2003 - 2005 Biennial Report

Volume 2

# The OREGON PLAN FOR SALMON AND WATERSHEDS

This biennial report consists of two volumes:

- Volume 1 is a statewide review of Oregon Plan implementation. The report summarizes basin-level accomplishments and investments related to water quality improvements, fish recovery, and watershed health. The report also provides an overview of state agency actions and recommendations to enhance the effectiveness of the Oregon Plan.

- Volume 2 is an executive summary of Oregon's assessment of the Oregon Coastal Coho Evolutionarily Significant Unit (ESU), including the following key elements:

  1. Viability analysis
  2. Population bottlenecks
  3. Evaluation of conservation efforts
  4. Monitoring
  5. Evaluating current threats to ESU viability
  6. Oregon's conclusions regarding future ESU viability
  7. Lessons learned and adaptive management commitments

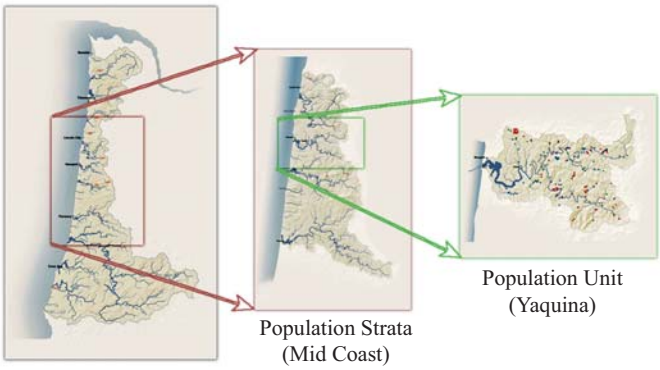
Together, Volumes 1 and 2 report on the most recent Oregon Plan actions and accomplishments and lay the groundwork for continuing and improving its effectiveness.

## The Oregon Plan for Salmon and Watersheds Mission:

To restore the watersheds of Oregon and to recover the fish and wildlife populations of those watersheds to productive and sustainable levels in a manner that provides substantial environmental, cultural, and economic benefits.

Volume 1

Volume 2



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This document (Oregon Plan Biennial Report · Volume 2) captures the key elements of the State of Oregon Assessment of the Coastal Coho ESU. This Assessment required significant contributions from local watershed partners and Oregon and federal agencies that contributed data, analyses, and administrative support. The complete Assessment documents can be viewed at: http://nrimp.dfw.state.or.us/OregonPlan/. This document is produced by the Oregon Watershed Enhancement Board, as part of Biennial Reporting of Oregon Plan work by government agencies and local partners. This document should be cited as: Oregon Watershed Enhancement Board. 2005. 2003-2005 Oregon Plan Biennial Report, Volume 2. Salem, Oregon.


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# Description of Volume 2

## Assessment of the Oregon Coastal Coho Evolutionarily Significant Unit

The Oregon Coastal Coho Evolutionarily Significant Unit (ESU) is being considered for listing as threatened under the federal Endangered Species Act (ESA).

The State of Oregon has completed a comprehensive Assessment of the status of the fish and the ongoing conservation efforts for this ESU in order to inform the ongoing conservation efforts as well as the federal government's listing decision. This Assessment required significant contributions from local watershed partners and Oregon and federal agencies that contributed data, analyses, and administrative support.

The complete Assessment documents can be viewed at:
**http://nrimp.dfw.state.or.us/OregonPlan/**

Oregon's assessment includes:

1. Evaluating the biological viability (sustainability) of the ESU.
2. Identifying risk factors contributing to the decline of coho or potentially threatening viability in the foreseeable future.
3. Evaluating the status and trends in management programs, restoration work, habitat, and other conditions in place to address these risk factors and maintain or enhance the continued viability of the ESU.

This document (Oregon Plan Biennial Report - Volume 2) captures the key elements of the Assessment.

# Map of the Oregon Coastal Coho Evolutionarily Significant Unit

# Background

Populations of coho salmon (*Oncorhynchus kisutch*) that occur in coastal watersheds between Seaside and Cape Blanco are being evaluated by the National Oceanic and Atmospheric Administration (NOAA) Fisheries for listing under the federal Endangered Species Act (ESA). These populations, which have been designated a single Evolutionarily Significant Unit (ESU), have been the focus of a considerable conservation effort by the State of Oregon, local and private entities, and federal management partners. Much of this conservation effort has been developed and implemented under a planning framework called the Oregon Plan for Salmon and Watersheds (Oregon Plan). The Oregon Plan brings together various governmental and non-governmental entities to implement conservation strategies for fish populations throughout Oregon, including those belonging to the Oregon Coastal Coho ESU. In this context, the Oregon Plan refers to the broad suite of conservation efforts implemented to improve the status of coho and their watersheds, e.g., harvest, hatcheries, habitat, etc.

## The Coastal Coho Project and the Coho Assessment

The State of Oregon, in partnership with the National Marine Fisheries Service (NMFS), initiated a collaborative project to address the conservation of coastal coho on the Oregon coast. The primary objectives of the Coastal Coho Project are to:

1. Assess Oregon Plan efforts to conserve and rebuild coastal coho populations.
2. Use the assessment to inform NOAA Fisheries' status review listing determination.
3. Use the assessment as a foundation for developing a conservation and recovery plan for coastal coho.
4. In the event that NOAA Fisheries determines to list this ESU as threatened, use the assessment as a basis to seek legal assurances for those carrying out activities that are consistent with the Oregon Plan.

Volume 2 is an executive summary of Oregon's assessment of the Oregon Coastal Coho Evolutionarily Significant Unit (ESU) that addresses objective two above.

## The Coho Assessment Process

The framework for this Assessment included developing measurable criteria to define population and ESU viability, utilizing the best available information to evaluate fish status relative to these criteria, identifying key factors likely responsible for the evaluation result, assessing the implementation certainty and effectiveness of conservation efforts to address factors for decline and potential threats to viability, and concluding with Oregon's overall evaluation of what threats to this ESU remain and what the significance of those threats is in terms of risk to viability.

To accomplish this, various types of data were examined, including: fish abundance and distribution; marine survival; fishery harvest; hatchery programs; stream complexity; riparian condition; water quality; streamflow; fish passage (access to spawning and rearing streams); predation; fish disease; and exotic fish species. These data represent available information collected both before and after the formal implementation of the Oregon Plan in 1997.

The State of Oregon has conducted this comprehensive assessment of the status of the fish, the status of freshwater habitat that supports the species' life cycle, and the ongoing conservation efforts for this ESU in order to inform the continued management programs and activities. The results of this Assessment are intended also to inform the federal government's listing decision. Oregon's assessment includes:

1. An evaluation of the biological viability (sustainability) of the ESU.
2. Identification of key risk factors that contributed to the past decline of coho or threaten coho viability in the foreseeable future.
3. A determination of the current levels of risk to ESU viability presented by these key risk factors.
4. An evaluation of the status and trends of management programs, restoration work, habitat, and other conditions in place to address these risk factors and maintain or enhance the continued viability of the ESU.

## The Coho Assessment will Inform Recovery Planning

The Coastal Coho ESU Assessment is the starting point for more effective future restoration investment, monitoring, and adaptive management action. Regardless of the current ESA listing decision, Oregon, in partnership with NOAA Fisheries and interested stakeholders, will continue the ongoing process of completing a full conservation/recovery plan. This plan builds upon the Assessment to establish goals beyond the threshold of viability, focuses management actions on the primary limiting threats to reaching those goals, and establishes a comprehensive monitoring and evaluation program for adaptive management. The draft conservation/recovery plan is scheduled to be completed by the end of 2006.

# Key Conclusions Regarding ESU Viability

## Analysis of ESU

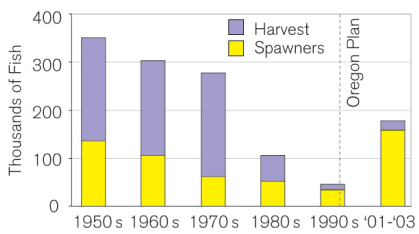
**Biological Viability Status**

PASS+

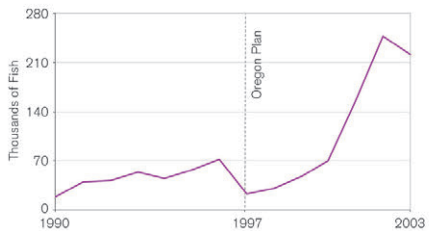
**PASS**

FAIL

**Coho Abundance**

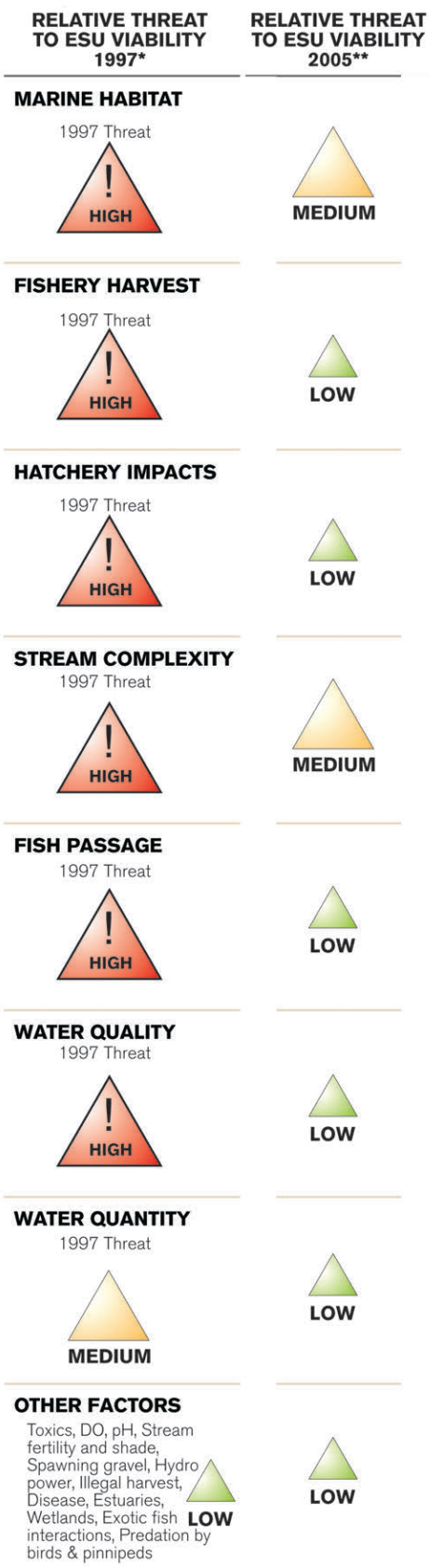



**Number of Wild Spawners**




Average abundance of wild coho spawners in the ESU during 2001-2003 was greater than the average for any of the previous five decades.

1. The Coastal Coho ESU is viable, that is, coho populations generally demonstrate sufficient abundance, productivity, distribution and diversity to be sustained under the current and foreseeable range of environmental conditions. In fact, the ESU retains sufficient productivity and is supported by sufficient habitat to be sustainable through a future period of adverse ocean, drought, and flood conditions similar to or somewhat more adverse than the most recent period of poor survival conditions (late 1980s and 1990s).
2. During and after the recent period of poor marine survival, coho populations generally demonstrated adequate resiliency to resist continued downward population trends, and demonstrated the ability to rebound dramatically as marine survival conditions improved.
3. The mechanisms for this response are most likely a combination of inherently strong density-dependent recruitment coupled with sufficient high quality habitats to sustain productivity during periods of adverse environmental conditions. This reasoning does not imply that habitat conditions are optimum for the species nor that habitat is currently sufficient to achieve broader Oregon Plan recovery goals for the ESU.
4. Although the ESU passed viability criteria, 7 of 21 independent coho populations failed at least one of the viability criteria. These populations are distributed across 4 of 5 population strata.
5. The possibility that a number of adverse environmental conditions could converge and create a catastrophic threat to ESU viability is real. The convergence of the worst marine survival conditions in the last five decades, drought and extreme floods all occurred in the 1990s. Although the impacts were dramatic, the ESU remained viable through this period and rebounded quickly once conditions moderated. The life cycle of the species, its population dynamics and structure, and its broad geographic distribution reduce the likelihood that catastrophic events or convergence of multiple adverse environmental conditions would result in this ESU not being viable in the foreseeable future.
6. The assessment that Oregon coastal coho are likely to persist into the foreseeable future is predicated on the assumption that freshwater habitat and marine survival conditions in the future will generally correspond with environmental conditions and variability evident in the past several decades.




This chart compares perceived level of threat to ESU viability, for each potential limiting factor, in 1997 and 2005.

* 1997 threats are Oregon's interpretation of NOAA evaluation.

** 2005 threats are Oregon's assessment.

## Threats to ESU Viability

1. Based on Oregon's finding that the Coastal Coho ESU is viable – plus evaluation of habitat data, conservation efforts, and monitoring programs – current levels of threat to continued ESU viability were determined.
2. Oregon concluded that two risk factors (marine habitat and stream complexity) currently present moderate levels of risk to future ESU viability.
3. This finding is in sharp contrast to 1997 when many risk factors (marine habitat, fishery harvest, hatchery impacts, stream complexity, fish passage, and water quality) were thought to present high levels of threat to ESU viability.

## Future ESU Viability

1. A diverse set of conditions supports the conclusion that this ESU will maintain its viability into the foreseeable future. This set of conditions includes laws, management programs, monitoring, environmental conditions, and societal networks. In concert, these conditions serve to sustain and improve future viability of the ESU by: (1) reversing many of the environmental alterations and fishery impacts caused by historical management practices; (2) conserving existing conditions that support viability of the ESU; (3) creating future environmental conditions, based on an understanding of primary threats to individual populations, that will further improve the viability of the ESU in fulfillment of Oregon Plan objectives; and (4) maintaining a comprehensive monitoring program to allow adaptive management of conservation efforts as new information is gained.
2. It is unlikely that conditions currently supporting viability of the ESU will change so rapidly or dramatically as to preclude future, timely detection and protective action under Oregon management programs or the federal ESA.
3. Ongoing vigilance regarding conservation and restoration programs is necessary to sustain and improve viability of the ESU, most notably the responsiveness of these programs to variation in marine survival.

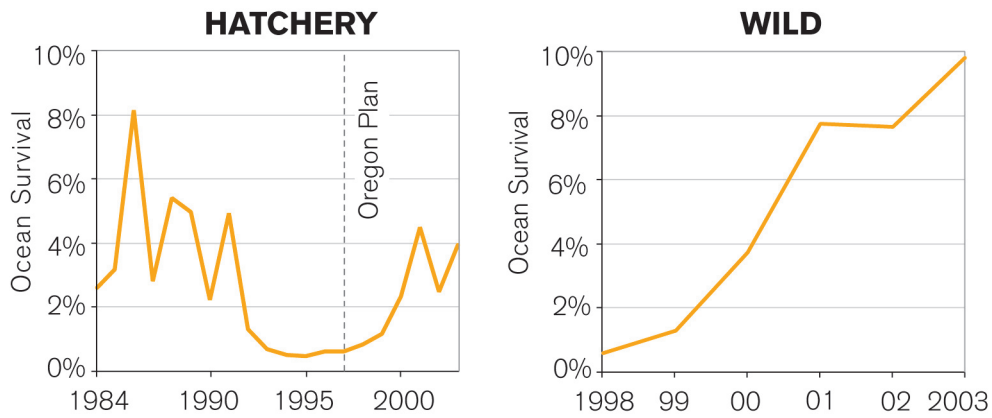
# Key Conclusions Regarding Population Bottlenecks

1. Oregon has identified primary and secondary risk factor bottlenecks for each of the 21 independent populations that comprise the ESU.
2. This work will help prioritize future management and restoration work to further strengthen ESU viability and achieve the intent of the Oregon Plan.
3. Stream complexity and water quality were the two most commonly identified population bottlenecks, regardless of whether populations were or were not classified as viable.
4. Stream complexity was the primary bottleneck for 13 of 21 populations and was a secondary bottleneck for eight of 21 populations.
5. Water quality was not a primary bottleneck for any populations; however, it is a secondary bottleneck for 15 of 21 populations.
6. Other risk factors that were identified as primary population bottlenecks include: hatchery impacts (two populations), exotic fish species (three populations), water quantity (two populations), and spawning gravel (one population).
7. Oregon concludes that it will often be more reasonable to simultaneously pursue remediation of both primary and secondary population bottlenecks, using local data to prioritize restoration funding at local spatial scales, rather than to adopt a narrow view of only attempting to remediate the primary risk factor bottleneck.

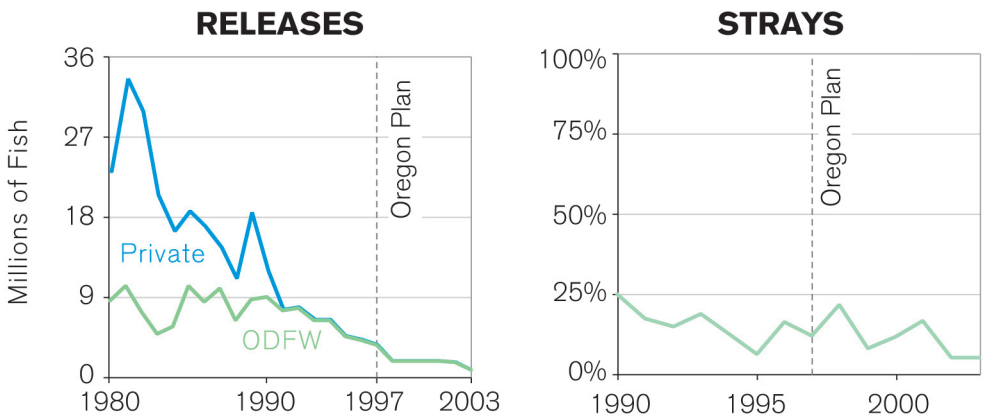
**PRIMARY LIMITING FACTORS:** The risk factor (bottleneck) that most limits the population. Consequently, effective efforts to improve viability or production of the population will address this risk factor first.

| Risk Factor | Necanicum | Nehalem | Tillamook | Nestucca | Salmon | Siletz | Yaquina | Alsea | Beaver | Siuslaw | Lower Umpqua | Middle Umpqua |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MARINE HABITAT | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| FISHERY HARVEST | | | | | | | | | | | | |
| HATCHERY IMPACTS | | | | | ● | | | | | | | |
| STREAM COMPLEXITY | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| FISH PASSAGE | | | | | | | | | | | | |
| WATER QUALITY | | ● | ● | | | | ● | ● | | ● | ● | ● |
| WATER QUANTITY | | | | | | | | | | | | ● |
| OTHER FACTORS | | | | | | | | | ● [1] | | | |
| Biological Viability Status | PASS | FAIL | FAIL | PASS | FAIL | FAIL | PASS+ | FAIL | PASS+ | PASS+ | PASS+ | PASS+ |

[1] Spawning Gravel




Survival of hatchery and wild coho salmon is strongly influenced by ocean conditions. The graph at left represents an average survival for all coho returning to Oregon hatcheries; the graph at right represents an average survival of wild coho returning to 5 life-cycle monitoring sites in the ESU. Year indicates year of return.

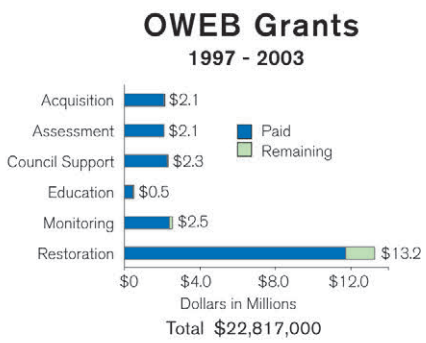


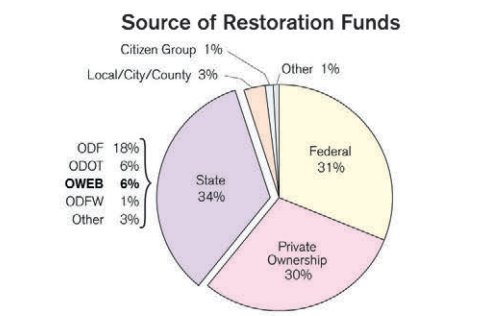

Estimated releases of hatchery coho salmon juveniles, and occurrence of stray hatchery coho adults in natural spawning streams, for the Coastal Coho ESU. The graph at left represents estimated releases of hatchery coho juveniles by private and ODFW hatcheries; the graph at right represents estimated percent of coho observed in spawning areas that were stray hatchery fish. Year indicates year of release or return.

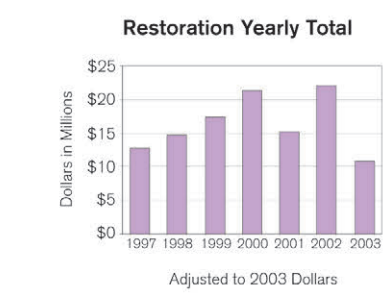
Summary of conclusions from the Coastal Coho ESU Assessment regarding population viability and risk factor bottlenecks.

(Populations are listed north to south.)

# Key Conclusions Regarding Oregon's Conservation Effort



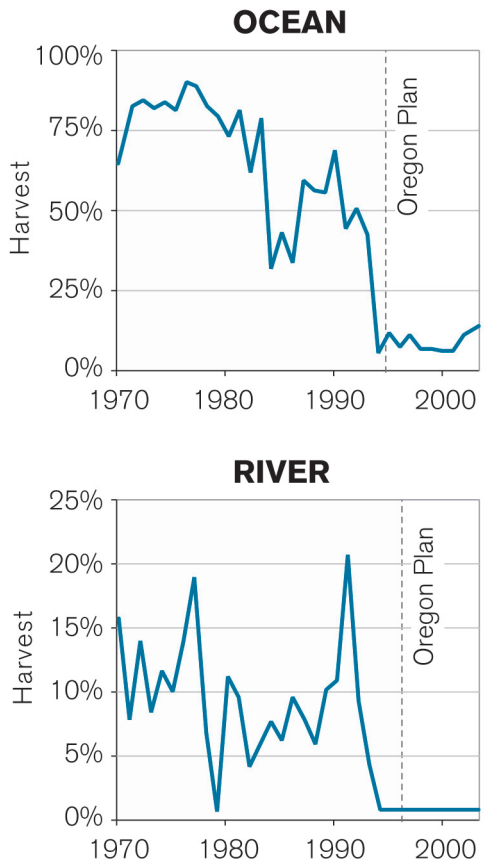





Restoration funding data for the Coastal Coho ESU. (Source: OWEB Restoration Database and federal Regional Ecosystem Office.)

1. Historical land, water and fish management activities that were the key contributing factors for the legacy of coho declines have been stopped.
2. State and federal laws established during the 1950s through 2004 (splash damming eliminated, gill-netting eliminated in coastal rivers, federal Clean Water Act, federal Endangered Species Act, Oregon Forest Practices Law, Oregon Fill and Removal Law, PFMC Harvest Matrix Amendment 13, Native Fish Conservation Policy, Salmon and Parks Initiative, etc.) establish a far more protective management environment than existed previously.
3. Implementation of the Oregon Plan beginning in 1997 demonstrated a substantial effort by the state to expand and strengthen an already considerable programmatic conservation and restoration effort – designed to improve the status and prevent any future deterioration of this ESU's viability.
4. Fishery harvest rates over the last decade have been maintained by management action at unprecedented low levels compared to the prior four decades.
5. Hatchery programs and impacts are lower now than in the past four decades.
6. Conservative fishery and hatchery management required by state and federal policies will continue to protect and strengthen future ESU viability.
7. Reduced adverse impacts from hatchery programs across the ESU in the last two decades may not have been fully reflected in populations that were most adversely affected by historical practices. Such positive expression of current management practices may occur in the next decade or so.
8. New regulatory and program action by DEQ, ODA, and ODF should further improve water quality and habitat supporting the ESU.
9. A new analysis of water use in the ESU indicates that permitted water use is not and will not become a primary limiting factor of ESU viability.
10. Restoration work (including fish passage) in the ESU during 1997-2003 exceeded any previous level of effort.
11. Recent analyses of wetlands associated with coastal estuaries indicate that these habitats are being protected by current regulations.
12. Primary habitat-related threats to coho viability are being addressed through ongoing conservation efforts.

# Key Findings Regarding Future Conditions in the ESU




Estimated fishery mortality (harvest rate) of naturally produced coho salmon, (direct take plus indirect mortality). The top graph presents estimates of fishery mortality in ocean fisheries; the bottom graph presents estimates of mortality rate in river-based (terminal) recreational fisheries. Year indicates year of fishery.

1. Watershed councils have been established throughout the ESU; these groups will complement future conservation and restoration efforts by soil and water conservation districts, private landowners, and state and federal agencies.
2. State funding to support Oregon Plan work (e.g., restoration, watershed council support, soil and water conservation district support, monitoring, assessments, etc.) is provided by Oregon Law until at least mid-2014.
3. Substantial new investments in monitoring of coho, habitat, and water quality provided a rich source of data to support Oregon's ESU assessment and adaptive management of conservation efforts.
4. The ocean environment for coho survival improved since the mid-to-late 1990s, although current conditions and future trend is uncertain.
5. Abundance and density of coho spawners throughout the ESU increased since 1998 to the highest average level observed in five decades, reflecting a rapid and ESU-wide response of the populations that comprise the ESU. Higher spawner numbers distributed widely across the ESU should have a positive impact on the ESU as a consequence of increased input of marine derived nutrients.
6. Analyses by the Coastal Landscape Analysis and Modeling Study (CLAMS) suggest that the future availability of larger riparian trees in forestlands will increase on fish-bearing streams regardless of land ownership. In contrast, the future potential for wood recruitment is likely to vary across forestland ownerships, with the higher potentials on public lands and lower potentials on private lands. Oregon concludes that these projections suggest that future habitat conditions for coho across the ESU will be at least similar to and perhaps improved over current conditions.
7. CLAMS analyses did not consider what is likely to happen to riparian vegetation on agricultural or urban portions of the landscape. The State concludes that modest improvement in riparian vegetation is likely to accrue on agricultural lands under current rules but acknowledges that considerable uncertainty exists regarding specificity of improvement.
8. Monitoring of habitat and water quality since 1997 provides a baseline to detect future trends (positive or negative) that could affect ESU viability. The sensitivity (ability to detect change) of monitoring will increase substantially in the next 3-8 years as more data become available.

# Coho Assessment Storyboards

ESU

Population Strata (Mid Coast)

Population Unit (Yaquina)

Key elements of the Oregon Coastal Coho Assessment (including maps, data and interpretation) are illustrated on storyboards. Storyboards included in this document are highlighted below. All storyboards can be viewed at **http://nrimp.dfw.state.or.us/OregonPlan/**. Depending on the available data, one of three scales is used:

1. ESU. The Oregon Coastal Coho ESU extends from Seaside to Cape Blanco.
2. Monitoring Area. The ESU is divided into four distinct monitoring areas for data collection. These roughly correspond with population strata.
3. Population. The ESU contains 21 population units, which are roughly analogous to major river or lake basins along the coast. Maps also show the location of restoration work from 1997-2003.

| Monitoring Area | Population Strata | Population |
|---|---|---|
| North Coast | North Coast | Necanicum |
| | | Nehalem |
| | | Tillamook |
| | | Nestucca |
| Mid Coast | Mid Coast | Salmon |
| | | Siletz |
| | | Yaquina |
| | | Beaver |
| | | Alsea |
| | | Siuslaw |
| Umpqua | Umpqua | Lower Umpqua |
| | | Middle Umpqua |
| | | North Umpqua |
| | | South Umpqua |
| Mid-South Coast | Lakes | Siltcoos |
| | | Tahkenitch |
| | | Tenmile |
| | Mid-South Coast | Coos |
| | | Coquille |
| | | Floras |
| | | Sixes |

**Characteristics of Coho Habitat**
Graphs show ownership and number of miles (at the 1:100,000 scale) for all streams within the distribution of coho and those streams thought to have the highest potential to provide over-winter rearing habitat for coho. These High Intrinsic Potential or HIP streams are relatively small, have modest slope, and a U-shaped valley cross-section.

**Coho and Chinook Abundance**
A graph of abundance from 1950 to 2003 by decade demonstrates that different species can exhibit different trends in the same region.

**Biological Criteria Status**
A summary shows the viability of each population or population stratum. (The strata align with the monitoring areas but also include the Lakes stratum, which is part of the Mid-South Coast monitoring area.)

**Monitoring**
Oregon's investment in monitoring in this ESU includes coho counts, measures of physical habitat, and water quality. The amounts do not include federal, private or other investments.

**OWEB Grants**
The Oregon Watershed Enhancement Board invests in salmon recovery, water quality, and watershed health statewide. Grant amounts shown were dedicated for the Oregon Coastal Coho ESU from 1997-2003.

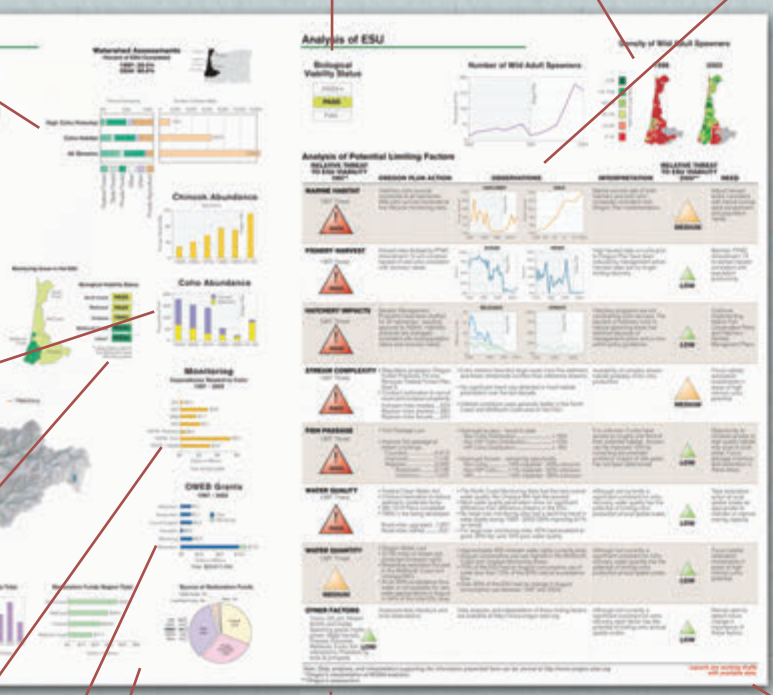
**Restoration and Funding**
Graphs and charts show how and where funds were spent for restoration in the ESU and the sources of funds.

**The state determined viability on three scales:**

ESU
Population Strata
Population

**Recent Trend Data for Wild Coho**

A graph shows the trend in wild coho spawners; maps show density of adult coho per mile.




## Analysis of Potential Limiting Factors

Column 1: Level of risk to ESU viability associated with each limiting factor in 1997. These risk levels were established by NMFS/NOAA.

Column 2: Oregon Plan Action – Actions to address limiting factors include regulatory programs and restoration efforts.

Column 3: Observations – Data on limiting factors allow biologists to determine how conditions have changed since 1997.

Column 4: Interpretation – Actions under the Oregon Plan to address limiting factors have generally resulted in positive impacts.

Column 5: Conclusions of this assessment regarding the current level of risk associated with each limiting factor. These determinations where made by the State of Oregon.

Column 6: Need – These actions would help maintain or improve viability and capacity of the ESU.

The entire Assessment can be viewed at this website.
**http://nrimp.dfw.state.or.us/OregonPlan/**

**Limiting Factors:** Physical, biological or management conditions that may affect the viability or production of coho were considered in the Oregon Coastal Coho Assessment.

**Marine Habitat**
*Environmental (ocean) conditions that influence survival* – ESU-scale estimates of Oregon Production Index hatchery coho and survival of wild coho from life-cycle monitoring sites.

**Stream Complexity**
*A variety of physical habitat conditions (large wood, alcoves, etc.) that provide shelter to young coho, especially in the winter* – Data collected across land ownerships, analyzed at ESU and monitoring area scales.

**Water Quantity**
*The amount of water present in streams that support coho* – The assessment compared modeled August streamflow to permitted withdrawals at the ESU, monitoring area and population scales.

**Fishery Harvest**
*How many fish were caught before they spawned* – ESU-scale estimates of ocean and in-river fishery harvest rates.

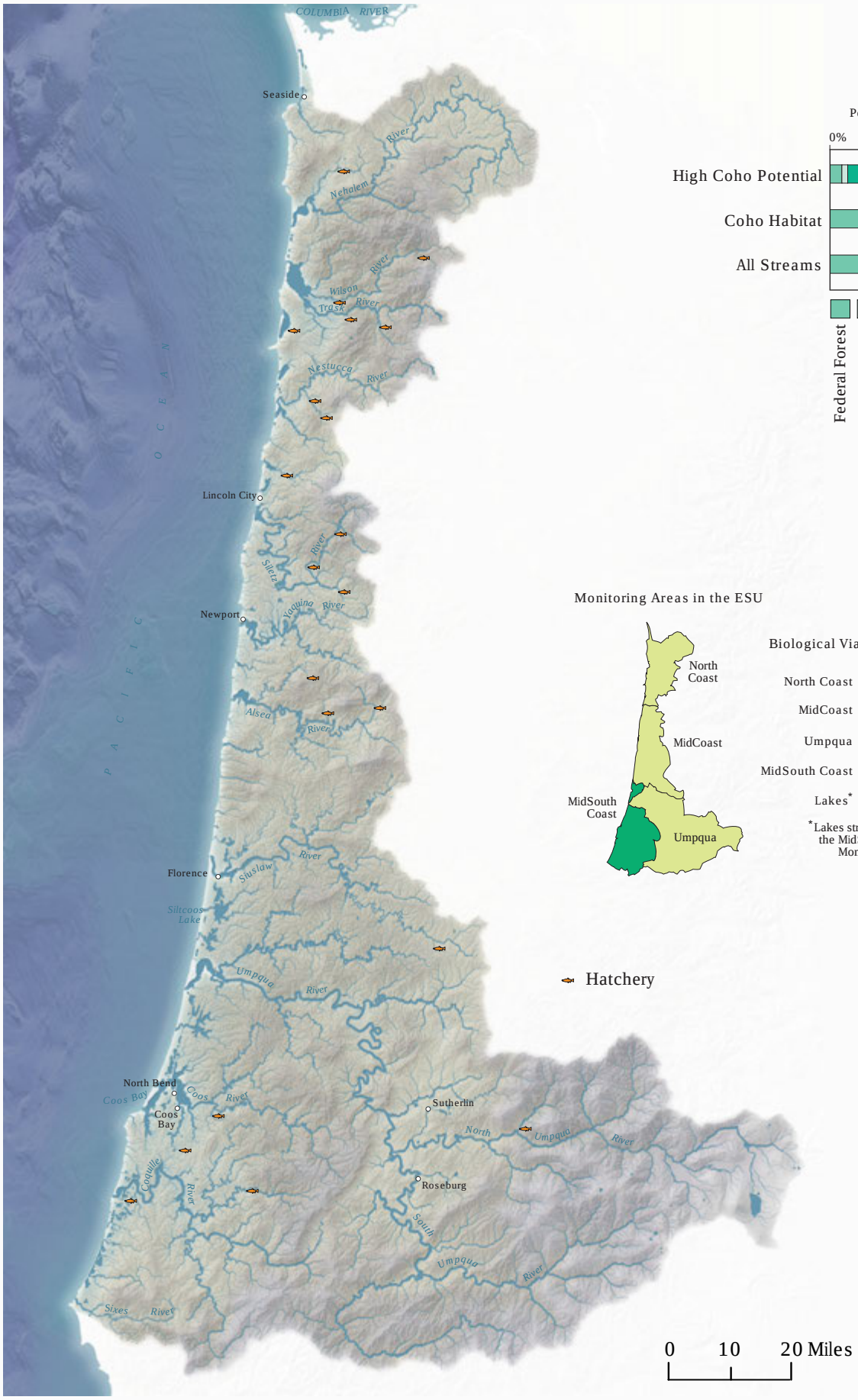
**Fish Passage**
*The ability of adult and juvenile coho to reach spawning and rearing habitat* – Obstacles include dams, culverts, and tide gates. The assessment included culvert data collected across land ownerships, analyzed at the ESU scale.

**Other Factors**
*A partial accounting of other limiting factors that were identified when the ESU was listed in 1997.*

**Hatchery Impacts**
*Effects of hatchery operations on wild coho, such as competition for habitat, food or shelter, as well as attracting predators and interbreeding* – Releases of coho in each of the population units within the ESU.

**Water Quality**
*Physical and chemical properties of streams that support coho, including temperature, dissolved oxygen, pH, and sediment* – Data collected across land ownerships, analyzed at ESU and monitoring area scales.

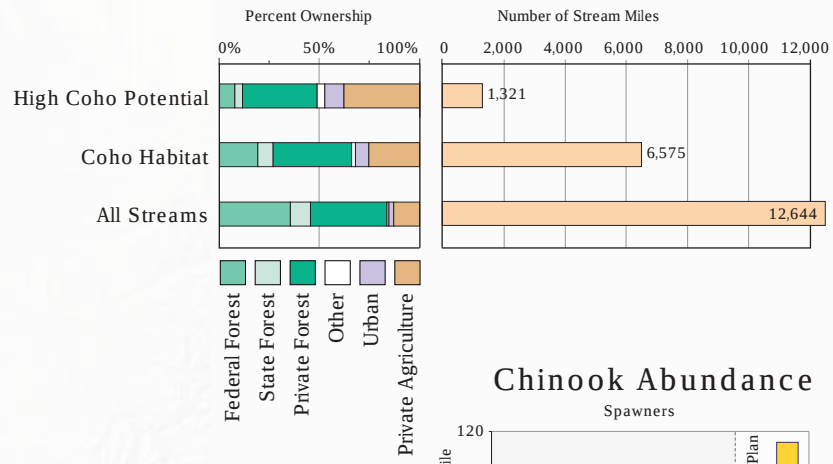
# Oregon Coastal Coho ESU




## Watershed Assessments

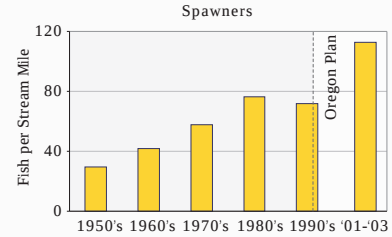
Percent of ESU Completed

1997: *29.5%*
2004: *96.6%*




## Chinook Abundance

Spawners




Monitoring Areas in the ESU

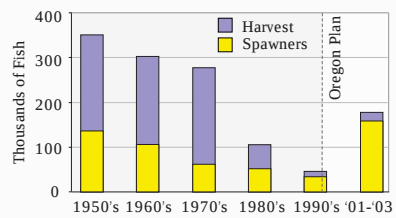



Biological Viability Status

| | |
|---|---|
| North Coast | PASS |
| MidCoast | PASS |
| Umpqua | PASS |
| MidSouth Coast | PASS+ |
| Lakes* | PASS+ |

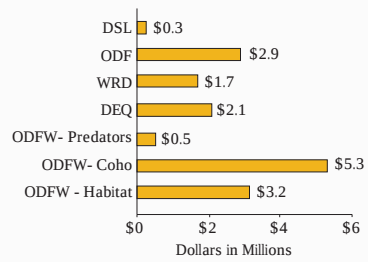
*Lakes strata is part of the MidSouth Coast Monitoring Area

## Coho Abundance




## Monitoring

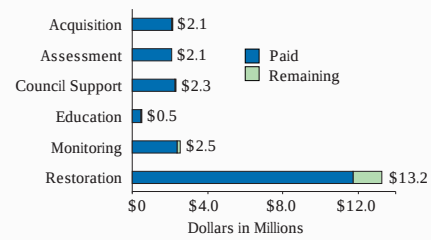
Expenditures Related to Coho
1997 - 2003




Total $15,912,900

## OWEB Grants

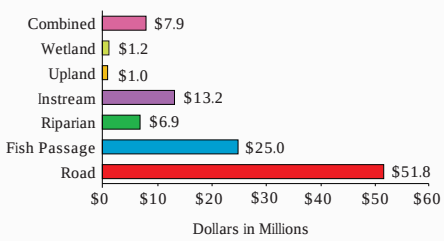
1997 - 2003



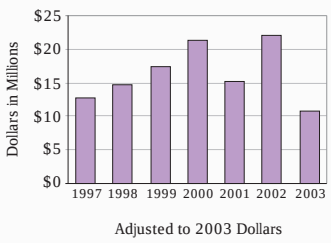

Total $22,817,000

## Restoration Funding 1997 - 2003: $107 Million

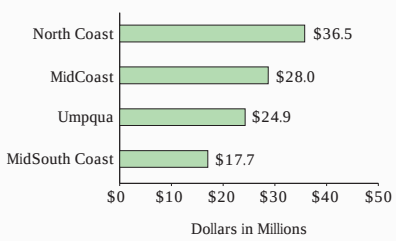
Restoration Activity Type



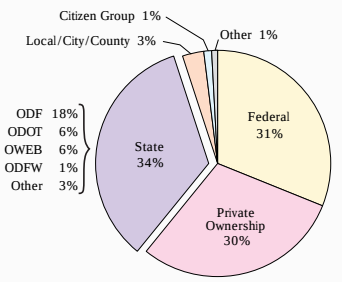

Restoration Yearly Total




Restoration Funds Region Total




Source of Restoration Funds

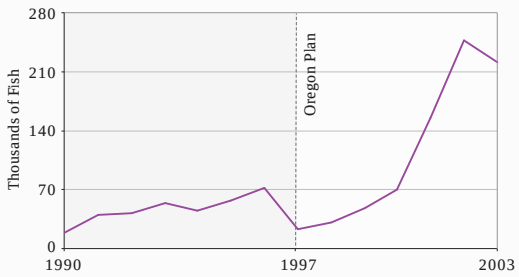


# Analysis of ESU

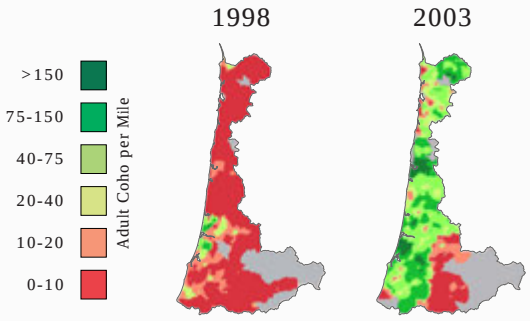
## Biological Viability Status

PASS+
PASS
FAIL

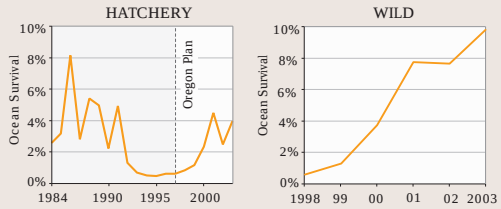
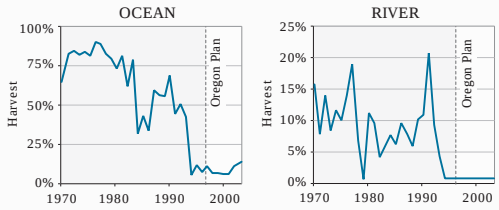
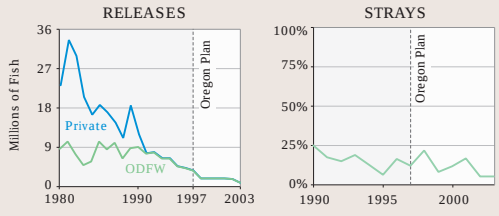
## Number of Wild Adult Spawners




## Density of Wild Adult Spawners




## Analysis of Potential Limiting Factors

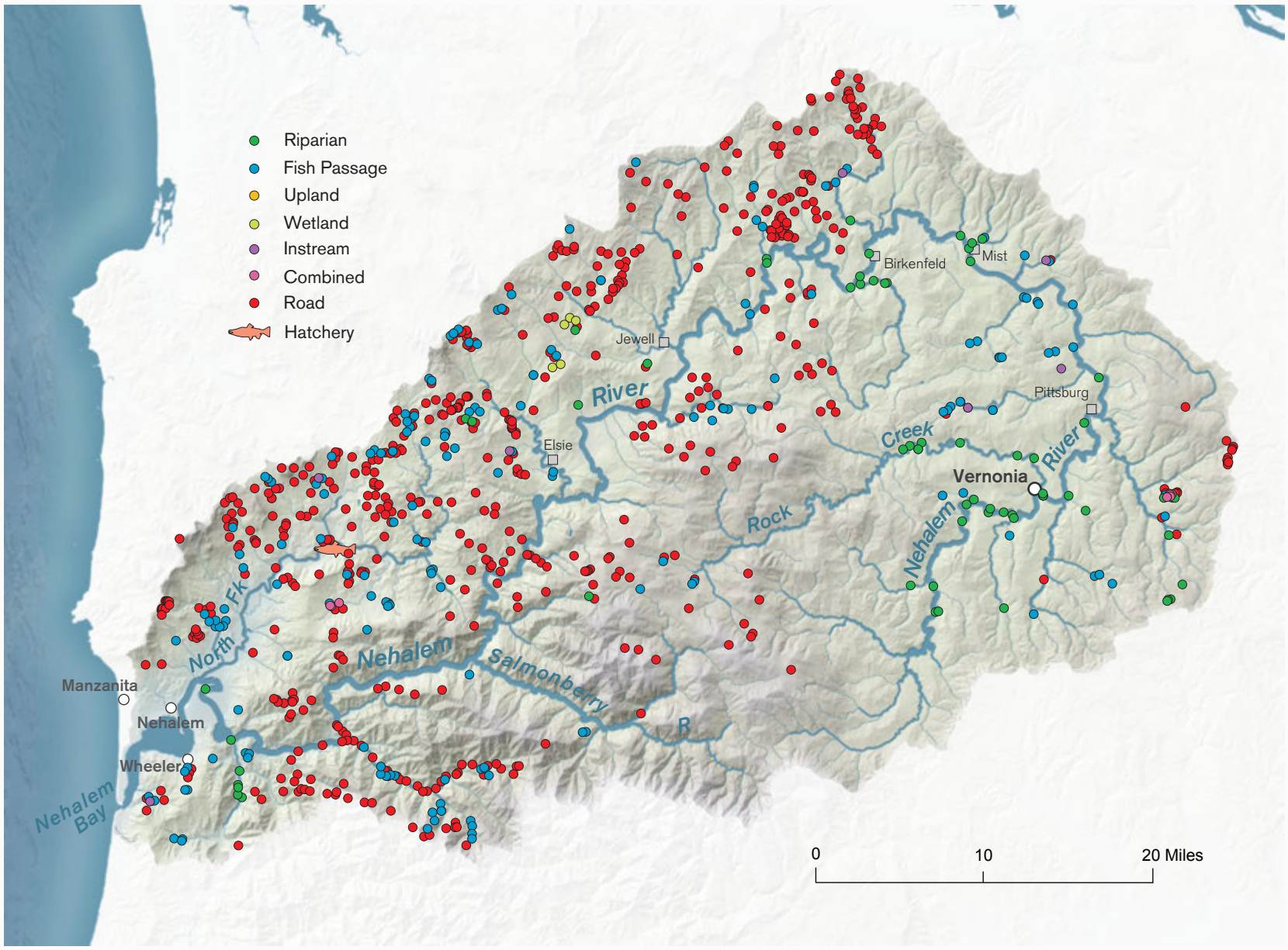
| RELATIVE THREAT TO ESU VIABILITY 1997* | OREGON PLAN ACTION | OBSERVATIONS | INTERPRETATION | RELATIVE THREAT TO ESU VIABILITY 2005** | NEED |
|---|---|---|---|---|---|
| MARINE HABITAT<br>1997 Threat<br>HIGH | Hatchery coho survival monitored at all hatcheries. Wild coho survival monitored at five lifecycle monitoring sites. |  | Marine survival rate of both hatchery and wild coho increased coincident with Oregon Plan implementation. | MEDIUM | Adjust harvest levels consistent with marine survival, adult escapement and population needs. |
| FISHERY HARVEST<br>1997 Threat<br>HIGH | Harvest rates dictated by PFMC Amendment 13 will constrain harvest of wild coho consistent with recovery needs. |  | High harvest rates on coho prior to Oregon Plan have been reduced by management action. Harvest rates are no longer limiting recovery. | LOW | Maintain PFMC Amendment 13 to restrain harvest consistent with population productivity. |
| HATCHERY IMPACTS<br>1997 Threat<br>HIGH | Genetic Management Plans have been drafted for all hatcheries - awaiting approval by NOAA. Hatchery practices are managed consistent with local population status and recovery needs. |  | Hatchery programs are not constraining coho recovery. The percent of hatchery coho in natural spawning areas has declined because of management action and is now within policy guidelines. | LOW | Continue implementing Native Fish Conservation Policy and Hatchery Genetic Management Plans. |
| STREAM COMPLEXITY<br>1997 Threat<br>HIGH | • Regulatory programs: Oregon Forest Practices, Fill and Removal, Federal Forest Plan, Goal 5.<br>• Conduct restoration to recruit wood and increase complexity.<br>Instream miles treated.....524<br>Riparian miles planted.....380<br>Riparian miles fenced.....231 | • Coho streams have less large wood, more fine sediment, and fewer streamside conifers than reference streams.<br>• No significant trend was detected in most habitat parameters over the last decade.<br>• Habitat conditions were generally better in the North Coast and MidSouth Coast area of the ESU. | Availability of complex stream habitat probably limits coho production. | MEDIUM | Focus habitat restoration investments in areas of high intrinsic coho potential. |
| FISH PASSAGE<br>1997 Threat<br>HIGH | • Fish Passage Law<br>• Improve fish passage at stream crossings.<br>Counted.....4,413<br>Improved.....1,140<br>Mapped.....3,392<br>Assessed.....2,145<br>Unknown.....1,247 | • Improved access - result to date<br>Non Coho Distribution.....+16%<br>Non HIP Coho Distribution.....+10%<br>HIP Coho Distribution.....+ 6%<br>• Improved Access - remaining opportunity<br>Non Coho.....16% impaired - 40% unknown<br>Non HIP Coho.....11% impaired - 32% unknown<br>HIP.....10% impaired - 28% unknown | It is unknown if coho have access to roughly one third of their potential habitat. Access can be improved 10% by correcting documented problems. Impact of tide gates has not been determined. | LOW | Opportunity to increase access to high quality habitat may exist in local areas. Focus passage inventory and restoration in these areas. |
| WATER QUALITY<br>1997 Threat<br>HIGH | • Federal Clean Water Act<br>• Conduct restoration to reduce sediment, moderate temp.<br>• SB-1010 Plans completed<br>• TMDL's are being developed<br>Road miles upgraded ...1,557<br>Road miles retired .....521 | • The North Coast Monitoring Area had the best overall water quality; the Umpqua MA had the poorest.<br>• Most water quality parameters show no significant difference from reference streams in the ESU.<br>• No large river monitoring sites had a declining trend in water quality during 1993 - 2002 (39% improving; 61% no trend).<br>• For large river monitoring sites, 42% had excellent to good, 39% fair, and 19% poor water quality. | Although not currently a significant constraint on coho recovery, water quality has the potential of limiting coho production at local spatial scales. | LOW | Take restoration action at local spatial scales as appropriate to maintain or improve rearing capacity. |
| WATER QUANTITY<br>1997 Threat<br>MEDIUM | • Oregon Water Law<br>• 3,700 miles of stream are protected (instream right).<br>• Streamflow restoration focused in the MidSouth Coast and Umpqua MA's.<br>• At an 80% exceedance flow, water is not available for new water appropriations in August in 94% of the total ESU area. | • Approximately 800 instream water rights currently exist.<br>• August consumptive use was highest in the MidSouth Coast and Umpqua Monitoring Areas.<br>• 70% of the ESU had an August consumptive use of water less than 10% of the 80% natural exceedance flow.<br>• Over 90% of the ESU had no change in August consumptive use between 1997 and 2004. | Although not currently a significant constraint on coho recovery, water quantity has the potential of limiting coho production at local spatial scales. | LOW | Focus habitat restoration investments in areas of high intrinsic coho potential. |
| OTHER FACTORS<br>Toxics, DO, pH, Stream fertility and shade, Spawning gravel, Hydro power, Illegal harvest, Disease, Estuaries, Wetlands, Exotic fish interactions, Predation by birds & pinnipeds<br>LOW | Assessed data, literature, and local observations. | Data, analyses, and interpretation of these limiting factors are available at www.oregon-plan.org. | Although not currently a significant constraint on coho recovery, each factor has the potential of limiting coho at local spatial scales. | LOW | Remain alert to detect future change in importance of these factors. |

** Oregon's interpretation of NOAA evaluation. ** Oregon's assessment. Supporting information can be viewed at* www.oregon-plan.org/OPSW/cohoproject/coho_proj.shtml.

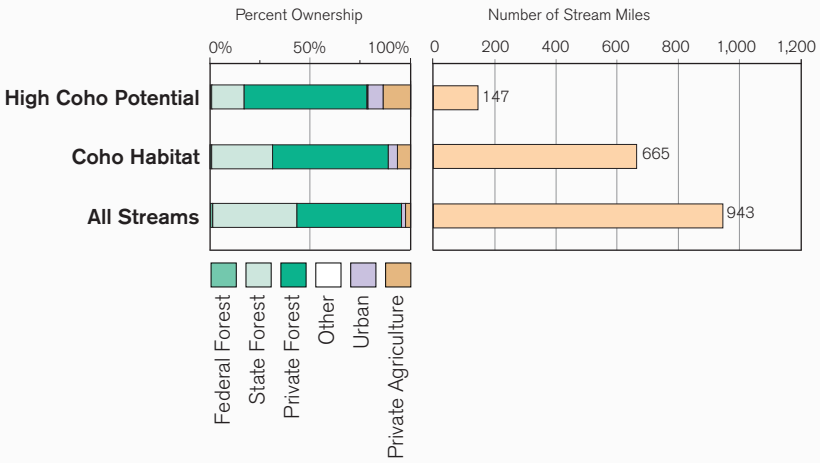
# Nehalem Population Unit

**Watershed Assessments**
**Percent of Population Unit Completed**
**1997: *0%***
**2004: *100%***

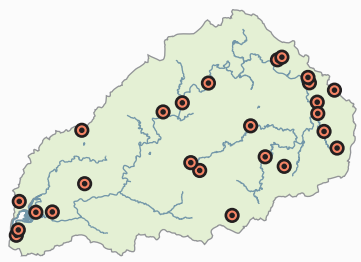
## Restoration Completed and Reported 1997 - 2003



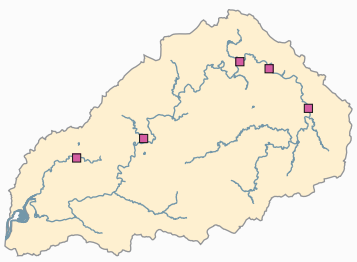

## Characteristics of Coho Habitat




## State/County Culverts with High Priority for Improvement

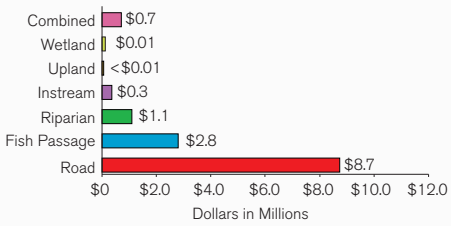


## Historic Splash Dam Sites

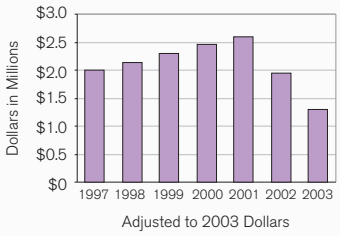


## Restoration Funding 1997 - 2003: $13.7 Million

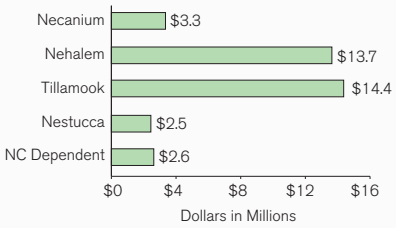
### Restoration Activity Type



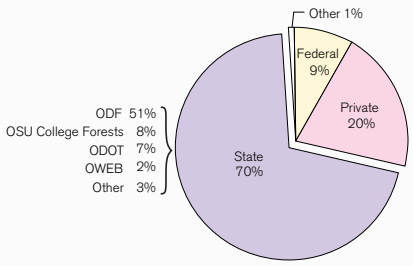

### Restoration Yearly Total




### Restoration Funds Region Total




### Source of Restoration Funds



# Analysis of Nehalem Population Unit

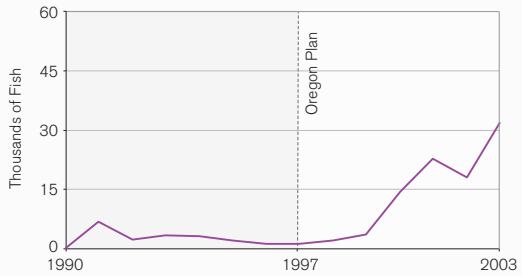
## Biological Viability Status

PASS+

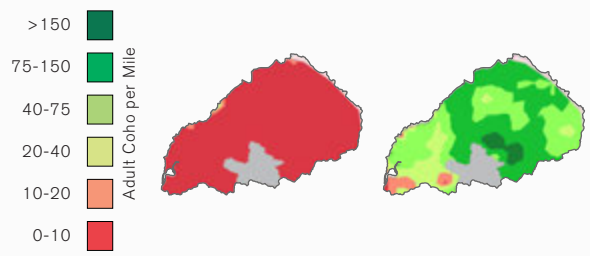
PASS

**FAIL**

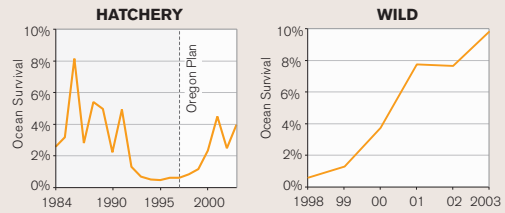
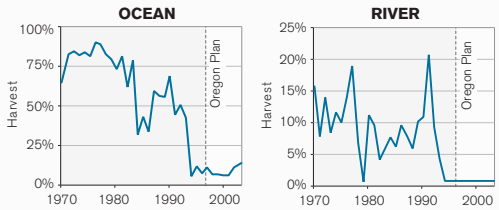
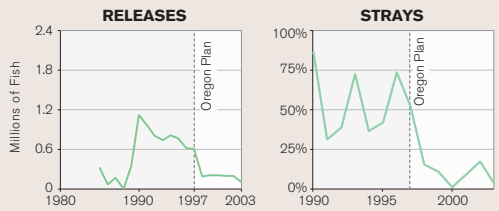
## Number of Wild Adult Spawners




## Density of Wild Adult Spawners




## Analysis of Potential Limiting Factors

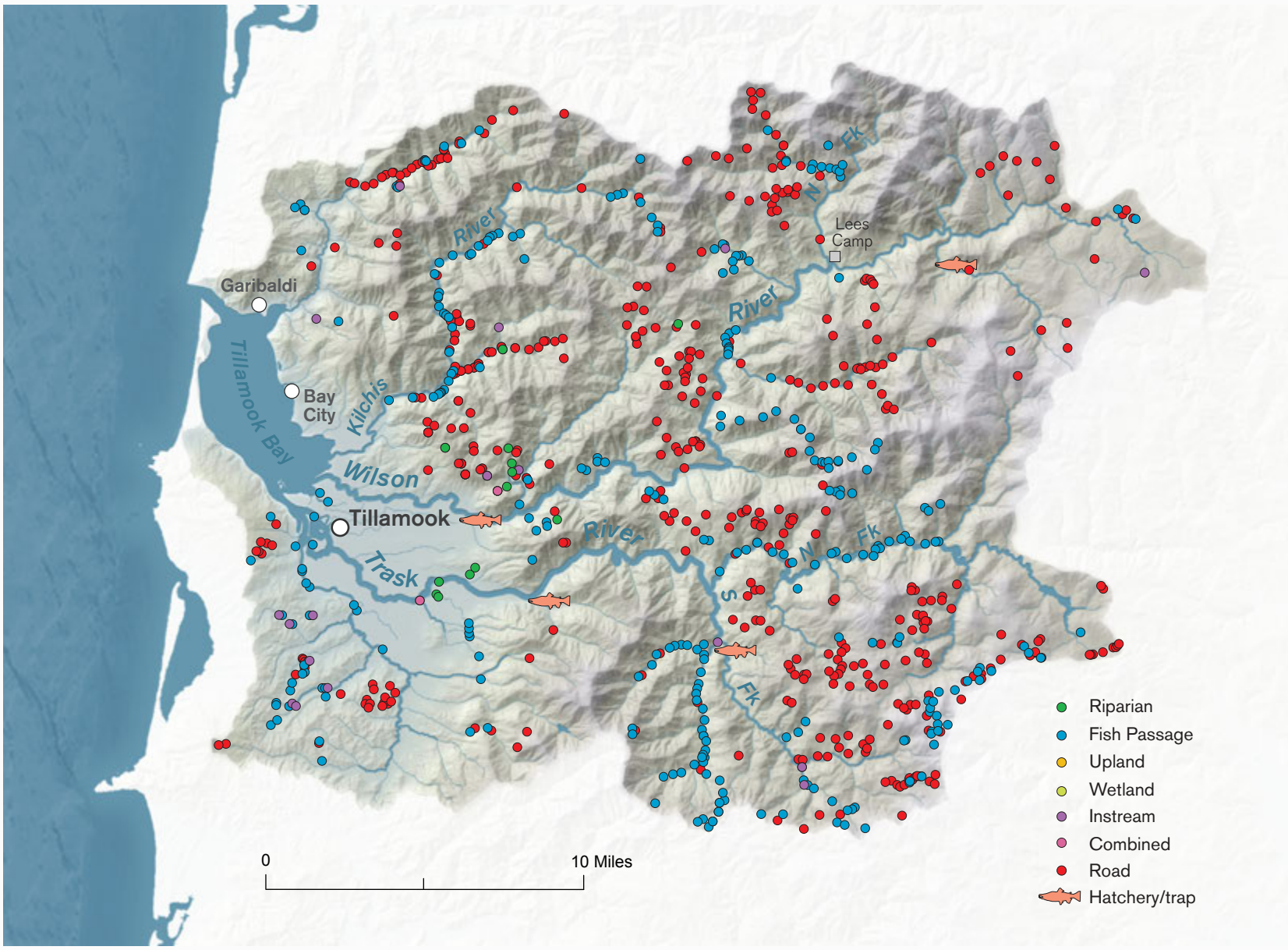
| FACTOR | OREGON PLAN ACTION | OBSERVATIONS | INTERPRETATION | PRIMARY LIMITING FACTOR* | NEED |
|---|---|---|---|---|---|
| **MARINE HABITAT**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | Hatchery coho survival monitored at all hatcheries. Wild coho survival monitored at five lifecycle monitoring sites. |  | Marine survival rate of both hatchery and wild coho increased coincident with Oregon Plan implementation. | **N/A** | Adjust harvest levels consistent with marine survival, adult escapement and population needs. |
| **FISHERY HARVEST**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | Harvest rates dictated by PFMC Amendment 13 will constrain harvest of wild coho consistent with recovery needs. |  | High harvest rates on coho prior to Oregon Plan have been reduced by management action. Harvest rates are no longer limiting recovery. | | Maintain PFMC Amendment 13 to restrain harvest consistent with population productivity. |
| **HATCHERY IMPACTS**<br>Data scale: ESU MA POP<br>☐ ☐ ☒ | Genetic Management Plans have been drafted for all hatcheries - awaiting approval by NOAA. Hatchery practices are managed consistent with local population status and recovery needs. |  | Hatchery programs are not constraining coho recovery. The percent of hatchery coho in natural spawning areas has declined because of management action and is now within policy guidelines. | | Continue implementing Native Fish Conservation Policy and Hatchery Genetic Management Plans. |
| **STREAM COMPLEXITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Regulatory programs: Oregon For. Practices, Fill and Removal, Federal Forest Plan, Goal 5.<br>▪ Conduct restoration to recruit wood and increase complexity.<br>Instream miles treated.....77<br>Riparian miles planted.....130<br>Riparian miles fenced.....44 | ▪ Coho streams have less large wood, more fine sediment, and fewer streamside conifers than reference streams.<br>▪ No significant trend was detected in most habitat parameters over the last decade.<br>▪ Habitat conditions were generally better in the North Coast and MidSouth Coast area of the ESU. | Availability of complex stream habitat probably limits coho production. | | Focus habitat restoration investments in areas of high intrinsic coho potential. |
| **FISH PASSAGE**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | ▪ Fish Passage Law<br>▪ Improve fish passage at stream crossings.<br>Counted.....4,413<br>Improved.....1,140<br>Mapped.....3,392<br>Assessed.....2,145<br>Unknown.....1,247 | ▪ Improved access - result to date<br>Non Coho Distribution.....+16%<br>Non HIP Coho Distribution.....+10%<br>HIP Coho Distribution.....+6%<br>▪ Improved Access - remaining opportunity<br>Non Coho.....16% impaired - 40% unknown<br>Non HIP Coho.....11% impaired - 32% unknown<br>HIP.....10% impaired - 28% unknown | It is unknown if coho have access to roughly one third of their potential habitat. Access can be improved 10% by correcting documented problems. Impact of tide gates has not been determined. | | Opportunity to increase access to high quality habitat may exist in local areas. Focus passage inventory and restoration in these areas. |
| **WATER QUALITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Federal Clean Water Act<br>▪ Conduct restoration to reduce sediment, moderate temp.<br>▪ SB-1010 Plans completed<br>▪ TMDLs are being developed<br>Road miles upgraded .....692<br>Road miles retired .....115 | ▪ The North Coast MA had the best overall water quality with the fewest stream miles exceeding standards or benchmarks (targets) for temperature, pH, fine sediment, total solids, and vertebrate assemblage.<br>▪ 6 of 9 large river ambient monitoring sites in the North Coast MA had improving trends in water quality.<br>▪ Compared to other MAs the North Coast had the poorest dissolved oxygen saturation levels and macroinvertebrates. | Although not currently a significant constraint on coho recovery, water quality has the potential of limiting coho production at local spatial scales. | | Take restoration action at local spatial scales as appropriate to maintain or improve rearing capacity. |
| **WATER QUANTITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Oregon Water Law<br>▪ 850 miles of stream are protected (instream right).<br>▪ At an 80% exceedance flow, water is not available for new appropriations in August in 97% of the total area of the North Coast MA. | ▪ Over 80% of the North Coast MA had an August consumptive use less than 10% of the 80% natural exceedance flow.<br>▪ The Necanicum and Tillamook populations had the greatest portion of their total watershed (up to 12% of the total area) with August consumptive use more than 100% of the 80% exceedance natural flow.<br>▪ 97% of the total North Coast MA had no change in August consumptive use between 1997 and 2004. | Although not currently a significant constraint on coho recovery, water quantity has the potential of limiting coho production at local spatial scales. | | Focus habitat restoration investments in areas of high intrinsic coho potential. |
| **OTHER FACTORS**<br>Toxics, DO, pH, Stream fertility and shade, Spawning gravel, Hydro power, Illegal harvest, Disease, Estuaries, Wetlands, Exotic fish interactions, Predation by birds & pinnipeds | Assessed data, literature, and local observations. | Data, analyses, and interpretation of these limiting factors are available at www.oregon-plan.org. | Although not currently a significant constraint on coho recovery, each factor has the potential of limiting coho at local spatial scales. | | Remain alert to detect future change in importance of these factors. |

** Primary and Secondary risk factor(s) that most limit the population. Supporting information can be viewed at* www.oregon-plan.org/OPSW/cohoproject/coho_proj.shtml.

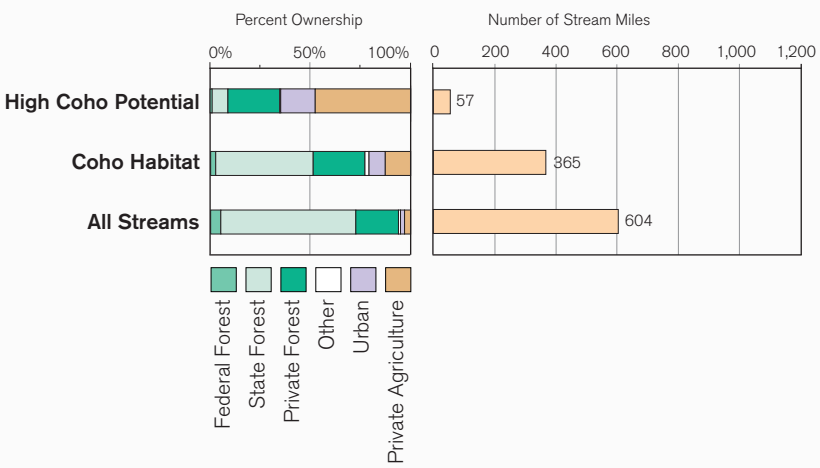
# Tillamook Population Unit

**Watershed Assessments**
**Percent of Population Unit Completed**
**1997: *0%***
**2004: *85.7%***

## Restoration Completed and Reported 1997 - 2003

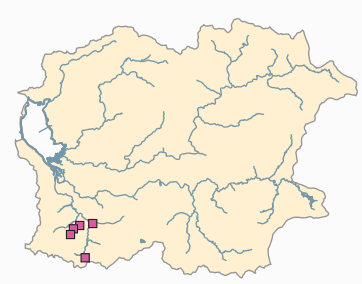



## Characteristics of Coho Habitat



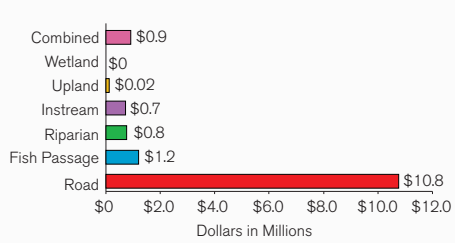

## State/County Culverts with High Priority for Improvement

## Historic Splash Dam Sites

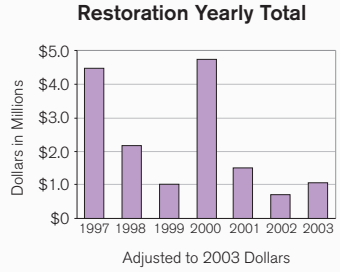


## Restoration Funding 1997 - 2003: $14.4 Million

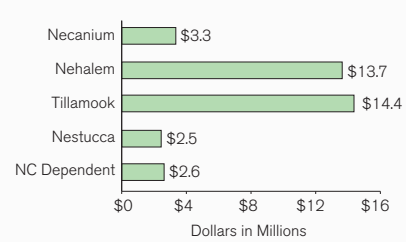
### Restoration Activity Type



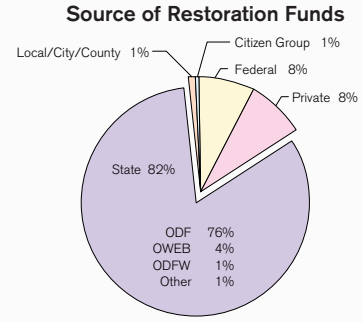

### Restoration Yearly Total




### Restoration Funds Region Total




### Source of Restoration Funds



# Analysis of Tillamook Population Unit

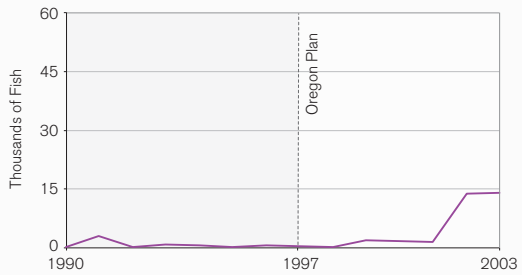
## Biological Viability Status

PASS+

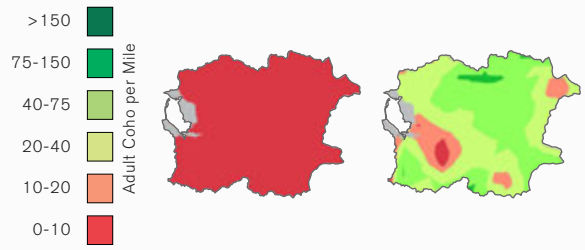
PASS

**FAIL**

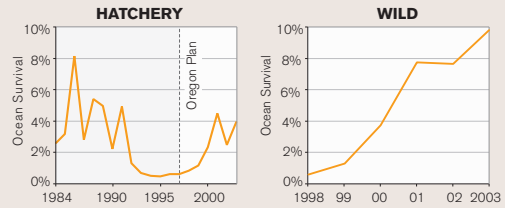
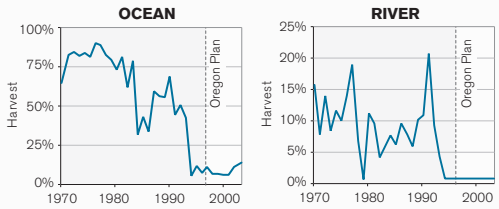
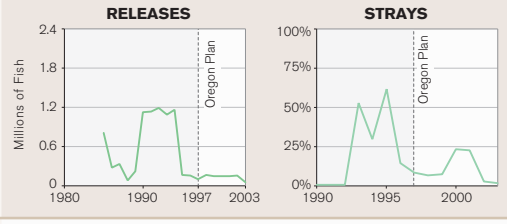
## Number of Wild Adult Spawners




## Density of Wild Adult Spawners




## Analysis of Potential Limiting Factors

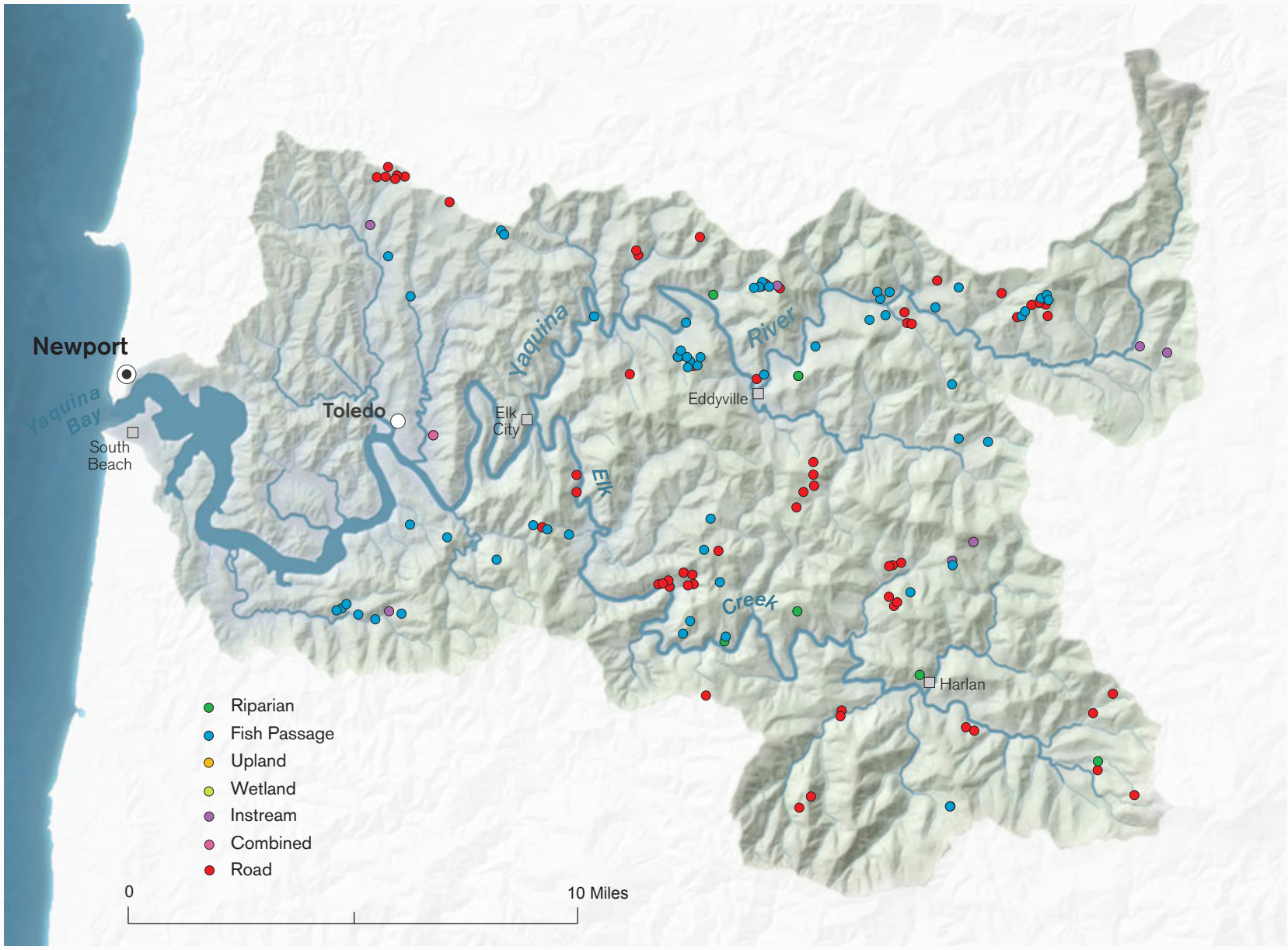
| FACTOR | OREGON PLAN ACTION | OBSERVATIONS | INTERPRETATION | PRIMARY LIMITING FACTOR* | NEED |
|---|---|---|---|---|---|
| **MARINE HABITAT**<br>Data scale: ESU [X] MA [ ] POP [ ] | Hatchery coho survival monitored at all hatcheries. Wild coho survival monitored at five lifecycle monitoring sites. |  | Marine survival rate of both hatchery and wild coho increased coincident with Oregon Plan implementation. | **N/A** | Adjust harvest levels consistent with marine survival, adult escapement and population needs. |
| **FISHERY HARVEST**<br>Data scale: ESU [X] MA [ ] POP [ ] | Harvest rates dictated by PFMC Amendment 13 will constrain harvest of wild coho consistent with recovery needs. |  | High harvest rates on coho prior to Oregon Plan have been reduced by management action. Harvest rates are no longer limiting recovery. | | Maintain PFMC Amendment 13 to restrain harvest consistent with population productivity. |
| **HATCHERY IMPACTS**<br>Data scale: ESU [ ] MA [ ] POP [X] | Genetic Management Plans have been drafted for all hatcheries - awaiting approval by NOAA. Hatchery practices are managed consistent with local population status and recovery needs. |  | Hatchery programs are not constraining coho recovery. The percent of hatchery coho in natural spawning areas has declined because of management action and is now within policy guidelines. | | Continue implementing Native Fish Conservation Policy and Hatchery Genetic Management Plans. |
| **STREAM COMPLEXITY**<br>Data scale: ESU [ ] MA [X] POP [ ] | ▪ Regulatory programs: Oregon For. Practices, Fill and Removal, Federal Forest Plan, Goal 5.<br>▪ Conduct restoration to recruit wood and increase complexity.<br>Instream miles treated.....77<br>Riparian miles planted.....130<br>Riparian miles fenced..... 44 | ▪ Coho streams have less large wood, more fine sediment, and fewer streamside conifers than reference streams.<br>▪ No significant trend was detected in most habitat parameters over the last decade.<br>▪ Habitat conditions were generally better in the North Coast and MidSouth Coast area of the ESU. | Availability of complex stream habitat probably limits coho production. | ● | Focus habitat restoration investments in areas of high intrinsic coho potential. |
| **FISH PASSAGE**<br>Data scale: ESU [X] MA [ ] POP [ ] | ▪ Fish Passage Law<br>▪ Improve fish passage at stream crossings.<br>Counted.....4,413<br>Improved.....1,140<br>Mapped.....3,392<br>Assessed.....2,145<br>Unknown.....1,247 | ▪ Improved access - result to date<br>Non Coho Distribution.....+16%<br>Non HIP Coho Distribution.....+10%<br>HIP Coho Distribution.....+6%<br>▪ Improved Access - remaining opportunity<br>Non Coho.....16% impaired - 40% unknown<br>Non HIP Coho.....11% impaired - 32% unknown<br>HIP.....10% impaired - 28% unknown | It is unknown if coho have access to roughly one third of their potential habitat. Access can be improved 10% by correcting documented problems. Impact of tide gates has not been determined. | | Opportunity to increase access to high quality habitat may exist in local areas. Focus passage inventory and restoration in these areas. |
| **WATER QUALITY**<br>Data scale: ESU [ ] MA [X] POP [ ] | ▪ Federal Clean Water Act<br>▪ Conduct restoration to reduce sediment, moderate temp.<br>▪ SB-1010 Plans completed<br>▪ TMDLs are being developed<br>Road miles upgraded ..... 692<br>Road miles retired .....115 | ▪ The North Coast MA had the best overall water quality with the fewest stream miles exceeding standards or benchmarks (targets) for temperature, pH, fine sediment, total solids, and vertebrate assemblage.<br>▪ 6 of 9 large river ambient monitoring sites in the North Coast MA had improving trends in water quality.<br>▪ Compared to other MAs the North Coast had the poorest dissolved oxygen saturation levels and macroinvertebrates. | Although not currently a significant constraint on coho recovery, water quality has the potential of limiting coho production at local spatial scales. | ● | Take restoration action at local spatial scales as appropriate to maintain or improve rearing capacity. |
| **WATER QUANTITY**<br>Data scale: ESU [ ] MA [X] POP [ ] | ▪ Oregon Water Law<br>▪ 850 miles of stream are protected (instream right).<br>▪ At an 80% exceedance flow, water is not available for new appropriations in August in 97% of the total area of the North Coast MA. | ▪ Over 80% of the North Coast MA had an August consumptive use less than 10% of the 80% natural exceedance flow.<br>▪ The Necanicum, Tillamook, and Netarts populations had the greatest portion of their total watershed (up to 12% of the total area) with August consumptive use more than 100% of the 80% exceedance natural flow.<br>▪ 97% of the total North Coast MA had no change in August consumptive use between 1997 and 2004. | Although not currently a significant constraint on coho recovery, water quantity has the potential of limiting coho production at local spatial scales. | | Focus habitat restoration investments in areas of high intrinsic coho potential. |
| **OTHER FACTORS**<br>Toxics, DO, pH, Stream fertility and shade, Spawning gravel, Hydro power, Illegal harvest, Disease, Estuaries, Wetlands, Exotic fish interactions, Predation by birds & pinnipeds | Assessed data, literature, and local observations. | Data, analyses, and interpretation of these limiting factors are available at www.oregon-plan.org. | Although not currently a significant constraint on coho recovery, each factor has the potential of limiting coho at local spatial scales. | | Remain alert to detect future change in importance of these factors. |

* *Primary and Secondary risk factors that most limit the population. Supporting information can be viewed at* www.oregon-plan.org/OPSW/cohoproject/coho_proj.shtml.

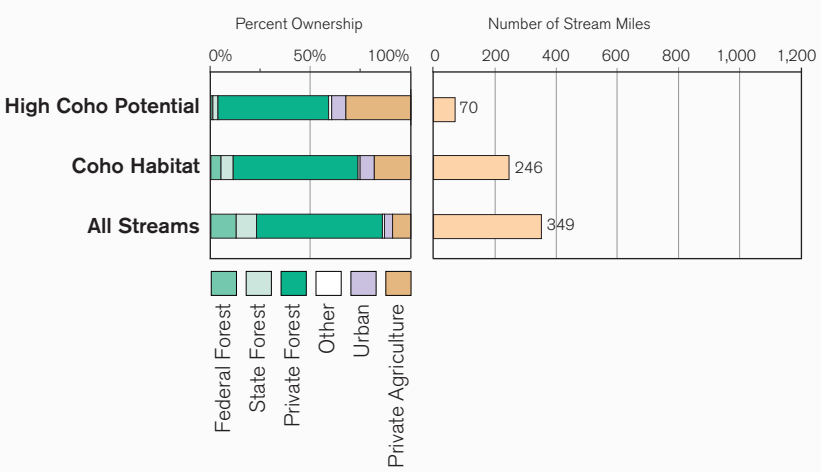
# Yaquina Population Unit

**Watershed Assessments**
**Percent of Population Unit Completed**
**1997: *25.5%***
**2004: *100%***

## Restoration Completed and Reported 1997 - 2003




## Characteristics of Coho Habitat

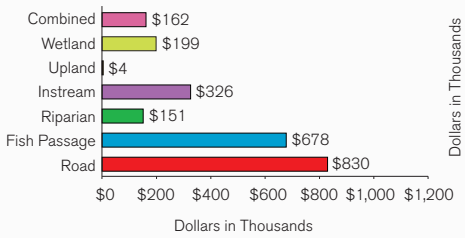



## State/County Culverts with High Priority for Improvement

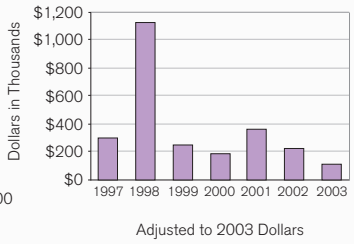
## Historic Splash Dam Sites

## Restoration Funding 1997 - 2003: $2.3 Million

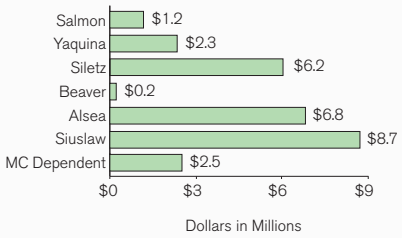
### Restoration Activity Type



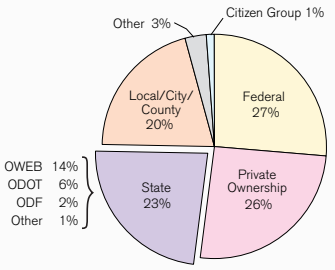

### Restoration Yearly Total




### Restoration Funds Region Total




### Source of Restoration Funds



# Analysis of Yaquina Population Unit

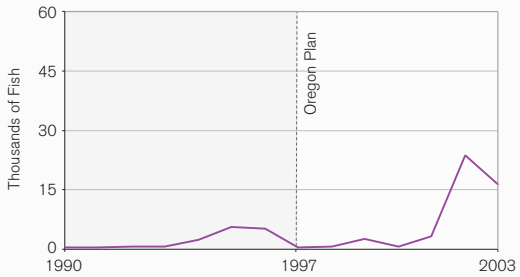
## Biological Viability Status

**PASS+**

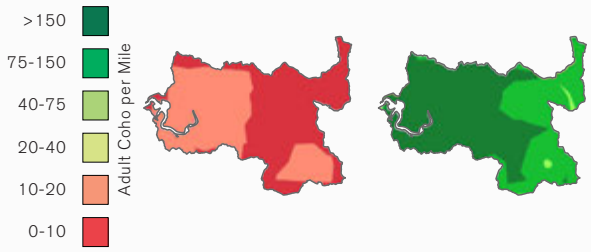
PASS

FAIL

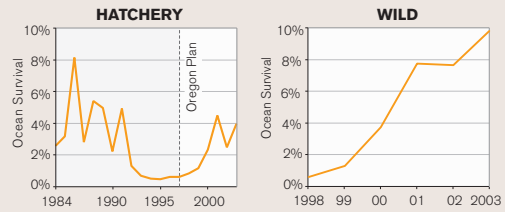
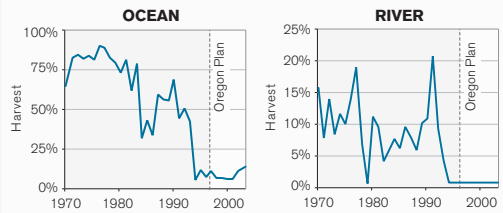
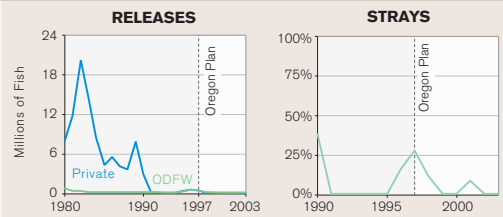
## Number of Wild Adult Spawners




## Density of Wild Adult Spawners




## Analysis of Potential Limiting Factors

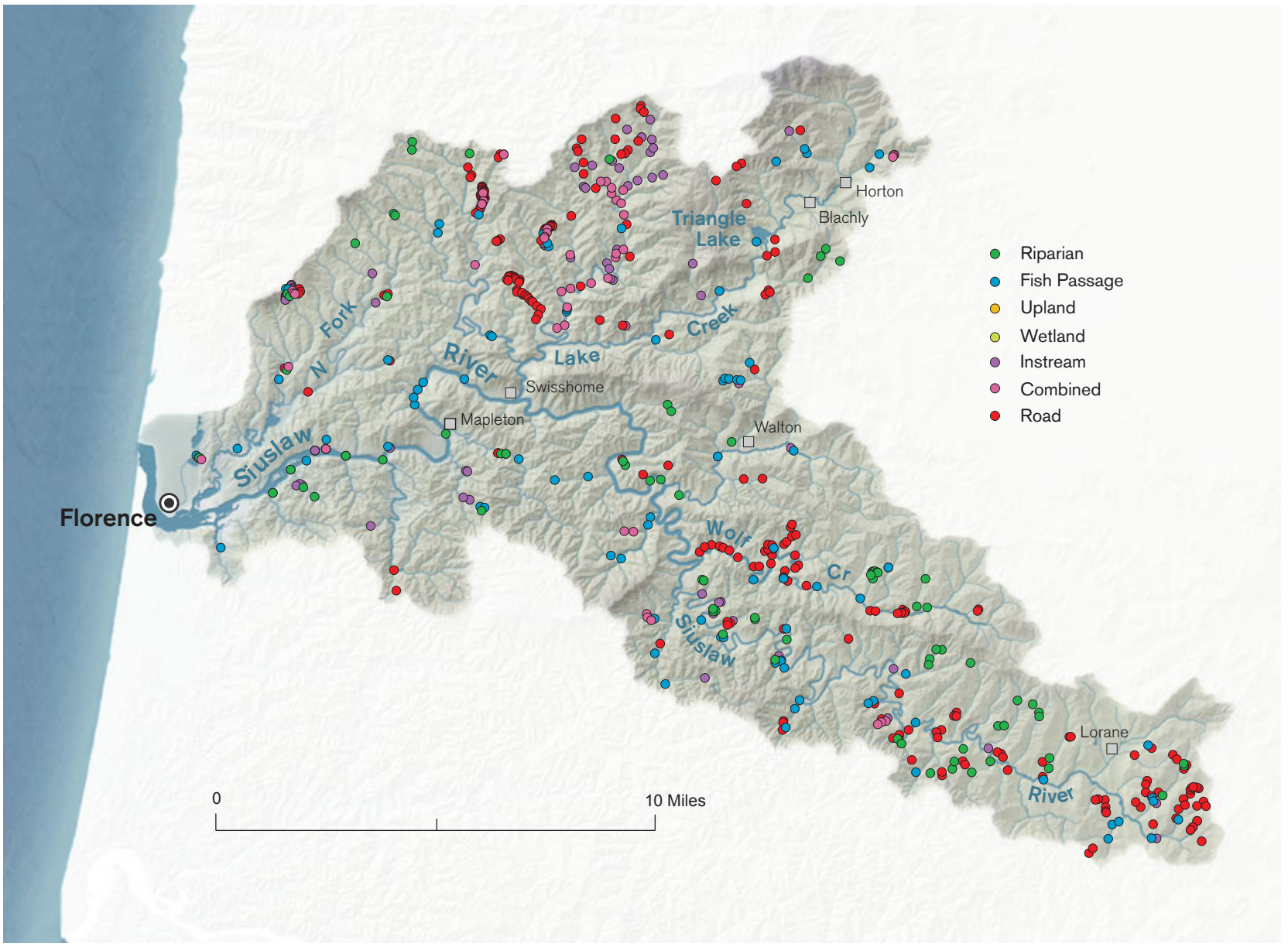
| FACTOR | OREGON PLAN ACTION | OBSERVATIONS | INTERPRETATION | PRIMARY LIMITING FACTOR* | NEED |
|---|---|---|---|---|---|
| **MARINE HABITAT**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | Hatchery coho survival monitored at all hatcheries. Wild coho survival monitored at five lifecycle monitoring sites. |  | Marine survival rate of both hatchery and wild coho increased coincident with Oregon Plan implementation. | **N/A** | Adjust harvest levels consistent with marine survival, adult escapement and population needs. |
| **FISHERY HARVEST**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | Harvest rates dictated by PFMC Amendment 13 will constrain harvest of wild coho consistent with recovery needs. |  | High harvest rates on coho prior to Oregon Plan have been reduced by management action. Harvest rates are no longer limiting recovery. | | Maintain PFMC Amendment 13 to restrain harvest consistent with population productivity. |
| **HATCHERY IMPACTS**<br>Data scale: ESU MA POP<br>☐ ☐ ☒ | Genetic Management Plans have been drafted for all hatcheries - awaiting approval by NOAA. Hatchery practices are managed consistent with local population status and recovery needs. |  | Hatchery programs are not constraining coho recovery. The percent of hatchery coho in natural spawning areas has declined because of management action and is now within policy guidelines. | | Continue implementing Native Fish Conservation Policy and Hatchery Genetic Management Plans. |
| **STREAM COMPLEXITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Regulatory programs: Oregon For. Practices, Fill and Removal, Federal Forest Plan, Goal 5.<br>▪ Conduct restoration to recruit wood and increase complexity.<br>Instream miles treated.....219<br>Riparian miles planted.....108<br>Riparian miles fenced.....18 | ▪ Coho streams have less large wood, more fine sediment, and fewer streamside conifers than reference streams.<br>▪ No significant trend was detected in most habitat parameters over the last decade. | Availability of complex stream habitat probably limits coho production. | ● | Focus habitat restoration investments in areas of high intrinsic coho potential. |
| **FISH PASSAGE**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | ▪ Fish Passage Law<br>▪ Improve fish passage at stream crossings.<br>Counted.....4,413<br>Improved.....1,140<br>Mapped.....3,392<br>Assessed.....2,145<br>Unknown.....1,247 | ▪ Improved access - result to date<br>Non Coho Distribution.....+16%<br>Non HIP Coho Distribution.....+10%<br>HIP Coho Distribution.....+6%<br>▪ Improved Access - remaining opportunity<br>Non Coho.....16% impaired - 40% unknown<br>Non HIP Coho.....11% impaired - 32% unknown<br>HIP.....10% impaired - 28% unknown | It is unknown if coho have access to roughly one third of their potential habitat. Access can be improved 10% by correcting documented problems. Impact of tide gates has not been determined. | | Opportunity to increase access to high quality habitat may exist in local areas. Focus passage inventory and restoration in these areas. |
| **WATER QUALITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Federal Clean Water Act<br>▪ Conduct restoration to reduce sediment, moderate temp.<br>▪ SB-1010 Plans completed<br>▪ TMDLs are being developed<br>Road miles upgraded ..... 337<br>Road miles retired .....147 | ▪ The MidCoast MA showed moderate to poor water quality.<br>▪ 54% and 44% of coho streams miles exceeded criteria for temperature and fine sediment respectively; macroinvertebrate targets were met for 62% of coho stream miles.<br>▪ 1 of 5 large river ambient monitoring sites had an improving trend in water quality. | Although not currently a significant constraint on coho recovery, water quality has the potential of limiting coho production at local spatial scales. | ● | Take restoration action at local spatial scales as appropriate to maintain or improve rearing capacity. |
| **WATER QUANTITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Oregon Water Law<br>▪ 1,000 miles of stream are protected (instream right).<br>▪ At an 80% exceedance flow, water is not available for new appropriations in August in 83% of the MidCoast MA. | ▪ 80% of the MidCoast MA had an August consumptive use less than 10% of the 80% natural exceedance flow.<br>▪ 96% of the MidCoast MA had no change in August consumptive use between 1997 and 2004. | Although not currently a significant constraint on coho recovery, water quantity has the potential of limiting coho production at local spatial scales. | | Focus habitat restoration investments in areas of high intrinsic coho potential. |
| **OTHER FACTORS**<br>Toxics, DO, pH, Stream fertility and shade, Spawning gravel, Hydro power, Illegal harvest, Disease, Estuaries, Wetlands, Exotic fish interactions, Predation by birds & pinnipeds | Assessed data, literature, and local observations. | Data, analyses, and interpretation of these limiting factors are available at www.oregon-plan.org. | Although not currently a significant constraint on coho recovery, each factor has the potential of limiting coho at local spatial scales. | | Remain alert to detect future change in importance of these factors. |

** Primary and secondary risk factor(s) that most limit the population. Supporting information can be viewed at* www.oregon-plan.org/OPSW/cohoproject/coho_proj.shtml.

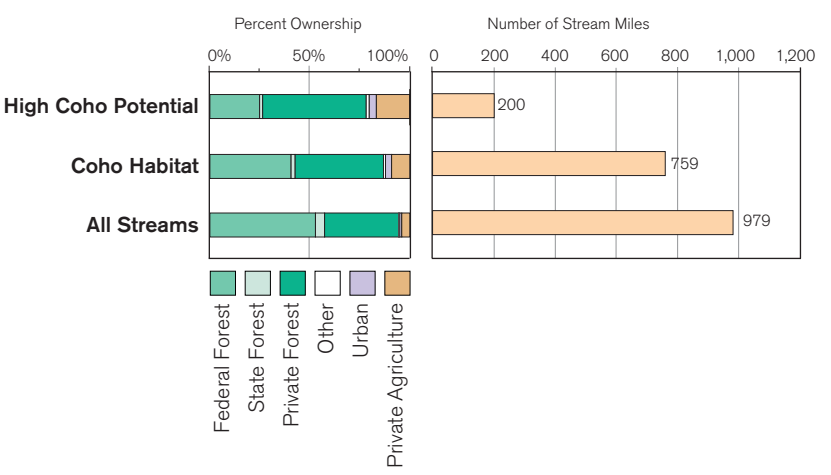
# Siuslaw Population Unit

**Watershed Assessments**
**Percent of Population Unit Completed**
**1997: 44.3%**
**2004: 100%**

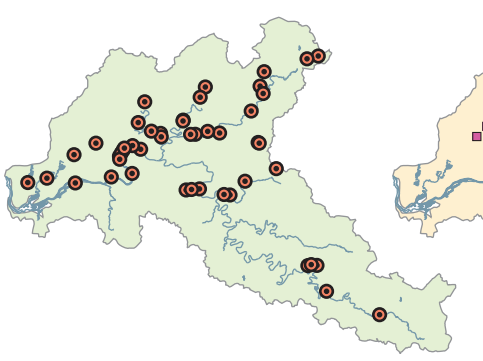
## Restoration Completed and Reported 1997 - 2003



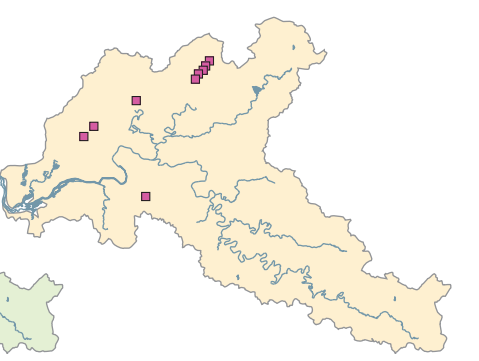

## Characteristics of Coho Habitat




## State/County Culverts with High Priority for Improvement

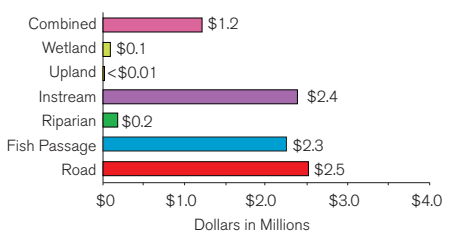


## Historic Splash Dam Sites

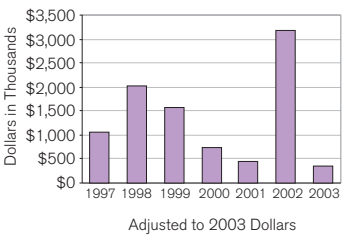


## Restoration Funding 1997 - 2003: $8.7 Million

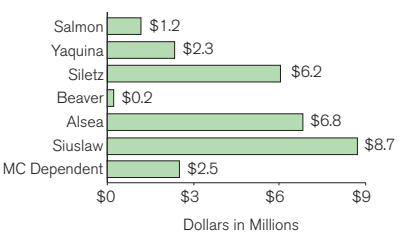
### Restoration Activity Type



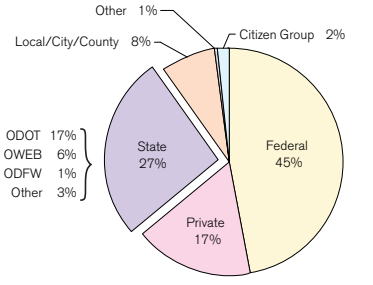

### Restoration Yearly Total




### Restoration Funds Region Total




### Source of Restoration Funds



# Analysis of Siuslaw Population Unit

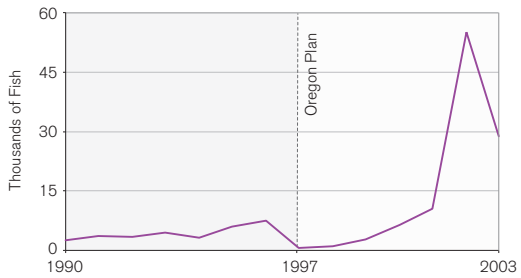
## Biological Viability Status

PASS+

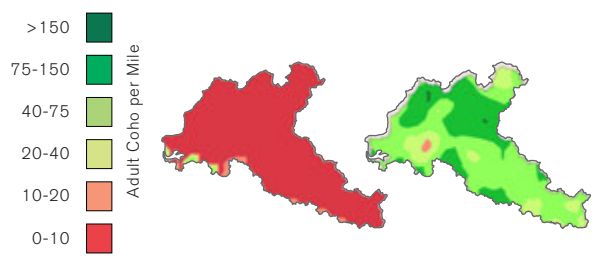
PASS

FAIL

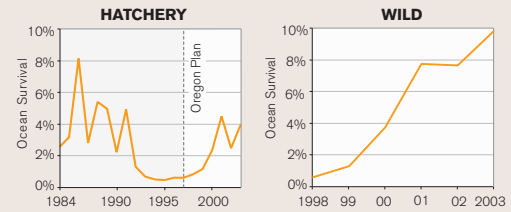
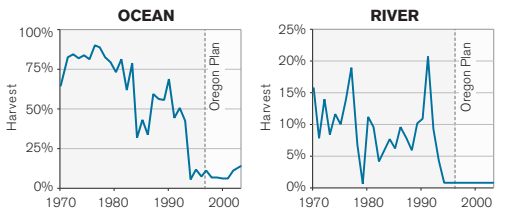
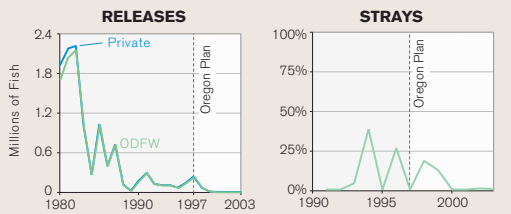
## Number of Wild Adult Spawners




## Density of Wild Adult Spawners




## Analysis of Potential Limiting Factors

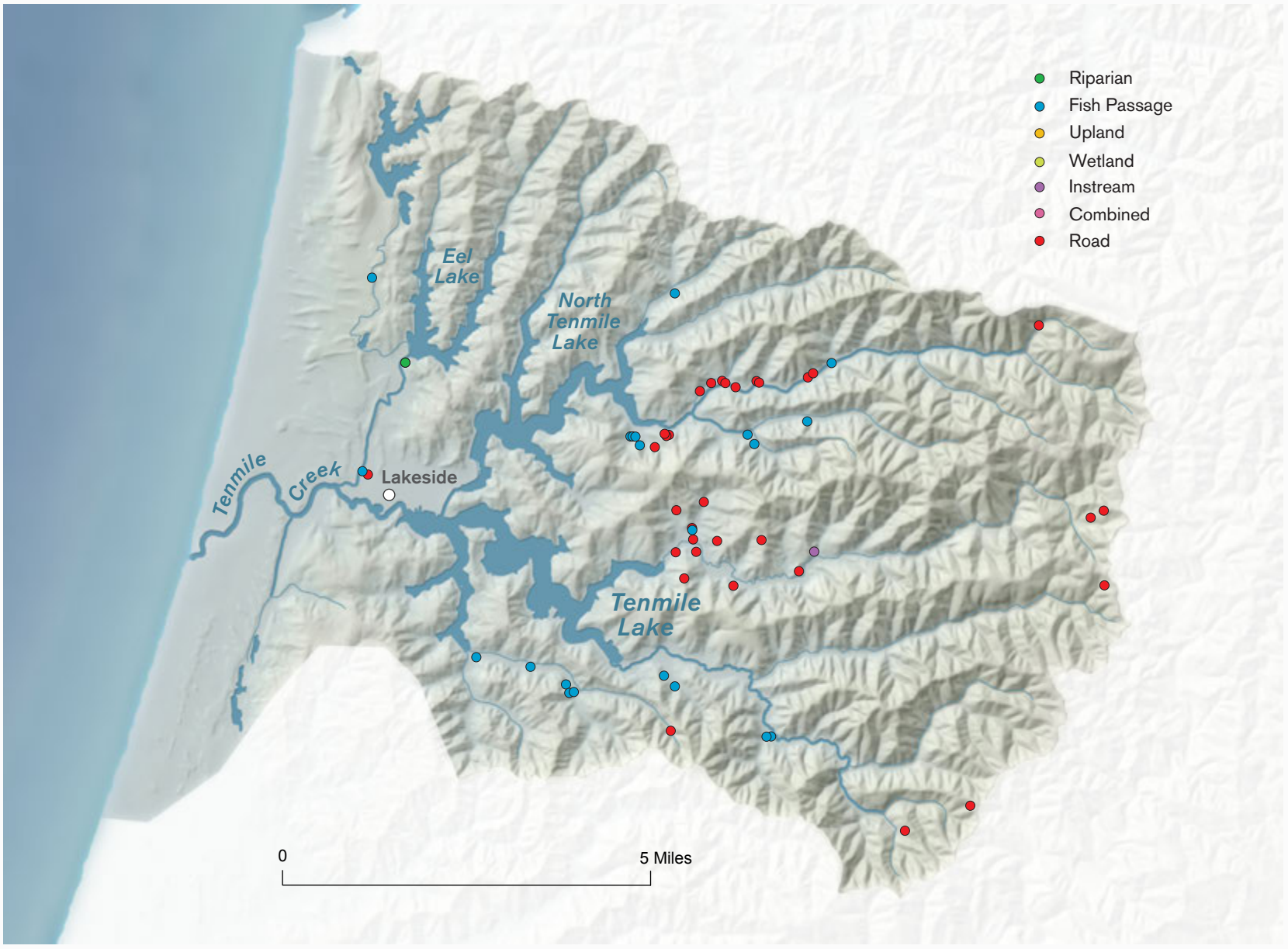
| FACTOR | OREGON PLAN ACTION | OBSERVATIONS | INTERPRETATION | PRIMARY LIMITING FACTOR* | NEED |
|---|---|---|---|---|---|
| **MARINE HABITAT**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | Hatchery coho survival monitored at all hatcheries. Wild coho survival monitored at five lifecycle monitoring sites. |  | Marine survival rate of both hatchery and wild coho increased coincident with Oregon Plan implementation. | **N/A** | Adjust harvest levels consistent with marine survival, adult escapement and population needs. |
| **FISHERY HARVEST**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | Harvest rates dictated by PFMC Amendment 13 will constrain harvest of wild coho consistent with recovery needs. |  | High harvest rates on coho prior to Oregon Plan have been reduced by management action. Harvest rates are no longer limiting recovery. | | Maintain PFMC Amendment 13 to restrain harvest consistent with population productivity. |
| **HATCHERY IMPACTS**<br>Data scale: ESU MA POP<br>☐ ☐ ☒ | Genetic Management Plans have been drafted for all hatcheries - awaiting approval by NOAA. Hatchery practices are managed consistent with local population status and recovery needs. |  | Hatchery programs are not constraining coho recovery. The percent of hatchery coho in natural spawning areas has declined because of management action and is now within policy guidelines. | | Continue implementing Native Fish Conservation Policy and Hatchery Genetic Management Plans. |
| **STREAM COMPLEXITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Regulatory programs: Oregon For. Practices, Fill and Removal, Federal Forest Plan, Goal 5.<br>▪ Conduct restoration to recruit wood and increase complexity.<br>Instream miles treated.....219<br>Riparian miles planted.....108<br>Riparian miles fenced.....18 | ▪ Coho streams have less large wood, more fine sediment, and fewer streamside conifers than reference streams.<br>▪ No significant trend was detected in most habitat parameters over the last decade. | Availability of complex stream habitat probably limits coho production. | | Focus habitat restoration investments in areas of high intrinsic coho potential. |
| **FISH PASSAGE**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | ▪ Fish Passage Law<br>▪ Improve fish passage at stream crossings.<br>Counted.....4,413<br>Improved.....1,140<br>Mapped.....3,392<br>Assessed.....2,145<br>Unknown.....1,247 | ▪ Improved access - result to date<br>Non Coho Distribution.....+16%<br>Non HIP Coho Distribution.....+10%<br>HIP Coho Distribution.....+6%<br>▪ Improved Access - remaining opportunity<br>Non Coho.....16% impaired - 40% unknown<br>Non HIP Coho.....11% impaired - 32% unknown<br>HIP.....10% impaired - 28% unknown | It is unknown if coho have access to roughly one third of their potential habitat. Access can be improved 10% by correcting documented problems. Impact of tide gates has not been determined. | | Opportunity to increase access to high quality habitat may exist in local areas. Focus passage inventory and restoration in these areas. |
| **WATER QUALITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Federal Clean Water Act<br>▪ Conduct restoration to reduce sediment, moderate temp.<br>▪ SB-1010 Plans completed<br>▪ TMDLs are being developed<br>Road miles upgraded ..... 337<br>Road miles retired .....147 | ▪ The MidCoast MA showed moderate to poor water quality.<br>▪ 54% and 44% of coho streams miles exceeded criteria for temperature and fine sediment respectively; macroinvertebrate targets were met for 62% of coho stream miles.<br>▪ 1 of 5 large river ambient monitoring sites had an improving trend in water quality. | Although not currently a significant constraint on coho recovery, water quality has the potential of limiting coho production at local spatial scales. | | Take restoration action at local spatial scales as appropriate to maintain or improve rearing capacity. |
| **WATER QUANTITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Oregon Water Law<br>▪ 1,000 miles of stream are protected (instream right).<br>▪ At an 80% exceedance flow, water is not available for new appropriations in August in 83% of the MidCoast MA. | ▪ 80% of the MidCoast MA had an August consumptive use less than 10% of the 80% natural exceedance flow.<br>▪ 96% of the MidCoast MA had no change in August consumptive use between 1997 and 2004. | Although not currently a significant constraint on coho recovery, water quantity has the potential of limiting coho production at local spatial scales. | | Focus habitat restoration investments in areas of high intrinsic coho potential. |
| **OTHER FACTORS**<br>Toxics, DO, pH, Stream fertility and shade, Spawning gravel, Hydro power, Illegal harvest, Disease, Estuaries, Wetlands, Exotic fish interactions, Predation by birds & pinnipeds | Assessed data, literature, and local observations. | Data, analyses, and interpretation of these limiting factors are available at www.oregon-plan.org. | Although not currently a significant constraint on coho recovery, each factor has the potential of limiting coho at local spatial scales. | | Remain alert to detect future change in importance of these factors. |

* Primary and secondary risk factor(s) that most limit the population. Supporting information can be viewed at www.oregon-plan.org/OPSW/cohoproject/coho_proj.shtml.

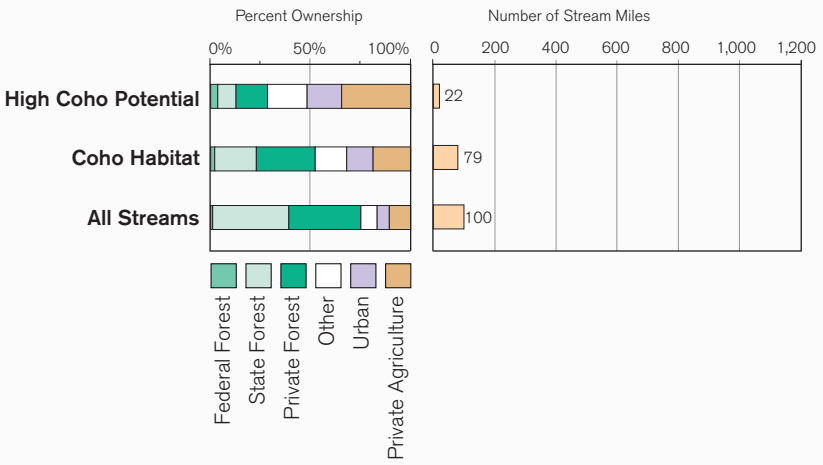
# Tenmile Population Unit

**Watershed Assessments**
**Percent of Population Unit Completed**
**1997: *0%***
**2004: *100%***

## Restoration Completed and Reported 1997 - 2003




## Characteristics of Coho Habitat

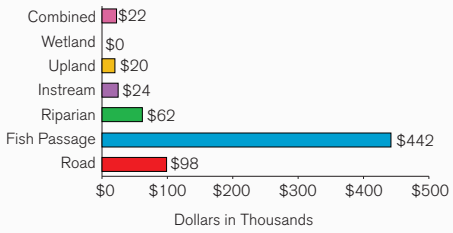



## State/County Culverts with High Priority for Improvement

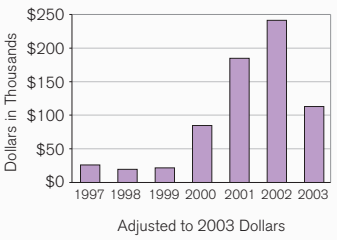
## Historic Splash Dam Sites

## Restoration Funding 1997 - 2003: $0.7 Million

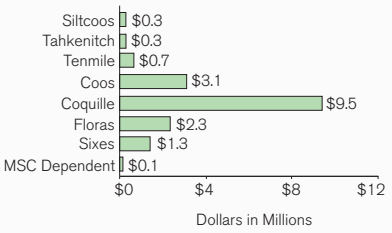
### Restoration Activity Type



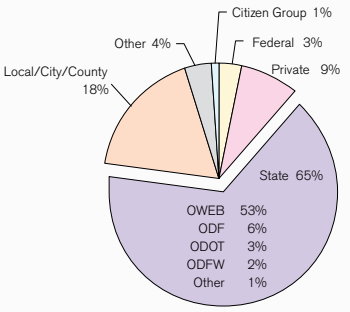

### Restoration Yearly Total




### Restoration Funds Region Total




### Source of Restoration Funds



# Analysis of Tenmile Population Unit

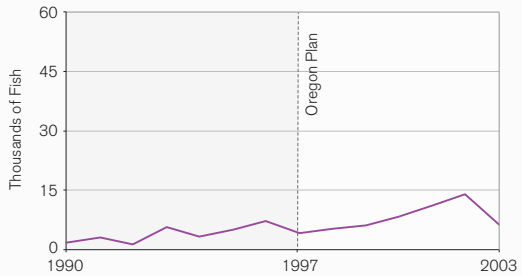
## Biological Viability Status

**PASS+**

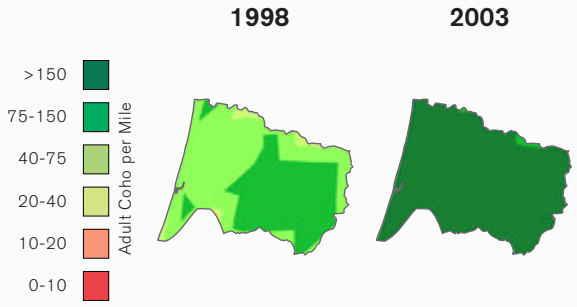
PASS

FAIL

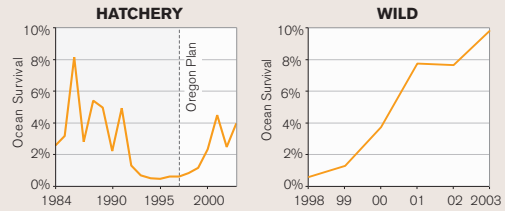
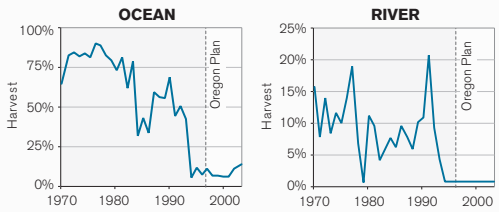
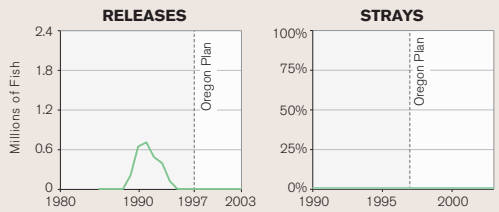
## Number of Wild Adult Spawners




## Density of Wild Adult Spawners




## Analysis of Potential Limiting Factors

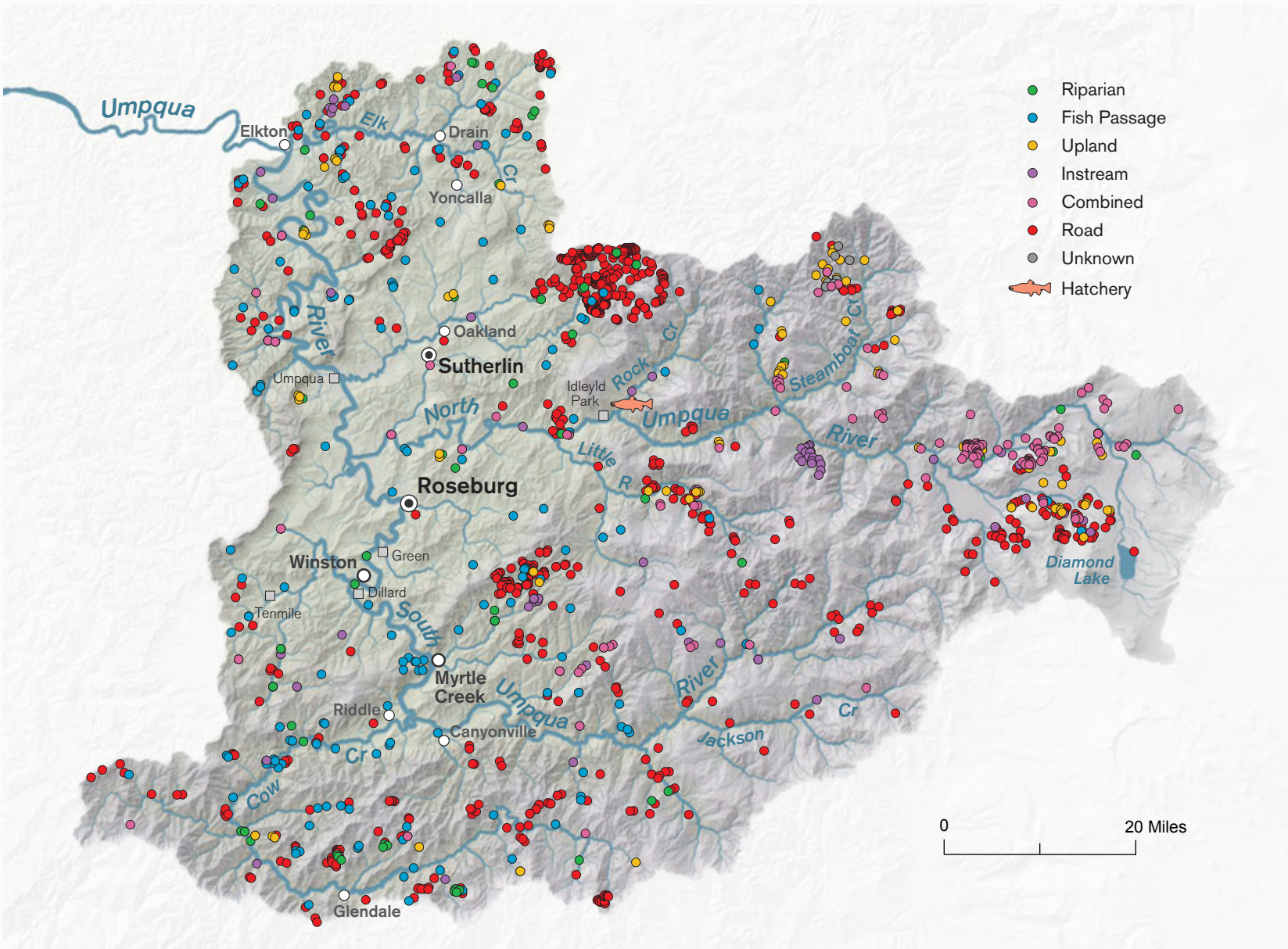
| FACTOR | OREGON PLAN ACTION | OBSERVATIONS | INTERPRETATION | PRIMARY LIMITING FACTOR* | NEED |
|---|---|---|---|---|---|
| **MARINE HABITAT**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | Hatchery coho survival monitored at all hatcheries. Wild coho survival monitored at five lifecycle monitoring sites. |  | Marine survival rate of both hatchery and wild coho increased coincident with Oregon Plan implementation. | **N/A** | Adjust harvest levels consistent with marine survival, adult escapement and population needs. |
| **FISHERY HARVEST**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | Harvest rates dictated by PFMC Amendment 13 will constrain harvest of wild coho consistent with recovery needs. |  | High harvest rates on coho prior to Oregon Plan have been reduced by management action. Harvest rates are no longer limiting recovery. | | Maintain PFMC Amendment 13 to restrain harvest consistent with population productivity. |
| **HATCHERY IMPACTS**<br>Data scale: ESU MA POP<br>☐ ☐ ☒ | Genetic Management Plans have been drafted for all hatcheries - awaiting approval by NOAA. Hatchery practices are managed consistent with local population status and recovery needs. |  | Hatchery programs are not constraining coho recovery. The percent of hatchery coho in natural spawning areas has declined because of management action and is now within policy guidelines. | | Continue implementing Native Fish Conservation Policy and Hatchery Genetic Management Plans. |
| **STREAM COMPLEXITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Regulatory programs: Oregon For. Practices, Fill and Removal, Federal Forest Plan, Goal 5.<br>▪ Conduct restoration to recruit wood and increase complexity.<br>Instream miles treated.....85<br>Riparian miles planted.....121<br>Riparian miles fenced.....120 | ▪ Coho streams have less large wood, more fine sediment, and fewer streamside conifers than reference streams.<br>▪ No significant trend was detected in most habitat parameters over the last decade. | Availability of spawning habitat probably limits coho production. | | Focus habitat restoration investments in areas of high intrinsic coho potential. |
| **FISH PASSAGE**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | ▪ Fish Passage Law<br>▪ Improve fish passage at stream crossings.<br>Counted.....4,413<br>Improved.....1,140<br>Mapped.....3,392<br>Assessed.....2,145<br>Unknown.....1,247 | ▪ Improved access - result to date<br>Non Coho Distribution.....+16%<br>Non HIP Coho Distribution.....+10%<br>HIP Coho Distribution.....+6%<br>▪ Improved Access - remaining opportunity<br>Non Coho.....16% impaired - 40% unknown<br>Non HIP Coho.....11% impaired - 32% unknown<br>HIP.....10% impaired - 28% unknown | It is unknown if coho have access to roughly one third of their potential habitat. Access can be improved 10% by correcting documented problems. Impact of tide gates has not been determined. | | Opportunity to increase access to high quality habitat may exist in local areas. Focus passage inventory and restoration in these areas. |
| **WATER QUALITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Federal Clean Water Act<br>▪ Conduct restoration to reduce sediment, moderate temp.<br>▪ SB-1010 Plans completed<br>▪ TMDLs are being developed<br>Road miles upgraded .....194<br>Road miles retired .....56 | ▪ The MidSouth Coast had moderate to good water quality.<br>▪ This MA had the best water quality for dissolved oxygen concentration, pH, phosphorus, and macroinvertebrates, but the poorest conditions for nitrogen.<br>▪ 70% of the stream miles met benchmarks for macroinvertebrates.<br>▪ 4 of 8 larger river ambient sites had improving water quality trends; 50% fair, 25% good, and 25% very poor water quality. | Although not currently a significant constraint on coho recovery, water quality has the potential of limiting coho production at local spatial scales. | | Take restoration action at local spatial scales as appropriate to maintain or improve rearing capacity. |
| **WATER QUANTITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Oregon Water Law<br>▪ 900 miles of stream are protected (instream right).<br>▪ 9 cfs of water has been leased instream in the MidSouth MA.<br>▪ At an 80% exceedance flow, water is not available for new appropriations in August in 93% of the MidSouth MA. | ▪ August consumptive use was highest in the MidSouth Coast and Umpqua MAs.<br>▪ Over 60% of the MidSouth Coast MA had an August consumptive use less than 10% of the 80% natural exceedance flow.<br>▪ 92% of the MidSouth Coast MA had no change in August consumptive use between 1997 and 2004. | Although not currently a significant constraint on coho recovery, water quantity has the potential of limiting coho production at local spatial scales. | | Focus habitat restoration investments in areas of high intrinsic coho potential. |
| **OTHER FACTORS**<br>Toxics, DO, pH, Stream fertility and shade, Spawning gravel, Hydro power, Illegal harvest, Disease, Estuaries, Wetlands, Exotic fish interactions, Predation by birds & pinnipeds | Assessed data, literature, and local observations. | Data, analyses, and interpretation of these limiting factors are available at www.oregon-plan.org. | Although not currently a significant constraint on coho recovery, each factor has the potential of limiting coho at local spatial scales. | *Exotic fish species* | Remain alert to detect future change in importance of these factors. |

* *Primary and secondary risk factor(s) that most limit the population. Supporting information can be viewed at* www.oregon-plan.org/OPSW/cohoproject/coho_proj.shtml.

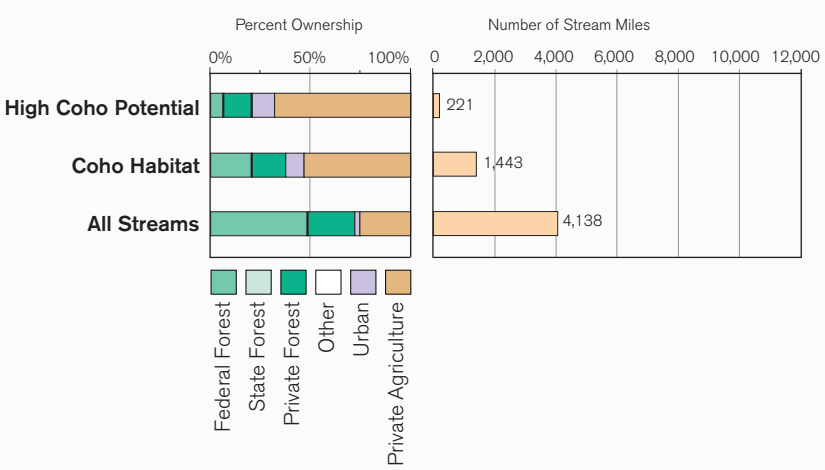
# Upper Umpqua Population Unit

**Watershed Assessments**
**Percent of Population Unit Completed**
**1997: *34.0%***
**2004: *98.5%***

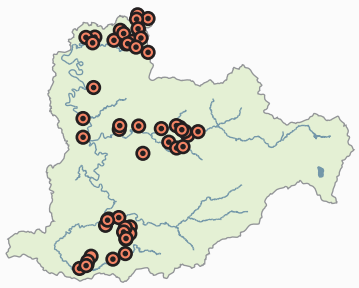
## Restoration Completed and Reported 1997 - 2003



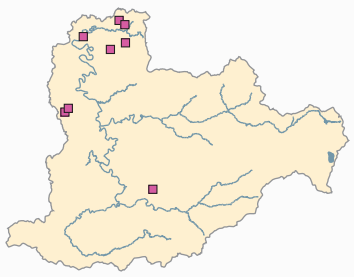

## Characteristics of Coho Habitat




## State/County Culverts with High Priority for Improvement

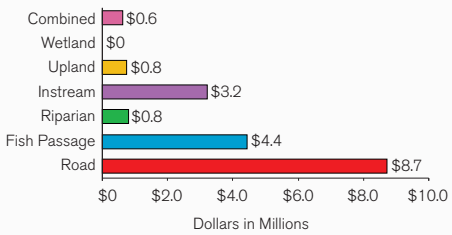


## Historic Splash Dam Sites

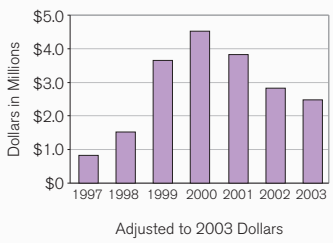


## Restoration Funding 1997 - 2003: $18.6 Million

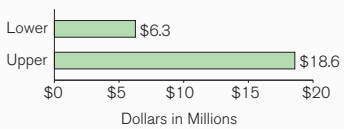
### Restoration Activity Type



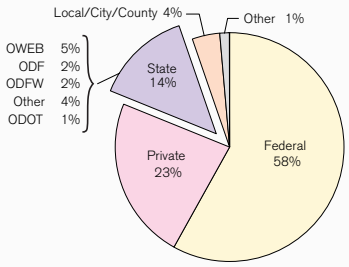

### Restoration Yearly Total




### Restoration Funds Region Total




### Source of Restoration Funds

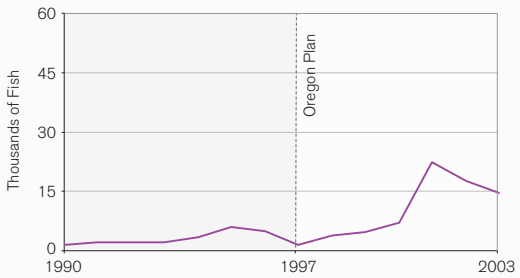


# Analysis of Upper Umpqua Populations

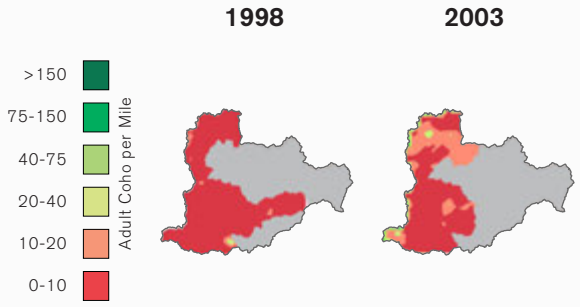
## Biological Viability Status

| Middle Umpqua | North Umpqua | South Umpqua |
|---|---|---|
| **PASS+** | PASS+ | **PASS+** |
| PASS | PASS | PASS |
| FAIL | **FAIL** | FAIL |

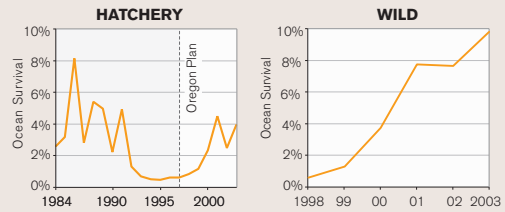
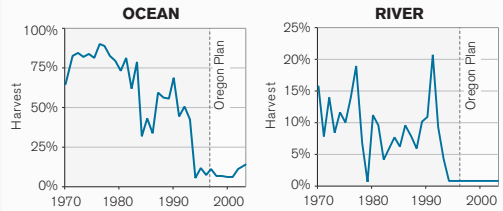
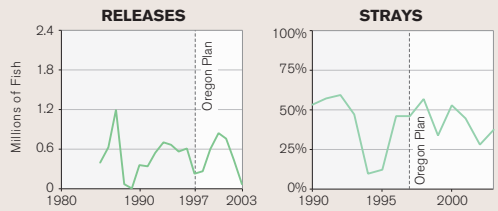
## Number of Wild Adult Spawners




## Density of Wild Adult Spawners




## Analysis of Potential Limiting Factors

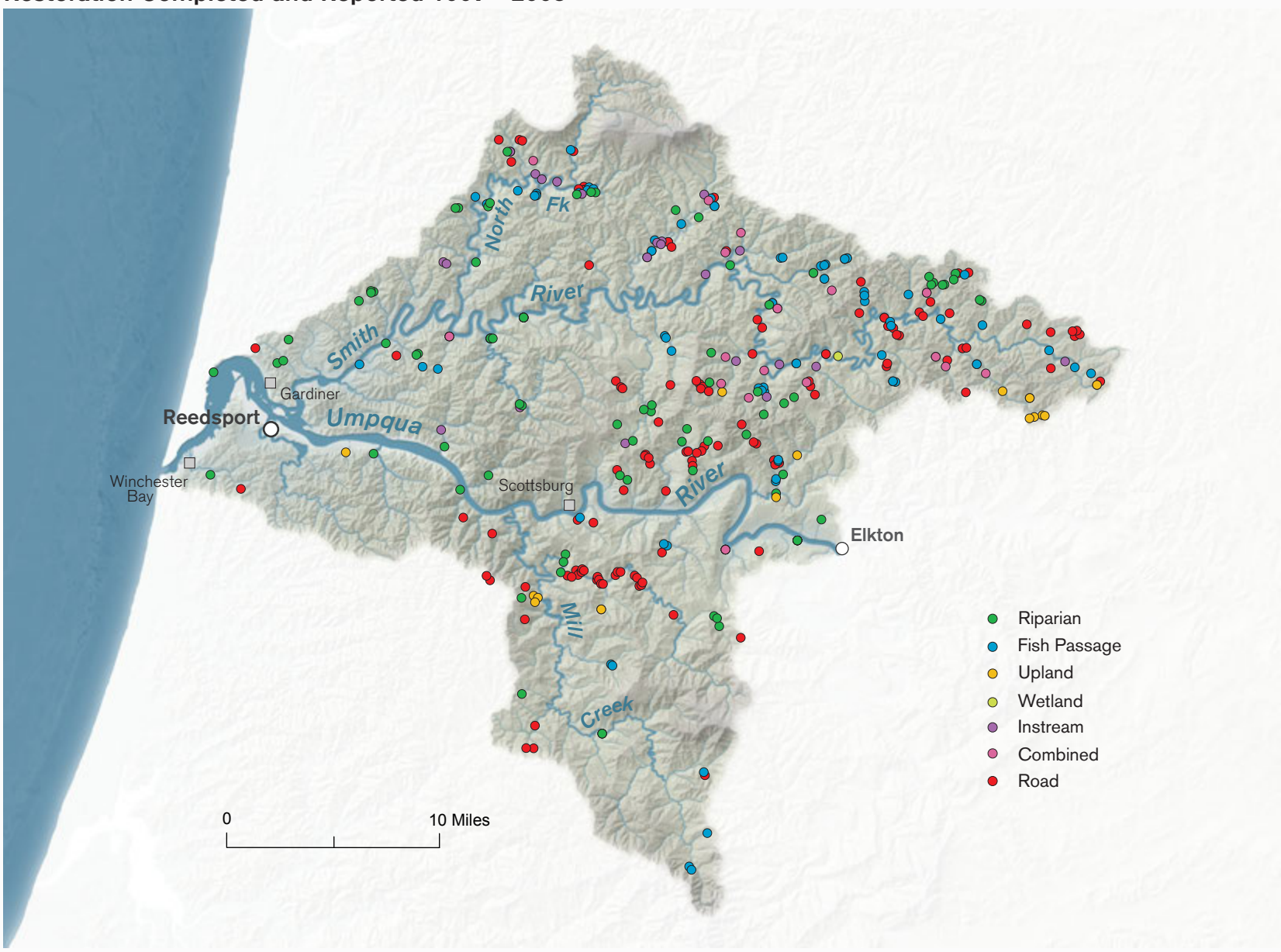
| FACTOR | OREGON PLAN ACTION | OBSERVATIONS | INTERPRETATION | PRIMARY LIMITING FACTOR* | NEED |
|---|---|---|---|---|---|
| **MARINE HABITAT**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | Hatchery coho survival monitored at all hatcheries. Wild coho survival monitored at five lifecycle monitoring sites. |  | Marine survival rate of both hatchery and wild coho increased coincident with Oregon Plan implementation. | **N/A** | Adjust harvest levels consistent with marine survival, adult escapement and population needs. |
| **FISHERY HARVEST**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | Harvest rates dictated by PFMC Amendment 13 will constrain harvest of wild coho consistent with recovery needs. |  | High harvest rates on coho prior to Oregon Plan have been reduced by management action. Harvest rates are no longer limiting recovery. | | Maintain PFMC Amendment 13 to restrain harvest consistent with population productivity. |
| **HATCHERY IMPACTS**<br>Data scale: ESU MA POP<br>☐ ☐ ☒ | Genetic Management Plans have been drafted for all hatcheries - awaiting approval by NOAA. Hatchery practices are managed consistent with local population status and recovery needs. |  | Hatchery programs are not constraining coho recovery. The percent of hatchery coho in natural spawning areas has declined because of management action and is now within policy guidelines. | **North Umpqua** | Continue implementing Native Fish Conservation Policy and Hatchery Genetic Management Plans. |
| **STREAM COMPLEXITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Regulatory programs: Oregon For. Practices, Fill and Removal, Federal Forest Plan, Goal 5.<br>▪ Conduct restoration to recruit wood and increase complexity.<br>Instream miles treated.....142<br>Riparian miles planted.....21<br>Riparian miles fenced.....49 | ▪ Coho streams have less large wood, less gravel in riffles, and fewer streamside conifers than reference streams.<br>▪ No significant trend was detected in most habitat parameters over the last decade.<br>▪ Umpqua habitat conditions were generally ranked lower than in other areas of the ESU. | Availability of complex stream habitat probably limits coho production. | **Middle Umpqua**<br>**North Umpqua**<br>**South Umpqua** | Focus habitat restoration investments in areas of high intrinsic coho potential. |
| **FISH PASSAGE**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | ▪ Fish Passage Law<br>▪ Improve fish passage at stream crossings.<br>Counted.....4,413<br>Improved.....1,140<br>Mapped.....3,392<br>Assessed.....2,145<br>Unknown.....1,247 | ▪ Improved access - result to date<br>Non Coho Distribution.....+16%<br>Non HIP Coho Distribution.....+10%<br>HIP Coho Distribution.....+6%<br>▪ Improved Access - remaining opportunity<br>Non Coho.....16% impaired - 40% unknown<br>Non HIP Coho.....11% impaired - 32% unknown<br>HIP.....10% impaired - 28% unknown | It is unknown if coho have access to roughly one third of their potential habitat. Access can be improved 10% by correcting documented problems. Impact of tide gates has not been determined. | | Opportunity to increase access to high quality habitat may exist in local areas. Focus passage inventory and restoration in these areas. |
| **WATER QUALITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Federal Clean Water Act<br>▪ Conduct restoration to reduce sediment, moderate temp.<br>▪ SB-1010 Plans have been completed<br>▪ TMDLs are being developed<br>Road miles upgraded .....334<br>Road miles retired .....203 | ▪ The Umpqua MA had the poorest overall water quality.<br>▪ This MA had the highest percentage of coho stream miles exceeding criteria for temperature, dissolved oxygen concentration, fine sediment, total solids, phosphorus, and vertebrate assemblage.<br>▪ 1 of 9 larger river ambient sites had an improving trend; 56% fair, 22% good to excellent, and 22% poor water quality. | Although not currently a significant constraint on coho recovery, water quality has the potential of limiting coho production at local spatial scales. | **Middle Umpqua**<br>**South Umpqua** | Take restoration action at local spatial scales as appropriate to maintain or improve rearing capacity. |
| **WATER QUANTITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Oregon Water Law<br>▪ 800 miles of stream are protected (instream right).<br>▪ At an 80% exceedance flow, water is not available for new appropriations in August in 98% of the Umpqua MA.<br>▪ 16 cfs of water has been restored in the Umpqua MA. | ▪ August consumptive use was highest in the MidSouth Coast and Umpqua MAs.<br>▪ Over 60% of the Umpqua MA had an August consumptive use less than 10% of the 80% natural exceedance flow.<br>▪ The Umpqua MA had up to 10% of watershed area with August consumptive use more than 100% of the 80% exceedance natural flow.<br>▪ 90% of the Umpqua area had no change in August consumptive use between 1997 and 2004. | Although not currently a significant constraint on coho recovery, water quantity has the potential of limiting coho production at local spatial scales. | **Middle Umpqua**<br>**South Umpqua** | Focus habitat restoration investments in areas of high intrinsic coho potential. |
| **OTHER FACTORS**<br>Toxics, DO, pH, Stream fertility and shade, Spawning gravel, Hydro power, Illegal harvest, Disease, Estuaries, Wetlands, Exotic fish interactions, Predation by birds & pinnipeds | Assessed data, literature, and local observations. | Data, analyses, and interpretation of these limiting factors are available at www.oregon-plan.org. | Although not currently a significant constraint on coho recovery, each factor has the potential of limiting coho at local spatial scales. | | Remain alert to detect future change in importance of these factors. |

** Primary and secondary risk factor(s) that most limit the population. Supporting information can be viewed at* www.oregon-plan.org/OPSW/cohoproject/coho_proj.shtml.

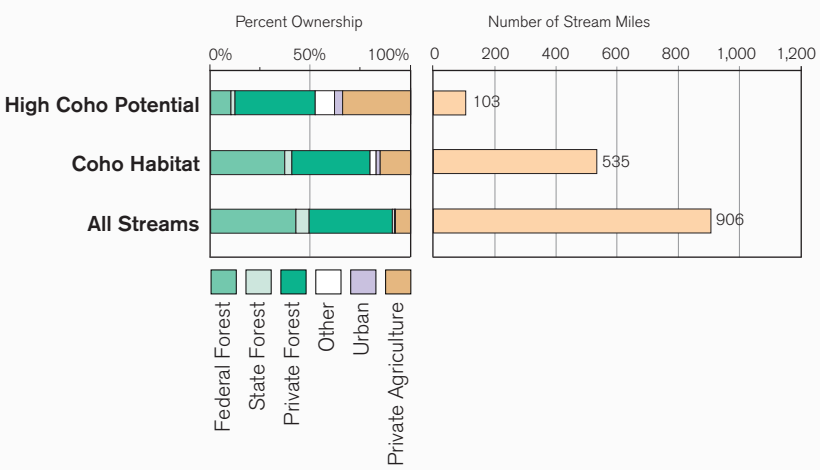
# Lower Umpqua Population Unit

**Watershed Assessments**
**Percent of Population Unit Completed**
**1997: *64.6%***
**2004: *97.2%***

## Restoration Completed and Reported 1997 - 2003




## Characteristics of Coho Habitat

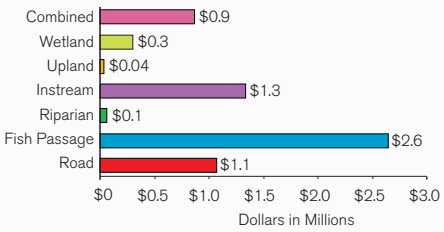



## State/County Culverts with High Priority for Improvement

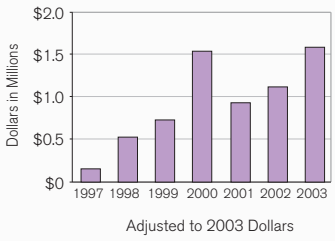
## Historic Splash Dam Sites

## Restoration Funding 1997 - 2003: $6.3 Million

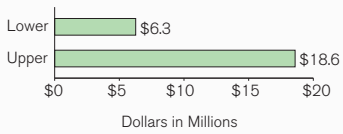
### Restoration Activity Type



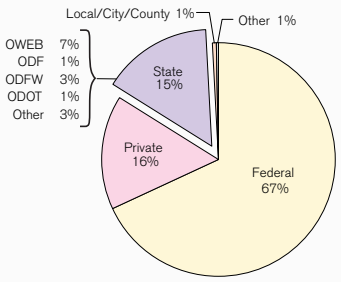

### Restoration Yearly Total




### Restoration Funds Region Total




### Source of Restoration Funds



# Analysis of Lower Umpqua Population Unit

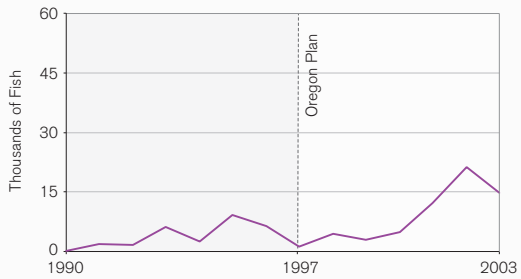
## Biological Viability Status

**PASS+**

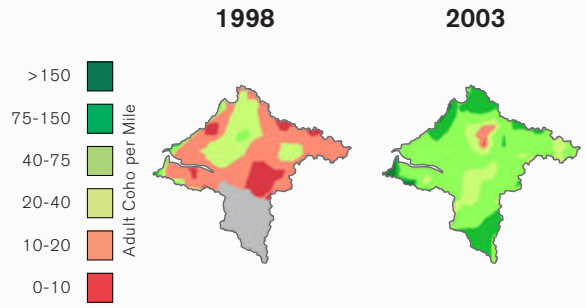
PASS

FAIL

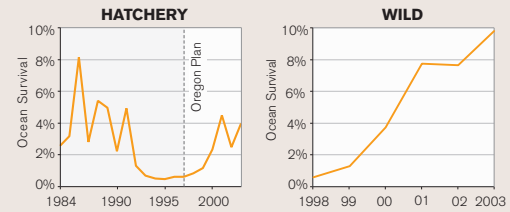
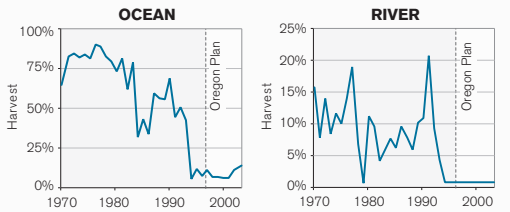
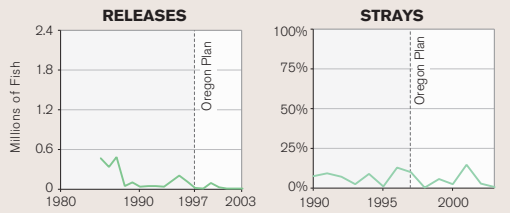
## Number of Wild Adult Spawners




## Density of Wild Adult Spawners




## Analysis of Potential Limiting Factors

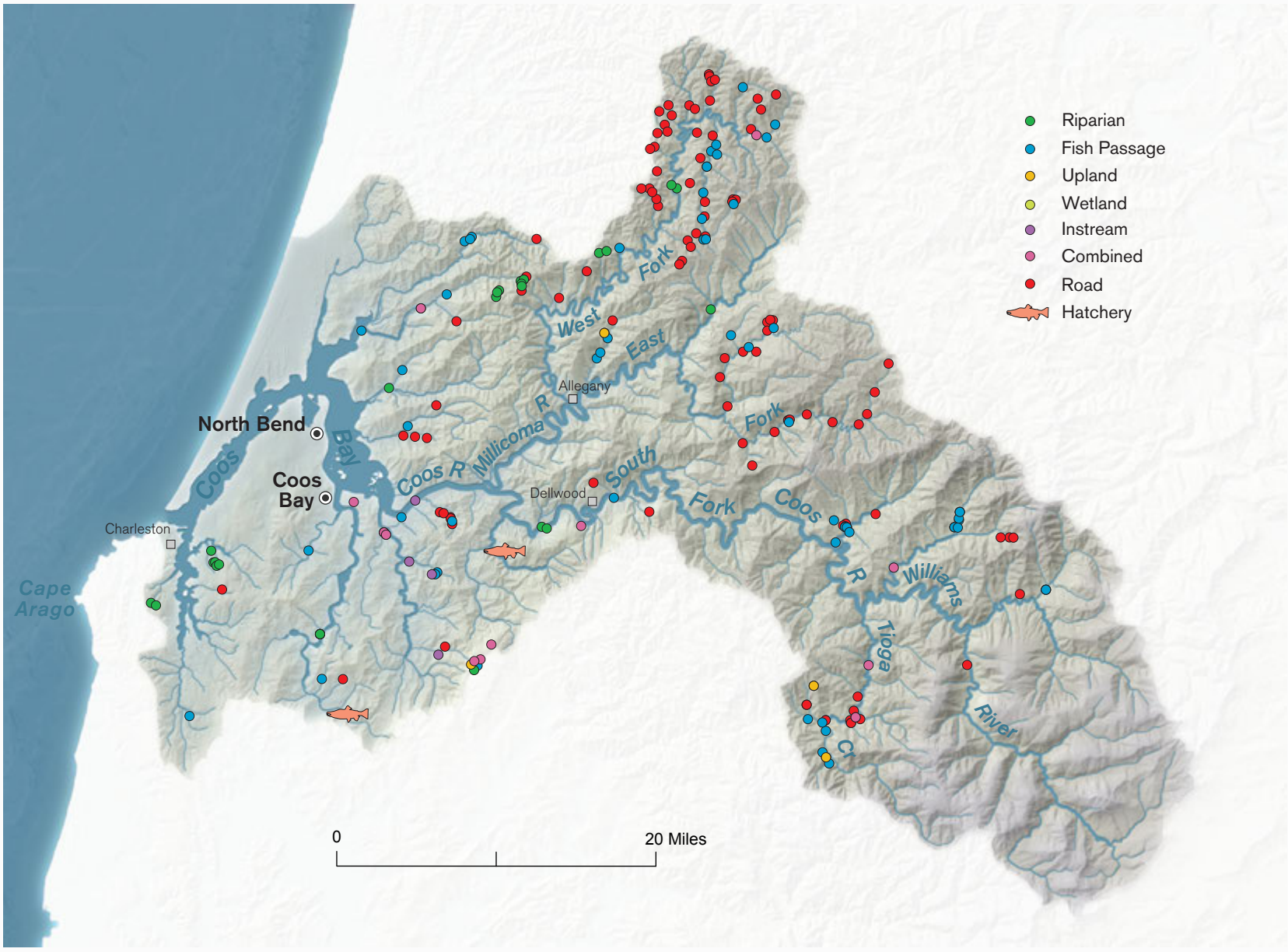
| FACTOR | OREGON PLAN ACTION | OBSERVATIONS | INTERPRETATION | PRIMARY LIMITING FACTOR* | NEED |
|---|---|---|---|---|---|
| **MARINE HABITAT**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | Hatchery Coho survival monitored at all hatcheries. Wild coho survival monitored at five lifecycle monitoring sites. |  | Marine survival rate of both hatchery and wild coho increased coincident with Oregon Plan implementation. | **N/A** | Adjust harvest levels consistent with marine survival, adult escapement and population needs. |
| **FISHERY HARVEST**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | Harvest rates dictated by PFMC Amendment 13 will constrain harvest of wild coho consistent with recovery needs. |  | High harvest rates on coho prior to Oregon Plan have been reduced by management action. Harvest rates are no longer limiting recovery. | | Maintain PFMC Amendment 13 to restrain harvest consistent with population productivity. |
| **HATCHERY IMPACTS**<br>Data scale: ESU MA POP<br>☐ ☐ ☒ | Genetic Management Plans have been drafted for all hatcheries - awaiting approval by NOAA. Hatchery practices are managed consistent with local population status and recovery needs. |  | Hatchery programs are not constraining coho recovery. The percent of hatchery coho in natural spawning areas has declined because of management action and is now within policy guidelines. | | Continue implementing Native Fish Conservation Policy and Hatchery Genetic Management Plans. |
| **STREAM COMPLEXITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Regulatory programs: OR For. Practices, Fill and Removal, Federal For. Plan, Goal 5.<br>▪ Conduct restoration to recruit wood and increase complexity.<br>Instream miles treated.....142<br>Riparian miles planted.....21<br>Riparian miles fenced.....49 | ▪ Coho streams have less large wood, less gravel in riffles, and fewer streamside conifers than reference streams.<br>▪ No significant trend was detected in most habitat parameters over the last decade.<br>▪ Umpqua habitat conditions were generally ranked lower than in other areas of the ESU. | Availability of complex stream habitat probably limits coho production. | ● | Focus habitat restoration investments in areas of high intrinsic coho potential. |
| **FISH PASSAGE**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | ▪ Fish Passage Law<br>▪ Improve fish passage at stream crossings.<br>Counted.....4,413<br>Improved.....1,140<br>Mapped.....3,392<br>Assessed.....2,145<br>Unknown.....1,247 | ▪ Improved access - result to date<br>Non Coho Distribution.....+16%<br>Non HIP Coho Distribution.....+10%<br>HIP Coho Distribution.....+6%<br>▪ Improved Access - remaining opportunity<br>Non Coho.....16% impaired - 40% unknown<br>Non HIP Coho.....11% impaired - 32% unknown<br>HIP.....10% impaired - 28% unknown | It is unknown if coho have access to roughly one third of their potential habitat. Access can be improved 10% by correcting documented problems. Impact of tide gates has not been determined. | | Opportunity to increase access to high quality habitat may exist in local areas. Focus passage inventory and restoration in these areas. |
| **WATER QUALITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Federal Clean Water Act<br>▪ Conduct restoration to reduce sediment, moderate temp.<br>▪ SB-1010 Plans have been completed<br>▪ TMDLs are being developed<br>Road miles upgraded .....334<br>Road miles retired .....203 | ▪ The Umpqua MA had the poorest overall water quality.<br>▪ This MA had the highest percentage of coho stream miles exceeding criteria for temperature, dissolved oxygen concentration, fine sediment, total solids, phosphorus, and vertebrate assemblage.<br>▪ 1 of 9 larger river ambient sites had an improving trend; 56% fair, 22% good to excellent, and 22% poor water quality. | Although not currently a significant constraint on coho recovery, water quality has the potential of limiting coho production at local spatial scales. | ● | Take restoration action at local spatial scales as appropriate to maintain or improve rearing capacity. |
| **WATER QUANTITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Oregon Water Law<br>▪ 800 miles of stream are protected (instream right).<br>▪ At an 80% exceedance flow, water is not available for new appropriations in August in 98% of the Umpqua MA.<br>▪ 16 cfs of water has been restored in the Umpqua MA. | ▪ August consumptive use was highest in the MidSouth Coast and Umpqua MAs.<br>▪ Over 60% of the Umpqua MA had an August consumptive use less than 10% of the 80% natural exceedance flow.<br>▪ The Umpqua MA had up to 10% of watershed area with August consumptive use more than 100% of the 80% exceedance natural flow.<br>▪ 90% of the Umpqua area had no change in August consumptive use between 1997 and 2004. | Although not currently a significant constraint on coho recovery, water quantity has the potential of limiting coho production at local spatial scales. | | Focus habitat restoration investments in areas of high intrinsic coho potential. |
| **OTHER FACTORS**<br>Toxics, DO, pH, Stream fertility and shade, Spawning gravel, Hydro power, Illegal harvest, Disease, Estuaries, Wetlands, Exotic fish interactions, Predation by birds & pinnipeds | Assessed data, literature, and local observations. | Data, analyses, and interpretation of these limiting factors are available at www.oregon-plan.org. | Although not currently a significant constraint on coho recovery, each factor has the potential of limiting coho at local spatial scales. | | Remain alert to detect future change in importance of these factors. |

** Primary and secondary risk factor(s) that most limit the population. Supporting information can be viewed at* www.oregon-plan.org/OPSW/cohoproject/coho_proj.shtml.

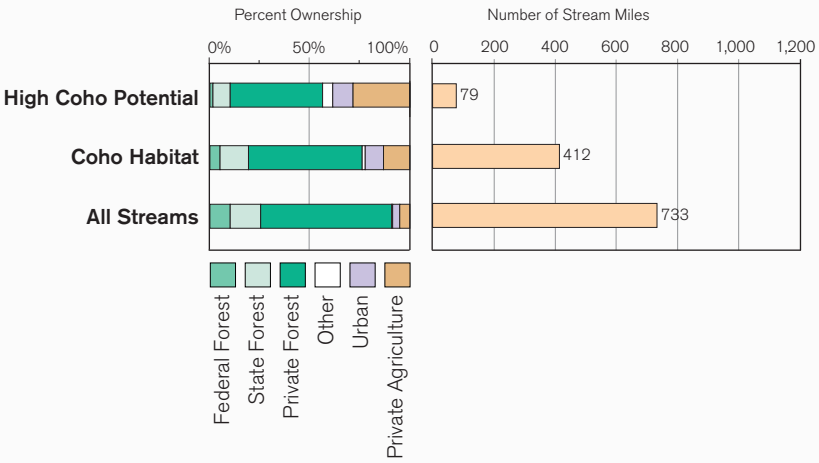
# Coos Population Unit

**Watershed Assessments**
**Percent of Population Unit Completed**
**1997: *6.5%***
**2004: *42.8%***

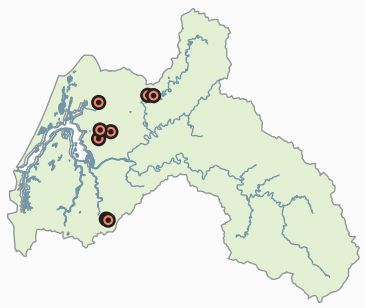
## Restoration Completed and Reported 1997 - 2003



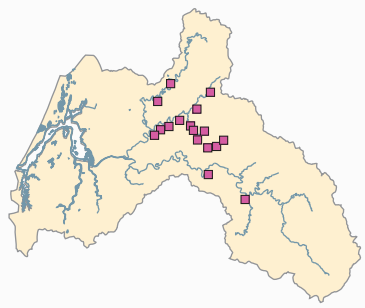

## Characteristics of Coho Habitat




## State/County Culverts with High Priority for Improvement

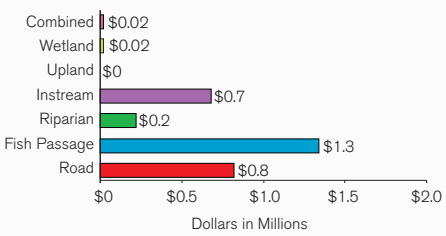


## Historic Splash Dam Sites

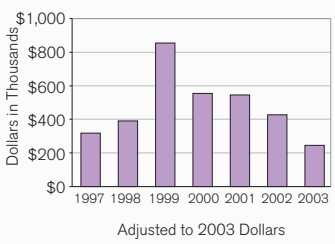


## Restoration Funding 1997 - 2003: $3.1 Million

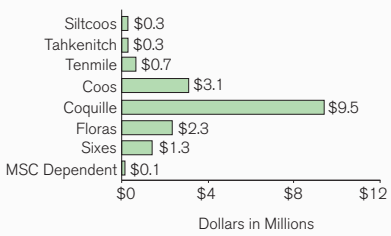
### Restoration Activity Type



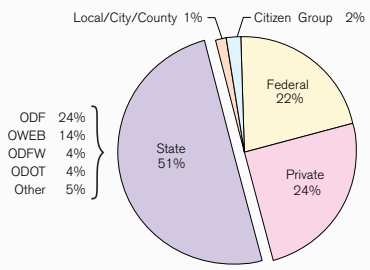

### Restoration Yearly Total




### Restoration Funds Region Total




### Source of Restoration Funds



# Analysis of Coos Population Unit

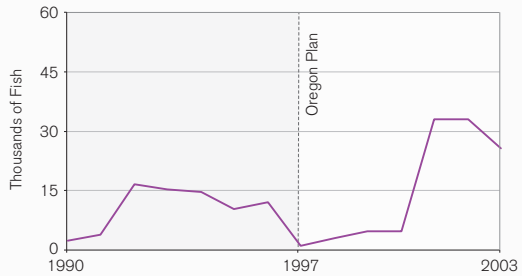
## Biological Viability Status

**PASS+**

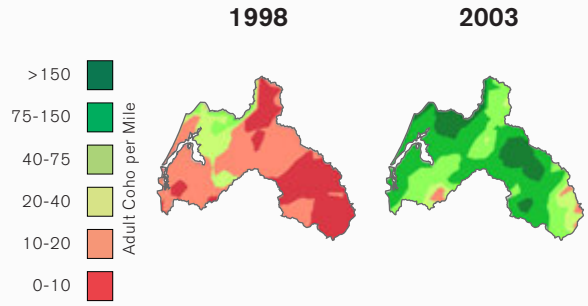
PASS

FAIL

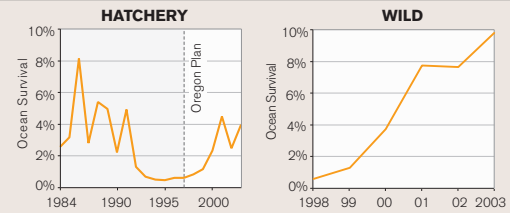
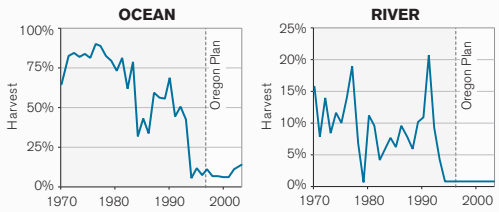
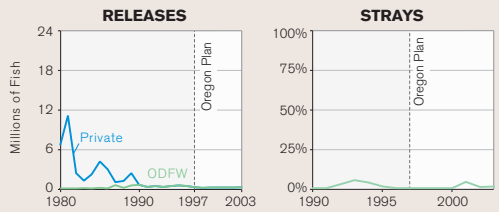
## Number of Wild Adult Spawners




## Density of Wild Adult Spawners




## Analysis of Potential Limiting Factors

| FACTOR | OREGON PLAN ACTION | OBSERVATIONS | INTERPRETATION | PRIMARY LIMITING FACTOR* | NEED |
|---|---|---|---|---|---|
| **MARINE HABITAT**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | Hatchery coho survival monitored at all hatcheries. Wild Coho survival monitored at five lifecycle monitoring sites. |  | Marine survival rate of both hatchery and wild coho increased coincident with Oregon Plan implementation. | **N/A** | Adjust harvest levels consistent with marine survival, adult escapement and population needs. |
| **FISHERY HARVEST**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | Harvest rates dictated by PFMC Amendment 13 will constrain harvest of wild coho consistent with recovery needs. |  | High harvest rates on coho prior to Oregon Plan have been reduced by management action. Harvest rates are no longer limiting recovery. | | Maintain PFMC Amendment 13 to restrain harvest consistent with population productivity. |
| **HATCHERY IMPACTS**<br>Data scale: ESU MA POP<br>☐ ☐ ☒ | Genetic Management Plans have been drafted for all hatcheries - awaiting approval by NOAA. Hatchery practices are managed consistent with local population status and recovery needs. |  | Hatchery programs are not constraining coho recovery. The percent of hatchery coho in natural spawning areas has declined because of management action and is now within policy guidelines. | | Continue implementing Native Fish Conservation Policy and Hatchery Genetic Management Plans. |
| **STREAM COMPLEXITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Regulatory programs: Oregon For. Practices, Fill and Removal, Federal Forest Plan, Goal 5.<br>▪ Conduct restoration to recruit wood and increase complexity.<br>Instream miles treated.....85<br>Riparian miles planted.....121<br>Riparian miles fenced.....120 | ▪ Coho streams have less large wood, more fine sediment, and fewer streamside conifers than reference streams.<br>▪ No significant trend detected in most habitat parameters over recent decade.<br>▪ Habitat conditions were generally better in the North Coast and MidSouth Coast area of the ESU. | Availability of complex stream habitat probably limits coho production. | ● | Focus habitat restoration investments in areas of high intrinsic coho potential. |
| **FISH PASSAGE**<br>Data scale: ESU MA POP<br>☒ ☐ ☐ | ▪ Fish Passage Law<br>▪ Improve fish passage at stream crossings.<br>Counted.....4,413<br>Improved.....1,140<br>Mapped.....3,392<br>Assessed.....2,145<br>Unknown.....1,247 | ▪ Improved access - result to date<br>Non Coho Distribution.....+16%<br>Non HIP Coho Distribution.....+10%<br>HIP Coho Distribution.....+6%<br>▪ Improved Access - remaining opportunity<br>Non Coho.....16% impaired - 40% unknown<br>Non HIP Coho.....11% impaired - 32% unknown<br>HIP.....10% impaired - 28% unknown | It is unknown if coho have access to roughly one third of their potential habitat. Access can be improved 10% by correcting documented problems. Impact of tide gates has not been determined. | | Opportunity to increase access to high quality habitat may exist in local areas. Focus passage inventory and restoration in these areas. |
| **WATER QUALITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Federal Clean Water Act<br>▪ Conduct restoration to reduce sediment, moderate temp.<br>▪ SB-1010 Plans completed<br>▪ TMDLs are being developed<br>Road miles upgraded .....194<br>Road miles retired .....56 | ▪ The MidSouth Coast had moderate to good water quality.<br>▪ This MA had the best water quality for dissolved oxygen concentration, pH, phosphorus, and macroinvertebrates, but the poorest conditions for nitrogen.<br>▪ 70% of the stream miles met benchmarks for macroinvertebrates.<br>▪ 4 of 8 larger river ambient sites had improving water quality trends; 50% fair, 25% good, and 25% very poor water quality. | Although not currently a significant constraint on coho recovery, water quality has the potential of limiting coho production at local spatial scales. | ● | Take restoration action at local spatial scales as appropriate to maintain or improve rearing capacity. |
| **WATER QUANTITY**<br>Data scale: ESU MA POP<br>☐ ☒ ☐ | ▪ Oregon Water Law<br>▪ 900 miles of stream are protected (instream right).<br>▪ 9 cfs of water has been leased instream in the MidSouth MA.<br>▪ At an 80% exceedance flow, water is not available for new appropriations in August in 93% of the MidSouth MA. | ▪ August consumptive use was highest in the MidSouth Coast and Umpqua MAs.<br>▪ Over 60% of the MidSouth Coast MA had an August consumptive use less than 10% of the 80% natural exceedance flow.<br>▪ 92% of the MidSouth Coast MA had no change in August consumptive use between 1997 and 2004. | Although not currently a significant constraint on coho recovery, water quantity has the potential of limiting coho production at local spatial scales. | | Focus habitat restoration investments in areas of high intrinsic coho potential. |
| **OTHER FACTORS**<br>Toxics, DO, pH, Stream fertility and shade, Spawning gravel, Hydro power, Illegal harvest, Disease, Estuaries, Wetlands, Exotic fish interactions, Predation by birds & pinnipeds | Assessed data, literature, and local observations. | Data, analyses, and interpretation of these limiting factors are available at www.oregon-plan.org. | Although not currently a significant constraint on coho recovery, each factor has the potential of limiting coho at local spatial scales. | | Remain alert to detect future change in importance of these factors. |

** Primary and secondary risk factor(s) that most limit the population. Supporting information can be viewed at* www.oregon-plan.org/OPSW/cohoproject/coho_proj.shtml.

# Data Sources

Cartography and GIS
University of Oregon InfoGraphics Lab, Department of Geography
**Project Manager**: Ken Kato
**Lead Designer**: Erik Steiner
**Lab Director**: Jim Meacham
**Researchers**: Mike Engelmann, Nick Kohler
**Student Cartographers**: Jon McConnel, Eric Sproles, Jacob Blair

**Coho abundance**: ODFW
**Elevation**: USGS (10 meter DEM)
**EMAP Sampling**: ODFW
**Fish Passage**: ODFW
**Land Cover**: Oregon Natural Heritage Program (GAP Analysis)
**Land Ownership**: BLM
**Oregon Plan Basins**: OWEB
**OWEB Grant Information**: OWEB
**Populated Places**: USGS (GNIS)
**Population**: PSU Population Research Center
**Projected Agency Investments**: respective agencies
**Roads**: ODOT
**Streams**: EPA, StreamNet, USGS

**Oregon Watershed Restoration Inventory (OWRI):** Bobbi Riggers. The OWRI is the primary statewide database for watershed restoration project information voluntarily submitted by restoration practitioners. The database includes completed projects funded by private landowners as well as projects funded with public monies such as OWEB grants. **http://www.oregon.gov/OWEB/MONITOR/OWRI.shtml.**

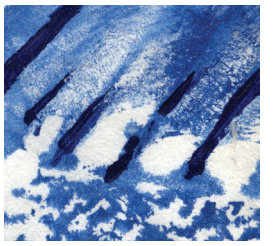
**Federal Interagency Restoration Database (IRDA):** Debra Kroeger, Jeanne Keyes, Jim Edmonds. The program is administered jointly between Bureau of Land Management and U.S. Forest Service staff. The database represents completed projects implemented on federal land. **http://www.reo.gov/restoration/**.

Writer/Editor: Jay Nicholas
Layout and Design: John Ame
Acknowledgements: This document (Oregon Plan Biennial Report - Volume 2) captures the key elements of the State of Oregon Assessment of the Coastal Coho ESU. This Assessment required significant contributions from local watershed partners and Oregon and federal agencies that contributed data, analyses, and administrative support. The complete Assessment documents can be viewed at: http://nrimp.dfw.state.or.us/OregonPlan/. Thanks for the production assistance by OWEB Grant, Fiscal, and Monitoring section staff.

# Acronyms

| | |
|---|---|
| BLM | Bureau of Land Management |
| EPA | Environmental Protection Agency |
| GAP | Gap Analysis Program |
| GIS | Geographic Information Systems |
| CLAMS | Coastal Landscape Analysis and Modeling Study |
| DEQ | Oregon Department of Environmental Quality |
| DSL | Oregon Department of State Lands |
| ESA | Endangered Species Act |
| ESU | Evolutionarily Significant Unit |
| HIP | High Intrinsic Potential |
| MA | Monitoring Area |
| MC | MidCoast |
| MSC | MidSouth Coast |
| NC | North Coast |
| NMFS | National Marine Fisheries Service |
| NOAA | National Oceanic and Atmospheric Administration |
| ODA | Oregon Department of Agriculture |
| ODF | Oregon Department of Forestry |
| ODFW | Oregon Department of Fish and Wildlife |
| ODOT | Oregon Department of Transportation |
| OWEB | Oregon Watershed Enhancement Board |
| OWRI | Oregon Watershed Restoration Inventory |
| PFMC | Pacific Fishery Management Council |
| POP | Population Unit |
| PSU | Portland State University |
| TMDL | Total Maximum Daily Load |
| USGS (GNIS) | U.S. Geological Survey Geographic Names Information System |
| WRD | Oregon Water Resources Department |

# Lessons Learned and Adaptive Management



The Coastal Coho ESU Assessment represents one example of Oregon's long-standing effort to learn and adapt management programs through time. Implementation of the Oregon Plan for Salmon and Watersheds represents a continuation of constructive departure from historic practices. Here are three key lessons learned from the Assessment and Oregon's intended action in response.

**Assessment Lesson 1.** Adequate resources have not been devoted to data analysis. Collaborative analysis is a difficult, resource-demanding process that does not occur as a routine part of agency workloads. Also, current systems for storage, inventory, and sharing of data collected by state and federal agencies hamper collaborative analysis.

**Oregon's Commitment to Action.** The Oregon Plan Core Team will direct state agencies to:

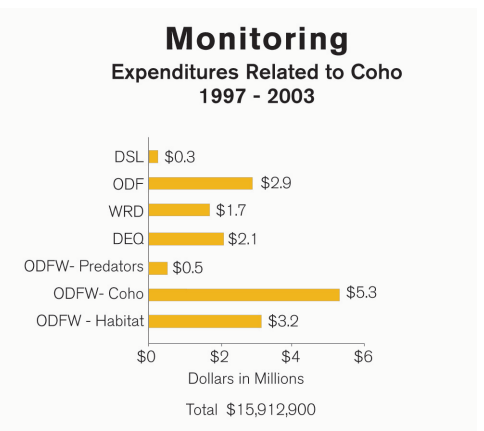
1. Oregon will update, as necessary, data and analysis related to the Oregon Coast Coho ESU to facilitate tracking of population status and implementation of conservation measures for adaptive management.
2. Determine if (monitoring) sampling designs should be modified to answer key questions related to species recovery and other Oregon Plan effectiveness issues, specifically at the fish population scale. Focus this evaluation first in the Coastal Coho ESU and complete prior to the 2006 field season.
3. Improve state agency capability to store, retrieve, and share data collected by all parties. Implement this action first in data systems that incorporate information related to the Coastal Coho ESU.

**Assessment Lesson 2**. An effort to improve the viability of a listed fish species is likely to be most effective if restoration is focused on *bottlenecks* identified for specific populations.

**Oregon's Commitment to Action.** Develop a draft conservation plan for the Oregon Coastal Coho ESU by December 2006. The conservation/recovery plan that is currently being developed for the Coastal Coho ESU will consider the results of the viability analysis in context with population bottlenecks identified in the Assessment. This information will provide a basis for focusing future conservation, management, and restoration action to most effectively conserve viability of the ESU and meet Oregon Plan goals (that are being established through the conservation/recovery planning process) for the ESU.

**Assessment Lesson 3.** The resiliency observed in coastal coho is likely a combination of a strong density-dependent response in productivity at low spawner density and an increased importance of habitats that are of sufficiently high quality (especially over-wintering refuge habitats) to sustain populations during periods of extremely poor ocean survival. Therefore, it is important to define, map and track the status of these high quality habitats over time to ensure they are conserved or enhanced consistent with the conservation/recovery plan that is currently being developed.

**Oregon's Commitment to Action:** Ensure that high quality habitats are mapped. Adjust monitoring to increase sensitivity to measure potential deterioration in key habitat parameters. Restoration activities that provide increased access to high quality habitats or that maintain/enhance currently accessible high quality habitats will be given higher priority for implementation.




Monitoring expenditures by state agency programs in the Oregon Coastal Coho ESU, related to coho salmon, 1997-2003. These values do not include monitoring by federal agencies, private landowners, or watershed councils. (Source: Unpublished responses to inquiry posed to state agencies participating in the Oregon Coastal Coho ESU Assessment)

## OWEB's Mission

"To help create and maintain healthy watersheds and natural habitats that support thriving communities and strong economies."