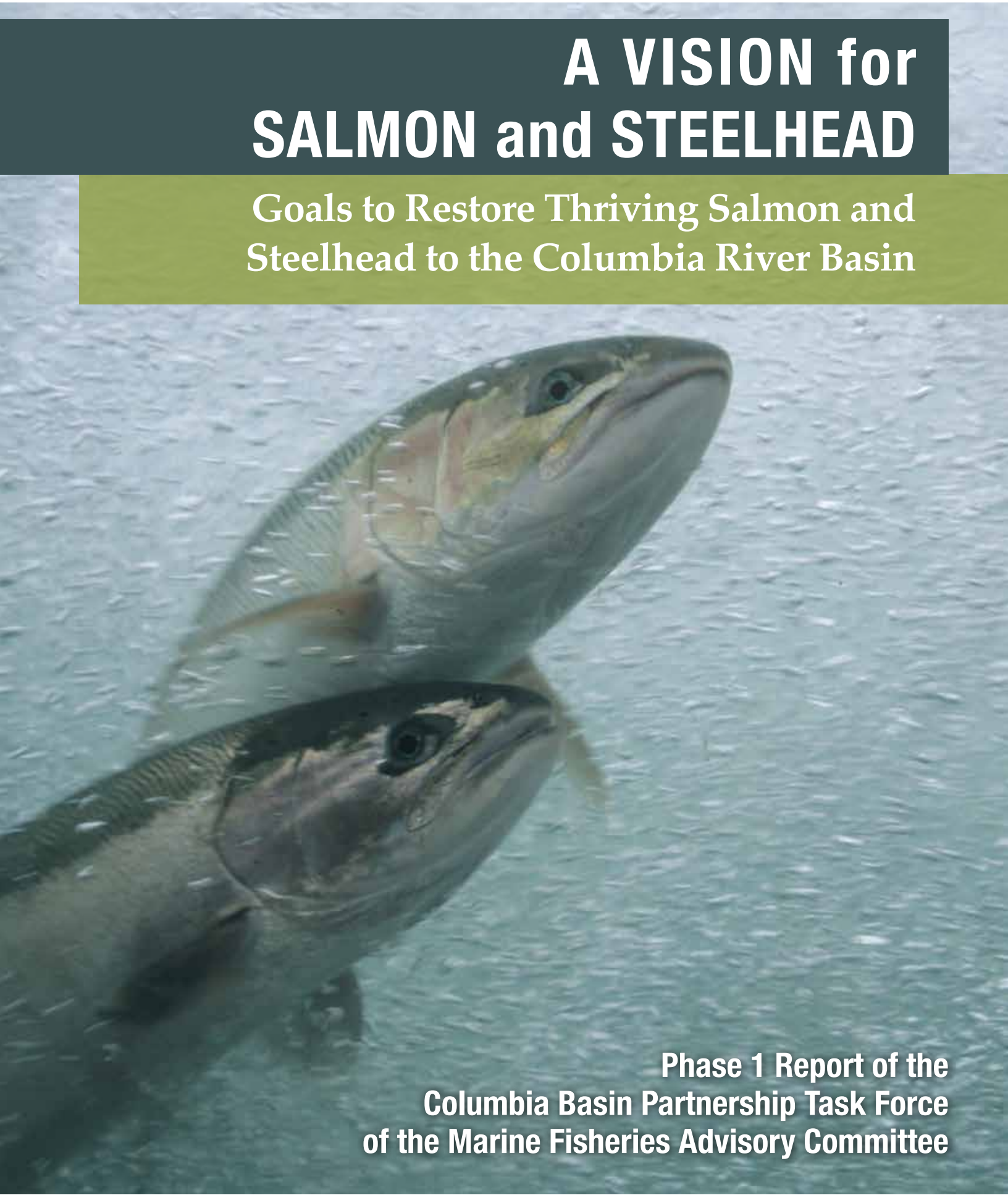
A VISION for SALMON and STEELHEAD

Goals to Restore Thriving Salmon and Steelhead to the Columbia River Basin



Phase 1 Report of the
Columbia Basin Partnership Task Force
of the Marine Fisheries Advisory Committee

I appreciate that the Columbia Basin Partnership has proven to be a unique forum of people representing diverse regional sovereigns and stakeholders with their own discrete missions and clearly focused on working together, at times outside of their comfort zones, to collaboratively develop far reaching aspirational goals for salmon and steelhead across the Columbia River Basin. — Bob Austin, *Upper Snake River Tribes*

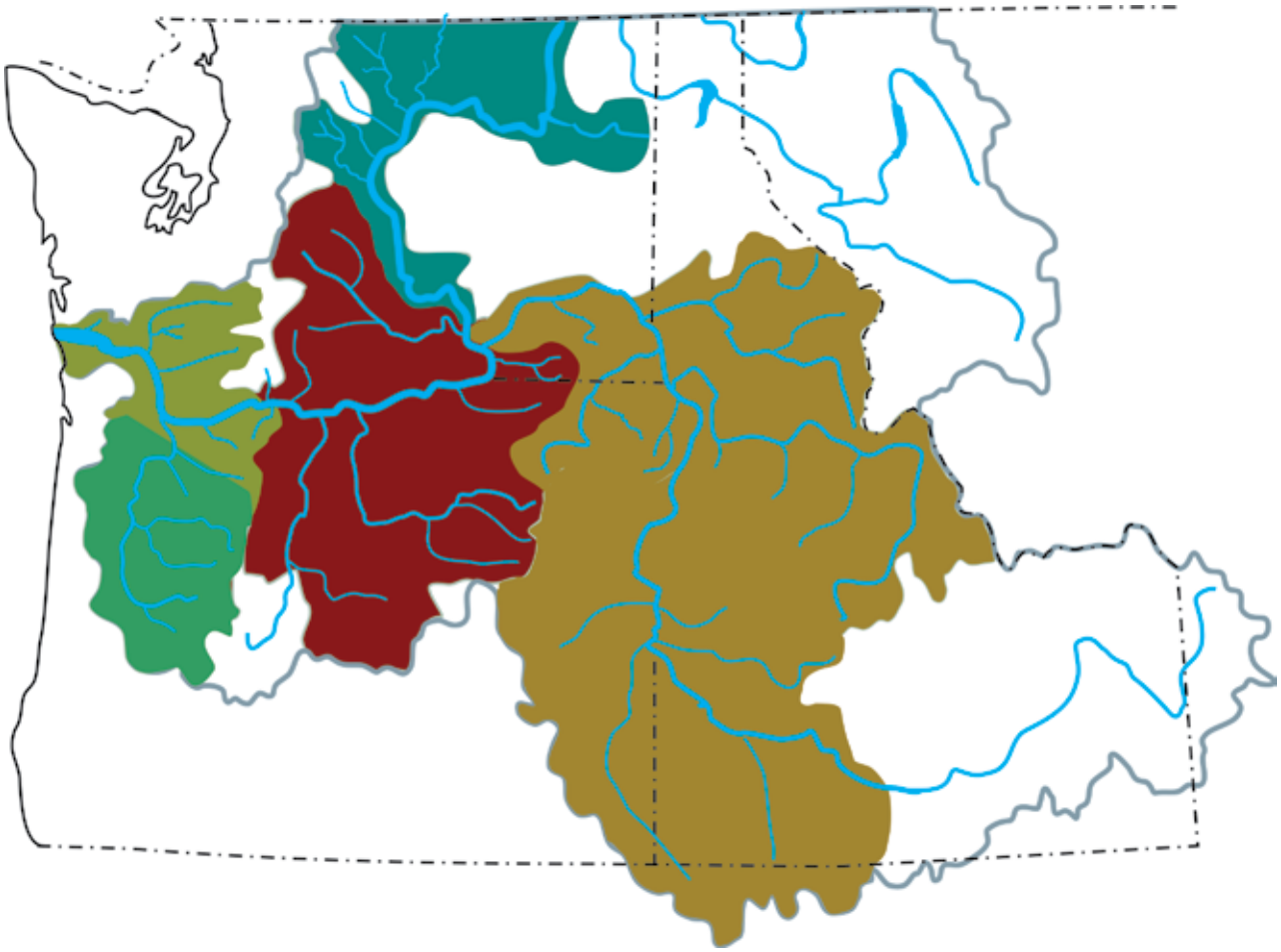
The Columbia Basin Partnership Task Force was convened in 2017 by NOAA Fisheries and the Marine Fisheries Advisory Committee to develop shared goals and a comprehensive vision for the future of Columbia Basin salmon and steelhead. The Task Force is an unprecedented collaboration of different interests from across the Basin landscape—environmental, fishing, agricultural, utility, and river-user groups; local recovery groups; the states of Idaho, Montana, Washington, and Oregon; and federally recognized tribes. The process arose from growing frustration across the region with uneven progress and conflicts around fish conservation and restoration efforts and a widespread desire to find a better way. This report presents a shared purpose gained through these collaborations and envisions a future where coming generations enjoy healthy and abundant salmon and steelhead runs across the Columbia Basin.

For more information of the CBP Task Force please visit: https://www.fisheries.noaa.gov/west-coast/partners/columbia-basin-partnership-task-force.

Cover image: Columbia Basin steelhead. Credit: Richard Grost

A VISION for SALMON and STEELHEAD

Goals to Restore Thriving Salmon and Steelhead to the Columbia River Basin



Phase 1 Report of the
Columbia Basin Partnership Task Force
of the Marine Fisheries Advisory Committee

May 2019

Contents

This is an important collaboration between the stakeholders that have different goals and needs. — Jess Groves, *Port of Cascade Locks*

Tables and Figures

Tables

I most appreciate the willingness of all interests to put the fate of salmon above special interests. — Joel Kawahara, *Coastal Trollers Association*

Figures

Columbia Basin Partnership Task Force Members

Jennifer Anders, Northwest Power and Conservation Council, Montana, Salish-Kootenai Tribes and Kootenai Tribe of Idaho

Bob Austin, Snake River Tribes Foundation, Shoshone-Paiute Tribes of the Duck Valley Reservation, Shoshone-Bannock Tribes of the Fort Hall Reservation, Fort McDermitt Paiute and Shoshone Tribe, and Burns Paiute Tribe.

Bert Bowler, Idaho Rivers United, Idaho Conservation League, Idaho Wildlife Federation, International Federation of Fly Fishers, Idaho Sierra Club, and Snake River Waterkeepers

Bill Bradbury, State of Oregon

Urban Eberhart, Kittitas Reclamation District

Mike Edmondson, Idaho Governor's Office of Species Conservation

Ben Enticknap, Oceana

Steve Fick, Fishhawk Fisheries

Randy Friedlander, Confederated Tribes of the Colville Reservation

Jeff Grizzel, Grant County Public Utility District

Tony Grover, Northwest Power and Conservation Council, *ex-officio*

Jess Groves, Port of Cascade Locks

Liz Hamilton, Northwest Sport Fishing Industry Association

Marla Harrison, Port of Portland

Heath Heikkila, Coastal Conservation Association, Pacific Northwest Fisheries

Joel Kawahara, Coastal Trollers Association

BJ Kieffer, Spokane Tribe

Joe Lukas, Western Montana Electric Generating and Transmission Cooperative

Deb Marriott, Lower Columbia Estuary Partnership

Steve Martin, Washington State Salmon Recovery Office

Rob Masonis, Trout Unlimited

Liza Jane McAlister, 6 Ranch, Inc.

Jim McKenna, Governor Brown's Natural Resource Office, Oregon

Kristin Meira, Pacific Northwest Waterways Association

Guy Norman, Northwest Power and Conservation Council, Washington

Zachary Penney, Columbia Inter-Tribal Fish Commission, Nez Perce Tribe, Confederated Tribes of the Umatilla Indian Reservation, Confederated Tribes of the Warm Springs Reservation of Oregon, and Confederated Tribes and Bands of the Yakama Nation

Kevin Scribner, Salmon Safe

Norm Semanko, Idaho Water Users Association

Glen Spain, Pacific Coast Federation of Fishermen's Associations

Jim Yost, Northwest Power and Conservation Council, Idaho

MAFAC Liaison Team

Heidi Lovett, MAFAC assistant designated federal officer

Jennifer Lukens, MAFAC designated federal officer

Mike Okoniewski, MAFAC member

Peter Shelley, MAFAC member

NOAA Fisheries Project Team

Barry Thom, West Coast Region

Michael Tehan, West Coast Region

Katherine Cheney, West Coast Region

Patty Dornbusch, West Coast Region

Ray Beamesderfer, Affiliate

Patrick Frazier, Affiliate

Bonnie Hossack, Affiliate

Barbara Taylor, Affiliate

Kearns & West Facilitation Team

Debra Nudelman

Sylvia Ciborowski

Annie Kilburg

Cate Bush

Columbia Basin Partnership Task Force Members, June 2018.
Credit: Tony Grover

The Task Force is thankful for the technical support of the many regional experts who contributed to these recommendations:

Paul Arrington, Idaho Water Users Association

Adrienne Averett, Oregon Department of Fish and Wildlife

Casey Baldwin, Confederated Tribes of the Colville Reservation

Ryan Blackadar, Shoshone-Bannock Tribes

Bill Bosch, Yakama Nation Fisheries

Jim Brick, Oregon Department of Fish and Wildlife

Alex Conley, Yakima Basin Fish and Wildlife Recovery Board

Ryan Couture, Oregon Department of Fish and Wildlife

Ben Cox, Washington Department of Fish and Wildlife

Quinten Daugherty, Washington Department of Fish and Wildlife

Kevin Eslinger, Kittitas Reclamation District

Matthew Falcy, Oregon Department of Fish and Wildlife

Dave Fast, Yakama Nation Fisheries

Kurt Kesenmyer, Trout Unlimited

John Foltz, Washington Snake River Salmon Recovery Board

Chris Frederiksen, Yakama Nation Fisheries

Conor Giorgi, Spokane Tribe

Steve Hays, Chelan PUD

Jay Hesse, Nez Perce Tribe

Kristen Homel, Oregon Department of Fish and Wildlife

Chris Hyland, Walla Walla Watershed Partnership

Tom Iverson, Yakama Nation

Gary James, Confederated Tribes of the Umatilla Indian Reservation

Dave Jepsen, Oregon Department of Fish and Wildlife

Amelia Johnson, Washington Lower Columbia Salmon Recovery Board

Tucker Jones, Oregon Department of Fish and Wildlife

Jeromy Jording, NOAA Fisheries

Paul Kline, Idaho Department of Fish and Game

Cindy LeFleur, Washington Department of Fish and Wildlife

Nancy Leonard, Northwest Power and Conservation Council

Bob Lessard, Columbia River Inter-Tribal Fish Commission

Mark Lewis, Oregon Department of Fish and Wildlife

Ryan Lothrop, Washington Department of Fish and Wildlife

Greer Maier, Washington Upper Columbia Salmon Recovery Board

Steve Manlow, Washington Lower Columbia Salmon Recovery Board

Art Martin, Oregon Department of Fish and Wildlife

John McMillan, Trout Unlimited

Kevleen Melcher, Oregon Department of Fish and Wildlife

Keely Murdoch, Yakama Nation Fisheries

Todd Olson, PacifiCorp

Todd Pearsons, Grant PUD

Levi Pienovi, PacifiCorp

Dan Rawding, Washington Department of Fish and Wildlife

Kelly Reis, Oregon Department of Fish and Wildlife

James Ruzycki, Oregon Department of Fish and Wildlife

Bill Sharp, Columbia River Inter-Tribal Fish Commission

John Simpson, Idaho Water Users Association

Tim Sippel, Washington Department of Fish and Wildlife

Tom Skiles, Columbia River Inter-Tribal Fish Commission

Thomas Stahl, Oregon Department of Fish and Wildlife

Ian Tattam, Oregon Department of Fish and Wildlife

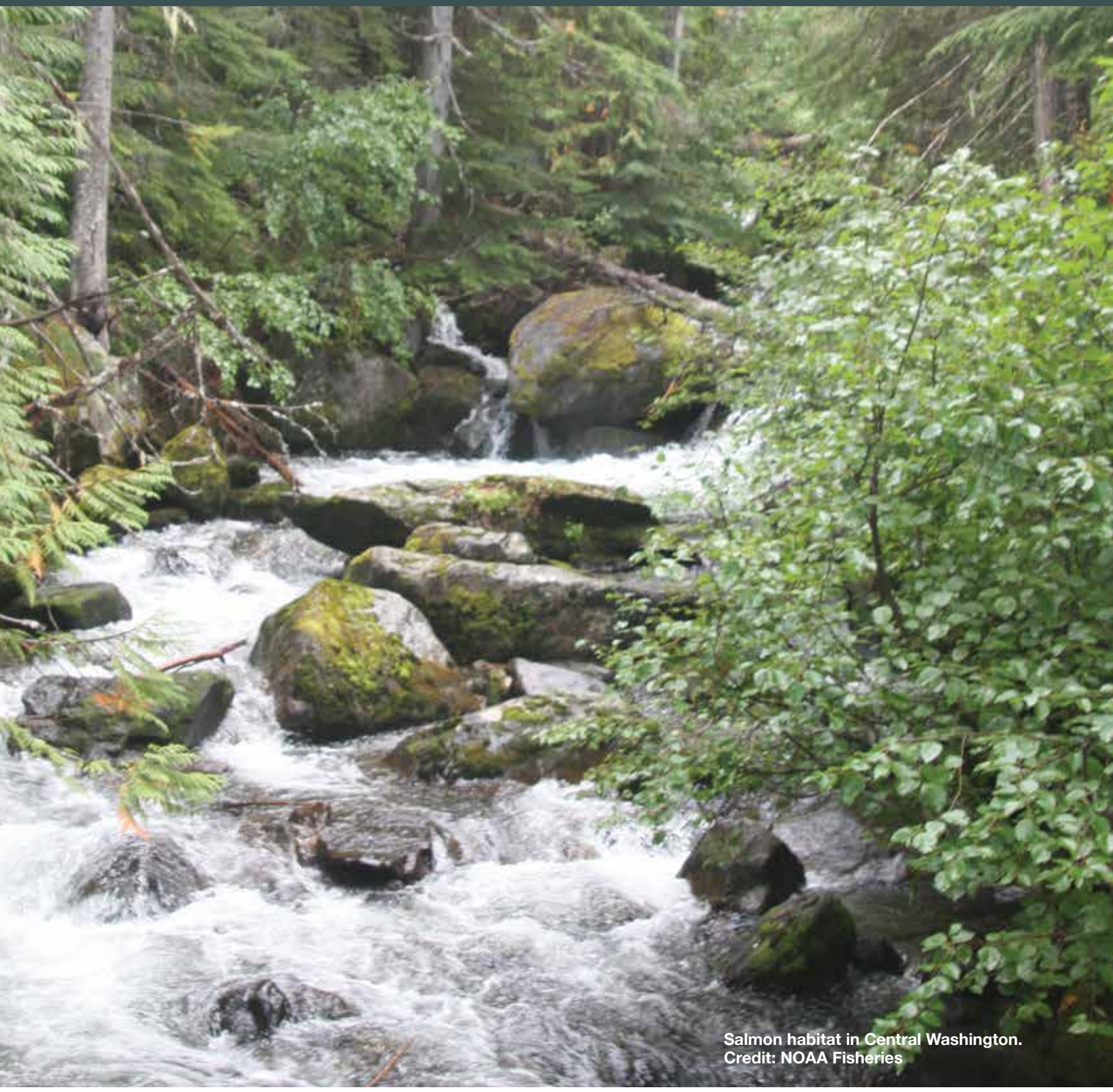
Jeff Whisler, Oregon Department of Fish and Wildlife

Brian Wolcott, Walla Walla Basin Watershed Council

Bill Young, Nez Perce Tribe

Joe Zendt, Yakama Nation Fisheries

The CBP Task Force includes a diversity of stakeholders with many viewpoints. The goal setting process reflects a robust analysis of information based on copious amounts of data. — Bert Bowler, *Idaho Rivers United, Idaho Conservation League, Idaho Wildlife Federation, International Federation of Fly Fishers, Idaho Sierra Club, and Snake River Waterkeepers*



Salmon habitat in Central Washington.
Credit: NOAA Fisheries

Executive Summary

This report presents a unique voice for the future of salmon and steelhead of the Columbia River Basin. These fish are an integral feature of the Columbia River landscape, culture, and economy and represent the lifeblood of the Columbia Basin. Preserving the fish for future generations is one of the greatest challenges we face today.

Over the past two years, the 28 members of the Columbia Basin Partnership Task Force (Task Force), representing a diversity of managers and stakeholders across the Columbia Basin, have worked diligently and sincerely to develop a shared vision and goals for Columbia Basin salmon and steelhead. The Task Force forwarded these goals as recommendations to the NOAA Fisheries Marine Fisheries Advisory Committee (MAFAC) for their consideration in April 2019. MAFAC reviewed, discussed, and recommended these goals and the full report for submission to the NOAA Fisheries Administrator.

Great runs of salmon and steelhead historically returned to the Columbia River Basin. Estimated at between five and 16 million fish, they returned each year like clockwork to spawn across the vast Columbia landscape. Numbers began to decline in the late 1800s with the advancement of European settlement and continued to drop into the late 1900s. Today, the annual runs average just over two million fish, of which only 40 percent are naturally produced. The rest come from hatchery programs developed as natural production declined. Since 1992, more than half of Columbia River salmon and steelhead species have been listed under the U.S. Endangered Species Act (ESA). Tremendous effort and hundreds of millions of dollars have been invested in the Basin over the last 50 years to stem the decline and attempt to rebuild the runs to healthy levels. Results to date are mixed. Many runs remain at low levels; none have been delisted.

Considering the continuing challenges in sustaining the fish, NOAA Fisheries commissioned an independent, impartial assessment in 2010 to gain advice on how best to approach comprehensive, long-term salmon and steelhead recovery in the region. The Situation Assessment, completed in 2012, reflected the views of more than 200 stakeholders, including federal, state, and tribal managers and other parties interested in salmon and steelhead recovery. Important recommendations came from this assessment: getting to recovery will require creative, bold, and effective actions at multiple levels; it will also demand attention to interdependent legal, regulatory, ecological, social, cultural, and economic elements. In particular, the Situation Assessment highlighted the lack of common goals in multiple overlapping federal, state, and tribal recovery and management plans and that effective recovery processes need to include a shared regional definition of success.

The Task Force grew out of these recommendations. Convened by NOAA Fisheries and MAFAC in 2017, the Task Force represents an unprecedented collaboration of parties representing environmental, fishing, agricultural, utility, and river-user interests; local recovery groups; the states of Idaho, Montana, Washington, and Oregon; and federally recognized tribes in the region. These parties share overlapping and sometimes conflicting values and views about the Columbia River and its salmon and steelhead. In the past, many of the parties faced each other from opposite sides of a courtroom. The Task Force brought these representatives together at one table

[1] Sources: Northwest Power and Conversation Council's 1987 Fish and Wildlife Program https://www.nwcouncil.org/fish-and-wildlife/previous-programs/1987-columbia-river-basin-fishwildlife-program and Appendix D of the program "Compilation of Salmon and Steelhead Losses in the Columbia River Basin, March 1986": https://www.nwcouncil.org/sites/default/files/AppendixDLosses.pdf; and ISAB report 2015-1: https://www.nwcouncil.org/sites/default/files/isab2015-1_0.pdf

for the first time to find common ground and foster a collaborative approach to ensure the long-term persistence of our salmon and steelhead.

Through the Task Force process, these interests have arrived at a shared purpose and vision for future generations.

Vision for the Columbia Basin

A healthy Columbia River Basin ecosystem with thriving salmon and steelhead that are indicators of clean and abundant water, reliable and clean energy, a robust regional economy, and vibrant cultural and spiritual traditions, all interdependent and existing in harmony.

The Task Force developed **Qualitative Goals** and Provisional Quantitatve Goals that reflect the vision. The Qualitative Goals are:

1. Restore salmon and steelhead in the Columbia Basin to healthy and harvestable/fishable levels.
2. Provide diverse, productive, and dependable tribal and non-tribal harvest and fishing opportunities for Columbia Basin salmon and steelhead in fresh and marine waters.
3. Produce hatchery salmon and steelhead to support conservation, mitigate for lost natural production, and support fisheries in a manner that strategically aligns hatchery production with natural production recovery goals.
4. Make decisions within a broader context that reflects and considers effects to the full range of social, cultural, economic, and ecosystem values and diversity in the Columbia Basin.

The Task Force sees both the need and opportunity to act today while at the same time envisioning salmon and steelhead runs 100 years from now. They recognize the sense of urgency to help Columbia Basin salmon and steelhead, the people and communities that rely on them, and the wildlife, such as Southern Resident killer whales, that depend on them for survival.

The Task Force's **Provisional Quantitative Goals** describe a range of abundance numbers for salmon and steelhead that indicate whether a Qualitative Goal has been achieved. Provisional Quantitative Goals are identified for natural production of all ESA-listed and non-listed salmon and steelhead in the U.S. portion of the Columbia River Basin and its tributaries, including some historical production areas that are currently blocked. The goals are based, wherever possible, on existing goals and take into account a number of factors, including ESA delisting requirements, habitat constraints and production potential, density dependence, cultural needs of tribes, fishing interests and sustainability, and mitigation responsibilities. In order to provide a complete accounting of future needs and desires for Columbia Basin salmon and steelhead, the Task Force also quantified current and anticipated hatchery production consistent with the goals for natural production, and current and potential harvest and fisheries.

The Provisional Quantitative Goals translate into a total increase of naturally produced salmon and steelhead from the current average of 400,000 to as high as 3.6 million adults. This represents an eightfold improvement from current levels, but is considerably less than the number of salmon and steelhead that the Basin produced historically. The goals also reflect available information on habitat production potential. The corresponding average total Columbia River run (natural- plus hatchery-origin fish) would be projected to increase from 2.3 million to approximately 11.4 million fish.

Continuing the Work of the Task Force

The Task Force recommends these Quantitative Goals as provisional, meaning members agree to them in principle and support further exploration in the next phase of this effort. These recommendations provide critical direction to help guide the Task Force's future discussions. For instance, additional work will be required to strategically align harvest and fishing aspirations and hatchery production with the natural production goals.

The work of the Task Force represents an opportunity to define a clear measure of success and a shared future for Columbia Basin salmon and steelhead. Achieving healthy and harvestable levels of salmon and steelhead will take all regional interests working together in an integrated and efficient manner. The Task Force's long-term goals will help to align the efforts of federal, state, and tribal managers and other stakeholders on a common path to recovering salmon and steelhead in the Columbia Basin.

In June 2018, the MAFAC approved continuation of this effort, providing the Task Force with the opportunity to further test and refine the Provisional Quantitative Goals. The Task Force anticipates that the next phase of work will address many of the questions around how the goals might be achieved. The common foundation developed through this initial phase provides Task Force members with the tools, respect, and inspiration to move forward.

DEFINITIONS OF KEY TERMS USED BY THE TASK FORCE

Escapement	Escapement typically refers to the number of adult salmon or steelhead surviving harvest and other mortality factors to reach a particular point in their return to freshwater.
Harvestable	Species, stocks, or populations of salmon and steelhead that are sufficiently viable, abundant, and productive to sustain significant levels of exploitation and harvest. Harvestable stocks are typically managed to produce optimum or maximum sustained yield. Harvest ability can encompass both numbers of fish harvested and qualities of fisheries, including opportunity and success. Harvestable can be broadly defined to include "fishable," which refers to fishery opportunities that may not include direct harvest (e.g., catch and release recreational fisheries).
Hatchery-origin fish	Fish that were spawned and/or reared during a portion of their life cycle in an artificial production facility.
Healthy	Salmon or steelhead populations, ESUs, DPSs, or stocks that are abundant, productive, widely distributed, diverse, and resilient to environmental perturbations including climate change; can sustain significant levels of harvest; and support a full range of ecological benefits including the needs of dependent species. Generally, healthy refers to a point substantially above ESA delisting on the spectrum from threatened/endangered to extremely low extinction risk.
Mitigation hatchery production	Hatchery fish production used for conservation or harvest purposes that is funded through legislation or legal agreement to compensate for natural production lost due to a specific action, such as construction and operation of a dam.
Natural production	Natural production, or naturally produced fish, refers to the progeny of fish that spawn in the wild, regardless of parental origin (wild, natural, or hatchery). This term is interchangeable with the term natural-origin fish. It is important to distinguish natural production from natural productivity, which refers to the rate at which natural-origin fish are able to produce offspring.
Recovery	Recovery in general refers to improvement in the biological status of a depleted, weak, or at-risk species to a high level of viability and function. NOAA Fisheries uses the term ESA recovery to refer to reducing threats and improving a species status to a point where it is no longer threatened or endangered and can be removed from ESA protection. For salmon and steelhead, this involves improving the species' abundance, productivity, spatial structure, and diversity to levels which provide a high likelihood of long-term persistence (i.e., viable with a low risk of extinction). NOAA Fisheries uses the term broad sense recovery to define further improvements in a species' status. Broad sense recovery goals, generally defined by state and tribal entities or stakeholders, go beyond the requirements for ESA delisting to achieve even lower extinction risk and/or to address other legislative mandates or social, cultural, economic, or ecological values.
Stock	A group of fish of the same species that spawns in a particular lake or stream (or portion thereof) at a particular season and which, to a substantial degree, does not interbreed with fish from any other group spawning in a different place or in the same place in a different season. For the purposes of the Columbia Basin Partnership Task Force, a stock is defined for Columbia Basin salmon and steelhead based on species (Chinook salmon, coho salmon, sockeye salmon, chum salmon, steelhead), region of origin (e.g., Lower Columbia, Middle Columbia, Upper Columbia, Snake, or Willamette), and run type (e.g. spring, summer, fall, late fall).

People working in collaboration, as we have, lets everyone have a role in designing solutions. This produces a better outcome than a single judge or agency making decisions in isolation. — Jennifer Anders, *Northwest Power and Conservation Council, Montana, Salish-Kootenai Tribes and Kootenai Tribe of Idaho*

Juvenile steelhead.
Credit: John McMillan

The Context for Shared Goals for Columbia Basin Salmon and Steelhead

All of us who call the Columbia Basin home have high expectations for the future of our salmon and steelhead. While we may value the fish for different reasons, they tie us with a common bond — to each other, our past, and our future. Today, many of these salmon and steelhead runs are struggling. While great runs of salmon and steelhead historically returned to the Columbia Basin (Figure 1), the runs are now considerably smaller and many are at risk of extinction.

Why Shared Goals?

Significant effort is underway in the Columbia Basin to address the problems that hamper the fish, but these different actions lack a common endpoint. A variety of federal, state, and tribal management plans identify goals for various aspects of salmon and steelhead management and recovery. However, these plans are focused on specific areas or purposes and do not provide a comprehensive suite of complementary goals for Columbia Basin salmon and steelhead. For example, plans for salmon and steelhead listed under the Endangered Species Act (ESA) provide goals for the recovery of these listed species. Other plans address specific factors for decline, including habitat degradation and the adverse effects of hydropower, hatcheries, and harvest, or aim to achieve different federal mandates or broader social, cultural, economic, and ecological values. All of these plans and goals provide important guidance. Yet each measures success through its own yardstick, leaving open the questions: *Where are we, and our salmon and steelhead, headed? What unifying goals should lead us there?* What is missing is a coordinated, basinwide, multi-partner long-term vision and a common set of goals.

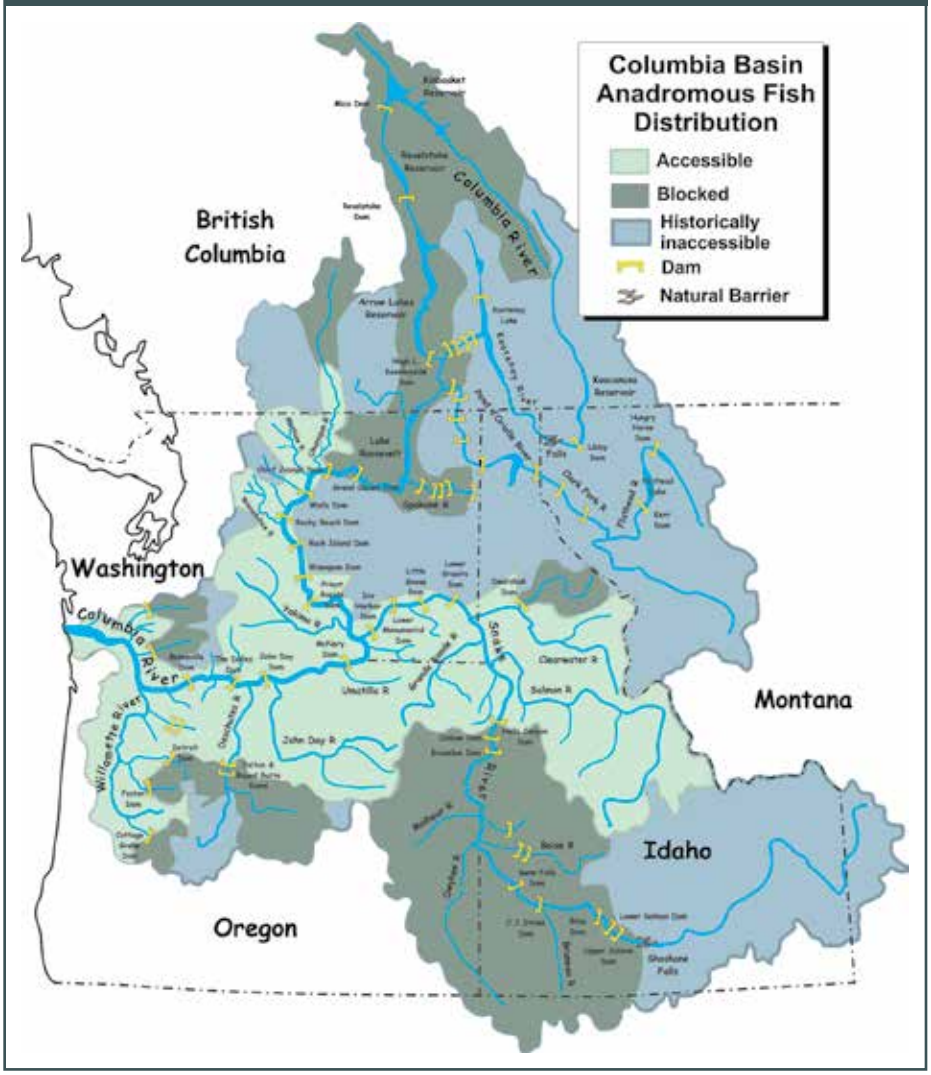
The Columbia Basin Partnership Task Force (Task Force) was created to provide a comprehensive approach. The Task Force provides a forum for parties with overlapping values and missions for the Columbia River and its salmon and steelhead to collaborate on *shared* goals. Task Force recommendations reflect shared social, cultural, economic, and ecological values. They define a comprehensive vision of what we want for the fish, and what we want from them. They aspire to "healthy and harvestable" levels of salmon and steelhead — well above levels requiring protection under the ESA, where more than half of the Columbia Basin species now stand[2] (Figure 2.) At the same time, the goals reflect current realities, including today's significantly altered landscape, and are set below historical levels.

Family fishing on Lewis River, Washington. Credit: Richard Grost

[2] Of the 19 Columbia Basin salmon and steelhead species (defined as evolutionarily significant units or distinct population segments), 13 are listed and protected under the Endangered Species Act: Lower Columbia River, Upper Columbia River, Upper Willamette River, and Snake River (spring/summer and fall runs) Chinook; Columbia River Chum; Snake River Sockeye; Lower Columbia River Coho; and Upper Columbia River, Middle Columbia River, Lower Columbia River, Upper Willamette River, and Snake River steelhead.

Long-term, shared goals will help align federal, state, and tribal managers and stakeholder interests on a common path toward recovering salmon and steelhead in the Columbia Basin. While NOAA Fisheries convened the Task Force, the goals are not just for NOAA Fisheries to oversee and implement. NOAA Fisheries' regulatory role is primarily limited to the ESA, and achieving ESA recovery for listed species represents the low end of our recommended goals. Once listed salmon and steelhead achieve ESA recovery and delisting, NOAA Fisheries will work with federal, state and tribal managers and stakeholders, using other authorities, to achieve goals that provide cultural, economic, and ecological values beyond the ESA, such as supporting sustainable fisheries. In addition, sovereign and stakeholder members of the CPB Task Force can use these shared goals in their planning and management processes. Having common goals among managers and stakeholders provides a means to define success, measure progress, and maintain accountability.

FIGURE 1. Map of salmon and steelhead distribution across the Columbia Basin.



Attaining ESA recovery and delisting for listed species and then achieving the healthy and harvestable levels of salmon and steelhead — beyond mere ESA delisting levels — will take all regional interests working together in an integrated and efficient manner. The Task Force recommendations represent an opportunity to define a clear measure of success and a shared future for Columbia Basin salmon and steelhead.

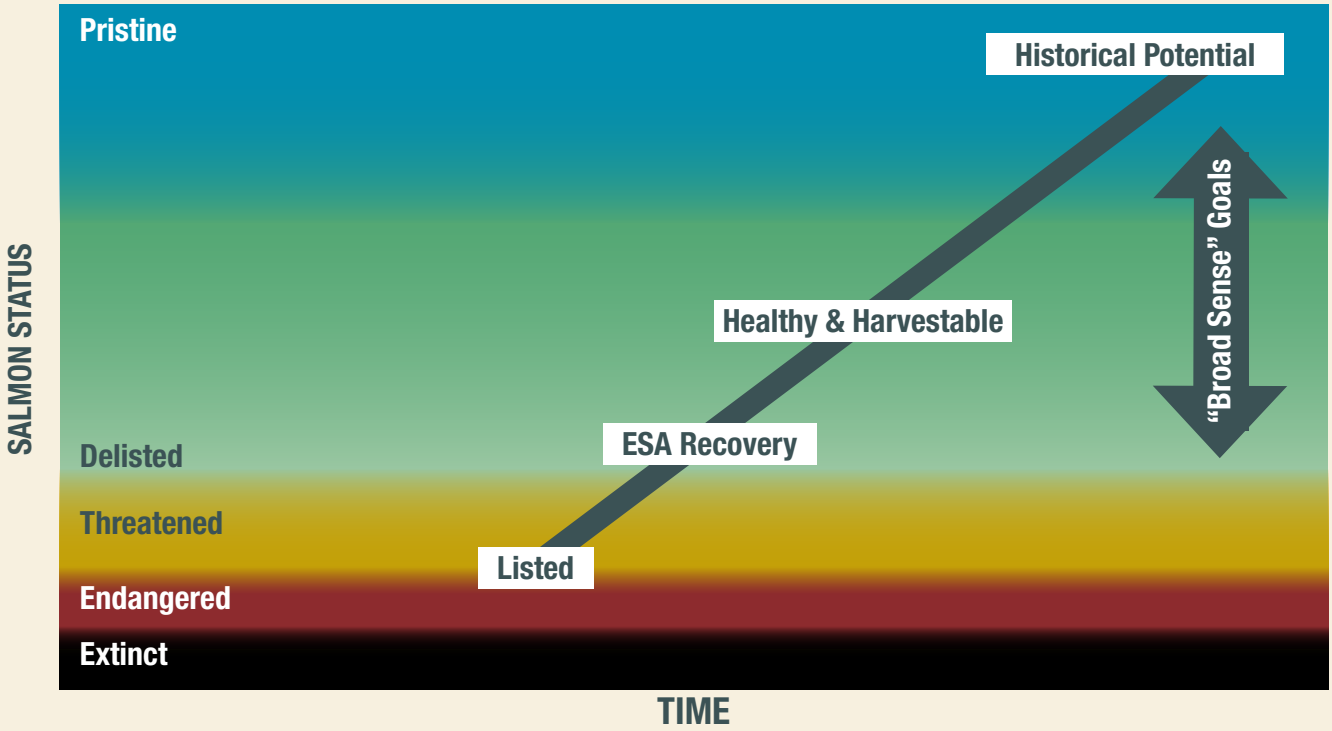
Concept of a Regional Partnership

In 2012, NOAA Fisheries commissioned two neutral, university-based institutions to assess the views of states, tribes, federal agencies, and other stakeholders as to how the region should pursue long-term salmon and steelhead recovery goals. Through an interview-based process, the Oregon Consensus Program at Portland State University and the William D. Ruckelshaus Center at the University of Washington consulted more than 200 stakeholders and federal, state, and tribal government representatives and managers for their insights on past, current, and future approaches to salmon and steelhead recovery.

The Oregon Consensus Program and Ruckelshaus Center issued their final report of that work, the *Columbia River Basin Salmon and Steelhead Long-Term Recovery Situation Assessment*[3] (Situation Assessment), in December 2013. In the report, many respondents voiced support for addressing salmon and steelhead recovery in a more coherent, integrated, and efficient way. Many participants also expressed the desire for bold leadership, noting their frustration with two decades of institutional gridlock and the absence of common goals.

[3] https://s3.wp.wsu.edu/uploads/sites/2180/2013/06/ColumbiaRiverBasinSalmonandSteelheadLong-TermRecoverySituationAssessment-FinalReport_000.pdf.

FIGURE 2. Relationship of types of goals relative to a continuum of fish status ranging from extinct to pristine.



The Task Force grew out of these findings. NOAA Fisheries convened the Task Force under and with the approval of the Marine Fisheries Advisory Committee (MAFAC) to bring together people from across the salmon and steelhead landscape. For the first time managers, stakeholders, and representatives of many different interests came together to consider the full range of salmon and steelhead needs, impacts, and perspectives — scientific, biological, social, cultural, and economic. The recommendations of the Task Force are intended to establish a vision of what we want for our salmon and steelhead, and what we want from them, in a set of shared goals for these iconic fish.

Recommendations to the Marine Fisheries Advisory Committee

Over the past two years, the 28 members of this Task Force, representing a diversity of managers and stakeholders across the Columbia Basin, have worked diligently and sincerely to develop shared long-term goals for Columbia Basin salmon and steelhead. This report presents the work of the Task Force to describe those shared goals, expressed as value statements (qualitative goals) and as the range of potential abundance levels for the 24 distinct stocks of salmon and steelhead in the Columbia Basin (quantitative goals). The Task Force adopted these goals as provisional in March 2019. This means that Task Force members agree to them in principle and support these goals being further explored in a second phase of this effort. The Task Force forwarded these recommendations on provisional goals to the MAFAC for their consideration. MAFAC reviewed and discussed the provisional goals and approved them in late April 2019, and is recommending these goals to the NOAA Fisheries Administrator. Furthermore, MAFAC has extended the term of the Task Force to conduct the Phase 2 work including developing options and recommendations for how the goals could be achieved.

The Task Force is forwarding these recommendations on provisional goals to the MAFAC for their consideration and to further recommend these goals to the NOAA Fisheries Administrator.

Moving Forward with a Sense of Urgency

The Columbia River and its tributaries, including its largest tributary, the Snake River, drain a watershed of 258,500 square miles (669,500 square kilometers) that reaches across seven states (Oregon, Washington, Idaho, Montana, Nevada, Wyoming, and Utah) and into British Columbia.

Sockeye salmon.
Credit: Thomas Kline/Design Pics Inc.

SALMON AND STEELHEAD RECOVERY UNDER THE ENDANGERED SPECIES ACT

Thirteen salmon and steelhead species in the Columbia Basin are listed under the Endangered Species Act (ESA). Recovery plans developed for these ESA-listed species — often through locally led, science-driven processes that included federal, state, tribal, and county representatives and other stakeholders — provide recovery direction that meets the needs of the fish and people. ESA recovery plans are roadmaps to rebuilding the natural populations and ecosystems upon which they depend so the species are self-sustaining in the wild for the long term and, thus, no longer need ESA protection.

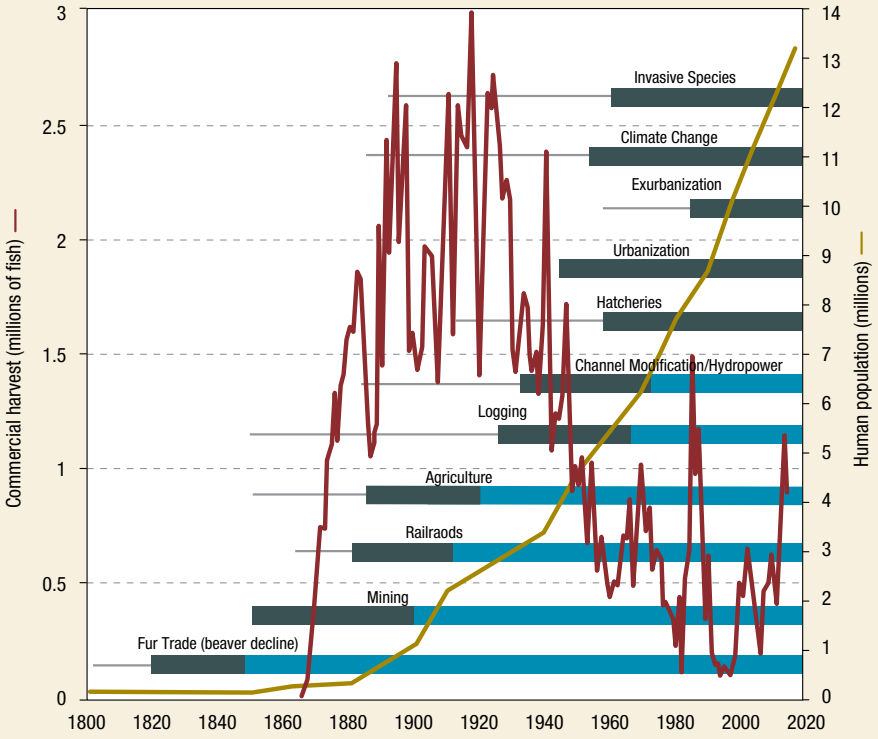
For these ESA-listed salmon and steelhead, the regional priority remains achieving ESA delisting, which represents the low end of the CBP Task Force's recommended goals. Numerous partners are currently engaged in implementing hundreds of recovery actions across the Columbia Basin. In Washington State, for example, recovery boards, directed by county, city, tribal, and citizen representatives, and advised by federal, state, and tribal scientists, are engaged in aggressive recovery efforts. The CBP Task Force goals build on this critical recovery work, embracing the momentum and commitment of the many partners recovering ESA-listed salmon and steelhead across the Columbia landscape.

Many of these ESA recovery plans also identify broad sense goals, which describe other social, cultural, economic, and ecological values beyond ESA. These broad sense goals are the basis of the CBP Task Force healthy and harvestable goals for those species.

The vast river system once supported massive runs of salmon and steelhead, which traversed its estuary and traveled hundreds of miles inland to populate the majority of its tributaries (Figure 1). Historical abundance is uncertain, but estimates of adult fish per year (~mid 1800s) range from 5–9 million (ISAB 2015), to 7.5–8.9 million (Chapman 1986), to 8.3 million (PFMC 1979), and to 10–16 million (NPCC 1986).

Current salmon and steelhead runs of the Columbia Basin number only about 2.3 million fish (2008–17), with the majority of these from hatchery production. Thirteen of the Columbia Basin species are listed under the ESA. Numerous factors have contributed to the species' decline, and it will take a concerted effort across the salmon and steelhead life cycle to recover them to healthy and harvestable levels (Figure 3). Some salmon and steelhead runs have improved from what they were in the 1990s, in large part due to numerous partners who are currently engaged in implementing hundreds of recovery actions across the Columbia Basin. Still, we have a long way to go to address the many challenges facing these treasured species.

FIGURE 3. Human population growth and activities in Columbia Basin compared to commercial landings of salmon and steelhead (adapted from Penaluna et al. 2016).



Data sources: Columbia River commercial harvest numbers from ODFW, WDFW, and ISAB (2015); human population growth from U.S. Census data for Oregon, Washington, and Idaho; and hatchery timeframe from National Research Council (1998). Records of commercial landings do not completely reflect historical abundance but are used here because historical numbers for salmon and steelhead abundance do not exist.

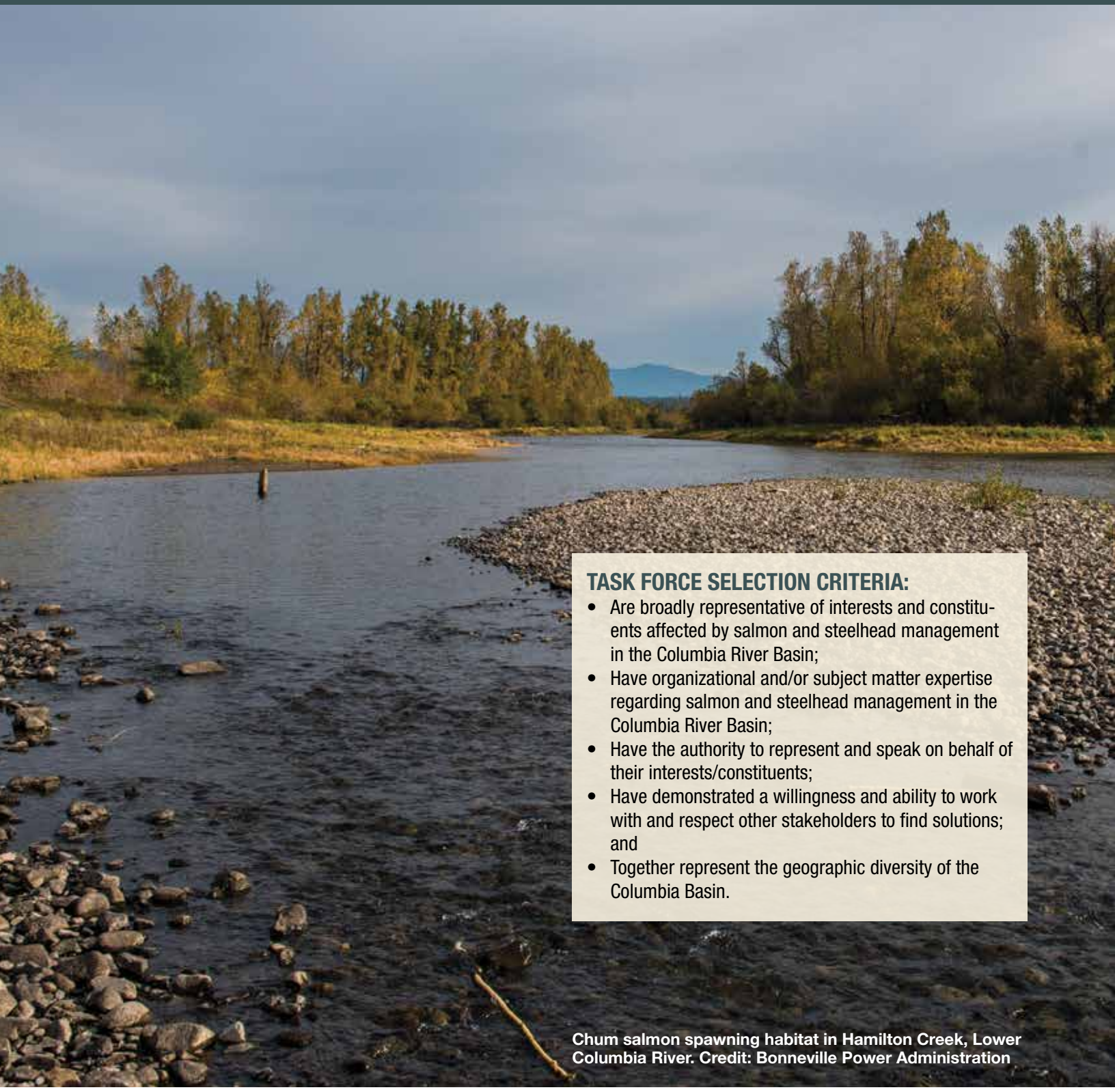
While the work of the Task Force looks ahead to envision salmon and steelhead runs 100 years from now, members also recognize that there is both an urgent need as well as an *opportunity* to act today. The work of the Task Force highlights the potential — and challenge — before us to ensure that salmon and steelhead can persist long into the future. Starting now on a common path toward achieving healthy and harvestable levels of salmon and steelhead will enrich the lives of many people, including tribes, recreational and commercial fishers, and rural business owners and employees dependent on salmon and steelhead fishing. The longer that "fish" potential goes unrealized, so too will the opportunity to revitalize salmon and steelhead-dependent communities in the Columbia Basin be delayed.

This urgency is not just for the benefit of people of the Columbia Basin. Salmon and steelhead are a critical component of a complex ecosystem and food web for many species. Critically endangered Southern Resident killer whales, as one urgent example, depend upon a diversity and abundance of salmon stocks up and down the West Coast, including many from the Columbia Basin, to provide the food they need at certain times of the year. Consequently, efforts now underway to save the endangered killer whales include working with salmon management partners in the Columbia Basin.

The Task Force recognizes the many interdependencies of salmon and steelhead in the fabric of our landscape and culture. It embraces the need to work collectively and decisively on a common path towards shared goals and a better future.

Based on my short tenure with the Partnership, I am most impressed with the dialogue amongst the stakeholders and sovereigns. It is professional, respectful, and honest. Continued interaction like this is our best hope for success.

— Jim McKenna, *State of Oregon*



TASK FORCE SELECTION CRITERIA:

- Are broadly representative of interests and constituents affected by salmon and steelhead management in the Columbia River Basin;
- Have organizational and/or subject matter expertise regarding salmon and steelhead management in the Columbia River Basin;
- Have the authority to represent and speak on behalf of their interests/constituents;
- Have demonstrated a willingness and ability to work with and respect other stakeholders to find solutions; and
- Together represent the geographic diversity of the Columbia Basin.

Chum salmon spawning habitat in Hamilton Creek, Lower Columbia River. Credit: Bonneville Power Administration

Building a Regional Partnership

Creation of the Columbia Basin Partnership Task Force addressed one of the key recommendations from the Oregon Consensus Program and the Ruckelshaus Center Situation Assessment — the need to make sure those in the Columbia Basin whose lives and futures are affected by decisions have an authentic role in developing the long-term goals for salmon and steelhead recovery. NOAA Fisheries, the Northwest Power and Conservation Council (representing the four Columbia Basin states), and other regional partners held informal discussions about the best way to address this finding. NOAA Fisheries was highlighted for its leadership role and agreed to pursue a comprehensive, collaborative effort to move forward.

Several steps ensued that led to the formation of the Task Force. In February 2015, the Northwest Power and Conservation Council (Council) agreed to align the objectives of the salmon and steelhead elements of its Fish and Wildlife Program with NOAA Fisheries' efforts to follow up on the Situation Assessment. Recognizing the importance of a shared vision among parties with overlapping and complementary missions, the Council tasked staff with compiling existing Columbia River Basin salmon and steelhead goals and objectives, beginning with goals for naturally produced salmon and steelhead. The information generated through this effort provided a foundation for the work of the Task Force.

NOAA Fisheries then began to address several important process considerations related to forming a group, including the need to comply with the Federal Advisory Committee Act (FACA). This Act formalizes processes for how agencies can receive objective advice from stakeholders. NOAA Fisheries presented the opportunity to its existing federal advisory group, the MAFAC, which agreed to support this goal-setting effort. The MAFAC determined that the best approach was to form a task force of experts and stakeholders from across the region under its existing FACA authorities. In the spring of 2016, the MAFAC officially approved the creation of the Columbia Basin Partnership Task Force and developed Terms of Reference to define its purpose and parameters (see Appendix C).

In the summer of 2016, NOAA Fisheries initiated a formal nominations process and identified criteria for Task Force members through a *Federal Register* notice (81 FR 47776) and other public announcements. Individuals and stakeholder organizations were asked to submit nominees who met the criteria and represented the broad array of interests in the region, particularly:

- NGO and environmental
- Commercial fishing
- Recreational fishing
- Utilities
- River industries
- Agricultural/irrigation
- Local salmon and steelhead recovery groups from each state

On behalf of the MAFAC, NOAA Fisheries also invited the governors of Idaho, Montana, Washington, and Oregon and the chairs of federally recognized tribes in the Columbia Basin to submit the names of individuals they wished to represent them as sovereign entities.

Twenty-eight individuals were selected from across the Columbia Basin region by MAFAC to serve on the Task Force for two years, according to the selection criteria and approved by the NOAA Fisheries' Assistant Administrator. The Task Force's in-depth work and recommendations provide necessary input for MAFAC to formalize its advice for NOAA consideration, per FACA processes.

I feel that the process the Columbia Basin Partnership facilitated allowed me the opportunity to "walk a mile in the shoes" of my partners. Partners who, like me, joined the group with deeply held yet diverse perspectives. — Mike Edmondson, *Idaho Governor's Office*

Yakama tribal fishers pulling nets from the Columbia River near Hood River, Oregon. Credit: Columbia River Inter-Tribal Fish Commission

Creating a Common Foundation

Salmon and steelhead contribute much to the identity of the Columbia Basin. They form the backbone of coastal communities, support jobs, and provide recreational opportunities for many people across social classes and geographic origins. Salmon and steelhead and the Columbia Basin ecosystem that supports them are also central to tribal culture, ceremony, and subsistence and are integral to their economy as the first fishers of the Columbia Basin. The Task Force members often reflected upon the importance of the fish for future generations and the landscape, and considered a broad array of values in developing work products. All of these interconnections to salmon and steelhead require that long-term, stable solutions consider the full range of interests and impacts. The range of interests represented at the Task Force embraced the many values of salmon and steelhead to our society, culture, economy, and ecosystem.

Recognizing the Many Values of Salmon and Steelhead and the Columbia River

Although our current landscape is significantly altered from pre-European settlement, salmon and steelhead continue to be an integral part of the fabric and identity of the Pacific Northwest. Writer Tim Egan once defined the Pacific Northwest as "*Wherever the salmon can get to.*" Salmon and steelhead are a major cultural icon for the entire region, and are woven into the lives and cultures of many communities throughout the Columbia River Basin.

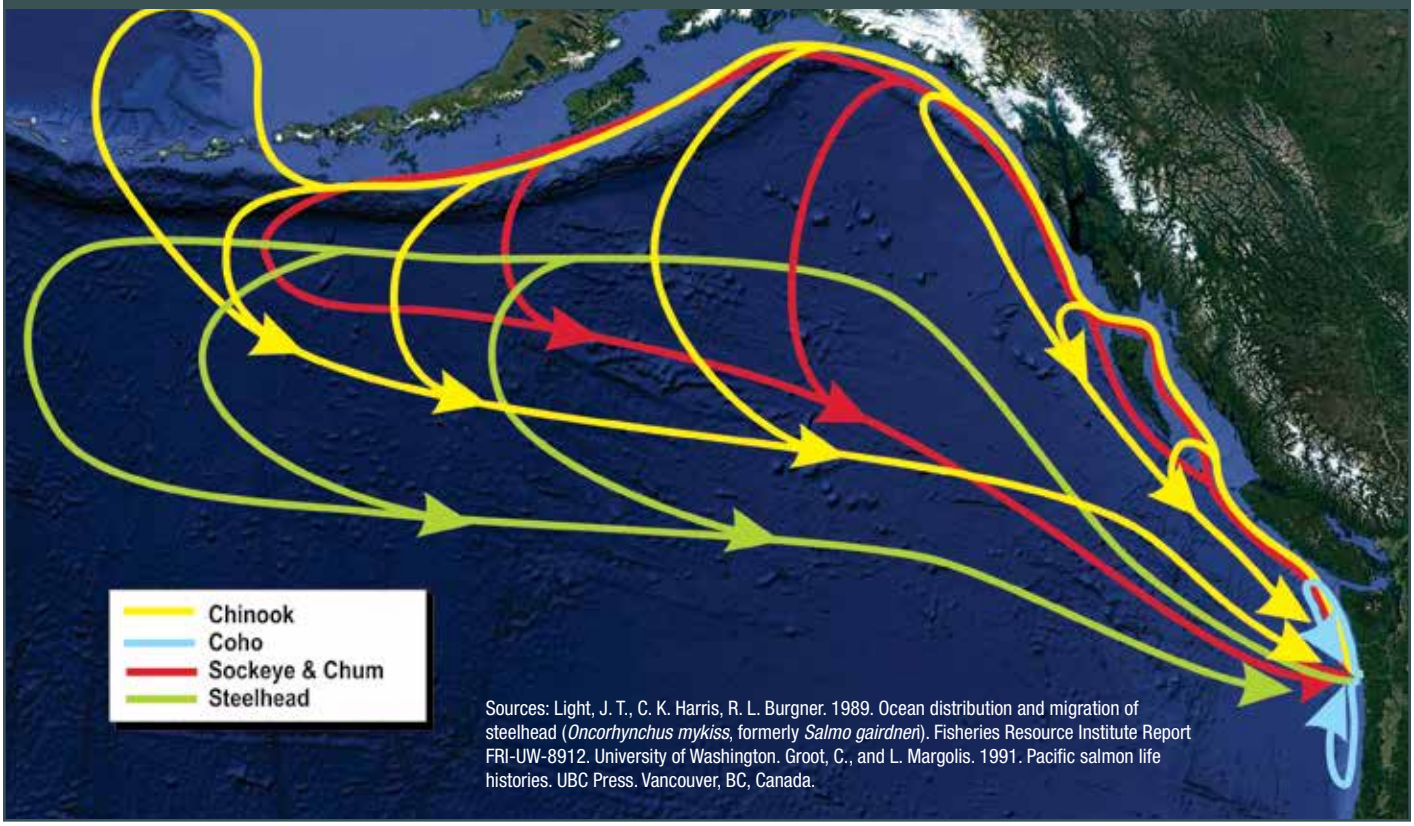
Unfortunately, the fish are now struggling. Recovering salmon and steelhead to healthy and harvestable levels is essential for multiple social, cultural, and ecological reasons. Because the Columbia River's runs are highly migratory, their value is disbursed over a wide geographical region in

Salmon troller off the North Oregon Coast.
Credit: NOAA Fisheries

Partnership members rolled up their sleeves and developed a strong shared purpose to restore salmon populations to the basin and also developed a genuine appreciation and understanding of each other's needs and interests resulting in transformation to a place of acceptance.

— Marla Harrison, *Port of Portland*

FIGURE 4. Ocean migration routes of Columbia River salmon runs.



Sources: Light, J. T., C. K. Harris, R. L. Burgner. 1989. Ocean distribution and migration of steelhead (*Oncorhynchus mykiss*, formerly *Salmo gairdneri*). Fisheries Resource Institute Report FRI-UW-8912. University of Washington. Groot, C., and L. Margolis. 1991. Pacific salmon life histories. UBC Press. Vancouver, BC, Canada.

the ocean, south from Central California to far north in the Gulf of Alaska, where salmon and steelhead harvests provide food, jobs, and economic value to many communities and support multiple food chains and ecosystems (Figure 4). The values of the river system impact the entire West Coast, including areas where salmon and steelhead no longer swim due to dams and blockages, such as in the Upper Columbia and Upper Snake Basins. They also include areas that never supported salmon and steelhead but now reap the benefits from the river's uses, including hydropower, transportation, and irrigation.

Fishery Values

Columbia River salmon and steelhead support long-standing and valuable fisheries throughout the Columbia Basin and in the ocean. Direct and indirect economic values of commercial, recreational, and subsistence fisheries are significant for many communities.

Commercial Fishing. Columbia River stocks of Chinook and coho salmon contribute to commercial fisheries in the Pacific Ocean off the coasts of Oregon, Washington, British Columbia, and Alaska. About 32 percent of the Chinook salmon in non-tribal commercial fisheries and 22 percent of the Chinook salmon harvested in tribal commercial fisheries north of Cape Falcon on the Oregon coast consist of Columbia River stocks. Columbia River stocks of Chinook salmon are a primary target of commercial fisheries in the Astoria area of northern Oregon and along the Washington coast. These stocks also account for about 28 percent of Chinook salmon harvested in the Southeast Alaska commercial fishery and about 7 percent of the commercial harvest of Chinook salmon harvested in British Columbia marine waters.

Commercial fisheries are tremendously important to tribal communities. For many tribal members, fishing is still the preferred livelihood, and Columbia River salmon and steelhead support essential commercial, ceremonial, and subsistence fisheries.

Based on annual data from 2008 to 2011, commercial fisheries (tribal and non-tribal) harvested 327,493 salmon and steelhead per year, worth $5,591,040 (ex-vessel value) annually within the Columbia Basin.[4] Washington and Oregon coastal commercial fisheries, where the contribution of

[4] Mitchell Act EIS, p. 4-178-179. For commercial harvesters (including both tribal and non-tribal), the ex-vessel value (i.e., the price received for the product at the dock) of salmon and steelhead provides a measure of its gross economic value. Ex-vessel value represents the direct benefits to the harvester and does not include additional economic benefits resulting from processing and sales associated with retail or restaurant markets. If the cost of fishing (e.g., equipment, fuel, boats, insurance) that commercial harvesters incur is considered, the resulting net income (ex-vessel value minus costs) provides a measure of net economic value.

Columbia River stocks is substantial, harvested another 129,208 fish with an estimated value of $2,635,952. These figures represent the income and employment from the harvester and processor stages only and do not include additional benefits resulting from sales associated with retail or restaurant markets.

From boat builders to seafood processors, commercial salmon and steelhead fishing generates an estimated 1,244 jobs, worth $57,457,390 in personal income to the Columbia Basin economy. Many of these jobs are indirectly generated by the salmon and steelhead fishing industry and occur in smaller coastal communities whose economies are heavily dependent on the fishery. For example, the Astoria, Oregon, and Ilwaco, Washington port areas were important salmon and steelhead processing centers, and declining harvests in the Columbia River have led to major declines in these industries.[5]

Recreational Fishing. Recreational fishing is also a major economic driver in the Pacific Northwest, especially in smaller rural communities. Most of this activity is inland, but significant ocean recreational salmon fisheries also exist in several smaller coastal ports. Economic benefits are shared across communities, from fishing guides to small bait-and-tackle store owners, boat dealers to local hotel proprietors, authors of printed fishing guides to local restaurants, and charter boat operators to outfitters. Steelhead account for about 45 percent (139,507 fish) of all salmon and steelhead caught in recreational fisheries in the Columbia River Basin (311,252 fish). A little more than half (161,313 fish) of the annual average recreational harvest of salmon and steelhead in the Columbia River Basin (305,168 fish) occurs in the Lower Columbia River and tributaries. Along the West Coast (including Southeast Alaska), coho and Chinook salmon contribute fairly evenly to recreational salmon fisheries, with an estimated 224,023 coho salmon and 224,058 Chinook salmon caught annually.[6]

The economic benefits from recreational catch of salmon and steelhead in the Columbia River Basin, based on data from 2008 to 2011, reflect an estimated 1,515,038 trips resulting in 305,705 fish and about $125,136,636 in trip-related expenditures.[7] Recreational catch and associated trips and expenditures tend to be highest in the Lower Columbia River and next highest in the lower Snake River where steelhead is the primary target species. About 18 percent of the recreational catch and expenditures are from the middle and lower Columbia River Basin. These trip expenditures contributed to $160,815,403 in personal income and 4,035 jobs. In addition to these trip expenditures, other expenditures for equipment (e.g., boats, rods and reels, tackle) also contribute to the economy. Sales of these durable goods are a primary source of income for many Oregon, Washington, and Idaho businesses. It is not known how such expenses on fishing-related equipment amortizes into trip-related expenditures.

Subsistence Fishing. As the primary food source for the Columbia Basin tribes for thousands of years, salmon and steelhead continue to provide an essential component of their nutritional health.[8] Many tribal members living within the Columbia Basin engage in subsistence fisheries as a foundation of their diets, with fish consumption rates far greater than non-native populations.[9] As discussed above, there are also important tribal commercial fisheries that provide livelihoods to tribal members.

The net economic benefit derived from commercial, recreational, and subsistence fisheries on Columbia Basin-origin salmon and steelhead is only one part of the total regional economic impact related to the health (or lack of health) of these stocks. Most coastal ocean salmon commercial and recreational fisheries are governed by "weak stock management" rules, under which the weakest stock becomes the limiting factor in all other intermingled ocean fisheries. Under weak stock management rules, severely depressed but intermingled Columbia Basin-origin salmon and steelhead stocks can trigger widespread coastal fisheries closures to protect the weakest stocks. In other words, harvest of more abundant stocks can be severely restricted whenever there are intermingling weak stocks present, particularly of those too depressed to safely allow even accidental harvest. Such weak stock management closures can cause major economic losses as a result of lost harvest opportunities of the more abundant stocks. These lost opportunities affect

[5] Mitchell Act EIS p. 3-84.

[6] Mitchell Act EIS p. 3-85. Based on data from 2002 through 2009.

[7] Mitchell Act EIS, p. 179-180. Recreational fishers' willingness to pay for their recreational fishing experience represents a measure of gross economic value associated with fishing for salmon or steelhead. Because recreational anglers also incur costs to fish (e.g., bait, tackle, lodging, guide fees, boat-related expenses, travel expenses, etc.), subtracting out these costs provides a measure of net economic value (i.e., net willingness to pay) for fishing opportunities.

[8] See *Wy-Kan-Ush-Mi Wa-Kish-Wit,* CRITFC's Spirit of the Salmon Plan.

[9] A survey by CRITFC concluded that the average fish consumption rate for members of Native American Tribes in the Columbia Basin was about 58.7 grams/day. A Fish Consumption Survey of the Umatilla, Nez Perce, Yakama, and Warm Springs Tribes in the Columbia Basin, CRITFC Technical Report 94-3 (Oct. 1994), available at: http://www.critfc.org/wp-content/uploads/2015/06/94-3report.pdf.

ocean coastal fisheries as far south as Central California and as far north as Southeast Alaska, as well as freshwater fisheries in the mainstem Columbia River and tributaries.

The overall trend in commercial salmon and steelhead landings has been downward since the late 1930s (although short-term increases were seen in the late 1980s and between 2001 and 2004).[10] The good news is that much of what has been lost over the past decades in salmon and steelhead economic contributions could be recaptured if efforts to improve abundance prove successful. One estimate is that restored salmon fisheries in the Columbia Basin could generate up to $500 million/year in additional regional personal income benefits and support up to 25,000 new family wage jobs.[11]

Other Resource Values

Today salmon and steelhead share much of their remaining habitat with cities, towns, farms, ranches, managed forests, and other land uses across the resource-rich Columbia Basin. The fish share a river migration corridor with a vast network of Northwest hydropower projects that serve many purposes including commercial navigation, electricity generation, recreation, irrigation, and municipal and industrial water supply. These developments have significantly impacted salmon and steelhead survival and habitat quality. They also make significant contributions to local communities and the Pacific Northwest economy, including:

Hydropower and Flood Control. Federal agencies have built 31 major multipurpose dams on the Columbia River and its tributaries. The hydropower generated from the federal projects, sold on the wholesale power market by the Bonneville Power Administration to public utility districts, rural electric cooperatives, municipal utility departments, and investor-owned utilities, provides about 28 percent of the electric power used in the Pacific Northwest. The federal dams also provide a critical function in flood control protecting homes, businesses, and livelihoods. More than 30 privately owned dams have also been built in the Basin and serve a variety of purposes.

Transportation. Over 50 million tons of cargo worth over $21 billion passes each year through the waterway, including over 9 million tons of cargo moving through the mainstem Columbia and Snake River dams and their federal navigation locks. The Columbia and Snake River system is the nation's top wheat export gateway, second in the nation for soy, and top on the West Coast for forest products and minerals exports. Over 50 percent of the nation's wheat moves out of the Lower Columbia River. Of all U.S. wheat exports, 17 percent travels through the dams on the Columbia River, and nearly 10 percent moves through the four lower Snake River dams, destined for oversea markets.[12]

Agriculture. Water storage and irrigation networks have helped transform arid portions of the Columbia Basin into rich agricultural areas. Many of these projects also have recreational, flood control, and power generation benefits. The Yakima Project, for example, has been a driving force in the economic status of the Yakima Valley since its inception in 1902. Today over 60 different irrigated crops, such as apples, mint, and hops, are valued at $1.3 billion annually in this subbasin alone.[13] The Columbia Basin Project in northeastern Washington produces over $1.27 billion worth of potatoes, sweet corn, and onions, as well as specialty crops like grapes, hops, fruit trees, and alfalfa.[14] In Idaho, over 300 irrigation districts and canal companies contribute water supplies for more than two million acres of irrigated Idaho farmland, which produce potatoes, vegetables, and dairy products valued at $6–7 billion annually.[15]

Ecological Values

The historic salmon and steelhead runs of the Columbia Basin did not exist in isolation; they were an integral part of a vast and intricate food web supporting many other species, spanning an area across the West Coast from San Diego to Southeast Alaska. Of note:

A Source of Food. Salmon and steelhead are a major or important food source not just for humans, but for at least 138 species of birds, mammals, amphibians, and reptiles native to the Pacific Northwest that have been identified by scientists as

[10] Mitchell Act EIS p 3-83.

[11] The Cost of Doing Nothing: The Economic Burden of Salmon Declines in the Columbia River Basin, Institute for Fisheries Resources (Oct. 1996), available at: http://pcffa.org/wp-content/uploads/2016/10/CDNReport-Columbia.pdf.

[12] Statistics sources: Waterborne Commerce of the United States (U.S. Army Corps of Engineers' Institute for Water Resources), U.S. Department of Agriculture. U.S. Census Foreign Trade Statistics. https://www.census.gov/foreign-trade/guide/index.html

[13] Source: https://www.usbr.gov/pn/project/brochures/fullyak.pdf.

[14] Source: https://www.usbr.gov/pn/project/brochures/columbiabasinproject.pdf.

[15] Source: Pacific Northwest Project 2015. The Economic Importance of Western Irrigated Agriculture, Family Farm Alliance Review. Figure 4. Baseline Production Data from National Agricultural Statistics Service (NASS), USDA, Annual Bulletins and NASS Census Data for 2012 (2013, 2014); and irrigation production estimates from Appendix tables 1 and 2, and methodology described in Pacific Northwest Project water resources-white paper. The Economic Importance of Western Irrigated Agriculture, Family Farm Alliance Review, 2015.

predators or scavengers of salmon and steelhead at one or more stages of the salmonid life cycle. Of this group of 138 species, nine have a strong, consistent relationship with salmon and steelhead, and another 58 have a recurrent relationship with the fish. Yet another 25 species have indirect relationships that depend upon healthy salmon and steelhead runs to support their direct prey base.[16]

Southern Resident killer whales depend almost exclusively on salmon, with various species comprising over 98 percent of their diet;[17] of that, roughly 80 percent is comprised of Chinook salmon. A lack of prey, principally Chinook, is among the greatest threats to Southern Resident killer whale recovery and survival. The science shows they are feeding on salmon off the outer coast of Washington, Oregon, and California between January and June, but that these whales concentrate near the mouth of the Columbia River at times that coincide with the return of spring Chinook.[18]

The 2008 NOAA Fisheries *Southern Resident Killer Whale Recovery Plan* states, "Perhaps the single greatest change in food availability for resident killer whales since the late 1800s has been the decline of salmon in the Columbia River Basin."[19] Given the potential for substantial salmon recovery in the Columbia River Basin, conservation efforts to rebuild natural Chinook populations, along with Chinook produced from Columbia Basin hatcheries, can contribute significantly to adequate and abundant prey for Southern Resident killer whale. Hatchery-produced Chinook are particularly important to supply prey in the near term while natural populations are rebuilding.

A Source of Nutrients. When they return to spawn, salmon and steelhead become a unique biological conveyor belt for nutrients from the ocean back to land. For example, an adult chum salmon returning to spawn contains an average of 130 grams of nitrogen, 20 grams of phosphorus and more than 20,000 kilojoules of energy in the form of protein and fat. A 250-meter reach of salmon stream in southeast Alaska receives more than 80 kilograms of nitrogen and 11 kilograms of phosphorous in the form of chum salmon tissue in just over one month.[20]

As the bodies of spawning salmon and steelhead break down, nitrogen, phosphorus, and other nutrients become available to streamside vegetation. According to Robert Naiman of the University of Washington, annual spawning migrations of salmon transport substantial quantities of marine-derived nutrients from the fertile North Pacific Ocean to freshwater and terrestrial ecosystems.[21] One study concludes that trees on the banks of salmon-stocked rivers grow more than three times faster than their counterparts along salmonid-free rivers. Growing side by side with the fish, Sitka spruce take only 86 years, rather the usual 300 years, to reach 50 cm thick.[22] However, a century of widespread salmon declines has brought this important natural nutrient recycling system down to an estimated 6 to 7 percent of historic marine nutrient recycling loads.[23]

Understanding the Challenges of Salmon and Steelhead Recovery

Given the complexity of salmon and steelhead management, a critical aspect of the Task Force process was to provide a common foundation of knowledge about fish management and needs across the complex life cycle. NOAA Fisheries held two public workshops to develop this common understanding of salmon and steelhead status, management approaches, and tribal treaty and trust responsibilities. During the workshops,

[16] Species numbers from introductory Abstract in Cederholm, C. J., D. H. Johnson, R. E. Bilby, L. G. Dominguez, A. M. Garrett, W. H. Graeber, E. L. Greda, M. D. Kunze, B. G. Marcot, J. F. Palmisano, R. W. Plotnikoff, W. G. Pearcy, C. A. Simenstad, and P. C. Trotter. 2000. Pacific Salmon and Wildlife – Ecological Contexts, Relationship, and Implications for Management. Special Edition Technical Report, Prepared for D. H. Johnson and T. A. O'Neil (Managing directors), Wildlife-Habitat Relationships in Oregon and Washington. WA Dept. of Fish & Wildlife, Olympia, WA. (Hereinafter "Pacific Salmon and Wildlife.)

[17] Ford MJ, Hempelmann J, Hanson MB, Ayres KL, Baird RW, Emmons CK, et al. (2016) Estimation of a Killer Whale (*Orcinus orca*) Population's Diet Using Sequencing Analysis of DNA from Feces. PLoS ONE 11(1): e0144956.doi:10.1371/journal.pone.0144956.

[18] Haneson MB, Emmons CK, Ward EJ (2013) Assessing the coastal occurrence of endangered killer whales using autonomous passive acoustic recorders. J. Acoustic Soc. Am. 134(5) 3486-3495.

[19] National Marine Fisheries Service (2008) Recovery Plan for Southern Resident Killer Whales (*Orcinus orca*). National Marine Fisheries Service, Northwest Region, Seattle, Washington. At: II-82.

[20] Scott M Gende, Thomas P. Quinn, Mary F. Wilson, Ron Heintz & Thomas M Scott (2004). Magnitude and Fate of Salmon-Derived Nutrients and Energy in a Coastal Stream Ecosystem, Journal of Freshwater Ecology, 19:1 (149-160), DOI:10.1080/02705060.2004.9664522; see also Bilby, Robert E; Beach, Eric W.; Fransen, Brian R.; Walter, Jason K.; Bisson, Peter A. Transfer of Nutrients from Spawning Salmon to Riparian Vegetation in Western Washington. Transactions of American Fisheries Society, July 2003, Vol.132(4), pp. 733-745.

[21] Naiman, R. J., J. M. Helfield, K. K. Bartz, D. C. Drake, J. M. Honea. 2009. Pacific Salmon, Marine-Derived Nutrients and the Characteristics of Aquatic and Riparian Ecosystems. Challenges for diadromous fishes in a global environment. Pages 395-425 in American Fisheries Society Symposium 69.

[22] Helfield, James M., "Effects of Salmon-Derived Nitrogen on Riparian Forest Growth and Implications for Stream Productivity"(2001). Environmental Sciences Faculty Publications. 19. https://cedar.wwu.edu/esci_facpubs/19; Reimchen, T., et al. 2003. Isotopic evidence for enrichment of salmon-derived nutrients in vegetation, soil and insects in riparian zones in coastal British Columbia. American Fisheries Society Symposium 34:59–69.

[23] Gresh, Ted; Jim Lichatowich; Peter Schoonmaker. An Estimation of Historical and Current Levels of Salmon Production in the Northwest Pacific Ecosystem: Evidence of a Nutrient Deficit in Freshwater Systems of the Pacific Northwest. Fisheries, Vol. 25(1) (2000), pp. 15-21.

After the first two meetings, I left those meetings thinking, there is no way this process is ever going to work, nor will it accomplish anything meaningful for my tribe let alone recovery within the Columbia River Basin. What has since impressed me was the folks around the table rolled up their sleeves and dove in and began a dialogue of working towards a common goal. — BJ Kieffer, *Spokane Tribe*

regional experts provided background presentations on harvest, hatchery, hydrosystem, and habitat management, as well as on recent species status and related scientific research, to over 100 attendees. These presentations are posted on the Task Force webpage: https://www.westcoast.fisheries.noaa.gov/columbia_river/index.html.

In addition, the Task Force identified major factors that influence salmon and steelhead recovery. These factors are associated with hydropower, habitat, hatcheries, harvest, and reintroduction of salmon and steelhead into blocked areas. Task Force members also discussed ecosystem benefits from recovery. Members brought their experience and expertise to the discussions, providing informative presentations on each issue. NOAA Fisheries staff also brought extensive expertise to these discussions. This breadth and depth of Task Force members' participation, and their interactions with NOAA staff, allowed the Task Force members to consider the Columbia Basin comprehensively and inclusively, including visualizing desired future conditions for salmon and steelhead within several future timeframes.

Developing Shared Interests

From the outset, the Task Force made a commit ment to foster the effort as a "collaborative and science-based forum to provide a shared definition of success for salmon and steelhead recovery." For many members, the Task Force process is their first time working directly with each other. In the past, many of the members have faced each other in the court room on opposing sides. In the Columbia Basin, never before has there been one table with all of these interests working with a shared purpose. And the investment each has in the outcome is significant. The commitment to work together established a common bond and sense of community around the table. Given a history of contention in the Columbia River Basin on a variety of salmon and steelhead-related issues, this level of commitment provides a unique opportunity for long-term salmon and steelhead recovery.

To foster a cooperative atmosphere and build trust and respect, NOAA Fisheries engaged neutral facilitation expertise to promote interest-based discussions. The Task Force facilitators encouraged Task Force members to listen, inquire, and understand each other's interests. Each meeting included time for several Task Force members to share their interests and hopes, addressing two questions:

- *How do people in your community view salmon and steelhead recovery efforts?*
- *How would you describe the key challenges, priorities, and opportunities you see for salmon and steelhead recovery?*

Over the course of six Task Force meetings, all Task Force members shared personal stories and experiences in response to these prompts. This process encouraged members to step into one another's shoes and more deeply understand the wide range of interests, values, and concerns shared by members. In addition, the Task Force meetings were structured to allow participants time to thoroughly express their points of view, ask questions to explore varied interests and understand the root of differences, and develop creative solutions to meet all interests. As a result, members fostered greater respect and understanding for the multitude of interests and values of those who care about the future of the Columbia Basin and found ways to positively move forward.

This open and forthright atmosphere highlighted the commitment, experience, and collective wisdom among members. Members regularly expressed appreciation for respectful discussions about difficult challenges. Many members acknowledged the Task Force as a forum that recognized everyone's interests, while providing an opportunity to look honestly and openly at the current landscape and toward a future for the Columbia Basin with healthy and abundant salmon and steelhead. As the Task Force continued to meet, the approach allowed members to seek common interests and develop a shared vision. With the fish as a common bond, Task Force members fostered the trust and respect essential to finding solutions and synergies.

Boats docked at marina in Westport, Washington.
Credit: NOAA Fisheries

SAMPLES OF DECLARED HOPES AND EXPECTATIONS FROM THE FIRST MEETING OF THE TASK FORCE:

- Educate task force members on the cultural and spiritual role salmon and steelhead have on people's lives, including treaty/trust responsibility, and that the Columbia Basin provides direct food resources to hundreds of communities.
- Salmon is an icon of magic, hope, and renewal in the Pacific Northwest; this aspect should be integrated to sustain cultural significance.
- This process can be used to establish and build relationships based on transparency, trust, and accountability to move forward together.
- The hope is that this process will help increase communication amongst members to avoid unnecessary litigation in the future.
- Success is working together to support, explain, and argue passionately to defend the outcomes of this process in any venue, friendly or unfriendly, public or private.
- This process provides the opportunity to listen, learn, and offer expertise as well as to approach issues from each other's perspectives to meet all interests.
- Identify a solution that works towards long-term, lasting, and sustainable change for all interests at the table.

What has struck me most about the Columbia Basin Partnership is the strong desire and commitment by all Task Force members to achieve success. That success is not defined by winners and losers, but by healthy rivers and wild salmon; a vision we are all committed to seeing come true. — Ben Enticknap, *OCEANA*

Chum salmon in salmon redd, or spawning bed. Credit: Peter Mather

The First People of the Columbia Basin: A Tribal Perspective on Developing Shared Goals

This chapter was provided by the tribal members of the Task Force to share their perspective on the development of salmon and steelhead recovery goals for the Columbia River Basin.

More Than a Tradition

The tribal delegates to the Columbia Basin Partnership Task Force represent a contingent of diverse sovereign nations that have existed in the Columbia Basin since time immemorial. The rivers and tributaries of the Columbia and Snake Basins have always provided for our people's needs. We are of this land, and as sovereign tribal nations, we are distinct in our connection to it. Anadromous and native fish, including the five species of Pacific salmon, steelhead, Pacific lamprey, white sturgeon, and eulachon, are part of our identity. They are our relatives, and we participate on this Task Force as part of our sacred responsibility to speak for those who cannot.

These fish and the Columbia Basin ecosystem are central to tribal culture, ceremony, and subsistence. They have always been a fundamental component of our tribal economies and trade. The rivers and the fish have taught us many lessons. We are honored and take seriously the opportunity to share our ways and to teach these lessons to those who will listen. We accept that compromise is necessary to bring about a better environment and a better future for the fish, but we will not compromise our identity, and we will never cease to be tribal members.

While the participating tribes of the Task Force share different relationships and agreements with the United States federal government and one another, we are aligned in the perspective that salmon and steelhead are more than a vibrant

Yakama fisher dipnetting from a scaffold along the Klickitat River in Washington. Credit: Columbia River Inter-Tribal Fish Commission

The Task Force is an opportunity to meet and interact with a diverse and knowledgeable group of people with an interest in NW Salmon recovery.

— Joe Lukas, *Western Montana Electric Generating and Transmission Cooperative*

cultural or spiritual tradition. The participating tribes of the Task Force agree that we have a sacred duty to salmon and steelhead — indeed all the natural resources in the Columbia Basin. We believe that if you take care of the resources, the resources will take care of you. A common tribal perspective is that we are borrowing these resources from future generations.

Our participation on the Task Force is contingent on the honoring of tribal treaty and trust responsibilities/obligations and the Task Force's continued engagement to help restore and care for what has been diminished, conceded, or lost. To this end, the participating tribal delegates want to be forthright in our perspective of how the Columbia Basin moves forward to achieve the Qualitative and Provisional Quantitative Goals presented in this document.

No False Equivalencies in Achieving Recovery

Participants on the Task Force have developed provisional "broad sense" recovery goals to address long-term conservation, harvest, and mitigation needs for Columbia Basin salmon and steelhead. It has been clear to us that no members of the Task Force want to see Columbia Basin salmon and steelhead go extinct or live in an endless cycle of adversarial litigation.

To accomplish the broad sense goals presented in this document, we must identify the factors that are within our control to improve salmon and steelhead survival. This requires change and compromise. For tribal nations, the inherent challenge with being in a working group like the Task Force is the overarching principle of fair play and compromise. All members of the Task Force need to be open minded and willing to compromise. The tribal perspective is unique, in that our history has been one of a continuous and unabated loss of resources. Conversely, other sovereign and stakeholder participants' histories show significant, measurable resource gains, even if they can identify a period of decline in their recent histories or if their constituents are frustrated or fatigued by salmon and steelhead mitigation that is perceived to have demonstrated little in the way of recovery.

Over the last 200 years, tribal resource losses, including reduced availability of salmon and steelhead, are a direct consequence of the resource gains of others in the Columbia Basin. It is a false equivalency to propose that all parties on the Task Force should be willing to give up equally, because historical gain/loss balances weigh heavily against tribes. This is especially true for the many tribal nations that no longer have anadromous fish returning to their homelands.

As we move toward testing these provisional broad sense goals, we are looking for zero-loss compromises and win-win solutions. The tribal nations are not willing to accept the normalization of the *status quo* and do not concede our long-term tribal goals for salmon and steelhead restoration, including restoring passage to blocked regions of the Columbia River Basin that historically supported anadromous fish. We will continue to look for the shared responsibility and accountability for this resource into the future.

Moving Baselines and the Future

The pristine potential of the Columbia Basin is the basis for long-term tribal goals for salmon and steelhead restoration; however, it is important to articulate that the tribes are looking to the future, not striving to return the Columbia Basin to 19th century conditions. We now live in a society that relies heavily on hydropower production and economies associated with it, but the salmon and steelhead are showing us that the balance of this relationship is skewed. The people of the Pacific Northwest, including British Columbia and Alaska, ask a lot of these fish. In some places, we have already asked too much. The Task Force can change this conversation and determine what we can do to help these fish recover.

The participating tribes of the Task Force have been sensitive to the establishment of Provisional Quantitative Goals with concern that some escapement objectives may reset baselines to levels of already degraded conditions. However, for tribal

Together, we've built the relationships, knowledge, information, and empathy to move on to bold and durable solutions. — Liz Hamilton, *Northwest Sport Fishing Industry Association*

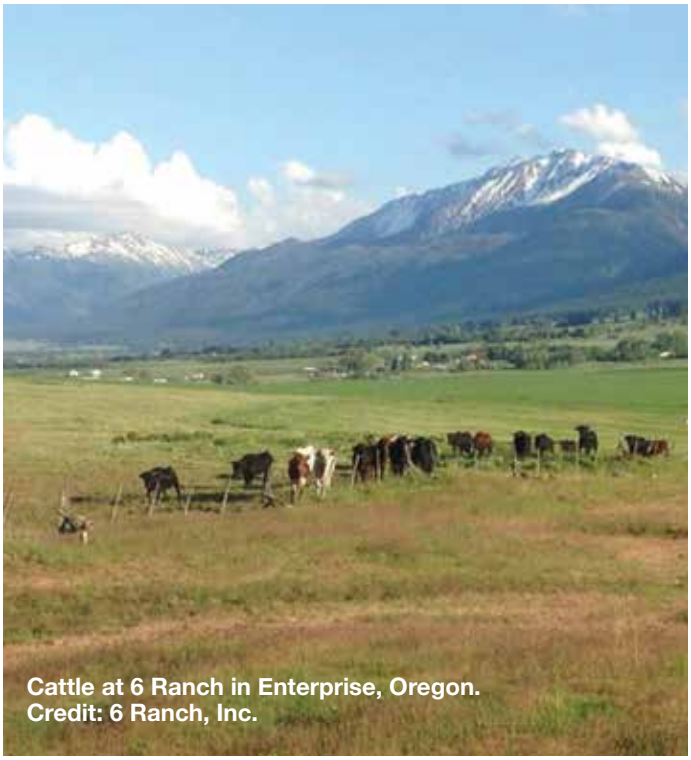
nations that no longer have returning salmon and steelhead, they have everything to gain from this process. We view the Task Force provisional goals as a step in the right direction and in line with long-term tribal recovery goals.

Moving Forward

We are encouraged by the relationships that have been built, and the respectful dialogue that has ensued between the sovereigns and stakeholders of this Task Force. It is promising that the members of the Task Force are not just focused on the *status quo* or merely achieving ESA-delisting goals, but rather focused on the future potential of the entirety of the Columbia Basin.

With or without the Task Force, the tribes will continue their work to return fish to rivers and heal the Columbia Basin ecosystem. Achieving the goals set forth in this document however, will require coordinated long-term commitment and investment by sovereigns and stakeholders alike. With respect to salmon and steelhead recovery, we recognize that there are many things outside of our control, including ocean conditions and climate change. However, there are undoubtedly many things on the landscape that are within our control, and we must evaluate and implement the critical actions that can move us toward achieving these broad sense provisional goals.

As has been our agreement since the beginning, we will continue to speak on behalf of the fish and the ecosystem we have always been in partnership with. We offer this perspective to invite readers of this document to view the Columbia Basin from the tribal lens. Like the salmon and steelhead, the tribes have adapted to the challenges of the last 200 years and have persisted. As measures are implemented to achieve provisional goals, we are sensitive to the reality that Task Force members and their constituents will experience similar challenges to the ones that tribes have faced. We respect and honor your willingness to face those challenges. We look forward to continued collaboration and partnership with the Task Force.



Cattle at 6 Ranch in Enterprise, Oregon.
Credit: 6 Ranch, Inc.

Quantitative natural production goals are essential to drive strategy and action selection. — Rob Masonis, *Trout Unlimited*

Coming from Astoria at the mouth of the Columbia River, I have learned about concerns from those who live in the Upper Columbia. We seem to have more in common than not. — Steve Fick, *Fishhawk Fisheries*

Confederated Tribes of the Warm Springs Reservation's habitat restoration site on the Middle Fork John Day River, Oregon. Credit: Columbia River Inter-Tribal Fish Commission

Building a Collaborative Approach

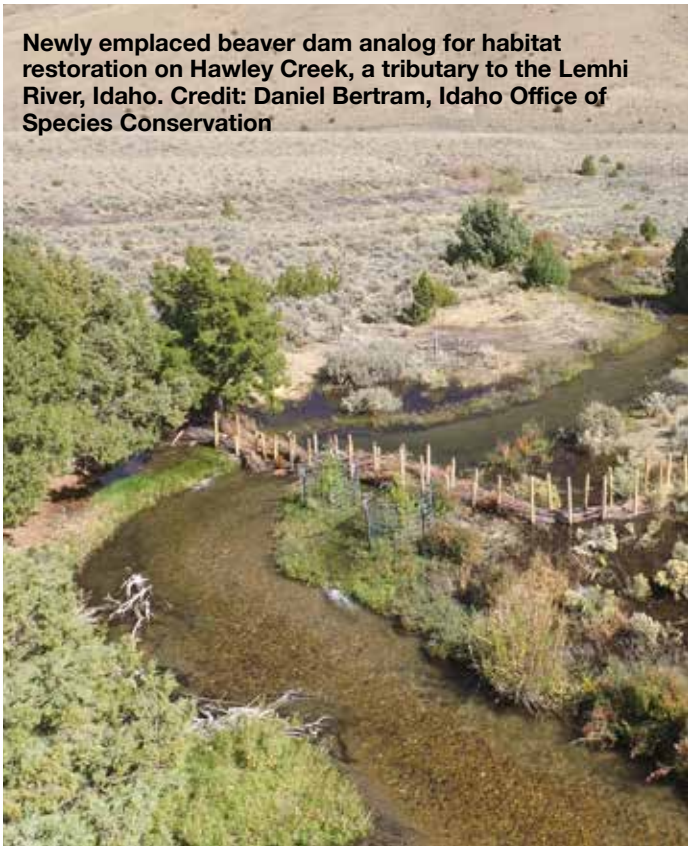
The Task Force employed a collaborative approach to ensure that all of the different interests represented around the table — and across the Columbia Basin — were fully heard and considered during group discussions.

Task Force Organization

NOAA Fisheries formally convened the Task Force on January 24–25, 2017. Among the first efforts of the Task Force was developing and agreeing to a set of Operating Principles that outlined how the group would conduct its work (see Appendix D). In addition, the Task Force developed and agreed to work plans that identified products and timeframes and established various teams to work on specific aspects of the work plan. Various teams developed draft work products, which were then considered and discussed by the full Task Force at meetings.

Task Force teams included:

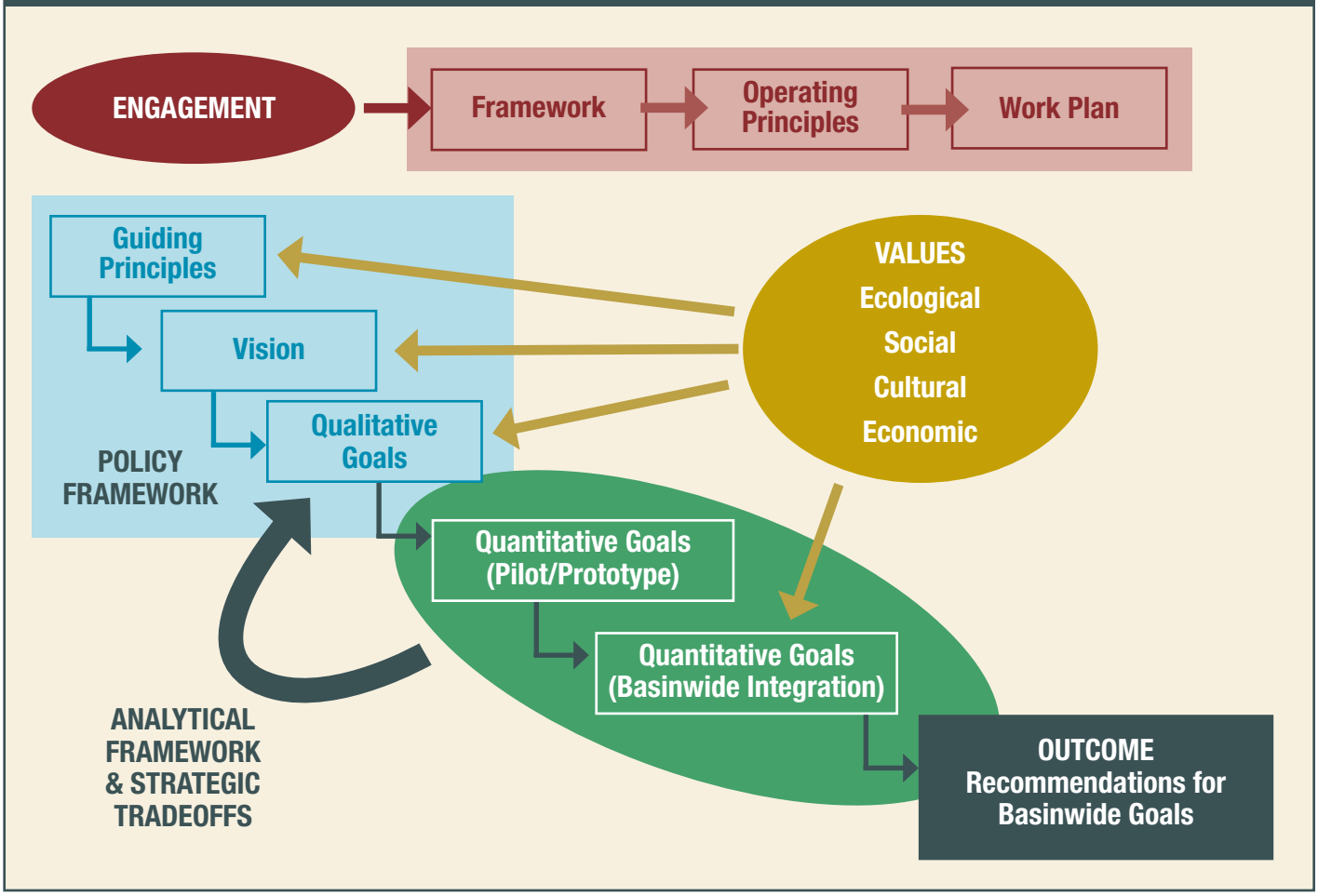
- A Coordinating Committee, which addressed identified agenda topics and approaches for the Task Force meetings.
- A Vision Team, which worked on honing the vision statement for review and discussion by the Task Force.
- A Qualitative Goals Team, which worked to refine the qualitative goals between Task Force meetings.
- An Integration Team, which worked on ways to consider the goals across species.
- Regional technical teams, which were geographically based and developed Provisional Quantitative Goals for each region.
- A Drafting Team, which worked on developing this report to reflect the work of the Task Force.



Newly emplaced beaver dam analog for habitat restoration on Hawley Creek, a tributary to the Lemhi River, Idaho. Credit: Daniel Bertram, Idaho Office of Species Conservation

The CBP is a breath of fresh air – finally a potential shift away from gridlock toward a cooperative and comprehensive salmon recovery effort. It will make a real difference! — Glen Spain, *Pacific Coast Federation of Fishermen's Association.*

FIGURE 5. The major work products that form the Task Force recommendations.



Major Work Products

The Task Force developed several major products: Guiding Principles, a Vision Statement, Qualitative Goals, and Provisional Quantitative Goals. These products address all salmon and steelhead species in the United States portion of the Columbia River Basin, including all its tributaries, ESA-listed and non-listed salmon and steelhead, and historical anadromous production areas that are currently blocked by dams.

The Guiding Principles, Vision Statement, and Qualitative Goals together form the policy framework of the Task Force. The policy framework was intended to inform the analytical work of the Task Force, including the development of Quantitative Goals. All of these products together form the final recommendations of the Task Force (Figure 5).

Qualitative Goals reflect statements of purpose or outcomes consistent with the overarching vision for Columbia Basin salmon and steelhead. They describe our ecological, social, cultural, and economic values, and reflect desired outcomes in terms of human experience, opportunity, and biological status of the Columbia Basin environment. The Qualitative Goals reflect the Guiding Principles and Vision, and serve as a foundation for development of Quantitative Goals. The Qualitative Goals team worked to write and refine the Qualitative Goals over multiple iterations, with many opportunities for Task Force members to provide feedback. The Qualitative Goals are described later in this report.

Quantitative Goals are measurable and specific conditions that would indicate whether a qualitative goal has been achieved. Quantitative Goals translate qualitative outcomes into numerical values. In this report, we use the term Quantitative Goals, to refer to the quantitative natural production goals, the quantified anticipated hatchery production, and quantified potential harvest.

The Task Force originally intended to develop Quantitative Goals for naturally produced salmon and steelhead, for hatchery production, and for harvest and fisheries. As the work of the Task Force

I've appreciated being a part of a diverse group who first listened to each other to gain understanding and then worked together to find solutions. — Liza Jane McAlister, *6 Ranch, Inc.*

proceeded, the group determined that additional time, evaluation, and integration among the goal categories was needed to complete Quantitative Goals for hatchery production and for harvest and fisheries. Therefore, this report reflects Provisional Quantitative Goals for natural production for salmon and steelhead in the U.S. portion of the Columbia River Basin and its tributaries, including listed and non-listed salmon and steelhead, and some historical production areas that are currently blocked. For hatchery production, this report reflects information on current and anticipated hatchery production. For harvest and fisheries, it reflects potential harvest under several scenarios. Additional work to refine, integrate, and align the goals for hatchery production and for harvest and fisheries with the natural production goals will occur in the next phase of the Task Force process.

To develop Quantitative Goals and access the abundance of available data, NOAA Fisheries convened regional technical teams with significant experience in the subject area to support the Task Force effort. Each team addressed salmon and steelhead stocks in a particular region of the Columbia Basin: Upper Columbia, Snake, Middle Columbia, Lower Columbia, and Willamette River Basins. Team members generally included staff from states, tribes, NOAA Fisheries, and local experts. Each regional team operated under the Guiding Principles set by the Task Force, including the principle that recommendations be firmly grounded in sound science.

Early in the effort to develop Quantitative Goals, regional technical teams conducted pilot studies to identify goals for particular salmon and steelhead stocks. These pilot efforts for five prototype stocks were presented to the entire Task Force to determine the most appropriate approach for goal-setting for all Columbia Basin runs.

Teams identified Provisional Quantitative Goals in several categories (natural production, harvest, hatchery production, and total number of adults returning to the mouth and to specific regions of the Columbia River, called the "run" size) for each stock. For each category, they also developed goals in low, medium, and high ranges that reflect a continuum of aspiration for progressive improvements to be achieved over an extended time period.

The teams developed the Quantitative Goals to consider a number of factors, including ESA delisting requirements, habitat constraints and natural production potential, tribal treaty obligations and cultural needs, fishing interests and sustainability, and mitigation responsibilities, including in currently blocked historical anadromous production areas. Additionally, teams were careful to critically consider and make use of related goals identified in the variety of recovery, management, and mitigation plans that exist in the Basin. This report summarizes the approach and method used to develop each set of Provisional Quantitative Goals. Appendix A presents the Provisional Quantitative Goals details by stock. These goals will be refined in the next phase of this effort.

Guiding Principles

The Task Force developed Guiding Principles early in the process to capture the spirit of openness, fairness, transparency, and respect among the members. These Guiding Principles were unanimously adopted at the June 2018 meeting of the Task Force.

TASK FORCE GUIDING PRINCIPLES

- **FAIRNESS:** Foster a culture of respect, equity and generosity and be accountable for our interests.
- **OPENNESS & TRANSPARENCY:** Everything is on the table — recognize yours and others' needs, acknowledge fears, threats, and limitations to success, and be willing to re-evaluate them together.
- **OBLIGATIONS & RESPONSIBILITIES:** Honor legal, statutory, treaty/trust and regulatory obligations, rights, and responsibilities.
- **CLARITY:** Collaboratively arrive at solutions that improve regulatory and legal certainty.
- **SUSTAINABILITY:** Strive for durable and practical outcomes, seeking clarity while acknowledging a dynamic social/cultural, economic, and natural landscape.
- **KNOWLEDGE & WISDOM:** Ground decisions and recommendations in science, while accepting that science may not be definitive.
- **INNOVATION & ADAPTIVENESS:** Plan for the long term, act in the short term, and be bold in the face of uncertainty and change.
- **INTERCONNECTION & COMPLEXITY:** Envision a healthy and resilient ecosystem. Assume there are multiple solutions to resolving Basin issues.

The Task Force defines the multiple lenses that folks view salmon and steelhead restoration in the Columbia River Basin. — Zach Penney, *Columbia River Inter-Tribal Fish Committee (CRITFC).*

Vision

The Task Force devoted significant time and care to the creation of an overarching Vision statement to capture the many views and uses of the Columbia River Basin represented by the group, as well as the hopes of each Task Force member for the future of our region. For over one year, each Task Force meeting included an opportunity to review the draft Vision statement, such that Task Force members could reflect on the importance of each word and suggest ways for the group to reach consensus. The word cloud below reflects the nature of the discussions leading up to the Vision statement.

The final Vision statement was unanimously adopted at the June 2018 meeting.

VISION FOR THE COLUMBIA BASIN

A healthy Columbia River Basin ecosystem with thriving salmon and steelhead that are indicators of clean and abundant water, reliable and clean energy, a robust regional economy, and vibrant cultural and spiritual traditions, all interdependent and existing in harmony.

The CBP Task Force is a unique forum that built success with broad representation, honest and respectful dialogue, and region-wide technical contributions.

— Guy Norman, *State of Washington*

The CBP Task Force has provided an opportunity to include goals for the entire Columbia Basin all the way to the U.S./Canadian Border.

— Randy Friedlander, *Colville Tribes*

Coho salmon. Credit: John McMillan

Qualitative Goals

Qualitative Goals capture our different ecological, social, cultural, and economic values, and reflect desired outcomes in terms of human experience, opportunity, and the biological status of the Columbia Basin environment. They describe changes over time in support of the larger Vision and provide context for the Provisional Quantitative Goals, which are measurable, specific, numeric values that indicate whether a Qualitative Goal has been achieved.

Overview

The Task Force identified several Qualitative Goals to clarify an approach to achieve their Vision for the Columbia Basin. These Qualitative Goals recognize the need to integrate and balance sometimes competing values and purposes.

TASK FORCE QUALITATIVE GOALS:

1. Restore salmon and steelhead in the Columbia Basin to healthy and harvestable/fishable levels.
2. Provide diverse, productive, and dependable tribal and non-tribal harvest and fishing opportunities for Columbia Basin salmon and steelhead in fresh and marine waters.
3. Produce hatchery salmon and steelhead to support conservation, mitigate for lost natural production, and support fisheries, in a manner that strategically aligns hatchery production with natural production recovery goals.
4. Make decisions within a broader context that reflects and considers effects to the full range of social, cultural, economic, and ecosystem values and diversity in the Columbia Basin.

In establishing its goals, the Task Force recognized both the need and opportunity to act today, while at the same time envisioning salmon and steelhead runs 100 years from now. The Task Force often reflected upon this sense of urgency needed to help the Columbia Basin runs, the people and communities that rely on them, and the wildlife, such as Southern Resident killer whales, that depend on them for survival.

The first three goals have a subset of goals that anticipates progress in 25, 50, and 100 years. These timeframes provide a general sense of how we might anticipate steady progress over time. However, they are not intended to reflect a starting or ending point for any particular action. Nor should long timelines ever be an excuse for postponing necessary measures. Actions should be taken as soon as practicable, wherever practical, and sustained for as long as necessary to achieve these goals. For some salmon and steelhead stocks, some subgoals may be attainable on a more rapid timeline, depending on the opportunity to take corrective actions to address them. Others will, by their very nature, take much longer to achieve. Overall, achieving our shared Vision of the desired future conditions for salmon and steelhead in the Columbia Basin will take a multitude of actions, starting immediately and in an orderly sequence. The sequence of actions will be better defined during the next phase of this effort.

The fourth goal does not include a timeframe because the values it describes are constant. Over time, the decisions that reflect those values may change, but the values themselves will not.

Together, the Qualitative Goals represent important values that need to be realized throughout the Columbia Basin for this effort to be successful. While each of these goals stands by itself, this does

not mean that they are mutually exclusive. Success will depend on the ability and willingness of the region to balance these goals.

As the Task Force moves into further exploring provisional goals in the next phase of this effort, discussions will focus on how to balance achievement of the Qualitative Goals on a stock-specific basis. Different Qualitative Goals may be prioritized for individual stocks. Ultimately, the stock-specific strategies will be combined and evaluated to determine if they will achieve benefits to the natural resource and people interacting with that resource, in harmony, as contemplated by the Task Force Vision.

Goal 1: Natural Production

The natural production goal is to restore both listed and non-listed salmon and steelhead to "healthy and harvestable levels" (Table 1).

Within the natural production goal are five subgoals with corresponding temporal achievements. For ESA-listed fish, the first three subgoals reflect a progression from current population status to delisting to broad sense recovery. For non-listed fish, the progression is from current population status to broad sense recovery. The last two subgoals address spatial distribution, run timing, diversity, and resiliency, which are ongoing concerns as fish populations, both listed and non-listed, increase under the first three subgoals.

SubGoal 1A: Prevent Declines

Subgoal 1A is to reverse and prevent declines of listed and non-listed stocks within 25 years. It is assumed that under current conditions, some stocks are doing well while others are not. At a minimum, the first subgoal is to protect all stocks (listed and unlisted) from further decline and to reverse the trend for depleted stocks.

SubGoal 1B: Achieve ESA Delisting

For ESA-listed fish, it is assumed that progress on Subgoal 1A will lead to Subgoal 1B, which is to achieve ESA delisting, or recover the species to a point where they are no longer threatened or endangered. ESA recovery includes addressing all Viable Salmonid Population (VSP) parameters, including abundance, productivity, spatial structure, and diversity, as well as addressing the species' major threats to survival. The timeframes associated with this subgoal reflect the idea that not all stocks can be recovered at once. Thus, within 25 years, it is anticipated that some salmon and steelhead stocks will be delisted, followed by additional stocks within 50 years, and ESA delisting for all listed salmon and steelhead within 100 years. These goals are intended to build upon existing efforts towards ESA delisting and not to reset any specific timeline proposed in ESA recovery or other plans. Progress will take a concerted and comprehensive effort over many years. To date, progress has not been sufficient to delist any Columba Basin salmon or steelhead.

As ESA delisting occurs and ESA regulatory oversight is no longer a legal requirement for some stocks, NOAA Fisheries will continue to be an integral partner in the Columbia Basin, working with state, tribal, and federal co-managers to provide sustainable fishery management for salmon and steelhead under the Magnuson–Stevens Fishery Conservation and Management Act, including ongoing protections for salmon and steelhead habitat.

SubGoal 1C: Achieve Broad Sense Recovery

Subgoal 1C is to achieve broad sense recovery beyond ESA delisting to restore listed and unlisted salmon and steelhead to healthy and harvestable levels. Broad sense recovery typically is reflected in goals developed by stakeholders to go beyond the requirements for delisting under the ESA. Broad sense recovery efforts can address other legislative mandates or social, economic, and ecological values of having healthy, diverse salmon and steelhead populations.

SubGoal 1D: Expand Spatial and Temporal Range

Subgoal 1D is to expand spatial and temporal range, e.g., rebuild historical spatial distribution and run timing of salmon and steelhead at local and basin-wide scales, including in currently inaccessible areas within the historical range. The objectives of this subgoal are (1) to minimize the risk of extinction and maximize survival by ensuring that fish are broadly distributed and that their migration patterns are varied, to provide the greatest security against environmental disaster or change; and (2) to return fish into areas that have been blocked due to anthropogenic impacts. Goals were not considered or identified in areas that have historically been blocked by natural barriers (e.g., above Shoshone Falls in Idaho and Kootenai Falls in Montana).

In the Upper Columbia, studies to reintroduce salmon and steelhead are already underway. Within the next 25 years, it is assumed those studies will continue and over time, significant, measurable progress will be made toward rebuilding historical spatial distribution and run timing.

TABLE 1. Natural production goal and subgoals for Columbia Basin salmon and steelhead.

GOAL 1. Restore salmon and steelhead in the Columbia Basin to healthy and harvestable levels.			
Subgoals	Within 25 years	Within 50 years	Within 100 years
1-A. **Prevent Declines:** Reverse and prevent declines of both listed and unlisted salmon and steelhead.	a. Reverse and prevent declines of both listed and unlisted salmon and steelhead.		
1-B. **Achieve ESA Delisting:** Recover ESA-listed salmon and steelhead to a point where they are no longer threatened or endangered.	a. Achieve ESA delisting for at least some salmon ESUs and steelhead DPSs.	b. Achieve ESA delisting for additional salmon ESUs and steelhead DPSs.	c. Achieve ESA delisting for all listed salmon and steelhead.
1-C. **Achieve Broad Sense Recovery:** Restore listed and unlisted salmon and steelhead to healthy and harvestable levels.	a. Make significant, measurable progress toward broad sense recovery of all salmon and steelhead.	b. Achieve healthy and harvestable levels for some salmon and steelhead.	c. Achieve healthy and harvestable levels for all salmon and steelhead.
1–D. **Expand Spatial and Temporal Range:** Rebuild spatial distribution and run timing of salmon and steelhead at local and basinwide scales, including in currently inaccessible areas within the historical range.	a. Make significant, measurable progress toward rebuilding spatial distribution and run timing of salmon and steelhead at local and basinwide scales, including beginning to study, develop, and implement plans for restoring salmon and steelhead to currently inaccessible areas within their historical range.	b. Continue rebuilding spatial distribution and run timing of salmon and steelhead at local and basinwide scales, including in currently inaccessible areas within their historical range.	c. Complete rebuilding of spatial distribution and run timing of salmon and steelhead at local and basinwide scales, including in currently inaccessible areas within their historical range.
1-E. **Expand Diversity and Resiliency:** Rebuild salmon and steelhead runs that are adaptive and resilient to climate change and other environmental perturbations.	a. Rebuild salmon and steelhead runs that are adaptive and resilient to climate change and other environmental perturbations.	b. Continue rebuilding adaptive and resilient salmon and steelhead runs and proactively and adaptively manage for a changing climate.	c. Ensure continued resiliency of salmon and steelhead runs and continue to adaptively manage for a changing climate.

The Task Force is a unique, collaborative effort to bring a diverse, basin-wide stakeholder group together around a common vision for Columbia River salmon recovery. — Heath Heikkila, *Coastal Conservation Association*

The Upper Snake River Tribes have developed a long-term, phased approach to restoring anadromous fish to several major tributaries above the Hells Canyon Complex of hydropower projects in the Upper Snake River.[24] NOAA Fisheries' recovery plans for Snake River fall Chinook, spring/summer Chinook, and steelhead recommend exploring the feasibility of reintroduction above blocked areas to support broad sense recovery goals and, in the case of Snake River fall Chinook salmon, in the event it is necessary for ESA recovery.[25] However, the Task Force is advised that reintroduction of ESA-listed fish to historical habitat upstream of the Hells Canyon Complex needs to be consistent with Idaho state statute, which requires state consultation and approval. Consideration of restoring natural reproduction of anadromous fish throughout their historical distribution in the Upper Snake Basin, consistent with Subgoal 1D, will require broad regional discussions, and development of plans, guiding principles, and agreements among state and treaty tribe fishery co-managers, the Upper Snake River Tribes, and others (e.g., Idaho Power Company). The Task Force is committed to continuing discussion on this topic during the next phase of work.

Within 100 years, consistent with Subgoal 1D, it is anticipated there will be a complete rebuilding of spatial distribution and run timing in all areas of the Basin that historically have been home to anadromous fish.

As natural production increases and spatial and temporal ranges become more diverse, harvest and fishing opportunities may expand.

SubGoal 1E: Expand Diversity and Resiliency

Subgoal 1E is to expand biological diversity, including genetic and phenotypic (life history, behavioral, and morphological) diversity, so salmon and steelhead populations are more adaptive and resilient to climate change and other environmental perturbations. Increasing and maintaining biological diversity is critical to enable populations to adapt to major environmental changes, such as the warming climate and new hydrologic regimes. This subgoal further ensures that hatchery and harvest and fishing opportunity goals are aligned with natural production goals.

Goal 2: Harvest and Fishing Opportunity

The harvest and fishing opportunity goal is to provide diverse, productive, and dependable tribal treaty, other tribal, and non-tribal harvest and fishing opportunities for Columbia Basin salmon and steelhead in fresh and marine waters. Three subgoals are associated with harvest: (1) ensure sustainability, (2) optimize harvest and fishery opportunity, and (3) share benefits among citizens (Table 2).

In-river and ocean harvest is currently regulated and constrained by various state, federal, and tribal entities based on *U.S. v. Oregon*, *U.S. v. Washington*, and corresponding agreements; the Magnuson–Stevens Fishery Conservation and Management Act; the Pacific Salmon Treaty; the Marine Mammal Protection Act; the Endangered Species Act; and state statutes, regulations, and policies. Fisheries data show harvest rates have been reduced as wild stocks have declined. Moving forward in recovery, the presumption is that increased natural production will lead to fewer legal constraints, which then would result in increased and more consistent harvest and fishing opportunities for both hatchery and natural stocks. The overriding theme of Goal 2 is to optimize and align harvest and fishing opportunities when salmon and steelhead populations are thriving.

[24] http://www.uppersnakerivertribes.org/frg-usrtsproposedfisheriesresourcemanagementprogram_april-2018-2-2/

[25] The ESA recovery plan for Snake River fall Chinook salmon identified three potential pathways to ESA recovery: two via the single, extant population and one that would involve reestablishing the historical population above the Hells Canyon Complex. It identified one of the single-population scenarios as the most likely pathway to recovery but recommended pursuing opportunities for reestablishing natural production of fall Chinook salmon above the Hells Canyon Complex to contribute to broad sense recovery and in the event that achieving a single-population scenario consistent with ESA delisting proves infeasible or unsuccessful.

TABLE 2. Harvest and fishing opportunity goal and subgoals for Columbia Basin salmon and steelhead.

GOAL 2. Provide diverse, productive, and dependable tribal and non-tribal harvest and fishing opportunities for Columbia Basin salmon and steelhead in fresh and marine waters.			
Subgoals	Within 25 years	Within 50 years	Within 100 years
2-A. **Ensure Sustainability:** Manage harvest and fisheries at levels consistent with conserving natural salmon and steelhead populations	a. Ensure that fishery impacts on weak and listed stocks allow rebuilding of natural stocks and do not impede recovery.	b. Manage fisheries based on annual abundance to promote rebuilding of natural production and share the recovery burden.	c. Manage for optimum sustainable harvest and fishing opportunity as healthy stocks are restored.
2-B. **Optimize Harvest and Fishery Opportunity:** Optimize fishery opportunity and harvest of healthy natural and hatchery stocks based on availability.	a. Optimize fishery opportunity and access to harvestable surpluses of unlisted and hatchery stocks consistent with conservation.	b. Expand fishery opportunity concurrent with progress toward ESA delisting and broad sense recovery.	c. Fully realize harvest potential with increasing opportunity throughout the range of salmon and steelhead stocks.
2-C. **Share Benefits:** Realize all fishery obligations and share benefits among users.	a. Meet fishery obligations and share available harvest within the constraints imposed by conservation.	b. As constraints are reduced, move into focusing fisheries on sharing the benefits of increasing numbers of harvestable stocks.	c. Realize all fishery obligations and share benefits among users.

SubGoal 2A: Ensure Sustainability

Subgoal 2A is to manage harvest and fisheries at levels consistent with species status. Fishing levels are limited to low levels on weak or depleted stocks. Higher fishing levels can be allowed as status improves. The current management regime is to adjust harvest numbers up or down depending on numbers of returns (annual abundance). As natural populations increase, it is anticipated that fisheries will continue to be managed based on annual abundance to promote natural production and to share the burden of recovery. This will presumably result in gradually increased harvest and fishing opportunities as healthy stocks are restored, with the long-term goal of optimal sustainable harvest and fishing opportunity.

SubGoal 2B: Optimize Harvest and Fishing Opportunity

Subgoal 2B is to optimize fishery opportunity and harvest of healthy natural and hatchery stocks based on availability. In the short term, this means access to harvestable surpluses of unlisted and hatchery stocks. As natural production increases, harvest and fishing opportunities may expand.

SubGoal 2C: Share Benefits

Subgoal 2C is to realize all fishery obligations and share benefits among users in a manner consistent with the natural production goal and other constraints imposed by conservation needs. As natural production increases, the focus becomes sharing the benefits of harvestable stocks among tribal, non-tribal, commercial, and sport fishing users from across the Columbia Basin and elsewhere.

I've appreciated what I consider to be two significant achievements: (1) regional support for both the words and the quantitative goals related to salmon recovery, and (2) the collaboration and relationships which have come about in this very diverse group. Neither would have occurred without the CBP Task Force.

— Kristin Meira, *Pacific Northwest Waterways Association*

Goal 3: Hatchery/Mitigation

The hatchery/mitigation goal is to produce hatchery salmon and steelhead to support conservation, mitigate for lost natural production, and support fisheries, all in a manner that strategically aligns hatchery production with natural production recovery goals and is consistent with best available science.

Artificial production is an important tool for supporting conservation and providing fish for harvest and mitigation. Each hatchery subgoal requires consistency with natural production goals, and it is presumed that hatchery managers will use best management practices to achieve conservation needs.

SubGoal 3A: Support Natural Production

Subgoal 3A recognizes that hatcheries may be utilized to maintain, support, and restore abundance of natural populations. Hatchery fish can provide support for natural populations. For example, one common use is to release hatchery adults or juveniles in order to increase abundance of depressed natural populations (commonly referred to as supplementation).

SubGoal 3B: Mitigate for Lost Production and Support Fisheries

Subgoal 3B recognizes that hatchery fish are a tool to replace lost natural production and/or lost harvest and fishing opportunity, and contemplates that this tool will be important into the future until naturally reproducing fish recover. Some Columbia Basin hatchery production is mandated by law to mitigate for losses caused by dam construction and operation, while in other situations hatchery production is determined by agreement of the co-managers (states and tribes) to supply fisheries. These hatchery programs will be aligned with natural production goals on a stock-specific basis.

SubGoal 3C: Fish Protection

Subgoal 3C contemplates changes in hatchery management practices and programs over time based on best available science to minimize adverse impacts on natural salmon and steelhead. The intent of this subgoal is to contemplate a time when conservation hatcheries are not necessary.

Goal 4: Social, Cultural, Economic, and Ecosystem

Society today places a high value on protecting and preserving salmon and steelhead runs and their watersheds. The role that salmon and steelhead play in the overall health of Pacific Northwest ecosystems, and the economic and other non-monetary benefits, are better understood than in the past.

Goal 4 recommends making decisions within a broader context that reflects and considers effects to the full range of social, cultural, economic, and ecosystem values and diversity in the Columbia Basin (Table 4). These considerations are ongoing and, therefore, do not have any particular timeframe.

Most past development decisions were made without regard to their impacts on salmon and steelhead. Goal 4 takes a broader look at other salmon and steelhead social values. It stresses the importance of approaching decision-making in a holistic fashion, including but not limited to traditional economics. Goal 4 recognizes that many important social and cultural values, as well as major ecological values, represent important benefits to society as a whole. Although these values may be difficult to monetize, they are essential to the identity of the Columbia Basin.

Goal 4 recognizes that all of these values and benefits are interconnected, entwined, and to the extent that one suffers, they all suffer. Salmon and steelhead are the common denominator, an indicator, creating an important bond between humans, animals, and the ecosystem. Goal 4 asks decision makers to acknowledge and respect this interconnection.

SubGoal 4A: Consider Social Values

Social values are often underrepresented in decision-making. These are the criteria or general

TABLE 3. Hatchery/mitigation goal and subgoals for Columbia Basin salmon and steelhead.

GOAL 3. Produce hatchery salmon and steelhead to support conservation, mitigate for lost natural production, and support fisheries, in a manner that strategically aligns hatchery production with natural production recovery goals.			
Subgoals	Within 25 years	Within 50 years	Within 100 years
3-A. **Support Natural Production:** Utilize hatcheries to maintain, support and restore natural production where appropriate.	a. As appropriate, continue to utilize hatcheries to maintain, support, and restore at-risk populations, including those affected by climate change.	b. Use conservation hatchery strategies as needed to proactively address future threats, including climate change.	c. Achieve a future where conservation hatcheries are not necessary unless unforeseen natural events require an emergency response.
3-B. **Mitigate for Lost Production and Support Fisheries:** Produce hatchery fish to support tribal treaty/ trust responsibilities and meaningful fishery opportunities to mitigate for historical losses due to development and to enhance fisheries.	a. Make progress in reducing reliance on hatchery production for mitigation consistent with improvements in natural production.	b. Consider changes in hatchery objectives and production levels as overall fishery opportunities are maintained through increased fish abundance.	c. Achieve a future where we rely less on hatchery production for mitigation and fishery enhancement only when natural production has increased.
3-C. **Fish Protection:** Strategically align hatchery production with natural production recovery goals, consistent with tribal treaty/ trust responsibilities, and with other legal and mitigation requirements.	a. Continue to implement changes in hatchery practices and programs based on best available science (including, in some cases, changes in stocks or species produced) to minimize adverse effects of hatchery-origin salmon and steelhead on naturally produced salmon and steelhead.	b. Continue to refine hatchery production, strategies, and practices based on assessments of effectiveness and technology advances to minimize hatchery impacts on natural salmon and steelhead.	c. Reduce long-term hatchery impacts by rebuilding abundance, productivity, diversity, and distribution of natural salmon and steelhead.

I've really appreciated the robust exchange of information and views that has built some solid relationships and support for a shared vision for salmon across the Basin. That and the fact that people showed up time and time again to engage.

— Barry Thom, *NOAA Fisheries*

guidelines we use to assess our lives, set our priorities, and measure successes. They provide guidance to individuals and communities in assessing alternative courses of action and making decisions that will affect them and their futures. Subgoal 4A requires us to make salmon and steelhead restoration decisions that reflect a range of social values in all their diversity, including consideration of future generations.

SubGoal 4B: Consider Cultural Values

Salmon and steelhead are a major cultural icon for the entire region and are woven into the lives and cultures of many communities throughout the Columbia River Basin. Cultural values are the core principles shared by a community, and they may be customs, religion, practices, a set of beliefs, or shared values.

Nowhere is the connection between salmon, steelhead, and culture more direct than within the various tribal communities in the Pacific Northwest and Alaska. As described in the Tribal Perspective section, salmon, steelhead, and other native fish are an integral part of the tribal identity.

SubGoal 4C: Consider Economic Values

Salmon and/or steelhead fisheries dependent on the Columbia River Basin drive a vast, multi-million dollar fishing-based economy extending all the way south to central California, and north well into the Gulf of Alaska. Salmon and steelhead are a major source of high-quality food on America's tables and for export.

There are also a multitude of economic impacts and benefits derived from the past industrial development of the Columbia Basin, including the generation of hydropower, irrigation in the upper parts of the Basin, river transportation to and from the Port of Astoria to Lewiston, Idaho, and the supporting infrastructure for international shipping from Portland.

Subgoal 4C calls for future decisions about river management to recognize sharing of costs and benefits across economic sectors. It recognizes the great economic value of the Columbia River and its tributaries for other purposes, and the importance of this natural capital as a major driver of the present and future economy.

The Task Force acknowledges that many things will change in the Columbia Basin over the next 100 years. One of the values of this process is that fostering ongoing collaboration among different Columbia Basin partners will facilitate beneficial change for all interests over time.

SubGoal 4D: Consider Ecosystem Values

Subgoal 4D calls us to make future decisions that consider the role of salmon and steelhead in the whole ecosystem and support a full range of ecological benefits from restored runs, including the needs of dependent wildlife.

As noted previously in the report, the historic salmon and steelhead runs of the Columbia Basin did not exist in isolation; they were an integral part of (and a major support for) a vast and intricate food web supporting many other species. Spanning an area across the West Coast from San Diego to the Gulf of Alaska, salmon and steelhead are a major or important food source not just for humans, but for at least 138 other species of birds, mammals, amphibians, and reptiles native to the Pacific Northwest. For example, endangered Southern Resident killer whales are declining, in part due to lack of salmon coming from West Coast rivers, including the Columbia River. As noted previously, salmon and steelhead are likewise an important driver of the forest nutrient cycle that supports forest health and are important to the health of the region's saltwater estuaries.

TABLE 4. Social, cultural, economic, and ecosystem goal and subgoals for Columbia Basin salmon and steelhead.

GOAL 4. Make decisions within a broader context that reflects, and considers effects to, the full range of social, cultural, economic, and ecosystem values and diversity in the Columbia Basin.
4-A. Social Goal: Make decisions that reflect the social importance of salmon and steelhead to people throughout the Columbia Basin, recognizing the full range of social diversity and values that are present.
4-B. Cultural Goal: Make decisions that reflect the cultural importance of salmon and steelhead to people throughout the Columbia Basin, recognizing the full range of cultural values that are present.
4-C. Economic Goal: Make decisions that are based on the principle of equitable sharing of costs and benefits across economic sectors. Also, make decisions that recognize the great economic value of the Columbia River and its tributaries, and the importance of this natural capital as a major driver of the present and future economy for all in the Pacific Northwest.
4-D. Ecosystem Goal: Make decisions that consider the role of salmon and steelhead in the ecosystem and that support a full range of ecological benefits, including the needs of dependent wildlife.

Southern Resident killer whale. Credit: NOAA Fisheries

We are all very proud of successfully completing Phase 1 of our MAFAC CBP Task Force work. It is a shining example of how people from diverse points of view can gather together, establish friendships, understand problems and come up with goals that are the beginning of setting up the river basin ecosystem and the society that depends on it for survival into the coming centuries. — Urban Eberhart, *Kittitas Reclamation District*

The greatest value and benefit of the Task Force has been the relationships that have developed amongst many members and the mutual trust and respect generated from those relationships. — Jeff Grizzel, *Grant County Public Utility District*

Cruikshank Creek, a tributary to Upper Lemhi River, Upper Salmon Basin, Idaho. Newly emplaced beaver dam analog on river for habitat restoration. Credit: Daniel Bertram, Idaho Office of Species Conservation

Provisional Quantitative Goals

Quantitative goals are measurable and specific conditions that would indicate whether a qualitative goal described in the last chapter has been achieved. Quantitative goals translate qualitative outcomes into numerical values.

The Task Force originally intended to develop quantitative goals for naturally produced salmon and steelhead, hatchery production, and harvest and fisheries. As the work of the Task Force proceeded, the group determined that additional time, evaluation, and integration among the goal categories was needed to complete quantitative goals for hatchery production and for harvest and fisheries. Therefore, this report reflects Provisional Quantitative Goals for natural production for all salmon and steelhead in the U.S. portion of the Columbia River Basin and its tributaries, including listed and non-listed salmon and steelhead, and some historical production areas that are currently blocked. For hatchery production, this report reflects information on current and anticipated hatchery production; for harvest and fisheries, it reflects potential harvest under several scenarios. Additional work to refine, integrate, and align the goals for hatchery production and for harvest and fisheries with the Provisional Quantitative Goals for natural production will occur in the next phase of the Task Force process.

In this report, we use the term "Quantitative Goals" to refer to the Provisional Quantitative Goals for natural production, the quantified anticipated hatchery production, and quantified potential harvest. Below we describe the approach and methods used to develop and summarize the Quantitative Goals identified by the Task Force.

Overview

To develop the quantitative goals and access numerous data sources, NOAA Fisheries convened regional technical teams with subject matter and geographic expertise. A NOAA Fisheries project team provided technical guidance to the Task Force and the regional teams. Regional technical team members generally included staff from state and tribal entities and other Task Force member organizations. These regional teams operated under the Guiding Principles adopted by the Task Force, including the principle that all products be grounded in sound science. Where possible, the Quantitative Goals are based on existing goals established by state, federal, and tribal entities. All products developed by the technical teams were provided for Task Force consideration.

The goals are identified at the scale of 24 "stocks" defined for the purposes of the Task Force's goal-setting effort.[26] For each stock, regional technical teams identified Provisional Quantitative Goals for natural production, expressed in terms of adult abundance, and identified current and anticipated hatchery production, potential harvest, and total run size.[27] Provisional Quantitative Goals for natural production and numbers for potential harvest were identified in a series of ranges — low, medium, and high — that represent a continuum of decreased extinction risk and increased ecological and societal benefits. The Task Force recognizes that Provisional Quantitative Goals do not diminish the long-term desire and intent of some fish and wildlife managers to achieve even higher levels of abundance.

[26] For the purposes of the CBP Task Force, a stock is defined based on species (Chinook salmon, coho salmon, sockeye salmon, chum salmon, steelhead), region of origin (e.g., Lower Columbia, Middle Columbia, Upper Columbia, Snake, or Willamette) and run type (e.g. spring, summer, fall, late fall).

[27] Total *run-size goals* are aggregate numbers of salmon and steelhead that would be needed to meet natural production goals, provide for identified levels of harvest and fisheries, and meet anticipated hatchery production levels. They are identified at basin, species, and stock scales and used for evaluating status and goals relative to a variety of needs across the Basin.

Provisional Quantitative Goals for Natural Production. Provisional Quantitative Goals, referred to here as "Quantitative Goals" for natural production, are expressed as numbers of natural-origin spawners at the population level.[28] For listed salmon and steelhead, the low-range natural production goals are, in most cases, consistent with ESA delisting goals. Generally, this is defined as the abundance number consistent with a viable population (i.e., a population with a five percent risk of extinction over a 100-year timeframe). In some cases, however, ESA recovery plans identified an abundance target consistent with an ESA "recovery scenario." Under these scenarios, the abundance goal for a specific population might be higher or lower than the abundance number consistent with a viable population.[29] In these cases, the Task Force adopted the specific recovery plan abundance target for that population. For non-listed species, low-range goals were based on application of the same technical guidance used in ESA recovery plans to identify abundance levels consistent with a viable population. In some cases, non-listed populations are already meeting these low-range goals, and in these cases, the low-range goal serves as a reference point rather than a management goal.

High-range goals reflect "healthy and harvestable" levels that are consistent with the potential (i.e., restored) capacity of habitat. They are typically about three times greater than low-range goals, but generally are still 50 percent or less than historical average abundance estimates. Mid-range goals are approximately halfway between the low-range goals and the high-range goals for listed stocks. For unlisted stocks, mid-range goals are generally defined as the number of natural-origin spawners that could effectively use available habitat and sustain high levels of harvest.

For the Upper Columbia Basin, this report includes Provisional Quantitative Goals for natural production in historically accessible areas that are currently blocked. For the Upper Snake Basin, Provisional Quantitative Goals are not included at this time, as the Task Force did not reach agreement on numerical goals. Those considerations will require continued discussion by the Task Force during the next phase of work as well as a broad regional discussion, and development of plans, guiding principles, and agreements, among state and treaty tribe fishery co-managers, the Upper Snake River Tribes, and others (e.g., Idaho Power Company). For areas above tributary dams where plans for passage have been identified or are starting to be implemented through some other process (e.g., Cowlitz River, Lewis River, Willamette River tributaries, and Deschutes River), Provisional Quantitative Goals are included in this report. They are not included for areas above tributary dams where no formal plans for passage have been agreed to or where no goals have been identified through some other process (e.g., North Fork Clearwater River). Provisional Quantitative Goals were not considered or identified in areas that have been historically blocked by natural barriers (e.g., above Shoshone Falls in Idaho and Kootenai Falls in Montana).

Potential Harvest and Fisheries. Potential harvest and fishery levels are expressed in terms of numbers of fish harvested and harvest rates (the proportion of total adult salmon and steelhead that die as a result of fishing activity in a given year) by species and run type. To identify these numbers, regional technical teams used the abundance-based management plans that are currently in place under existing harvest management processes to project harvest levels and exploitation rates that would result if natural production increased consistent with the Provisional Quantitative Goals for natural production. The technical teams also identified aspirational harvest and fishery numbers and rates based on harvest that would be sustainable by healthy salmon and steelhead stocks. Healthy stocks would likely support higher harvest rates than those currently in place to protect weak or listed stocks. As noted above, additional work to refine, integrate, and align the goals for hatchery production and for harvest and fisheries with the Provisional Quantitative Goals for natural production will occur in the next phase of the Task Force process.

Anticipated Hatchery/Mitigation Production. Anticipated hatchery production is expressed as juvenile production levels and corresponding adult returns under existing conservation and mitigation programs throughout the Basin. Regional technical teams also identified anticipated additional hatchery production levels where they were defined in existing processes and plans (e.g., the John Day

[28] Natural-origin spawners are adult fish returning to spawn that were spawned and reared in the wild, regardless of parental origin (natural or hatchery). Goals are intended to be measured as 10-year geometric means. The geometric mean is defined as the nth root of n products. Geometric means are considered to be a better measure of central tendency for data such as fish abundance, which is typically highly skewed. The geometric mean smooths the contribution of periodic large run sizes which can inflate simple averages relative to typical population values. The 10-year period was selected because it represents an interval of sustained abundance across multiple generational cycle and is consistent with how NOAA Fisheries evaluates abundance.

[29] To achieve ESA recovery, not all populations are required to achieve "viability." Instead, a sufficient number of populations, identified based on spatial distribution, historical population size, historical productivity, diversity, and other factors must achieve viability, a few populations must achieve highly viable status, and others can be maintained at lower levels of viability.

Mitigation Program) or where they were proposed by Task Force members to address specific purposes (e.g., currently blocked historical anadromous production areas). As noted above, additional work to refine, integrate, and align the goals for hatchery production and for harvest and fisheries with the Provisional Quantitative Goals for natural production will occur in the next phase of the Task Force process.

Run-Size Goals. Run-size goals are aggregate numbers of salmon and steelhead that would be needed to meet the identified levels of natural production, potential harvest, and anticipated hatchery production. They are identified at basin, species, and stock scales and used for evaluating status and goals at regional and local spatial scales relative to a variety of needs across the Basin.

Approach

The Provisional Quantitative Goals are intended to complement goals identified by other entities throughout the region. This section describes the approach used to develop these goals.

Basis of Provisional Quantitative Goals: Existing Plans

The Provisional Quantitative Goals are based on the various conservation, recovery, management, and mitigation plans developed throughout the region to address various purposes and programs. In some cases, these plans contain different numerical goals identified by different entities for different purposes. The Task Force considered these different goals and integrated or reconciled them based on input from its regional technical teams. There were also instances where quantitative goals had not yet been identified for specific stocks or outcomes. In these cases, the Task Force identified appropriate values based on input from its regional technical teams.

Key sources of existing goals include:

ESA Recovery Plans. NOAA Fisheries has adopted ESA recovery plans for all listed salmon and steelhead in the Columbia River Basin (UCRSB 2007; NMFS 2013, 2015, 2017a, 2017b; ODFW and NMFS 2011). These plans were developed with local partners. The plans include objective, measurable criteria for delisting threatened or endangered salmon ESUs and steelhead DPSs. Delisting criteria include both biological criteria (for evaluating a species' demographic risk status) and threats criteria (for evaluating whether the threats to a species have been addressed). The biological criteria include criteria at the ESU/DPS, major population group,[30] and population levels. Population-level criteria include specific numerical goals for abundance, as well as goals for productivity, spatial structure, and diversity. Provisional Quantitative Goals for natural production are consistent with ESA delisting goals (with a few noted exceptions). In some cases, ESA recovery plans also include "broad sense recovery goals." These goals are generally defined by co-managers (state and tribal entities) or stakeholders and go beyond the requirements for ESA delisting to achieve even lower extinction risk and/or to address, for example, other legislative mandates or social, economic, and ecological values.[31]

Northwest Power and Conservation Council Fish and Wildlife Program. The Northwest Power and Conservation Council (Council) was established pursuant to the Pacific Northwest Electric Power Planning and Conservation Act of 1980. The Act authorizes the Council to serve as a comprehensive planning agency for energy, fish, and wildlife policy, and citizen involvement in the Columbia River Basin. Council members include the states of Idaho, Montana, Oregon, and Washington. The Council's Fish and Wildlife Program is intended to protect, mitigate, and enhance fish and wildlife affected by the development and operation of the hydroelectric dams in the Columbia River Basin. The majority of the program is funded by the Bonneville Power Administration.

The program includes qualitative goal statements and quantitative objectives. The quantitative objectives include increasing total adult salmon and steelhead abundance to an average of 5 million fish annually by 2025 in a manner that emphasizes the populations that originate above Bonneville Dam. More-specific objectives are identified for some populations in subbasin plans prepared by local groups for the Fish and Wildlife Program. The Council is currently considering adopting a comprehensive suite of quantitative objectives into the program. In support of this consideration, Council staff have compiled a comprehensive inventory of existing abundance goals at the population and aggregate levels, which is available in a

[30] Major population groups (MPG) are aggregates of independent populations within an ESU or DPS that share similar genetic and spatial characteristic and are important components of ESA delisting criteria and species status.

[31] In ESA recovery plans, NOAA Fisheries has stated our support for these broad sense goals, and our commitment, upon delisting, to work with co-managers and local stakeholders, using our non-ESA authorities, to pursue broad sense recovery goals while continuing to maintain robust natural populations. In some situations, is also appropriate to consider broad sense goals in designing ESA recovery strategies and scenarios.

web-accessible database https://www.nwcouncil.org/ext/maps/AFObjPrograms/. This database was a key reference for goals incorporated into the Task Force recommendations.

Tribal Plans. Tribal plans include the Spirit of the Salmon Plan *(Wy-Kan-Ush-Mi Wa-Kish-Wit)* as well as local plans developed by individual tribes. *Wy-Kan-Ush-Mi Wa-Kish-Wit* is a regional fish restoration plan adopted in 1995 and updated in 2014 by the Nez Perce, Umatilla, Warm Springs, and Yakama Tribes (CRITFC 2014). The plan includes several goals and objectives, including an objective to increase the total adult salmon and steelhead returns above Bonneville Dam to four million annually (by 2020), and in a manner that sustains natural production to support tribal commercial as well as ceremonial and subsistence harvests. In addition, the plan establishes a long-term objective to "restore anadromous fish to historical abundance in perpetuity."

A Nez Perce tribal fisheries managment plan (NPT 2014)[32] identifies specific abundance objectives and thresholds at the species and population levels for salmon and steelhead within Nez Perce tribal usual and accustomed fishing areas of the Snake River Basin, and corresponding hatchery and harvest strategies. The plan identifies viable, sustainable, and ecological escapement objectives for salmon and steelhead populations in the Snake River Basin. The viable abundance objectives are considered the minimum size at which a population maintains essential genetic diversity. They generally align with NOAA Fisheries' minimum abundance thresholds (and with the Task Force low-range Provisional Quantitative Goals for natural production). Sustainable escapement objectives describe the numbers of returning adults that would annually sustain spawning, as well as harvest for tribal and non-tribal fisheries. Sustainable objectives generally align with the Task Force high-range Provisional Quantitative Goals for natural production. Ecological escapement objectives refer to the escapement level at which sustainable spawning abundance for a population is maximized, the full utilization of available spawning and rearing habitat is promoted, and ecosystem-level processes (e.g., nutrient redistribution) for multiple species are fostered. Ecological escapement objectives describe a future desired condition that extends beyond the planning timeline used by the Task Force to develop Provisional Quantitative Goals. Ecological escapement objectives are referenced in this report for contextual purposes only.

The Upper Snake River Tribes (USRT), comprised of the Burns Paiute Tribe, Fort McDermitt Paiute and Shoshone Tribe, Shoshone–Bannock Tribes of the Fort Hall Reservation, and the Shoshone-Paiute Tribes of the Duck Valley Reservation, developed the *Hells Canyon Complex Fisheries Resource Management Plan* (USRT 2018).[33] This plan seeks to restore fishing opportunities through anadromous and resident fish management programs conducted in a phased approach in the Snake River and in significant tributaries (including the Bruneau/Jarbidge, Owyhee, Malheur, Boise, Payette, and Weiser Rivers). Restoration of these conservation and subsistence fisheries would be accomplished in a manner intended to complement the ongoing recovery efforts of anadromous and resident fish in the Upper Salmon River Basin.

The USRT Plan's tribal goals for numbers of adult fish, including Snake River spring/summer Chinook salmon, steelhead, and, eventually, fall Chinook salmon, anticipated in the watersheds above the Hells Canyon Complex (HCC), are long-term goals. In some instances, these tribal goals extend beyond the planning timeline used by the Task Force to develop the Provisional Quantitative Goals contained in this report. Although other co-managers in the Upper Snake River, including the states of Oregon and Idaho and the Nez Perce and Umatilla Tribes, are aware of these USRT tribal goals, they have not formally come to agreement on these goals at this time. USRT anticipates further discussion about these goals in the near future with the state and tribal co-managers within Oregon and Idaho, as well as with the Task Force during the next phase of this effort.

The Provisional Quantitative Goals for natural abundance also include goals for salmon and steelhead returning to the Columbia River upstream of Chief Joseph and Grand Coulee Dams, which currently block access to portions of the historical range of anadromous fish. The intent of these goals is to restore meaningful fishing opportunities in areas of historical use by the Colville and Spokane Tribes. The goals were developed by the Upper Columbia regional technical team, including staff from the Colville and Spokane Tribes. The goals were informed by estimates of numbers of fish historically available to tribal fisheries, including fish originating in both U.S. and Canadian waters. However, the goals do not apportion production into specific populations or geographic areas, nor do they make any assumptions, either explicit or implicit, regarding any future salmon or steelhead

[32] The NPT Tribal Fisheries Management Plan can be accessed at the following web location: http://www.nptfisheries.org/portals/0/images/dfrm/home/fisheries-management-plan-final-sm.pdf.
[33] The USRT Plan can be accessed at the following web location: http://www.uppersnakerivertribes.org/frg-usrtsproposedfisheriesresourcemanagementprogram_april-2018-2-2/

production in the Canadian portion of the Columbia River Basin. The goals represent only a fraction of the estimated historical production, and additional analysis would be needed to apportion production to different populations or geographic areas. As with all Quantitative Goals, these provisional numbers will be further explored and evaluated in the next phase of this Task Force effort.

State Plans. The states of Washington, Oregon, and Idaho have identified salmon and steelhead goals and related policies in a variety of forums. Task Force goals were intended to be consistent with related guidance in state plans and policies.

Washington established a series of regional salmon recovery boards that worked as partners to develop regional recovery plans in the Columbia Basin in conjunction with the Northwest Power and Conservation Council's subbasin planning process. These plans have been incorporated into NOAA Fisheries' ESA recovery plans. Guidance is also available in other state programs, plans, and policies. For instance, statewide policies have been developed by the Washington Department of Fish and Wildlife for some species, such as steelhead, and for hatchery operations and fisheries.

In Oregon, the Oregon Department of Fish and Wildlife led development of an overarching statewide conservation strategy to provide priorities for fish and wildlife. Oregon has also developed a number of conservation and recovery plans for specific regions. All of these plans have been incorporated into NOAA Fisheries' ESA recovery plans. Oregon's efforts are guided by statewide policies that have been adopted into regulation (e.g., the Native Fish Conservation Policy, OAR 635-007-0502, and the Fish Hatchery Management Policy, OAR 635-007-0542). Oregon is supporting recovery with a variety of related activities. The Oregon Watershed Enhancement Board is the state agency charged with directing funds for habitat activities supporting recovery.

Although Oregon's statewide goals and strategies call for recovery across species ranges — and NOAA Fisheries' recovery plans for Snake River fall Chinook, spring/summer Chinook, and steelhead recommend exploring the feasibility of reintroduction above blocked areas to minimize extinction risk and support broad sense recovery goals — a consensus between co-managers in the Snake River on specific quantitative goals for basins and areas upstream of Hells Canyon has not yet been reached in this phase. Oregon expects continued and robust discussions leading to the ultimate setting of these Quantitative Goals in the next phase of this Task Force effort.

Idaho participated with NOAA Fisheries and other federal agencies; the states of Washington and Oregon; the Nez Perce, Shoshone–Bannock, and Shoshone-Paiute Tribes; and other entities to develop ESA recovery plans for Snake River spring Chinook salmon, fall Chinook salmon, and steelhead. Idaho and other partners also worked with NOAA Fisheries to develop the ESA recovery plan for Snake River sockeye salmon. Policy and strategic guidance regarding state management of fish and fisheries is provided in multi-year management plans prepared by the Idaho Department of Fish and Game. In addition, the Idaho Legislature has created an Office of Species Conservation within the Office of the Governor to provide coordination, cooperation, and consultation among the state and federal agencies with ESA responsibilities in Idaho.

Hatchery/Mitigation Plans and Policies. A variety of plans and policies define goals and govern operation of the more than 80 hatchery facilities operated by federal and state agencies, tribes, and private interests to produce salmon and steelhead in the Columbia River Basin. While some hatcheries are operated for conservation purposes, others are operated for fisheries enhancement and many have dual purposes. Most hatcheries in the Columbia River Basin were initiated as mitigation to offset natural production losses caused by human development and activities. Major hatchery programs in the Columbia Basin have been developed under the Mitchell Act (1938); the Lower Snake River Compensation Plan (1976); the John Day Mitigation Program (1978); the Mid-Columbia Public Utility Districts (PUD) Habitat Conservation Plans, Settlement Agreements, and Biological Opinions; and the Northwest Power and Conservation Council Fish and Wildlife Program.

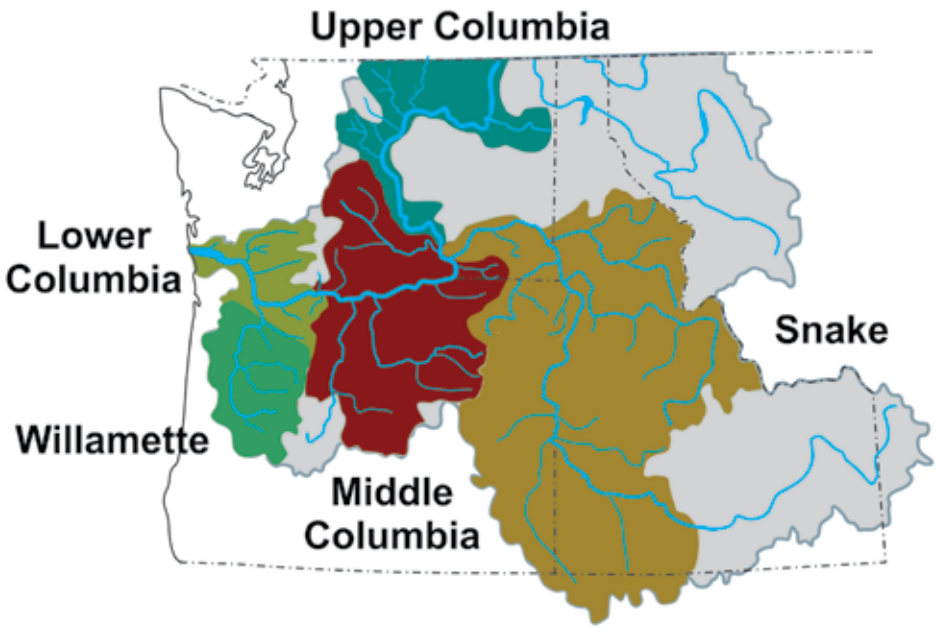
Fishery Management Plans. Fisheries for Columbia River salmon and steelhead are generally managed under four governmental/jurisdictional authorities, each of which provides some policy and planning guidance related to fishery goal setting. States and tribes are responsible for fishery management in waters under their specific jurisdictions. Columbia River mainstem fisheries are co-managed by the states, tribes, and the federal government, according to a management plan developed under U.S. District Federal Court direction in the *U.S. v. Oregon* Court case. Fisheries in marine waters under the jurisdiction of the United States (from 3 miles to 200 nautical miles offshore) are managed under the Pacific Fisheries Management Council (PFMC) process, according to authorities in the

Magnuson—Stevens Fisheries Conservation and Management Act. The Pacific Salmon Treaty governs harvest of salmon that swim across United States–Canada international borders.

Regional Technical Teams

NOAA Fisheries convened regional technical teams for the Upper Columbia, Snake, Middle Columbia, Lower Columbia, and Willamette River Basins to assist the Task Force in developing Provisional Quantitative Goals and provide other technical input (Figure 6). Initially, the technical teams focused on one stock per region, which served as prototypes to test concepts and better define information needs. The teams then expanded their efforts to address all stocks occurring in each region.

FIGURE 6. Areas addressed by regional technical teams.



NOAA Fisheries and the Task Force asked the regional technical teams to:

1. Review and refine stock definitions, including subject populations, hatchery production programs, and fisheries.
2. Summarize reference information for each stock, including current spawning escapements, historical production potential, numbers of hatchery fish produced, harvest rates, and run-size estimates.
3. Review and summarize existing natural escapement goals, hatchery production levels, harvest rates, and run sizes.
4. Develop options for integrating differing goals identified by various entities or for identifying additional quantitative goals where they had not been otherwise identified.
5. Provide technical documentation for the sources of existing goals and the basis of any new goals identified.

The technical teams operated under the Guiding Principles set by the Task Force, including the requirement to rely on best available science. The teams also considered consistency between Provisional Quantitative Goals and the Qualitative Goals identified by the Task Force. All technical team products were developed for consideration by the Task Force.

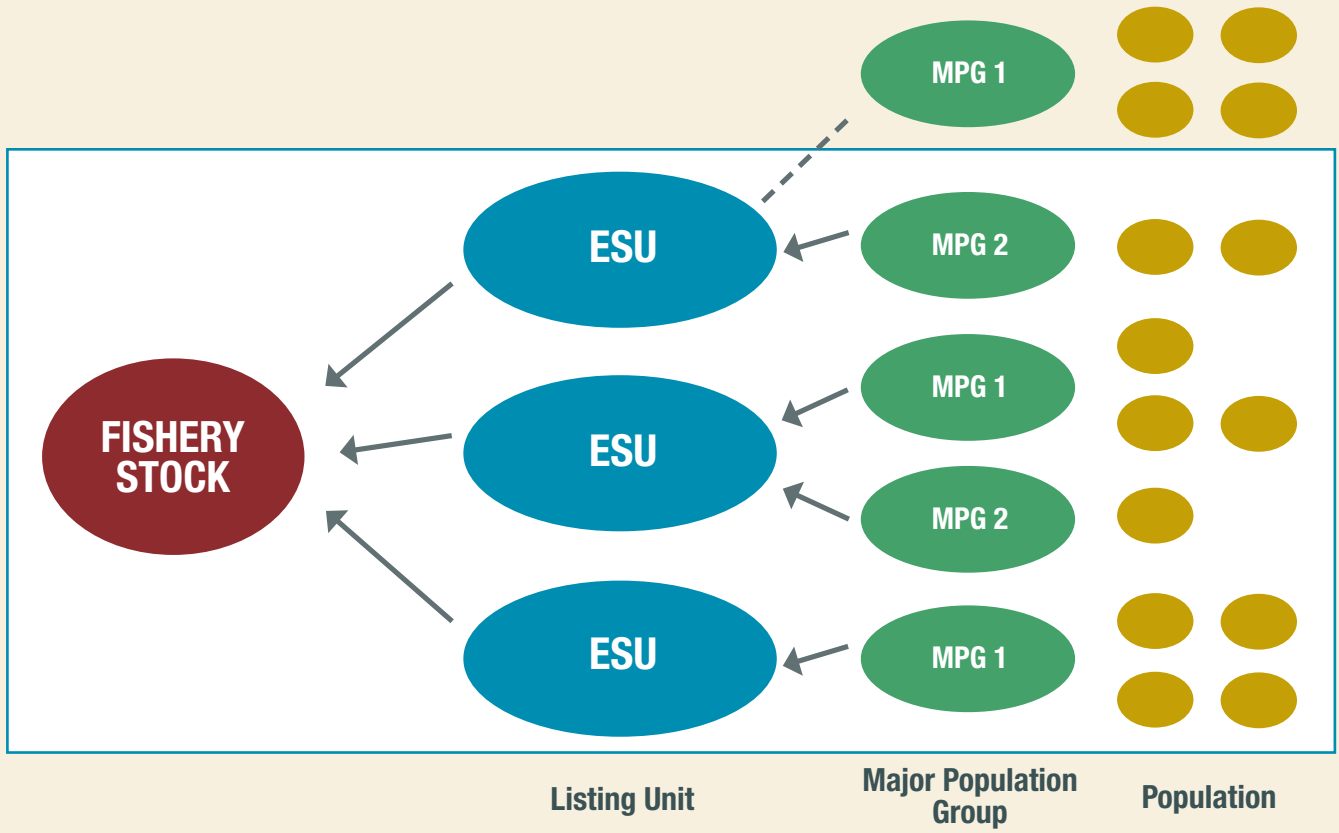
Scale of Goals: Defining Stocks

Provisional Quantitative Goals are identified for stocks, which regional technical teams defined, for the purposes of the Task Force based on species (i.e., Chinook, coho, sockeye, and chum salmon, and steelhead), region of origin (i.e., Lower Columbia, Middle Columbia, Upper Columbia, Snake, or Willamette), and run timing (i.e., spring, summer, fall, or late-fall). Stocks include both listed and unlisted salmon and steelhead. Twenty-four stocks including 331 historical populations, some of which are extirpated, were identified (Table 5).

Stocks are generally the same as the ESUs or DPSs that NOAA Fisheries defines for ESA listing purposes.[34] One exception is in cases where

[34] The ESA allows listing decisions at the level of a species, subspecies, or distinct population segment. For salmon, NMFS applies its ESU policy and treats ESUs as distinct population segments. An ESU is a group of Pacific salmon that is (1) substantially reproductively isolated from other conspecific units and (2) represents an important component of the evolutionary legacy of the species. For steelhead, NMFS applies the DPS policy. A DPS is a population or group of populations that is discrete from and significant to the remainder of its species based on factors such as physical, behavioral, or genetic characteristics, because it occupies an unusual or unique ecological setting, or because its loss would represent a significant gap in the species' range. A DPS is defined based on discreteness in behavioral, physiological, and morphological characteristics, whereas the definition of an ESU emphasizes genetic and reproductive isolation.

FIGURE 7. Relationship of fishery management units to hierarchy of listing units, major population groups (MPG), and populations. A fishery management unit and an ESU/DPS can include one or more Columbia Basin Partnership stocks.



an ESU or DPS contained multiple run-timings. In these cases, the ESUs were split by run type into separate stocks so that abundance numbers could be more easily aggregated by run type (i.e., by stock) in a basinwide accounting and aligned more closely to fishery management units. For instance, the lower Columbia River Chinook salmon ESU was split into three stocks: Lower Columbia spring Chinook, Lower Columbia fall Chinook, and Lower Columbia late-fall Chinook. Similar splits were made for the Lower Columbia River steelhead DPS (stocks separated into winter and summer runs) and Upper Columbia River summer/fall Chinook ESU (stocks separated into summer and fall runs).

In addition, NOAA Fisheries has not identified ESUs or DPSs for some unlisted or extirpated stocks, including in blocked areas within the historical range where salmon and steelhead no longer have access. In these cases, the regional technical teams identified stocks based on the available scientific information.

Each stock (and each ESU or DPS) contains a number of independent populations. An independent population is defined as a group of fish of the same species that spawns in a particular locality at a particular season and does not interbreed substantially with fish from any other group. Independent populations spawning naturally, and groups of such populations (major population groups), are the essential building blocks of an ESU or DPS (Figure 7). For listed ESUs or DPSs, NOAA Fisheries' technical recovery teams (TRTs) — teams of scientists convened to provide guidance for recovery planning — used this concept to define independent populations and those definitions were incorporated into ESA recovery plans. For unlisted stocks, population delineations are sometimes less formal, particularly where they have been extirpated (e.g., coho upstream from Bonneville Dam). Where NOAA Fisheries had not identified populations, the regional technical teams identified provisional populations for each stock based on the best available information. Populations were identified for every stock regardless of whether they were listed, unlisted, extant, or extirpated.

Fishery Management Units. Fishery Management Units (FMUs) are stocks or groups of stocks that are subject to similar management strategies and objectives. FMUs are primarily

TABLE 5. Columbia Basin salmon and steelhead stocks defined for Columbia Basin Partnership Task Force based on listing unit and run type.

Region	Species	Run type	ESA	CBP Stock	
Lower Columbia	Chinook Chinook Chinook	Spring Fall (tules) Fall (late brights)	Yes* Yes* Yes*	L Columbia R Spring Chinook L Columbia R Fall (tule) Chinook L Columbia R Late Fall (bright) Chinook	
	Chum	Late Fall	Yes*	Columbia R Chum	
	Steelhead Steelhead Steelhead	Winter Winter Summer	No Yes* Yes*	L Columbia R Winter Steelhead L Columbia R Winter Steelhead L Columbia R Summer Steelhead	
	Coho	Fall (early & late)	Yes*	L Columbia R Coho	
Upriver	Coho	Fall	Extinct	Upriver Coho	
Middle Columbia	Chinook Chinook	Spring Summer/Fall	No No	M Columbia R Spring Chinook M Columbia R Sum/Fall Chinook	
	Sockeye	Summer	Extinct	M Columbia R Sockeye	
	Steelhead	Summer	Yes*	Mid Columbia R Steelhead	
Snake	Chinook Chinook	Summer/Fall Fall (brights)	Yes* Yes*	Snake R Spring/Sum Chinook Snake R Fall Chinook	
	Sockeye	Summer	Yes*	Snake R Sockeye	
	Steelhead	Summer	Yes*	Snake R Steelhead	
Upper Columbia	Chinook Chinook Chinook	Spring Summer Fall	Yes* No No	U Columbia R Spring Chinook U Columbia R Sum/Fall Chinook U Columbia R Sum/Fall Chinook	
	Sockeye	Summer	No	U Columbia R Sockeye	
	Steelhead	Summer	Yes*	U Columbia R Summer Steelhead	
Willamette	Chinook	Spring	Yes*	U Willamette R Spring Chinook	
	Steelhead	Winter	Yes*	U Willamette R Winter Steelhead	
All	Total Listed	including extinct -	24 16	- -	

* shows it is ESA listed.

				Number of Populations			
	Evolutionarily Significant Unit or Distinct Population Segment	Fishery Management Unit	Major Pop Group	Total	Extant	Extirpated	Reintroduced
	L Columbia R Chinook	Lower River Spring	2	9	9	-	-
	L Columbia R Chinook	Lower River Hatchery (LRH)	3	21	21	-	-
	L Columbia R Chinook	Lower River Wild (LRW)	1	2	2	-	-
	Columbia R Chum	Columbia R Chum	4	18	17	1	-
	SW Washington Steelhead	Winter run	1	7	7	0	-
	L Columbia R Steelhead	Winter run	2	17	17	0	-
	L Columbia R Steelhead	L Columbia R Summer	2	6	6	-	-
	L Columbia R Coho	Columbia R Coho	4	25	25	0	1
	-	Columbia R Coho	3	15	0	15	7
	M Columbia R Spring Chinook	Upriver Spring	4	14	7	7	7
	M Columbia R Sum/Fall Chinook	Upriver Bright (URB)	1	1	1	0	-
	-	-	1	1	0	1	1
	Mid Columbia R Steelhead	Upriver Summer	4	20	17	3	2
	Snake R Spring/Sum Chinook	Upriver Spring	12	68	28	40	-
	Snake R Fall Chinook	Upriver Bright / Snake R Bright	1	2	1	1	-
	Snake R Sockeye	Snake R Sockeye	4	9	1	8	-
	Snake R Steelhead	Upriver Summer (A & B runs)	9	40	25	15	-
	U Columbia R Spring Chinook	Upriver Spring	4	10	3	7	1
	U Columbia R Summer Chinook	Upper Columbia Summer	3	13	6	7	2
	-	Upriver Bright Fall Chinook (URB)	1	5	4	1	-
	Wenatchee, Okanogan Sockeye	U Columbia R Sockeye	4	6	2	4	1
	U Columbia R Steelhead	Upriver Summer	3	11	4	7	-
	U Willamette R Spring Chinook	Willamette Spring	1	7	7	0	-
	U Willamette R Steelhead	Winter run	1	4	4	0	-
	-	-	75	331	214	117	22
	-	-	37	241	186	-	-

determined by run type and return timing in relation to Columbia River mainstem fisheries, which account for the largest share of salmon and steelhead harvest. One FMU may include several listing units of similar run type (Figure 7). For example, fishery managers identify an Upriver spring Chinook management unit, which includes all spring Chinook destined for areas upstream from Bonneville Dam (Mid-Columbia, Upper Columbia, and Snake ESUs). Listing units may sometimes be split among different fishery management units when the listing units include different run types.

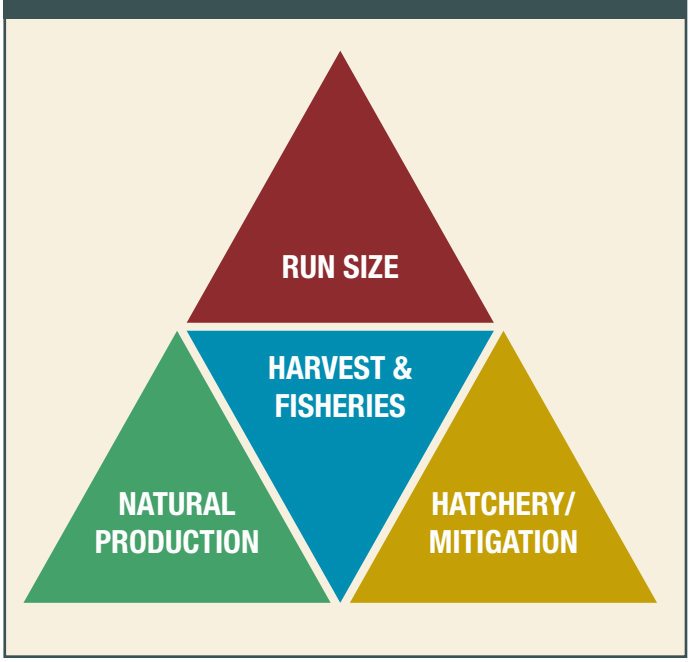
Quantitative Goal Categories

The scope of the Task Force, as originally defined, included both conservation (natural production) and harvest goals, so the Task Force products address both of those categories. Hatchery production is addressed because of the essential role of hatcheries in conservation, fisheries, and mitigation for Columbia Basin salmon and steelhead. Natural production, harvest/fishery, and hatchery/mitigation goals are often defined at a population or stock scale. These numbers can also be aggregated into run-size estimates, which identify aggregate numbers of salmon and steelhead needed to meet natural production, fisheries, and hatchery production goals. Run-size estimates are identified at basin, species, and stock scales and used for evaluating status and goals relative to a variety of needs across the Basin.

Figure 8 shows the categories and relationships of Quantitative Goals identified by the Task Force. Goals in these categories need to address specific purposes and provide a comprehensive accounting of how many salmon and steelhead are needed to meet goals in the Columbia Basin consistent with the Vision and Qualitative Goals identified by the Task Force.

Natural Production. Natural production goals are defined in terms of abundance of natural-origin spawners for each salmon and steelhead population. Natural-origin fish are those that were spawned and reared in the wild, regardless of parental origin (natural or hatchery). Abundance is one of the four parameters (along with productivity, spatial structure, and diversity) commonly used to evaluate the biological health of salmon and steelhead, and upon which the long-term viability of salmon and steelhead depends. Abundance goals are intended to be evaluated based on 10-year geometric means.[35]

FIGURE 8. Categories of goals addressed by the Columbia Basin Partnership Task Force.



Hatchery/Mitigation. Current and anticipated hatchery production and mitigation levels are expressed in terms of numbers of juveniles released and the corresponding return of adult salmon and steelhead. Hatchery-origin salmon and steelhead play important roles in supporting harvest and fishery opportunities, and in contributing to conservation of natural populations across the Basin. Large-scale hatchery programs are operated throughout the Columbia River Basin to provide fish as mitigation for historical losses of natural production as a result of development and other human activities. In some cases, these hatchery programs are tied to specific mitigation programs (e.g., the Lower Snake River Compensation Plan). In other cases, hatchery production is more loosely related to a general need to mitigate for production lost as a result of human impacts. In addition to providing fish to enhance fisheries, hatchery production also serves conservation purposes — for example, to supplement abundance of naturally spawning fish, reintroduce fish into areas where fish have been extirpated, avoid extinction (through measures such as captive broodstock programs), and provide ecological benefits to wildlife including Southern Resident killer whales.

Harvest and Fishery Opportunity. Columbia River salmon and steelhead are harvested in tribal

[35] The geometric mean is defined as the nth root of n products. Geometric means are considered to be a better measure of central tendency for data such as fish abundance which is typically highly skewed. The geometric mean smooths the contribution of periodic large run sizes which can inflate simple averages relative to typical population values. The 10-year period was selected to represent an interval of sustained abundance across multiple generational cycles.

and nontribal commercial, sport, subsistence, and ceremonial fisheries in the ocean as far north as Canada and Alaska, in the Columbia River mainstem, and in some tributaries. These fisheries provide important economic, social, and cultural values. Related metrics can include quantity (number of fish harvested), quality or opportunity (e.g., fishing effort, catch per effort, fish size and condition, open seasons), or related economic values. In this report, the Task Force has identified potential harvest and fishery opportunity under several scenarios (described later in this chapter under Methods for Developing Quantitative Goals) and in terms of both numbers of fish harvested and exploitation rates (which are defined as the percentage of total abundance harvested in one or more fisheries).

Run Size. Run-size goals are aggregations of area and species-specific goals at a local, regional, or basinwide scale. They include numbers of hatchery- and natural-origin fish returning to basin streams and harvested in fisheries. Run sizes may be calculated for specific stocks, but also may be calculated across wider regions and multiple species, for instance for the entire Columbia River return. Run-size estimates are useful for evaluating status and goals relative to a variety of regional needs.

Quantitative Goal Metrics

The Provisional Quantitative Goals are defined in terms of abundance of adult salmon and steelhead.[36] Numbers of adult fish are an essential measure of conservation status, fishery value, and mitigation. Abundance also provides an objective measure applicable to each of the purposes identified in the Qualitative Goals.

Abundance is not the sole measure of conservation status, but it is strongly associated with a variety of other metrics of interest. For instance, long-term biological viability and long-term resilience of salmon and steelhead populations have been related to abundance, productivity, spatial structure, and diversity (McElhany et al. 2000). Population-level biological viability criteria identified in ESA recovery plans are typically based on a combination of these parameters. Therefore, the Task Force abundance goals should be considered in the context of the other parameters related to long-term viability. In practice, abundance is positively correlated with and strongly influenced by productivity, spatial structure, and diversity. Because of this relationship, it is difficult to achieve high levels of abundance without simultaneous increases in other parameters (although there are exceptions).

Other metrics related to population life-cycle dynamics are also considered in some contexts. For instance, smolt-to-adult survival rates (SAR) describe a portion of the life cycle encompassing outmigration from natal streams to the point of freshwater return at adulthood. The Council included SAR goals in its 2014 Fish and Wildlife Program. SARs are a measure of population productivity over a portion of the life cycle outside of the freshwater spawning and rearing stages. They can be used to distinguish the influences of local freshwater habitat and environmental conditions in natal streams from nonlocal influences in the migration corridor and ocean. However, SARs are also influenced by survival in marine waters, which varies considerably from year to year.

Quantitative Goal Ranges

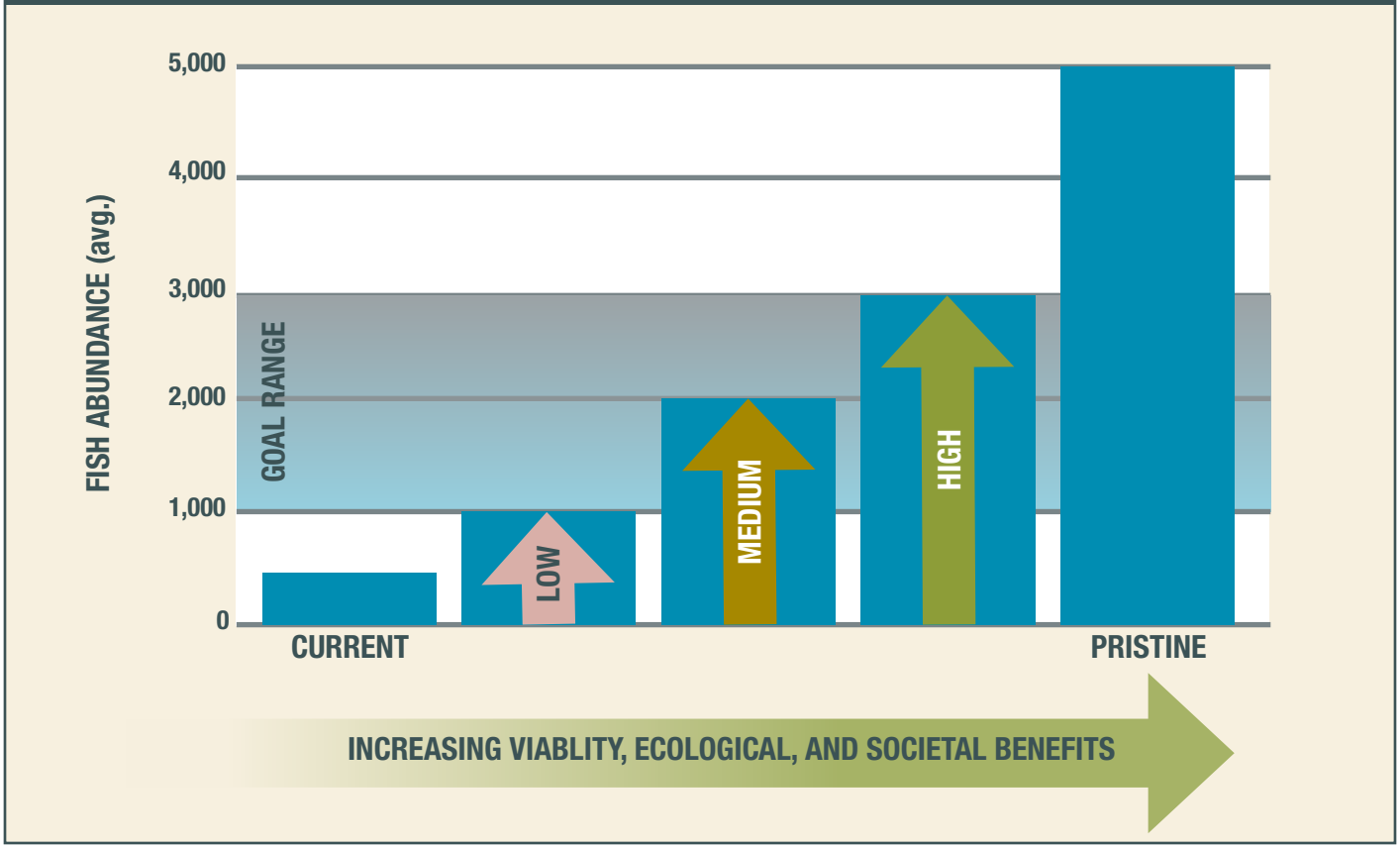
In each category, the Provisional Quantitative Goals are identified as ranges rather than single-point estimates. Ranges reflect a continuum of aspiration for progressive improvements. Goal ranges also reflect the increasing benefits that more fish will provide, including higher viability of fish species, increased fishing opportunities, and enhanced social, cultural, economic, and ecological benefits. In many cases, goal ranges incorporate values identified in other plans and processes to address a variety of purposes. For instance, goals to meet ESA delisting requirements are identified as increments to achieving higher numbers that support higher viability, fishery opportunity, and ecological benefits.

Quantitative Goal Templates

To facilitate review of existing information and development of Quantitative Goals for each stock, NOAA Fisheries developed a three-page template for use by the work groups (see Appendix A). The template includes bulleted text describing key information about the stock; a map showing the geographic distribution of the stock; graphs summarizing current trends in abundance; pie charts showing the distribution of harvest among various fisheries and the distribution of hatchery releases among various programs; and a table summarizing aggregate run sizes at the mouth of the Columbia River, Bonneville Dam, and point of tributary entry, and the numbers of fish harvested in the Columbia River mainstem. The template also includes tables

[36] For consistency with NOAA Fisheries' technical recovery team guidance and fishery stock assessment convention, abundance goals do not include jacks. Jacks are generally males returning to freshwater one year earlier than most mature fish of a particular species. They typically comprise a small proportion (<10%) of the total return of natural-origin fish (although hatchery programs may produce higher percentages).

FIGURE 9. Concepts for defining natural production goals.



showing existing natural-origin production, hatchery production, fishery exploitation and harvest, and run sizes. For each stock, a notes page summarizes the basis for specific numbers. Additional details and documentation on numbers are also available on MS Excel worksheets for each stock.

Methods for Developing Quantitative Goals

This section describes the methods used by the Task Force to develop Quantitative Goals for natural production, potential harvest and fishery opportunity, and anticipated hatchery production.

Quantitative Goals for Natural Production

Provisional Qualitative Goal 1 calls for restoration of Columbia Basin salmon and steelhead to healthy and harvestable/fishable levels. Achieving this goal will require substantial improvements in natural production of these species. Natural production goals are expressed in terms of natural-origin adults spawning naturally are identified in three ranges — low, medium, and high (Figure 9). These ranges represent a continuum of decreased extinction risk and increased ecological and societal benefits.

Table 6 summarizes how the regional technical teams identified the low-, medium-, and high-range Provisional Quantitative Goals for natural production. To place the goals into context, estimates of current and historical abundance were also developed.

Estimates of the *current abundance* of natural-origin spawners for each extant salmon and steelhead population provided a point of reference for identifying natural production goals. For consistency with metrics that NOAA Fisheries uses in ESA status assessments and delisting goals, abundance of natural-origin adults in each population is expressed using a 10-year geometric mean. The geometric mean values are based on the most recent 10 years of data available. Because of a one- to two-year lag time in derivation and reporting of abundance numbers for some populations, year ranges vary slightly among populations.

Historical abundance estimates for salmon and steelhead were also compiled wherever possible to place goals in the context of the production that could be realized under historical, or pristine, conditions. Historical is defined as pre-development,

TABLE 6. Rule set for quantifying low-, medium-, and high-range goals for natural production. Rules are numbered in priority of application.

RULE SET FOR QUANTIFYING RANGE OF GOALS FOR NATURAL PRODUCTION	
Low	1. Delisting abundance goal consistent with recovery scenario as specified in ESA recovery plan. (Not every population required to achieve high level of viability.) 2. Minimum abundance threshold (equivalent to a viable population with ≤5% risk of extinction in 100 years) inferred from rule set developed and applied by the Technical Recovery Teams to similar populations by species. (Applicable where population-specific viability goals were not otherwise identified.)
Medium	1. From existing plans, where identified. 2. Mid-way between low- and high-range goals for listed populations where not otherwise identified in existing plans. 3. Yield-based escapement goals where defined for unlisted populations based on stock-recruitment analyses. 4. Based on current abundance where yield-based goals have not been identified for unlisted populations.
High	1. Based on broad sense goals identified in existing plans where consistent with qualitative goals identified by the Columbia Basin Partnership. 2. Equivalent to empirical estimates of abundance under conditions when populations were previously considered to be reasonably healthy. 3. Based on habitat-model inferences of abundance that would result from reasonably feasible habitat restoration actions and/or favorable habitat conditions. 4. Default values (generally three times the low-range value) where historical or model-derived values were not available (not to exceed the estimated pre-development habitat potential).

and corresponding numbers were estimated by various means. Many of these estimates were based on Ecosystem Diagnosis and Treatment (EDT) modelling. EDT modeling can be used to evaluate and compare salmon and steelhead production under current conditions, historical/pristine conditions, and various habitat restoration scenarios. Most of the EDT results used by the Task Force were developed during the 2005 subbasin planning process overseen by the Council. The regional technical teams reviewed these results, and the NOAA Fisheries project team compared the EDT-based historical estimates to pre-development run sizes identified by the Council (1986) and recently reviewed by the Independent Scientific Advisory Board (ISAB) (2015). Regional technical teams sometimes also considered other habitat models. Habitat restoration assumptions embedded in these models took a variety of forms. Some were based on a specific suite of improvements determined by recovery and subbasin planners to be reasonably feasible. Others were based on more general assumptions regarding restoration of habitat conditions favorable for salmonids (e.g., Properly Functioning Conditions: NMFS 1996).

Low-range goals for natural production for listed populations are defined as the natural-origin adult spawner abundance consistent with ESA delisting goals in NOAA Fisheries' recovery plans. These goals are based on recommendations developed by the TRTs to provide guidance for recovery planning. The goals generally represent a viable population, which is considered a population not threatened with a risk of extinction (i.e., a population with a 5 percent risk of extinction over a 100-year timeframe).

The TRTs generally derived these abundance goals from population viability analyses using stochastic life-cycle models. These models project the probability of abundance falling to critically low levels (i.e., a quasi-extinction threshold) based on population productivity and normal variation in abundance due to environmental factors. Viability curves used

by TRTs to identify abundance goals for delisting also sometimes incorporated minimum abundance thresholds (MATs) to address genetic and spatial structure components in general abundance and productivity objectives.[37] In cases where recovery plans targeted populations for high levels of viability, delisting goals are often equivalent to the MAT.

In addition, for ESA delisting, not every population is required to achieve viable status. The TRTs noted that as long as a sufficient number of populations representing the historical productivity, diversity, and spatial distributions of the species are restored to viable levels, other populations could be maintained at lower levels of viability. In some recovery plans, abundance goals consistent with these lower levels of viability are identified, consistent with TRT guidance on how many and which populations need to be at various levels of viability of an ESU or DPS to be considered viable. In these cases, the Task Force recommendations for low-range Provisional Quantitative Goals for natural production are generally consistent with those lower numbers.[38] Similarly, recovery plans sometimes identify quantitative goals for some populations to be restored to levels of very high viability. In these cases, the Task Force generally incorporated these goals as the low-range Provisional Quantitative Goals for natural production. Exceptions are noted in specific stock summaries.

For unlisted stocks, there are no ESA recovery plans or delisting goals. For these stocks, the regional technical teams used MATs as the low-range natural production abundance goals. Both the Interior Columbia and Willamette/Lower Columbia TRTs identified species-specific MATs based on the size and spatial complexity of the historical population distribution (ICTRT 2007; McElhany et al. 2007; LCFRB 2010). Current abundance in unlisted populations typically far exceeds these minimum abundance thresholds. Since the low-range goals have been achieved in these cases, management efforts will now focus on the medium-range and high-range goals, and the low-range goals represent a biological reference point rather than a future goal.

Medium-range goals define an intermediate step between low-range goals and high-range goals. For some stocks, ESA recovery, subbasin, or other management plans have previously identified a range of goals including values intermediate between delisting and higher, longer-term values. Medium-range goals identified in other plans were used where consistent with other low- and high-range goals developed by the Task Force.

For populations in listed ESUs or DPSs where medium-range goals were not identified in other plans, the regional technical teams simply derived medium-range goals as the midpoint between low-range and high-range goal values.

For unlisted populations, where current abundance is substantially greater than the low-range goal, the regional technical teams applied one of two goals: (1) medium-range goals are equal to yield-based goals where identified from stock-recruit analyses for relatively healthy populations (e.g., Hanford bright fall Chinook, Lewis River wild fall Chinook); or (2) where yield-based goals have not been derived for relatively healthy populations, medium-range goals are simply defined as equivalent to current abundance.

High-range goals are intended to represent "healthy and harvestable" abundance levels that would sustain very high levels of species viability, significant fishery opportunities and harvest, and a fuller range of ecological values. These goals reflect potential future habitat conditions (i.e., restored habitats) but are still typically just a fraction of historical numbers before development.

Regional technical teams identified high-range goals based on the information available for each stock. In some cases, existing plans identified goals or reference values consistent with the high-range definition. In these cases, the existing goals are incorporated into the Task Force goals. For instance, ESA recovery plans (and the locally developed plans they were based on) sometimes quantified "broad sense" goals in addition to delisting goals.[39] In other cases, these plans identified qualitative broad sense goals and reported modeling results consistent with those goals, but did not adopt actual quantitative broad sense goals. Other management plans also occasionally identified goals with broad sense purposes. For most stocks, however, numbers consistent with the high-range category were not available. Thus, most high-range

[37] For more information on ESA delisting goals and their derivation, see ICTRT 2007; UCRSB 2007; NMFS 2013, 2015, 2017a, 2017b; ODFW and NMFS 2011; WLCTRT and ODFW 2006.

[38] One exception is in the ESA recovery plan for Lower Columbia River salmon and steelhead. In that plan, the recovery scenario did not identify abundance goals for all populations designated as "stabilizing." The stabilizing designation signifies that under the recovery scenario, the goal is to maintain these populations at their current risk status and not to improve their status. Where more recent monitoring information is available regarding current abundance of such populations than was available during recovery plan development, the current abundance estimates are incorporated into the CBP Task Force recommendations as the low-range natural production abundance goal. Those targets are not included in the ESA recovery plan, and do not represent delisting abundance targets. We have noted this and other specific instances where the low-range goals differ from this general rule in the methodology summaries that accompany the stock summaries included in Appendix A of this report.

Provisional Quantitative Goals were derived by the regional technical teams.

Where possible, high-range goals reflect empirical estimates of historical salmon or steelhead abundance. These historical empirical estimates provide a sound measure of what might meaningfully be expected with reduced constraints. For instance, the state of Idaho surveyed spring Chinook salmon in many natural production areas during the 1950s and 1960s, when fish numbers were substantially higher. In other cases, historical dam counts provide solid reference points upon which to base high-range goals.

Where such empirical data were lacking, high-range goals were generally based on inferences from modeling of habitat productive potential. A variety of models relate fish abundance and other population parameters to habitat conditions (i.e., stream size, gradient, morphology, substrate, riparian conditions). These models can be used to project changes in abundance based on improvement in habitat conditions and other life-cycle limitations. Estimates based on these habitat models of fish abundance under scenarios with significant habitat restoration were documented in many subbasin plans or ESA recovery plans. For instance, many subbasin plans incorporated EDT-based estimates of fish numbers that might be expected with habitat improvements that subbasin planners deemed to be realistically feasible or otherwise desirable.[40] These were the source of many of the high-range goals identified by the Task Force for populations where empirical historical estimates were not available.

In some cases, neither empirical nor model-based numbers were available for use in deriving high-range goals. In this event, regional technical teams identified high-range goals that were three times the abundance identified in the low-range goal for the population. The threefold difference was generally similar to the interval observed for populations where both low- and high-range goals were otherwise documented. High-range values were limited to estimated levels of pre-development habitat potential when three times the low-range value exceeded that value.

Natural-origin spawning escapement was estimated independent of numbers of hatchery-origin fish returning to natural spawning areas. Thus, total spawning escapement was greater than natural-origin spawning escapement when hatchery fish were also present. Spawning escapements were also estimated independent of any harvest that might occur locally or downstream. Thus, total production of natural-origin fish would include both spawning escapement and downstream harvest.

Natural production goals take into account density dependence and carrying capacity of the existing spawning and rearing habitats for salmon and steelhead. The ISAB (2015) reviewed the status of Columbia River salmonid populations in the context of density dependence, which they defined as changes in one or more vital rates (birth, death, immigration, or emigration) in response to changing population density. Most common is compensatory density dependence (also termed compensation) in which a population's growth rate is highest at low density and decreases as density increases. Compensation is typically caused by competition for limited resources, such as food or habitat. The ISAB found that understanding density dependence in salmon and steelhead populations is important in evaluating responses to recovery actions and for setting spawning escapement goals that will be sustainable.

Potential Harvest and Fishery Opportunity

The Qualitative Goals call for providing "diverse, productive, and dependable tribal and non-tribal harvest and fishing opportunities for Columbia Basin salmon and steelhead." Achieving this goal would reflect a substantial improvement from the current state of these fisheries.

To provide baseline information, the NOAA Fisheries project team documented current harvest rates for all Columbia Basin salmon and steelhead. Current fisheries are generally managed under harvest rate limits prescribed through a complex of management plans, agreements, and processes (e.g., *U.S. v. Oregon*, the Pacific Fishery Management Council process, and the Pacific Salmon Treaty), and include a combination of abundance-based, escapement-based, and harvest-rate-based goals for specific stocks. These current harvest rates do not represent fishery goals, per se, but rather allowable harvest under frameworks designed to protect weak and listed stocks. The weak stock constraints in these existing frameworks also limit access to harvestable surpluses of strong natural and hatchery stocks in many fisheries.

Many stocks are currently managed under abundance-based management frameworks. These

[39] Broad sense recovery is defined outside of the ESA recovery planning process, generally by fisheries managers (state and tribal entities) or stakeholders, and goes beyond the requirements for ESA delisting to achieve even lower extinction risk and/or to address, for example, other legislative mandates or social, economic, and ecological values.

[40] For additional discussion of EDT modeling, see above. Examples of goals based on restoration scenarios may be found in YBFWRB (2009), ODFW (2010), and ODFW and NMFS (2011).

frameworks were developed to guide fisheries in response to annual variability in run size. They allow higher harvest rates in years of greater abundance and reduce harvest rates to protect escapements in years of lower abundance. One practical effect is that, for recovering stocks whose average abundance improves over time, harvest rates in general are also higher on average. This means that, as an outcome of the existing fishery management structure, benefits of higher abundance are shared between increased numbers of natural-origin spawners and increased harvest. For reference purposes, the regional technical teams estimated approximate increases in harvest rates that would occur under existing management frameworks if abundance increased consistent with the Task Force natural production goals.

Healthy stocks can typically support substantially higher harvest rates than are currently identified in existing management frameworks, which are designed to protect weak and listed stocks. Therefore, the Task Force also identifies potential harvest rates and numbers that would be sustainable by abundant and productive salmon and steelhead stocks. These potential harvest rates and numbers are identified in conjunction with the low-, medium-, and high-range natural production goals. As described in Table 7, the low-range potential harvest is based on the assumption that existing management frameworks (designed to protect weak stocks) will still be in place; therefore, there is no change from the estimated harvest rates under existing frameworks for low-range natural production goals. The high-range potential harvest rates are based on existing management frameworks for currently healthy stocks (i.e., Upper Columbia River (UCR) spring Chinook, UCR fall Chinook, Deschutes fall Chinook, and Lower Columbia River (LCR) bright fall Chinook). For currently weak or depleted stocks, the high-range potential rates were identified by the NOAA Fisheries project team, in consultation with regional technical team members, and based on their professional judgement and knowledge of harvest rates typically sustained by healthy stocks, depending on life-history type (i.e., spring, fall, or late-fall) and species. The high-range potential harvest rates were also calibrated down slightly for stocks that would be harvested in mixed-stock fisheries, due to the need to protect weaker stocks in such fisheries. These potential harvest levels are generally conservative relative to historical harvest rates and those sustained by salmon and steelhead stocks in more pristine areas of the North Pacific.

Potential harvest rate estimates do not attempt to allocate fishery opportunities among specific fisheries. It is assumed that opportunities for additional harvest will be distributed among fisheries through existing management authorities and processes, and that harvest managers will continue to constrain harvest (or set harvest rates) consistent with achieving escapement goals for naturally produced fish. Mid- to high-range fishing levels are assumed to occur at the same time that mid- to high-range natural production goals for spawning escapement are achieved, although the Task Force may want to explore tradeoffs among various goal scenarios in the next phase of the process.

Current and Anticipated Hatchery Production

The Qualitative Goals call for producing hatchery salmon and steelhead to support conservation, mitigate for lost natural production, and support fisheries.

Existing hatchery production levels are defined in different ways for programs throughout the Basin. Some programs define production levels in terms of adult returns, but many programs focus solely on juvenile production. For Task Force purposes regional technical teams documented current hatchery production levels (i.e., juvenile production) for each stock by hatchery program, and estimated corresponding numbers of adults by stock. Adult return expectations were identified where available. Table 8 shows the rule set for quantifying current and anticipated hatchery production.

Anticipated future hatchery production is identified based on available information. In most cases, future production is anticipated to be similar to current production (*status quo*). In some cases, planned changes or additions are identified. For instance, existing programs may be undergoing modifications based on new information or direction (e.g., Mitchell Act program revisions). Several new hatchery programs are also currently under development are likely to be implemented (e.g., John Day Mitigation, Yakama Coho Hatchery, Walla Walla Spring Chinook Hatchery). Mid-Columbia PUD hatchery mitigation production requirements change with periodic survival studies, and are recalculated every 10 years to adjust for changes in fish abundance and survival. It should not be expected that future recalculated numbers for PUD programs will be the same as current mitigation numbers; however, because it is not clear what the future numbers will be, current numbers are used as interim estimates. Finally, some Task Force members highlighted a desire for additional new

TABLE 7. Approach to identifying potential harvest and fishery opportunity consistent with Provisional Quantitative Goals for natural production identified by the Columbia Basin Partnership Task Force.

APPROACH USED TO IDENTIFY HARVEST AND FISHING OPPORTUNITIES	
Harvest under Existing Management Plans	1. Harvests by stock are projected with increased natural-origin abundance and incremental increases according to existing abundance-based harvest management frameworks. 2. If there is currently no abundance-based management framework, current harvest rate limits were used for all natural production goal ranges.
Low-range potential harvest	1. For weak stocks, assume that existing management frameworks remain in place. 2. For currently healthy stocks (i.e., UCR spring Chinook, UCR fall Chinook, Deschutes fall Chinook, and LCR bright fall Chinook), based on existing management frameworks. 3. Ranges reflect annual variation in harvest rates based on abundance in order to meet natural-origin spawning escapement goals and access higher numbers during large run years.
Mid-range potential harvest	1. Based on existing management frameworks for currently healthy stocks (i.e., UCR spring Chinook, UCR fall Chinook, Deschutes fall Chinook, and LCR bright fall Chinook). 2. Intermediate between low- and high-range goals for currently weak or depleted stocks.
High-range potential harvest	1. Based on existing management frameworks for currently healthy stocks (i.e., UCR spring Chinook, UCR fall Chinook, Deschutes fall Chinook, and LCR bright fall Chinook). 2. For currently weak or depleted stocks, based on reasonably realistic harvest rates expected to be sustainable by healthy natural-origin stocks. 3. Prescribed rates were also consistent with needs to provide significant access to wild and hatchery fish in mixed-stock fisheries across the range of harvest including ocean, Columbia River mainstem, and tributary fisheries.

programs to support other needs, for example to reintroduce salmon and steelhead into blocked areas within their historical range, and to increase Chinook salmon prey for Southern Resident killer whales.

Specific hatchery programs are inevitably subject to continuing refinements under the authority and auspices of oversight, funding, and implementing entities. Anticipated future hatchery production identified by the Task Force is intended to describe expectations based on current information. They are not intended to supersede or undermine specific management authorities governing implementation of any particular program, or to preclude future changes based on new information, conditions, or requirements. For example, hatchery mitigation production requirements for the Mid-Columbia PUDs will change following scheduled project survival-verification studies, and every 10 years with scheduled recalculations as described above, and these changes will be developed and approved by hatchery oversight committees authorized and required as part of each PUD's federal operating license issued by the Federal Energy Regulatory Commission (FERC).

Columbia River Run Sizes

The regional technical teams also developed aggregate abundance numbers for natural production, fisheries, and hatchery production at Basin and species scales. These total run-size goals represent total numbers of salmon and steelhead that would be needed to meet natural production, fisheries, and anticipated hatchery production levels. They are identified at Basin, species, and stock scales and used for evaluating status and goals relative to a variety of needs across the Basin. Numbers are reported for total adult returns at the mouth of the Columbia River, and for numbers of fish returning to different regions of the Basin. These numbers are useful references for comparison with various goals that have been established across the Basin, and are also the basis for many fishery or mitigation-related goals.

Spawning escapement is less than the total number of fish returning to the Columbia River mouth because fish are lost to harvest, other causes of mortality (e.g., dam passage mortality, high temperature effects, marine mammal predation), and

TABLE 8. Rule set for quantifying current and anticipated hatchery production.

RULE SET FOR QUANTIFYING HATCHERY PRODUCTION		
Current		1. Juvenile production levels of existing programs. (Juveniles provide a common currency for all programs including those where adult return goals are not specifically identified.) 2. Adult returns from current programs to the Columbia River and regional production areas (Lower Columbia, Willamette, Middle Columbia, Upper Columbia, and Snake) are identified by stock based on recent average numbers.
Future production	Status quo	1. Juvenile production continues at current levels (barring refinements of programs based on performance or new information). 2. Corresponding adult returns as defined or inferred from current program return rates.
	Planned adjustments	3. Identify additional juvenile production in development where defined in existing processes and plans (e.g., John Day Mitigation). 4. Corresponding adult returns as defined or inferred from current program return rates.
	Additional needs	5. Identify any additional or reduced juvenile production needs to address specific purposes identified by Columbia Basin Partnership (e.g., reintroduction of extirpated populations or production for currently blocked historical anadromous production areas). 6. Corresponding to adult returns as defined or inferred from current program return rates.

straying between the river mouth and the spawning grounds. Therefore, spawning escapement and river mouth return numbers are related but not directly comparable.

Quantitative Goal Summaries

This section summarizes the Provisional Quantitative Goals identified by the Task Force. Detailed goals by stock and population are provided in Appendix A.

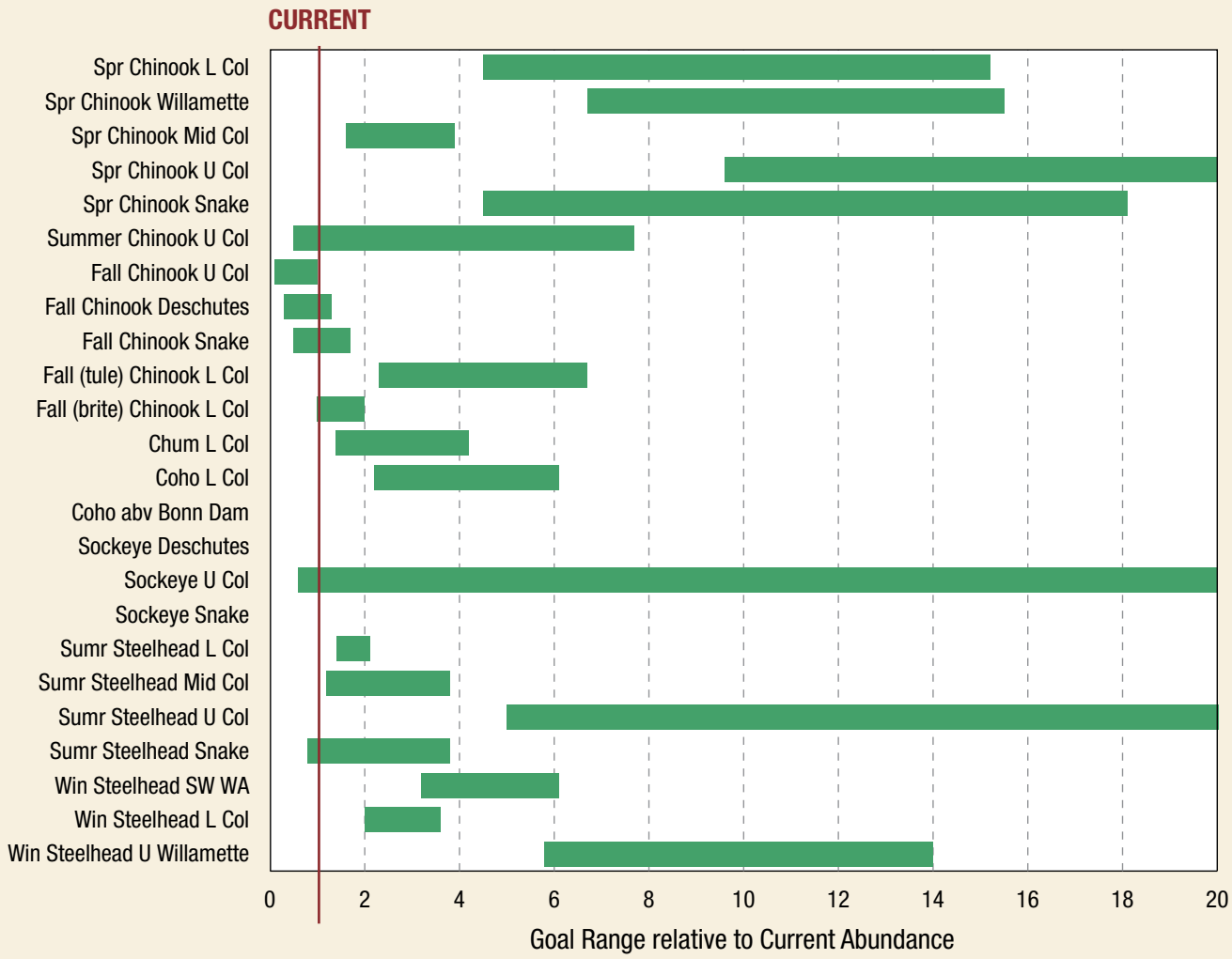
Provisional Quantitative Goals for Natural Production

The Provisional Quantitative Goals for natural production identify natural-origin escapements under low, medium, and high goal ranges. Figure 10 shows low- and high-goal ranges in aggregate by stock in relation to current abundance. Corresponding numbers are identified in Table 9. Values are normalized so that ranges for more or less abundant stocks can be illustrated on the same graph. The gap between current abundance (value of 1) and the low end of the goal range shows the proportional increase in abundance needed to reach the minimum goal. Current values overlap the goal range for stocks that are relatively healthy in terms of abundance.

Current mean numbers for most stocks fall below target goal ranges (Figure 10). This is particularly true for depleted and listed stocks whose numbers are typically much less than low range goals consistent with minimum viability levels or ESA recovery goals. For healthy stocks, current mean numbers generally fall within the target goal range but are less than the high goal range which is indicative of additional scope for improvement. Current mean numbers are sometimes greater than the target goal range – that is the case for Upper Columbia fall Chinook where recent returns have benefited from a period of favorable marine environmental conditions which are not likely to be representative of a long-term average future condition.

High goals are typically less than estimated historical abundance before development (Table 9). These cases would be consistent with an implicit assumption that it would be difficult to approach historical abundance without restoration of pristine conditions. In some cases, goals are a small fraction of the historical number. For instance, the aggregate high range goal for chum salmon is just four percent of the historical abundance. This low percentage reflects the severely depleted status of chum salmon and the ambitious nature of the Task Force goals which will require successful reintroduction into numerous areas where current habitat

FIGURE 10. Aggregate abundance values for natural-origin spawning escapements under current, historical (pre-development), and low, medium and high escapement goal ranges. The reference line for current mean number depicts the stock-specific reference value in relation to the goal range. Relative goal ranges are calculated by dividing the goal by the current abundance.



conditions do not support significant natural production of this species. In the case of sockeye salmon, the high range goal is actually 112 percent of the estimated historical abundance. This high value reflects goals identified for the Upper Columbia where impoundment creates more current sockeye rearing habitat in reservoirs than historically existed.

Potential Harvest and Fishery Opportunity

Incremental increases in average harvest rates likely to occur with increasing natural production in relation to current management frameworks are shown in Figure 11. Corresponding numbers are identified in Table 10. Increases occur only for stocks where the harvest is regulated according to an abundance-based framework. For stocks currently managed under a fixed harvest rate, it is assumed for the purposes of this exercise that future harvest rates would be the same as current (although harvest numbers would be expected to increase due to a higher abundance of fish available to the fishery). These projections make no assumptions at this point regarding the ability to access allowable rates due to other stock limits in mixed-stock fisheries. Figure 12 shows abundance-based harvest/impact rates that reflect aspirational fishery objectives beyond incremental increases projected under existing management frameworks consistent with increases in fish abundance identified in Provisional Quantitative Goals for natural production.

Developing basin-wide goals for salmon and steelhead at sustainable populations is daunting at best. We did it! We did it because of the depth of science we had, solid, expert facilitation and deadlines, but mostly because of the diverse people who sat together, listened, learned, and for me, came to care about each other as well as the fish. — Deb Marriott, *Lower Columbia Estuary Partnership*

Current and Anticipated Hatchery Production

Current hatchery production by stock is shown in Figure 13. Table 11 summarizes releases and corresponding adult returns. Adult returns are rough approximations at this time.

Columbia River Run Sizes

Total Columbia River salmon and steelhead run size averaged 2.3 million for 2008–2017 (Figures 14 and 15). Annual numbers have varied between 1.2 million and 3.6 million over the same time period. Chinook salmon (spring, summer, and fall) typically comprise about half of the total return with the rest about

FIGURE 11. Current average fishery harvest/impact rates of natural-origin fish and range of increases consistent with Provisional Quantitative Goals for natural production under current management frameworks in combined marine and freshwater fisheries for Columbia Basin salmon and steelhead stocks.

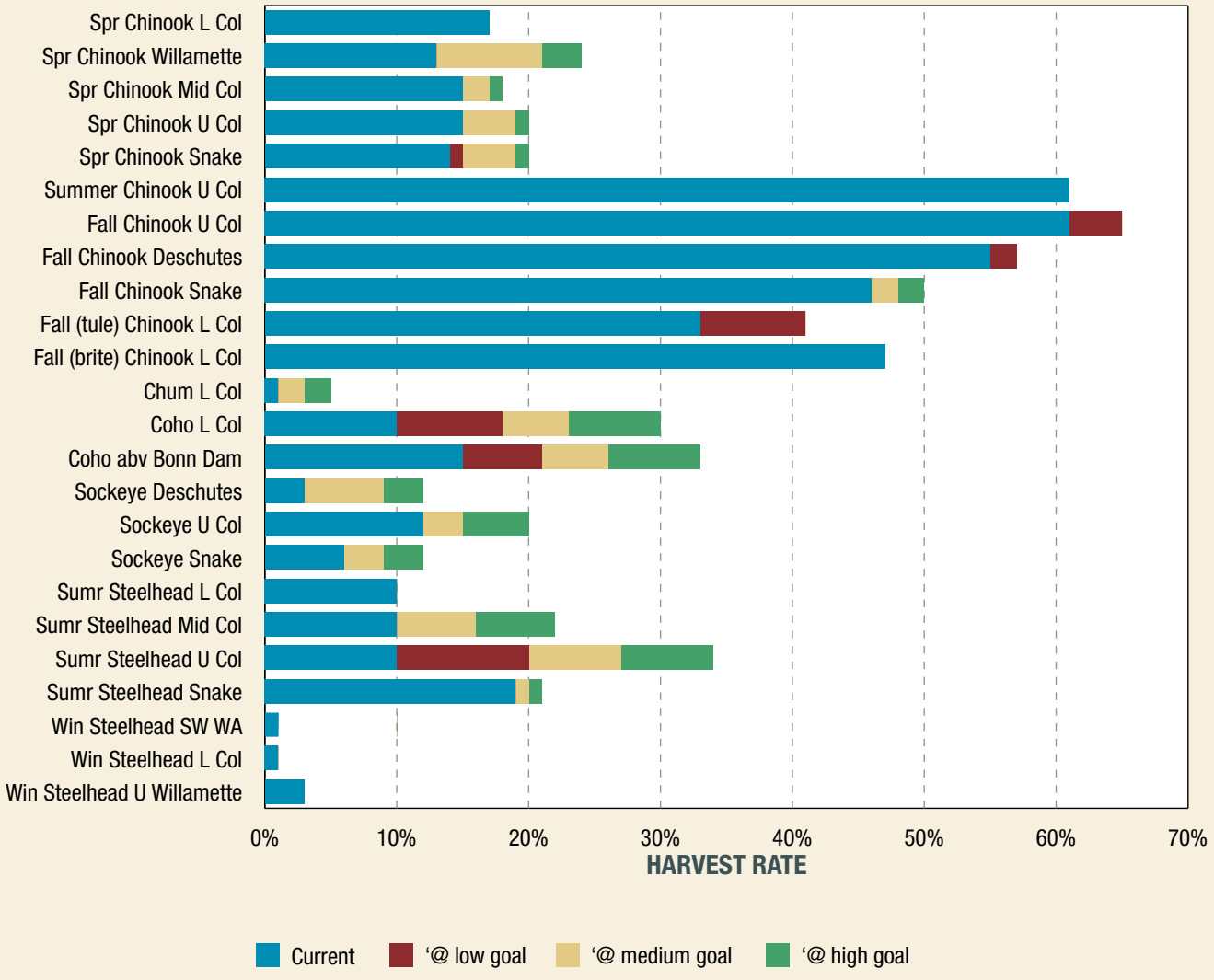


TABLE 9. Aggregate abundance values for natural-origin escapements under current, historical, and low, medium, and high escapement goal ranges. Numbers reflect current progress by work groups and may be revised based on new information.

Evolutionarily Significant Unit or Distinct Population Segment		Run type	ESA	Current	Historical	Low goal	Med goal	High goal	High as % of historical
Chinook	L Columbia	Spring	X	2,200	101,700	9,800	21,550	33,300	33%
Chinook	U Willamette	Spring	X	4,300	312,200	28,900	47,800	66,800	21%
Chinook	M Columbia Spr	Spring		9,600	103,700	15,800	26,900	38,000	37%
Chinook	U Columbia Spr	Spring	X	1,200	259,000	11,500	19,800	30,100	12%
Chinook	Snake Spr/Sum	Spring/ Summer	X	7,000	671,000	31,800	79,400	127,000	19%
Chinook	U Columbia Sum/Fall	Summer		16,900	694,000	9,000	78,400	131,300	19%
Chinook	U Columbia Sum/Fall	Fall		92,400	680,000	9,200	62,200	87,800	13%
Chinook	Deschutes Sum/Fall	Summer/ Fall		11,500	17,000	4,000	13,000	16,000	94%
Chinook	Snake Fall	Fall (brights)	X	8,360	500,000	4,200	9,300	14,360	3%
Chinook	L Columbia	Fall (tules)	X	12,300	169,700	28,000	54,100	82,000	48%
Chinook	L Columbia	Fall (late brights)	X	10,800	33,000	11,100	16,700	22,200	67%
Chum	Columbia	Late Fall	X	11,800	461,300	16,500	33,000	49,500	11%
Coho	L Columbia	Fall (early & late)	X	31,500	301,900	67,900	129,500	191,400	63%
Coho	(Columbia upriver)	Fall		10,000	320,000	24,000	57,800	96,900	30%
Sockeye	(Mid Columbia)	Summer		30	30,000	2,500	5,000	7,500	25%
Sockeye	(U Columbia)	Summer		80,800	2,000,000	49,000	620,000	2,235,000	112%
Sockeye	Snake	Summer	X	100	84,000	2,500	5,800	9,000	11%
Steelhead	L Columbia	Summer	X	3,300	19,100	4,600	5,850	6,950	36%
Steelhead	Mid Columbia	Summer	X	18,200	132,800	21,200	43,400	69,200	52%
Steelhead	U Columbia	Summer	X	1,500	1,121,400	7,500	31,000	47,000	4%
Steelhead	Snake	Summer	X	28,000	600,000	21,000	63,000	105,000	18%
Steelhead	SW Washington	Winter		6,000	41,900	19,000	27,900	36,400	87%
Steelhead	L Columbia	Winter	X	10,600	61,200	21,100	29,800	38,100	62%
Steelhead	U Willamette	Winter	X	2,800	220,000	16,300	27,800	39,300	18%
Totals				381,190	8,934,900	436,400	1,509,000	3,580,110	40%

TABLE 10. Current fishery harvest/impact rates, range of increases under current management frameworks, and low, medium, and high goals for natural-origin fish in combined marine and freshwater fisheries for Columbia Basin salmon and steelhead stocks.

Stock	Current Exploitation Rates (wild/natural)				Current Management Framework		
	Ocean	Fresh Water	Total (avg)	Range	Related guidance	Guidance includes	
Spr Chinook L Col	9%	8%	17%	10-40%	–	–	
Spr Chinook Willamette	9%	4%	13%	8-25%	<15%/<12%*	Fresh/Ocean	
Spr Chinook Mid Col	–	14.5%	14.5%	5.5-17%	5.5-17%*	Freshwater	
Spr Chinook U Col	–	14.8%	14.8%	7.5-23%	7.5-23%*	Freshwater	
Spr Chinook Snake	–	14.4%	14.4%	7.5-23%	7.5-23%*	Freshwater	
Summer Chinook U Col	36%	25%	61%	40-80%	5.2-50%*	Freshwater	
Fall Chinook U Col	36%	26%	61%	40-80%	21.5-45%*	Freshwater	
Fall Chinook Deschutes	36%	19%	55%	30-70%	21.5-45%*	Freshwater	
Fall Chinook Snake	20%	27%	46%	30-70%	21.5-45%*	Freshwater	
Fall (tule) Chinook L Col	21%	12%	33%	30-41%	30-41%*	All	
Fall (brite) Chinook L Col	34%	13%	47%	35-70%	*	–	
Chum L Col	–	1%	1%	<5%	<5%	Freshwater	
Coho L Col	5%	5%	10%	<10-30%	<10-30%*	All	
Coho abv Bonn Dam	5%	10%	15%	<10-35%	<10-30%*	All < BON	
Sockeye Deschutes	–	3.3%	3.3%	3-11%	6-8+%*	Freshwater	
Sockeye U Col	–	11.6%	11.6%	6-19%	6-26+%*	Freshwater	
Sockeye Snake	–	5.6%	5.6%	6-11%	6-8+%*	Freshwater	
Sumr Steelhead L Col	–	<10%	10%	<10%	<10%	Freshwater	
Sumr Steelhead Mid Col	–	9.5%	9.5%	8-22%	15-22%*	Freshwater	
Sumr Steelhead U Col	–	10.1%	10.1%	20-34%	20-34%*	Freshwater	
Sumr Steelhead Snake	–	19.1%	19.1%	15-22%	15-22%*	Freshwater	
Win Steelhead SW WA	–	1%	1%	<10%	<10%	Freshwater	
Win Steelhead L Col	–	1%	1%	<10%	<10%	Freshwater	
Win Steelhead U Willamette	–	3%	3%	<20%	<20%	Freshwater	

* Abundance-based management framework for Columbia River fisheries.

Notes:

- Task Force Stocks defined based on the combination of conservation (ESU or DPS) and fishery management units.
- Goal ranges reflect abundance-based annual harvest strategies as well as normal annual variation in fisheries.
- Related guidance is for reference purposes – typically these are abundance-based ranges identified in U.S. v. Oregon or other NOAA Fisheries consultations for Columbia Basin fisheries. In a few cases, may also include marine harvest in OR/WA Ocean (e.g., Lower River Hatchery Fall Chinook, Columbia River Coho).
- Potential future harvest rates not specifically identified for hatchery fish at this time. Sustainable rates will typically be substantially higher than for natural-origin fish.

	Rates under existing plans			Potential rates with production improvements					
	@ low natl	@ med natl	@ high natl	@ low natl Avg.	@ low natl Range	@ med natl Avg.	@ med natl Range	@ high natl Avg	@ high natl Range
	17%	17%	17%	17%	10-40%	28%	15-45%	40%	20-60%
	13%	21%	24%	13%	8-25%	26%	15-45%	40%	20-60%
	15%	16%	17%	15%	5.5-17%	27%	20-35%	40%	20-60%
	15%	19%	20%	15%	7.5-23%	28%	20-40%	40%	20-60%
	15%	19%	20%	15%	7.5-23%	28%	20-40%	40%	20-60%
	61%	61%	61%	61%	40-80%	61%	40-80%	61%	40-80%
	65%	65%	65%	65%	40-80%	65%	40-80%	65%	40-80%
	57%	57%	57%	57%	30-70%	61%	30-70%	65%	30-80%
	46%	48%	50%	46%	30-70%	51%	30-75%	55%	30-80%
	41%	41%	41%	41%	30-41%	53%	30-55%	65%	30-80%
	47%	47%	47%	47%	35-70%	50%	35-70%	53%	35-70%
	1%	2.8%	5%	1%	<5%	20%	5-30%	40%	20-60%
	18%	23%	30%	18%	<10-30%	24%	10-40%	30%	10-50%
	21%	26%	33%	21%	<10-40%	30%	10-50%	40%	20-60%
	3%	9%	12%	3%	3-11%	15%	10-30%	25%	10-40%
	12%	15%	20%	12%	6-19%	25%	10-40%	40%	20-60%
	6%	9%	12%	6%	6-11%	15%	10-30%	25%	10-40%
	10%	10%	10%	10%	<10%	18%	10-25%	25%	10-40%
	10%	15.8%	22%	10%	8-22%	22%	15-30%	35%	20-50%
	20%	27%	34%	20%	20-34%	28%	20-40%	35%	20-50%
	19%	20.6%	22%	19%	15-22%	27%	20-40%	35%	20-50%
	1%	1%	1%	1%	<10%	13%	10-30%	25%	10-40%
	1%	1%	1%	1%	<10%	13%	10-30%	25%	10-40%
	3%	3%	3%	3%	<20%	14%	10-30%	25%	10-40%

FIGURE 12. Potential harvest/impact rates under abundance-based management frameworks at low, medium, and high natural production (assuming corresponding changes in fishery management frameworks). Average values are depicted by vertical lines within colored bars.

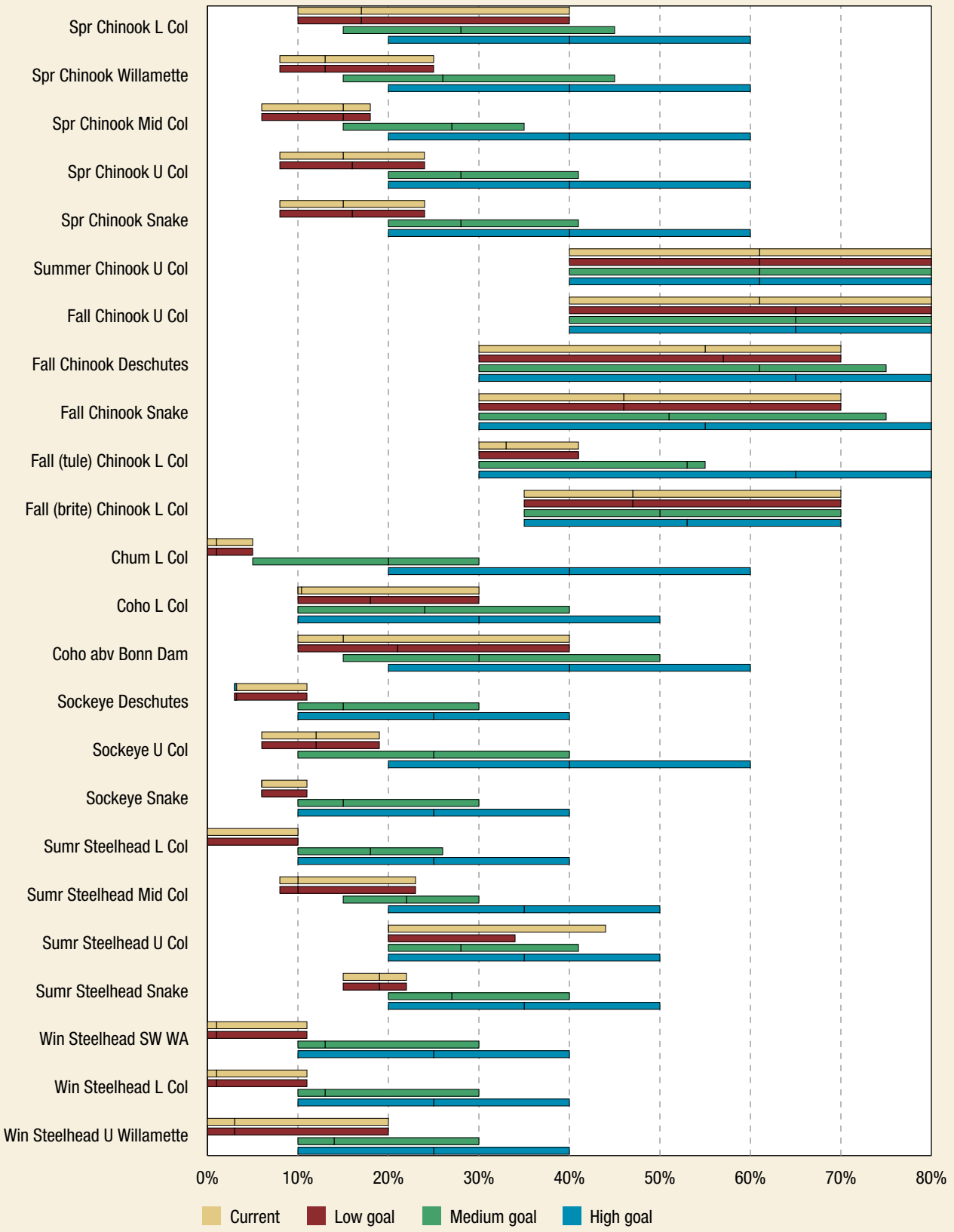


FIGURE 13. Current and anticipated hatchery production for Columbia Basin salmon and steelhead stocks.

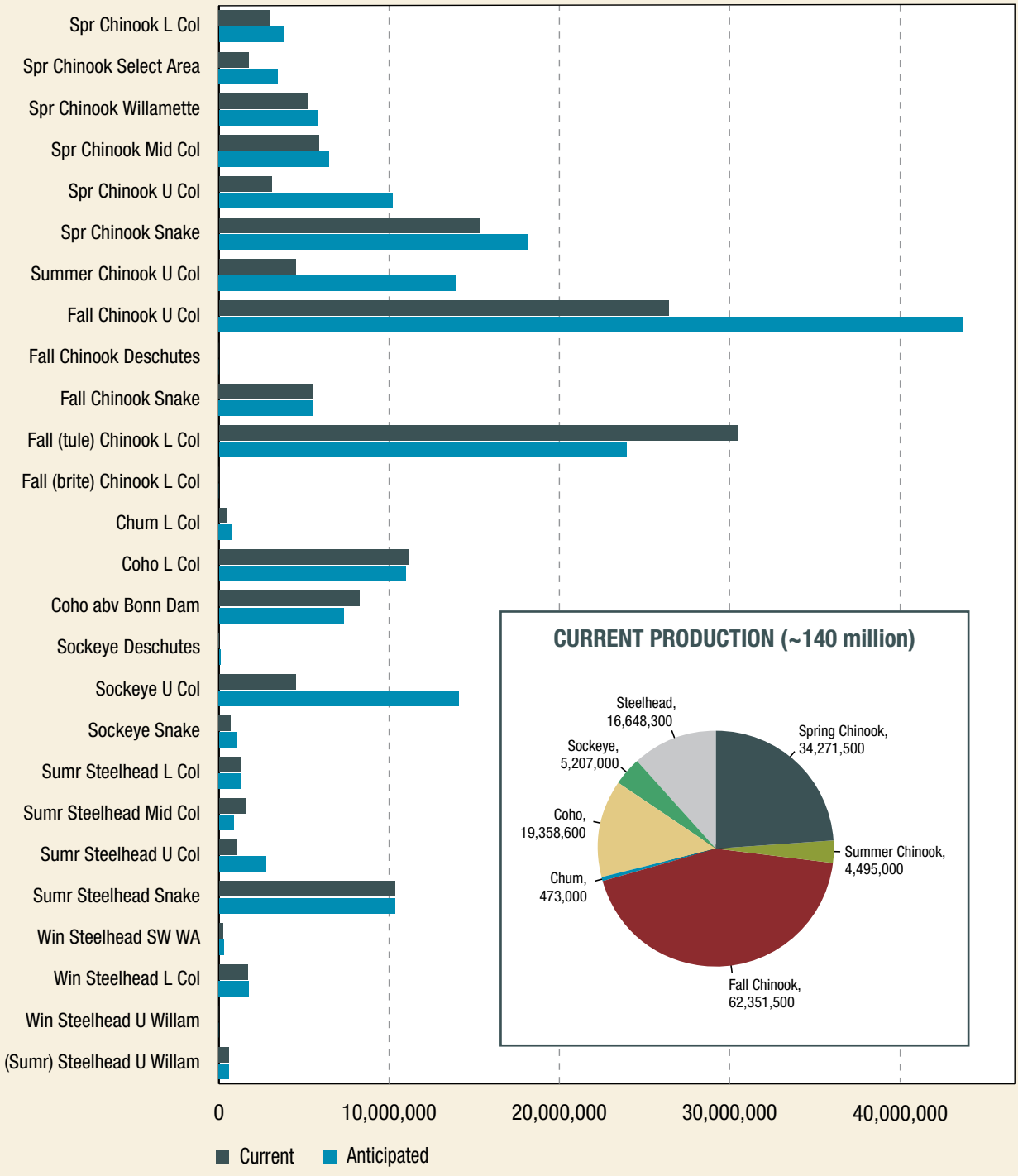
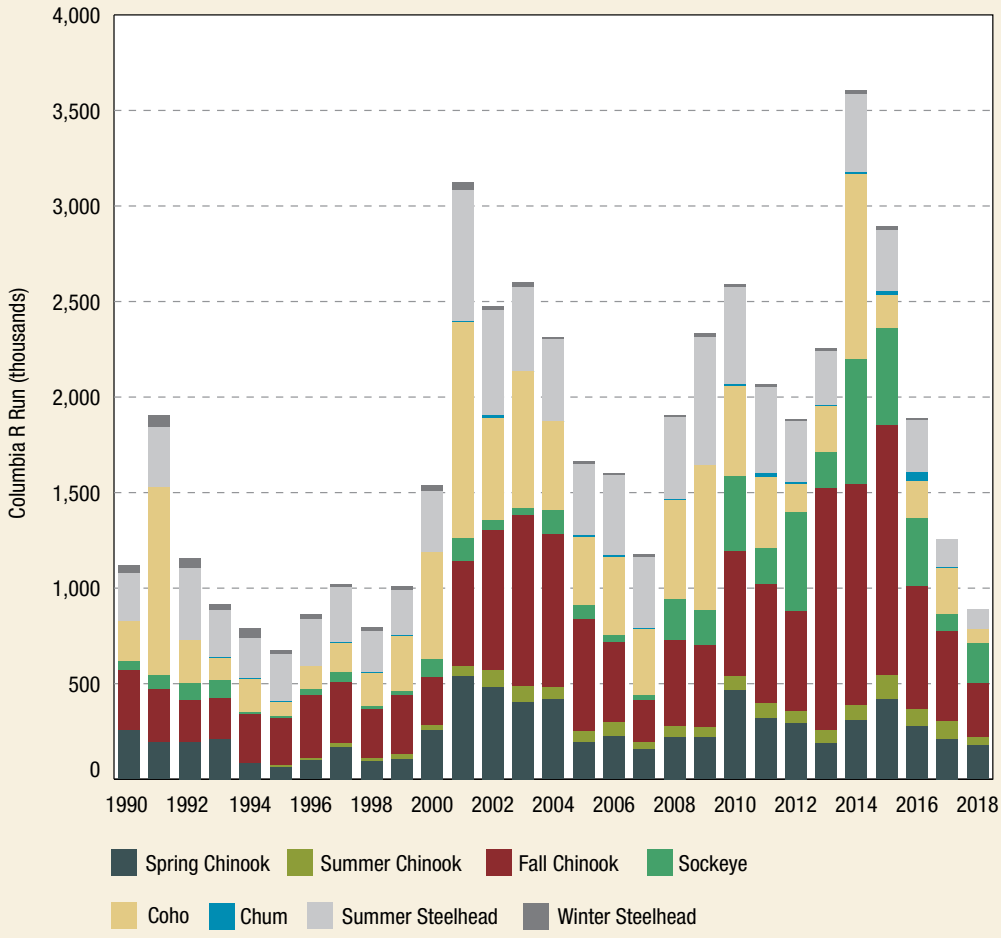


TABLE 11. Current and anticipated hatchery production and approximate adult returns to the Columbia River mouth for Columbia Basin salmon and steelhead stocks.

Stock	Current production (average)				Anticipated production	
	Yearlings	Other	Total	Col R adults	Total	Col R adults
Spr Chinook L Col	2,570,000	416,000	2,986,000	17,000	3,780,000	25,000
Spr Chinook Select Area	1,750,000	0	1,750,000	0	3,450,000	0
Spr Chinook Willamette	5,241,000	0	5,241,000	48,000	5,817,000	53,000
Spr Chinook Mid Col	5,400,000	460,000	5,860,000	47,200	6,480,000	52,200
Spr Chinook U Col	3,094,000	0	3,094,000	19,400	10,200,000	104,300
Spr Chinook Snake	14,115,500	1,225,000	15,340,500	85,500	18,115,500	110,000
Summer Chinook U Col	3,311,000	1,184,000	4,495,000	46,800	13,950,000	146,000
Fall Chinook U Col	210,000	26,200,000	26,410,000	233,400	43,750,000	357,100
Fall Chinook Deschutes	0	0	0	0	0	0
Fall Chinook Snake	0	5,500,000	5,500,000	49,200	5,500,000	49,200
Fall (tule) Chinook L Col	0	30,441,500	30,441,500	163,000	23,941,500	139,000
Fall (brite) Chinook L Col	0	0	0	0	0	0
Chum L Col	0	473,000	473,000	300	750,000	500
Coho L Col	11,100,000	8,600	11,108,600	246,000	10,960,000	246,000
Coho abv Bonn Dam	8,250,000	0	8,250,000	128,000	7,325,000	128,000
Sockeye Deschutes	0	7,000	7,000	100	80,000	1,000
Sockeye U Col	0	4,500,000	4,500,000	32,700	14,100,000	141,000
Sockeye Snake	0	700,000	700,000	1,200	1,000,000	1,700
Sumr Steelhead L Col	1,241,000	0	1,241,000	44,000	1,316,000	44,000
Sumr Steelhead Mid Col	865,000	670,000	1,535,000	58,000	865,000	32,700
Sumr Steelhead U Col	1,005,300	0	1,005,300	21,000	2,750,000	58,000
Sumr Steelhead Snake	9,328,000	1,000,000	10,328,000	203,400	10,328,000	203,400
Win Steelhead SW WA	243,000	0	243,000	4,100	290,000	4,100
Win Steelhead L Col	1,696,000	0	1,696,000	28,900	1,765,000	28,900
Win Steelhead U Willam	0	0	0	0	0	0
(Sumr) Steelhead U Willam	600,000	0	600,000	17,000	600,000	17,000
Totals	70,019,800	72,785,100	142,804,900	1,494,200	187,113,000	1,942,100

evenly distributed among sockeye salmon, coho salmon, and steelhead. Chum salmon typically comprise less than one percent of the total return. Naturally produced fish comprise about 40 percent of the run on average, with percentages varying among species and life-history types (Table 13). Approximately 60 percent of the total average run originates from hatchery production. About 35 percent of the Columbia River run is harvested in freshwater fisheries. Additional harvest occurs in marine waters as far north as Alaska.

FIGURE 14. Annual salmon and steelhead run size to the Columbia River by stock, 1990-2017.



Estimates of historical abundance are used as a point of reference for current abundance. Historical abundance is uncertain, and various estimates have been developed over time. Total annual abundance of adult salmon and steelhead in the Columbia River Basin during the pre-development period (~mid 1800s) has been estimated to be 8.3 million (PFMC 1979), 7.5 to 8.9 million (Chapman 1986), 10 to 16 million (NPPC 1986), and 5 to 9 million (ISAB 2015).

Stock-specific estimates of historical (pre-development) natural production were identified by the regional technical teams. The total of all stock-specific estimates of historical natural production is 9 million (Table 13). This estimate is within the range of the various historical Columbia River run-size estimates documented in Table 12, although greater than estimates by the ISAB (2015) and Chapman (1986).[41]

High-end Quantitative Goals for natural production identified by the Task Force on the spawning grounds for all stocks totaled 3.6 million salmon and steelhead (Figure 16). This would be nine times higher than current numbers. Species and run-specific improvement increments range from 1.6 for fall Chinook to 27.8 for sockeye.

Provisional Quantitative Goals for natural production were translated into equivalent Columbia River mouth numbers by accounting for harvest and other mortality (natural or human-caused) between the mouth and the spawning grounds. Columbia River mouth estimates corresponding to high-range Quantitative Goals for natural production and assuming high potential fishing rates on healthy stocks are approximately 11.4 million (4.7 million excluding sockeye). This includes natural-origin and hatchery-origin fish as well as projected harvest in freshwater.

[41] Comparisons of historical (pre-development) numbers and CBP Task Force Provisional Quantitative Goals for natural production make no correction for mortality between the mouth and spawning grounds. Historical harvest and migration mortalities were unknown and the magnitude is dwarfed by inherent uncertainties in historical run-size estimates.

TABLE 12. Historical run-size estimates, current run sizes, and harvest of salmon and steelhead in the Columbia River.

Species	Historical Columbia River Run (millions)					
	Northwest Power Planning Council, 1986	Chapman 1986	Pacific Fisheries Management Council, 1979	Independent Scientific Advisory Board, 2015	Columbia Basin Partnership, 2019[a]	
Chinook	5.4-9.2	3.75-4.34	3.44	–	3.54	
Spring	1.4-2.3	0.5-0.6	–	–	1.45	
Summer	2.7-4.6	2.0-2.5	–	–	0.69	
Fall	1.3-2.3	1.25	–	–	1.40	
Chum	0.8-1.0	0.45-0.75	0.95	–	0.46	
Coho	1.0-1.8	0.56-0.62	1.20	–	0.62	
Sockeye	1.5-2.6	2.25-2.62	0.65	–	2.11	
Steelhead	0.8-1.4	0.45-0.55	2.04	–	2.20	
Winter	–	–	–	–	1.87	
Summer	–	–	–	–	0.32	
Total	9.6-16.3	7.5-8.9	8.28	5.0-9.0	8.93	

[a] Based on population-specific inferences for natural-origin spawners prior to development.

TABLE 13. Columbia Basin Partnership Task Force high-range goals for natural-origin spawners in relation to historical and current numbers, and corresponding totals for the Columbia River mouth run size and harvest.

Species	Natural-origin Spawners				
	Current	High goal	% of historical	Goal / current	
Chinook	176,000	648,000	18%	3.7	
Spring	24,000	295,000	20%	12.3	
Summer	17,000	131,000	19%	7.7	
Fall	135,000	222,000	16%	1.6	
Chum	12,000	49,500	11%	4.1	
Coho	42,000	288,300	46%	6.9	
Sockeye	81,000	2,251,500	107%	27.8	
Steelhead	70,000	342,000	16%	4.9	
Winter	51,000	228,200	12%	4.5	
Summer	19,000	113,800	35%	6.0	
Total	381,000	3,579,300	40%	9.4	

	Current Columbia River Run (2008-2017 averages)				Current Harvest (10-year averages)			
	Natural origin	Hatchery origin	Total	% Hat	Col Basin	Ocean	Total	% of run
	383,000	710,000	1,093,000	58%	419,400	427,500	846,900	56%
	56,000	217,000	273,000	79%	88,500	7,400	95,900	34%
	31,000	47,000	78,000	60%	31,100	43,300	74,400	61%
	296,000	446,000	742,000	60%	299,800	376,800	676,600	60%
	15,000	0	15,000	2%	100	0	100	1%
	34,000	374,000	408,000	90%	145,000	85,000	230,000	47%
	295,000	34,000	329,000	10%	41,900	0	41,900	13%
	104,000	377,000	481,000	79%	222,800	0	222,800	46%
	14,000	33,000	47,000	50%	19,700	0	19,700	42%
	90,000	344,000	434,000	80%	203,100	0	203,100	47%
	831,000	1,495,000	2,326,000	64%	829,200	512,500	1,341,700	37%

	Columbia River Run @ high goals				Harvest @ high goals			
	Natural origin	Hatchery origin	Total	% Hat	Col Basin	Ocean	Total	% of run
	1,494,900	1,035,800	2,530,700	41%	1,154,500	711,600	1,866,100	58%
	777,100	344,500	1,121,600	31%	515,000	30,000	545,000	47%
	241,000	146,000	387,000	38%	154,000	215,000	369,000	61%
	476,800	545,300	1,022,100	53%	485,500	466,600	952,100	64%
	102,000	500	102,500	0%	41,000	0	41,000	40%
	432,000	374,000	806,000	46%	499,000	109,000	608,000	66%
	6,560,400	143,700	6,704,100	2%	3,006,200	0	3,006,200	45%
	899,200	388,100	1,287,300	30%	520,300	0	520,300	40%
	163,000	33,000	196,000	17%	63,000	0	63,000	32%
	736,200	355,100	1,091,300	33%	457,300	0	457,300	42%
	9,488,500	1,942,100	11,430,600	17%	5,221,000	820,600	6,041,600	35%

FIGURE 15. Composition of recent 10-year average salmon and steelhead run to the Columbia River. Area-specific numbers are as measured at the Columbia River mouth.

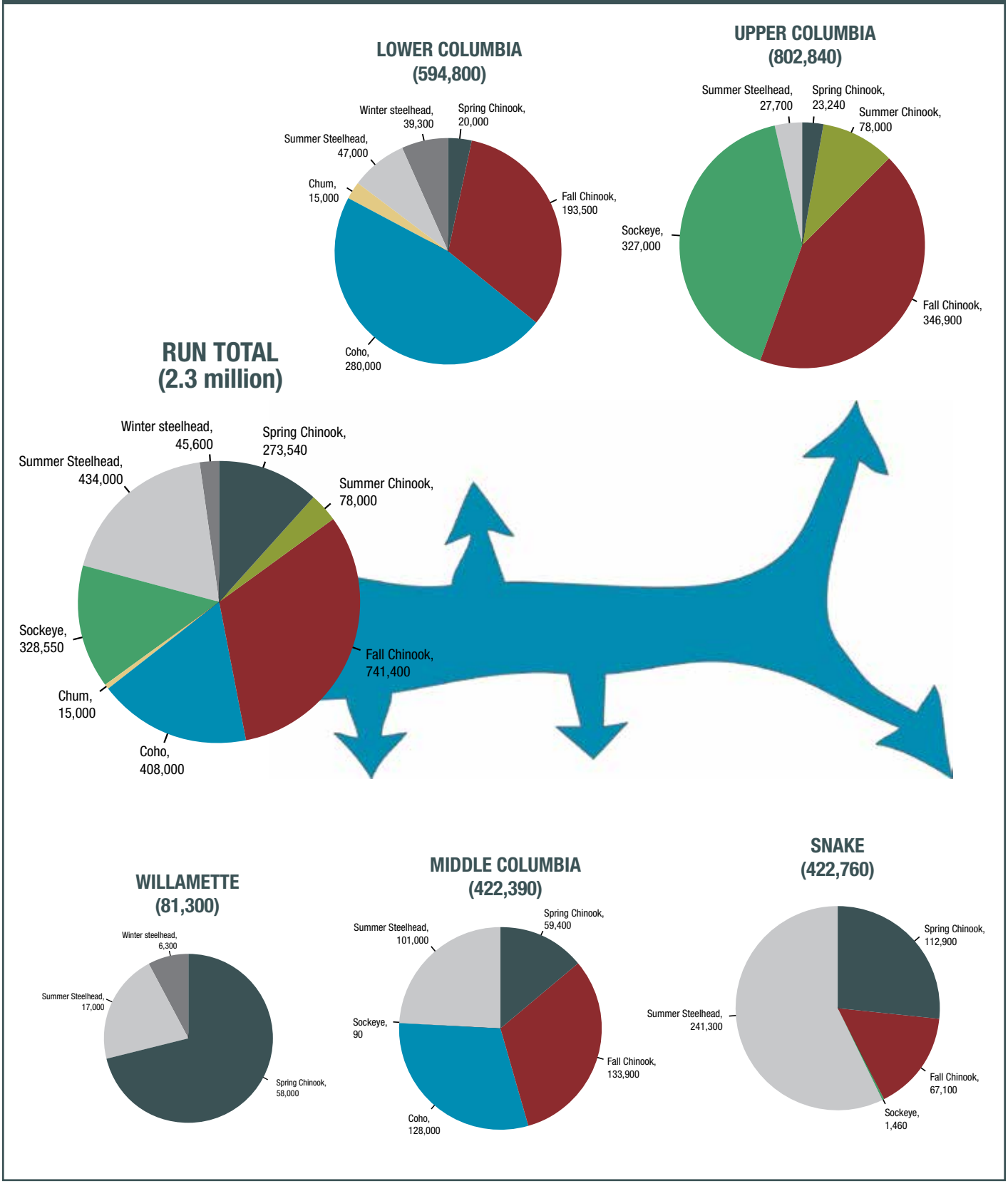
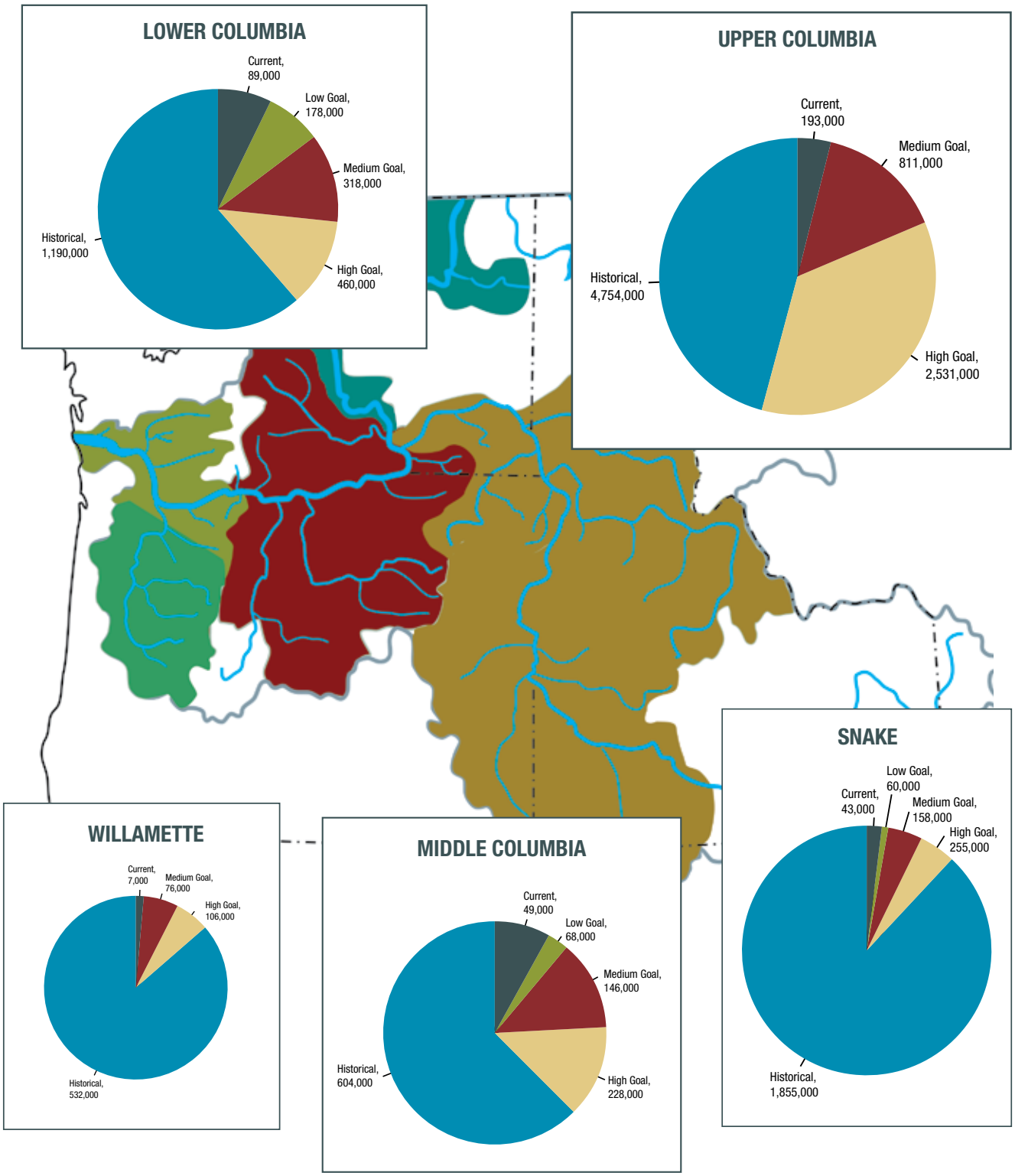


FIGURE 16. Natural production goals for spawning escapement relative to current and historical values. Current, low goal, medium goal and high goal pie slices are incremental relative to lower values (e.g., low goal total = current + additional increment needed to reach the total identified for the low goal.



Continuing the Work of the Task Force

The efforts of the Task Force focused first and foremost on setting goals for salmon and steelhead recovery in the Columbia Basin. These goals are reflected in both Qualitative Goal statements and Provisional Quantitative Goals for each of the 24 stocks. These goals reflect values for our collective future — for example, the aspiration to have heathy and harvestable levels of salmon and steelhead, and the intent to include social, cultural, ecological, and economic considerations in salmon and steelhead management decisions.

Frequently, however, Task Force discussions included questions about how the goals would be realized, what actions would be necessary to achieve the goals, and what implications those actions might have for diverse interests in the Columbia Basin. Task Force members held back on resolving those questions because of the importance of first setting goals. Members frequently reminded each other of the saying that *"If you don't know where you are going, any road will take you there."*

The MAFAC approved continuation of this effort in late June 2018, providing the opportunity to further test and refine the Provisional Quantitative Goals and address many of the questions around how the goals might be achieved. The Task Force has had many preliminary discussions about what the next phase would cover.

POTENTIAL TOPICS FOR FURTHER EXPLORATION AND EVALUATION INCLUDE:

1. How to balance achievement of the qualitative goals on a stock-specific basis, considering that different qualitative goals may be prioritized for individual stocks.
2. How to strategically align harvest aspirations and future hatchery production with natural production goals.
3. How to refine goals for salmon and steelhead in blocked areas in the Columbia and Snake River Basins.
4. Identifying potential opportunities and multiple benefits among all of the species and actions.
5. Developing alternative scenarios with strategies and action to achieve the goals.

The relationships built on mutual trust and respect that Task Force members fostered over the last two years are essential to finding solutions and synergies. The common foundation developed through this initial phase provides the Task Force members with the tools, confidence, and inspiration to move forward.

References

Chapman, D. W. 1986. Salmon and Steelhead Abundance in the Columbia River in the Nineteenth Century. *Transactions of the American Fisheries Society* 115:662-670.

CRITFC (Columbia River Inter-Tribal Fish Commission). 2014. *Spirit of the Salmon Plan: Wy-Kan-Ush-Mi Wa-Kish-Wit*. Portland, Oregon. http://plan.critfc.org/.

Flores, L., J. Mojica, A. Fletcher, A, P. Casey, Z. Christin, C. Armistead, and D. Batker. 2017. *The Value of Natural Capital in the Columbia River Basin: A Comprehensive Analysis.* Earth Economics, Tacoma, WA. Available at: https://ucut.org/wp-content/uploads/2017/12/ValueNaturalCapitalColumbiaRiverBasinDec2017.pdf.

ICTRT (Interior Columbia Basin Technical Recovery Team). 2007. *Viability Criteria for Application to Interior Columbia Basin Salmonid ESUs*. https://www.nwfsc.noaa.gov/research/divisions/cb/genetics/trt/trt_documents/ictrt_viability_criteria_reviewdraft_2007_complete.pdf.

ISAB (Independent Scientific Advisory Board). 2015. *Density Dependence and Its Implications for Fish Management and Restoration in the Columbia River Basin* (and July 2016 addendum). Northwest Power and Conservation Council Document: ISAB 2015-1. https://www.nwcouncil.org/fish-and-wildlife/fw-independent-advisory-committees/independent-scientific-advisory-board/density-dependence-and-its-implications-for-fish-management-and-restoration-in-the-columbia-river-basin-and-july-2016-addendum.

LCFRB (Lower Columbia River Fish Recovery Board). 2010. *Washington Lower Columbia Salmon Recovery and Fish and Wildlife Subbasin Plan.* https://docs.wixstatic.com/ugd/810197_dec0786f0c474a-1192fa14b45bde9be3.pdf.

McElhany, P., M. H. Ruckelshaus, M. J. Ford, T. C. Wainwright, and E. P. Bjorkstedt. 2000. *Viable Salmonid Populations and the Recovery of Evolutionarily Significant Units.* U.S. Department Commerce, NOAA Tech. Memo. NMFS NWFSC-42,156 p. https://repository.library.noaa.gov/view/noaa/3139.

NMFS (National Marine Fisheries Service). 2009. *Middle Columbia River Steelhead Distinct Population Segment ESA Recovery Plan.* https://repository.library.noaa.gov/view/noaa/16003.

NMFS (National Marine Fisheries Service). 2013. ESA *Recovery Plan for Lower Columbia River Chinook Salmon, Lower Columbia River Coho Salmon, Columbia River Chum Salmon, and Lower Columbia River Steelhead*. https://repository.library.noaa.gov/view/noaa/16002.

NMFS (National Marine Fisheries Service). 2015. ESA *Recovery Plan for Snake River Sockeye Salmon (Oncorhynchus nerka)*. https://repository.library.noaa.gov/view/noaa/16001

NMFS (National Marine Fisheries Service). 2017a. *ESA Recovery Plan for Snake River Fall Chinook Salmon (Oncorhynchus tshawytscha)*. West Coast Region. Portland, Oregon. https://www.fisheries.noaa.gov/resource/document/recovery-plan-snake-river-fall-chinook-salmon

NMFS (National Marine Fisheries Service). 2017b. *ESA Recovery Plan for Snake River Spring/Summer Chinook (Oncorhynchus tshawytscha) and Snake River Steelhead (Oncorhynchus mykiss)*. https://www.fisheries.noaa.gov/resource/document/recovery-plan-snake-river-spring-summer-chinook-salmon-and-snake-river-basin.

NPCC (Northwest Power and Conservation Council). 2014. *Columbia River Basin Fish and Wildlife Program.* Council Document Number 2014-12. Portland, Oregon. https://www.nwcouncil.org/reports/2014-columbia-river-basin-fish-and-wildlife-program.

NPPC (Northwest Power Planning Council) 1986. Compilation of information on salmon and steelhead losses in the Columbia River Basin. Northwest Power and Conservation Council (formerly named Northwest Power Planning Council) Portland, OR.

NPT (Nez Perce Tribe). 2013. *Nez Perce Tribe Department of Fisheries Resources Management Plan*. http://www.nptfisheries.org/portals/0/images/dfrm/home/fisheries-management-plan-final-sm.pdf.

NRC (National Research Council). 1998. *Upstream: Salmon and Society in the Pacific Northwest.* National Academy Press. Washington, D.C.

ODFW (Oregon Department of Fish and Wildlife). 2010. *Lower Columbia River Conservation and Recovery Plan for Oregon Populations of Salmon and Steelhead*. https://www.dfw.state.or.us/fish/CRP/lower_columbia_plan.asp.

ODFW (Oregon Department of Fish and Wildlife) and NMFS (National Marine Fisheries Service). 2011. *Upper Willamette River Conservation and Recovery Plan for Chinook Salmon and Steelhead.* https://repository.library.noaa.gov/view/noaa/15981.

Pacific Northwest Projects. 2015. *The Economic Importance of Western Irrigated Agriculture, Family Farm Alliance Review, 2015*. Water resources white paper. Prepared for The Family Farm Alliance. March 2015.

Penaluna, B. E., A. Abadía-Cardoso, J. B. Dunham, F. J. García-Dé León, R. E. Gresswell, A. Ruiz Luna, E. B. Taylor, B. B. Shepard, R. Al-Chokhachy, C. C. Muhlfeld, K. R. Bestgen, K. Rogers, M. A. Escalante, E. R. Keeley, G. M. Temple, J. E. Williams, K. R. Matthews, R. Pierce, R. L. Mayden, R. P. Kovach, J. Carlos Garza, and K. D. Fausch 2016. Conservation of Native Pacific Trout Diversity in Western North America. *Fisheries* 41:6, 286-300. DOI: 10.1080/03632415.2016.1175888.

UCSRB (Upper Columbia Salmon Recovery Board). 2007. *Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan*. https://repository.library.noaa.gov/view/noaa/15990.

UCUT (Upper Columbia United Tribes). 1985. *Compilation of Information on Salmon and Steelhead Total Run Size, Catch and Hydropower Related Losses in the Upper Columbia River Basin, Above Grand Coulee Dam.* Upper Columbia United Tribes Fisheries Technical Report #2.

USRT (Upper Snake River Tribes). 2018. *Hells Canyon Fisheries Resource Management Plan*. April 27.

Williams, R. N. 2006. *Return to the River: Restoring Salmon to the Columbia River*. Edited by Richard N. Williams. 2006, digital printing 2011. Elsevier Academic Press (ISNB 10:0-12-088414-3).

WLCTRT (Willamette/Lower Columbia Technical Recovery Team) and ODFW (Oregon Department of Fish and Wildlife). 2006. *Revised Viability Criteria for Salmon and Steelhead in the Willamette and Lower Columbia Basins*. https://www.researchgate.net/publication/280628372_Revised_Viability_Criteria_for_Salmon_and_Steelhead_in_the_Willamette_and_Lower_Columbia_Basins.

YBFWRB (Yakima Basin Fish and Wildlife Recovery Board). 2009. *Yakima Steelhead Recovery Plan*. http://www.ybfwrb.org/recovery-planning/steelhead-recovery-plan/.

Appendices

Appendix A. Provisional Quantitative Goal Summaries by Stock

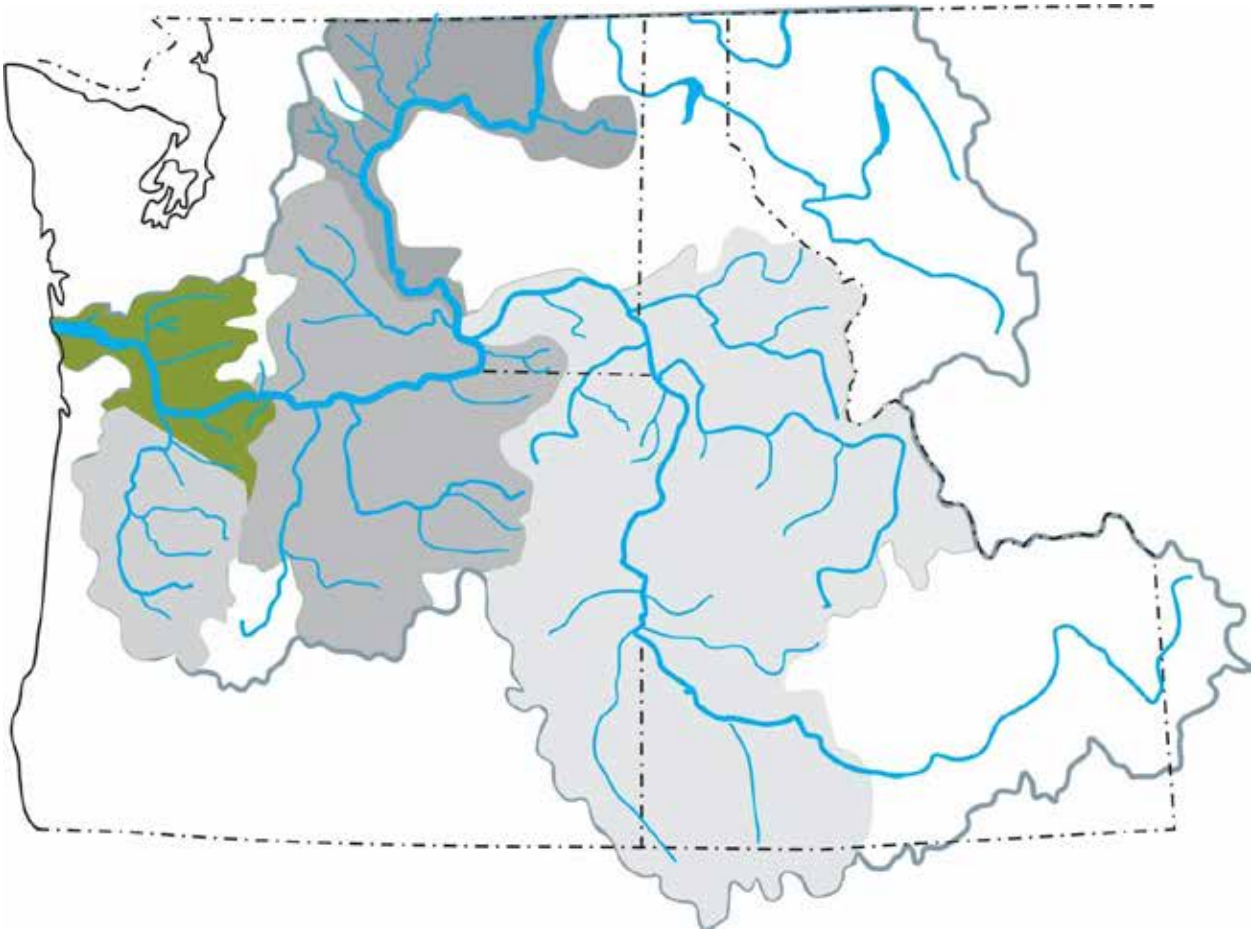
CONTENTS

For assistance with this Appendix, please contact NOAA Fisheries West Coast Region at (503) 230-5400 or visit https://www.fisheries.noaa.gov/west-coast/partners/columbia-basin-partnership-task-force.

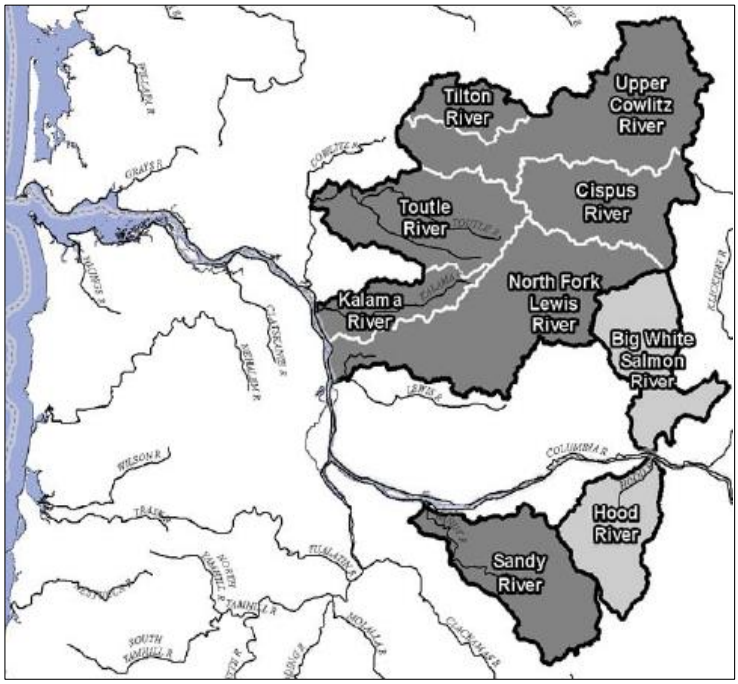
List of Acronyms and Abbreviations

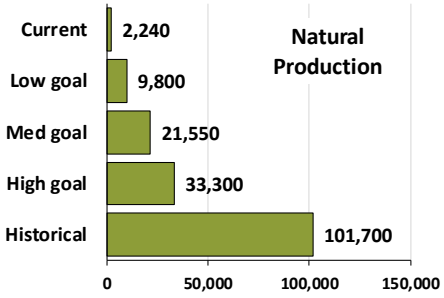
AK	Alaska
BON	Bonneville Dam
Can	Canada
CJD	Chief Joseph Dam
CR	Columbia River
Crk	Creek
DPS	Distinct Population Segment
EDT	Ecosystem Diagnosis and Treatment
EF	East Fork
ER	Exploitation Rate
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
Hat	Hatchery
ICTRT	Interior Columbia Technical Recovery Team
ID	Idaho
IDFG	Idaho Department of Fish and Game
IHR	Ice Harbor Dam
LCR	Lower Columbia River
LGR	Lower Granite Dam
LRH	Lower River Hatchery (fall Chinook stock)
LRW	Lower River Wild (fall Chinook stock)
MAT	Minimum Abundance Threshold
MCN	McNary Dam
MCR	Middle Columbia River
MPG	Major Population Group
Natl	Natural
NF	North Fork
NMFS	National Marine Fisheries Service
NPCC	Northwest Power and Conservation Council
Ocn	Ocean
ODFW	Oregon Department of Fish and Wildlife
OR	Oregon
PFC	Properly Function Conditions (freshwater habitat)
PRD	Priest Rapids Dam
R	River
SAB	Select Area Bright (fall Chinook stock)
SF	South Fork
TDA	The Dalles Dam
UCR	Upper Columbia River
URB	Upriver Bright (fall Chinook stock)
WA	Washington
WDFW	Washington Department of Fish and Wildlife
WLCTRT	Willamette Lower Columbia Technical Recovery Team
YN	Yakama Nation

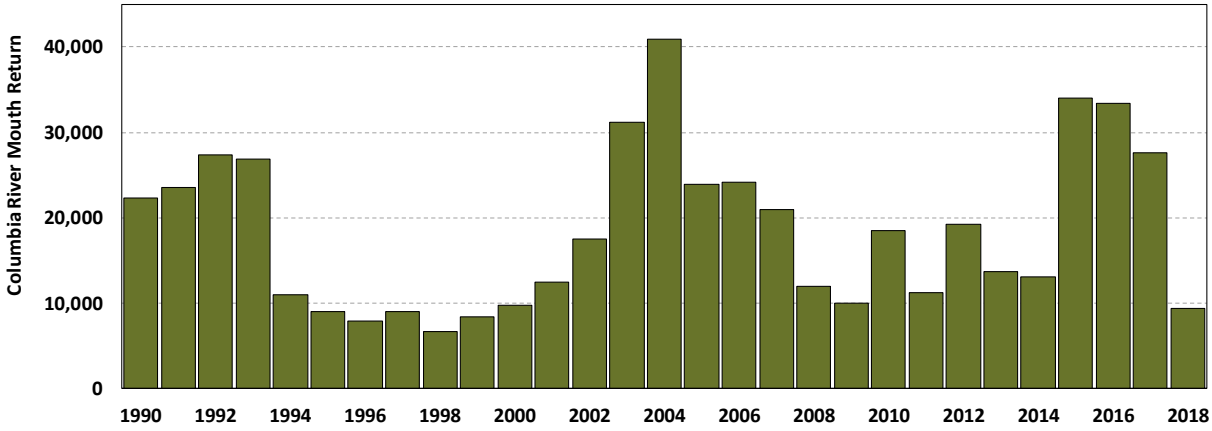
LOWER COLUMBIA

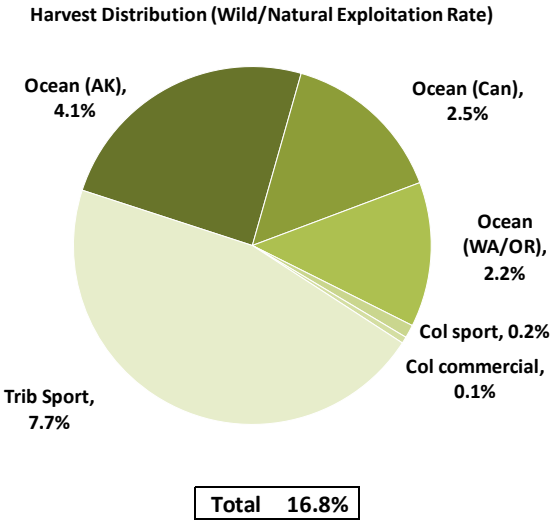


- Return to mid to upper reaches of Cascade tributaries in the lower Columbia and Columbia River gorge.
- Significant historical production areas in the upper Cowlitz and Lewis rivers were blocked but are currently the focus of reintroduction efforts.
- Hatchery programs are currently operated in many areas to mitigate for lost production.

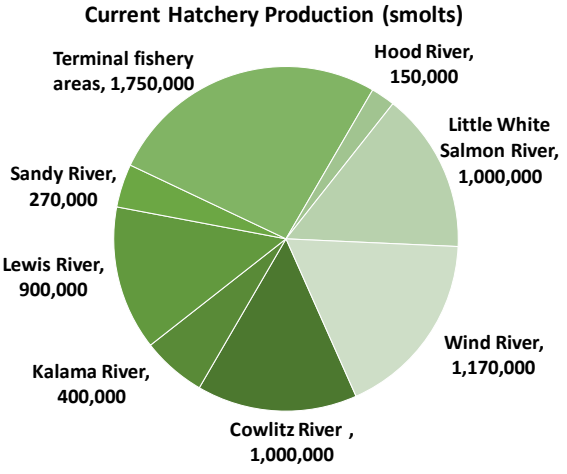








Total 16.8%



Total 6.6 million

Natural Production		Abundance		Potential Goal Range		
MPG	Population	Recent	Historical	Low	Med	High
Cascade	Upper Cowlitz (WA)	150	22,000	1,800	4,100	6,400
	Cispus (WA)		7,800	1,800	1,800	1,800
	Tilton (WA)	0	5,400	100	1,650	3,200
	Toutle (WA)	100	3,100	1,100	1,900	2,700
	Kalama (WA)	160	4,900	300	550	800
	NF Lewis (WA)	150	15,700	1,500	2,300	3,100
	Sandy (OR)	1,560	26,900	1,200	4,550	7,900
Gorge	White Salmon (WA)	50	900	500	700	900
	Hood (OR)	70	15,000	1,500	4,000	6,500
Totals		**2,240**	**101,700**	**9,800**	**21,550**	**33,300**

Artificial Production	Current Production			Return	Anticipated
Location (Program)	Brood	Yearling	Subyearling	Goal	production
Cowlitz River		1,000,000	400,000		1,800,000
Kalama River		400,000			500,000
Lewis River		900,000	16,000		1,350,000
Sandy River		270,000			130,000
Subtotal		**2,570,000**	**416,000**		**3,780,000**
Terminal fishery areas		1,750,000			3,450,000
Hood River		150,000			250,000
Little White Salmon River		1,000,000			1,000,000
Wind River		1,170,000			1,170,000
Total		**6,640,000**	**416,000**		**9,650,000**

Fisheries / Harvest		Exploitation rate				Harvest *	
	Location	Avg (v ocn)	Avg (v CR)	Limits	Potential	Recent	Potential
Natural	Ocean (AK)	4.1%	--	10-40%	20-50%	109	6,000
	Ocean (Can)	2.5%	--			60	
	Ocean (WA/OR)	2.2%	--			63	
	Col sport	0.2%	0.3%			7	21,000
	Col commercial	0.1%	0.1%			2	
	Trib Sport	7.7%	8.4%			191	
	Total	**16.8%**	**8.8%**	***10-40%***	***20-50%***	**433**	**27,000**
Hatchery	Ocean (AK)	4.1%	--	≤ 70%	≤ 70%	736	2,000
	Ocean (Can)	2.5%	--			373	
	Ocean (WA/OR)	2.2%	--			495	
	Col sport	2.2%	2.4%			436	17,000
	Col commercial	0.8%	0.9%			159	
	Trib Sport	22.1%	24.2%			5,095	
	Total	**33.9%**	**27.6%**	***≤ 70%***	***≤ 70%***	**7,294**	**19,000**
Select Area	Col Sport	--	7.8%			10,100	21,883
	Col Commercial	--	91.1%			1,000	
	Total		***98.9%***			**11,100**	**21,883**
Bonn Tribs	Treaty	--	19.7%			4,200	10,400
	Sport	--	34.6%			6,200	
	Total	***0.0%***	***54.3%***			**10,400**	**10,400**

** Columbia River sport and commercial fisheries are mark selective*

Total Return	Recent avg. (2008-2017)	@ Goals		
		Low	Med	High
@ Columbia R Mouth	**20,000**	**30,000**	**54,000**	**86,000**
Natural	3,000	13,000	33,000	61,000
Hatchery	17,000	17,000	21,000	25,000
% hatchery	85%	57%	39%	29%
Escapement	**14,000**	**24,000**	**37,000**	**48,000**
Natural	3,000	12,000	26,000	40,000
Hatchery	11,000	12,000	11,000	8,000
% hatchery	79%	50%	30%	17%
Harvest (Col basin)	**6,200**	**6,000**	**17,000**	**38,000**
Natural	200	1,000	7,000	21,000
Hatchery	6,000	5,000	10,000	17,000
% hatchery	97%	83%	59%	45%
Harvest (Total)	**7,400**	**8,000**	**22,000**	**46,000**
Natural	400	2,000	10,000	27,000
Hatchery	7,000	6,000	12,000	19,000
% hatchery	95%	75%	55%	41%

Notes - Natural Production

Historical populations returned to Cascade tributaries in the lower Columbia and the Columbia River Gorge. Spawning occurred in mid to upper reaches of streams. Significant historical production areas in the upper Cowlitz and Lewis rivers were historically blocked but are currently the focus of reintroduction efforts. Hatchery programs are currently operated in many areas to mitigate for lost production. This stock is not subject to significant harvest in the ocean due to run timing and distribution.

Distribution: LCR spring Chinook salmon historically spawned in large tributaries in the western Cascade and Gorge ecoregions. The WLCTRT identified a total of 32 historical populations in 6 MPGs in this ESU. While all identified historical populations are extant, access to historical spawning habitat in the Cowlitz and Lewis populations has been limited by tributary dams.

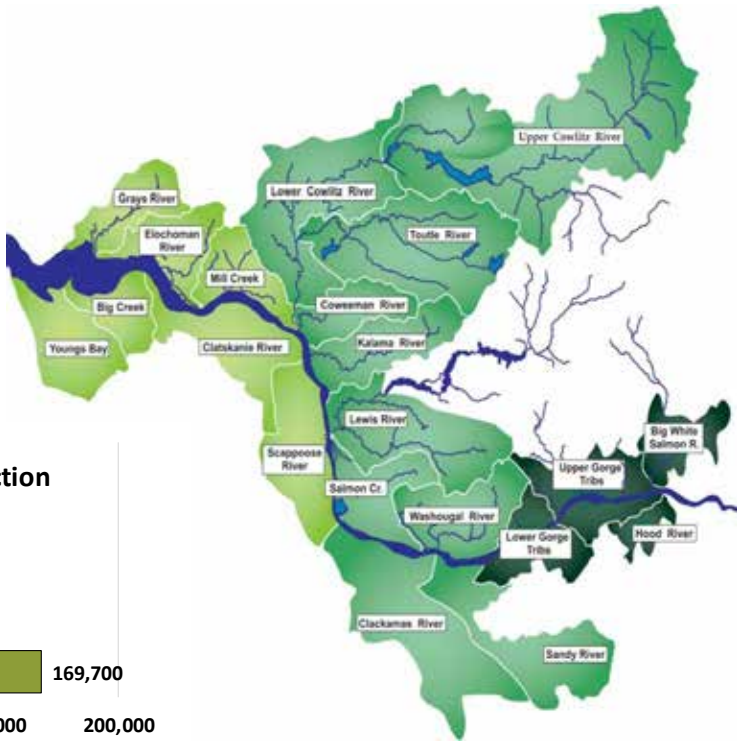
Historical abundance: Estimates from LCR recovery plan. For WA populations, historical abundance is estimated based on EDT modeling using estimated historical habitat conditions. For OR populations, ODFW developed estimates using information from NMFS status reviews and the WLCTRT. (NMFS estimates of historical kilometers of habitat for each species and population were used to apportion the ESU abundance estimate between all populations.)

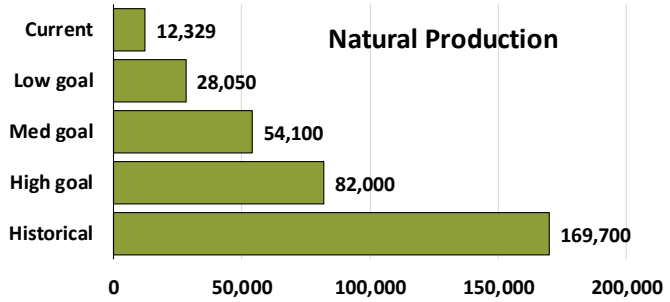
Current abundance: Estimated from spawning ground surveys and/or tributary dam counts. In Toutle and White Salmon abundance estimates not available; therefore, used baseline abundance from WA and OR LCR recovery plans, respectively.

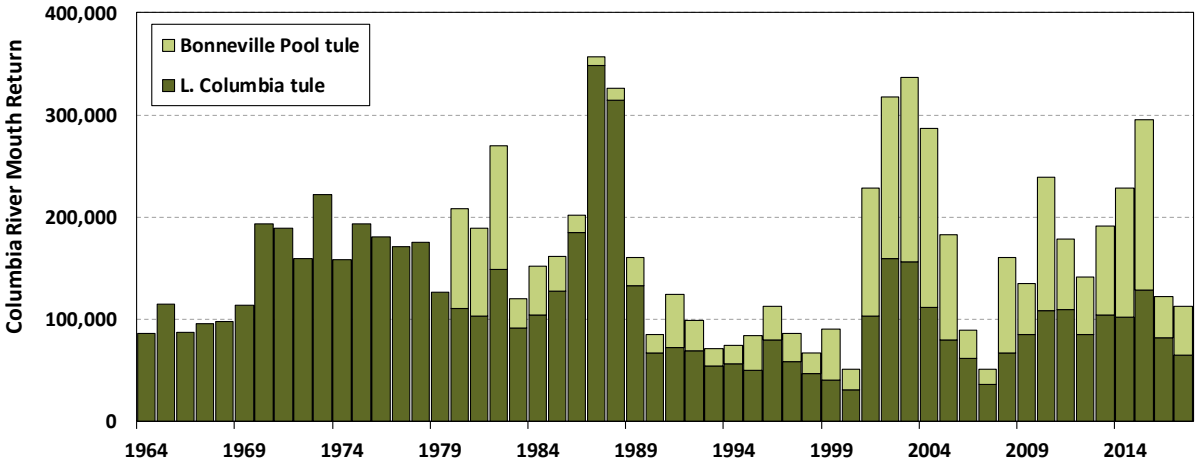
Goals:

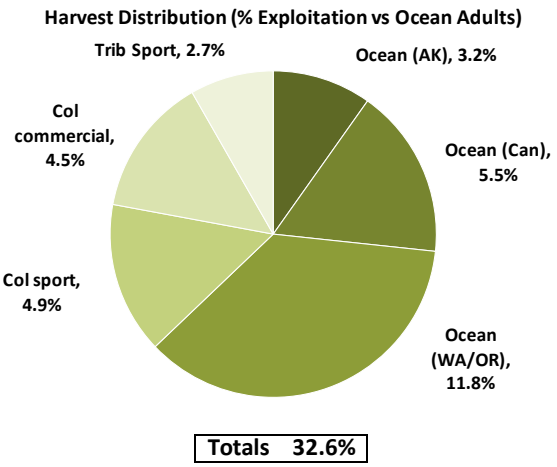
- *Low range*: Population-specific delisting abundance target from ESA recovery plan. In Tilton no delisting goal established; therefore, low goal is set equal to baseline abundance estimate from WA LCR recovery plan.
- *Medium range:* Mid-point between low and high goals.
- *High range*: For WA populations, based on EDT modeling of tributary habitat restored to properly functioning condition that is incorporated into recovery plan. (In White Salmon, high range goal is based on EDT historical estimate because no modeling of PFC conditions is available.) For OR populations (Hood and Sandy), based on broad sense recovery goals developed by ODFW and incorporated into OR LCR recovery plan, table 10-1.

- One of three stocks, along with a spring run and a late "bright" fall stock, in the lower Columbia River Chinook ESU.
- The "tule" stock is distinguished by their dark skin coloration and advanced stage of maturation at freshwater entry.
- Spawned historically in the mainstem & large tributaries up to the Klickitat River.
- Ocean range is primarily along Washington and British Columbia coasts.
- Predominately hatchery fish at this time.

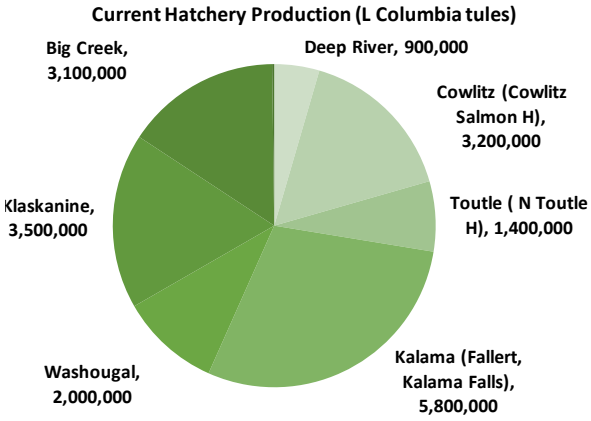








Totals 32.6%



Totals 19.9 million

LOWER COLUMBIA Fall Chinook (Tules) ▪ ESA: Threatened ▪ Life History: Ocean rearing

Natural Production		Abundance		Potential Goal Range		
MPG	Population	Recent	Historical	Low	Med	High
Coast Fall	Grays/Chinook	106	800	1,000	1,000	1,000
	Elochoman/Skamokawa	100	3,000	1,500	2,200	2,900
	Mill/Abernathy/Germany	71	2,500	900	1,500	2,100
	Youngs Bay	219	15,100	500	1,000	1,500
	Big Creek	24	8,800	600	1,100	1,500
	Clatskanie	5	14,400	1,300	1,500	1,700
	Scappoose	0	12,500	1,200	1,800	2,300
Cascade Fall	Lower Cowlitz	2,810	24,000	3,000	12,000	20,900
	Upper Cowlitz	2,585	28,000	2,800	5,600	11,000
	Toutle	337	11,000	4,000	6,600	9,100
	Coweeman	784	3,500	900	1,900	2,900
	Kalama	934	2,700	500	1,500	2,400
	Lewis	2,738	2,600	1,400	1,800	2,200
	Salmon	na	400	50	200	400
	Washougal	712	2,600	1,200	2,000	2,800
	Clackamas	152	22,600	1,600	3,000	4,400
	Sandy	89	6,200	1,000	1,300	1,500
Gorge Fall	Lower Gorge	124	3,200	1,600	3,400	5,100
	Upper Gorge	201	3,400	1,300	2,600	3,900
	White Salmon	300	1,000	500	700	900
	Hood	39	1,400	1,200	1,400	1,500
Totals		**12,329**	**169,700**	**28,050**	**54,100**	**82,000**

Hatchery Production				Current Production		Anticipated
Location (Program)		Stock	Brood	No.	Goal	production
WA tules	Deep River	Tule		900,000		0
	Cowlitz (Cowlitz Salmon H)	Tule		3,200,000		3,500,000
	Toutle (N Toutle H)	Tule		1,400,000		1,100,000
	Kalama (Fallert, Kalama Falls)	Tule		5,800,000		2,600,000
	Washougal	Tule		2,000,000		1,200,000
OR tules	Klaskanine	Tule		3,500,000		3,600,000
	Big Creek	Tule		3,100,000		1,400,000
	Oregon STEP	Tule		41,500		41,500
	Subtotals	LRH		**19,941,500**		**13,441,500**
BPH	Bonneville Pool H (Spring Crk)	BPH	**7,000**	**10,500,000**		**10,500,000**
SAB*	Youngs R	SAB		900,000		900,000
	Klaskanine R	SAB		1,100,000		1,100,000
	Subtotals	SAB		**2,000,000**		**2,000,000**
MCB*	L White Salmon (LWSNFH)	Bright		4,700,000		4,700,000
	L White Salmon (Willard)	Bright		1,800,000		1,800,000
	L Gorge (Bonneville H)	Bright		2,500,000		5,000,000
	Subtotals	MCB		**9,000,000**		**11,500,000**
Totals			**21,800**	**41,441,500**		**37,441,500**

** Non-ESU hatchery production of Fall Chinook in the lower-Columbia region.*

Fisheries / Harvest		Exploitation Rate				Harvest	
	Location	Avg (v ocn)	Avg (v CR)	Limits	Potential	10-yr avg	Potential
Natural Tules (LRH)	Ocean (AK)	3.2%	--	30-41%	30-80%	700	117,000
	Ocean (Can)	5.5%	--			1,200	
	Ocean (WA/OR)	11.8%	--			2,600	
	Col sport	4.9%	6.2%			1,000	54,000
	Col commercial	4.5%	5.7%			900	
	Trib Sport	2.7%	3.4%			600	
	Total	***32.6%***	***15.3%***	***30-41%***	***30-80%***	**7,000**	171,000
Hatchery tules (LRH)	Ocean (AK)	3.2%	--	≤75%	≤75%	3,800	36,000
	Ocean (Can)	5.5%	--			5,500	
	Ocean (WA/OR)	11.8%	--			12,700	
	Col sport	5.9%	7.4%			6,800	13,000
	Col commercial	10.1%	12.7%			11,800	
	Trib Sport	6.3%	7.9%			6,300	
	Total	***42.8%***	***28.0%***	***≤75%***	***≤75%***	**46,900**	49,000
Select brights	Col sport	--	19.5%	≤75%	≤75%	2,200	2,200
	Col commercial	--	60.3%			7,700	7,700
	Total		***79.8%***	***≤75%***	***≤75%***	**9,900**	**9,900**
Bonneville Pool Hatchery	Ocean (AK)	0.0%	--	≤75%	≤75%	0	35,000
	Ocean (Can)	10.0%	--			13,000	
	Ocean (WA/OR)	18.2%	--			21,700	
	Col sport	3.0%	4.2%			3,400	52,000
	Col commercial	10.1%	14.0%			11,900	
	Col treaty	29.2%	40.5%			35,800	
	Trib Sport	0.5%	0.7%			500	
	Total	***71.0%***	***59.4%***	***≤75%***	***≤75%***	**86,300**	**87,000**

Total Return (LRH)	Recent avg. (2008-2017)	@ Goals		
		Low	Med	High
@ Columbia R Mouth	**92,000**	**113,000**	**158,000**	**261,000**
Natural	16,000	37,000	94,000	209,000
Hatchery	76,000	76,000	64,000	52,000
% hatchery	83%	67%	41%	20%
Escapement	**71,000**	**82,000**	**88,000**	**102,000**
Natural	13,000	30,000	57,000	87,000
Hatchery	58,000	52,000	31,000	15,000
% hatchery	82%	63%	35%	15%
Harvest (Col basin)	**21,000**	**27,000**	**65,000**	**153,000**
Natural	2,000	6,000	34,000	117,000
Hatchery	19,000	21,000	31,000	36,000
% hatchery	91%	78%	48%	24%
Harvest (Total)	**54,000**	**56,000**	**105,000**	**220,000**
Natural	7,000	15,000	58,000	171,000
Hatchery	47,000	41,000	47,000	49,000
% hatchery	87%	73%	45%	22%

Total Return (BPH)	Recent avg. (2008-2017)	@ Goals		
		Low	Med	High
@ Columbia R Mouth	**87,000**	**87,000**	**87,000**	**87,000**
Natural	0	0	0	0
Hatchery	87,000	87,000	87,000	87,000
% hatchery	100%	100%	100%	100%
Bonneville Dam	**67,000**	**67,000**	**67,000**	**67,000**
Natural	0	0	0	0
Hatchery	67,000	67,000	67,000	67,000
% hatchery	100%	100%	100%	100%
Escapement	**32,000**	**32,000**	**32,000**	**32,000**
Natural	0	0	0	0
Hatchery	32,000	32,000	32,000	32,000
% hatchery	100%	100%	100%	100%
Harvest (Col basin)	**52,000**	**52,000**	**52,000**	**52,000**
Natural	0	0	0	0
Hatchery	52,000	52,000	52,000	52,000
% hatchery	100%	100%	100%	100%
Harvest (Total)	**86,000**	**86,000**	**86,000**	**86,000**
Natural	0	0	0	0
Hatchery	86,000	86,000	86,000	86,000
% hatchery	100%	100%	100%	100%

Notes - Natural Production

One of three stocks, along with a spring run and a late "bright" fall stock, in the lower Columbia River Chinook ESU. The "tule" stock is distinguished from lower river and upriver bright fall Chinook stocks by their dark skin coloration and advanced stage of maturation at freshwater entry. The Lower Columbia River tule run is typically distinguished for management purposes into a lower river hatchery (LRH) and Bonneville Pool Hatchery (BPH) stocks. The LRH stock includes both hatchery and natural origin fish - current returns and natural spawning escapments are dominated by hatchery-origin fish. Tules spawned historically in the mainstem & large tributaries up to the Klickitat River. The ocean range is primarily along Washington and British Columbia coasts. Status has been severely reduced by habitat degradation in spawning streams.

Distribution: Historically distributed in Coast, Cascade, and Gorge tributaries east to Hood and White Salmon Rivers. The WLCTRT identified 21 historical populations in 3 MPGs. All identified historical populations are extant, although a number have been reduced to very low levels.

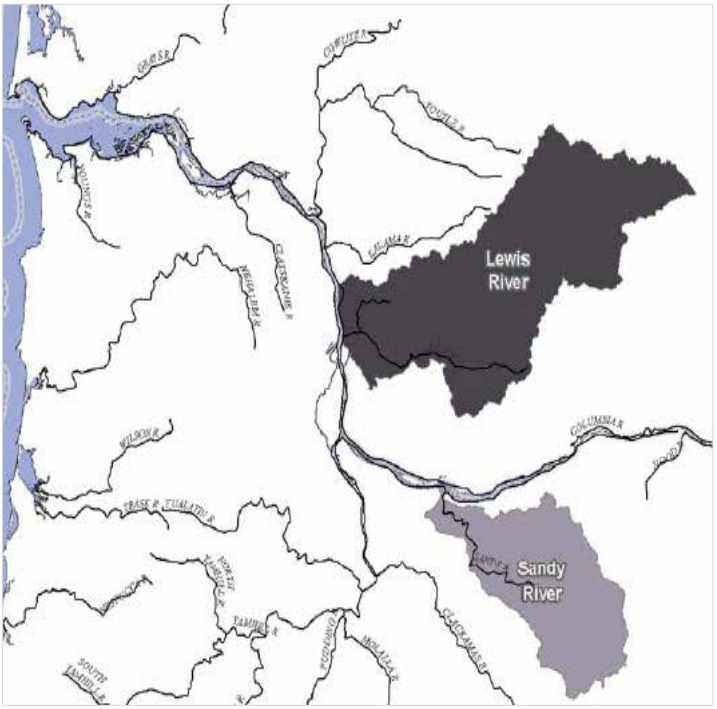
Historical abundance: Estimates from LCR recovery plan. For WA populations, historical abundance is estimated based on EDT modeling using estimated historical habitat conditions. For OR populations, ODFW developed estimates using information from NMFS status reviews and the WLCTRT. (NMFS estimates of historical kilometers of habitat for each species and population were used to apportion the ESU abundance estimate between all populations.)

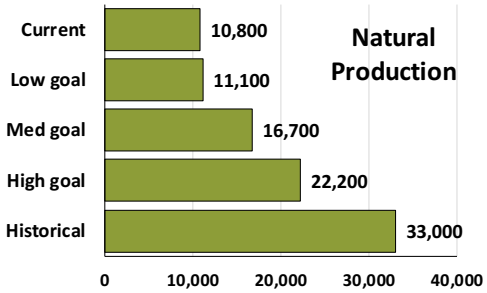
Current abundance: Based on spawning ground surveys. For Upper Cowlitz population based on natural fish trucked upstream of Cowlitz Falls Dam. For Scappoose, Lower Gorge and Salmon Creek no estimates of current abundance is available; therefore, used baseline abundance estimates from OR LCR recovery plans as current abundance.

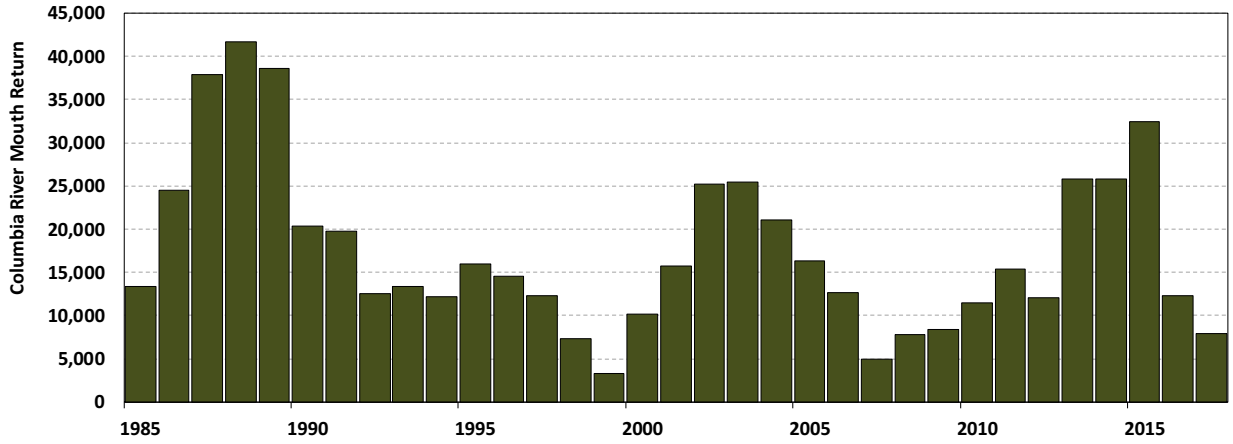
Goals:

- *Low range:* Population-specific delisting abundance target from ESA recovery plan. For Upper Cowlitz and Salmon Creek no delisting goals were established; therefore, used current abundance estimates for low goal.
- *Medium range:* Mid-point between low and high goals.
- *High range:* For WA populations, based on EDT modeling of tributary habitat restored to properly functioning condition that is incorporated into recovery plan. (In White Salmon, high range goal is based on EDT historical estimate because no modeling of PFC conditions is available). For OR populations (Hood and Sandy), based on broad sense recovery goals developed by ODFW and incorporated into OR LCR recovery plan, table 10-1. For Upper Cowlitz high goal is three times low goal because no EDT modeling is available for this population.

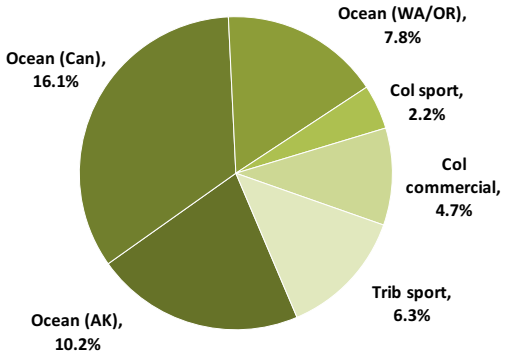
- This "bright" stock is one of three types, along with a spring run and a "tule" Fall stock, in the listed lower Columbia River Chinook ESU.
- The "late fall" stock is distinguished from the lower river tule stock by a later run timing and earlier stage of maturation at freshwater entry.
- Returns are entirely wild-origin, for this reason the stock is also referred to as Lower River Wild or LRW.







Harvest Distribution
(% Exploitation vs Ocean Adults)



Totals 47.3%

No Current Hatchery Production

Totals 0

Natural Production		Abundance		Potential Goal Range		
MPG	Population	Recent	Historical	Low	Med	High
Late	North Fork Lewis	9,700	23,000	7,300	11,000	14,600
Fall	Sandy	1,100	10,000	3,800	5,700	7,600
Totals		**10,800**	**33,000**	**11,100**	**16,700**	**22,200**

Hatchery Production		Current Production			Return	Anticipated
Location (Program)		Brood	Smolts	Fry	Goal	production
None		0	0	0	0	0
Totals		**0**	**0**	**0**	**0**	**0**

Fisheries / Harvest		Exploitation rate				Harvest	
	Location	Avg (v ocn)	Avg (v CR)	Limits	Potential	Recent	Potential
Wild/Natural	Ocean (AK)	10.2%	--	35-70%	35-70%	2,100	17,300
	Ocean (Can)	16.1%	--			3,400	
	Ocean (WA/OR)	7.8%	--			2,000	
	Col sport	2.2%	3.3%			600	9,600
	Col commercial	4.7%	7.2%			900	
	Trib sport	6.3%	9.5%			1,300	
	Total	**47.3%**	***20.0%***	***35-70%***	***35-70%***	**10,300**	**26,900**

Total Return		Recent avg (2008-2017)	@ Goals		
			Low	Med	High
@ Columbia R Mouth		**14,500**	**14,900**	**23,700**	**33,500**
	Natural	14,500	14,900	23,700	33,500
	Hatchery	0	0	0	0
	% hatchery	0%	0%	0%	0%
Escapement		**11,700**	**12,000**	**18,100**	**24,100**
	Natural	11,700	12,000	18,100	24,100
	Hatchery	0	0	0	0
	% hatchery	0%	0%	0%	0%
Harvest (Col basin)		**2,800**	**3,000**	**5,800**	**9,600**
	Natural	2,800	3,000	5,800	9,600
	Hatchery	0	0	0	0
	% hatchery	0%	0%	0%	0%
Harvest (Total)		**10,300**	**10,700**	**18,100**	**26,900**
	Natural	10,300	10,700	18,100	26,900
	Hatchery	0	0	0	0
	% hatchery	0%	0%	0%	0%

Notes - Natural Production

This "bright" stock is one of three types, along with a spring run and a "tule" fall stock, in the listed lower Columbia River Chinook ESU. The "late fall" stock is distinguished from the lower river tule stock by a later run timing and earlier stage of maturation at freshwater entry. In the ocean this stock is subject to harvest from Southeast Alaska south to the Columbia River. The Lewis River population is among the most productive Chinook stocks in the Columbia basin. Returns are entirely wild-origin - for this reason the stock is also referred to as "Lower River Wild or LRW".

Distribution: The WLCTRT identified two historical populations – the Sandy River Basin in Oregon and the Lewis River Basin in Washington. Both populations are extant.

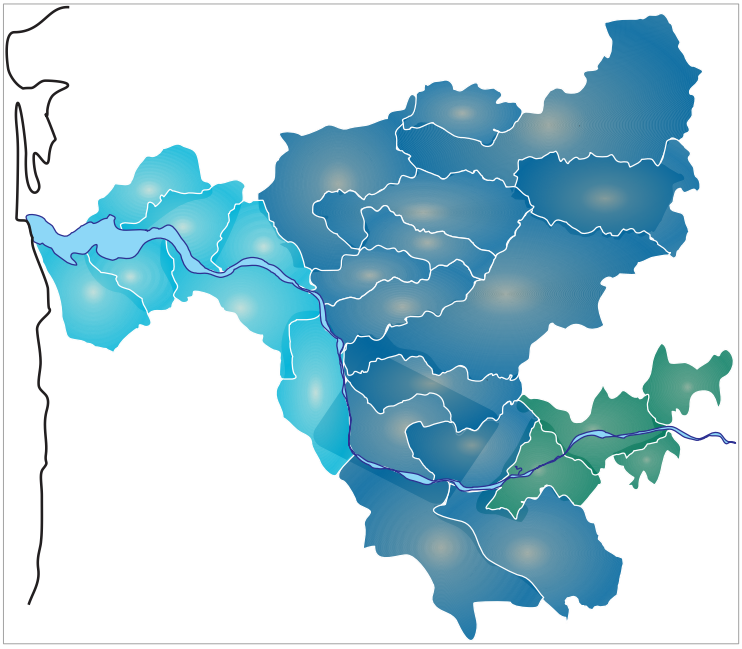
Historical abundance: For the Washington population (Lewis River), the estimate of historical abundance is based on EDT modeling using estimated historical habitat conditions. For the Oregon population (Sandy River), ODFW developed estimates using information from NMFS status reviews and the WLCTRT. (NMFS estimates of historical kilometers of habitat for each species and population were used to apportion the ESU abundance estimate between all populations.)

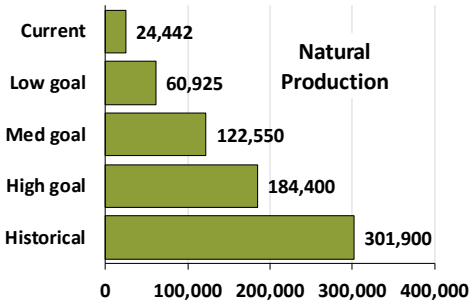
Current abundance: Based on spawning ground surveys for both populations.

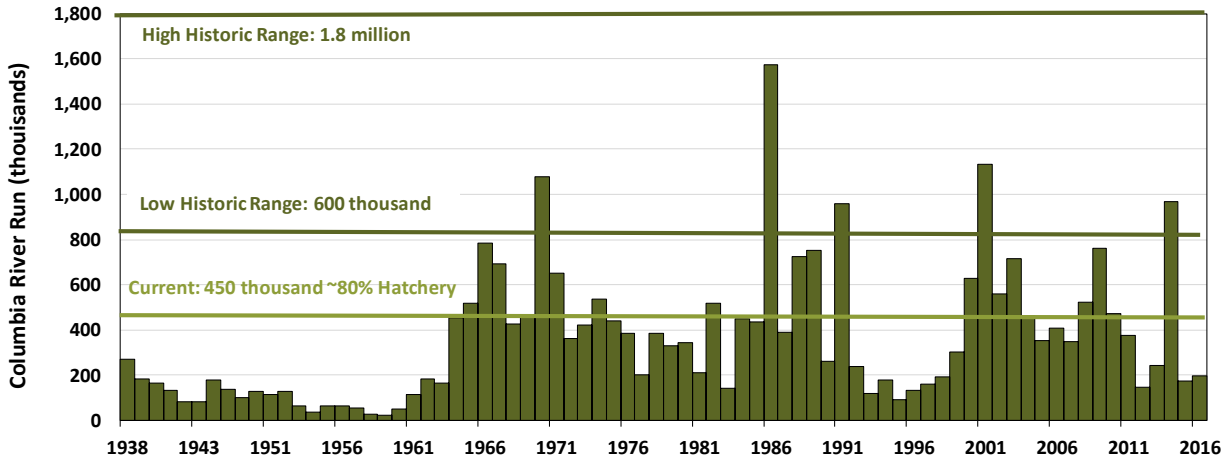
Goals:

- *Low range*: Population-specific delisting abundance target from ESA recovery plan.
- *Medium range*: Midpoint between low range and high range goals for both populations.
- *High range*: For Sandy, 4000 (which is rounded up from BROAD SENSE RECOVERY GOAL identified in ODFW recovery plan). For both populations, doubled low goal as a placeholder.

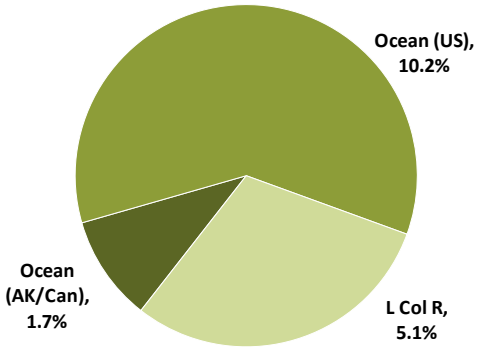
- Currently inhabits low to moderate elevation streams throughout the accessible portion of the lower Columbia.
- ESA-listed coho occur from the Columbia River gorge downstream.
- Current runs are mostly hatchery origin.
- Significant natural populations occur in some streams.





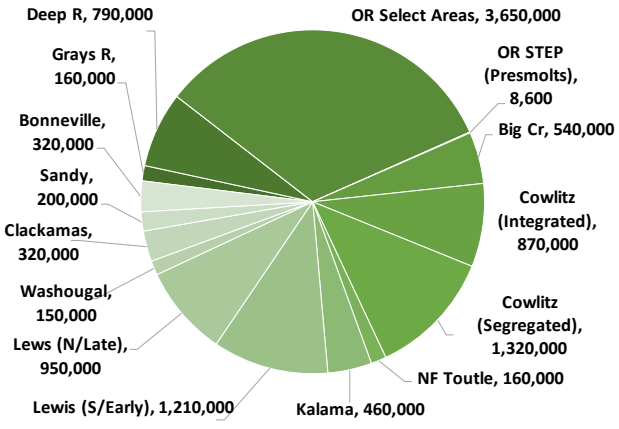


Current Fishery Distribution (Wild/Natural Exploitation Rate)



total 17%

Hatchery Releases



total 11.1 million

Natural Production		Abundance		Potential Goal Range		
MPG	Population	Recent	Historical	Low	Med	High
Coast	Grays	399	3,800	2,400	3,100	3,800
	Eloch/Skam	439	6,500	2,400	4,100	5,800
	Mill/Aber/Germ	605	2,800	1,800	2,400	3,000
	Youngs	79	18,600	75	6,000	11,900
	Big	349	10,800	350	3,300	6,300
	Clatskanie	867	16,800	3,200	6,400	9,600
	Scappoose	629	22,200	3,200	3,700	4,200
Cascade	L. Cowlitz	4,423	18,000	3,700	9,700	15,700
	Coweeman	2,046	5,000	1,200	3,700	6,200
	SF Toutle	1,792	27,000	1,900	3,000	4,100
	NF Toutle	1,483		1,900	3,000	4,100
	U Cowlitz	867	18,000	2,000	12,800	23,600
	Cispus		8,000	2,000	3,700	5,400
	Tilton	2,228	5,600	2,200	2,700	3,200
	Kalama	18	800	500	750	1,000
	NF Lewis	917	40,000	500	10,750	21,000
	EF Lewis	912	3,000	2,000	2,650	3,300
	Salmon	1,244	5,300	1,200	2,900	4,600
	Washougal	331	3,000	1,500	2,450	3,400
	Sandy	1,393	19,600	5,700	6,100	6,500
	Clackamas	3,023	52,600	11,200	14,450	17,700
Gorge	L. Gorge	259	4,700	2,900	5,800	8,800
	U. Gorge	140	9,800	7,100	9,100	11,200
	Hood					
	Subtotal	**24,442**	**301,900**	**60,925**	**122,550**	**184,400**
Other	Willamette*	7,082	0	7,000	7,000	7,000
Total		**31,524**	**301,900**	**67,925**	**129,550**	**191,400**

** Not part of Listed ESU*

Fisheries / Harvest		Exploitation rate				Harvest	
	Location	Avg (v ocn)	Ave (v CR)	Limits	Potential	10-yr avg	Potential
Natural	Ocean (AK/Can)	1.7%	--	<10-30%	<10-50%	500	32,000
	Ocean (US)	10.2%	--			3,000	
	L Col R	5.1%	5.7%			2,000	70,000
	Total	***17.0%***	***5.7%***	***<10-30%***	***<10-50%***	***39,110***	***102,000***
Hatchery	Ocean (AK/Can)	0.7%	--	≤70%	≤70%	2,000	25,000
	Ocean (US)	18.4%	--			58,000	
	L Col R	34.1%	42.7%			106,000	192,000
	Total	***53.2%***	***42.7%***	***≤70%***	***≤70%***	**166,000**	***217,000***

Hatchery Production	Current Production		Return	Anticipated
Location (Program)	Brood	Yearlings	goal	production
Grays R		160,000		75,000
Deep R		790,000		700,000
Elochoman		0		150,000
OR Select Areas		3,650,000		3,745,000
OR STEP (Presmolts)		8,600		9,000
Big Cr		540,000		700,000
Cowlitz (Integrated)		870,000		1,000,000
Cowlitz (Segregated)		1,320,000		1,200,000
NF Toutle		160,000		90,000
Kalama		460,000		300,000
Lewis (S/Early)		1,210,000		1,100,000
Lews (N/Late)		950,000		900,000
Washougal		150,000		100,000
Clackamas		320,000		350,000
Sandy		200,000		300,000
Bonneville		320,000		250,000
Subtotal (Yearlings)		**11,100,000**		**10,960,000**
Subtotal (Presmolts)		**8,600**		**9,000**

Total Return		Abundance	@ Goals		
		recent	Low	Med	High
@ Columbia R Mouth		**408,000**	**457,000**	**586,000**	**806,000**
	Natural	34,000	83,000	212,000	432,000
	Hatchery	374,000	374,000	374,000	374,000
	% hatchery	92%	81.8%	0.0%	46.4%
Harvest (Total)		**230,000**	**259,000**	**360,000**	**562,000**
	Natural	5,000	13,000	75,000	238,000
	Hatchery	225,000	246,000	285,000	324,000
	% hatchery	98%	95%	79%	58%

L Col stock		Abundance	@ Goals		
		recent	Low	Med	High
@ Columbia R Mouth		**280,000**	**329,000**	**431,000**	**555,000**
	Natural	34,000	83,000	185,000	309,000
	Hatchery	246,000	246,000	246,000	246,000
	% hatchery	88%	75%	57%	44%
Escapement		**172,000**	**206,000**	**249,000**	**292,000**
	Natural	32,000	79,000	158,000	238,000
	Hatchery	140,000	127,000	91,000	54,000
	% hatchery	81%	62%	37%	18%
Harvest (L Col basin)		**108,000**	**124,000**	**182,000**	**262,000**
	Natural	2,000	5,000	26,000	70,000
	Hatchery	106,000	119,000	156,000	192,000
	% hatchery	98%	96%	86%	73%
Harvest (Total)		**171,000**	**157,000**	**226,000**	**319,000**
	Natural	5,000	13,000	45,000	102,000
	Hatchery	166,000	144,000	181,000	217,000
	% hatchery	97%	92%	80%	68%

Notes - Natural Production

Currently inhabit low to moderate elevation streams throughout the accessible portion of the Lower Columbia. ESA-listed Coho occur from the Columbia River Gorge downstream - most populations are at very low viability. Coho were largely extirpated upstream from The Dalles Dam but has since been reintroduced. Ocean distribution is mainly Oregon and Washington coasts where they are subject to variable marine upwelling influences and local fisheries. Current runs are predominately hatchery origin.

Distribution: Listed LCR coho ESU historically spawned in Coast, Cascade, and Gorge ecoregions. All 24 identified historical populations are extant. (Also historically returned to tributaries throughout Middle Columbia, Upper Columbia, and Snake. These populations have been largely extirpated. Reintroduction efforts are underway, and they are treated here as a separate stock – see Upriver Coho). Coho salmon did not historically occur upstream from Willamette Falls. Hatchery fish were historically planted upstream but plants have been discontinued. A natural-producing population has became established because the fish ladder at Willamette Falls now provides passage. This population is not administratively considered part of the listed ESU because it is outside the historical range.

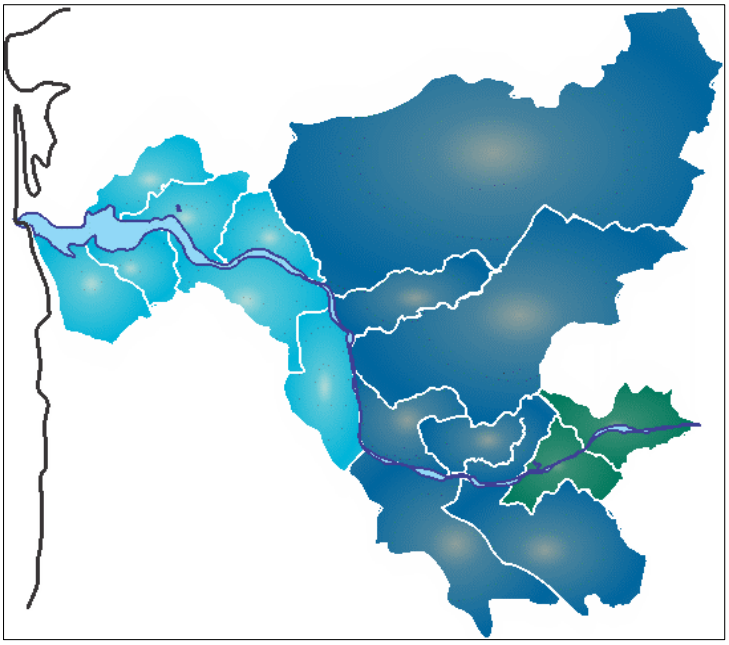
Historical abundance: For all WA populations, historical abundance is estimated based on EDT modeling of estimated historical habitat conditions. For OR populations, historical abundance came from ODFW recovery plan. Historical estimates not available for some populations.

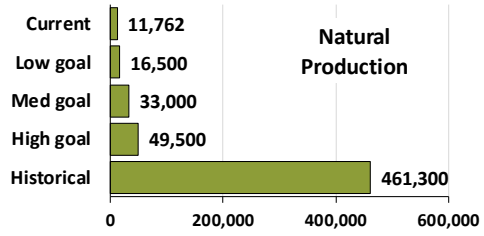
Current abundance: Based on spawning ground surveys and/or tributary dam counts.

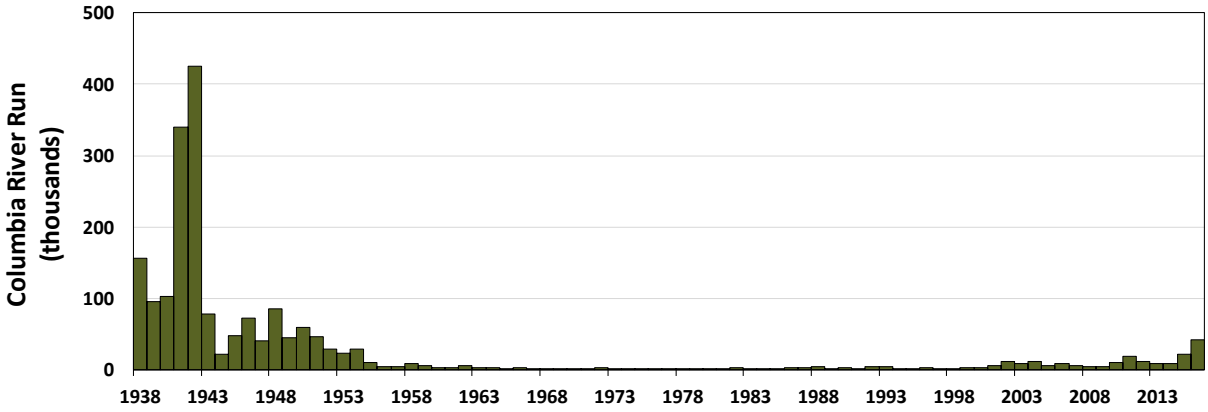
Goals:

- *Low range*: Population-specific delisting abundance target from ESA recovery plan. For Youngs Bay, Big Creek, Tilton River and Salmon Creek populations, at the time of completion of the OR and WA recovery plans abundance estimates did not exist or significantly underestimated actual abundance. Subsequently, additional data have become available, and for the purpose of the CBP this data have been used to establish the low goals for these four populations. Low goals are based on current abundance estimates developed using spawning ground survey methodology. The recovery scenario did not identify abundance goals for WA LCR coho populations designated as “stabilizing.” The stabilizing designation signifies that under the recovery scenario, the goal is to maintain these populations at their current risk status and not to improve their status. Where more recent monitoring information is available regarding current abundance of these stabilizing populations than was available during recovery plan development, the current abundance estimates are incorporated into the CBP Task Force recommendations as the low-range natural production abundance goal. Those targets are not included in the ESA recovery plan, and do not represent delisting abundance targets.
- *Medium range*: Mid-point between low and high goals.
- *High range*: For WA populations, based on EDT modeling of tributary habitat restored to properly functioning condition. For OR populations, based on OR LCR recovery plan BROAD SENSE RECOVERY GOALs, table 10-1. For Tilton River and Salmon Creek populations high goal is three times low goal because EDT modeling is not available for this population. For the Clatskanie population tripled lo goal as a placeholder, because broad sense goal in OR recovery plan showed no improvement from delisting goal.

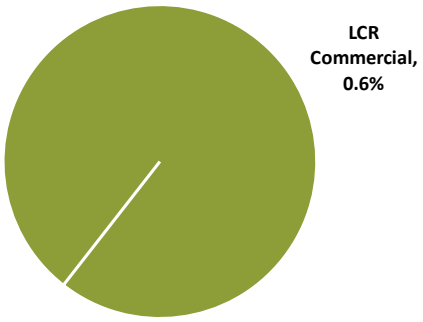
- Historically spawned in lower reaches of streams and the mainstem downstream from Celilo Falls.
- Juveniles migrate seaward as fry soon after emergence from the gravel in late winter and early spring.
- Chum have declined to very low levels consisting of a few small remnant populations.
- Hatchery production is limited to small-scale supplementation efforts.





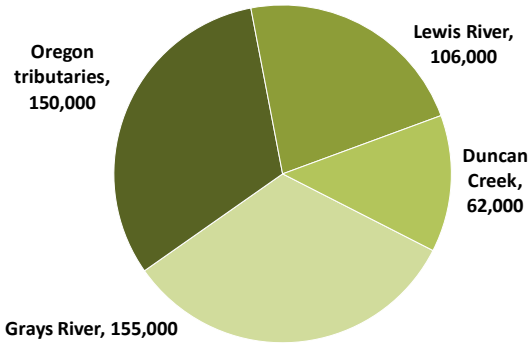


Current Fishery Distribution (Exploitation Rates)



Totals 0.6%

Current Hatchery Production (fry)



Totals 473,000

Natural Production		Abundance		Potential Goal Range		
MPG	Population	Recent	Historical	Low	Med	High
Coast	Grays	6,766	10,000	1,600	3,200	4,800
	Eloch/Skam	200	16,000	1,300	2,600	3,900
	Mill/Aber/Germ	100	7,000	1,300	2,600	3,900
	Youngs	15	9,000	2,500	5,000	7,500
	Big	299	5,000			
	Clatskanie	3	6,000			
	Scappoose	0	500			
Cascade	Cowlitz	300	195,000	1,800	3,600	5,400
	Kalama	100	21,000	900	1,800	2,700
	Lewis	100	125,000	1,300	2,600	3,900
	Salmon	100	4,000	100	200	300
	Washougal / I205	1,911	18,000	1,300	2,600	3,900
	Clackamas	0	12,000	500	1,000	1,500
	Sandy	0	14,000	1,000	2,000	3,000
Gorge	Lower gorge	1,787	7,800	2,000	4,000	6,000
	Upper gorge	81	11,000	900	1,800	2,700
Totals		**11,762**	**461,300**	**16,500**	**33,000**	**49,500**

Artificial Production	Current Production			Return	Anticipated
Location (Program)	Brood	Smolts	Fry	Goal	production
Grays River	178	0	155,000		300,000
Oregon tributaries	--	0	150,000		300,000
Lewis River	88	0	106,000		100,000
Duncan Creek	54	0	62,000		50,000
Totals	**320**	**0**	**473,000**		**750,000**

Fisheries / Harvest		Exploitation rate			Harvest	
	Location	Avg.	Limits	Potential	Recent	Potential
Natural	Ocean	--	--	--	--	--
	Freshwater	0.6%	<5%	10-30%	80	40%
	Total	***0.6%***	***<5%***	***10-30%***	***--***	***40%***

Total Return		Recent avg. (2008-2017)	@ Goals		
			Low	Med	High
@ Columbia R Mouth		**15,000**	**21,000**	**51,000**	**102,000**
	Wild/Natural				
	Hatchery				
	% hatchery				
To Mid Col R (BON)		**100**	**140**	**340**	**680**
	Wild/Natural				
	Hatchery				
	% hatchery				
Escapement		**15,000**	**20,000**	**41,000**	**61,000**
	Wild/Natural				
	Hatchery				
	% hatchery				
Harvest (Col mainstem)		**80**	**100**	**10,000**	**41,000**
	Wild/Natural				
	Hatchery				
	% hatchery				

Notes - Natural Production

Historically spawned in lower reaches of streams and the mainstem downstream from Celilo Falls. Chum need clean gravel beds and intergravel flow or upwelling for successful spawning and incubation. Juveniles migrate seaward as fry soon after emergence from the gravel in late winter and early spring. Chum have declined to very low levels consisting of a few small remnant populations. Causes are loss of critical stream habitats due to watershed and stream alteration. Hatchery production is limited to small-scale supplementation efforts.

Distribution: The WLCTRT identified 17 historical populations spawning in Coast, Cascade, and Gorge tributaries up to the White Salmon River in WA and the Hood River in OR, but anecdotal information indicates historical distribution up to Celilo Falls. Most identified historical populations are extirpated or nearly so, with most natural production at present occurring in the Grays/Chinook and Lower Gorge populations.

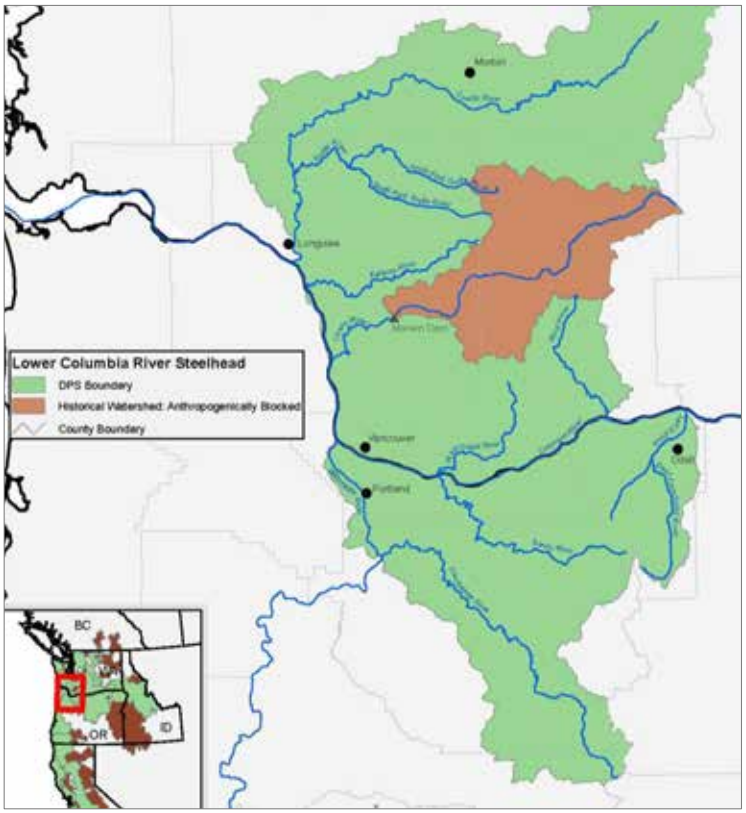
Historical abundance: A total estimate, based on fishery landings, of 900,000 has been reported by the NPCC. Population-specific estimates of historical abundance are available only for WA populations, and are based on EDT modeling of estimated historical habitat conditions. For OR population, historical estimates not available.

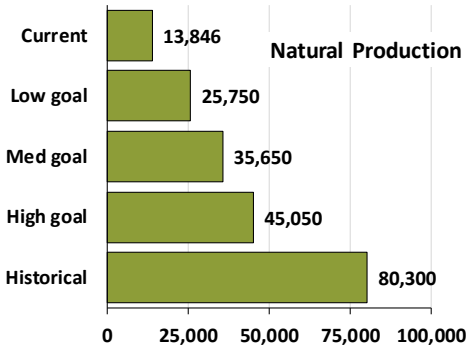
Current abundance: Based on spawning ground surveys (targeted spawning surveys take place on the Grays, Lower Lewis, Mainstem Columbia above I205, and Lower Gorge tributaries); in other tributaries, chum would be observed during fall Chinook surveys.

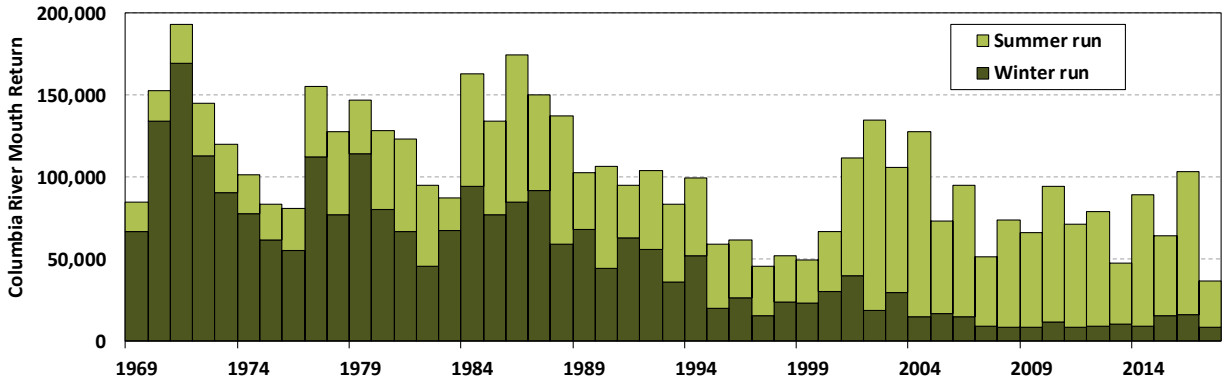
Goals:

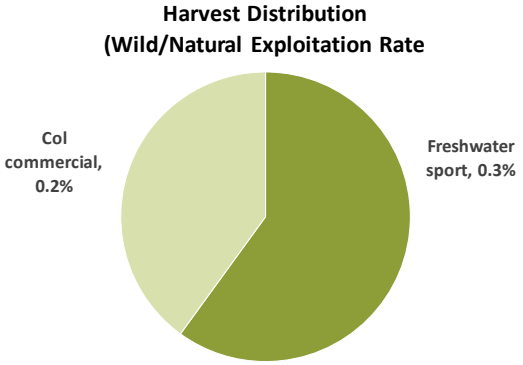
- *Low range*: Population-specific delisting abundance target from ESA recovery plan. (Note: ODFW did not identify abundance goals for OR chum populations in its LCR recovery plan, but NOAA Fisheries did in the ESU-level plan, based on McElhany et al. ICTRT). For Salmon Creek population no delisting goal is established; therefore, the baseline abundance from the WA recovery plan is used as the low goal.
- *Medium range*: Midpoint between low and high goals.
- *High range*: White paper on high range goals for chum salmon (developed for CBP process by Lower Columbia regional technical team members).

- Spawns in tributaries of the Cascades from the Cowlitz to the Hood River.
- Oregon and Washington populations (all winter run) in downstream tributaries are in a different ESU (Southwest Washington).
- Extirpated from the upper Cowlitz and Lewis rivers where they are being reintroduced.
- Sport fisheries focus on marked hatchery fish in tributary streams. No directed commercial harvest.

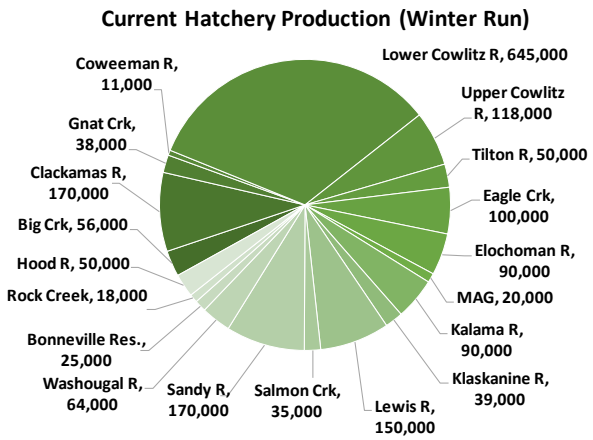








Totals 0.5%



Totals 1.9 million

Natural Production			Abundance		Potential Goal Range		
MPG	Population	State	Recent	Historical	Low	Med	High
Coast Winter (SW WA ESU)	Grays/Chinook	WA	609	1,600	800	1,400	1,900
	Elochoman/Skamokawa	WA	552	1,100	600	900	1,100
	Mill/Abernathy/Germany	WA	357	900	500	900	1,200
	Youngs Bay	OR	2,500	10,400	4,700	6,100	7,400
	Big Creek	OR	1,100	6,100	3,200	4,800	6,400
	Clatskanie	OR	769	9,400	4,000	6,000	8,000
	Scappoose	OR	102	12,400	5,200	7,800	10,400
SW WA ESU total			**5,989**	**41,900**	**19,000**	**27,900**	**36,400**
Cascade Winter	Lower Cowlitz	WA	350	1,400	400	900	1,400
	Upper Cowlitz	WA	268	1,400	500	1,000	1,400
	Cispus	WA		1,500	500	800	1,000
	Tilton	WA	222	1,700	200	700	1,100
	Toutle SF	WA	542	3,600	600	3,000	4,800
	Toutle NF	WA	628		600		
	Coweeman	WA	532	900	500	800	1,000
	Kalama	WA	911	800	600	800	1,000
	Lewis NF	WA	150	8,300	400	1,700	3,000
	Lewis EF	WA	504	900	500	800	1,100
	Salmon	WA	50	500	50	100	200
	Clackamas	OR	2,314	21,200	10,700	12,200	13,600
	Sandy	OR	2,160	11,700	1,500	1,800	2,100
	Washougal	WA	443	800	350	600	900
Gorge Winter	L Gorge	OR-WA	750	2,100	1,200	1,600	2,000
	U Gorge	OR-WA	351	600	400	500	600
	Hood	OR	419	3,800	2,100	2,500	2,900
Cascade Summer	Kalama	WA	513	1,000	500	800	1,000
	Lewis NF	WA	150	6,500	150	300	450
	Lewis EF	WA	762	600	500	550	600
	Washougal	WA	684	2,200	500	700	900
Gorge Summer	Wind	WA	724	5,000	1,000	1,200	1,400
	Hood	OR	419	3,800	2,000	2,300	2,600
LCR ESU	**Winter**		**10,594**	**61,200**	**21,100**	**29,800**	**38,100**
	Summer		**3,252**	**19,100**	**4,650**	**5,850**	**6,950**
	All		**13,846**	**80,300**	**25,750**	**35,650**	**45,050**

Fisheries / Harvest		Exploitation rate				Harvest	
	Location	Avg (v ocn)	Avg (v CR)	Goal	Potential	Recent	Potential
LCR Winter (natural)	Ocean	0.0%	--	--	--	--	--
	Freshwater sport	0.3%	0.3%	<2.0%	10-40%	30	35,000
	Col commercial	0.2%	0.2%			24	
	Total	***0.5%***	***0.5%***	***<2.0%***	***10-40%***	**54**	35,000
LCR Winter (hatchery)	Ocean	0.0%	--	--	--	--	--
	Freshwater sport	58.0%	**58.0%**	≤70%	≤70%	820	53,000
	Col commercial	**0.2%**	**0.2%**			0	
	Total	***58.2%***	***58.2%***	***≤70%***	***≤70%***	**820**	**53,000**
LCR Summer (natural)	Ocean	0.0%	--	--	--	--	--
	Freshwater sport	0.4%	0.4%	<2.0%	10-40%	11	3,000
	Col commercial	0.1%	0.1%			4	
	Total	***0.5%***	***0.5%***	***<2.0%***	***10-40%***	**15**	**3,000**
LCR Summer (hatchery)	Ocean	0.0%	--	--	--	--	--
	Freshwater sport	**55.0%**	**55.0%**	≤70%	≤70%	2,060	31,000
	Col commercial	0.1%	0.1%			40	
	Total	***55.1%***	***55.1%***	***≤70%***	***≤70%***	**2,100**	**31,000**

Artificial Production		Current Production			Return	Anticipated
Location (Program)		Brood	Smolts	Fry	Goal	production
Winter run	Big Crk		56,000			60,000
	Clackamas R		170,000			165,000
	Gnat Crk		38,000			40,000
	Coweeman R		11,000			12,000
	Lower Cowlitz R		645,000			645,000
	Upper Cowlitz R		118,000			118,000
	Tilton R		50,000			50,000
	Eagle Crk		100,000			100,000
	Elochoman R		90,000			130,000
	MAG		20,000			20,000
	Kalama R		90,000			135,000
	Klaskanine R		39,000			40,000
	Lewis R		150,000			150,000
	Salmon Crk		35,000			40,000
	Sandy R		170,000			170,000
	Washougal R		64,000			85,000
	Bonneville Res.		25,000			25,000
	Rock Creek		18,000			20,000
	Hood R		50,000			50,000
	Subtotal		**1,939,000**			**2,055,000**
Summer run	Clackamas R		129,000			165,000
	Cowlitz R		600,000			626,000
	Elochoman R		31,000			30,000
	Kalama R		83,000			90,000
	Lewis R		235,000			235,000
	Sandy R		80,000			80,000
	Toutle		20,000			20,000
	Washougal R		63,000			70,000
	L White Salmon		25,000			25,000
	Hood		0			0
	Subtotal		**1,266,000**			**1,341,000**

Total Return		Abundance	@ Goals		
		Recent	Low	Med	High
LCR / SWW Winter	**@ Columbia R Mouth**	**44,000**	**54,000**	**67,000**	**82,000**
	Natural	11,000	21,000	34,000	49,000
	Hatchery	33,000	33,000	33,000	33,000
	% hatchery	75%	61%	49%	40%
	Escapement	**24,000**	**34,000**	**41,000**	**46,000**
	Natural	10,000	20,000	29,000	36,000
	Hatchery	14,000	14,000	12,000	10,000
	% hatchery	58%	41%	29%	22%
	Harvest (Col basin)	**19,500**	**20,000**	**26,000**	**35,000**
	Natural	500	1,000	5,000	12,000
	Hatchery	19,000	19,000	21,000	23,000
	% hatchery	97%	95%	81%	66%
LCR Summer	**@ Columbia R Mouth**	**47,000**	**48,000**	**50,000**	**53,000**
	Natural	3,000	4,000	6,000	9,000
	Hatchery	44,000	44,000	44,000	44,000
	% hatchery	94%	92%	88%	83%
	Escapement	**23,000**	**24,000**	**22,000**	**19,000**
	Natural	3,000	4,000	5,000	6,000
	Hatchery	20,000	20,000	17,000	13,000
	% hatchery	87%	83%	77%	68%
	Harvest (Col basin)	**24,200**	**24,250**	**29,000**	**34,000**
	Natural	200	250	1,000	3,000
	Hatchery	24,000	24,000	28,000	31,000
	% hatchery	99%	99%	97%	91%

Notes - Natural Production

Winter Steelhead

This stock spawns throughout Columbia River tributaries of the Cascades from the Cowlitz to the Hood River. Oregon and Washington populations (all winter run) in dowmstream tributaries are in a different ESU (Southwest Washington). Wide distribution in the high seas of the North Pacific Ocean where they are are seldom caught in marine fisheries. Limited sport fisheries in freshwater, primarily focused on marked hatchery fish in tribtary streams. No directed commercial harvest (small incidental impacts only). Populations in the upper Cowlitz and Lewis rivers, where they were extirpated by dams, are being reintroduced.

Distribution: This stock includes the 17 winter-run populations in the LCR Steelhead DPS plus the Columbia Basin portion of the unlisted the Southwest Washington DPS. The populations in the LCR DPS historically spawned in tributaries in the Cascade and Gorge ecoregions. While all identified historical populations are extant, access to historical spawning habitat in the Cowlitz and Lewis populations has been limited by tributary dams. The unlisted SW Washington DPS includes populations spawning in Columbia Basin tributaries downstream of the Cowlitz River – those populations are extant.

Historical abundance: For all WA populations (listed and listed), historical abundance is estimated based on EDT modeling of estimated historical habitat conditions. For OR populations, historical abundance estimates came from the ODFW recovery plan. Historical estimates not available for some populations.

Current abundance: Based on spawning ground surveys and/or tributary dam counts for most Washington populations. Oregon populations plus Colwitz, Salmon Creek, Lower Gorge and Upper Gorge populations are based on baseline abundance estimates identified in the Oregon and Washington recovery plans. (current average abundances are from ESA recovery plan and will be updated).

Goals:

- *Low range*: For listed populations, population-specific delisting abundance target from ESA recovery plan. For unlisted WA populations, the Lower Columbia Fish Recovery Board plan for SW Washington plan identifies minimum viability goals. For unlisted OR populations, low-range goals are based on Delisting Abundance estimates produced by the Scenario Analysis utilized in the OR recovery plan. For Salmon Creek population no delisting goal is established; therefore, the baseline abundance from the WA recovery plan is used as the low goal.
- *Medium range*: Mid-point between low and high goals.
- *High range*: For WA populations, based on EDT modeling of tributary habitat restored to properly functioning condition. For OR populations, based on OR LCR recovery plan broad sense recovery goals, table 10-1. For Youngs Bay, Big Creek, Clatskanie and Scappoose populations doubled low goal as a placeholder, because broad sense goal in OR recovery plan showed no improvement from delisting goal. For Salmon Creek population low goal is four times low goal because not EDT modeling is available for this population.

Summer Steelhead

Distribution: This stock includes 6 historical populations that spawned in tributaries in the Cascade and Gorge ecoregions. While all identified historical populations are extant, access to historical spawning habitat in the Lewis population has been limited by tributary dams.

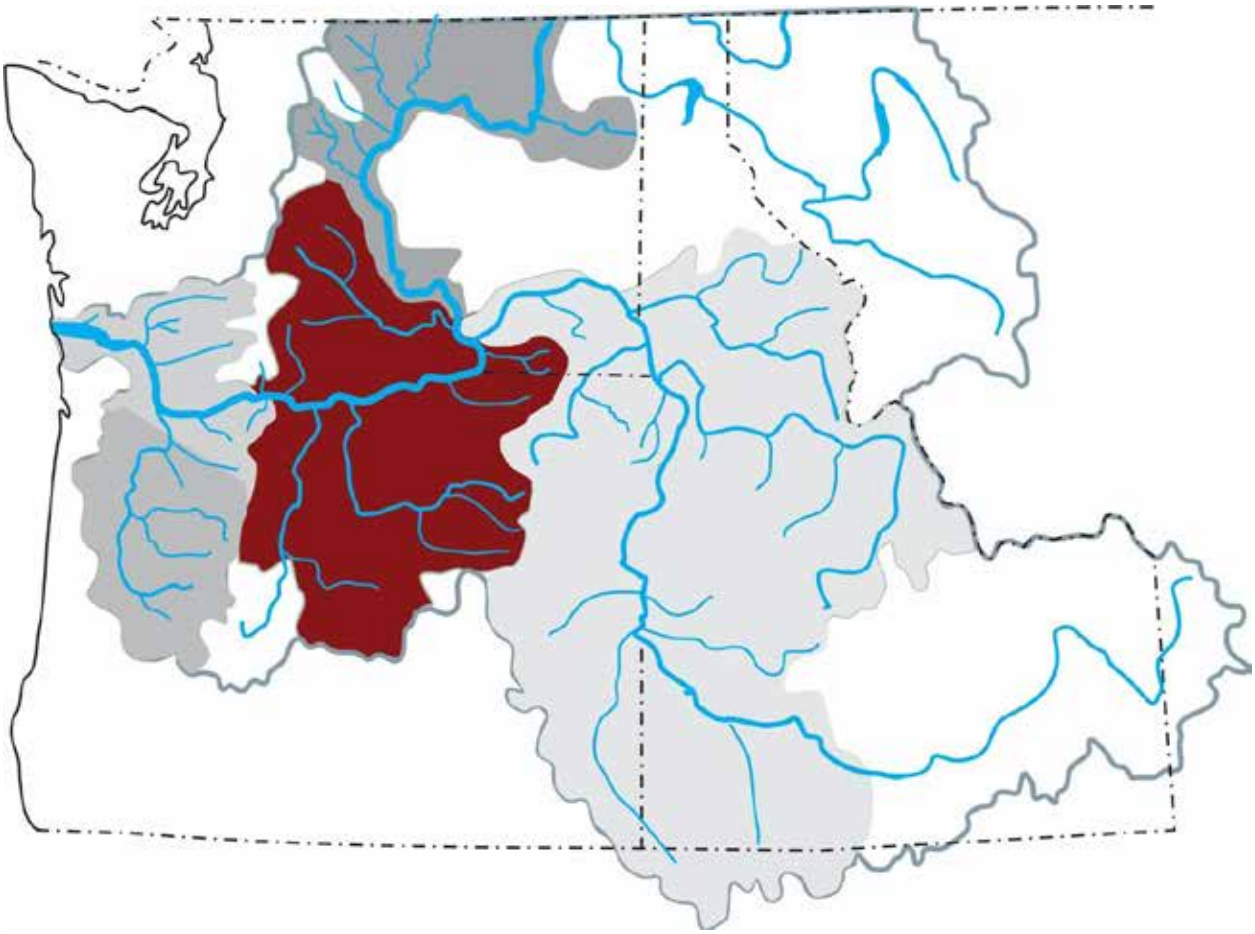
Historical abundance: For all WA populations, historical abundance is estimated based on EDT modeling of estimated historical habitat conditions. For OR populations, historical abundance came from ODFW recovery plan. Historical estimates not available for some populations.

Current abundance: Based on spawning ground surveys, tributary dam counts, and mark-recapture methods (current average abundances are from ESA recovery plan and will be updated). Current abundance data are not available for Hood and North Fork Lewis populations; therefore, abundance estimates from the OR (current abundance) and WA (baseline abundance) estimates were used.

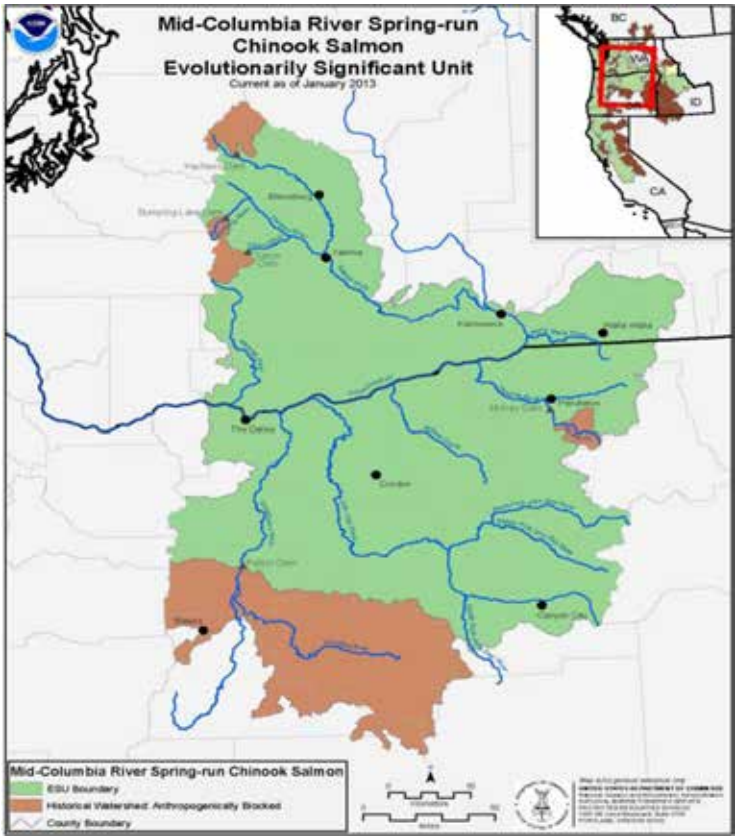
Goals:

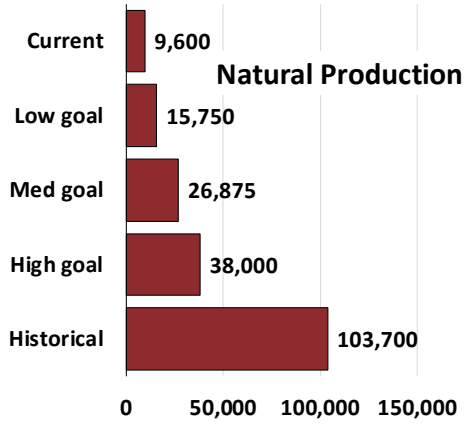
- *Low range*: Population-specific delisting abundance target from ESA recovery plan. No delisting goal is established for North Fork Lewis population; therefore, baseline abundance estimate from WA recovery plan is used as the low goal.
- *Medium range*: Mid-point between low and high goals.
- *High range*: For WA populations, based on EDT modeling of tributary habitat restored to properly functioning condition. For OR populations, based on OR LCR recovery plan broad sense recovery goals, table 10-1. For North Fork Lewis high goal is three times low goal.

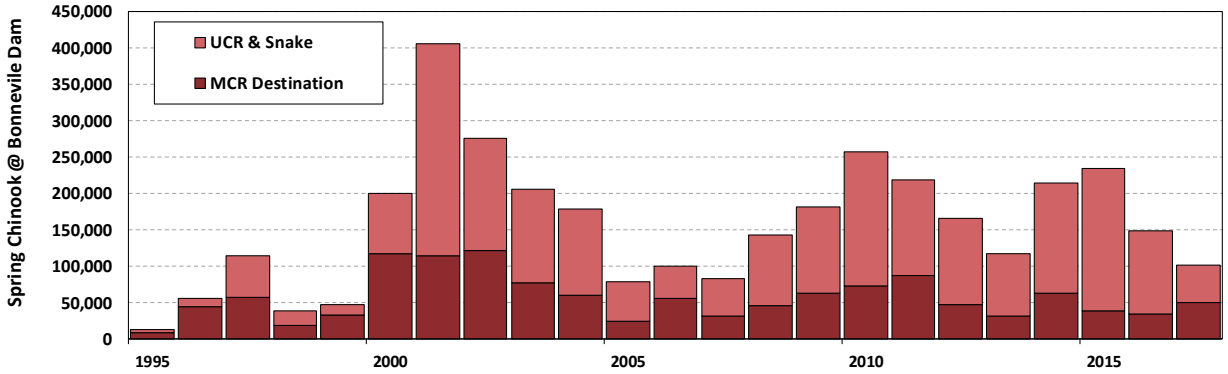
MID-COLUMBIA



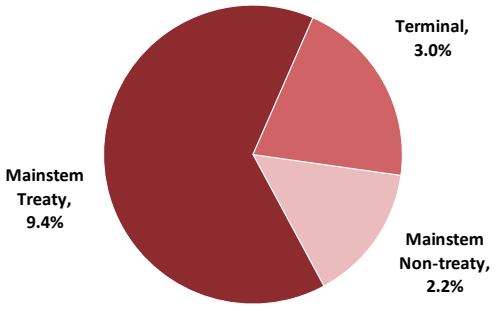
- Inhabits mid to high elevation streams draining the eastern Cascades and west Blue Mountains.
- One ofthe healthiest spring Chinooks in the basin with several viable or moderately viable populations.
- Limited hatchery production.
- Several populations that were historically extirpated by tributary dams are being reintroduced.





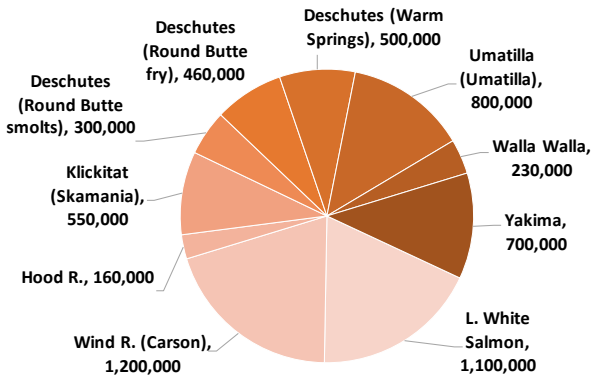


Current Harvest Distribution (Natural Exploitation Rates)



Totals 14.5%

Current Hatchery Production



Total smolts: 3,080,000 fry: 460,000

Natural Production		Abundance		Potential Goal Range		
MPG	Population	Recent	Historical	Low	Med	High
East Cascade	Klickitat R.	500	2,500	750	975	1,200
	Warm Springs	1,000	5,700	1,000	2,100	3,200
	Metolius R.	100	1,300	750	1,075	1,400
	U Deschutes		3,800	750	1,025	1,300
John Day	U. mainstem	1,400	1,800	1,000	2,000	3,000
	North Fork	1,400	7,300	2,000	4,000	6,000
	Middle Fork	700	2,200	1,000	2,000	3,000
Blue Mountains	Umatilla R.	300	5,000	1,000	1,350	1,700
	Walla Walla upper	200	4,900	1,000	1,800	2,600
	Walla Walla-Mill Cr		2,700	750	975	1,200
	Walla Walla S Fk		1,900	750	875	1,000
	Touchet		8,400	1,000	2,750	4,500
Yakima	U. mainstem	3,000	34,800	2,000	3,300	4,600
	Naches/American	1,000	21,400	2,000	2,650	3,300
Totals		**9,600**	**103,700**	**15,750**	**26,875**	**38,000**

Artificial Production		Current Production			Return	Anticipated
Location (Program)		Brood	Smolts	Fry	Goal	production
Mid Columbia ESU	Klickitat	500	550,000	--	549	800,000
	Deschutes (Round Butte)		300,000	460,000	1,200	760,000
	Deschutes (Warm Springs)		500,000	--		500,000
	Umatilla (Umatilla)		800,000	--		800,000
	Walla Walla		230,000	--		500,000
	Yakima		700,000	--		700,000
Totals			**3,080,000**	**460,000**		**4,060,000**
LCR ESU	L. White Salmon*		1,000,000	--		1,000,000
	Wind R. (Carson)*		1,170,000	--		1,170,000
	Hood R.*		150,000	--		250,000
Totals			**2,320,000**	**0**		**2,420,000**

Fisheries / Harvest		Exploitation rate (v Col R)			Harvest	
	Location	Avg.	Limits	Potential	Recent	Potential
Wild/Natural	Ocean	0%	--	--	0	0
	Mainstem Non-treaty	2.2%	5.5-17%	20-60%	300	27,100
	Mainstem Treaty	9.4%			1,100	
	Terminal	3.0%			400	
	Total	***14.5%***	***5.5-17%***	***20-60%***	***1,800***	***27,100***
Hatchery	Ocean	0%	--	~70%	0	0
	Mainstem Non-treaty	10.3%	--		4,800	36,500
	Mainstem Treaty	9.4%	--		4,400	
	Terminal	5.0%	--		2,400	
	Total	***24.6%***	***--***	***~70%***	***11,600***	***36,500***

Total Return		Recent avg. (2008-2013)	@ Goals		
			Low	Med	High
@ Columbia R Mouth		**59,400**	**67,200**	**89,500**	**120,000**
	Wild/Natural	12,200	20,000	39,800	67,800
	Hatchery	47,200	47,200	49,700	52,200
	% hatchery	79%	70%	56%	44%
To Mid Col R (BON)		**53,400**	**62,300**	**77,800**	**97,800**
	Wild/Natural	11,900	19,500	38,200	63,800
	Hatchery	42,800	42,800	39,600	34,000
	% hatchery	80%	69%	51%	35%
Escapement		**43,400**	**49,600**	**51,600**	**52,600**
	Wild/Natural	9,600	15,800	26,900	38,000
	Hatchery	33,800	33,800	24,700	14,600
	% hatchery	78%	68%	48%	28%
Harvest (Columbia Basin)		**13,300**	**14,700**	**34,600**	**63,600**
	Wild/Natural	1,800	3,200	11,100	27,100
	Hatchery	11,500	11,500	23,500	36,500
	% hatchery	86%	78%	68%	57%

Notes - Natural Production

Distribution: Populations within this unlisted ESU historically spawned throughout Mid-Columbia tributaries, including in the Deschutes, Klickitat, Warm Springs, Umatilla, Walla Walla, John Day, Yakama subbasins. Mid-Columbia spring Chinook salmon are extirpated above Pelton Round Butte Dam (Upper Deschutes, Metolius subbasins) and extirpated or nearly so in the Blue Mountain and Yakima MPGs. The John Day and Warm Springs MPGs still have extant populations.

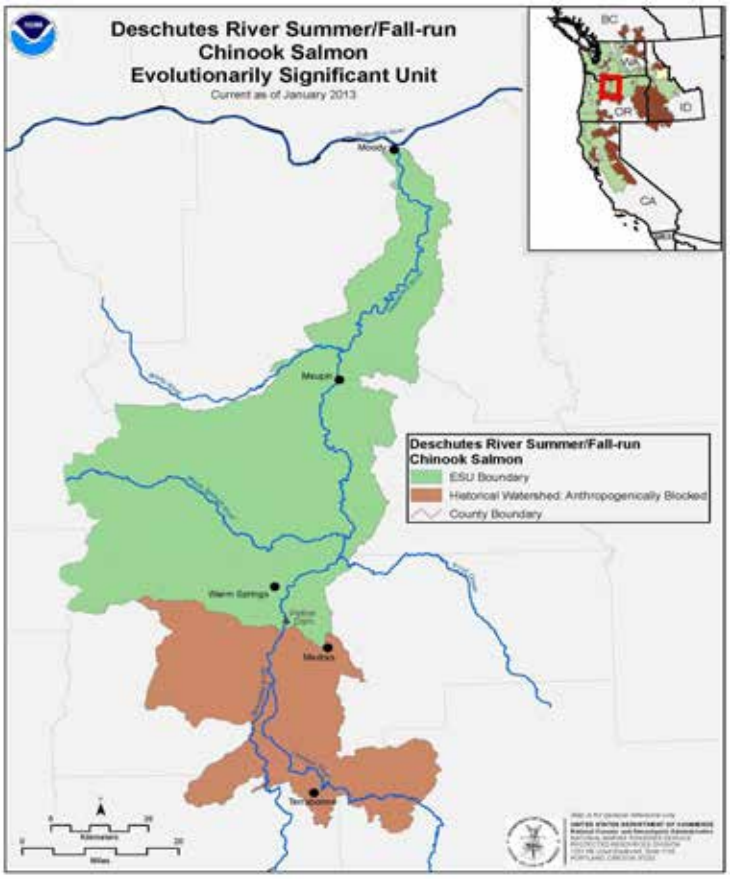
Historical abundance: Historical abundance is estimated based on EDT modeling of estimated historical habitat conditions (from the 2005 sub-basin plan), except for the Klickitat population, which is estimated based on historical documents (by the Yakama Nation).

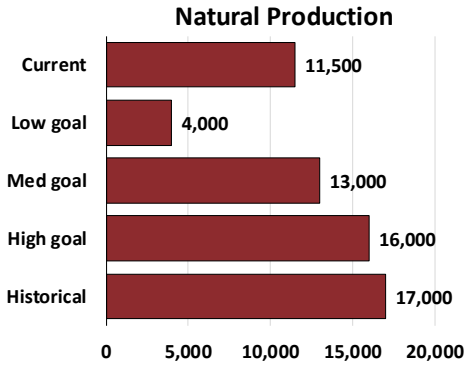
Current abundance: Based on spawning ground surveys, weir counts, tributary dam counts, and mark/recapture.

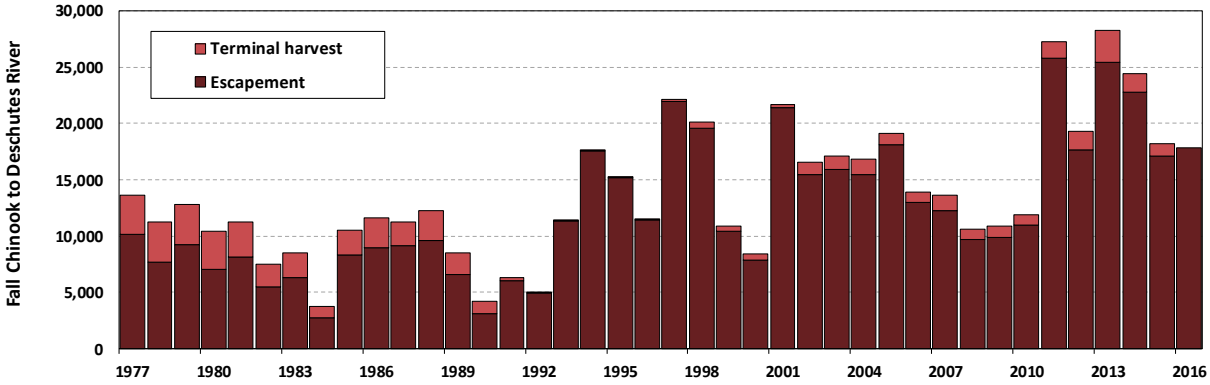
Goals:

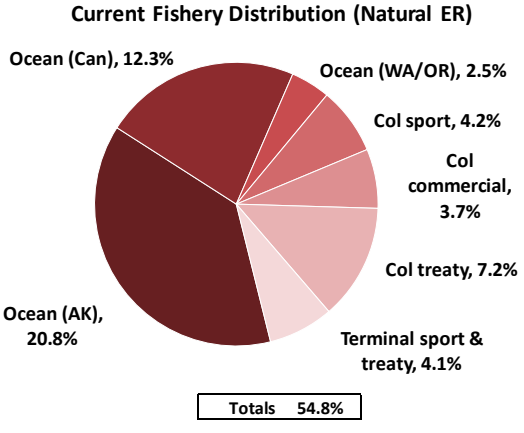
- *Low range*: Based on ICTRT MATs, using professional judgement to determine historical population size category.
- *Medium range*: Mid-point between low and high goals.
- *High range*: Mix of approaches. Many NPCC subbasin plans identify potential production under moderate habitat restoration scenarios (based on EDT analysis of restoration scenario) – e.g., in the Deschutes, Blue Mountains, and Yakama. Where that is not available (i.e., John Day), high end goals are three times MAT.

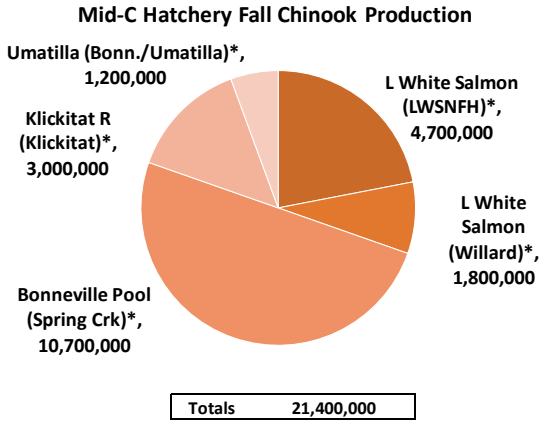
- Consists of a single population occuring in the Deschutes River.
- Upriver bright stock similar to the productive Hanford population returning to the upper Columbia.
- Spawning occurs in the mainstem Deschutes River where distribution may have been slightly truncated by Pelton and Round Butte dams.
- No hatchery production of this stock occurs in the Deschutes River.
- Ranges widely in the ocean and is harvested from the Pacific Northwest to Canada and Alaska.











Natural Production		Abundance		Potential Goal Range		
MPG	Population	Recent	Historical	Low	Med	High
Mid-C	Deschutes River	11,500	17,000	4,000	13,000	16,000

Hatchery Production	Current Production			Return	Anticipated
Location (Program)	Stock	Brood	Subyearlings	goal	production
Deschutes R	--	0	0	0	0
L White Salmon (LWSNFH)*	bright		4,700,000		4,700,000
L White Salmon (Willard)*	bright		1,800,000		1,800,000
Bonneville Pool (Spring Crk)*	tule		10,700,000		10,700,000
Klickitat R (Klickitat)*	bright	2,600	3,000,000		4,000,000
Umatilla (Bonn./Umatilla)*	bright		1,200,000		1,200,000
Subtotal		**2,600**	**21,400,000**		**22,400,000**

** Non-ESU hatchery production of Fall Chinook in the mid-Columbia region*

Fisheries / Harvest		Exploitation rate				Harvest	
	Location	Avg (v ocn)	Avg (v CR)	Limits	Potential	Recent	Potential
Wild/Natural	Ocean (AK)	20.8%	--	--	40-80%	6,000	18,600
	Ocean (Can)	12.3%	--	--		3,600	
	Ocean (WA/OR)	2.5%	--	--		700	
	Col sport	4.2%	6.5%	21.5-45%		1,200	15,400
	Col commercial	3.7%	5.8%			1,100	
	Col treaty	7.2%	11.2%			2,100	
	Terminal sport & treaty	4.1%	6.3%			1,200	
	Total	***54.8%***	***29.8%***	***30-70%***	***40-80%***	***15,900***	***34,000***

Total Return		Recent avg. (2008-2017)	@ Goals		
			Low	Med	High
@ Columbia R Mouth		**18,600**	**6,500**	**21,200**	**33,700**
	Wild/Natural	18,600	6,500	21,200	33,700
	Hatchery	0	0	0	0
	% hatchery	0%	0%	0%	0%
To Mid Col R (BON)		**16,300**	**5,700**	**18,700**	**27,100**
	Wild/Natural	16,300	5,700	18,700	27,100
	Hatchery	0	0	0	0
	% hatchery	0%	0%	0%	0%
Escape (Spawners)		**13,800**	**4,400**	**14,400**	**17,700**
	Wild/Natural	13,800	4,400	14,400	17,700
	Hatchery	0	0	0	0
	% hatchery	0%	0%	0%	0%
Harvest (Col basin)		**5,600**	**2,000**	**6,400**	**15,400**
	Wild/Natural	5,600	2,000	6,400	15,400
	Hatchery	0	0	0	0
	% hatchery	0%	0%	0%	0%
Harvest (Total)		**15,900**	**5,600**	**18,100**	**34,000**
	Wild/Natural	15,900	5,600	18,100	34,000
	Hatchery	0	0	0	0
	% hatchery	0%	0%	0%	0%

Notes - Natural Production

Distribution: The unlisted Mid C summer/fall Chinook ESU includes a single population – the Deschutes. This population is extant, and robust.

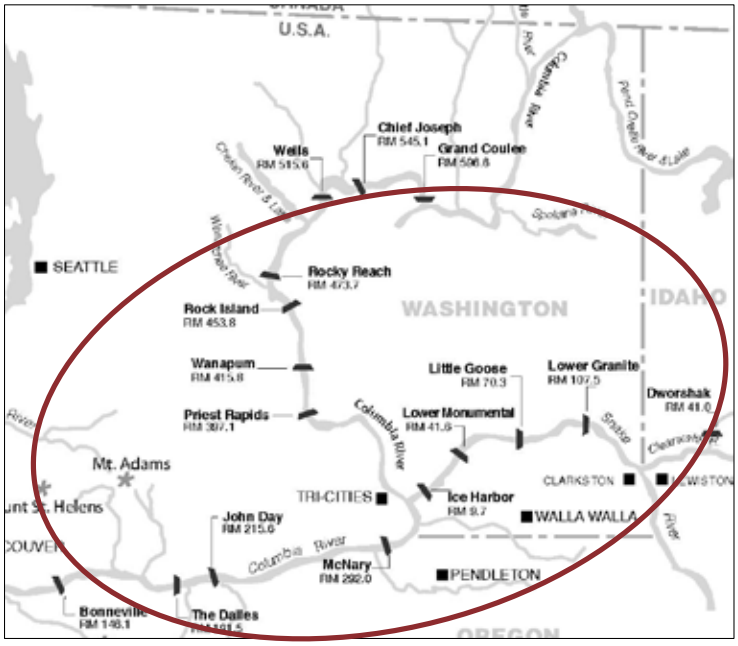
Historical abundance: Historical abundance is estimated based on EDT modeling of estimated historical habitat conditions (from 2005 subbasin planning process).

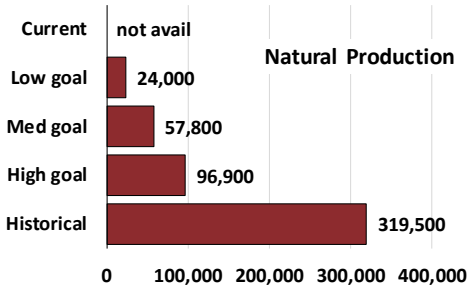
Current abundance: Based on mark/recapture estimate and trap count at Sherars Falls.

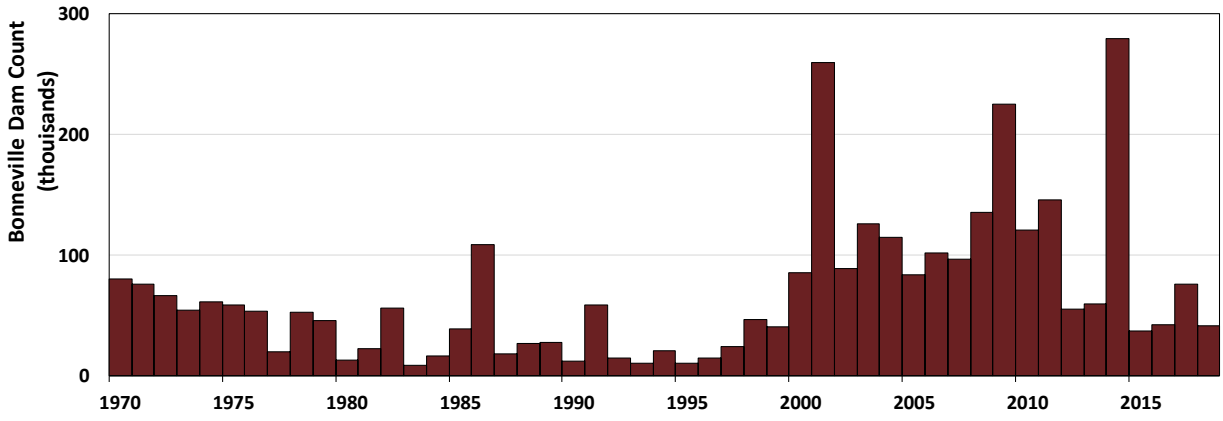
Goals:

- *Low-range*: Based on the SR fall Chinook recovery plan goal (because that ESU also is a single-population fall Chinook salmon ESU). The goals is also equivalent to the ODFW minimum escapement goal.
- *Medium-range*: Deschutes subbasin plan.
- *High-range*: Deschutes subbasin (EDT-derived).

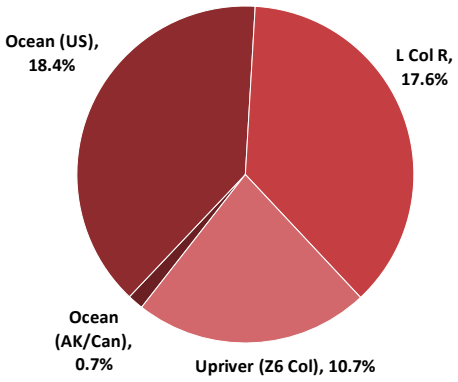
- "Upriver" Coho include fish returning to areas upstream from Bonneville Dam (including middle Columbia, upper Columbia and Snake rivers).
- Gorge populations are part of the lower Columbia ESU.
- Historically extirpated upstream from The Dalles Dam but subsequently reintroduced.
- Currently predominately hatchery origin.





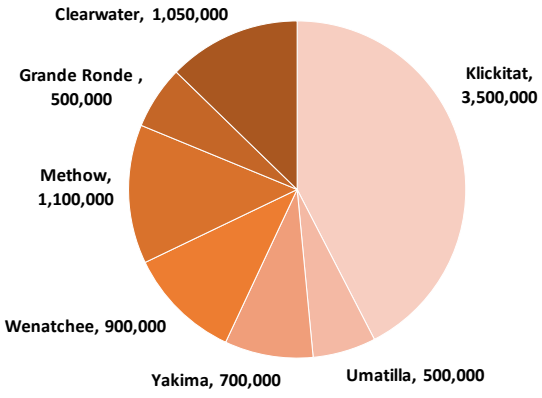


Current Fishery Distribution (Total Harvest)



Total 47%

Hatchery releases (smolts)



Total 8.3 million

Natural Production		Abundance		Potential Goal Range		
(ESU)/(MPG)	Population	Recent	Historical	Low	Med	High
Mid Columbia	John Day	na	na	3,400	6,800	10,200
	Umatilla	5,039	na	1,100	2,200	3,300
	Yakima	800	75,000	2,000	5,000	10,000
	Klickitat	485	0	0	0	0
	subtotal	*6,324*	*75,000*	*6,500*	*14,000*	*23,500*
Upper Columbia	Wenatchee	367	6,500	1,500	3,000	6,000
	Entiat	na	11,000	500	1,000	2,000
	Methow	25	27,000	1,500	3,000	6,000
	Okanogan	na	na	500	1,000	1,500
	Abv. Coulee	0	na	3,500	7,000	10,500
	subtotal	*392*	*44,500*	*7,500*	*15,000*	*26,000*
Snake	Walla Walla	na	na	1,100	2,200	3,300
	Tucannon	na	na	1,100	2,200	3,300
	Grande Ronde	na	5,000	2,200	2,900	3,500
	Imnaha	na	na	1,100	2,200	3,300
	Clearwater	na	na	1,100	7,600	14,000
	Salmon	na	na	3,400	11,700	20,000
	subtotal	*na*	*200,000*	*10,000*	*28,800*	*47,400*
Total		**na**	**319,500**	**24,000**	**57,800**	**96,900**

Hatchery Production		Current Production		Return	Anticipated
Location (Program)		Subyearlings	Yearlings	goal	production
Klickitat			3,500,000	11,799	3,500,000
Umatilla			500,000	5,377	TBD
Yakima		500,000	700,000	15,000	1,200,000
Wenatchee			900,000	5,374	0.40-1.0 mil
Methow			1,100,000	1,399	0.35-1.0 mil
Grande Ronde			500,000		200,000
Clearwater			1,050,000	2,573	TBD
Subtotal (Upriver)		**500,000**	**8,250,000**	**41,522**	**7.20-8.45 mil**

Fisheries / Harvest		Exploitation rate				Harvest	
	Location	avg (v ocn)	avg (v CR)	Limits	Potential	10-yr avg	Potential
Hatchery / Natural	Ocean (AK/Can)	0.7%	--		≤70%	1,000	32,000
	Ocean (US)	18.4%	--			31,000	
	L Col R	17.6%	22.0%			10,000	27,000
	Upriver (Z6 Col)	10.7%	12.9%			17,000	
	Total	***47.3%***	***34.9%***		***≤70%***	**59,000**	***59,000***

Total Return		Recent avg.	@ Goals		
		(2008-2017)	Low	Med	High
@ Columbia R Mouth		**408,000**	**457,000**	**586,000**	**806,000**
	Natural	34,000	83,000	212,000	432,000
	Hatchery	374,000	374,000	374,000	374,000
	% hatchery	92%	81.8%	63.8%	46.4%
Harvest (total)		**230,000**	**259,000**	**360,000**	**562,000**
	Natural	5,000	13,000	75,000	238,000
	Hatchery	225,000	246,000	285,000	324,000
	% hatchery	98%	95%	79%	58%

Upriver Run	Recent avg.	@ Goals		
	(2008-2017)	Low	Med	High
@ Columbia R Mouth	**128,000**			
Upriver Run (@ Bonn Dam)	**118,000**			
Escapement	**101,000**			
Harvest (Zone 6)	**17,000**			

Notes - Natural Production

Upriver coho are generally defined to include fish returning upstream from Bonneville Dam. Small numbers of coho returning to stream in Columbia Gorge tributaries below and above Bonneville Dam are part of the listed Lower Columbia River coho ESU. Population-specific data for these listed Coho may be found in the lower Columbia coho stock summary. For ease of calculation, small numbers of listed lower Columbia River coho are included in the run reconstruction for upriver coho stock.

Upriver coho also return to areas of the middle Columbia, Upper Columbia and Snake. Numbers for all of these areas are combined on the stock summary for upriver coho.

Distribution: Upriver coho historically returned to tributaries throughout the Middle Columbia, Upper Columbia, and Snake River basins. NOAA Fisheries' project team and regional technical team members tentatively identified at least 15 historical populations. These populations have been largely extirpated. Reintroduction efforts are underway. ESUs or MPGs were not formally identified by technical recovery teams for these upriver coho populations – therefore the project team inferred ESUs and MPGs based on similar delineations in the lower Columbia River.

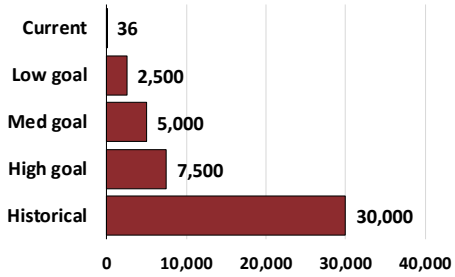
Historical abundance: Information on historical abundance is limited. Estimates for individual populations are based on a mix of EDT results and expert judgement.

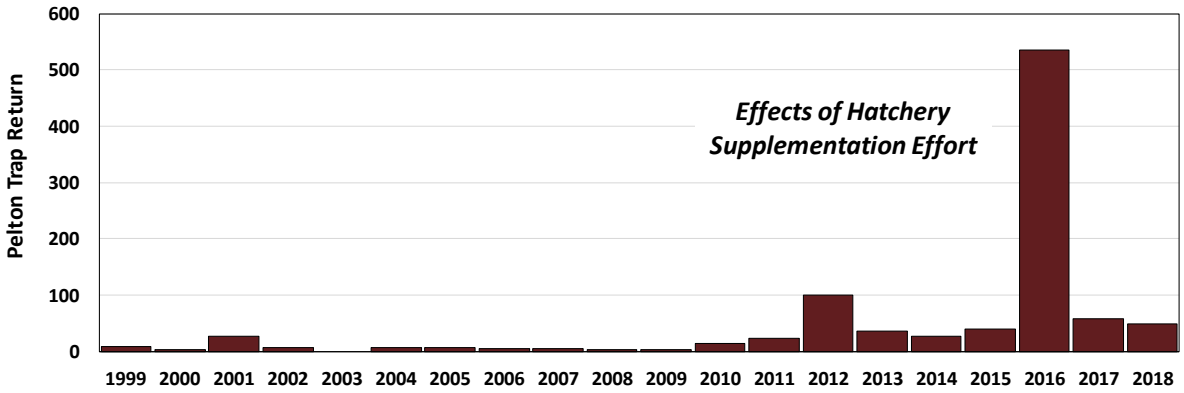
Current abundance: Generally based on tributary dam counts in Umatilla and Yakima. For Wentachee and Methow based on spawning ground surveys occurring as part of the ongoing reintroduction monitoring program.

Goals:

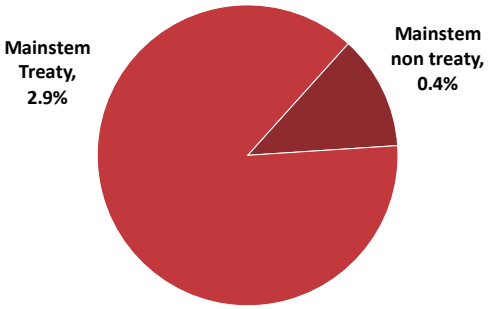
- *Low-range*: Based on ICTRT MATs.
- *Medium-range*: Mid-point between low and high goals.
- *High-range*: Generally, three to four times low goal as placeholders.

- Historical population was extirpated.
- Construction of a barrier at Suttle Lake outlet in 1900s and the later completion of Pelton Round Butte Dam complex in 1960s blocked anadromous passage to the population.
- A naturally spawning population of kokanee (land-locked sockeye) exists in Suttle Lake and Link Creek as well as in Lake Billy Chinook.
- Reintroduction of sockeye using hatchery supplementation is being explored under FERC licensing agreement for Pelton Round Butte.





Harvest Distribution (Exploitation rates)



Totals	3.3%

Natural Production		Abundance (mean)		Potential Goal Range		
MPG	Population	Recent	Historical	Low	Med	High
Mid-Col	Deschutes	36	30,000	2,500	5,000	7,500

Hatchery Production	Current Production			Return	Anticipated
Location (Program)	Brood	Smolts	Fry	goal	production
Round Butte		limited		--	--

Fisheries / Harvest		Exploitation rate			Harvest	
Location		Avg.	Limits	Potential	10-yr avg	Potential
All	Ocean	0	--	--	--	--
	Mainstem non treaty	0.4%	5-7%	10-40%	0	0
	Mainstem Treaty	2.9%			3	
	Terminal	0	--		--	
	Total	***3.3%***	***5-7%***	***10-40%***	**3**	***0***

Total Return		Recent avg (209-2018)	@ Goals Low	Med	High
@ Columbia R Mouth		**91**			
	Wild/Natural				
	Hatchery				
	% hatchery				
Deschutes return		**88**	**2,500**	**5,000**	**7,500**
	Wild/Natural				
	Hatchery				
	% hatchery				
Harvest (Col mainstem)		**3**			
	Wild/Natural				
	Hatchery				
	% hatchery				

Notes - Natural Production

Distribution: Sockeye historically returned to Suttle Lake in upper Metolius River of the Deschutes basin. The anadromous portion of population was severely impacted by barriers on Lake Creek in the 1930s and officially extirpated in 1966 with the failure of downstream passage facilities at the newly constructed Round Butte Dam. A remnant kokanee population (land-locked sockeye) still exists in Lake Billy Chinook and Suttle Lake. Small numbers of adult Sockeye continue to return to the Pelton fish trap. These fish originate from juvenile outmigrants produced by the resident kokanee population. The 2004 settlement agreement for relicensing of the Pelton-Round Butte Project identifies a goal of re-establishing a self-sustaining, harvestable, anadromous sockeye run into the upper Deschutes. This effort utilizes smolt-sized fish attempting to emigrate from the system.

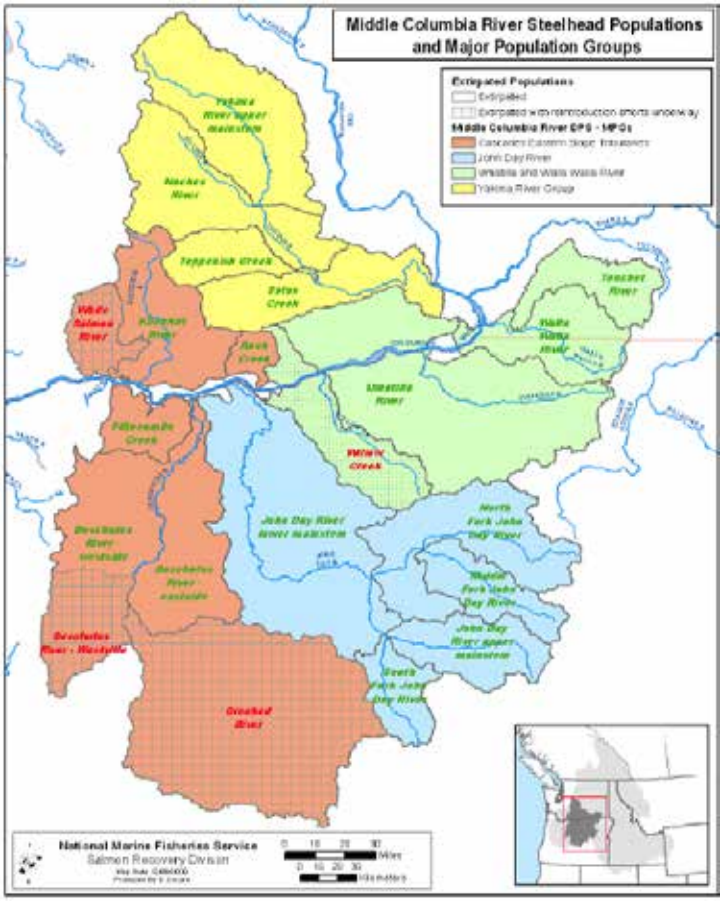
Historical abundance: Placeholder based on similar-sized populations in other areas of the basin.

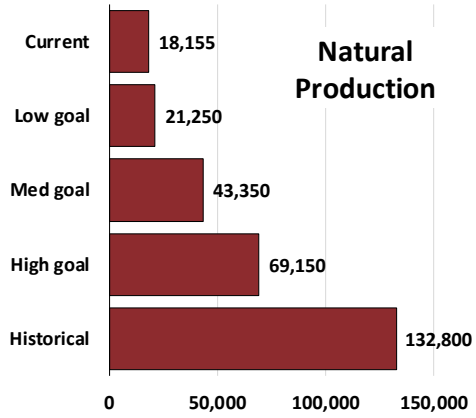
Current abundance: Based on sockeye returns to Pelton Round Butte trap (some kokanee smolt, migrate to the ocean, and return).

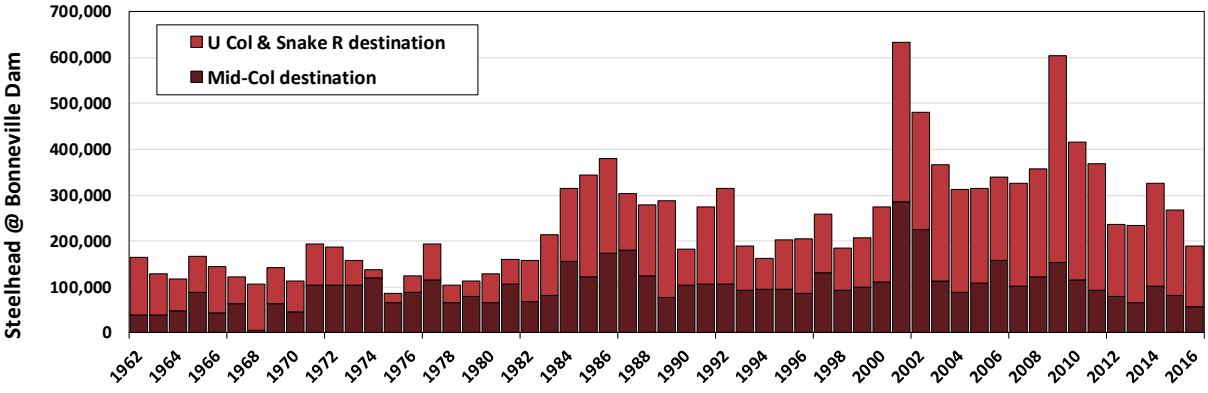
Goals:

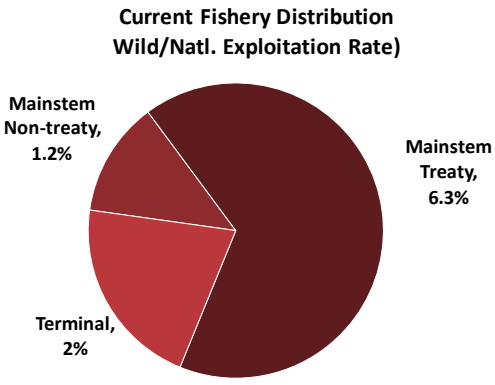
- *Low range*: Based on Snake River sockeye goal identified in the recovery plan for the aggregate of Stanley Basin.
- *Medium range*: Intermediate between high and low values. Also equivalent to the Warm Springs tribal goal identified in Deschutes Subbasin Plan.
- *High range*: Default rule three times low goal.

- Inhabitats low to mid-elevation streams draining the eastern Cascades and west Blue mountains.
- Includes viable and moderately viable populations and is among the listed species that are closest to recovery.
- Hatchery production is limited to a few systems.
- Several populations that were historically extirpated by tributary dams, are being reintroduced.

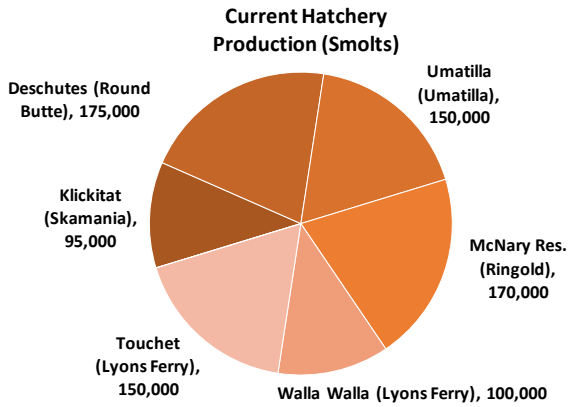








Totals 9.5%



Total smolts: 0.9 million

Natural Production		Abundance		Potential Goal Range		
MPG	Population	Recent	Historical	Low	Med	High
Cascade E Slope	White Salmon R.	200	1,100	500	750	1,100
	Klickitat R.	1,500	3,500	1,000	2,000	3,000
	Fifteenmile Cr.	400	2,000	500	1,000	1,500
	Deschutes R. east	1,700	14,700	1,000	2,000	3,400
	Deschutes R. west	600	6,900	1,500	3,000	2,800
	Crooked R.	0	14,800	2,250	4,500	4,900
	Rock Cr.	455	600	500	550	600
John Day	L. mainstem	1,600	10,100	2,250	4,500	6,750
	North Fork	2,000	14,700	1,500	3,000	4,500
	Middle Fork	1,700	5,900	1,000	2,100	3,900
	South Fork	800	2,900	500	1000	1500
	U. mainstem	700	5,900	1,000	2,000	3,000
Umatilla - Walla Walla	Willow Cr.	0	--	1,000	2,000	3,000
	Umatilla R.	2,400	7,000	1,500	4,000	7,000
	Walla Walla R.	900	16,500	1,000	2,000	3,400
	Touchet R.	200		1,000	2,000	2,200
Yakima	Satus Cr.	1,100	4,000	1,000	1,500	2,000
	Toppenish Cr.	500	3,400	250	500	1,500
	Naches R.	1,200	8,400	1,500	3,450	5,400
	U. mainstem	200	10,400	500	1,500	7,700
Totals		**18,155**	**132,800**	**21,250**	**43,350**	**69,150**

Artificial Production	Current Production			Return	Anticipated
Location (Program)	Brood	Smolts	Fry	goal	production
Bonneville/L White Salmon*		25,000	0		25,000
Hood*		0	0		0
Klickitat (Skamania)	144	95,000	0	4,000	95,000
Deschutes (Round Butte)	1,100	175,000	670,000	4,300	175,000
Umatilla (Umatilla)	110	150,000	0	750	150,000
McNary Res. (Ringold)	300	170,000	0	3,200	170,000
Walla Walla (Lyons Ferry)	35	100,000	0	1,200	100,000
Touchet (Lyons Ferry)	88	150,000	0	1,800	150,000
Yakima	0	0	0	0	0
Totals	**1,777**	**865,000**	**670,000**	**15,250**	**865,000**

** Lower Columbia River ESU (counted in Bonneville Dam return)*

Fisheries / Harvest		Exploitation rate			Harvest	
	Location	Avg.	Limits	Potential	10 yr avg	Potential
Wild/Natural	Ocean	0	--	--	--	--
	Mainstem Non-treaty	1.2%	15-22%	20-50%	700	80,400
	Mainstem Treaty	6.3%			2,800	
	Terminal	2%			800	
	Total	***9.5%***			***4,300***	***80,400***
Hatchery	Ocean	0	--	--	--	--
	Mainstem Non-treaty	13%	~70%	~70%	7,100	22,600
	Mainstem Treaty	6%			3,300	
	Terminal	20%			12,100	
	Total	***39%***	***~70%***	***~70%***	***22,500***	***22,600***

Total Return		Abundance recent	@ Goals Low	@ Goals Med	@ Goals High
@ Columbia R Mouth		**101,000**	**109,000**	**166,300**	**263,700**
	Wild/Natural	43,000	51,000	121,000	231,000
	Hatchery	58,000	58,000	45,300	32,700
	% hatchery	57%	53%	27%	12%
To Mid Col R (BON)		**97,000**	**104,000**	**154,400**	**234,100**
	Wild/Natural	43,000	50,000	115,000	208,000
	Hatchery	54,000	54,000	39,400	26,100
	% hatchery	56%	52%	26%	11%
Local return (tributary entry)		**83,000**	**90,000**	**122,000**	**166,400**
	Wild/Natural	38,000	45,000	94,000	149,000
	Hatchery	45,000	45,000	28,000	17,400
	% hatchery	54%	50%	23%	10%
Harvest (Col basin)		**26,800**	**27,300**	**51,800**	**103,000**
	Wild/Natural	4,300	4,800	26,800	80,400
	Hatchery	22,500	22,500	25,000	22,600
	% hatchery	84%	82%	48%	22%

Notes - Natural Production

Distribution: The ICTRT identified 4 MPGs and 20 historical populations in the Mid-Columbia River steelhead DPS: Cascades Eastern Slope Tributaries (7 historical populations), Yakima Basin (4 historical populations), John Day Basin (5 historical populations), and Umatilla/Walla Walla (4 historical populations). Seventeen of these populations are extant. Three are extirpated: White Salmon River and Deschutes Crooked River (above Pelton Dam) in the Cascades Eastern Slope MPG and Willow Creek in the Umatilla/Walla Walla MPG). The populations are mostly summer run (15-mile creek is winter run).

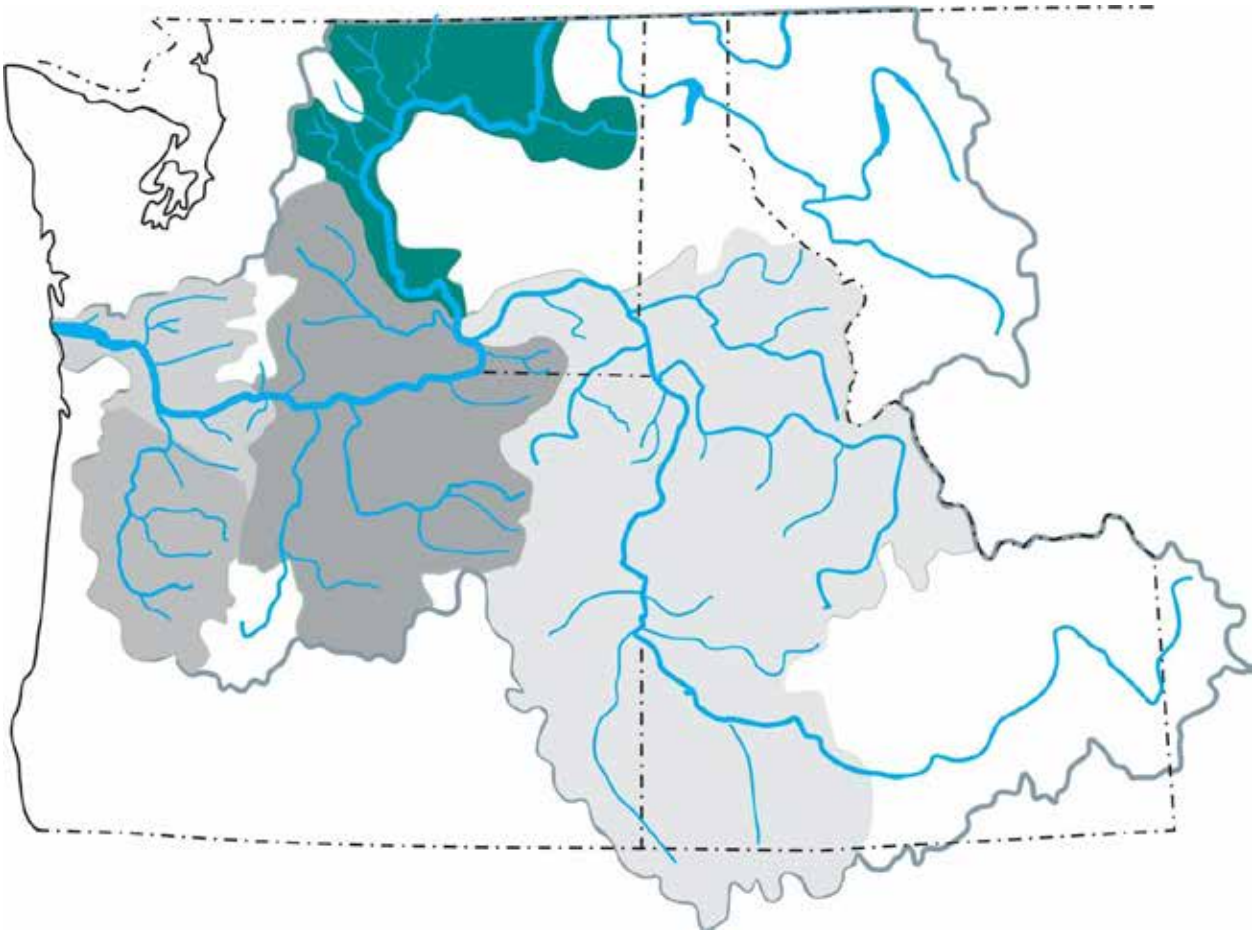
Historical abundance: Historical abundance is estimated based on EDT modeling reported in the 2005 NPCC Subbasin Plan or in EDT modeling by the Yakima tribe. Where EDT estimates were not available, values reported in the subbasin plans and based on historical information were used.

Current abundance: Based on spawning surveys, mark/recapture estimate, and tributary dam counts.

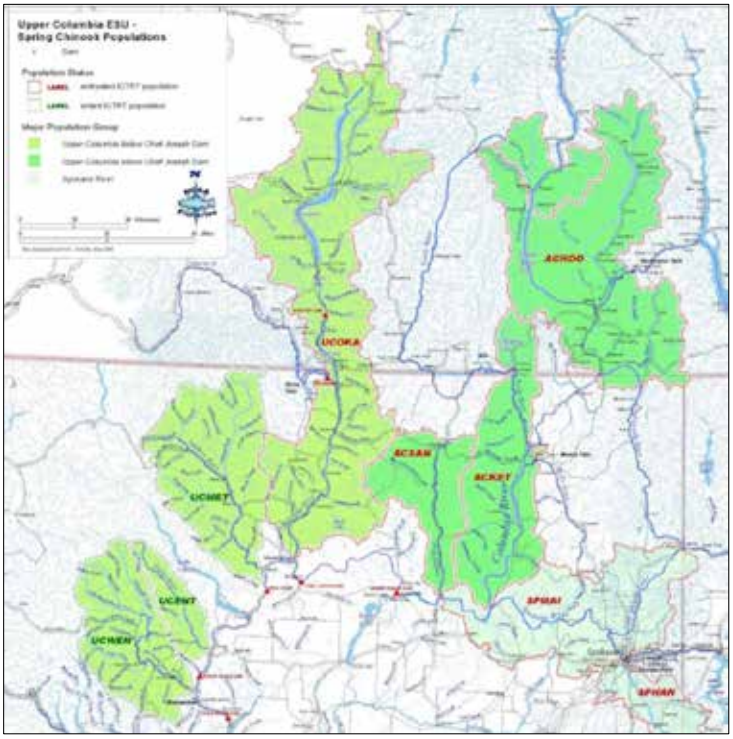
Goals:

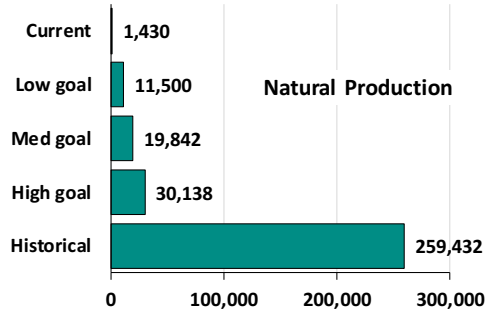
- *Low range*: Based on ESA recovery plan population-level abundance goals (ICTRT MAT).
- *Medium range*: Midpoint between low and high goals.
- *High range*: Some from EDT estimates based on moderate habitat improvement (from SBPs); for some populations high is limited to historical estimate because model-derived exceeded historical; for some no estimate is available so the three times MAT default is used.

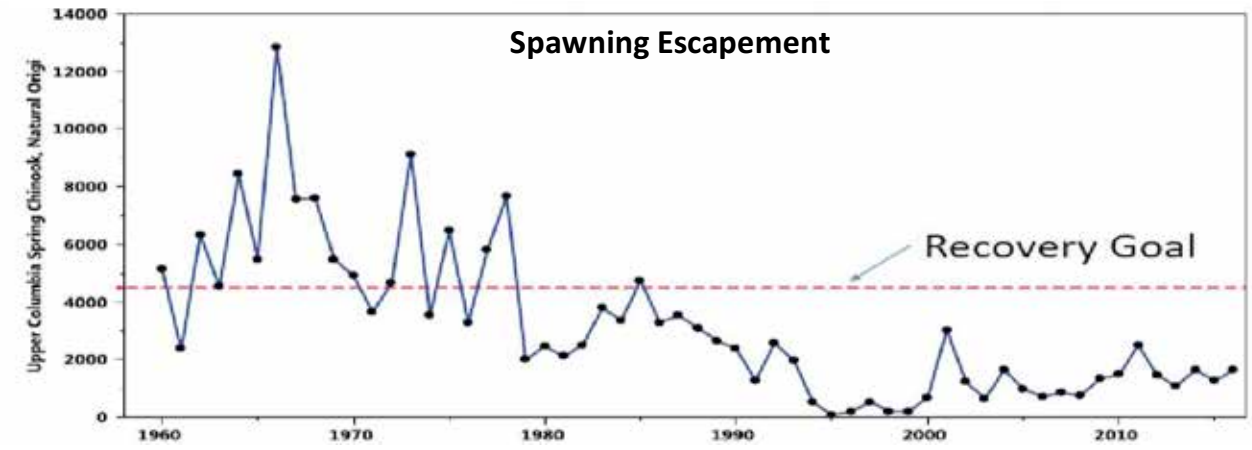
UPPER COLUMBIA



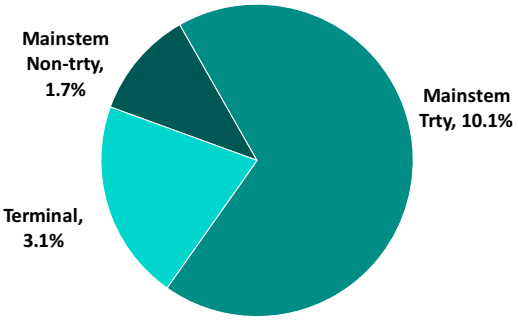
- Currently inhabits large tributaries upstream from Priest Rapids Dam.
- Spawning occurs in mid to high elevation reaches
- A portion of the historical habitat upstream from Chief Joseph and Grand Coulee dams is not currently accessible under current management.
- This stock ranges widely in the ocean along the Pacific Coast where it is not subject to fisheries.





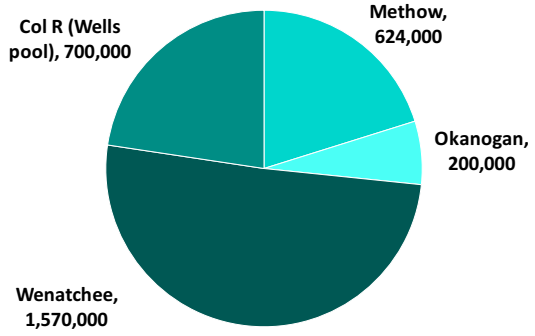


Current Fishery Distribution of Wild/Natural Impacts (v Col R)



Totals 14.8%

Current Hatchery Production (smolts)



Totals 3.0 million

Natural Production		Abundance		Potential Goal Range		
MPG	Population	Recent	Historical	Low	Med	High
N Cascades	Methow	430	24,000	2,000	2,698	4,047
	Wenatchee	680	20,650	2,000	2,714	4,071
	Entiat	220	3,400	500	680	1,020
	Okanogan (US)	100	14,125	500	750	1,500
Blocked area		0	197,257	6,500	13,000	19,500
Totals		**1,430**	**259,432**	**11,500**	**19,842**	**30,138**

Hatchery Production	Current Production		Return	Anticipated
Location (Program)	Brood	Yearlings	goal	production
Methow	340	624,000		624,000
Okanogan	140	200,000		200,000
Wenatchee	1,087	1,570,000		1,570,000
Col R (Wells pool)	486	700,000		700,000
New (blocked area)	0	0		0.7 - 13.5 million
Subtotal	**2,053**	**3,094,000**		**3.8-16.6 million**

Fisheries / Harvest			Exploitation rate (v Col R)			Harvest	
	Location		Avg.	Limits	Potential	10-yr avg	Potential
Wild/Natural	Ocean	--	0%	--	--	--	--
	Mainstem Non-trty	v Col R.	1.7%	5.5-17%	20-60%	60	46,500
	Mainstem Trty	v Col R.	10.1%			390	
	Terminal	v PRD	4.0%	2-6%		120	
	Blocked area		0%	--		--	
	Total	v Col R.	***14.8%***	***7.5-23%***	***20-60%***	***570***	***46,500***
Hatchery	Ocean	--	0	--	--	--	--
	Mainstem Non-trty	v Col R.	12.1%	--	≤70%	2,350	72,900
	Mainstem Trty	v Col R.	10.1%	--		1,750	
	Terminal	v PRD	10.0%	--		1,340	
	Blocked area		0%	--		0	
	Total	v Col R.	***32.2%***		***≤70%***	***5,440***	***72,900***

Total Return		Recent avg (2008-2017)	@ Goals		
			Low	Med	High
@ Columbia R Mouth		**23,240**	**50,300**	**87,300**	**220,500**
	Wild/Natural	3,840	30,900	63,400	116,300
	Hatchery	19,400	19,400	23,900	104,200
	% hatchery	**83%**	39%	27%	47%
To Bonneville Dam		**20,880**	**47,500**	**79,600**	**174,800**
	Wild/Natural	3,780	30,400	61,400	110,700
	Hatchery	17,100	17,100	18,200	64,100
	% hatchery	**82%**	36%	23%	37%
To Upper Col R (PRD)		**16,360**	**37,200**	**55,500**	**105,500**
	Wild/Natural	2,960	23,800	42,800	67,800
	Hatchery	13,400	13,400	12,700	37,700
	% hatchery	**82%**	36%	23%	36%
Escapement		**7,530**	**17,600**	**24,900**	**43,100**
	Wild/Natural	1,430	11,500	19,800	30,100
	Hatchery	6,100	6,100	5,100	13,000
	% hatchery	81%	35%	20%	30%
Harvest (Col Basin)		**5,970**	**10,000**	**29,600**	**119,400**
	Wild/Natural	570	4,600	17,800	46,500
	Hatchery	5,400	5,400	11,800	72,900
	% hatchery	90%	54%	40%	61%

Notes - Natural Production

Distribution: Historically distributed in Wenatchee, Entiat, Methow, and Okanogan subbasins as well as currently-blocked areas upstream from Chief Joseph and Grand Coulee Dams. The Okanogan population was historically extirpated; the other three populations are extant. At least 3 populations were historically assumed to occur upstream from Chief Joseph Dam (Spokane, Hangman, Sanpoil, Kettle/Colville, Kootenay and headwaters).

Historical abundance: Based on combination of harvest/consumption-based estimates by Upper Columbia River tribes and EDT-based estimates under assumed historical conditions.

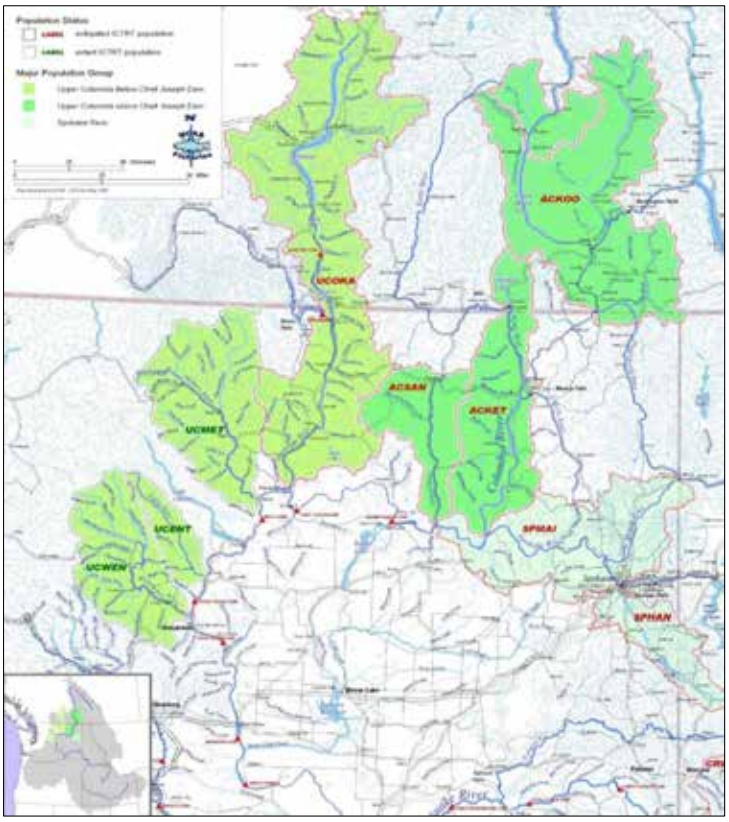
Current abundance: Based on spawning surveys.

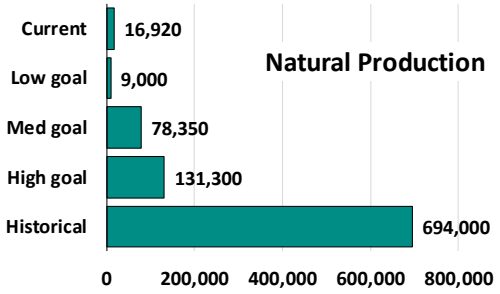
Goals:

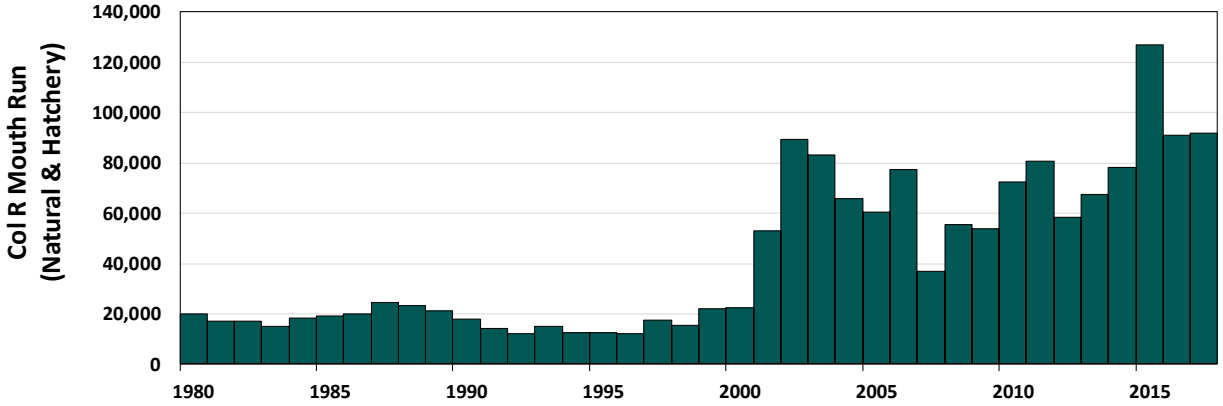
- Low: Based on recovery plan goals. In some cases, modeled abundance identified by the recovery plan is less than the minimum abundance threshold (MAT) identified by the Interior Columbia Technical Recovery Team – in these cases, the modeled abundance is used. Value for blocked areas is equal to the minimum abundance threshold for six assumed historical populations upstream from Chief Joseph Dam – this number is intended to represent numbers of fish that would be available to Colville and Spokane Tribes in historical fishing areas under conditions equivalent to minimum viability of historical populations.
- Medium: Based on modeled equilibrium abundance using EDT model assuming implementation of a suite of habitat restoration actions as reported in the recovery plan appendix. Value for blocked areas is intermediate between low and high values.
- High: Generally based on 1.5 times medium goal. Okanogan value is default three times low goal. Value for blocked areas is default three times low goal.

Provisional goals are identified for salmon and steelhead returning to the Columbia River upstream of Chief Joseph and Grand Coulee dams. The intent of these goals is to restore meaningful fishing opportunities in areas of historical use by the Colville and Spokane tribes. Goals represent only returns to areas upstream from Chief Joseph and Grand Coulee dams and do not apportion production into specific populations or geographic areas. See Chapter 10 for further explanation.

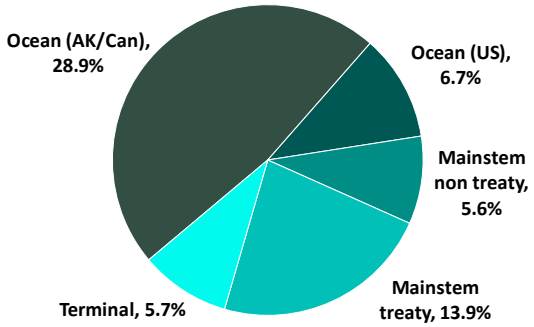
- Currently inhabits mainstem and large tributaries upstream of Priest Rapids Dam.
- Historical habitat upstream from Chief Joseph and Grand Coulee dams is not accessible under current management.
- Historical population structure assumed similar to that of spring Chinook.
- Part of the unlisted upper Columbia summer/fall Chinook ESU, which also includes Hanford bright fall Chinook.
- Ranges widely in the ocean along the Pacific Coast where they are subject to fisheries from the Pacific Northwest to Canada and Alaska.





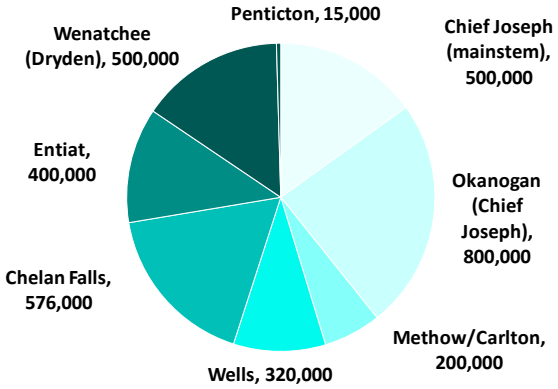


Fishery Distribution
(Exploitation Rate v Ocean abundance)



Total 61%

Current Hatchery Production (smolts)



Total (smolts) 3.3 million

Natural Production		Abundance		Potential Goal Range		
MPG	Population	Recent	Historical	Low	Med	High
Cascades	Methow	1,400	12,000	1,000	2,900	4,400
	Wenatchee	5,950	21,000	1,000	5,700	8,600
	Entiat	240	0	--	--	--
	Okanogan (US)	5,150	44,000	2,000	6,000	17,400
	Chelan	880	0	500	1,350	2,000
	Mainstem Columbia	3,200	0	500	1,900	3,900
Yakima	Yakima	100	50,000	1,000	3,500	10,000
Blocked area		0	567,000	3,000	57,000	85,000
Totals		**16,920**	**694,000**	**9,000**	**78,350**	**131,300**

Hatchery Production	Current Production				Anticipated
Location (Program)	Brood	Yearlings	Subyearlings	Goal	Production
Chief Joseph (mainstem)	503	500,000	400,000		900,000
Okanogan (Chief Joseph)	616	800,000	300,000		1,100,000
Methow/Carlton	118	200,000	0		200,000
Wells	494	320,000	484,000		804,000
Chelan Falls	358	576,000	0		576,000
Entiat	210	400,000	0		400,000
Wenatchee (Dryden)	262	500,000	0		500,000
Penticton	6	15,000	0		15,000
New (blocked area)	0	0	0	20-35 thou	0.9 - 18 mil
Subtotal	**2,567**	**3,311,000**	**1,184,000**	**-**	**5.4-22.5 mil**

Fisheries / Harvest		Exploitation rate				Harvest	
	Location	Avg (v ocn)	Avg (v CR)	Limit	Potential	Now	Potential
Combined Natural/Hatchery	Ocean (AK/Can)	28.9%	--	--	40-80%	35,100	215,000
	Ocean (US)	6.7%	--	--		8,200	
	Mainstem non treaty	5.6%	8.6%	5.2-50%		6,700	154,000
	Mainstem treaty	13.9%	21.6%			17,400	
	Terminal	5.7%	8.9%			7,000	
	Blocked area	0.0%	0%	--		--	
	Total	**61%**	**39%**		***40-80%***	***74,400***	***369,000***

Total Return		Current avg (2008-2017)	@ Goals		
			Low	Med	High
@ Columbia R Mouth		**78,000**	**64,000**	**240,000**	**387,000**
	Wild/Natural	31,200	17,000	144,000	241,000
	Hatchery	46,800	47,000	96,000	146,000
	% hatchery	60%	73%	40%	38%
To Bonneville Dam		**71,400**	**58,000**	**221,000**	**355,000**
	Wild/Natural	28,600	15,000	132,000	221,000
	Hatchery	42,800	43,000	89,000	134,000
	% hatchery	60%	74%	40%	38%
To Upper Col R (PRD)		**52,800**	**43,000**	**164,000**	**263,000**
	Wild/Natural	21,120	11,000	98,000	164,000
	Hatchery	31,680	32,000	66,000	99,000
	% hatchery	60%	74%	40%	38%
Escapement		**36,300**	**30,000**	**112,000**	**181,000**
	Wild/Natural	14,500	8,000	67,000	113,000
	Hatchery	21,800	22,000	45,000	68,000
	% hatchery	60%	73%	40%	38%
Harvest (Col Basin)		**31,100**	**26,000**	**95,000**	**154,000**
	Wild/Natural	12,400	7,000	57,000	96,000
	Hatchery	18,700	19,000	38,000	58,000
	% hatchery	60%	73%	40%	38%
Harvest (Total)		**74,400**	**61,000**	**229,000**	**369,000**
	Wild/Natural	29,800	16,000	137,000	230,000
	Hatchery	44,600	45,000	92,000	139,000
	% hatchery	60%	74%	40%	38%

Notes - Natural Production

Distribution: This stock is part of the upper Columbia summer/fall Chinook ESU which also includes Hanford bright fall Chinook. Summer and fall Chinook were treated as separate CBP stocks due to their different life history and distribution. Major population groups and demographically independent populations are not formally designated under the ESA for this listed population. For the purposes of this exercise, historical population structure is assumed similar to that of spring Chinook For the purposes of this exercise, the regional technical team identified seven extant populations in the Columbia River and tributaries between the Yakima River and Chief Joseph Dam. Three of these "populations" were not historically significant (Entiat, Chelan and the mainstem Columbia between Rock Island and Chief Joseph dams. Summer Chinook also historically migrated into currently-blocked areas upstream from Chief Joseph and Grand Coulee dams.

Historical abundance: Based on combination of harvest/consumption-based estimates by Upper Columbia River tribes and EDT-based estimates under assumed historical conditions.

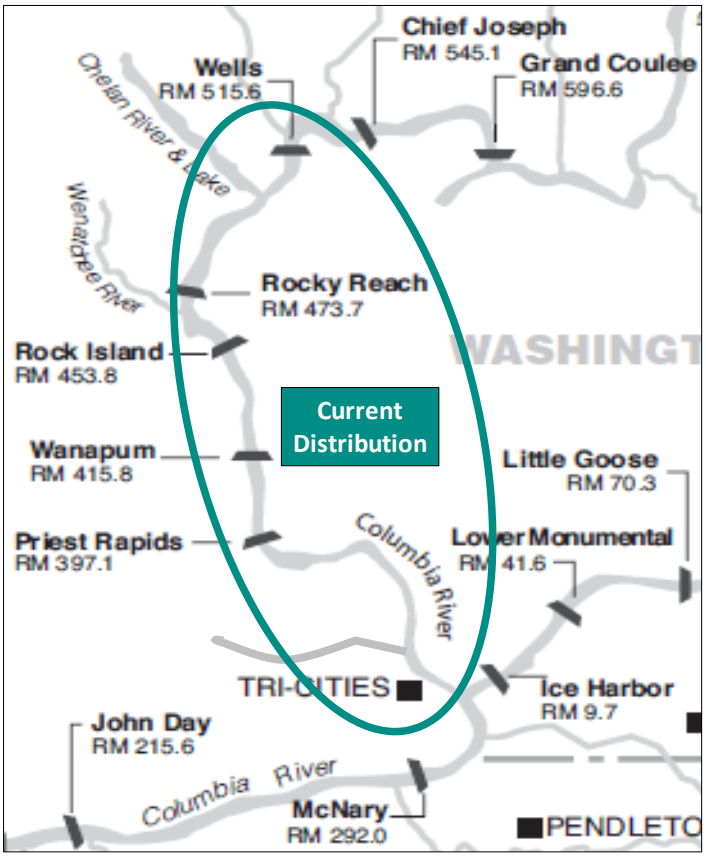
Current abundance: Based on spawning surveys and dam counts.

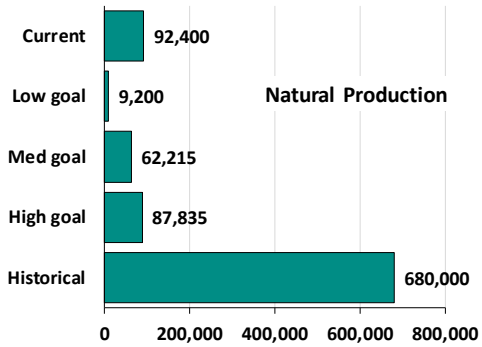
Goals:

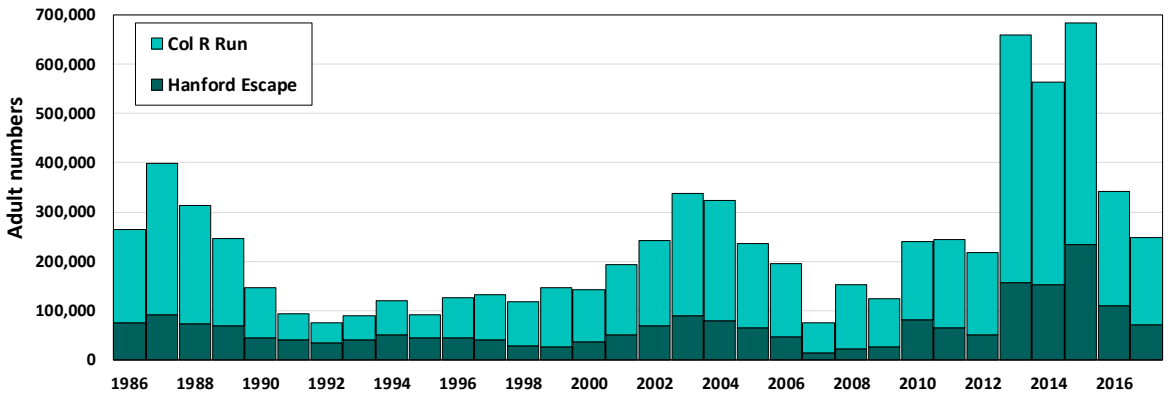
- *Low range:* Based on minimum abundance threshold values identified by the Interior Columbia Technical Recovery Team for similar-sized Spring Chinook populations. As current numbers are substantially greater this these minimal levels, the low range numbers function primarily as biological reference points rather than goals for current management purposes. No goal is identified for the Entiat system which is not a historical population and is currently being managed for Spring Chinook. Value for blocked areas is equal to the minimum abundance threshold for five assumed historical populations upstream from Chief Joseph Dam – this number is intended to represent numbers of fish that would be available to Colville and Spokane Tribes in historical fishing areas under conditions equivalent to minimum viability of historical populations.
- *Medium range:* Current capacity/production-based optimum escapement levels for these healthy populations. Wenatchee value is based on stock-recruitment analysis. Okanogan value is based on EDT analysis under patient condition. Value for blocked areas is based on various models of habitat potential – this number is intended to represent numbers of fish that would be available to Colville and Spokane Tribes in historical fishing areas with restoration of significant production in the blocked area.
- *High range:* Values generally based on 1.5 times medium range goal reflecting potential improvements hypothesized by the Upper Columbia River technical team. The estimate for the Okanogan is based on EDT analysis.

Provisional goals are identified for salmon and steelhead returning to the Columbia River upstream of Chief Joseph and Grand Coulee dams. The intent of these goals is to restore meaningful fishing opportunities in areas of historical use by the Colville and Spokane tribes. Goals represent only returns to areas upstream from Chief Joseph and Grand Coulee dams and do not apportion production into specific populations or geographic areas. See Chapter 10 for further explanation.

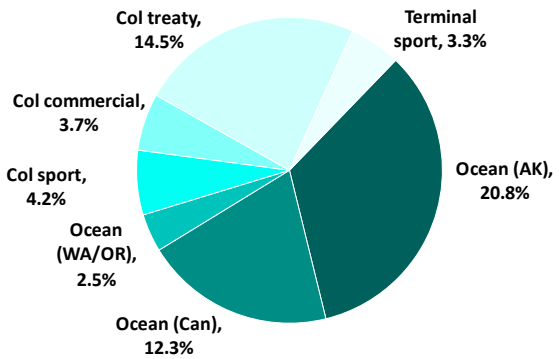
- Includes Hanford Bright fall Chinook, which are among the largest and most productive salmon stocks remaining in the Columbia Basin.
- This stock spawns in the unimpounded Columbia River mainstem between Richland, WA and Chief Joseph Dam.
- Fish also spawned in currently-inaccessible portions of the river upstream from Chief Joseph Dam.
- This stock ranges widely in the ocean along the Pacific Coast where they are subject to fisheries from the Pacific Northwest to Canada and Alaska.





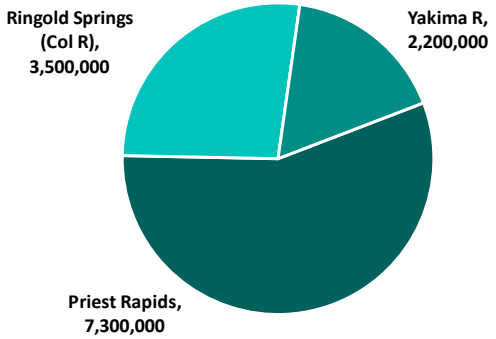


Harvest Distribution
(Exploitation rate vs. Ocean Adults)



Total 61.3%

Current Hatchery Production (subyearlings)



Total 13.0 million

Natural Production		Abundance		Potential Goal Range		
MPG	Population	Recent	Historical	Low	Med	High
UCR Fall	Hanford	70,400	500,000	4,200	40,950	51,188
	Yakima R	1,000	150,000	2,000	3,500	10,000
	PRD-CJD	21,000		1000	2,000	3,000
	Blocked area	0	30,000	2,000	15,765	23,648
Totals		**92,400**	**680,000**	**9,200**	**62,215**	**87,835**

Hatchery Production	Current Production				Anticipated
Location (Program)	Brood	Yearlings	Subyearlings	Goal	production
Priest Rapids	7,376	0	7,300,000	54,000	7,300,000
Ringold Springs (Col R)		0	3,500,000		3,500,000
Yakima R		210,000	2,200,000		2,410,000
New (John Day Mitigation)	--	--	--	45,000	11,000,000
Blocked area	--	--	--	54,126	0.27-0.54 mil
Subtotal	**7,376**	**210,000**	**13,000,000**	**153,126**	**24.5-29.6 mil**

Fisheries / Harvest		Exploitation rate				Harvest	
	Location	Avg (v ocn)	Avg (v CR)	Limit	Potential	10-yr avg	Potential
Combined Hatch / Natl	Ocean (AK)	20.8%	--	--	40-80%	112,000	225,500
	Ocean (Can)	12.3%	--	--		66,300	
	Ocean (WA/OR)	2.5%	--	--		13,300	
	Col sport	4.2%	6.5%	21.5-45%		21,700	163,600
	Col commercial	3.7%	5.8%			20,900	
	Col treaty	14.5%	22.5%			75,900	
	Terminal sport	3.3%	5.2%			17,800	
	Blocked area	--	--	--		--	
	Total	***61.3%***	***39.9%***	***40-80%***	***40-80%***	***327,900***	***389,100***

Total Return		Recent avg (2008-2017)	@ Goals		
			Low	Med	High
@ Columbia R Mouth		**346,900**	**131,700**	**251,200**	**408,200**
	Wild/Natural	228,800	13,600	133,100	166,400
	Hatchery	118,100	118,100	118,100	241,800
	% hatchery	34%	90%	47%	59%
@ Bonneville Dam		**305,600**	**116,000**	**221,200**	**359,500**
	Wild/Natural	201,600	12,000	117,200	146,500
	Hatchery	104,000	104,000	104,000	213,000
	% hatchery	34%	90%	47%	59%
To Upper Col R (MCN)		**231,500**	**85,900**	**163,700**	**266,000**
	Wild/Natural	152,700	8,900	86,700	108,400
	Hatchery	78,800	77,000	77,000	157,600
	% hatchery	34%	90%	47%	59%
Escape (MCN-PRD)		**133,000**	**50,400**	**96,200**	**156,300**
	Wild/Natural	87,600	5,200	51,000	63,700
	Hatchery	45,400	45,200	45,200	92,600
	% hatchery	34%	90%	47%	59%
Harvest (Col Basin)		**136,200**	**52,800**	**100,600**	**163,600**
	Wild/Natural	89,800	5,500	53,300	66,700
	Hatchery	46,400	47,300	47,300	96,900
	% hatchery	34%	90%	47%	59%
Harvest (Total)		**327,900**	**125,600**	**239,500**	**389,100**
	Wild/Natural	216,300	13,000	126,900	158,600
	Hatchery	111,600	112,600	112,600	230,500
	% hatchery	34%	90%	47%	59%

Notes - Natural Production

Distribution: This stock includes the large Hanford Reach population of bright fall Chinook which is currently one of the robust salmon runs in the Columbia Basin. Smaller numbers of fall Chinook also return to the lower Yakima River and mainstem Columbia between Priest Rapids and Chief Joseph Dams. This was historically likely one contiguous metapopulation but populations are identified here for accounting purposes. Major population groups and demographically independent populations are not formally designated under the ESA for this listed population. Fall Chinook also historically migrated into currently-blocked areas upstream from Chief Joseph and Grand Coulee dams.

Historical abundance: Generally based on assumed habitat availability, historical Columbia River runs and tribal utilization.

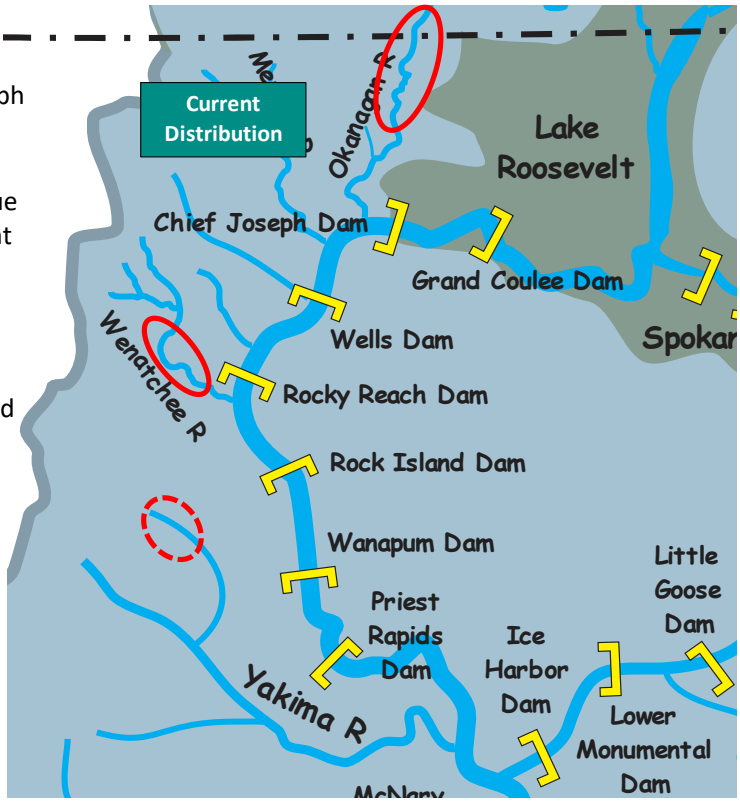
Current abundance: Based on spawning ground surveys and dam counts.

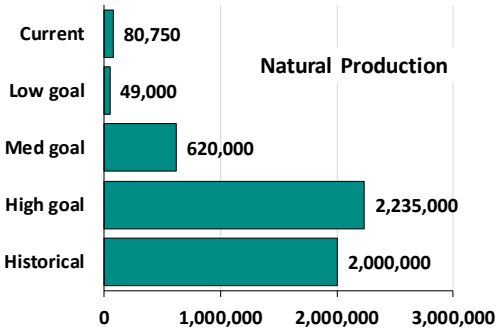
Goals:

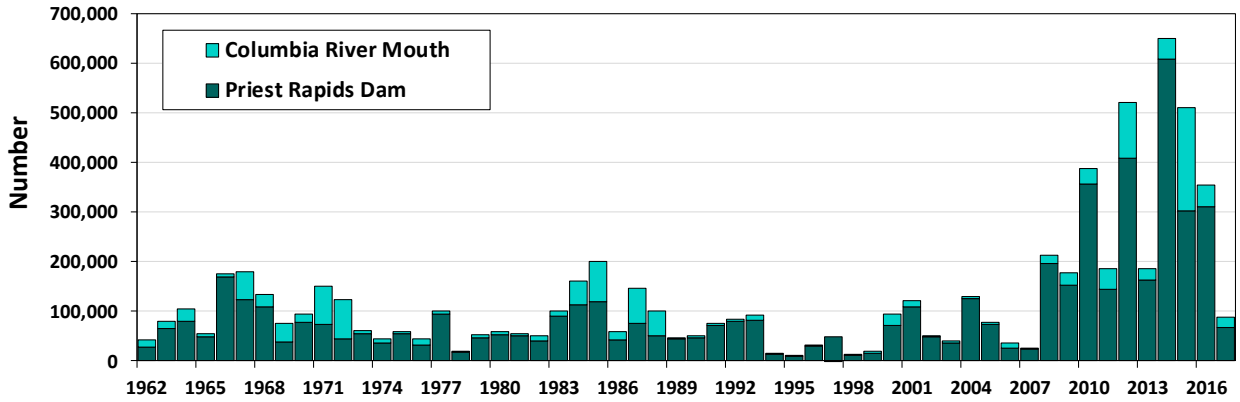
- *Low range:* Minimum abundance levels consistent with high viability are based on Snake River fall Chinook values defined in their recovery plan. As current numbers are substantially greater this these minimal levels, the low range numbers function primarily as biological reference points rather than goals for current management purposes. Value for blocked areas is equal to the minimum abundance threshold for three assumed historical populations upstream from Chief Joseph Dam – this number is intended to represent numbers of fish that would be available to Colville and Spokane Tribes in historical fishing areas under conditions equivalent to minimum viability of historical populations.
- *Medium range:* For the healthy Hanford Reach population, this goal is the current capacity/production-based optimum escapement level. The goal is based on stock-recruitment analysis of empirical data. Goals for the Yakima and PRD-CJD mainstem populations reflect modest improvement which might result from reasonable improvements in habitat and migration conditions. The value for the blocked area is based on various models of habitat potential – this number is intended to represent numbers of fish that would be available to Colville and Spokane Tribes in historical fishing areas with restoration of significant production in the blocked area.
- *High range:* For the healthy Hanford Reach population, this goal is based on the potential improvements due to predator, habitat and migration condition management. The Yakima goal is identified by the Yakama Nation. The PRD-CJD mainstem population goal is the default of three times the low range value. The value for the blocked area is based on 1.5 times medium range goal reflecting potential improvements hypothesized by the Upper Columbia River technical team.

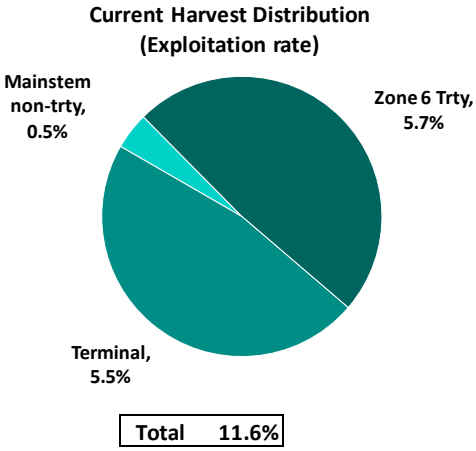
Provisional goals are identified for salmon and steelhead returning to the Columbia River upstream of Chief Joseph and Grand Coulee dams. The intent of these goals is to restore meaningful fishing opportunities in areas of historical use by the Colville and Spokane tribes. Goals represent only returns to areas upstream from Chief Joseph and Grand Coulee dams and do not apportion production into specific populations or geographic areas.

- Historically produced in large natural lakes where juvenile sockeye rear.
- Historical habitat upstream from Chief Joseph Dam and the Okanogan is not currently accessible under current management.
- Abundance has increased in recent years due to tributary passage and water management improvements in the Okanogan system and favorable marine survival.
- This stock ranges widely in the ocean along the Pacific Coast where it is not subject to fisheries. Columbia River fisheries are limited as well.

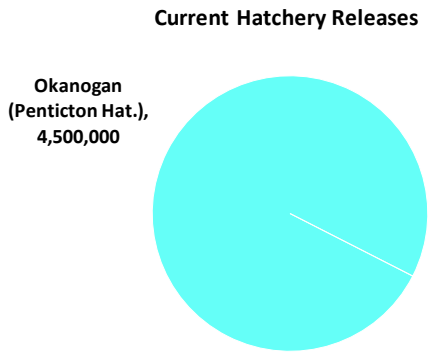








Total 11.6%



Total 4.5 million

Natural Production	Abundance (mean)		Potential Goal Range		
Population	Recent	Historical	Low	Med	High
Yakima (reintroduction)	900	200,000	17,500	40,000	1,000,000
Wenatchee	21,850	35,000	3,500	23,000	35,000
Okanogan	58,000	500,000	10,500	207,000	500,000
Blocked area	0	1,265,000	17,500	350,000	700,000
Totals	**80,750**	**2,000,000**	**49,000**	**620,000**	**2,235,000**

Hatchery Production	Current Production		Return	Anticipated
Location (Program)	Brood	Subyearlings	Goal	production
Okanogan (Penticton Hat.)	3,000	4,500,000	250,000	5,000,000
Yakima	1,000-10,000			
Blocked Area	0	0	360,000	9,100,000
Subtotal	**3,000**	**4,500,000**	**610,000**	**14,100,000**

Fisheries / Harvest		Exploitation rate				Harvest	
	Location		Avg.	Limits	Potential	10 yr avg	Potential
Combined Hatchery/Natural	Ocean	--	0	--	--	--	--
	Mainstem non-trty	v Col R	0.5%	6-8+%	20-60%	1,500	3,000,000
	Zone 6 Trty	v Col R	5.7%			19,300	
	Terminal	v Col R	5.5%	<18%		21,000	
	Blocked area		0.0%			0	
	Total	**v Col R**	***11.6%***	***6-26+%***	***20-60%***	***41,800***	***3,000,000***

Total Return		Recent avg (2008-2017)	@ Goals		
			Low	Med	High
@ Columbia R Mouth		**327,000**	**225,000**	**395,000**	**6,661,000**
	Wild/Natural	294,300	180,000	350,000	6,520,000
	Hatchery	32,700	45,000	45,000	141,000
	% hatchery	10%	20%	11%	2%
@ Bonneville Dam		**326,000**	**225,000**	**385,000**	**6,538,000**
	Wild/Natural	293,400	180,000	340,000	6,400,000
	Hatchery	32,600	45,000	45,000	138,000
	% hatchery	10%	20%	12%	2%
To Upper Col R (PRD)		**271,000**	**187,000**	**305,000**	**4,434,000**
	Wild/Natural	243,900	150,000	270,000	4,340,000
	Hatchery	27,100	37,000	35,000	94,000
	% hatchery	10%	20%	11%	2%
Escapement		**134,800**	**87,000**	**124,000**	**3,052,000**
	Wild/Natural	121,300	70,000	110,000	3,020,000
	Hatchery	14,000	17,000	14,000	32,000
	% hatchery	10%	20%	11%	1%
Harvest (Col Basin)		**41,800**	**28,600**	**354,300**	**2,995,900**
	Wild/Natural	37,600	22,800	343,000	2,932,400
	Hatchery	4,200	5,800	11,300	63,500
	% hatchery	10%	20%	3%	2%

Notes - Natural Production

Distribution: This stock includes the Wenatchee and Okanogan populations, both of which are relatively healthy. Sockeye also historically occurred in the Yakima system where they are currently being introduced. Large populations were present in Canadian Lakes upstream from current passage barriers at Chief Joseph, Grand Coulee, Keenleyside, and Revelstoke dams.

Historical abundance: Based on historical river mouth returns inferred from Lower Columbia River harvests and relative amounts of habitat available to individual populations. The value for the blocked area is based on various models of habitat potential – this number is intended to represent numbers of fish that would be available to Colville and Spokane Tribes in historical fishing areas with restoration of significant production in the blocked area.

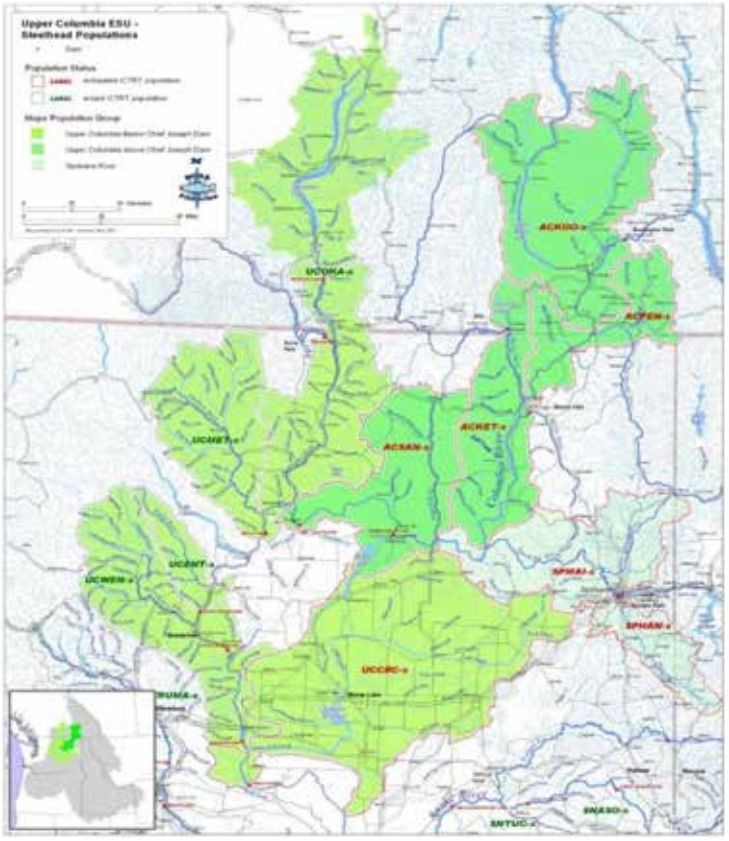
Current abundance: Based on spawning ground surveys and dam counts.

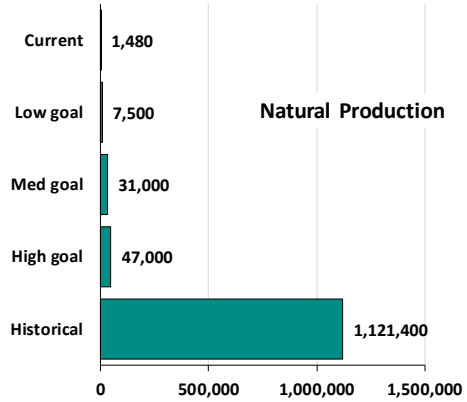
Goals:

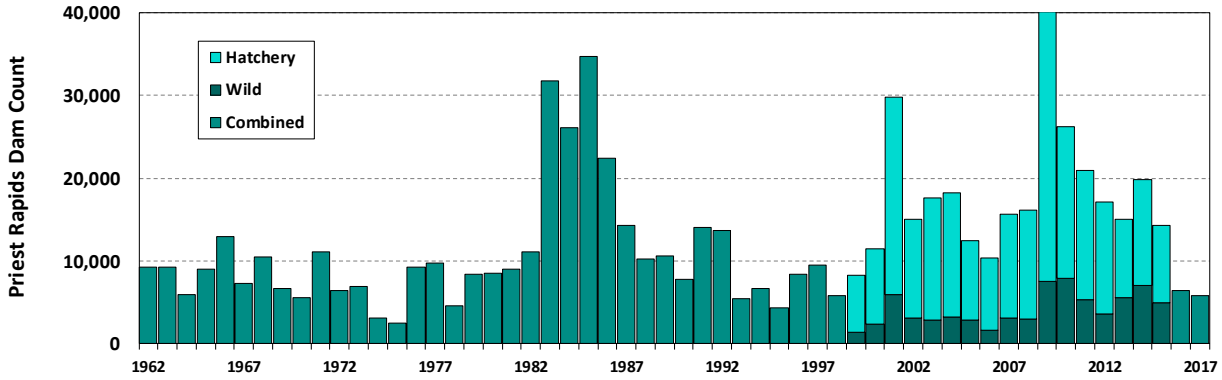
- *Low range:* Based on values identified for Snake River populations. Values are multiplied by the number of historical subpopulation assumed to be present in each system (5 in the Yakima, e in the Okanogan). As current numbers in the Okanogan and Wenatchee are substantially greater than this these minimal levels, the low range numbers function primarily as biological reference points rather than goals for current management purposes. The value for blocked areas is equal to the minimum abundance threshold for five assumed historical populations upstream from Chief Joseph Dam – this number is intended to represent numbers of fish that would be available to Colville and Spokane Tribes in historical fishing areas under conditions equivalent to minimum viability of historical populations.
- *Medium range:* For the healthy Wenatchee and Okanogan populations, goals are current capacity/production-based optimum escapement levels. The Wenatchee goal is based on empirical return data. The Okanogan goal is based on current habitat availability in accessible areas (not including Okanogan Lake in Canada which was historically a large producer of Sockeye). Values for the Yakima were provided by the YN and assume reintroduced levels of 8,000 fish for each of five populations.
- *High range:* For the Wenatchee and Okanogan populations, goals are based on production potential with continuing habitat improvements. Values for the Yakima were provided by the YN. Numbers for both the Yakima and the areas upstream from Chief Joseph and Grand Coulee dams assume substantial improvements in production potential for sockeye due to increased rearing habitat provided by reservoirs.

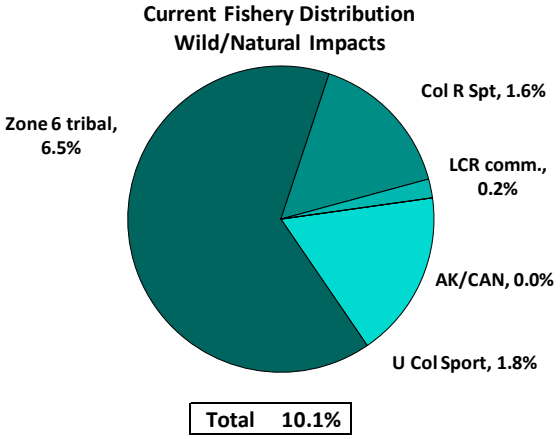
Provisional goals are identified for salmon and steelhead returning to the Columbia River in currently blocked areas upstream of Chief Joseph and Grand Coulee dams. The intent of these goals is to restore meaningful fishing opportunities in areas of historical use by the Colville and Spokane tribes. Goals represent only returns to areas upstream from Chief Joseph and Grand Coulee dams and do not apportion production into specific populations or geographic areas.

- Currently inhabits large tributaries upstream from Priest Rapids Dam.
- A large portion of the historical habitat upstream from Chief Joseph and Grand Coulee dams is no longer accessible under current management.
- This stock ranges widely in the ocean along the Pacific Coast where it is not subject to fisheries.
- Hatchery production is significant.

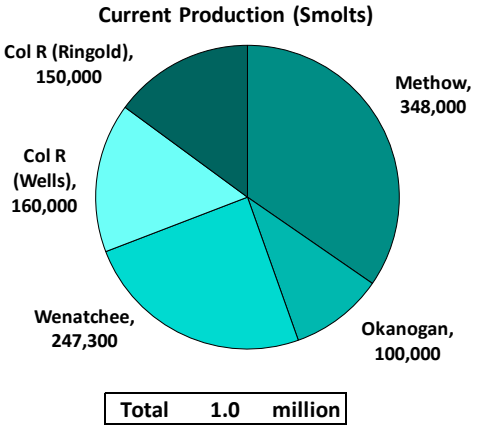








Total 10.1%



Total 1.0 million

Natural Production		Abundance		Potential Goal Range		
MPG	Population	Recent	Historical	Low	Med	High
N Cascades	Crab	na	0	--	--	--
	Entiat	140	500	500	1,000	1,500
	Methow	790	3,600	1,000	1,100	1,650
	Okanogan	240	10,000	500	1,900	2,850
	Wenatchee	310	7,300	1,000	2,000	3,000
Blocked area		0	1,100,000	4,500	25,000	38,000
Totals		**1,480**	**1,121,400**	**7,500**	**31,000**	**47,000**

Hatchery Production	Current Production		Return	Anticipated
Location (Program)	Brood	Yearlings	Goal	production
Methow	202	348,000		348,000
Okanogan	58	100,000		100,000
Wenatchee	140	247,300		247,300
Col R (Wells)	108	160,000		160,000
Col R (Ringold)		150,000		180,000
New (blocked area)	0	0		50,000 - 3 mil
Subtotal	**508**	**1,005,300**		**1.0 - 4.1 mil**

Fisheries / Harvest		Exploitation rate (v Col R)			Harvest	
Location		Avg.	Limits	Potential	10-yr avg	Potential
Wild/Natural	Ocean	0	--	--	0	--
	Mainstem Non-treaty	1.8%	15-22%	20-50%	100	99,000
	Mainstem Treaty	6.5%			400	
	Terminal (>PRD)	1.8%	5-12%		100	
	Blocked area	0.0%			0	
	Total	***10.1%***	**20-34%**	**20-50%**	***600***	
Hatchery	Ocean	0	--	--	0	--
	Mainstem Non-treaty	12.0%	--	<70%	2,500	27,000
	Mainstem Treaty	6.1%	--		1,300	
	Terminal (>PRD)	24.9%	--		5,300	
	Blocked area	--	--		--	
	Total	***43.0%***	**--**	***<70%***	***9,100***	

Total Return		Recent avg (2006-2015)	@ Goals		
			Low	Med	High
@ Columbia R Mouth		**27,700**	**58,000**	**211,000**	**342,000**
	Wild/Natural	6,400	37,000	171,000	284,000
	Hatchery	21,300	21,000	40,000	58,000
	% hatchery	77%	36%	19%	17%
@ Bonneville Fam		**26,700**	**56,000**	**203,000**	**327,000**
	Wild/Natural	6,400	36,000	165,000	272,000
	Hatchery	20,300	20,000	38,000	55,000
	% hatchery	76%	36%	19%	17%
To Upper Col R (PRD)		**19,600**	**41,000**	**138,000**	**211,000**
	Wild/Natural	5,000	26,000	110,000	170,000
	Hatchery	14,600	15,000	28,000	41,000
	% hatchery	74%	37%	20%	19%
Escapement					
	Wild/Natural	1,500	8,000	31,000	48,000
	Hatchery				
	% hatchery				
Harvest (Col Basin)		**9,700**	**17,000**	**68,000**	**126,000**
	Wild/Natural	600	7,000	50,000	99,000
	Hatchery	9,100	10,000	18,000	27,000
	% hatchery	94%	59%	26%	21%
Harvest (total)		**9,700**	**17,000**	**68,000**	**126,000**
	Wild/Natural	600	7,000	50,000	99,000
	Hatchery	9,100	10,000	18,000	27,000
	% hatchery	94%	59%	26%	21%

Notes - Natural Production

Distribution: Historically distributed in Wenatchee, Entiat, Methow, and Okanogan subbasins as well as currently-blocked areas upstream from Chief Joseph and Grand Coulee Dams. At least 7 populations were historically assumed to occur upstream from Chief Joseph Dam (Spokane, Hangman, Sanpoil, Kettle/Colville, Kootenay, Pend Oreille, and headwaters). Summer steelhead also currently occur in Crab Creek where summer flows have been substantially increased from historical levels due to irrigation return flows.

Historical abundance: Based on harvest/consumption-based estimates by Upper Columbia River tribes.

Current abundance: Based on spawning ground surveys.

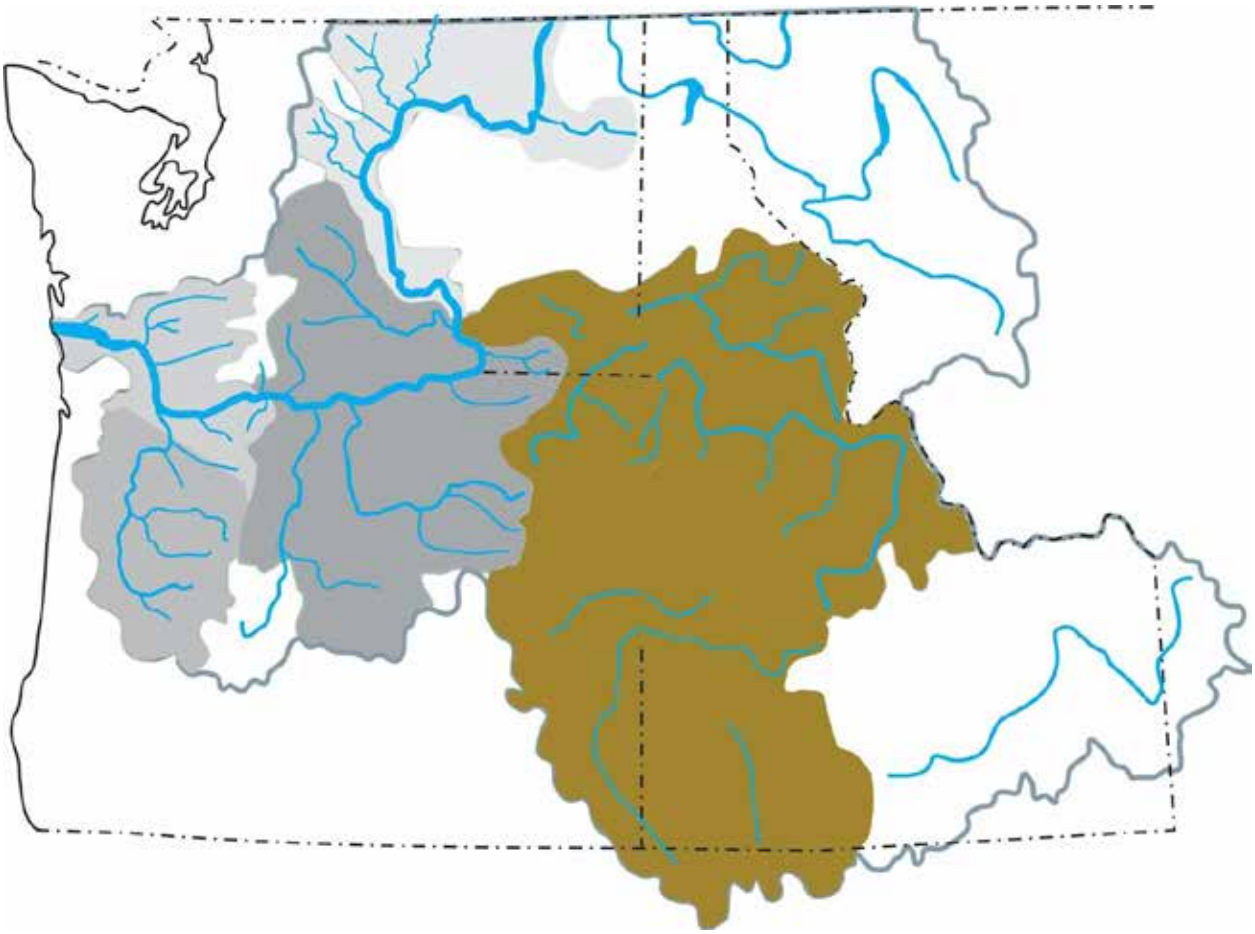
Goals:

- *Low range:* Based on recovery plan goals in the currently-accessible area. Value for blocked areas is equal to the minimum abundance threshold for seven assumed historical populations upstream from Chief Joseph Dam – this number is intended to represent numbers of fish that would be available to Colville and Spokane Tribes in historical fishing areas under conditions equivalent to minimum viability of historical populations.
- Medium: Based on modeled equilibrium abundance using EDT model assuming implementation of a suite of habitat restoration actions as reported in the recovery plan appendix. Value for blocked areas is intermediate between low and high values.
- *High range:* Values generally based on 1.5 times medium range goal reflecting potential improvements hypothesized by the Upper Columbia River technical team.

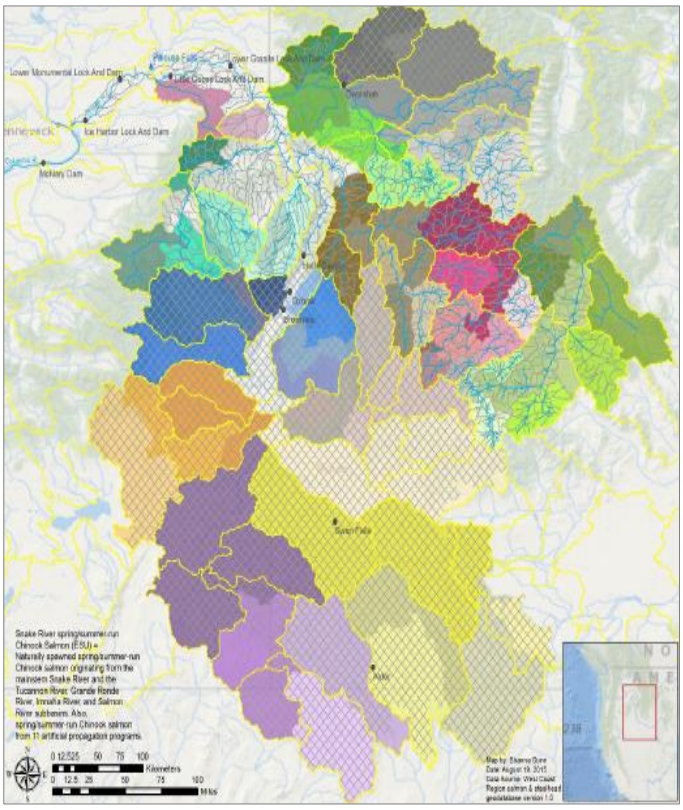
Provisional goals are identified for salmon and steelhead returning to the Columbia River upstream of Chief Joseph and Grand Coulee dams. The intent of these goals is to restore meaningful fishing opportunities in areas of historical use by the Colville and Spokane tribes. Goals represent only returns to areas upstream from Chief Joseph and Grand Coulee dams and do not apportion production into specific populations or geographic areas.

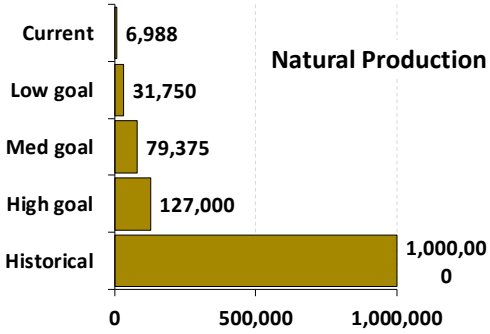
This page is intentionally left blank.

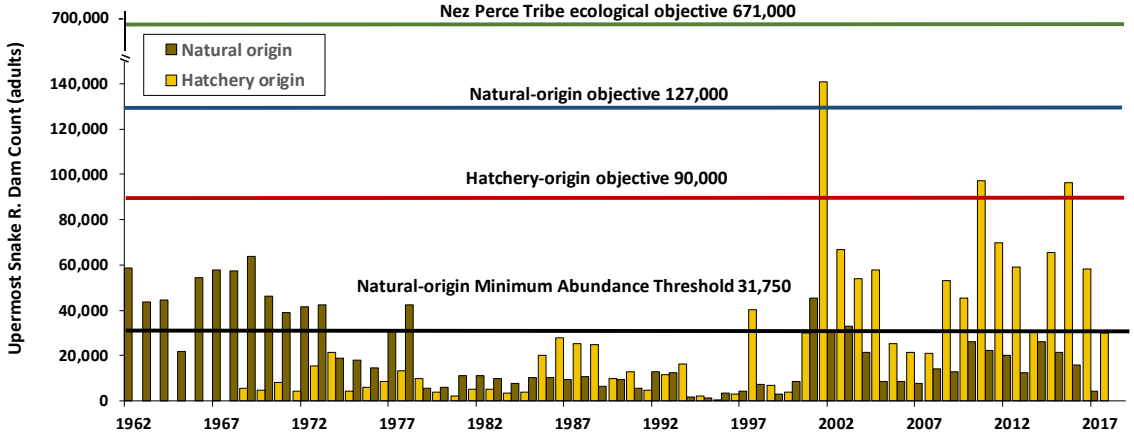
SNAKE



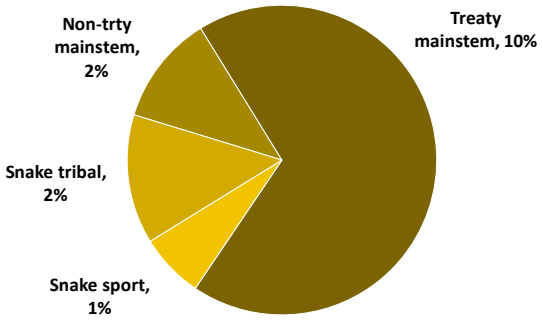
- Inhabits moderate to high elevation areas of major tributaries.
- Historically exceeded one million fish annually in the late 1800s according to the ESA recovery plan.
- Areas upstream from the Hells Canyon Dam complex are not currently accessible. This included 25 historical populations and five major population groups identified by the Interior Columbia Technical Recovery Team.
- Harvest occurs entirely in freshwater and is much reduced from historical levels.
- Hatchery production is significant.





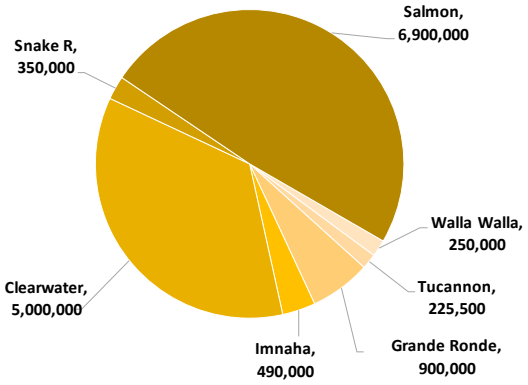


Fishery Distribution Natural-origin 2007-2016 avg.



Total 14.4%

Hatchery Production by release area (smolts)



Total 14.1 million

Natural Production		Abundance (mean)		NPT ecological	Potential Goal Range		
MPG	Population	Recent	1950s	goal	Low	Med	High
L. Snake	Tucannon	240	na	22,000	750	1,875	3,000
	Asotin*	10	0	10,000	500	1,250	2,000
Dry Clearwater	Potlatch*	na	0		500	1,250	2,000
	Lapwai/Big Canyon*	na	0	15,000	750	1,875	3,000
	Lawyer*	na	0	13,000	500	1,250	2,000
	Upper South Fork*	na	0	22,000	1,000	2,500	4,000
Wet Clearwater	N Fk Lower mainstem*	0	0		--	--	--
	N Fk Upper mainstem*	0	0		--	--	--
	Lolo*	na	0	15,000	500	1,250	2,000
	Lochsa*	na	0	24,000	1,000	2,500	4,000
	Meadow*	na	0	8,000	500	1,250	2,000
	Moose*	na	0	12,000	750	1,875	3,000
	Upper Selway*	na	0	18,000	1,000	2,500	4,000
Grande Ronde / Imnaha	Wenaha	420	820	13,000	750	1,875	3,000
	Minam	530	1,276	14,000	750	1,875	3,000
	Catherine	190	969	22,000	750	1,875	3,000
	Lookingglass*	na	na	3,000	500	1,250	2,000
	Lostine/Wallowa	635	926	36,000	1,000	2,500	4,000
	U Grande Ronde	70	111	31,000	1,000	2,500	4,000
	Imnaha	410	2,340	38,000	750	1,875	3,000
	Big Sheep*	na	na		500	1,250	2,000
South Fork Salmon	Little Salmon	na		14,000	500	1,250	2,000
	Secesh	na	828	15,000	750	1,875	3,000
	South Fork Salmon	510	3,270	24,000	1,000	2,500	4,000
	East Fork South Fork	na	537	19,000	1,000	2,500	4,000
Middle Fork Salmon	Chamberlain	840	780	11,000	500	1,250	2,000
	Big	200	620	19,000	1,000	2,500	4,000
	Lower Middle Fork	10	60	6,000	500	1,250	2,000
	Camas	40	240	8,000	500	1,250	2,000
	Loon	60	540	9,000	500	1,250	2,000
	Upper Middle Fork Salmon	80	560	17,000	750	1,875	3,000
	Sulphur	90	280	4,000	500	1,250	2,000
	Bear Valley	510	1,540	16,000	750	1,875	3,000
	Marsh	400	510	7,000	500	1,250	2,000
Upper Salmon	North Fork Salmon	100	290	6,000	500	1,250	2,000
	Lemhi	200	1,160	43,000	2,000	5,000	8,000
	Lower Mainstem Salmon	90	1,210	46,000	2,000	5,000	8,000
	Pahsimeroi	270		35,000	1,000	2,500	4,000
	East Fork Salmon	440	1,320	18,000	1,000	2,500	4,000
	Yankee Fork Salmon River	90	220	7,000	500	1,250	2,000
	Valley	150	450	9,000	500	1,250	2,000
	Upper Mainstem Salmon	390	1,350	22,000	1,000	2,500	4,000
	Panther*	13	0	na	750	1,875	3,000
Totals		**6,988**	**22,207**	**671,000**	**31,750**	**79,375**	**127,000**

** Functionally extirpated (some of which are being reintroduced).*

Fisheries / Harvest			Exploitation rates			Harvest	
	Location		Avg.	Limits	Potential	10 yr avg	Potential
Natural	Ocean	--	0%	--	--	--	--
	Mainstem Non-trty	v Col R.	1.7%	5.5-17%	20-60%	450	110,000
	Mainstem Trty	v Col R.	10.1%			2,900	
	Snake R Sport	v L Gr	3.5%	0-4%		600	
	Snake R Tribes	v L Gr					
	Total	v Col R.	***14.4%***	***5.5-19%***	***20-60%***	***3,950***	***110,000***
Hatchery	Ocean	--	0%	--	--	--	--
	Mainstem Non-trty	v Col R.	12.1%	--	≤70%	10,300	75,000
	Mainstem Treaty	v Col R.	10.1%	--		8,200	
	Snake R Sport	v L Gr	18.0%	--		10,900	
	Snake R Tribes	v L Gr	18.0%	--		10,900	
	Total	v Col R.	***47.1%***		***≤70%***	***40,300***	***75,000***

Hatchery Production				Current Production			Return	Anticipated
Location (Program)	Release	Type	Brood	Smolts	Subyearlings	Goal	production
McCall Hatchery	Johnson Cr	Summer	100	150,000		8,000	same
	S Fk Salmon	Summer	648	1,000,000			same
	Curtis/Cabin Cr.	Summer	175		300,000		same
Pahsimeroi Hatchery	Pahsimeroi	Summer	648	1,000,000		8,000	same
TBD	Panther Cr	Summer					TBD
Carson NFH	Walla Walla	Spring	165	250,000			same
Tucannon/Lyons Ferry	Tucannon	Spring	150	225,500		1,152	same
TBD	Asotin Cr	Spring					TBD
Lookingglass Hatchery	Catherine Cr	Spring	100	150,000		5,820	same
	U Grande Ronde	Spring	165	250,000			same
	Lostine	Spring	165	250,000			same
	lookingglass Cr	Spring	165	250,000			same
	Imnaha	Spring	320	490,000		3,210	same
Rapid River Hatchery	Rapid	Spring	1,621	2,500,000		24,000	same
	Little Salmon	Spring	100	150,000			same
	Hells Cyn Snake R	Spring	230	350,000			same
Sawtooth Hatchery	Salmon R	Spring	972	1,800,000		19,445	same
Crystal Spr/Sawtooth	Yankee Fk Salmon	Spring	200	300,000			same
Nez Perce Tribal Hat.	Meadow (Selway)	Spring	285		400,000	9,135	same
	Lolo Cr	Spring	106		150,000		same
	Newsome Cr	Spring	55		75,000		same
NPTH / Dworshak NFH	Clearwater R	Spring	130	200,000			same
Dworshak NFH	U Selway R	Spring	215		300,000		same
	NF Clearwater R	Spring	690	1,050,000			same
Kooskia Hatchery	Clear Cr	Spring	425	650,000			same
Clearwater Hatchery	Other locations	Spring	260	1,000,000		11,915	same
	Clear Cr	Spring	415	900,000			same
	Red River	Spring	715	1,200,000			same
TBD	Upper Snake	Spring	--	0			4,000,000
Subtotal			***12,000***	***14,115,500***	***1,225,000***	***90,677***	***18,115,500***

Total Return (avg)	Recent	@ goals		
	(2008-2017)	Low	Med	High
@ Columbia R Mouth	**112,900**	**141,500**	**264,000**	**422,000**
Natural	27,400	56,000	166,000	312,000
Hatchery	85,500	85,500	98,000	110,000
% hatchery	76%	60%	37%	26%
Lower Granite Dam	**78,100**	**96,500**	**173,250**	**256,000**
Natural	17,600	36,000	98,000	166,000
Hatchery	60,500	60,500	75,250	90,000
% hatchery	77%	63%	43%	35%
Escapement*	**50,100**	**66,550**	**109,375**	**151,000**
Natural	15,300	31,750	79,375	127,000
Hatchery	34,800	34,800	30,000	24,000
% hatchery	69%	52%	27%	16%
Harvest (Columbia basin)	**44,250**	**48,300**	**99,000**	**185,000**
Natural	3,950	8,000	42,000	110,000
Hatchery	40,300	40,300	57,000	75,000
% hatchery	91%	83%	58%	41%

** Escapement to spawning tributaries and hatchery return.*

Notes - Natural Production

Distribution: The ICTRT identified 5 MPGs, containing 28 extant populations, 3 functionally extirpated populations, and 1 extirpated population, in the Snake River spring/summer Chinook salmon ESU: (1) Upper Salmon River MPG (8 extant populations and 1 extirpated population); (2) Middle Fork Salmon River MPG (9 extant populations); (3) South Fork Salmon River MPG (4 extant populations); (4) Grande Ronde/Imnaha River MPG (6 extant populations and 2 functionally extirpated populations); (5) Lower Snake River MPG (1 extant population and 1 functionally extirpated population). The South Fork and Middle Fork Salmon Rivers currently support most of the natural spring/summer Chinook salmon production in the Snake River drainage. Historically, Snake River spring/summer Chinook salmon also spawned and reared in areas above the Hells Canyon dams on the Snake River and in the North Fork Clearwater River.

Historical abundance: Historical abundance during the 1950s is documented where available based on stream survey information. However, Information or inferences for historical abundance prior to to development is not available for most populations. Estimates of production potential identified by the Nez Perce Tribe as ecological goals were included instead for reference purposes.

Current abundance: Current spawning escapement is estimated for most extant populations based on annual ground surveys, which count fish redds in representative portions of the spawning grounds. Spawning ground surveys have been conducted in many areas since the 1950s.

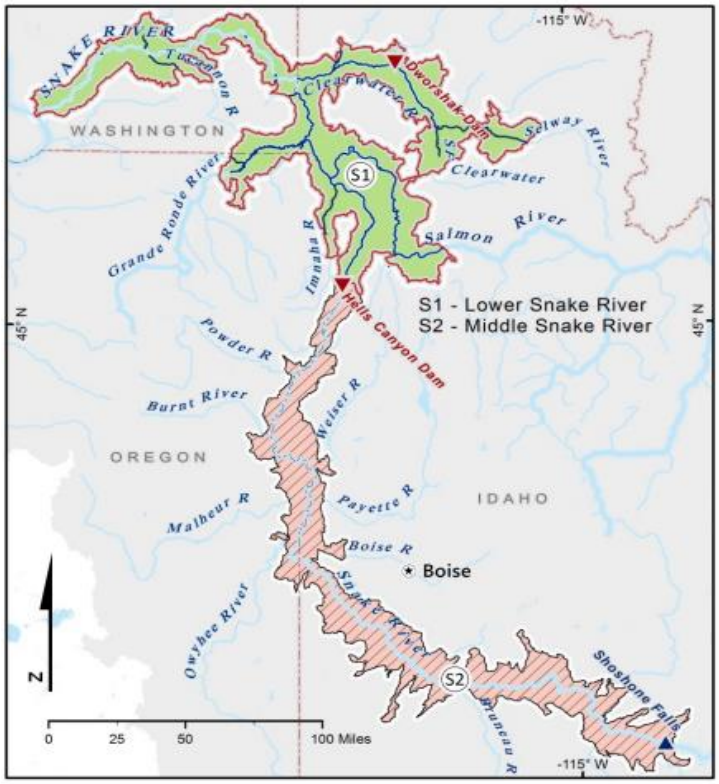
Goals:

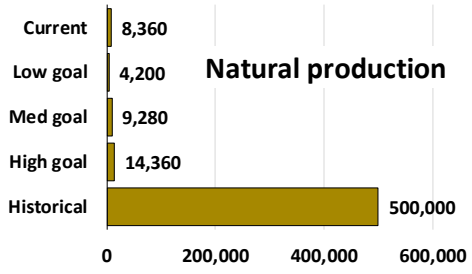
- *Low range:* Minimum Abundance Thresholds (MAT) identified by the Interior Columbia Technical Recovery Team
- *Medium range:* Mid-point between low and high range goals.
- *High range*: High range goals are four times the low range goal (i.e., four times MAT). This multiplier is based on estimates of historical spawning escapements during the 1950s, which were deemed by the CBP Snake River regional technical group to be a reasonable representation of the potential production capacity of existing habitats.

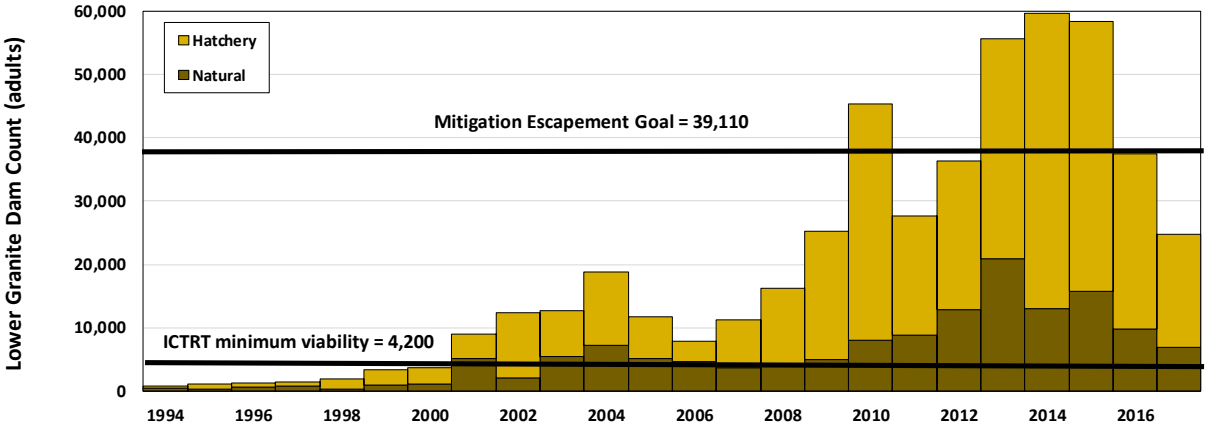
Goals are identified only for accessible systems. No goals are currently included for extirpated populations upstream of the Hells Canyon Dam complex. The Upper Snake River Tribes (USRT) have developed a plan seeking to restore anadromous fishing opportunities in currently inaccessible areas. Although other co-managers in the Upper Snake River, including the states of Oregon and Idaho and the Nez Perce and Umatilla Tribes, are aware of USRT goals, they have not formally come to agreement on these at this time. USRT anticipates further discussion about these goals in the near future with the state and tribal co-managers within Oregon and Idaho, as well as with the CBP Task Force during the next phase of its work.

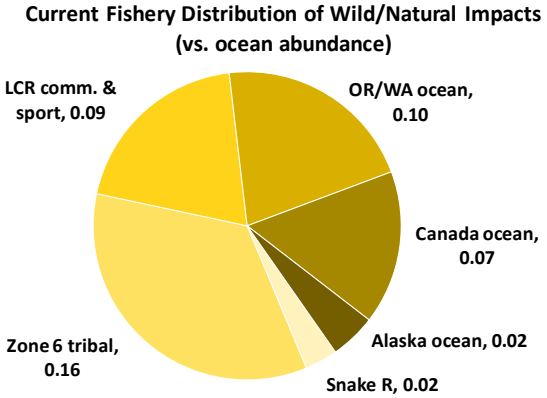
The Nez Perce Tribe has identified ecological goals which are higher than provisional high range goals currently identified by the Columbia Basin Partnership. The CBP recognizes that provisional goals do not diminish the long-term desire and intent of some Fish and Wildlife Manager's to achieve higher levels of abundance.

- Currently produced in the Snake River between Lewiston and Hells Canyon Dam and portions of major tributaries.
- Most historical habitat was located upstream from the Hells Canyon Dam complex and is not currently accessible.
- Classified in fishery management as upriver bright fall Chinook along with the healthy Hanford Reach stock.
- Harvest of this stock is significant in the ocean and in freshwater.
- Hatchery production has rebuilt a significant natural return and continues to produce a high proportion of the run.

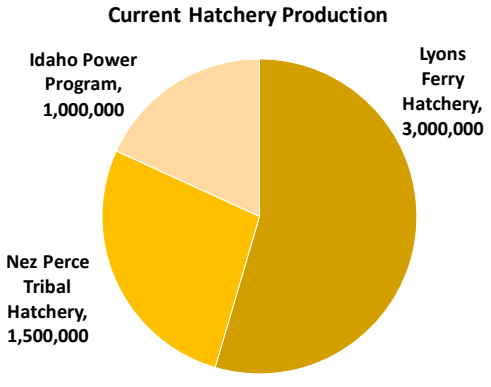








Total 46%



Total 5.5 million

Natural Production		Abundance (mean)		Potential Goal Range		
MPG	Population	Recent	Historical	Low	Med	High
Snake	Lower Snake R	8,360	500,000	4,200	9,280	14,360
	Middle Snake R	0		--	--	--
Totals		**8,360**	**500,000**	**4,200**	**9,280**	**14,360**

Artificial Production	Current Production		Return	Anticipated
Location (Program)	Brood	Smolts	goal	production
Lyons Ferry Hatchery		3,000,000		3,000,000
Nez Perce Tribal Hatchery		1,500,000		1,500,000
Idaho Power Program		1,000,000		1,000,000
Subtotal		5,500,000	39,110	5,500,000

Fisheries / Harvest		Exploitation rate				Harvest	
	Location	Avg (v ocn)	Avg (v CR)	Goal	Potential	10 yr avg	Potential
Natural & Hatchery	Ocean (AK/Can)	9.7%	--	--	30-80%	8,100	20,200
	Ocean (WA/OR)	9.8%	--	--		8,200	
	Col sport	9.1%	11.4%	21.5-45%		7,600	31,900
	Col commercial						
	Col treaty	16.0%	19.9%			13,300	
	Terminal	1.6%	2.0%	--		1,300	
	Blocked area	--	--	--	--	--	--
	Total	***46.2%***	**33.3%**	***21.5-45%***	***30-80%***	***38,500***	***52,100***

Total Return (averages)		Recent avg (2008-2017)	@ Goals		
			Low	Med	High
@ Columbia R Mouth		**67,100**	**58,200**	**70,100**	**83,400**
	Natural	17,900	9,000	20,900	34,200
	Hatchery	49,200	49,200	49,200	49,200
	% hatchery	73%	85%	70%	59%
@ Bonneville Dam		**60,000**	**52,000**	**62,500**	**73,700**
	Natural	16,000	8,000	18,500	29,700
	Hatchery	44,000	44,000	44,000	44,000
	% hatchery	73%	85%	70%	60%
@ Lower Granite Dam		**38,700**	**20,784**	**36,450**	**42,950**
	Natural	10,500	5,300	11,700	18,200
	Hatchery	28,200	15,484	24,750	24,750
	% hatchery	73%	74%	68%	58%
Spawning escapement		**31,800**	**27,508**	**32,573**	**37,526**
	Natural	9,600	4,800	10,700	16,500
	Hatchery	22,200	22,708	21,873	21,026
	% hatchery	70%	83%	67%	56%
Harvest (Col basin)		**22,200**	**19,000**	**24,800**	**31,900**
	Natural	6,000	2,900	7,500	13,400
	Hatchery	16,200	16,100	17,300	18,500
	% hatchery	73%	85%	70%	58%
Harvest (total)		**38,500**	**33,100**	**41,800**	**52,100**
	Natural	10,400	5,100	12,600	21,700
	Hatchery	28,100	28,000	29,200	30,400
	% hatchery	73%	85%	70%	58%

Notes - Natural Production

Distribution: NOAA Fisheries identified two historical populations: the Lower Mainstem Snake and the Middle Mainstem Snake. Only the Lower Mainstem population is extant, due to loss of access to historical spawning habitat above the Hells Canyon Dam complex. Historically, most Snake River fall Chinook salmon spawned in the Middle Mainstem Snake River from its confluence with the Columbia River upstream to Shoshone Falls, with some production likely also coming from nine major tributaries to the Middle Snake River (Salmon Falls Creek and the Owyhee, Bruneau, Boise, Payette, Weiser, Malheur, Burnt, and Powder Rivers). Today, Snake River fall Chinook salmon spawn primarily in the 100-mile reach of the Lower Snake River downstream of Hells Canyon Dam. Lower Granite Reservoir is effectively the downstream limit of spawning, although limited spawning occurs in the tailraces of Ice Harbor, Lower Monumental, Little Goose, and Lower Granite Dams. Substantial numbers of fall Chinook salmon also spawn in the lower mainstem Clearwater River, and some spawn in the lower reaches of the Tucannon, Grande Ronde, Salmon, and Imnaha Rivers.

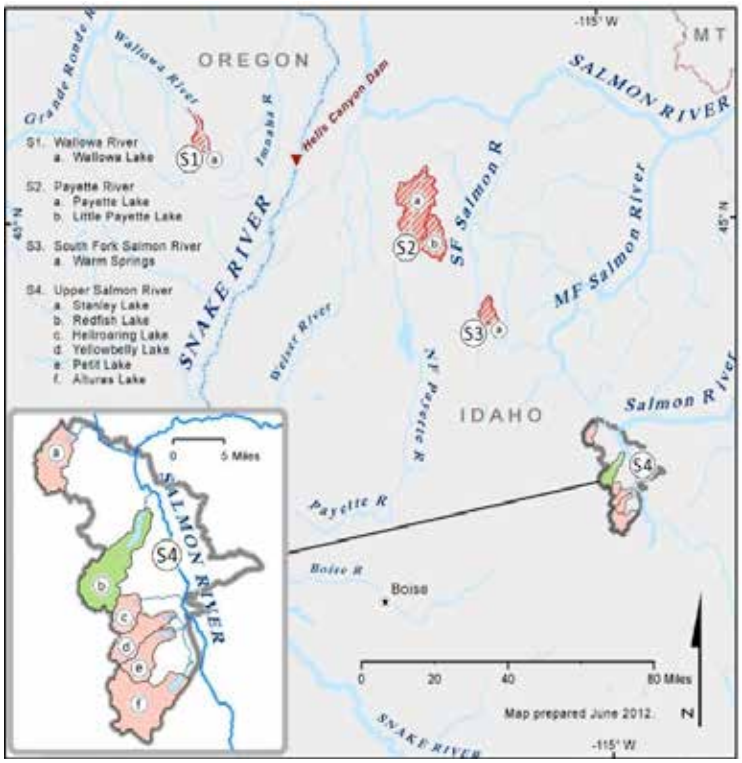
Historical abundance: Fall Chinook retrospective study by Connor et al. 2016.

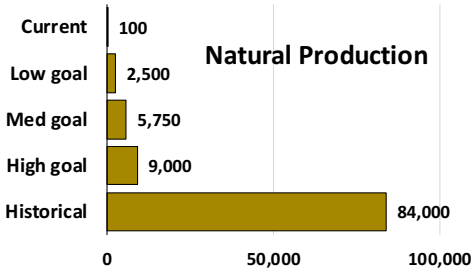
Current abundance: Run reconstruction by the Nez Perce Tribe, which incorporates counts and sampling at Lower Granite Dam and adjustments for fallback, hatchery broodstock removals, and harvest above Lower Granite Dam.

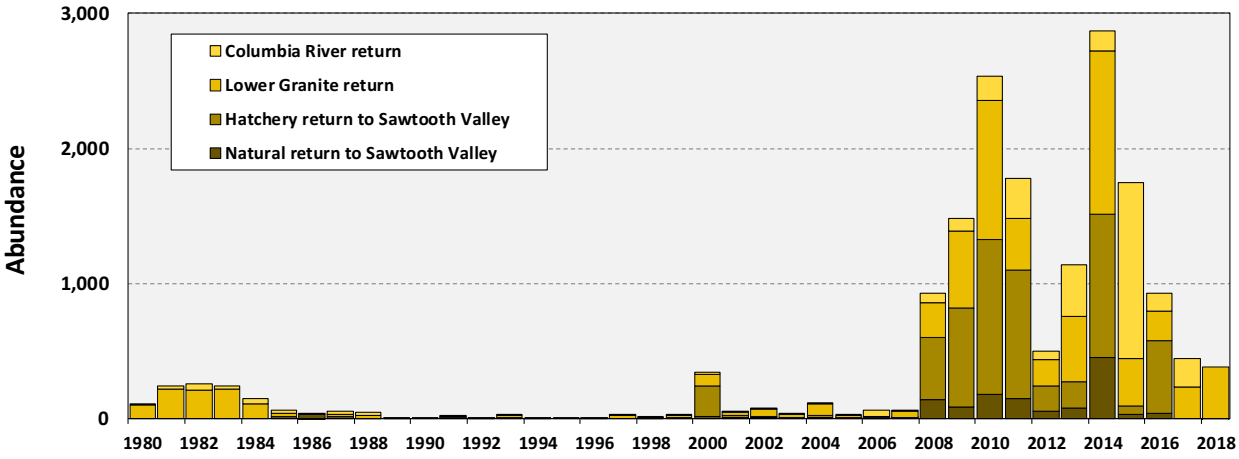
Goals:

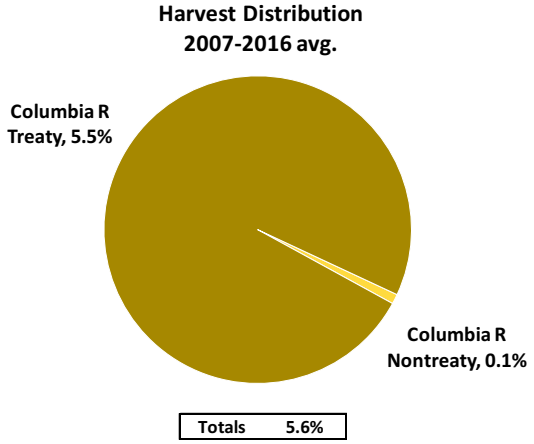
- *Low-range*: Based on recovery plan abundance goals under one of the single population recovery scenarios (achieve highly viable status for Lower Snake River population, measured in the aggregate).
- *Medium-range*: Reflect long-term objectives of the Nez Perce Tribe and the Washington Department of Fish and Wildlife as reported in ESA recovery plan.
- *High-range*: Reflect long-term objectives of the Nez Perce Tribe and the Washington Department of Fish and Wildlife as reported in ESA recovery plan.

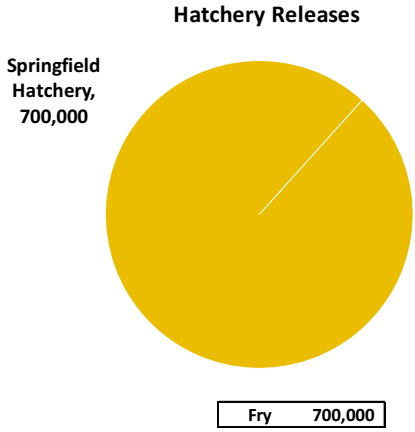
- At listing, only one populations remained (Redfish Lake in the Sawtooth Valley).
- Returns dwindled to zero to 10 fish/year.
- Extirpated from five other Stanley Basin Lakes, the Payette system upstream from Hells Canyon, and Wallowa Lake in the upper Grande Ronde.
- An intensive conservation aquaculture program with captive broodstock began in 1991.
- Hatchery fish are currently being released into Redfish, Petit, and Alturus Lakes.











Natural Production		Abundance (mean)		Potential Goal Range		
ESU/MPG	Population	Recent	Historical	Low	Med	High
Stanley Basin	Redfish Lake	100	25,000	1,000	5,750	9,000
	Alturas Lake	0		1,000		
	Hell Roaring Lake	0		--		
	Stanley Lake	0		--		
	Pettit Lake	0		500		
	Yellow Belly Lake	0		--		
(SF Salmon)	Warm Springs	0		--	--	--
(Payette)	Payette	0	35,000	--	--	--
(Wallowa)	Wallowa Lake	0	24,000	--	--	--
Totals		**100**	**84,000**	**2,500**	**5,750**	**9,000**

Hatchery Production	Current Production			Return	Anticipated
Location (Program)	Brood	Smolts	Fry	goal	production
Springfield Hatchery			700,000	10,000	1,000,000
Totals			**700,000**	**10,000**	**1,000,000**

Fisheries / Harvest		Exploitation rate			Harvest	
Location		Avg.	Limits	Potential	10-yr avg	Potential
Natural & Hatchery	Ocean	0	--	--	--	--
	Mainstem non treaty	0.1%	5-7%	10-40%	1	8,200
	Mainstem Treaty	5.5%			81	
	Terminal	0	--		--	
	Total	***5.6%***	***5-7%***	***10-40%***	**82**	***8,200***

Total Return		Recent avg (2008-2017)	@ Goals		
			Low	Med	High
@ Columbia R Mouth		**1,460**	**8,470**	**18,500**	**32,900**
	Natural	290	7,300	18,500	32,900
	Hatchery	1,170	1,170	0	0
	% hatchery	80%	14%	0%	0%
@ Bonneville Dam		**1,460**	**8,370**	**18,500**	**32,700**
	Natural	290	7,200	18,500	32,700
	Hatchery	1,170	1,170	0	0
	% hatchery	80%	14%	0%	0%
To Snake R (L Granite)		**1,130**	**6,120**	**12,100**	**18,900**
	Natural	210	5,200	12,100	18,900
	Hatchery	920	920	0	0
	% hatchery	80%	15%	0%	0%
Local Return		**752**	**4,114**	**7,900**	**12,400**
	Natural	138	3,500	7,900	12,400
	Hatchery	614	614	0	0
	% hatchery	80%	15%	0%	0%
Harvest (Col mainstem)		**82**	**470**	**2,800**	**8,200**
	Natural	12	400	2,800	8,200
	Hatchery	70	70	0	0
	% hatchery	80%	15%	0%	0%

Notes - Natural Production

Distribution: Historically, sockeye salmon ascended the Snake River to the Wallowa River basin in northeastern Oregon and the Payette and Salmon River basins in Idaho to spawn in natural lakes. Within the Snake River drainage, Wallowa Lake, the Payette Lake basin, and the Stanley Basin are separated by distances that are consistent with those between other Sockeye Salmon ESUs (NMFS 2015). The ICTRT concluded that it is unclear, and currently unresolvable, whether these lake groups were MPGs of the same ESU or separate ESUs (ICTRT 2007). Given this uncertainty, the ICTRT treats the Snake River Sawtooth Valley Sockeye Salmon as a single ESU with a single MPG (ICTRT 2010). Within the Salmon River basin, sockeye salmon spawned in Warm Lake in the South Fork Salmon River basin, as well as in the Sawtooth Valley lakes: Stanley, Redfish, Yellowbelly, Pettit and Alturas Lakes. A smaller Sawtooth Valley lake, Hell Roaring Lake, may have also supported some Sockeye Salmon production. The historical relationships between the different fish populations are not known. All populations except Redfish Lake are extirpated; sockeye are being reintroduced into Petit and Alturas lakes. The Technical Recovery Team did not formally designate mpgs for populations in the South Fork Salmon or Payette systems but treatment of Upper Columbia River populations, the project team labeled these exitirpated sockeye as separate mpgs - parentheses are used to designate these mpgs as assumed for the purposes of this exercise.

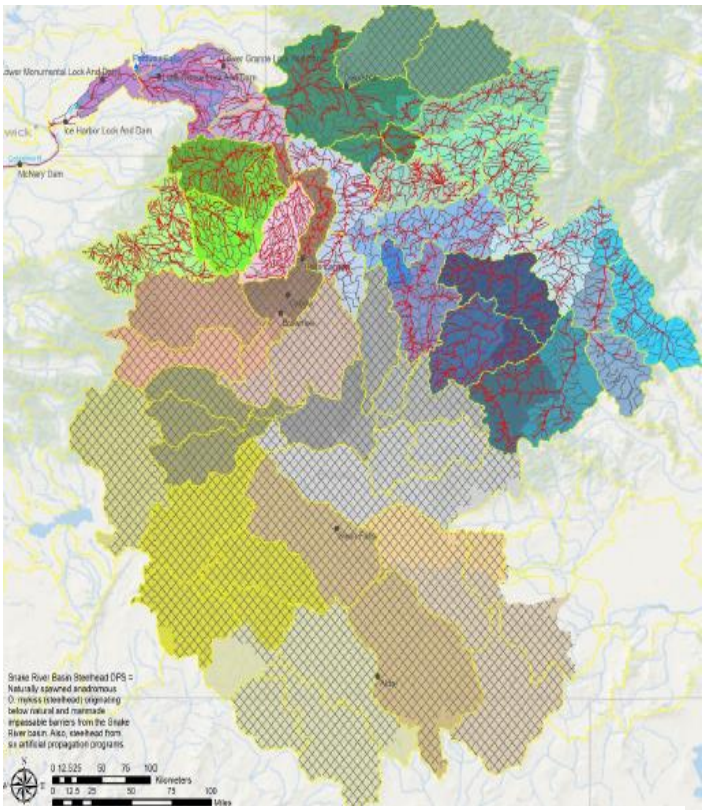
Historical abundance: From IDFG website. Little information on historical abundance exists.

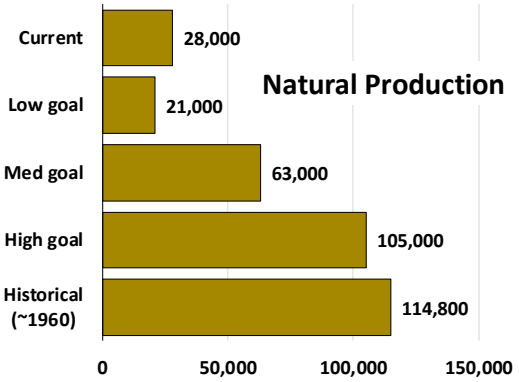
Current abundance: Fish traps and spawning surveys in the Stanley Basin.

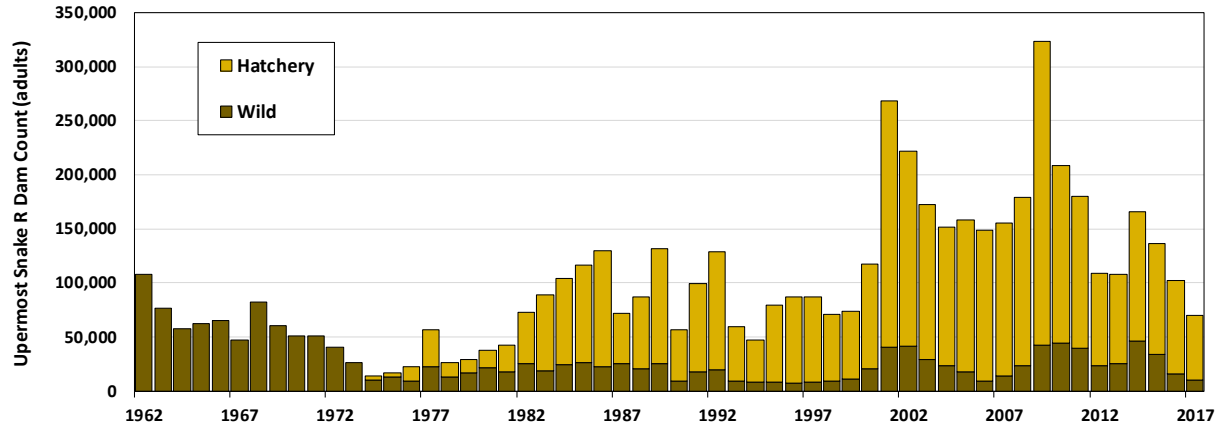
Goals:

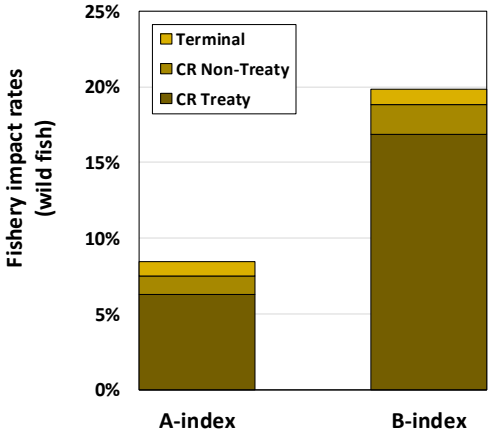
- *Low range*: ESA recovery plan (for Redfish, Alturas, and Petit Lake populations)
- *Medium range*: Mid-point between low and high goals
- *High range*: IDFG

- Inhabit moderate to high elevation areas of major tributaries.
- Areas upstream from the Hells Canyon Dam complex are not currenty accessible. This included 15 historical populations and four major population groups identified by the Interior Columbia Technical Recovery Team.
- Harvest occurs entirely in freshwater and is much reduced from historical levels.
- Hatchery production is significant.

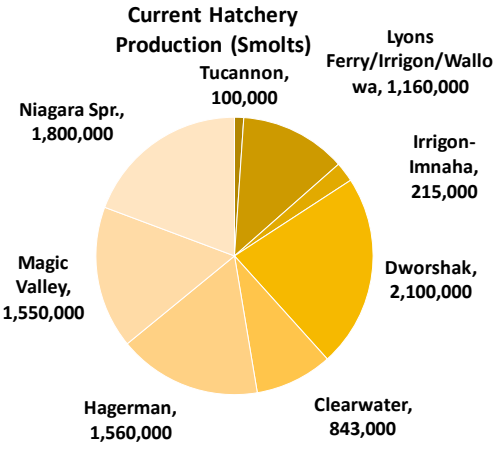








Totals	10.2%	19.1%



Smolts	9.3	million

Natural Production		Abundance (mean)		NPT ecological	Potential Goal Range		
MPG	Population	Recent	~1960	goal	Low	Med	High
Lower Snake	Asotin Creek	610	1,700	15,000	500	1,500	2,500
	Tucannon River	640	3,400	15,000	1,000	3,000	5,000
Clearwater	Lower Mainstem	na	43,200	45,000	1,500	4,500	7,500
	Lochsa River	340		37,000	1,000	3,000	5,000
	Selway River			55,000	1,000	3,000	5,000
	Lolo Creek	na		7,000	500	1,500	2,500
	North Fork	na			--	--	--
	South Fork	2,040		25,000	1,000	3,000	5,000
Grande Ronde	Lower Mainstem	610	15,900	38,000	1,000	3,000	5,000
	Upper Mainstem	2,630		81,000	1,500	4,500	7,500
	Joseph Creek	2,330		24,000	500	1,500	2,500
	Wallowa River	1,190		41,000	1,000	3,000	5,000
Imnaha	Imnaha River	na	4,000	21,000	1,000	3,000	5,000
Salmon	Chamberlain Creek	na	35,200	13,000	500	1,500	2,500
	East Fork Salmon River	na		19,000	1,000	3,000	5,000
	Lemhi River	na		22,000	1,000	3,000	5,000
	Little Salmon River	na		16,000	500	1,500	2,500
	Middle Fk Lower Mainstem	2,470		31,000	1,000	3,000	5,000
	Middle Fk Upper Mainstem			28,000	1,000	3,000	5,000
	North Fork	na		6,000	500	1,500	2,500
	Pahsimeroi River	na		18,000	1,000	3,000	5,000
	Panther Creek	na		13,000	500	1,500	2,500
	Upper Mainstem	na		24,000	1,000	3,000	5,000
	Secesh River	1,220		6,000	500	1,500	2,500
	South Fork			2,000	1,000	3,000	5,000
Other	Misc L Snake tribs	--	11,400	--	--	--	--
Totals		**28,000**	**114,800**	**602,000**	**21,000**	**63,000**	**105,000**

Artificial Production		Current Production			Return	Anticipated
Location (Program)	Type	Brood	Smolts	Subyearlings	Goal	production
Tucannon	A	60	100,000		4,656	100,000
Lyons Ferry/Irrigon/Wallowa	A	472	1,160,000			1,160,000
Irrigon-Imnaha	A	132	215,000		11,184	215,000
Dworshak	B	872	2,100,000		60,264	2,100,000
Clearwater	B	452	843,000			843,000
Hagerman	A	878	1,560,000			1,560,000
Magic Valley	A	812	1,550,000			1,550,000
Niagara Spr.	B	1,152	1,800,000			1,800,000
Sawtooth/Pahsimeroi	A/B	455		1,000,000		1,000,000
Subtotal		***5,285***	***9,328,000***	***1,000,000***	***88,100***	***10,328,000***

Note: Return goal of 60,264 = sum of LSRCP, ACOE and IPC goals

Fisheries / Harvest		Exploitation rate (v Col R run)				Harvest	
	Location	A-run avg	B run avg	Limits	Potential	10 yr avg	Potential
Natural	Ocean	--	--	--	--	--	--
	Mainstem Non-treaty	1.9%	2.2%	15-22%	20-50%	700	43,900
	Mainstem Treaty	6.3%	14.9%			2,900	
	Snake R (below L. Granite Dam)						
	Snake R (abv L. Granite Dam)	2.0%	2.0%	<2%		600	
	Total	***10.2%***	***19.1%***	***17-22%***	***20-50%***	***4,200***	***43,900***
Hatchery	Ocean	--	--	--	--	--	--
	Mainstem Non-treaty	14.3%	15.5%	≤70%	≤70%	28,600	141,900
	Mainstem Treaty	6.7%	15.2%			15,500	
	Snake R (below L. Granite Dam	4.1%				8,400	
	Snake R (abv L. Granite Dam)	38.0%				77,200	
	Total	***63%***	***73%***	***≤70%***	***≤70%***	***129,700***	***141,900***

Total Return	Recent 10-yr avg (2007-2016)			@ Goals		
	A-run	B-run	Total	Low	Med	High
@ Columbia R Mouth	**196,100**	**45,200**	**241,300**	**241,300**	**323,500**	**415,600**
Natural	31,800	6,100	37,900	37,900	120,100	212,200
Hatchery	164,300	39,100	203,400	203,400	203,400	203,400
% hatchery	84%	87%	84%	84%	63%	49%
@ Bonneville Dam	**185,900**	**44,400**	**230,300**	**230,300**	**309,500**	**399,100**
Natural	31,400	6,000	37,400	37,400	118,200	207,800
Hatchery	154,500	38,400	192,900	192,900	191,300	191,300
% hatchery	83%	86%	84%	84%	62%	48%
@Lower Granite Dam	**138,600**	**28,100**	**166,700**	**166,700**	**223,300**	**286,900**
Natural	26,300	4,500	30,800	30,800	93,200	156,800
Hatchery	112,300	23,600	135,900	135,900	130,100	130,100
% hatchery	81%	84%	82%	82%	58%	45%
Spawning Escapement						
Natural				21,000	63,000	105,000
Hatchery						
% hatchery						
Harvest (total)			**133,900**	**134,000**	**161,100**	**185,800**
Wild/Natural			4,200	4,300	19,200	43,900
Hatchery			129,700	129,700	141,900	141,900
% hatchery			97%	97%	88%	76%

Notes - Natural Production

Distribution: The ICTRT identified nine historical MPGs in the Snake River Basin steelhead DPS. Five of the MPGs are extant and support 24 extant populations: Lower Snake River MPG (two populations); the Grande Ronde MPG (four populations); the Imnaha River MPG (one population); the Clearwater River MPG (five extant populations and one extirpated); and the Salmon River MPG (11 extant populations and one extirpated population). Historically, Snake River steelhead also spawned and reared in areas above the Hells Canyon Complex on the Snake River and in the North Fork Clearwater River. Steelhead are currently blocked from historical habitat in this area, but the ICTRT identified four historical MPGs in this area.

Historical abundance: Near-term historical abundance for the total return downstream from Hells Canyon is based on estimated production in the early 1960s, as identified in the Lower Snake River Compensation Plan. However, information or inferences for historical abundance prior to to development is not available for most populations. Estimates of production potential identified by the Nez Perce Tribe as ecological goals were included instead for reference purposes.

Current abundance: Identified only for aggregate returns to Lower Granite Dam. Few population-specific estimates available (due to difficulty of spawning surveys –e.g., extended spawn timing, inaccessible spawning areas in winter). Redd count indices are available for some steelhead populations but have not been translated into fish numbers. Parr density is also available but has not been related to corresponding adult abundance. EDT model-based estimates of current production potential are documented for populations where available.

Goals:

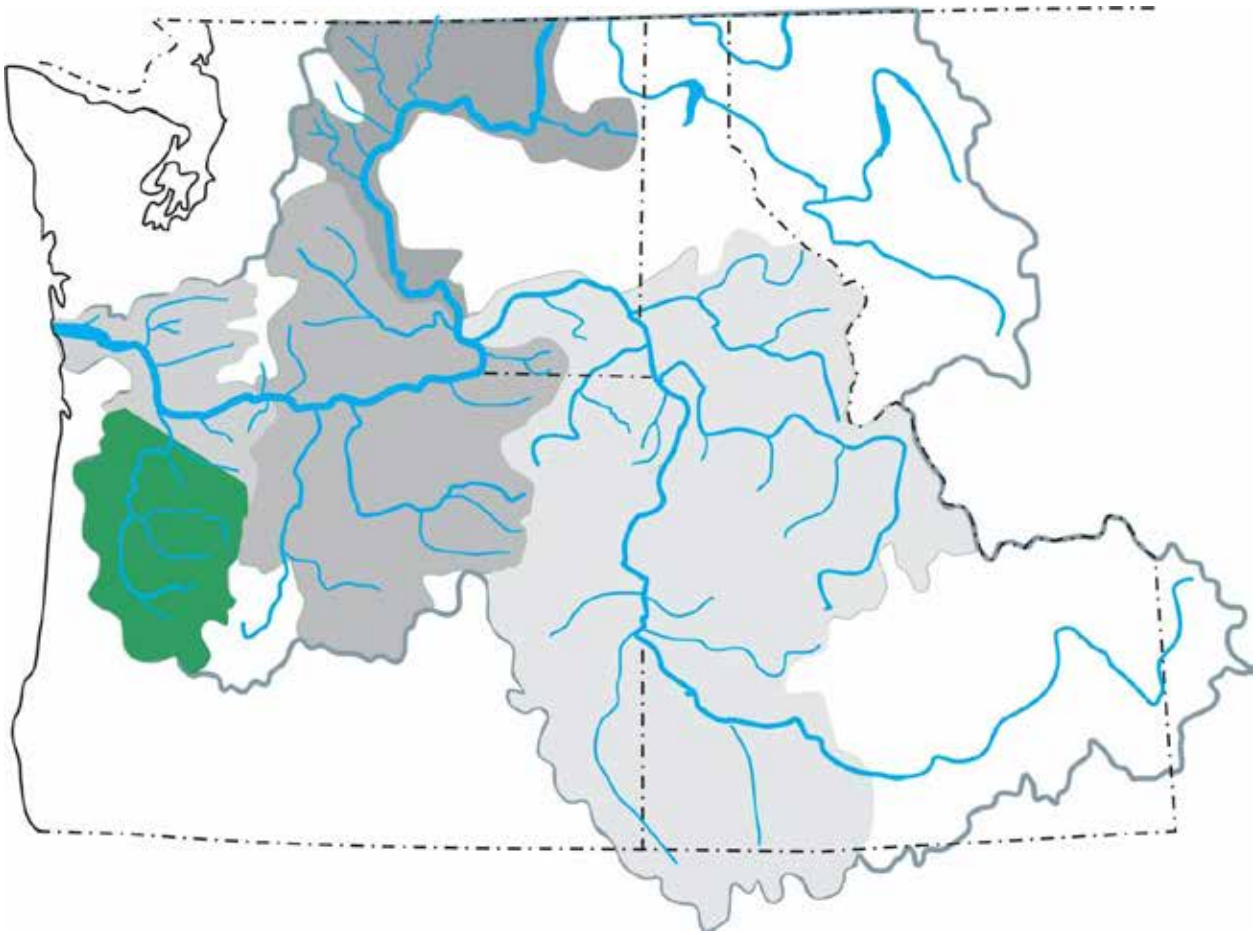
- *Low range*: Minimum Abundance Thresholds (MAT) identified by the Interior Columbia Technical Recovery Team.
- *Medium range*: Midpoint between low and high goals
- *High range*: High range goals are 5x the low range goal. This multiplier is based on estimates of historical dam counts during the 1950s, which were deemed by the CBP Snake River regional technical group to be a reasonable representation of the potential production capacity of existing habitats.

Goals are identified only for accessible systems. No goals are currently included for extirpated populations upstream of the Hells Canyon Dam complex. The Upper Snake River Tribes (USRT) have developed a plan seeking to restore anadromous fishing opportunities in currently inaccessible areas. Although other co-managers in the Upper Snake River, including the states of Oregon and Idaho and the Nez Perce and Umatilla Tribes, are aware of USRT goals, they have not formally come to agreement on these at this time. USRT anticipates further discussion about these goals in the near future with the state and tribal co-managers within Oregon and Idaho, as well as with the CBP Task Force during the next phase of its work.

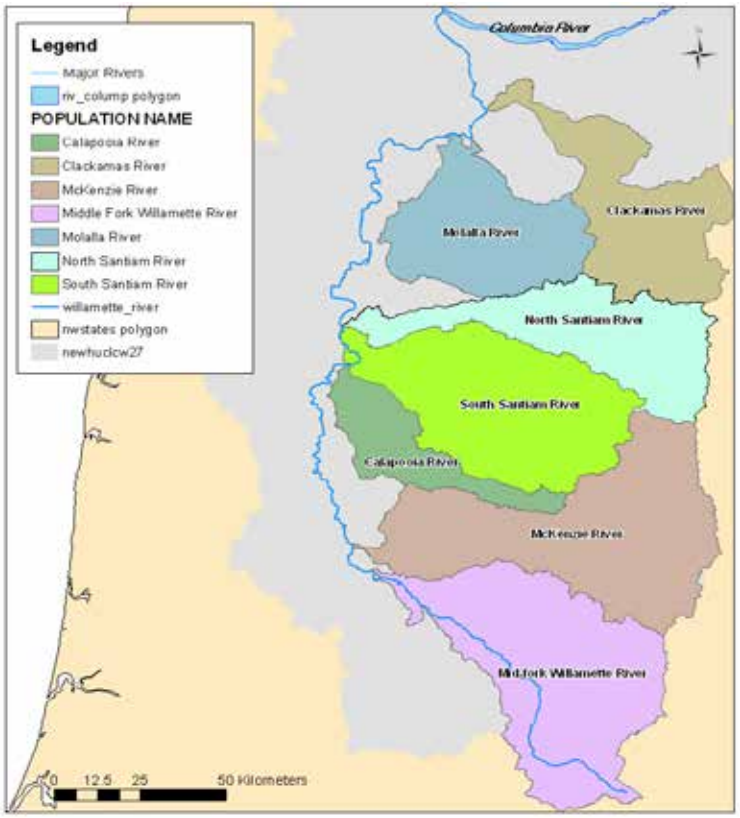
The Nez Perce Tribe has identified ecological goals which are higher than provisional high range goals currently identified by the Columbia Basin Partnership. The CBP recognizes that provisional goals do not diminish the long-term desire and intent of some Fish and Wildlife Manager's to achieve higher levels of abundance.

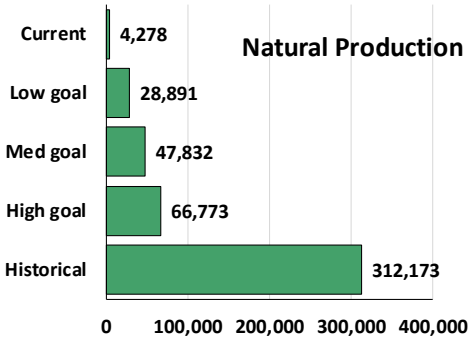
This page is intentionally left blank.

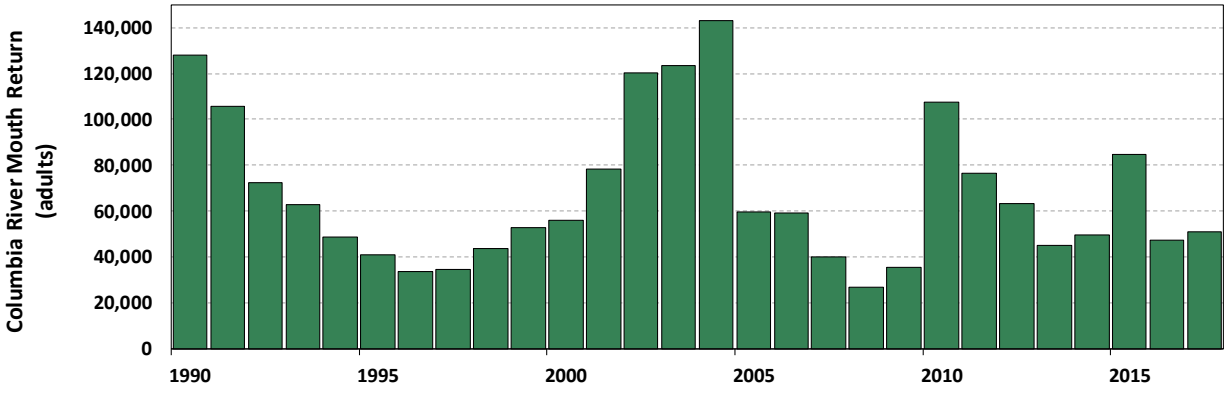
WILLAMETTE



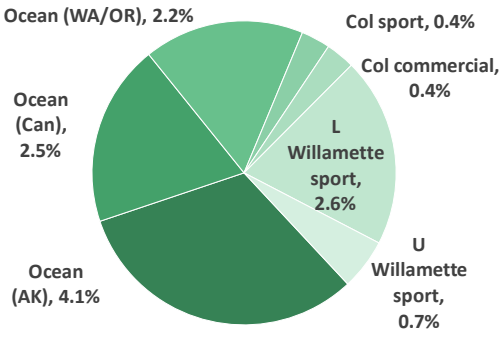
- Return to mid to high elevations streams on the western slope of the Cascades.
- Five of the seven historical populations are currently at low levels of viability.
- Dams which block passage to historical production areas in the Santiam and Middle Fork Willamette rivers.
- Significant hatchery production occurs as mitigation for reduced natural production.





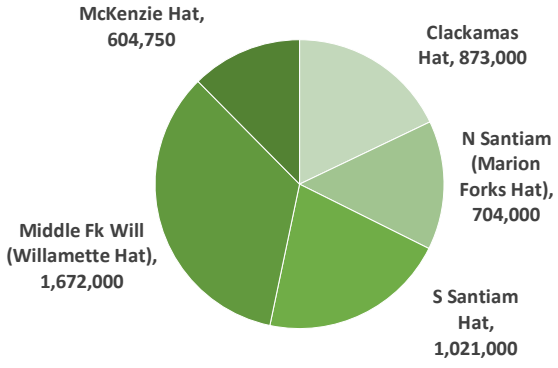


Harvest Distribution (Wild/Natl Exploitation Rate)



Totals 13%

Current Hatchery Production (smolts)



Total smolts 5.2 million

Natural Production		Abundance		Potential Goal Range		
MPG	Population	Recent	Historical	Low	Med	High
Coast Fall	Clackamas River	1,695	27,673	2,314	3,966	5,618
	Molalla River	NA	13,750	699	1,663	2,627
	North Santiam River	361	56,100	5,428	10,864	16,300
	South Santiam River	536	37,400	3,116	6,208	9,300
	Calapooia River	0	9,500	598	1,207	1,815
	McKenzie River	1,549	110,000	10,916	12,265	13,613
	Middle Fk Willamette	136	57,750	5,820	11,660	17,500
Totals		**4,278**	**312,173**	**28,891**	**47,832**	**66,773**

Artificial Production	Current Production		Return	Anticipated
Location (Program)	Brood	Smolts	Goal	production
Clackamas Hat		873,000		1,005,000
N Santiam (Marion Forks Hat)		704,000		704,000
S Santiam Hat		1,021,000		1,021,000
Middle Fk Will (Willamette Hat)		1,672,000		1,672,000
McKenzie Hat		604,750		787,000
Coast Fork Will		267,000		528,000
Molalla		99,700		100,000
Totals		**5,241,000**		**5,817,000**

Fisheries / Harvest		Exploitation rate				Harvest	
	Location	Avg (v ocn)	Avg (v CR)	Limits	Potential	Recent	Potential
Natural	Ocean (AK)	4.1%	--	12%	20-60%	470	21,000
	Ocean (Can)	2.5%	--			260	
	Ocean (WA/OR)	2.2%	--			280	
	Col sport	0.4%	0.4%	15%		40	75,000
	Col commercial	0.4%	0.4%			40	
	L Willamette sport	2.6%	2.6%			240	
	U Willamette sport	0.7%	0.7%			70	
	Total	**12.9%**	***4.1%***			**1,400**	**96,000**
Hatchery	Ocean (AK)	4.1%	--	≤70%	≤70%	2,400	5,300
	Ocean (Can)	2.5%	--			1,300	
	Ocean (WA/OR)	2.2%	--			1,500	
	Col sport	4.0%	4.3%			2,200	96,000
	Col commercial	2.8%	3.0%			1,600	
	L Willamette sport	19.2%	20.6%			10,500	
	U Willamette sport	6.5%	7.5%			3,800	
	Total	**41.3%**	***35.4%***	***≤70%***	***≤70%***	**23,300**	**101,300**

Total Return	Recent avg (2008-2017)	@ Goals		
		Low	Med	High
@ Columbia R Mouth	**58,000**	**113,000**	**179,000**	**273,000**
Natural	10,000	65,000	128,000	220,000
Hatchery	48,000	48,000	51,000	53,000
% hatchery	83%	42%	28%	19%
Escapement	**30,000**	**45,000**	**61,000**	**76,000**
Natural	4,000	30,000	49,000	68,000
Hatchery	26,000	15,000	12,000	8,000
% hatchery	87%	33%	20%	11%
Local return (Willamette Falls)	**34,000**	**76,433**	**103,609**	**129,087**
Natural	7,000	50,955	83,227	115,499
Hatchery	27,000	25,478	20,382	13,588
% hatchery	79%	0	0	0
Harvest (Col basin)	**18,800**	**20,000**	**51,000**	**110,700**
Natural	400	3,000	25,000	75,000
Hatchery	18,400	17,000	26,000	35,700
% hatchery	98%	85%	51%	32%
Harvest (Total)	**25,000**	**31,000**	**68,000**	**137,000**
Natural	1,000	9,000	37,000	96,000
Hatchery	24,000	22,000	31,000	41,000
% hatchery	96%	71%	46%	30%

Notes - Natural Production

Distribution: The WLCTRT identified seven demographically independent populations of spring Chinook in the UWR Chinook ESU: Clackamas, Molalla, North Santiam, South Santiam, Calapooia, McKenzie, and the Middle Fork Willamette.

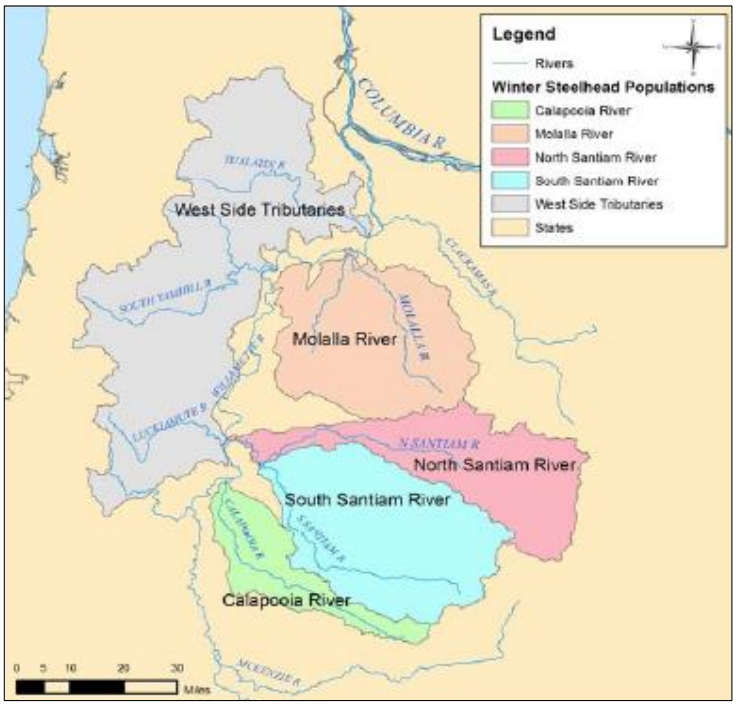
Historical abundance: Based on habitat-population viability analysis reported by ODFW in the ODFW/ESA recovery plan.

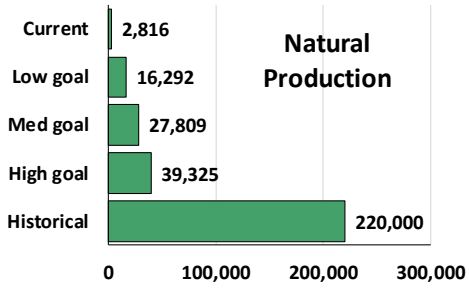
Current abundance: Based on dam counts or spawning ground surveys.

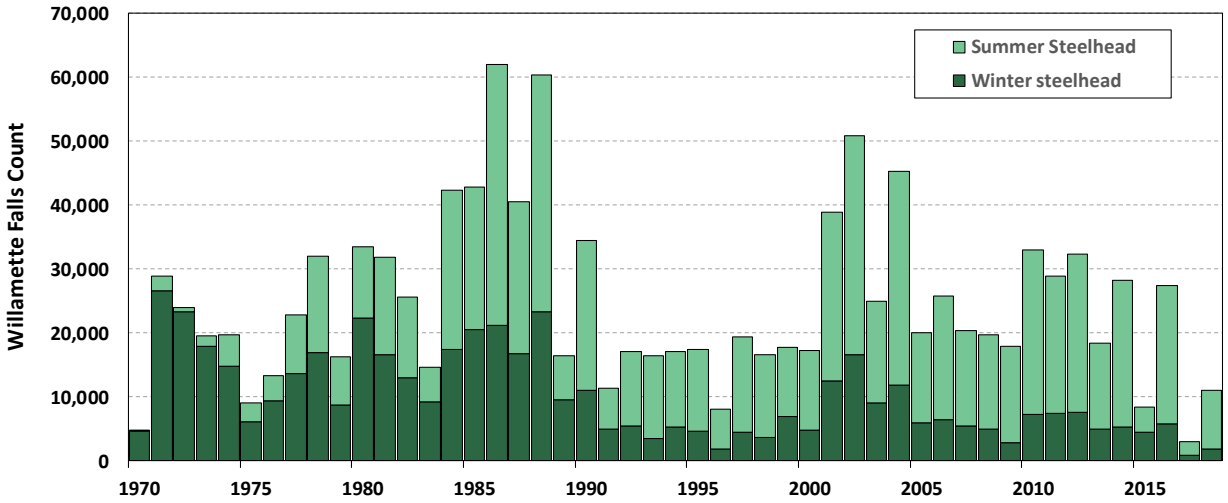
Goals:

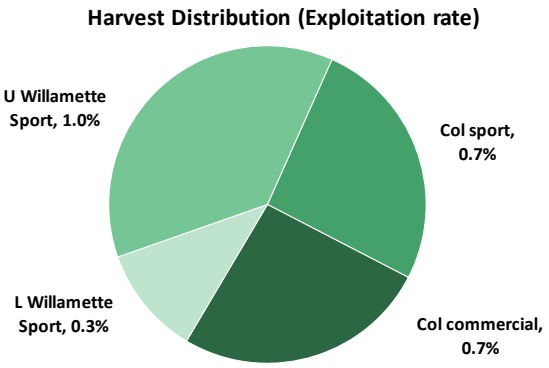
- *Low range*: Identified in ODFW/ESA recovery plan, based on population modeling developed by ODFW and the ICTRT.
- *Medium range*: Midpoint between low and high goals.
- *High range*: For some populations, based on broad-sense goals identified in recovery plan (based on ODFW's population viability modeling). For populations for which modeling is not available (N. Santiam, S. Santiam, and MF Willamette), ODFW did not identify broad sense goals, so CBP Task Force goal is based on three times the recovery plan goal.

- Historically returned to four west slope Cascade tributaries upstream from Willamette Falls.
- Significant portions of the historical range are currently blocked by dams.
- Historical hatchery winter steelhead programs in the upper Willamette have been discontinued.
- Hatchery summer steelhead are released into the upper Willamette for mitigation purposes.

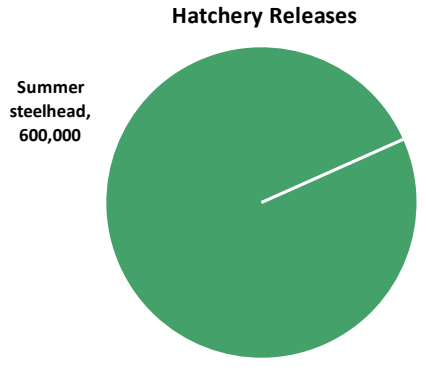








Totals 2.7%



Total Winter run 0

Natural Production (Winter run)		Abundance		Potential Goal Range		
MPG	Population	Recent	Historical	Low	Med	High
Upper Willamette	Molalla	1,231	77,000	3,226	11,348	19,470
	North Santiam	690	75,200	8,632	9,323	10,013
	South Santiam	718	50,200	3,912	4,642	5,371
	Calapooia	177	17,600	522	2,497	4,471
Totals		**2,816**	**220,000**	**16,292**	**27,809**	**39,325**

Artificial Production	Current Production			Return	Anticipated
Location (Program)	Brood	Smolts	Fry	Goal	production
Winter steelhead	0	0	0	0	0
Summer steelhead		600,000	0		550,000
Totals	**0**	**600,000**	**0**	**0**	**550,000**

Fisheries / Harvest		Exploitation rates				Harvest	
	Location	Avg (v ocn)	Avg. (v CR)	Limits	Potential	Recent	Potential
Winter run Natural	Ocean	0.00%	--	--	--	--	--
	Col sport	0.70%	0.70%	<2.0%	10-40%	50	28,000
	Col commercial	0.70%	0.70%			50	
	L Willamette Sport	0.30%	0.30%			20	
	U Willamette Sport	1.00%	1.00%	10-20%		70	
	Total	***2.7%***	***2.7%***		***10-40%***	**190**	**28,000**

Total Return (Winter run)		Recent (avg)	@ Goals		
		(2008-2017)	Low	Med	High
@ Columbia R Mouth		**6,300**	**36,000**	**70,000**	**114,000**
	Natural	6,300	36,000	70,000	114,000
	Hatchery	0	0	0	0
	% hatchery	0%	0%	0%	0%
Local return (Willamette Falls)		**5,500**	**32,000**	**54,000**	**76,000**
	Natural	5,500	32,000	54,000	76,000
	Hatchery	0	0	0	0
	% hatchery	0%	0%	0%	0%
Harvest (Col basin)		**200**	**1,000**	**10,000**	**28,000**
	Natural	200	1,000	10,000	28,000
	Hatchery	0	0	0	0
	% hatchery	0%	0%	0%	0%
Harvest (Total)		**200**	**1,000**	**10,000**	**28,000**
	Natural	200	1,000	10,000	28,000
	Hatchery	0	0	0	0
	% hatchery	0%	0%	0%	0%

Notes - Natural Production

Historically returned to four west slope Cascade tributaries upstream from Willamette Falls. Significant portions of the historical range are currently blocked by dams. Steelhead are broadly distributed in the north Pacific Ocean where they are not subject to marine harvest. Historical hatchery winter steelhead programs in the upper Willamette have been discontinued. Hatchery summer steelhead are released into the upper Willamette for mitigation purposes.

Distribution: The WLCTRT identified four historical populations: the Molalla, North Santiam, South Santiam, and Calapooia. Winter steelhead have also been reported spawning in the westside tributaries to the Willamette River above Willamette falls. While ODFW recognizes these tributaries as part of the Willamette Winter Steelhead stock, the WLCTRT did not consider these tributaries to have constituted independent populations historically, but rather identified them as a population sink within the DPS. Numbers identified for the CBP Task Force address only the populations identified by the WLC TRT and incorporate into the ESA recovery plan.

Summer run steelhead also return to the upper Willamette but originate from hatchery production. Summer run steelhead were historically unable to pass Willamette Falls so historically did not occur in the Upper Willamette.

Historical abundance: Based on habitat-population viability analysis reported by ODFW in the ODFW/ESA recovery plan.

Current abundance: Willamette Falls counts, radio telemetry, tributary dam counts, and spawning surveys.

Goals:

- Low *range*: Identified in ODFW/NMFS ESA recovery plan, based on population modeling developed by ODFW and the ICTRT.
- *Medium range*: Midpoint between low and high goals.
- *High range*: Based on broad-sense goals identified in recovery plan (based on ODFW's population viability modeling).

Appendix B. Glossary

Abundance In the context of the Task Force, abundance refers to the number of natural- or hatchery-origin adult salmon and steelhead (excluding jacks) measured at various points (e.g., spawning grounds, returning to hatcheries, returning to a local area, available for harvest, returning to the Columbia River mouth). In the context of ESA delisting, abundance refers to the number of natural-origin adult fish (excluding jacks) reaching spawning grounds.

Broad sense recovery goals Recovery goals, generally defined by state and tribal entities or stakeholders that go beyond the requirements for ESA delisting to achieve even lower extinction risk and/or to address other legislative mandates or social, cultural, economic, and ecological values.

Carrying capacity An upper limit to population growth as density increases which determines a maximum equilibrium population size. Population size is expected to fluctuate around the maximum equilibrium population size because of variability that is unrelated to density. Moreover, the carrying capacity parameter itself may change over time, tracking changes in habitat conditions. [ISAB 2015]

Conversion rate For Columbia River salmon and steelhead, the conversion rate is defined as fishery-independent survival between points in freshwater migration. It is typically estimated between dams based on counts or tag recovery rates.

Conservation Used generally, the act or instance of conserving or keeping fish resources from change, loss, or injury, and leading to their protection and preservation. The Endangered Species Act (ESA) defines conservation as the use of all methods and procedures necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to the ESA are no longer necessary.

Delisting criteria Criteria incorporated into ESA recovery plans that define both biological criteria and threats criteria based on the five listing factors in ESA section 4[a][1]), and related to alleviating the causes for decline that, when met, would result in a determination that a species is no longer threatened or endangered and can be proposed for removal from the Federal list of threatened and endangered species.

Density dependence Density dependence occurs when a population's density affects its growth rate by changing one or more vital rates — birth, death, immigration, or emigration.

Distinct population segment (DPS) The ESA allows listing decisions at the level of a species, subspecies, or distinct population segment (DPS). For steelhead, NOAA Fisheries applies a joint policy with the U.S. Fish and Wildlife Service policy that defines a DPS as a population or group of populations that is discrete from and significant to the remainder of its species based on factors such as physical, behavioral, or genetic characteristics, because it occupies an unusual or unique ecological setting, or because its loss would represent a significant gap in the species' range. Also see *evolutionarily significant unit* (ESU).

Diversity The genetic and phenotypic (life history, behavioral, and morphological) variation within a population. Variation could include anadromous or resident life histories, fecundity, run timing, spawn timing, juvenile behavior, age at smoltification, age at maturity, egg size, developmental rate, ocean distribution patterns, male and female spawning behavior, physiology, molecular genetic characteristics, etc. Abundance, productivity and resilience are strongly related to diversity which allows fish to succeed under conditions that may vary substantially in time and space.

***De Minimis* exploitation rates** Low rates of fishery exploitation determined to pose negligible risk to the long-term viability of endangered, threatened, depleted, or weak fish stocks.

Ecosystem A community of organisms, including humans, in conjunction with their nonliving environment. Ecosystems involve complex interactions between organisms, their environment, and the processes that drive the system. Ecosystems are complex and continuously changing. Humans and human institutions, beliefs and practices are integral parts of the ecosystem.

Endangered Species Act (ESA) Federal law passed in 1973 (16 U.S.C. § 1531 et seq.) that aims to prevent the extinction of invertebrates, vertebrates, and plants listed as threatened or endangered. A species must be listed if it is threatened or endangered due to any of the following five factors: (1) present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; and (5) other natural or manmade factors affecting its continued existence. After being listed, a recovery plan must be created that aims to recovery the species The Act also requires federal agencies or their non-federal permit applicants to determine whether their proposed action may impact a listed species.

ESA recovery plan A plan to recover a species listed as threatened or endangered under the U.S. Endangered Species Act (ESA). The ESA requires that recovery plans, to the extent practicable, incorporate (1) objective, measurable criteria that, when met, would result in a determination that the species is no longer threatened or endangered; (2) site-specific management actions that may be necessary to achieve the plan's goals; and (3) estimates of the time required and costs to implement recovery actions. The ESA requires NOAA Fisheries to develop and implement recovery plans for ESA-listed salmon and steelhead species. Recovery plans are guidance, not regulatory documents.

Escapement Escapement typically refers to the number of adult salmon or steelhead surviving harvest and other mortality factors to reach a particular point in their return to freshwater.

Evolutionarily significant unit (ESU) The ESA allows listing decisions at the level of a species, subspecies, or distinct population segment (DPS). For salmon, NOAA Fisheries applies its 1991 ESU policy and treats ESUs as DPSs. An ESU is a group of Pacific **salmon** that is (1) substantially reproductively isolated from other conspecific units and (2) represents an important component of the evolutionary legacy of the species. Also see *distinct population segment* (DPS).

Exploitation rate The proportion of a total run that is harvested in one or more fisheries. Exploitation rates may be calculated relative to ocean abundance, freshwater return or local return depending on the distribution of fisheries and the management application. For the purposes of the Task Force, exploitation rate is defined broadly to include all fish harvested and any incidental mortalities that may result from fishing activities.

Fishery management unit (FMU) Fishery management units (FMUs) are stocks or groups of stocks that are subject to similar management strategies and objectives. FMUs are primarily determined by run type and return timing in relation to Columbia River mainstem fisheries, which account for a large share of salmon and steelhead harvest. One fishery management unit may include several ESA listing units of similar run type.

Harvestable Species, stocks or populations of salmon and steelhead that are sufficiently viable, abundant, and productive to sustain significant levels of exploitation and harvest. Harvestable stocks are typically managed to produce optimum or maximum sustained yield. Harvest ability can encompass both numbers of fish harvested and qualities of fisheries including opportunity and success. Harvestable can be broadly defined to include "fishable," which refers to fishery opportunities that may not include direct harvest (e.g., catch and release recreational fisheries).

Hatchery-origin fish Fish that were spawned and/or reared during a portion of their life cycle in an artificial production facility.

Healthy Salmon or steelhead populations, ESUs, DPSs, or stocks that are abundant, productive, widely distributed, diverse, and resilient to environmental perturbations including climate change; can

sustain significant levels of harvest; and support a full range of ecological benefits including the needs of dependent species. Generally, healthy refers to a point substantially above ESA delisting on the spectrum from threatened/endangered to extremely low extinction risk.

Jacks Jacks are sexually mature salmon, generally males, returning to freshwater one year earlier than most mature salmon. They typically comprise a small proportion of the total return of natural-origin fish, but many hatchery programs produce higher percentages of jacks. Numbers of jacks returning in one year are frequently used as predictors of the number of fully mature fish likely to return in the following year.

Listing unit A grouping of salmon or steelhead (see *evolutionarily significant unit* for salmon or *distinct population segment* for steelhead) that is listable under the ESA.

Minimum abundance threshold (MAT) A minimum population abundance level corresponding with a viable population (i.e., a population with a low risk of extinction [<5 percent] over a 100-year timeframe. Incorporates spatial structure and diversity considerations into population viability curves based on abundance and productivity.

Mitigation hatchery production Hatchery fish production used for conservation or harvest purposes that is funded through legislation or legal agreement to compensate for natural production lost due to a specific action, such as construction and operation of a dam.

Major population group (MPG) An aggregate of independent populations within an ESU or DPS that share similar genetic and spatial characteristics.

Metrics Something that quantifies a characteristic of a situation or process; for example, the number of natural-origin salmon returning to spawn to a specific location is a metric for population abundance.

Natural production Natural production, or naturally produced fish, refers to the progeny of fish that spawn in the wild, regardless of parental origin (wild, natural, or hatchery). This term is interchangeable with the term natural-origin fish. It is important to distinguish natural production from natural productivity, which refers to the rate at which natural origin fish are able to produce offspring

Natural-origin fish Fish that spawned and reared in the wild, regardless of parental origin (wild, natural or hatchery).

Population A group of fish of the same species that spawns in a particular locality at a particular season and does not interbreed substantially with fish from any other group.

Productivity The rate at which a population is able to produce offspring. Productivity is used as an indicator of a population's ability to sustain itself or its ability to rebound from low numbers. The terms "population growth rate" and "population productivity" are interchangeable when referring to measures of population productivity over an entire life cycle. The indicator for productivity is the average number of surviving offspring per parent, which can be expressed as the number of recruits (adults) per spawner or the number of smolts per spawner.

Rebuilding exploitation rates (RERs) A harvest exploitation rate consistent with a population's survival and recovery requirements under the Endangered Species Act according to quantitative risk assessment.

Recovery Recovery in general refers to improvement in the biological status of a depleted, weak, or at-risk species to a high level of viability and function. Recovery can be viewed as a spectrum — for example, from improving a species likelihood of persistence to a point where it is no longer threatened or endangered and can be removed from ESA protection to improving a species to a point where it has an extremely low risk of extinction. NOAA Fisheries uses the term ESA recovery to refer to reducing threats and improving a species status to a point where it is no longer threatened or endangered and can be removed from ESA protection. For salmon and steelhead, this involves improving the species' abundance, productivity, spatial structure, and diversity to levels which provide a high likelihood of long-term persistence (i.e., viable with a low risk of extinction).

Recovery goals Recovery goals may include both ESA recovery (delisting) goals and broad sense recovery goals that go beyond the requirements of ESA delisting by addressing other legislative mandates or social, cultural, economic, and ecological values.

Recovery scenario Scenario that describes a target status for each population included in an ESU or DPS, generally consistent with ICTRT recommendations for ESU/DPS viability.

Run The migration of salmon or steelhead from the ocean to freshwater to spawn. Defined by the season, they return as adults to the mouths of their home rivers.

Run size The total number of adult salmon or steelhead (i.e., number of fish harvested plus escapement from fisheries) returning to their systems of origin.

Self-sustaining A self-sustaining viable population has a negligible risk of extinction due to reasonably foreseeable changes in circumstances affecting its abundance, productivity, spatial structure, and diversity characteristics over a 100-year period, and achieves these characteristics without dependence upon artificial propagation. Artificial propagation may be used to benefit threatened and endangered species, and a self-sustaining population may include artificially propagated fish, but a self-sustaining population must not be dependent upon propagation measures to achieve its viable characteristics. Artificial propagation may contribute to recovery, but is not a substitute for addressing the underlying factors (threats) causing or contributing to a species' decline.

Smolt-to-adult return ratio (SAR) Smolt-to-adult return ratio (SAR) is the survival from a beginning point as a smolt to an ending point as an adult. SARs are influenced by both natural environmental conditions and human factors in the freshwater migration corridor, estuary and marine waters. In the Columbia Basin, SARs are typically calculated from measurement points at dams (Lower Granite Dam to Lower Granite Dam, Bonneville Dam to Bonneville Dam, Bonneville to Lower Granite Dam, or below Bonneville to Bonneville Dam).

Spatial structure The geographic distribution and organization of a population or groups of populations.

Stock A group of fish of the same species that spawns in a particular lake or stream (or portion thereof) at a particular season and which, to a substantial degree, does not interbreed with fish from any other group spawning in a different place or in the same place in a different season. For the purposes of the Columbia Basin Partnership Task Force, a stock is defined for Columbia Basin salmon and steelhead based on species (Chinook salmon, coho salmon, sockeye salmon, chum salmon, steelhead), region of origin (e.g., Lower Columbia, Middle Columbia, Upper Columbia, Snake, or Willamette) and run type (e.g. spring, summer, fall, late fall).

Stock-recruitment The relationship between parent spawners (stock) and the subsequent returns of progeny as maturing adults (recruitment). Stock-recruitment models are commonly used to describe and quantify compensation in a managed fish population, to develop biologically based spawning and harvest rate goals, and to estimate the maximum equilibrium abundance that the habitat can support (ISAB 2015).

Technical recovery team Teams of scientists convened by NOAA Fisheries to develop technical products and recommendations related to ESA recovery planning. Technical recovery teams were complemented by planning forums unique to specific states, tribes, or regions, which used TRT and other technical products to develop ESA recovery plans.

Viable salmonid population (VSP) An independent population of Pacific salmon or steelhead that has a negligible risk of extinction due to threats from demographic variation (random or directional), local environmental variation, and genetic diversity changes (random or directional) over a 100-year timeframe.

VSP parameters Abundance, productivity, spatial structure, and diversity. These parameters describe characteristics of salmon and steelhead populations that are useful in evaluating population viability. See NOAA Technical Memorandum NMFS-NWFSC-42, Viable salmonid populations and the recovery of evolutionarily significant units (McElhany et al. 2000).

Wild fish Fish that spawned and reared in the wild and originated from parents and a lineage that does not include significant numbers of hatchery-origin fish. Distinguished in some applications from natural-origin fish, whose parents might include hatchery-origin fish spawning in the wild.

Appendix C. Terms of Reference

Marine Fisheries Advisory Committee
Columbia Basin Partnership (CBP) Task Force
Terms of Reference

July 2016, and
Amended by Addendum, June 2018

Purpose

The purpose is to establish a task force under the authority of the Marine Fisheries Advisory Committee (MAFAC) to provide expert advice and create a communication conduit for geographically focused stakeholder input to MAFAC, and subsequently from MAFAC to NOAA's National Marine Fisheries Service (NOAA Fisheries) Leadership, on Endangered Species Act (ESA) listed and non-listed salmon and steelhead issues and goals that integrate long-term conservation and harvest/fishing and support regional and local efforts amongst Columbia Basin partners. This advice and related information will contribute to fulfilling NOAA Fisheries mission activities.

Objective

This Task Force is being established to expand the expertise of MAFAC and to help MAFAC provide advice and input to NOAA Fisheries Leadership on the Columbia Basin Partnership (CBP) and its future activities. By reporting to MAFAC, the Task Force will assist NOAA Fisheries in fulfilling its central role in ensuring that ESA, tribal trust, and sustainable fishing responsibilities integrate conservation and harvest through an inclusive approach in the Columbia Basin. The Task Force will be science-based, results driven, transparent, and publicly embraced.

The initial actions for consideration of the Task Force include:

- Provide a framework for developing quantitative goals for salmon and steelhead at the species, stock, and major population group (MPG).
- Collaboratively develop goals to meet conservation needs while also providing harvest, including that necessary to satisfy treaty rights, and fishing opportunities. Goals will be developed in light of habitat capacity, climate change, and other ecosystem conditions that affect natural production.
- Foster a strong foundation of collaborative relationships to address multiple management decisions in coming years.

Background/Scope

The Columbia Basin is home to one of the richest arrays of salmon and steelhead in the world, and this wealth of anadromous species holds great ecological, cultural, spiritual, and economic value. Protecting, restoring, and effectively managing these valuable species is one of the region's greatest responsibilities, and one of NOAA Fisheries' greatest challenges. The Task Force's work will depend on wide, candid, and honest participation by all who care about salmon and steelhead.

The scope of this effort covers:

- All ESA-listed and non-listed salmon and steelhead in the Columbia Basin, above and below Bonneville Dam;
- Ocean, main stem, and tributary fisheries that harvest Columbia Basin stocks, including commercial, recreational, and tribal fisheries;
- Multiple scales (basinwide, species, and major population group);
- All impacts across salmon and steelhead life-cycles (e.g. habitat, harvest, hatchery, and hydro); and
- Consideration of ecological conditions and current and future habitat capacity.

NOAA Fisheries West Coast Region and the Northwest Power and Conservation Council will serve as *ex-officio* members of the Task Force.

Terms and Composition

This Task Force will consist of 25 to 35 individuals. The individuals will be made up of regional sovereigns and stakeholders. Given the long history of sovereign collaboration in the Columbia Basin as well an obligation for Government-to-Government relations with Tribes, up to 10 member seats will be allocated to sovereigns and the remainder (up to 25) for stakeholders. This Task Force creates an important opportunity for stakeholders to engage in meaningful collaboration along with regional sovereigns.

The Task Force members will strive to work together to seek support for common goals over the long term by integrating local and regional efforts, improving efficiency, considering existing information on goals, the full salmon life-cycle, the four Hs (habitat, hydropower, hatcheries, and harvest), species' status, and current environmental conditions.

Members of the Task Force will serve to reflect the broader constituency that they represent. The Task Force will be made up of representatives from the four Northwest states (Oregon, Washington, Idaho, and Montana), regional tribes, state agencies, and local recovery groups, as well as members that represent the following interests:

- Environment
- Commercial fishing
- Recreational fishing
- Utilities
- River industries
- Agriculture

It is intended that the Task Force members represent the diverse constituent groups and partners that interact with NOAA Fisheries from the states of Oregon, Washington, Idaho, and Montana. Task Force members will be appointed for a term up to two (2) years.

Organization and Reporting

The Task Force may meet in person at the discretion of MAFAC with the concurrence of the members. Other meetings may be conducted by telephone or using other meeting technology. The Task Force will report to the MAFAC's Ecosystem Approach Subcommittee, which will report on its activities, findings, recommendations, reports, and other deliverables at regular meetings of MAFAC. Individual members of the Task Force are not prohibited from providing individual input to NOAA Fisheries on topics which do not concern MAFAC upon NOAA Fisheries' request.

Funding

Funding would be provided by NOAA Fisheries West Coast Region. Members of the Task Force are not compensated for their services, but will upon request be allowed to travel and per diem expenses as authorized by 5 U.S.C. § 5701 et seq.

Duration

The Task Force will be established for an initial period of two (2) years with a possibility of extending that term if deemed necessary by NOAA Fisheries and MAFAC.

ADDENDUM - June 2018

The term for the initial two-year period for the Columbia Basin Partnership Task Force began in January 2017, when its members were brought together for its first meeting. The initial two year period ends at the end of January 2019.

The Marine Fisheries Advisory Committee (MAFAC) held its spring 2018 meeting in June in Portland, Oregon, with the specific purpose of receiving an extensive update on the progress of the Task Force. On June 27, members of the Task Force presented on their progress to date and discussed their operating principles, the overarching vision that has been guiding their work, and the development of qualitative and technical quantitative goals. The members presented their timeline and confirmed that a report on the Qualitative and Provisional Quantitative Goals under consideration was due for completion by the end of January 2019.

MAFAC members were extremely pleased with the progress and work completed to date. MAFAC agreed that a second phase of work, comprised of scenario planning and related efforts, would help establish integrated goals for long-term conservation and harvest/fishing of salmon and steelhead and would support collaborative regional and local efforts amongst Columbia Basin partners.

Based on this assessment, MAFAC members unanimously approved extending the term of the Task Force for an additional two-year period, from the end of January 2019 through the end of January 2021.

Appendix D. Operating Principles

MARINE FISHERIES FEDERAL ADVISORY COMMITTEE (MAFAC)

COLUMBIA BASIN PARTNERSHIP TASK FORCE (CBP TASK FORCE)

OPERATING PRINCIPLES (adopted on 06-27-2017)

For any collaborative process to operate smoothly, it is necessary for those involved to agree on the purpose for the process and the procedures by which the group will conduct its business. These operating principles are intended to support a constructive and productive process.

I. INTRODUCTION AND PURPOSE OF THE COLUMBIA BASIN PARTNERSHIP TASK FORCE

Introduction. NOAA Fisheries has Endangered Species Act (ESA), tribal treaty/trust responsibilities, and sustainable fishing responsibilities that require integrating conservation and harvest needs. The discussions and products of the Columbia Basin Partnership Task Force (CBP Task Force) will help advise the Marine Fisheries Advisory Committee (MAFAC) and, through MAFAC, NOAA Fisheries on ways to integrate those responsibilities to help inform future management decisions.

The CBP Task Force is a subcommittee of the MAFAC, formed at the request of NOAA Fisheries pursuant to the MAFAC Charter (Section 13(b) and the Federal Advisory Committee Act (FACA)), subject to procedures according to FACA. MAFAC and its subcommittees are managed by a Designated Federal Officer (DFO).

Purpose

The purpose of the CBP Task Force, as tasked by MAFAC, is to provide for a science-based, results-driven, transparent, and publicly embraced process to recommend broad sense recovery goals for Columbia Basin salmon and steelhead, listed and non-listed, that incorporate long-term conservation and provide harvest/fishing opportunities, while also satisfying tribal treaty/trust responsibilities. This task is a living marine resource matter that is a responsibility of the Department of Commerce, and falls within the scope of MAFAC per its charter.

Scope

The scope of this effort covers:

- All Columbia Basin listed and non-listed salmon and steelhead, including some extirpated populations, above and below Bonneville Dam; and including the upper, middle, and lower basins, and the estuary.
- Ocean, mainstem, and tributary fisheries that harvest Columbia Basin stocks, including commercial, recreational, and tribal fisheries.
- Multiple geographic scales (basin, subbasin, evolutionarily significant unit (ESU), and major population group (MPG)).
- Multiple temporal scales (e.g., 100-, 50-, or 25-year goals).
- All impacts across the salmon and steelhead life-cycle (e.g., habitat (mainstem, tributary, estuary, and ocean), harvest, hatchery, and hydro).
- Ecological functions, conditions, and current and future habitat capacity.

Products

MAFAC has tasked the CBP Task Force to provide advice and recommendations for quantitative goals for salmon and steelhead at the ESU, stock, and MPG levels for Pacific salmon and steelhead in the Columbia Basin. The CBP Task Force will consider

the best available science including information on habitat capacity, climate change, impacts to resident fish and other species, and other ecosystem conditions. The Task Force will also consider restoration potential of the currently blocked historical salmon and steelhead habitat.

In addition to enhanced engagement and understanding among CBP Task Force members, the outcome of its advice may be a concise, common definition of success. Numerical adult return goals may allow a means to measure progress and a clear way to maintain public support for regional recovery efforts and investments. Additionally, chances of achieving broad sense salmon recovery may be enhanced through better coordination and effective use of resources.

The recommendations of the CBP Task Force will not obligate any CBP Task Force member to undertake certain activities or diminish tribal treaty/trust responsibilities. It is the sincere hope of the Task Force that recommendations for common, long-term goals for salmon and steelhead will inspire our many partners to integrate efforts to achieve the final recommendations.

II. STRUCTURE OF THE CBP TASK FORCE

CBP Task Force Members. The CBP Task Force will consist of stakeholders, tribes, and states. The CBP Task Force members are voluntarily working together to achieve a mutually acceptable outcome that satisfies, to the greatest degree possible, the interests of all members. It is essential that the CBP Task Force members reflect the range of views from across the Columbia Basin.

Members of the CBP Task Force will serve to reflect the broader constituency that they represent. The CBP Task Force will include:

- Four Northwest states: Oregon, Washington, Idaho, and Montana;
- Columbia River Tribes: Confederated Tribes of the Colville Reservation, Spokane Tribe of Indians, Columbia River Inter-Tribal Fish Commission (representing the Nez Perce Tribe, Confederated Tribes of the Umatilla Indian Reservation, Confederated Tribes of the Warm Springs Reservation of Oregon, and the Confederated Tribes and Bands of the Yakama Nation), Upper Snake River Tribes Foundation (representing the Burns Paiute Tribe, Shoshone–Bannock Tribes of the Fort Hall Reservation, Shoshone–Paiute Tribes of the Duck Valley Indian Reservation, and Fort McDermitt Paiute and Shoshone Tribe), Confederated Salish and Kootenai Tribes of the Flathead Nation, and Kootenai Tribe of Idaho;
- NGO/environmental representative(s);
- Commercial fishing representative(s);
- Recreational fishing representative(s);
- Utilities representative(s);
- River industries representative(s);
- Agricultural/irrigation representative(s);
- A local recovery group representative from each state;
- MAFAC member(s); and
- A representative from the Northwest Power and Conservation Council (ex-officio).
- Membership Criteria. Members of the CBP Task Force have been appointed by the NOAA Fisheries Administrator, based on the recommendations of MAFAC using the following criteria:
- Are broadly representative of their interests and constituents affected by salmon and steelhead management in the Columbia River Basin.
- Have organizational and/or subject matter expertise regarding salmon and steelhead management in the Columbia River Basin.
- Together represent the geographic diversity of the Columbia River Basin.

Working Teams. As needed, with the approval of NOAA Fisheries and pursuant to the MAFAC Charter, the CBP Task Force may organize teams comprised of CBP Task Force members to inform the CBP Task Force.

Coordinating Team. The CBP Task Force may decide to designate a balanced, representative group of members as a Coordinating Team with specified process-related roles and responsibilities in between meetings. This group may assist the MAFAC DFO and the DFO's Fisheries staff in preparing proposed agenda topics for CBP Task Force meetings.

III. MEETINGS AND PUBLIC INTERACTIONS

Meeting Principles.

- Members of the CBP Task Force will be open, transparent, inclusive, and accountable in all of their actions. They will adhere to the highest ethical standards in their work and deliberations and are committed to using informed judgment and thoughtfulness in decision-making.

- Members of the CBP Task Force will listen and understand broad stakeholder interests and diversity within the Columbia Basin.
- Members of the CBP Task Force will provide input to each other and MAFAC that is strategic and science-based and will reflect a basin-wide perspective and long-term view.
- While the work of the CBP Task Force will be accomplished cooperatively whenever possible, when individual CBP Task Force members decline to support a recommendation, they may explain their decisions to the CBP Task Force, and all views will be shared with MAFAC.

Meeting Coordination.

NOAA Fisheries and the MAFAC DFO may hire facilitators or consultants to assist in ensuring CBP Task Force meetings run smoothly and efficiently. The MAFAC DFO will approve all meeting schedules. The DFO and DFO's Fisheries staff and consultants will:

- Develop draft agendas, distribute meeting materials, facilitate meetings, work to resolve any process issues or impasse that may arise, prepare action items, and other tasks as requested.
- Provide a process that supports constructive and productive dialogue and stays focused on the agreed-upon scope of work for CBP Task Force meetings.
- Offer process skills to support open, balanced, respectful dialogue and interest-based CBP Task Force problem-solving.
- Track areas of alignment and divergence, recommendations, and next steps.
- Send draft documents to CBP Task Force members for review.

Meeting Attendance.

Each member will make a good faith effort to attend each CBP Task Force meeting. It is the responsibility of the member to stay fully briefed on all CBP Task Force meeting discussions and deliberations. If a member misses more than half the meetings in a year or is not engaged in the between-meeting work, or for any other reason at NOAA's discretion, NOAA Fisheries and MAFAC may terminate the term of that member and seek and appoint a new representative to fill the responsibility.

Public Input and Public Outreach.

The public may attend CBP Task Force meetings as audience members. Meeting materials will be available on the MAFAC and NOAA Fisheries West Coast Region website. There will be an opportunity for public input during meetings of the CBP Task Force. Comments from the public will be limited in time to allow sufficient opportunity to conduct other portions of the agenda. The MAFAC DFO may engage the CBP Task Force in a "town hall" or other type of public meeting or forum on Columbia Basin topics to provide the public with opportunity for providing input and feedback.

IV. RECOMMENDATIONS

It is understood that CBP Task Force members are representing the interests of their agency, organization, and/or constituents and providing input based on those interests. CBP Task Force members will engage in dialogue to seek common ground, support interests, and address differences to develop recommended goals.

The CBP Task Force shall report all advice, recommendations, and reports to MAFAC for its feedback and consideration and must not provide advice or work products directly to NOAA or NOAA Fisheries. MAFAC will present its own final recommendations to NOAA Fisheries, and will meet and discuss its draft recommendations with the CBP Task Force to seek feedback prior to finalizing its recommendations.

V. RELATIONSHIP OF THE CBP TASK FORCE TO OTHER PROCEEDINGS

The CBP Task Force is a task force of the MAFAC. Participation in the CBP Task Force will not limit any member from taking whatever actions or asserting positions that the member determined was in its best interest and, for sovereigns, is consistent with its legal and/or regulatory obligations.

VI. GROUND RULES

- Learn from and understand each other's perspective.
- Be respectful, candid, and constructive.
- Provide balance of speaking time.
- Test assumptions by asking questions.
- Resolve differences and reach consensus.
- Personal attacks and prejudicial statements are not acceptable.
- Explore innovative solutions based upon common interests.
- Discuss topics together rather than in isolation.
- Avoid surprises.
- Limit side conversations.
- Turn off cell phones or place in the non-ring mode during meeting sessions.

VII. SAFEGUARDS

Right to Withdraw.
Any member may temporarily or permanently withdraw from the CBP Task Force at any time after discussing the reasons for withdrawal with the DFO or meeting facilitator. A CBP Task Force member wishing to resign from the CBP Task Force should submit a letter of resignation to the NOAA Fisheries Administrator with a copy to the MAFAC DFO.

VIII. AGREEMENT AND ADOPTION

The CBP Task Force members agree to abide by the preceding CBP Task Force Operating Principles.

Lower Lemhi River, Upper Salmon Basin, Idaho. Newly constructed stream channel, floodplain, and side channel complex providing off-channel rearing and overwintering capacity for Chinook salmon and steelhead. Credit: Daniel Bertram, Idaho Office of Species Conservation

Three inspiring words ring through my Partnership experience: Gifts – We who are served so well by the River and its salmon, are committed to giving back; Trust – We are learning to rely upon each other; Boldness – We are demonstrating the collective will to take on even the most difficult issues, with eyes wide open.

— Kevin Scribner, *Salmon Safe*