

2005 Oregon Native Fish Status Report

Volume I Species Management Unit Summaries



Oregon Department of Fish & Wildlife

Fish Division

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Acknowledgments

The Oregon Watershed Enhancement Board for contributing funds to this project.

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2005 Oregon Native Fish Status Report

Executive Summary

Native Fish Conservation Policy Goals [OAR 635-007-0507]

- ❖ **Prevent the serious depletion of any native fish species by protecting natural ecological communities, conserving genetic resources, managing consumptive and nonconsumptive fisheries, and using hatcheries responsibly so that naturally produced native fish are sustainable.**
- ❖ **Maintain and restore naturally produced native fish species, taking full advantage of the productive capacity of natural habitats, in order to provide substantial ecological, economic, and cultural benefits to the citizens of Oregon.**
- ❖ **Foster and sustain opportunities for sport, commercial, and tribal fishers consistent with the conservation of naturally produced native fish and responsible use of hatcheries.**

This report describes the current conservation status of native fishes in Oregon based on criteria defined in Oregon's Native Fish Conservation Policy. The Native Fish Conservation Policy (NFCP) provides a basis for managing hatcheries, fisheries, habitat, predators, competitors, and pathogens in balance with sustainable natural fish production. NFCP implementation priorities and actions will, in part, be based on assessments of current conservation risks. This report summarizes risk assessments completed for native salmon and steelhead, most native trout, and other selected native fish species using the NFCP interim criteria. Available data through 2004 were compiled for these assessments. Risk, as used in this report, refers to the threat to the conservation of a unique group of populations in the near-term (5-10 years). Conservation is defined as maintaining the sustainability of native fish at levels that provide ecological, economic, recreational and aesthetic benefits to present and future generations.

The NFCP interim criteria provide temporary guidance to ensure the conservation of native fish prior to completion of more detailed conservation plans for each species or group of populations. Risks evaluated based on interim criteria refer to the immediate possibility that a unique group of populations may not be able to provide all societal benefits in the interim until an effective conservation plan can be developed and implemented. The interim criteria do not describe long-term, extinction risks such as continuing downward trends, increasing threats, or extended intervals of unfavorable environmental conditions. Such long-term risks are better assessed with more in-depth analyses than was conducted for this report and will be considered in conservation plans. The interim risk assessment provided in this report will help guide priorities for conservation planning.

This assessment focuses on groups of populations from a common geographic area with similar genetic and life history characteristics called *Species Management Units (SMUs)*. SMUs are the level at which native fish will be managed in Oregon, as directed in the NFCP. The Oregon Department of Fish and Wildlife (ODFW) identified 33 SMUs and 216 populations of salmon and steelhead in Oregon (Table 1). Of these SMUs, 8 (24%) are extinct, 11 (33%) are at risk, 7 (21%) are potentially at risk, and 7 (21%) are not at risk of not providing societal benefits before conservation plans can be developed to address threats. Extinct salmon and steelhead SMUs are concentrated in the upper Snake and Klamath basins where dams have eliminated access. At-risk and potentially-at-risk SMUs occur throughout Oregon coastal and interior Columbia regions. The few SMUs that are not at risk occur mainly on the coast. Salmon and steelhead numbers have increased in many areas during 2000-2004 in response to favorable ocean survival conditions

following an unprecedented series of El Niños in the 1980s and 1990s widely associated with poor ocean survival of salmon. These improvements have somewhat lessened immediate risks to some salmon and steelhead populations suffering from declining long-term trends.

Oregon’s native trout species include Oregon Basin redband trout, cutthroat trout, and bull trout. ODFW delineated 27 trout SMUs containing 219 populations (Table 1). The Alvord cutthroat trout is the only trout SMU considered extinct. Of the remaining SMUs assessed, 18 (69%) are at risk, 4 (15%) are potentially at risk, and 4 (15%) are not at risk of not providing societal benefits in the near future. A majority of the SMUs are classified as at risk due to highly fragmented habitats and discontinuous distributions related to both natural and human-related causes. Bull trout and westslope cutthroat trout, in particular, reside in cold headwater streams where access to migratory corridors and rearing habitat exists only seasonally. Oregon Basin redband trout populations fluctuate annually with drought cycles and instream flow. Recent high water years have provided an environment for depressed populations to potentially rebound.

Other native fish populations of concern or interest addressed by this assessment include several minnow, lamprey and sturgeon species. Among these 9 SMUs there are 33 populations. Six of the SMUs are at risk of not providing societal benefits in the near future and three SMU’s were not assessed.

This assessment highlights widespread risks to the existence of native Oregon fishes in the face of extensive and continuing habitat changes and other threats. Natural production is the foundation for long-term sustainability of native species, hatchery programs, and fish resource-based economies. Effective management through conservation plans will be critical to ensuring conservation and recovery of Oregon’s native fish species.

Not all native fish SMUs were assessed in this report due to constraints of staff and time. ODFW’s 1995 Biennial Report on the Status of Wild Fish in Oregon (Kostow 1995) provides the most recent assessment for many of those fish species and SMUs not covered here. A complete list of Oregon native freshwater fish species can be found in Appendix A of Volume II of this report.

Table 1. Species management units for Oregon native fish species.

Species	Number Of Populations	Species Management Units	Status (number of SMUs)				
			Not at risk	Potentially at risk	At risk	Extinct	Not Assessed
Salmon							
Coho	33	5	2	0	1	2	0
Fall Chinook	41	5	2	2	1	0	0
Spring Chinook	42	8	0	2	4	2	0
Chum	20	2	0	0	1	1	0
Sockeye	2	2	0	0	0	2	0
Steelhead							
Winter Steelhead	49	4	1	2	1	0	0
Summer Steelhead	29	7	2	1	3	1	0
Trout							
Redband	49	7	0	2	5	0	0
Cutthroat	85	8	3	1	3	1	0
Bull	85	12	1	1	10	0	0
Other Species of Interests							
Borax Lake Chub	1	1	0	0	1	0	0
Hutton Springs Tui Chub	1	1	0	0	1	0	0
Oregon Chub	15	1	0	0	1	0	0
Foskett Springs Speckled Dace	1	1	0	0	1	0	0
Pacific Lamprey	3	1	0	0	1	0	0
Western Brook Lamprey	3	1	0	0	1	0	0
Green Sturgeon	2	2	0	0	0	0	2
Oregon White Sturgeon	7	1	0	0	0	0	1
TOTALS	468	69	11	11	35	9	3

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Introduction

This report describes the current conservation status of many of the native fishes in Oregon based on interim criteria defined in Oregon’s Native Fish Conservation Policy [OAR 635-007-0507]. The purpose of the Native Fish Conservation Policy (NFCP) is to ensure conservation and recovery of native fish in Oregon. The policy focuses on naturally-produced fish. Natural production is the foundation for long-term sustainability of native species, hatchery programs, and fish resource-based economies. Naturally-produced native fish are also the primary basis for Federal Endangered Species Act listing and delisting decisions that can have significant impacts on the citizens of Oregon.

The Native Fish Conservation Policy provides a foundation for managing hatcheries, fisheries, habitat, predators, competitors, and pathogens in balance with sustainable natural fish production. Goals of the NFCP are: 1) prevent the serious depletion of native fish species, 2) maintain and restore native fish at levels providing ecological and societal benefits, and 3) ease constraints on fisheries and other resource uses. Implementation of the policy occurs through conservation plans tailored to the needs, opportunities, and constraints of each group of fish populations. Implementation priorities and actions will, in part, be based on assessments of current conservation risks.

Preliminary risk assessments were completed for native salmon and steelhead, most native trout, and other selected native species using interim criteria that are based on biological attributes related to species performance. The interim criteria provide temporary guidance to ensure the sustainability of native fish prior to completion of conservation plans. Once a conservation plan is approved, the interim criteria are superseded by a broader set of measurable primary and secondary criteria (OAR 635-007-0505 (6) & (7)) identified in the plan. Unique groups of populations, or Species Management Units (SMUs), of each species are classified as “not at risk”, “potentially at risk”, or “at risk” (denoted by green, yellow, and red shading throughout this report). Risk, as used in this report, refers to the threat to the conservation of a unique group of populations (e.g. SMU) in the near-term (5-10 years). Interim criteria help identify priorities for fish management actions and conservation plan completion by flagging cases where conservation risks are acute. Conservation plans will include a more comprehensive assessment of long-term extinction risks and may include additional evaluation criteria.

This report is comprised of two volumes, an SMU summary, and a Methods and Data report. The SMU summary briefly describes the results of the assessment for each species management unit. The second volume documents data and methods used to evaluate individual populations and includes detailed explanations of how each salmon and steelhead population fared in the assessment.

Assessment Methods

Species Management Units

Oregon's Native Fish Conservation Policy calls for fish to be managed at the *Species Management Unit*, or SMU, level. SMUs are groups of populations from a common geographic area that share similar life history, genetic, and ecological characteristics. Populations within an SMU are locally adapted to the specific conditions encountered in their native streams. Because of their shared characteristics, fish from one population within an SMU may be generally representative of other populations in that SMU and respond in a similar manner to conditions encountered throughout the life cycle. Fish trying to inhabit areas outside their own SMU do not typically fare as well as the native inhabitants in any given area. The greater the difference in characteristics between fish from different geographic areas, the greater the average disparity in survival, growth, and productivity. Thus, long-term sustainability depends on preservation of the native characteristics and diversity of each unique group of populations.

Species Management Units are similar in concept to Evolutionarily Significant Units (ESUs) or Distinct Population Segments (DPSs) upon which Endangered Species Act listing decisions by NOAA Fisheries or the U.S. Fish and Wildlife Service are based. ESUs and DPSs include Oregon and non-Oregon stocks, whereas, SMUs are limited to Oregon stocks. Oregon's SMUs generally reflect finer breakdowns of ESU's where ESU's include multiple stocks (e.g. lower Columbia River spring and fall Chinook) or broad geographical regions (e.g. bull trout). Salmon, steelhead and trout populations identified by ODFW within this report are consistent with Biological Reviews prepared by NOAA Fisheries Technical Recovery Teams and the U.S. Fish and Wildlife Service in their listing decisions and recovery planning processes. It is ODFW's intention to re-evaluate the SMU boundaries and population structure used in this report when conservation plans are developed for each SMU.

Risk Classification

This is an interim assessment intended to flag acute problems and help identify priorities for more detailed conservation planning evaluations. Risk, as used in this report, refers to the risk to the conservation of a unique group of populations (e.g. SMU), not the risk of extinction. A conservation risk relates to the ability of the SMU to provide economic, cultural and ecological benefits to the citizens of Oregon. The interim assessment is based only on immediate status and is only intended to ensure that SMUs will be conserved until a conservation plan can be developed. It does not consider long-term risks. For instance, better-than-average ocean conditions might temporarily increase numbers of salmon, but have little effect on long-term risks where other threats remain significant and a species has exhibited a long-term declining trend. Nor does the interim assessment weigh the projected future benefits of recent conservation actions that are not yet fully reflected in recent fish numbers.

Interim criteria were based on six biological characteristics related to species performance (Figure 1). These include existing populations, habitat use distribution, abundance, productivity, reproductive independence, and hybridization. The six criteria are described in more detail below. Each of these attributes was evaluated for every population based on benchmark values related to species viability, persistence probability, and conservation risks. Criteria for individual SMUs were met when at least 80% of existing constituent populations met the standard. In some instances, data were not available to evaluate against a numerical benchmark and inferences from other information were used to determine whether or not the criteria were met. Risk categories were assigned based on the number of interim criteria met by each SMU.

SMUs that met six of the six criteria were classified as “not at risk”. SMUs that met only four or five criteria were “potentially at risk”. SMUs that met three or fewer criteria were classified as “at risk”.

Assessments for each population were based on the best available scientific data which included direct empirical estimates and inferences from other evidence. In most cases where specific point estimates were not available for all criteria, population values could be determined based on inferences from other evidence or values in other representative populations. For instance, habitat use distribution could be inferred from stream accessibility where annual habitat use information was unavailable. Similarly, reproductive independence could be inferred from the size and location of hatchery releases where hatchery spawner data were incomplete. In some cases, those populations that had data available were assumed to be representative of the SMU. In a few populations, information was not adequate to assess a criterion. Treating these missing values the same as criteria failures provided a conservative assessment of risk consistent with the precautionary principles of the Native Fish Conservation Policy. At least some information was available for most populations and so missing values were rare and ultimately did not affect the risk category assigned to an SMU.

The risk assessment for each SMU includes a qualitative evaluation of the uncertainty in the data used to infer risk based on interim criteria. A high level of confidence was identified where extensive and detailed data was available for populations throughout the SMU. A moderate level of confidence was identified where data and other information were generally suitable for assessments of interim criteria for many or most representative populations throughout the SMU. A qualified level of confidence was identified where the assessment was based on limited data sets and inferences from other information for significant populations within an SMU. Qualitative descriptions of uncertainty and detailed descriptions in Volume II of the methodology, inferences, and assumptions for each SMU and population provide the basis for independent evaluation of the accuracy of each risk assessment by the reader.

Interim Criteria are designed to flag near term conservation risks. Indicators are highly interrelated and provide for redundant detection of problems. For instance, declining abundance occurs coincident with reduced productivity and distribution. Significant conservation problems invariably trigger multiple indicators. Thus, while each indicator might suffer from specific limitations of information or interpretation, the suite of indicators provides a robust basis for identifying relative priorities for detailed conservation plans.

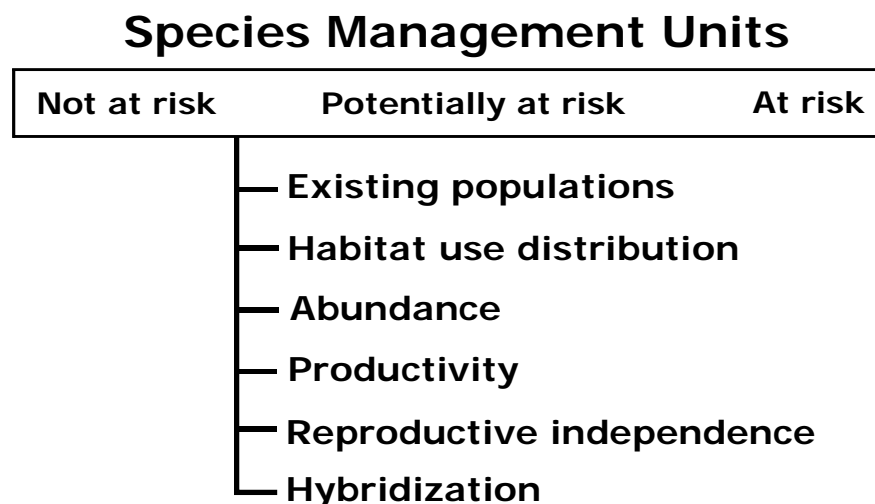


Figure 1. Criteria for assessing conservation risks based on Oregon’s Native Fish Conservation Policy.

Existing Populations

Criteria: At least 80% of historical populations are still in existence (i.e. not extinct) *and* not at risk of extinction in the near future.

The Species Management Unit identifies groups of similar populations that are uniquely adapted to local conditions. A group of diverse populations within a geographic area provides a strong “safety net” for species persistence. The loss of a significant portion of an SMU’s populations inhibits the ability of the SMU to persist over time. Continued persistence is a direct demonstration of a species’ performance in the face of historical risks. Conversely, extinction of closely related populations in an SMU is an indicator of problems that may threaten all populations within a region. Many extinct populations occurred in areas that are no longer accessible to anadromous fish (fish that rear in the ocean and return to streams and rivers to spawn), for instance where dams block passage. Other extinct populations were eliminated by a combination of detrimental impacts of land and water use, barriers, fishing, and variable ocean conditions. Extinction occurs when numbers and productivity are no longer sufficient to maintain an independent, self-supporting population. Functional extinction may occur before the last few fish disappear. Small numbers of fish may continue to return in some areas due to sporadic straying from other hatchery or naturally produced populations.

Habitat Use Distribution

Criteria: Naturally produced members of a population occupy at least 50% of the historically-used (pre-development) habitat in at least three of the last five years for at least 80% of existing populations.

Healthy fish populations benefit from access to diverse and abundant habitat. Diverse habitats can sustain a diversity of life-history types within a population. This life-history diversity allows a population to be more resilient to risks. A lack of habitat quantity or diversity makes a population more vulnerable to natural and human-caused disturbances. Fish distribution depends on the amount of habitat that remains accessible and the portion of the accessible habitat that is used in any given year. Passage may be blocked by dams, culverts, or other barriers. Habitat degradation may render some accessible habitats unsuitable for migration, spawning, or rearing. Declining populations may no longer be able to fully seed all suitable remaining areas. Seeding levels may vary considerably from year to year depending on escapement levels. The most robust fish populations are typically those that access all historical areas and use all available areas in most years. This criterion was evaluated using annual distribution data where available and current versus historically-accessible habitat where annual distribution data were lacking.

Abundance

Criteria: Number of naturally-produced fish is greater than 25% of average levels in at least three of the last five years for at least 80% of existing populations.

Fish numbers fluctuate from year to year in response to normal variation in environmental conditions. Extinction typically occurs when weak populations placed at risk by one or more factors “bottom out” during normal periods of low productivity. The interim abundance criterion is based on critical low fish numbers below which normal population dynamics might falter, key population elements begin to be lost, safety factors for chance events or catastrophes are marginal, and recovery cannot be assured. This criterion flags groups of populations where recent numbers have fallen to low levels relative to normal ranges observed for each population

or the existing habitat capacity. Normal ranges were based on long-term average spawner numbers and/or estimates of basin capacity to produce fish.

Productivity

Criteria	Population replacement rate for at least 80% of existing populations is at least 1.2 naturally-produced adult offspring per parent in three of the last five years when total abundance was less than average returns of naturally-produced fish.
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Productivity refers to a population’s ability to replace itself with significant numbers of juveniles and adults in the next generation. Higher productivity generally corresponds to lower extinction risk. Productive populations are better able to withstand years of poor ocean survival and rebound more quickly from low numbers. Productivity is generally related to high habitat quality and high life-history and genetic diversity that allow a population to take maximum advantage of a variety of habitat and environmental conditions. Productivity is best measured at low to moderate population sizes where density-dependent effects are not likely to be strong. As densities increase, competition for habitat begins to reduce the number of offspring per spawner. Replacement rates averaging less than 1.0 indicate a declining population. Replacement rates averaging greater than 1.0 indicate an increasing population. Replacement rates greater than 1.2 indicate a population with strong intrinsic productivity.

Reproductive Independence

Criteria	90% or more of spawners are naturally produced in at least three of the last five years for at least 80% of existing populations.
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Reproductive independence depends on populations that consist primarily of naturally-produced and not hatchery-produced fish. The effects of hatchery and naturally produced fish interactions are complex and controversial. Hatchery fish can bolster natural population sizes. However, large numbers of highly-domesticated or non-local hatchery fish spawning in the wild can be detrimental to natural population productivity under certain circumstances. Large numbers of hatchery fish also obscure our ability to accurately evaluate the status of the wild population component. This criterion flags cases where significant numbers of hatchery fish potentially interact with or subsidize the natural population. Interim criteria do not distinguish cases where hatchery contributions are intended for conservation or supplementation purposes. Specific cases may then be more fully considered in appropriate conservation plans.

Hybridization

Criteria	Hybridization with non-native species is rare or nonexistent in three of the last five years for at least 80% of existing populations.
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This criterion highlights specific cases where native species are threatened by hybridization. Hybridization involves interbreeding between related species (cutthroat vs. rainbow trout or bull trout and brook trout) and can lead to reduced productivity and loss of unique genetic characteristics. Hybridization is not typically an issue for anadromous species but can be significant between native and introduced species of trout.

Key to Assessment Summaries

Coastal Coho

The color of the bar represents the assessment outcome. Green = Not at Risk, Yellow = Potentially at Risk, Red = At Risk, Brown = Extinct.

ESA Designation:

State Status:

Interim Assessment:

Proposed Threatened 2004

Critical

Not at Risk

This SMU includes 19 populations in ocean tributaries from the Necanicum to the Sixes rivers that were assessed. All of the six interim criteria were met by at least 80% of the populations. Until recently, escapements have been at or near record lows. However, numbers, distributions and productivity have rebounded for most populations in the last four years following improved ocean productivity. These improvements have eased near term risks, but it is not clear whether all underlying factors for the recent decline have been addressed or if this is just a temporary response to improved ocean conditions. Extensive and detailed data on populations throughout this SMU provide a high level of confidence in the assessment of interim criteria.

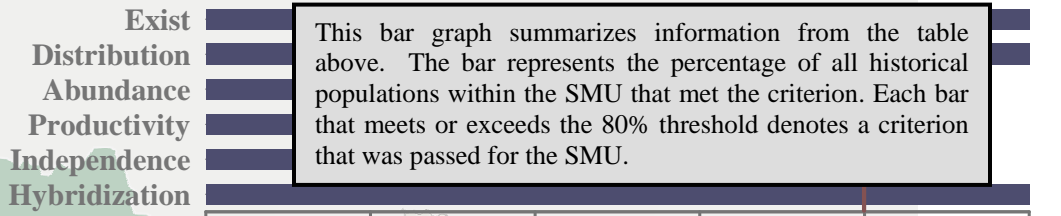


Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Necanicum/Ecola	Pass	Pass	Pass	Pass	Pass	Pass
Nehalem	Pass	Pass	Pass	Pass	Pass	Pass
Tillamook	Pass	Pass	Pass	Pass	Pass	Pass
Nestucca	SS	SS	SS	SS	SS	SS
Salmon	SS	SS	SS	SS	SS	SS
Siletz	SS	SS	SS	SS	SS	SS
Yaquina	SS	SS	SS	SS	SS	SS
Beaver	SS	SS	SS	SS	SS	SS
Alsea	SS	SS	SS	SS	SS	SS
Siuslaw	SS	SS	SS	SS	SS	SS
Upper U	SS	SS	SS	SS	SS	SS
Lower U	SS	SS	SS	SS	SS	SS
Tahkent	SS	SS	SS	SS	SS	SS
Siltcoos	SS	SS	SS	SS	SS	SS
Tenmile	SS	SS	SS	SS	SS	SS
Coos	Pass	Pass	Pass	Pass	Pass	Pass
Coquille	Pass	Pass	Pass	Pass	Pass	Pass
Florás	Pass	Pass	Pass*	Fail*	Pass	Pass
Sixes	Pass	Pass	Pass*	--	Pass	Pass

* Inferred

This table summarizes the assessment outcome for each population within the SMU for each of the interim criteria. A "pass" indicates that the population met the terms of the criteria, and a "fail" indicates that it did not. Criteria evaluated based on inference from qualitative or incomplete information are distinguished with an asterisk (*) from cases where quantitative analyses of population specific data provided a direct test of the criterion. Where information was inconclusive or insufficient for assessment, the outcome was treated as a failure in assessment of risks to the SMU.

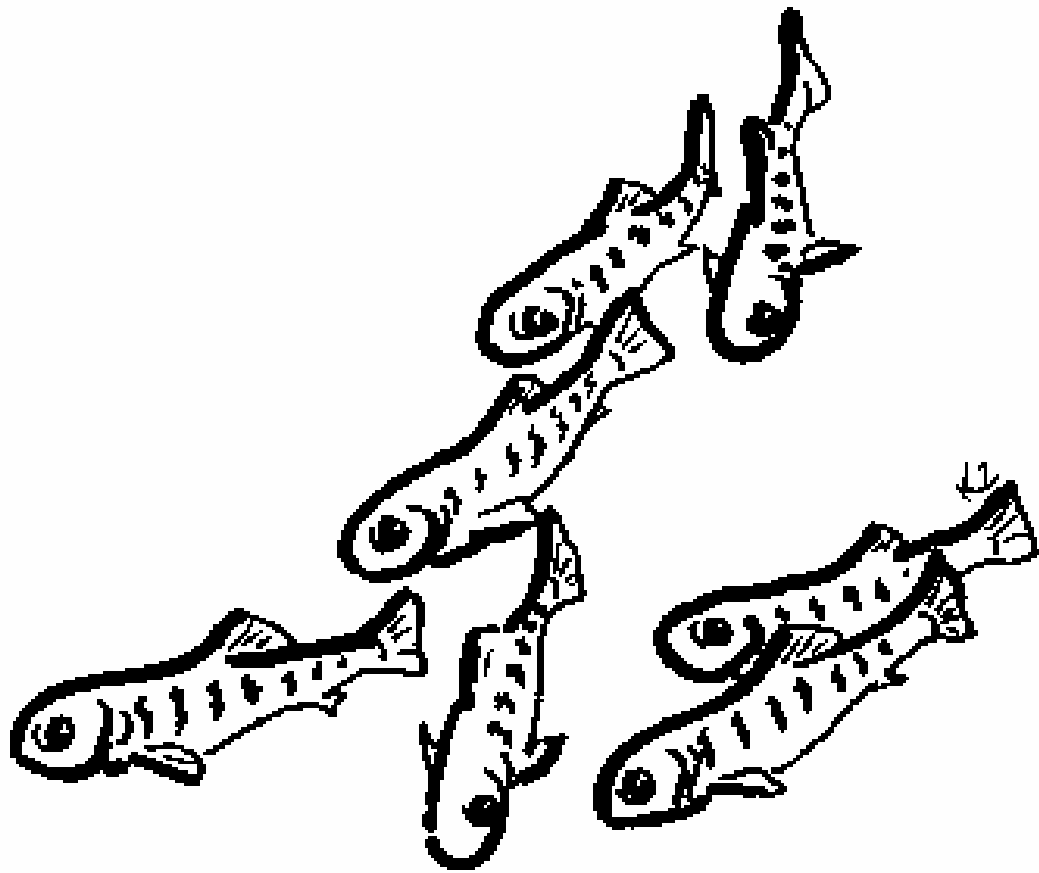
Percent of Existing Populations Meeting Criteria



This bar graph summarizes information from the table above. The bar represents the percentage of all historical populations within the SMU that met the criterion. Each bar that meets or exceeds the 80% threshold denotes a criterion that was passed for the SMU.

The map displays the SMU and its constituent populations as well as the status of each population based on interim criteria. A key explains the significance of each of the different colors. Risk is assessed for the SMU based on population data. Risk levels are not assigned to specific populations but populations are color coded to identify their contribution to the SMU assessment.

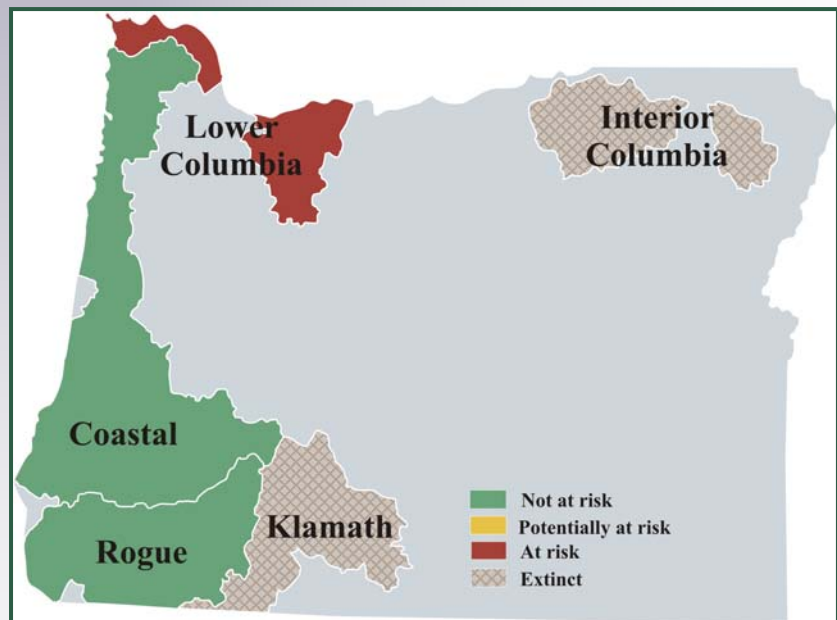




Coho



Coho salmon are widespread in small, low gradient streams of the coast and lower Columbia. They enter freshwater and spawn after fall rains raise river levels, typically from September through December. Coho smolts migrate seaward on spring freshets after one year of freshwater rearing. Virtually all adults return at three years of age with sizes averaging 5-10 pounds. A small percentage of males return one year earlier as jacks. Oregon coho generally range



along the Oregon coast where survival is closely related to upwelling of cool, nutrient-rich waters. Five coho SMUs include a total of 34 historical populations. Interior Columbia and Klamath populations are extinct. Low numbers, low productivity, and large hatchery influence place the lower Columbia coho SMU at risk. Coastal and Rogue coho have recently rebounded from critical low numbers to the point where their near term sustainability is not at risk.

Coastal Coho SMU

ESA Designation:

State Status:

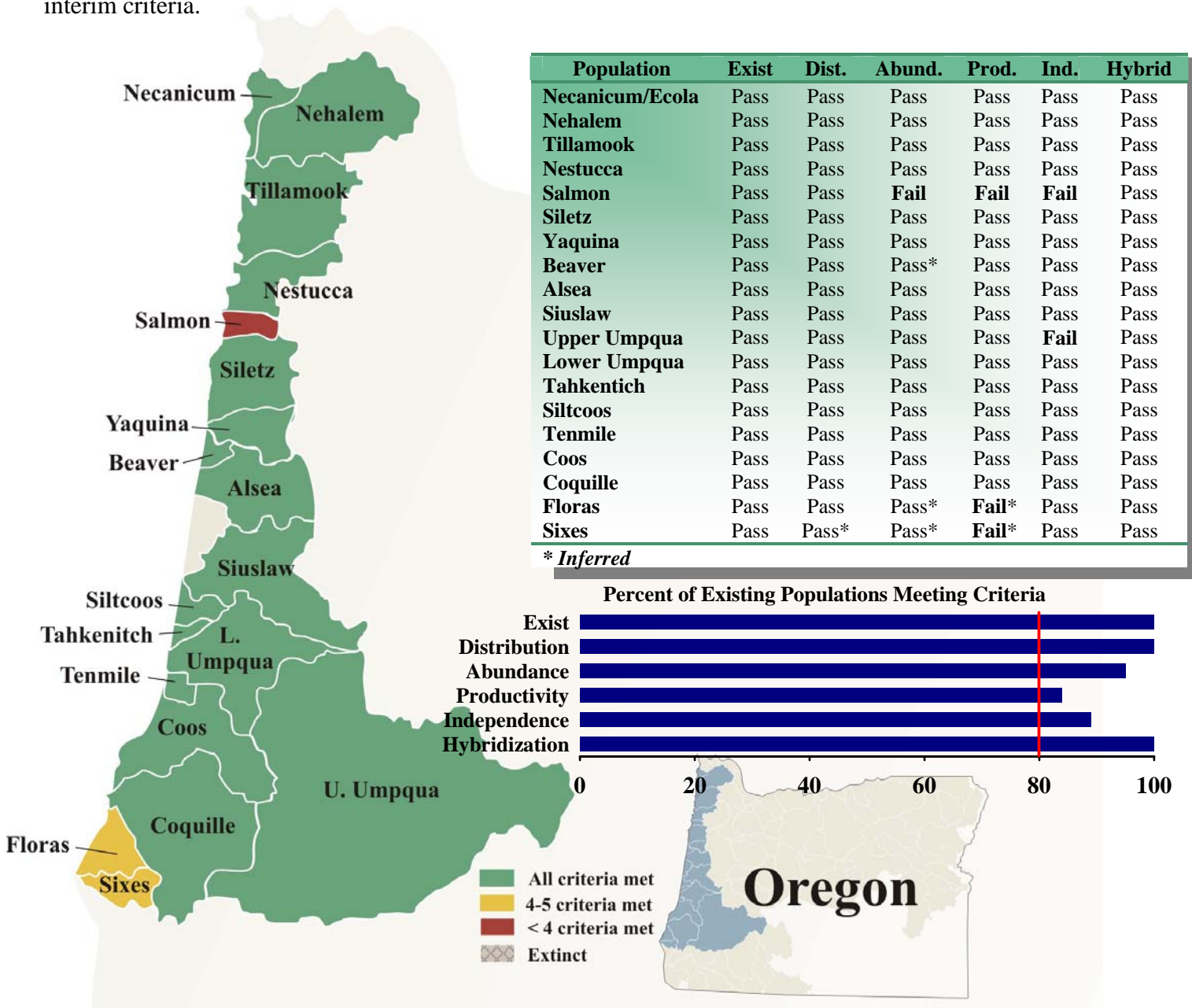
Interim Assessment:

Proposed Threatened 2004

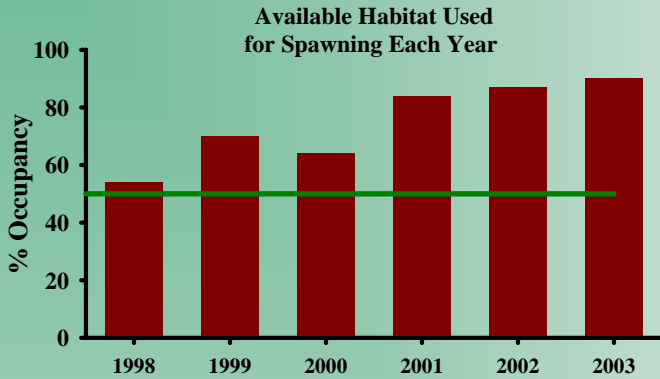
Critical

Not at Risk

This SMU includes 19 populations in ocean tributaries from the Necanicum to the Sixes rivers that were assessed. All of the six interim criteria were met by at least 80% of the populations. Until recently, escapements have been at or near record lows. However, numbers, distributions, and productivity have rebounded for most populations in the last four years following improved ocean productivity. These improvements have eased near-term risks, but it is not clear whether all underlying factors for the recent decline have been addressed or if this is just a temporary response to improved ocean conditions. Extensive and detailed data on populations throughout this SMU provide a high level of confidence in the assessment of interim criteria.

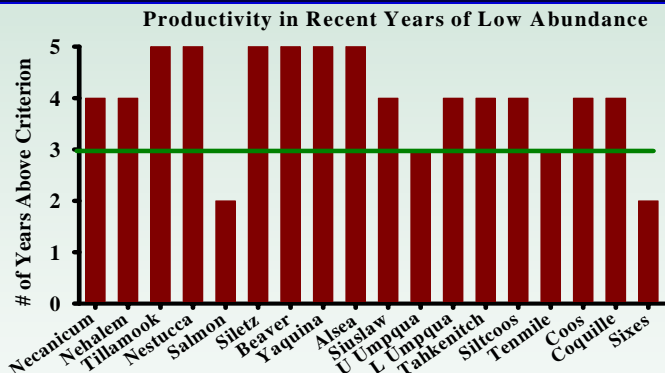


Distribution - Pass



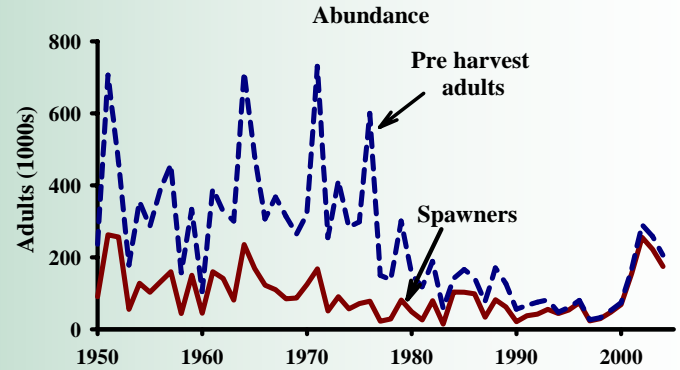
- All of the populations within the SMU passed the criterion.
- Nearly 100% of the historical habitat is still accessible today. Habitat suitability is likely below historic levels at certain stages of the coho life cycle (e.g. over-winter rearing).
- Occupancy has been greater than 50% for all years where data were available.
- Occupancy rates in the SMU have climbed each year since 1998 due to increased returns of naturally-produced fish.
- In the last three years, SMU wide occupancy has exceeded 80%.

Productivity - Pass



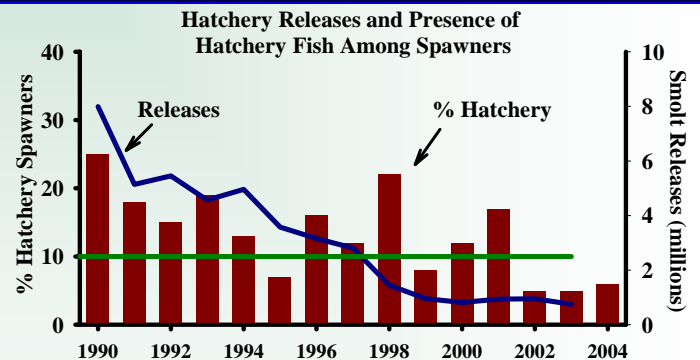
- 16 of 19 populations met the productivity criterion demonstrating the resiliency of the SMU.
- Productivity in the early-to-mid 1990s was at or below replacement in much of the SMU despite adult seeding well below carrying capacity.
- The median productivity for the SMU over the last five broods was 2.8 recruits per spawner.
- Annual productivity estimates for each population between 1990 and 2000 varied widely, but generally ranged between 0.3 and 3.6 recruits per spawner.

Abundance - Pass



- 18 of the 19 populations passed the abundance criterion causing the SMU to pass.
- Implementation of selective fisheries for marked hatchery fish and abundance-based limits on incidental impacts have reduced ocean harvest rates of wild fish from 80% as late as the 1980s to 5-15% today.
- An extended period of poor ocean conditions dropped 1990s numbers to record low levels, despite fisheries reductions.
- Recent spawner numbers in the SMU have rebounded to 30 year highs following improvements in ocean productivity, but pre-harvest abundance remains well below historical levels.

Independence - Pass



- 17 of 19 populations assessed passed the criterion. Only the Salmon and Upper Umpqua populations failed.
- The graph above represents the coast-wide aggregate. Reductions in smolt releases have reduced stray hatchery spawners throughout the SMU.
- Releases of coho smolts into coastal basins have been reduced from eight million per year in the 1990s to one million per year in the early 2000s.
- In 1990, hatchery fish made up 25% of the naturally spawning population within the SMU. By 2002, that level had been reduced to 5%.

Rogue Coho SMU

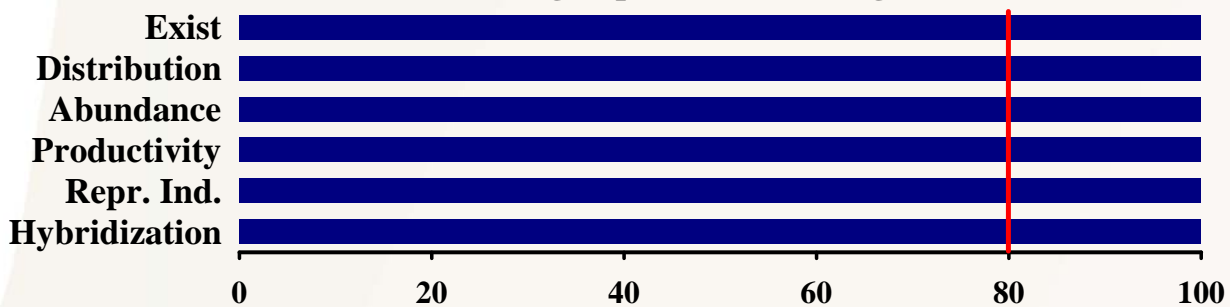
ESA Designation:
Threatened 1997

State Status:
Critical

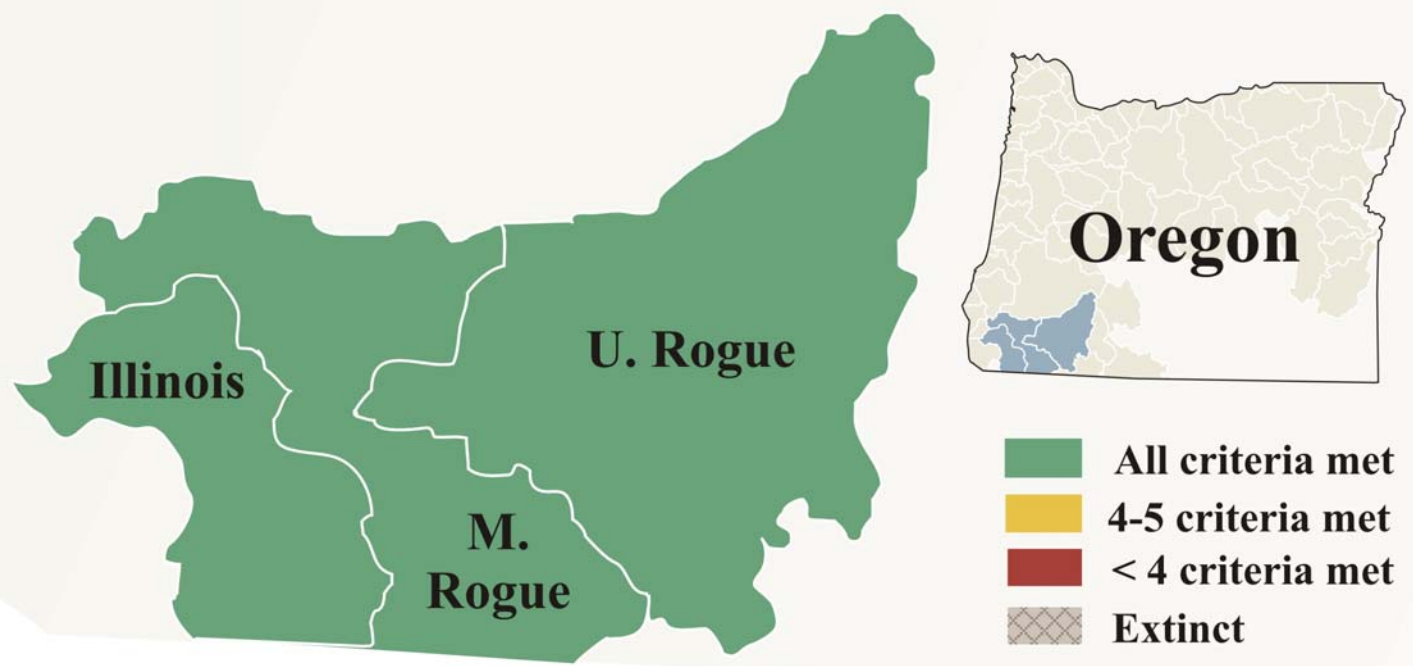
Interim Assessment:
Not at Risk

The SMU consists of three populations within the Rogue Basin. This SMU met all six of the interim criteria meaning the near-term sustainability is not at risk. Data from annual seining surveys near Huntley Park were used to assess the abundance and productivity criterion in aggregate for the SMU. Spawning ground observations were used to assess the reproductive independence criterion. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.

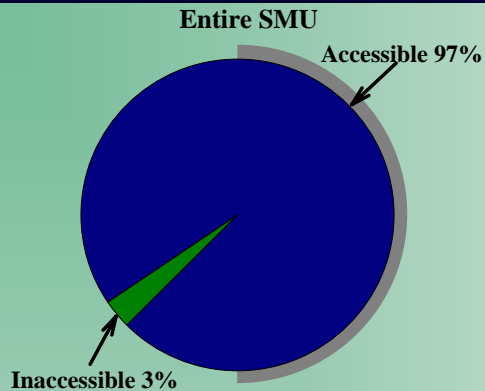
Percent of Existing Populations Meeting Criteria



Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Illinois	Pass	Pass*	Pass	Pass	Pass	Pass
Middle Rogue	Pass	Pass*	Pass	Pass	Pass	Pass
Upper Rogue	Pass	Pass*	Pass	Pass	Pass	Pass

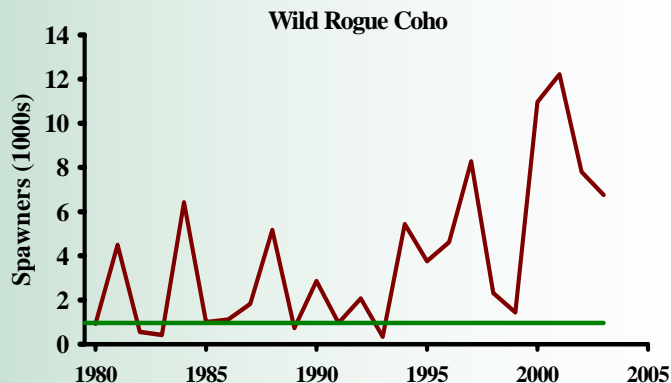


Distribution – Pass



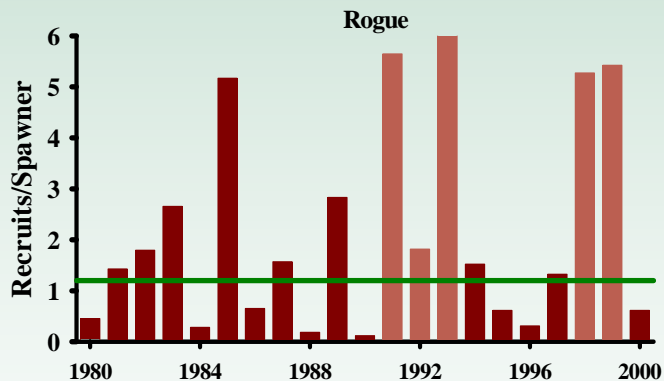
- Each of the populations within the Rogue passed the distribution criterion.
- 97% of historical coho habitat remains accessible.
- Lost Creek Dam, built in 1977, blocked access to 12 miles of historical coho habitat in the upper Rogue River. Applegate Dam eliminated 19 miles of habitat in the Middle Rogue. Over 900 miles of coho habitat remain accessible in the SMU.

Abundance – Pass



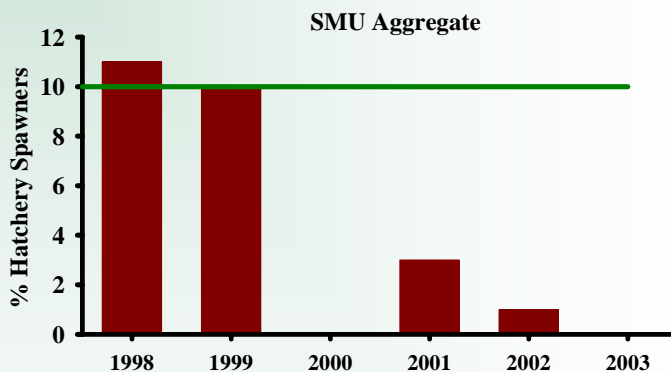
- The abundance criterion was exceeded in each of the past five years based on aggregate Rogue River data.
- All of the populations were assessed as one based on Huntley Park mark-recapture estimates adjusted for upstream harvest.
- Wild returns to the Rogue in the last four years are among the greatest in the 20 years of estimates.

Productivity – Pass



- Aggregate productivity exceeded 1.2 recruits per spawner in each of the last five broods.
- Productivity has been greater than 1.2 recruits per spawner in 13 of the last 21 broods. Recruits per spawner often exceeded 2.0.

Independence - Pass



- Each population passed this criterion in at least four of the last five years based on observed ratios of hatchery and wild fish during standard random spawning surveys.
- Observed hatchery fractions on spawning grounds are consistent with independent population estimates via run reconstruction.

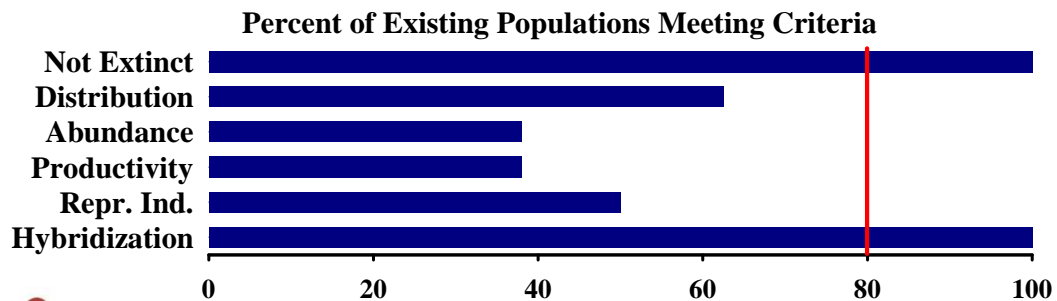
Lower Columbia Coho SMU

ESA Designation:
Threatened 2004

State Status:
Endangered

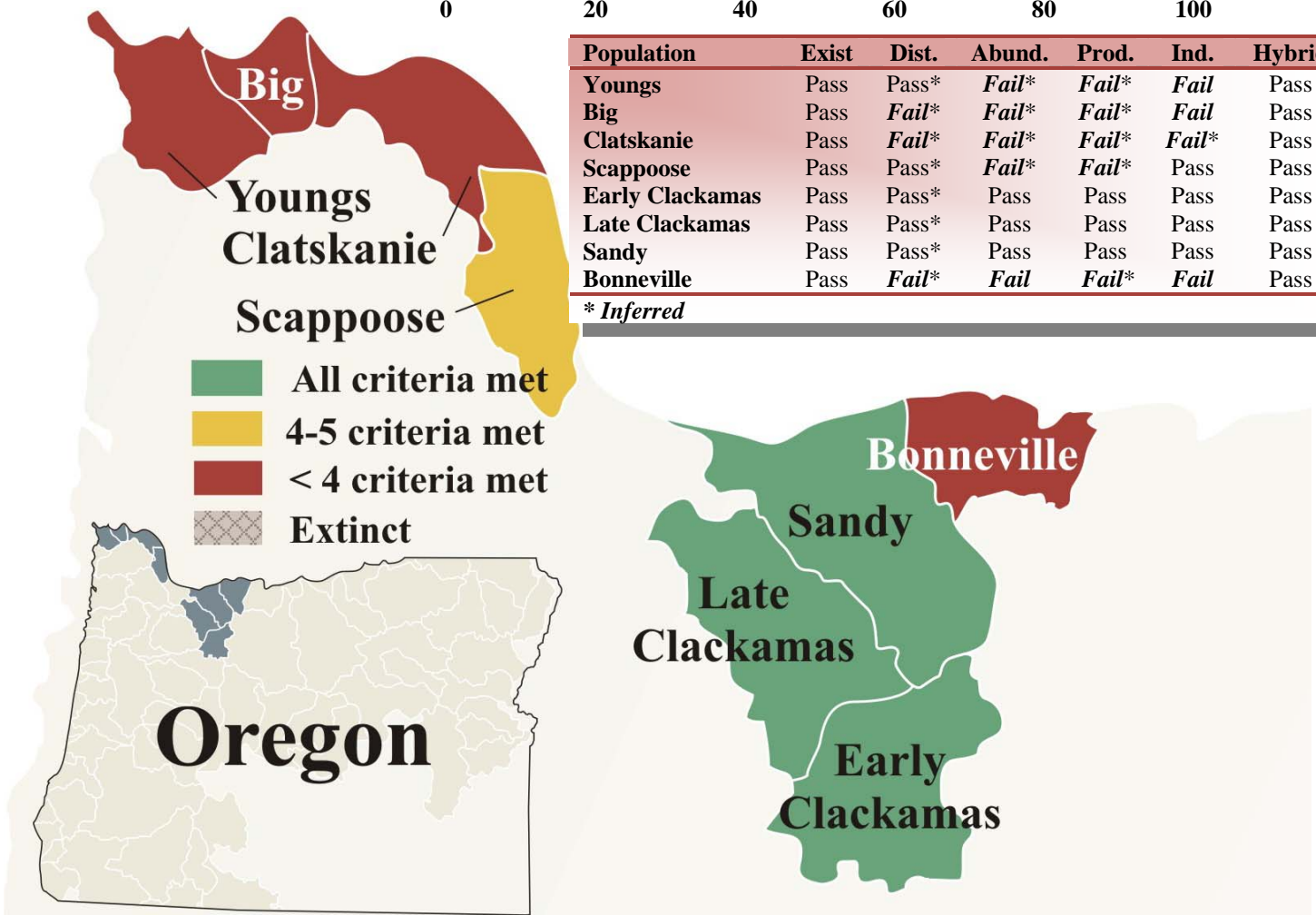
Interim Assessment:
At Risk

This SMU includes eight populations in tributaries from the Columbia River mouth to Fifteenmile Creek upstream of Hood River. Both early and late-run Clackamas coho are also included in this SMU. None of the populations are officially designated as extinct, though several populations are severely depressed and current returns may primarily be offspring of naturally spawning hatchery fish. The SMU failed four of the six criteria so its near-term sustainability is at risk. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.

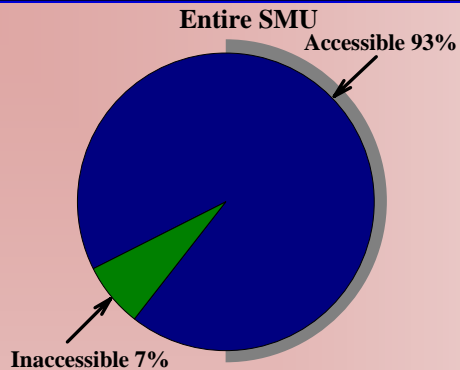


Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Youngs	Pass	Pass*	Fail*	Fail*	Fail	Pass
Big	Pass	Fail*	Fail*	Fail*	Fail	Pass
Clatskanie	Pass	Fail*	Fail*	Fail*	Fail*	Pass
Scappoose	Pass	Pass*	Fail*	Fail*	Pass	Pass
Early Clackamas	Pass	Pass*	Pass	Pass	Pass	Pass
Late Clackamas	Pass	Pass*	Pass	Pass	Pass	Pass
Sandy	Pass	Pass*	Pass	Pass	Pass	Pass
Bonneville	Pass	Fail*	Fail	Fail*	Fail	Pass

* Inferred

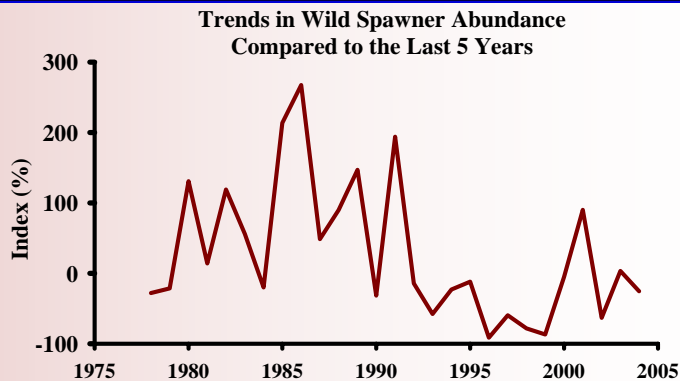


Distribution - Fail



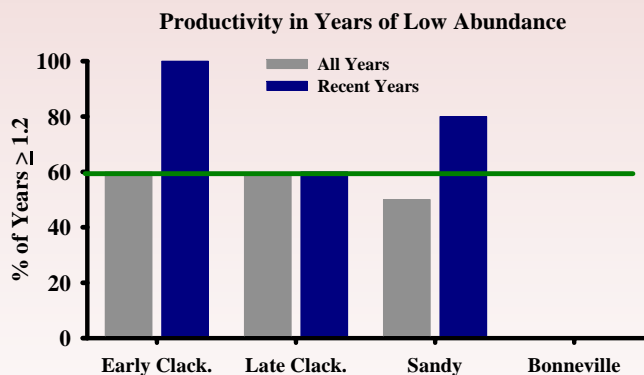
- Five of eight populations passed this criterion.
- The Sandy population has lost the most habitat (19%).
- Beginning in 2000, naturally produced coho were allowed access to habitat above hatchery barriers in Youngs River and Big Creek basins. A hatchery barrier on Gnat Creek (Big) blocks access to four miles of habitat.
- Given the small size of populations in Big, Clatskanie, and Bonneville, it is unlikely that wild spawners are distributing themselves throughout the available habitat in these populations.

Abundance - Fail



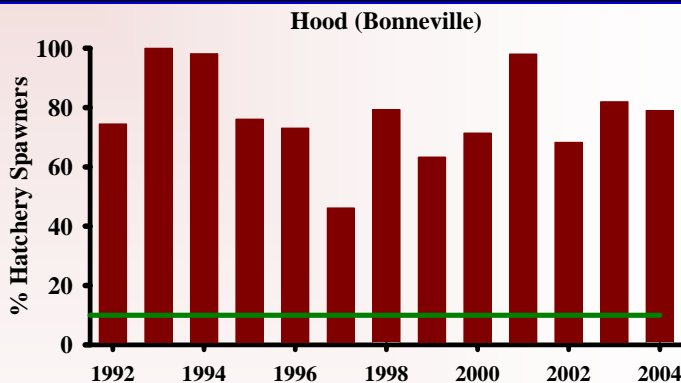
- Only three of eight populations passed this criterion.
- The graph above is an index of returns to the Clackamas (early and late run) and Sandy and reflects relative changes in abundance in those populations. Returns among those populations have declined from levels in the 1980s, but are higher than the depressed returns of the late 1990s.
- Though some spawners have been seen in populations downstream of the Willamette River the past few years, no fish were observed in index reaches for several years in the 1990s.
- Returns to the Hood River (Bonneville population) are consistently low and are primarily hatchery strays.

Productivity – Fail



- Three of eight populations met the criterion.
- Productivity in Youngs, Big, and Clatskanie was assumed to be low because abundance is low and hatchery fractions are high. Data were inconclusive in the Scappoose resulting in a treatment as a criterion failure.
- Clackamas late-run productivity has varied between 0.1 and 14.3 since 1992. Recruits per spawner in the Sandy have exceeded 1.2 for nine of 22 broods since 1978.
- Productivity of the Clackamas early-run population has generally been low over the last three generations, but has been above the interim criterion in recent years.

Independence - Fail



- Four of eight populations passed this criterion.
- Hatchery fish dominate returns to the Youngs River and Big Creek, but are less frequent in the Clatskanie and Scappoose. The Scappoose passed the criterion, but the Clatskanie did not.
- Few hatchery fish return to North Fork Dam (Clackamas) or Marmot Dam (Sandy) and current practices allow hatchery fish to be identified and prevented from passing upstream.
- No coho hatchery fish releases are made in the Hood, but hatchery fish make up more than 50% of annual returns.

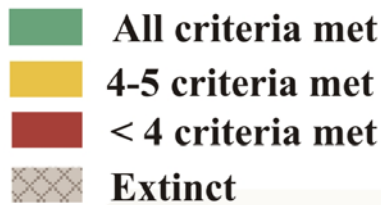
Columbia Interior Coho SMU

ESA Designation:
No Designation

State Status:
No Status

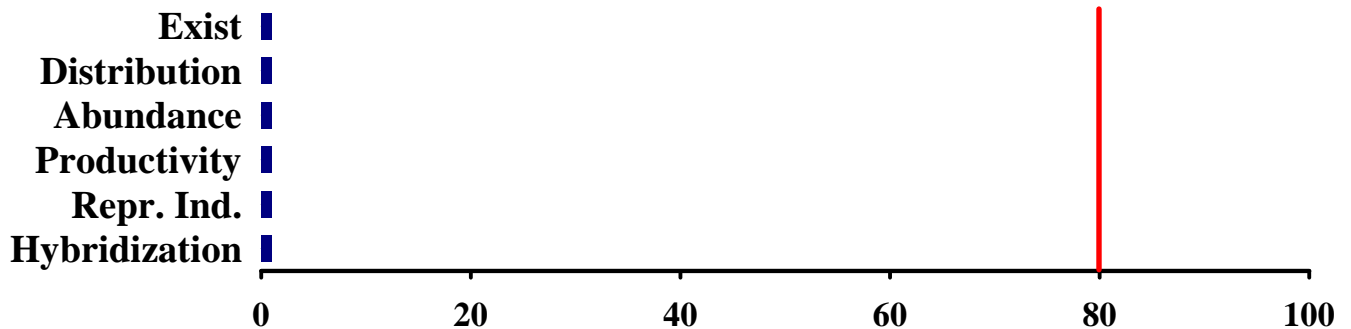
Interim Assessment:
Extinct

Both of the populations (Umatilla and Wallowa) within this SMU are extinct as a result of extensive water use, habitat degradation, and mainstem dam passage problems. It is believed that coho were eliminated from the Umatilla shortly after the construction of Three Mile Dam in 1914. Coho were virtually eliminated from the Wallowa by a 14 foot dam at river mile 3.0 in place between 1907 and 1924. Spawners were occasionally observed in the basin as late as the 1970s, but none have been seen since then.



Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Umatilla	Fail					Extinct Population
Wallowa	Fail					Extinct Population

Percent of Populations Meeting Criteria



Klamath Coho SMU

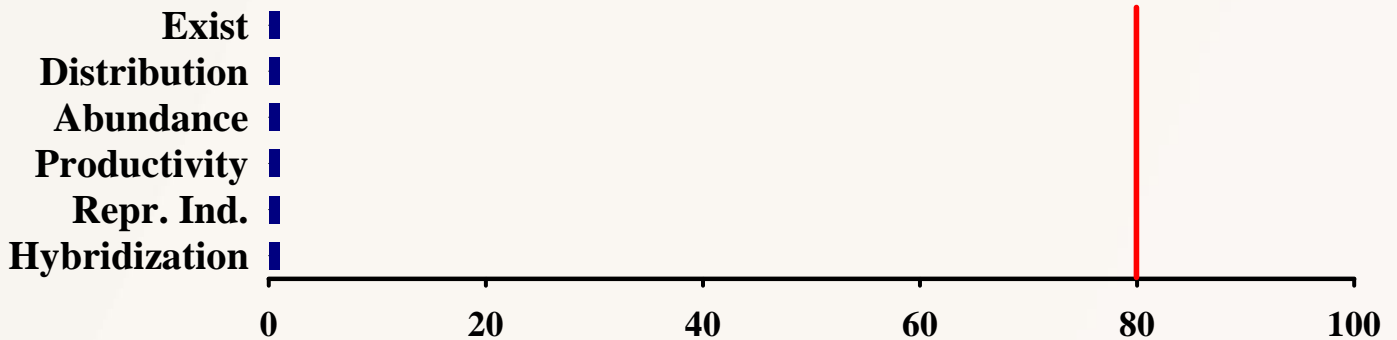
ESA Designation:
No Designation

State Status:
No Status

Interim Assessment:
Extinct

This SMU historically consisted of a single population in the Klamath basin upstream of the Oregon/California border. A series of dams has extirpated coho and other anadromous salmonids in the upper Klamath, 190 miles upstream from the river mouth. Access was originally blocked in 1918 with the installation of Copco 1 Dam. In 1925, Copco 2 Dam was built just a quarter mile downstream of the original dam. Iron Gate Dam, built in 1962, eliminated another seven miles of habitat downstream of the previous two dams.

Percent of Populations Meeting Criteria

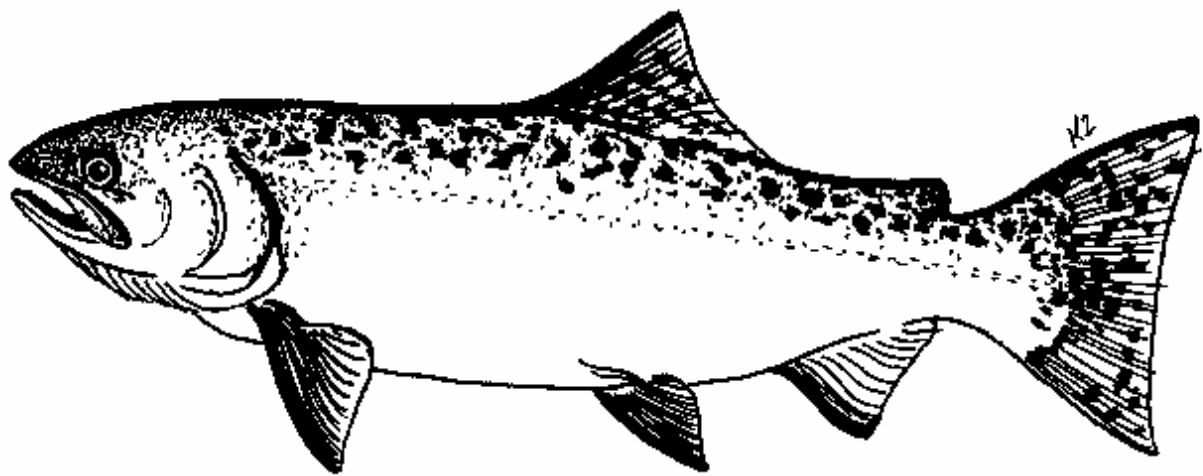


Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Upper Klamath	Fail		Extinct Population			



- All criteria met
- 4-5 criteria met
- < 4 criteria met
- Extinct

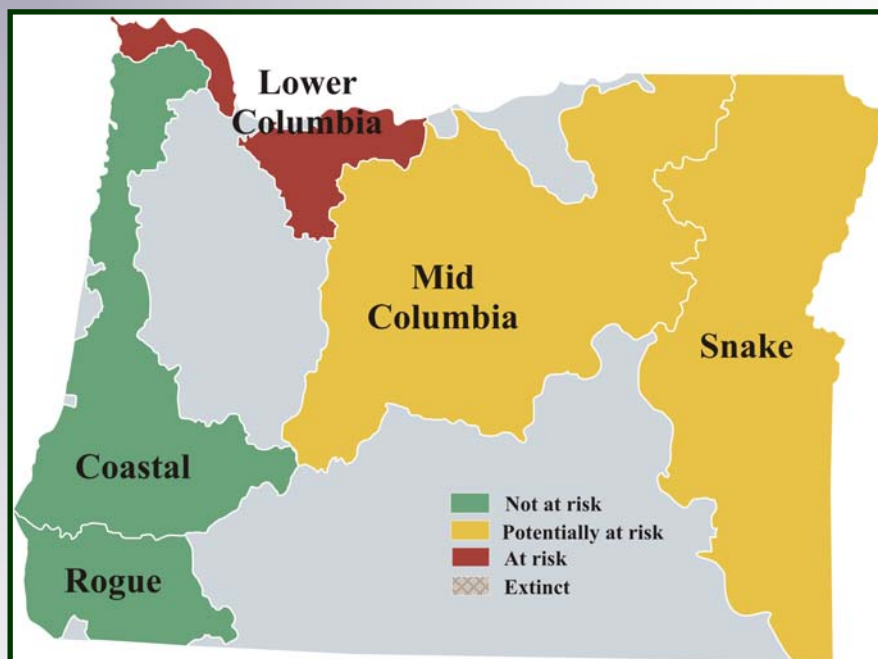




Fall Chinook



Fall Chinook return to spawn in large streams and river mainstems throughout the Oregon Coast and Columbia River, typically from October through December. Young fall Chinook emigrate to the ocean during the first summer and return 1-5 years later as the largest of the salmon species. Adults are generally 20-40 pounds and occasionally reach 70 pounds. In the ocean, they range from California to southeast Alaska with different distributions depending on river of origin.



A total of 41 historical populations are distributed among five SMUs. No fall Chinook SMU is extinct although a number of Columbia basin populations have disappeared. Lower Columbia SMUs are currently at risk due to low numbers, low productivity, and significant hatchery fractions. The mid-Columbia SMU is potentially at risk although the single remaining population is relatively healthy. Recent strong returns have improved the outlook for the Snake SMU which was rated as potentially at risk. Coastal and Rogue fall Chinook SMUs are not at risk. Immediate risks have been at least temporarily ameliorated for many Chinook SMUs by recent large returns produced by favorable ocean conditions. Lower Columbia and Snake river populations are listed under the ESA. Oregon Coastal and mid-Columbia fall Chinook populations are not federally listed.

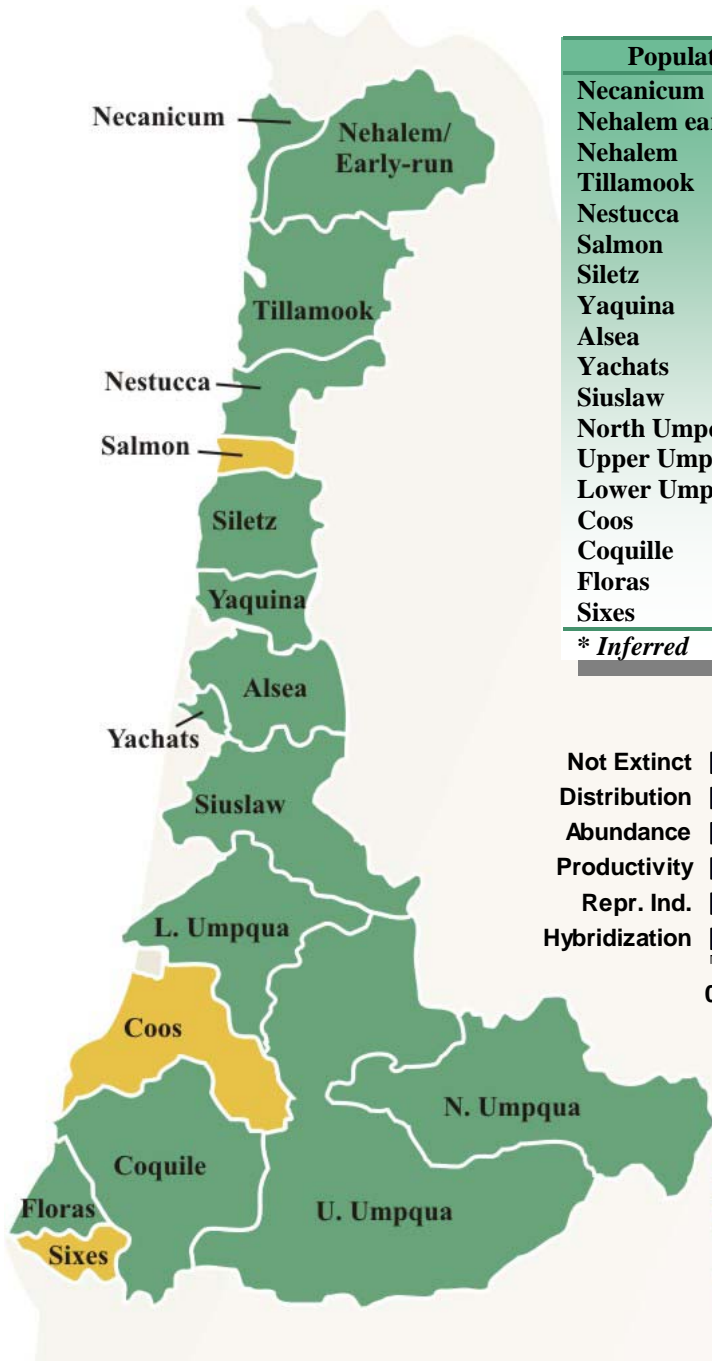
Coastal Fall Chinook SMU

ESA Designation:
Not Warranted 1999

State Status:
Not Listed

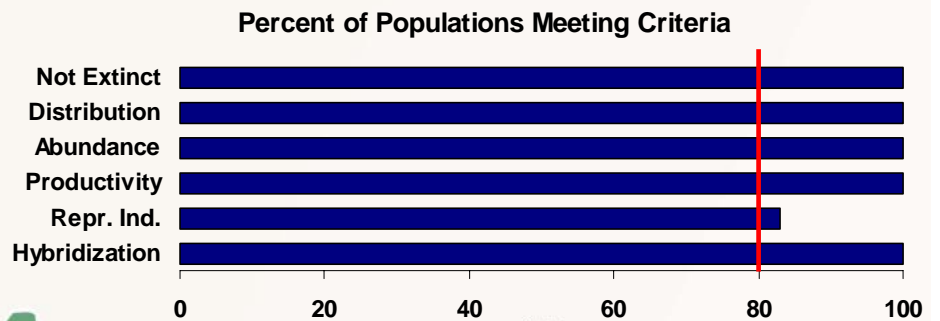
Interim Assessment:
Not at Risk

The Coastal Fall Chinook SMU includes 18 populations between the Necanicum and Sixes basins. Spawner returns to these basins have been strong in recent years, and hatchery influence is generally low. The SMU met all six criteria so the near-term sustainability of the population is not at risk. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.



Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Necanicum	Pass	Pass*	Pass*	Pass	Pass*	Pass
Nehalem early-run	Pass	Pass*	Pass*	Pass*	Pass*	Pass
Nehalem	Pass	Pass*	Pass	Pass	Pass*	Pass
Tillamook	Pass	Pass*	Pass	Pass*	Pass*	Pass
Nestucca	Pass	Pass*	Pass	Pass	Pass*	Pass
Salmon	Pass	Pass*	Pass	Pass*	Fail	Pass
Siletz	Pass	Pass*	Pass	Pass*	Pass*	Pass
Yaquina	Pass	Pass*	Pass	Pass	Pass*	Pass
Alea	Pass	Pass*	Pass	Pass	Pass*	Pass
Yachats	Pass	Pass*	Pass*	Pass*	Pass*	Pass
Siuslaw	Pass	Pass*	Pass	Pass	Pass*	Pass
North Umpqua	Pass	Pass*	Pass	Pass	Pass*	Pass
Upper Umpqua	Pass	Pass*	Pass	Pass	Pass*	Pass
Lower Umpqua	Pass	Pass*	Pass*	Pass*	Pass*	Pass
Coos	Pass	Pass*	Pass	Pass	Fail*	Pass
Coquille	Pass	Pass*	Pass	Pass	Pass	Pass
Floras	Pass	Pass*	Pass	Pass	Pass*	Pass
Sixes	Pass	Pass*	Pass	Pass	Fail*	Pass

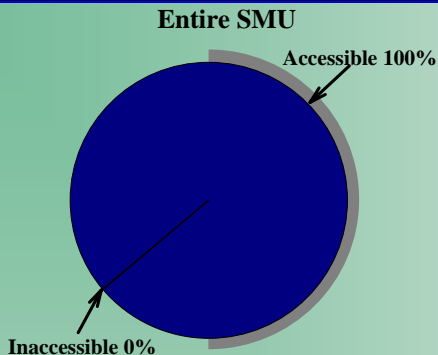
* Inferred



■ All criteria met
■ 4-5 criteria met
■ < 4 criteria met
■ Extinct

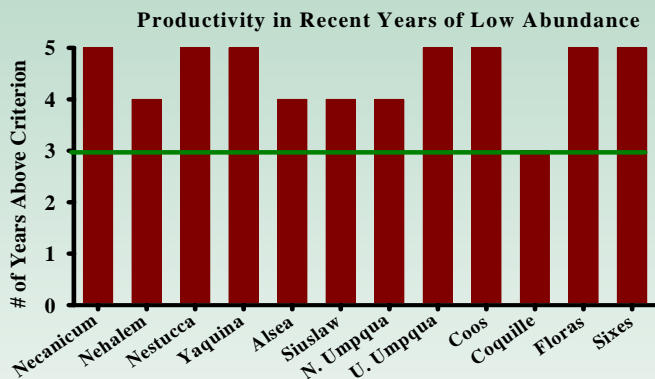


Distribution – Pass



- Essentially all of the historically-accessible habitat for fall Chinook within the SMU remains accessible today.
- Distribution and habitat use patterns within accessible habitats may vary annually, and likely do not include all of the available habitat in each year.

Productivity - Pass

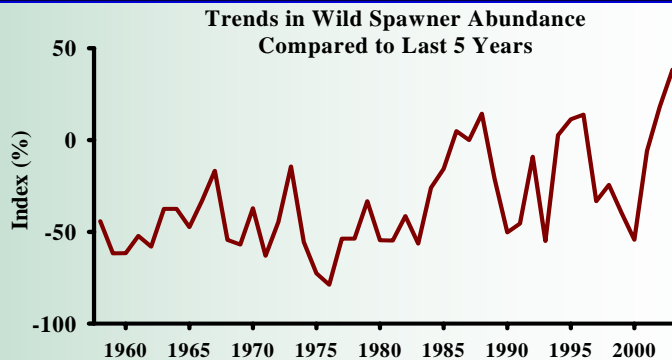


- All 18 populations passed this criterion. All 12 populations with at least five years of productivity estimates passed the criterion. The remaining six populations passed based on anecdotal information.
- The Tillamook and Siletz passed the criterion because juvenile data indicate that these populations have been well seeded in recent years, and that in years of low seeding, recruit per spawner estimates were greater than 1.2.

Additional Information

- The Nehalem contains a unique early-run population that have also been known as a “summer run”. These fish begin entering the Nehalem as early as July, and the end of their arrival overlaps with the arrival of the later-run Nehalem fall Chinook in October. These two populations are distinguished in the assessment as the “Nehalem early-run” and “Nehalem” populations.

Abundance – Pass



- All of the 18 populations passed this criterion.
- Wild fall Chinook abundance, averaged for populations across the SMU, has fluctuated but shown a general increasing trend since the 1950s.
- Returns in from 2001-2004, have been among the largest recorded in the last 45 years.

Independence - Pass

- 15 of 18 populations passed the criterion based on the absence of hatchery releases, or low proportions of hatchery fish observed during spawning surveys.
- No hatchery fall Chinook are released into the Nehalem, Siletz, Alsea, Yachats, or Siuslaw basins.
- Hatchery Chinook are released into both the Necanicum and Yaquina. The Necanicum passed because release levels are low relative to basin size, and the Yaquina passed because data from spawning surveys indicate very few hatchery fish are spawning naturally.
- Trapping data from the Coquille indicate that hatchery fractions among natural spawners are low in this basin.
- Hatchery releases are nearly 200,000 smolts annually in the Salmon River. Hatchery fish comprise more than 50% of natural spawners.
- Straying of Elk River fall Chinook into the Sixes has resulted in high hatchery fractions there.

Rogue Fall Chinook SMU

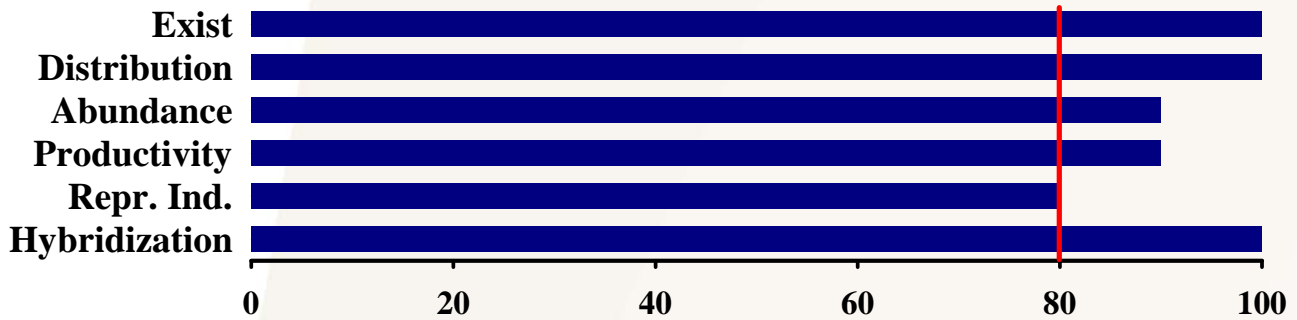
ESA Designation:
Not Warranted 1999

State Status:
Critical

Interim Assessment:
Not at Risk

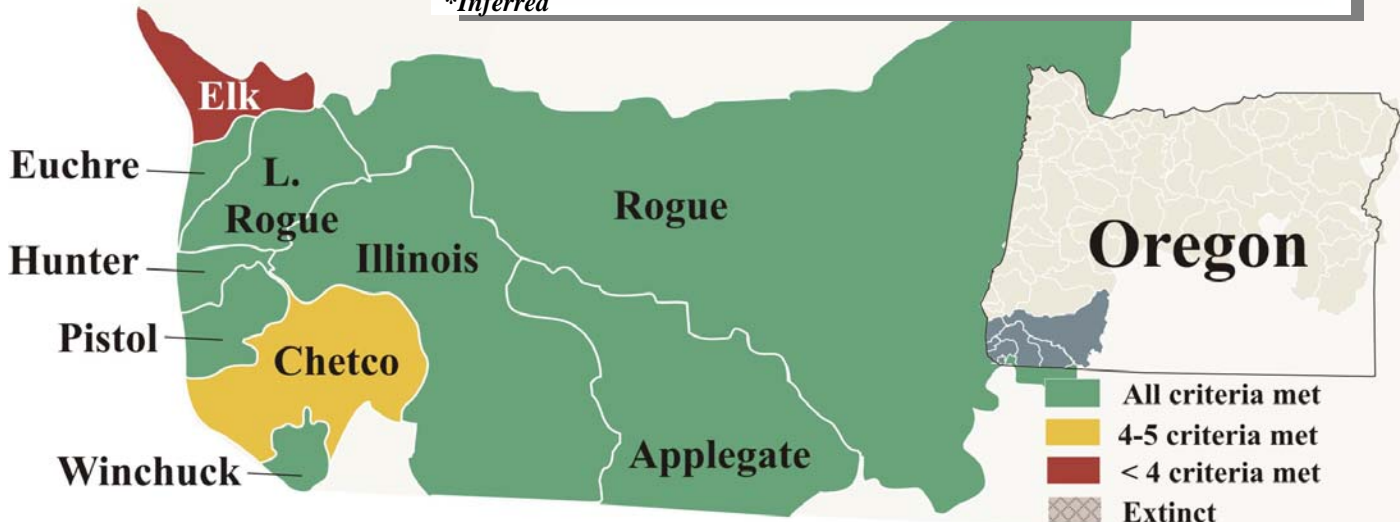
This SMU includes ten populations within coastal basins of the Klamath Mountains Province in southwestern Oregon. Spawner returns to these basins have been strong in recent years, and hatchery influences are generally low. The SMU met all six criteria so its near-term sustainability is not at risk. Significant spawning by hatchery fish within the Elk Basin caused that population to fail three of the six interim criteria. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.

Percent of Existing Populations Meeting Criteria

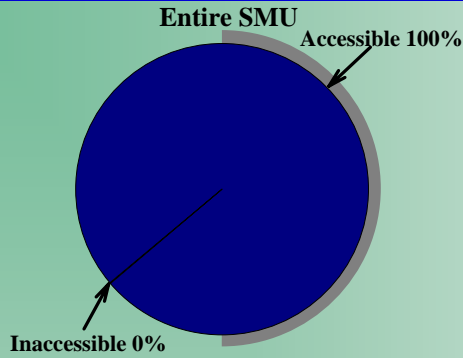


Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Winchuck	Pass	Pass*	Pass	Pass	Pass*	Pass
Chetco	Pass	Pass*	Pass	Pass	<i>Fail*</i>	Pass
Pistol	Pass	Pass*	Pass	Pass	Pass*	Pass
Lower Rogue	Pass	Pass*	Pass	Pass	Pass*	Pass
Hunter	Pass	Pass*	Pass	Pass	Pass*	Pass
Euchre	Pass	Pass*	Pass	Pass	Pass*	Pass
Illinois	Pass	Pass*	Pass*	Pass*	Pass*	Pass
Rogue	Pass	Pass*	Pass	Pass	Pass*	Pass
Applegate	Pass	Pass*	Pass	Pass	Pass*	Pass
Elk	Pass	Pass*	<i>Fail</i>	<i>Fail</i>	<i>Fail</i>	Pass

**Inferred*

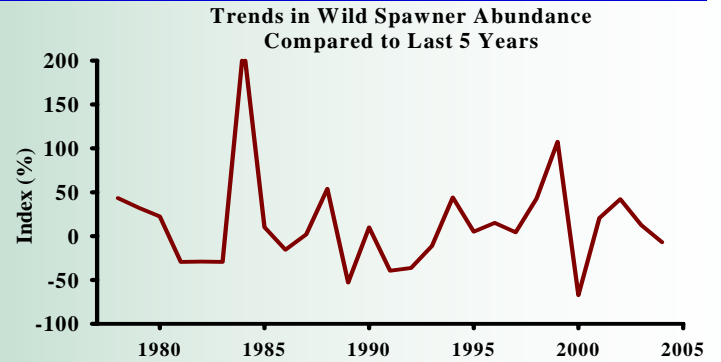


Distribution – Pass



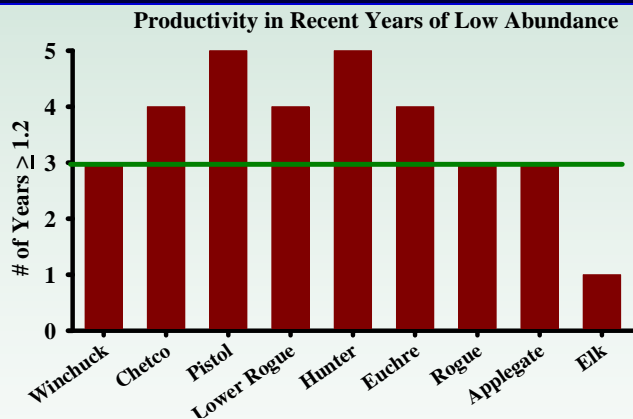
- All of the historically accessible habitat for fall Chinook within the SMU remains accessible today.
- Distribution and habitat use patterns within accessible habitats may vary annually, and likely do not include all of the available habitat each year.

Abundance - Pass



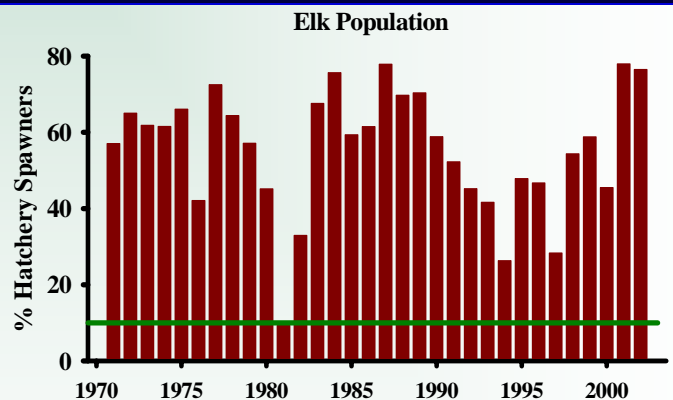
- Nine of ten populations passed the criterion. The Elk population failed because abundance has been driven by natural spawning of hatchery fish.
- No data were available for the Illinois, but it was assumed to have passed based on representative results from the rest of the SMU.
- Average abundance across the SMU has varied with no consistent trend since the late 1970s. Since different metrics are used to describe abundance in these populations, a relative index was used in the graph above.
- Recent returns in some populations have been noteworthy. Returns in 2003 were the 2nd highest observed in 26 years of monitoring.

Productivity - Pass



- Eight of ten populations passed the criterion. The Elk population failed this criterion. The Elk population has only reached or exceeded 1.2 recruits per spawner once in the past 28 years.
- A 10th population in the Illinois basin was inferred to pass because a majority of the populations within the SMU passed.

Independence - Pass



- Eight of ten populations passed this criterion.
- Spawning ground surveys in 2002 and 2003 and hatchery release levels indicate that the Winchuck, Lower Rogue, Illinois, Rogue, Pistol, and Applegate populations typically have <10% hatchery spawners.
- The Elk (graphed above) is the largest hatchery program in this SMU and hatchery spawners typically account for greater than 50% of the natural spawning population.
- The Chetco has averaged 36% hatchery spawners over the last 17 years. No year has been less than 10%.

Lower Columbia Fall Chinook SMU

ESA Designation:
Threatened 1999

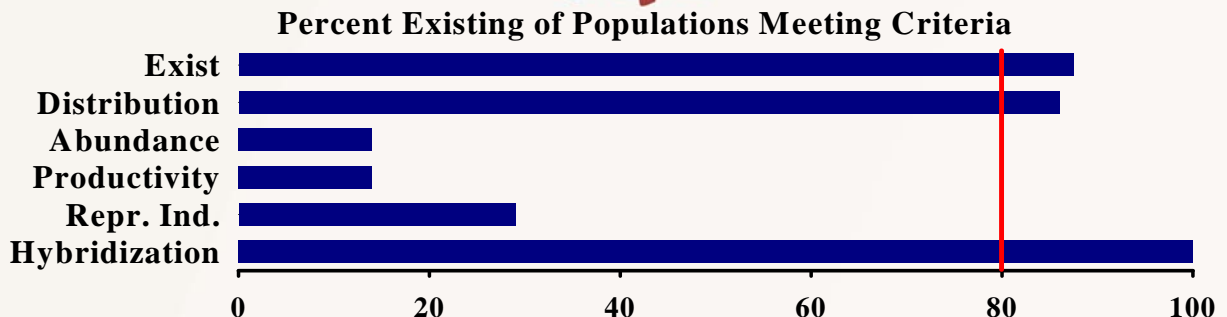
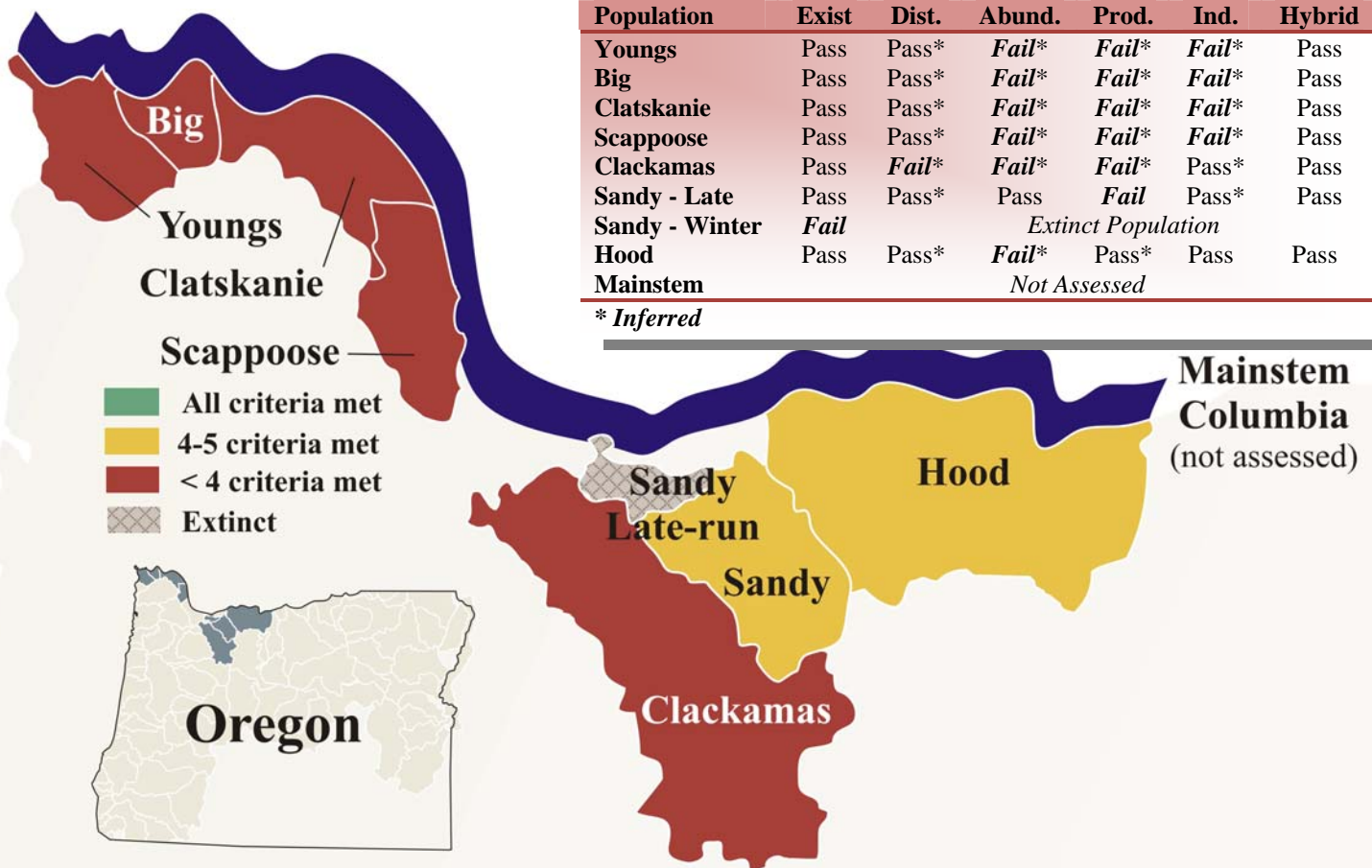
State Status:
Critical

Interim Assessment:
At Risk

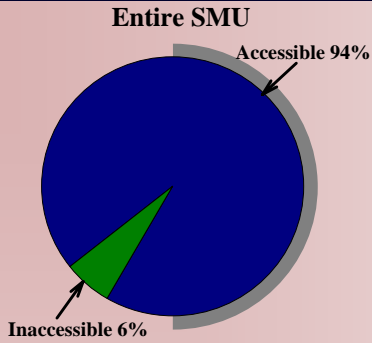
This SMU includes nine populations in Columbia River tributaries between the Columbia River mouth and Fifteenmile Creek. A mainstem Columbia River population may exist, but it was not assessed under this report. The near term sustainability of the SMU is at risk with one population extinct (Sandy winter-run), and several others with extremely low returns or a high degree of hatchery influence. Numerous hatcheries in both Oregon and Washington release fall Chinook which spawn in tributaries within this SMU. The mainstem Columbia population was not considered in the assessment outcome of this SMU because its status is poorly understood as well as its dynamics with tributary populations in both Oregon and Washington. Limited data and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of interim criteria.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Youngs	Pass	Pass*	Fail*	Fail*	Fail*	Pass
Big	Pass	Pass*	Fail*	Fail*	Fail*	Pass
Clatskanie	Pass	Pass*	Fail*	Fail*	Fail*	Pass
Scappoose	Pass	Pass*	Fail*	Fail*	Fail*	Pass
Clackamas	Pass	Fail*	Fail*	Fail*	Pass*	Pass
Sandy - Late	Pass	Pass*	Pass	Fail	Pass*	Pass
Sandy - Winter	Fail		Extinct Population			
Hood	Pass	Pass*	Fail*	Pass*	Pass	Pass
Mainstem			Not Assessed			

* Inferred

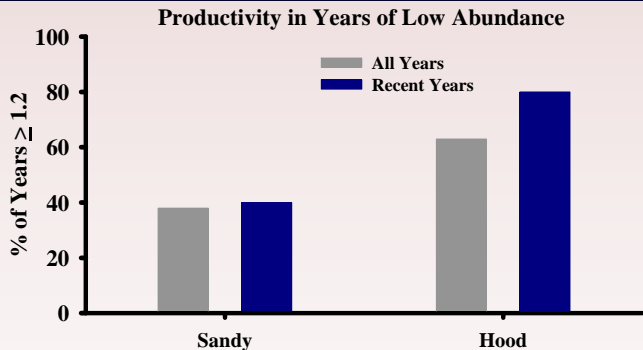


Distribution - Pass



- The SMU passed this criterion because six of seven existing populations access most of their historical habitat. Most (94%) of the habitat historically used within the SMU is still accessible today.
- Current distribution and habitat use of spawners relative to historic distribution is not well understood.
- The only population to fail was the Clackamas. With recent small runs in the Clackamas, it is likely less than 50% of the historic habitat is being used.
- Habitat modifications affecting this SMU include passage barriers within the Clackamas, Sandy, and Hood basins, and urbanization.

Productivity –Fail

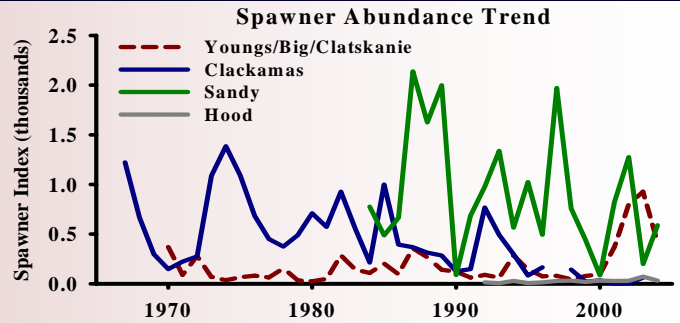


- Productivity could only be estimated in the Sandy and Hood.
- Though estimates could not be made for the Clackamas, it failed because of a consistent downward trend in returns since termination of hatchery releases.
- Productivity for the Sandy late-run has generally been less than 1.2 recruits per spawner.
- The Youngs, Big, Clatskanie, and Scappoose populations failed productivity because of high hatchery influences.

Additional Information

- The continued recent decline of fall Chinook abundance in the Clackamas despite recent improvements in ocean conditions is concern for the future of this population.

Abundance - Fail



- Only one population, the Sandy late-run passed the criterion.
- Abundance trends have been variable for each of the populations within the SMU.
- The abundance trends for the Youngs/Big/Clatskanie, and Clackamas reflect the combined abundance of hatchery and wild fish. The Youngs/Big/Clatskanie trend is in terms of fish-per-mile in index reaches. Trends in the Sandy and Hood are wild fish counts.
- Abundance in the Clackamas has been declining since in-basin hatchery releases were terminated in the 1980s.
- Returns to the Hood have consistently been below 100 fish.

Independence – Fail

- The significance of hatchery fish to natural spawning is not well understood in this SMU. Evaluations of the interim criterion were based primarily on anecdotal information.
- Three of seven existing populations passed this criterion including the Clackamas, Sandy late-run, and Hood.
- Until the late 1990s many of the returns to the Clackamas were thought to be hatchery fish. Since hatchery releases were terminated, all spawners are naturally produced but returns have dropped significantly.
- Coded-wire tag (CWT) recoveries indicated that few (<10%) spawning late-run Chinook in the Sandy were of hatchery origin.
- The hatchery fraction of returns to Powerdale Dam in the Hood ranged from 0-40% since 1992 but have been less than 10% in 3 of the last 5 years.
- CWT recoveries showed that a majority of spawners in the Youngs, Big, and Clatskanie are hatchery strays from hatchery releases in both Oregon and Washington.

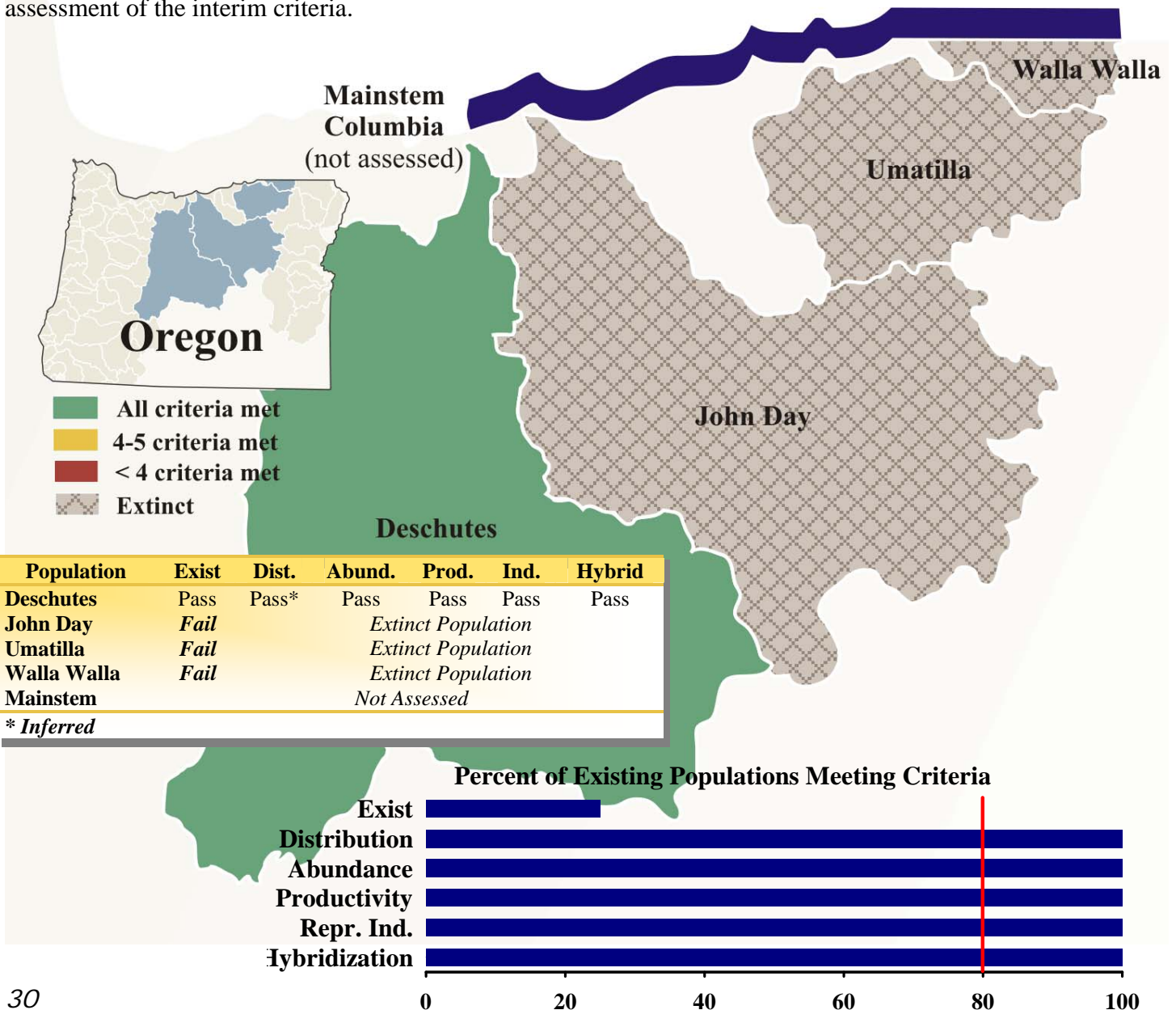
Mid Columbia Fall Chinook SMU

ESA Designation:
Not Warranted

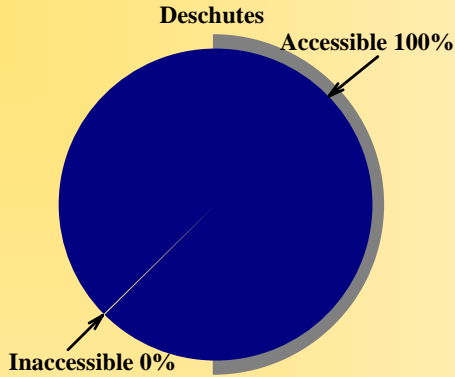
State Status:
Not Listed

Interim Assessment:
Potentially At Risk

This SMU historically included five populations in Oregon tributaries between The Dalles Dam and the Snake River. A mainstem Columbia River population may exist, but it was not assessed under this report because it is poorly understood. Three of the four historical populations in Oregon tributaries are extinct causing the SMU to fail the existence criterion. The Deschutes population still exists and met each of the five population-specific, interim criteria. The SMU met five of the six interim criteria so the near-term sustainability is potentially at risk. The loss or uncertainty in status of four of the five populations reflects the significance of historical habitat impacts but the strength of the remaining population in the Deschutes ameliorates risks of further population losses. The mainstem Columbia population was not considered in the assessment outcome of this SMU because its status and dynamics with tributary populations in both Oregon and Washington are poorly understood. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.

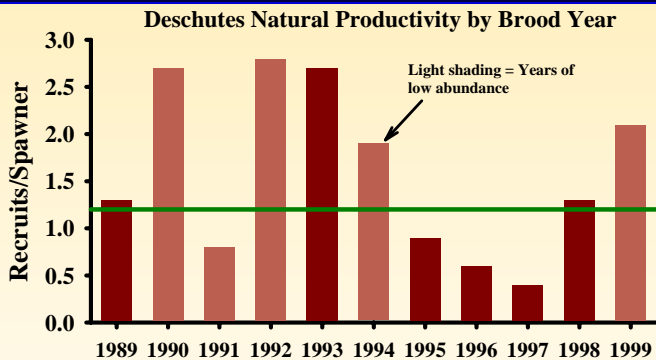


Distribution - Pass



- Deschutes fall Chinook did not historically occur in significant numbers upstream of the current site of Pelton Dam, hence, all of the available habitat in the Deschutes basin is still available today.
- The distribution of fall Chinook in this SMU was drastically reduced by the loss of the John Day, Umatilla, and Walla Walla populations – this effect is reflected in the existence criterion.

Productivity - Pass

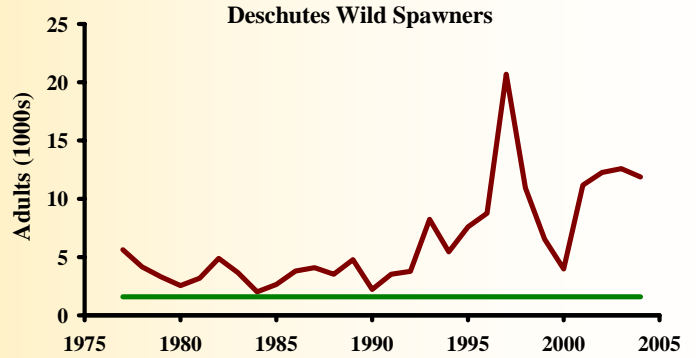


- Productivity of the Deschutes population exceeded 1.2 in seven of 11 brood years that estimates are available, including most years when spawner numbers were low.
- Recent low production rates likely resulted from large returns causing density-dependent factors to limit juvenile survival.

Additional Information

- The John Day, Umatilla, and Walla Walla populations became extinct in the early 1900s due to degradation of their lower mainstem habitats. Primary impacts included reduced flows, increased temperatures, and increased sedimentation, primarily as a result of water diversion and land use.
- While the Deschutes fall Chinook population passed all of the interim criteria, there is concern that the SMU has only one population still in existence. The persistence of an SMU is more secure if it contains several healthy populations.
- Reintroduction efforts for fall Chinook have been underway in the Umatilla since 1982. Data are not currently available to determine if these efforts are being successful in restoring a self-sustaining natural population.
- Mid Columbia fall Chinook must navigate from two to four Columbia River dams that have increased juvenile and adult mortality beyond pre-development conditions. Passage improvement efforts are ongoing.

Abundance- Pass



- Recent Deschutes spawner numbers are substantially greater than the 26-year average, the interim criterion threshold.
- The 2003 Deschutes run was the second highest since monitoring began in 1977.

Independence - Pass

- No hatchery fall Chinook have ever been released in the Deschutes basin.
- Hatchery strays from other basins made up less than 1% of the Deschutes fall Chinook observed at Sherars Falls in years of available data (1998-2002).

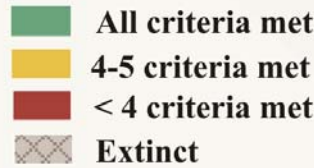
Snake Fall Chinook SMU

ESA Designation:
Threatened 1992

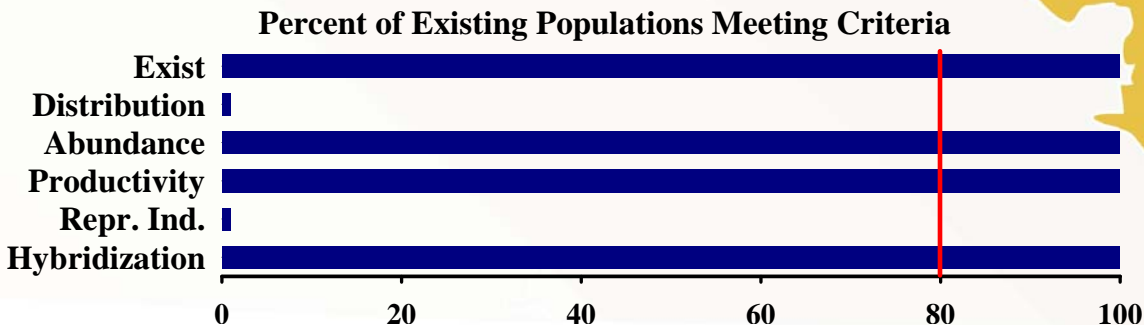
State Status:
Threatened

Interim Assessment:
Potentially At Risk

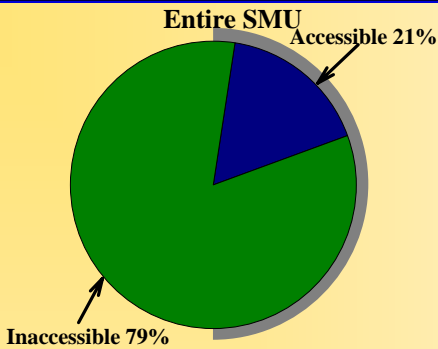
This SMU includes a single remnant population currently limited to Oregon, Washington, and Idaho portions of the Snake River between Lower Granite Reservoir and Hells Canyon Dam. Construction of three dams in Hells Canyon eliminated access to historic spawning areas in tributary mainstems and the Snake mainstem as far upstream as Shoshone Falls in central Idaho. Numbers today are near 5% of estimates in the 1940s, but in the last few years have approached the capacity of remaining habitat due to aggressive hatchery supplementation and favorable ocean conditions. The Snake population met four of six interim risk criteria leading to the conclusion that its near-term sustainability is potentially at risk. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.



Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Snake	Pass	<i>Fail</i>	Pass	Pass	<i>Fail</i>	Pass

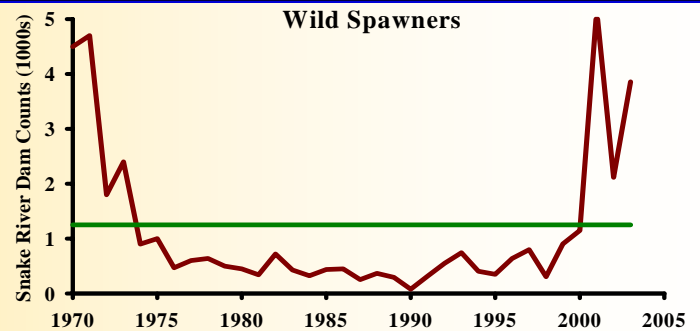


Distribution – Fail



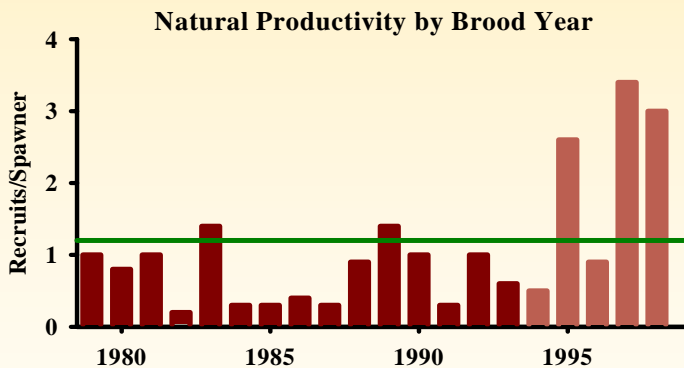
- Only 21% of the habitat area historically available to fall Chinook in the Snake basin remains accessible.
- Construction of the lower Snake and Hells Canyon dam complexes eliminated much of the historical habitat. Prior to dam construction, adults migrated as far upstream as Shoshone Falls, Idaho.
- Current spawning areas include the Snake mainstem – between the upstream end of Lower Granite Reservoir and Hells Canyon Dam - and the lower portions of large tributaries including Oregon’s Grande Ronde and Imnaha rivers.

Abundance - Pass



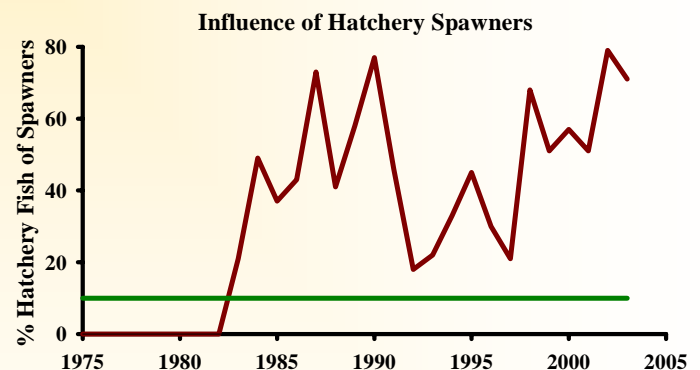
- In the early 1940s, the Snake return averaged 72,000 fish. By the 1950s the number dropped to 15,000-29,000. In the early 1970s, counts at Little Goose Dam were near 5,000. Between 1975 and 2000, counts at Lower Granite Dam ranged between 75 and 1,000 fish.
- Returns in 2001-2003 are the first since 1973 to be above the criterion threshold. These returns are associated with aggressive hatchery supplementation and good ocean conditions.
- Recent redd counts in the Grande Ronde and Imnaha rivers have increased in conjunction with Lower Granite escapements.

Productivity - Pass



- Productivity has exceeded 1.2 recruits per spawner in only five of the last 25 years despite consistently low parent abundance levels.
- Recent productivities of greater than 1.2 recruits per spawner coincide with good ocean conditions.

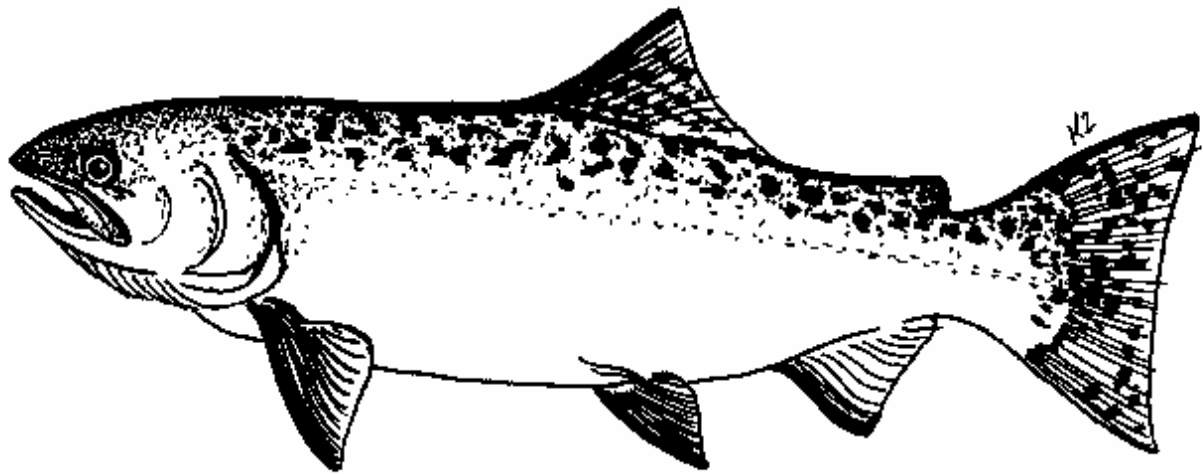
Independence - Fail



- The independence criterion was exceeded in each of the last 21 years for the single Snake River population.
- Hatchery conservation programs are an important tool in attempts to preserve Snake River fall Chinook. Fish are released from a series of acclimation sites upstream from Lower Granite Dam.
- Hatchery fish have made up 47% of the natural spawning population since 1983.

Additional Information

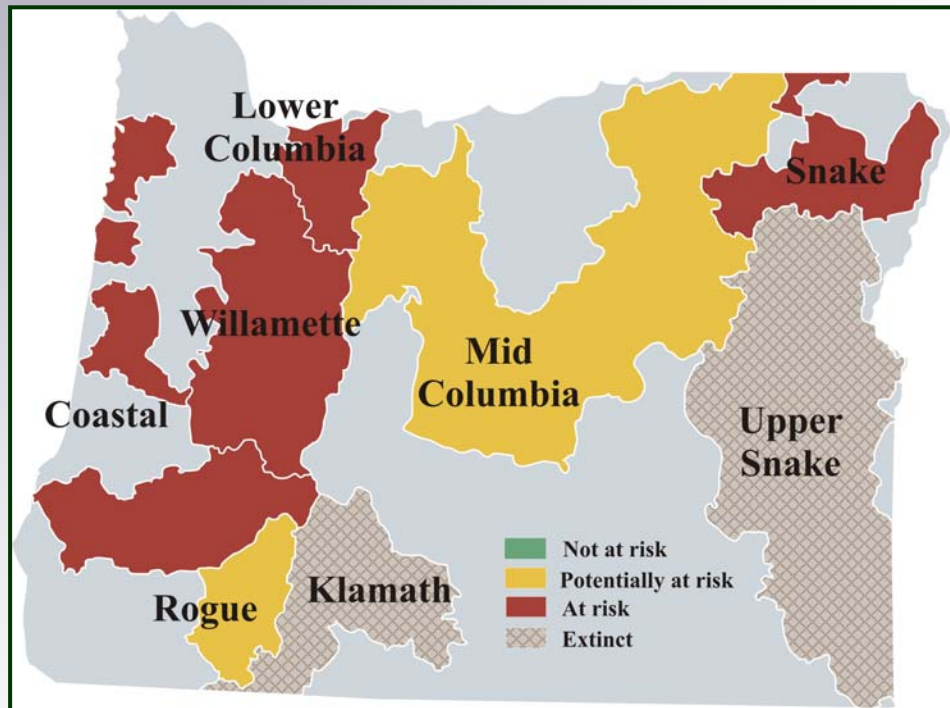
- Snake fall Chinook numbers are affected by, mixed stock fisheries, downstream and upstream passage mortality at eight Snake and Columbia river dams, as well as migration effects of flow and temperature changes related to hydropower system operation.



Spring Chinook



Spring Chinook are found in large river basins of the Oregon Coast, Willamette River, and Columbia River. These fish typically return to freshwater from March through June and spawn in late summer. Adults average 10-20 pounds. Juveniles generally leave freshwater in their second spring and adults return at ages 3 to 6. In the ocean, spring Chinook are far northward



migrating stocks. Eight spring Chinook SMUs include 40 historical populations. The upper Snake and Klamath SMUs are blocked by impassable dams and are extinct. Every remaining SMU is at risk or potentially at risk. Low numbers, low productivity, and significant hatchery fractions place the Snake SMU at risk. Lower Columbia and Willamette SMUs are at risk because some populations are extinct and others include significant fractions of hatchery fish. Extinction of half of the historical mid-Columbia populations flags this SMU as potentially at risk. The coastal SMU is at risk because abundance and productivity are low and hatchery fractions are high in a few populations. The Rogue SMU is potentially at risk from high levels of natural spawning by hatchery fish.

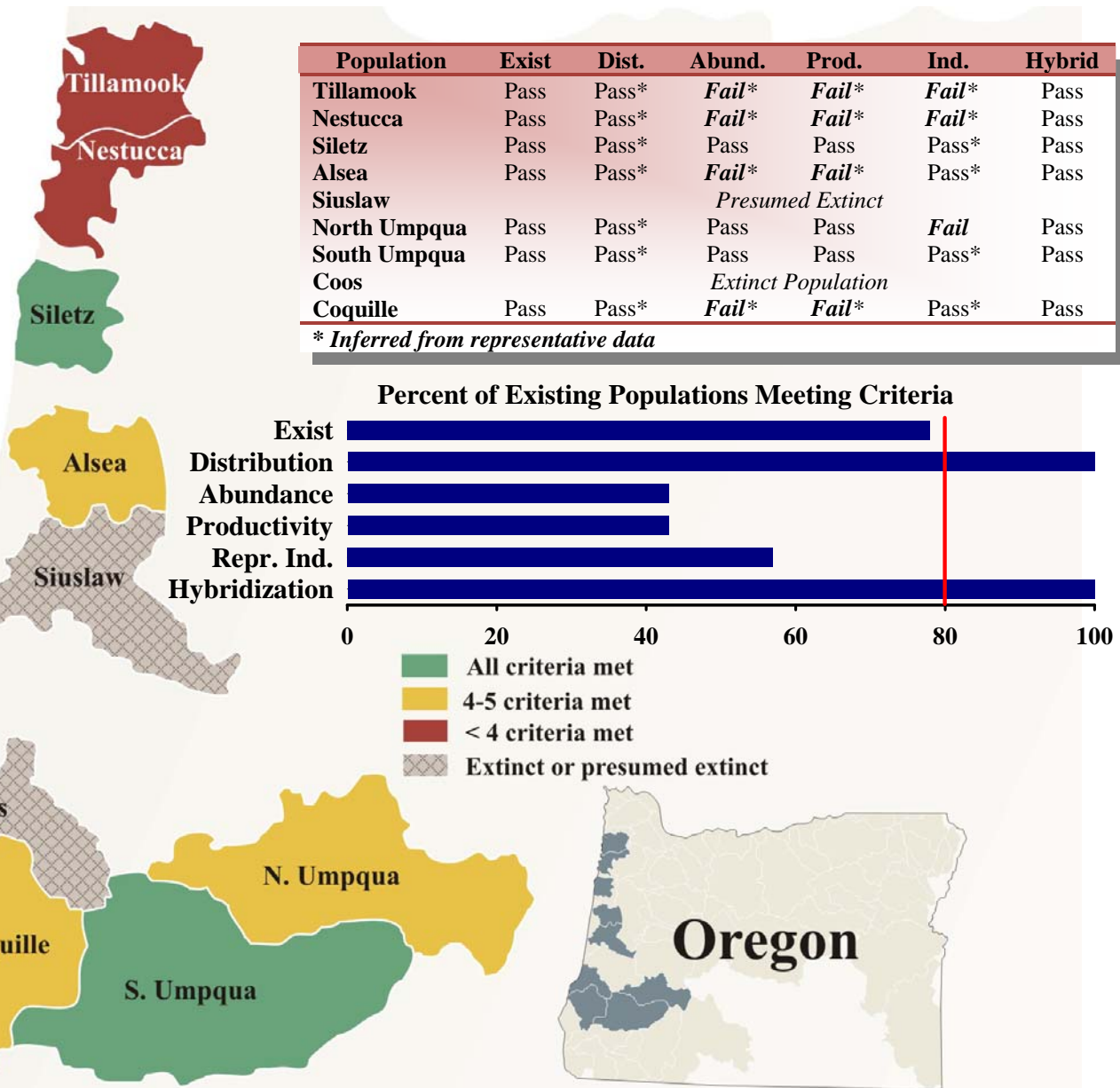
Coastal Spring Chinook SMU

ESA Designation:
Not Warranted 1998

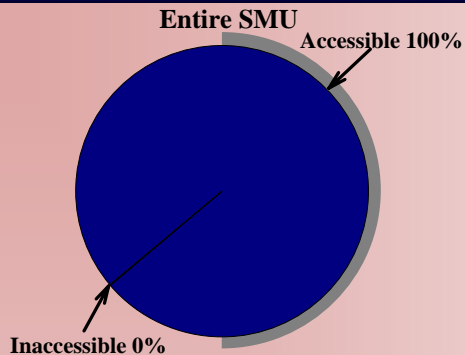
State Status:
Not Listed

Interim Assessment:
At Risk

This SMU includes nine populations between Tillamook Bay and the Coquille River. There is no comprehensive monitoring program for coastal spring Chinook, so the assessment was based on available indices of abundance and anecdotal information. The SMU met only two of six criteria so the near-term sustainability of the SMU is at risk. While a couple of the populations appear to be stable and passed each of the criteria, it is thought that returns to the SMU are generally low. The 1998 ESA designation of “Not Warranted” by NOAA Fisheries does not distinguish between coastal fall Chinook and spring Chinook. Elsewhere in this report coastal fall Chinook are assessed as “Not at Risk”. Limited data and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of interim criteria.



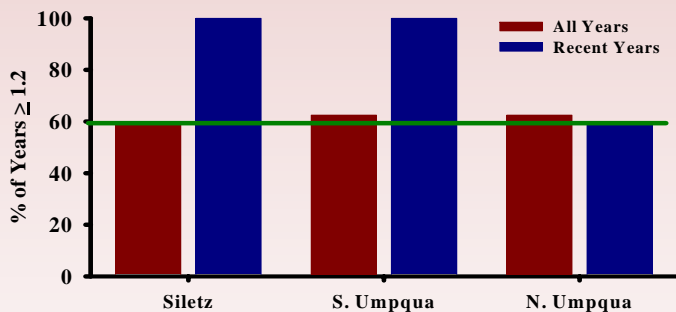
Distribution – Pass



- Essentially all of the potential spring Chinook habitat within the SMU remains accessible today.
- Distribution and habitat use patterns within accessible habitats may vary annually, and likely do not include all of the available habitat in each year. Some of the accessible habitats may not be in a condition that they can currently be used as they were in pre-settlement times.
- Habitat changes and use patterns have not been reduced to the point where this criterion is failed.

Productivity - Fail

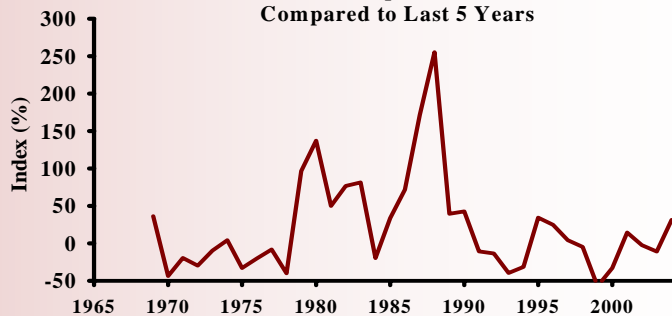
Productivity in Years of Low Abundance



- Three of seven existing populations passed this criterion.
- Productivity could not be estimated for the Tillamook and Nestucca because hatchery and wild fish could not be distinguished in the abundance data. These populations were assumed to have failed based on reduced returns since the late 1980s.
- The Alsea failed the criterion due to chronically low abundance indicating the population is not resilient.
- The remaining populations exceeded the 1.2 recruits per spawner standard in at least three of the last five years. Productivity in recent years of low abundance has been somewhat better than the long-term average in the Siletz and South Umpqua.

Abundance – Fail

Trends in Wild Spawner Abundance Compared to Last 5 Years



- Three of seven existing populations passed the criterion.
- The Tillamook and Nestucca populations failed this criterion because returns (hatchery and wild combined) have declined since the 1980s despite significant hatchery releases. The Alsea and Coquille failed because of chronically low returns.
- Returns in each of the other existing populations exceeded the criterion in at least four of the last five years.
- The abundance trend above incorporates data from the Tillamook, Nestucca, Siletz, North Umpqua, and South Umpqua populations. Since abundance is measured by different metrics in these basins, a relative index was used within the graph.

Independence - Fail

- Four of seven existing populations passed this criterion.
- The Tillamook and Nestucca failed based on the presence of hatchery releases.
- The Siletz, Alsea, South Umpqua, and Coquille each passed because no hatchery fish are released there.
- The assessment for the North Umpqua was based on a 2004 spawning survey that showed 17% of naturally spawning fish were hatchery origin. Based on hatchery release practices, it is likely that this estimate is representative of recent years.

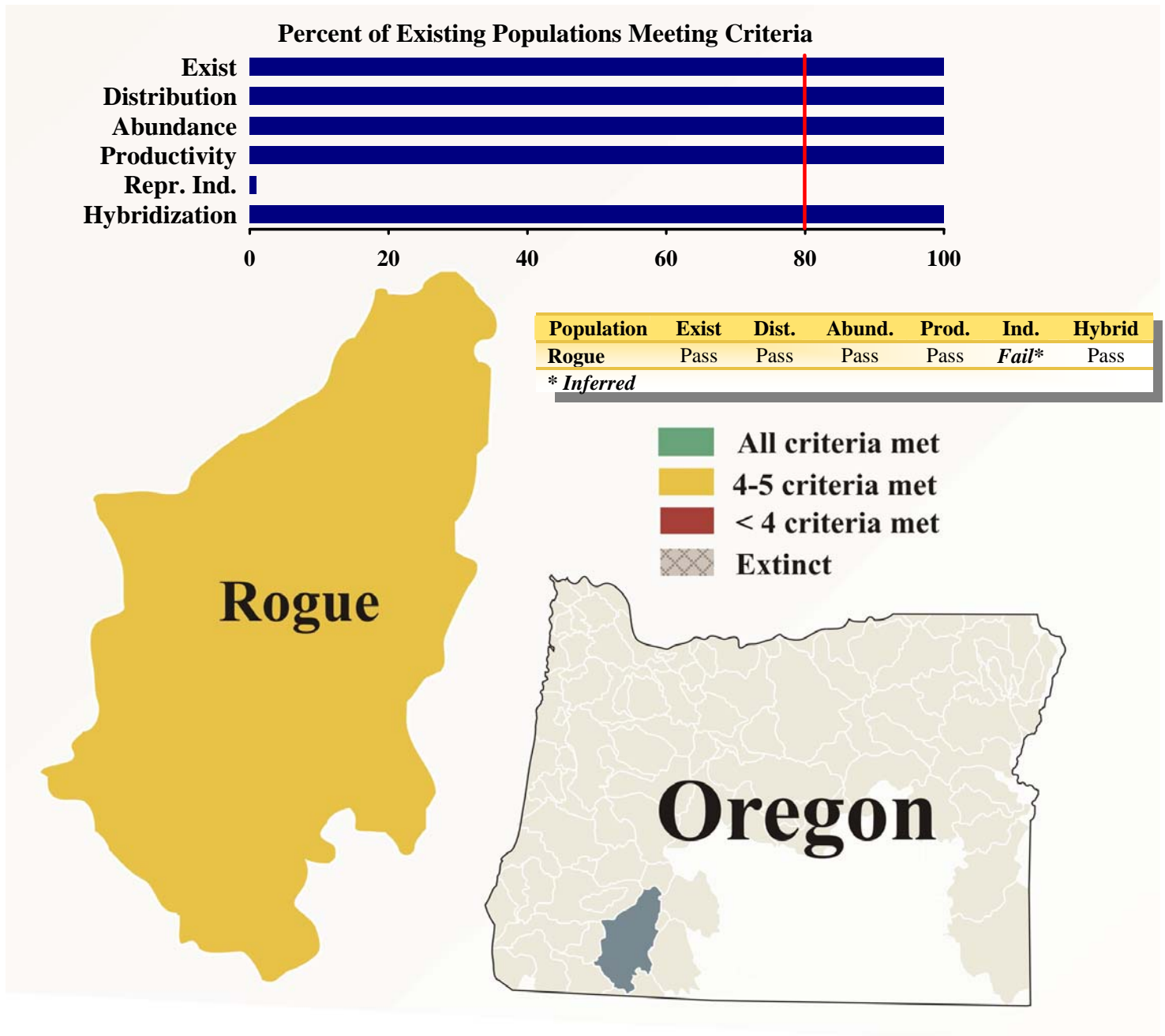
Rogue Spring Chinook SMU

ESA Designation:
Not Warranted 1999

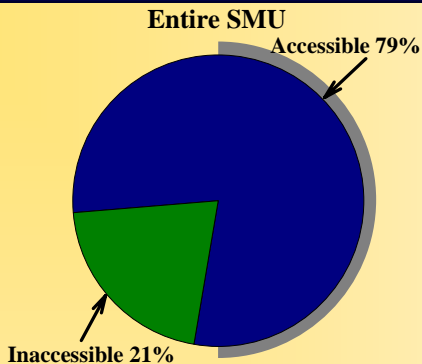
State Status:
Not Listed

Interim Assessment:
Potentially at Risk

This SMU consists of a single population upstream of Gold Ray Dam in the Rogue River. The population passed all criteria except for reproductive independence resulting indicating the near-term sustainability of the SMU is potentially at risk. The Rogue Basin is home of the largest Chinook hatchery program on the Oregon coast. Cole Rivers Hatchery releases approximately 1.9 million spring Chinook smolts annually to mitigate for habitat lost to Lost Creek Dam.

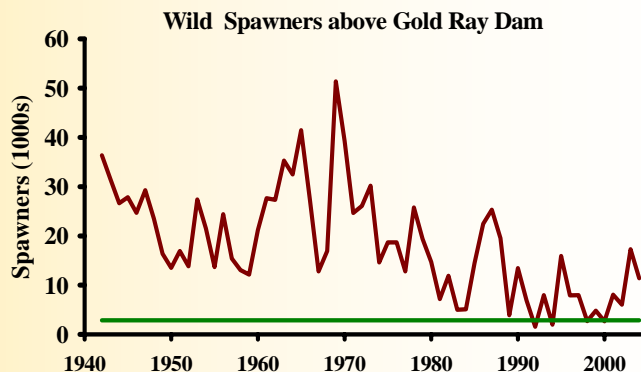


Distribution – Pass



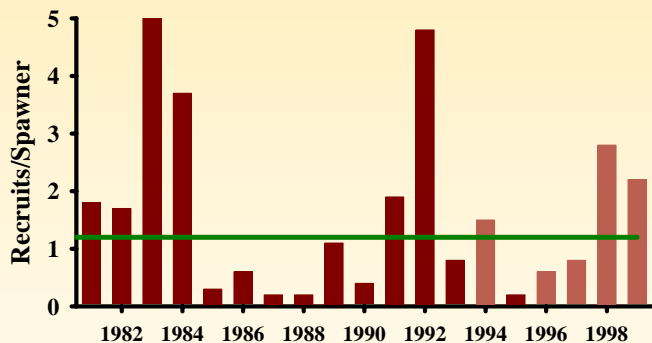
- Construction of Lost Creek Dam in 1977 on the mainstem upper Rogue eliminated access to 21% of the spring chinook habitat in the basin.
- More than 50% of the historically accessible habitat remains accessible today, so the SMU passes the criterion.

Abundance - Pass



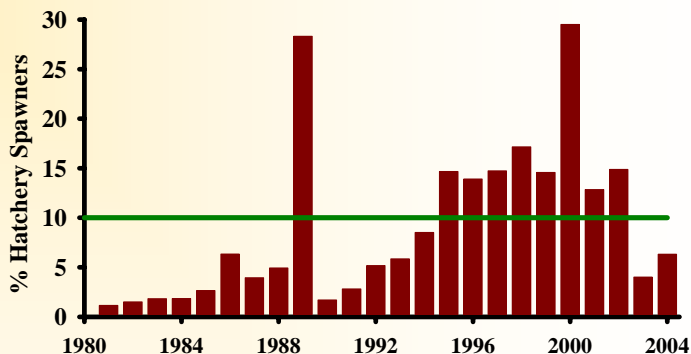
- Returns have generally declined since 1970 with a slight increase since 2000.
- The graph above reflects adult and jack abundance up until 1977, and only adult abundance since 1978. Jacks have made up 18% of returns since 1978.
- The population exceeded the abundance criterion in four of the last five years.

Productivity - Pass



- The population met the criterion threshold of 1.2 in three of the last five years of low abundance. In the graph above, the last five years of low abundance are identified by lighter shading.
- Productivity estimates in the Rogue have exceeded 1.2 recruits per spawner in nine of the last 19 years.

Independence - Fail



- Over 10% of spawners have been of hatchery origin in three of the last five years.
- The proportional contribution of hatchery spawners to the natural spawning population has decreased with increased returns of wild fish in the last couple years.
- From 1995-2002 hatchery fractions among natural spawners exceeded 10% in every year.

Additional Information

- A new regulation was implemented in 2004 to reduce freshwater harvest of wild spring Chinook in the Rogue. Anglers are now limited to one non-finclipped fish per day and three per year. Previous regulations allowed harvest of two non-finclipped fish per day and 20 per year.
- A Conservation Plan is currently under development for Rogue spring Chinook. The Plan will identify goals for the wild spring Chinook population in the Rogue and management strategies that will help achieve those goals.

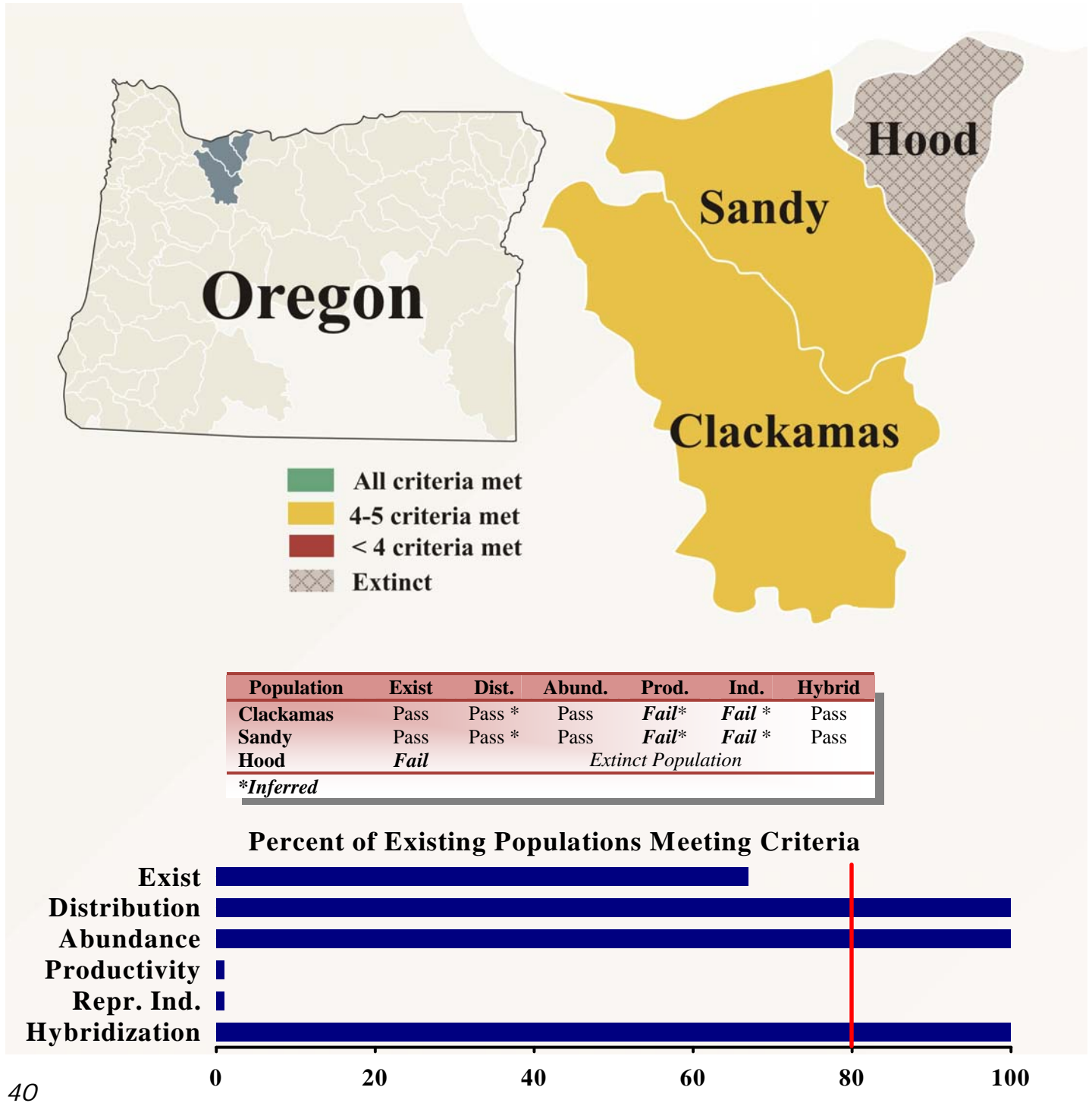
Lower Columbia Spring Chinook SMU

ESA Designation:
Threatened 1999

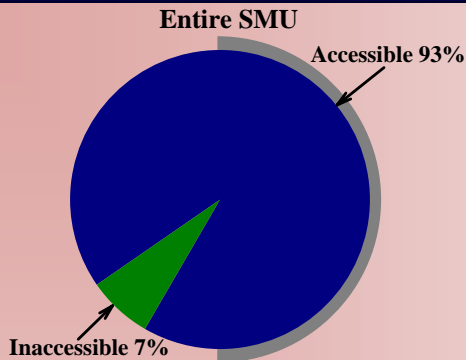
State Status:
Not Listed

Interim Assessment:
At Risk

This SMU includes Clackamas, Sandy, and Hood historical populations. The Clackamas and Sandy have been substantially influenced by hatchery fish. The Hood population is extinct. The SMU only met three of the interim criteria indicating the near-term sustainability is at risk. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.



Distribution – Pass



- Both remaining populations passed the criterion.
- 93% of the historical spring Chinook habitat within the SMU remains accessible today, though actual habitat use is unknown.
- Hydrosystem modifications on the Sandy have eliminated 18 miles of historic habitat.
- All of the historical spring Chinook habitat in the Hood Basin (56 miles) is still accessible today.

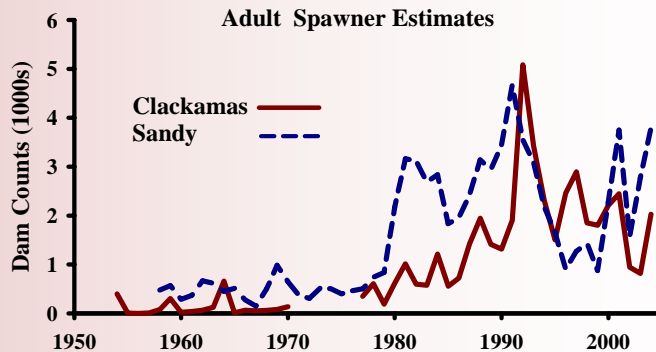
Productivity – Fail

- Uncertain hatchery fractions among spawners prior to 2002 in the Clackamas and 1996 in the Sandy made estimating productivity difficult. High numbers of hatchery spawners resulted in low estimates of productivity for both populations. However, parent abundance levels were typically above the 30-year natural return average.
- The Clackamas failed because in one of two years of low abundance, productivity was below 1.2. The Sandy failed based on insufficient information. Precautionary application of the interim criteria treat incomplete data as a failure in assessment of risks to the SMU.

Additional Information

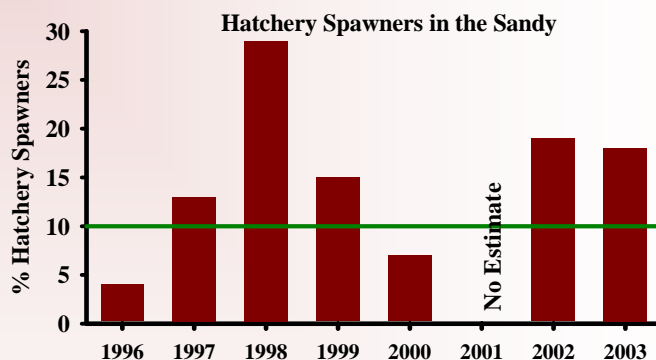
- The Confederated Tribes of the Warm Springs Reservation of Oregon, Bonneville Power Administration, and ODFW are currently operating a supplementation program to re-introduce spring Chinook in the Hood Basin using Deschutes stock. Initial returns over the past decade have been low.
- Management practices are aimed at reducing passage of hatchery adults into natural production areas. In recent years, all spring Chinook smolts released into the Clackamas and Sandy have been adipose fin-clipped. Only unclipped adults returning to North Fork Dam and Marmot Dam are allowed upstream.

Abundance - Pass



- Trends above reflect returns of both wild and hatchery fish prior to 2002 in the Clackamas, and prior to 1996 in the Sandy, because spawner origin could not be identified.
- Prior to major hatchery fish returns in the 1980s, natural returns were consistently at low levels.
- Both the Clackamas and Sandy have exceeded the interim criterion in each of the last five years.

Independence - Fail



- Both the Clackamas and Sandy failed this criterion.
- Prior to 2002, not all hatchery returns were adipose fin-clipped so many hatchery fish were passed above the dams in each basin onto the spawning grounds.
- Since 2002, only unmarked fish have been passed above the dams. However, research has found that there are many hatchery fish even among the unmarked fish passed above the dam.
- Despite passing only non-finclipped fish, studies found that 24-30% of spawners above North Fork Dam, and 18-19% of spawners above Marmot Dam were hatchery fish in 2002 and 2003.

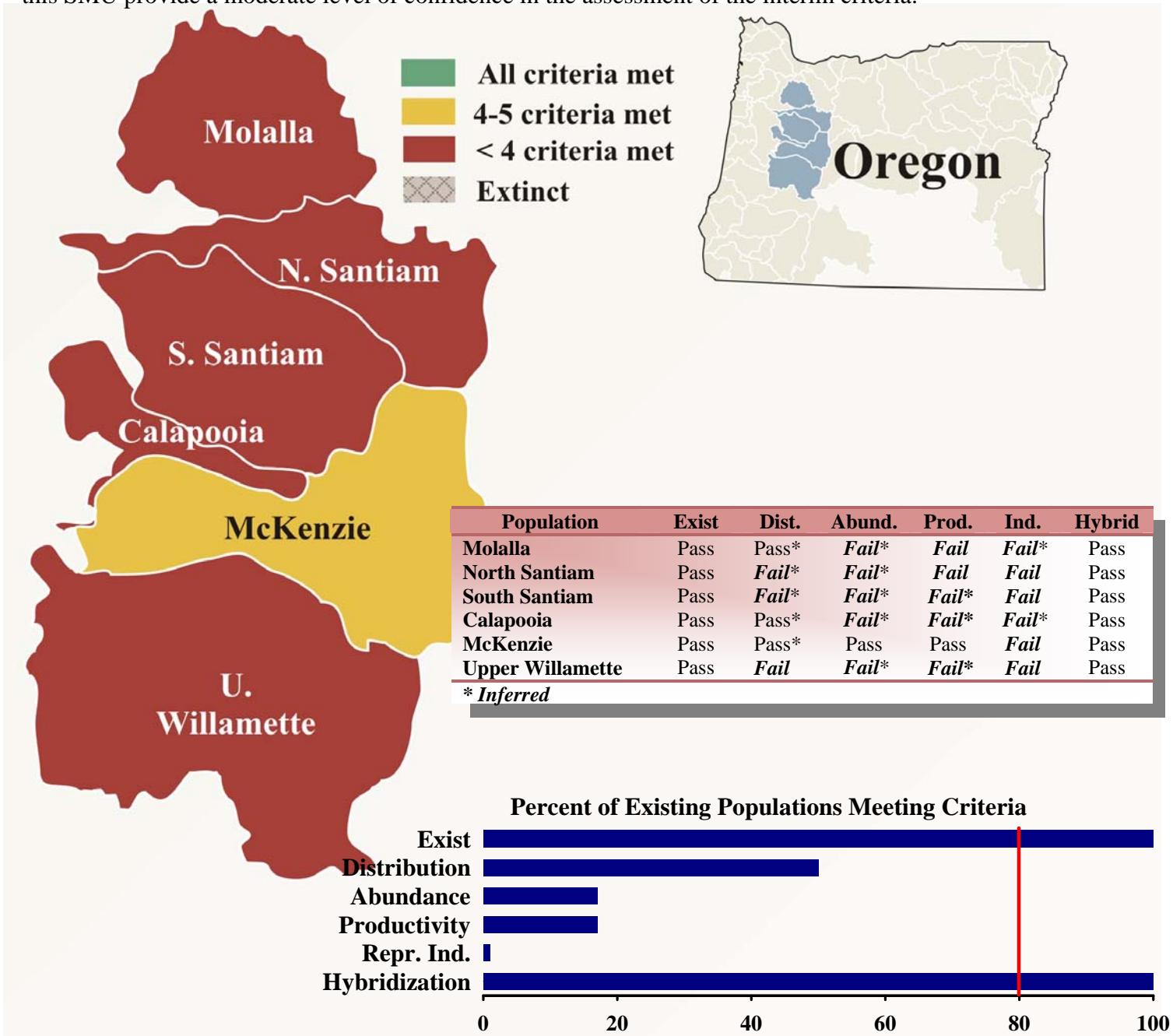
Willamette Spring Chinook SMU

ESA Designation:
Threatened 1999

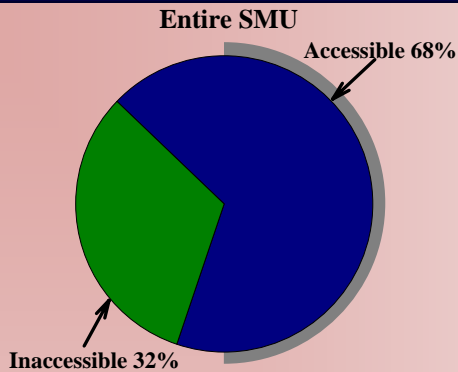
State Status:
Not Listed

Interim Assessment:
At Risk

This SMU includes six populations in the basin above Willamette Falls. The SMU only met two of the six interim criteria leading to the conclusion that the near-term sustainability of the SMU is at risk. The largest remaining natural population in the SMU is in the McKenzie River. Tributary dams block passage to most historical habitats, and have altered habitat quality in downstream reaches. Hatchery fish make up a substantial portion of natural spawning within the Willamette Basin. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.

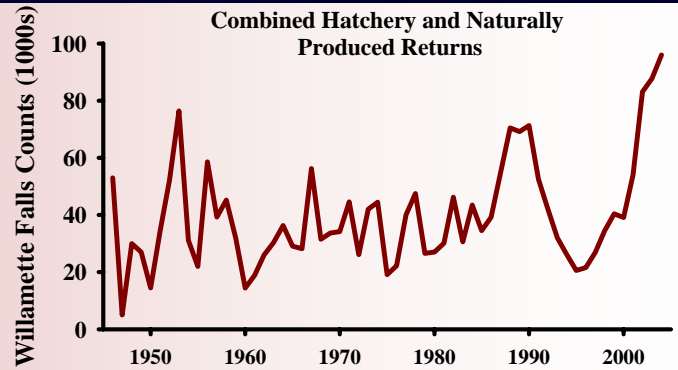


Distribution – Fail



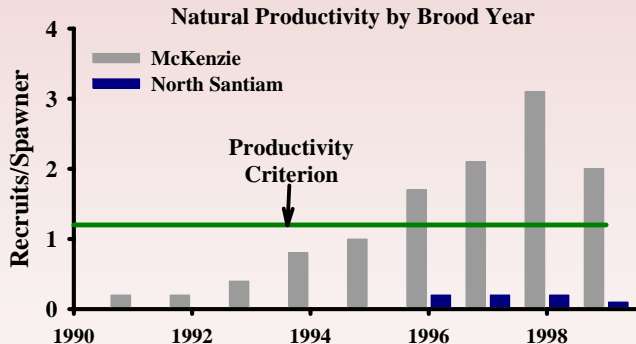
- 32% of the historically available habitat in the SMU is inaccessible today.
- Only three of six populations can still access over 50% of their historical range.
- Green Peter Dam (South Santiam), Foster Dam (South Santiam), Detroit Dam (North Santiam), Dexter Dam (Middle Fork Willamette) have all eliminated habitat historically accessible to spring Chinook, and have altered habitat quality in accessible areas.
- Cougar Dam and Blue River Dam have blocked habitat in the McKenzie.

Abundance – Fail



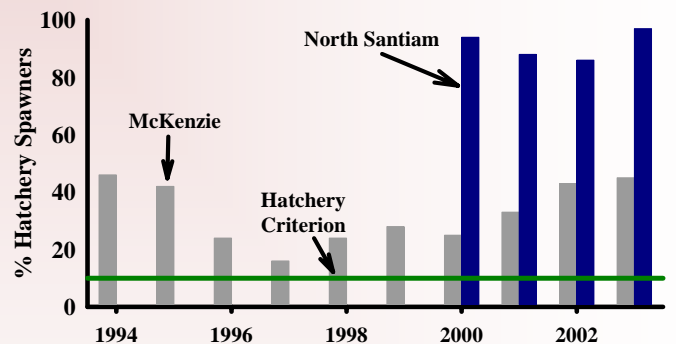
- Five of six populations did not meet the interim criterion causing the SMU to fail.
- Returns of naturally-produced fish in the North and South Santiam, Calapooia, Upper Willamette, and Molalla have been chronically low for many years.
- Counts of wild fish at Leaburg Dam in the McKenzie have risen since 1994.
- Combined counts of wild and hatchery fish at Willamette Falls have fluctuated widely over time, but in 2004 reached the highest level in 58 years. Most are hatchery origin.

Productivity – Fail



- Only one of six populations (McKenzie) met the productivity criterion.
- Productivity estimates in the McKenzie have been increased steadily since the 1992 brood.
- Recruit per spawner estimates were very low in four years that estimates could be made for the North Santiam.
- South Santiam, Calapooia, and Upper Willamette populations failed the criterion because of altered habitat quality, chronically low returns of naturally produced fish, high hatchery fractions among spawners, and lack of data.
- The Molalla was presumed to have failed based on similarity to the Calapooia and S. Santiam.

Independence – Fail



- None of the populations passed this criterion.
- Hatchery spawners have made up 15-46% of the spawning population in the McKenzie since 1994.
- Most spawners in the N. Santiam are hatchery origin.
- Hatchery fish comprise at least 10% and up to 97% of the spawning population in the South Santiam, Calapooia, and Upper Willamette.
- The Molalla population failed because hatchery releases are made in the basin. Two years of data indicate hatchery fractions in the Molalla are greater than 90%.

Mid Columbia Spring Chinook SMU

ESA Designation:
Not Warranted 1998

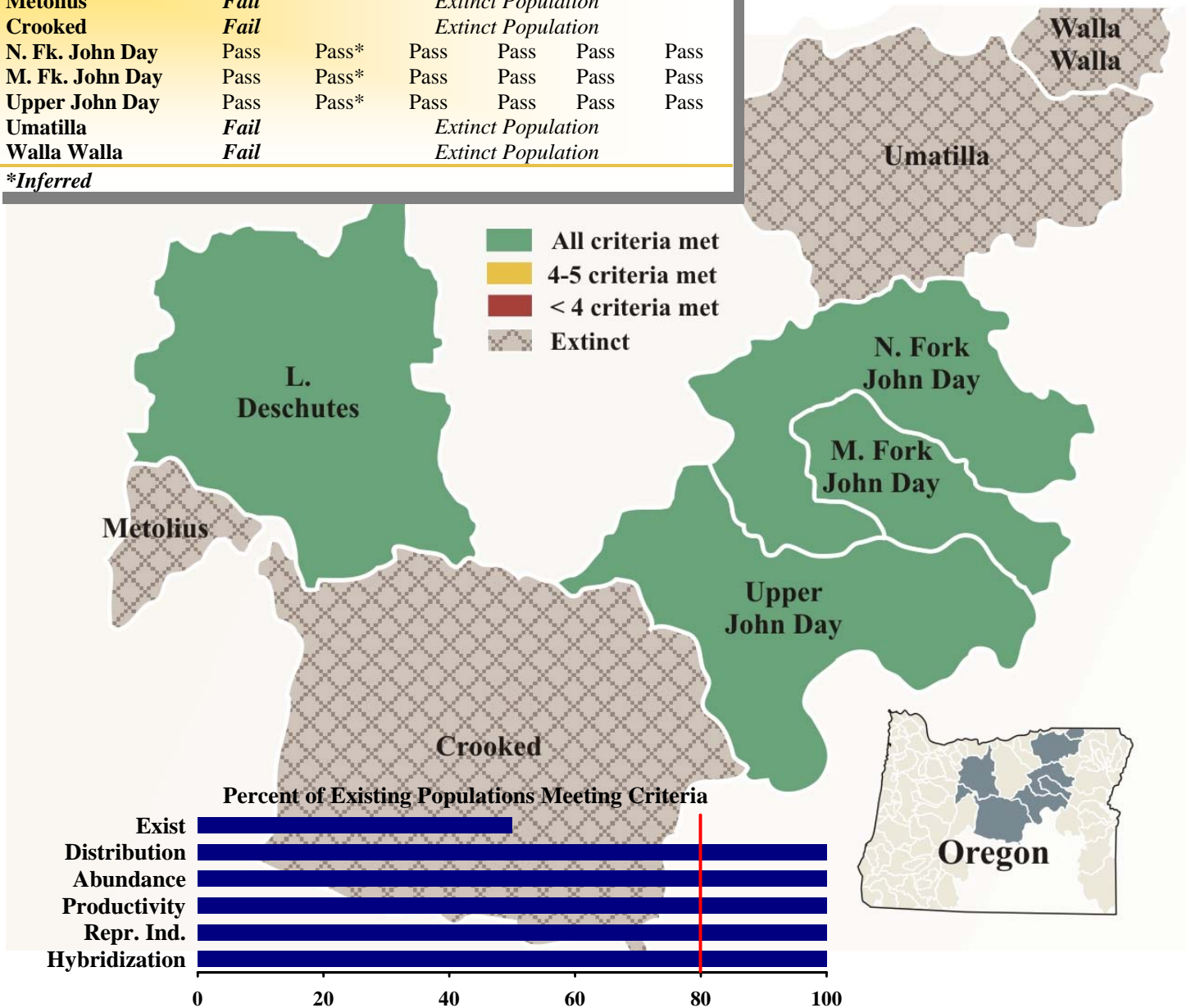
State Status:
Not Listed

Interim Assessment:
Potentially at Risk

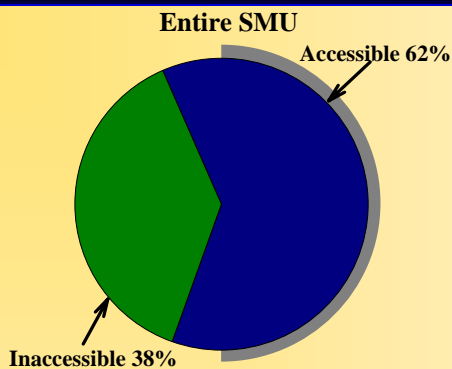
This SMU includes eight populations in tributaries between The Dalles Dam and the Snake River. The Deschutes population and all three John Day populations met each of the interim criteria. However, extinction of 4 of 8 historical populations causes the near-term sustainability of the SMU to be potentially at risk. The Umatilla and Walla Walla populations became extinct in the early 1900s due to extensive irrigation development. Construction of the Pelton-Round Butte complex eliminated access to the Metolius and Crooked populations in 1958. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Lower Deschutes	Pass	Pass*	Pass	Pass	Pass	Pass
Metolius	<i>Fail</i>		<i>Extinct Population</i>			
Crooked	<i>Fail</i>		<i>Extinct Population</i>			
N. Fk. John Day	Pass	Pass*	Pass	Pass	Pass	Pass
M. Fk. John Day	Pass	Pass*	Pass	Pass	Pass	Pass
Upper John Day	Pass	Pass*	Pass	Pass	Pass	Pass
Umatilla	<i>Fail</i>		<i>Extinct Population</i>			
Walla Walla	<i>Fail</i>		<i>Extinct Population</i>			

**Inferred*

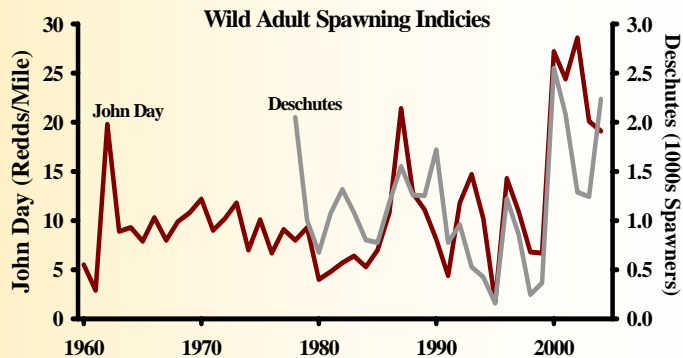


Distribution – Pass



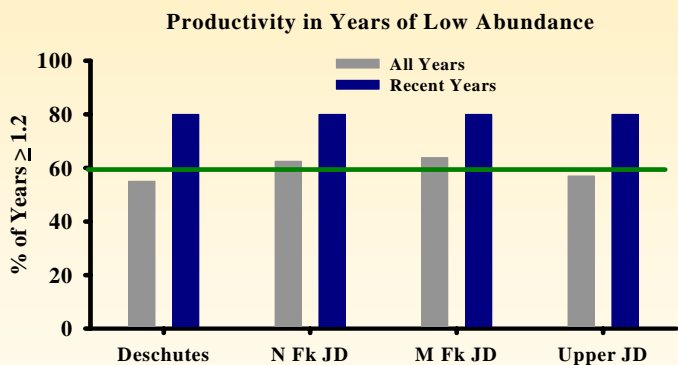
- The distribution of spring Chinook in this SMU was drastically reduced by the loss of Metolius, Crooked, Umatilla, and Walla Walla populations.
- Approximately 99% of historical habitat is still accessible within the existing populations.
- Habitat availability at certain life stages has probably been reduced by high stream temperatures and low flows in the John Day River.

Abundance - Pass



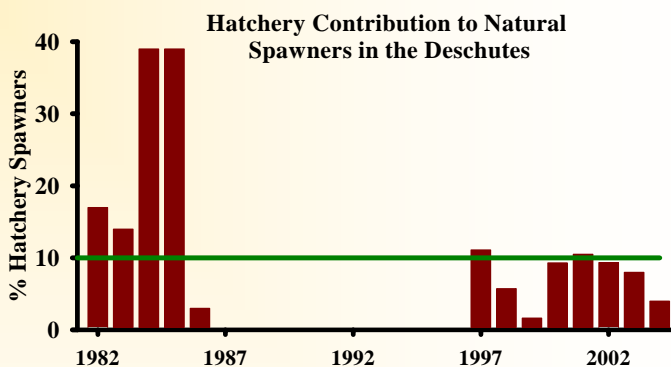
- Each of the four existing populations passed the abundance criterion.
- Good ocean conditions recently produced strong returns in both the Deschutes and John Day rivers which closely follow low numbers in the late 1990s.
- Recent returns to the John Day were the largest in 40 years.
- Deschutes returns have been variable and have not shown a clear increasing or decreasing trend.

Productivity - Pass



- Each of the four remaining populations met the criterion of 1.2 in at four of the last five years of below- average abundance.
- Productivity in the Deschutes and John Day have rebounded in recent years following a long period when spawners frequently failed to replace themselves.
- In years of low parent abundance over the long-term, productivity has been similar among each of the four existing populations. In 55-65% of those years, recruits per spawner exceed 1.2.

Independence - Pass



- Each of the four existing populations passed the reproductive independence criterion.
- A weir at Warm Springs National Fish Hatchery on the Warm Springs River limits numbers of hatchery fish among natural spawners in the lower Deschutes population.
- The John Day Basin is managed as a wild fish basin and stray hatchery fish comprise <2% of the spawners.

Additional Information

- A feasibility study is currently underway in the Deschutes to assess the potential of re-establishing spring Chinook, summer steelhead, and sockeye passage through the Pelton-Round Butte Dam Complex. If successful, this would restore salmon and steelhead access to historical habitat in the Crooked and Metolius rivers.

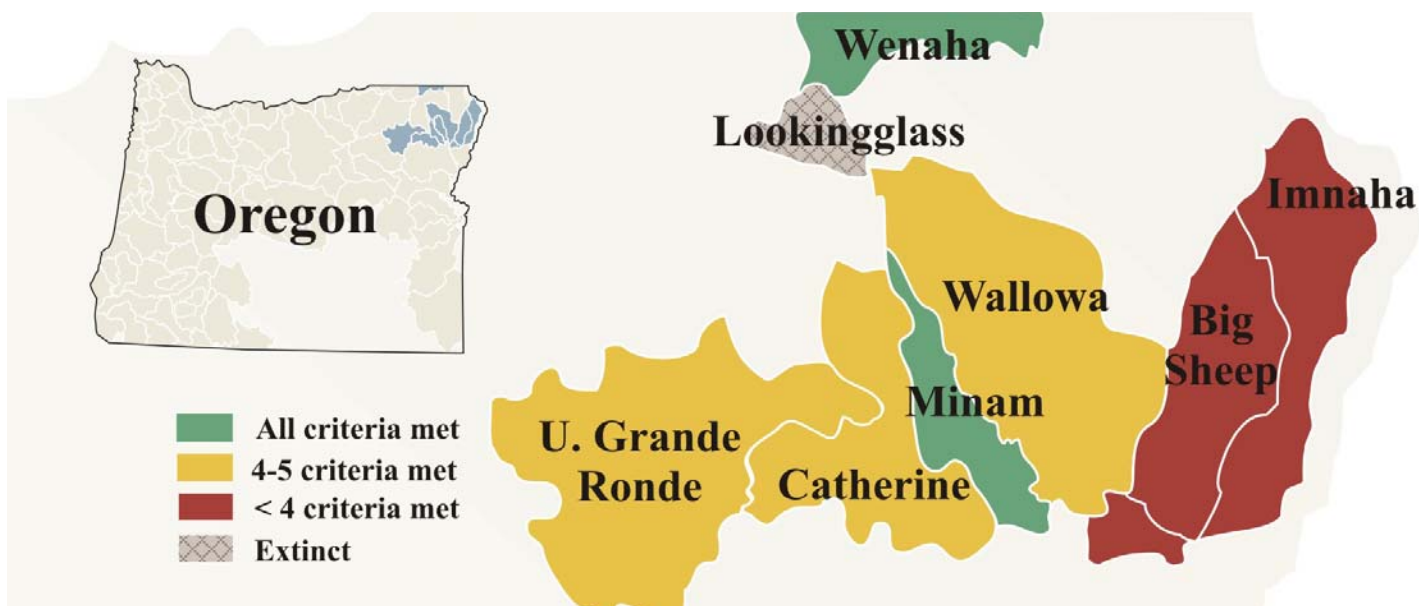
Lower Snake Spring Chinook SMU

ESA Designation:
Threatened 1992

State Status:
Threatened

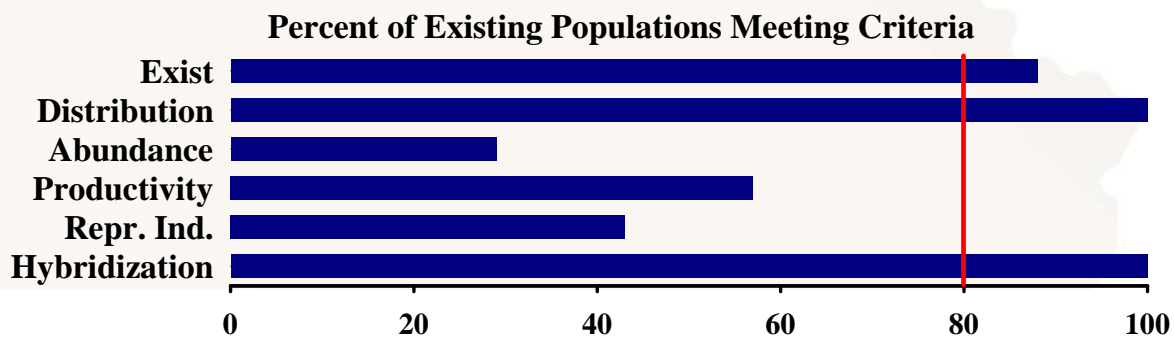
Interim Assessment:
At Risk

This SMU includes eight populations in tributaries between the mouth of the Snake River and Hells Canyon Dam. Failure to meet three of six interim criteria led to the conclusion that the near-term sustainability of the SMU is at risk. The SMU includes a mixture of populations at varying levels of health depending on the quality of spawning and rearing habitats. All populations have been constrained by Snake and Columbia dam passage and migration conditions. Significant hatchery programs have occurred in Lookingglass Creek (Lower Grande Ronde), the Upper Grande Ronde, Catherine Creek, Lostine River, and the Imnaha River basin. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.

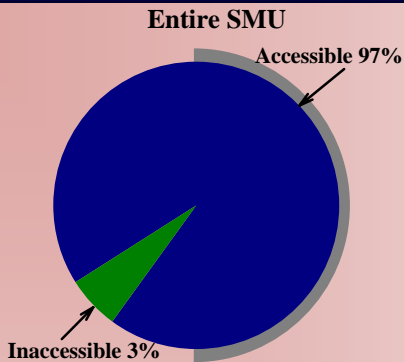


Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Wenaha	Pass	Pass*	Pass	Pass	Pass	Pass
Wallowa	Pass	Pass*	<i>Fail</i>	Pass	<i>Fail</i>	Pass
Minam	Pass	Pass*	Pass	Pass	Pass	Pass
Catherine	Pass	Pass*	<i>Fail</i>	Pass	<i>Fail</i>	Pass
Lookingglass	<i>Fail</i>			<i>Extinct Population</i>		
U. Grande Ronde	Pass	Pass*	<i>Fail</i>	<i>Fail</i>	Pass	Pass
Imnaha	Pass	Pass*	<i>Fail</i>	<i>Fail</i>	<i>Fail</i>	Pass
Big Sheep	Pass	Pass*	<i>Fail</i>	<i>Fail*</i>	<i>Fail*</i>	Pass

* *Inferred*

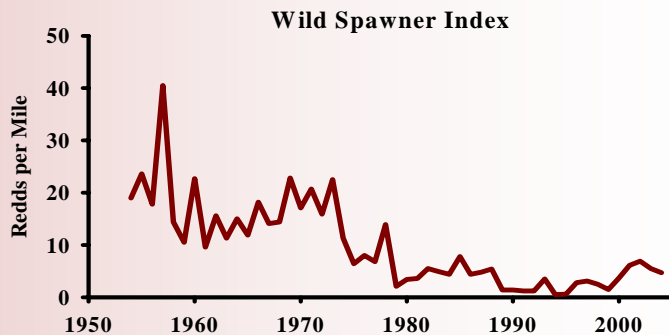


Distribution – Pass



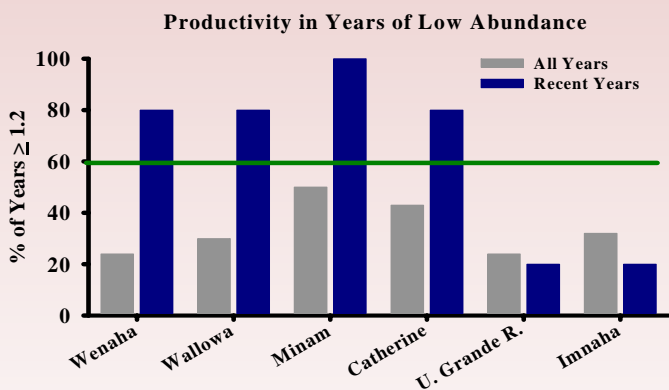
- Each of the seven existing populations passed the distribution criterion.
- Nearly all of the habitat historically accessible to Oregon populations of spring Chinook is still accessible today. However, declines in spawning and rearing habitat quality have reduced the extent of use.
- The Wallowa has lost the largest proportion of its historical habitat, but still maintains 92% accessibility.

Abundance – Fail



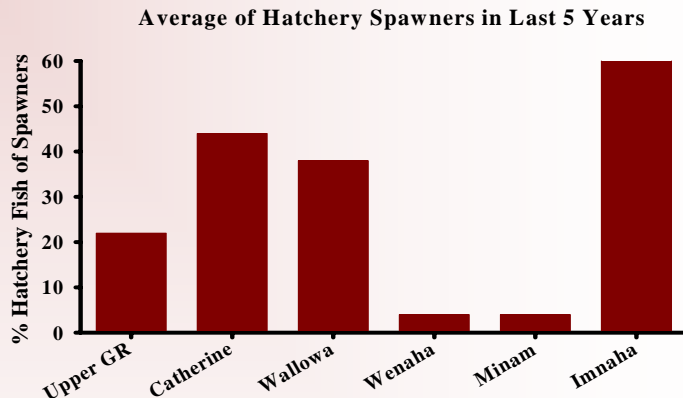
- Only two of seven populations (Wehnaha and Minam) within the SMU met the interim criterion.
- All of the populations within the SMU had a drastic reduction in adult returns from historical levels. Most populations have shown some increases in the last 3-5 years from critical lows in the mid 1990s. The Minam has increased to levels of the 1950s and 1960s.
- Increases in Catherine Creek and the Upper Grande Ronde have not been as strong as for other populations.

Productivity - Fail



- Four of seven existing populations failed the criterion.
- In the years of low abundance within the last 50 years the Snake populations typically have not shown strong resilience. Productivity has been less than 1.2 in more than half of those years. Resilience in recent years of low abundance has been stronger.
- Long-term recruit per spawner estimates have averaged greater than 1.2 in the Minam, Catherine and Wallowa populations, and less than 1.2 for all other populations.
- Data were not available to evaluate the Big Sheep population. Significant natural spawning by hatchery fish occurs within the basin and it is suspected this would drive productivity below the criterion.

Independence - Fail



- Only three of seven populations passed, causing the SMU to fail this criterion.
- Historical hatchery practices oriented to mitigation have resulted in substantial straying. In the early 1990s goals were re-directed towards genetic conservation and population recovery.
- Hatchery fractions in the Wenaha and Minam have consistently been low in recent years.
- Hatchery ratios were below 10% in three of five years in the Upper Grande Ronde.
- Natural spawning by hatchery fish has been very high in the Catherine, Wallowa, and Innaha.

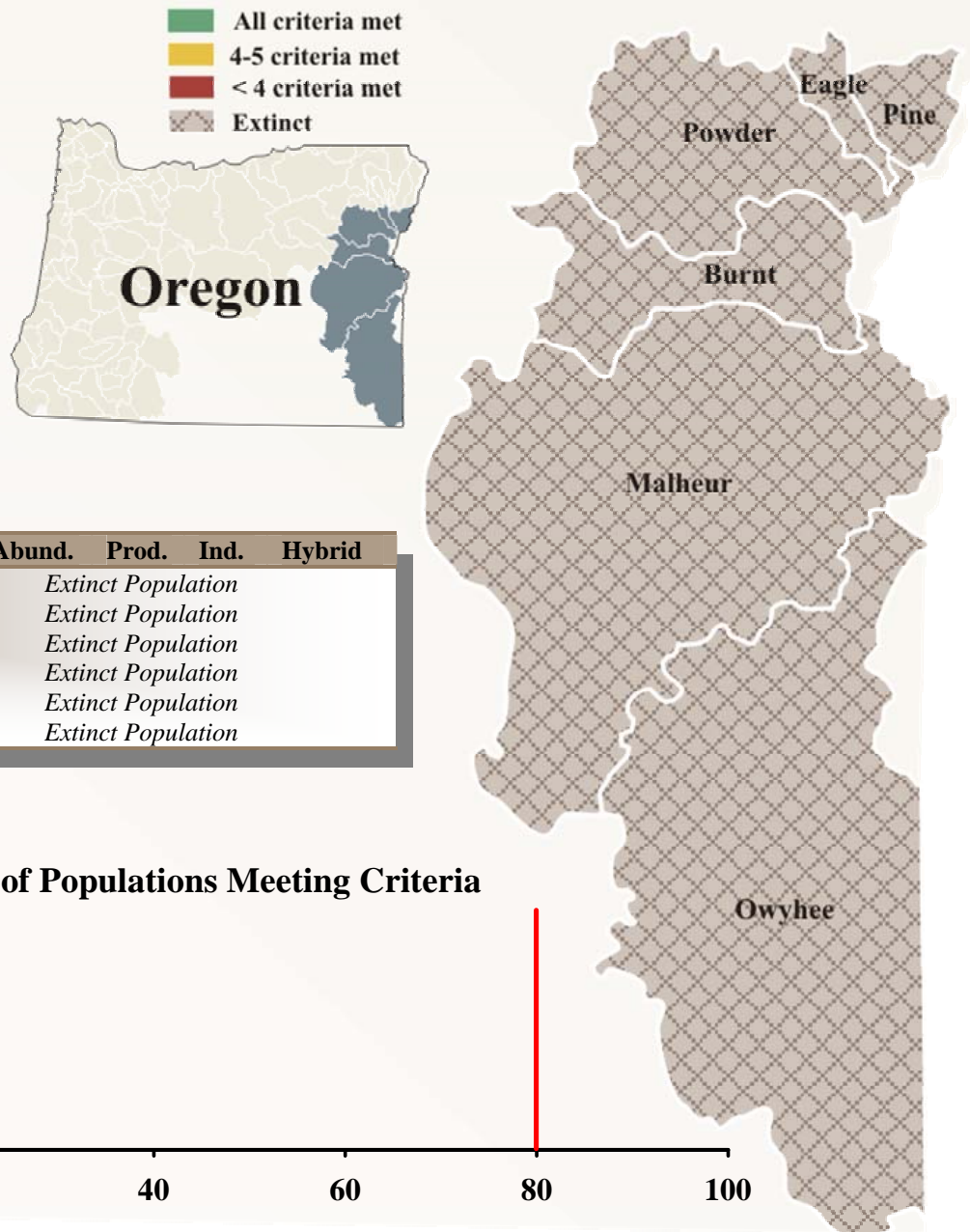
Upper Snake Spring Chinook SMU

ESA Designation:
No Designation

State Status:
No Status

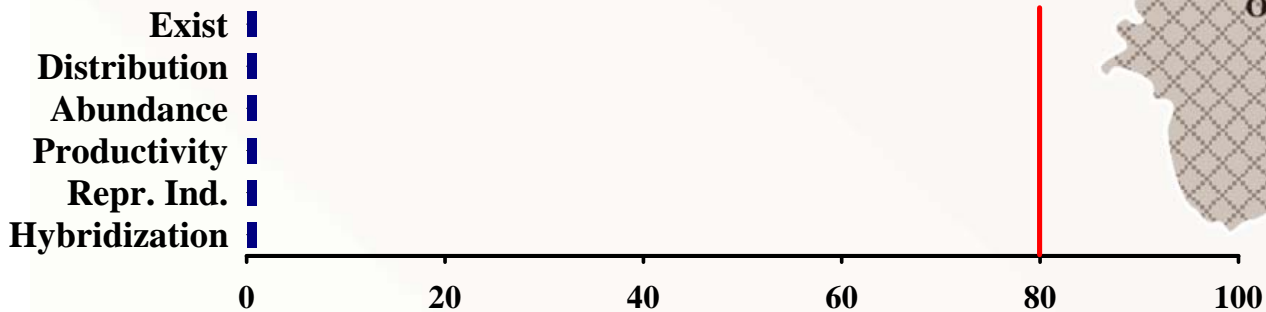
Interim Assessment:
Extinct

Small irrigation dams and diversions had already reduced habitat quality in the first half of the 20th century. Passage to the Malheur basin was eliminated with the construction of Warm Springs Dam (1919) and Agency Dam (1935). All of the populations within this SMU became extinct after completion of the Hells Canyon Dam complex in 1967 eliminated anadromous passage.



Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Pine	Fail					<i>Extinct Population</i>
Eagle	Fail					<i>Extinct Population</i>
Powder	Fail					<i>Extinct Population</i>
Burnt	Fail					<i>Extinct Population</i>
Malheur	Fail					<i>Extinct Population</i>
Owyhee	Fail					<i>Extinct Population</i>

Percent of Populations Meeting Criteria



Upper Klamath Spring Chinook SMU

ESA Designation:
No Designation

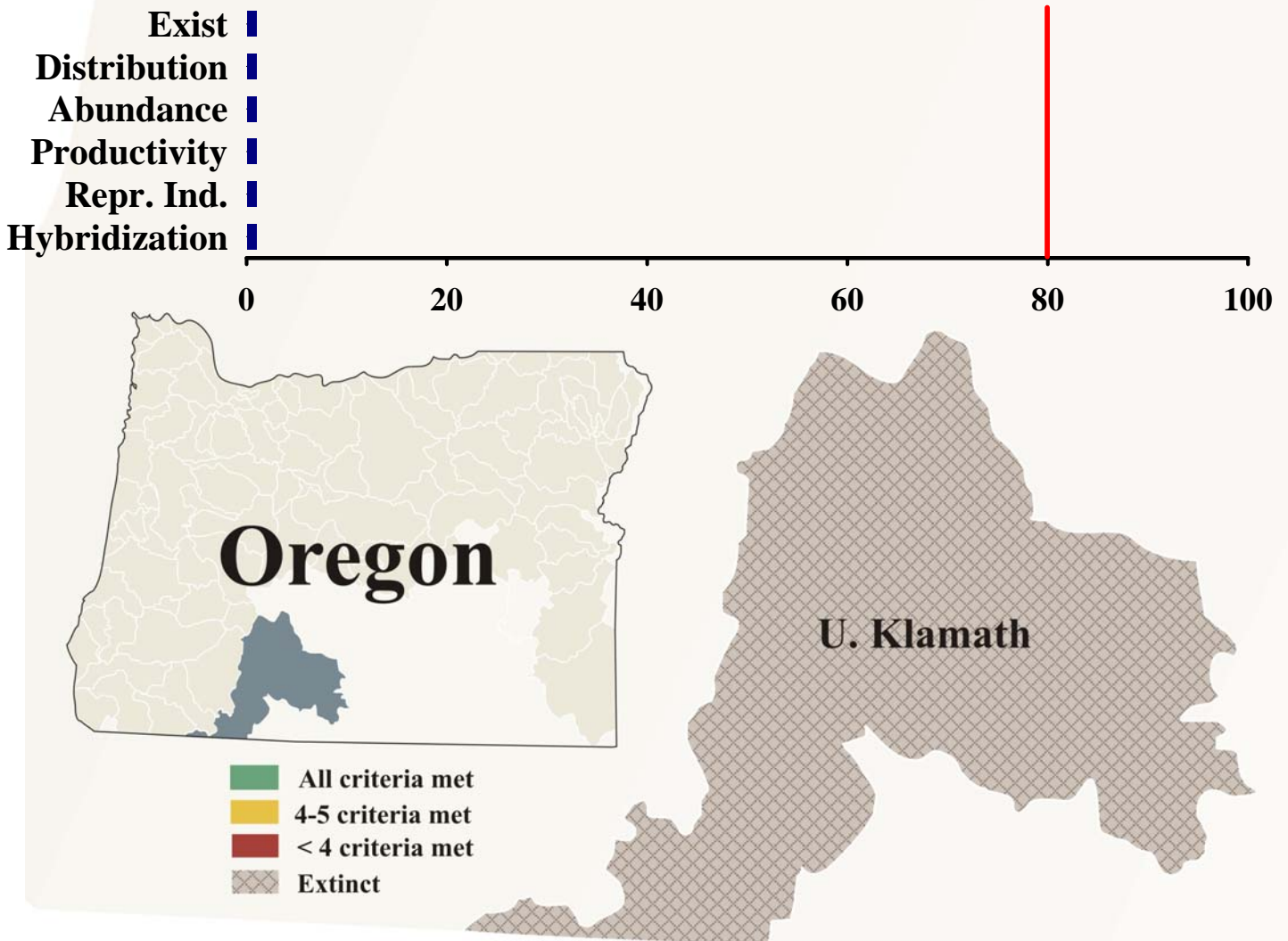
State Status:
No Status

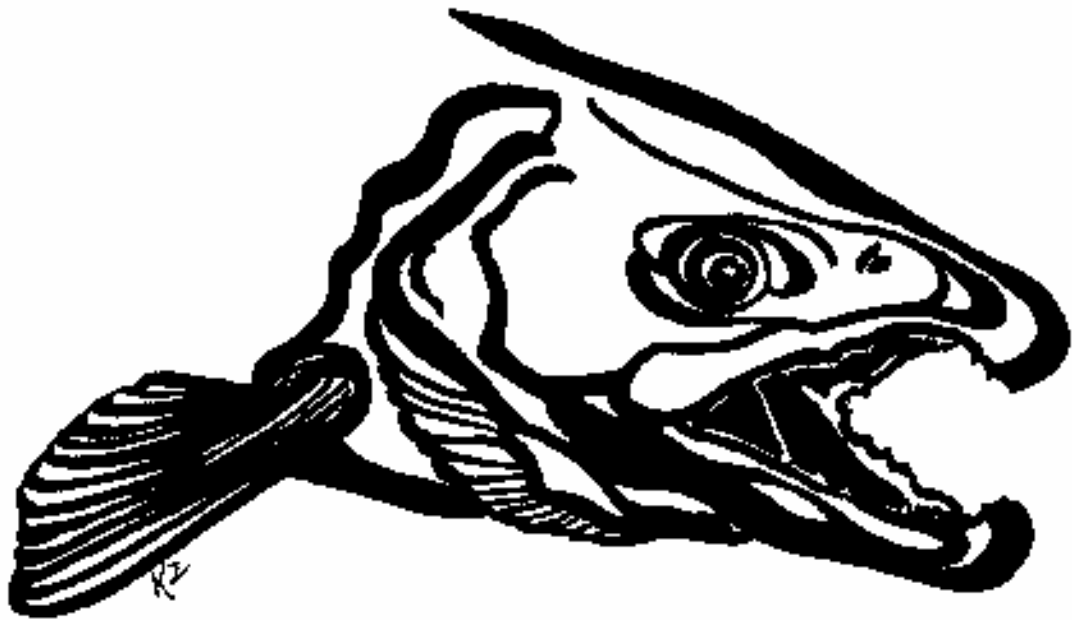
Interim Assessment:
Extinct

This SMU historically consisted of a single population in the Klamath basin upstream of the Oregon/California border. A series of dams has extirpated spring Chinook and other anadromous salmonids in the upper Klamath, 190 miles upstream from the river mouth. Access was originally blocked in 1918 with the installation of Copco 1 Dam. In 1925, Copco 2 Dam was built just a quarter mile downstream of the original dam. Iron Gate Dam, built in 1962, eliminated another seven miles of habitat downstream of the previous two dams.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Upper Klamath	<i>Fail</i>					<i>Extinct Population</i>

Percent of Populations Meeting Criteria

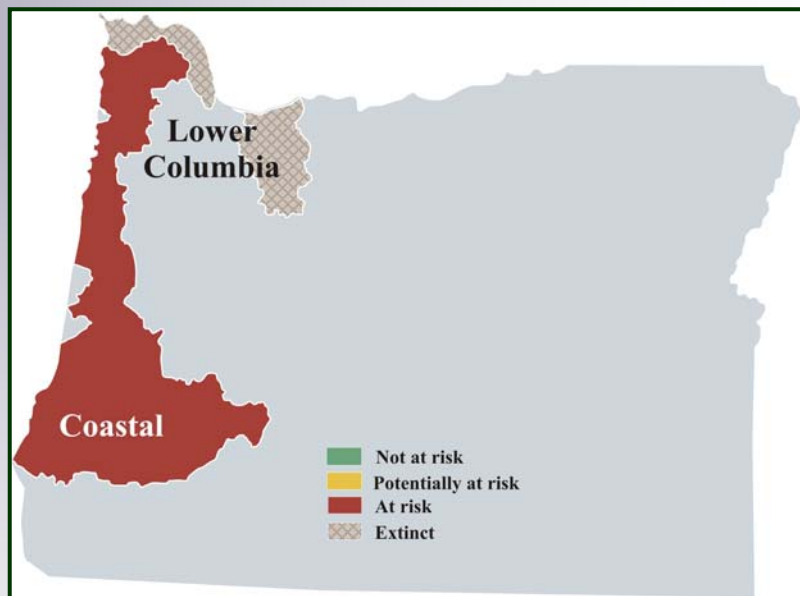




Chum



Chum salmon return to the lower reaches of small to moderate-sized streams and rivers of the Oregon coast and lower Columbia. Oregon populations are near the southern limits of the chum salmon range. Chum salmon enter freshwater and spawn during late fall on stream gravel bars and side channels just upstream from tidewater. Juveniles migrate seaward soon after emergence from the gravel. Chum salmon return at 3-6 years of age and average 10-15 pounds. Two chum SMU's contain a total of 20 populations.



Population data are extremely limited for chum which are not subject to extensive fisheries or significant hatchery programs. Lower Columbia chum numbers have declined from the hundreds of thousands to just a few thousand fish and this SMU is considered to be extinct. Coastal chum are at risk because of the loss of populations and low returns and productivity.

Coastal Chum SMU

ESA Designation:
Not Warranted 1998

State Status:
Critical

Interim Assessment:
At Risk

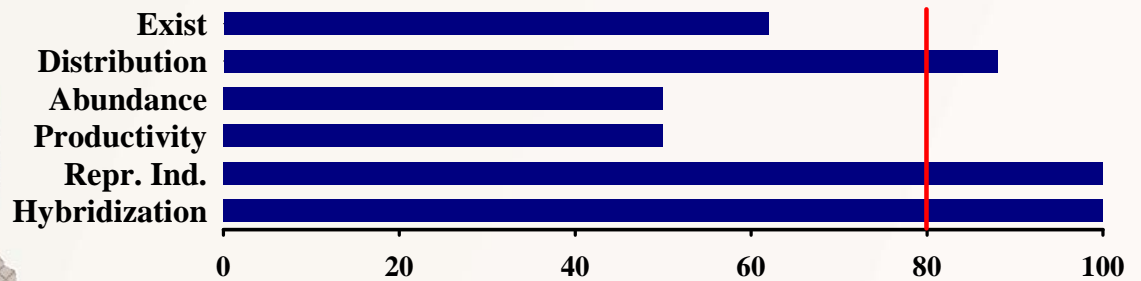
The Coastal Chum SMU is comprised of 13 historical populations. Eight populations continue to exist, two are presumed to be extinct, and three are extinct. The SMU met three of six interim criteria so the near-term sustainability of the SMU is at risk. ODFW speculated in the 1995 Stock Status Review that the historical populations south of the Nestucca were naturally small. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Necanicum	Pass	Pass*	Pass	Pass*	Pass*	Pass
Nehalem	Pass	Pass*	Pass	Pass	Pass*	Pass
Tillamook	Pass	Pass*	Pass	Pass	Pass*	Pass
Netarts	Pass	Pass*	<i>Fail</i>	<i>Fail</i>	Pass*	Pass
Nestucca	Pass	<i>Fail</i> *	<i>Fail</i>	<i>Fail</i>	Pass*	Pass
Salmon	Pass	Pass*	<i>Fail</i> *	<i>Fail</i> *	Pass*	Pass
Siletz	Pass	Pass*	<i>Fail</i> *	<i>Fail</i> *	Pass*	Pass
Yaquina	Pass	Pass*	Pass	Pass	Pass*	Pass
Alsea	<i>Fail</i> *		<i>Presumed Extinct</i>			
Siuslaw	<i>Fail</i> *		<i>Extinct Population</i>			
Umpqua	<i>Fail</i> *		<i>Extinct Population</i>			
Coos	<i>Fail</i> *		<i>Presumed Extinct</i>			
Coquille	<i>Fail</i> *		<i>Extinct Population</i>			

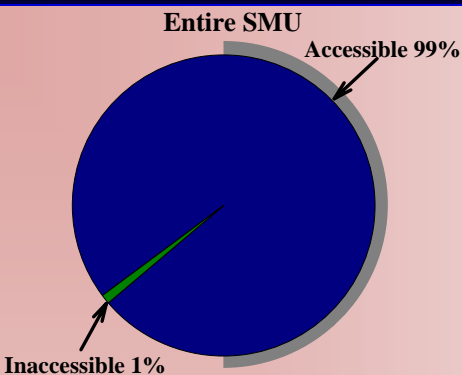
* *Inferred*



Percent of Existing Populations Meeting Criteria

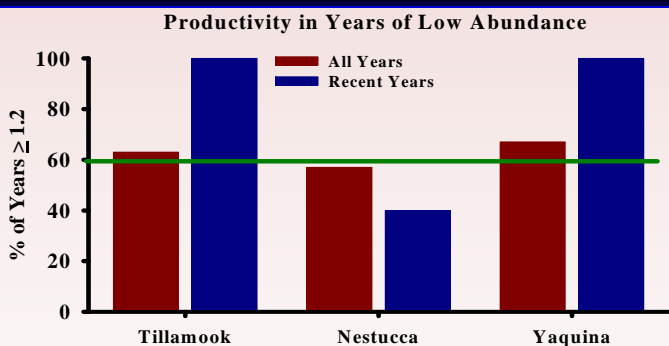


Distribution - Pass



- All of the existing populations passed this criterion except for the Nestucca.
- Nearly all (99%) of the historical habitat within the SMU is still accessible today.
- The Necanicum is the only population to have lost accessible habitat (11% of historic habitat).
- The Nestucca failed the criterion because returns have been so low in recent years to indicate that 50% of historical habitat has not been utilized.

Productivity - Fail

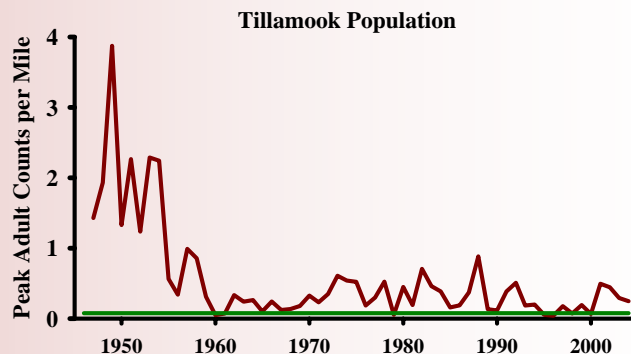


- Four of eight populations passed the criterion.
- Productivity in the Netarts and Nestucca has been very low in recent years. Recruits per spawner could only be estimated in five years in the Netarts, so it is not displayed above.
- The Siletz and Salmon failed the criterion because abundance levels in those populations have been chronically low.

Additional Information

- Chum are occasionally observed in basins with populations that were thought to be extinct. The origins of these fish is uncertain and more work is needed to clarify relationships among Oregon coastal populations.

Abundance - Fail



- Four of eight populations passed this criterion.
- The Tillamook and Nestucca had the longest trend of data. Returns dropped through the 1950s and 1960s and have yet to recover. Recent returns to the Tillamook were high enough to pass the criterion.
- Abundance trends in Yaquina and Nehalem surveys initiated in 1981 and 1990 respectively have not shown a consistent increasing or decreasing trend.
- Returns to the Netarts in the 1990s and early 2000s are far lower than returns in the 1950s and 1960s.
- The Necanicum has had low abundance levels since surveys were initiated in 1991, but recent years have been high enough to pass the criterion.

Independence - Pass

- All of the populations passed the reproductive independence criterion.
- Oregon has never had a significant chum salmon hatchery program, and no programs, public or private, currently exist.
- One private hatchery released chum into the Nehalem between 1981 and 1993, but releases were terminated in 1994.
- Based on the absence of hatchery releases within the SMU, it was presumed that all extant populations passed the reproductive independence criterion.

Lower Columbia Chum SMU

ESA Designation:
Threatened 1999

State Status:
Critical

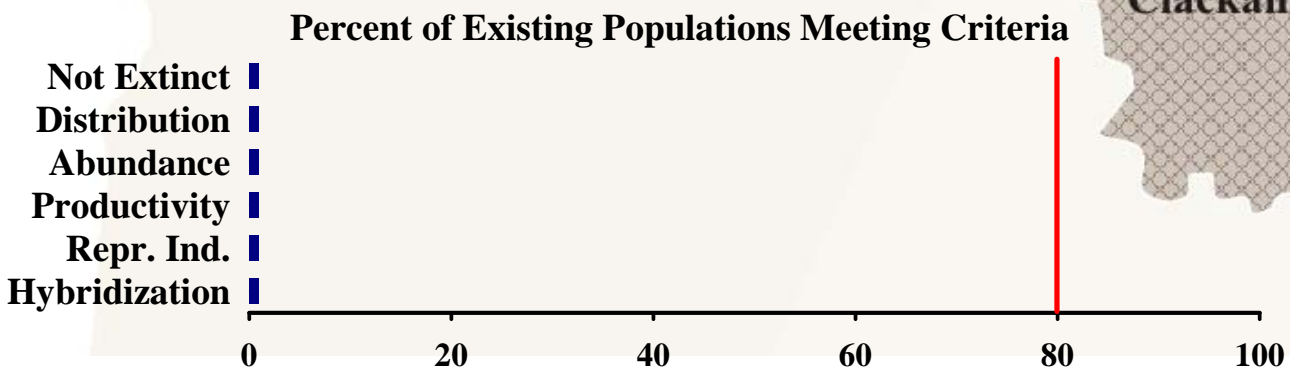
Interim Assessment:
Extinct

This SMU includes seven populations in tributaries between the Columbia River mouth and Herman Creek in the Gorge. Historically, annual Columbia River harvest of chum reached 500,000 fish. Today, these populations are extinct. Extensive chum spawning surveys by ODFW in 1999-2001 yielded a total of three live chum and one dead chum. It is believed that the few fish observed in Oregon are strays from runs returning to the Washington tributaries of the lower Columbia. Estuarine and lower river habitat degradation have been implicated as likely causes for the decline of this SMU.



Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Youngs	Fail					Extinct Population
Big	Fail					Extinct Population
Clatskanie	Fail					Extinct Population
Scappoose	Fail					Extinct Population
Clackamas	Fail					Extinct Population
Sandy	Fail					Extinct Population
Gorge	Fail					Extinct Population

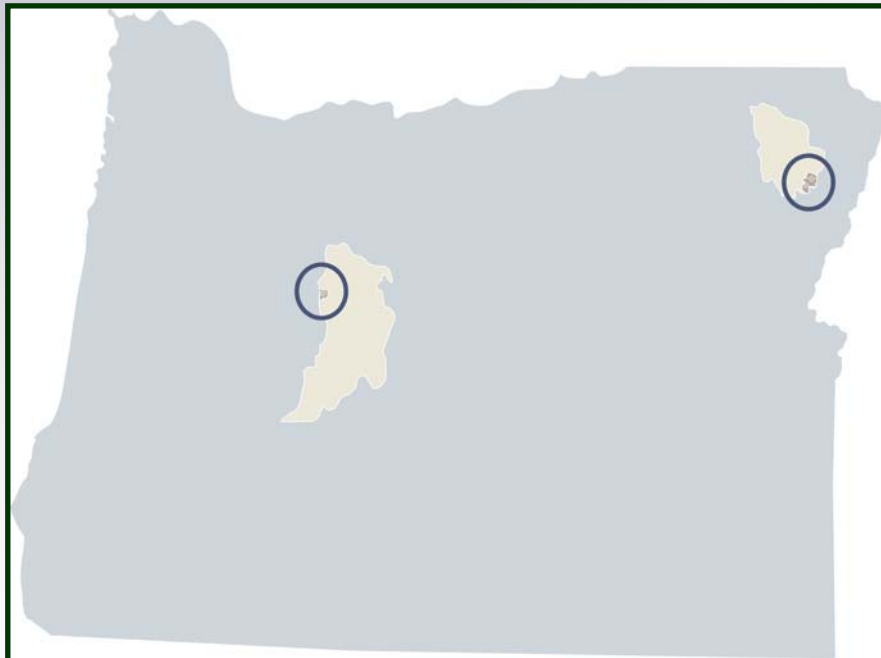
**Inferred*



Sockeye



Sockeye salmon were never widely distributed in Oregon but historically returned to the upper Deschutes and Willamette systems. Sockeye rear in freshwater lakes, typically spawning in inlet streams, outlet streams, or along lake shorelines. Kokanee are a landlocked form of sockeye salmon. Kokanee have been widely transplanted in eastern Oregon lakes and are still present in historical rearing lakes including Suttle Lake in the upper Deschutes and Wallowa Lake in the upper Grande Ronde system. Anadromous sockeye were eliminated from both these systems by dams which blocked access.



Mid Columbia Sockeye SMU

ESA Designation:
No Designation

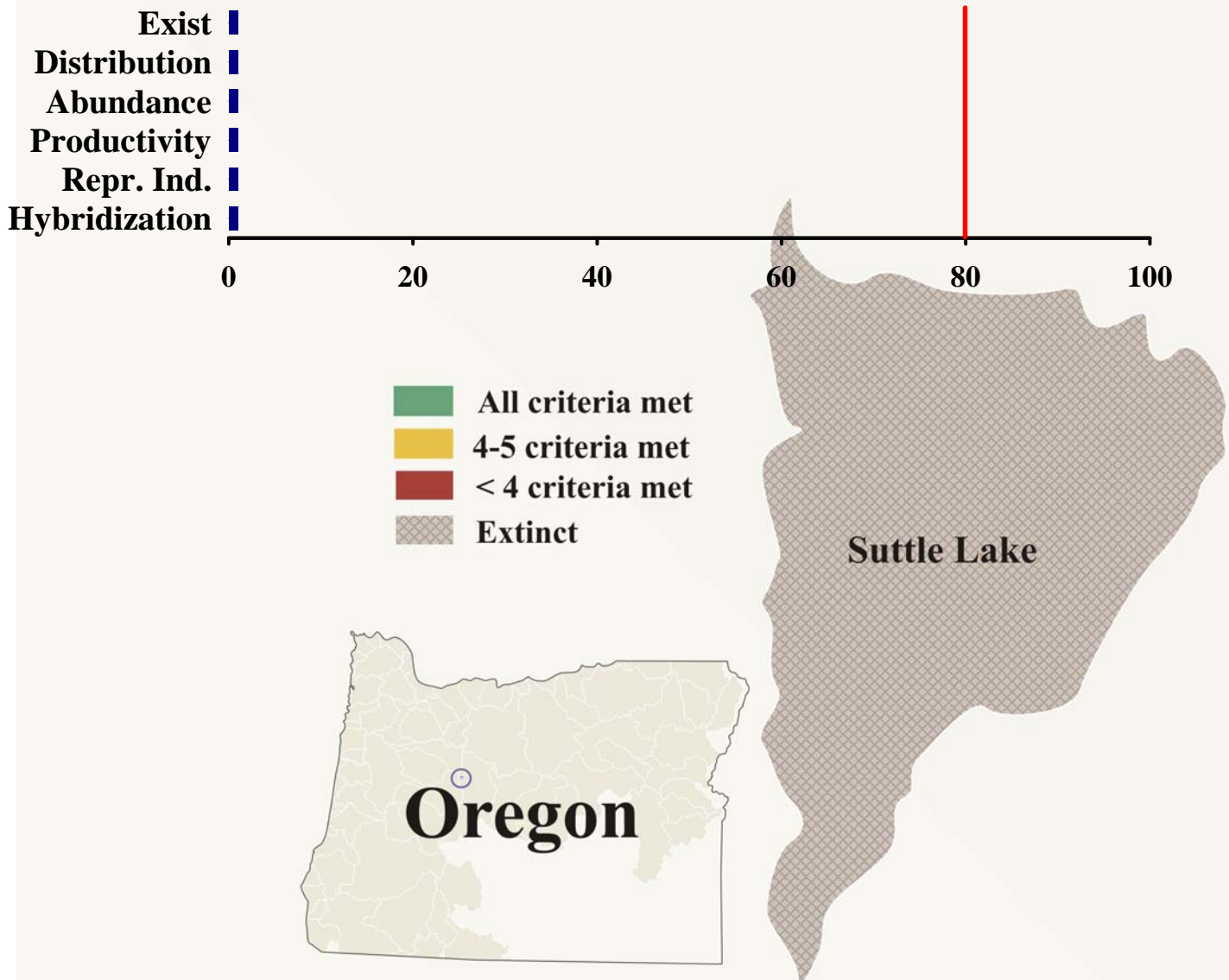
State Status:
No Status

Interim Assessment:
Extinct

The only sockeye population in this SMU is extinct. A population historically existed in Suttle Lake and its tributaries in the upper Deschutes Basin. The construction of a barrier at the lake outlet in the 1900s and later the completion of the Pelton/Round Butte dam complex in the 1960s blocked anadromous passage to the population. A naturally spawning population of kokanee exists in Suttle Lake and Link Creek.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Suttle	Fail					<i>Extinct Population</i>

Percent of Populations Meeting Criteria



Snake Sockeye SMU

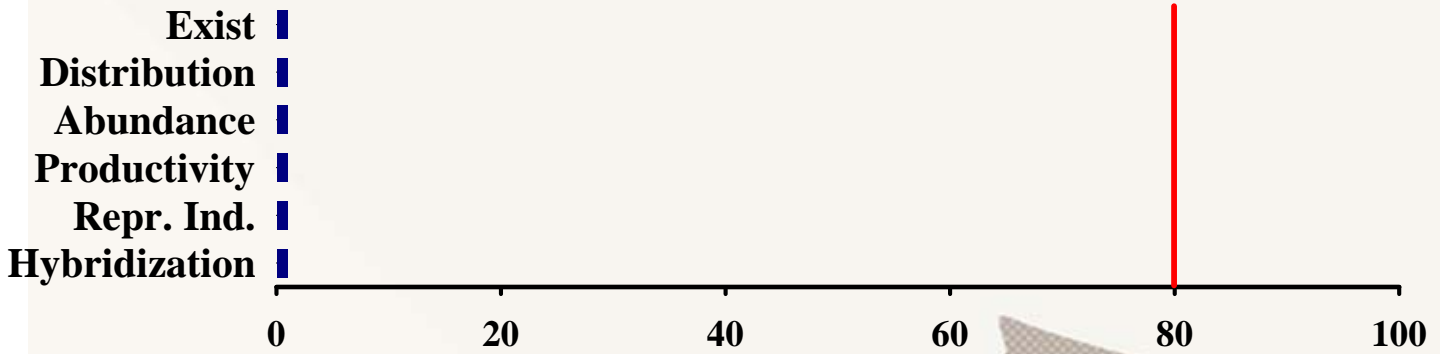
ESA Designation:
No Designation

State Status:
No Status

Interim Assessment:
Extinct

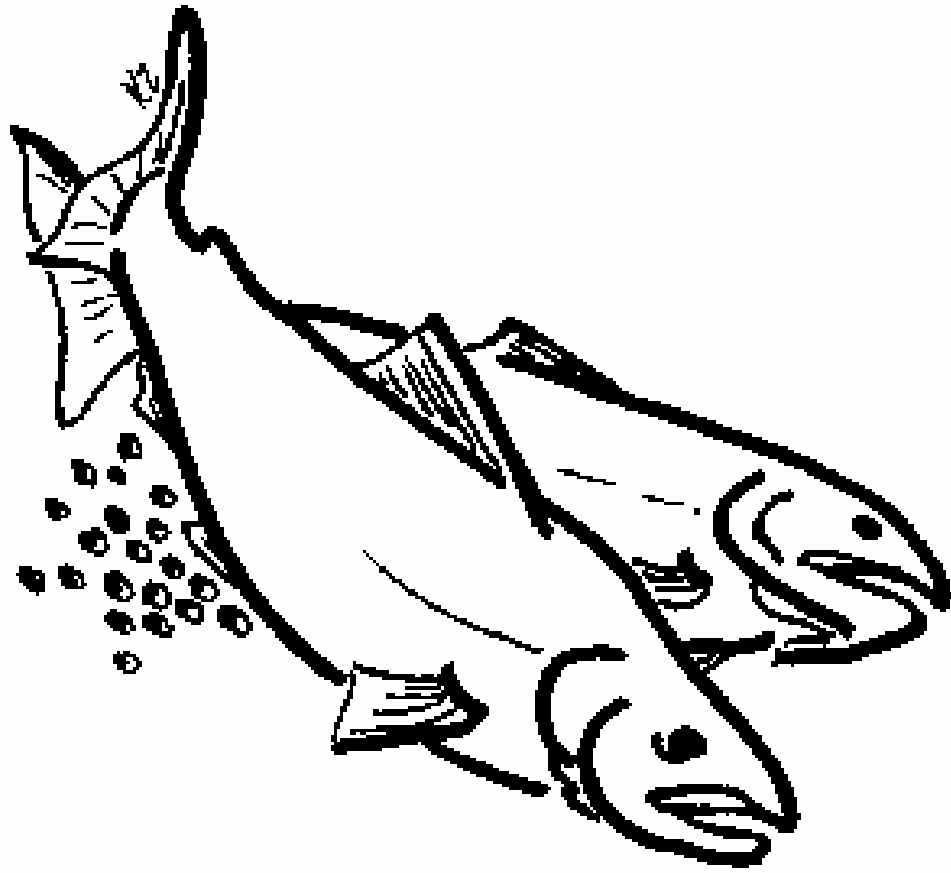
This SMU is extinct. A population historically existed in Wallowa Lake and its tributaries in the Wallowa Basin in Northeast Oregon. The construction of a barrier at the lake outlet in 1916 blocked anadromous passage. Sockeye were observed in Wallowa River below the lake until the early 1930s when they became extinct. Two resident kokanee populations persist in Wallowa Lake today, spawning in the inlet and on shore.

Percent of Populations Meeting Criteria



Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Wallowa	<i>Fail</i>		<i>Extinct Population</i>			

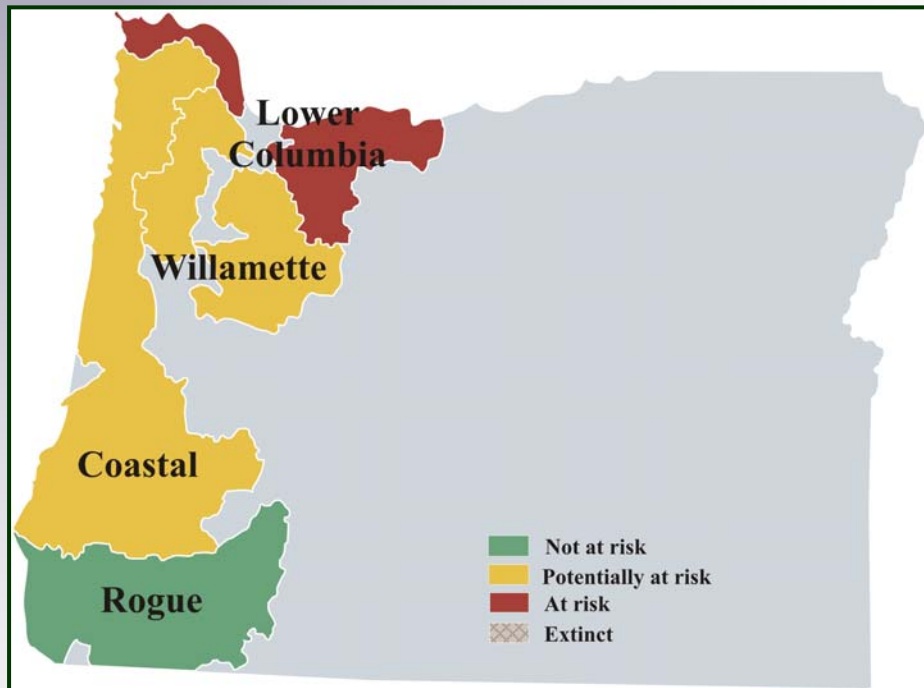




Winter Steelhead



Winter steelhead are widely distributed in small to moderate-sized coastal, lower Willamette, and lower Columbia streams. They mature in the ocean, return in fall or winter, and spawn from December through March. Young steelhead rear for 1-4 years in freshwater and spend 1-3 years in the ocean. In some streams, anadromous steelhead and resident rainbow trout populations are interrelated.



Unlike salmon, some steelhead survive spawning to return in later years. Winter steelhead typically average 6-12 pounds. In the ocean, steelhead migrate into far north offshore waters. Five winter steelhead SMUs include a total of 48 populations. The coastal SMU is potentially at risk because of hatchery fish influence in some basins. The Rogue SMU is not immediately at risk. Low returns and low productivity place the lower Columbia and Willamette SMUs at risk.

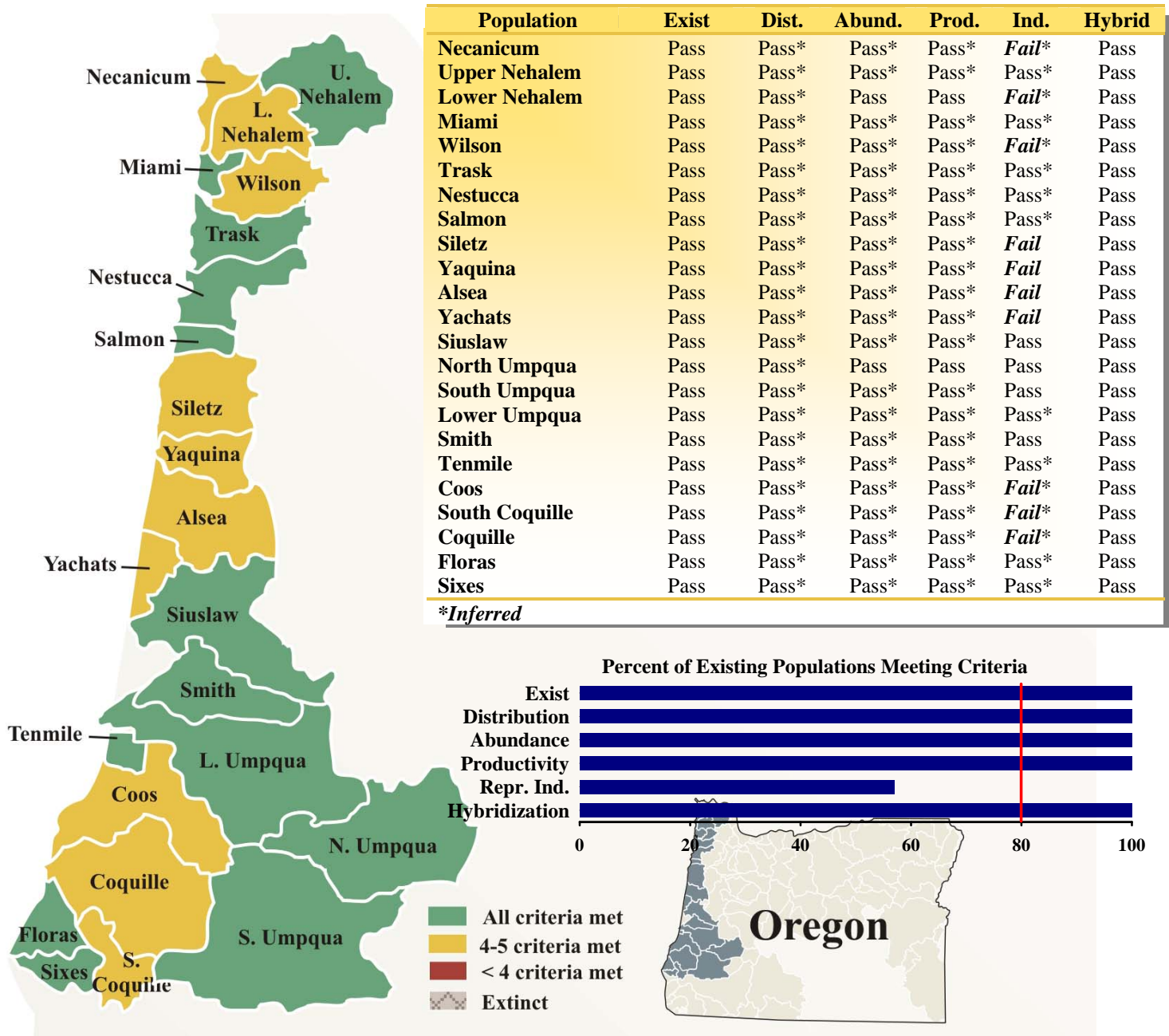
Coastal Winter Steelhead SMU

ESA Designation:
Candidate 1998

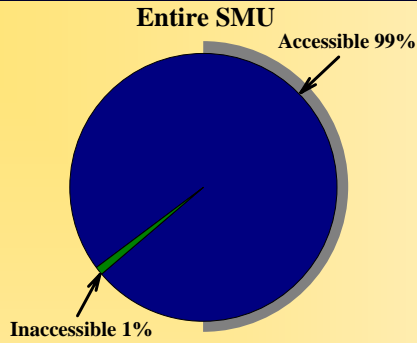
State Status:
Vulnerable

Interim Assessment:
Potentially at Risk

This SMU has more populations (23) than any other SMU and all historical populations are still present. Abundance is monitored at Winchester Dam on the North Umpqua, and the Salmonberry River in the Lower Nehalem. The SMU met five of six interim criteria. Failure of the reproductive independence criterion places the near-term sustainability of the SMU potentially at risk. Lack of data resulted in significant assumptions regarding abundance and productivity be made to make an assessment for this SMU. Limited data and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of interim criteria.

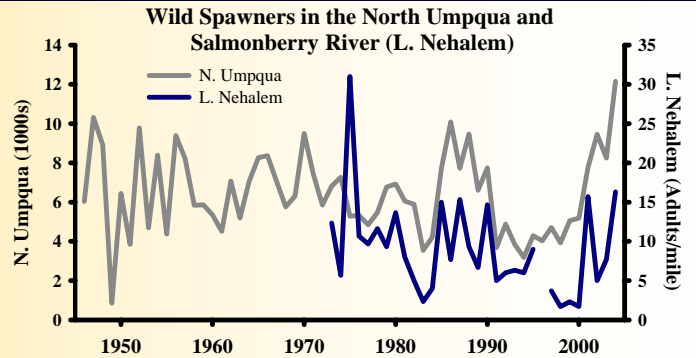


Distribution – Pass



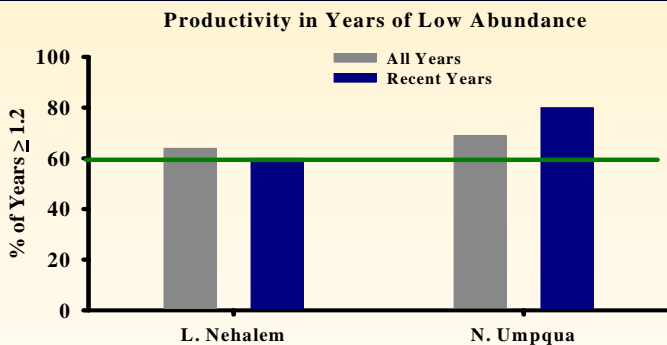
- Nearly all of the historically-available habitat (99%) of this species management unit is still available today.
- The South Umpqua has lost access to the most habitat of any population and still maintains 94% of historic availability.

Abundance - Pass



- Both populations with long-term data passed.
- Numbers in the North Umpqua have been at or above the interim criterion in most years since 1974. Abundance in the Lower Nehalem was above the criterion in four of the last five years.
- Few indices of abundance are available in other populations within the SMU. Trends in the North Umpqua and Lower Nehalem were assumed to be representative of the SMU.
- Trapping of adults in mid-coast basins, and spawning surveys in coastal basins in the last two years support the assumption that the North Umpqua and Lower Nehalem are representative of other populations.

Productivity - Pass

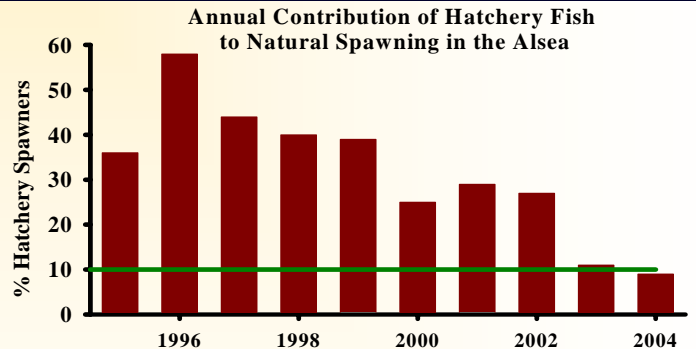


- Both the North Umpqua and Lower Nehalem passed the criterion.
- These results were assumed to be representative of the SMU.

Additional Information

- In 2003, ODFW initiated an annual coast-wide monitoring program to estimate steelhead spawner numbers and hatchery-to-wild ratios. In the future, these data will allow a more comprehensive assessment of the coastal winter steelhead SMU.

Independence - Fail



- 13 of 23 populations passed this criterion based on trap and hatchery release data.
- Adult traps in the mid-coast suggest that natural spawning by hatchery fish is above 10% in the Siletz, Alesia, and Yaquina. Similar data showed that Siuslaw hatchery fractions are low.
- Adult trapping and counts at Winchester Dam adjusted for harvest show that hatchery ratios in the Umpqua are low.
- Creel survey data suggest that hatchery fractions in the Yachats are above the criterion threshold.
- Assessments in other populations of the North and South Coast were based on the presence (or absence) of hatchery releases.

Rogue Winter Steelhead SMU

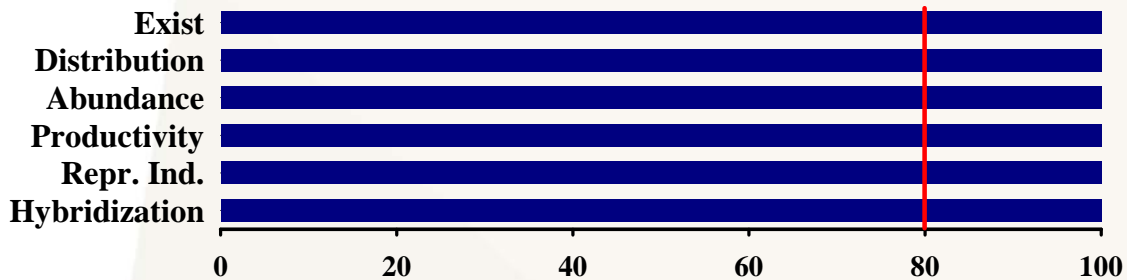
ESA Designation:
Not Warranted 2001

State Status:
Vulnerable

NFCP Interim Assessment:
Not at Risk

This SMU includes eight populations within coastal basins of the Klamath Mountains Province in southwestern Oregon. Each of the interim criteria was passed so the near-term sustainability of the SMU is not at risk. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria. Limited data and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of interim criteria.

Percent of Existing Populations Meeting Criteria

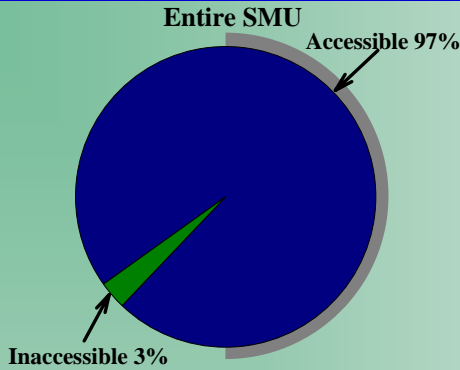


Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Winchuck	Pass	Pass*	Pass*	Pass*	Pass*	Pass
Chetco	Pass	Pass*	Pass*	Pass*	Pass*	Pass
Pistol	Pass	Pass*	Pass*	Pass*	Pass*	Pass
Coastal Rogue	Pass	Pass*	Pass*	Pass*	Pass*	Pass
Illinois	Pass	Pass*	Pass*	Pass*	Pass*	Pass
Mainstem Rogue	Pass	Pass*	Pass	Pass	Pass	Pass
Applegate	Pass	Pass*	Pass	Pass*	Pass*	Pass
Elk	Pass	Pass*	Pass*	Pass*	Pass*	Pass

* *Inferred*

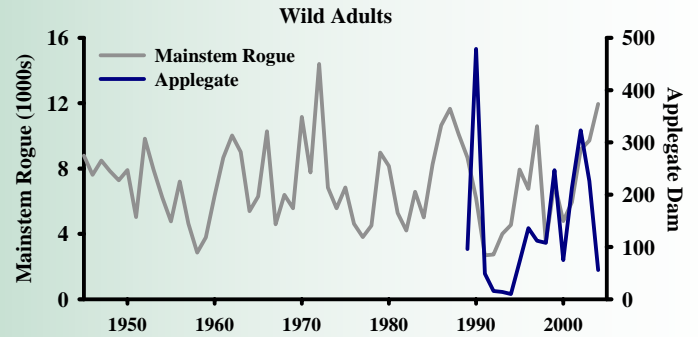


Distribution – Pass



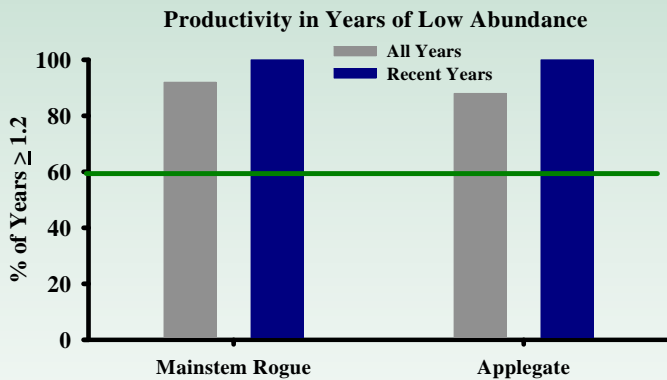
- Each population in the SMU is able to access at least 50% of their historical habitat.
- Construction of Applegate Dam blocked roughly 32 miles of habitat in the Applegate River leaving 87% of the historic habitat accessible.
- Construction of Lost Creek Dam in the mainstem Rogue eliminated access to roughly 4% of winter steelhead habitat for the mainstem Rogue population.

Abundance - Pass



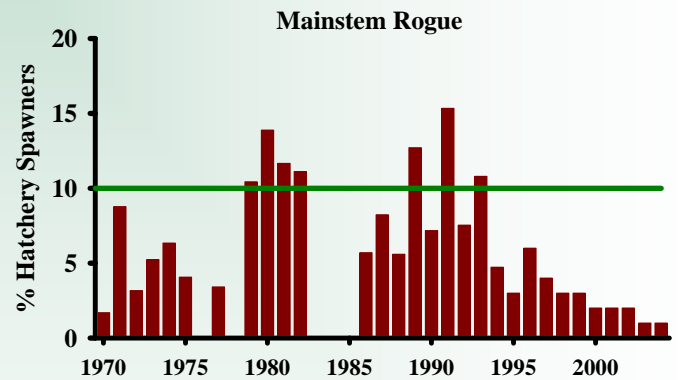
- Both of the populations with abundance data passed the criterion. These populations were assumed to be representative of the SMU. Spawning surveys in 2003 and 2004 in the other populations, and juvenile abundance data from the SMU support this assumption.
- Returns to the Mainstem Rogue have rebounded from record low numbers in the early 1990s. Recent numbers are among the highest since the 1940s.
- Applegate numbers have been above average in three of the last four years.

Productivity - Pass



- Recruit per spawner estimates were available for the mainstem Rogue and Applegate, and both of these populations passed.
- Data were not available for other populations, so the Rogue and Applegate were assumed to be representative of the SMU.
- Low spawner numbers in the late 1980s and early 1990s produced high rates of return.

Independence - Pass



- Monitoring at Elk Creek since 1995 has shown that hatchery fractions in the mainstem Rogue are below 10%.
- Recent data from the Applegate indicated that the presence of naturally spawning hatchery fish was below 10%.
- No hatchery fish are released in the Winchuck, Pistol, Illinois, or Elk rivers and out-of-basin straying is uncommon.
- Hatchery spawners in the Chetco are likely below 10% based on spawning surveys in 2004.

Lower Columbia Winter Steelhead SMU

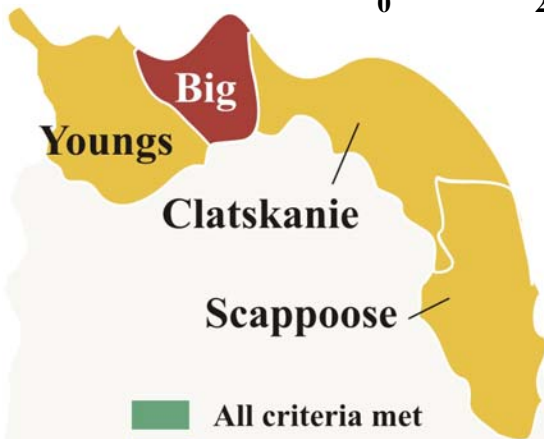
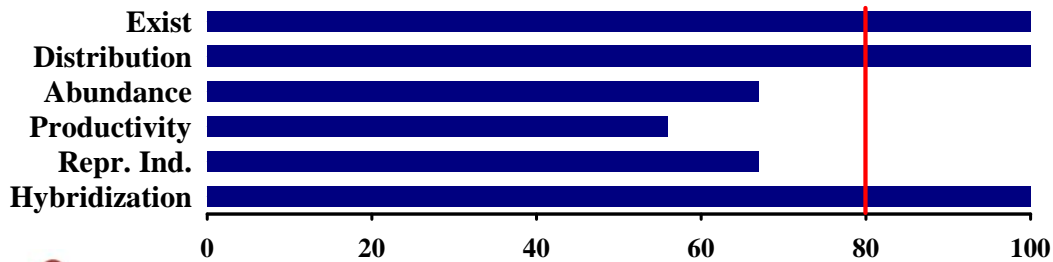
ESA Designation:
Threatened 1998

State Status:
Critical

Interim Assessment:
At Risk

This SMU consists of nine populations in tributaries to the Columbia River from the mouth up to Fifteenmile Creek near The Dalles. The Clackamas population is also included within this SMU. Data are limited for the Youngs, Big, Clatskanie, and Gorge populations and the status of these populations is unknown. Precautionary application of interim criteria treats inconclusive or insufficient data as failure in the assessment of risks to the SMU. The SMU only met three of the six interim criteria indicating its near-term sustainability is at risk. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.

Percent of Existing Populations Meeting Criteria



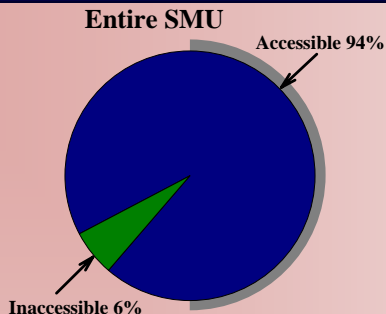
Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Youngs	Pass	Pass*	Pass*	Pass*	Fail*	Pass
Big	Pass	Pass*	Fail*	Fail*	Fail*	Pass
Clatskanie	Pass	Pass*	Fail*	Fail*	Pass*	Pass
Scappoose	Pass	Pass*	Fail*	Fail*	Pass	Pass
Clackamas	Pass	Pass*	Pass	Pass	Pass	Pass
Sandy	Pass	Pass*	Pass	Fail	Pass	Pass
Gorge	Pass	Pass*	Pass*	Pass*	Pass*	Pass
Hood	Pass	Pass*	Pass	Pass	Fail	Pass
Fifteenmile	Pass	Pass*	Pass	Pass	Pass*	Pass

* Inferred

- All criteria met
- 4-5 criteria met
- < 4 criteria met
- Extinct

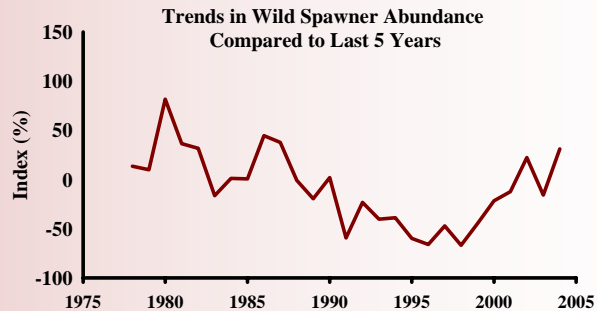


Distribution - Pass



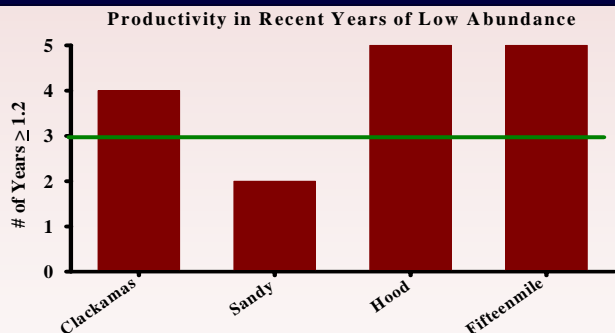
- All nine populations passed the distribution criterion.
- 94% of the historically-available habitat of this species management unit is still available today.
- Seven of the nine populations have lost access to 5% or less of their historic habitat.
- Dams in the Sandy have blocked 23% of the historic habitat.
- Starting in 2000, naturally-produced fish were allowed access to habitat above hatchery barriers in the Youngs and Big basins. A hatchery barrier on Gnat Creek (Big population) blocks access to four miles of habitat.

Abundance - Fail



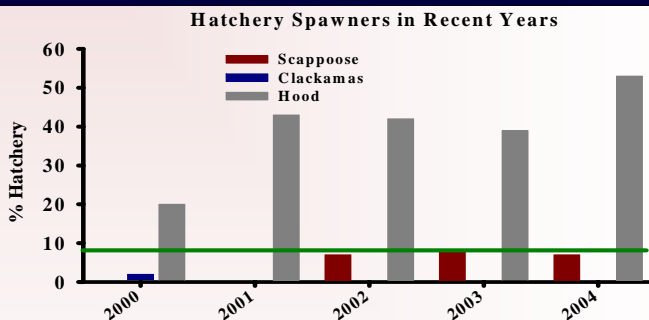
- Each of the four populations with abundance estimates passed. The graph above includes data from the Clackamas, Sandy, Hood, and Fifteenmile populations and reflects changes in abundance relative to the last five years.
- Wild numbers in the Sandy declined steadily through the mid 1980s and early 1990s, but remained above the criterion level in all but one year.
- Wild returns to the Clackamas in 2002 and 2003 were the highest in 15 years. The 2004 return was the largest since 1971.
- The Youngs population was assumed to have passed because redd densities in 2003 and 2004 were higher than in most coastal basins which are relatively healthy. In the same years, redd densities were low in the Big and Clatskanie causing those populations to fail.

Productivity - Fail



- Of the four populations for which productivity could be estimated, three passed the criterion. The Youngs population passed based on its abundance assessment. The Big and Clatskanie populations because of the abundance outcome, and Scappoose failed based on inconclusive data.
- Productivity in the Clackamas exceeded the criterion in four of the last five years of low abundance.
- Productivity in the Sandy has exceeded 1.2 for only two of the past 22 broods.
- Productivity for the Hood exceeded 1.2 in five of eight broods. Hood River estimates were assumed to be representative of the Gorge.

Independence - Fail



- Three of nine populations failed this criterion.
- Significant releases occur in the Youngs and Big populations.
- Hood River stock hatchery steelhead are passed above Powerdale Dam to supplement natural spawning.
- No hatchery releases occur in the Clatskanie or Gorge populations and strays are rare.
- Less than 10% of fish observed at Bonnie Falls in the Scappoose in the last five years were hatchery origin.
- Since 2001, only wild fish are allowed to pass above North Fork Dam in the Clackamas.
- In the Sandy, passage of hatchery fish above Marmot Dam was terminated in 1999.

Willamette Winter Steelhead SMU

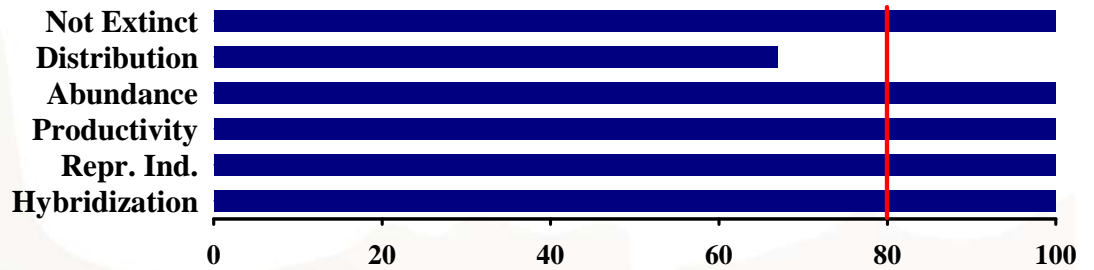
ESA Designation:
Threatened 1999

State Status:
Critical

Interim Assessment:
Potentially at Risk

This SMU includes nine populations in tributaries to the Willamette River above Willamette Falls. None of the populations are extinct, but the status of four populations (Tualatin, Yamhill, Rickreall, and Luckiamute) is unclear because data are scarce. Each of the populations met five or six criteria, and the SMU as a whole met five of six criteria indicating the near-term sustainability of the SMU is potentially at risk. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.

Percent of Existing Populations Meeting Criteria



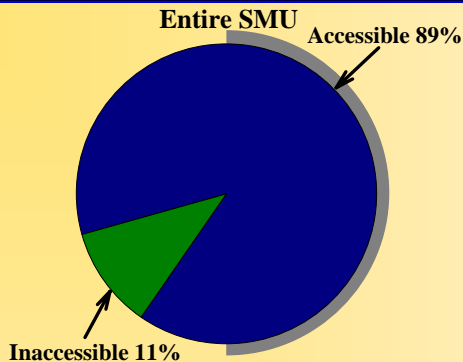
Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Tualatin	Pass	Pass*	Pass*	Pass*	Pass*	Pass
Yamhill	Pass	Pass*	Pass*	Pass*	Pass*	Pass
Rickreall	Pass	Fail*	Pass*	Pass*	Pass*	Pass
Luckiamute	Pass	Pass*	Pass*	Pass*	Pass*	Pass
Calapooia	Pass	Pass*	Pass	Pass	Pass*	Pass
Upper South Santiam	Pass	Fail	Pass	Pass	Pass	Pass
Lower South Santiam	Pass	Pass*	Pass	Pass	Pass	Pass
North Santiam	Pass	Fail*	Pass	Pass	Pass	Pass
Molalla	Pass	Pass*	Pass	Pass	Pass	Pass

* Inferred



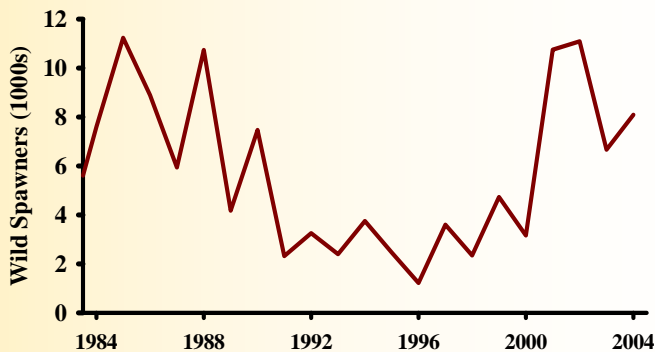
Oregon

Distribution - Fail



- Six of nine population passed the criterion.
- 87% of the habitat remains accessible today.
- Detroit Dam in the North Santiam, Foster Dam in the Upper South Santiam, and Mercer Dam in Rickreall Creek have blocked passage to part of these basins, and have reduced downstream habitat quality to the point that usage of historical habitat is likely less than 50%.

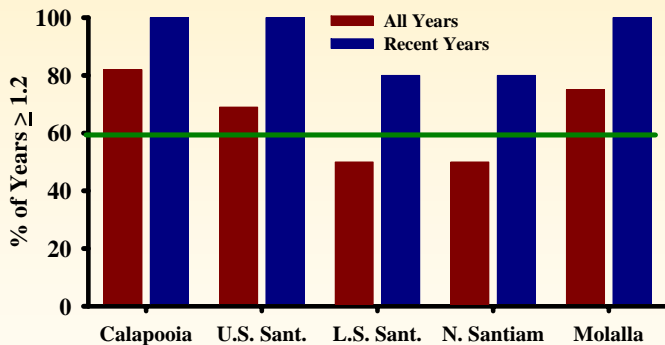
Abundance - Pass



- Abundance trends were available for the East-side populations (Santiam, Calapooia and Molalla) but not for the west-side populations (Tualatin, Yamhill, Rickreall and Luckiamute).
- The abundance trend above is based on wild returns to the east-side basins. Returns have been improving since 1996.
- All of the East-side populations exceeded the criterion in each of the last five years.
- The West-side tributaries each passed based on observations of moderate juvenile and adult abundance levels during occasional surveys.

Productivity – Pass

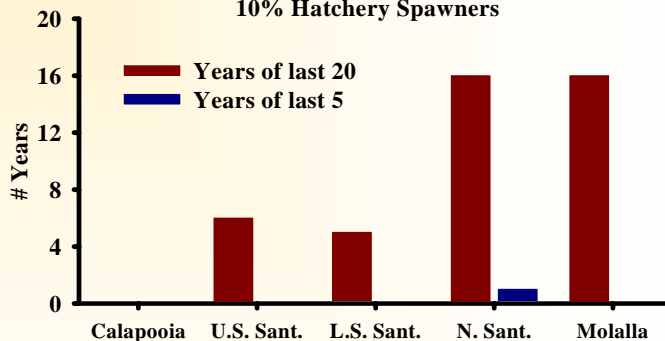
Productivity in Years of Low Abundance



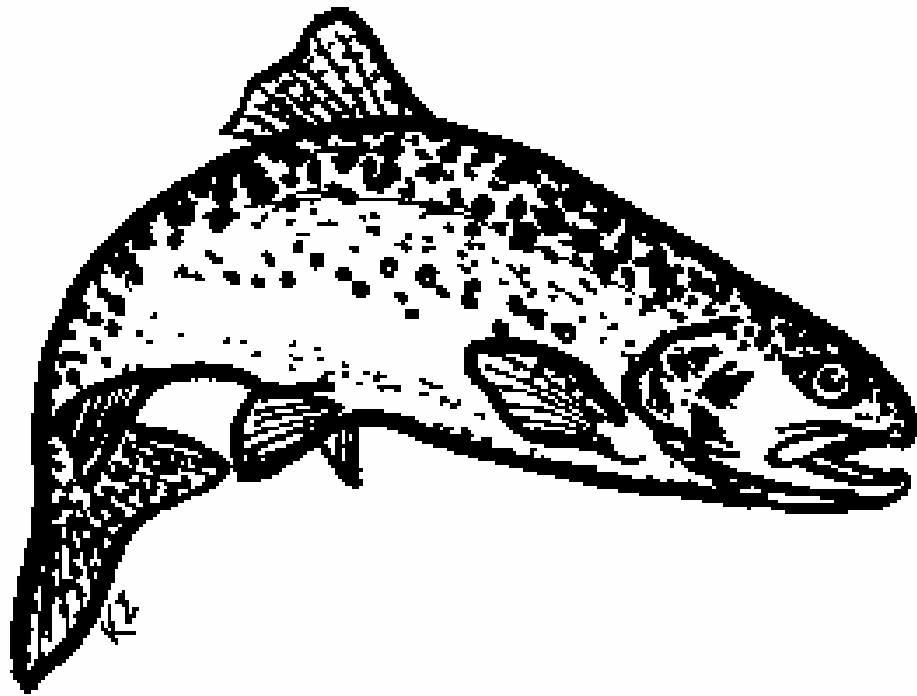
- Each of the five populations with data, passed the criterion.
- Productivity in all years of low abundance has not been as high as in the recent five years.
- Productivity in each of the populations with monitoring data tends to be greater than 1.2 in years of low abundance. Of all years when abundance was below the 30-year average, productivity was higher than 1.2 in at least 50% of those years.
- The Tualatin, Yamhill, Rickreall, and Luckiamute passed based on increasing returns seen in limited spawner survey data, and reports that juvenile densities are at moderate levels across these populations.

Independence - Pass

Number of Years with Greater than 10% Hatchery Spawners



- Each of the populations passed the criterion.
- Until recently, hatchery winter steelhead made up a significant portion of spawners in the Santiam and Molalla basins.
- Data were not available for the West-side tributaries, but no hatchery fish are released there.
- Termination of hatchery winter steelhead releases in the late 1990s has virtually eliminated hatchery numbers passing Willamette Falls.
- Hatchery summer steelhead return to some Willamette tributaries but winter run and summer-run spawn timing is largely segregated.



Summer Steelhead



Summer steelhead naturally occur in some coastal basins and most large Columbia River tributaries from Hood River upstream. They return from March through November, and spawn from January through April. Young steelhead rear for 1-4 years in freshwater and return to spawn after 1-3 years in the ocean. Oregon populations of summer steelhead typically average 6-10 pounds. Seven summer steelhead SMUs include a total of 29 populations. The upper Snake



population has been blocked by impassable dams and is extinct. The near term sustainability of both the Rogue and Snake SMUs is not at risk. Remaining populations are all either at risk or potentially at risk. The Klamath SMU has been blocked from a large part of its historical range but unknown numbers of fish still return to a few accessible tributaries.

Coastal Summer Steelhead SMU

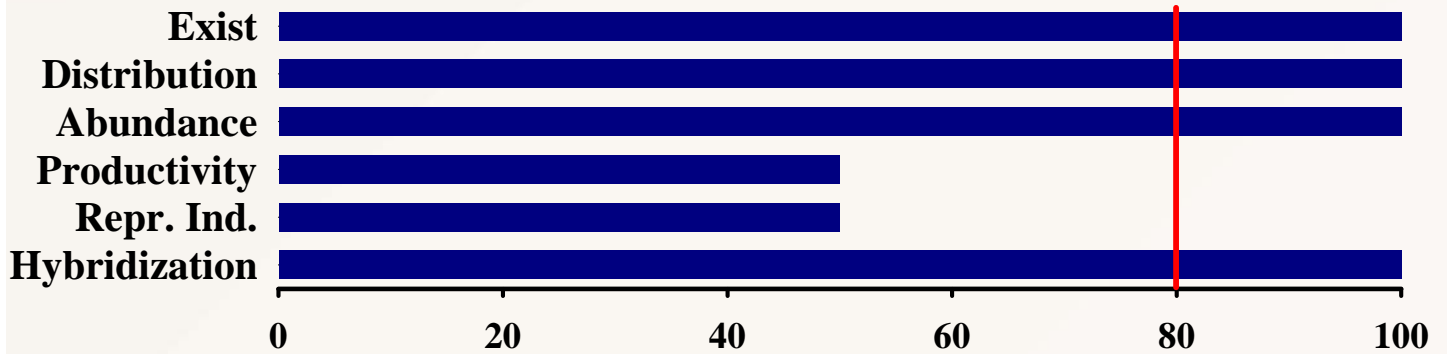
ESA Designation:
Candidate 1998

State Status:
Vulnerable

Interim Assessment:
Potentially At Risk

This SMU includes the North Umpqua and Siletz populations. The lack of reproductive independence by the North Umpqua population and low productivity for the Siletz indicate the near-term sustainability of the SMU is potentially at risk. Roughly 20% of the spawners in the North Umpqua are hatchery fish. Productivity in the Siletz should improve in the future because ODFW has ceased passing hatchery steelhead onto the spawning grounds above Siletz Falls. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.

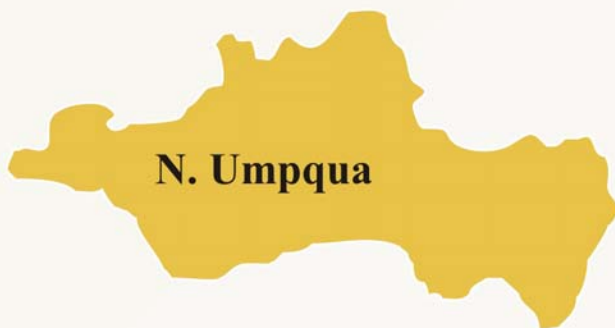
Percent of Existing Populations Meeting Criteria



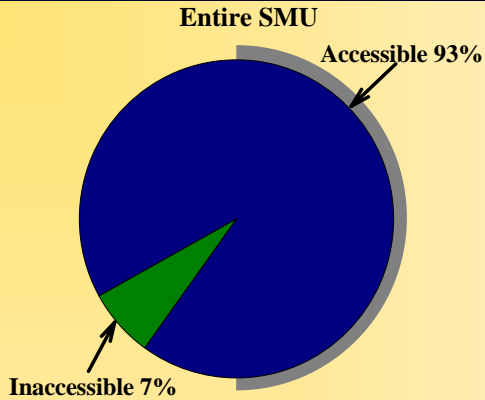
Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Siletz	Pass	Pass*	Pass	<i>Fail</i>	Pass	Pass
North Umpqua	Pass	Pass*	Pass	Pass	<i>Fail</i>	Pass

**Inferred*

- All criteria met
- 4-5 criteria met
- < 4 criteria met
- Extinct

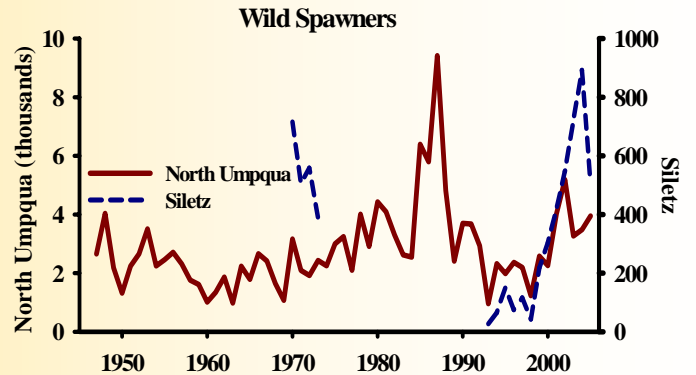


Distribution – Pass



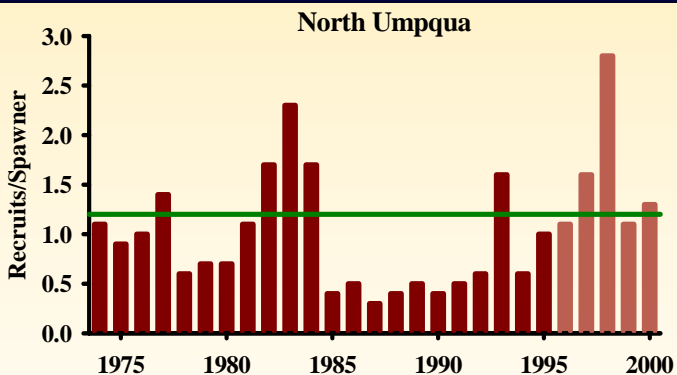
- 93% of the habitat used by spring Chinook in the past remains accessible.
- All of the habitat within the Siletz remains accessible, and 92% of the habitat within the North Umpqua can still be accessed.

Abundance - Pass



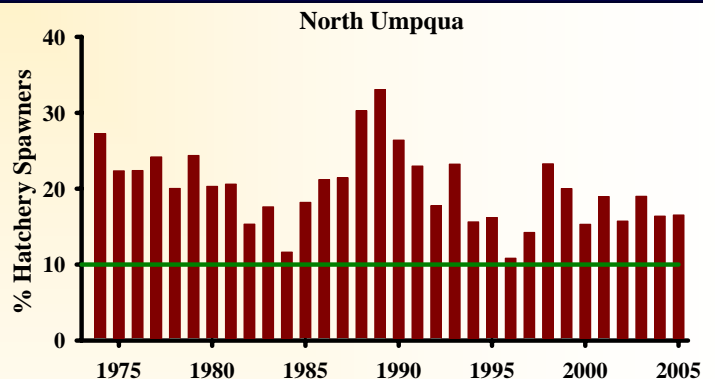
- Both populations exceeded the minimum abundance criterion in each of the last five years.
- Returns to the North Umpqua have been monitored at Winchester Dam since the 1946-47 run year and numbers have only twice fallen below the interim criterion of 849 spawners.
- Wild returns to the Siletz increased for six consecutive years prior to the 2004/2005 run year and have now rebounded to levels observed around 1970.

Productivity - Fail



- The North Umpqua passed the productivity criterion, but the Siletz did not.
- Productivity in the North Umpqua has been greater than 1.2 in six of 11 years of low abundance including three of the last five.
- Productivity in the Siletz ranged from 0.1 to 1.1 recruits per spawner in the seven years where data were available. High numbers of hatchery spawners pushed abundance levels beyond the average wild abundance in each of those years raising the possibility of density dependence.

Independence - Fail



- In the North Umpqua, hatchery fractions in natural spawning areas have been 10-35% since 1974.
- Many hatchery fish that spawn naturally in the North Umpqua do not spawn in the same areas as wild fish.
- Between 1992 and 1999, hatchery fish made up 72-97% of the spawning population in the Siletz.
- In the Siletz, adult steelhead are trapped at Siletz Falls, which is below the primary spawning grounds. Beginning in 2000, wild fish were selectively passed at Siletz Falls, and hatchery fish were either recycled downstream into the recreational fishery, or were removed from the system.

Rogue Summer Steelhead SMU

ESA Designation:
Not Warranted 2001

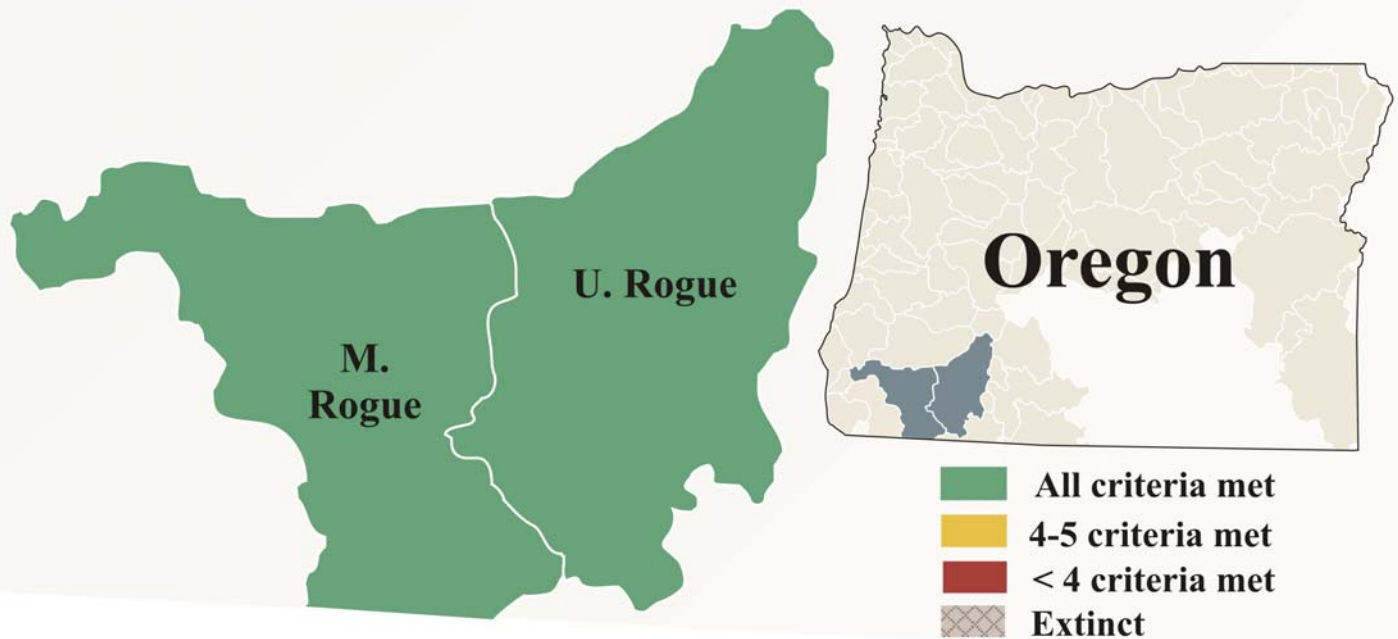
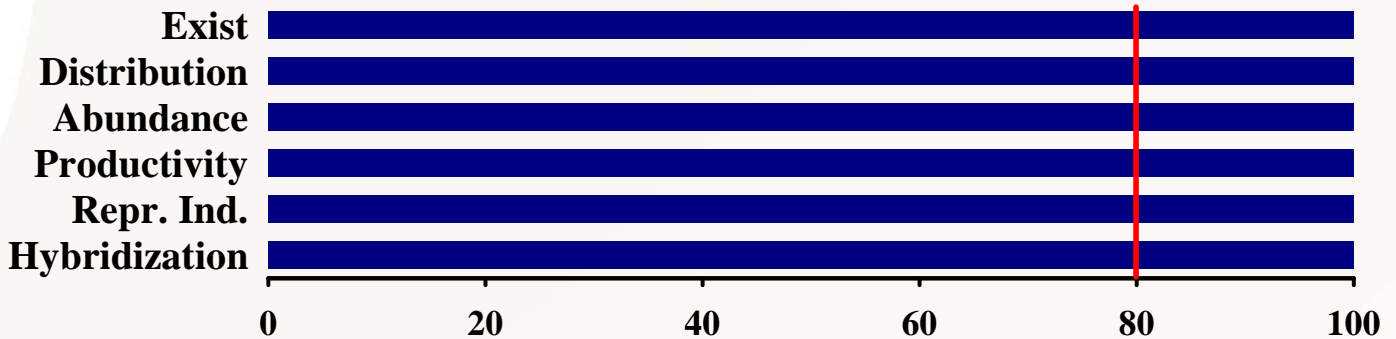
State Status:
Vulnerable

Interim Assessment:
Not at Risk

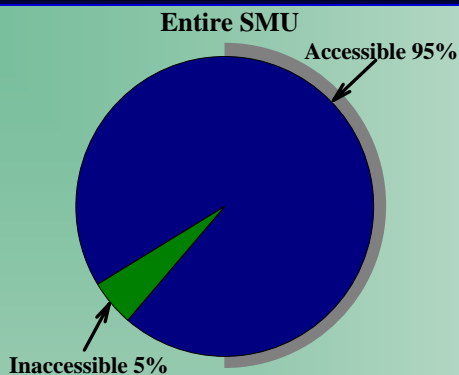
This SMU included Middle and Upper Rogue populations. Monitoring data for the Middle Rogue includes spawner surveys in Kane and Foots creeks. Abundance in the Upper Rogue is monitored by passage at Gold Ray Dam. The near-term sustainability of the SMU is not at risk because both populations met each of the interim criteria.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Middle Rogue	Pass	Pass *	Pass	Pass	Pass *	Pass
Upper Rogue	Pass	Pass *	Pass	Pass	Pass	Pass

Percent of Existing Populations Meeting Criteria

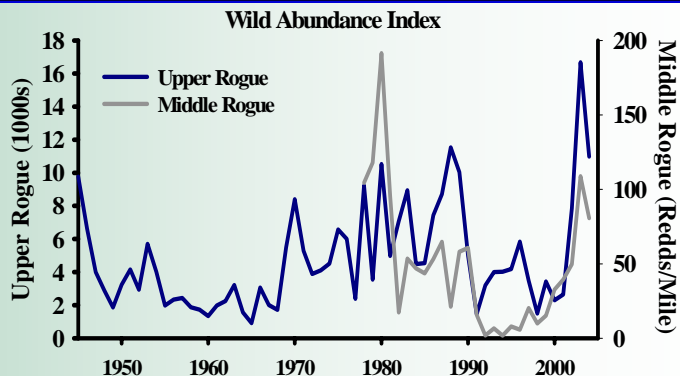


Distribution – Pass



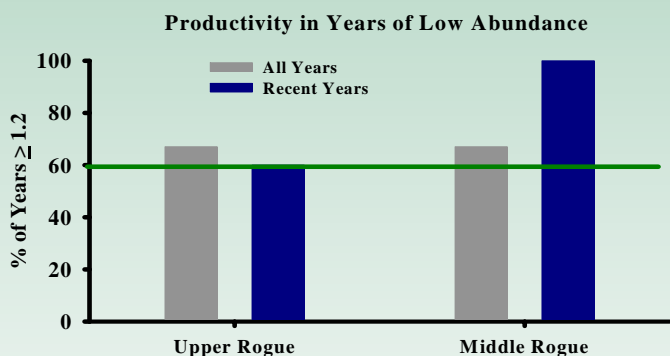
- Each of the two populations maintains access to at least 50% of their historical habitat. Frequent spawning escapements above full seeding ensure that most of the available habitat is in use.
- Construction of Lost Creek Dam and Applegate Dam eliminated 5% historical steelhead habitat for the population.

Abundance - Pass



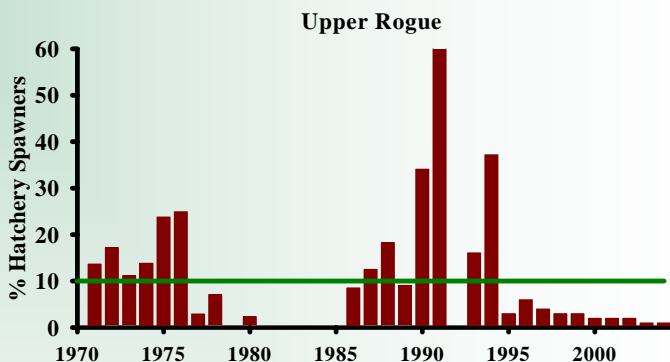
- Both populations passed the abundance criterion in each of the last five years.
- Returns to the Upper Rogue have been higher in the last 2 years than in any year since 1943.
- Returns to Kane and Foots Creek in the Middle Rogue have been steadily increasing since the early 1990s.

Productivity - Pass



- Both populations exceeded 1.2 recruits per spawner in at least three of the last five years when returns were below the 30 year average.
- Both populations have shown productivity above the interim criterion in years of low abundance over the long term.
- The Middle Rogue has been above 2.0 recruits per spawner over the past eight years.

Independence - Pass



- Hatchery fractions on the spawning grounds have been low for both populations over the past decade.
- For instance, hatchery fractions in the Upper Rogue escapement have been 7% or less since 1995.

Additional Information

- The Rogue basin is home to a unique steelhead life history pattern involving a false spawning run known as “half-pounders.” These fish migrate to the ocean as smolts, return temporarily to freshwater, then go back to the ocean before returning again in subsequent years to spawn. Returns of “half-pounders” were not included in this assessment since they do not spawn upon initial return.

Lower Columbia Summer Steelhead SMU

ESA Designation:
Threatened 1998

State Status:
Critical

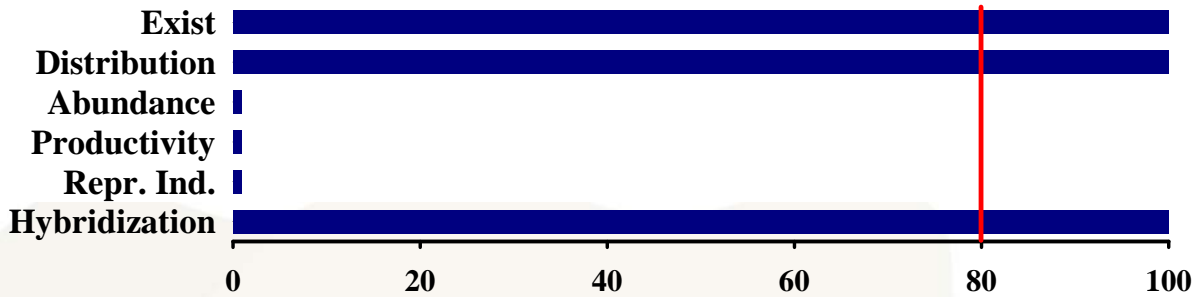
Interim Assessment:
At Risk

This SMU consists of a single population in the Hood River. Hood River summer steelhead primarily inhabit the West Fork. The inherent habitat productivity in Hood River is limited by high gradient and glacial turbidity. The population met three of six criteria and its near term sustainability is at risk. Extensive and detailed data on populations throughout this SMU provide a high level of confidence in the assessment of interim criteria.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid.
Hood	Pass	Pass*	Fail	Fail*	Fail	Pass

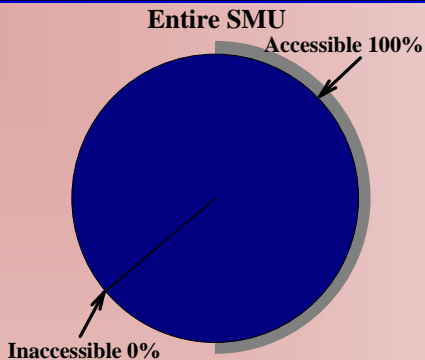
*Inferred

Percent of Populations Meeting Criteria



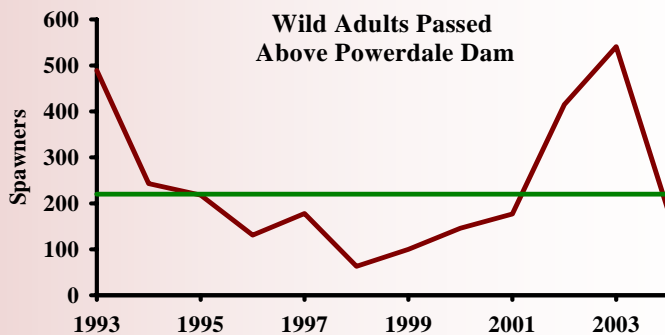
- All criteria met
- 4-5 criteria met
- < 4 criteria met
- Extinct

Distribution – Pass



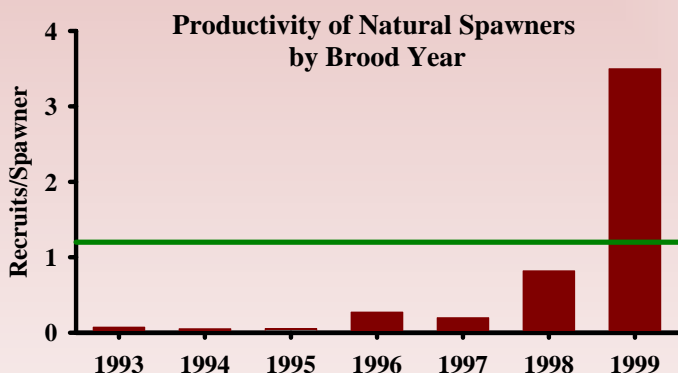
- All of the historical habitat in the Hood basin remains accessible today.
- Passage at Powerdale Dam in the lower mainstem Hood allows for continued access to the spawning grounds including the West Fork Hood River.

Abundance - Fail



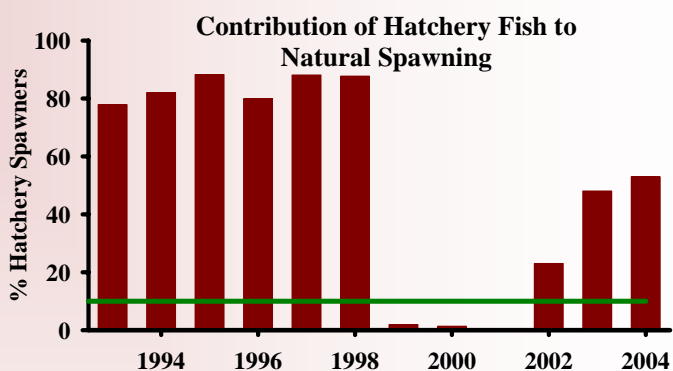
- The fish ladder at Powerdale Dam just upstream from the mouth of Hood River allows all returning adults to be identified and counted.
- Wild returns rose above the criterion threshold in 2002 and 2003, but fell below the criterion again in 2004.

Productivity - Fail



- Productivity has been extremely low over the last seven broods, but has been greater the last four years.
- Productivity only once reached the productivity criterion of 1.2 recruits per spawner.

Independence - Pass



- The Hood River summer steelhead hatchery program is integrated, meaning that wild fish are used to supplement broodstock, and hatchery fish are used to supplement natural spawning.
- Beginning in 1999 the number and origin of hatchery summer steelhead has been controlled by selectively passing fish at Powerdale Dam. Up to 50% of the summer steelhead passed above the dam may be hatchery fish.

Additional Information

- The hatchery supplementation program underway in the Hood River includes significant monitoring to assess its effectiveness and to support adaptive management. The goal of the program is to rebuild the naturally-reproducing population while providing for a consumptive fishery.
- The Powerdale Dam has been scheduled for removal in 2010. Efforts will be made to establish a new monitoring site.
- Habitat conditions for steelhead are affected by irrigation withdrawals, logging in the upper watershed, and grazing and other agricultural practices in the lower watershed.

Mid Columbia Summer Steelhead SMU

ESA Designation:
Threatened 1999

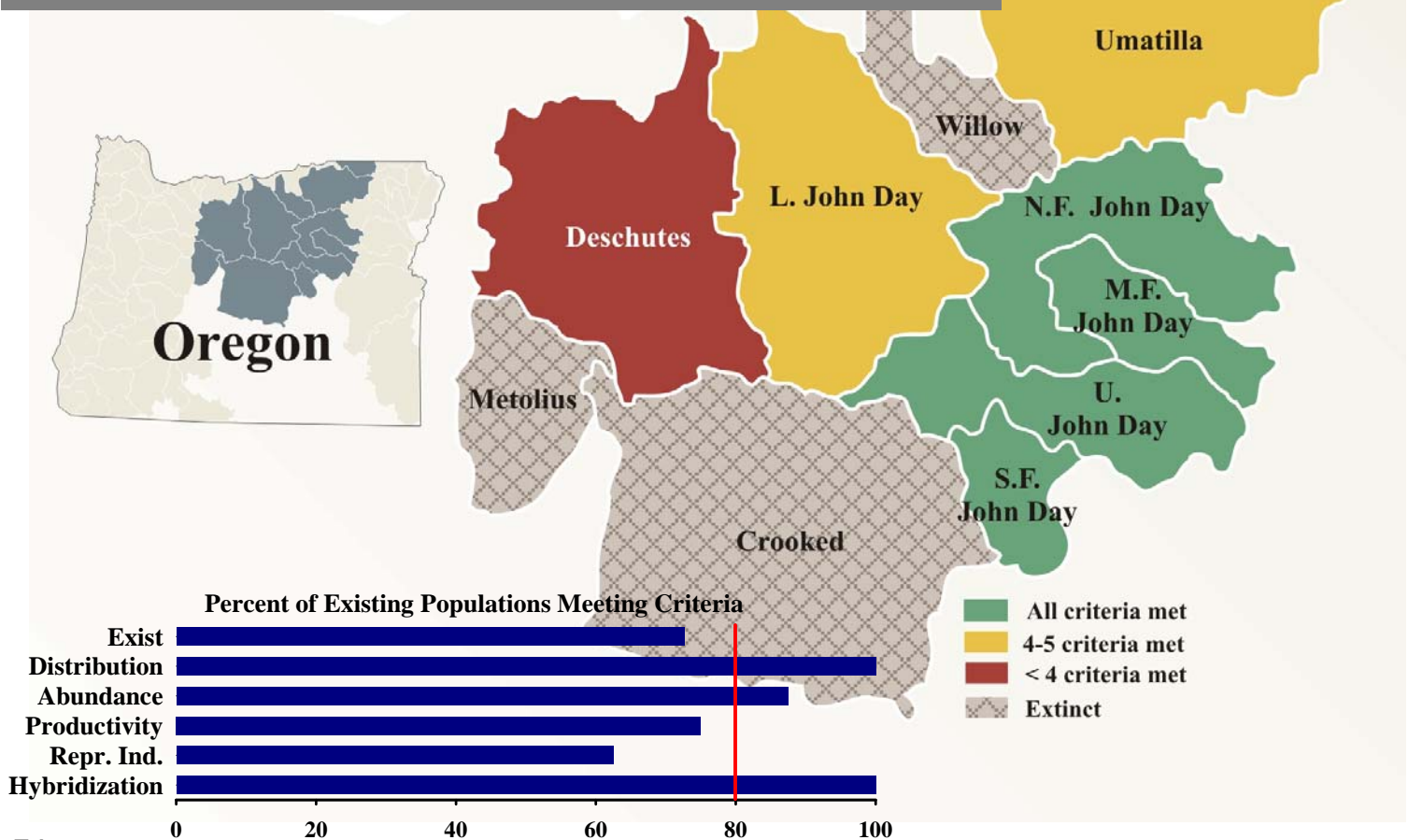
State Status:
Vulnerable

Interim Assessment:
At Risk

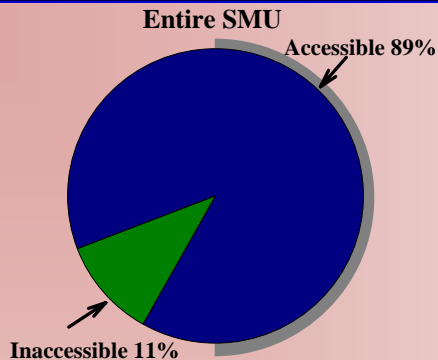
This SMU includes 11 historic populations in Columbia River tributaries between The Dalles Dam and the Snake River. The SMU only met three of the six interim criteria indicating the near-term sustainability is at risk. Four of the five John Day populations and the Walla Walla meet all of the five population-specific interim criteria. The Deschutes and Umatilla populations are constrained by variable productivity. The Deschutes, Lower John Day, and Umatilla are affected by naturally-spawning hatchery fish. Historical populations in the upper Deschutes and Willow Creek are extinct. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Deschutes	Pass	Pass*	Fail	Fail	Fail	Pass
Metolius	Fail		Extinct Population			
Crooked	Fail		Extinct Population			
Lower John Day	Pass	Pass*	Pass	Pass	Fail	Pass
North Fork John Day	Pass	Pass*	Pass	Pass	Pass	Pass
Middle Fork John Day	Pass	Pass*	Pass	Pass	Pass	Pass
South Fork John Day	Pass	Pass*	Pass	Pass	Pass	Pass
Upper John Day	Pass	Pass*	Pass	Pass	Pass	Pass
Willow	Fail		Extinct Population			
Umatilla	Pass	Pass*	Pass	Fail	Fail	Pass
Walla Walla	Pass	Pass*	Pass	Pass	Pass	Pass

*Inferred from representative data

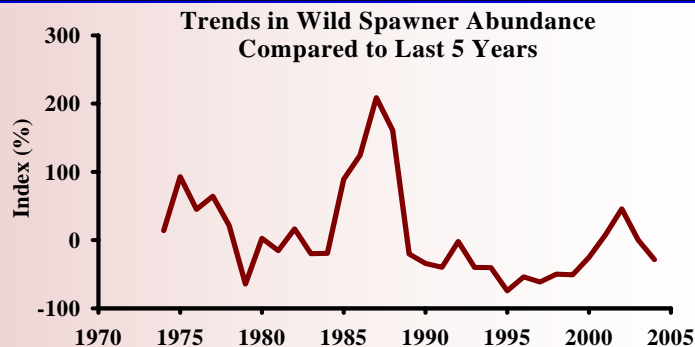


Distribution – Pass



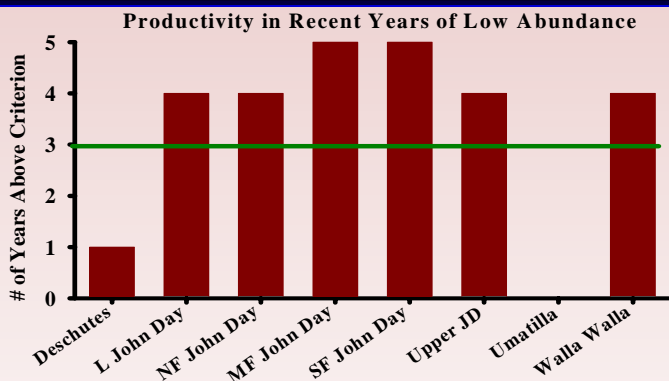
- Roughly 265 miles of habitat in the Metolius and Crooked rivers was blocked in 1958 by construction of the Pelton and Round Butte dams in the Deschutes.
- 99% of habitat within existing populations remains accessible.
- Each of the existing populations passed the criterion.

Abundance– Pass



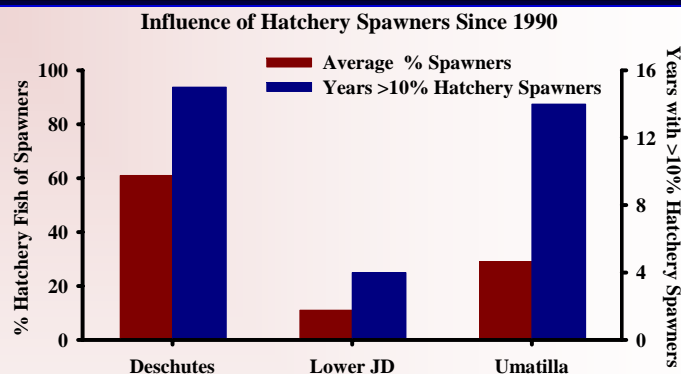
- Seven of the eight existing populations passed the criterion.
- Abundance has fluctuated since monitoring began but the long term trend has been slightly down. The graph above reflects relative changes in abundance relative to the last five years for all populations combined.
- Record low numbers were observed during the 1990s.
- Increased escapements in the late 1980s and early 2000s followed years of better-than-average ocean conditions.

Productivity – Fail



- Only six of eight existing populations met the interim criterion.
- Productivity was consistently above the interim criterion from the late 1970s through the early 1980s.
- The mid 1980s to mid 1990s were a period of low productivity, but have been followed by three strong broods in the mid 1990s.

Independence - Fail



- Only five of eight existing populations passed the criterion.
- The graph above includes only populations that failed the criterion.
- The Deschutes and Umatilla exceeded 10% naturally spawning hatchery fish each of the last five years.
- Very few hatchery fish are observed in the Walla Walla and in the John Day outside of the lower John Day.
- A hatchery supplementation program is currently operated in the Umatilla basin, incorporating wild broodstock into the hatchery and releasing hatchery fish into the wild.

Additional Information

- Hatchery summer steelhead have comprised 60% of the spawners in the Deschutes population over the last four generations. This suggests that abundance has been driven by hatchery fish rather than wild fish. For this reason, the Deschutes failed the abundance criterion despite numbers of naturally produced fish above the criterion for the last five years.

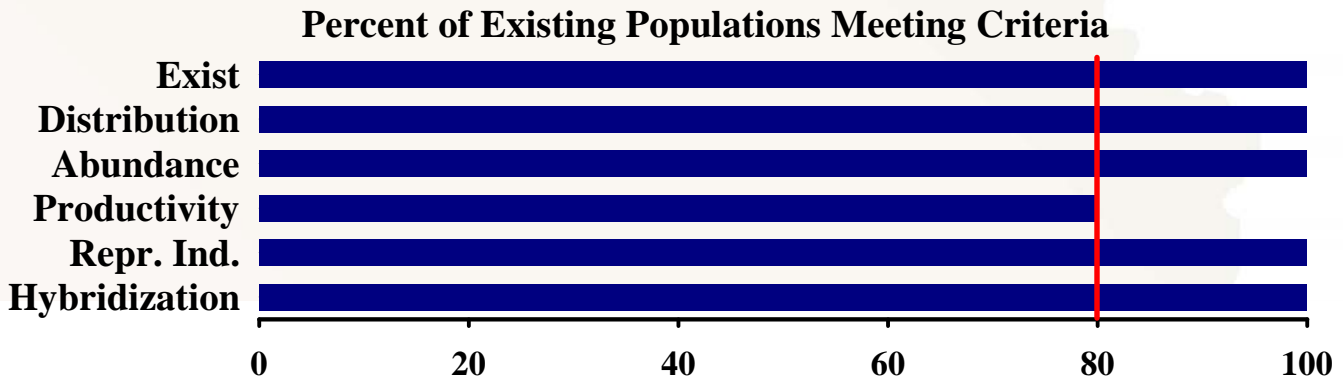
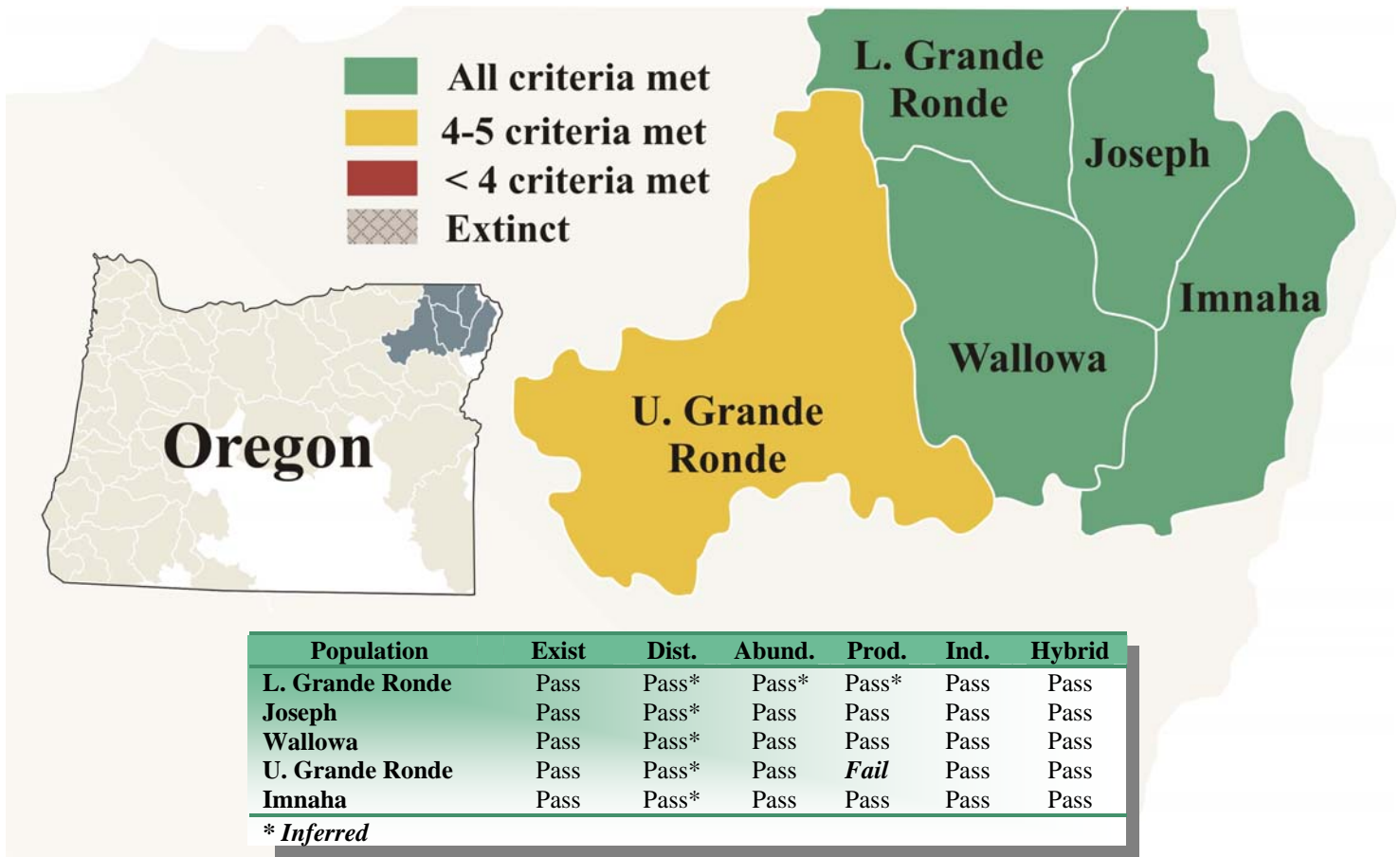
Lower Snake Summer Steelhead SMU

ESA Designation:
Threatened 1997

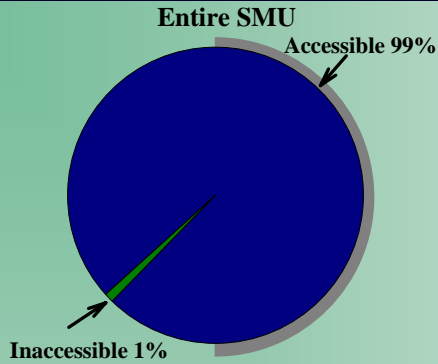
State Status:
Vulnerable

Interim Assessment:
Not at Risk

This SMU consists of five populations from tributaries flowing into the Snake River below Hells Canyon Dam. The SMU near-term sustainability of the SMU is not at risk because each of the six interim criteria were met by at least 80% of the populations. All of the populations with the exception of the Upper Grande Ronde passed all of the criteria. The Upper Grande Ronde population did not meet the productivity criterion. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.

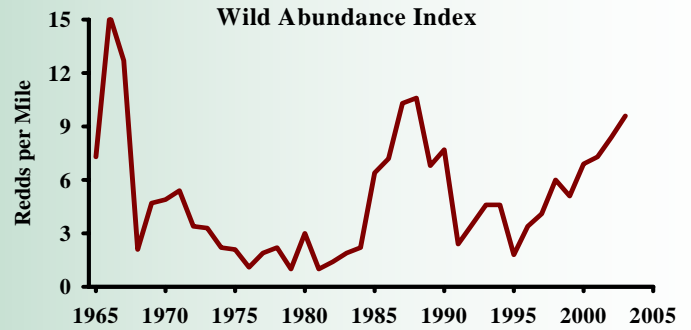


Distribution - Pass



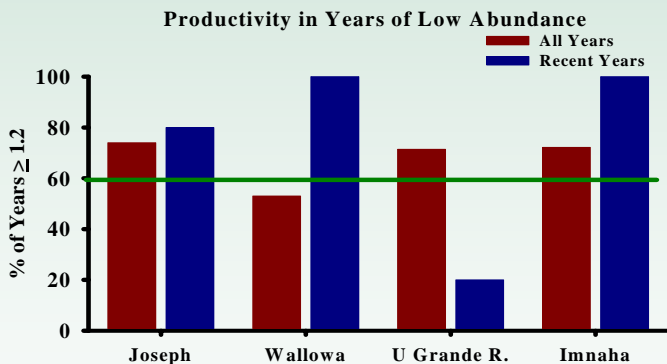
- Each of the five populations passed the distribution criterion.
- Nearly all (99%) of the historically-available habitat of this SMU is still available today. Much of the habitat however is degraded from pre-settlement conditions.

Abundance – Pass



- Each of the populations passed the criterion.
- Beginning in the late 1960s, spawner abundance dropped sharply and remained depressed until the early 1980s. This decline is attributed to effects of lower Snake River dams and an extended period of poor ocean conditions.
- Populations rebounded in the mid-1980s only to fall again in the late 1980s and early 1990s, again reflecting changes in ocean conditions.
- Each of the populations exceeded the minimum criterion in all of the last five years, and in at least 80% of all years with abundance estimates. No data are available for the Lower Grande Ronde, but it was assumed to have performed similar to the Joseph population.

Productivity - Pass



- Four of the five populations passed this criterion.
- In the upper Grande Ronde, low abundance years in the 70s and 80s are associated with high productivity. Resiliency was not as strong during low abundance years in the late 90s.
- All populations have shown similar resiliency in years of low abundance over time the long term.
- Resiliency in the Wallowa and Imnaha has been stronger in recent years than in the past. The opposite is true for the upper Grande Ronde.

Independence - Pass

- Hatchery fish made up about 23% of natural spawners in the Upper Grande Ronde between 1988 and 2001, but have been less than 1% since 2002.
- Elimination of acclimated hatchery releases by ODFW in the Upper and Lower Grande Ronde populations has reduced the presence of hatchery fish on the spawning grounds in these populations the last few years.
- Less than 10% of spawning steelhead are hatchery origin in the Joseph and Wallowa populations.
- Hatchery fractions at monitoring weirs on the Imnaha have fluctuated between three and 14% hatchery fish over the past five years. Three of those years have been less than 10% hatchery fish.

Upper Snake Summer Steelhead SMU

ESA Designation:
No Designation

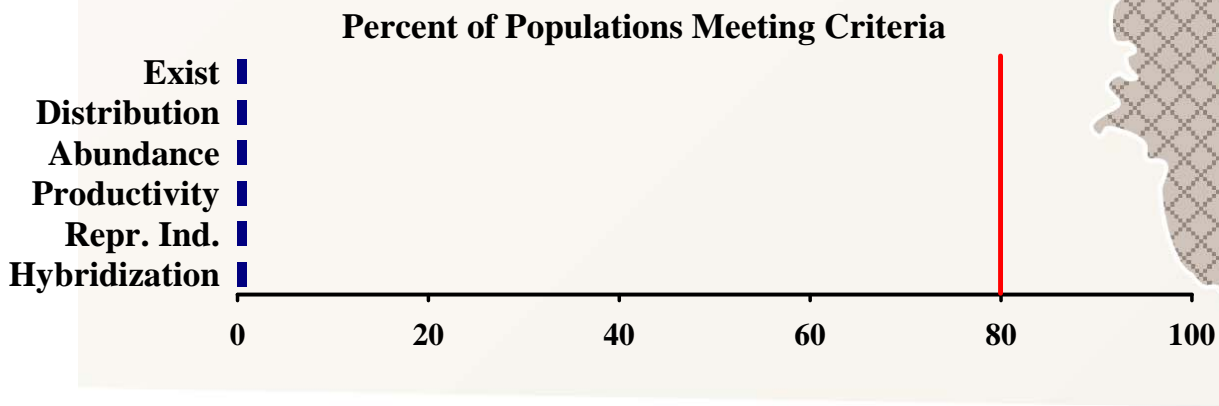
State Status:
No Status

Interim Assessment:
Extinct

Small irrigation dams and diversions had already reduced habitat quality in the first half of the 20th century. Passage to the Malheur basin was eliminated with the construction of Warm Springs Dam (1919) and Agency Dam (1935). All of the populations within this SMU became extinct after completion of the Hells Canyon Dam complex in 1967 eliminated anadromous passage. Resident and fluvial forms of redband trout persist in these basins.



Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Pine	Fail					Extinct Population
Eagle	Fail					Extinct Population
Powder	Fail					Extinct Population
Burnt	Fail					Extinct Population
Malheur	Fail					Extinct Population
Owyhee	Fail					Extinct Population



Klamath Steelhead SMU

ESA Designation:
Not Warranted 2001

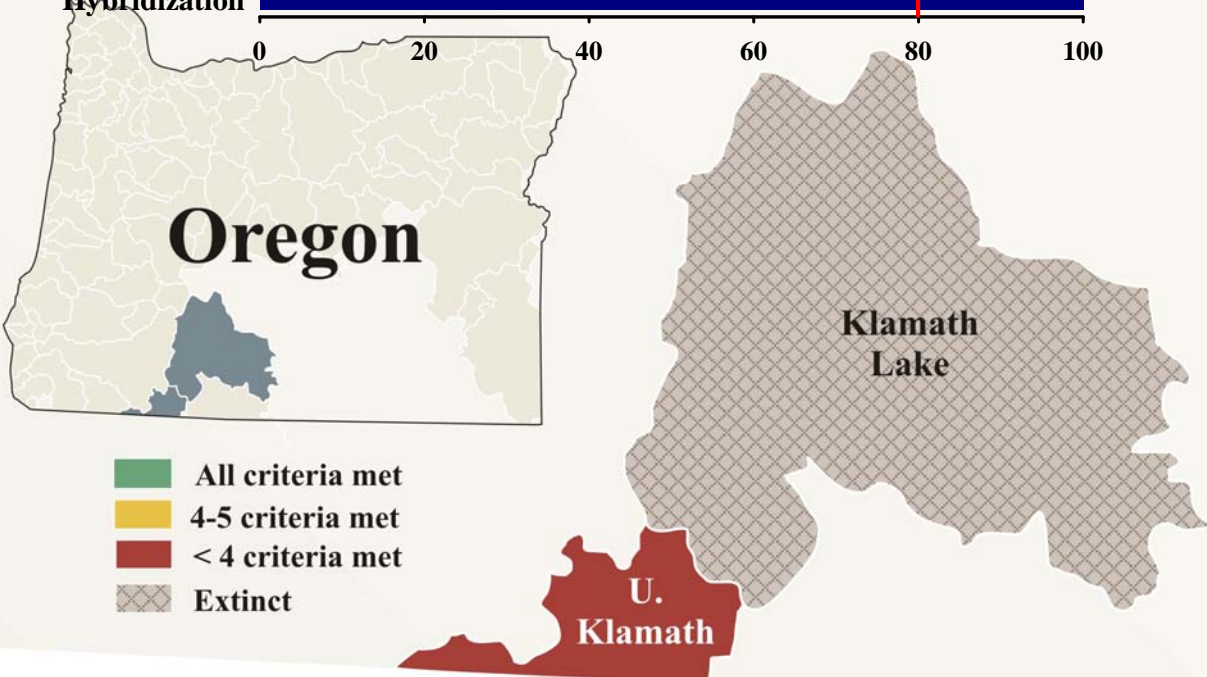
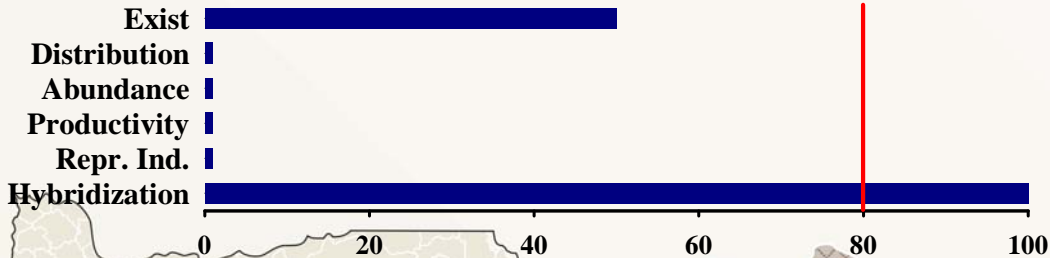
State Status:
Not Listed

Interim Assessment:
At Risk

This SMU consists of two populations in the Klamath basin upstream of the Oregon/California border. The Klamath Mountains Province ESU, of which the Klamath Steelhead SMU is a part, was determined to be “not warranted” for listing under the Endangered Species Act in 2001. Construction of a series of three dams without passage between 1918 and 1962 effectively extirpated the Klamath Lake tributary population. Steelhead persist below Iron Gate Dam but only a very small portion of anadromous accessible waters within the basin extend into Oregon. A steelhead population may exist in Oregon in Upper Cottonwood Creek, a tributary to the Klamath below Iron Gate Dam. No data are available to assess the current status of this population. Electrofishing surveys in Cottonwood Creek, Cow Creek, and Long John Creek yielded *O. mykiss*, but no adult size trout suggesting these may have been juvenile steelhead. Additionally, a potential steelhead redd was observed in Cottonwood Creek by ODFW in 2003. The SMU fails the distribution criterion because access to a substantial portion of the historical habitat was eliminated by the Copco Dams and Iron Gate Dam. The near-term sustainability of the SMU is at risk because of the loss of one of the two populations, loss of substantial habitat for the other population, and indications from anecdotal information that the population is depressed. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Upper Klamath	Pass	Fail	--	--	--	Pass
Klamath Lake	Fail		Extinct Population			

Percent of Existing Populations Meeting Criteria



Redband Trout

Photo by Native Fish Investigations Project, ODFW



Malheur Lakes Redband Trout SMU

ESA Designation:
Not Warranted 2000

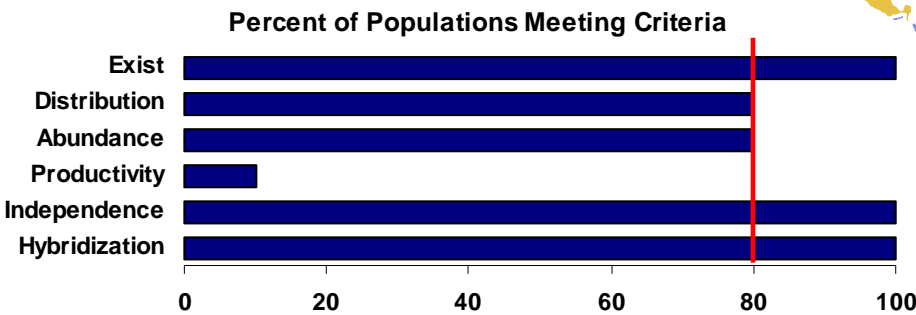
State Status:
Vulnerable

Interim Assessment:
Potentially at Risk

The Malheur Lakes Redband Trout SMU includes ten populations in the closed interior basin of Harney and Malheur lakes. Historically, all streams were interconnected and fish could move to the lakes and among populations. Currently, populations are isolated by natural and manmade barriers. Only the Blitzen population is known to express a migratory life history. Redband trout in the SMU are widely distributed in small and medium sized streams and moderately abundant during high water years. The SMU meets five of the six interim criteria and is classified as ‘potentially at risk’. Population status varies significantly within the SMU. Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Silver	Pass	Pass	Pass	Fail*	Pass	Pass
Silvies	Pass	Pass	Pass	Fail*	Pass	Pass
Poison	Pass	Pass	Pass	Fail*	Pass	Pass
Prater	Pass	Fail*	Fail*	Fail*	Pass	Pass
Coffeepot	Pass	Fail*	Pass*	Fail*	Pass	Pass
Rattlesnake	Pass	Pass	Pass	Fail*	Pass	Pass
Cow	Pass	Pass	Fail*	Fail*	Pass	Pass
Riddle	Pass	Pass	Pass	Fail*	Pass	Pass
McCoy	Pass	Pass	Pass	Fail*	Pass	Pass
Blitzen	Pass	Pass	Pass	Pass*	Pass	Pass

*Inferred



■ All criteria met
■ 4-5 criteria met
■ < 4 criteria met
■ Extinct

Distribution - Pass



- Year around distribution occurs in small and medium sized streams. Access to lakes and lower mainstem habitats is limited due to warm water temperatures, low flow conditions, and natural and manmade barriers.
- Most populations are isolated from lakes and other populations, which limit the expression of a migratory life history, prevents mixing between populations, and increases risk of extinction. However, many of these populations are naturally isolated; consecutive high water years or a change in climate may be required to reconnect these populations.

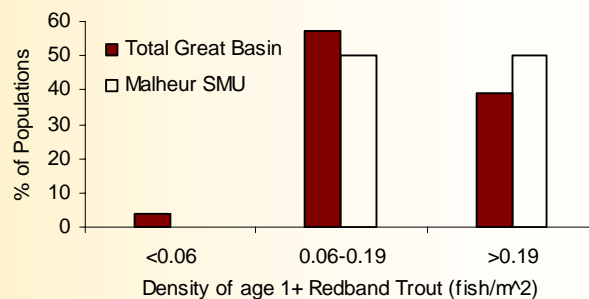
Productivity – Fail

- Quantitative productivity data are not available. The criterion is assessed based on the qualitative evaluation of distribution, abundance, presence of large fluvial fish, habitat quality, and presence of non-native species.
- Only the Blitzen population expresses a migratory life history and passes the criterion. Other populations are limited by distribution, a lack of connectivity to other populations, and a migratory life history, poor habitat quality, and presence of non-native species.

Additional Information

- Non-native cutthroat trout are not present in the Malheur Lakes Basin and not a threat to redband trout. All populations pass the hybridization criterion.
- Redband trout abundance and distribution fluctuates considerably between drought and high water years.
- Reduction in the complexity of streamside vegetation, the presence of artificial barriers, and reduced stream flows have degraded habitat quality and availability for redband trout.
- Exotic species (i.e., carp, large mouth bass, small mouth bass, and yellow perch) in lakes and lower mainstem rivers alter habitat, compete for resources, and modify community structure.
- ODFW is currently developing a conservation plan for this species management unit.
- The Steens Mountain Cooperative Management and Protection Act of 2000 improved protection of Riddle, McCoy, and Blitzen populations.

Abundance - Pass



- A population estimate counted 414,551 (+/- 43%) age 1+ redband trout across all ten populations in 1999.
- Overall mean density (0.156 fish/m²) was considered moderate relative to densities through out eastern Oregon, although half of the populations had high densities. These estimates were made during high water years and are expected to fluctuate with habitat quality and instream flows.
- Abundance of Prater and Cow populations is severely depressed. Recent surveys for Malheur mottled sculpin did not document redband trout.

Independence - Pass

- Hatchery rainbow stocking programs were eliminated in rivers and streams by 1993. Brood stocks used in these programs were not local. Effects of interbreeding do not appear to be significant, however genetic analysis found evidence of minimal introgression in Silvies and McCoy populations. No introgression was detected in Blitzen.
- Current stocking activities occur only in lakes and reservoirs where trout are thought to be unable to escape.

Catlow Valley Redband Trout SMU

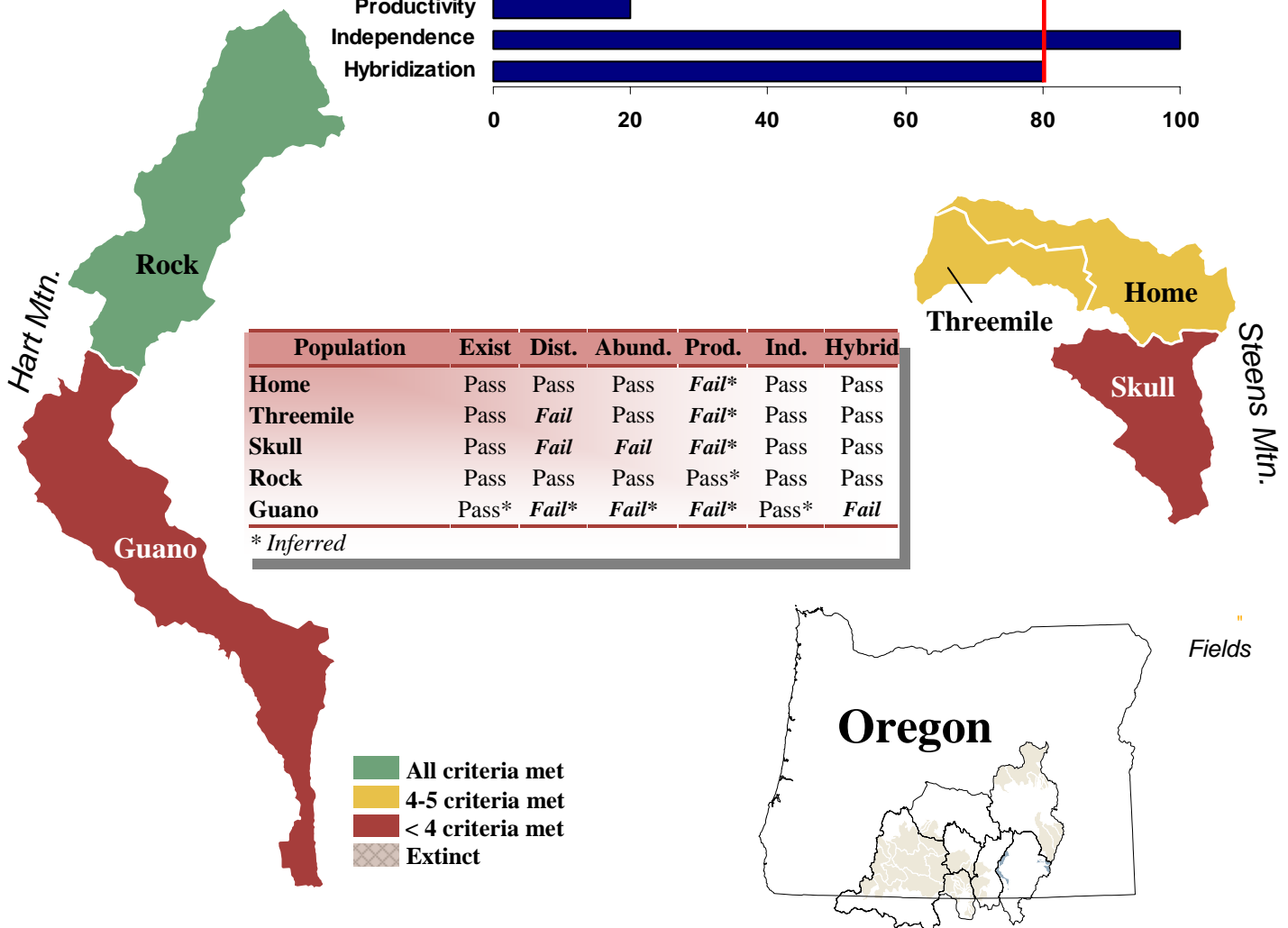
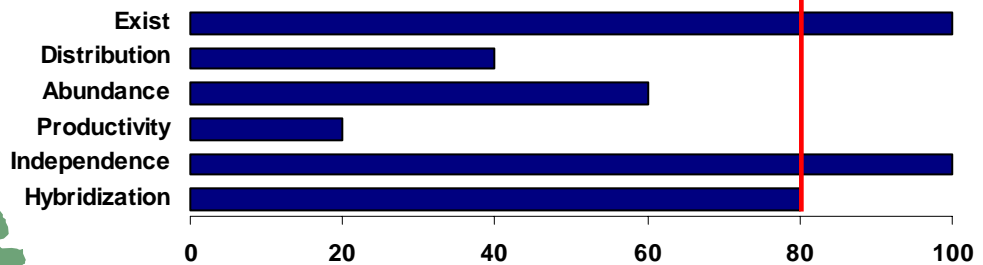
ESA Designation:
Not Warranted 2000

State Status:
Vulnerable

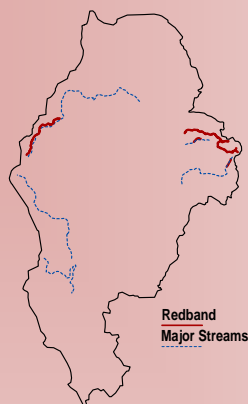
Interim Assessment:
At Risk

The Catlow Valley Redband Trout SMU includes five populations in the closed interior basin of Catlow Valley. Even though redband trout are present in most perennial streams in Catlow Valley, the distribution is highly fragmented. Connection does not exist between any populations, which prevents genetic mixing, limits opportunities to express a migratory life history, and increases risk of extinction from stochastic events. Populations have limited access to lakes minimizing the expression of migratory life history strategies. Densities fluctuate accordingly with water years, although Skull and Guano populations appear perilously depressed in all conditions. The Guano population is also potentially threatened by hybridization with cutthroat trout. Eighty percent of the populations met three of the six interim criteria thereby classifying this SMU as 'at risk'. Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria.

Percent of Populations Meeting Criteria



Distribution - Fail



- Year around distribution is fragmented. Lack of connection between populations or to habitats capable of producing large individuals prohibits inter-population mixing and minimizes the expression of multiple life history types.
- Threemile and Skull Creek distributions are limited to less than four kilometers each. Distribution in Guano Creek is undetermined but likely extremely limited. All three populations fail the criterion.
- The distribution of redband trout varies according to annual precipitation and fluctuation of instream flows.

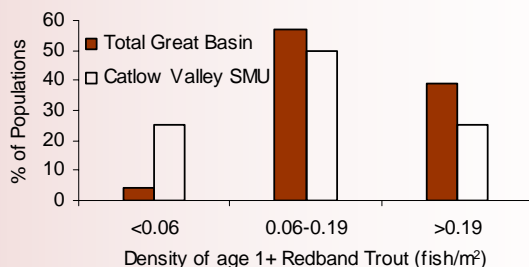
Productivity - Fail

- Quantitative productivity data are not available. The criterion is assessed based on distribution, abundance, presence of large migratory fish, habitat quality, and presence of non-native species.
- Only the Rock Creek population passes the criterion based on data that show re-colonization of previously dry stream reaches during a high water year.
- The remaining populations fail the criterion due to no evidence of a lack of a migratory life history, limited distribution or abundance, and degraded habitats.

Additional Information

- Lahontan cutthroat trout were stocked in Guano Creek in 1957, 1967, and 1973 and hybridize with redband trout. This population fails the hybridization criterion.
- Through the Catlow Valley Conservation Agreement, private landowners and Federal and State agencies have implemented a variety of habitat conservation activities on Home, Threemile, and Skull creeks. These actions include creating passage to Skull Creek Reservoir and adjusting grazing practices to allow regeneration of riparian communities. Fish and habitat response to these activities has not been documented.
- ODFW is currently developing a conservation plan for this species management unit.
- Rock and Guano creeks are located on Hart Mountain National Antelope Refuge.

Abundance - Fail



- A population survey estimated 54,866 (+/- 33%) age 1+ redband trout in four of the five populations in 1999. Guano Creek was not included in this estimate.
- SMU-wide mean density (0.423 fish/m²) was considered high relative to densities throughout eastern Oregon, although 25% of the sample sites had very low densities. Only a few sites supported extremely high densities. Estimates were made during high water years and are expected to fluctuate with habitat quality and instream flows. However, density in Skull Creek was estimated to be low even during high water years. This population failed the criterion.
- Abundance in Guano is undetermined but likely extremely low. This population also failed the criterion.

Independence - Pass

- Stocking of hatchery origin rainbow trout has not occurred in Threemile, Skull, and Home creeks.
- The hatchery rainbow trout stocking program on Rock Creek was eliminated in 1973. Guano Creek was stocked with coastal rainbow trout in the 1960s.
- All populations pass the criterion since rainbow trout are not currently stocked and all populations are managed for natural production.

Warner Lakes Redband Trout SMU

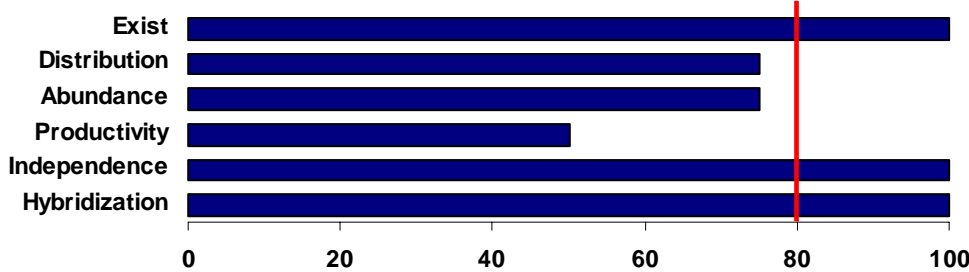
ESA Designation:
Not Warranted 2000

State Status:
Vulnerable

Interim Assessment:
At Risk

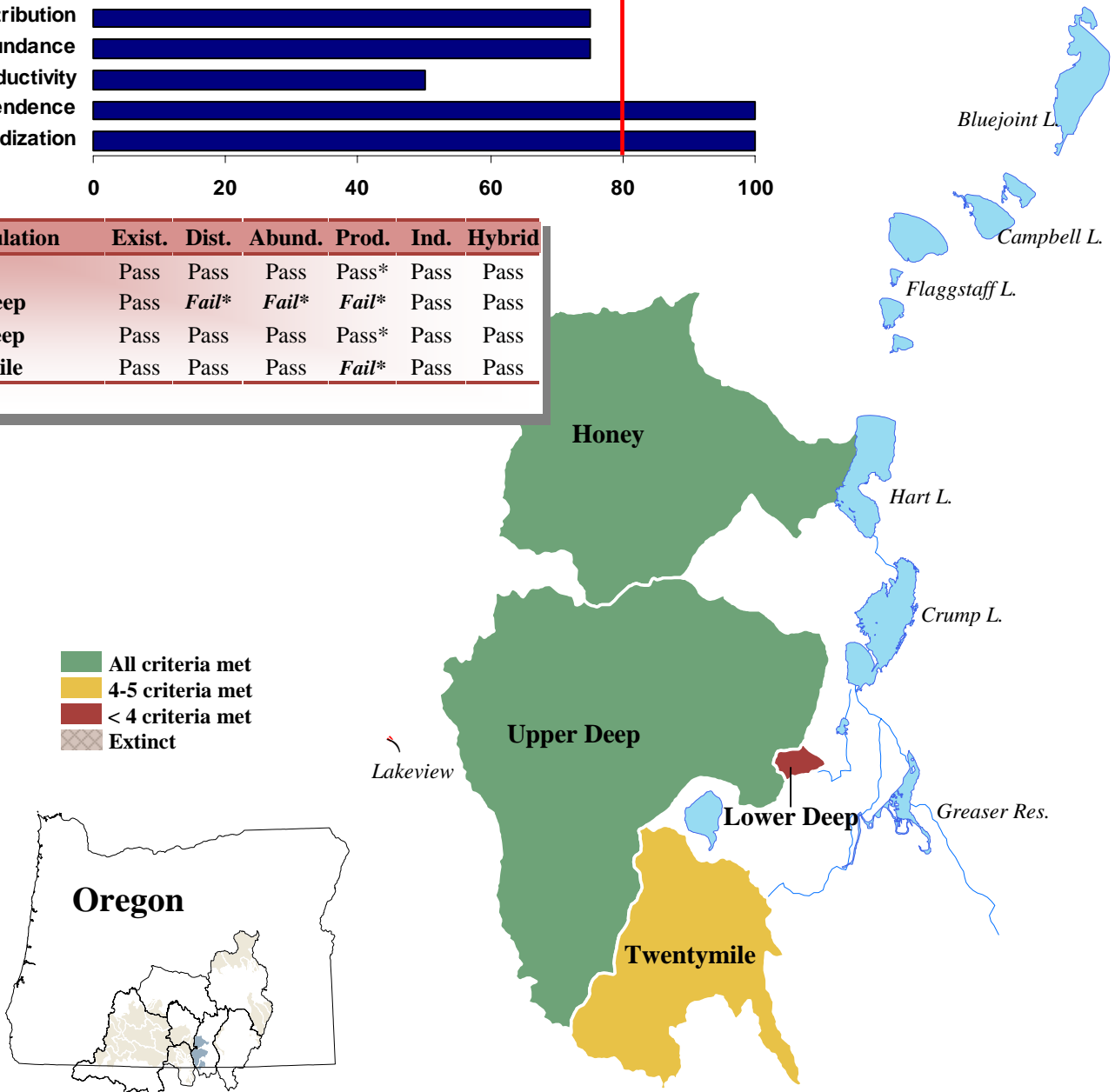
The Warner Lakes Redband Trout SMU includes four populations in the interior basin of pluvial Lake Warner. Distribution is widespread in perennial streams and lakes, although multiple irrigation diversions and the presence of non-native warm water fish in Warner Lakes limits the expression of an adfluvial life history. Although densities and abundance are relatively high in the headwater and mid-reaches, densities in the lower reaches may be low and vulnerable to extreme environmental fluctuations and degraded habitat. Only three of the six interim criteria were met, thereby classifying this SMU as ‘at risk’. Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria.

Percent of Populations Meeting Criteria



Population	Exist.	Dist.	Abund.	Prod.	Ind.	Hybrid
Honey	Pass	Pass	Pass	Pass*	Pass	Pass
Lower Deep	Pass	Fail*	Fail*	Fail*	Pass	Pass
Upper Deep	Pass	Pass	Pass	Pass*	Pass	Pass
Twentymile	Pass	Pass	Pass	Fail*	Pass	Pass

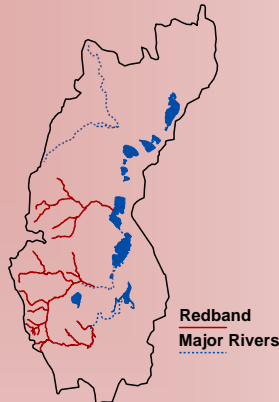
* Inferred



■ All criteria met
■ 4-5 criteria met
■ < 4 criteria met
■ Extinct



Distribution - Fail



- Redband trout are widespread in perennial streams and lakes.
- The Upper Deep population is isolated upstream by Deep Creek falls and is unable to mix with other populations in the SMU. Twentymile is also isolated from other populations by irrigation dams and diversions.
- Other populations are connected to large lakes and able to intermix in high water years, however irrigation diversions and low water quality limit the expression of an adfluvial life history.
- The distribution of redband trout varies according to annual precipitation and fluctuation of instream flows.

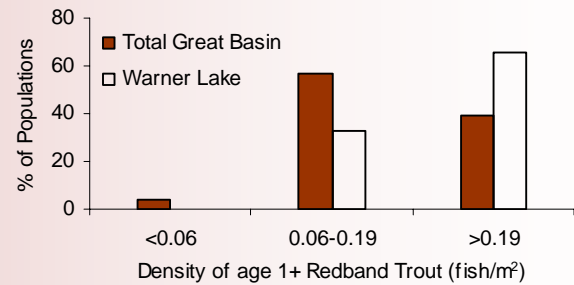
Productivity - Fail

- Quantitative data necessary to accurately assess productivity do not exist. The criterion is assessed based on the qualitative evaluation of current distribution and abundance, presence of large migratory individuals, habitat quality, and presence of non-native species.
- Populations where distribution and abundance are limited and not connected to habitats capable of supporting multiple life histories fail the criterion.
- Recruitment may be inconsistent as observed in total or partial year class failures. Reduced and episodic population growth may put small populations further at risk.

Additional Information

- Non-native cutthroat trout are not present in the Warner Lakes Basin and not a threat to redband trout. All populations pass the hybridization criterion.
- Crappie, largemouth bass, and brown bullheads were introduced into many of the Warner Lakes in the 1970s. Non-native warm-water fish species in the lakes and reservoirs compete with redband trout and prey on smaller individuals.
- Upstream and downstream passage is lacking or inadequate in many of the lower reaches and is also a serious issue for Warner Suckers.

Abundance - Fail



- A population survey estimated 54,866 (+/- 33%) age 1+ redband trout in Warner Valley in 1999. Mean density was considered high relative to densities throughout Eastern Oregon, although lower reaches of stream in each population unit were under-represented.
- A 2000 population survey of Twentymile documented high densities in the upper reaches and extremely low densities in the lower reaches. The low densities were due to a die off caused by high water temperatures.
- Abundance of adfluvial redband trout in Warner Lakes is severely depressed and significantly less than historical levels.

Independence - Pass

- Hatchery rainbow trout were stocked in all populations between 1925 and 1989. Stocking programs were eliminated in 1989.
- Effects of interbreeding are uncertain. Warner Valley redband trout is considered genetically distinct and any introgression has reached equilibrium within the SMU.

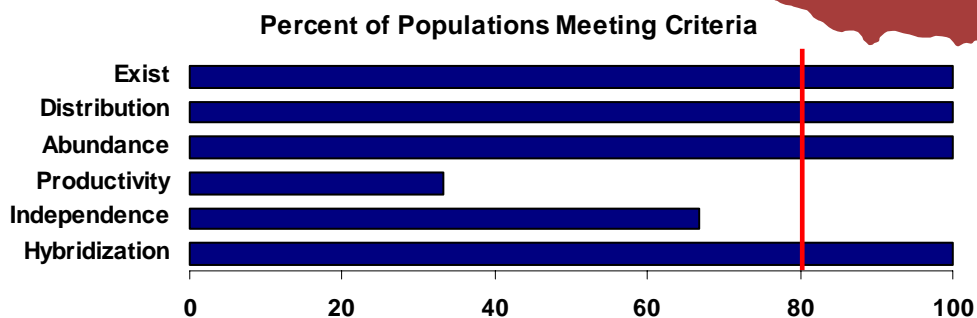
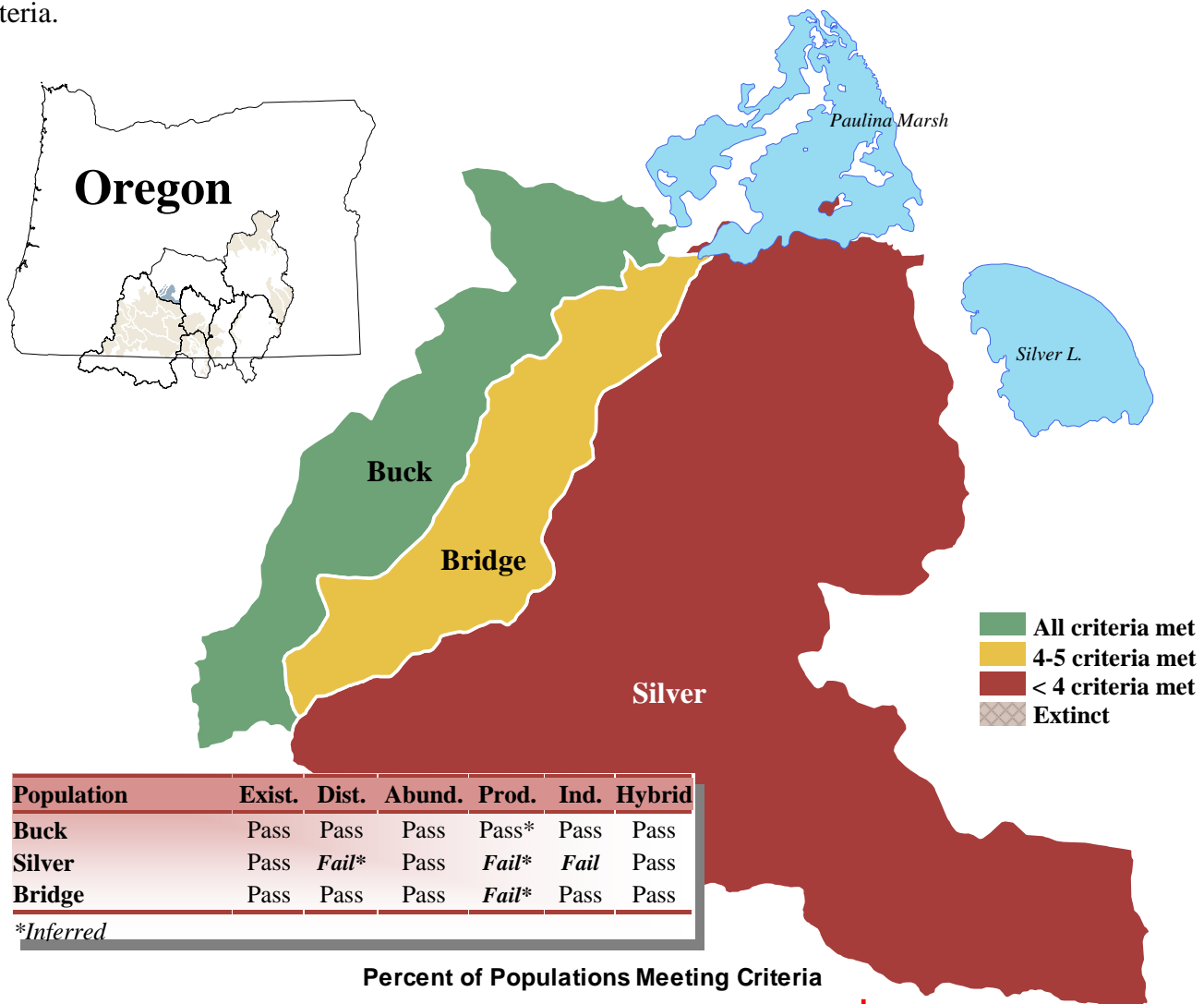
Fort Rock Redband Trout SMU

ESA Designation:
Not Warranted 2000

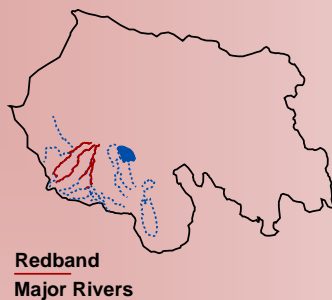
State Status:
Vulnerable

Interim Assessment:
At Risk

The Fort Rock Redband Trout SMU is comprised of three populations in the Silver Lake basin. Populations occupy tributaries of Paulina Marsh which has been diked, channelized, and drained for agricultural purposes. Populations are only connected during consecutive high water years, severely limiting the opportunities for the expression of a migratory life history and inter-population mixing. Lack of a migratory life history and degraded habitat impacts the potential productivity. This SMU is classified as ‘at risk’ because eighty percent of the populations meet only three of the six interim criteria. Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria.



Distribution - Fail



- Redband trout occupy three tributary streams of Paulina Marsh. The marsh is diked, channelized, and drained. As a result populations are connected infrequently during consecutive high water years providing sporadic opportunities for inter-population mixing. The expression of migratory life histories is rare.
- Distribution in Silver Creek is limited relative to the size of the basin. Redband are not present in the upper tributaries and Thompson Valley Reservoir is a barrier to upstream movement. Silver Creek failed the distribution criterion.
- Silver Lake, a remnant pluvial lake, is uninhabitable and disconnected from native trout populations.

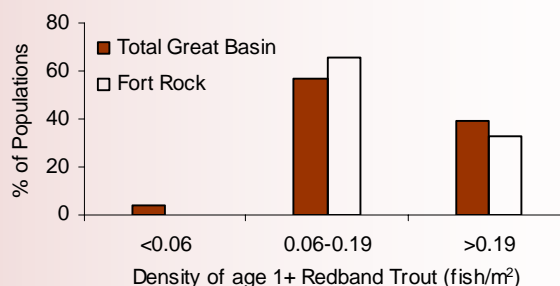
Productivity – Fail

- Quantitative data necessary to accurately assess productivity do not exist. The criterion is assessed based on the qualitative evaluation of current distribution and abundance, presence of large migratory individuals, habitat quality and presence of non-native species.
- Populations, where distribution and abundance are limited, and not connected to habitats capable of supporting multiple life histories, fail the criterion. High densities of brook trout in the upper reaches of Silver Creek may also limit productivity of that population.
- The Buck population passes the criterion based on sampling in 1976, which documented similar densities found in 1999, suggesting population trend is stable through varying climactic cycles.

Additional Information

- Non-native cutthroat trout are not present in the Fort Rock Basin and not a threat to redband trout. All populations pass the hybridization criterion.
- Past logging activities may have caused increased sedimentation in the upper reaches. The lower reaches are impacted by grazing, channelization, and flooding. However, due to restoration efforts habitat conditions in upper Buck Creek are improving.

Abundance - Pass



- A population survey estimated 56,964 (+/- 23%) age 1+ redband trout in Fort Rock Basin in 1999.
- Mean density was considered moderate relative to densities throughout Eastern Oregon. Sites with the highest densities were located in narrow, protected canyon reaches. Given moderate to high densities, all populations meet the abundance criterion.
- This review is based on estimates made during high water years. Densities and total population abundance are expected to fluctuate with instream flow and habitat quality.

Independence - Fail

- Hatchery rainbow trout were stocked extensively in Silver Creek between 1925 and 1984. Buck and Bridge creeks were stocked periodically through the 1960s. Stocking programs in moving waters were eliminated in 1984.
- The extent and effects of interbreeding between hatchery and wild stocks are unknown.
- Stocking of domestic rainbow trout currently occurs in Thompson Valley Reservoir on Silver Creek. Hatchery fish are able to leave the reservoir during high water years and may potentially spawn with native redband trout. Silver Creek fails the reproductive independence criterion until effects of current stocking programs can be better assessed.

Chewaucan Redband Trout SMU

ESA Designation:
Not Warranted 2000

State Status:
Vulnerable

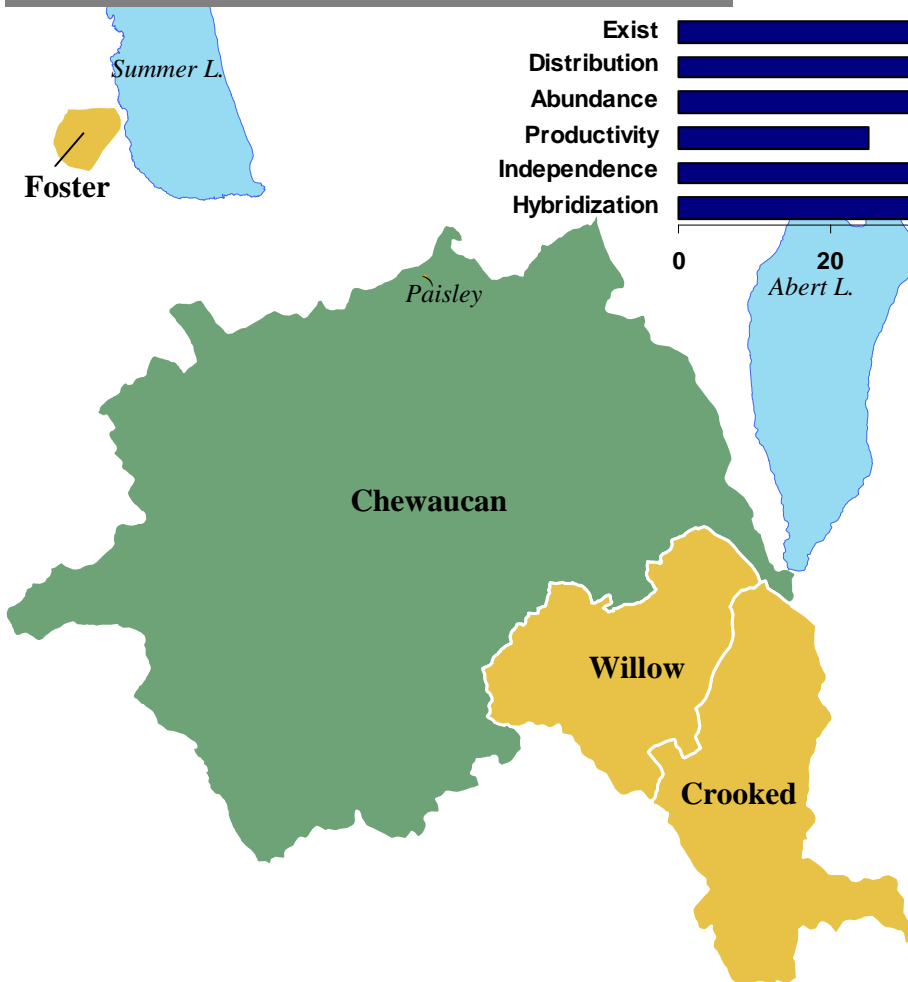
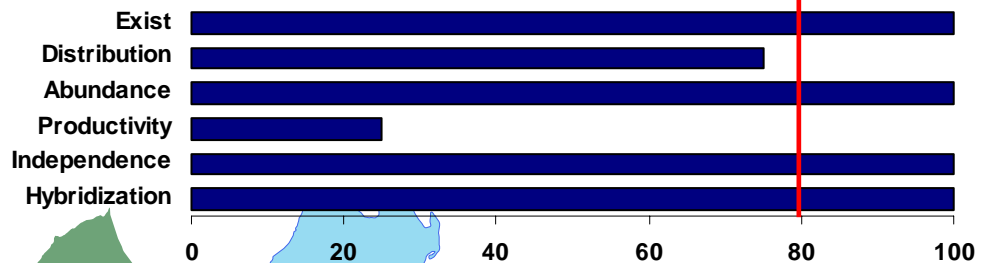
Interim Assessment:
Potentially at Risk

The Chewaucan Redband Trout SMU consists of four populations, three in Lake Abert Basin and one in Summer Lake Basin. Lake Abert and Summer Lake are remnants of ancient Lake Chewaucan and naturally separated by large sand dunes. Redband trout in Lake Abert Basin are distributed throughout the basin and moderately abundant. Degraded habitat conditions and barriers to migration are the most persistent threats to populations in the SMU. Foster Creek population has an extremely limited distribution and is isolated from large water bodies and other populations. The SMU met four of the six interim criteria and is classified as 'potentially at risk'. Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria.

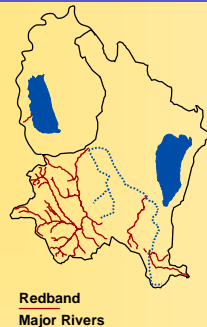
Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Chewaucan	Pass	Pass	Pass	Pass*	Pass	Pass
Willow	Pass	Pass	Pass	Fail*	Pass	Pass
Crooked	Pass	Pass	Pass	Fail*	Pass	Pass
Foster	Pass	Fail	Pass*	Fail*	Pass	Pass

* *Inferred*

Percent of Populations Meeting Criteria



Distribution - Fail



- Year-around distribution is widespread in headwater and mid order streams.
- All streams in the Lake Abert Basin are connected to Rivers End Reservoir where migratory redband trout rear before returning to their natal streams. However three large irrigation weirs exist on the Chewaucan River, as well as one on each of Willow and Crooked creeks. The weirs on Willow and Crooked creeks are impassable preventing upstream migration and inter-population mixing. Fish ladders on all Chewaucan River weirs will be completed in 2006 ensuring passage.
- Foster Creek population (Summer Lake Basin) is extremely limited, < 2 km of habitat, and isolated from other populations and water bodies. The Foster population fails the criterion.

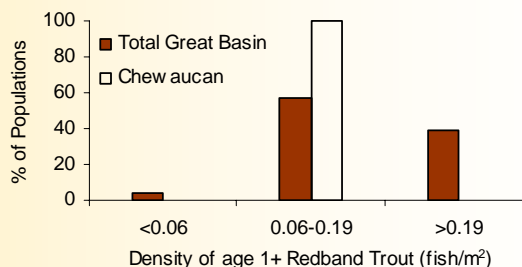
Productivity - Fail

- Quantitative data necessary to accurately assess productivity do not exist. The criterion is assessed based on the qualitative evaluation of current distribution and abundance, presence of large migratory individuals, habitat quality, and presence of non-native species.
- The Chewaucan population passes the productivity criterion based on diverse habitats in the upper basin and connectivity to the Rivers End Reservoir through trap and haul efforts.
- The other populations fail the criterion due to degraded habitat conditions and the inability of migratory individuals to return to the spawning grounds.

Additional Information

- Non-native cutthroat trout are not present in the Fort Rock Basin and not a threat to redband trout. All populations pass the hybridization criterion.
- Non-native largemouth bass and brown bullheads are present in the lower reaches of Chewaucan River and brook trout inhabit the headwater streams.

Abundance - Pass



- A population survey estimated 147,878 (95%CI +/- 41%) age 1+ redband trout in the Lake Abert Basin in 1999.
- All sites had moderate densities of age 1+ fish relative to densities throughout the Great Basin. Estimates were made during high water years and are expected to fluctuate with habitat quality and instream flows.
- Survey data from Foster Creek suggests density of redband trout is comparable to populations in the Lake Abert Basin. It is unknown if a 2002 forest fire impacted densities in this population.
- All populations pass the abundance criterion.

Independence - Pass

- The hatchery rainbow trout stocking program in the Chewaucan Basin was eliminated in 1998. The extent and effects of interbreeding between hatchery and wild stocks are uncertain.
- Hatchery rainbow trout were not stocked in Foster Creek.
- All populations pass the criterion since stocking of hatchery rainbow trout in the basin has ceased.

Goose Lake Redband Trout SMU

ESA Designation:
Not Warranted 2000

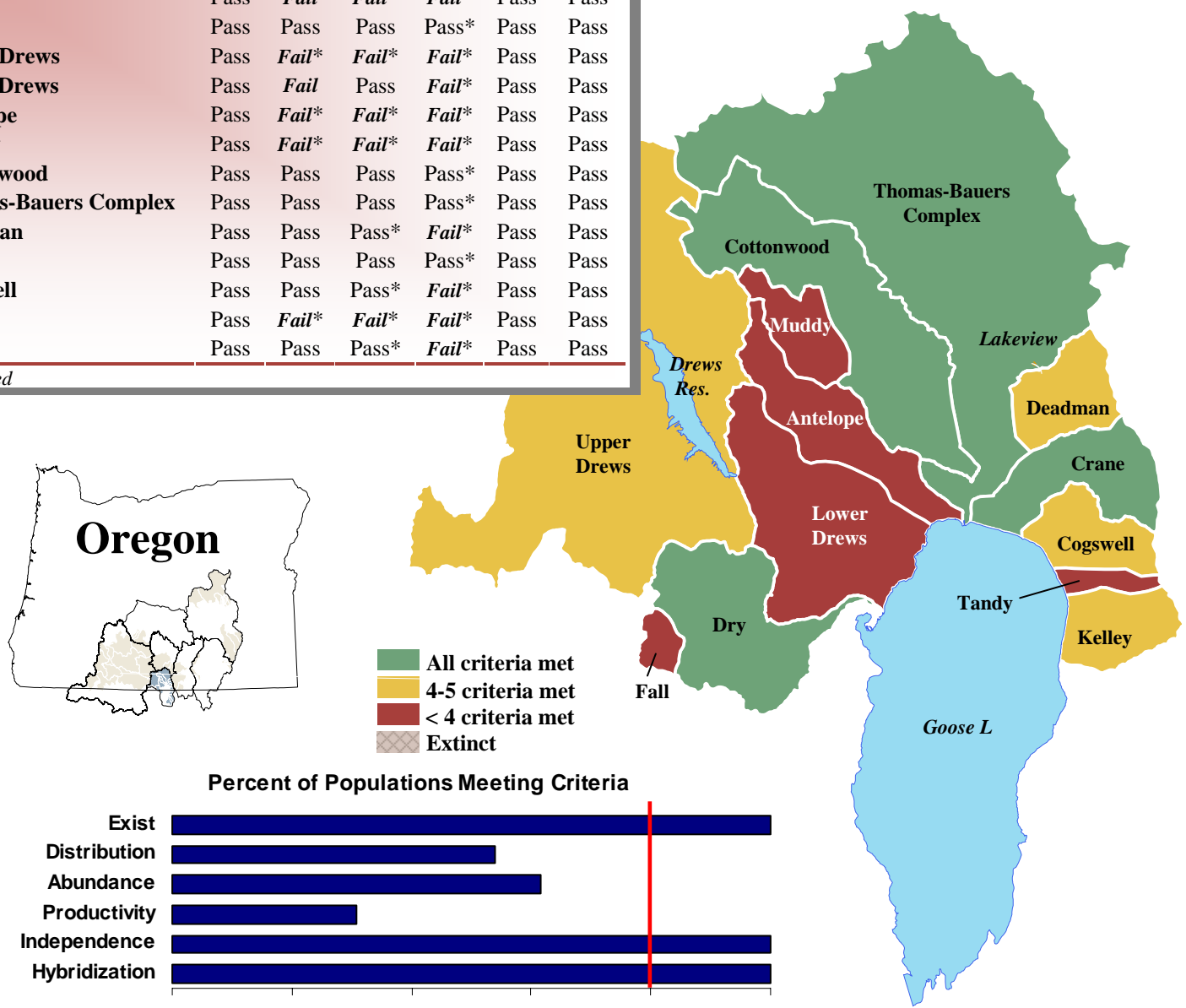
State Status:
Vulnerable

Interim Assessment:
At Risk

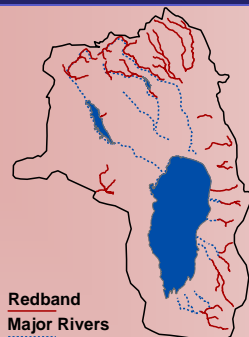
The Goose Lake Redband Trout SMU is comprised of thirteen populations. Six populations exist in the California, but are not assessed in this review. Spawning and resident fish distribution is fragmented and limited to headwater and mid-order streams. Abundance of redband trout fluctuates with instream flows and habitat quality. Migratory redband trout are present when rearing conditions in Goose Lake are adequate, though irrigation activities and degraded habitat quality hinder movement between the lake and the spawning grounds. Eighty percent of the populations meet three of the six interim criteria, thereby classifying this SMU as 'at risk'. Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Fall	Pass	Fail	Fail*	Fail*	Pass	Pass
Dry	Pass	Pass	Pass	Pass*	Pass	Pass
Lower Drews	Pass	Fail*	Fail*	Fail*	Pass	Pass
Upper Drews	Pass	Fail	Pass	Fail*	Pass	Pass
Antelope	Pass	Fail*	Fail*	Fail*	Pass	Pass
Muddy	Pass	Fail*	Fail*	Fail*	Pass	Pass
Cottonwood	Pass	Pass	Pass	Pass*	Pass	Pass
Thomas-Bauers Complex	Pass	Pass	Pass	Pass*	Pass	Pass
Deadman	Pass	Pass	Pass*	Fail*	Pass	Pass
Crane	Pass	Pass	Pass	Pass*	Pass	Pass
Cogswell	Pass	Pass	Pass*	Fail*	Pass	Pass
Tandy	Pass	Fail*	Fail*	Fail*	Pass	Pass
Kelley	Pass	Pass	Pass*	Fail*	Pass	Pass

* Inferred



Distribution - Fail



- Populations with connections to Goose Lake have migratory fish and potentially inter-mix with other populations. Cottonwood, Tandy, Muddy, and Upper Drews have no access to the lake or other populations due to irrigation withdrawal and migration barriers. Redband trout in Fall Creek are isolated above a barrier falls. These populations have no opportunity to mix with other populations.
- Distribution in Tandy, Muddy, Antelope, and Lower Drews is not documented. These populations are assumed to be extremely limited until distribution can be better assessed.
- The distribution of redband trout varies according to annual precipitation and fluctuation of instream flows.

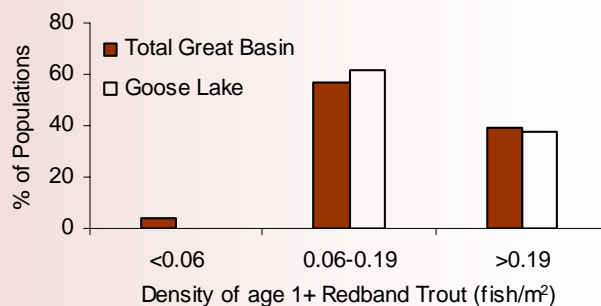
Productivity - Fail

- Quantitative data necessary to assess productivity do not exist. The criterion is assessed based on the qualitative evaluation of distribution, abundance, presence of large fluvial fish, habitat quality, and presence of non-native species.
- Populations where distribution and abundance are limited and not connected to habitats capable of supporting multiple life history fail the productivity criterion.

Additional Information

- Non-native cutthroat trout are not present in the Goose Lake Basin and not a threat to redband trout. All populations pass the hybridization criterion.
- Goose Lake redband trout are unique and thought to be a distinct subspecies. Genetic analysis suggest they evolved from the Sacramento redband trout lineage and are most similar to the Warner Lake basin redband trout
- Habitat quality in Goose Lake basin is severely degraded. Thirty nine percent of streams with redband trout are temperature limited. Water resources within the basin are over appropriated and irrigation diversions hinder migratory fish movement. Lower floodplain reaches have eroding banks, headcuts, a loss of meanders, and incised channels.
- Goose Lake provides highly productive rearing environment for redband trout but few drainages retain adequate and regular connectivity to the lake.

Abundance - Fail



- A population survey estimated 102,352 (+/- 32%) age 1+ redband trout in Goose Lake Basin in 1999. Mean density for the SMU was considered moderate relative to densities throughout Eastern Oregon. Estimates were made during high water years and are expected to fluctuate with instream flow and habitat quality.
- Populations in Antelope, Lower Drews, Muddy, and Tandy do not have current measures of abundance and have low quality habitat. These populations fail the abundance criterion until they can be better assessed. These populations are not included in the survey mentioned above.
- Data are limited pertaining to the abundance of adfluvial redband trout in Goose Lake.

Independence - Pass

- Hatchery rainbow trout were stocked in all populations between 1925 and 1961. Stocking programs were eliminated in streams in 1961. Because stocking programs do not currently exist in moving waters all populations pass the reproductive independence criterion.
- Current stocking activities occur in Cottonwood Meadows Reservoir where domestic rainbow trout rarely escape.
- Effects of interbreeding are unknown. A recent sample from Thomas Creek indicates interbreeding with hatchery rainbow trout.

Upper Klamath Basin Redband Trout SMU

ESA Designation:
Not Proposed

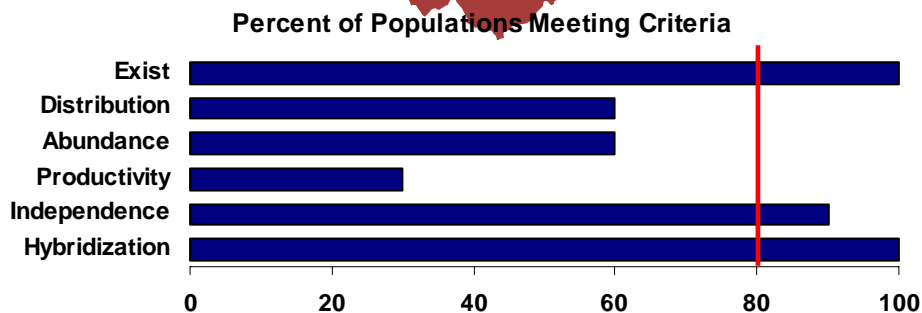
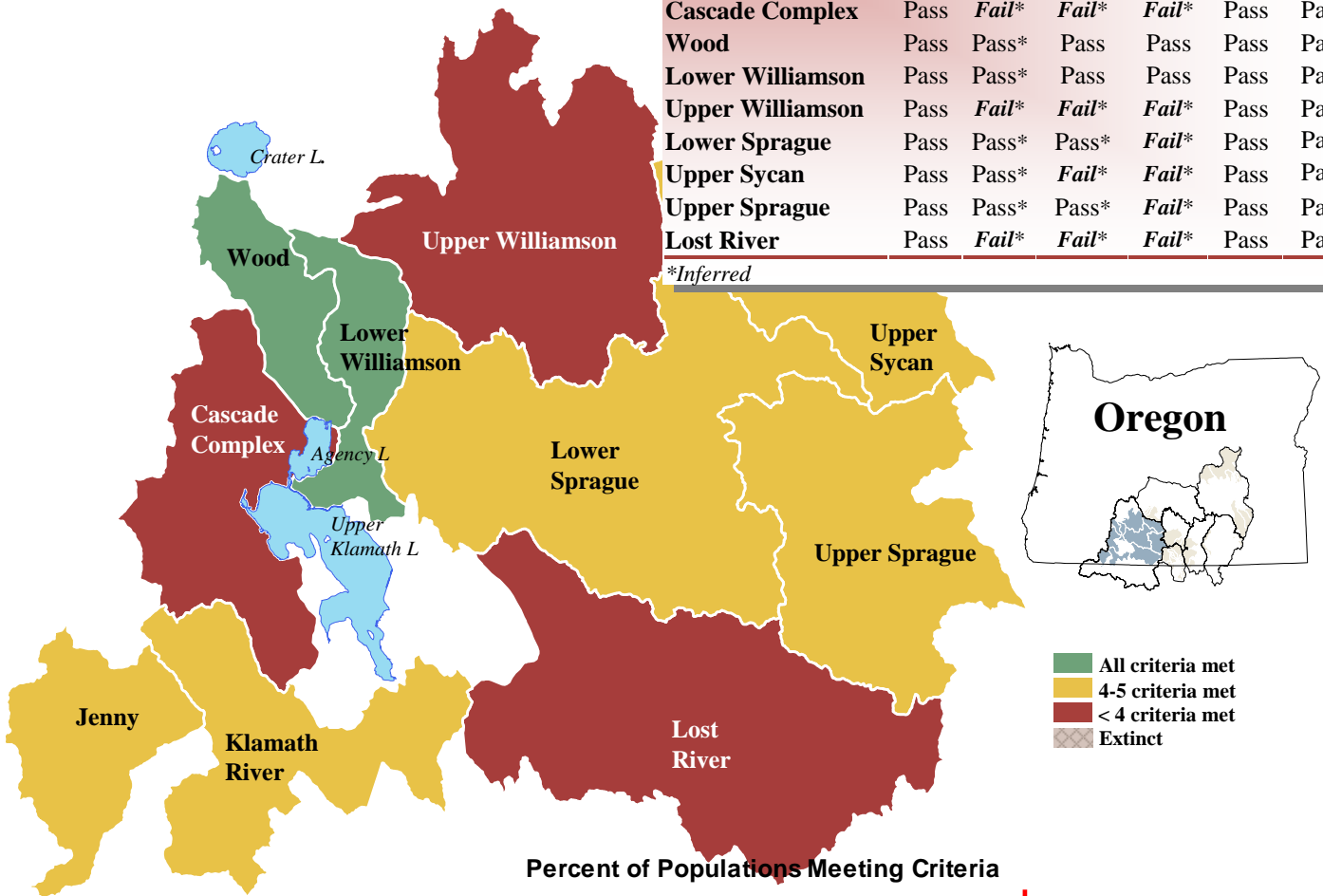
State Status:
Vulnerable

Interim Assessment:
At Risk

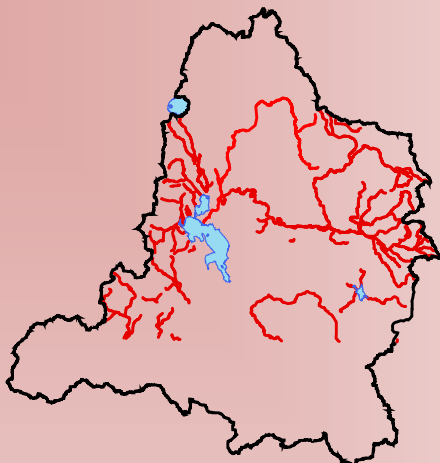
The Upper Klamath Lake basin contains the remnants of Pleistocene Lake Modoc, which redband trout may have entered from interior connections. Currently, the Upper Klamath Lake Basin supports the largest and most functional adfluvial redband trout populations of Oregon interior basins, however, some populations are severely limited in distribution and abundance by habitat quality and non-native species. The SMU is comprised of 10 populations that vary in life history, genetics, disease resistance, and status. Eighty percent of the populations meet three of the six interim criteria, thereby classifying this SMU as ‘at risk’. Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria

Population	Exist.	Dist.	Abund.	Prod.	Ind.	Hybrid
Jenny	Pass	Fail*	Pass*	Pass*	Fail	Pass
Klamath River	Pass	Pass*	Pass*	Fail*	Pass	Pass
Cascade Complex	Pass	Fail*	Fail*	Fail*	Pass	Pass
Wood	Pass	Pass*	Pass	Pass	Pass	Pass
Lower Williamson	Pass	Pass*	Pass	Pass	Pass	Pass
Upper Williamson	Pass	Fail*	Fail*	Fail*	Pass	Pass
Lower Sprague	Pass	Pass*	Pass*	Fail*	Pass	Pass
Upper Sycan	Pass	Pass*	Fail*	Fail*	Pass	Pass
Upper Sprague	Pass	Pass*	Pass*	Fail*	Pass	Pass
Lost River	Pass	Fail*	Fail*	Fail*	Pass	Pass

*Inferred



Distribution - Fail



Redband Distribution

- Redband trout are widely distributed throughout the upper Klamath basin. Resident and/or migratory redband trout are present in Klamath River, the major tributaries of Upper Klamath and Agency Lakes, and headwater streams of the Gearhart and Cascade mountains.
- Four populations fail the distribution criterion. Jenny and Upper Williamson are isolated above natural barriers to migration. Distributions in Cascade and Lost River populations are extremely limited.
- Distribution of resident redband varies according to annual precipitation and instream flows.

Productivity - Fail

- Quantitative productivity data are not available. The criterion is assessed based on the qualitative evaluation of distribution, abundance, presence of large fluvial fish, habitat quality, and presence of non-native species.
- Long term redd counts in the Wood and Lower Williamson populations reflect stable or increasing trends in abundance. Both populations pass the criterion. The Jenny population passes the criterion based on habitat quality and diversity.
- Remaining populations fail due to degraded habitat conditions, presence of brown trout and brook trout, or limited expression of a migratory life history.

Additional Information

- Adult passage over the J.C. Boyle Dam has declined dramatically over the past 50 years. In 1959, 5,529 redband trout moved over the J.C. Boyle Dam; 70 redband trout passed the dam in 1991. These data demonstrate the severity of the impact that J.C Boyle Dam has had on movement and migratory behavior of redband trout.
 - Current and past agricultural and timber practices have degraded stream habitat in much of the basin; stream habitat suffers from channelization, sedimentation, irrigation diversions, and water withdrawal. Consequently some streams and populations are fragmented and have lost connection to lakes and marshes.
 - Federal, private, and tribal landowners are implementing habitat restoration projects including wetland restoration and riparian fencing.
-

Abundance - Fail

- The Wood and Lower Williamson populations are extremely abundant and may be the largest of Oregon's interior basins.
- Densities in the headwater populations, particularly Upper Williamson and Upper Sycan are apparently low and abundance is depressed. These populations fail the criterion. The Cascade Complex and Lost River populations also fail the criterion.
- Abundance fluctuates with water year and habitat quality.

Independence - Pass

- Stocking in moving waters, except Spring Creek, ceased in 1991.
- A coastal rainbow trout stock is planted in Spring Creek. These fish are susceptible to *C. shasta* and thought to not survive to reproduce with native fish. The Lower Williamson population passes the reproductive independence criterion but assumptions should be verified with genetic analysis.
- Coastal rainbow trout stocks are planted in Hyatt and Little Hyatt reservoirs and are assumed able to move into Jenny Creek. This population fails the criterion.
- The extent and impact of interbreeding with coastal rainbow trout stocks is unknown. Genetics studies have found evidence of introgression in the Jenny population and is suspected in Lost River.

Cutthroat Trout



Photo by S. Gunckel, ODFW

Oregon Coast Coastal Cutthroat SMU

ESA Designation:
None

State Status:
Vulnerable

Interim Assessment:
Not At Risk

Basins along the Oregon Coast support all life history types of coastal cutthroat trout; resident, fluvial, adfluvial, and anadromous. The Oregon Coast SMU is comprised of twenty-four populations, all of which meet all of the six interim criteria. Since quantitative data are limited, the assessment was based on available data, as well as anecdotal evidence and professional opinion. Coastal cutthroat trout are distributed widely throughout the basins and abundance is thought to be relatively high. The populations appear to be very resilient and able to respond to events that reduce abundance. The sustainability of this SMU is not at risk. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.

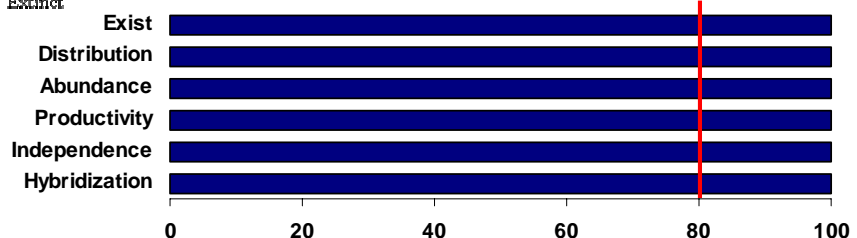


Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Necanicum	Pass	Pass	Pass*	Pass*	Pass	Pass
Nehalem	Pass	Pass	Pass*	Pass*	Pass	Pass
Rockaway	Pass	Pass	Pass*	Pass*	Pass	Pass
Tillamook	Pass	Pass	Pass*	Pass*	Pass	Pass
Netarts	Pass	Pass	Pass*	Pass*	Pass	Pass
Nestucca	Pass	Pass	Pass*	Pass*	Pass	Pass
Neskowin	Pass	Pass	Pass*	Pass*	Pass	Pass
Salmon	Pass	Pass	Pass*	Pass*	Pass	Pass
Devils Lake	Pass	Pass	Pass*	Pass*	Pass	Pass
Siletz	Pass	Pass	Pass*	Pass*	Pass	Pass
Depoe Bay	Pass	Pass	Pass*	Pass*	Pass	Pass
Yaquina	Pass	Pass	Pass*	Pass*	Pass	Pass
Beaver	Pass	Pass	Pass*	Pass*	Pass	Pass
Alesea	Pass	Pass	Pass*	Pass*	Pass	Pass
Yachats	Pass	Pass	Pass*	Pass*	Pass	Pass
Siuslaw	Pass	Pass	Pass*	Pass*	Pass	Pass
Siltcoos	Pass	Pass	Pass*	Pass*	Pass	Pass
Lower Umpqua	Pass	Pass	Pass*	Pass*	Pass	Pass
Upper Umpqua	Pass	Pass	Pass*	Pass*	Pass	Pass
Tenmile	Pass	Pass	Pass*	Pass*	Pass	Pass
Coos	Pass	Pass	Pass*	Pass*	Pass	Pass
Coquille	Pass	Pass	Pass*	Pass*	Pass	Pass
Floras	Pass	Pass	Pass*	Pass*	Pass	Pass
Sixes	Pass	Pass	Pass*	Pass*	Pass	Pass

*Inferred

- All criteria met
- 4-5 criteria met
- < 4 criteria met
- Extinct

Percent of Populations Meeting Criteria



Distribution - Pass

- All life history types are present and distributed widely.
- Empirical and anecdotal evidence suggests that coastal cutthroat trout are distributed widely in each population within the SMU.

Abundance - Pass

- All life history forms of coastal cutthroat trout (resident, fluvial, adfluvial, anadromous) were considered part of the same population for this assessment.
- Quantitative data are not available at a population level. However, the existing data, along with professional opinion and anecdotal observations suggest that coastal cutthroat trout are relatively abundant throughout the SMU.
- Data on the anadromous form of cutthroat trout in several populations have been collected on a regular basis. Most of this data showed a decreasing trend in anadromous adults in the late 1980s and 1990s. A favorable change in the ocean environment over the last several years appears to have had a positive impact on anadromous coastal cutthroat trout. Reports from anglers tend to suggest that the number of large cutthroat, presumably anadromous, has increased over the last several years.

Productivity – Pass

- No spawning data are available for coastal cutthroat trout.
- For this criterion, coastal cutthroat trout populations were assessed on their ability to rebuild after periods of low abundance.
- The majority of professional opinion within ODFW is that the universal distribution of coastal cutthroat trout in significant numbers, despite natural and human-caused disturbances, suggests the SMU is productive.

Independence - Pass

- All stocking of coastal cutthroat trout in moving waters was ceased by 1994. The effects of historical breeding between hatchery cutthroat trout and wild coastal cutthroat trout have not been determined.

Additional Information

- Most coastal cutthroat trout data in the Oregon Coast SMU come from occasional sampling by ODFW Watershed Districts or from sampling targeted at other species. These various datasets are difficult to compare to each other when the sampling procedures are not consistent. During the development of a conservation plan for the Oregon Coast coastal cutthroat trout SMU, ODFW will consider ways to compare these datasets and develop protocols for future data collection to make datasets more compatible.
-

Southern Oregon Coastal Cutthroat SMU

ESA Designation:

Not Listed

State Status:

Vulnerable

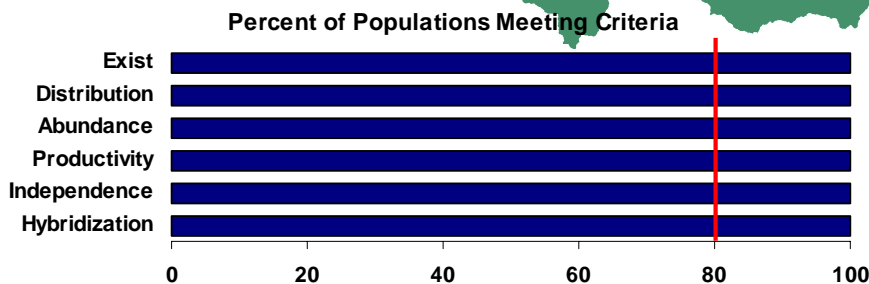
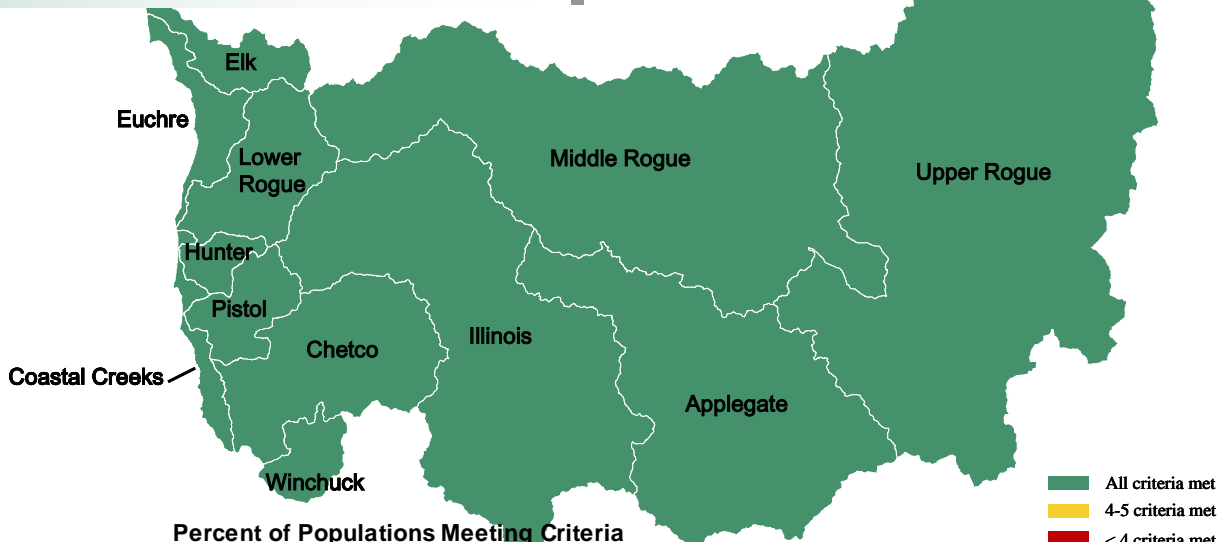
Interim Assessment:

Not At Risk

The Southern Oregon Coastal Cutthroat trout SMU supports the resident, fluvial, adfluvial, and anadromous life histories of cutthroat trout. The SMU is comprised of twelve populations, all of which meet all six of the interim criteria. Since quantitative data are limited, the assessment was based on available data, as well as anecdotal evidence and professional opinion. Coastal cutthroat trout are distributed widely throughout the basins and abundance is thought to be relatively high. The populations appear to be very resilient and able to respond to events that reduce abundance. The sustainability of this SMU is not at risk. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Elk	Pass	Pass	Pass*	Pass*	Pass	Pass
Euchre	Pass	Pass	Pass*	Pass*	Pass	Pass
Lower Rogue	Pass	Pass	Pass*	Pass*	Pass	Pass
Illinois	Pass	Pass	Pass*	Pass*	Pass	Pass
Middle Rogue	Pass	Pass	Pass*	Pass*	Pass	Pass
Applegate	Pass	Pass	Pass*	Pass*	Pass	Pass
Upper Rogue	Pass	Pass	Pass*	Pass*	Pass	Pass
Hunter	Pass	Pass	Pass*	Pass*	Pass	Pass
Coastal Creeks	Pass	Pass	Pass*	Pass*	Pass	Pass
Pistol	Pass	Pass	Pass*	Pass*	Pass	Pass
Chetco	Pass	Pass	Pass*	Pass*	Pass	Pass
Winchuck	Pass	Pass	Pass*	Pass*	Pass	Pass

*Inferred



■ All criteria met
■ 4-5 criteria met
■ < 4 criteria met
 Extinct

Distribution - Pass

- Empirical and anecdotal evidence suggests that coastal cutthroat trout are distributed widely in each major watershed within the SMU.
- All life history types are present and distributed widely.

Abundance - Pass

- All life history forms of coastal cutthroat trout (resident, fluvial, adfluvial, anadromous) were considered part of the same population for this assessment.
- Quantitative data are not available at a population level. However, the existing data, along with professional opinion and anecdotal observations, suggest that coastal cutthroat trout are relatively abundant throughout the SMU.

Productivity – Pass

- For this criterion, coastal cutthroat trout populations were assessed on their ability to rebuild after periods of low abundance.
- The majority of professional opinion within ODFW is that the universal distribution of coastal cutthroat trout in significant numbers, despite natural and human-caused disturbances, suggests the SMU is productive.

Independence - Pass

- All stocking of coastal cutthroat trout in moving waters was ceased by 1985. The effects of historical breeding between hatchery cutthroat trout and wild coastal cutthroat trout have not been determined.

Additional Information

- Most coastal cutthroat trout data in the Southern Oregon SMU come from occasional sampling by ODFW Watershed Districts or from sampling targeted at other species. These various datasets are difficult to compare to each other when the sampling procedures are not consistent. During the development of a conservation plan for the Southern Oregon coastal cutthroat trout SMU, ODFW will consider ways to compare these datasets and develop protocols for future data collection to make datasets more compatible.
-

Lower Columbia Coastal Cutthroat SMU

ESA Designation:
None

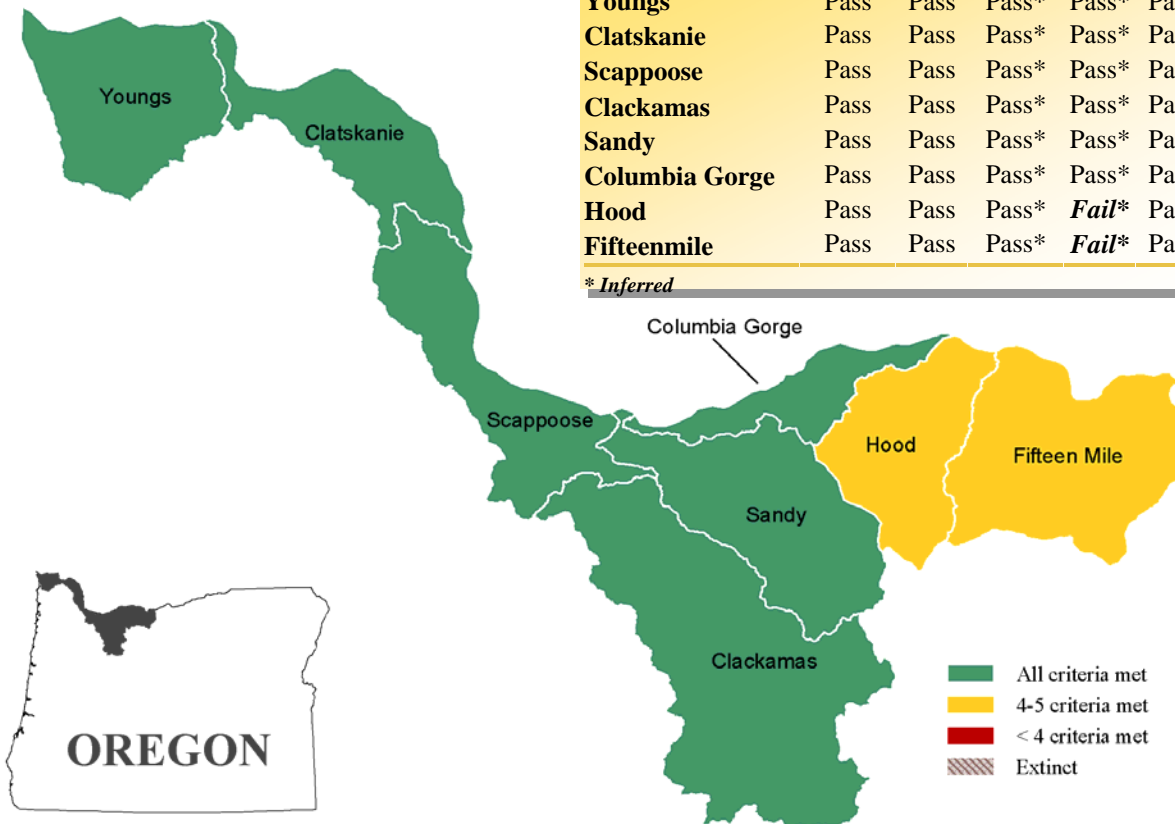
State Status:
Critical

Interim Assessment:
Potentially at Risk

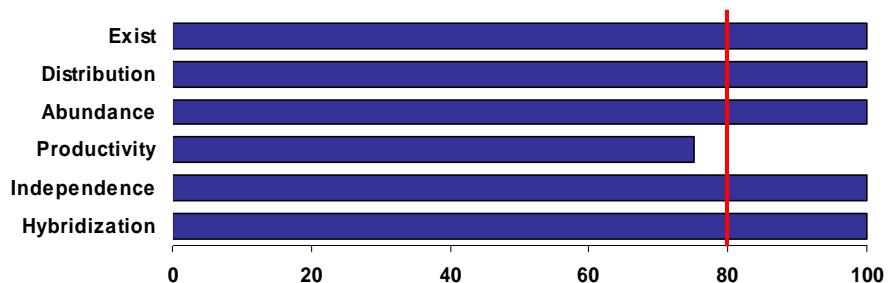
The Lower Columbia River basin supports the resident, fluvial, adfluvial and anadromous life histories of coastal cutthroat trout. The Lower Columbia River Coastal Cutthroat SMU is comprised of eight populations. All populations passed all six of the interim criteria except the Hood and Fifteenmile populations, which failed the productivity criterion due to the extremely depressed anadromous life-history. Since quantitative data are limited, the assessment was based on available data, as well as anecdotal evidence and professional opinion. This SMU was assessed as ‘potentially at risk’ due to the failure of the productivity criterion. Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Youngs	Pass	Pass	Pass*	Pass*	Pass	Pass
Clatskanie	Pass	Pass	Pass*	Pass*	Pass	Pass
Scappoose	Pass	Pass	Pass*	Pass*	Pass	Pass
Clackamas	Pass	Pass	Pass*	Pass*	Pass	Pass
Sandy	Pass	Pass	Pass*	Pass*	Pass	Pass
Columbia Gorge	Pass	Pass	Pass*	Pass*	Pass	Pass
Hood	Pass	Pass	Pass*	Fail*	Pass	Pass
Fifteenmile	Pass	Pass	Pass*	Fail*	Pass	Pass

* Inferred



Percent of Populations Meeting Criteria



Distribution - Pass

- All life history types (resident, fluvial, adfluvial, anadromous) are present and distributed widely.
- Empirical and anecdotal evidence suggests that coastal cutthroat trout are distributed widely in each population within the SMU.

Productivity – Fail

- No spawning data are available for coastal cutthroat trout.
- For this criterion, coastal cutthroat trout populations were assessed on their ability to rebuild after periods of low abundance.
- The Hood and Fifteenmile populations of coastal cutthroat trout failed the productivity criterion due to the extremely low levels of anadromous adults seen over the last twenty years. Populations that have lost a life-history strategy may become less productive. The SMU also failed this criterion.

Additional Information

- Most coastal cutthroat trout data in the Lower Columbia River SMU come from occasional sampling by ODFW Watershed Districts or from sampling targeted at other species. These various datasets are difficult to compare to each other when the sampling procedures are not consistent. During the development of a conservation plan for the Lower Columbia River coastal cutthroat trout SMU, ODFW will consider ways to compare these datasets and develop protocols for future data collection to make datasets more compatible.
 - During development of a conservation plan, the historical presence of the anadromous life-history in the Hood and Fifteenmile will be investigated. The significance of losing that life-history will also be examined
-

Abundance – Pass

- All life history forms of coastal cutthroat trout (resident, fluvial, adfluvial, anadromous) were considered part of the same population for this assessment.
- Quantitative data are not available at a population level. However, the existing data, along with professional opinion and anecdotal observations suggest that coastal cutthroat trout are relatively abundant throughout the SMU.

Independence - Pass

- All stocking of coastal cutthroat trout in moving waters was ceased by 1994. The effects of historical breeding between hatchery cutthroat trout and wild coastal cutthroat trout have not been determined.

Willamette Coastal Cutthroat SMU

ESA Designation:

Not Listed

State Status:

No Status

Interim Assessment:

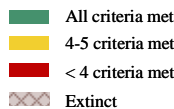
Not At Risk

The Willamette Coastal Cutthroat Trout SMU supports the resident, fluvial, and adfluvial life histories of cutthroat trout. The entire SMU is located upstream of Willamette Falls, above which no anadromous coastal cutthroat trout are found. The SMU is comprised of fourteen populations, all of which meet all six of the interim criteria. Since quantitative data are limited, the assessment was based on available data, as well as anecdotal evidence and professional opinion. Coastal cutthroat trout are distributed widely throughout the Willamette Basin and abundance is thought to be relatively high. The populations appear to be very resilient and able to respond to events that reduce abundance. This SMU was assessed as ‘not at risk’ and does not currently face a conservation risk. Suitable data and other information on populations in this SMU provide a moderate level of confidence in the assessment of the interim criteria.

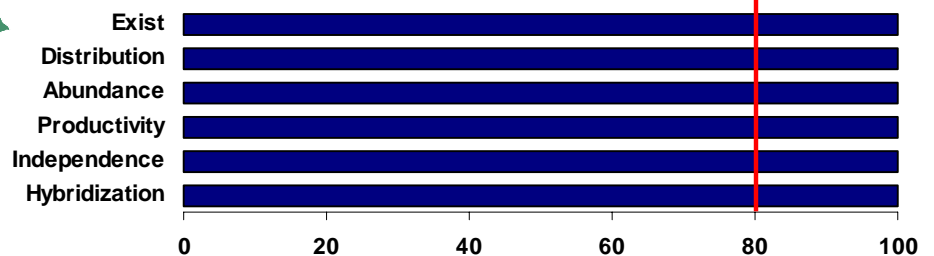


Population	Exixt	Dist.	Abund.	Prod.	Ind.	Hybrid
Lower Willamette	Pass	Pass	Pass*	Pass*	Pass	Pass
Tualatin	Pass	Pass	Pass*	Pass*	Pass	Pass
Yamhill	Pass	Pass	Pass*	Pass*	Pass	Pass
Molalla	Pass	Pass	Pass*	Pass*	Pass	Pass
Luckiamute	Pass	Pass	Pass*	Pass*	Pass	Pass
North Santiam	Pass	Pass	Pass*	Pass*	Pass	Pass
South Santiam	Pass	Pass	Pass*	Pass*	Pass	Pass
Mid Willamette	Pass	Pass	Pass*	Pass*	Pass	Pass
Marys	Pass	Pass	Pass*	Pass*	Pass	Pass
Calapooia	Pass	Pass	Pass*	Pass*	Pass	Pass
Long Tom	Pass	Pass	Pass*	Pass*	Pass	Pass
McKenzie	Pass	Pass	Pass*	Pass*	Pass	Pass
Middle Fork Willamette	Pass	Pass	Pass*	Pass*	Pass	Pass
Coast Fork Willamette	Pass	Pass	Pass*	Pass*	Pass	Pass

* Inferred



Percent of Populations Meeting Criteria



Distribution - Pass

- Empirical and anecdotal evidence suggests that coastal cutthroat trout are distributed widely in each major watershed within the SMU.
- All life history types, with the exception of the anadromous form, are present and distributed widely.

Productivity - Pass

- No spawning data are available for coastal cutthroat trout.
- For this criterion, coastal cutthroat trout populations were assessed on their ability to rebuild after periods of low abundance.
- The majority of professional opinion within ODFW is that the universal distribution of coastal cutthroat trout in significant numbers, despite natural and human-caused disturbances, suggests the SMU is productive.

Additional Information

- Most coastal cutthroat trout data in the Willamette SMU come from occasional sampling by ODFW Watershed Districts or from sampling targeted at other species. These various datasets are difficult to compare to each other when the sampling procedures are not consistent. During the development of a conservation plan for the Willamette coastal cutthroat trout SMU, ODFW will consider ways to compare these datasets and develop protocols for future data collection to make datasets more compatible.
-

Abundance - Pass

- All life history forms of coastal cutthroat trout (resident, fluvial, adfluvial) were considered part of the same population for this assessment.
- Anadromous coastal cutthroat trout are not found in the Willamette SMU. There are no anadromous trout upstream of Willamette Falls, the downstream border of this SMU.
- Abundance estimates could not be made for any population. However, the existing data, along with professional opinion, suggest that coastal cutthroat trout are relatively abundant throughout the SMU.

Independence - Pass

- All stocking of coastal cutthroat trout in moving waters was ceased by 1980. The effects of historical breeding between hatchery cutthroat trout and wild coastal cutthroat trout have not been determined.

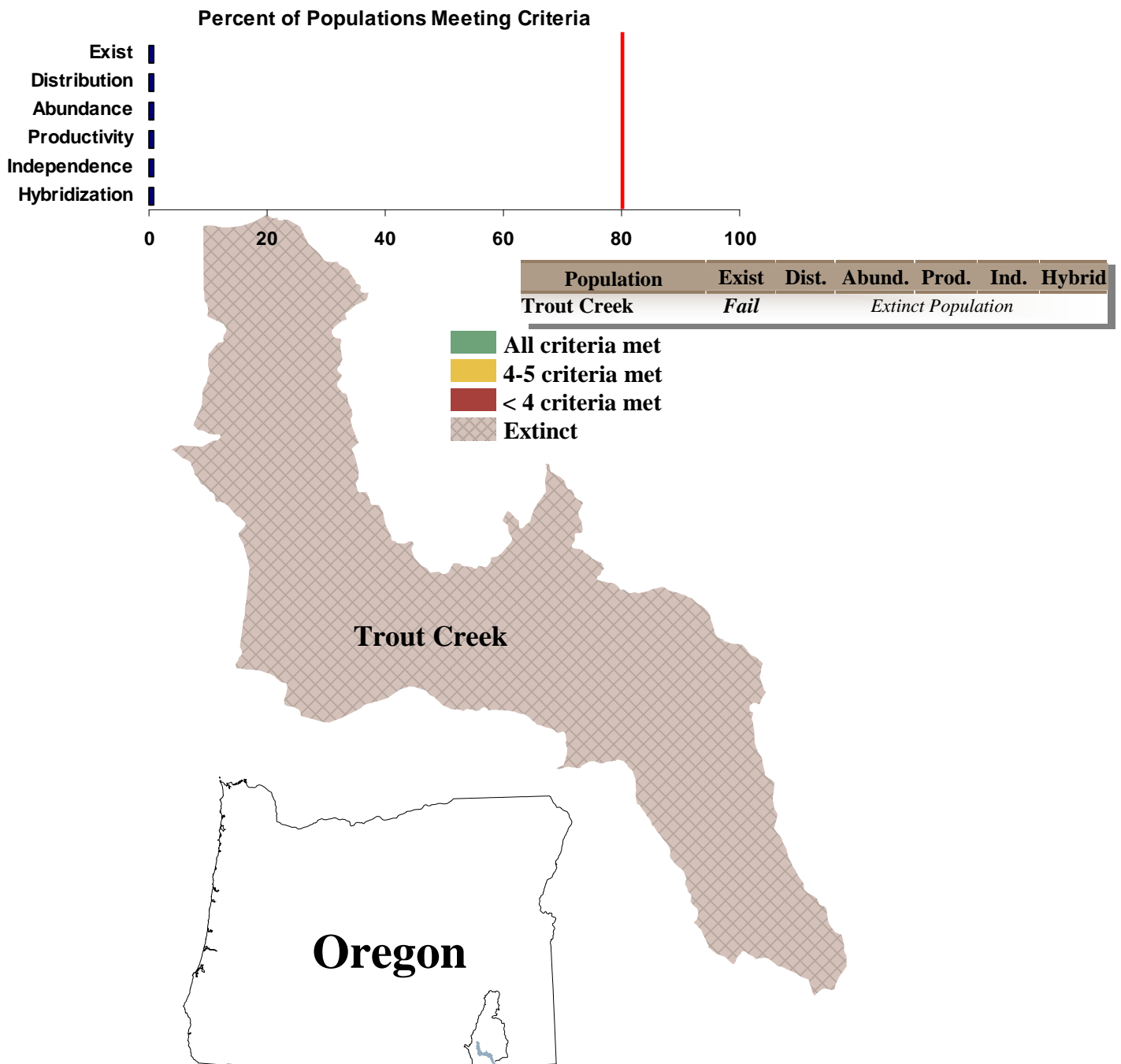
Alvord Cutthroat Trout SMU

ESA Designation:
No Designation

State Status:
No Designation

Interim Assessment:
Extinct

The Alvord Cutthroat Trout SMU is comprised of one population in Trout Creek, a tributary to ancient Lake Alvord. After the desiccation of Alvord Lake, approximately 10,000 years ago, native cutthroat trout were restricted to a few perennial streams in the Trout Creek basin, Oregon and the Virgin – Thousand Creek drainage, Nevada. Extinction of Alvord cutthroat trout rapidly followed the introduction of rainbow trout in 1929. The Alvord Cutthroat SMU is classified as ‘extinct’.



Coyote Lake Lahontan Cutthroat Trout

ESA Designation:
Threatened 1975

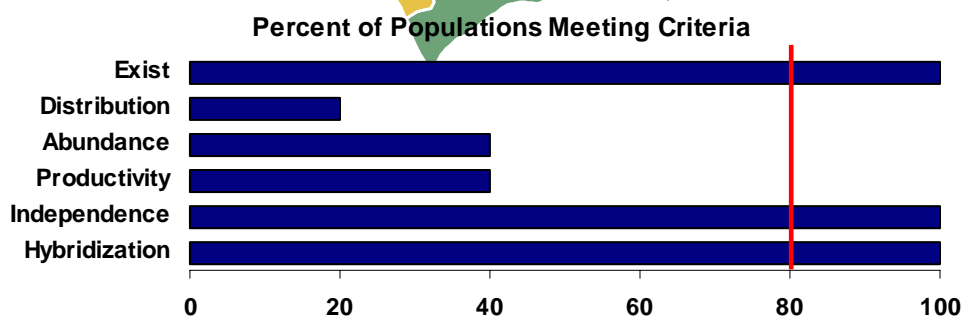
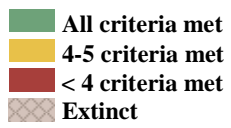
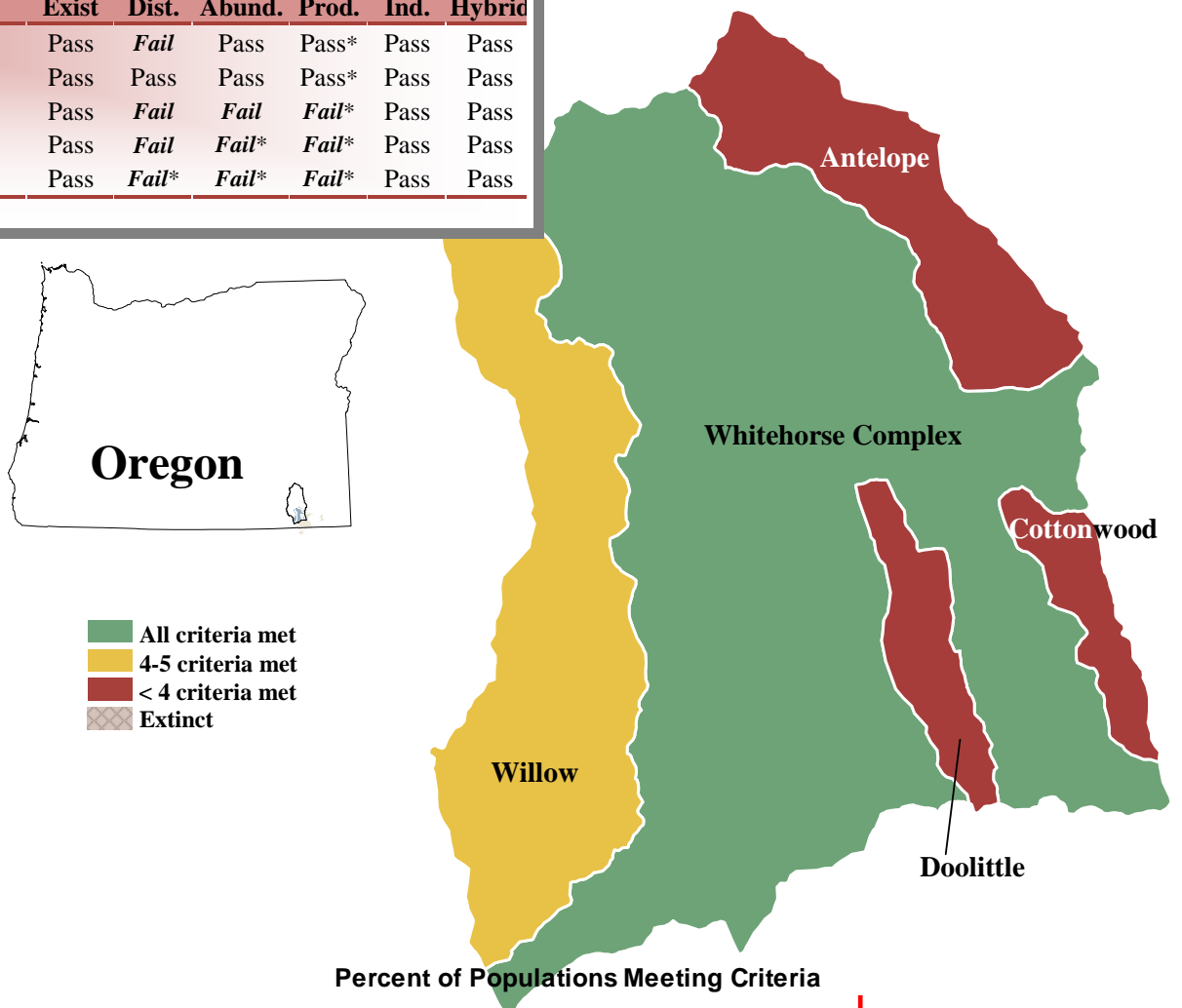
State Status:
Threatened

Interim Assessment:
At Risk

Lahontan cutthroat trout in the Coyote Lake basin are likely descendants of populations inhabiting pluvial Lake Lahontan during the Pleistocene era. The Coyote Lake SMU is comprised of five native cutthroat trout populations. Distribution is naturally fragmented, restricted by barrier falls and a discontinuous stream network. Three populations have low abundance and limited productivity. Ten naturalized populations were established during the 1970s in Alvord Lake basin and Catlow Valley for conservation purposes. These populations were not evaluated in this review. The SMU passes three of the six interim criteria and is classified as ‘at risk’. Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Willow	Pass	<i>Fail</i>	Pass	Pass*	Pass	Pass
Whitehorse Complex	Pass	Pass	Pass	Pass*	Pass	Pass
Doolittle	Pass	<i>Fail</i>	<i>Fail</i>	<i>Fail</i> *	Pass	Pass
Cottonwood	Pass	<i>Fail</i>	<i>Fail</i> *	<i>Fail</i> *	Pass	Pass
Antelope	Pass	<i>Fail</i> *	<i>Fail</i> *	<i>Fail</i> *	Pass	Pass

*Inferred

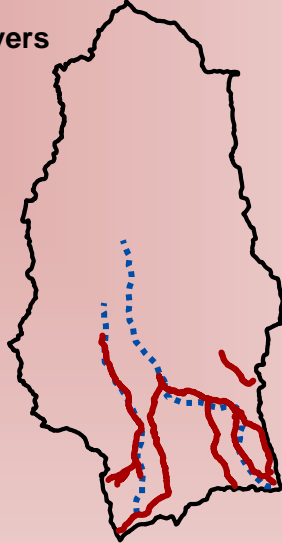


Distribution - Fail

Lahontan Cutthroat Trout

Major Rivers

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- Populations in the SMU are naturally isolated. Historically streams flowed into pluvial Coyote Lake. These streams are no longer connected due to desiccation of Coyote Lake, a drier climate, and irrigation diversions and withdrawal.
- Distribution varies according to water year and annual fluctuation of instream flows.
- Willow, Antelope, Doolittle, and Cottonwood populations are isolated from other populations and fail the criterion. Distribution in Antelope and Cottonwood creeks is extremely limited, less than ten km.

Productivity - Fail

- Data available to appropriately evaluate the productivity criterion are insufficient. Instead the criterion is assessed based on the qualitative evaluation of current abundance, distribution, habitat quality, and connectivity.
- Willow and Whitehorse pass the criterion due to evidence of increasing abundance, adequate distribution, and lack of year class failures. Antelope, Cottonwood and Doolittle fail the criterion due to limited distribution and abundance population, isolation, and limited habitat quality.
- Drying in the lower portion of Little Whitehorse Creek due to drought and grazing disrupts connectivity of Little Whitehorse to the greater Whitehorse system, this periodic connection potentially reduces productivity in the Whitehorse Complex

Additional Information

- Coyote Lake Lahontan cutthroat trout are native trout sustained by natural production and pass the reproductive independence criterion.
- Following the implementation of a new grazing regime in 1989 and the establishment of the Trout Creek Mountain Working Group, habitat conditions are significantly improving throughout the SMU.

Abundance - Fail

- Population estimates for Coyote Lakes populations have occurred every five years since 1985. ODFW last evaluated abundance in 1999.
- Willow and Whitehorse complex populations both exceeded 500 adults and pass the abundance criterion. Doolittle and Cottonwood populations were estimated to contain less than 120 adults and fail the criterion.
- Data are not available for the Antelope population.
- Abundance fluctuates with habitat quality and water year.

Hybridization - Pass

- Lahontan cutthroat trout are the only fish species present in Willow, Whitehorse, and Antelope basins. Hybridization with non-native species is not a concern. All populations pass the hybridization criterion

Quinn River Lahontan Cutthroat Trout

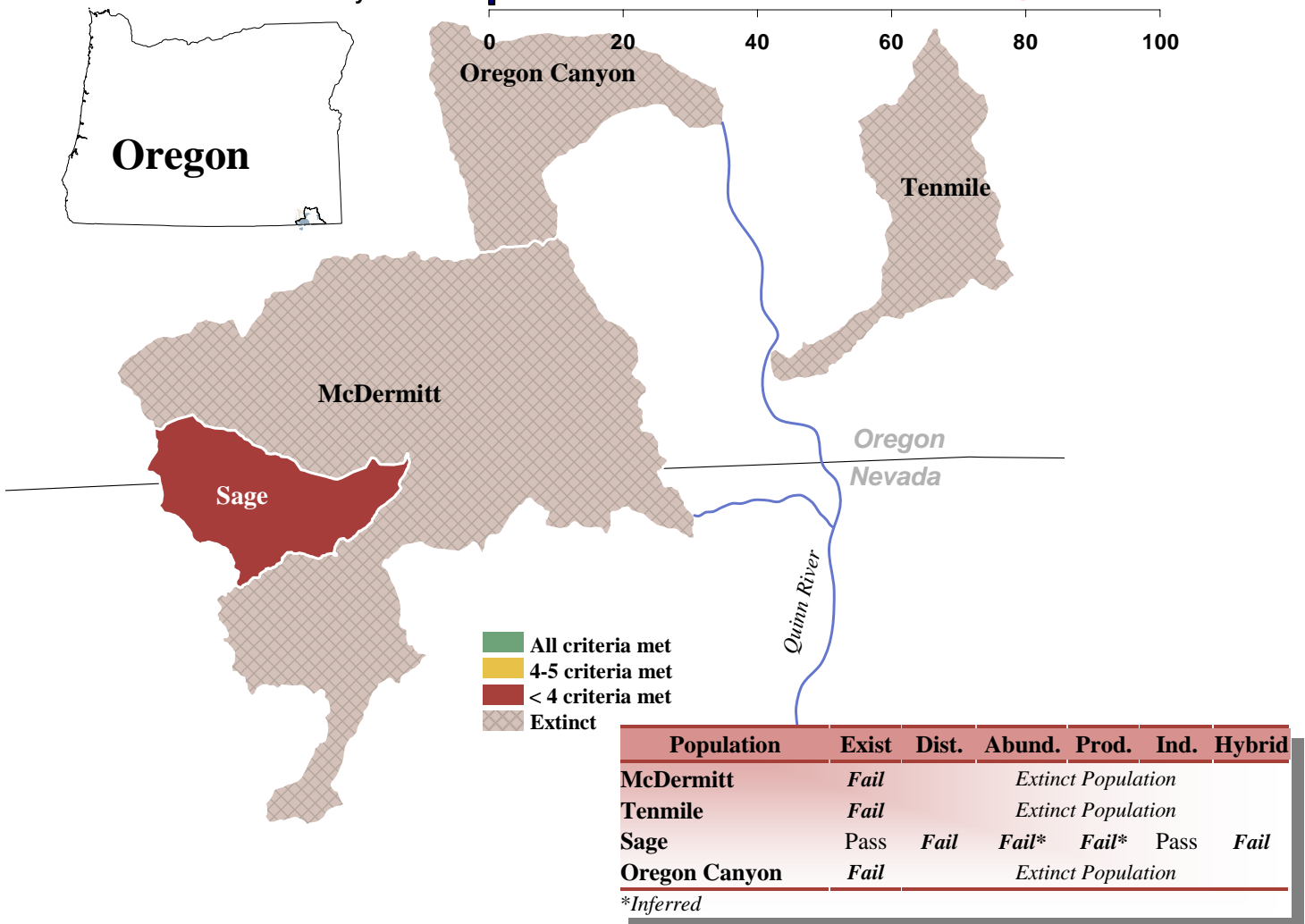
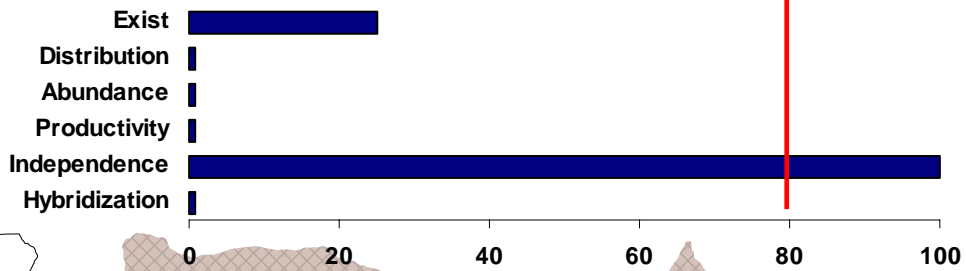
ESA Designation:
Threatened 1975

State Status:
Threatened

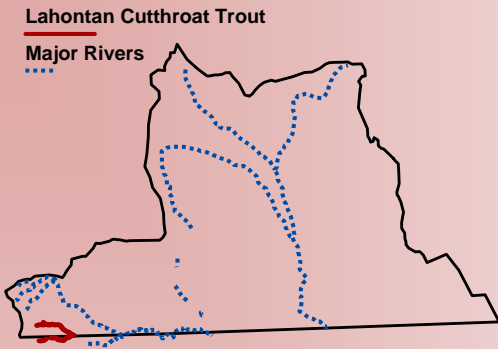
Interim Assessment:
At Risk

Lahontan cutthroat trout populations in the Quinn River basin are remnants of a larger population inhabiting pluvial Lake Lahontan during the Pleistocene era. The Quinn River Lahontan Cutthroat Trout SMU is comprised of four populations, three of which are now extinct due to hybridization with non-native rainbow trout. Sage Creek is the only population to persist in the SMU, has an extremely limited distribution and abundance, and is vulnerable to hybridization. The population is located above a barrier designed to slow the invasion of rainbow and hybrid trout. Eight populations exist in Nevada and are not evaluated in this review. The SMU meets one of the six interim criteria and is classified as ‘at risk’. Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria.

Percent of Populations Meeting Criteria



Distribution - Fail



- Distribution of Lahontan cutthroat trout in the Oregon portion of the Quinn River Basin is limited to 15 km in Sage and Line Canyon creeks. Given the short distribution the population is at risk of extinction due to stochastic events.
- The Sage population is isolated above a man-made barrier designed to slow the invasion of introduced rainbow trout and other non-native species.
- Given the isolated nature of the Sage population and its inability to mix with other populations, it fails the distribution criterion.

Productivity - Fail

- Data available to appropriately assess the productivity criterion are insufficient, however, productivity in the Sage population is likely limited by poor habitat quality, inbreeding depression, absence of a migratory life history, and isolation.

Additional Information

- Lahontan cutthroat trout in the Sage population are native fish sustained by natural production. The Sage population passes the reproductive independence criterion.
 - The McDermitt Creek population was also subject to competition with brook trout in the upper reaches and brown trout in the lower reaches.
-

Abundance - Fail

- A population survey in 1996 estimated less than 200 adult Lahontan cutthroat trout in the Sage population. The population fails the abundance criterion.
- The Sage population does not have access to other populations and has no opportunity for gene flow from other populations. It is at greater risk of extinction due to the deleterious effects of inbreeding depression and genetic drift.

Hybridization - Fail

- Hybridization and introgression with non-native rainbow trout was the primary cause of extinction of the Indian, McDermitt, and Oregon Canyon populations.
- A man-made barrier on Sage Creek was designed to prevent the invasion of non-native rainbow trout.
- Genetic analysis of fish captured in Sage and Line Canyon creeks documented 20% of the samples in Sage Creek were cutthroat trout x rainbow trout hybrids. Samples from Line Canyon were all pure Lahontan Cutthroat trout. The Sage population fails the hybridization criterion

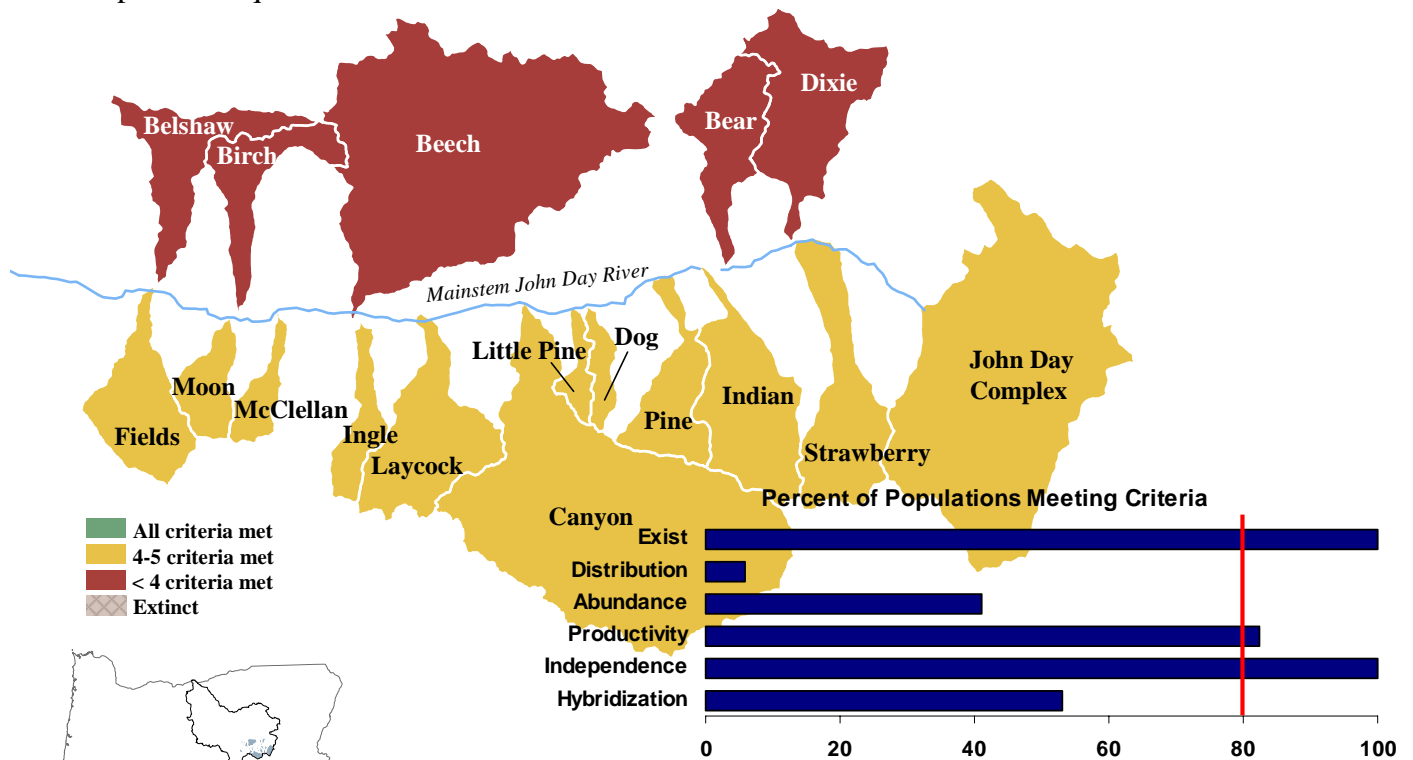
Westslope Cutthroat Trout SMU

ESA Designation:
Not Listed

State Status:
Vulnerable

Interim Assessment:
At Risk

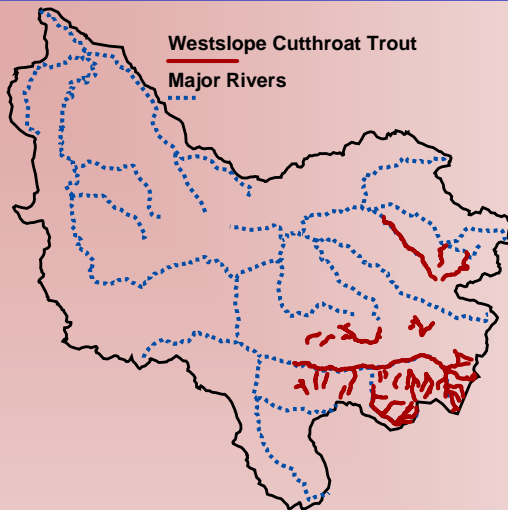
All westslope cutthroat trout in Oregon exist in the John Day River Basin. These populations are disjunct from the greater contiguous distribution in the Upper Missouri and Columbia basins of Montana and Idaho. The Westslope Cutthroat Trout SMU consists of 17 population in the upper mainstem John Day River Basin. Three naturalized populations also exist in the North Fork John Day Basin; however these were established through stocking activities and are not evaluated in this review. The SMU meets three of the six interim criteria, and is classified as ‘at risk’. Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria.



Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Upper John Day Complex	Pass	Pass*	Pass*	Pass*	Pass	Fail*
Strawberry	Pass	Fail*	Pass*	Pass*	Pass	Fail*
Dixie	Pass	Fail*	Fail*	Pass*	Pass	Fail*
Indian	Pass	Fail*	Pass*	Pass*	Pass	Pass*
Bear	Pass	Fail*	Fail*	Fail*	Pass	Fail*
Pine	Pass	Fail*	Fail*	Pass*	Pass	Pass*
Dog	Pass	Fail*	Fail*	Pass*	Pass	Pass*
Little Pine	Pass	Fail*	Fail*	Pass*	Pass	Pass*
Canyon Complex	Pass	Fail*	Pass*	Pass*	Pass	Fail*
Laycock	Pass	Fail*	Fail*	Pass*	Pass	Pass*
Ingle	Pass	Fail*	Fail*	Pass*	Pass	Pass*
Beech	Pass	Fail*	Fail*	Pass*	Pass	Fail*
McClellan	Pass	Fail*	Pass*	Pass*	Pass	Pass*
Birch	Pass	Fail*	Fail*	Fail*	Pass	Pass*
Moon	Pass	Fail*	Pass*	Pass*	Pass	Pass*
Belshaw	Pass	Fail*	Fail*	Fail*	Pass	Fail*
Fields	Pass	Fail*	Pass*	Pass*	Pass	Fail*

Inferred

Distribution - Fail



- Distribution is highly fragmented and limited to headwater streams and the upper mainstem of the John Day River.
- The John Day Complex is the only population to pass the distribution criterion. This population occupies over 50% of the historical distribution, is distributed over 90 km, and is suspected to express a migratory life history strategy. The remaining populations fail the distribution criterion either because they occupy less than ten km of stream distance or 50% of the historical distribution.
- Apart from the John Day Complex, most populations are isolated from others during the summer months due to elevated water temperatures and low flows. Functionally these populations are isolated from each other due to the lack of movement, seasonal connectivity, and distance between populations.

Productivity - Pass

- Bear, Birch, and Belshaw populations are reduced and declining in abundance. These populations fail the productivity criterion.
- All other populations are considered to be depressed relative to historical levels of abundance, but appear to be maintaining stable levels of abundance. Degraded habitat, presence of non-native fish, and limited expression of a migratory life history are factors that influence productivity of westslope cutthroat trout.

Additional Information

- Populations of westslope cutthroat trout in the upper John Day basin are native. Only two documented stocking events are known; one in Deardorff Creek (Upper John Day Complex) and one in Strawberry Lake, both prior to 1935. Neither of these events likely impacted westslope cutthroat trout, thus all populations pass the reproductive independence criterion.
- ODFW is conducting research to obtain a genetic description of the populations, and to determine the extent of hybridization between cutthroat trout and rainbow trout.

Abundance - Fail

- Only the upper John Day and Canyon complexes, and the Moon populations are estimated to exceed 500 adults and pass the abundance criterion.
- Bear, Dog, Little Pine, Ingle, and Birch populations are estimated to be less than 50 reproductive adults and fail the abundance criterion.
- Dixie, Pine, Beech and Belshaw populations are thought to occupy the available habitat at abundances significantly below the habitat's potential capacity. These populations also fail the abundance criterion.

Hybridization - Fail

- Hybridization with introduced hatchery rainbow trout can be detrimental to westslope cutthroat trout populations and is considered one of the greatest risks of extinction.
- 500,000 hatchery rainbow trout were planted in the John Day River and one million in Canyon Creek before stocking programs ceased in 1997.
- Westslope cutthroat trout x hatchery rainbow trout hybrids may be extensive in the John Day basin where both species are sympatric. Populations fail the hybridization criterion if hatchery rainbow trout were either planted on top of westslope cutthroat trout or had access from other stocking locations in nearby streams. Populations located above barriers to passage and that have no records of stocking pass the criterion.

Bull Trout



Photo by K.K. Jones, ODFW

Klamath Lake Bull Trout SMU

ESA Designation:
Threatened 1998

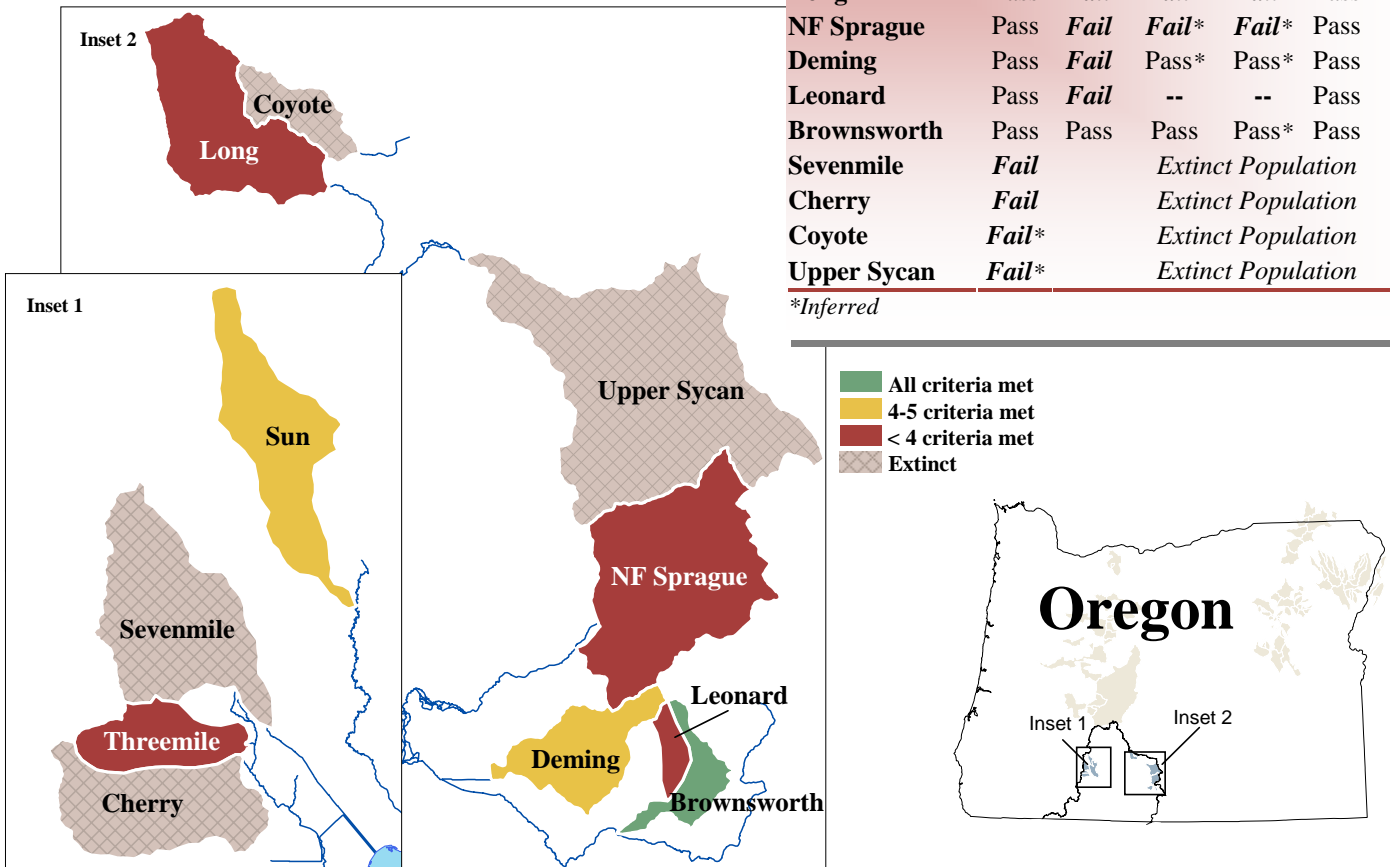
State Status:
Critical

Interim Assessment:
At Risk

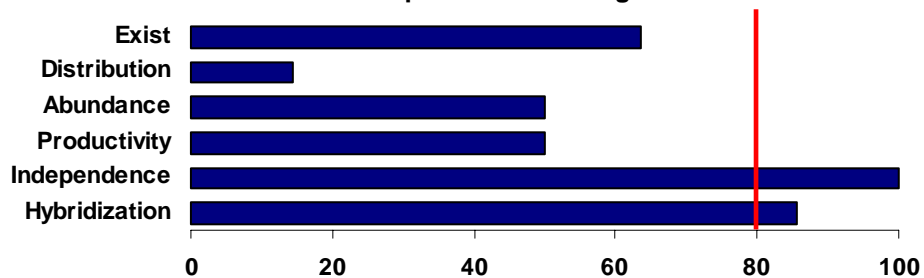
The Klamath Lake Bull Trout SMU is comprised of eleven populations, four of which are considered extinct. Distribution of bull trout within the SMU is highly fragmented and concentrated in a few isolated headwater streams of Sycan and Sprague rivers, and Klamath Lake. Movement between populations is hindered by barriers and poor habitat quality. Abundance is extremely depressed and in some cases considered precariously low. The introduction of non-native salmonids particularly brook trout and brown trout, and degraded habitat quality has impacted the productivity of many populations. The SMU meets only the reproductive independence and hybridization criteria and is classified as ‘at risk’. Limited datasets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Sun	Pass	Fail	Pass	Pass*	Pass	Pass
Threemile	Pass	Fail	Fail*	Fail*	Pass	Pass
Long	Pass	Fail	Fail*	Fail*	Pass	Fail
NF Sprague	Pass	Fail	Fail*	Fail*	Pass	Pass
Deming	Pass	Fail	Pass*	Pass*	Pass	Pass
Leonard	Pass	Fail	--	--	Pass	Pass
Brownsworth	Pass	Pass	Pass	Pass*	Pass	Pass
Sevenmile	Fail		Extinct Population			
Cherry	Fail		Extinct Population			
Coyote	Fail*		Extinct Population			
Upper Sycan	Fail*		Extinct Population			

**Inferred*



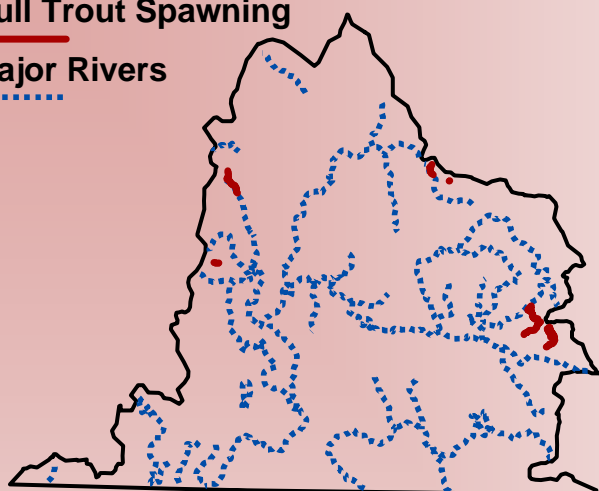
Percent of Populations Meeting Criteria



Distribution - Fail

Bull Trout Spawning

Major Rivers



- Current spawning and resident bull trout distribution in Klamath basin is highly fragmented and limited to a few headwater streams. Poor water quality and irrigation diversions have isolated populations, minimizing opportunities for bull trout to express a migratory life history, mix among populations, and colonize unoccupied habitats.
- Only Brownsworth passes the distribution criterion.
- Physical barriers on Deming, Sun, and Threemile prevent connection to migratory corridors and other populations. Bull trout are unable to move between subbasins, further isolating populations.
- Bull trout spawning distribution is limited to less than ten km in Threemile, NF Sprague, Deming, and Leonard.

Productivity – Fail

- Productivity data are not available. The criterion was assessed based on professional judgment of agency biologists. Populations with good and improving habitat quality and apparently stable or increasing trends in abundance pass the criterion.
- Threemile, Long, and NF Sprague populations fail the criterion due to low and declining abundance, threats of hybridization with brook trout or competition with brown trout, and declining habitat quality

Additional Information

- Bull trout in the Klamath Lake SMU are naturally produced and all populations passed the reproductive independence criterion.
- Brown trout are present in NF Sprague and Brownsworth populations and potentially depress bull trout populations.

Abundance - Fail

- Sun, Deming, and Brownsworth populations are estimated to contain greater than 100 adults each. These populations pass the abundance criterion.
- Threemile, Long, and NF Sprague populations are estimated to contain less than 100 adults and fail the abundance criterion. These populations are precariously low and considered at risk of inbreeding.
- Abundance in Leonard has not been evaluated for 15 years (approx. three generations), past estimates may not reflect current status. This population was not assessed due to lack of current population information.
- All populations are considered to be at risk of genetic drift.

Hybridization - Pass

- The first documented introductions of brook trout into Klamath Basin occurred in 1925
- Brook trout exist in Threemile and Long creeks and efforts to remove brook trout are ongoing. Brook trout and hybrids have not been observed in Threemile Creek above the culvert since 2000. Brook trout are still a threat in Long Creek.
- Crater Lake National Park eradicated brook trout in Sun Creek 1999 using antimycin treatments. Brook trout have not been detected in recent surveys and are not considered a threat to bull trout in Sun Creek.

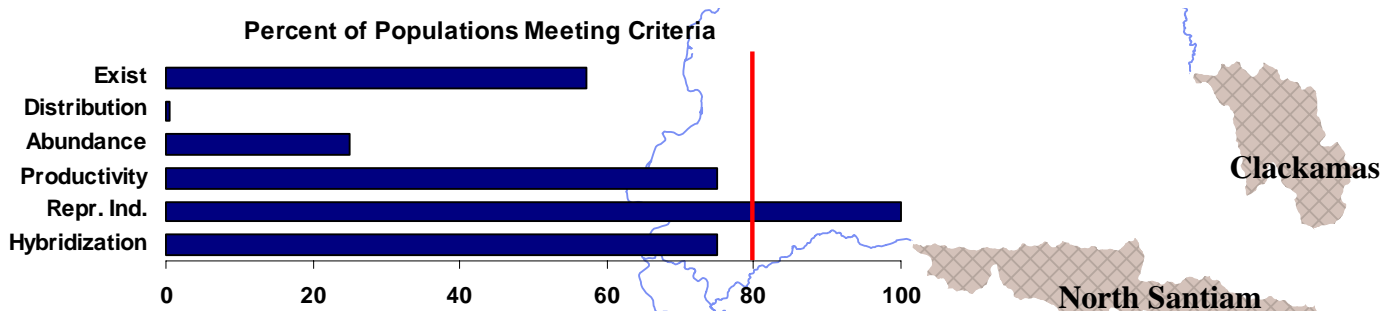
Willamette Bull Trout SMU

ESA Designation:
Threatened 1998

State Status:
Critical

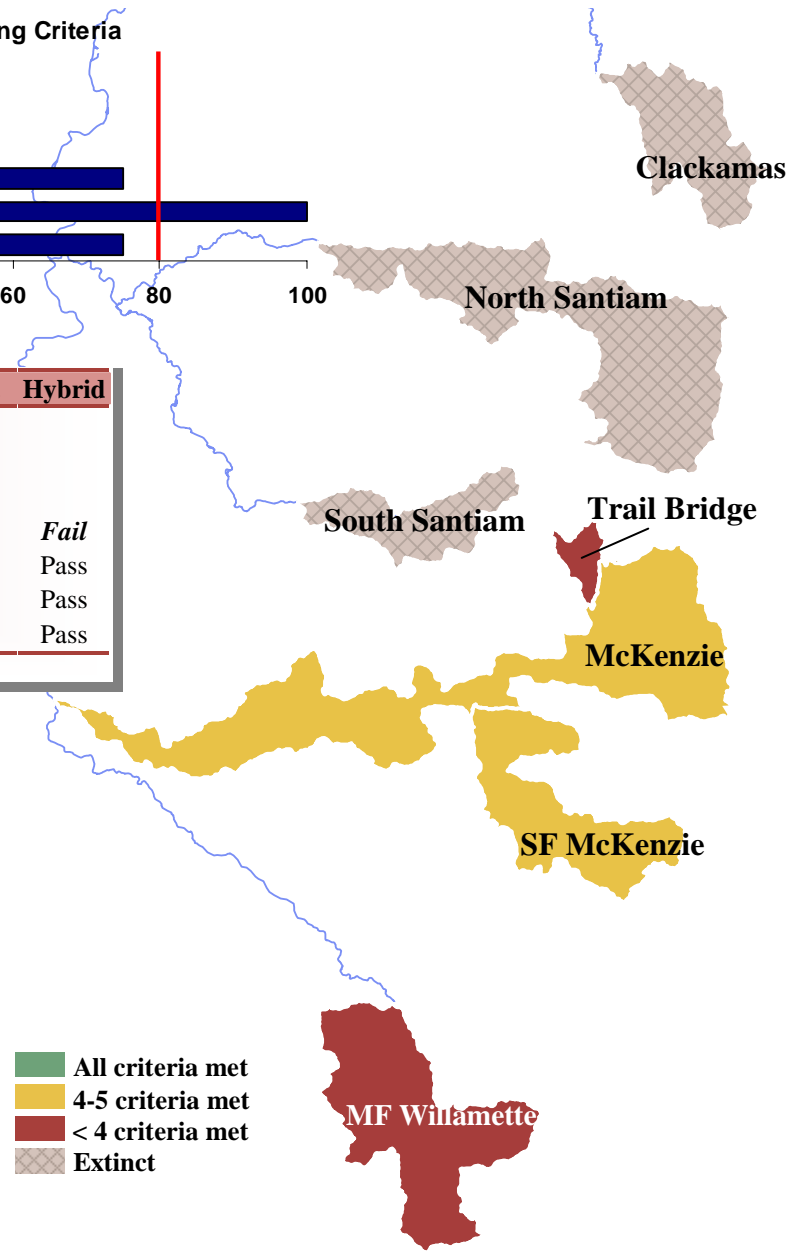
Interim Assessment:
At Risk

The Willamette Bull Trout SMU is comprised of seven populations, three of which are classified as extinct. Sightings of bull trout were last documented before 1960 in Clackamas, North Santiam, and South Santiam basins. All four existing populations have an extremely limited spawning distribution, and three populations are isolated above dams lacking upstream passage. Bull trout abundance in the Middle Fork Willamette population has dropped to precariously low numbers. ODFW and USFS biologists are attempting to restore this population with bull trout from the McKenzie population. The SMU meets only the reproductive independence criterion and is classified as ‘at risk’. Limited datasets and inferences from other populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria.

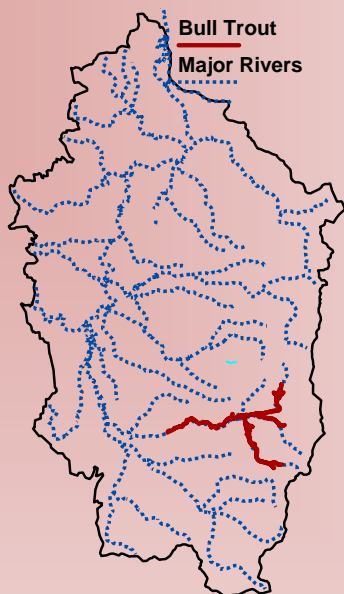


Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Clackamas	Fail		Extinct Population			
North Santiam	Fail		Extinct Population			
South Santiam	Fail		Extinct Population			
Trail Bridge	Pass	Fail	Fail	Pass*	Pass	Fail
McKenzie	Pass	Fail	Pass	Pass*	Pass	Pass
SF McKenzie	Pass	Fail	Fail	Pass*	Pass	Pass
MF Willamette	Pass*	Fail	Fail	Fail*	Pass	Pass

*Inferred

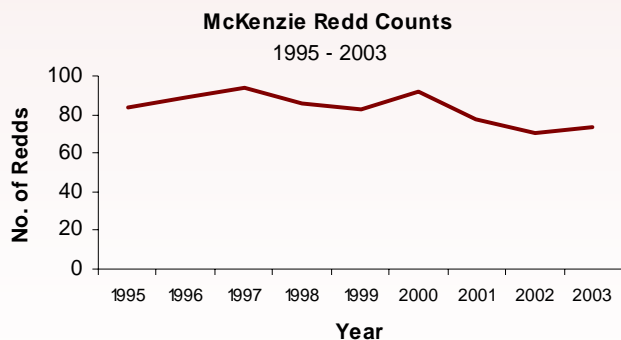


Distribution - Fail



- Historically, bull trout in the McKenzie River basin functioned as a single population. Dam construction in the early 1960s fragmented the population and spawning habitat.
- Currently spawning distribution of each population is less than five Km and movement between populations is impeded by dams. Therefore each existing population fails the distribution criterion.
- Bull trout in the McKenzie population utilize up to 170 km of the McKenzie River and its tributaries throughout their life cycle. Large fluvial adults have been observed downstream of Leaburg Dam and a few individuals pass above the dam each year.

Productivity - Fail



- The McKenzie population is estimated to contain 200 adults and passes the abundance criterion.
- Trail Bridge, SF McKenzie, and Middle Fork Willamette populations are very small; each is estimated to contain fewer than 50 adults. These populations fail the criterion and are at risk of inbreeding.
- All existing populations are at risk of the deleterious effects of genetic drift.

Hybridization - Fail

- Brook trout have been stocked in many Cascade Mountain high alpine lakes. Some releases resulted in self-sustaining brook trout populations.
- A population of brook trout is present in Trail Bridge Reservoir, where hybridization between bull trout and brook trout is a threat to bull trout. The Trail Bridge bull trout population fails the criterion.
- Brook trout are present in the Middle Fork Willamette, McKenzie, and SF McKenzie basins, however distribution of bull trout and brook trout do not overlap. Hybridization has not been observed during routine sampling in these bull trout populations, therefore they pass the hybridization criterion.

Additional Information

- Bull trout in the Willamette SMU are native fish sustained by natural production. All populations pass the reproductive independence criterion.

Hood River Bull Trout SMU

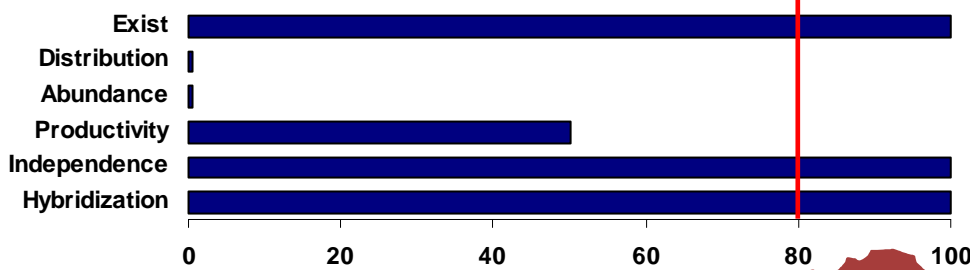
ESA Designation:
Threatened 1998

State Status:
Critical

Interim Assessment:
At Risk

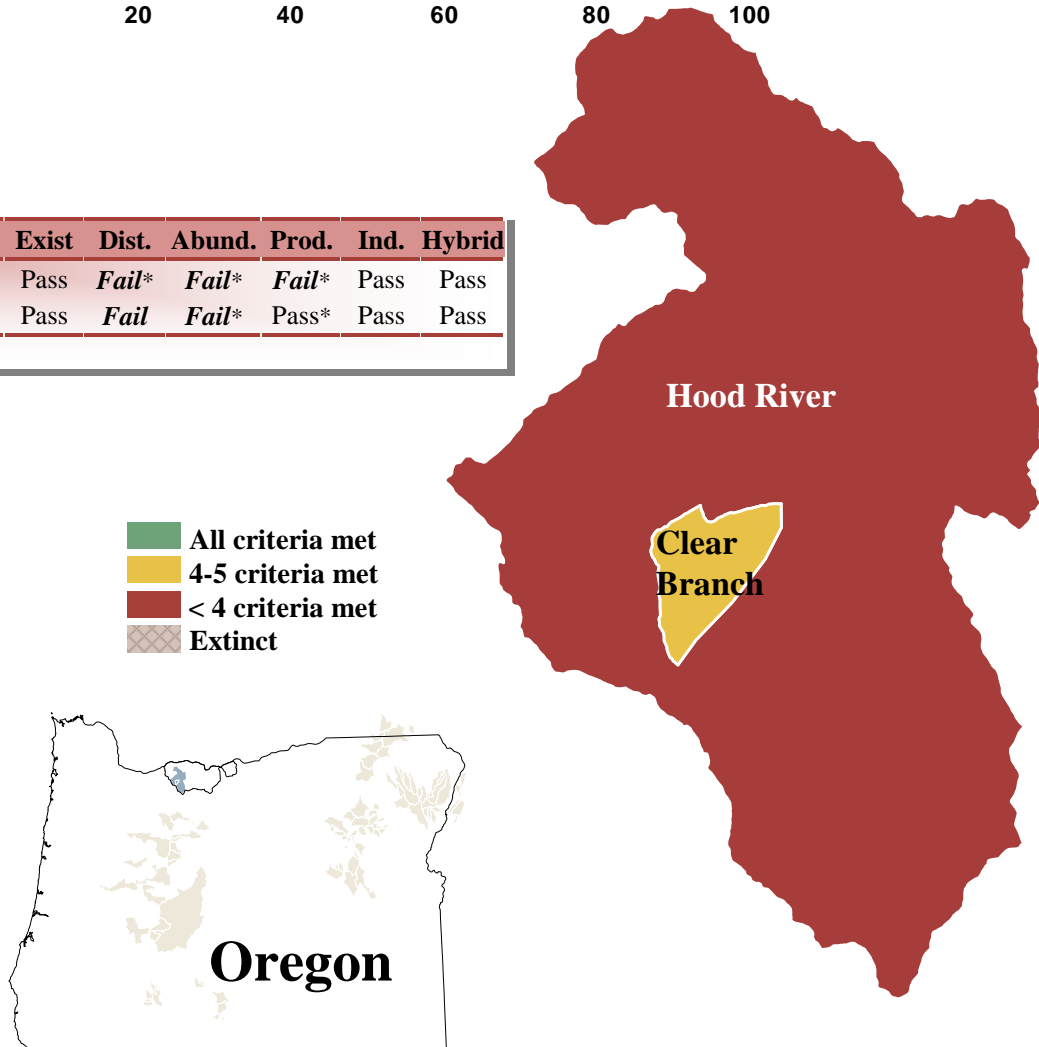
Two populations, Clear Branch and Hood River, comprise the Hood River Bull Trout SMU. Genetic analysis shows Hood River bull trout to be unique; the basin was likely colonized by fish from both coastal and Snake River populations. Historically, bull trout in the Hood River basin functioned as a single population. Construction of the Clear Branch Dam in 1969 fragmented the population and spawning habitat. Distribution of both populations is extremely limited and abundance is precariously low. This SMU meets three of the six interim criteria and is classified as 'at risk'. Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria.

Percent of Populations Meeting Criteria



Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Hood River	Pass	<i>Fail*</i>	<i>Fail*</i>	<i>Fail*</i>	Pass	Pass
Clear Branch	Pass	<i>Fail</i>	<i>Fail*</i>	Pass*	Pass	Pass

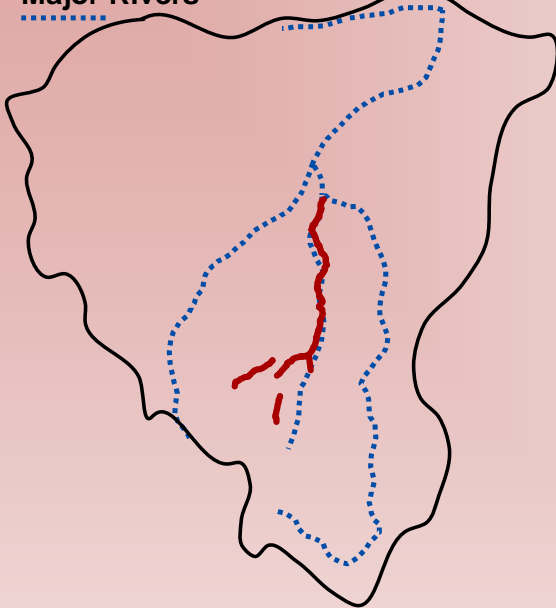
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Distribution - Fail

Bull Trout Spawning /Rearing

Major Rivers



- Current distribution likely reflects historical distribution; however dams and diversions have resulted in fragmentation and limited spawning habitat to a few tributary streams.
- Clear Branch population is isolated above the Clear Branch Dam and spawning distribution is restricted to eight km. This population is at a high risk of extinction due to stochastic events and fails the criterion.
- Spawning distribution of the Hood River population is highly fragmented and limited to a few short stream sections totaling <ten km. Water temperature and glacial melt affects the quality of spawning habitat. This population fails the criterion.
- Migratory bull trout from the Hood River population have been located rearing in the Columbia River.

Additional Information

- Both populations in the Hood River Bull Trout SMU are native fish sustained by natural production and pass the reproductive independence criterion.
 - Powerdale Dam on the Hood River is scheduled for decommissioning and removal starting in 2010.
 - The Sandy River is included in the SMU. Even though a self-sustaining population does not currently exist in the Sandy River, recent bull trout sightings suggest this river as a possible location for recovery.
-

Abundance - Fail

- Dam counts, redd surveys, and snorkel observations suggest abundance of both populations is extremely low. Each population likely contains fewer than 100 adults. Counts of adult bull trout over the Powerdale Dam ranged from two to 28 between 1992 and 2001.
- The relative abundance of the Clear Branch population is larger than that of the Hood population, and is considered to be the ‘core’ of the Hood River SMU.
- Bull trout populations in this SMU are at risk of the deleterious effects of genetic drift and inbreeding, and fail the abundance criterion.

Hybridization - Pass

- Brook trout are present in the Hood River Basin, but are not sympatric with bull trout and not considered a threat. Both populations pass this criterion.

Productivity – Fail

- Data specifically describing productivity do not exist.
- Snorkel counts suggest the Clear Branch population is likely stable and sustaining itself. The population passes the criterion.
- The Hood River population fails the criterion due to extremely low abundance, limited distribution, and highly variable capture rates at the Powerdale Dam.

Deschutes Bull Trout SMU

ESA Designation:
Threatened 1998

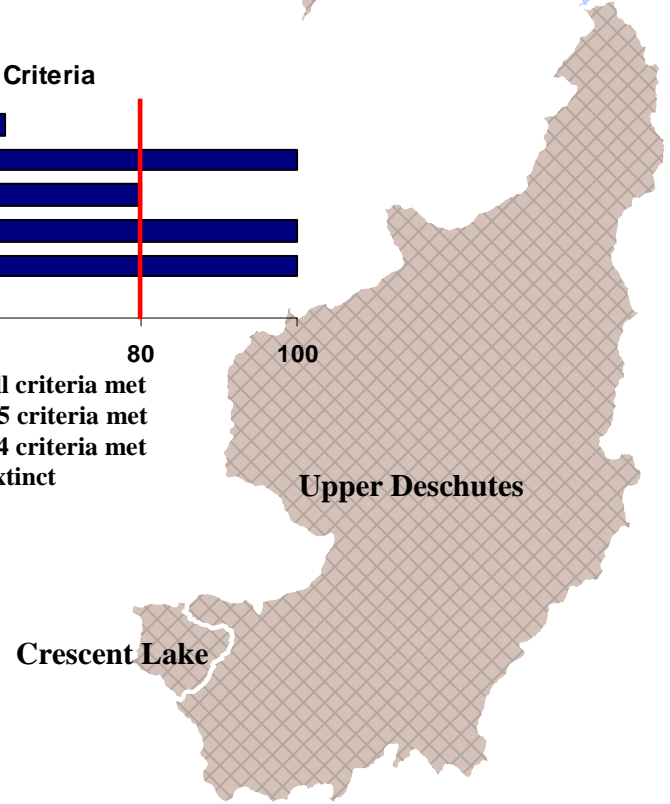
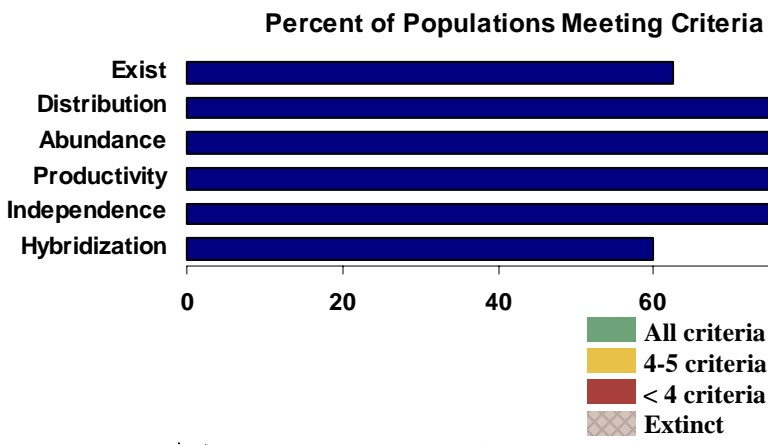
State Status:
Critical

Interim Assessment:
Potentially At Risk

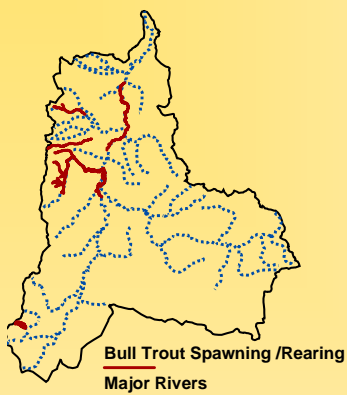
The Deschutes Bull Trout SMU contains eight populations, three of which are considered extinct. Bull trout no longer exist in the upper Deschutes River Basin, Crescent Lake, and Suttle Lake. Movement between populations in the Warm Springs Indian Reservation and the Metolius River Basin is impeded by the Pelton Round Butte Hydroelectric Project. Jack and Jefferson complexes are two of the most abundant and productive in Oregon; both populations pass all interim criteria and are considered ‘not at risk’. The SMU is classified as ‘potentially at risk’, failing the hybridization and extinction criteria. Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Warm Springs	Pass	Pass	Pass	Pass*	Pass	<i>Fail</i>
Shitike	Pass	Pass	Pass	Pass*	Pass	<i>Fail</i>
Whitewater	Pass	Pass*	<i>Fail*</i>	Pass*	Pass	Pass
Jefferson Complex	Pass	Pass	Pass	Pass*	Pass	Pass
Jack Complex	Pass	Pass	Pass	Pass*	Pass	Pass
Suttle Lake	<i>Fail</i>		<i>Extinct Population</i>			
Upper Deschutes	<i>Fail</i>		<i>Extinct Population</i>			
Crescent	<i>Fail</i>		<i>Extinct Population</i>			

**Inferred*



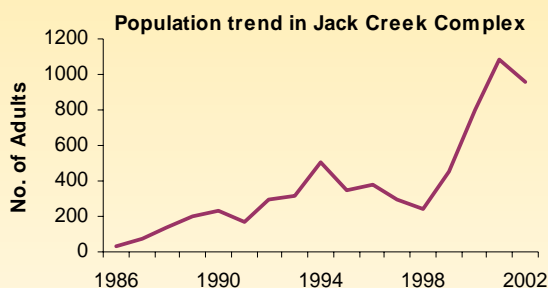
Distribution - Pass



- The spawning distribution within each population is relatively extensive. All existing populations pass the distribution criterion.

- Adult and sub-adult bull trout in the Metolius River rear in Lake Billy Chinook and its larger tributaries, and those from Warm Springs and Shitike creeks utilize the Deschutes River down to Sherars Falls.

Productivity - Pass



- All populations pass the productivity criterion.
- Population trend in the Warm Springs River is stable. Jack and Jefferson complexes and Shitike Creek show increasing trends in abundance. All four populations pass the criterion.
- Productivity information is not available for Whitewater. The population passes the criterion based on trend of other Metolius populations. This review assumes productivity is minimally adequate for the population to sustain itself.

Additional Information

- Bull trout in the Deschutes SMU are native fish sustained by natural production. All populations pass the reproductive independence criterion.
- Harvest of bull trout is illegal in the Deschutes River basin except in Lake Billy Chinook, upstream to Benham Falls where the bull trout bag limit is 1/day over 24 inches. Lake Billy Chinook is the only consumptive bull trout fishery in Oregon and one of two in the nation. All tributaries of the Metolius River below Lake Creek are closed to angling.
- Restoration of fish passage at Pelton Round Butte Hydroelectric project is scheduled for 2010.

Abundance - Pass

- All existing populations except Whitewater are estimated to be >100 adults and not at risk of inbreeding. These populations pass the abundance criterion.
- Whitewater is estimated to be between 0 and 60 adults and fails the criterion. This may be a conservative estimate since conditions make the population difficult to census.
- The Jack Complex is estimated to be the largest population of approximately 700 adults.

Hybridization - Fail

- Brook trout have been introduced into Warm Springs, Shitike, and Canyon creeks (Jack Complex).
- Brook trout are present in Canyon Creek (Jack Complex) but are not sympatric with bull trout; hybridization is rare. The Jack Complex passes the hybridization criterion.
- Data specific to the degree of hybridization in Warm Springs and Shitike are not available. These populations fail the hybridization criterion until they can be better assessed.

Odell Lake Bull Trout SMU

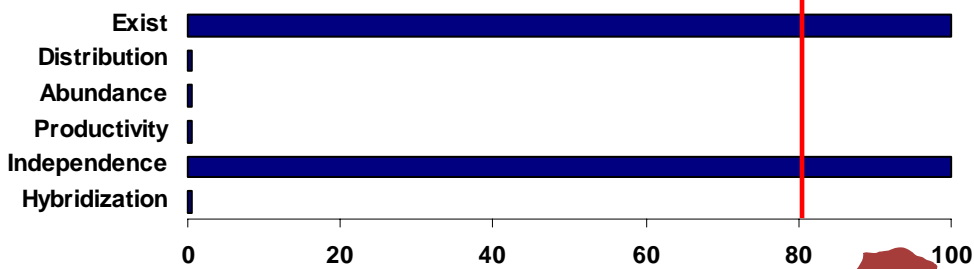
ESA Designation:
Threatened 1998

State Status:
Critical

Interim Assessment:
At Risk

The Odell Lake Bull Trout SMU is comprised of one population, the single remaining natural adfluvial population in Oregon. Odell Lake is physically isolated from the Upper Deschutes River basin by a 5,500 year old lava flow which impounded Odell Creek and created Davis Lake. The abundance of the Odell Lake bull trout population is perilously low and spawning habitat is severely limited and of marginal quality. The presence of non-native salmonids, particularly lake trout, brook trout, and kokanee, drastically limit productivity. The Odell Lake SMU meets two of the six interim criteria and is classified as ‘at risk’. Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of interim criteria.

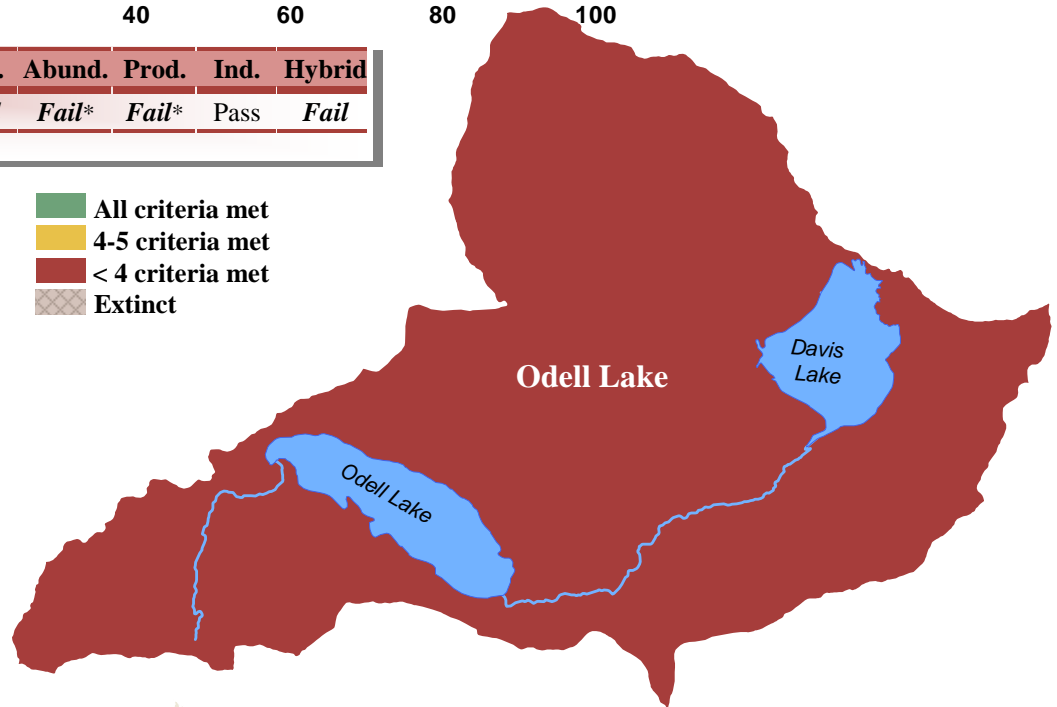
Percent of Populations Meeting Criteria



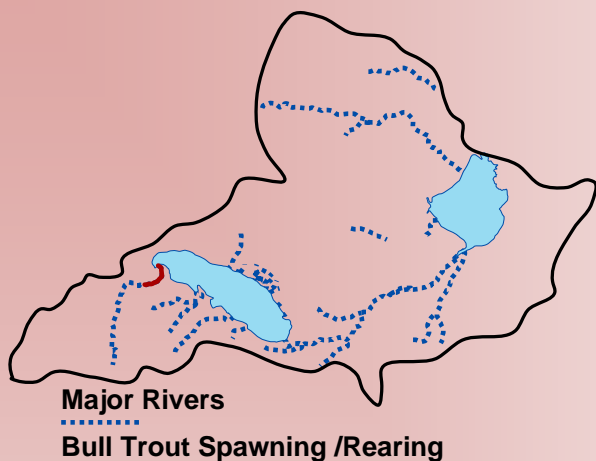
Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Odell Lake	Pass	Fail	Fail*	Fail*	Pass	Fail

* Inferred

- All criteria met
- 4-5 criteria met
- < 4 criteria met
- Extinct



Distribution - Fail



- Bull trout currently occupy Odell Lake, Trapper and Odell creeks, and two Odell Creek tributaries.
- Bull trout spawning distribution is limited to 1.3 km of Trapper Creek between the mouth and a barrier falls. Quality of spawning habitat is marginal, degrading significantly over the past 70 years.
- Crystal Creek historically supported spawning bull trout; however, sediment input from the construction of a railroad crossing impacted habitat quality. Only kokanee currently spawn in Crystal Creek.

Productivity - Fail

- Data are not available to quantitatively assess productivity.
- Productivity is likely depressed by interactions with non-native salmonids; brook trout hybridize with bull trout in Trapper Creek, kokanee redds are frequently superimposed over bull trout redds, and lake trout compete and/or prey on bull trout in Odell Lake.
- Degraded and restricted spawning habitat may also limit productivity.

Additional Information

- Odell Lake bull trout are native trout sustained by natural production and pass the reproductive independence criterion.
 - The USFW implemented a channel restoration project on Trapper Creek in 2002 and 2003. The project was designed to create high quality spawning and rearing habitat for bull trout through the addition of large wood and spawning gravel and by increasing the overall amount of pool habitat.
 - ODFW is currently evaluating the impact of superimposition of kokanee redds on bull trout redds.
-

Abundance - Fail

- Total abundance of Odell Lake bull trout is unknown.
- Based on field observations, selected datasets, and professional judgment, biologists estimate fewer than 50 adult bull trout exist in the Odell Lake population.
- Odell Lake bull trout are at risk of the deleterious effects of inbreeding and genetic drift.

Hybridization - Fail

- Historically brook trout were stocked in high mountain lakes in the Odell Lake watershed, including Yoran Lake, headwaters of Trapper Creek.
- Hybridization with brook trout has been observed in Trapper Creek; however the degree to which it occurs is undocumented. Given the extremely small size of the bull trout population, any degree of hybridization is considered a significant impact. The Odell Lake population fails the hybridization criterion.

John Day Bull Trout SMU

ESA Designation:
Threatened 1998

State Status:
Critical

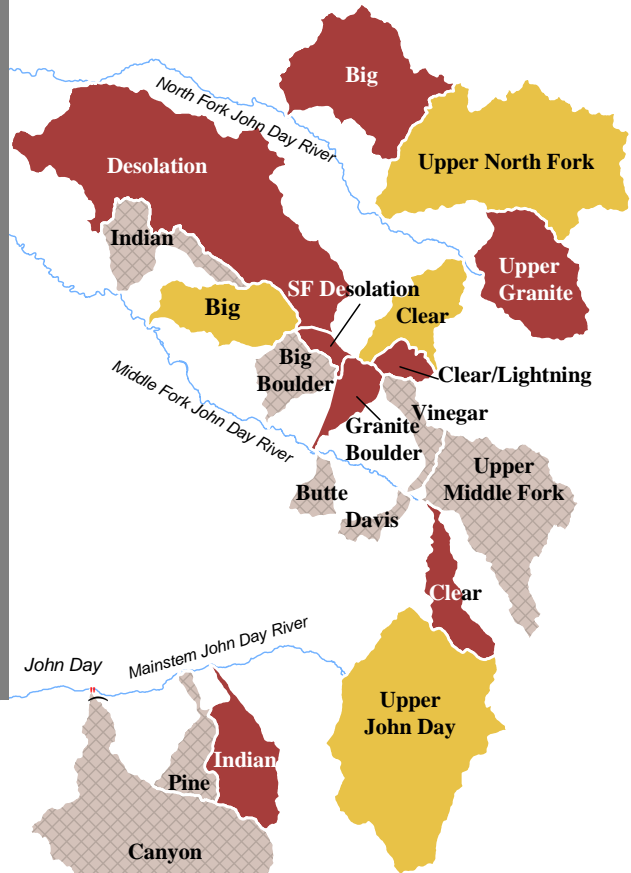
Interim Assessment:
At Risk

The John Day Bull Trout SMU includes 20 populations distributed among headwater streams of the North Fork, Middle Fork, and Upper Mainstem John Day Rivers. Five populations in the Middle Fork John Day and two in the Mainstem John Day Rivers are considered extinct. Overall abundance within the SMU is extremely low and spawning distribution is highly fragmented and restricted to small tributary streams. Productivity of most populations is limited by habitat quality, non-native species, and a lack of a migratory life history. The SMU only meets the reproductive independence criterion and is classified as ‘at risk’. Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria.

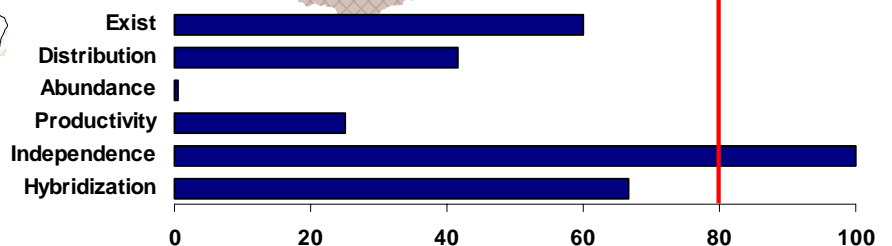
ning

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
North Fork						
Upper North Fork	Pass	Pass	Fail*	Pass*	Pass	Fail*
Upper Granite	Pass	Fail	Fail*	Fail*	Pass	Pass
Big	Pass	Fail*	Fail*	Fail*	Pass	Fail*
Clear	Pass	Pass	Fail*	Fail*	Pass	Pass
Clear/Lightning	Pass	Fail*	Fail*	Fail*	Pass	Pass
Desolation	Pass	Pass	Fail*	Fail*	Pass	Fail*
SF Desolation	Pass	Fail	Fail*	Fail*	Pass	Fail*
Middle Fork						
Clear	Pass	Fail	Fail*	Fail*	Pass	Pass
Granite Boulder	Pass	Fail	Fail*	Fail*	Pass	Pass
Big	Pass	Pass	Fail*	Pass*	Pass	Pass
Upper Middle Fork	Fail		Extinct Population			
Big Boulder	Fail		Extinct Population			
Davis	Fail		Extinct Population			
Vinegar	Fail		Extinct Population			
Butte	Fail		Extinct Population			
Indian	Fail		Extinct Population			
Mainstem						
Upper John Day	Pass	Pass	Fail*	Pass*	Pass	Pass*
Indian	Pass	Fail	Fail*	Fail*	Pass	Pass
Pine	Fail		Extinct Population			
Canyon	Fail		Extinct Population			

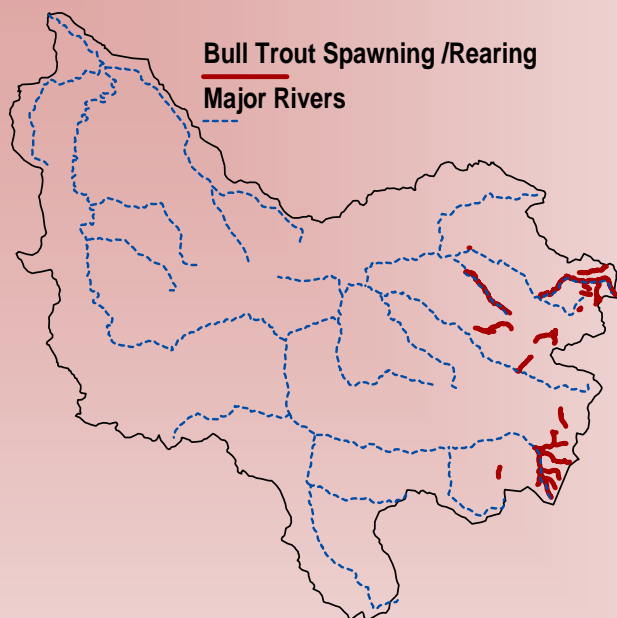
*Inferred



Percent of Populations Meeting Criteria



Distribution - Fail



- Bull trout distribution in the John Day basin is highly fragmented and constricted to headwater streams.
- Spawning and rearing distribution is limited to less than ten km for at least five of the populations: Clear (MFJD), Granite Boulder, Indian (MSJD), SF Desolation, and Upper Granite.
- Three populations do not have year-around access to migratory corridors or other populations. The SF Desolation population is above a natural barrier and Clear Creek (NFJD) and Indian Creek (MSJD) are above an impassable diversion and dewatered reaches respectively.
- Adult and sub-adult bull trout seasonally utilize the entire North Fork John Day River for rearing and foraging, and in the Upper Mainstem John Day River they are suspected to forage down to the vicinity of the town of John Day. Migratory bull trout have been captured in the Mainstem John Day River near the town of Spray; however use of the lower reaches is sporadic due to warm water temperatures and low flows during the summer months.

Additional Information

- Bull trout in the John Day Basin are native fish sustained by natural production. All populations pass the reproductive independence criterion.
- Elevated water temperature and reduced stream flow due to water diversions in the mainstem rivers and large tributaries act as barriers to migration during summer and early fall, impacting movement between populations.

Abundance- Fail

- Abundance estimates are not available for individual populations. Based on professional opinion, none of the John Day SMU populations exceed 100 reproductive adults. All populations are considered at risk of inbreeding and fail the abundance criterion.
- Abundance of all populations combine does not exceed 1,000 reproductive adults. Bull trout in the SMU are at risk of genetic drift. Basin-wide redd counts estimated 540 ($\pm 38\%$) redds in 2002, 193 ($\pm 31\%$) redds in 2003, and 235 ($\pm 35\%$) redds in 2004 in the John Day SMU.

Hybridization - Fail

- Brook trout were stocked in tributary streams and high alpine lakes in the North Fork John Day and mainstem John Day basins beginning in 1925.
- Four bull trout populations in the North Fork are sympatric with brook trout and hybridization is common. These populations fail the hybridization criterion.
- Brook trout are present in the Upper John Day population; however the incidence of hybridization is rare. This population passes the criterion.
- Brook trout are not present in the Middle Fork John Day Basin. All populations in this basin pass the hybridization criterion.

Productivity - Fail

- Data are not available to quantitatively assess productivity.
- Populations fail the criterion if they are limited in distribution and abundance, are sympatric with brook trout, or do not express a migratory life history.
- Only the North Fork John Day, Upper John Day, and Big (MFJD) populations pass the criterion. These populations appear to be the most abundant and widely distributed with access to habitats capable of supporting a migratory life history strategy.

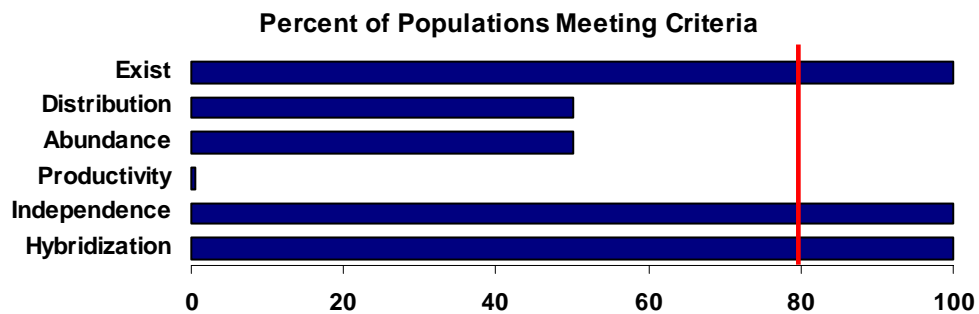
Umatilla Bull Trout SMU

ESA Designation:
Threatened 1998

State Status:
Critical

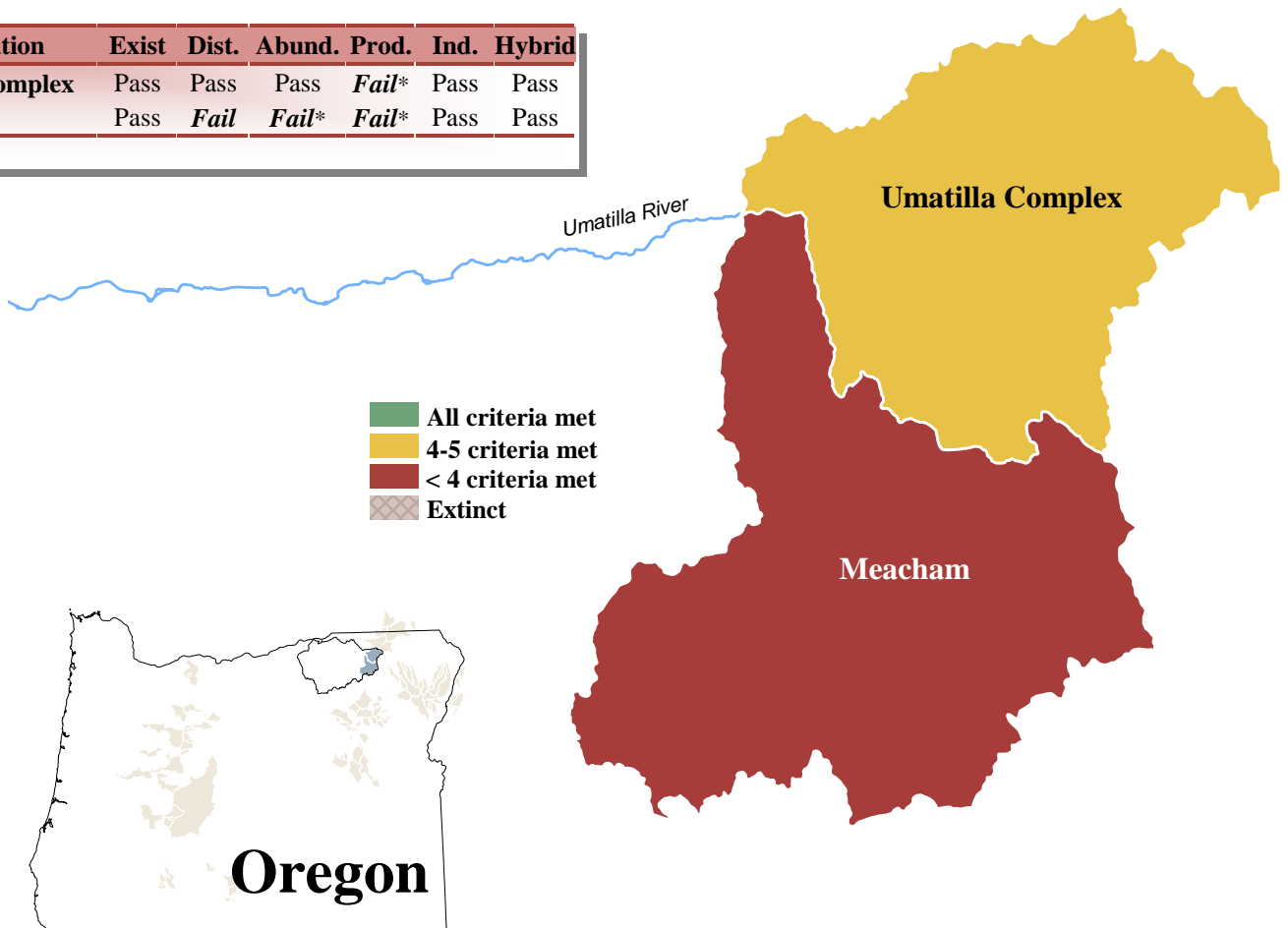
Interim Assessment:
At Risk

The Umatilla Bull Trout SMU consists of two populations, one in each of Meacham Creek and Upper Umatilla River. The abundance of the Meacham population is dangerously low and distribution is severely limited. Habitat degradation significantly impacts both populations, particularly in the lower reaches of the Umatilla River, where adult bull trout rear and overwinter. Movement between populations is possible, but undocumented. The SMU passes three of the six interim criteria and is classified as ‘at risk’. Limited data sets and inferences from other information for populations in the SMU provide a qualified level of confidence in the assessment of the interim criteria.

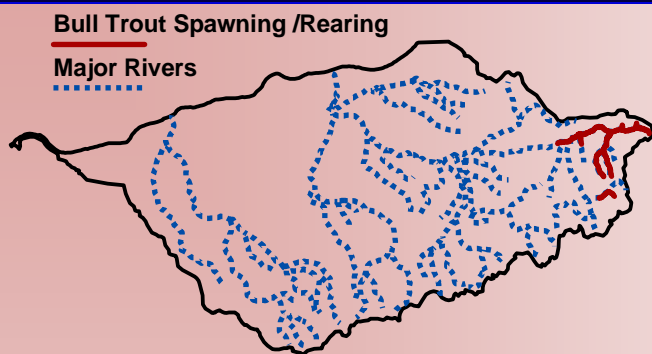


Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Umatilla Complex	Pass	Pass	Pass	Fail*	Pass	Pass
Meacham	Pass	Fail	Fail*	Fail*	Pass	Pass

*Inferred



Distribution - Fail

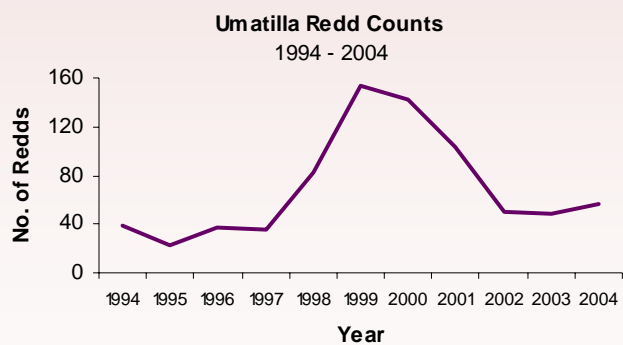


- Spawning, juvenile rearing, and resident bull trout distribution is limited to upper Umatilla River and portions of North Fork Meacham Creek. Spawning and rearing distribution in the Meacham population is limited to less than 10 km. This population fails the criterion.
- Connectivity between populations is hindered by seasonal low flows and thermal barriers. Access further downstream, as well as movement to and from the Columbia River, is hampered by poor water quality and six permanent in-stream diversions.

Hybridization - Pass

- Brook trout are not present in the Umatilla River Basin and not a threat for bull trout.

Productivity - Fail



- The Umatilla Complex shows decreasing trend in abundance over the past five years and is considered to fail the criterion until productivity can be better assessed.
- Productivity in the Meacham population could not be adequately evaluated. Given the extremely low abundance the population fails the criterion.

Additional Information

- Both populations in the Umatilla Bull Trout SMU are native fish sustained by natural production and pass the reproductive independence criterion.
- Angling is closed to direct take of bull trout on non-reservation lands. Tribal members may keep bull trout, however most release those they catch.
- Habitat degradation due to timber harvest and associated road development, agricultural practices, and grazing are considered the most significant threats to bull trout in the Umatilla SMU.

Walla Walla Bull Trout SMU

ESA Designation:
Threatened 1998

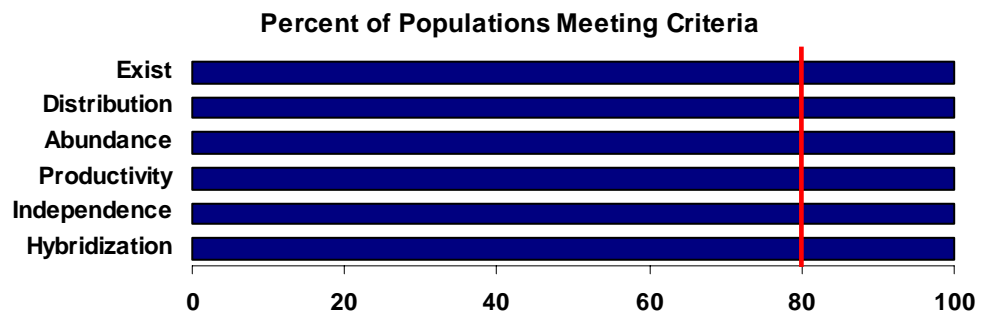
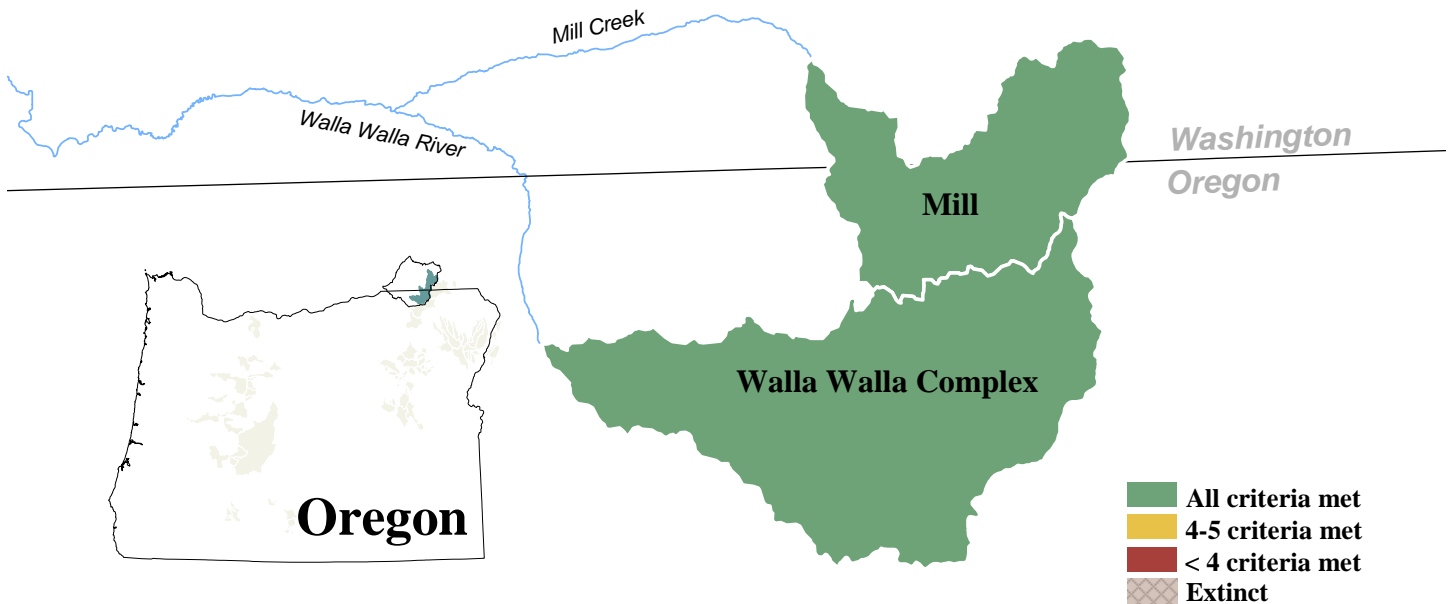
State Status:
Critical

Interim Assessment:
Not At Risk

The Walla Walla Bull Trout SMU consists of two populations, one in each of Upper Walla Walla River and Mill Creek. Three additional populations not considered in this assessment are present in Touchet River, a tributary of the Walla Walla River in Washington. Bull trout in both Oregon populations express a fluvial life history strategy and are relatively abundant and productive. High quality spawning habitat is extensive in the upper reaches of Mill Creek and Walla Walla River, however connectivity between populations is poor from late spring to fall. Both populations pass all six interim criteria and the SMU is classified as ‘not at risk’. Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Walla Walla Complex	Pass	Pass	Pass	Pass*	Pass	Pass
Mill	Pass	Pass	Pass	Pass*	Pass	Pass

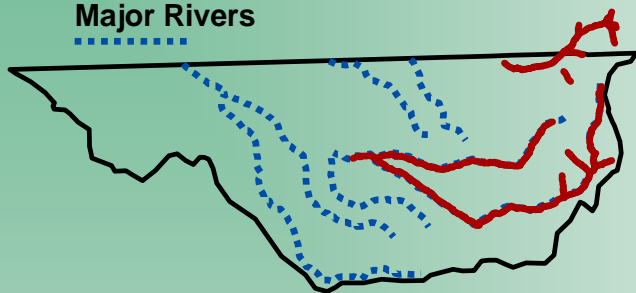
**Inferred*



Distribution – Pass

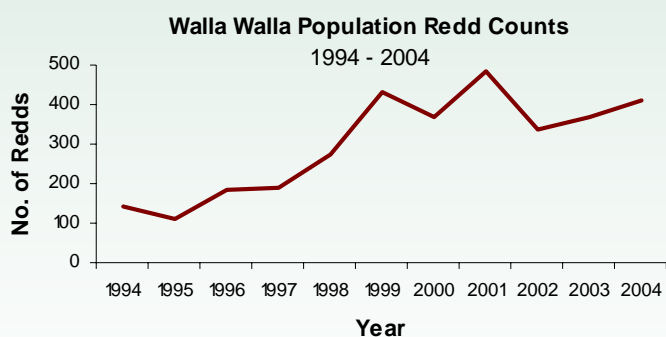
Bull Trout Spawning /Rearing

Major Rivers



- Extensive spawning, juvenile rearing, and resident adult bull trout distribution occurs in the upper reaches of South Fork and North Fork Walla Walla rivers and Mill Creek.
- Bull trout in both populations have access to larger rivers and migratory corridors; however connectivity between populations is poor. Low flow conditions, poor water quality and diversion dams hinder the ability of bull trout to move between populations from late spring through fall.
- Both populations pass the distribution criterion.
- Adult migratory bull trout rear and over winter in the mainstem of the Walla Walla River, upstream of the state border. Occasional sightings exist downstream of the Mill Creek confluence and at Bennington Dam.

Productivity - Pass



- Annual redd counts exhibit an increasing population trend in the Walla Walla Complex and a stable trend in Mill Creek. Both populations pass the productivity criterion.

Additional Information

- Populations in the Walla Walla Bull Trout SMU are native fish sustained by natural production, and pass the reproductive independence criterion.
- Habitat degradation due to dams, timber harvest, road development, and agricultural and grazing practices is considered the most significant threat to bull trout in the Walla Walla SMU.

Abundance - Pass

- Both populations exceed 100 spawning adults, are not considered at risk of inbreeding depression, and pass the criterion. The Walla Walla complex averaged 989 adults over the past five years. The Mill Creek population averaged 480 spawning adults.
- The total number of adults within the SMU exceeds 1,000, minimizing the occurrence of genetic drift. However, connectivity between populations must improve in order to fully avoid these genetic risks.

Hybridization - Pass

- Brook trout are not present in the Walla Walla River Basin and not a threat for bull trout.

Grande Ronde Bull Trout SMU

ESA Designation:
Threatened 1998

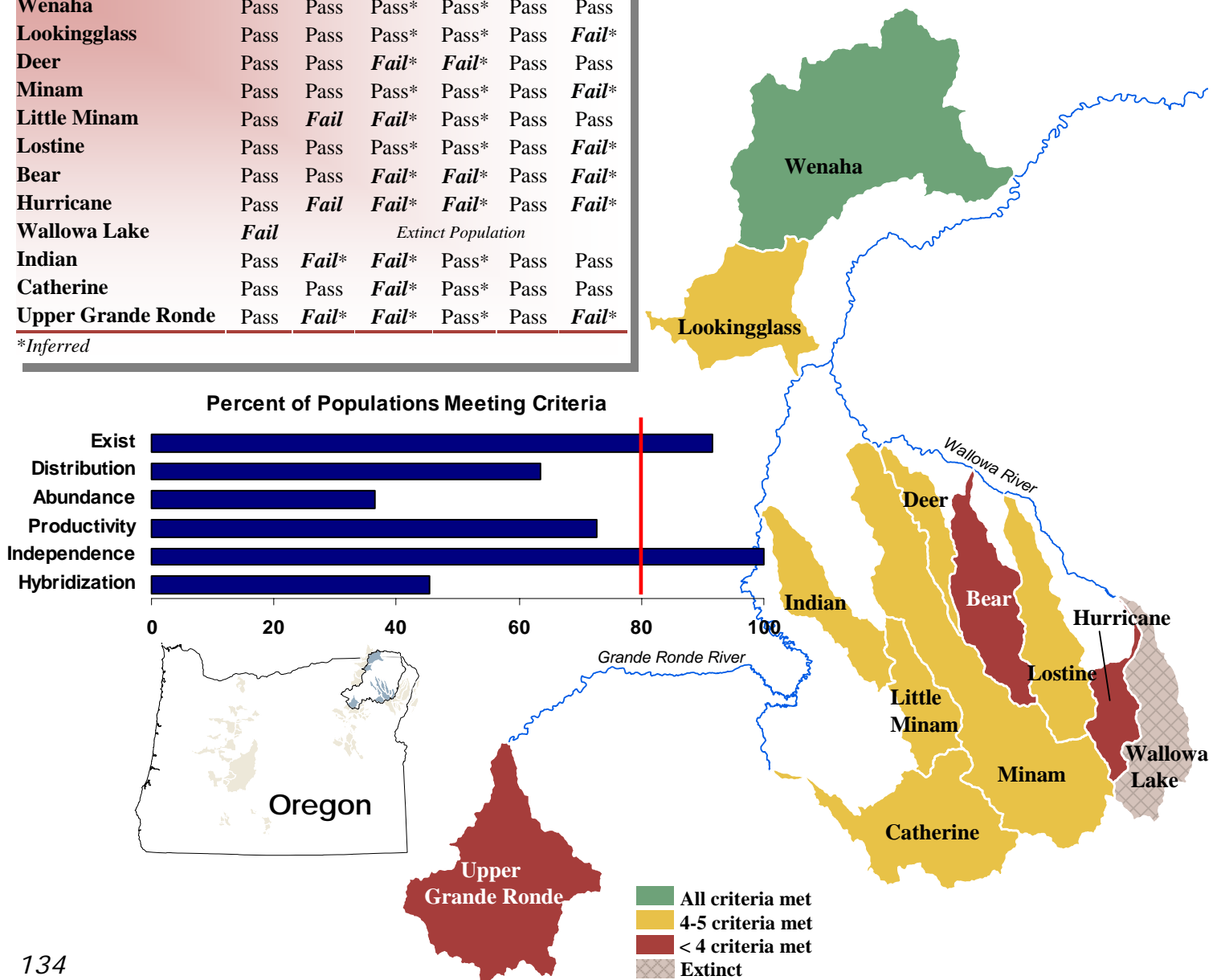
State Status:
Critical

Interim Assessment:
At Risk

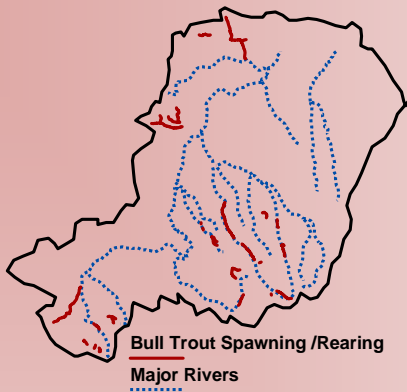
The Grand Ronde Bull trout SMU includes 12 populations, of which over half are concentrated in the Wallowa River basin. The Wallowa Lake population was eliminated by the 1950s and is now considered extinct. The Wenaha River is one of Oregon's most pristine and undisturbed river systems and contains one of the state's healthiest bull trout populations in this SMU. Abundance is considered precariously low in more than half of the populations and hybridization with introduced brook trout has put many populations at risk, particularly in the Wallowa River. The SMU passes two of the six interim criteria and is classified as 'at risk'. Limited data sets and inferences from other information for populations in the SMU provide a qualified level of confidence in the assessment of the interim criteria.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Wenaha	Pass	Pass	Pass*	Pass*	Pass	Pass
Lookingglass	Pass	Pass	Pass*	Pass*	Pass	Fail*
Deer	Pass	Pass	Fail*	Fail*	Pass	Pass
Minam	Pass	Pass	Pass*	Pass*	Pass	Fail*
Little Minam	Pass	Fail	Fail*	Pass*	Pass	Pass
Lostine	Pass	Pass	Pass*	Pass*	Pass	Fail*
Bear	Pass	Pass	Fail*	Fail*	Pass	Fail*
Hurricane	Pass	Fail	Fail*	Fail*	Pass	Fail*
Wallowa Lake	Fail	Extinct Population				
Indian	Pass	Fail*	Fail*	Pass*	Pass	Pass
Catherine	Pass	Pass	Fail*	Pass*	Pass	Pass
Upper Grande Ronde	Pass	Fail*	Fail*	Pass*	Pass	Fail*

*Inferred



Distribution - Pass



- Bull trout are distributed throughout the headwaters of the Grande Ronde and Wallowa River basins.
- Two populations, Little Minam and Hurricane, are isolated above natural and manmade barriers and fail the criterion.
- Indian and Upper Grande Ronde populations fail the criterion due to highly fragmented and restricted spawning distributions.

Productivity - Fail

- Data are not available to quantitatively assess productivity. Populations fail the criterion if they are limited in distribution and abundance, are sympatric with brook trout, or do not express a migratory life history.
- Even though many populations are low in abundance, they are considered to exhibit a level of productivity minimally adequate to sustain the population.
- The Bear, Deer, and Hurricane populations fail the productivity criterion due to limited distribution and abundance, degraded habitat quality, and the presence of brook trout.

Additional Information

- Bull trout in the Grande Ronde SMU are native fish sustained by natural production. Stocking or hatchery programs do not currently exist, however, Alaskan Dolly Varden were stocked in Wallowa Lake 1968-1978 as an attempt to reestablish bull trout. The Dolly Varden did not establish a self sustaining population. All populations pass the reproductive independence criterion.
 - Agricultural and grazing practices threaten water quality and bull trout particularly along major migratory corridors.
 - Minam, Little Minam, and Wenaha populations are partially or completely within designated wilderness areas. Impacts to habitat quality are minimal.
-

Abundance - Fail

- Few quantitative abundance data are available to assess each population. Assessment of populations were based on a combination of redd counts, trap data and professional judgment of agency biologists.
- The Wenaha, Lookingglass, Lostine, Minam, and Little Minam are the largest populations in the SMU. All except the Little Minam pass the criterion. Even though, the Little Minam was estimated to contain roughly 750 reproductive adults, it is isolated from other populations by a natural barrier and subject to risks associated with genetic drift and stochastic events.
- The remaining populations fail the criterion based on precariously low measures of abundance or field observations of extremely low densities.

Hybridization - Fail

- Historically brook trout were stocked in rivers, streams, and high alpine lakes in the Grande Ronde starting in the early 1900s.
- Brook trout are present in Minam, Lostine, Bear, Lookingglass, Hurricane, and Upper Grande Ronde populations. Data specific to the degree of hybridization in each population are not available. Populations where brook trout are present fail the hybridization criterion until populations can be thoroughly assessed.

Imnaha Bull Trout SMU

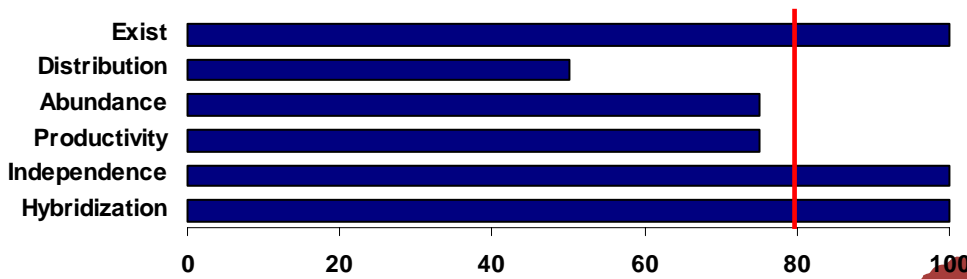
ESA Designation:
Threatened 1998

State Status:
Critical

Interim Assessment:
At Risk

The Imnaha Bull Trout SMU includes four populations in the Imnaha River Basin. Two additional populations occur in close proximity on the Idaho side of the Snake River. Potential of intermixing between all populations exists, but has not been documented. Distribution of McCully, Little Sheep, and Big Sheep populations is negatively impacted by irrigation diversions and barriers to movement. Even though the SMU is classified as ‘at risk’, passing only three of the six criteria, the Imnaha population is considered one of the most abundant and viable in Oregon. Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria.

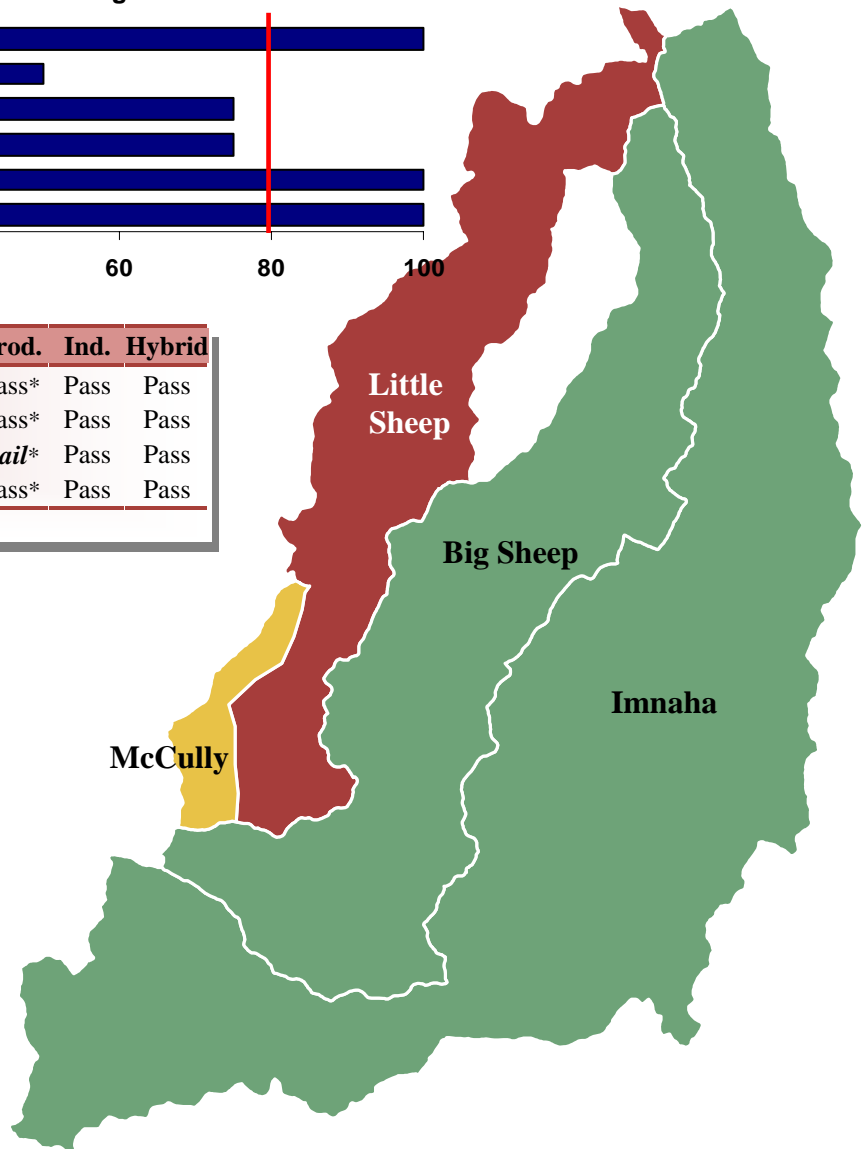
Percent of Populations Meeting Criteria



Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Imnaha	Pass	Pass	Pass*	Pass*	Pass	Pass
Big Sheep	Pass	Pass	Pass*	Pass*	Pass	Pass
Little Sheep	Pass	<i>Fail</i>	<i>Fail*</i>	<i>Fail*</i>	Pass	Pass
McCully	Pass	<i>Fail</i>	Pass*	Pass*	Pass	Pass

*Inferred

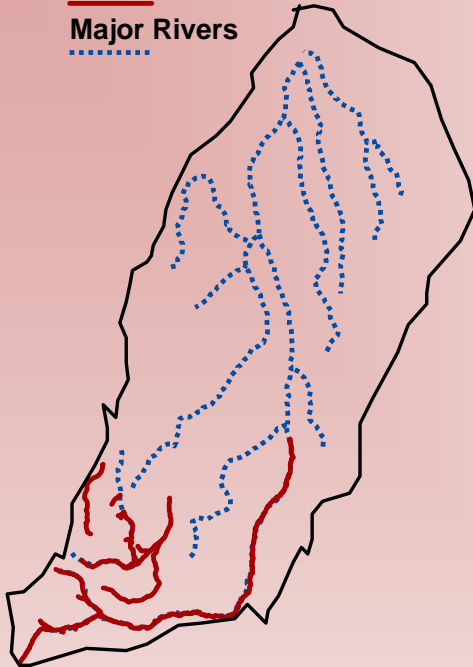
- All criteria met
- 4-5 criteria met
- < 4 criteria met
- Extinct



Distribution - Fail

Bull Trout Spawning /Rearing

Major Rivers



- The Wallowa Valley Improvement (WVI) Canal collects water from streams in the Big Sheep, Little Sheep, and McCully populations and transports it out of basin to the Wallowa River System. Unscreened diversions create barriers to upstream movement and potentially capture bull trout. The McCully population fails the distribution criterion because the entire population is upstream of the canal and isolated from other populations.
- The Little Sheep population fails the criterion due to a restricted and fragmented distribution. The WVI canal bisects the spawning grounds in this creek.
- Migratory bull trout overwinter and rear in the lower reaches of the Imnaha River and in the Snake River.

Additional Information

- Bull trout in the Imnaha SMU are native fish sustained by natural production. Stocking or hatchery programs do not currently exist.
- The headwaters of the Imnaha, McCully, and Big Sheep populations are partially or completely within designated wilderness areas. Impacts to habitat quality are minimal.

Abundance - Fail

- Few quantitative abundance data are available to assess each population. Population assessments were based on 1992 estimates, recent field observations, and professional judgment
- Three populations, Imnaha, McCully, and Big Sheep, were estimated to be large enough to avoid effects of inbreeding (>100 adults). The Imnaha population is arguably one of the most abundant bull trout populations in Oregon.
- Sampling efforts in Little Sheep suggest abundance is extremely low. The population is classified as at a 'high risk of extinction' and fails the abundance criterion.

Hybridization - Pass

- Brook trout are not present in the Imnaha River Basin. All populations pass the criterion.

Productivity – Fail

- Populations pass the criterion if they are abundant and widely distributed, express a migratory life history, and not sympatric with brook trout.
- Little Sheep population fails the productivity criterion due to an extremely limited distribution and low abundance.
- Even though the McCully population is isolated above an irrigation barrier and is limited to a resident life history, it is relatively abundant and apparently stable.

Hells Canyon Bull Trout SMU

ESA Designation:
Threatened 1998

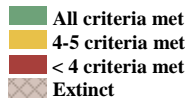
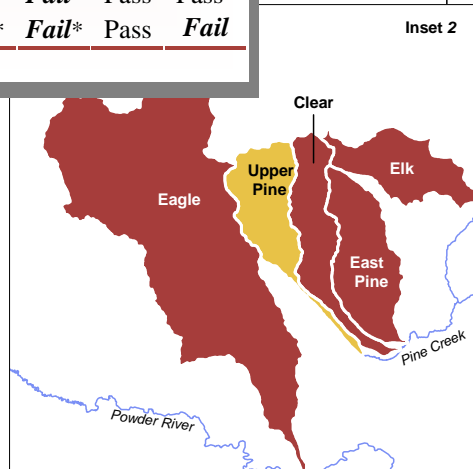
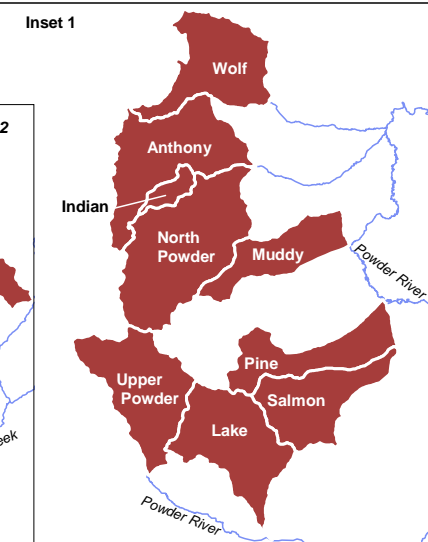
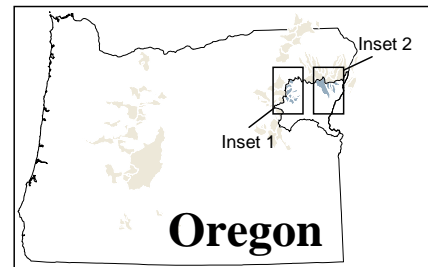
State Status:
Critical

Interim Assessment:
At Risk

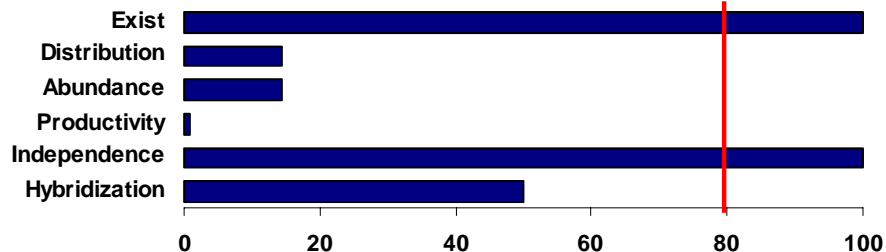
The Hells Canyon Bull Trout SMU includes 14 populations in Pine Creek and Powder River, both of which flow into the Snake River between Weiser River and Hells Canyon Dam. Three additional populations exist in close proximity on the Idaho side of the Snake River. Movement between the Idaho and Pine Creek populations is possible. Most populations in this SMU are characterized by extremely low abundances and restricted distributions. Productivity is hampered by habitat quality and quantity and the inability to express a migratory life history. The SMU passes two of the six criteria and is classified as ‘at risk’. Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Pine Creek						
Elk	Pass	<i>Fail</i>	<i>Fail*</i>	<i>Fail*</i>	Pass	Pass*
East Pine	Pass	<i>Fail</i>	<i>Fail*</i>	<i>Fail*</i>	Pass	Pass
Clear	Pass	Pass	<i>Fail*</i>	<i>Fail*</i>	Pass	<i>Fail</i>
Upper Pine	Pass	<i>Fail</i>	Pass*	<i>Fail*</i>	Pass	Pass*
Powder River						
Eagle	Pass	<i>Fail*</i>	<i>Fail*</i>	<i>Fail*</i>	Pass	<i>Fail</i>
Wolf	Pass	<i>Fail</i>	<i>Fail*</i>	<i>Fail*</i>	Pass	Pass
Anthony	Pass	Pass	<i>Fail*</i>	<i>Fail*</i>	Pass	<i>Fail</i>
Indian	Pass	<i>Fail</i>	<i>Fail*</i>	<i>Fail*</i>	Pass	<i>Fail</i>
North Powder	Pass	<i>Fail</i>	<i>Fail*</i>	<i>Fail*</i>	Pass	<i>Fail</i>
Muddy	Pass	<i>Fail</i>	<i>Fail*</i>	<i>Fail*</i>	Pass	Pass*
Pine	Pass	<i>Fail</i>	<i>Fail*</i>	<i>Fail*</i>	Pass	<i>Fail</i>
Salmon	Pass	<i>Fail</i>	<i>Fail*</i>	<i>Fail*</i>	Pass	Pass
Lake	Pass	<i>Fail</i>	<i>Fail*</i>	<i>Fail*</i>	Pass	Pass*
Upper Powder	Pass	<i>Fail</i>	Pass*	<i>Fail*</i>	Pass	<i>Fail</i>

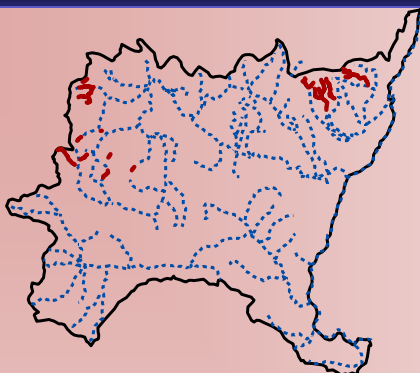
*Inferred



Percent of Populations Meeting Criteria



Distribution - Fail



Bull Trout Spawning /Rearing
Major Rivers

- Bull trout distribution in the SMU is highly fragmented and limited to short isolated segments of headwater streams. Fifty-four percent of the populations have a spawning distribution less than 4 km.
- Two populations, Clear and Anthony, pass the distribution criterion. These populations exceed ten km, occupy more than 50% of their historical distribution, and remain connected to migratory corridors and other populations.
- Large dams including Brownlee and Oxbow on the Snake River, and Thief Valley and Mason on the Powder River, restrict distribution and minimize connection between populations. Unscreened diversions and irrigation canals entrain bull trout and hinder migration and connectivity.

Productivity - Fail

- Quantitative productivity data are not available, however restricted and fragmented distribution, absence of a migratory life history, degraded habitat, low densities encountered during survey efforts, and the presence of brook trout all suggest the productivity of populations within the SMU is extremely depressed.
- None of the populations pass the productivity criterion.

Additional Information

- Bull trout in this SMU are naturally produced. All populations pass the reproductive independence criterion.
-

Abundance - Fail

- This review estimated the minimum number of adults present in each Pine Creek basin population from annual index redd counts. The Upper Pine population is the only population to consistently contain the minimum number of adults necessary to pass the abundance criterion.
- All populations in the Powder River basin, except the Upper Powder, fail the abundance criterion based on field observations of extremely low densities. None of the observations in these populations suggest abundance might exceed levels necessary to avoid the effects of inbreeding.
- A 1999 population survey in Silver Creek (Upper Powder) estimated the reproductive population to exceed levels necessary to avoid the effects of inbreeding. Based on this estimate the Upper Powder population passes the criterion.
- Even though data are not available to assess abundance of all populations, the SMU is considered to contain less than 1,000 reproductive adults and considered at risk of the deleterious effects of genetic drift.

Hybridization - Fail

- Brook trout were stocked in high alpine lakes in the Wallowa and Elkhorn mountains, and many introductions established self-sustaining populations. Most populations where brook trout are present fail the hybridization criterion.
- Brook trout are present in Upper Pine, Elk, Lake, and Muddy, however their distribution does not overlap that of bull trout. These populations pass the criterion.
- Brook trout are not present in East Pine, Salmon, and Wolf creeks. These populations also pass the criterion.

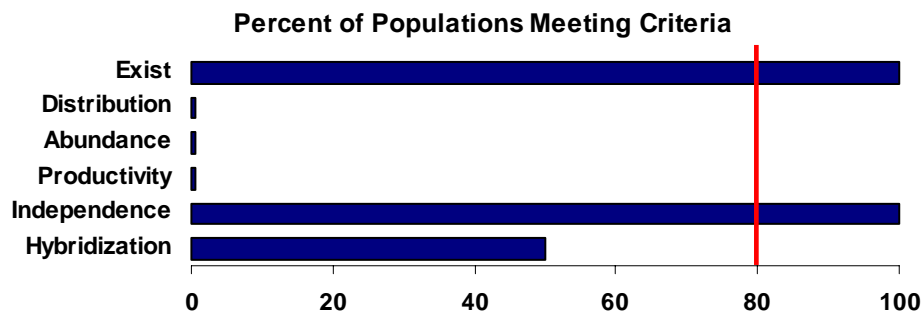
Malheur River Bull Trout SMU

ESA Designation:
Threatened 1998

State Status:
Critical

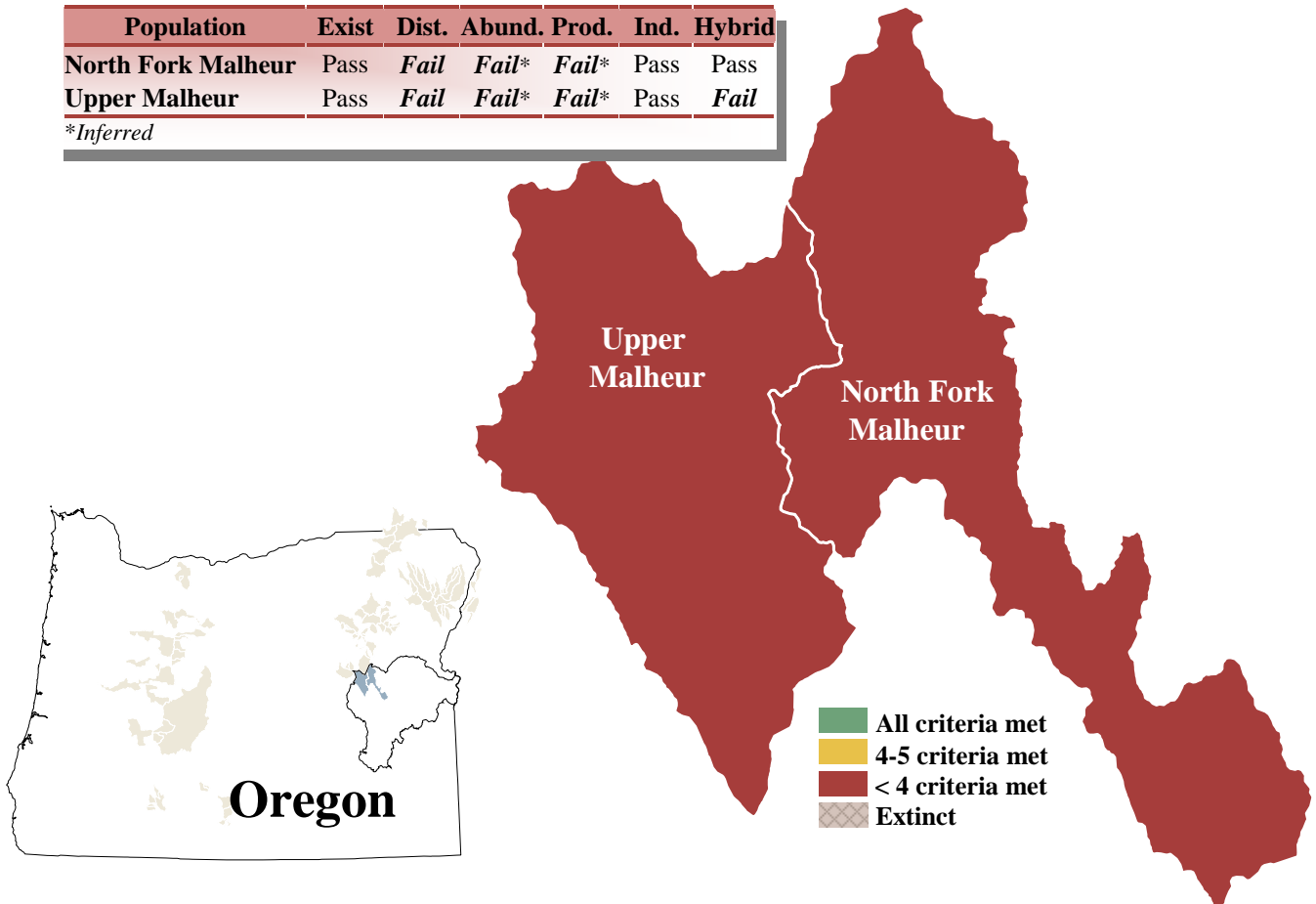
Interim Assessment:
At Risk

The Malheur River Bull Trout SMU consists of two populations, North Fork Malheur and Upper Malheur. Current spawning distribution is widespread, though fragmented, in headwater streams, and both populations are isolated from each other and other Snake River populations by impassable dams on the Malheur and North Fork Malheur Rivers. Brook trout are present and abundant in the Upper Malheur population and likely diminish the productivity of bull trout. The SMU met two of the six interim criteria and is classified as ‘at risk’. Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of the interim criteria.

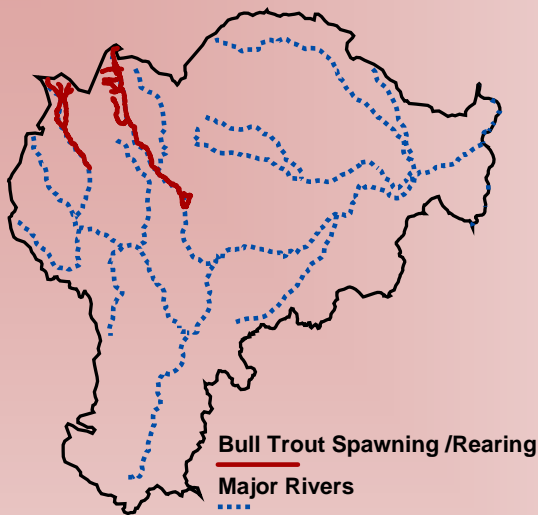


Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
North Fork Malheur	Pass	<i>Fail</i>	<i>Fail*</i>	<i>Fail*</i>	Pass	Pass
Upper Malheur	Pass	<i>Fail</i>	<i>Fail*</i>	<i>Fail*</i>	Pass	<i>Fail</i>

**Inferred*



Distribution - Fail



- Historically, bull trout were present throughout the entire Malheur River, downstream to the Snake River.
- Current spawning, juvenile rearing, and adult resident habitat is widely distributed in the upper basins. The North Fork Malheur distribution remains similar to when bull trout were first documented in 1955. Upper Malheur distribution is thought to be 54% of what it was historically.
- Current bull trout distribution is disjunct. Populations are isolated above Agency and Warm Springs dams and gene flow between populations is not possible. Given the lack of connectivity to other populations, both populations fail the distribution criterion.
- Migratory bull trout in the North Fork population rear and over winter in Beulah Reservoir and large river reaches upstream of the reservoir.

Hybridization - Fail

- Stocking of brook trout in the Malheur River basin was first recorded in the late 1920s and 1930s (ODFW stocking records). Some of the brook trout releases resulted in self-sustaining populations.
- Brook trout are present and abundant in the Upper Malheur population. Bull trout x brook trout hybrids are common. This population fails the hybridization criterion.
- Brook trout are not present in the North Fork Malheur population and the population passes the hybridization criterion.

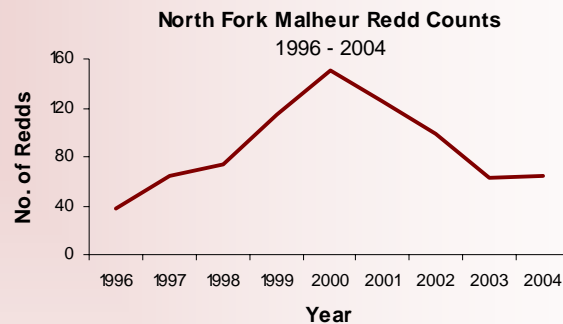
Additional Information

- Both populations in the Malheur River SMU are native fish sustained by natural production and pass the reproductive independence criterion.

Abundance - Fail

- Abundance of bull trout in the North Fork Malheur population exceeds that necessary to avoid the negative effects of inbreeding.
- Methods used to evaluate abundance of bull trout in the Upper Malheur population are confounded by the presence of brook trout. Field observations suggest densities are relatively low in this population, except in Meadow Fork of Big Creek, where densities appear highest.
- The total number of adults in the SMU is estimated to be fewer than 1,000. Given the lack of connectivity and the low estimate of abundance, the SMU is at risk of the deleterious effects of genetic drift. Both populations and the SMU fail the abundance criterion.

Productivity - Fail



- Annual redd counts in the North Fork Malheur population reflect a recent decreasing trend in abundance over the past five years.
- Data adequate to assess productivity of the Upper Malheur are not available. The population is considered to fail the criterion due to low abundance, an isolated and fragmented spawning distribution, and the presence of a large population of brook trout.

Other Species

Photo by P. Scheerer, ODFW



Photo by Gary Susac, ODFW

Borax Lake Chub SMU

ESA Designation:

State Status:

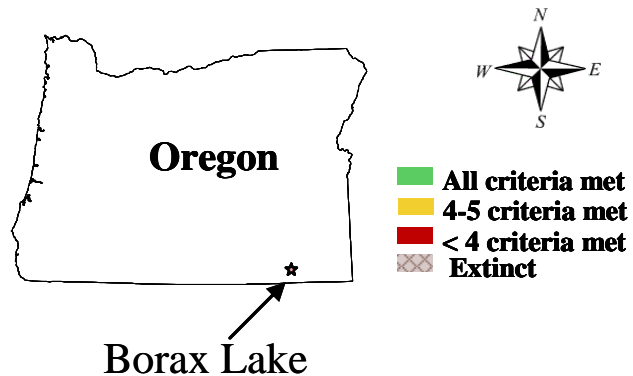
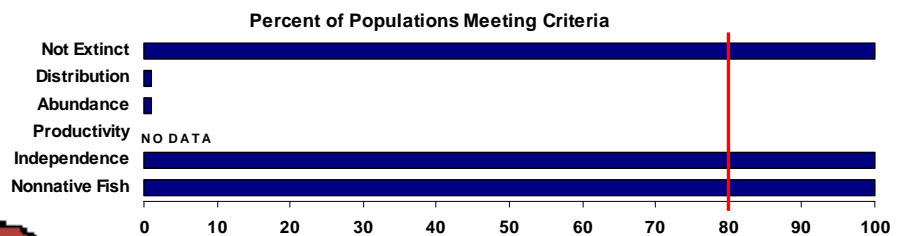
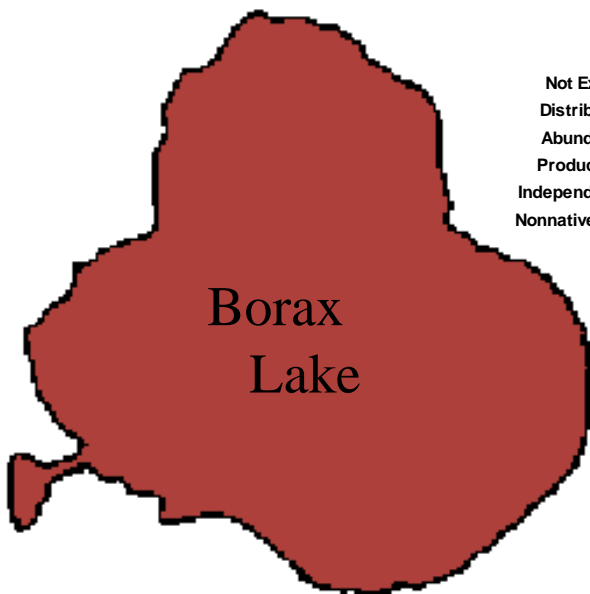
Interim Assessment:

Endangered 1982

Endangered

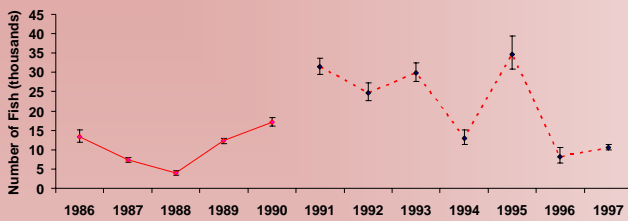
At Risk

The Borax Lake Chub SMU consists of one population that inhabits a single 4.1 hectare lake in the Alvord Desert, Harney County, Oregon. Only three of six interim risk criteria were met, thereby classifying this SMU as “at risk”. The basis for its listed status is not population size, but the security of a very limited, unique, isolated, and vulnerable habitat. Borax Lake is a natural lake fed by geothermal springs, which is perched 10 meters above the desert floor on fragile salt deposits. Numerous recovery measures implemented since listing have improved the conservation status of Borax Lake chub (*Gila boraxobius*) and protection of its habitat. The entire 259 hectare critical habitat is now in public (Bureau of Land Management) or conservation (The Nature Conservancy) ownership. The Nature Conservancy ended cattle grazing and diversion of lake water for irrigation which threatened the lake shores. In addition, passage of the Steens Mountain Cooperative Management and Protection act of 2002 removed BLM lands from mineral and geothermal development. Lack of recent monitoring efforts since 1997, a recent increase in recreational off-road vehicle use around the lake, and potential future impacts to the aquifer from geothermal groundwater withdrawal on private lands remain as threats to the Borax Lake chub and its habitat.



Abundance- fail

Borax Lake Chub Abundance Estimates



- Data describing the abundance of the Borax Lake chub population from 1998 to 2004 are not available.
- Abundance estimates obtained from 1986-1997 fluctuated from 3,934 to 34,634 fish. Population abundance was underestimated prior to 1991, and is not comparable with recent estimates.
- The most recent abundance estimates, obtained in 1996 and 1997, were some of the lowest estimates in recent years.
- A recent review of the conservation status of Borax Lake chub cited lack of recent and ongoing population and ecosystem monitoring as an argument against downlisting Borax Lake chub at this time.
- Borax Lake chub fail the abundance criterion.

Distribution- fail

- The distribution of Borax Lake chub is limited to a single 4.1 hectare lake.
- Records are not available to evaluate whether Borax Lake chub existed historically at other locations.
- Because of its highly restricted distribution, dependence on a single water source, perched topographic position, and existing threats to its fragile habitat, the Borax Lake chub is vulnerable to catastrophic loss.
- Borax Lake chub fail the distribution criterion.

Additional Information

- Recreation use of the Borax Lake critical habitat is currently being assessed to determine the types and timing of use. Oregon Department of Fish and Wildlife has undertaken a detailed assessment of Borax Lake chub.
 - Issues currently under consideration by the BLM include permanent elimination of livestock grazing and closure of roads within the critical habitat.
-

Productivity- not assessed

- No data are available to assess productivity and the rate of population growth at the population level. This criterion was not assessed.
- Limited population age structure data are available. These data suggest that the Borax Lake chub population consists primarily of age 1 fish (67-79 percent), with only a few age-2 and age-3 fish present.
- Because Borax Lake chub are only found in one location and the population is dominated by a single year-class of adults, the species has a high inherent risk of extinction.

Hybridization and negative impacts of nonnative fishes- pass

- Interspecific hybridization and other immediate threats from nonnative fishes have not been identified as issues for Borax Lake chub.
- Borax Lake chub pass this criterion.

Reproductive Independence- pass

- All Borax Lake chub are naturally produced. No hatchery program exists.
- Borax Lake chub pass this criterion

Hutton Springs Tui Chub SMU

ESA Designation:

Threatened 1985

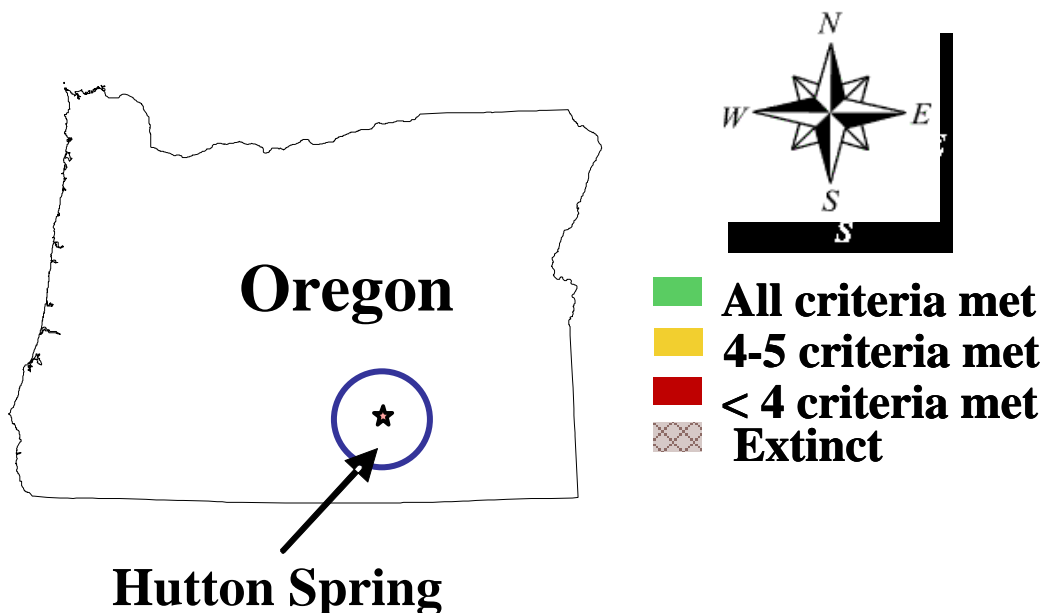
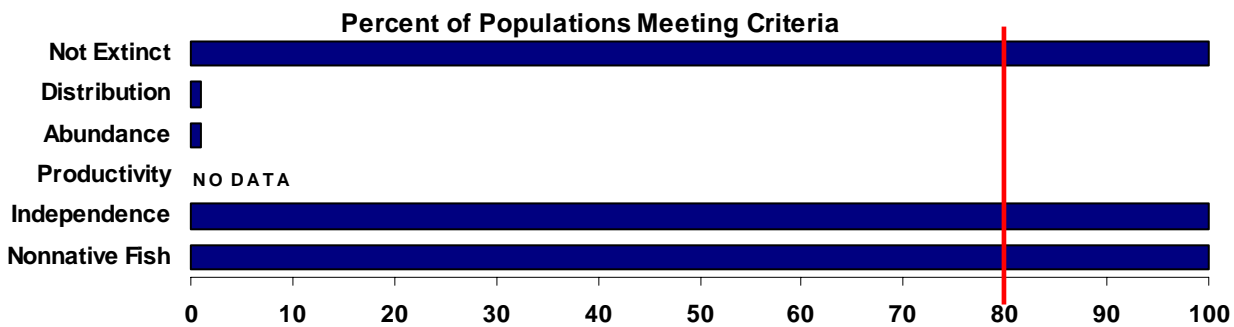
State Status:

Threatened

Interim Assessment:

At Risk

The Hutton Springs Tui Chub Species Management Unit (SMU) is comprised of a single population that inhabits Hutton Spring on the northwest side of Alkali Lake in Lake County, Oregon. The Hutton Springs tui chub (*Gila bicolor* ssp.) was listed as threatened under the federal Endangered Species Act in 1985. Hutton Spring is located on private land and the habitat is reportedly in good condition, primarily due to conscientious long-term land stewardship by the landowner. The habitat is currently fenced from cattle grazing and is in stable condition (U.S. Fish and Wildlife Service 1997). A second unnamed spring was reported to contain Hutton Springs tui chub but was not located in 1996 surveys and the existence of a second population is questionable. Records are not available to evaluate whether Hutton Springs tui chub existed historically at other locations.



Abundance- fail

- Data describing the abundance of the Hutton Springs tui chub population since 1977 are not available.
- The only population abundance estimate on record for tui chub in Hutton Spring is a visual estimate of 300 fish made in 1977.
- An estimate of 150 fish in a nearby unnamed spring was also obtained in 1997. This spring was not located in 1996 surveys and the existence of a second population is questionable.
- Hutton Springs tui chub fail the abundance criterion.

Hybridization and negative impacts of nonnative fishes- pass

- Interspecific hybridization and other immediate threats from non-native fishes have not been identified as issues for Hutton Springs tui chub.
- Hutton Springs tui chub pass this criterion.

Distribution- fail

- The known distribution of Hutton Springs tui chub is limited to a single spring in the Alkali basin.
- Records are not available to evaluate whether Hutton Springs tui chub existed historically at other locations.
- Because of its highly restricted distribution and dependence on a single water source, Hutton Springs tui chub are vulnerable to catastrophic loss.
- Hutton Springs tui chub fail this criterion.

Additional Information

- Oregon Department of Fish and Wildlife plans has undertaken a population estimate and habitat assessment of the tui chub in Hutton Springs.
-

Productivity- not assessed

- No data are available to assess productivity and the rate of population growth at the population level.
- This criterion was not assessed.

Reproductive Independence- pass

- All Hutton Springs tui chub are naturally produced. No hatchery program exists.
- Hutton Springs tui chub pass this criterion.

Willamette River Oregon Chub SMU

ESA Designation:
Endangered 1993

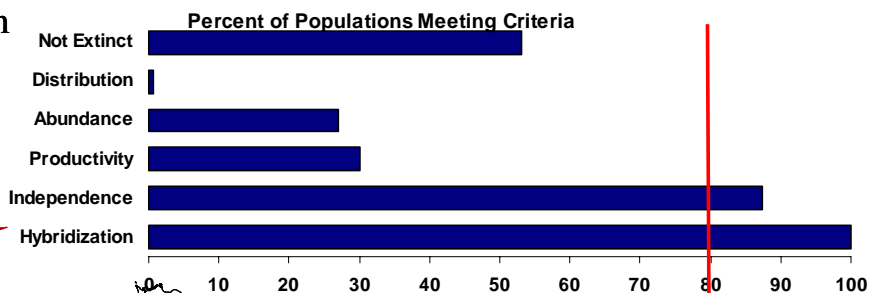
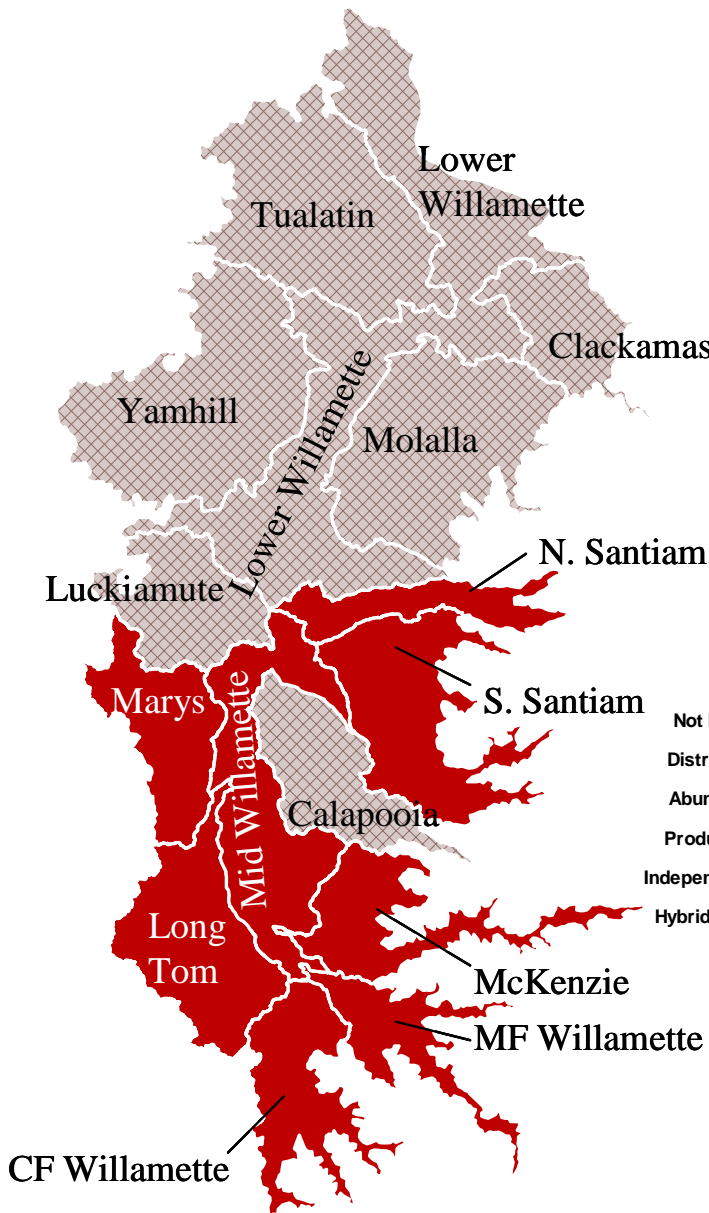
State Status:
Critical

Interim Assessment:
At Risk

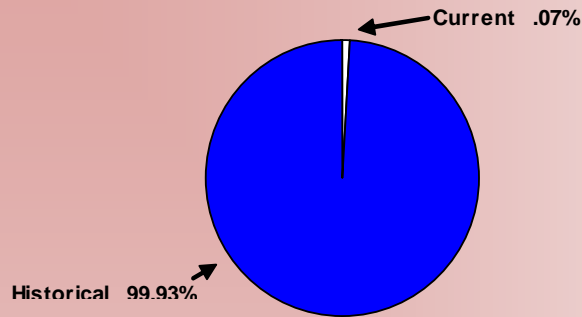
The Willamette River Oregon Chub SMU includes 15 populations in the Willamette River and its tributaries. Only two of six interim risk criteria were met for at least 80% of the populations, thereby classifying this SMU as “at risk”. The Oregon chub status has improved in recent years, resulting from the discovery of several new populations and successful reintroductions of Oregon chub with their historic range. However, these improvements have not eliminated the risks posed by non-native fishes, nor the substantial loss of historical habitats.

Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Lower Willamette	Fail		Extinct Population			
Tualatin	Fail		Extinct Population			
Clackamas	Fail		Extinct Population			
Yamhill	Fail		Extinct Population			
Molalla	Fail		Extinct Population			
Luckiamute	Fail		Extinct Population			
North Santiam	Pass	Fail	Pass	Fail	Pass	Pass
South Santiam	Pass	Fail	Pass	Fail	Pass	Pass
Mid Willamette	Pass	Fail	Fail*	Fail	Pass	Pass
Marys	Pass	Fail	Pass	Pass	Pass	Pass
Calapooia	Fail		Extinct Population			
Long Tom	Pass	Fail	Fail	Fail	Pass	Pass
McKenzie	Pass	Fail	Fail	Pass	Pass	Pass
Coast Fork Willamette	Pass	Fail	Fail	Fail	Pass	Pass
Middle Fk Willamette	Pass	Fail	Pass	Pass	Pass	Pass

* Failed due to lack of data

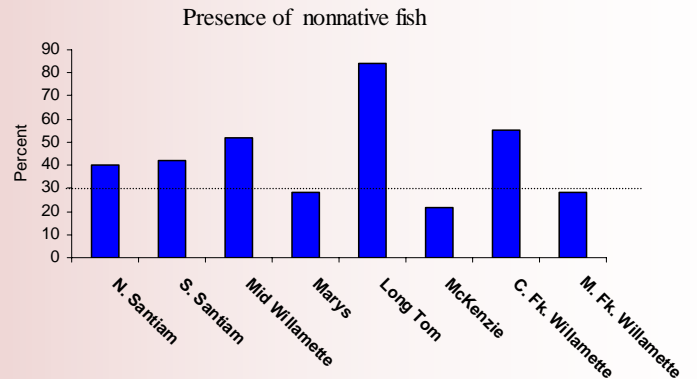


Distribution- fail



- Oregon chub are currently found in only eight of the 13 subbasins where they were documented to occur historically. Current distribution (wetted habitat area inhabited by chub) was estimated to be less than 0.1% of their historical distribution.
- Oregon chub are currently present at 32 locations representing 4.9% of the 650 suitable habitats ODFW sampled from 1991 to 2004.

Productivity- fail



- Little data are available to assess productivity and the rate of population growth at the population level.
- Monitoring of introduced populations of Oregon chub suggests that productivity is generally adequate to maintain chub abundance, in the absence of non-native fish.
- Chub productivity is reduced by the presence of non-native fish. Non-native fish have been identified as the largest current threat to Oregon chub populations in the Oregon Chub Recovery Plan.
- A benchmark of less than 30 percent occurrence of non-native fish in suitable chub habitats sampled in a basin (population) is considered acceptable and a minor risk.
- Only three of the eight existing populations (38%) passed this criterion. Five populations were not evaluated due to insufficient data (<20 sites sampled).

Abundance- fail

- In 2004, only four of eight currently existing populations (50%) met the abundance criteria of having at least one location that contained 500 or more Oregon chub and exhibited a stable or increasing 5-year trend (North Santiam, South Santiam, Marys, Middle Fork Willamette).
- Another population (McKenzie) had at least one location in 2004 that contained 500 or more Oregon chub, but lacked 5 years of data.

Additional Information

- All Oregon chub are naturally produced. No hatchery programs exist.
- Interspecific hybridization has not been identified as an issue for Oregon chub.
- Oregon chub habitat has been substantially reduced in the past 100 years, resulting from the construction of 13 major flood control dams, large scale removal of snags for navigation, channelization and revetments, and the drainage of wetlands to increase land available for river bottomland agriculture.
- Flood events have been reduced in magnitude and frequency by the construction of flood control dams, which reduces the formation of new off-channel habitats and restricts the ability of Oregon chub to colonize new habitats.

Foskett Speckled Dace SMU

ESA Designation:

Threatened 1985

State Status:

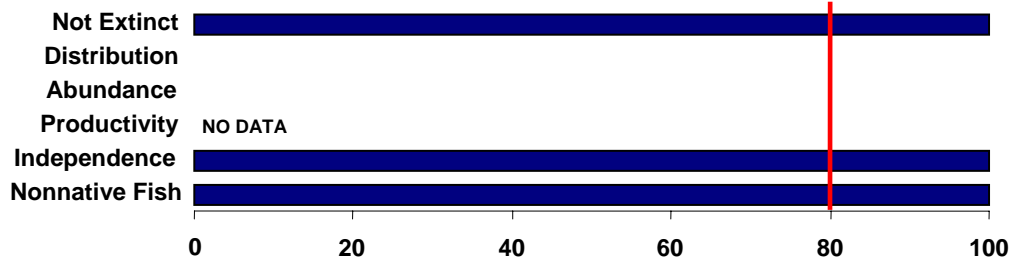
Threatened

Interim Assessment:

At Risk

The Foskett Speckled Dace SMU is comprised of populations that inhabit Foskett and Dace springs, small desert springs on the west side of Coleman Lake in Lake County, Oregon. This subspecies was initially known only from Foskett Spring. The second population, located approximately 0.8 kilometer south of Foskett Spring in Dace Spring, was established from an introduction of 100 fish from Foskett Spring in 1979-1980. The Foskett speckled dace was listed as threatened under the federal Endangered Species Act in 1985. In 1987, the U.S. Bureau of Land Management (BLM) acquired, through a land exchange, the 65 hectare parcel of land containing Foskett and Dace springs. Both springs were fenced to exclude livestock. Lack of recent monitoring efforts since 1997 and a reduction in the area of open water habitat, due to sedimentation and dense growth of aquatic macrophytes, remain as threats to the Foskett speckled dace population.

Percent of Populations Meeting Criteria



Foskett Spring



- All criteria met
- 4-5 criteria met
- < 4 criteria met
- Extinct

Abundance- fail

- Data describing the abundance of the Foskett speckled dace population from 1998 to 2004 are not available.
- An abundance estimate of nearly 28,000 fish was obtained in Foskett Spring in 1997, however most of the fish were found in a small pool located outside the cattle enclosure.
- An abundance estimate of 19 fish was obtained in Dace Spring. Only very large, presumably older dace were captured, suggesting recent recruitment failures.
- Foskett speckled dace fail the abundance criterion.

Hybridization and negative impacts of nonnative fishes- pass

- Interspecific hybridization and other immediate threats from non-native fishes have not been identified as issues for Foskett speckled dace.
- Foskett speckled dace pass this criterion.

Distribution- fail

- The distribution of Foskett speckled dace is limited to two small springs in the Warner Basin. The introduced population in Dace Spring totaled only 19 fish in 1996.
- Records are not available to evaluate whether Foskett speckled dace existed historically at other locations.
- Because of its highly restricted distribution, dependence on a single water source, and loss of habitat area from sedimentation and growth of aquatic macrophytes, Foskett speckled dace is vulnerable to catastrophic loss.
- Foskett speckled dace fail this criterion.

Additional Information

- In 2003, fish were collected from Foskett Spring and Twelvemile Creek for genetic analysis to determine whether these populations of speckled dace are unique, or should be considered to belong to the same subspecies (and SMU).
 - Oregon Department of Fish and Wildlife has undertaken population estimates and detailed habitat assessments of the speckled dace in Foskett and Dace Springs.
 - Foskett Spring is visited several times each year by ODFW district biologists to determine the habitat status, i.e., whether obvious problems exist, and the presence of dace. In 2004, two size classes (age classes) were observed.
-

Productivity- not assessed

- No data are available to assess productivity and the rate of population growth at the population level.
- This criterion was not assessed.

Reproductive Independence- pass

- All Foskett speckled dace are naturally produced. No hatchery program exists.
- Foskett speckled dace pass this criterion.

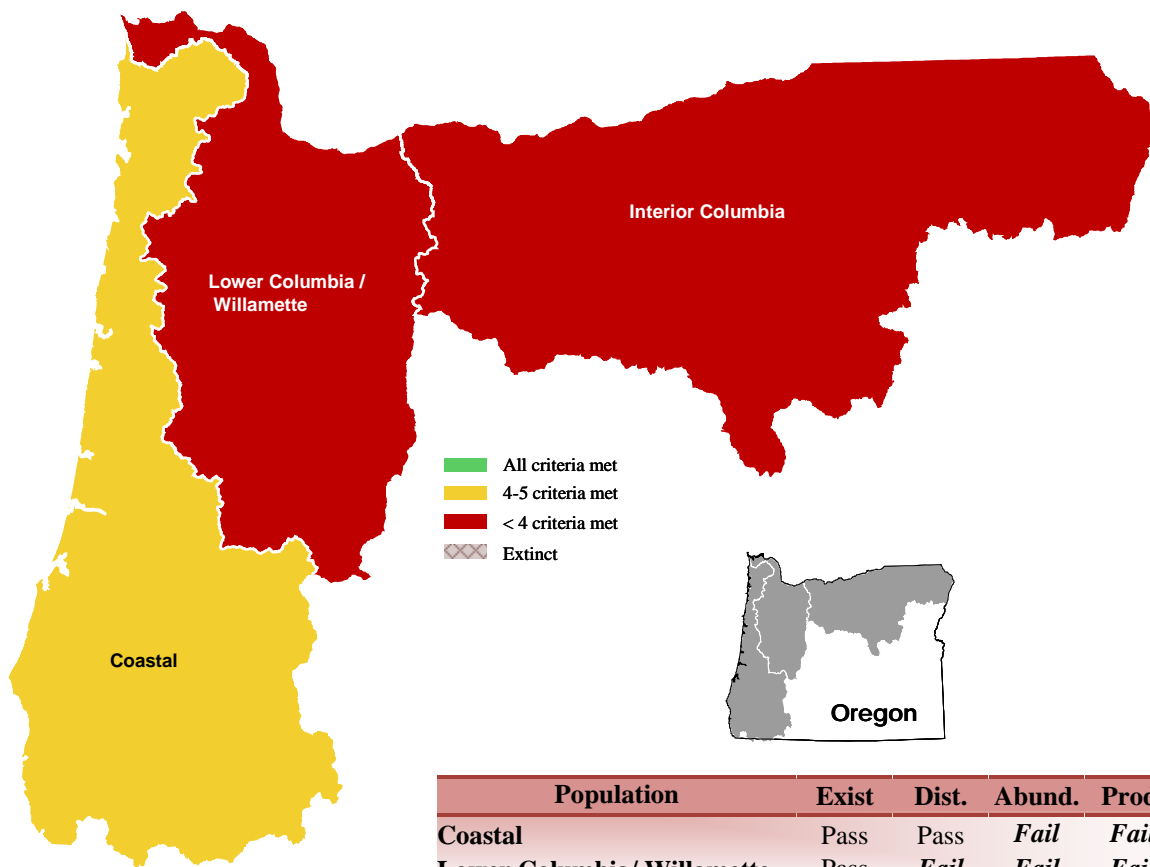
Oregon Pacific Lamprey SMU

ESA Designation:
None

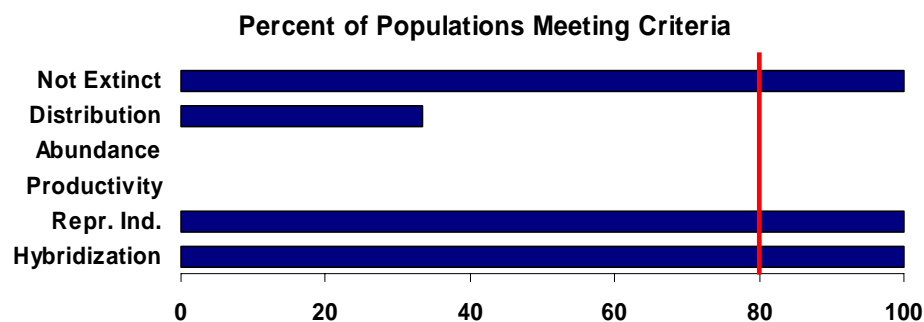
State Status:
Vulnerable

Interim Assessment:
At Risk

For purposes of this report, the Oregon Pacific Lamprey SMU is considered to include three populations in Oregon: coastal, lower Columbia/Willamette, and interior Columbia. Only three of six interim risk criteria were met for all three populations, thereby classifying this SMU as “at risk”. Pacific lampreys are widely distributed throughout Oregon, but both distribution and abundance have decreased in recent years. Passage barriers and habitat loss have contributed to the decline of Pacific lamprey. Although recent studies have increased our knowledge of habitat and passage requirements, many critical uncertainties regarding Pacific lamprey status, biology, and requirements remain.



Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Coastal	Pass	Pass	<i>Fail</i>	<i>Fail</i>	Pass	Pass
Lower Columbia/ Willamette	Pass	<i>Fail</i>	<i>Fail</i>	<i>Fail</i>	Pass	Pass
Interior Columbia	Pass	<i>Fail</i>	<i>Fail</i>	<i>Fail</i>	Pass	Pass



Distribution - Fail

- Pacific lampreys remain present throughout most coastal streams.
- Distribution has been reduced by passage barriers such as dams and road culverts, especially the lower Columbia/Willamette and Interior Columbia populations.
- Not all fish ladders at dams allow passage of adult lamprey.
- Road culverts have precluded distribution in the upper reaches of many basins without dams.

Productivity – Fail

- No productivity data are available to adequately assess the productivity criterion, but declining trends in abundance indicate that productivity is likely limited.
- Predation by exotic predators has been cited as contributing to the decline of Pacific lampreys, but available information indicates that predation by exotic fish predators may be lower than predation by native predators.

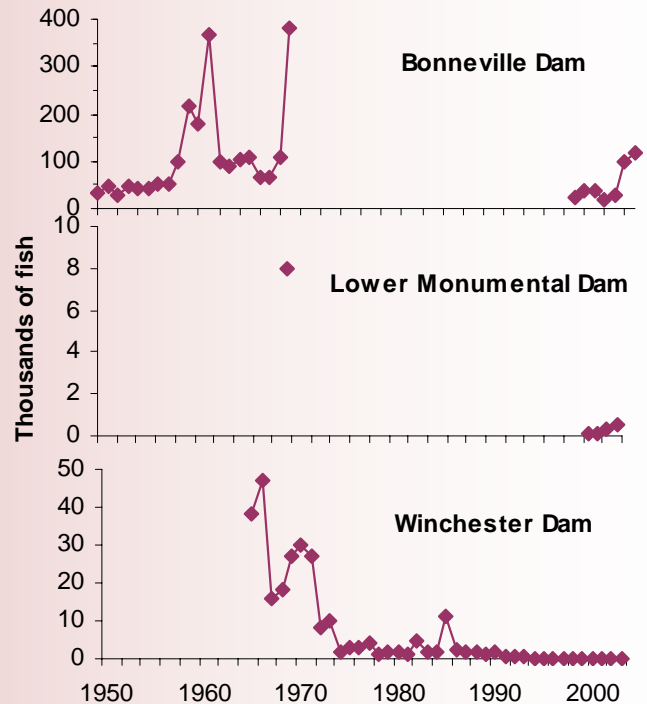
Hybridization - Pass

- Hybridization is not an issue for Pacific lamprey.

Independence - Pass

- All Pacific lampreys are naturally produced.
- Hatchery techniques are being developed, and artificial propagation is a management option under consideration.
- Adult lampreys from the John Day River have been transplanted to the Umatilla River to reestablish larval abundance.

Abundance - Fail



- Counts at Winchester Dam on the Umpqua River have decreased from over 40,000 to less than 50.
- Harvest at Willamette Falls and Lamprey counts at Leaburg Dam on the McKenzie River have decreased dramatically from historic levels. Harvest at Willamette Falls has been greatly reduced by regulations in recent years.
- Counts at dams on the Columbia and Snake rivers indicate a severe decline in abundance, although counts at Bonneville Dam have rebounded recently.

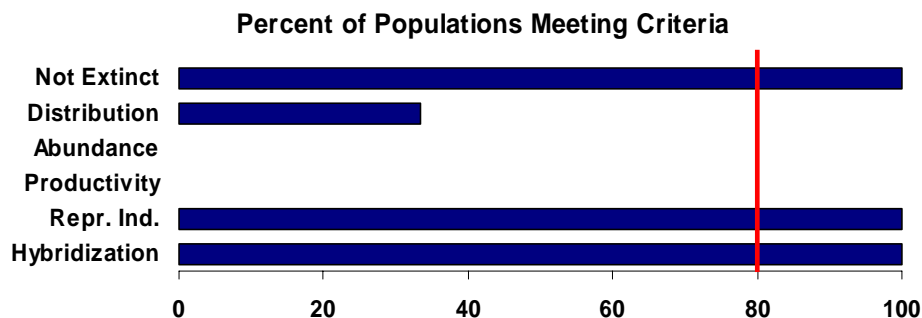
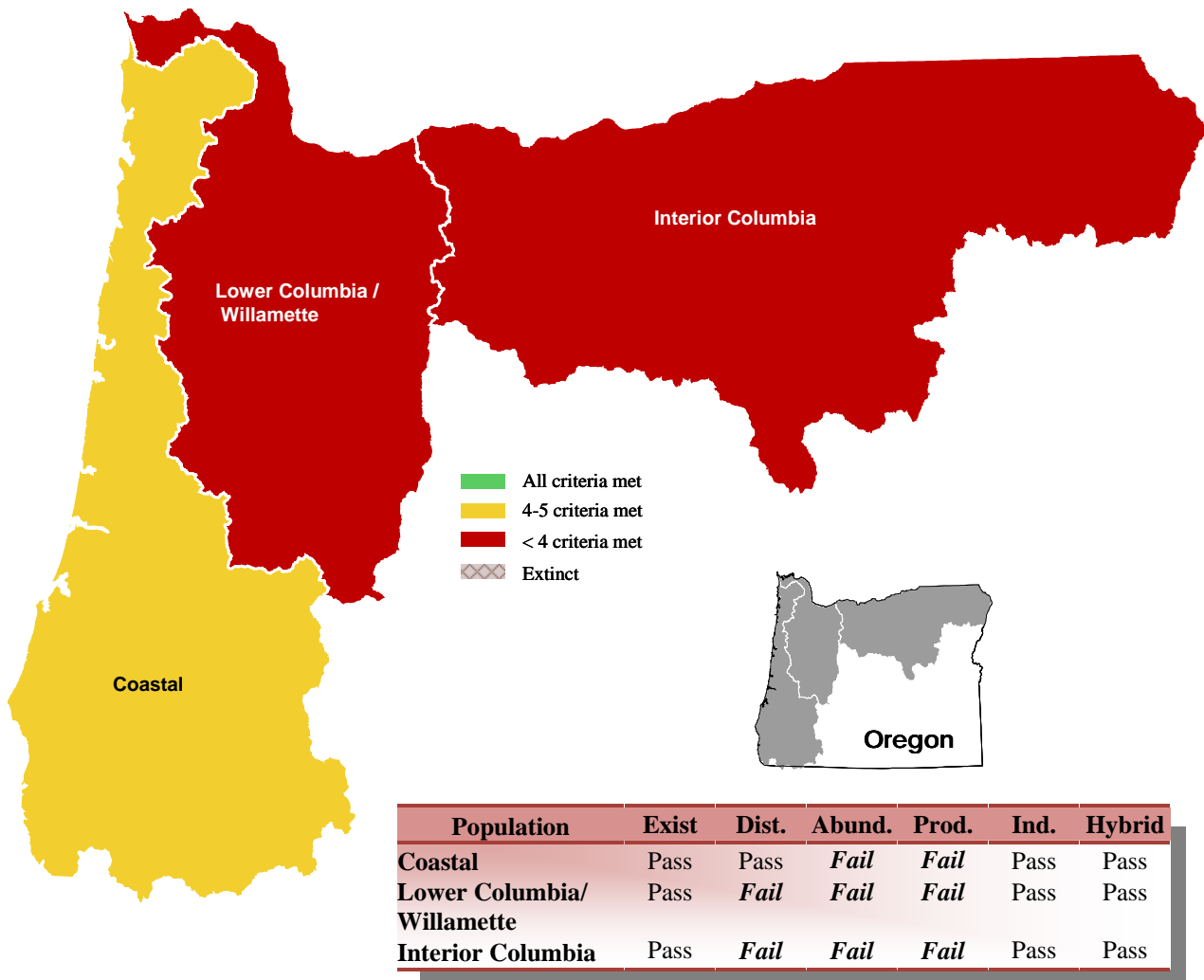
Oregon Western Brook Lamprey SMU

ESA Designation:
None

State Status:
None

Interim Assessment:
At Risk

For purposes of this report, the Oregon Western Brook Lamprey SMU is considered to include three populations in Oregon: coastal, lower Columbia/Willamette, and interior Columbia. Only three of six interim risk criteria were met for all three populations, thereby classifying this SMU as “at risk”. Western brook lampreys are widely distributed throughout Oregon, but both distribution and abundance have likely decreased in recent years. Habitat loss and pollution have contributed to the decline of western brook lamprey. Little is known about life history characteristics of western brook lamprey in Oregon, and many critical uncertainties regarding western brook lamprey status, biology, and requirements remain.



Distribution - Fail

- Western brook lampreys remain present throughout many coastal streams.
- Distribution has likely been reduced by habitat loss, pollution, and passage barriers such as road culverts.
- Road culverts have precluded distribution in the upper reaches of many basins without dams.

Productivity – Fail

- No productivity data are available to adequately assess the productivity criterion, but declining trends in abundance indicate that productivity is likely limited.
- Predation by exotic predators has been cited as contributing to the decline of western brook lampreys, but available information indicates that predation by exotic fish predators may be lower than predation by native predators.

Hybridization - Pass

- Hybridization is not an issue for western brook lamprey.

Abundance - Fail

- No historic or current abundance information is available; however, it is likely that abundance has decreased, especially for the lower Columbia/Willamette and interior Columbia populations.

Independence - Pass

- All western brook lampreys are naturally produced.

Northern Green Sturgeon SMU

ESA Designation:

State Designation:

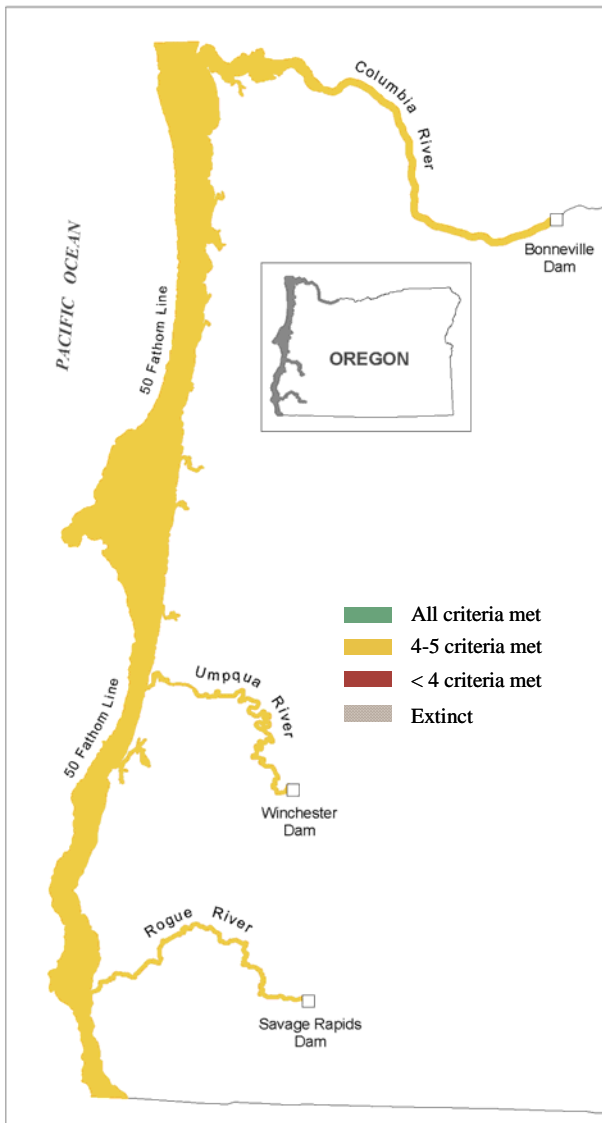
Interim Assessment:

Species of Concern

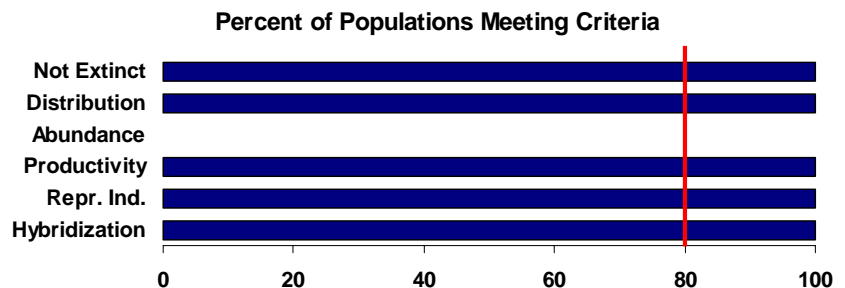
None

Not Assessed

For this report, green sturgeon in Oregon were divided into two SMU's to reflect the distinct population segment (DPS) designations of NOAA Fisheries. The Northern Green Sturgeon SMU consists of green sturgeon spawning in the Klamath and Trinity Rivers of California, and in the Rogue River, Oregon, and found off the Oregon coast, and in coastal estuaries, including the Columbia River estuary. The Southern Green Sturgeon SMU consists of green sturgeon spawning in the Sacramento River, and found off the Oregon coast, and in coastal estuaries, including the Columbia River estuary. Population boundaries for sturgeon are not clearly understood. For this exercise, the entire SMU is considered one population. Currently, green sturgeon carry no special status in Oregon. The NFCP interim criteria are not appropriate to assess the status of sturgeon. Therefore, we have not assessed the conservation risk to sturgeon in this report.



Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Northern	Pass	Pass	Fail*	Pass	Pass	Pass
*Inferred						



Distribution - Pass

- Green sturgeon remain present in all documented historic habitats and ranges in Oregon.

Abundance - Fail

- Limited information suggests no negative (or positive) population abundance trends in Oregon populations of green sturgeon.
- Historic abundance information is unavailable.
- Current abundance information is heavily reliant on inconsistent harvests of green sturgeon captured as bycatch in target fisheries for other species.
- A precautionary approach was taken in assessing the abundance criterion for green sturgeon. As a result of a lack of abundance data, the northern population failed this criterion.

Productivity - Pass

- Limited information suggests that size structure of harvested fish does not reflect a population that is experiencing negative trends in productivity.
- Size structure information is based on harvest of fish 42"-66" in total length, and does not capture the entire range of sizes in the population.
- Juvenile green sturgeon have been captured in South Coast Oregon estuaries intermittently during sampling for other species, indicating some production has occurred.
- Spawning of the Northern SMU occurs in the Rogue River and is suspected but poorly documented in the Umpqua River. Consistent spawning and production has been documented in the Klamath and Trinity rivers of California.

Independence - Pass

- No hatchery produced green sturgeon are present in Oregon waters.

Additional Information

- The harvest of green sturgeon has been reduced in recent years. This reduction is not due to declining catch-per-effort but is a response to market conditions, regulation changes, and changing fisheries for other species.
 - Green sturgeon that spawn in the Sacramento River are genetically different than green sturgeon that spawn in the Rogue River. This distinction is the reason for two separate species management units
-

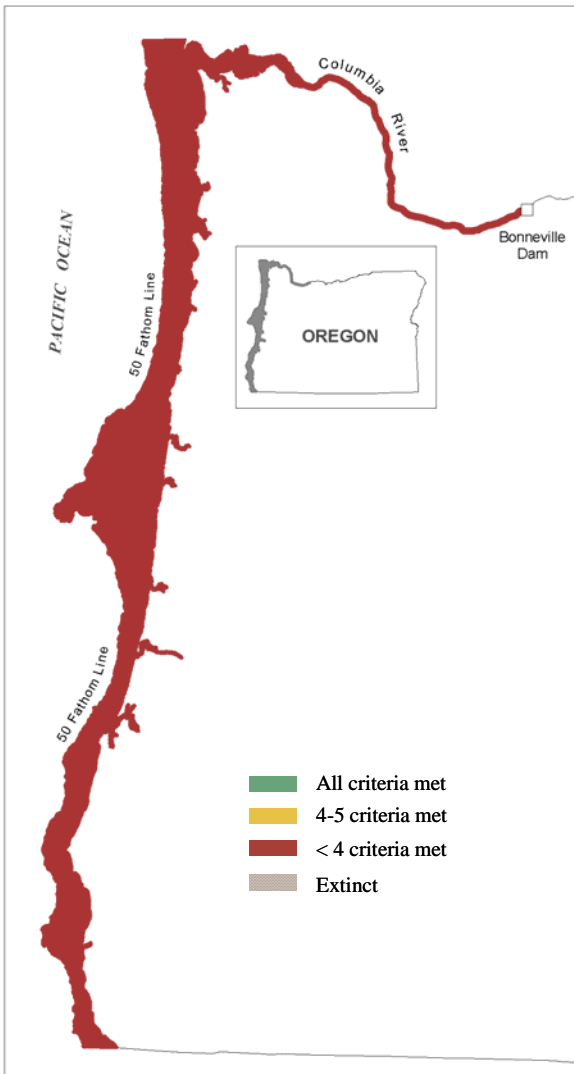
Southern Green Sturgeon SMU

ESA Designation:
Threatened

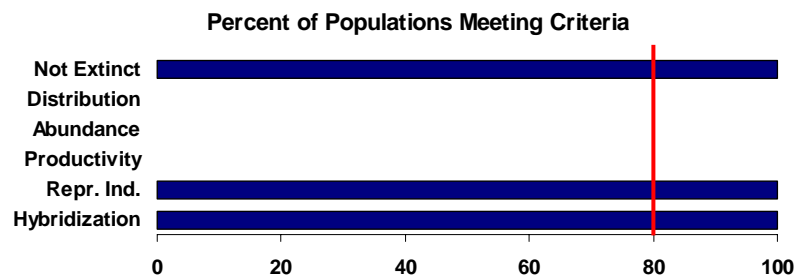
State Designation:
None

Interim Assessment:
Not Assessed

For this report, green sturgeon in Oregon were divided into two SMU's to reflect the distinct population segment (DPS) designations of NOAA Fisheries. The Southern Green Sturgeon SMU consists of green sturgeon spawning in the Sacramento River, and found off the Oregon coast, and in coastal estuaries, including the Columbia River estuary. The Northern Green Sturgeon SMU consists of green sturgeon spawning in the Klamath and Trinity Rivers of California, and in the Rogue River, Oregon, and found off the Oregon coast, and in coastal estuaries, including the Columbia River estuary. Population boundaries for sturgeon are not clearly understood. For this exercise, the entire SMU is considered one population. Currently, green sturgeon carry no special status in Oregon. The NFCP interim criteria are not appropriate to assess the status of sturgeon. Therefore, we have not assessed the conservation risk to sturgeon in this report.



Population	Exist	Dist.	Abund.	Prod.	Ind.	Hybrid
Southern	Pass	Fail*	Fail*	Fail*	Pass	Pass
* Inferred						



Distribution - Fail

- Green sturgeon remain present in all documented historic habitats and ranges in Oregon.
- The Southern SMU spawns exclusively in rivers in California.
- It is believed that over 50% of historical spawning habitat for this SMU is no longer accessible or usable.

Productivity - Fail

- Limited information suggests that size structure of harvested fish does not reflect a population that is experiencing negative trends in productivity.
- Size structure information is based on harvest of fish 42"-66" in total length, and does not capture the entire range of sizes in the population.
- Production of Southern SMU green sturgeon found in Oregon is believed to come from California rivers, primarily the Sacramento. Green sturgeon have been blocked from access to portions of the Sacramento River, putting the population at some risk due to limited potential spawning areas.

Additional Information

- Green sturgeon that spawn in the Sacramento River are genetically different than green sturgeon that spawn in the Rogue River. This distinction is the reason for two separate species management units
 - Green sturgeon spend most of their lives in marine waters. Radio-tagged fish from the Southern SMU have been found from Willapa Bay, Washington to the Sacramento River.
-

Abundance – Fail

- Limited information suggests no negative (or positive) population abundance trends in Oregon populations of green sturgeon.
- Historic abundance information is unavailable.
- Current abundance information is heavily reliant on inconsistent harvests of green sturgeon captured as bycatch in target fisheries for other species.

Independence - Pass

- No hatchery produced green sturgeon are present in Oregon waters.

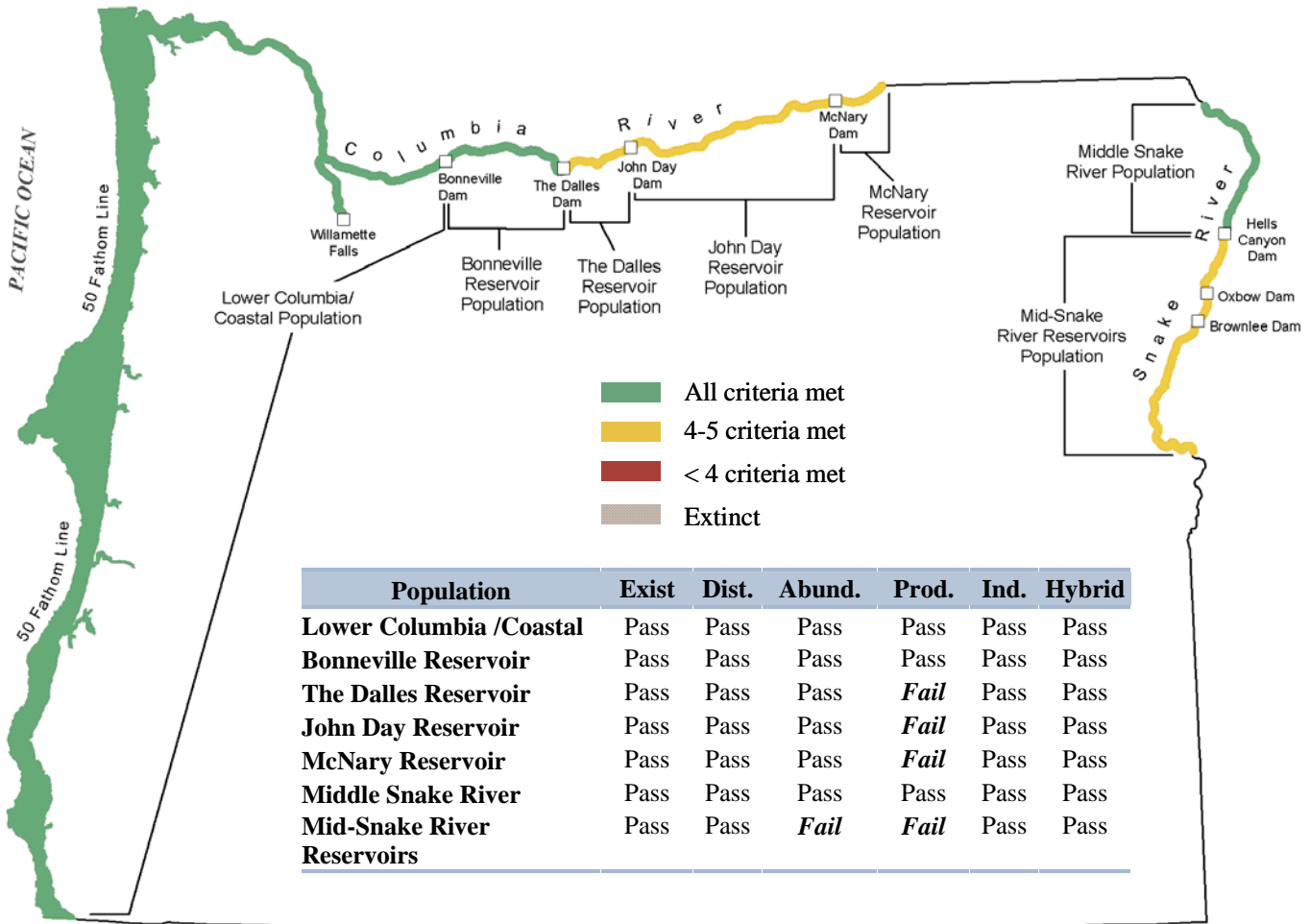
Oregon White Sturgeon SMU

ESA Designation:
Not Listed

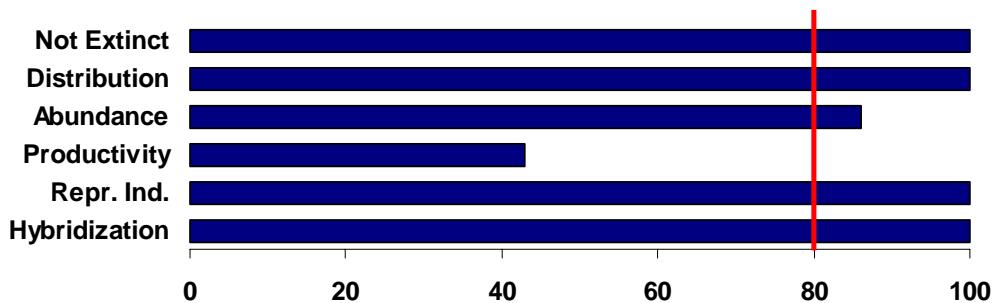
State Status:
Not Listed

Interim Assessment:
Not Assessed

For this report, white sturgeon in Oregon were considered to all belong to one SMU. This Oregon White Sturgeon SMU is broken into seven populations. Populations were grouped according to similarities in biology and management strategies. White sturgeon are present in the Willamette River above Willamette Falls, but are believed to be entirely supported by hatchery stocking and were not considered to be a population. The NFCP interim criteria are not appropriate to assess the status of sturgeon. Therefore, we have not assessed the conservation risk to sturgeon in this report.



Percent of Populations Meeting Criteria



Distribution - Pass

- White sturgeon remain present in all historic habitats and ranges.
- Passage of white sturgeon at fish ladders is typically low and occurs in a net downstream direction. Less upstream passage is documented.
- All populations pass this criterion.

Productivity - Fail

- Productivity is poor in half of the populations for which data were available.
- Measures of productivity are poorer in impounded reaches than in unimpounded areas.
- Inconsistent seasonal water flows and a corresponding lack of available, suitable spawning habitat are primary reasons for poor productivity in impounded populations.

Additional Information

- White sturgeon do not mature and begin reproducing until they are 15 - 20 years old. This equates to a size of over five feet. Length restrictions in the fisheries ensure that almost all fish of reproducing age are released.
 - Because white sturgeon are primarily found in the Columbia and Snake rivers, Oregon co-manages white sturgeon with Washington, Idaho and Native American tribes.
-

Abundance - Pass

- White sturgeon populations in Oregon outside the Middle Snake River Reservoirs are relatively abundant and at low, near-term extinction risk, with six of seven populations passing this criterion.
- Harvest fisheries are currently allowed on most sturgeon populations in Oregon,
- Population monitoring of the Lower Columbia River population is marginal and available information is limited. Fisheries on this population are the largest sturgeon fisheries in the world.
- Limited information suggests white sturgeon populations in the Middle Snake River Reservoirs are at remnant abundance levels and are at high risk due to low abundances and unhealthy stock structure.

Independence - Pass

- Small numbers of hatchery-reared white sturgeon have been released within the SMU for research purposes, but in low numbers that are not believed to have impacted the populations.

Glossary

Adfluvial: migrating between lakes and rivers or streams.

Conservation: managing for sustainability of native fish so present and future generations may enjoy their ecological, economic, recreational, and aesthetic benefits.

Endorheic: a watershed from which there is no outflow of water.

Hatchery-Produced Fish: a fish incubated or reared under artificial conditions for at least a portion of its life.

Indigenous: means descended from a population believed to have been present in the same geographical area prior to the year 1800 or from a natural colonization of another indigenous population.

Native Fish: indigenous to Oregon, not introduced. This includes both naturally-produced and hatchery-produced fish.

Naturally Produced: fish that reproduce and complete their full life cycle in natural habitats.

Population: a group of fish originating and reproducing in a particular time which do not interbreed to any substantial degree with any other group reproducing in a different area, or in the same area at a different time.

Pluvial: of or relating to rain; rainy

Sensitive: means those fishes that have been designated for special consideration pursuant to OAR 635-100-0040.

Serious Depletion: a significant likelihood the species management unit will become threatened or endangered under either the state or federal Endangered Species Act.

Species: any group of population that interbreeds and is substantially reproductively isolated.

Species Management Unit: a collection of populations from a common geographic region that share similar genetic and ecological characteristics.

Sustainable: persistence over time, that is to say the ability of a population or a species management unit to maintain temporal, spatial, genetic and ecological coherence while withstanding demographic, environmental, and genetic variation and catastrophic events from natural and human-induced causes.