wildlife’s Lower Columbia River Conservation and Recovery Plan website: http://www.dfw.state.or.us/fish/CRP/lower_columbia_river_plan.asp

Abbreviations and Acronyms:

Acronym Name

A/P	Abundance/ Productivity	CSWC	Columbia Slough Wa- tershed Council	CREST	Columbia River Estuary Task Force	m2	Meter squared	PGE	Pacific General Electric	StW	Winter Steel- head
BES	Portland Bu- reau of Environ- mental Services	CTWS	Confederate Tribes of the Warm Spring Reservation of Oregon	HIP	High Intrinsic Potential	MFID	Middle Fork Irrigation Dis- trict	PH	Phase	SW	South West
BLDR	Boulder	DID	Dee Irrigation District	HRSW CD	Hood River Soil and Water Conservation District	MHNF	Mount Hood National For- est	pHOS	Percent Hatchery Fish on Spawning Ground	SWCD	Soil and Wa- ter Conserva- tion District
BLM	U.S. Bureau of Land Manage- ment	DPS	Distinct Popu- lation Seg- ment	HRWG	Hood River Working Group	NCUW C	North Clacka- mas Urban Watershed Council	PWB	Portland Water Bu- reau	TCWC	Tryon Creek Watershed Council
BMP	Best Manage- ment Practice	EFID	East Fork Irrigation District	JCWC	Johnson Creek Water- shed Council	NCWA	North Coast Watershed Association	rKm	River Kilo- meter	TFT	The Freshwa- ter Trust
BOR	Bureau of Rec- lamation	EMS- WCD	East Multnomah Soil and Wa- ter Conserva- tion District	JOM	Juvenile Out Migrant	NFCP	Native Fish Conservation Policy	RM&E	Research Monitoring and Evalua- tion	TNC	The Nature Conservancy
BPA	Bonneville Pow- er Association	ESA	Endangered Species Act	K	Key or Prima- ry	NFK	North Fork	RPA	Reasonable and Pru- dent Alter- native	USACOE	United States Army Corps of Engineers
CFS	Cubic Feet Per Second	ESU	Evolutionary Significant Unit	LCR	Lower Colum- bia River	NMFS	National Ma- rine Fisheries Service	SAFE	Select Area Fisheries Enhance- ment	USFS	United States Forest Ser- vice
ChF	Fall Chinook	FID	Farmers Irri- gation District	LCRCR P	Lower Colum- bia River Con- servation and Recovery Plan	NOAA	National Oce- anic and At- mospheric Administration	SBWC	Scappoose Bay Water- shed Coun- cil	VSP	Viable Salm- onid Popula- tions
ChS	Spring Chinook	FP	Flood Plain	LCEP	Lower Colum- bia Estuary Partnership	ODFW	Oregon De- partment of Fish and Wild- life	SCH	Side Chan- nel	WDFW	Washington Department of Fish and Wildlife
CLT	Columbia Land Trust	GRTS	Generalized Random- Tessellation Stratified	LCRW C	Lower Colum- bia River Wa- tershed Coun- cil	ODOT	Oregon De- partment of Transportation	SRBW C	Sandy Riv- er Basin Watershed Council	WLC-TRT	Willamette Lower Co- lumbia Tech- nical Recov- ery Team
CR	Columbia River	HCP	Habitat Con- servation Plan	LiDAR	Light Detec- tion and Rang- ing	OFWC	Oregon Fish and Wildlife Commission	SS	Spatial Structure	WQMP	Water Quality Management Plan
CRS	Chum Recovery Strategy	CRBC	Clackamas River Basin Watershed Council	LWD	Large Woody Debris	OPRD	Oregon Parks and Recrea- tion Depart- ment	StS	Summer Steelhead	yd3	Cubic Yards

Introduction

The *Lower Columbia River Conservation and Recovery Plan for Oregon Populations of Salmon and Steelhead* (LCRCRP), referred to as the Plan hereafter, was adopted by the Oregon Fish and Wildlife Commission on August 10, 2010. The plan serves as both a federal recovery plan for Oregon fish populations listed under the Endangered Species Act (ESA) and a State of Oregon conservation plan under Oregon's Native Fish Conservation Policy (NFCP). The plan is designed to guide the strategic and voluntary implementation of actions needed to conserve and recover salmon and steelhead in the Oregon portion of the area designated as the Lower Columbia River sub-domain, which includes the Columbia River and its tributaries in Oregon and Washington from Hood River downstream to the Pacific Ocean, excluding the Willamette River above Willamette Falls which is a separate sub-domain. The plan is based on science, supported by stakeholders and built on existing efforts and new proposed actions. This annual report serves as a yearly review of population status, implementation actions, and adaptive management direction for the LCRCRP.



Photo: USFWS

This annual report summarizes the status of the Oregon LCR Recovery Plan's Implementation for the period of January 1, 2013 through December 31, 2013. This report will be updated annually to provide a continuous tracking of progress toward recovery plan action implementation and goals.

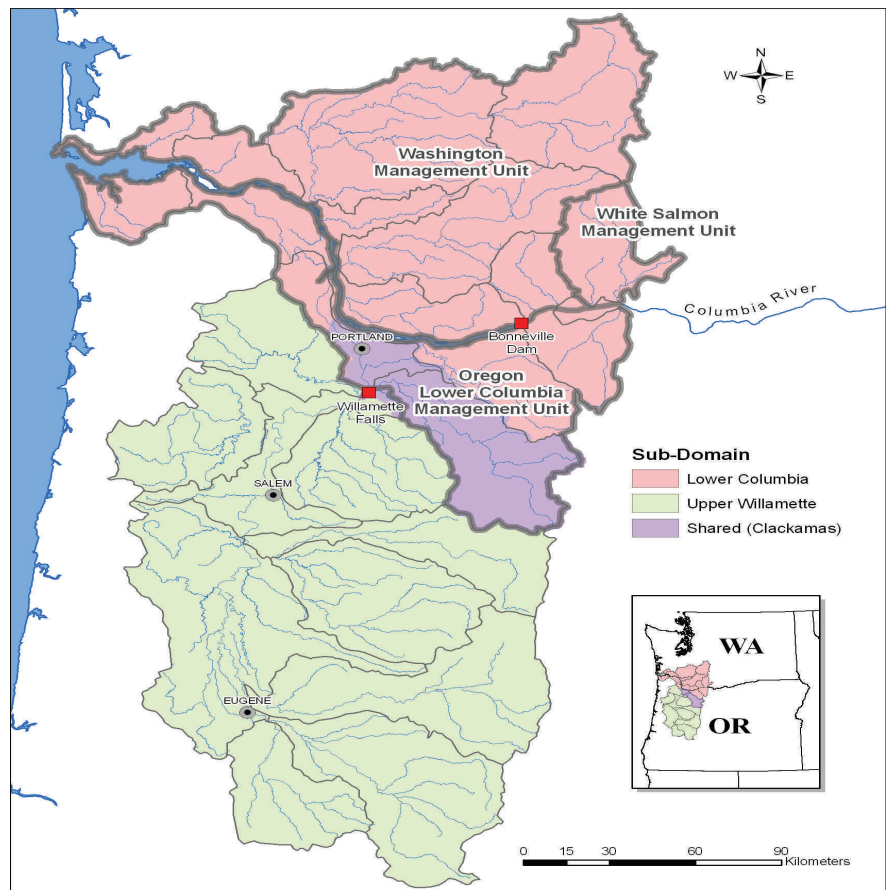


Figure 1. The three management units in the Lower Columbia River sub-domain, and the Upper Willamette River sub-domain. This Plan addresses the Oregon Lower Columbia Management Unit.

The Plan provides a framework and roadmap for the conservation and recovery of three lower Columbia River salmon (*Oncorhynchus* species) Evolutionarily Significant Units (ESUs) and one steelhead Distinct Population Segment (DPS); henceforth, the ESUs and DPS will be collectively referred to as ESUs in Oregon that are listed under the ESA: Lower Columbia River coho (*O. kisutch*), Lower Columbia River chinook (*O. tshawytscha*), Lower Columbia River steelhead (*O. mykiss*), and Columbia River chum (*O. keta*). These species occupy habitat in Oregon tributaries of the lower Columbia River below, and including, the Hood River at river kilometer (rkm) 270 (Figure 1). They are also present in Washington tributaries to the lower Columbia River. The Plan also considers the unlisted steelhead populations in Oregon downstream of the Willamette River and the Clackamas spring chinook population, which is ESA-listed, as threatened, as part of the Upper Willamette River chinook ESU.

Current Status

Chapter 4 of the Plan discusses the assessed status of each independent population and used the best available data and scientific inference, to determine extinction risk classes. The assessments took into account a number of biological **Viable Salmonid Population (VSP)** parameters related to salmonid viability, including **abundance, productivity, spatial distribution and diversity**. Assessments were done for all Oregon LCR populations, excluding chum, which are considered functional extirpated from the Oregon portion of the ESU.

In 2010, NOAA completed a 5-year status review for Pacific salmon and steelhead listed under the Endangered Species Act which evaluated status based on the most recent viability (VSP) criteria data and trends in threats limiting salmon and steelhead viability. The NOAA review did not indicate a change in the listing status for the Lower Columbia River salmon or steelhead populations. LCR coho, chinook, chum and steelhead remained listed under the ESA and classified as threatened.

The most up to date available information regarding VSP parameters is found on the ODFW Recovery Tracker at: http://www.dfw.state.or.us/fish/CRP/lower_columbia_plan.asp.

Desired Status

Chapter 6 of the Plan describes the desired status of Oregon's salmon and steelhead populations in the Lower Columbia River Recovery Domain, as well as the approach to achieving the desired status through threat reduction scenarios.

Threat reduction scenarios are the suite of threat reductions (achieved through actions) and resulting VSP parameters within a population that are intended to achieve the desired status for that population.

Oregon has two recovery goals that frame the State of Oregon's path toward recovery of the lower Columbia River salmon and steelhead populations. First, **delisting**, the populations must reach designated statuses of biological viability determined by the Willamette Lower Columbia Technical Review Team (WLC-TRT) to support removal of the LCR coho and chinook ESUs, the LCR steelhead DPS, and CR chum ESU from the threatened and endangered species list. Second, **broad sense recovery**, seeks to rebuild the populations to provide for sustainable fisheries and other ecological, cultural and social benefits.

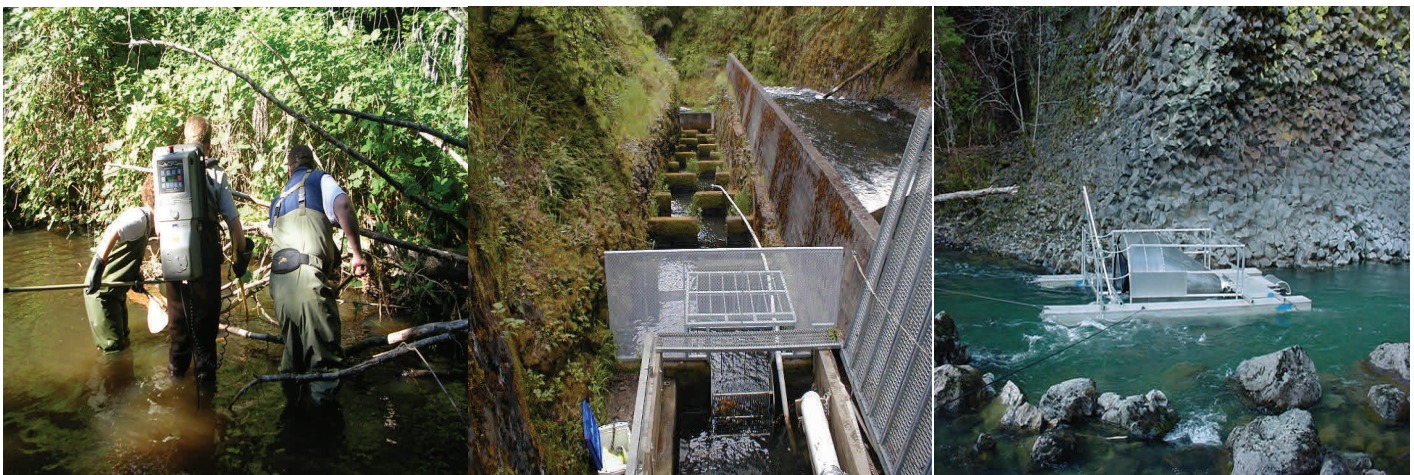
To meet the delisting goal, Oregon based the Plan on WLC-TRT's biological viability criteria (Figure 3) and recommended that NMFS consider delisting the four listed salmonid ESUs addressed by the Plan when the following *biological delisting criteria* are achieved:

- 1) **ESU/DPS**: all historically existing strata meet **Stratum** delisting criteria.
- 2) **Stratum**: the stratum has a high probability of persistence, where high probability of stratum persistence is defined as:
 - a) at least two populations in the stratum meet **Population** viability criteria,
 - b) the average of all stratum population extinction risk category scores is 2.25 or greater, and
 - c) all populations not meeting **Population** viability criteria do not deteriorate and are maintained.
- 3) **Population Viability**: a population is "viable" based on an integrated assessment of the population's abundance, productivity, spatial structure, and diversity statuses that produces an extinction risk classification score ranging from 0-4, based on the WLC-TRT's scoring system.

Status of VSP Monitoring of Salmon and Steelhead Populations in Lower Columbia River

Research, Monitoring and Evaluation (RM&E) are needed to assess the biological status of listed species and their habitat, track progress toward achieving recovery goals, and provide information needed to refine recovery strategies and actions through the process of adaptive management. Chapter 8 outlines the RM&E needs of this Plan as they pertain to biological criteria (i.e. abundance, productivity, diversity, and spatial structure) and listing criteria (i.e. habitat degradation, fish harvest, hatcheries, disease and predation, inadequate regulatory mechanisms, or other natural or manmade factors) affecting the continued existence of Oregon's salmon and steelhead populations in the lower Columbia River

Measurable VSP criteria related to biological recovery are based on the specific goals for each lower Columbia salmon and steelhead population established in threat reduction and recovery scenarios and based on the desired delisting status. With regards to the assessment of biological criteria (i.e. abundance, productivity, spatial structure, and diversity), the benchmarks outlined in chapter 8 are intended to serve as interim measures of progress towards achieving recovery goals absent full viability analyses (as conducted for development of this Plan), which require long term data trends to show progress. The suite of RM&E identified as necessary to evaluate these measurable criteria will also ultimately provide the foundation for more comprehensive viability analyses, such as those described in McElhany et al. (2007) that follow the viability criteria framework established by the WLC-TRT (McElhany et al. 2006).



ODFW Life Cycle Monitoring Photos: ODFW

As directed by the plan, ODFW conducts RM&E to assess the status and trends of VSP criteria per independent population which serves as an early warning system that will alert Oregon to unexpectedly adverse marine conditions; management conditions; biological characteristics of the LCR fish populations; or the habitat that supports the ESU's. The information will also assist with adaptive management decisions and prioritization of RM&E efforts and actions.

ODFW has not conducted a comprehensive ESU status review since the Plan was adopted. A twelve-year ESU assessment will be conducted in 2022. The comprehensive assessment will include fish performance, trends in habitat, and implementation and effectiveness of restoration and management commitments.

The RM&E data collected during this reporting period are detailed in the biological monitoring status section for each independent population and compared to the VSP goals established under the threat reduction scenarios to achieve each desired delisting goal.

Establishment of Specific Measurable Criteria Against Which Progress Toward Achieving Recovery Goals are Measured

Chapter 8 of the plan lists specific measurable criteria and evaluation thresholds (benchmarks) for the biological (VSP) and listing factor criteria.

Biological (VSP) Criteria

1. Abundance/productivity (A/P)—A viable population should demonstrate a combination of population growth rate, productivity, and abundance that produces an acceptable probability of population persistence.

Stock-recruitment curves were developed for each Oregon lower Columbia River population of salmon and steelhead as a way of determining the abundance and productivity needed to achieve delisting and broad sense recovery.

Annual benchmarks (goals) of the A/P metric are formulated yearly which allow managers to provide more timely assessments of the progress made in achieving recovery goals.

Each annual benchmark contains buffers against climate change and a “recovery scalar” which is defined as the amount that the current survival rate needs to be improved to get the probability of the critical risk threshold to the threshold for the risk category targeted for the population. The annual benchmark assumes full recovery which will most likely need a majority of actions listed in chapter 9 be completed.

A pass/fail is assigned during each 12-year assessment. Pass is achieved by having the observed spawner abundance greater to or equal than the abundance modeled for delisting desired status at least six times in a 12-year period and the average observed spawner abundance is greater or equal to the average modeled abundance for delisting desired status over that same time period.



Fall Chinook
Photo: NOAA

2. Spatial Structure (SS)—The occupancy of spawning adults or juveniles at spatially balanced, random survey sites.

Occupancy thresholds were set based upon the watershed size and delisting risk goal.

A pass/fail is assigned during each 12-year assessment. Pass is achieved if the percentage of sites not occupied by spawning adults or rearing juveniles is less than or equal to the thresholds listed in Table 8-1 of the Plan at least six times during a 12-year period and the overall average percentage of sites not occupied during that same time period is less than or equal to the thresholds show in Table 8-1 of the Plan.

Diversity- Life-history diversity must exist to sustain a population through short-term environmental perturbations and to provide for long-term evolutionary processes.

There are 5 diversity metrics. Two of the metrics have not yet been established.

1. **Effective Population Size:** Since the population abundance goals formulated for the abundance/productivity metric are designed to equal or exceed abundance needed to satisfy effective population size requirements, passing/failing the abundance/productivity thresholds means that effective population size requirements are or not met.
2. **Interbreeding with Hatchery Fish:** Hatchery related threats have been ameliorated such that they do not, and will not, limit attainment of the desired status of populations relative to the viability criteria. Pass is achieved if the average percentage of the total number of spawners that are of hatchery origin is on average less than or equal to the targets found under the Errata section (page 326) of the plan.
3. **Anthropogenic Mortality:** Over-utilization of populations for commercial, sport, recreational or scientific purposes. Based upon threat reduction scenarios harvest rate impacts have been set for each population. Currently harvest rates are determined at the ESU scale and need further refinement to determine population level harvest rates.

Listing Factors

In addition to RME needed to address the biological criteria, to be approved by NMFS, a recovery plan must also include RME that addresses the five ESA section 4(a)(1) listing factors:

- A. The present or threatened destruction, modification, or curtailment of the species' habitat or range
- B. Over-utilization for commercial, recreational, scientific or educational purposes
- C. Disease or predation
- D. The adequacy of existing regulatory mechanisms
- E. Other natural or manmade factors affecting its continued existence

In contrast to the viability assessment for biological recovery, the decision framework for listing factors does not rely on explicit criteria when considering the Stratum (major population group) scale, but steps down directly from the ESU to the individual population, when possible. Also in contrast to the assessment of biological criteria, NMFS offers no explicit analytical guidance for decisions related to the listing factors. In contrast to the measurable criteria developed for biological recovery (which have a direct connection to assessments of population viability), the measurable criteria described below for the listing factors are primarily related to directly tracking the success of actions designed to reduce the impact of current threats or serve as an early warning for emerging threats.

Listing Factor A: *The Present or Threatened Destruction, Modification, or Curtailment of a Species' Habitat or Range.* The metrics for this listing factor relate to habitat improvement needed over time to ameliorate the threats of on-going modification of species habitat. Three of the metrics are determined through aquatic habitat surveys and reported habitat restoration implementation. 1. Is there a positive trend in the status of habitat metrics? 2. Is the restoration action quantities equal or exceed "x"/15 from those noted in Table 8.2 of the plan? "X" is the number of years after adoption of the plan (2010) and 15 is the number of years the plan allows for tributary habitat restoration. 3. Is the number of additional/new miles of high quality coho habitat equal or exceed that shown in Table 8-2 of the Plan? 2 additional metrics pertain to meeting the goals outlined in the Clackamas River Hydroelectric Project Fish Passage and Protection Plan and providing fish passage at Laurance Lake Dam in the Hood River population.

Listing Factor B: Over-utilization for commercial, recreational, scientific or educational purposes. Harvest was briefly described in the Biological Criteria- Diversity section and serves as both biological and listing factor metrics.

Listing Factor C: Disease and Predation

This listing factor pertains to Caspian Tern, Double Crested Cormorant and pinned predation. Studies have yet to be implemented to detect population level threats.

Listing Factor D: Adequacy of Existing Regulatory Mechanisms

No measurable criteria have been determined for this metric.

Listing Factor E: Other Natural or Manmade Factors Affecting the Continued Existence of the ESU.

Percent hatchery fish on spawning grounds was briefly described in the Biological Criteria-Diversity section and serves as both biological and listing factor metrics.



Photo: WDFW

Measurable Criteria and the Early Warning Indicator System

The effectiveness of ODFW's LCRCRP to recover salmon and steelhead in the LCR will be determined by regularly assessing the status of each of population's status over time. To determine the status of each population, an assessment will be made of each population's current status and comparing against the interim measurable criteria identified in chapter 8. A comparison of that current status to the population's status at the time the plan was implemented, or either population's status at the time of the prior assessment, will be used to determine whether status has improved, remain the same, or declined. Status cannot be evaluated over a short period of time, but may be discernable prior to the full assessment period (2022) called for within each interim criterion.

In order to provide timely guidance to those responsible for the adaptive management of this recovery plan, it is important to incorporate information gathered by RME into an early warning system that will raise "red flags" regarding the need for potential corrections to the plan.

The early warning system for the Plan will be based on annual assessments of the likelihood of attaining the measurable criteria goals over the time interval specified by the criteria in chapter 8, given previously observed results.

Coho VSP Trends Since Plan Adoption

Youngs Bay and Big Creek populations were monitored during 2010-2012, but discontinued during 2013 due to prioritization of efforts towards primary populations. These two populations attained all measurable criteria goals for A/P and SS and below the pHOS diversity goals. The remaining populations (Clatskanie, Scappoose, Clackamas, Sandy, Lower Gorge and Upper Gorge/Hood), which all are primary populations, have yet to attain goals. The Scappoose, Sandy and Lower Gorge have attained the A/P goal in one of 4 years and the remaining populations have yet to attain the A/P goal for the past 4 years. Additionally, these populations are achieving less than 50% of the average A/P goals.

For SS (percent occupancy of habitat), the Clatskanie, Scappoose, Clackamas, Sandy and Upper Gorge/Hood have not met the goals in any year. The average SS for these populations are less than the goals and vary from a high of 82% of the goal in the Clatskanie to a low of 24% of the goal in the Clackamas. The Lower Gorge is a positive at this time and has attained the SS goal in 3 of 4 years and the average SS exceeds the goal by 19%.

For diversity (harvest) the goal has been met for all years at the ESU level. For diversity (average pHOS), both the Scappoose and Sandy are meeting the goal, while the Clatskanie, Clackamas, Lower Gorge and the Upper Gorge/Hood population are greater than the pHOS goals (for this criteria we want to be below the goal) during the 4 years since plan adoption. For the populations that are attaining the goal, the Clatskanie is the closest at 5% above and the Upper Gorge/Hood is the greatest at 69% above the goal.

With many of the evaluations occurring at 9-12 year intervals all of these measurable criteria bear close scrutiny over the next two years in regards to the early warning indicator system and the adaptive management process.

Fall and Late Fall Chinook VSP Trends Since Plan Adoption

Mass marking of hatchery fall chinook fry began in 2006. GRTS based spawning surveys began in the LCR in 2009 and include the Youngs Bay, Big Creek, Clatskanie, Scappoose, Clackamas and Sandy populations. However, low abundance in some populations (e.g. Clatskanie, Scappoose) and difficult survey conditions (i.e. high flows and visibility), which have combined to preclude a sufficient number of surveys for producing abundance estimates. Favorable survey conditions during 2013 facilitated estimates for the Youngs Bay, Clackamas and Sandy populations. Precision is typically low.

No abundance goals can be calculated at this time due to the short data series on the Youngs Bay, Big Creek, Clackamas and Sandy populations.

For all sampled populations, there is no method developed to determine spatial structure at this time.

For diversity (harvest), there is no reportable data at this time.

For diversity (pHOS), the Youngs Bay and Big Creek populations attained the goal of 90% for these maintaining populations, while the Clackamas and Sandy populations are well below the threshold of 30% for these contributing populations.

Spring Chinook VSP Trends Since Plan Adoption

Census based surveys are conducted for Clackamas and Sandy ChS and have occurred yearly since plan adoption. Sandy ChS have attained the A/P goal for 3 of 3 years that data are available and exceed the average abundance goal by 29%. pHOS exceeds the goal by 45%. The high pHOS is attributed to removal of Marmot Dam and had a high of 77% following dam removal. Since that time, multiple plan actions have been implemented and pHOS has dropped to 24%. pHOS will need continued monitoring to assess if the average goal will be met during the first assessment period in 2022, but is trending in a positive manner.

There are no current methods to determine spatial structure.

The Clackamas population only has one year of data available and attained the A/P goal as well as doubling the average goal. pHOS exceeded the goal by 27%.

Annual estimates of VSP metrics have been unavailable for Hood River spring chinook since the removal of Powerdale Dam in 2010. Work to develop reliable alternative methods for accurate characterization of this population is ongoing.

For diversity (harvest), there is no reportable data at this time.



Steelhead
Photo: NOAA

Winter Steelhead VSP Trends Since Plan Adoption

Winter steelhead redd counts began in 2012 for a majority of the populations, and calibration of a fish per redd relationship allowed redd abundance to be converted to fish abundance in 2013. The coastal stratum is considered part of the SW Washington DPS and therefore does not have delisting goals. The Youngs Bay, Big Creek, Clatskanie and Scappoose populations had a high abundance of 1530 in the Clatskanie and a low of 28 in the Big Creek drainage.

The Clackamas, Sandy and Hood populations were monitored while the upper and lower gorge were not. No goals have yet been set for the Sandy population but the Clackamas population attained the A/P goal for the first year and the Hood population has attained the goal in 2 of 4 years.

For diversity (average pHOS) the Clackamas and Hood populations exceed the goal by 5% and 45% respectively.

For diversity (harvest) there is no current data available.

For SS (percent occupancy of habitat) there is no current method to determine percent occupancy of habitat.

Summer Steelhead VSP Trends Since Plan Adoption

Native summer steelhead distribution is limited to the Hood River basin within the LCR ESU. Annual estimates of VSP metrics have been unavailable for Hood River summer steelhead since the removal of Powerdale Dam in 2010. Work to develop reliable alternative methods for accurate characterization of this population is ongoing.



Oregon's Columbia River Chum Recovery Strategy



Year 3

The Columbia River Chum Recovery Strategy (CRS) represents the first step in the State of Oregon's plan for recovering chum salmon in tributaries located on the Oregon side of the Columbia River Evolutionarily Significant Unit (ESU). This plan has been developed as a supplement to the Lower Columbia River Conservation and Recovery Plan for Oregon Populations of Salmon and Steelhead (LCR Recovery Plan-Appendix I(ODFW 2010)) and seeks to gather information and develop techniques that will provide the framework for establishment of viable chum populations on the Oregon side of the Lower Columbia River.

Year 3 of the Chum Recovery Strategy, the First Year of Adult Returns

- ODFW and volunteer crews assisted with adult brood collection on the Grays River.
- For the third consecutive year, chum fry (108,000) were released during the month of April in Big Creek. All fry received a coded wire tag and a unique thermal mark on the otolith. Fry are released in the evening at high tide in an attempt to reduce predation.
- Estuary sampling was conducted following the fry release to understand chum habitat occupancy, distribution and genetic structure.
- JOM traps were installed above head-of-tide in Milton Creek within the Scappoose population and above head-of-tide on Conyers Creek and in the Clatskanie River in the Clatskanie population for the second consecutive year, to continue baseline monitoring and to assess the potential for natural reproduction. No chum fry were captured. A JOM trap was installed in Big Creek, 38 fry were sampled.
- 15 unmarked adult chum returned to the Big Creek hatchery weir and passed upstream.
- 43 marked age 3 adult chum returned to Big Creek hatchery and were out-planted in Graham and Stewart Creeks in the Clatskanie population.
- Adult and fry traps were constructed at Graham and Stewart Creeks in the Clatskanie population. Natural production occurred in both drainages.
- Adult spawning ground surveys were conducted within HIP habitat in the Youngs Bay, Big Creek and Clackamas populations. Low numbers of adult chum were observed in Youngs Bay and Clackamas populations.
- Water quality samples were taken at 15 potential reintroduction sites.
- Physical habitat surveys were conducted in high intrinsic potential (HIP) habitat within the Scappoose and Clatskanie populations. Aquatic habitat was assessed and prioritized for potential restoration based upon substrate presence and size, degree of embeddedness, cold water ($> 1^{\circ}\text{C}$ colder than surrounding water) patch presence and presence of migration barriers.

Year 4 of the program should see an increased in adult returns with 3 and 4 year old age classes. The marked adult returns will be used to double hatchery production for eventual independency from Grays River chum. Big Creek fry releases will continue as previously. Expanded hatchery production will mark the first year of releases into the Clatskanie population. JOM trapping will continue at Graham, Stewart, Clatskanie River and Big Creek. Habitat and spawn surveys are planned, as well as an evaluation of constructing a spawning channel in the Sandy River Delta. Discussions with the Chum Work Group are ongoing regarding the habitat prioritization process and future release locations, as well as development of the chum re-introduction plan.

Oregon's LCR Population Fact Sheets

Since populations are the Primary Recovery Group, pages 17-63 are presented in the population fact sheet format to summarize:

- **Key Limiting Factors:** To successfully recover Oregon Lower Columbia River populations of salmon and steelhead, actions must be implemented that are effective at reducing or eliminating the limiting factors and threats that impact viability as identified in Chapter 5 and prevent factors that do not currently impact viability from doing so in the future.
- **Restoration and Protection Actions:** The success of action implementation will require significant funds and the coordinated work of ODFW, state agencies, tribes, counties, irrigation districts, agriculture and private forest land managers, NMFS, U.S. Forest Service, BLM, other federal agencies, municipalities, local residents, citizen groups, utilities, other agencies, and individuals.
- **RM&E:** Is critical to assess the status of species and their habitat, to track progress toward achieving recovery goals, and to provide information needed to refine recovery strategies and actions through the process of adaptive management.



Lower Columbia River Restoration
Photo: LCREP



Cascades of Columbia River; General View.
Hood River County, Oregon. 1899. Photo:

Helpful tips for reading the fact sheets:

1. The maps display spatial structure information and spawning distribution. Spawning distribution has changed from historic conditions in some populations due to dams.
2. The limiting factor tables summarize the primary factors and threats affecting the viability and recovery of each population.
 - Addressing primary factors/threats are the highest priority for improving a population's viability and meeting recovery goals.
 - Secondary limiting factors, threats and concerns are not listed for each population.
 - Actions implemented to address the limiting factors and threats are summarized in the protection/restoration tables for each population.
3. The protection and restoration tables summarize those activities reported and completed during this reporting period for each population. These tables reflect the best available information from existing reporting databases, agency staff and local implementers.
 - Graphics depict habitat restoration quantities compared to target amounts needed to overcome listing factor A.
4. Research, monitoring and evaluation are presented in graphics to depict the most current status of VSP parameters and compared to the delisting goals.

Oregon's LCR Population Fact Sheets

Restoration Activity Targets

The restoration quantity needs listed in Table 9-2 of the plan, and graphically depicted under each independent population in this report, were not modeled to determine the amount of any single action necessary for achieving a species given desired status. The habitat restoration quantities were developed in the plan as a method to estimate costs. These quantities were based in best available science and modeled in threat reduction scenarios to reduce tributary habitat mortality to a level that is consistent with the mortality rates for each population. These modeling results contain a blend of delisting and broad sense recovery goals and in some cases contain estimates beyond what the planning team deemed feasible.

The habitat restoration quantities depicted in the LCR population fact sheets do not represent a target or goal in which listing Factor A will be evaluated. The listed quantities should be reviewed with caution due to the limited amount of information existing during plan development and the uncertainty about the quality and functionality of restored habitat and fish use in restored habitats. The habitat restoration quantity need will ultimately be determined by fish response, and possibly change from estimates made during cost estimation. Additionally, the graphics under the independent populations for restoration quantities completed should be viewed in a cautious manner due to the lack of consistent reporting metrics for the amount of work completed (i.e. riparian plantings one side v. both sides of the stream, a 20' strip v. 100' strip). However, the identified habitat restoration needs are useful as a starting point to visualize the relative amounts and types of restoration work needed in tributaries and serve as a potential proxy until habitat restoration goals are established.

Where the restoration quantities appear to be met, implementers are encouraged to continue to conduct these types of projects until biological listing (VSP) factor parameters are fully met.



Young's Bay Populations

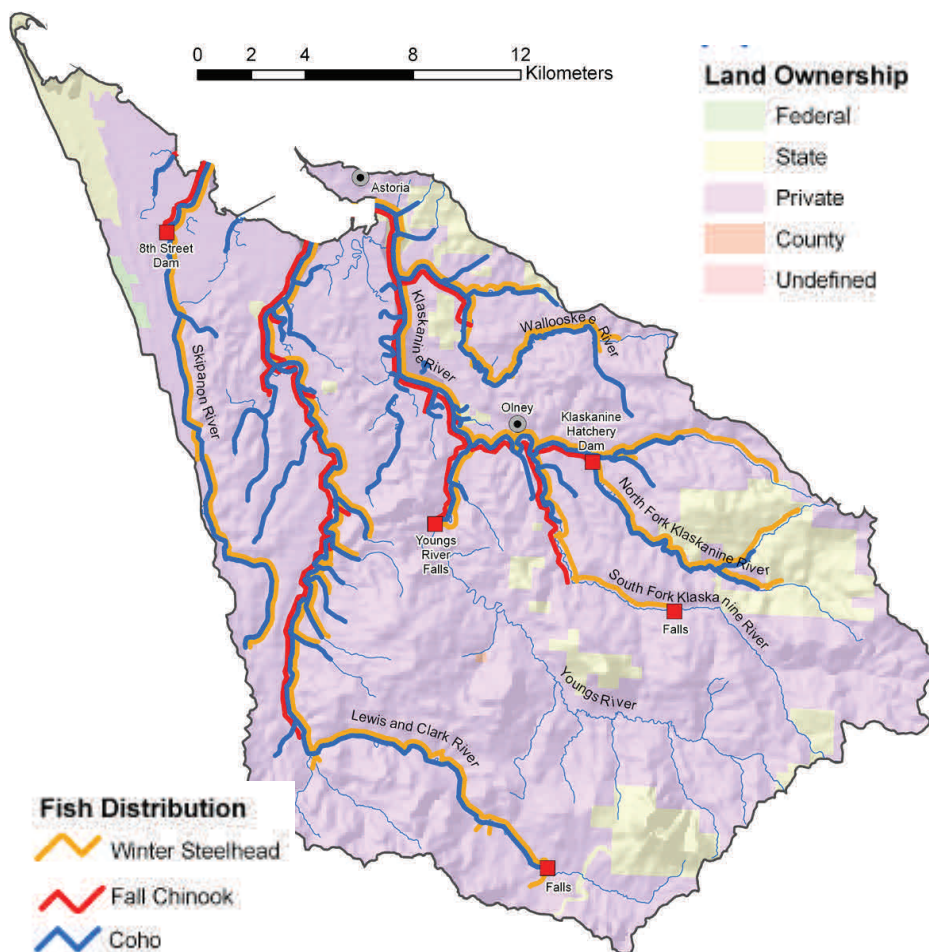


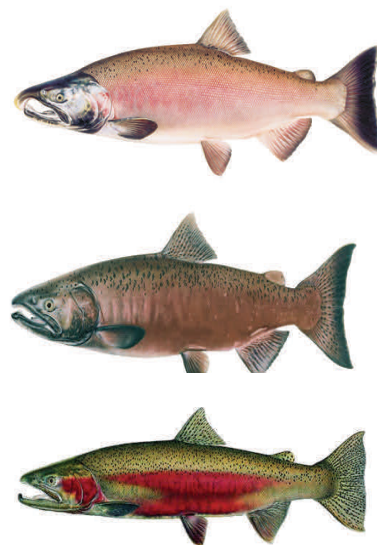
Photo: Youngs Bay Bridge
Steve Morgan

Key Limiting Factors Affecting Youngs Bay Coho, Fall Chinook and Winter Steelhead

Threat Category	Key Limiting Factor and Code		Coho	Fall Chinook	Winter Steelhead
Tributary Habitat	5c	Altered hydrograph/water quantity from upslope land use.	X	X	X
	6e	Reduced physical habitat quality/habitat access due to past and/or	X	X	X
Estuary Habitat	3a	Altered food web, reduced macrodetrital input due to Columbia Basin hydropower reservoirs, revetments and disposal of dredge materials.	X	X	X
	3b	Altered food web, increased microdetrital input due to Columbia Basin hydropower reservoirs.	X	X	X
	5b	Altered hydrograph/water quantity due to Columbia Basin hydropower	X	X	X
	6c	Impaired physical habitat quality due to Columbia Basin hydropower	X	X	X
Harvest	7a	Loss of population traits due to consumptive, target fisheries.	X	X	
Hatchery	7c	Loss of population traits, stray hatchery fish interbreeding with wild fish.	X	X	

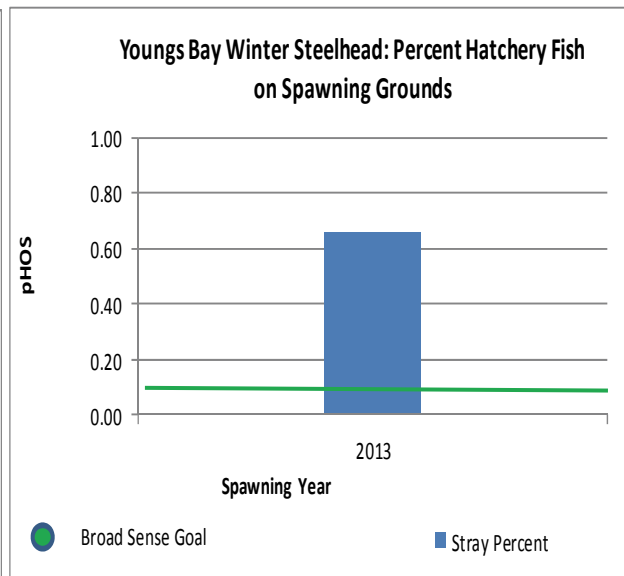
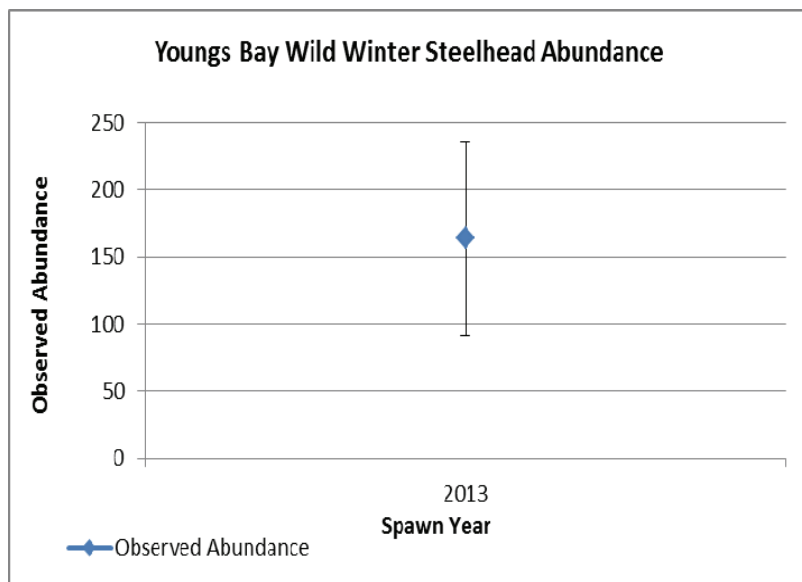
Young's Bay Populations

Extinction Risk	2010 Plan Assessment	Desired Delisting Goal
Coho	Very High	Very High
Fall Chinook	High	High
Winter Steelhead	Very Low	Very Low



Winter Steelhead Population Status Notes:

GRTS based redd surveys began during the 2012-2013 return year. Youngs Bay winter steelhead are not part of the Lower Columbia River Steelhead DPS and are not listed under the federal ESA, therefore there is no desired delisting goal for pHOS. GRTS surveys for StW will be discontinued in 2014 to address budget constraints. Some limited monitoring will remain (i.e. fish:redd calibration and above NFK Klaskanine Weir). GRST based VSP metrics will be unavailable for 2014.

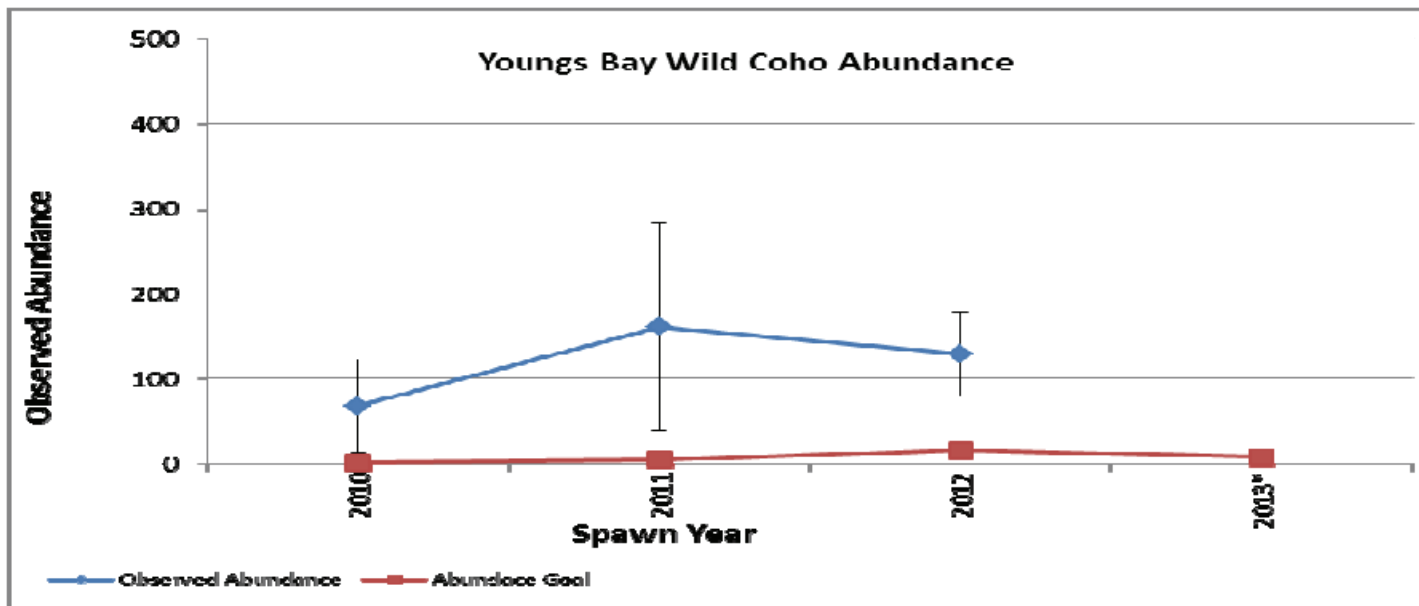


Youngs Bay yearly observed abundance estimates are a combination of GRTS redd estimates, which do not include area above Klaskanine Hatchery weir, and the number of unmarked adult fish passed above the hatchery weir.

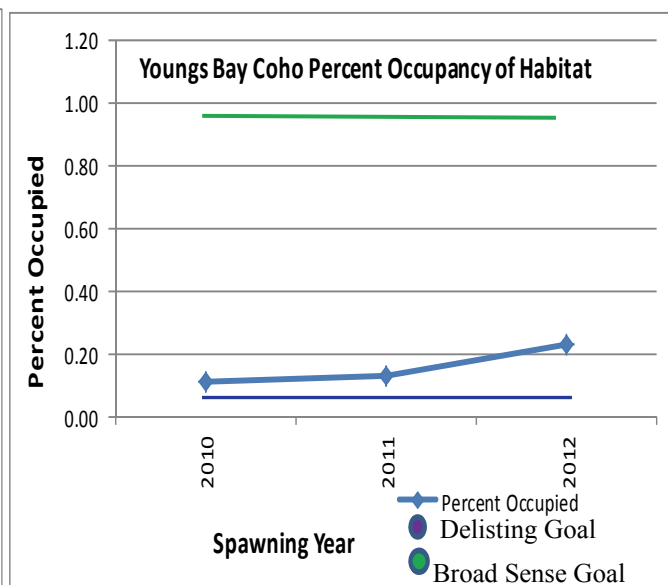
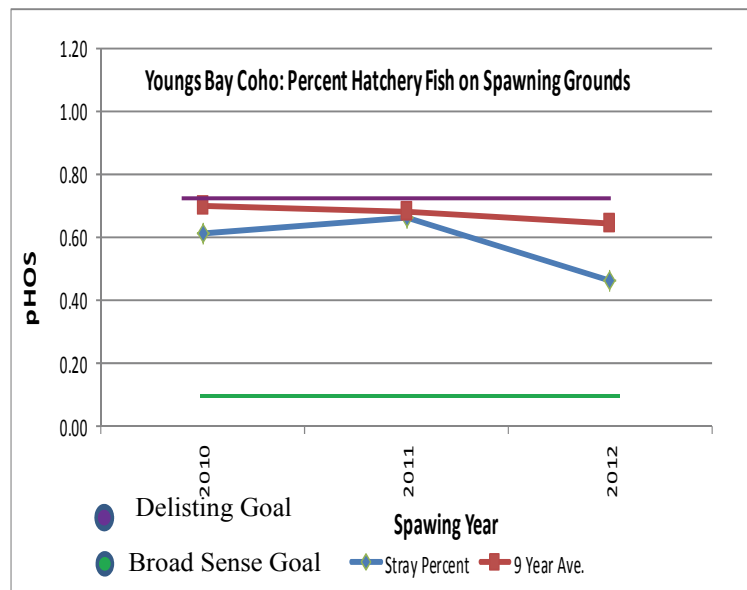
Youngs Bay pHOS is a function of estimated wild abundance determined from the GRTS redd surveys plus the number of wild fish passed above the weir at Klaskanine Hatchery and divided by the estimated hatchery abundance from GRTS redd surveys. The random GRTS redd surveys do not occur above the hatchery weir, where it is presumed to be 100% wild fish spawners. The area above the hatchery weir contains 5% of available spawning miles in the Youngs Bay population.

Youngs Bay Populations

Coho Population Status



Youngs Bay yearly observed abundance estimates are a combination of GRTS spawning ground estimates, which do not include area above Klaskanine Hatchery weir, and the number of unmarked adult fish passed above the hatchery weir.



Youngs Bay pHOS is a function of estimated wild abundance determined from the GRTS spawning ground surveys plus the number of wild fish passed above the weir at Klaskanine Hatchery and divided by the estimated hatchery abundance from GRTS spawning ground surveys. The random GRTS spawning surveys do not occur above the hatchery weir, where it is presumed to be 100% wild fish spawners. The area above the hatchery weir contains 5% of available spawning miles in the Youngs Bay population.

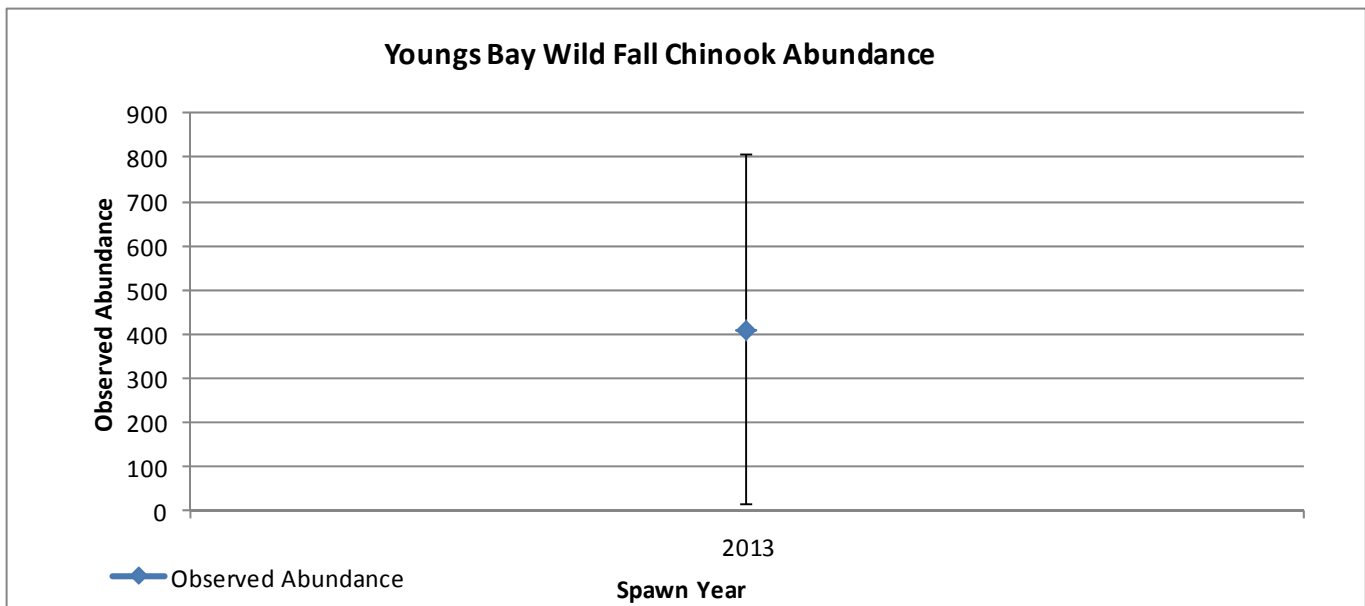
* Due to budget constraints, ODFW discontinued GRTS surveys in the Youngs Bay coho population in 2013. Some limited monitoring remains (i.e. standard index sites and hatchery weir counts) but GRTS-based VSP metrics will be unavailable until the budget can support expansion of monitoring efforts.

Youngs Bay Populations

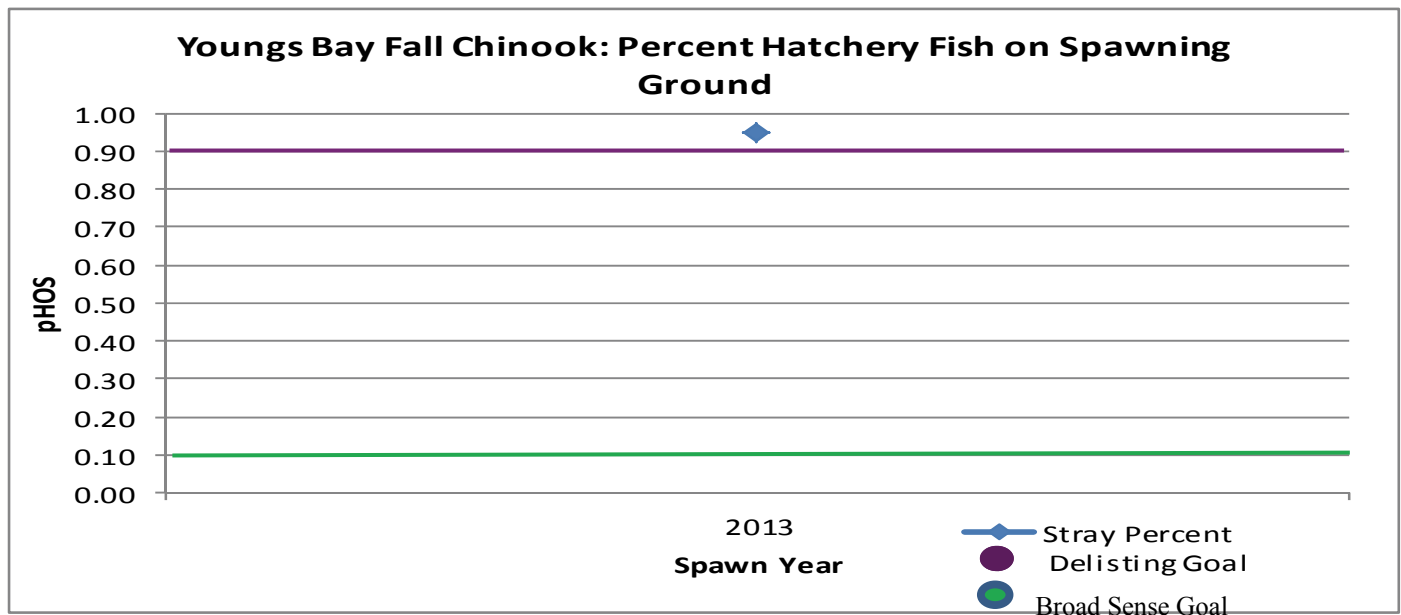
Fall Chinook Population Status



Coast Stratum



Youngs Bay annual abundance estimates are determined from GRTS based spawning ground surveys, which began in 2009. Adult ChF are not passed above the Klaskanine Hatchery Weir. Spawning locations are often in non-wadable portions of streams, which pose challenges for visual-based spawning surveys and frequently result in confidence intervals which exceed the abundance estimate.



Youngs Bay pHOS is a function of estimated wild:hatchery abundance determined from the GRTS spawning ground surveys.

Young's Bay Populations

Table 1. Status Summary of Protection and Restoration Activities Completed

Action ID	Project	Limiting Factor	Location	Species	Implementer	Action Type
113-YB	Bickmore riparian, .5 mile	K	Skipanon	Coho, StW	NCWA	Habitat
113-YB	Youngs River Fencing and Riparian, .4 mile	K	Youngs River	Coho, StW, ChF, Chum	NCWA	Habitat
117-YB	Maintain Wild Fish Sanctuary above Klaskanine Hatchery Weir	K	Klaskanine	Coho, StW, Chum	ODFW	Hatchery
118-YB	Pass Wild Chum at Klaskanine Hatchery	K	Klaskanine	Coho, StW	ODFW	Hatchery
113-YB	Mabel Creek Riparian 1 mile	K	Mabel Creek	NA	NCWA	Habitat
113-YB	Sheller Place Skipanon River Riparian, .12 mile	K	Skipanon	Coho, StW	NCWA	Habitat

*See table 7.3 of the plan to link the action ID to the plan action.

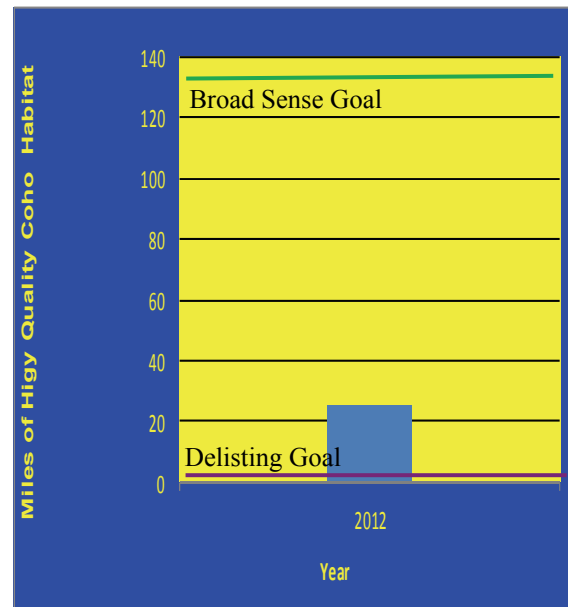
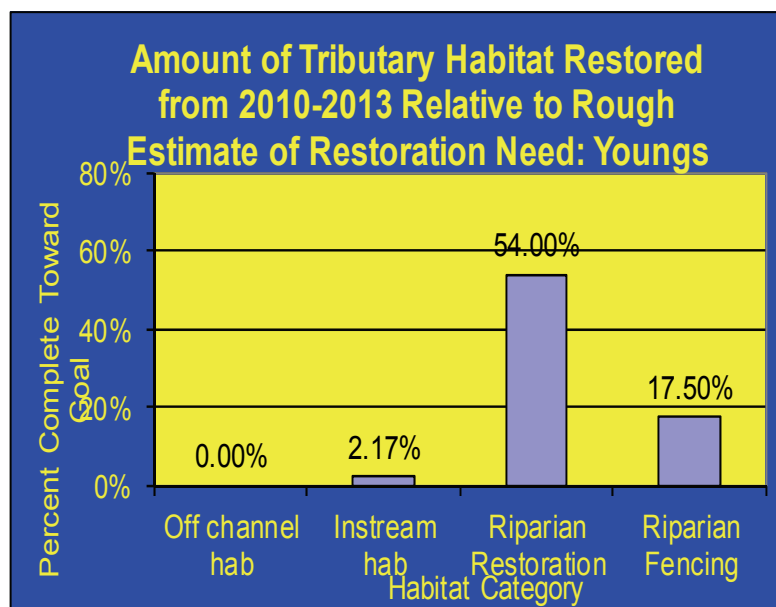
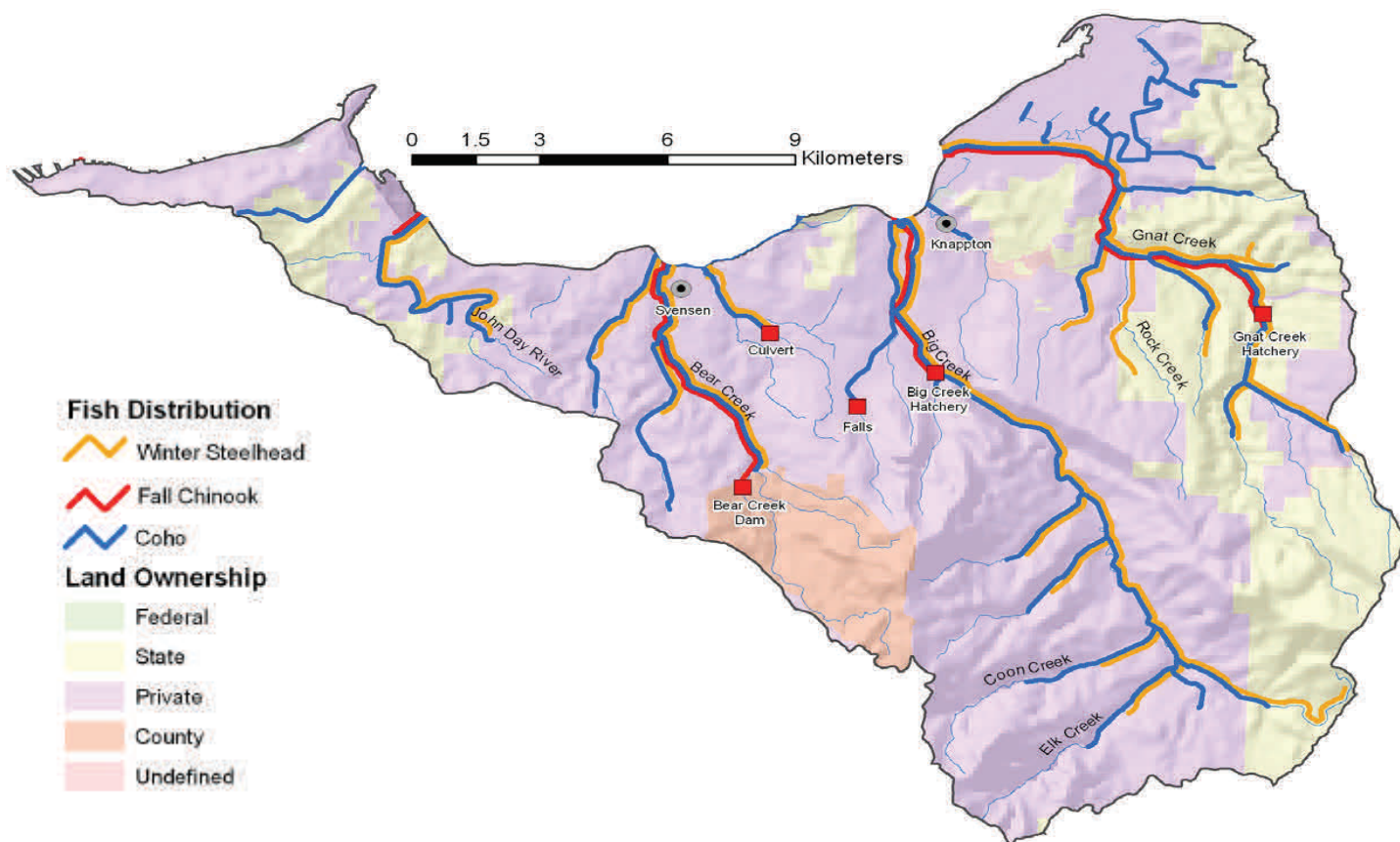


Figure 5. Habitat Restoration Completed 2010-2013 Compared to Plan Restoration Quantities

Figure 6. Miles of High Quality Coho Habitat

- Habitat restoration quantities for the Youngs Bay population are found on page 338 of the plan.
- Achievement of all habitat restoration quantities is planned for 15 years (2010-2025).
- Completion of approx. 6%/year in each category would hit plan quantities in 15 years.
- Miles of high quality coho habitat needed has met the delisting goal.
- See page 15 of this report for details regarding restoration action quantities, off-channel habitat explanation and miles of high quality coho habitat needs.

Big Creek Populations



Key Limiting Factors Affecting Big Creek Coho, Fall Chinook and Winter Steelhead

Threat Category	Key Limiting Factor and Code		Coho	Fall Chinook	Winter Steelhead
Tributary Habitat	5c	Altered hydrograph/water quantity from upslope land use.	X	X	X
	6e	Reduced physical habitat quality/habitat access due to past and/or current land use practices.	X	X	X
Estuary Habitat	3a	Altered food web, reduced macrodetrital input due to Columbia Basin hydropower reservoirs, revetments and disposal of dredge materials.	X	X	X
	3b	Altered food web, increased microdetrital input due to Columbia Basin hydropower reservoirs.	X	X	X
	5b	Altered hydrograph/water quantity due to Columbia Basin hydropower dams.	X	X	X
	6c	Impaired physical habitat quality due to Columbia Basin hydropower dams.	X	X	X
Harvest	7a	Loss of population traits due to consumptive, target fisheries.	X	X	
Hatchery	7c	Loss of population traits, stray hatchery fish interbreeding with wild fish.	X	X	X

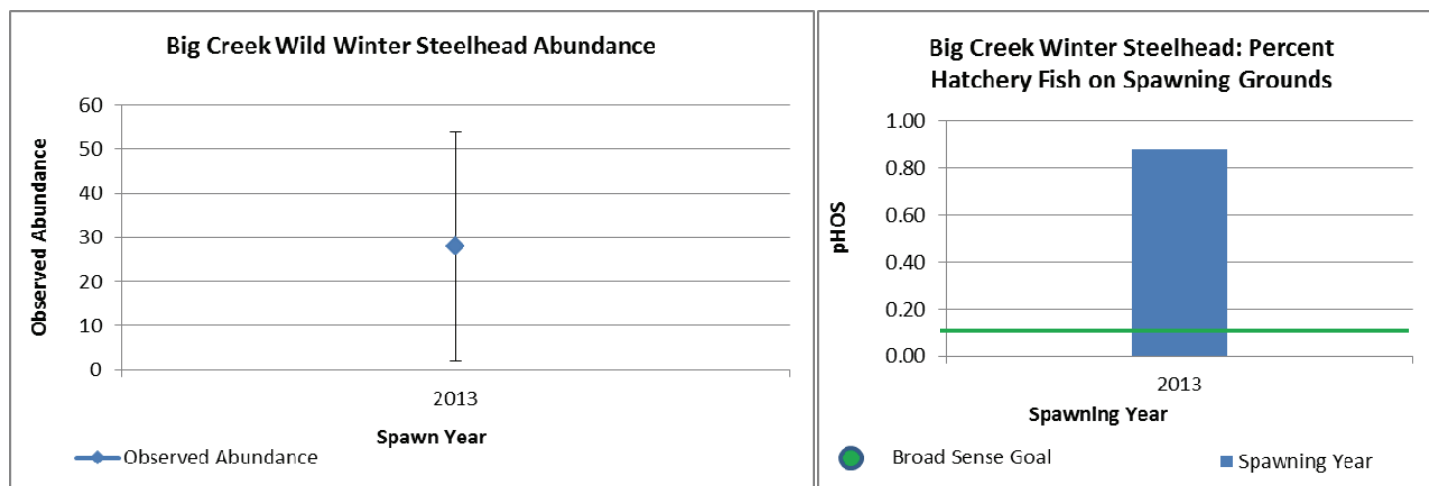
Big Creek Populations

	2010 Plan Assessment	Desired Delisting Goal
Coho	Very High	Very High
Fall Chinook	Very High	High
Winter Steelhead	Low	Very Low



Winter Steelhead Population Status Notes:

GRTS based redd surveys began during the 2012-2013 return year. Big Creek winter steelhead are not part of the Lower Columbia River Steelhead DPS and are not listed under the federal ESA, therefore there is no desired delisting goal for pHOS. GRTS surveys for StW will be discontinued in 2014 to address budget constraints. Some limited monitoring will remain (i.e. fish:redd calibration and above Big Creek Hatchery Weir). GRST based VSP metrics will be unavailable for 2014.

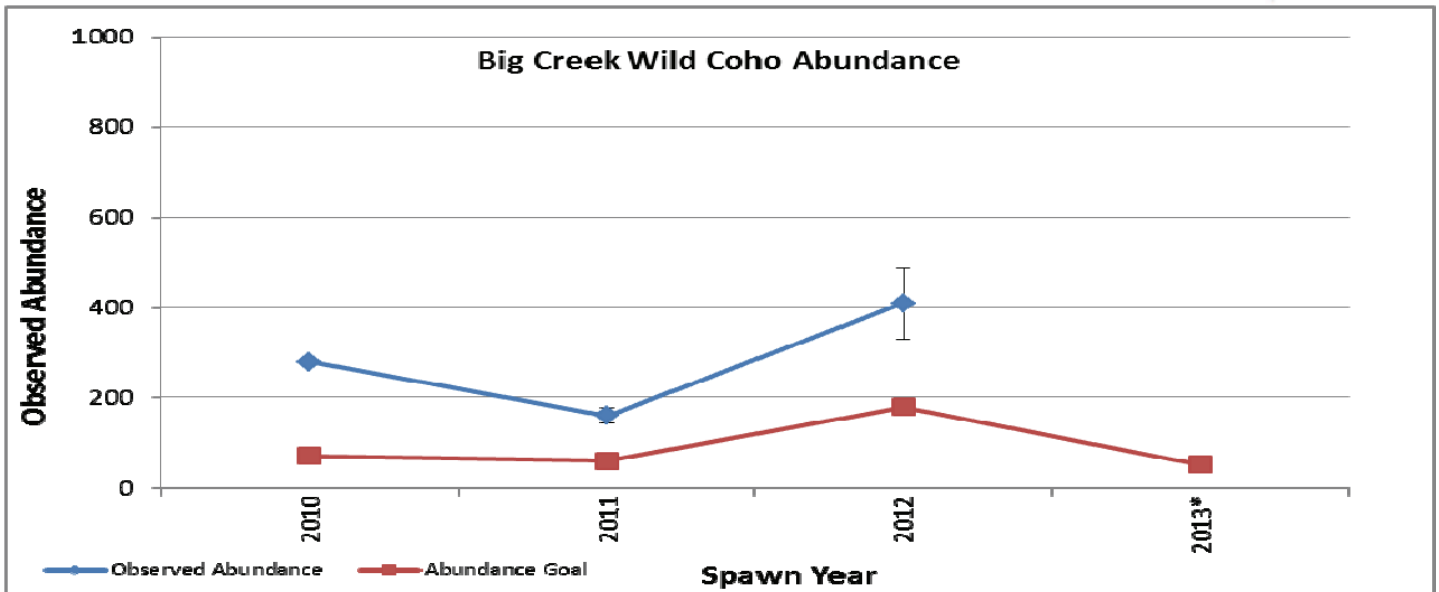


Big Creek yearly observed abundance estimates are a combination of GRTS redd estimates, which do not include areas above Big or Gnat Creek Hatchery weirs, and the number of unmarked adult fish passed above the hatchery weirs.

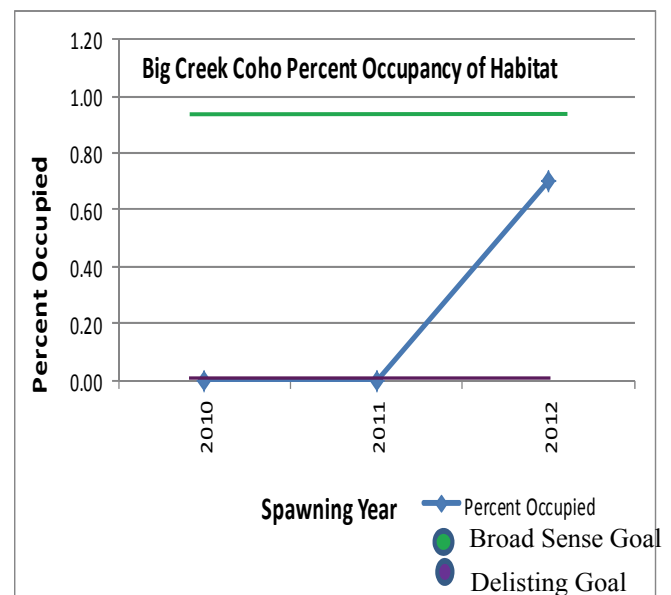
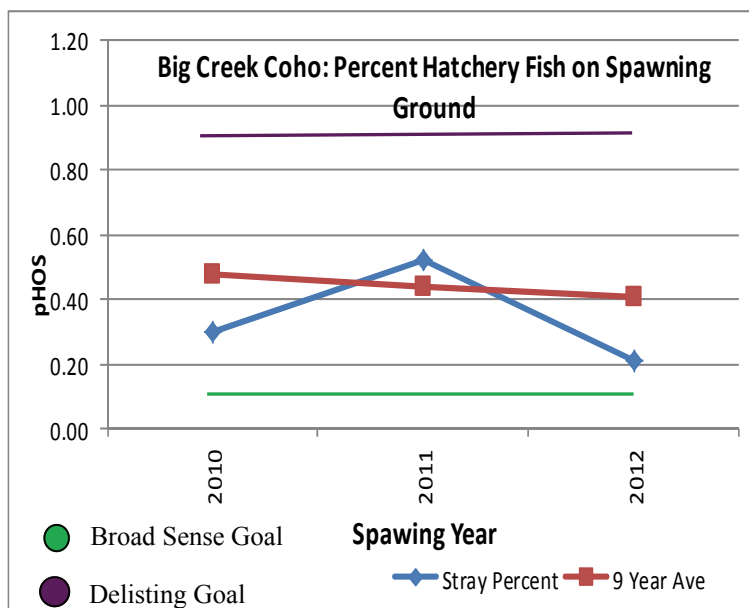
Big Creek pHOS is a function of estimated wild abundance determined from the GRTS redd surveys plus the number of wild fish passed above the weirs at Big and Gnat Creek Hatcheries and divided by the estimated hatchery abundance from GRTS redd surveys. The random GRTS redd surveys do not occur above the hatchery weirs, where it is presumed to be 100% wild fish spawners. The area above the hatchery weirs contains 50% of available spawning miles in the Big Creek population.

Big Creek Populations

Coho Population Status



Big Creek yearly observed abundance estimates are a combination of GRTS spawning ground estimates, which do not include areas above Big or Gnat Creek Hatchery weirs, and the number of unmarked adult fish passed above the hatchery weirs.

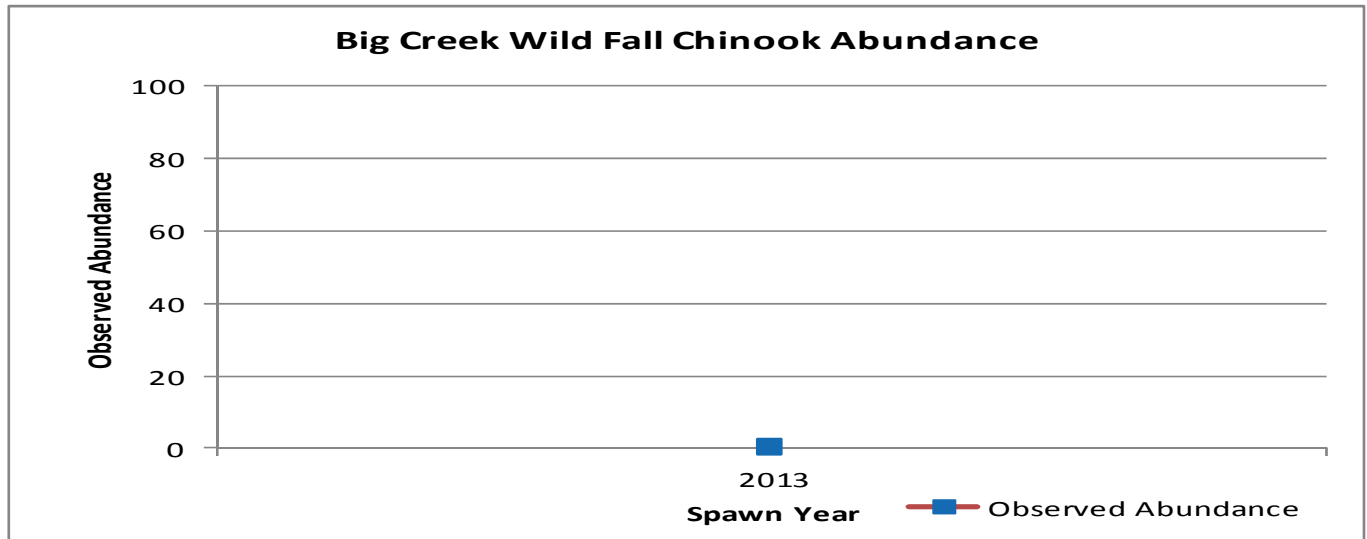


Big Creek PHOS is a function of estimated wild abundance determined from the GRTS spawning ground surveys plus the number of wild fish passed above the weirs at Big and Gnat Creek Hatcheries and divided by the estimated hatchery abundance from GRTS spawning ground surveys. The random GRTS spawning surveys do not occur above the hatchery weirs, where it is presumed to be 100% wild fish spawners. The area above the hatchery weirs contains 50% of available spawning miles in the Big Creek population.

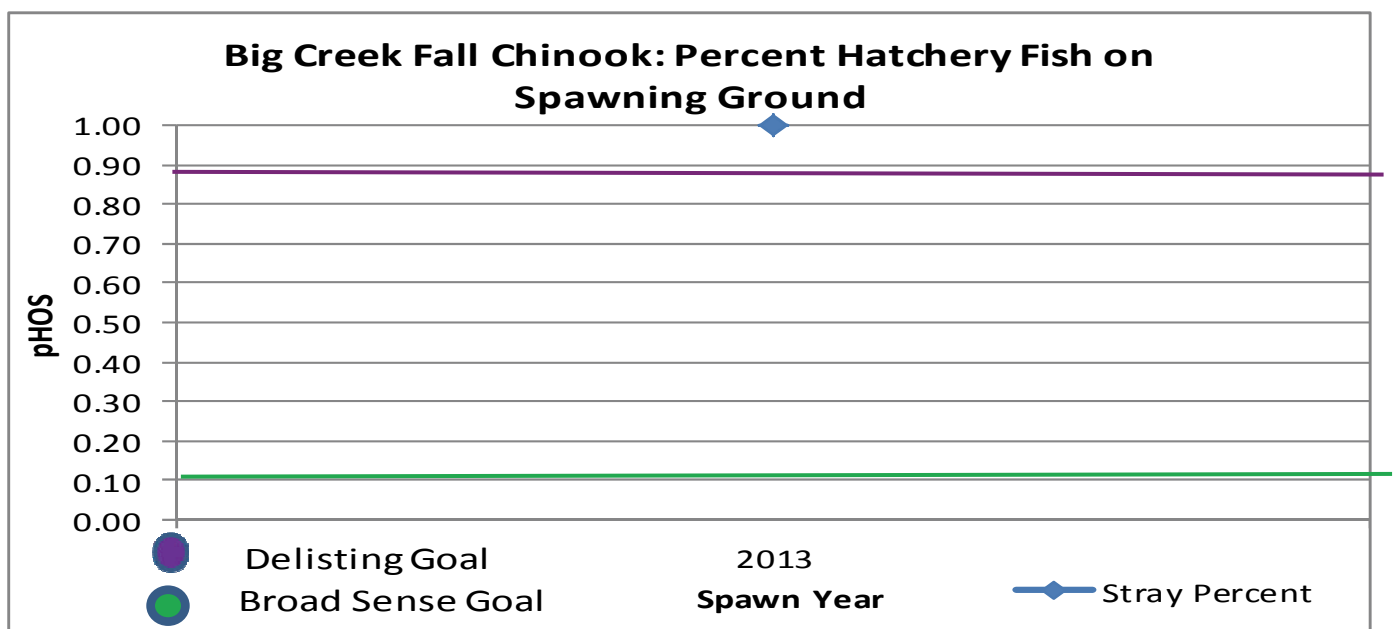
* Due to budget constraints, ODFW discontinued GRTS surveys in the Youngs Bay coho population in 2013. Some limited monitoring remains (i.e. standard index sites and hatchery weir counts) but GRTS-based VSP metrics will be unavailable until the budget can support expansion of monitoring efforts.

Big Creek Populations

Fall Chinook Population Status



Big Creek annual abundance estimates are determined from GRTS based spawning ground surveys, which began in 2009. Adult ChF are not passed above the Big or Gnat Creek Hatchery Weirs. Spawning locations are often in non-wadable portions of streams, which pose challenges for visual-based spawning surveys and frequently result in confidence intervals which exceed the abundance estimate.



Big Creek pHOS is a function of estimated wild abundance determined from the GRTS spawning ground surveys and divided by the estimated hatchery abundance from GRTS spawning ground surveys. The random GRTS spawning surveys do not occur above the hatchery weirs and no chinook are passed above the weirs.

Big Creek Populations

Table 2. Status Summary of Protection and restoration Activities Completed

Action ID	Project	Limiting Factor	Location	Species	Implementer	Action Type
122-BC, 125-BC, 126-BC	Gnat Creek North Tidal Reconnection, 60 acre, LWD at 5 Breach Locations, Riparian Reveg-disturbance Area, .1 mile	K	Gnat Creek	Coho, StW, ChF	CREST	Habitat
132-BC	Maintain Wild Fish Sanctuary above Big Creek Hatchery Weir	K	Big Creek	Coho, StW, Chum	ODFW	Hatchery
133-BC	Pass Wild Chum at Big Creek Hatchery	K	Big Creek	Chum	ODFW	Hatchery
126-BC	Big Creek County Park and Fishing Club Riparian, .75 mile	K	Big Creek	Coho, StW, ChF	NCWA	Habitat

*See table 7.3 of the plan to link the action ID to the plan action.

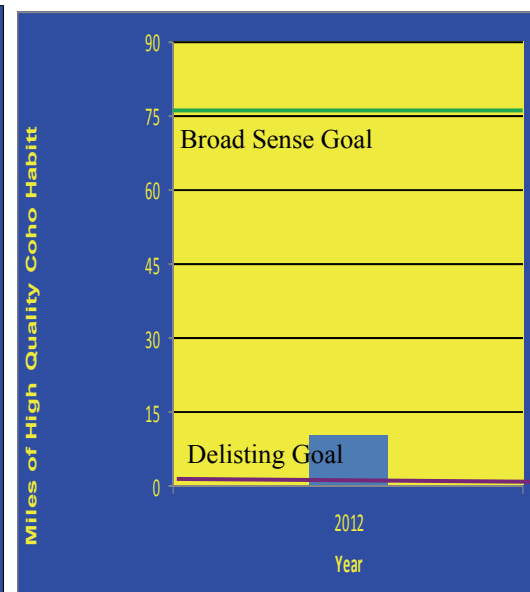
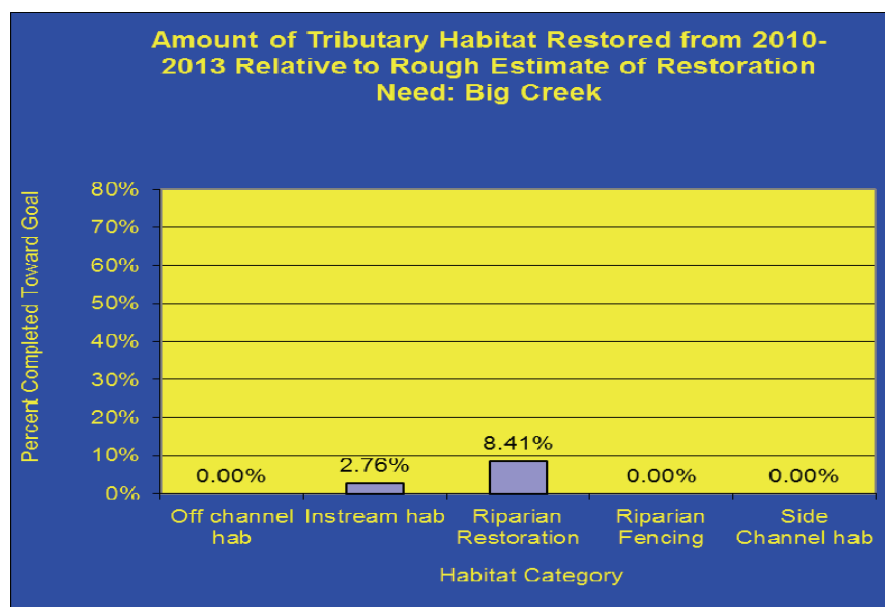
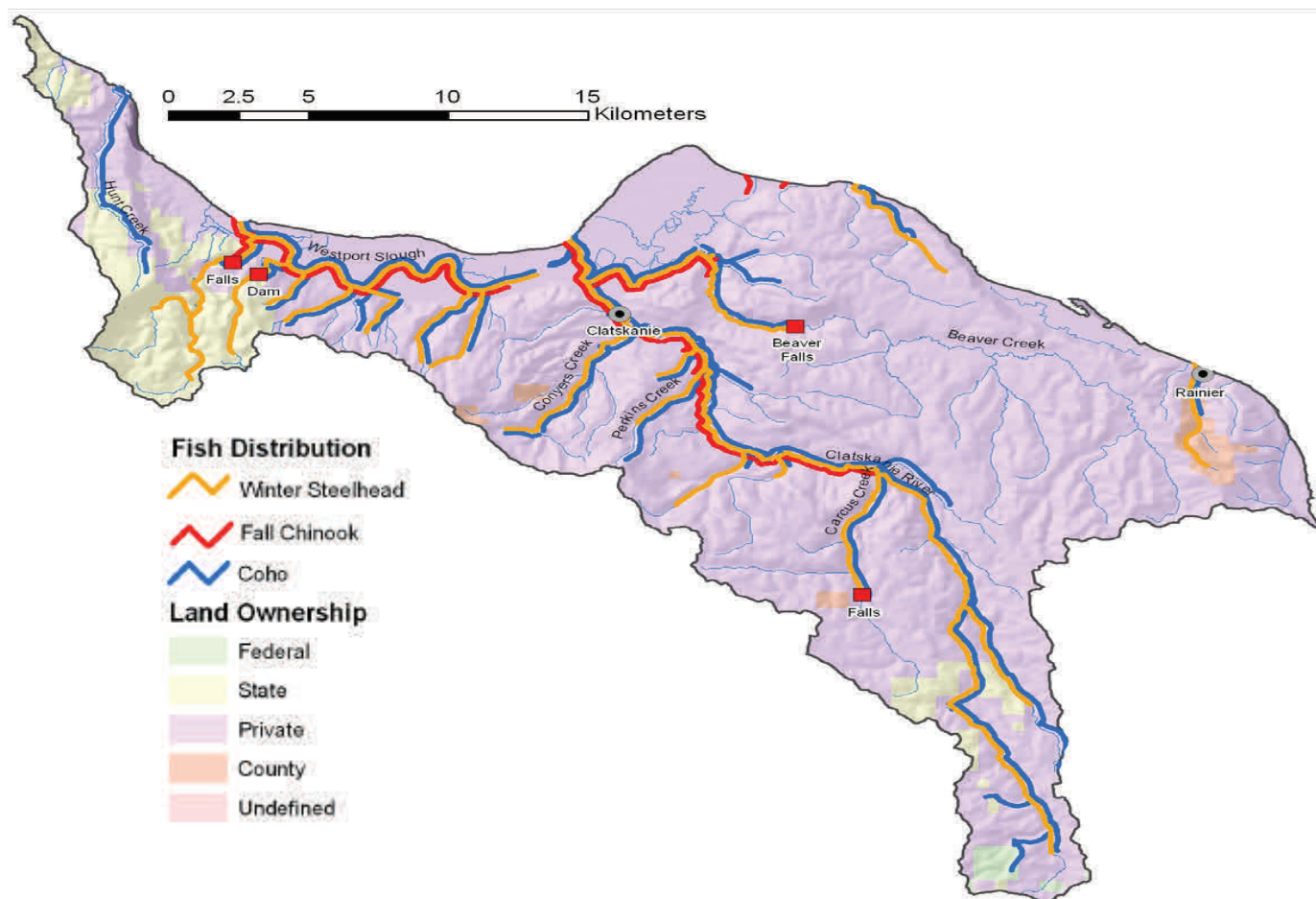


Figure 7. Habitat Restoration Completed 2010-2013 Compared to Plan Restoration Quantities

Figure 8. Miles of High Quality Coho Habitat

- Habitat restoration quantities for the Big Creek population are found on page 338 of the plan.
- Achievement of all habitat restoration quantities planned for 15 years (2010-2025).
- Completion of approx. 6%/year in each category would hit targets in 15 years.
- Miles of high quality coho habitat has met the delisting goal.
- See page 15 of this report for details regarding restoration action quantities, off-channel habitat explanation and miles of high quality coho habitat needs.

Clatskanie Populations

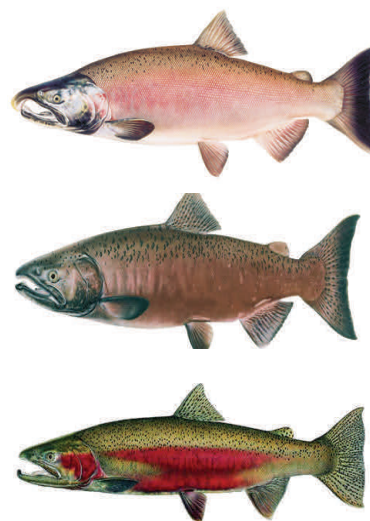


Key Limiting Factors Affecting Clatskanie Coho, Fall Chinook and Winter Steelhead

Threat Category	Key Limiting Factor and Code		Coho	Fall Chinook	Winter Steelhead
Tributary Habitat	6e	Reduced physical habitat quality/habitat access due to past and/or current land use practices.	X	X	X
Estuary Habitat	3a	Altered food web, reduced macrodetrital input due to Columbia Basin hydropower reservoirs, revetments and disposal of dredge materials.	X	X	X
	3b	Altered food web, increased microdetrital input due to Columbia Basin hydropower reservoirs.	X	X	X
	5b	Altered hydrograph/water quantity due to Columbia Basin hydropower dams.	X	X	X
	6c	Impaired physical habitat quality due to Columbia Basin hydropower dams.	X	X	X
Harvest	7a	Loss of population traits due to consumptive, target fisheries.	X	X	
Hatchery	7c	Loss of population traits, stray hatchery fish interbreeding with wild fish.		X	

Clatskanie Populations

	2010 Plan Assessment	Desired Delisting Goal
Coho	High	Very Low
Fall Chinook	Very High	Low
Winter Steelhead	Very Low	Very Low

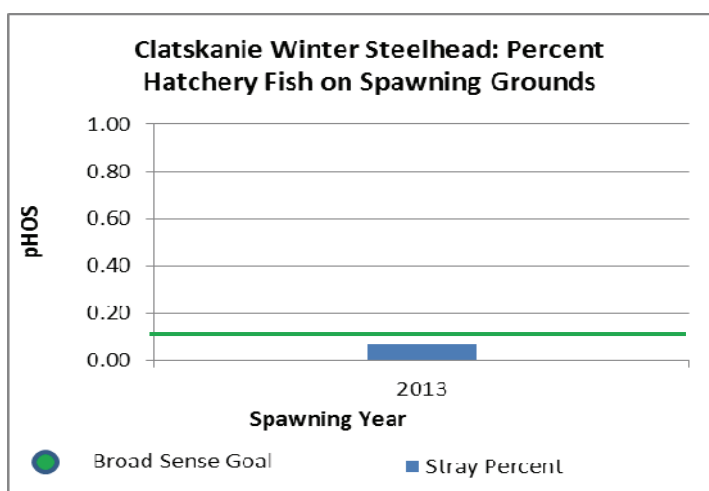
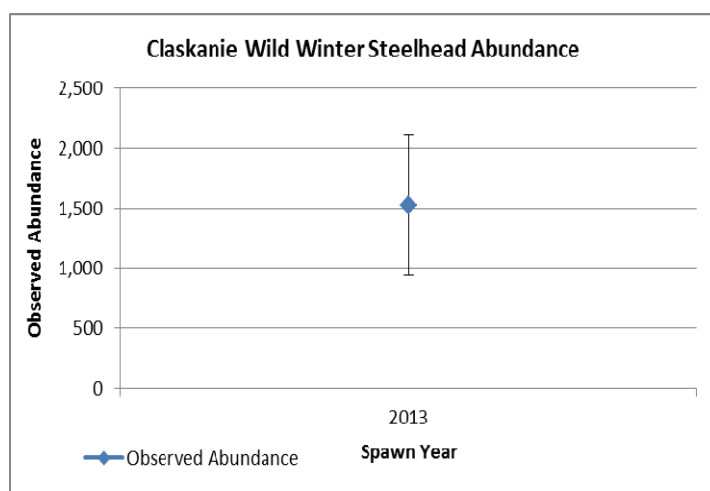


Fall Chinook Population Status Notes:

Clatskanie annual abundance estimates are determined from GRTS based spawning ground surveys, which began in 2009. Spawning locations are often in non-wadable portions of streams, which pose challenges for visual-based spawning surveys and frequently result in confidence intervals which exceed the abundance estimate.

Winter Steelhead Population Status Notes:

GRTS based redd surveys began during the 2012-2013 return year. Clatskanie winter steelhead are not part of the Lower Columbia River Steelhead DPS and are not listed under the federal ESA, therefore there is no desired delisting goal for pHOS. GRTS surveys for StW will be discontinued in 2014 to address budget constraints. GRST based VSP metrics will be unavailable for 2014.



Clatskanie yearly observed abundance estimates are obtained from GRTS redd estimates for the entire population.

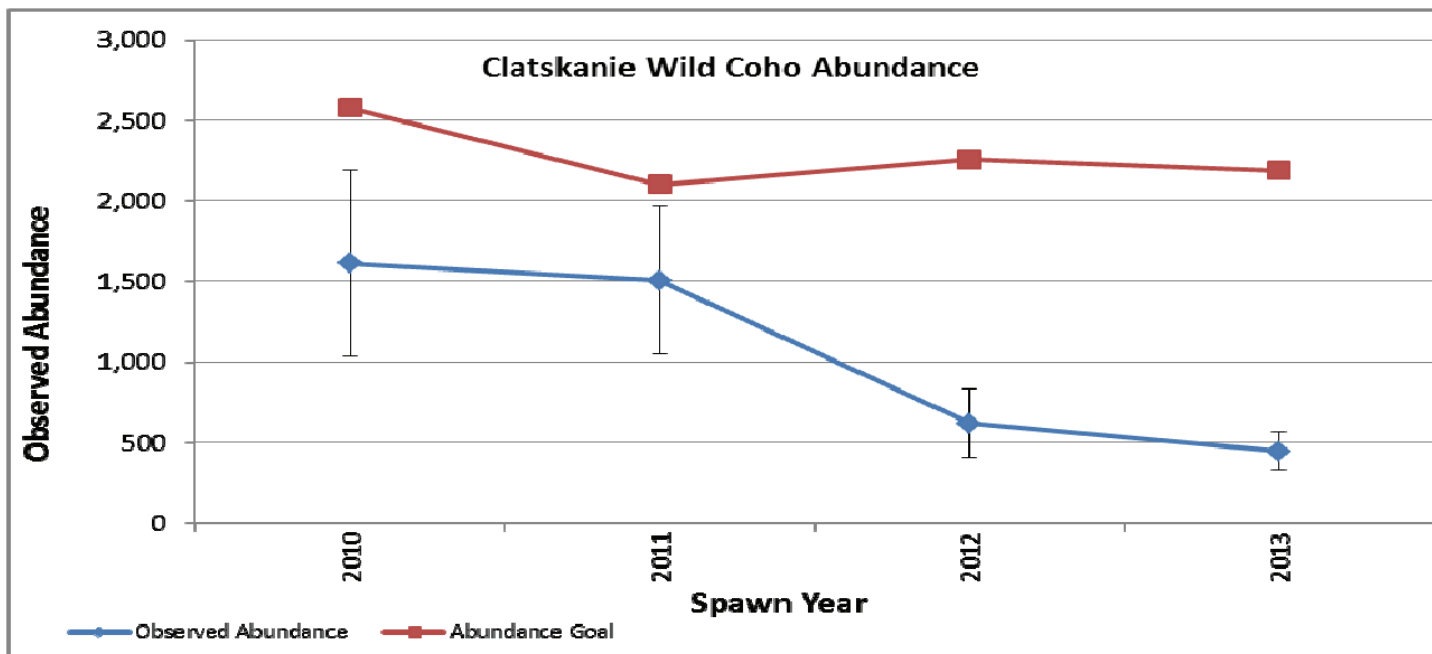
Clatskanie pHOS is a function of estimated wild abundance determined from the GRTS redd surveys divided by the estimated hatchery abundance from GRTS redd surveys.

Clatskanie Populations

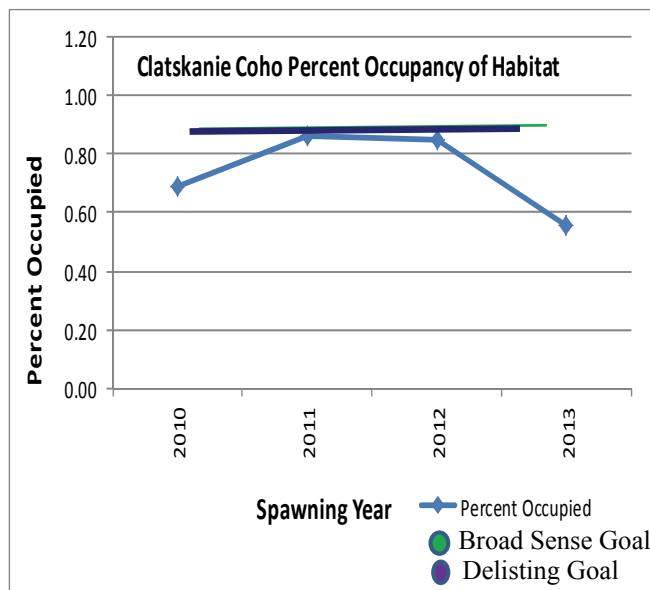
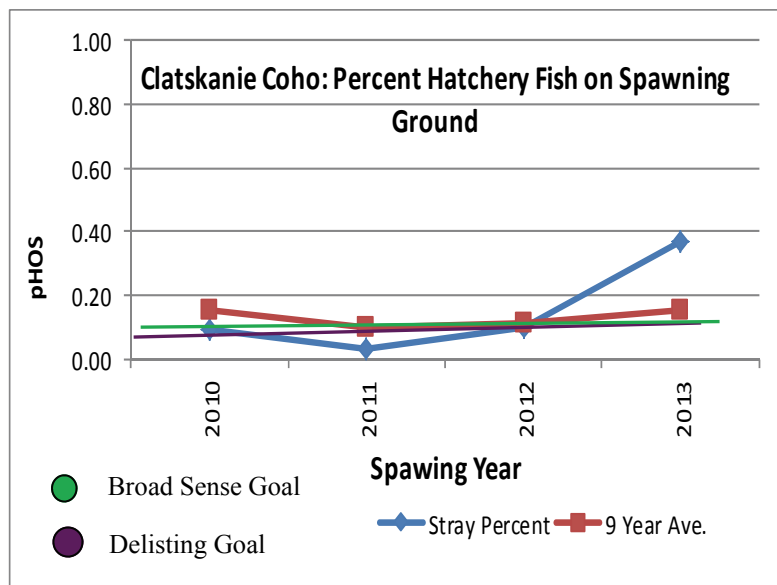
Coho Population Status



Coast Stratum



Clatskanie yearly observed abundance estimates are obtained from GRTS spawning ground estimates for the entire population.



Clatskanie pHOS is a function of estimated wild abundance determined from the GRTS spawning ground surveys divided by the estimated hatchery abundance from GRTS spawning ground surveys.

Clatskanie Populations

Table 3. Status Summary of Protection and Restoration Activities Completed

Action ID	Project	Limiting factor	Location	Species	Implementer	Action Type
138-CT, 139-CT, 145-CT	LA Swamp, 371 m2 off channel, 213 LWD, .6 mile riparian	K	Clatskanie Flood-plain	Coho, StW, ChF	LCRWC	Habitat
139-CT	Kloppman LWD, .35 mile, 40 LWD	K	Clatskanie Main-stem	Coho, StW	LCRWC	Habitat
36-Trib	Clatskanie FP Design Alternative Analysis	K	Goble Creek	Coho, StW ChF, Chum	LCRWC/LCEP	Plan
148-CT	Maintain Existing Wild Fish Sanctuary	K	Clatskanie	Coho, StW, ChF	ODFW	Hatchery
36-Trib	Batwater Station Alternatives Design	K	Clatskanie Flood-plain	Coho, StW ChF, Chum	LCEP	Plan
138-CT, 139-CT, 145-CT	Diblee Point, .25 mile riparian and LWD, Replace One culvert Improved Access to 5 Acre wetland	K	Columbia River	Coho, StW ChF, Chum	CREST	Habitat
138-CT	Kerry Island Land Acquisition, 109 Acres	K	Westport Slough	Coho, StW ChF, Chum	CLT	Habitat
139-CT	Tide Creek LWD, 1 mile	K	Tide Creek	Coho, StW	ODFW	Habitat

*See table 7.3 of the plan to link the action ID to the plan action.

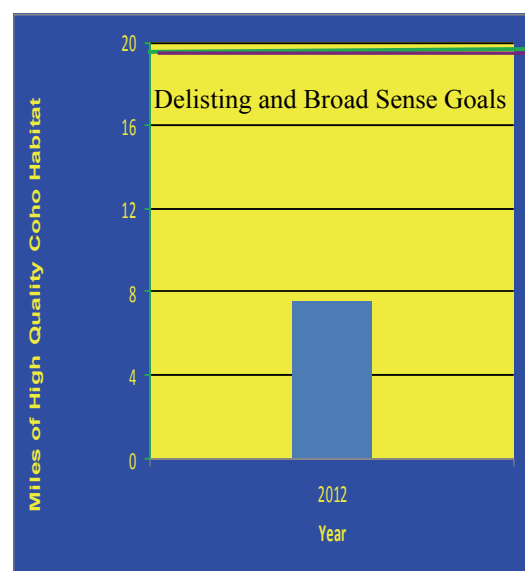
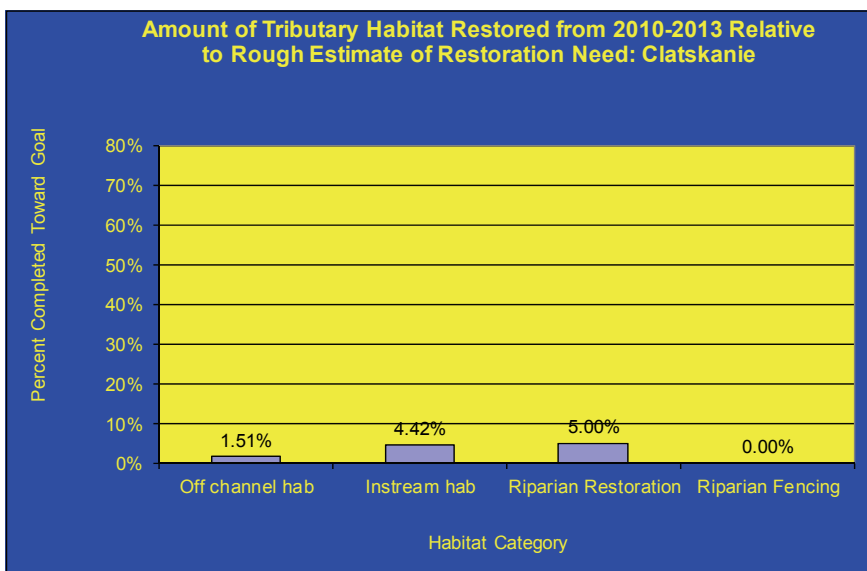
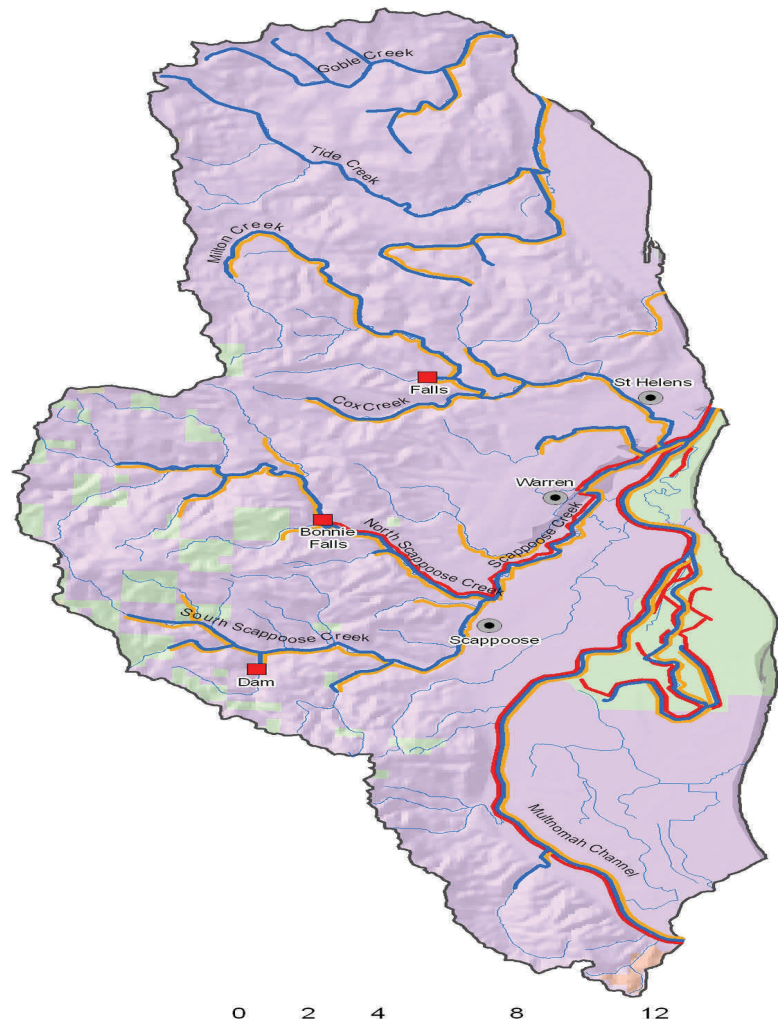


Figure 9. Habitat Restoration Completed 2010-2013 Compared to Plan Restoration Quantities

Figure 10. Miles of High Quality Coho Habitat

- Habitat restoration quantities for the Clatskanie population are found on page 338 of the plan.
- Achievement of all habitat restoration quantities is planned for 15 years (2010-2025).
- Completion of approx. 6%/year in each category would hit targets in 15 years.
- See page 15 of this report for details regarding restoration action quantities, off-channel habitat explanation and miles of high quality coho habitat needs.

Scappoose Populations



Coast Stratum



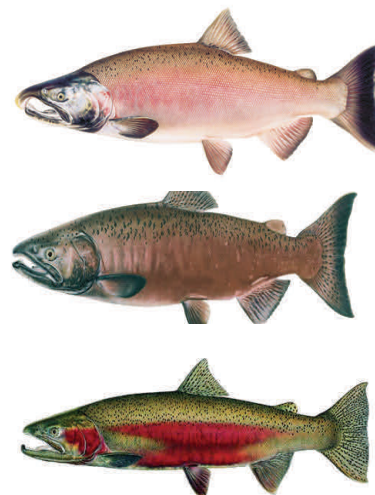
Sturgeon Lake, Oregon
Photo: Wikipedia-lumachrome

Key Limiting Factors Affecting Scappoose Coho, Fall Chinook and Winter Steelhead

Threat Category	Key Limiting Factor and Code		Coho	Fall Chinook	Winter Steelhead
Tributary Habitat	5c	Altered hydrograph/water quantity from upslope land use.		X	
	6e	Reduced physical habitat quality/habitat access due to past and/or current land use practices.	X	X	X
Estuary Habitat	3a	Altered food web, reduced macrodetrital input due to Columbia Basin hydropower reservoirs, revetments and disposal of dredge materials.	X	X	X
	3b	Altered food web, increased microdetrital input due to Columbia Basin hydropower reservoirs.	X	X	X
	5b	Altered hydrograph/water quantity due to Columbia Basin hydropower dams.	X	X	X
	6c	Impaired physical habitat quality due to Columbia Basin hydropower dams.	X	X	X
Harvest	7a	Loss of population traits due to consumptive, target fisheries.	X	X	
Hatchery	7c	Loss of population traits, stray hatchery fish interbreeding with wild fish.		X	

Scappoose Populations

	2010 Plan Assess- Extinction Risk	Desired Delisting Goal
Coho	Moderate	Very Low
Fall Chinook	High	Low
Winter Steelhead	Very Low	Very Low

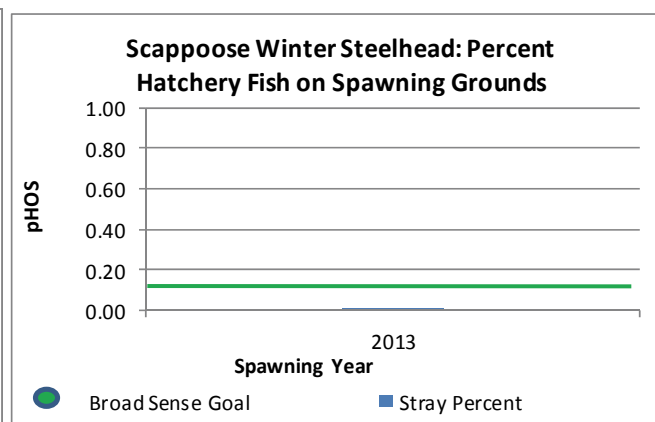
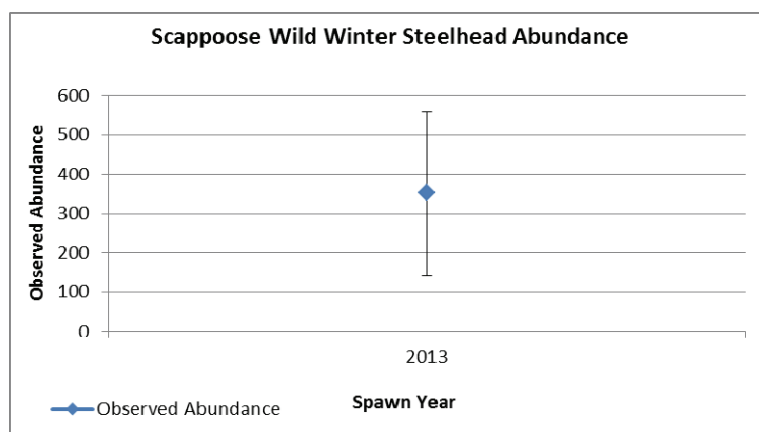


Fall Chinook Population Status Notes:

Scappoose annual abundance estimates are determined from GRTS based spawning ground surveys, which began in 2009. Spawning locations are often in non-wadable portions of streams, which pose challenges for visual-based spawning surveys and frequently result in confidence intervals which exceed the abundance estimate.

Winter Steelhead Population Status Notes:

GRTS based redd surveys began during the 2012-2013 return year. Scappoose winter steelhead are not part of the Lower Columbia River Steelhead DPS and are not listed under the federal ESA, therefore there is no desired delisting goal for pHOS. GRTS surveys for StW will be discontinued in 2014 to address budget constraints. GRST based VSP metrics will be unavailable for 2014.

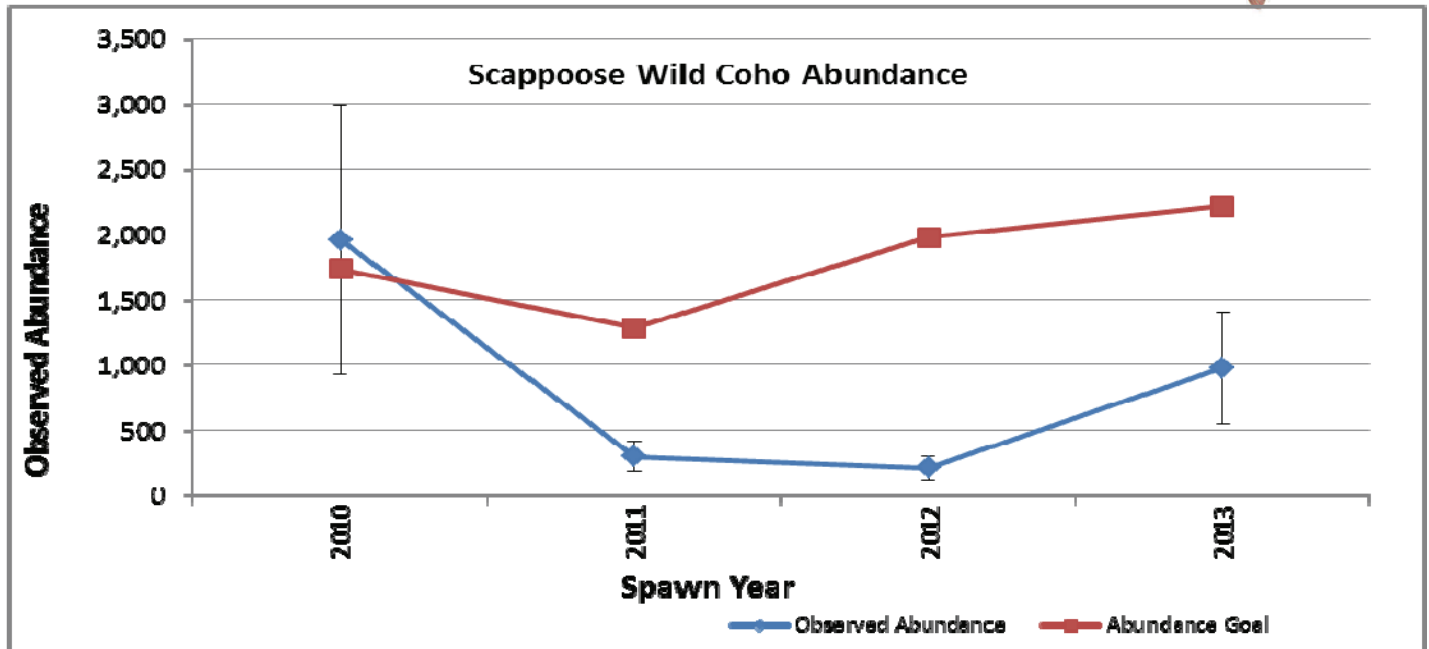


Scappoose yearly observed abundance estimates are a combination of GRTS redd estimates, which do not include area above Bonnie Falls, and the number of unmarked adult fish passed above the falls.

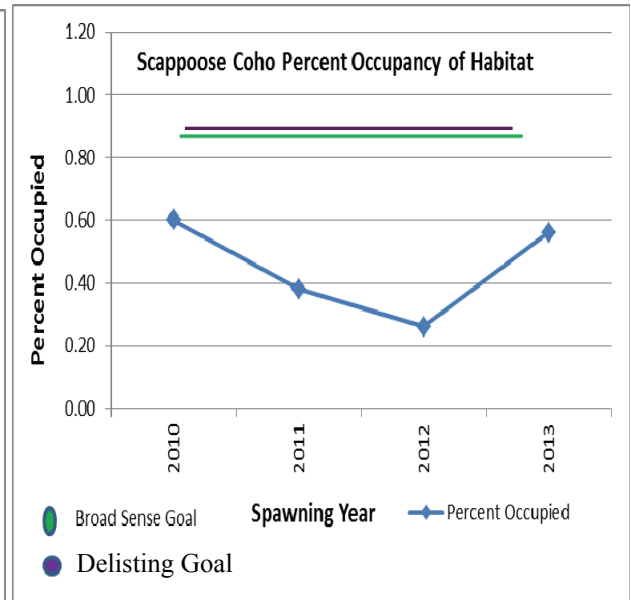
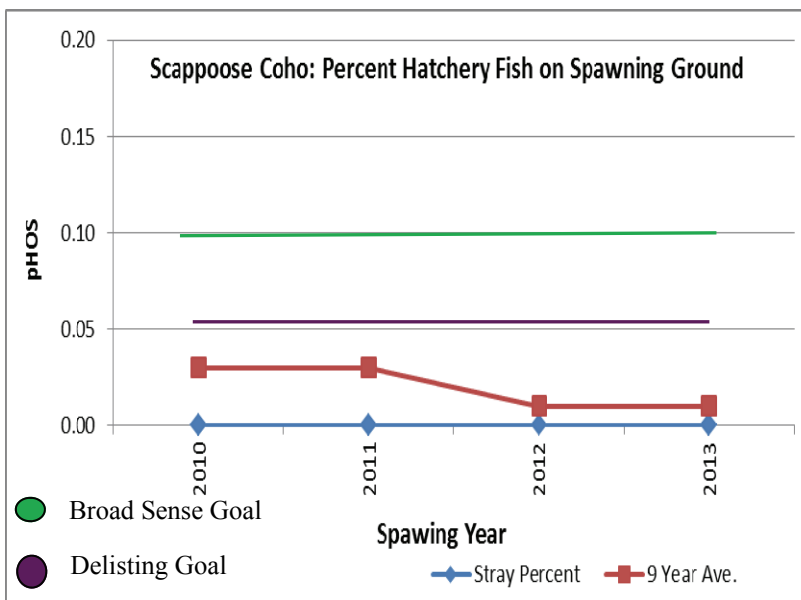
Scappoose pHOS is a function of estimated wild abundance determined from the GRTS redd surveys plus the number of wild fish passed above Bonnie Falls and divided by the estimated hatchery abundance from GRTS redd surveys. The random GRTS redd surveys do not occur above Bonnie Falls, where it is presumed to be 100% wild fish spawners. The area above the falls contains 15% of available spawning miles in the Scappoose population.

Scappoose Populations

Coho Population Status



Scappoose yearly observed abundance estimates are a combination of GRTS spawning ground estimates, which do not include area above Bonnie Falls, and the number of unmarked adult fish passed above the falls.



Scappoose p_{HOS} is a function of estimated wild abundance determined from the GRTS spawning ground surveys plus the number of wild fish passed above Bonnie Falls and divided by the estimated hatchery abundance from GRTS spawning ground surveys. The random GRTS spawning surveys do not occur above Bonnie Falls, where it is presumed to be 100% wild fish spawners. The area above the falls contains 15% of available spawning miles in the Scappoose population.

Scappoose Populations

Table 4. Status Summary of Protection and Restoration Activities Completed

Action ID	Project	Limiting Factor	Location	Species	Implementer
150-SC, 153-SC, 163-SC	North Unit Sauvie Island Phase 1 Water Control Structure Removal and Marsh Plain Lowering, 10 Acre, 1.5 mile Riparian	K	Sauvie Island	Coho, StW, ChF	CREST
153-SC	Haderly Riparian Treatment, .09 mile Riparian	K	NFk. Scappoose	Coho, StW	SBWC
168-SC	Maintain Wild Fish Sanctuary	K	Scappoose Basin	Coho, StW, ChF	ODFW
153-SC	Milton Creek Riparian, .17 mile	K	Milton Creek	Coho, StW	SBWC
155-SC	Lizzie Creek LWD, 1 mile	K	Lizzie Creek	Coho, StW	ODFW

*See table 7.3 of the plan to link the action ID to the plan action.

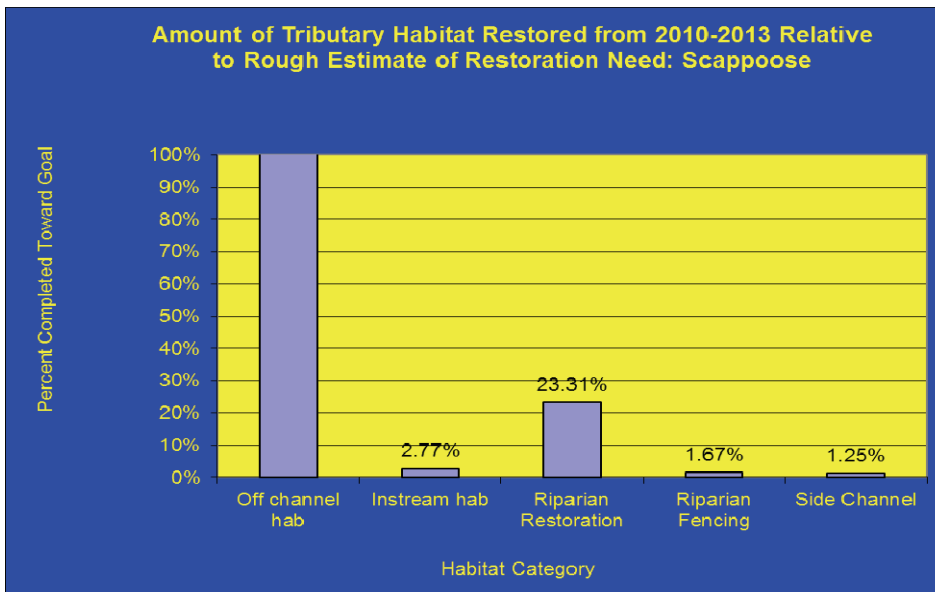


Figure 11. Habitat Restoration Completed 2010-2013 Compared to Plan Restoration Quantities

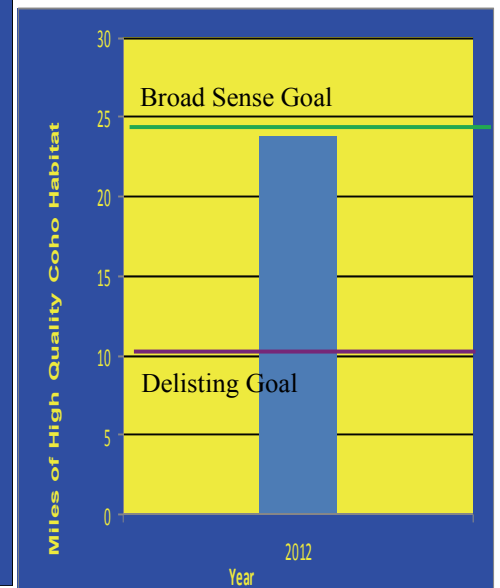
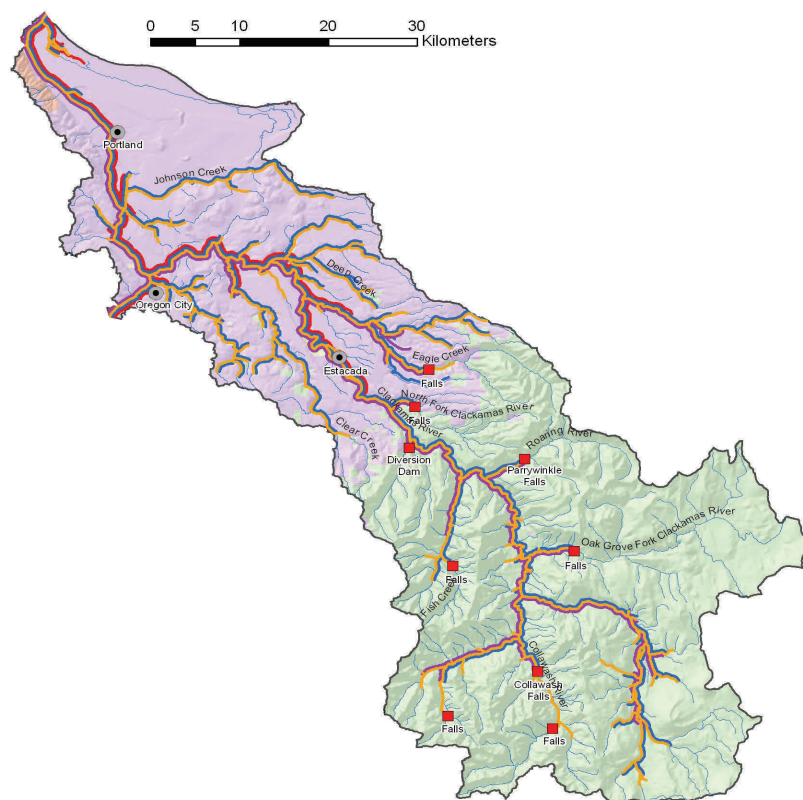


Figure 12. Miles of High Quality Coho Habitat

- Habitat restoration quantities for the Scappoose population are found on page 338 of the plan.
- Achievement of all habitat restoration quantities is planned for 15 years (2010-2025).
- Completion of approx. 6%/year in each category would hit targets in 15 years.
- The delisting goal for additional miles of high quality coho habitat is met.
- See page 15 of this report for details regarding restoration action quantities, off-channel habitat explanation and miles of high quality coho habitat needs.

Clackamas Populations



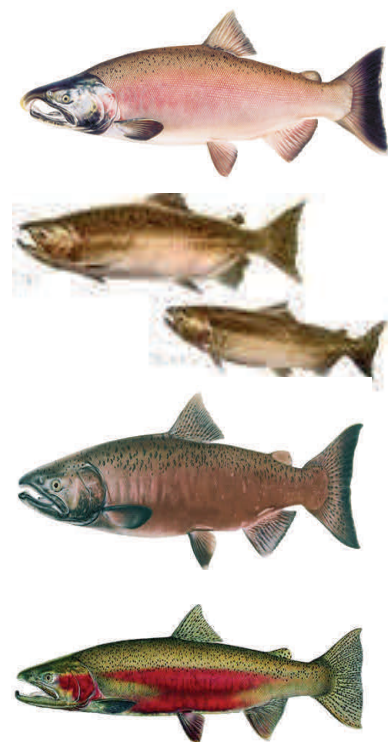
Fishermen's Bend, Clackamas River
Photo: ODFW

Key Limiting Factors Affecting Clackamas Coho, Spring and Fall Chinook and Winter Steelhead

Threat Category	Key Limiting Factor and Code		Coho	Spring Chinook	Fall Chinook	Winter Steelhead
Tributary Habitat	5c	Altered hydrograph/water quantity from upslope land use.				
	6e	Reduced physical habitat quality/habitat access due to past and/or current land use practices.	X	X	X	X
Estuary Habitat	3a	Altered food web, reduced macrodetrital input due to Columbia Basin hydropower reservoirs, revetments and disposal of dredge materials.	X	X	X	X
	3b	Altered food web, increased microdetrital input due to Columbia Basin hydropower reservoirs.	X	X	X	X
	5b	Altered hydrograph/water quantity due to Columbia Basin hydropower dams.	X	X	X	X
	6c	Impaired physical habitat quality due to Columbia Basin hydropower dams.	X	X	X	X
Harvest	7a	Loss of population traits due to consumptive, target fisheries.	X		X	
Hatchery	7c	Loss of population traits, stray hatchery fish interbreeding with wild fish.	X	X	X	
Hydro	4b	Impaired habitat access, downstream passage due to dam construction and operations.		X		

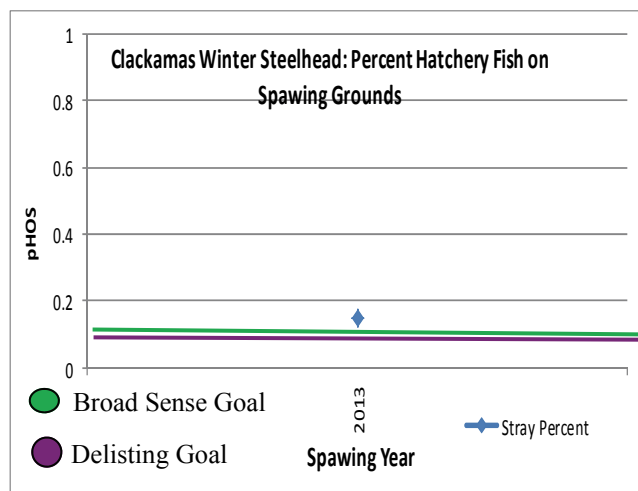
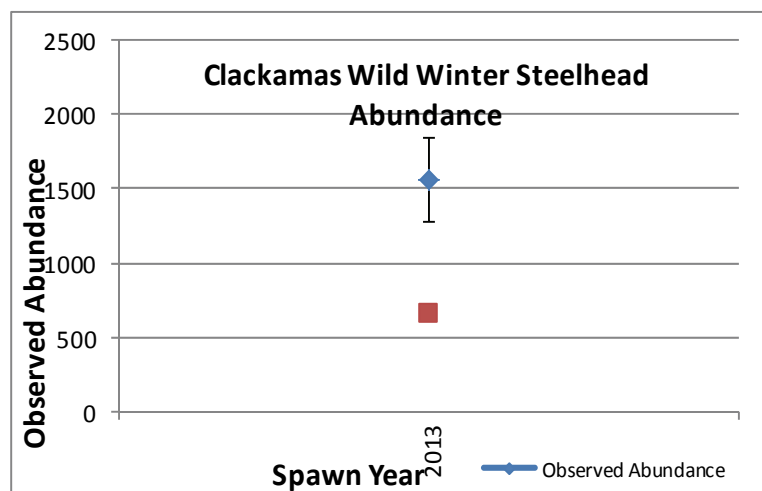
Clackamas Populations

Extinction Risk	2010 Plan Assessment	Desired Delisting Goal
Coho	Moderate	Very Low
Spring Chinook	Moderate	Very Low
Fall Chinook	Very High	Moderate
Winter Steelhead	Moderate	Low



Winter Steelhead Population Status Notes:

GRTS based redd surveys began during the 2012-2013 return year. The 2013 observed abundance is 1558 with a 95% confidence interval of 509.

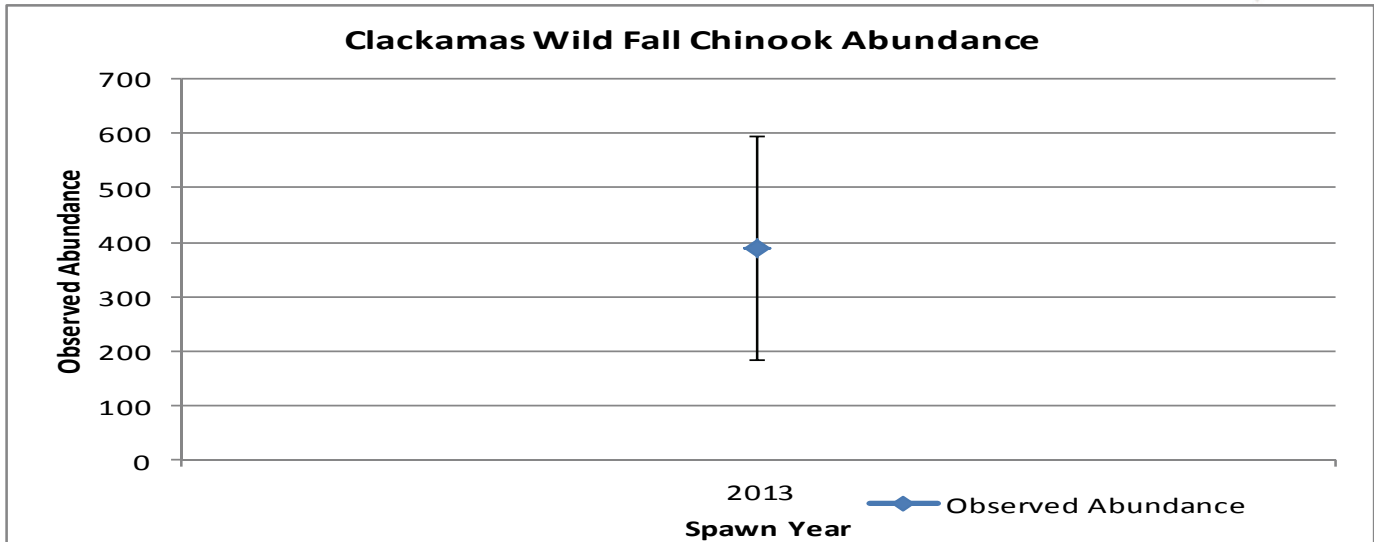


Clackamas yearly observed abundance estimates are a combination of GRTS redd surveys, which do not include area above North Fork Dam, and the number of unmarked adult fish passed above the dam.

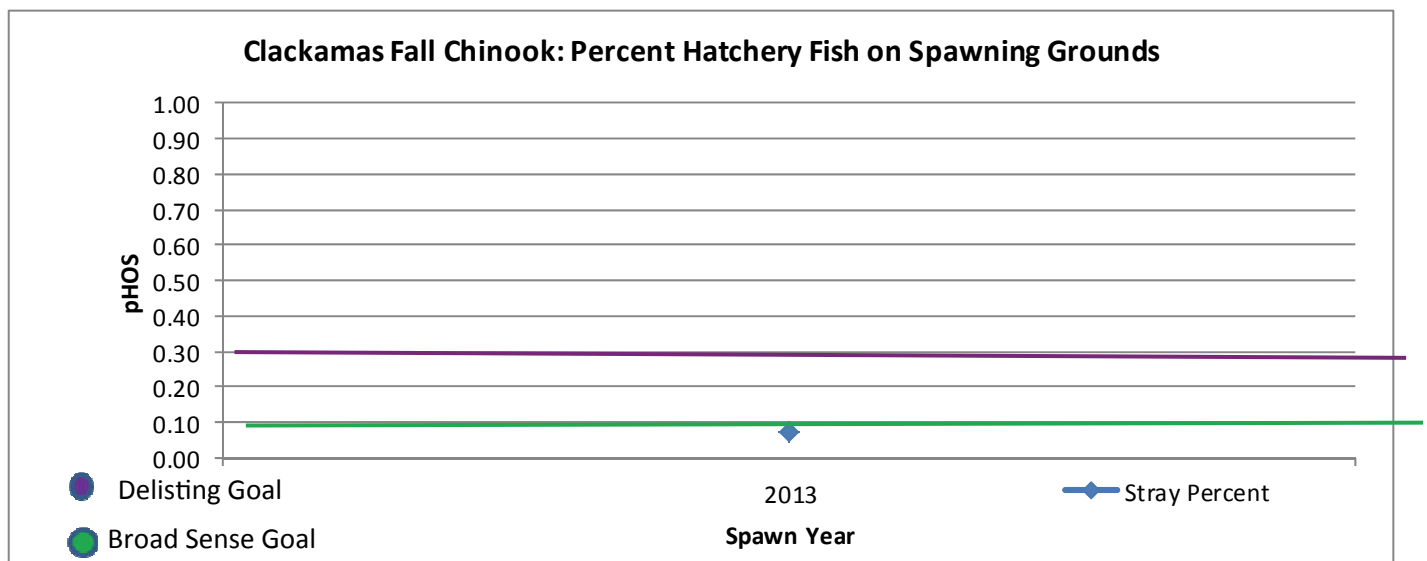
Clackamas whole basin pHOS is a function of estimated wild abundance determined from the GRTS redd surveys below NFK Dam plus the number of wild fish passed above the dam and divided by the estimated hatchery abundance from GRTS redd surveys. The random GRTS redd surveys do not occur above NFK Dam, where it is presumed to be 100% wild fish spawners. The area above the dam contains 50% of available spawning miles in the Clackamas population.

Clackamas Populations

Fall Chinook Population Status



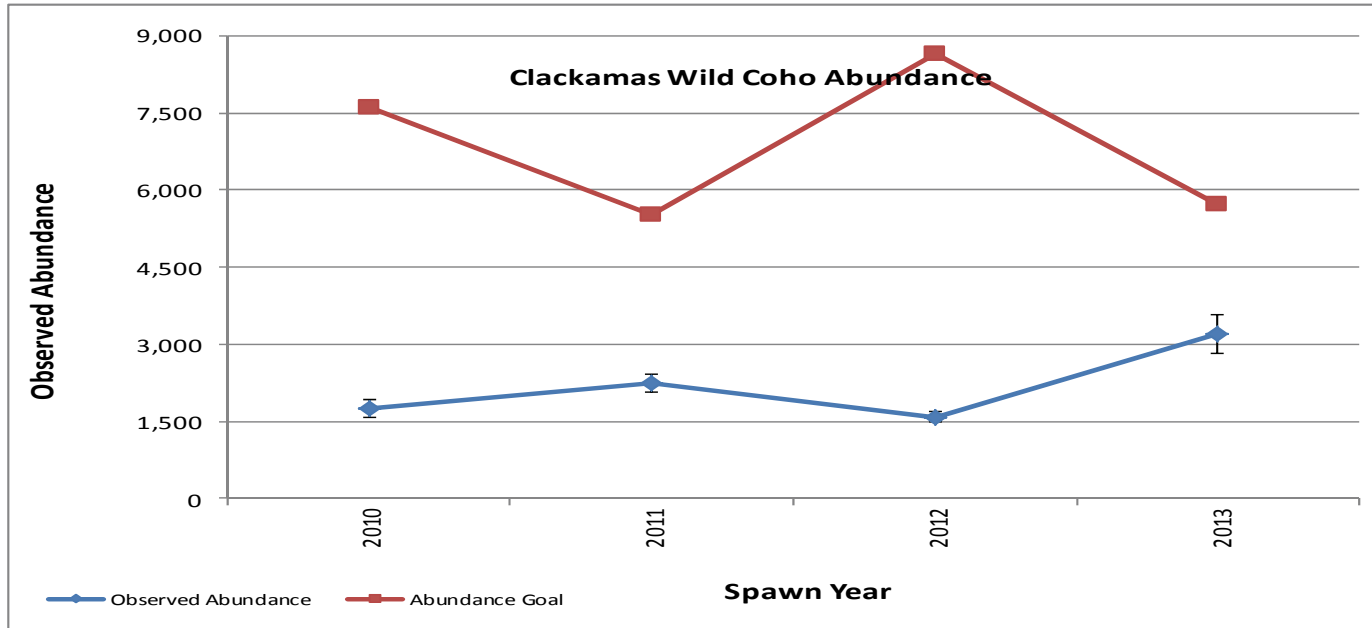
Clackamas annual abundance estimates are determined from GRTS based spawning ground surveys, which began in 2009. Spawning locations are often in non-wadable portions of streams, which pose challenges for visual-based spawning surveys and frequently result in confidence intervals which exceed the abundance estimate.



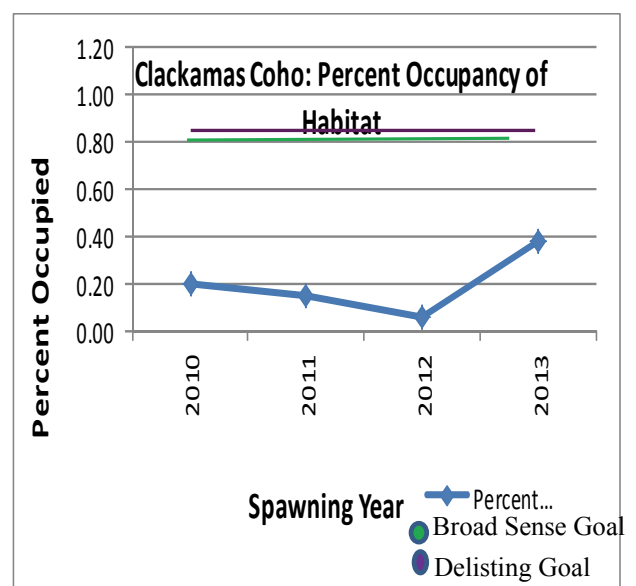
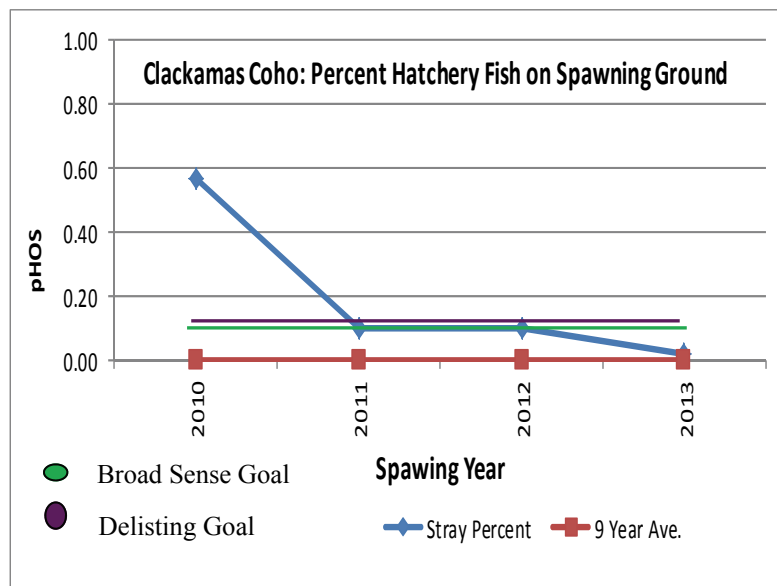
Clackamas basin pHOS is a function of estimated wild abundance determined from the GRTS spawning ground surveys divided by the estimated hatchery abundance from GRTS spawning ground surveys. The random GRTS spawning surveys do not occur above NFK Dam.

Clackamas Populations

Coho Population Status



Clackamas yearly observed abundance estimates are a combination of GRTS spawning ground estimates, which do not include area above North Fork Dam, and the number of unmarked adult fish passed above the dam.



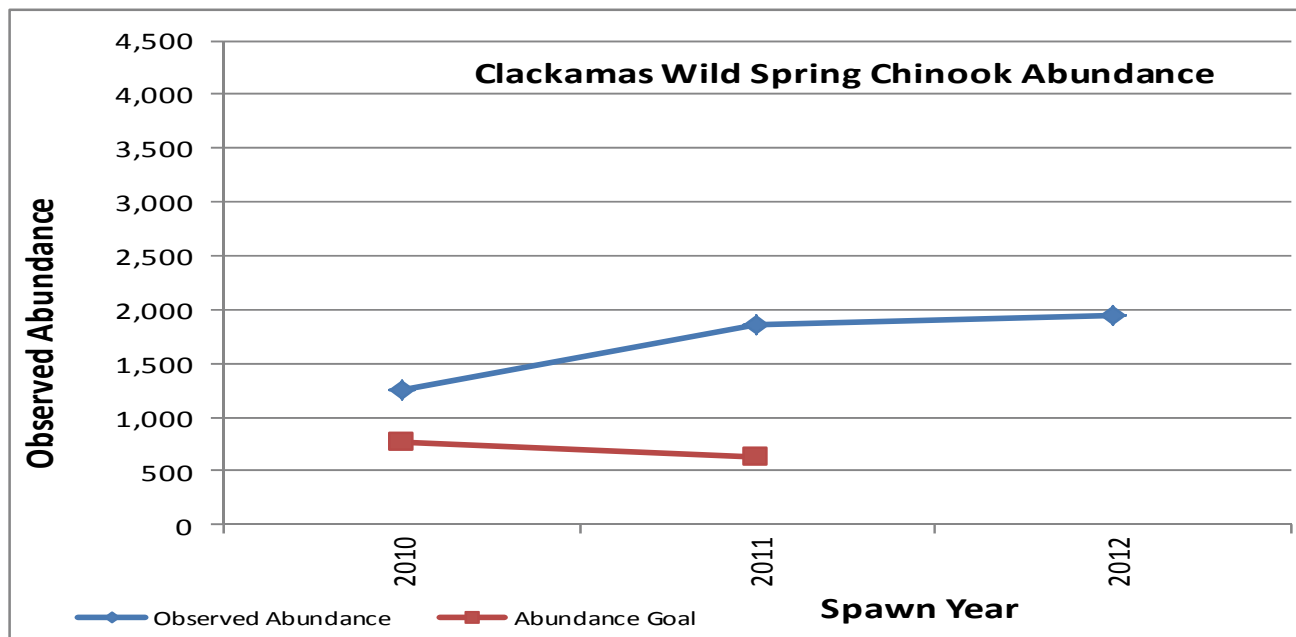
Clackamas whole basin pHOS (blue line) is a function of estimated wild abundance determined from the GRTS spawning ground surveys below NFK Dam plus the number of wild fish passed above the dam and divided by the estimated hatchery abundance from GRTS spawning ground surveys. The random GRTS spawning surveys do not occur above NFK Dam, where it is presumed to be 100% wild fish spawners. The area above the dam contains 50% of available spawning miles in the Clackamas population.

The Clackamas Coho 9 year average pHOS is for above NFK Dam only.

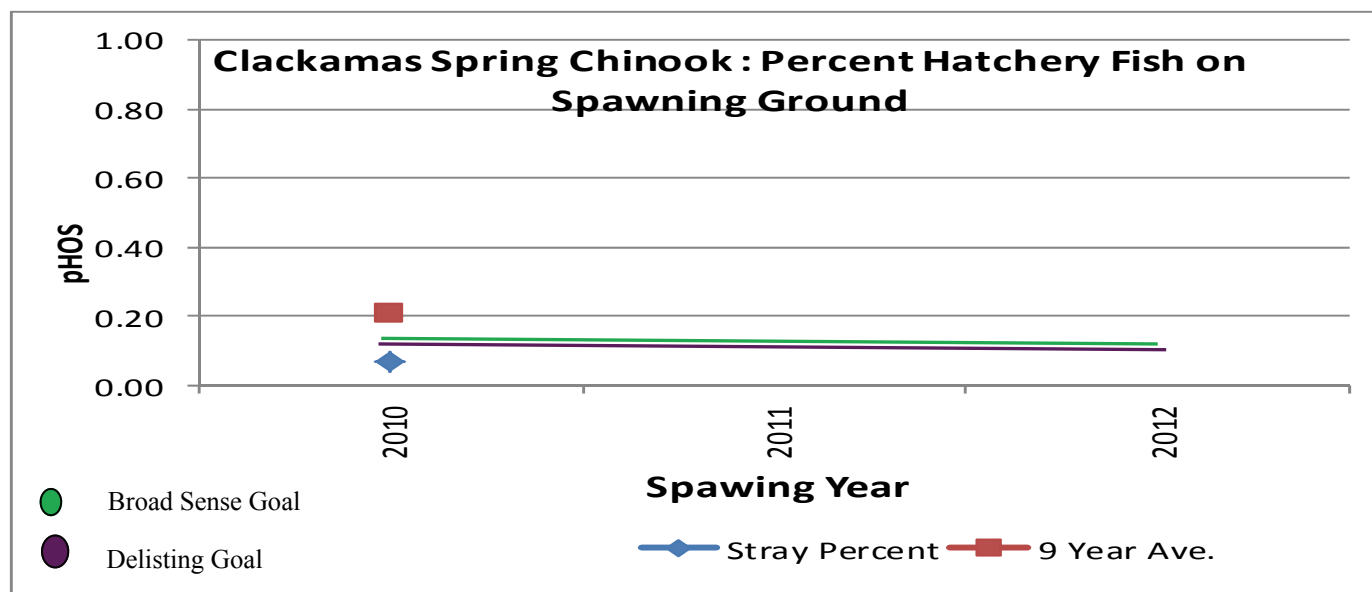


Clackamas Populations

Spring Chinook Population Status



Clackamas yearly observed abundance estimates are a count of natural origin fish passed at NFK Dam.



Clackamas pHOS is determined from carcass recoveries recovered above NFK Dam. Only non-fin clipped fish are allowed to pass the dam. Approximately 4% of the hatchery releases are not fin marked to assist with monitoring impacts of selective fisheries on wild fish (these fish are double-index tagged).

Clackamas Populations

Table 5. Status Summary of Protection and Restoration Activities Completed

Action ID	Project	Limiting Factor (key=k, secondary=s, none=n)	Location	Species	Implementer	Action Type
206-CM	Pesticide Reduction Campaign	S	Basin Wide	Coho, ChS, ChF, StW	CRBC	Habitat
24-Trib	Stash the Trash\Down by the River Clean-Up	S	Basin Wide	Coho, ChS, ChF, StW	CRBC	Habitat
24-Trib	Tour de Clack	S	Basin Wide	Coho, ChS, ChF, StW	CRBC	Habitat
24-Trib	Teacher Workshop	S	Basin Wide	Coho, ChS, ChF, StW	CRBC	Habitat
24-Trib	Celebrating Water Earth Day	S	Basin wide	Coho, ChS, ChF, StW	CRBC	Habitat
191-CM	Fish Passage and Protection Plan Measures are on Schedule	K	Clack R. Hydro Project	Coho, ChS, ChF, StW	PGE	Hydro
189-CM	EMSWCD Stream Care Program, .24 mile Riparian	K	Johnson Creek	Coho, StW	EMSWCD	Habitat
210-CM	Maintain Wild Fish Sanctuary	K	N. Fk Dam	Coho, ChS, StW	ODFW/PGE	Hatchery
170-CM	Eastmorland Golf Course Culvert Replacement	K	Crystal Springs Creek	Coho, StW	BES	Habitat
170-CM	SE Tacoma St Culvert Replacement	K	Crystal Springs Creek	Coho, StW	USACOE	Habitat
9-Trib, 183-CM	Multnomah Arts Center Stormwater, 3 Bioswales	S	Tryon Creek	NA	BES	Habitat
189-CM	Quail Creek Riparian Revegetation, .7 acre .03 mile	K	Quail Creek	NA	TCWC	Habitat
189-CM	Meadowview HOA Riparian Reveg. .05 mile riparian	K	Park Creek	NA	TCWC	Habitat
189-CM	Cedar Way Riparian Reveg.	K	Unnamed Trib to Mt. Scott	NA	NCUWC	Habitat
189-CM	Row Middle School Riparian Reveg. .01 mile riparian	K	Kellogg Creek	Coho, StW	NCUWC	Habitat
189-CM	Upper Johnson CreekCare, 1 mile riparian	K	Johnson Creek and tribs, 16 properties	Coho, StW	JCWC	Habitat
189-CM	Park Dr. Gresham Riparian Reveg. .44 acre, .03m mile	K	Johnson Creek	Coho, StW	JCWC	Habitat
189-CM	Johnson Creek Canyon Riparian Reveg. .25 miles	K	Johnson Creek	Coho, StW	JCWC	Habitat

Clackamas Populations

Action ID	Project	Limiting Factor (key=k, secondary=s, none=n)	Location	Species	Implementer	Action Type
189-CM	Kellogg Creek Riparian Reveg, .08 mile	K	Kellogg Creek	Coho, StW	NCUWC	Habitat
189-CM	Lower Clear Creek Riparian at Metro property, 2 miles riparian	K	Clear Creek	Coho, StW, ChS, ChF	CRBC	Habitat
207-CM	Tryon Creek Water Quality Monitoring	N	Tryon Creek	NA	TCWC	Monitoring
189-CM	OLCC Riparian Reveg, .13 mile	K	Johnson Creek	Coho, StW	JCWC	Habitat
36-Trib	Johnson Creek Reforestation Strategy	K	Johnson Creek	Coho, StW	JCWC	Plan
189-CM	Shade our Streams Program, 5.25 miles	K	Clear, Deep, Eagle	Coho, StW, ChS, ChF	CRBC	Habitat
189-CM	Johnson Creek Natural Areas Reforestation, .5 mile riparian	K	Johnson Creek-Hogan Rd	Coho, StW	Metro	Habitat
187-CM	Lower Clackamas Trolley Bridge Abutment Removal	K	Clackamas Mainstem	Coho, StW, ChS, ChF	Clackamas County	Habitat
189-CM	Rock Creek Partnership Riparian Reveg, .75 miles	K	lower Clack tribs	Coho, StW	CRBC	Habitat
189-CM	CRWP, riparian reveg, .19 miles	K	Clear, Deep	Coho, StW	CRBC	Habitat
170-CM, 178-CM, 185-CM, 187-CM, 189-CM, 197-CM, 198-CM	Crystal Springs Creek and Westmoreland Ecosystem Restoration Project Ph2, .12 mile LWD and riparian	K	Crystal Springs Creek	Coho, StW	USACOE	Habitat
185-CM, 198-CM	Johnson Creek/Tacoma Max Station, .04 mile Side Channel, .08 mile LWD	K	Johnson Creek	Coho, StW	JCWC	Habitat
189-CM	Osbourne/Fairview/Wilkes Creeks Riparian Restoration Project, .1 mile	N	Fairview Creek	NA	CSWC	Habitat
189-CM	Fairview Creek Riparian Enhancement Phase III, .28 mile	N	Fairview Creek	NA	CSWC	Habitat
198-CM	Suter Creek LWD	K	Suter Creek	NA	ODFW	Habitat
193-CM	Clackamas Hydroelectric Mitigation Fund	K	Basin Wide	Coho, StW, ChS, ChF	CRBC	Habitat
204-CM	Grey to Green Program ,Broadmoore/Catkin Marsh Wetlands 54 acre	K	Columbia Slough	NA	BES	Habitat

*See table 7.3 of the plan to link the action ID to the plan action.

Clackamas Populations



South Fork Clackamas River

Photo: finetooth

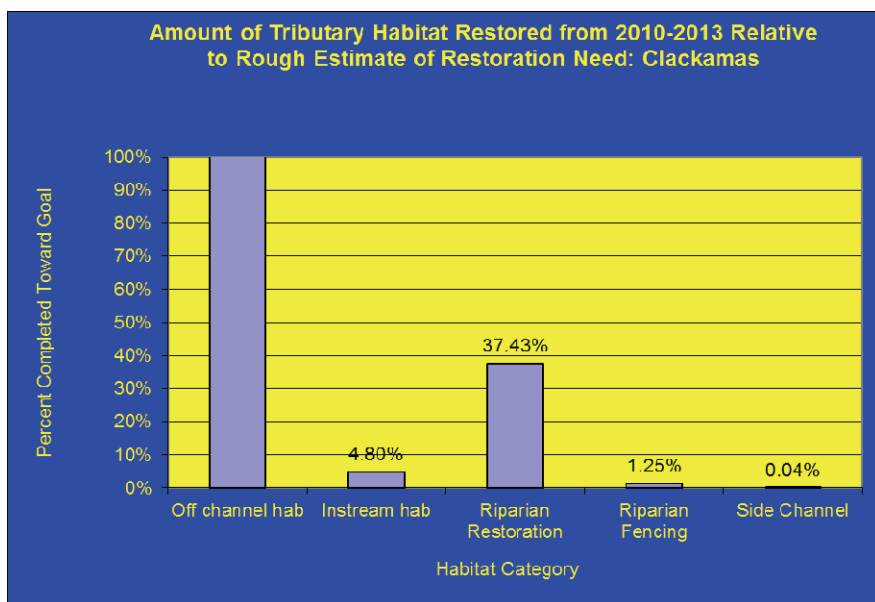


Figure 13. Habitat Restoration Completed 2010-2013 Compared to Plan Restoration Quantities

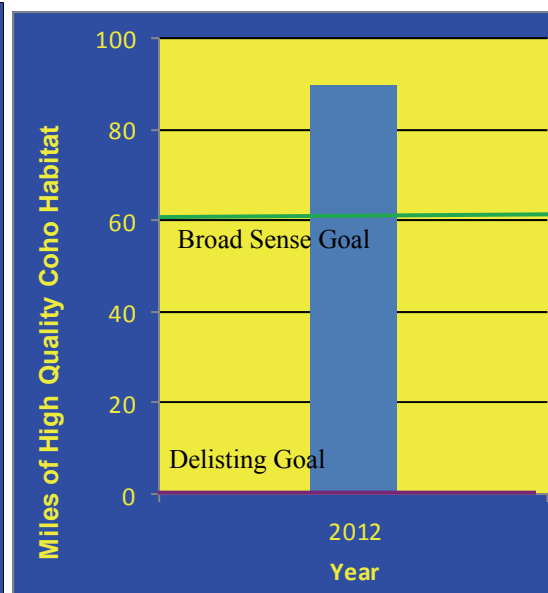
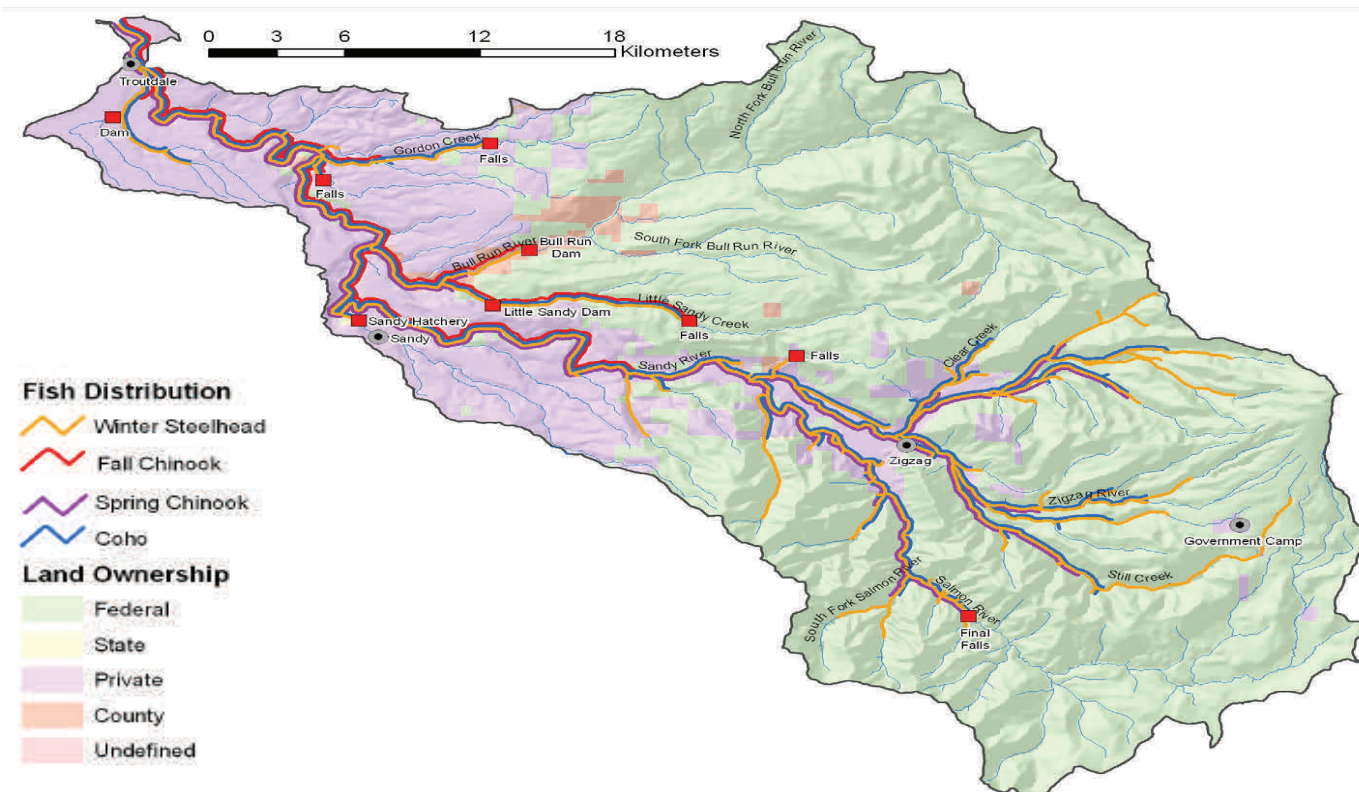


Figure 14. Additional Miles of High Quality Habitat

- Habitat restoration quantities for the Clackamas population are found on page 338 of the plan.
- Achievement of all habitat restoration quantities is planned for 15 years (2010-2025).
- Completion of approx. 6%/year in each category would hit targets in 15 years.
- The delisting and broad sense recovery goals for additional miles of high quality coho habitat are met.
- See page 15 of this report for details regarding restoration action quantities, off-channel habitat explanation* and miles of high quality coho habitat needs.

Sandy Populations



Key Limiting Factors Affecting Sandy Coho, Spring and Fall and Late Fall Chinook and Winter Steelhead

Threat Category	Key Limiting Factor and Code		Coho	Spring Chinook	Fall Chinook	Late Fall Chinook	Winter Steelhead
Tributary Habitat	5c	Altered hydrograph/water quantity from upslope land use.					
	6e	Reduced physical habitat quality/habitat access due to past and/or current land use practices.	X	X	X	X	X
Estuary Habitat	3a	Altered food web, reduced macrodetrital input due to Columbia Basin hydropower reservoirs, revetments and disposal of dredge materials.	X	X	X	X	X
	3b	Altered food web, increased microdetrital input due to Columbia Basin hydropower reservoirs.	X	X	X	X	X
	5b	Altered hydrograph/water quantity due to Columbia Basin hydropower dams.	X	X	X	X	X
	6c	Impaired physical habitat quality due to Columbia Basin hydropower dams.	X	X	X	X	X
Harvest	7a	Loss of population traits due to consumptive, target fisheries.	X		X		
Hatchery	7c	Loss of population traits, stray hatchery fish interbreeding with wild fish.		X	X	X	X

Sandy Populations

Extinction Risk	2010 Plan Assessment	Desired Delisting Goal
Coho	Very High	Low
Spring Chinook	Moderate	Low
Fall Chinook	Very High	Moderate
Late Fall Chinook	Low	Very Low
Winter Steelhead	High	Very Low



Cascade Stratum



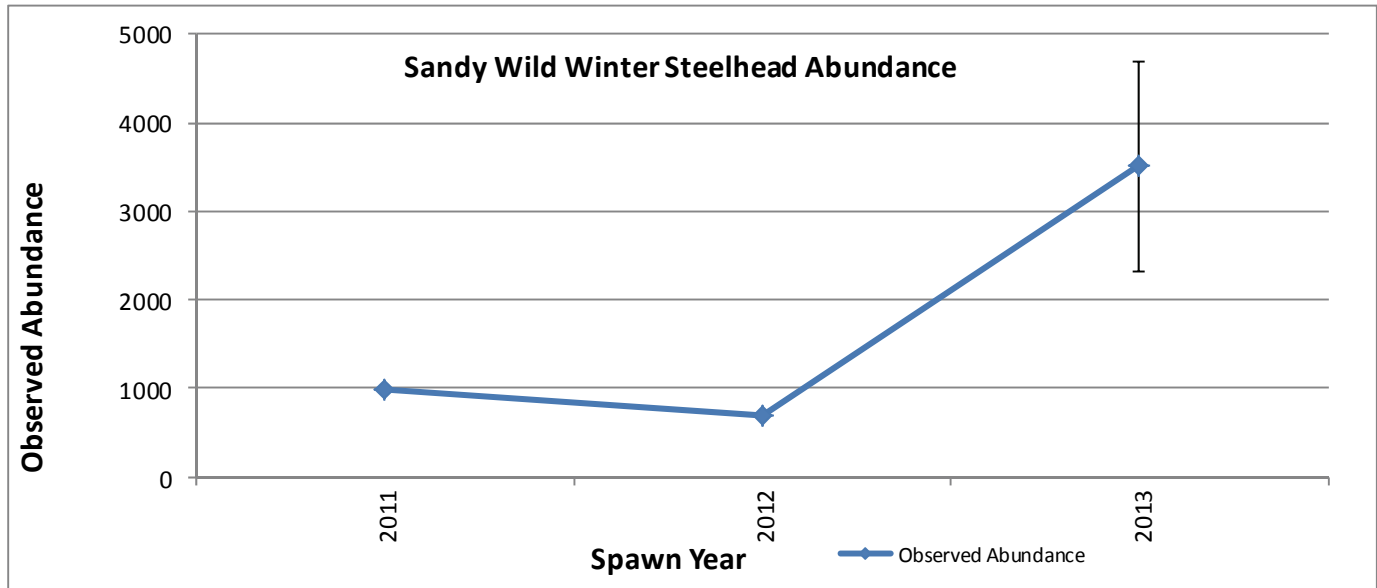
Cedar Creek at
Sandy River
Photo: ODFW

Sandy Populations

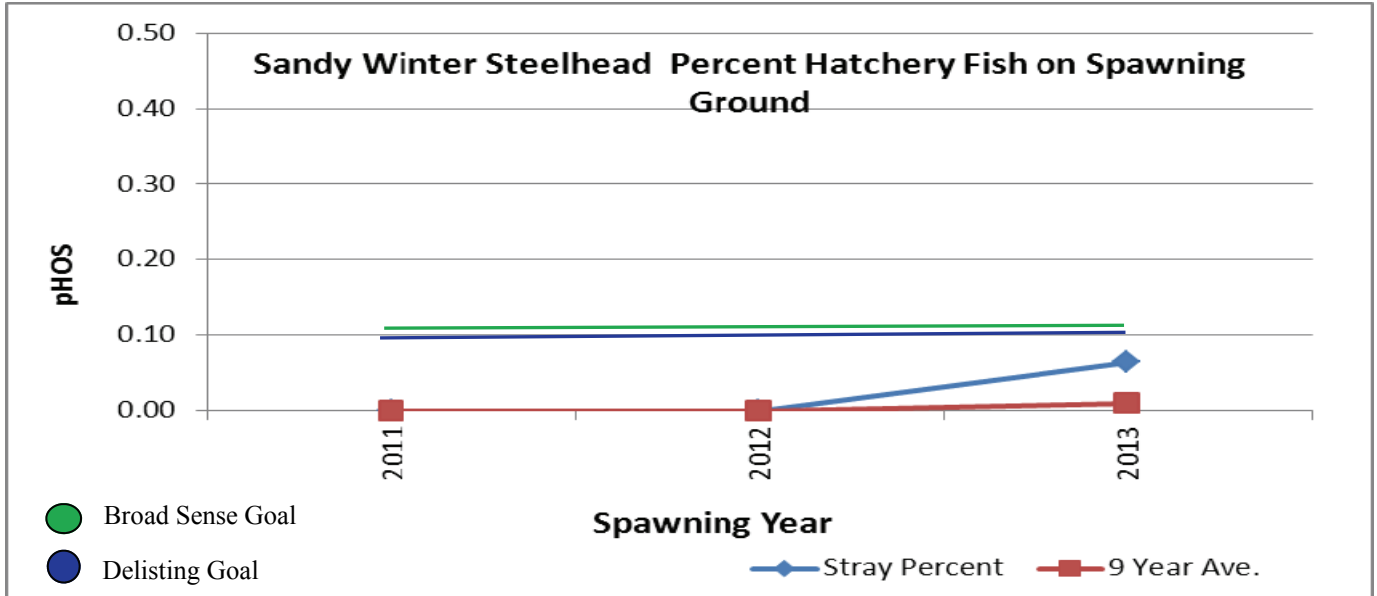
Winter Steelhead Population Status



Cascade Stratum



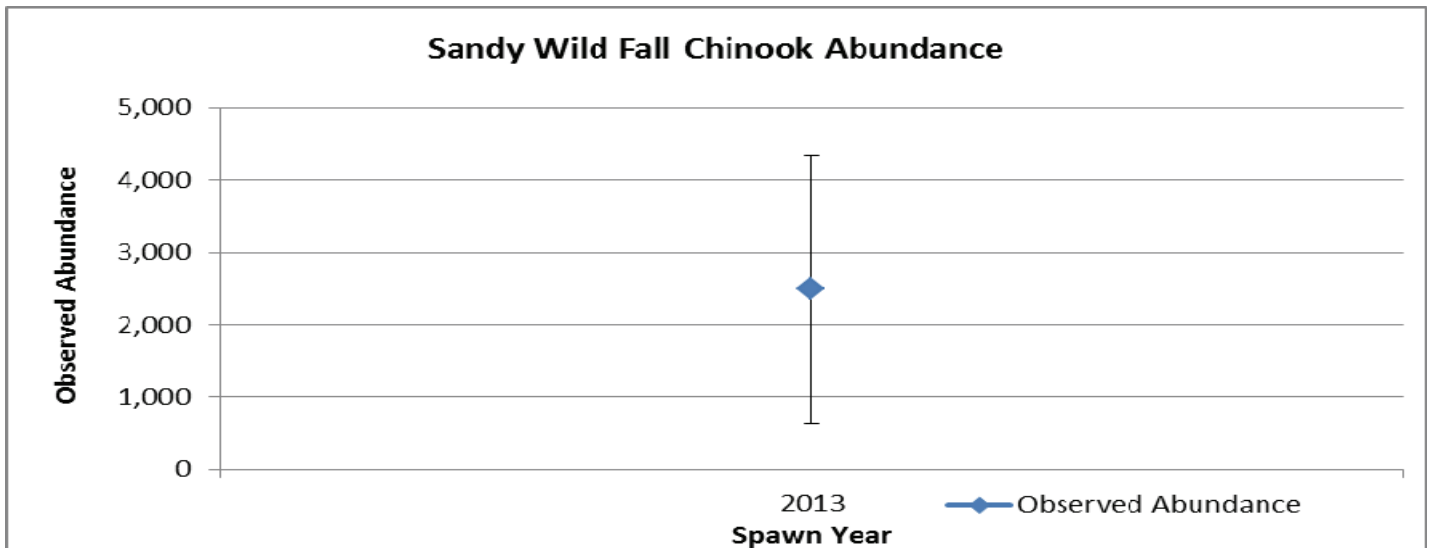
Sandy yearly observed abundance estimates are determined through GRTS redd surveys basin wide. To calculate yearly abundance goals for Sandy winter steelhead, additional years of observed abundance are needed.



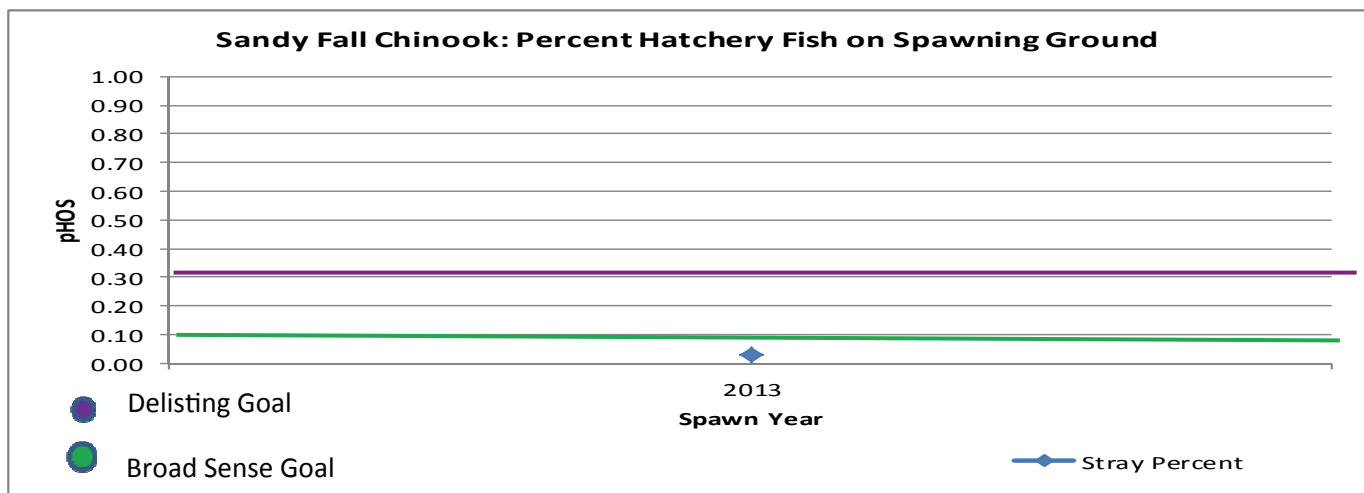
Sandy pHOS is determined from carcass recoveries during basin wide GRTS redd surveys.

Sandy Populations

Fall Chinook Population Status



Sandy annual abundance estimates are determined from GRTS based spawning ground surveys, which began in 2009. Spawning locations are often in non-wadable portions of streams, which pose challenges for visual-based spawning surveys and frequently result in confidence intervals which exceed the abundance estimate.



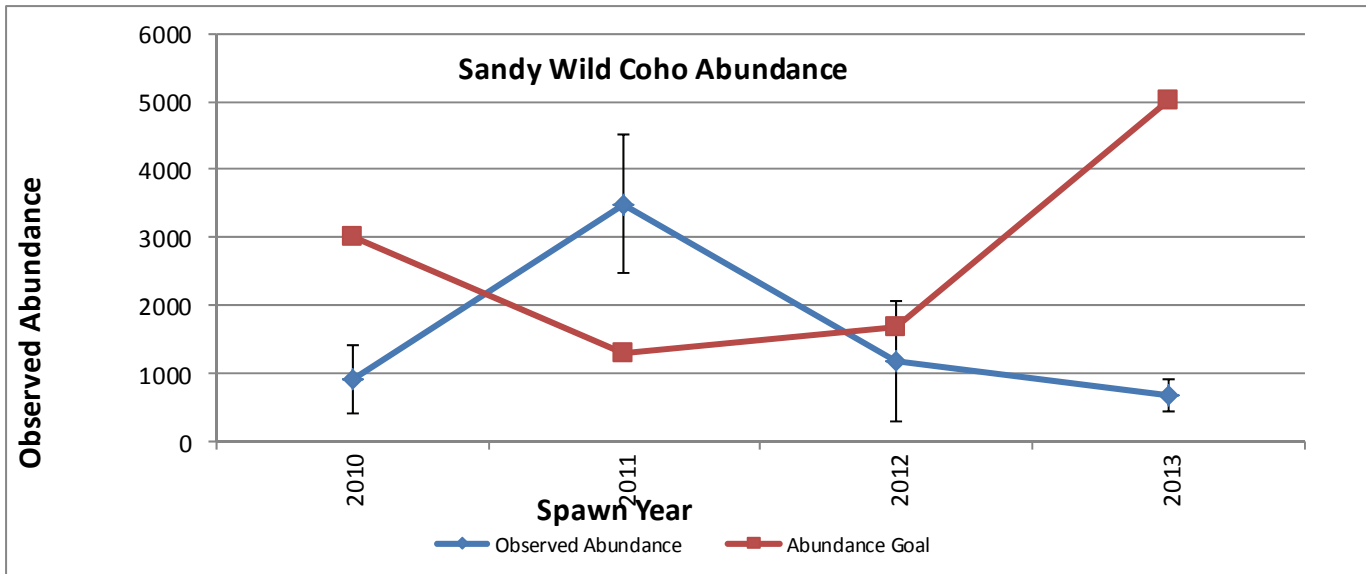
pHOS is a function of estimated wild abundance determined from the GRTS spawning ground surveys basin wide divided by the estimated hatchery abundance from GRTS spawning ground surveys.

Late Fall Chinook Population Status Notes:

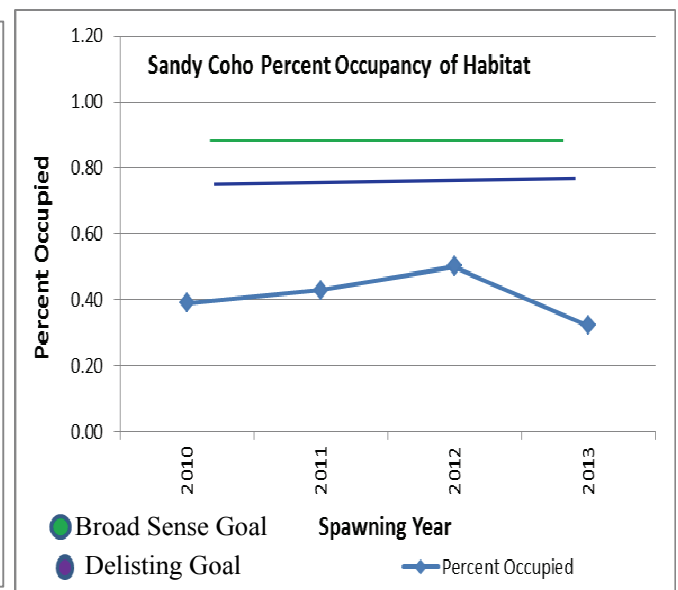
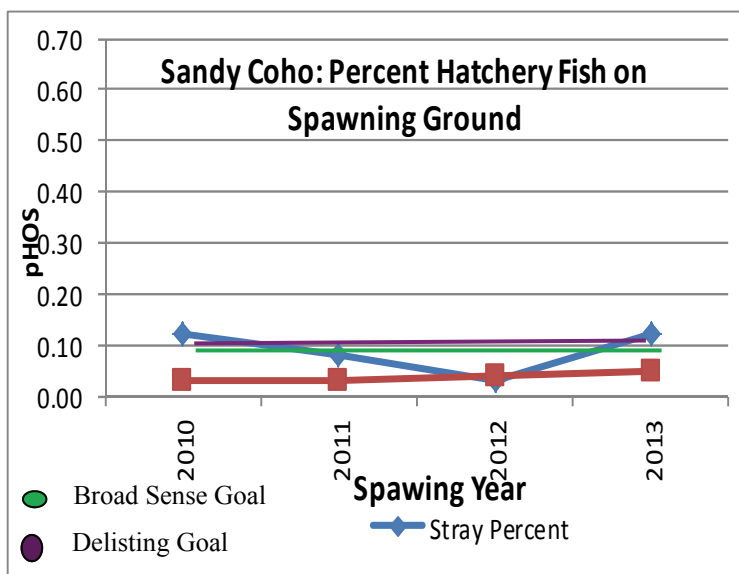
There is no current or past estimate of Sandy late fall chinook abundance which meets of the objective of a 95% confidence interval of +/- 30%.

Sandy Populations

Coho Population Status



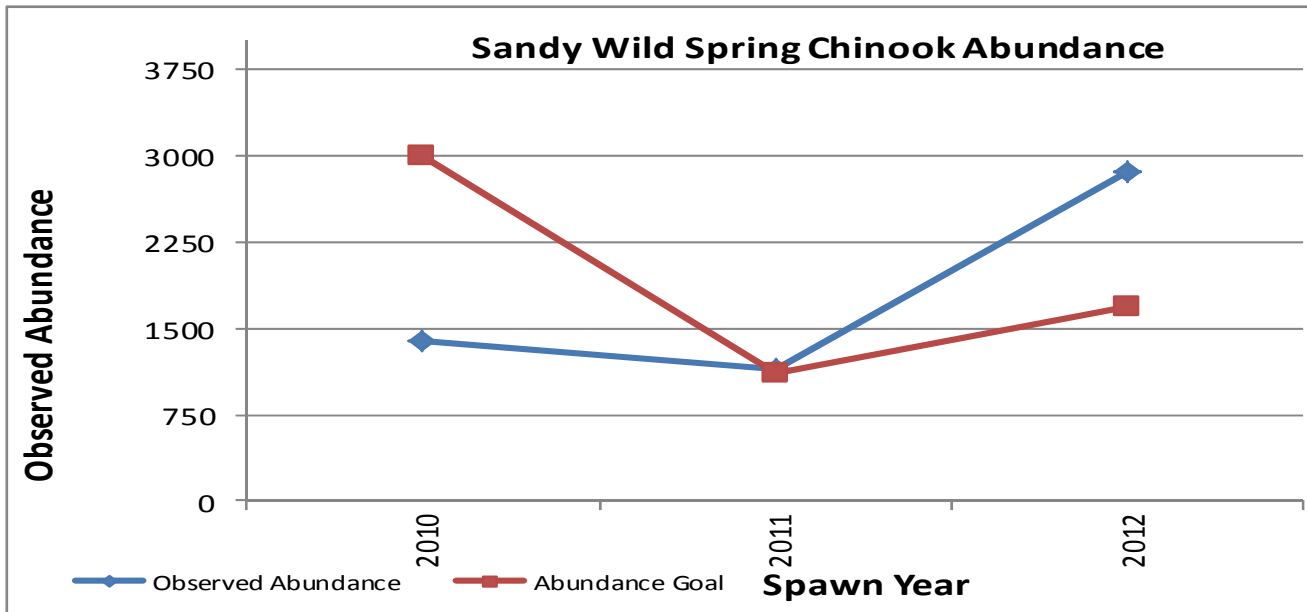
Sandy yearly observed abundance estimates are a combination of GRTS spawning ground estimates, which does not include area above the Cedar Creek Hatchery Weir plus the number of unmarked adult fish passed above the weir.



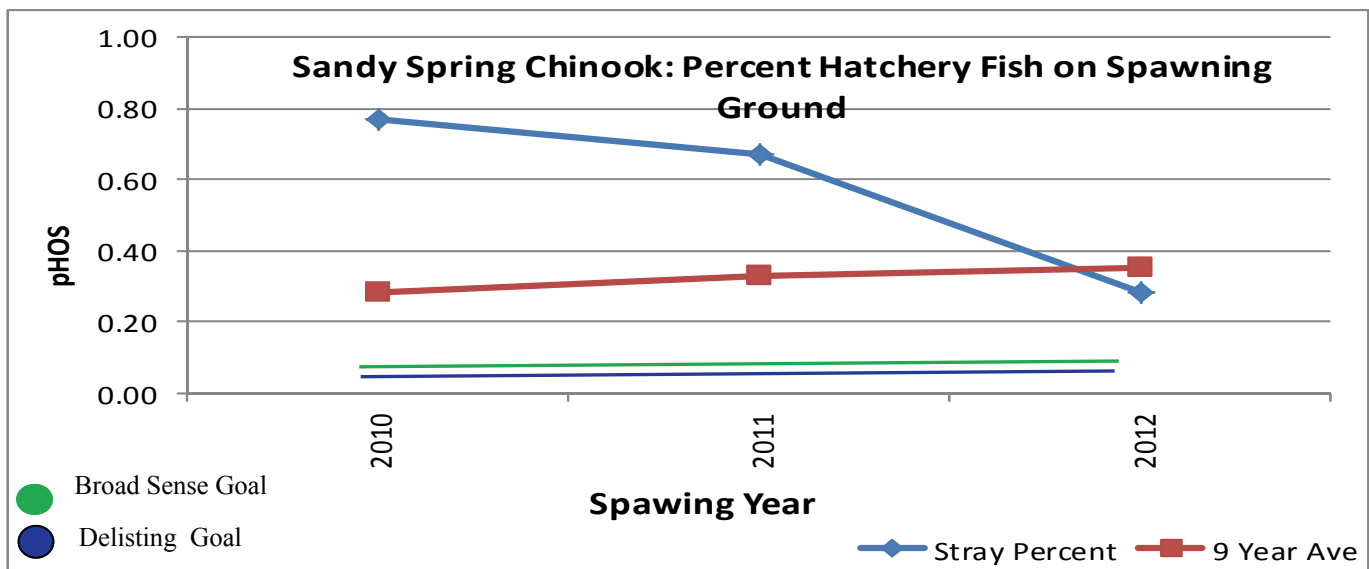
From 2010-present pHOS is a function of estimated wild abundance determined from the GRTS spawning ground surveys basin wide except above the Cedar Creek hatchery weir plus the number of wild fish passed above the weir and divided by the estimated hatchery abundance from GRTS spawning ground surveys. The random GRTS spawning surveys do not occur above the weir, where it is presumed to be 100% wild fish spawners. The area above the dam contains 2% of available spawning miles in the Sandy population.

Sandy Populations

Spring Chinook Population Status



Sandy yearly observed abundance estimates are determined by redd counts above former Marmot Dam site.



Sandy pHOS is determined by a redd count survey. Relationships between redd counts, recovered carcasses and fish passing the dam were examined between 2002-2007 and applied. Prior to 2008 only unclipped fish were allowed to pass over Marmot Dam. From 2008 to current, the past redd and carcass relationships are applied to redds observed from surveys.

Sandy Populations

Table 6. Status Summary of Protection and Restoration Activities Completed

Action ID	Project	Limiting Factor (key=k, secondary=s, none=n)	Location	Species	Implementer	Action Type
218-SY	City of Portland HCP For 2013 the City Was in Full Compliance with the Terms and Conditions of the HCP.	S	Basin Wide	Coho, StW, ChF, late ChF, ChS	PWB	Habitat
229-SY	1200 yd3 River-Gravel Placement for Spawning	S	Bull Run River	Coho, StW, ChF, late ChF, ChS	PWD	Habitat
238-SY	Acclimate 100% Hatchery Spring Chinook Release in the Sandy	K	Cedar Creek, Bull Run	ChS	ODFW	Hatchery
239-SY	Trap and Sort Hatchery Adults (Weir and Trap)	K	Salmon, Zigzag Cedar	ChS	ODFW	Hatchery
218-SY, 235-SY	City of Portland HCP-Off Site Measures, 88 Acre Easement of Riparian Area	K	Sandy Mainstem, Bull Run	ChS, Coho, StW	PWB	Habitat
218-SY, 219-SY	City of Portland HCP-Off Site Measures, Alder Creek Fish Ladder at Hwy 26	N	Alder Creek	StW	PWB	Passage
218-SY, 232-SY	City of Portland HCP-Off Site Measures, Gordon 3.15 mile (365 pcs) and Trout Creek .25 mile (55pcs) LWD	K	Gordon and Trout Creek	Coho, StW, ChF, late ChF	PWB	Habitat
219-SY, 221-SY	Sandy River Delta Dam Removal, 1.2 mile Side Channel	K	Sandy River	Coho, StW, ChF, late ChF, ChS	USACOE	Habitat
221-SY, 232-SY	Upper Sandy River Restoration, 25 LWD Structures, 1.54 mile instream, 7000' Side Channel	K	Salmon/Still	Coho, StW, ChS	TFT/USFS	Habitat
236-SY	EMSWCD Stream Care Program, 4.51 Mile riparian	K	Beaver Ck .18, Smith Creek 1.03, Big Creek 3.3	Coho, StW	EMSWCD	Habitat
236-SY	Salmon River/Still Creek Riparian Restoration, 2 miles	K	Salmon/Still	ChS, Coho, Stw	USFS	Habitat
221-SY, 232-SY	Salmon River Aquatic Habitat Restoration Project- Upper and Lower Miller Quarry, 1200' Side Channel and 4 LWD Jams	K	Salmon	ChS, Coho, Stw	TFT	Habitat
221-SY, 232-SY	Sandy River Restorative Flood Response Project, 1 design	K	Basin Wide	ChS, Coho, Stw	SRBWC	Plan
221-SY, 232-SY	Lower Sandy River Restoration Implementation - Phase I: Happy Creek Reconnection, 1825' Side channel, 225 logs, .75 mile riparian	K	Sandy River	Coho, StW, ChF, late ChF, ChS	SRBWC	Habitat
221-SY, 232-SY	Middle Sandy River Design	K	Sandy River	ChS, Coho, StW	SRBWC	Plan

*See table 7.3 of the plan to link the action ID to the plan action.

Sandy Populations

Table 6. Status Summary of Protection and Restoration Activities Completed

Action ID	Project	Limiting Factor (key=k, secondary=s, none=n)	Location	Species	Implementer	Action Type
221-SY, 232-SY	1000 Acre Design	K	Sandy River Delta	Coho, StW, ChF, late ChF, ChS	LCEP	Plan
236-SY	Oxbow Park Vegetation Restoration ph 2, 2 miles	K	Sandy River	Coho, StW, ChF, late ChF, ChS	Metro	Habitat
236-SY	Dabney to Camp Angelos Vegetation Restoration (Site 1) ph2, 2 miles	K	Sandy River	Coho, StW, ChF, late ChF, ChS	TNC/METRO	Habitat
236-SY	Lower Sandy Gorge Vegetation Rest (Site 2) ph2, 3.7 miles	K	Sandy River	Coho, StW, ChF, late ChF, ChS	TNC/METRO	Habitat
236-SY	City of Sandy/Lower Cedar (Site 3) ph2, 2.6 miles	K	Sandy River	Coho, StW, ChS	TNC/METRO	Habitat
236-SY	Sandy BLM Channel to Wildcat Creek Vegetation Restoration (Site 4), ph1, 1.9 miles	K	Sandy River	Coho, StW, ChS	BLM	Habitat
236-SY	Wilson FP Veg. Rest. Site 5 ph2, 1.1. mile	K	Sandy River	Coho, StW, ChS	TNC	Habitat
236-SY	Sandy/Salmon Confluence Veg. Rest. Site 6, ph2, .7 mile	K	Sandy River	Coho, StW, ChS	TNC/BLM	Habitat
236-SY	Salmon River Quarry Site 7 (Lower BLM Reach), ph2, .8 mile	K	Sandy River	Coho, StW, ChS	TNC/BLM	Habitat
236-SY	Arrah Wanna Camp Veg. Rest (Site 8) ph2, .6 mile	K	Sandy River	Coho, StW, ChS	TNC	Habitat
236-SY	Golf Course Channel Veg Rest Site 9, ph2, .5 mile	K	Sandy River	Coho, StW, ChS	TNC	Habitat
236-SY	USFS to Welches Veg. Rest Site 10, ph2, .3 mile	K	Sandy River	Coho, StW, ChS	BLM	Habitat



Sandy River backwater
Photo: ODFW

Sandy Populations

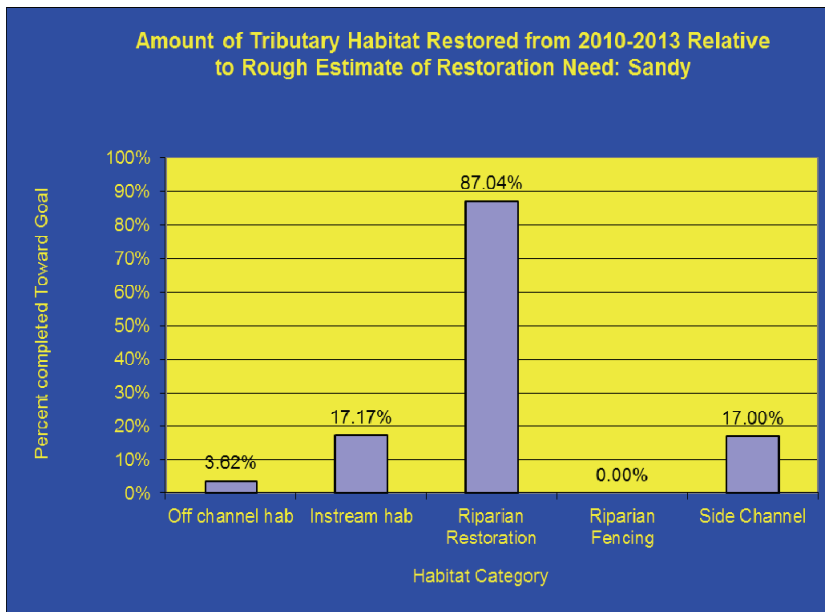


Figure 15. Habitat Restoration Completed 2010-2013 Compared to Plan Restoration Quantities

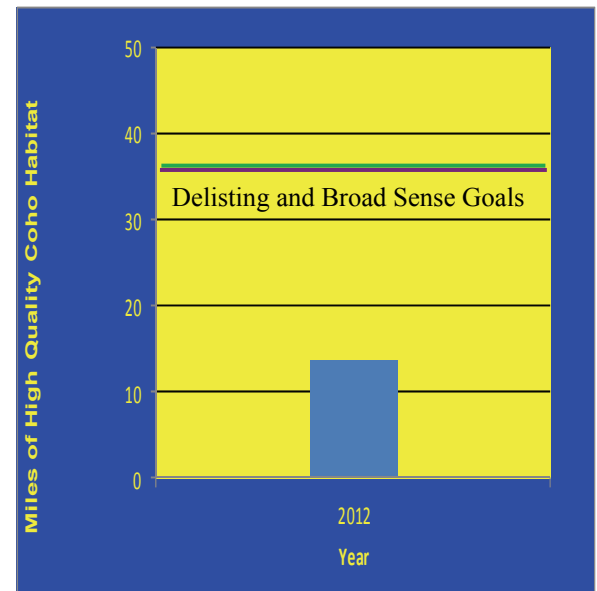


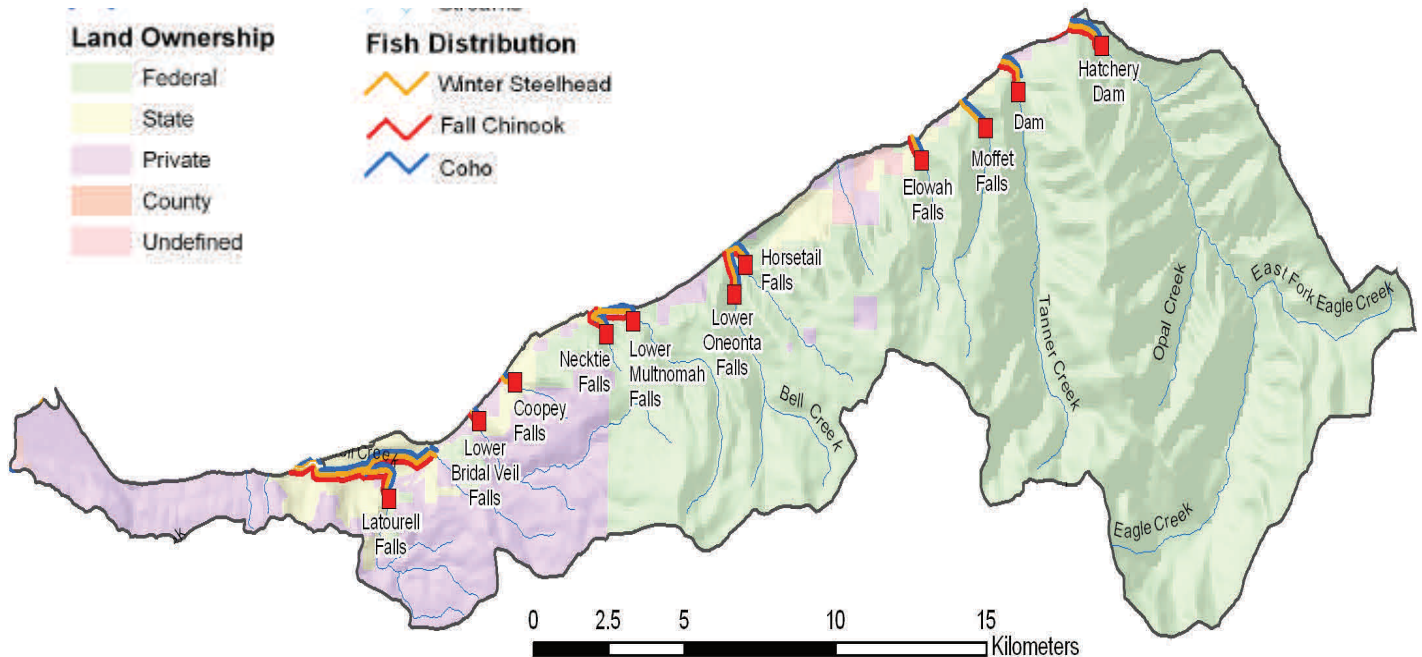
Figure 16. Miles of High Quality Coho Habitat

- Habitat restoration quantities for the Sandy population are found on page 338 of the plan.
- Achievement of all habitat restoration quantities is planned for 15 years (2010-2025).
- Completion of approx. 6%/year in each category would hit targets in 15 years.
- Riparian restoration is on target for the Sandy basin.
- See page 15 of this report for details regarding restoration action quantities, off-channel habitat explanation and miles of high quality coho habitat needs.



2011 Flood; Upper Sandy River
Photo: ODFW

Lower Gorge Populations



Key Limiting Factors Affecting Lower Gorge Coho, Fall Chinook and Winter Steelhead

Threat Category	Key Limiting Factor and Code		Coho	Fall Chinook	Winter Steelhead
Tributary Habitat	6f	Degraded physical habitat quality due to transportation corridor development and maintenance.	X	X	X
Estuary Habitat	3a	Altered food web, reduced macrodetrital input due to Columbia Basin hydropower reservoirs, revetments and disposal of dredge materials.	X	X	X
	3b	Altered food web, increased microdetrital input due to Columbia Basin hydropower reservoirs.	X	X	X
	5b	Altered hydrograph/water quantity due to Columbia Basin hydropower dams.	X	X	X
	6c	Impaired physical habitat quality due to Columbia Basin hydropower dams.	X	X	X
Harvest	7a	Loss of population traits due to consumptive, target fisheries.	X	X	
Hatchery	7c	Loss of population traits, stray hatchery fish interbreeding with wild fish.	X	X	

Lower Gorge Populations

	2010 Plan Assess- Extinction Risk	ment	Desired Delisting Goal
Coho	Very High		Low
Fall Chinook	Very High		Moderate
Winter Steelhead	High		Low



Fall Chinook Population Status Notes:

Lower Gorge annual abundance estimates are determined from GRTS based spawning ground surveys, which began in 2009. Spawning locations are often in non-wadable portions of streams, which pose challenges for visual-based spawning surveys and frequently result in confidence intervals which exceed the abundance estimate.

Winter Steelhead Population Status Notes:

No GRTS based spawner abundance estimates exist.

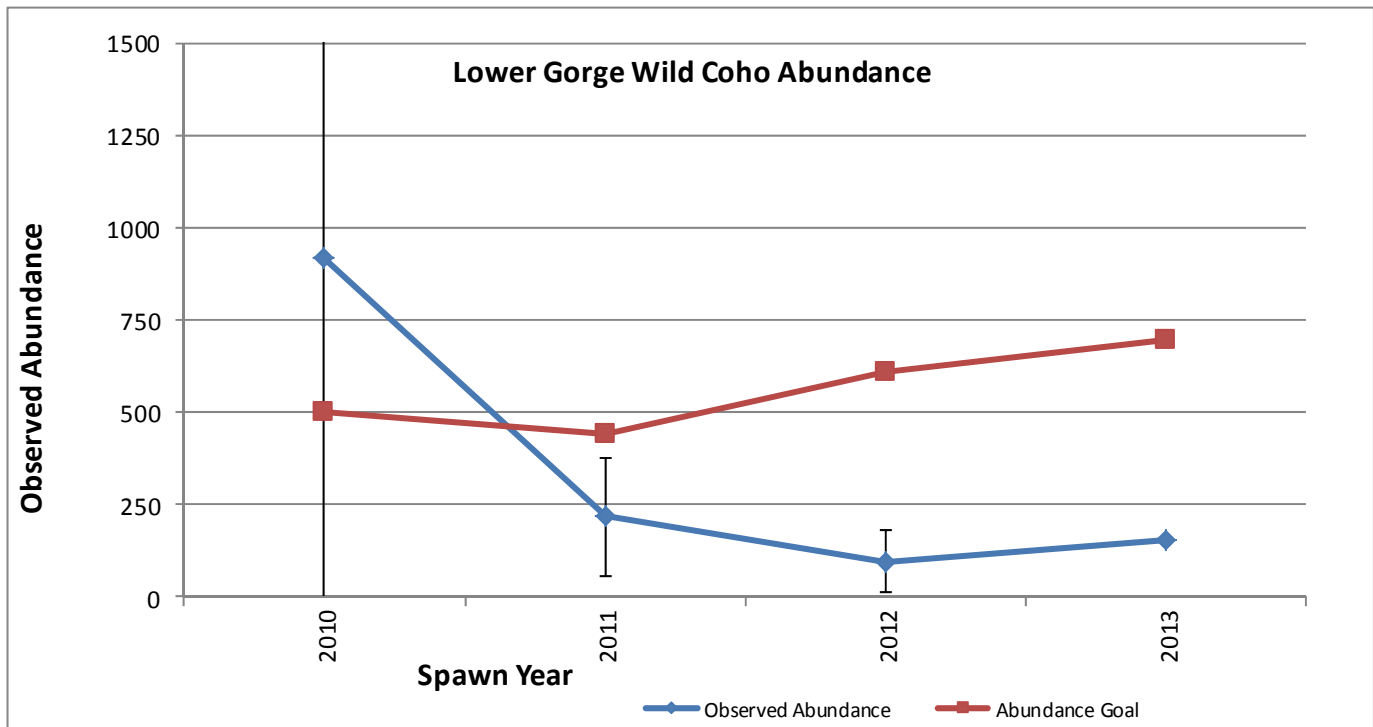


Lower Gorge Populations

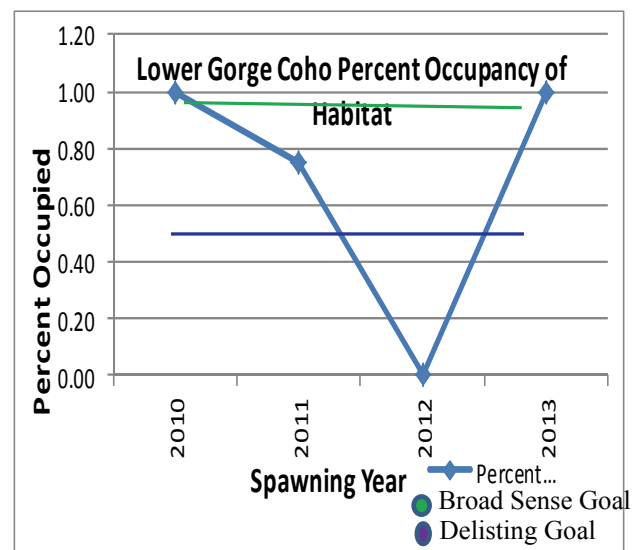
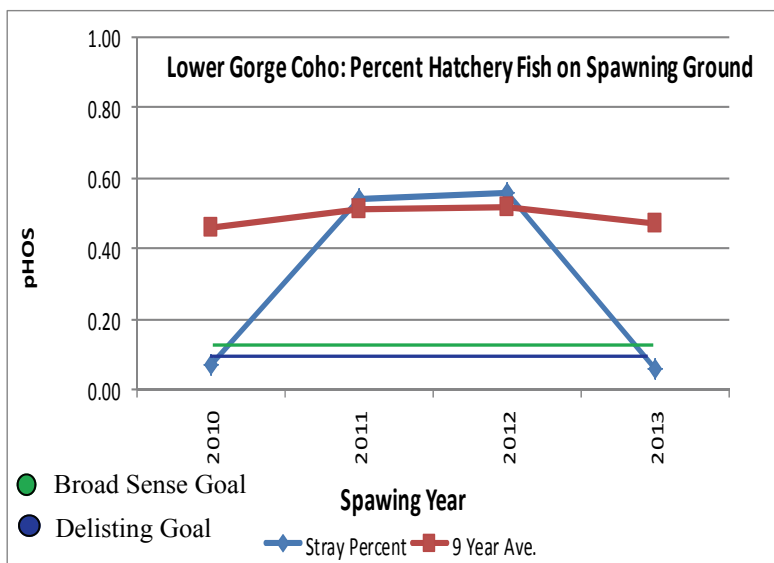
Coho Population Status



Gorge Stratum



Lower Gorge observed abundance estimates are determined by GRTS based spawning ground surveys. No fish or surveys are passed or conducted above hatchery weirs at Bonneville or Cascade Hatcheries.



Lower Gorge pHOS is a function of estimated wild abundance determined from the GRTS spawning ground surveys divided by the estimated hatchery abundance from GRTS spawning ground surveys.

Lower Gorge Populations

Table 7. Status Summary of Protection and Restoration Activities Completed

Action ID	Project	Limiting Factor	Location	Species	Implementer	Action Type
246-LG, 247-LG, 248-LG	Horsetail Creek, 184 Culvert Retrofit, .4 mile Channel Reconstruction, 400 LWD, Remove Stream Diversion	K	Horsetail Creek	Coho, StW	LCEP	Habitat
245-LG	Mirror Lake Riparian, 1 mile	K	Latorell and Young Creeks	Coho, StW	OPRD	Habitat

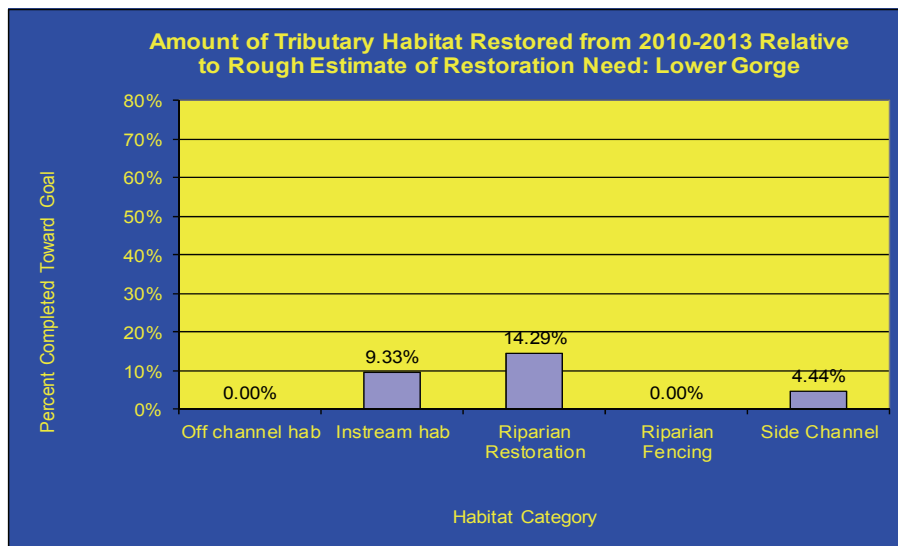


Figure 17. Habitat Restoration Completed 2010-2013 Compared to Plan Restoration Quantities.

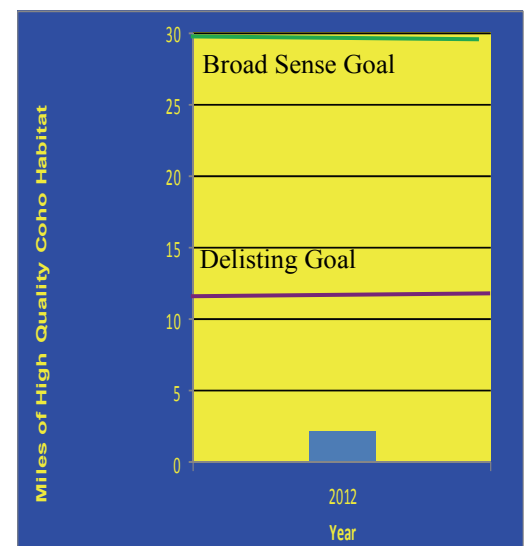


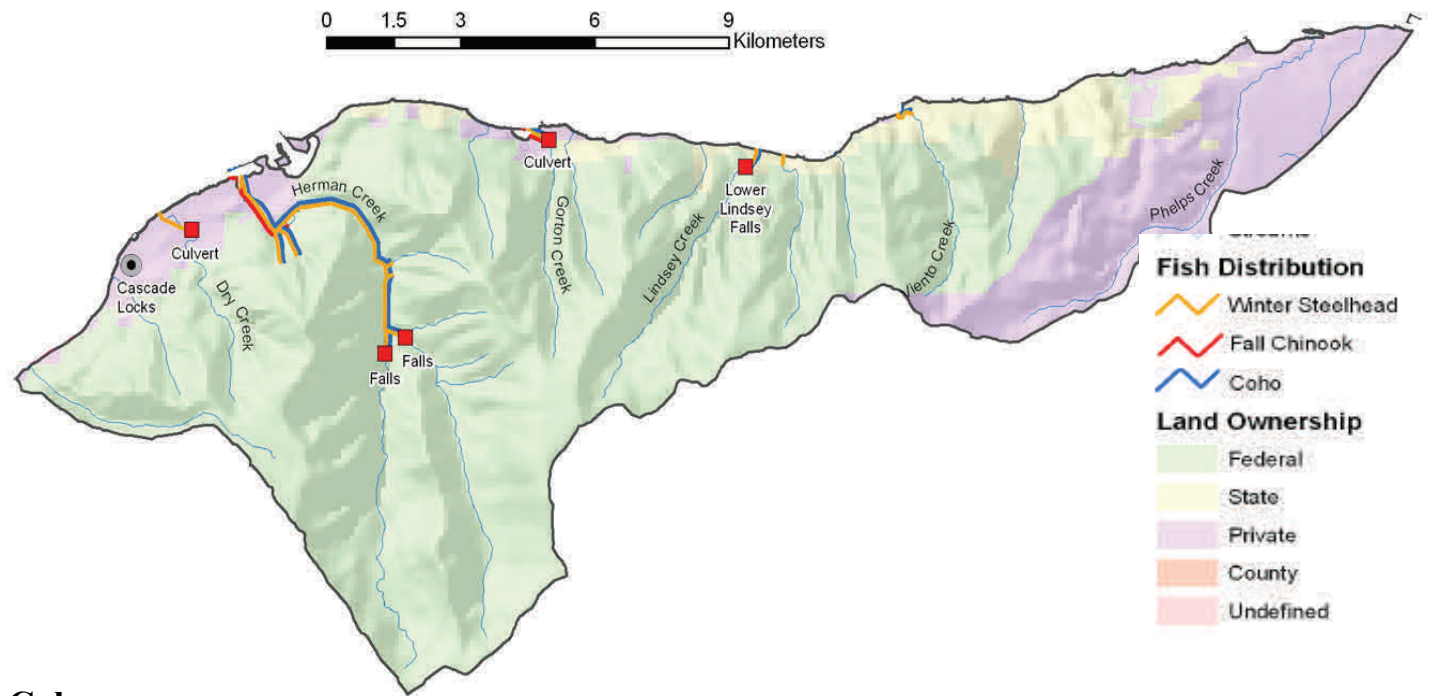
Figure 18. Miles of High Quality Coho Habitat



Multnomah Falls
Photo: ODFW

- Habitat restoration quantities for the Lower Gorge population are found on page 338 of the plan.
- Achievement of all habitat restoration quantities is planned for 15 years (2010-2025).
- Completion of approx. 6%/year in each category would hit targets in 15 years.
- See page 15 of this report for details regarding restoration action quantities, off-channel habitat explanation and miles of high quality coho habitat needs.

Upper Gorge Populations



Coho

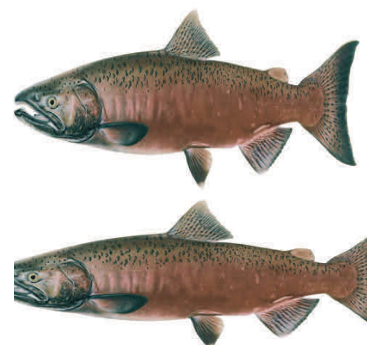
NOAA has defined the Upper Gorge and Hood River populations of coho as one independent population. See Hood River coho for the Upper Gorge/Hood population monitoring report.

Key Limiting Factors Affecting Upper Gorge Fall Chinook and Winter Steelhead

Threat Category	Key Limiting Factor and Code		Fall Chinook	Winter Steelhead
Tributary Habitat	6f	Degraded physical habitat quality due to transportation corridor development and maintenance.	X	X
	6g	Degraded physical habitat quality, inundation from Bonneville Dam.	X	X
Estuary Habitat	3a	Altered food web, reduced macrodetrital input due to Columbia Basin hydropower reservoirs, revetments and disposal of dredge materials.	X	X
	3b	Altered food web, increased microdetrital input due to Columbia Basin hydropower reservoirs.	X	X
	5b	Altered hydrograph/water quantity due to Columbia Basin hydropower dams.	X	X
	6c	Impaired physical habitat quality due to Columbia Basin hydropower dams.	X	X
Harvest	7a	Loss of population traits due to consumptive, target fisheries.	X	
Hatchery	7c	Loss of population traits, stray hatchery fish interbreeding with wild fish.	X	

Upper Gorge Populations

Extinction Risk	2010 Plan Assessment	Desired Delisting Goal
Fall Chinook	Very High	Moderate
Winter Steelhead	High	High



Fall Chinook Population Status Notes:

Upper Gorge annual abundance estimates are determined from GRTS based spawning ground surveys, which began in 2009. Spawning locations are often in non-wadable portions of streams, which pose challenges for visual-based spawning surveys and frequently result in confidence intervals which exceed the abundance estimate.

Winter Steelhead Population Status Notes:

No GRTS based spawner abundance estimates exists.

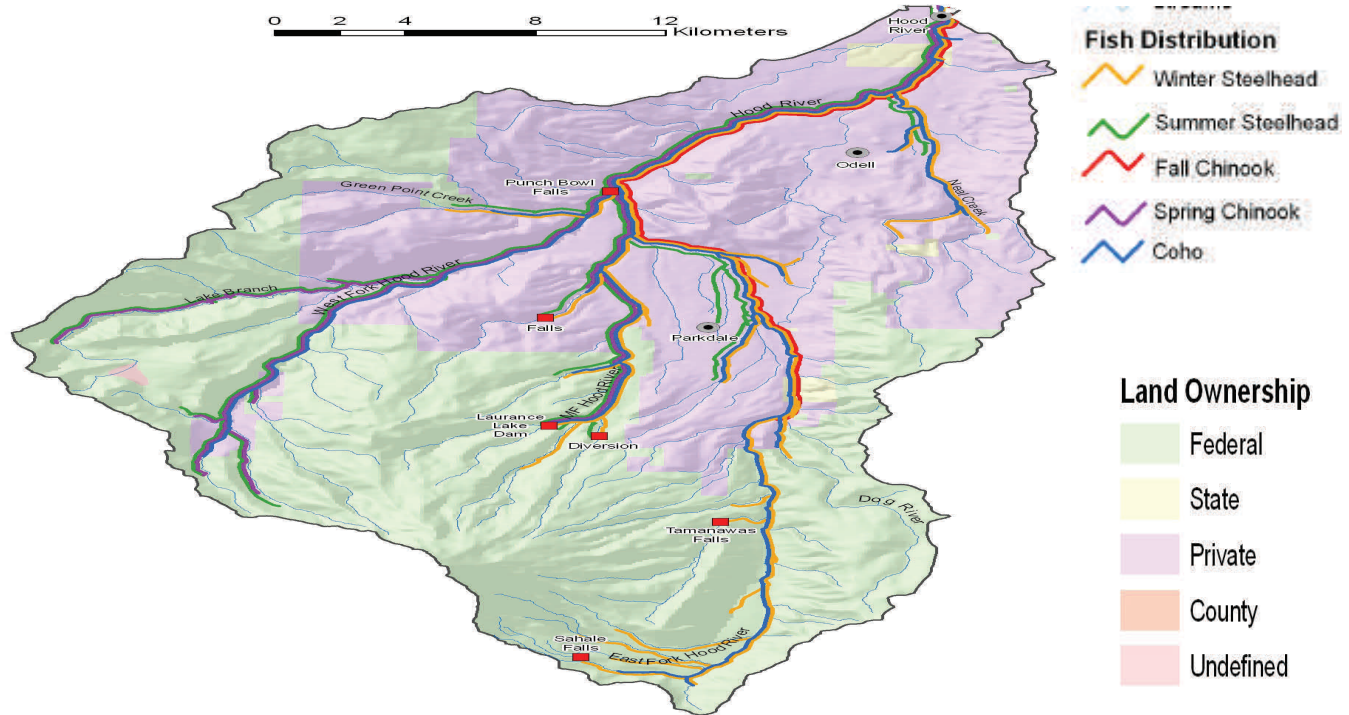
Many of the actions listed for the Upper Gorge Populations are reasonable and prudent alternatives (RPA's) associated with the Federal Columbia River Hydropower System. The action agencies typically produce an annual report detailing RPA action implementation. In past LCRCRP reports these were cross-referenced with Plan actions.

During 2013, the action agencies produced the first Comprehensive Evaluation of RPA's that occurred between 2008-2012. The Comprehensive report does not detail the past years accomplishments per RPA. For details of the last 5 years of RPA implementation, The Comprehensive Report can be found at http://www.salmonrecovery.gov/docs/FCRPS_2013_CE_Section_1.pdf

No tributary habitat restoration projects have been completed which contribute toward the specific restoration action quantity metrics.



Hood Populations

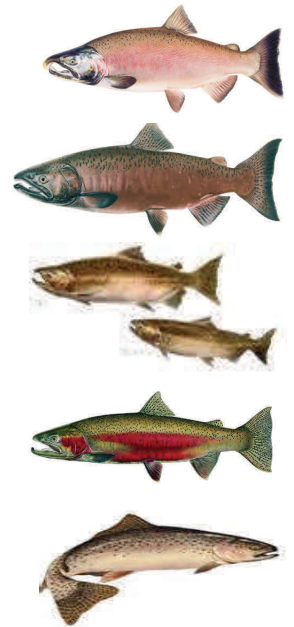


Key Limiting Factors Affecting Upper Gorge/Hood Coho and Hood River Spring and Fall Chinook and Winter and Summer Steelhead

Threat Category		Key Limiting Factor and Code	Coho	Fall Chinook	Spring Chinook	Winter Steelhead	Summer Steelhead
Tributary Habitat	6e	Reduced physical habitat quality/habitat access due to past and/or current land use practices.	X	X		X	X
	5d	Altered hydrograph/water quantity due to irrigation withdrawals.	X	X		X	X
Estuary Habitat	3a	Altered food web, reduced macrodetrital input due to Columbia Basin hydropower reservoirs, revetments and disposal of dredge materials.	X	X	X	X	X
	3b	Altered food web, increased microdetrital input due to Columbia Basin hydropower reservoirs.	X	X	X	X	X
	5b	Altered hydrograph/water quantity due to Columbia Basin hydropower dams.	X	X	X	X	X
	6c	Impaired physical habitat quality due to Columbia Basin	X	X	X	X	X
Harvest	7a	Loss of population traits due to consumptive, target fisheries.	X	X	X		
Hatchery	7c	Loss of population traits, stray hatchery fish interbreeding with wild fish.		X	X		X

Hood Populations

Extinction Risk	2010 Plan Assessment	Desired Delisting Goal
Coho	Very High	Low
Fall Chinook	Very High	Low
Spring Chinook	Very High	Very Low
Winter Steelhead	Moderate	Low
Summer Steelhead	Very High	Low



Gorge Stratum

Summer Steelhead Population Status Notes*:

No yearly abundance estimates are available post Powerdale Dam removal.

Spring Chinook Population Status Notes*:

No yearly abundance estimates are available post Powerdale Dam removal.

Fall Chinook Population Status Notes*:

No yearly abundance estimates are available post Powerdale Dam removal.

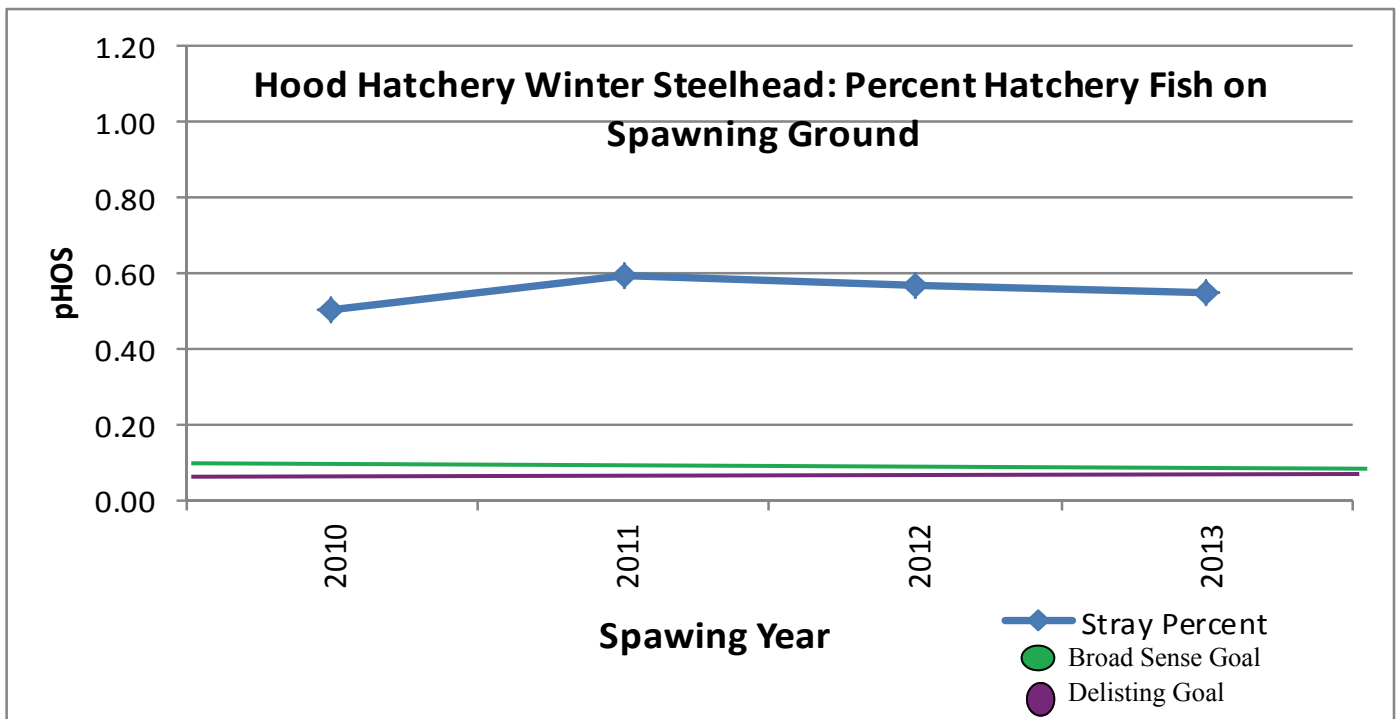
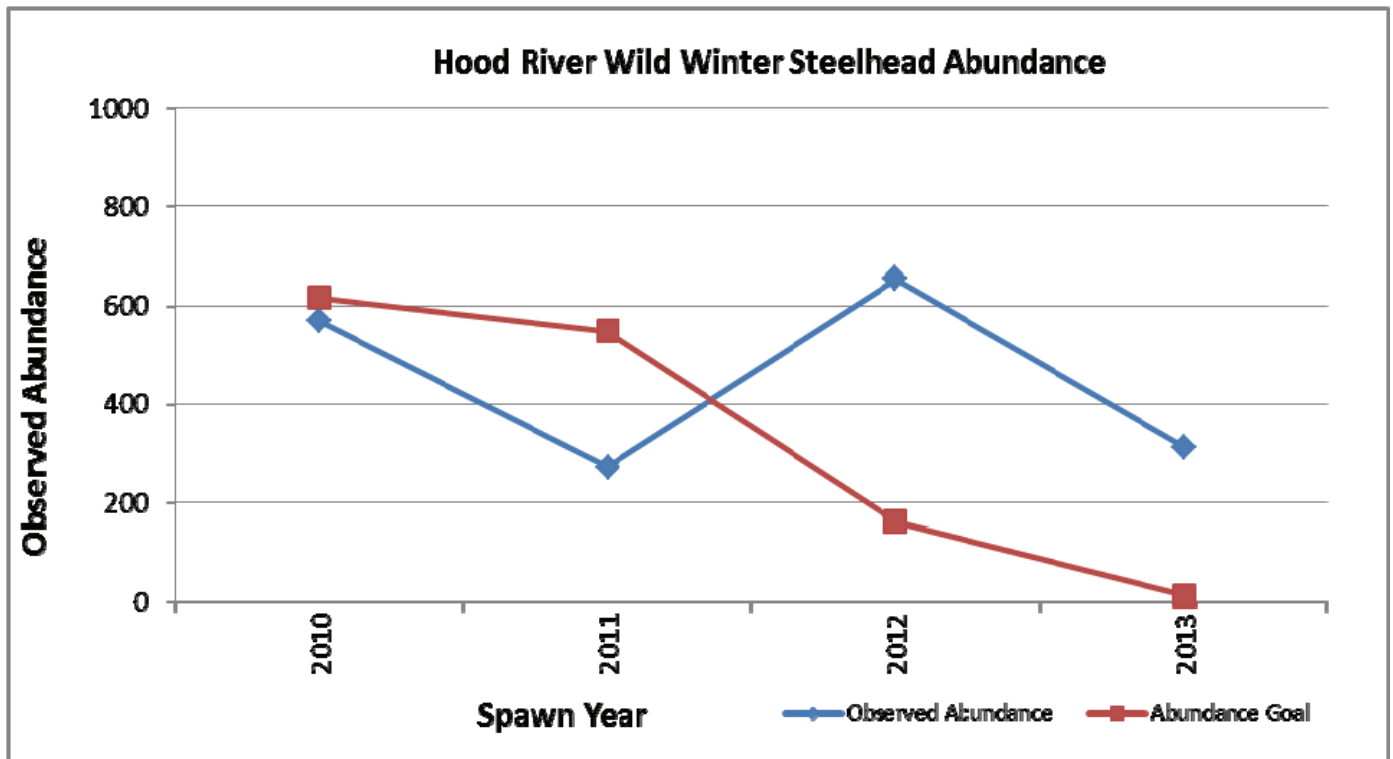
* Annual estimates of VSP metrics have been unavailable for Hood River populations of summer steelhead, spring chinook and fall chinook since the removal of Powerdale Dam in 2010. Work to develop reliable methods for accurate characterization of these populations is ongoing.



Photo: Finetooth-
Wikipedia

Hood Populations

Winter Steelhead Population Status

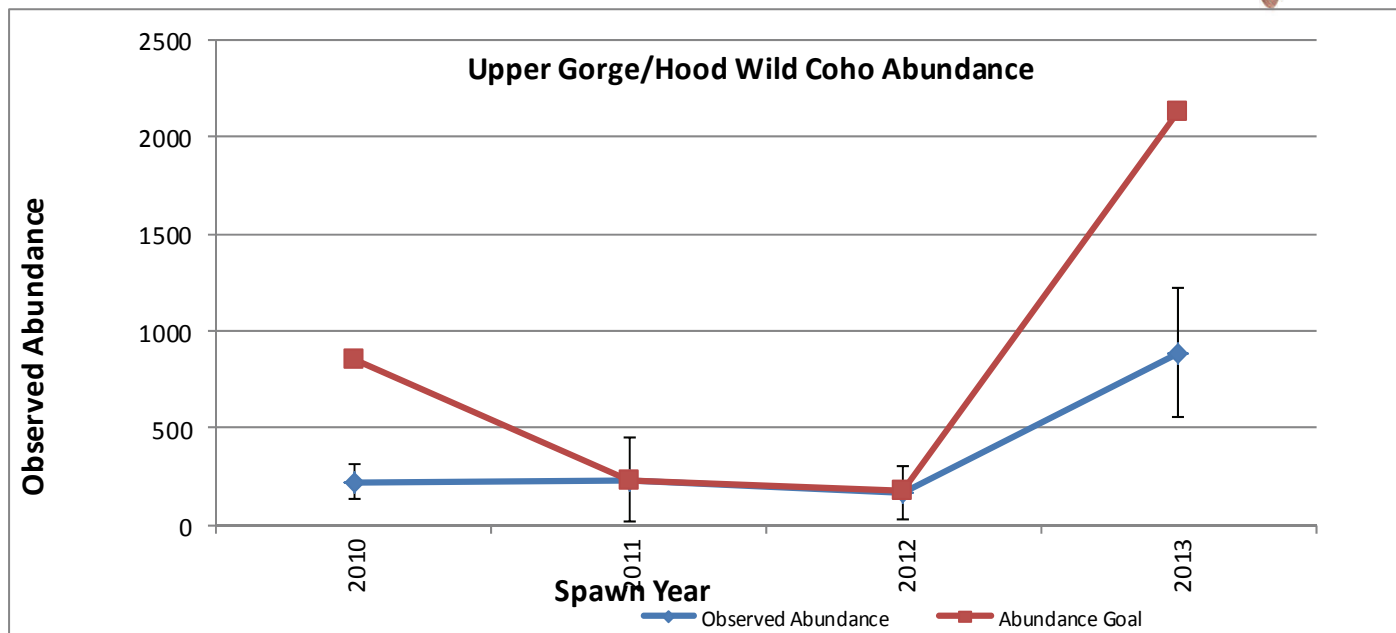


Upper Gorge/Hood Populations

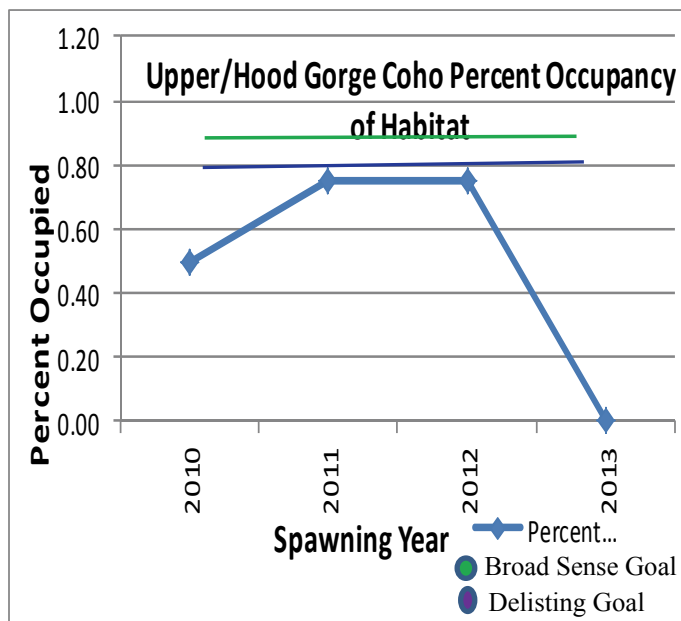
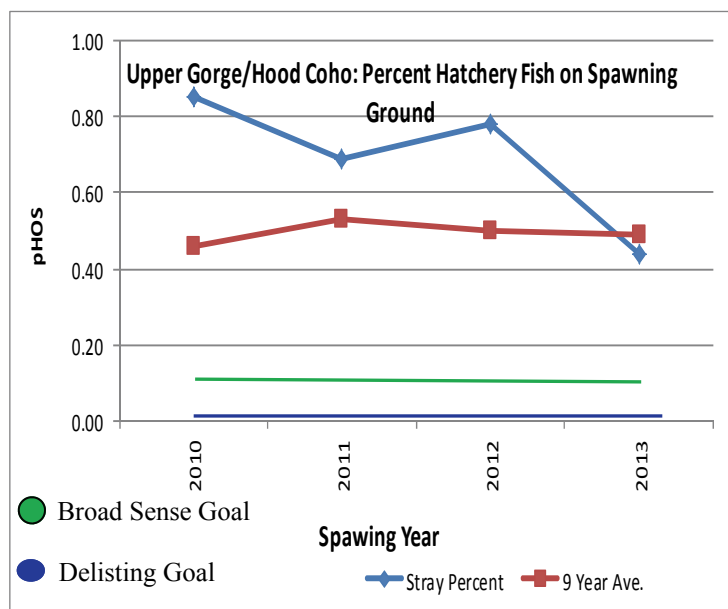
Coho Population Status



Gorge Stratum



Hood yearly observed abundance estimates (post Powerdale Dam Removal) are determined solely from GRTS spawning ground surveys located entirely within the Upper Gorge and Hood Population areas.



Upper Gorge/Hood pHOS (post Powerdale Dam removal) is a function of estimated wild abundance determined from GRTS spawning ground surveys conducted in the Upper Gorge portion of the population divided by the estimated number of hatchery fish from the Upper Gorge portion of the population and expanded for the Hood River portion.

Hood Populations

Table 8. Status summary of protection and restoration activities completed.

Action ID	Project	Limiting Factor (key=k, secondary=s, none=n)	Location	Species	Implementer	Action Type
270-HD, 272-HD, 274-HD	Dee Irrigation District Pipeline and Fish Passage Project, 3cfs Conserved, Fish Passage at 4 Tributary Streams	K	West Fork Hood River	ChS, StS, Coho	DID	Habitat
270-HD, 272-HD	EFID Head Gate and Fish Passage Project, Push up Dam Replaced with Weir and Fish Ladder	K	East Fork Hood River	Coho, StW, StS, ChF	EFID	Habitat
272-HD	Famers Canal Pipeline Phase 1, 12,000' of Canal Converted to Pipeline	K	Hood River	Coho, StW, StS, ChS, ChF	FID	Habitat
284-HD	Substrate Augmentation below Clear Branch Dam, 66cy Spawning Gravel	K	Middle Fork Hood River	ChS, StS, StW, Coho	MFID	Habitat
284-HD	McGee Creek Riparian Thinning and LWD, 1/2 mile of Stream and 29 Trees	K	McGee Creek	ChS, StS	USFS	Habitat
36-Trib	West Fk Hood River LiDAR Mapping and Intrinsic Potential Studies	K	East and West Forks Hood River	Coho, StW, StS, ChS, ChF	CTWS	Habitat
270-HD, 301-HD	Moving Falls Fish Ladder Installed	K	West Fork Hood River	ChS, StS, Coho	CTWS/ODFW	Hatchery
278, 280-HD	Orchard Spray Buffer Riparian Revegetation and Fencing Project, .9 mile, 3 sites	K	East Fork Hood	Coho, StW, StS, ChS, ChF	CTWS	Habitat
278-HD, 294-HD	Water Quality and Fish Habitat Protection at West Fork BPA Crossing (Veg Mngt-Eliminating Chemical Control)	S	West Fork Hood River	ChS, StS, Coho	CTWS	Habitat
273-HD	Provide Education to Assist with Water Saving Measures	K	Basin Wide	Coho, StW, StS, ChS, ChF	Hood River SWCD	Outreach
275-HD	Implement BMP's from HR Ag WQMP	K	Basin Wide	Coho, StW, StS, ChS, ChF	OSU-MCAREC	Outreach
276-HD	Continue Ed and Outreach from HRWAP	K	Basin Wide	Coho, StW, StS, ChS, ChF	HRWG	Outreach
294-HD	Implement BMP's for Ag Chemicals	S	Basin Wide	Coho, StW, StS, ChS, ChF	HRWG	Outreach
295-HD	Improve Residential Chemical Use	S	Basin Wide	Coho, StW, StS, ChS, ChF	HRWG	Outreach
272, 277-HD	Dykstra Orchards Irrigation Improvement	K	Lower Middle Fk	ChS, StS, StW, Coho	HRSWCD	Habitat
272, 277-HD	Nishimoto Irrigation Improvement	K	Lentz Creek	Coho, StW	Hood River SWCD	Habitat

Hood Populations

Action ID	Project	Limiting Factor (key=k, secondary=s, none=n)	Location	Species	Implementer	Action Type
272, 277-HD	Sawyers 31 Irrigation Improvement	K	Lower East Fk HR	Coho, StW, StS, ChS, ChF	Hood River SWCD	Habitat
272, 277-HD	Collins Road Irrigation Improvement	K	West Fork Hood River	ChS, StS, Coho	Hood River SWCD	Habitat
280-HD	Powerdale Lands Acquisition and Title Transfer	K	Mainstem Hood	Coho, StW, StS, ChS, ChF	PacifiCorp/CLT/ Hood River County	Habitat
272, 277-HD	Central Vale Irrigation Improvement	K	Odell Creek	StW	Hood River SWCD	Habitat

*See table 7.3 of the plan to link the action ID to the plan action.

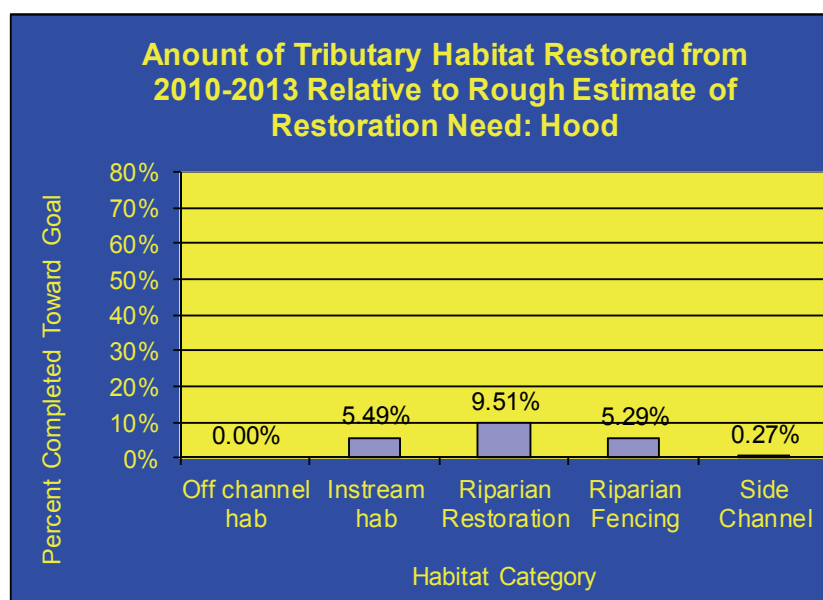
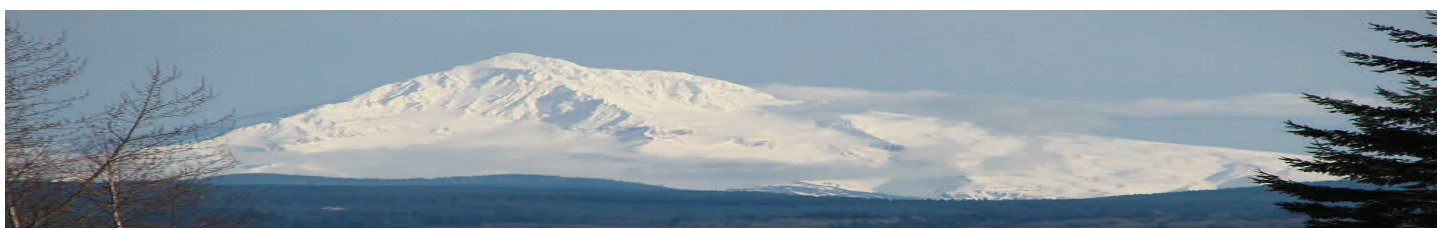


Figure 19. Habitat Restoration Completed 2010-2013 Compared to Plan Restoration Quantities



Figure 20. Miles of High Quality Coho Habitat

- Habitat restoration quantities for the Hood population are found on page 338 of the plan.
- Achievement of all habitat restoration quantities is planned for 15 years (2010-2025).
- Completion of approx. 6%/year in each category would hit targets in 15 years.
- See page 15 of this report for details regarding restoration action quantities, off-channel habitat explanation and miles of high quality coho habitat needs.



Mt Hood
Photo: Wikipedia: Moribunt

Implementation Coordination

A number of general coordination activities have taken place during this reporting period of January 1, 2012-December 31, 2013. These include:

- Held the second annual Implementation Team Meeting.
- Conducted a survey of the Implementation Team to determine priorities for tributary actions. Work has begun for conducting a climate change risk assessment and issues associated with LWD.
- A guidance document for habitat restoration prioritization for LCR was developed and posted on the ODFW web site, http://www.dfw.state.or.us/fish/CRP/lower_columbia_plan.asp
- The 3 Year Implementation Schedule (2012-2014) was developed, for habitat restoration projects across the ESU and posted at the above web link.
- All on-the-ground watershed enhancement implementers within the LCR sub-domain continue to meet with the Implementation Coordinator to discuss plan outreach and its implementation.
- The second Annual Report was completed and work began on the third annual report.
- Member of the Lower Columbia Estuary Partnership Science Work Group, focused on integrating LCR recovery plan priorities with the Estuary Partnership's prioritization of estuary habitat for restoration.
- Member of Oregon's chum recovery workgroup.
- Member of Oregon Watershed Enhancement Board Region 3 review team and providing input regarding LCR recovery plan priorities.
- Member of the USACOE General Investigative Study project development team. This study is using recovery plan priorities and locations to potentially put projects on the ground in the estuary and Oregon tributaries.
- Member of the NOAA led Lower Columbia Steering Committee, which assisted with finalization of the federal Lower Columbia River Recovery Plan.



Mouth of the Columbia River
Photo: Wikipedia– Little Mountain 5

Adaptive Management Recommendations

The 2011-12 annual report listed 5 recommendations to pursue. Four of the five have either been completed or in progress/on-going. This report's adaptive management section was built in response to progress within the previous recommendations and new challenges which surfaced during this reporting period.

Although not adaptive management actions per se, the third year of implementation highlighted the general need to accomplish the following coordination needs in order to assure successful plan implementation:

- Continue to meet with watershed enhancement practitioners to update watershed actions plans to reflect LCR recovery plan priorities where needed (i.e. Clackamas, Scappoose, Clatskanie).
- Work with funding entities to assure that funding priorities are consistent with LCR plan priorities and mechanisms are in place to assure that funding is allocated according to these priorities.
- Continue coordination with the Hood River Production Program to capture VSP metrics for all basin species.
- Implement alternative monitoring methods to improve VSP monitoring confidence estimates, particularly for chinook and reinstitute steelhead VSP monitoring in the coastal stratum if funding becomes available.
- Where the plan indicates that criteria or methods for evaluating listing factor status do not exist, ODFW and NOAA should work to develop these.
- Continue working with the Chum Workgroup to discuss re-introduction strategies in light of habitat assessment for the Scappoose basin.
- Early warning system: begin the evaluation process of the likelihood of attaining the measurable criteria goals over the time interval specified in the plan now that we are 3 years into the recovery plan.
- Review all plan actions listed as either immediate or within 5 years to determine plan implementation effectiveness.
- Continue work with Implementation sub-group to develop ESU wide habitat restoration goals.
- Replace Table C.1-2 in Appendix C. During the development of the 2010 biological opinion on the Effects of the Pacific Coast Salmon Plan on Lower Columbia River Chinook (NMFS 2010a) calculation errors were found in the use of converting annual peak count to season counts (spawners/km) for spawn years 2004-06' and in using the incorrect number of spawning miles available in the Clatskanie. The number of spawning miles used was higher than the true number of available spawning habitat. Applying the number of spawners/mile to the true amount of spawning habitat reduced the total number of spawners for all years used in the recruitment models.
- Clackamas ChS are not in the LCR sub-domain, but in the Upper Willamette sub-domain. The Upper Willamette River Conservation and Recovery Plan contains the most recent viability analysis and recovery targets. The Upper Willamette Conservation and Recovery Plan is found at: http://www.dfw.state.or.us/fish/CRP/upper_willamette_river_plan.asp.

Table C.1-2. Basic data set developed for Clatskanie Tule Fall Chinook

Spawn Year	Total Spawners	Proportion of Wild Spawners	Brood Year Average Total Fishery Exploitation Rates	Proportion by Age at Spawning			
				Age3	Age4	Age5	Age6
1974	67	0.10	0.780	0.211	0.540	0.250	0.000
1975	178	0.10	0.780	0.211	0.540	0.250	0.000
1976	154	0.10	0.840	0.211	0.540	0.250	0.000
1977	154	0.10	0.730	0.211	0.540	0.250	0.000
1978	154	0.10	0.720	0.211	0.540	0.250	0.000
1979	144	0.10	0.830	0.211	0.540	0.250	0.000
1980	229	0.10	0.750	0.211	0.540	0.250	0.000
1981	144	0.10	0.760	0.211	0.540	0.250	0.000
1982	456	0.10	0.670	0.211	0.540	0.250	0.000
1983	144	0.10	0.730	0.211	0.540	0.250	0.000
1984	110	0.10	0.790	0.211	0.540	0.250	0.000
1985	77	0.10	0.740	0.211	0.540	0.250	0.000
1986	144	0.10	0.620	0.211	0.540	0.250	0.000
1987	338	0.10	0.550	0.211	0.540	0.250	0.000
1988	194	0.10	0.540	0.211	0.540	0.250	0.000
1989	278	0.10	0.610	0.211	0.540	0.250	0.000
1990	77	0.10	0.640	0.211	0.540	0.250	0.000
1991	125	0.10	0.480	0.211	0.540	0.250	0.000
1992	125	0.10	0.380	0.211	0.540	0.250	0.000
1993	125	0.10	0.170	0.211	0.540	0.250	0.000
1994	59	0.10	0.490	0.211	0.540	0.250	0.000
1995	85	0.10	0.240	0.211	0.540	0.250	0.000
1996	464	0.10	0.400	0.211	0.540	0.250	0.000
1997	67	0.10	0.320	0.211	0.540	0.250	0.000
1998	93	0.10	0.440	0.211	0.540	0.250	0.000
1999	101	0.10	0.560	0.211	0.540	0.250	0.000
2000	264	0.10	0.660	0.211	0.540	0.250	0.000
2001	264	0.10	0.670	0.211	0.540	0.250	0.000
2002	389	0.10	0.640	0.211	0.540	0.250	0.000
2003	474	0.10	na	0.211	0.540	0.250	0.000
2004	110	0.10	na	0.211	0.540	0.250	0.000
2005	101	0.10	na	0.211	0.540	0.250	0.000
2006	42	0.10	na	0.211	0.540	0.250	0.000



Sandy River Delta Dam Removal
Photo: USACOE

Reference:

- Oregon Department of Fish and Wildlife. 2010. Lower Columbia River Conservation and Recovery Plan for Salmon and Steelhead Populations in Oregon.
- Oregon Department of Fish and Wildlife. 2010. Oregon's Columbia River Chum Salmon Recovery Strategy. Lower Columbia River Conservation and Recovery Plan for Salmon and Steelhead Populations in Oregon.
- McElhany, P., M.H.Ruckelshaus, M.J. Ford, T.C. Wainwright, and E.P. Bjorkstedt. 2000. Viable Salmonid Populations and Recovery of Evolutionarily Significant Units. U.S. Department of Commerce, NOAA Technical Memorandum: NMFS-NWFSC-42. NOAA, Seattle, WA.
- McElhany, P., C.Busack, M. Chilcote, S. Kolmes, B. McIntosh, J.M. Myers, D. Rawding, A. Steel, C. Steward, D. Ward, T. Whitesel, and C. Willis. 2006. Revised viability criteria for salmon steelhead in the Willamette and Lower Columbia Basins. Draft Report, NOAA Northwest Fisheries Science Center, Seattle, WA.
- McElhany, P., M.Chilcote, J. Myers, R. Beamesderfer. 2007. Viability status of Oregon salmon and steelhead populations in the Willamette and lower Columbia basins, review draft. National Marine Fisheries Service Northwest Fisheries Science Center, Seattle, WA.
- National Marine Fisheries Service. 2010. 5-Year Review: Summary and Evaluation of Lower Columbia River Chinook, Lower Columbia River Chum, Lower Columbia River Coho and Lower Columbia River Steelhead. U.S Department of Commerce. 53pp.
- National Marine Fisheries Service. 2010. Biological Opinion on the Effects of the Pacific Coast Salmon Plan and U.S. Frasier Panel Fisheries in 2010 and 2011 on the Lower Columbia River Chinook Evolutionary Significant Unit and Puget Sound/Georgia Basin Rockfish Distinct Populations Segments Listed Under the Endangered Species Act and Magnuson-Stevens Act Essential Fish Habitat Consultation. U.S. Department of Commerce. 155pp.
- Reagan, R.E. and E.A. Olsen, E.A. 2009. Hood River and Pelton ladder evaluation studies. Annual Report 2087 of the Oregon Department of Fish and Wildlife (Project Number 1988-053-04; Contract Number 00029641) to Bonneville Power Administration, Portland, Oregon.
- Schroeder, R. K., K. R. Kenaston, and L.K. McLaughlin. 2007. Spring Chinook salmon in the Willamette and Sandy rivers. Oregon Department of Fish and Wildlife, Fish Research Report F-163-R-11/12, Annual Progress Report, Salem, OR.



Kerry Island West
Port Slough
Clatskanie
Photo: Bonneville
Power Association