The Coastal Lakes Strategic Action Plan for Coho Salmon Recovery

FIP Draft Copy

June 28 2018

Note: This SAP is still under development, and is near final draft version at the time of the FIP application deadline.

Contents

Contributors and Acknowledgements

The Siuslaw Coho Partnership is a committed group of public and private partners dedicated to the broad sense recovery of Siuslaw Coho salmon. This Strategic Action Plan (SAP) was developed by a "core planning team" of these partners, which included:

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Most importantly, the SCP wants to especially thank Mark Trenholm who is responsible for writing the bulk of this plan and guiding partners through the process. Without Mark, we wouldn't have these Strategic Action Plans and the SCP is extremely grateful for his writing, facilitation and guidance in the creation of both the Siuslaw and Coastal Lakes Strategic Action Plans. Furthermore, the SCP thanks Mark and the Coho Business Planning team for their creation of the common framework and coordination among the many organizations engaged in coho restoration efforts across Oregon. The team has been invaluable in knowledge, as well as in attracting and marketing to funders for our restoration efforts.

This core planning team would like to thank the Business Plan Steering Committee for their support of the planning process. Special thanks to the NOAA Restoration Center for providing extensive GIS support to locate and prioritize the projects contained within this plan, and to the Wild Salmon Center for its role in facilitating the process, producing the plan, and working so diligently to get the initial work on the ground funded.

We'd also like to acknowledge the critical contributions of several project consultants, including: PC Trask for producing the literature review and bibliography; TerrainWorks for generating the Netmap layers and conducting the initial spatial analyses and; Barbara Taylor for the editorial support.

The Siuslaw Coho Partnership would also like to thank the funders of both the planning effort – the Oregon Watershed Enhancement Board (OWEB) and Oregon Community Foundation – and the first partners that stepped up to support implementation – the National Fish and Wildlife Foundation (NFWF) and the NOAA Restoration Center.

This plan represents a cooperative effort on behalf of all of these partners to assimilate, focus, and build on the vast body of knowledge available on the Siuslaw watershed to accelerate the strategic protection and restoration of critical coho habitats. The SCP deeply appreciates the hard work of all of those who preceded us in this effort, who dedicated their careers to better understanding the Siuslaw watershed and its extraordinary population of Oregon Coast (OC) coho.

Acronyms

AQI	Aquatic Inventories Project
BLM	Bureau of Land Management
BMP	Best Management Practice
CTCLUSI	Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians
ESA	Endangered Species Act
ESU	Evolutionary Significant Unit
HLFM	Habitat Limiting Factors Model
IP	Intrinsic Potential
KEAs	Key Ecological Attributes
HUC	Hydrologic Unit Code
LSR	Late Successional Reserve
LiDAR	Light Detection and Ranging
m	Million
NFWF	National Fish and Wildlife Foundation
NGOs	Non-Governmental Organizations
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OC	Oregon Coast
OCCCP	Oregon Coast Coho Conservation Plan
ODFW	Oregon Department of Fish and Wildlife
OWEB	Oregon Watershed Enhancement Board
RM	River Mile
RMP	Resource Management Plan
SAP	Strategic Action Plan
SCP	Siuslaw Coho Partnership
SNF	Siuslaw National Forest
SONCC	Southern Oregon/Northern California Coast Coho
SWC	Siuslaw Watershed Council
SSWCD	Siuslaw Soil and Water Conservation District
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
USFWS	U.S. Fish and Wildlife Service
WSC	Wild Salmon Center

Executive Summary

This Coastal Lakes Strategic Action Plan for Coho Salmon Recovery Plan was written and completed alongside the Siuslaw River Strategic Action Plan for Coho Recovery. The Siuslaw SAP was written with the help and facilitation of the Wild Salmon Center, who helped guide the planning process and brought expertise in planning and meeting facilitation to the Siuslaw Coho Partnership. This SAP is written to mirror and compliment the Siuslaw SAP in recognition that many of the partner organization that work in the Siuslaw River also work in this neighbor watershed. This document was adapted from the Siuslaw SAP to be specific to the neighboring watershed and to highlight the differences in the Coastal Lakes OC coho population from the Siuslaw population. One of the most noteworthy differences in these two populations is the absence of a large and productive estuary. This estuary habitat is replaced instead by the large coastal lakes formed by dunal processes, with a small outlet to the ocean controlled by dams. The estuary is much smaller for these systems and therefore likely plays a different role in the life history strategies for the Coastal Lakes OC coho as compared to the Siuslaw River OC coho population.

In 2015, the Siuslaw Coho Partnership (SCP) convened a two-year planning process to produce a Strategic Action Plan (SAP) for the recovery of the Siuslaw's wild coho (*Oncorhynchus kisutch*) population. Developed in partnership with a broader coast-wide effort known as the "Coast Coho Salmon Business Plan," the SCP's goal in developing the SAP was to guide habitat restoration work in the Siuslaw watershed through a transparent, science-driven process. In addition, the SCP sought to coordinate the work of the many partners engaged in habitat restoration in the Siuslaw River and Coastal Lakes watersheds, and to leverage funding to accelerate the implementation and effectiveness of on-the-ground habitat restoration projects. The SCP approached this effort guided by an inclusive vision: to integrate watershed restoration with social and economic goals that could promote healthy local communities and respect the rights and interests of private landowners.

While watershed-scale plans are increasingly moving away from a single-species approach, the SCP focuses on coho recovery for several reasons: First, coho salmon are considered a "keystone" species, with numerous other plant and animal species relying on them during some part of their life cycle. Second, coho spend over a year in freshwater, making them an excellent indicator of the health of a watershed year-round. Third, they are listed as a "threatened" species under the federal Endangered Species Act (ESA), which may have adverse social and economic effects locally.

The Coastal Lakes coho population is one of 21 independent populations that comprise the Oregon Coast (OC) Coho Salmon "evolutionarily significant unit" (ESU). Young OC coho salmon spend roughly eighteen months in freshwater before migrating to the sea. During this freshwater residency, they rely heavily on instream pools and off-channel habitats that are connected to mainstem and tributary channels. These off-channel habitats include alcoves, beaver ponds, side channels, and tidal and freshwater wetlands. In addition to providing food resources, these habitats generate clean, cool water in the summer, and serve as refuge areas from high velocity flows in winter.

The watershed processes that produce and maintain these habitats have undergone significant changes since European settlement of the region began in the mid-19th century. Resource extraction activities like unsustainable timber harvesting, splash damming, overharvesting of fisheries, and road building, as well as agricultural and residential development in floodplains have altered the ‘key ecological attributes’ (KEAs) of the watershed that are essential to the production of high-quality coho habitats. The modified KEAs that most severely limit coho production include: reduced tributary habitat complexity, reduced lateral connectivity between channels and floodplains, reduced riparian (streamside) function, reduced beaver ponds, and impaired water quality in the Siuslaw’s tributaries and mainstem (most notably elevated summer temperatures and sedimentation.)

These changes in the Coastal Lakes watershed reflect, to a large extent, broader changes that have taken place throughout the range of OC Coho. Intensive harvest by commercial and recreational fisheries into the mid-20th century, coupled with fish releases from large hatchery programs, exacerbated these declines in watershed function.

The impact of these changes on the abundance of coho across both the ESU and the Coastal has been profound. State and federal scientists estimate that annual runs of one to two million coho salmon once sustained the ESU, but dropped to a low of about 15,000 in 1983.

The dramatic reduction in OC coho abundance and productivity – including in the Coastal Lakes watershed – led to the listing of the ESU under the ESA in 1998. Concerns among federal managers that OC coho habitat was not sufficiently protected contributed significantly to the listing decision, as well as to subsequent decisions that the ESU remains in danger of extinction. This SAP supports implementation of two plans that resulted from the federal ESA listing: a state plan, the “Oregon Coast Coho Conservation Plan for the State of Oregon,” published in March, 2007, and a federal plan, the “Final ESA Recovery Plan for Oregon Coast Coho Salmon” published by the National Marine Fisheries Service in December, 2016. These state and federal plans describe conservation and recovery goals for the ESU, as well as broad strategies to restore the ESU to the point where ESA protection is no longer necessary.

To advance the state and federal plans in a manner that aligned with local social, economic, and ecological priorities, the SCP developed a Strategic Framework to guide the identification of site-specific restoration projects. The framework emphasizes the restoration of critical coho habitats by repairing the watershed processes that generate them. This process-based approach relies heavily on an anchor habitat strategy, and seeks to identify, protect, and restore the stream reaches most capable of supporting coho across the full spectrum of their freshwater residency, including egg incubation, rearing, smolting, and spawning. The primary conservation strategies presented in this plan to conserve anchor habitats (and other critical habitats) include: installing large woody debris to promote instream complexity and floodplain interaction; enhancing riparian function; restoring lateral reconnection of disconnected floodplains and tidal wetlands; and upgrading working lands infrastructure (culverts, tidegates, roads, etc.) to reconnect tributaries and tidal channels, and improve water quality. In addition, the Strategic Framework underscores the essential strategy of building collaborative relationships with landowners and managers to protect critical upland habitats.

The Strategic Framework recognizes the Coastal Lakes watershed as exhibiting the highest restoration potential, and the greatest capacity to substantially increase Coastal Lakes OC coho production in the short term at the least cost.

Over time, the SCP is confident that the implementation of this Strategic Framework (i.e. local partners collaborating on the strategies and in the locations listed above) can produce the following long-term outcomes:

1. an increase in the quality and quantity of rearing habitats sufficient to anchor population resilience;
2. a connected assemblage of diverse habitats, sufficient to foster a broad expression of life-history strategies in the Coastal Lakes coho population; and
3. a healthy watershed restoration economy that is viewed as an important source of income in the Coastal Lakes watershed.

Following a description of the Strategic Framework, the SAP lays out a short-term work plan for the SCP that describes the initial suite of projects that it will implement. This work plan describes the specific goals and objectives that the SCP seeks to achieve in its first six years of SAP implementation, as well as the corresponding costs of project implementation

The SCP recognizes that this plan, like all plans, has been generated with imperfect information and uncertainty about how global climate change will challenge many of the assumptions made about future watershed conditions and how aquatic systems may respond to restoration actions. Thus, adaptive management is essential to the long-term success of this plan and the SCP's ability to reach its stated goals. The SCP developed a monitoring framework to evaluate both the rate at which the SAP is being implemented, as well as the degree to which it is producing the desired results at a meaningful scale. The monitoring framework also presents several important data gaps, which – once filled – may redirect the SCP's efforts.

The SCP envisions our effort to rebuild salmon runs in the Coastal Lakes Basin as a community endeavor. The SCP invites all interested individuals and organizations to reach out to us with questions, comments, and suggestions by contacting the Siuslaw Watershed Council.

1. Introduction: Why Coho?

The Coastal Lakes Watershed is considered one of the best coho strongholds and possibly the best stronghold in the state of Oregon. Adult salmon returns to these stream systems have decreased less here than in many of the larger river systems along the Oregon Coast. The presence of the lakes and the associated freshwater wetland habitats within the tributary arms, are undoubtedly a major factor contributing to the health of these fish runs. On the other hand, these systems are not considered healthy, since substantial portions of the mainstems do not currently function as salmon rearing habitat as they did in the past. Over the last 150 years, both the quality of critical coho habitats and the watershed processes that generate and maintain these habitats have declined due to the impacts of resource extraction and other land use. These impacts have contributed to the decline of the Coastal Lakes' coho run, and raised uncertainty that the basin's habitat conditions will sustain healthy coho runs into the future.

Based on our current knowledge, the approach to ensure the long-term health of the Coastal Lakes coho population mirrors the one required to recover most of Oregon's coast coho populations: we must protect and restore freshwater and estuarine rearing habitats to increase the survival of juveniles. To re-establish a healthy Coastal Lakes coho population that is viable over the long term, local partners aim to strategically restore critical habitat and other degraded habitats while protecting those that remain intact. Importantly, the benefits of coho conservation extend beyond just the recovery of a threatened species; strategic protection and restoration will support numerous other species. Ultimately, it will also enhance the livability of our communities and stimulate our local economies.

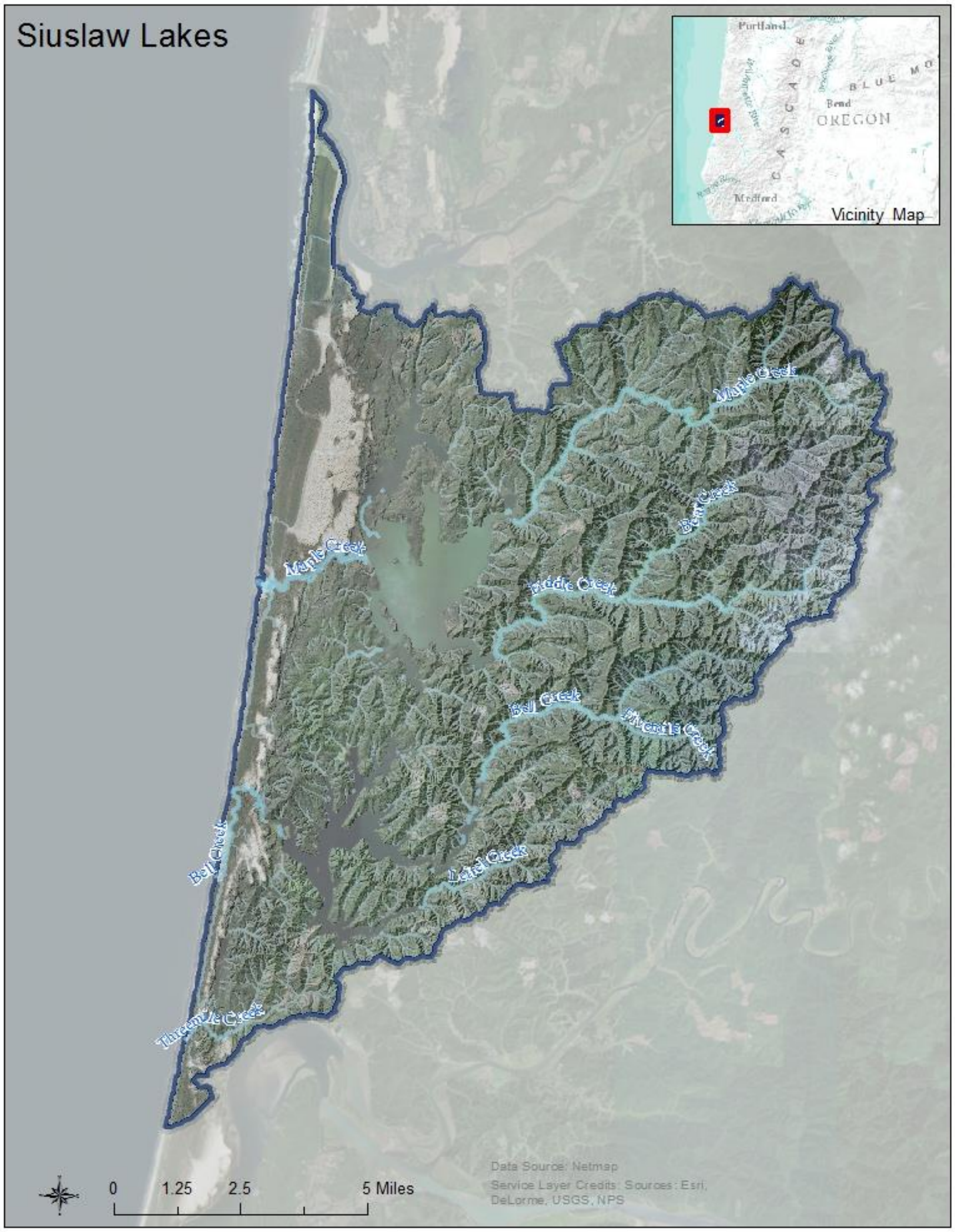


Figure 1 The Coastal Lakes Watershed

1.1 A Keystone Species

Coho salmon are a "keystone" species; a wide variety of terrestrial and aquatic plants and animals rely on coho for their survival. All life stages of coho (eggs, juveniles, smolts, and adults) are directly consumed by aquatic and terrestrial organisms – from otter and black bear, which consume returning adults, to the smallest aquatic invertebrates that shred the carcasses of decaying fish after they have spawned. Even forest and plant communities directly benefit from the deposition of marine-derived nutrients from decaying fish. Returning adults that have taken up phosphorous and other nutrients from the ocean release them to the watershed through decay after they spawn. If wild coho runs are further degraded or lost, the health of the watershed as a whole will suffer.

Because of the species' unique life history, which includes spending a full year maturing in freshwater, coho use a wide range of habitat types. Coho use mainstem river channels for upstream and downstream migration, tributaries for spawning and rearing, and estuaries/Lakes for migration and rearing. Off-channel areas in mainstem and tributary reaches, like alcoves, wetlands, side-channels, and beaver ponds, provide especially important habitat for coho, serving as cold-water refuge when temperatures spike in the summer and places to escape the high flows of winter. Since other salmon and trout species also use these habitats during their freshwater residency, the protection and restoration of these habitats benefit all of the Coastal Lakes' populations of steelhead and cutthroat trout, and other non-salmonid species.

Finally, the terrestrial features that give rise to aquatic habitats, like upland forests, riparian (streamside) zones and floodplains, provide food, cover, and nesting habitat for many birds and other wildlife. As we restore these terrestrial habitats for coho, we support the range of native flora and fauna present in the Coastal Lakes ecosystem.

1.2 An Indicator Watershed Function

Numerous watershed processes produce and maintain the diverse network of instream and off-channel habitats that coho need to survive and thrive. For example, as described above, off-channel habitats are essential to coho, providing refuge from seasonal spikes in temperatures and flows. The complex interaction of watershed processes – including flow, sediment/nutrient transport and storage, large wood delivery, riparian function, channel migration, floodplain-channel interaction, and other processes – governs the location, extent, and quality of these off-channel habitats. The widespread occurrence of these off-channel habitats signals that watershed processes are functioning well and able to produce and maintain the healthy habitats that coho require to persist. Conversely, when these habitats do not exist (especially in locations that have the geomorphic features – like low channel gradients and open valleys – necessary to support them), it is likely that critical watershed processes have been lost or impaired.

The loss of watershed processes impacts not only coho and other salmonids, but also the livability of coastal communities. The same processes that generate coho habitat also produce "ecosystem services" required by humans. For example, a healthy, vegetated riparian area will filter harmful contaminants out of the water, regulate stream flow, sequester carbon, and buffer streambanks from high flows that can cause erosion. When the riparian area is degraded through activities, such as the clearing native vegetation or livestock grazing, it can lead to increased flooding, streambank erosion, and reduced water quality. Thus, restoring and maintaining the habitat-forming watershed processes that promote healthy runs of coho can also benefit landowners and communities.

1.3 A Threatened Species

The Coastal Lakes coho population is one of 21 independent coho populations within the Oregon Coast (OC) coho salmon evolutionarily significant unit (ESU). The OC coho ESU is listed as "threatened" under the federal Endangered Species Act (ESA). The listing is due primarily – though not entirely – to habitat loss, and uncertainty concerning trends in freshwater and estuarine habitat quality. Reviews by the National Marine Fisheries Service (NMFS) and its Northwest Fisheries Science Center (NWFSC) in 2011 and 2015 found that the long-term decline in OC coho salmon productivity reflected deteriorating conditions in freshwater habitat, and that the remaining habitat may not be adequate to sustain species productivity during cycles of poor ocean conditions (NWFSC 2015; Stout et al. 2012). The National Marine Fisheries Service completed a recovery plan for OC coho in 2016.

1.4 A Unique Opportunity for Recovery

While the OC coho ESU is currently listed as threatened under the federal ESA, it represents a unique opportunity for recovery. The status of the species has improved since its crash in the late 1990s, which led to its listing as threatened, and recent years have boasted some of the strongest runs in decades. Like the Coastal Lakes watershed, much of the broader OC Coho ESU retains the building blocks of good quality habitat, which – when coupled with rebounding populations – indicates that recovery of the species may be possible. Strategic investment in the restoration of key habitat-forming watershed processes will further improve the coho population in the Coastal Lakes watershed, leveraging these building blocks of existing habitat to maximize benefits to the fish and local communities. Removal of OC coho from federal protection under the ESA would be a first; to date, no Pacific salmon species has been removed ("de-listed") from the ESA.

1.5 A Locally Led Partnership

If we are to recover coho, locally led restoration partnerships must take the broad recommendations contained in the federal recovery plan and translate them into strategically placed, well-coordinated on-the-ground projects. This is the purpose of this Strategic Action Plan (SAP). By merging the best available science with local knowledge of the watershed, this SAP seeks to pinpoint the specific projects that, if implemented, can enhance watershed function and ensure the long-term health of the Coastal Lakes coho population.

This type of locally led planning is essential to the recovery of OC Coho. In 2014, a small team of public and private agencies as well as non-governmental organizations (NGOs) convened to provide technical and financial support to local partnerships that seek to: (1) improve how restoration projects are selected, and (2) accelerate their implementation. This "Coast Coho Partnership" – which included the Oregon Watershed Enhancement Board (OWEB), Oregon Department of Fish and Wildlife (ODFW), National Marine Fisheries Service (NMFS), NOAA

Restoration Center, National Fish and Wildlife Foundation (NFWF), and Wild Salmon Center (WSC) – identified two priority structural needs to support locally led habitat restoration: First, a replicable, coho-specific prioritization model was needed to assist local teams in selecting habitat protection and restoration actions. Second, greater coordination of funders was needed to increase the resources available for locally led implementation of the completed plans.

The Coast Coho Partnership worked with the Siuslaw Coho Partnership to create a Strategic Action Plan for Coho Recovery in the Siuslaw River watershed. The Siuslaw Coho Partnership took the knowledge gained through that facilitated process to then create this SAP for the Coastal Lakes Basin, with the same three goals as the SCP and Coast Coho Partnership had for the Siuslaw Watershed:

1. Promote the conservation and recovery of coast coho in Oregon, and describe the essential role of voluntary habitat protection and restoration efforts;

2. Identify the highest-priority projects required at the population (watershed) scale to advance regional recovery goals; and

3. Aggregate the cumulative costs and anticipated benefits of these projects to clearly describe what funders can expect to gain from their restoration investments.

1. An Overview of the Siuslaw Coho Partnership and the Coastal Lakes Plan

The process to develop this SAP began in 2015 when several local, state, and federal partners involved in Coastal Lakes and Siuslaw coho habitat restoration convened as "the Siuslaw Coho Partnership" (SCP). Since its inception, the SCP has added several new partners representing local, state, and federal agencies, tribes, and NGOs. Today it continues to grow in scope and bring in new partners. The full partnership currently consists of the following members:

- Siuslaw Watershed Council
- USDA Forest Service, Siuslaw National Forest
- Siuslaw Soil and Water Conservation District
- Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians
- Confederated Tribes of the Siletz Indians
- Oregon Department of Fish and Wildlife
- National Oceanic and Atmospheric Administration
- Natural Resource Conservation Service
- McKenzie River Trust

Together, members of the SCP are working to advance three shared objectives:

1. Clarify restoration priorities and enhance coordination;
2. Increase community awareness of, and support for, coho conservation; and

3. Accelerate the rate of restoration to both promote species health and advance local economic goals.

This SAP represents the culmination of a three-year planning process that helped the SCP achieve its first objective, while laying a foundation to achieve the second and third objectives. Implementation of this plan will help the partners grow an already effective and collaborative habitat enhancement program in the Coastal Lakes watershed. Figure 2 shows a sampling of restoration projects successfully implemented on public and private lands within the Coastal Lakes watershed over the last two-plus decades. The SAP builds on the success of these and other restoration efforts in the Coastal Lakes Basin.

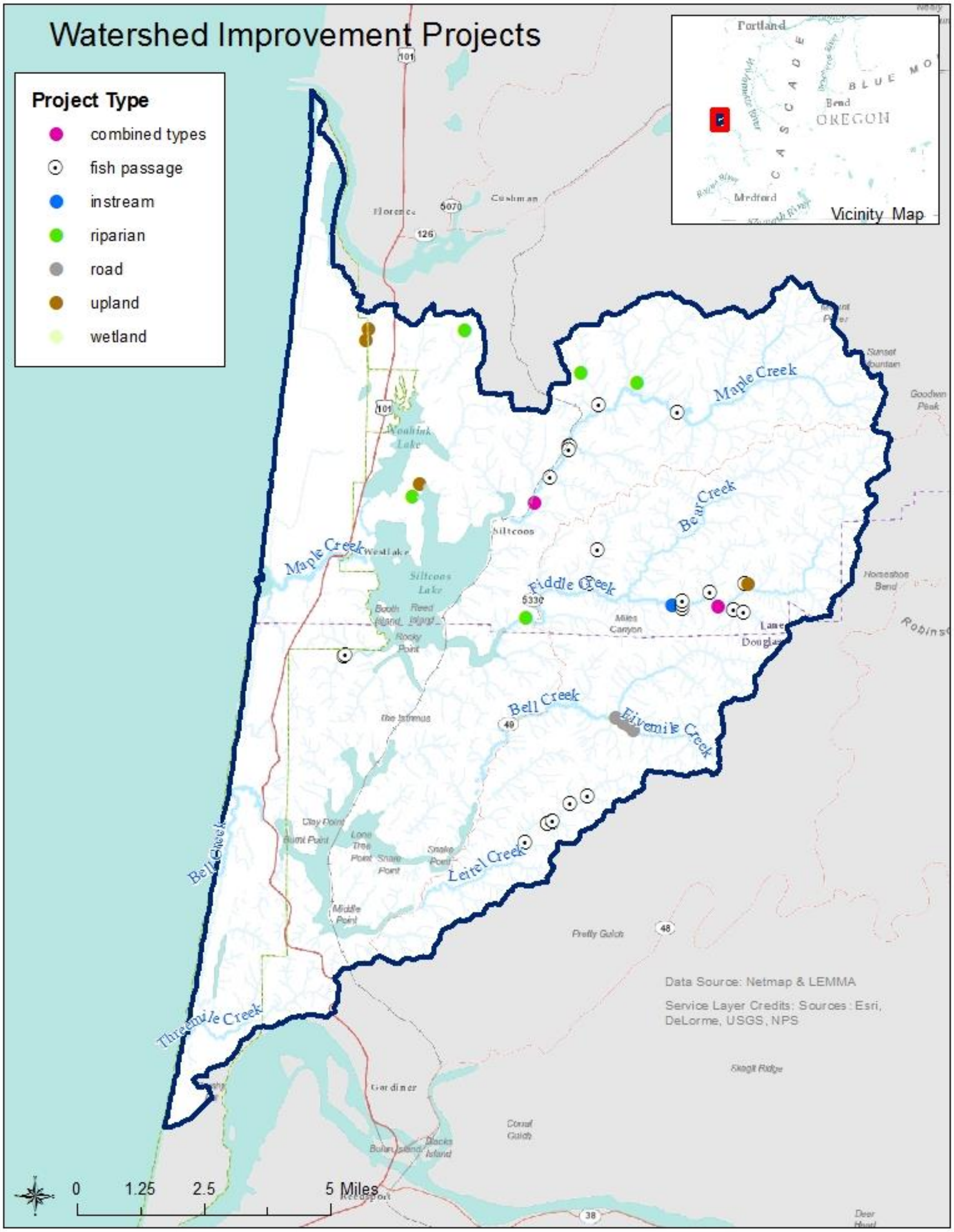


Figure 2 Map of recent watershed improvement projects

Two important groups played critical initial roles in helping the SCP develop this strategic action plan and will continue to support implementation efforts:

- **Core Planning Team**. The SCP's core planning team, a group of SCP members with substantial knowledge of basin resources, took the lead in developing this SAP based on guidance provided by the larger group. Core planning team participants included the Siuslaw Watershed Council, Siuslaw Soil and Water Conservation District (Siuslaw SWCD) Siuslaw National Forest (SNF), Bureau of Land Management Northwest Oregon District (BLM), Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians (CTCLUSI), National Marine Fisheries Service (NMFS), and Oregon Department of Fish and Wildlife (ODFW).
- **Siuslaw Watershed Council**. The Siuslaw Watershed Council (SWC) has served as the convener of the SCP since its inception and will serve as the steward of this SAP in the years to come.

The core planning team developed this SAP document using scientific data and modelling combined with professional experience gained from working in the watershed for decades. The SCP hopes to add new members over the coming years as new organizations develop, and/or community interest in restoration grows and existing organizations look to partner with the SCP. In the near term, the SCP is eager to involve land trusts and private forestry organizations in the partnership, and is making efforts to involve those organizations at the time of this publication. The process to add new members will be guided by governance documents which are now being finalized.

Both the SWC and the SCP's core planning team view this SAP is a living document. As the actions contained within the plan are implemented, there will be lessons learned along the way that inevitably alter priorities and change how, when, and where specific projects reach the ground. The capacity to ensure the long-term health of wild coho in the Coastal Lakes rests on the ability to adaptively manage in the face of a changing climate and potentially unpredictable watershed responses. Furthermore, it is important to recognize that the SCP's priorities need to remain flexible through time as more science becomes available to inform restoration investment priorities. It's also important to recognize that external factors like funding and stakeholder support may influence the SCP's priorities over the long term.

2.1 Our Vision of Recovery

The SCP began the development of this strategic action plan by discussing shared partnership values and priorities that would guide the planning process. They then crafted a long-term vision statement for the SCP that reflects these shared values. This vision statement is shown in the text box below:

Vision to Recover a Threatened Species

The Siuslaw Coho Partnership envisions a future where collaboration among residents drives thriving local communities that exist in balance with the region's highly productive Coastal Lakes watershed. In addition to providing critical services that promote a high quality of life for local residents (like drinking water, flood storage, and nature-based recreation), the Coastal Lakes watershed will continue to generate some of the largest, most diverse coast coho (and other) salmon runs on the Oregon coast. Healthy salmon habitats – and the numerous plant and animal species that rely on them – will foster social and economic well-being in the Coastal Lakes Watershed and promote resilience to changing watershed conditions.

To achieve this vision, the SCP recognizes that the watershed processes that generate and maintain critical coho habitats must be protected where they are intact, and restored where they are functionally impaired. In the federal coho recovery plan, these watershed processes are described as "key ecological attributes" (KEAs), a term used to describe the most important features of a watershed to support a healthy target species (in this case, Oregon Coast coho salmon). For the Coastal Lakes coho population, the most important KEAs include:

- instream complexity of priority tributary and mainstem reaches;
- water temperatures in the Coastal Lakes streams' mainstem and tributaries;
- riparian function along tributaries (stream temperature regulation, wood recruitment, sediment and nutrient retention, food source production (insects), etc.);
- lateral connectivity of mainstem and tributary channels with associated floodplains;
- connectivity of freshwater and tidal wetlands; and
- longitudinal (upstream-downstream) connectivity within potential coho-bearing tributaries.

2.2 SAP Implementation: Long-Term Outcomes & Short-Term Goals

Actions that improve these KEAs in the Coastal Lakes watershed advance strategies called for in the Recovery Plan for Oregon Coast Coho Salmon; however, restoring the KEAs will be a long-term endeavor. It will require decades of work on the ground.

This SAP provides a strategic framework that advances efforts to achieve the SCP's long-term vision. It presents the highest priority restoration strategies (in Chapter 7) as well as extensive lists of specific projects and project locations (in the Appendix). These project lists are intended to describe the "universe of projects" that partners will choose from as they seek to protect and restore the KEAs. The types of actions presented in the plan, as well as their proposed locations, were generated and prioritized through a combination of modeling and the expert opinions of local managers.

Over the long term, through the continued implementation of these projects and others added along the way, the SCP seeks to achieve three major outcomes. If the SCP can generate these outcomes, we can achieve the vision of a healthy coho population existing alongside vibrant, resilient communities:

1. an increase in the quality and quantity of summer and winter rearing habitats in selected sub-watersheds sufficient to anchor population viability;
2. a connected assemblage of diverse habitats sufficient to foster a broad expression of life-history strategies in the Coastal Lakes coho population; and
3. a healthy watershed restoration economy that is viewed as an important source of income in the Coastal Lakes watershed.

While the projects presented in this SAP have been ranked using objective criteria that reflects the best available science, ultimately the selection and sequencing of projects over the long term will be driven by countless external factors, including landowner willingness, permitting constraints, and funding availability. Chapter 8 presents the SCP's six-year implementation plan, which takes into account these "real world" considerations. By 2025, the SCP will seek to accomplish the following goals:

Goal 1) Restore and protect instream, riparian, and floodplain habitats on 17.8 miles within the Fiddle Creek 6^{th} Field H.U.C.

Goal 2) Restore and protect instream, riparian, and floodplain habitats on 8.8 miles within the Maple Creek 6^{th} Field H.U.C.

Goal 3) Restore and protect instream, riparian, floodplain and estuarine habitats on 101.2 (+) miles within the Siltcoos Lake Frontal Pacific 6^{th} Field H.U.C.

Goal 4) Restore and protect instream, riparian, floodplain and estuarine habitats on 100 (+) miles within the Tahkenitch Lake Frontal Pacific 6^{th} Field H.U.C.

2.3 Scope of this Strategic Action Plan

The SAP focuses on physically improving critical habitats for coho in the Coastal Lakes watershed. It recognizes that the SCP's ability to achieve the larger outcomes identified above (enhanced coho habitat quality and quantity, a connected assemblage of diverse habitats, and a robust local restoration economy) will be influenced by a variety of threats that cannot be fully prevented or ameliorated by habitat protection and restoration. Participants on the core planning team considered many of these threats, including predator management (sea lions, cormorants, etc.), the sufficiency of state water quality rules, fire prevention and response, and fisheries management, but opted to limit the scope of this plan to priorities that the partnership has greater control over: namely, where, when, and how coho habitats can and should be restored in the watershed. The SCP encourages reviewers of this plan to consider the policies governing land use and species/habitat management in the Coastal Lakes alongside this plan's restoration goals, and to use existing venues to promote policies that align with our shared vision of coho recovery.

In addition to limiting the scope of this plan to strategies which physically improve critical habitats, the SCP underscores that implementation of this plan is entirely voluntary. While maps contained in this plan do identify instream and upland habitats on some private lands as a high priority for restoration, implementation of actions on these lands is entirely voluntary. The identification of high-quality habitats on both public and private lands will guide the SCP's outreach to landowners, but participation in the implementation of this plan is entirely voluntary and no new actions will be required of public or private landowners. Accordingly, this SAP does not propose any new regulations or the modification of existing regulations.

2.4 Guiding Principles for Plan Development

The Siuslaw Coho SAP was developed as one of three pilot SAPs funded by OWEB to design and test a flexible methodology to identify and prioritize coho habitat restoration projects at the population scale. Staff from the WSC (Portland, OR) facilitated the SAP development process, which was overseen and advised by the full Coast Coho Partnership. The Siuslaw Coho Partnership, after being involved in the development of the Siuslaw SAP then replicated this process for the Coastal Lakes Watershed, spearheaded and facilitated by the Siuslaw Watershed Council with help from the Core Planning Team.

The SAP process was specifically designed to promote focused and coordinated implementation by narrowing down anchor habitats, locations in the population area where protection and restoration projects can yield the greatest benefit to coho, and by identifying site-specific restoration actions. Chapter 6 and accompanying appendices detail this SAP development process. Generally, the process was guided by the following principles:

- **Adopt the common framework and modify for the Coastal Lakes Watershed**. Prior to initiating the three pilot SAPs, the Coast Coho Partnership developed a common set of terms and definitions to use in each plan. The purpose of this "common framework" is to ensure consistency in how coho ecosystems are described and evaluated. Based on the Open Standards model,[1] the common framework defines the habitat components

[1] Developed by the Conservation Measures Partnership, the Open Standards for the Practice of Conservation is an approach to project design, management, and monitoring. The five-step approach used to guide decision making has been employed successfully in salmon recovery in California and in Washington's Puget Sound.

(types) used by coast coho, the key ecological attributes (KEAs) necessary to ensure coho viability in each component, and potential indicators through which the KEAs can be evaluated. At the start of the Siuslaw SAP process, the SCP modified the common framework for use in the Siuslaw and Coastal Lakes watersheds. The resulting “Coastal Lakes Common Framework” can be found in the Appendix.

- **Focus on protecting and restoring watershed function first.** While this SAP contains numerous habitat restoration projects that are designed to provide a short-term increase in production, the plan emphasizes the protection and restoration of watershed processes. A focus on enhancing natural watershed processes will promote landscape resilience and the restoration of critical habitats needed to sustain coho viability over the long term, while complementing other habitat restoration work in the short term. Process-based restoration also provides the greatest possible buffer to changing watershed conditions driven by climate change. As described in the recovery plan, “while considerable uncertainty exists about the magnitude that most of the specific effects of climate change will have on the coho salmon habitat, NMFS and the NWFSC remain concerned that most changes associated with climate change could result in poorer and more variable habitat conditions for Oregon Coast coho salmon in freshwater, estuarine, and marine environments” (NMFS 2016).

- **Focus initial restoration efforts within those watersheds currently demonstrating the highest ecosystem function.** The SCP ranked the health and production potential of both 6th field HUC sub-watershed, and focused the plan on the most productive and least degraded sub-watersheds. By enhancing the long-term function of these more intact sub-watersheds, the SCP is confident that it can maintain and promote population resilience over the long term. All four of the 6th field HUC sub-watershed were found to be worthy of investing time and efforts for restoration.

- **Focus on major stresses.** Each high-ranked sub-watershed (i.e., those areas in which local partners agree to focus and coordinate restoration projects) underwent an assessment of habitat stresses to ensure projects selected in each tributary had the highest likelihood of maximizing the watershed’s production potential. Goals and objectives determined by the SCP aim directly at reducing the highest priority stresses agreed upon by the core planning team.

- **Focus on a limited set of the most important coho habitat indicators.** The Oregon Coast Coho Salmon Recovery Plan (NMFS 2016) details the habitat stresses that limit coho production at the ESU and population scales. Drawing from the common framework, the SAPs adopt a limited set of indicators that assist managers in assessing the extent of these stresses. These indicators represent “the needles that need to move” to recover OC coho. All of the actions contained in the SAP aim to reduce the major stresses identified by the core planning team and improve the selected indicators.

- **Prioritize projects with objective scoring criteria.** Finally, SAPs use a suite of criteria to evaluate and prioritize proposed projects within the high-ranked sub-watersheds. The criteria focus primarily on the extent to which a project enhances ecosystem function and addresses primary stresses. In addition, three social and economic criteria are also considered, including: (1) a project’s educational value, (2) its demonstration value (of new or innovative conservation techniques), and (3) its “working lands” value (i.e. the extent to which it creates both durable conservation outcomes and benefits to a landowner.)

- **Promote Adaptive Management.** This plan presents a variety of projects that were developed in large part around an anchor habitat strategy, in which managers seek to protect and restore the watershed processes that are most likely to promote high quality habitats in the locations deemed most suitable for use across multiple coho life stages. This strategy does not capture all of the coho habitat available in the watershed, however. As managers continue to learn more about how and where coho use different habitats, and gauge the effectiveness of different restoration techniques in those habitats, the SCP may amend the priorities presented in this plan.

In addition, it should be emphasized that climate change is likely to drive unforeseen changes in watershed function and habitat availability over the life of this plan. According to NMFS, “the ESU remains particularly vulnerable to near-term and long-term climate effects because of the long-term loss of high quality rearing habitat. In the short term, the ESU could rapidly decline to the low abundance seen in the mid-1990s when ocean conditions cycle back to a period of poor survival for coho salmon. In the long term, global climate change could lead to a downward trend in freshwater and marine coho salmon habitat compared to current conditions” (NMFS 2016). As the effects of climate change become more pronounced and better understood, managers will re-prioritize actions.

3. The Coastal Lakes Watershed

The Coastal Lakes watershed is a remarkably rich ecosystem that was historically one of the most productive runs of coho salmon on the Oregon Coast. These lake ecosystems also contained healthy populations of steelhead and cutthroat trout, lamprey and other aquatic organisms. Terrestrial species like beaver, elk and deer utilized the habitats as well. Dunal processes control the productive estuaries.

This chapter describes the conditions in the Coastal Lakes watershed that once supported the great runs of coho and other aquatic organisms, as well as how these resources supported indigenous communities and promoted European settlement. Discussions in this chapter provide context for information presented later in Chapter 4, Coastal Lakes Coho and their Habitat Needs, and Chapter 5, Impaired Watershed Processes and Resulting Stresses on Coho Habitats.

Chapters 3, 4, and 5 use terminology developed in the common framework. The most often-used terms are defined in the box below. The full Coastal Lakes common framework can be found in the Appendix.

Common Framework Terminology

Key Ecological Attributes. Key Ecological Attributes, or "KEAs", are characteristics of watersheds and specific habitats that must function in order for coho salmonids to persist. KEAs are essentially proxies for ecosystem function. If KEAs like habitat connectivity, instream complexity, water quality, riparian function, and numerous others are in good condition then sufficient high quality habitats likely exist within a watershed to maintain viable coho populations.

Stresses. Stresses are impaired attributes of an ecosystem. Stresses are equivalent to altered or degraded KEAs. They are not threats, but rather degraded conditions or "symptoms" that result from threats. In the common framework, stresses represent the physical challenges to *coho recovery*, such as decreased low flows or reduced off-channel extent.

Threats. Threats are the human activities that have caused, are causing, or may cause the stresses that destroy, degrade, and/or impair components of KEAs. The common framework includes a list of threats with definitions and commonly associated stresses. This list is based on threats listed (sometimes using different terms) in existing coho recovery plans. The definitions are based on previous classifications (IUCN 2001; Salafsky et al. 2008) with minor modifications reflecting the work of the Coho Partnership

Habitat Components. Habitat components are the types of habitats that are essential to support the (non-marine) life cycle of coho salmon. The Coastal Lakes common framework identifies and defines these habitat types, which are presented in Chapter 4.

3.1 Physical Geography

The Coastal Lakes Watershed is unique in the Coast Province because of unusual physical features (e.g. sand dunes, aquifer, large lakes), abundant freshwater lakes that support anadromous fish, the opportunity to create large, healthy wetlands, historically high salmon runs, and a stronghold for coho salmon today. Certain of these physical and biological features are found nowhere else on the Oregon Coast, and are recognized globally. The watershed can be stratified into three distinctive block using these features. The stratifications differ physically, biologically, and socially.

Stratification of the Coastal Lakes Watersheds, and general social and biological characteristics of the stratified areas.

Stratification	The Dunes	The Lakes	The Upland Forest
Ownership	Oregon Dunes National Recreation Area	Industrial and small private land owners	Mostly the Siuslaw National Forest with some private industrial forest owners
Hydrology	Aquifer. Streams with sandy bottoms.	Lakes	Streams
Fish	Fish pass through. Use streams as migration corridor and for osmoregulatory change areas for moving from fresh to salt water.	Rearing	Spawning
Vegetation and Wildlife	Unique, special wildlife and plant habitats. Waterfowl.	Young seral forests, waterfowl, mammals	Mixture of early and late successional
Social Uses	Recreation	Urban, timber, agriculture	Low human use. Timber, water supply

3.2 Hydrology and Water Resources

Hydrology in the watershed is unique for many reasons. Nestled between the Siuslaw and Umpqua Rivers, it is a complete system, supporting strong anadromous fish runs and providing numerous wetland and deep water habitats. There are nineteen named, freshwater perennial lakes in the watershed, and the formation of all of them are either directly or indirectly related to dune formation. The Maple, Fiddle and Bear Creek systems flow into Siltcoos Lake while Fivemile and Leitel Creek systems flow into Tahkenitch Lake.

Tahkenitch and Siltcoos are large, shallow lakes that have outlets draining to the ocean currently controlled by dams. Both Siltcoos River and Tahkenitch Creek flow through dunes into the ocean. Woahink Lake, a much deeper lake, flows into Siltcoos Lake via Woahink Creek. Cleawox and Threemile Lakes have few tributaries and are fed primarily by the dunal aquifer. Within the dunes there are a number of perennial and ephemeral lakes that function with dunal aquifer levels throughout the year.

Dunal Aquifer and Dunal lakes

The average thickness of the sand deposit at the coastline is about 125 feet to bedrock. The saturated zone of this sand mantle creates a homogenous, simple dunal aquifer that ranges anywhere from three to thirty feet from the surface throughout the dunes are of the w3atershed. Groundwater testing by Hampton (1963) showed a drop in the water table of 2.5 feet from July 1 to October 1, and an increase of 5.15 feet from October 1 to March 1 during a period of 66.6 inches of rainfall in the area. In addition, it has been estimated that over 75% of average annual precipitation reaches the dunal aquifer (Brown and Newcomb 1963, Hampton 1963). Although lake levels of Siltcoos and Woahink are higher than the dunal water table during summer, recharge of the aquifer from the lakes has not been found to be significant (Schlicker, et al 1974).

Schlicker (1974) estimated that groundwater percolation to the ocean was about 50.3 million gallons per day or 56,400m acre-feet per year in a section of the dunes 15 miles long and 125 feet thick. He estimated the total annual discharge to surface water west and east would be 62,750 acre feet per year. Water quality is generally good from the dunal aquifer except for high iron content.

Cleawox Lake is another coastal lake referred to as a crytodepression due to its depth below sea level. It is fed primarily by the dunal aquifer as well as a few surface tributaries and does not have an outlet. It has historically had very good water quality and studies have confirmed oligotrophic conditions, with high transparency and low productivity as compared to other lakes in the area. Like Woahink Lake, Cleawox also stratifies in the summer.

The entire lake is encompassed by the dunal sheet with about half its western shore composed of an actively advancing sand dune, once moving northward as much as 20 feet per year prior to vegetation stabilization (Johnson et al, 1985). There are signs that advancing dunes at the southwest corner are slowly filling Cleawox Lake. The remaining 2/3 of the Cleawox basin is vegetated by a pine shrub complex. Small swampy areas are associated with the tributaries that come into this lake.

Threemile Lake is another dunal lake that is actually a pair of long narrow lakes joined by a channel in its middle. It formed in a trough between an older stabilized dune on its east side and an active dun on its west side, making it parallel to the shoreline of the Pacific Ocean. Similar to Cleawox Lake, it is a crytodepression without an outlet, and is fed by only a few surface tributaries and the dunal aquifer. Brush and trees cover most of its drainage basin with exception of an un-vegetated dune on the north end that is actively encroaching. Water quality on Threemile (mesotrophic) differs slightly from Cleawox (oligotrophic) due in part to strong winds on this lake that keep it from stratifying significantly. There are some small wetlands associated with the incoming tributaries to his lake.

Estuaries

Siltcoos River and Tahkenitch Creek estuaries make up the 66 acres of estuary in this watershed. A study of seasonal fish distribution in Siltcoos estuary was conducted in 1986 by the Oregon Department of Fish and Wildlife (Ely, 1987). This study revealed that Siltcoos estuary provides a migratory corridor to and from the lake and its tributaries for coho, cutthroat, steelhead, starry flounder, and sturgeon. Similar to the Tenmile Estuary south of this watershed, fish distribution is most diverse in the summer when saltwater is completely flushed with fresh water twice daily. Magnitude of salinity change as well as rate of change has the greatest effect on fish distribution. In the fall and winter, fresh water dominates these estuaries, causing fish abundance to drop dramatically.

Both the Siltcoos River and Tahkenitch Creek estuaries are subject to becoming bar bound in the fall. This propensity for bar formation at the mouth is much higher in Siltcoos River than in Tahkenitch Creek, given that Tahkenitch Lake elevation above mean sea level is twice that of Siltcoos Lake (15.4 ft vs 8ft, respectively). Under natural conditions, bar formation dictated the extent and concentration of brackish water in these estuaries. Larger storms in the late fall and early winter then washed these bars out and allowed anadromous fish passage and tidal influence in the estuary.

The establishment of European Beach grass in the early 1900's may not have directly impacted the estuaries present within this watershed, however it did have indirect impacts. Stabilized sand dunes create a new solid foundation on which other invasive plants such as scotch broom and gorse can establish and encroach on the riparian area surrounding a lake or estuary. These and other invasive plants can encroach and outcompete native plants that are important to the overall health and function of a riparian habitat. Dunes are not considered "aquatic" ecosystems, but they are dependent on water: Rivers provide sediment to the ocean, which deposits sand on the beach through wave action. These sands are blown inland and create dunes (CERES 2013). The stabilized sand dunes and invasive vegetation surrounding a lake, estuary, or river could also impede natural process of sand recruitment as described above, thus alter the natural process of that area. Sand movement not only affects wetlands within dune systems, but adjacent to them: Dunes can obstruct or re-direct seasonal drainages or impound hillslope runoff in gulches and ravines, forming ponds or wetlands (Coastal Dune Restoration Environmental Assessment, Point Reyes National Seashore 2015).

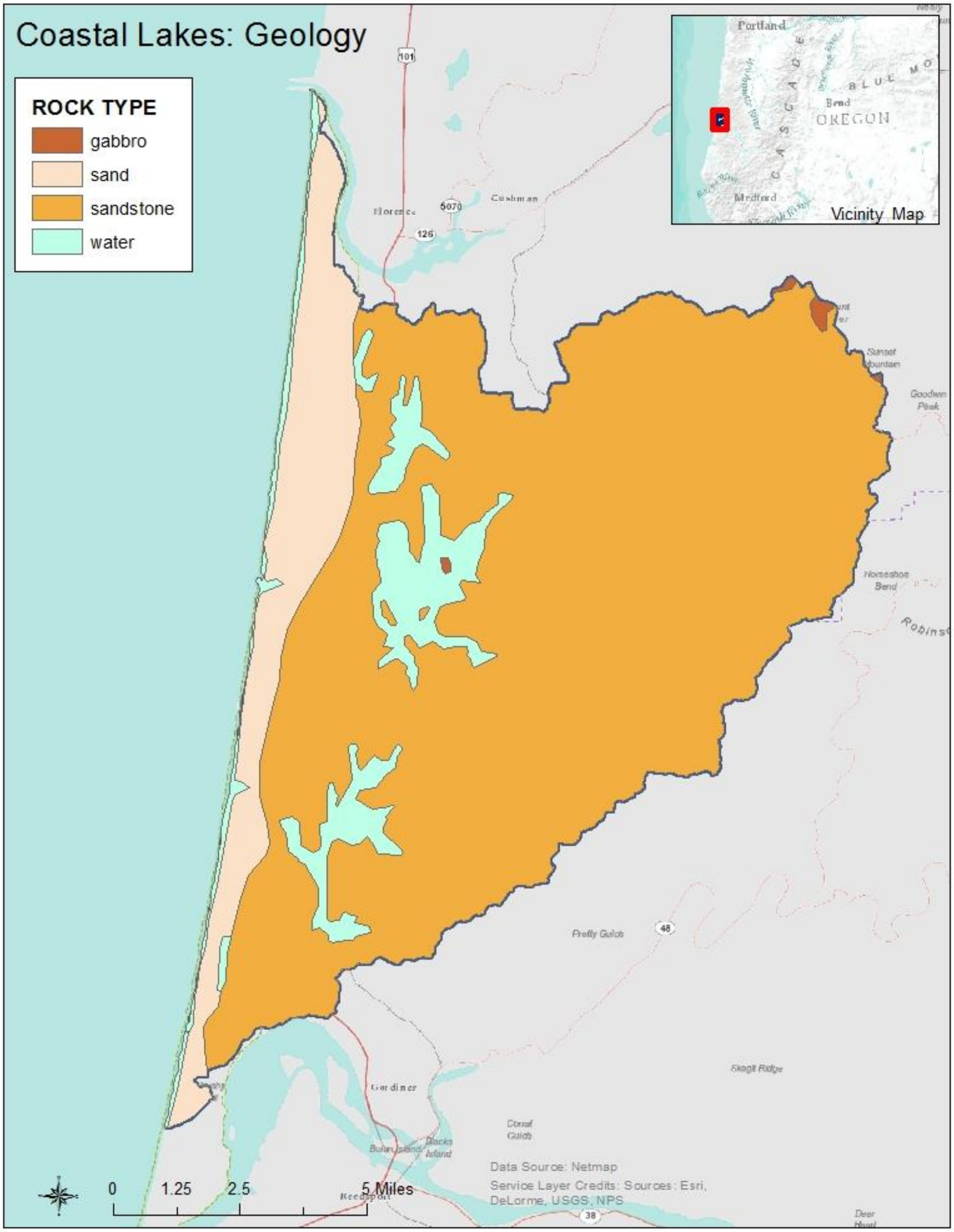


Figure 3 Coastal Lakes Geology

3.3 Biotic Systems

The ecosystems in the watershed include forest, wetland, and dunal types. The diversity of plant communities creates a wide range of plant and animal habitats and species. The watershed has both Sitka spruce and western hemlock climax forest communities. The predominant disturbance processes differ from coast to the inland. Fire, although infrequent, is the major disturbance process in the upper, drier parts of the watershed, while chronic (and occasionally catastrophic) wind is dominant process in the Coastal Fog Zone but does extend high into the watershed at times. Coastal Fog influences the valleys almost as far inland as the headwaters of the major streams in the watershed. The fog zone has more conifer tree species diversity, more complex forest structure, and higher site productivity and mortality rates than more inland Coast Range forests.

The forest lands have been logged extensively over the past few decades, and most of the remaining mature forest is in patches smaller than 100 acres. Much of the land around the lakes was being logged for a third time in 1998. The watershed is home to some wildlife species with special status (bald eagle, spotted owl, marbled murrelets, western snowy plover, white footed vole, and western pond turtle), plant and animal species were surveyed on federal lands and are being managed based on survey results. Urban growth/industrial logging is rapidly changing the ecosystem and having notable impacts on wildlife habitat and species, particularity waterfowl and wetlands. Certain habitat specialists (particularly wildlife species that require large home ranges or are reclusive in nature) are dwindling in population size while several introduced plant and animal species are increasing in numbers, altering the ecosystem, and often outcompeting some native fauna.

3.4 Indigenous Communities of the Coastal Lakes

The Siuslaw watershed's coastal lakes were home to both to the Kuuiich and Shayuushtl'axan, or Lower Umpqua and Siuslaw Peoples. Today, they are confederated with their southerly neighbors, the Coos Peoples, and are collectively known as the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians. Tahkenitch is the southernmost coastal lake in the Siuslaw watershed and is translated from its native name, Tsaxiniich, which means 'many arms'. It was home to the Kuuich Peoples and is believed to be one of the oldest village sites in our area, dating back to over 8,000 bp. From about 8,000 years ago to 3,000 years ago, Tahkenitch Lake was actually a marine estuary. Then, about 3,000 years ago, the dunes closed off the estuary and created the inland lake we know today. The lake later become a canoe landing site and popular place to hunt duck and beaver.

Ch'itlkuus, or Siltcoos, creek was a boundary between the Siuslaw Peoples to the north and the Lower Umpqua Peoples to the south. At the south end of Booth arm, there was a site called Owăcose, which served as a portage site between Tahkenitch Lake and Siltcoos Lake.

Cleawox Lake, or Tli'wax as recorded by Harvey Gordon in 1857, is close to the word tli'uu'wawax meaning they (two) have come. Woahink Lake is an anglicized version of the native name Waxiník. Both of these lakes were inhabited by the Siuslaw Peoples.

All of these ancient coastal lakes were highly productive for both Coho and Pacific Lamprey historically, according to tribal oral stories, which is why these lakes were so heavily populated by local Tribes. They had everything they needed in one place. Unfortunately, because coho population data for the coastal lakes systems weren't recorded pre-settlement, coho populations for these systems can only be speculated.

3.5 European Settlement and the Rise of a Resource Extraction Economy

The Central Oregon Coast was relatively late in getting settled due to the establishment of the reservation and poor accessibility. Most of the land from Glenada to Woahink Lake was homesteaded in 1889-1890 (The Siuslaw Pioneer, 1954). Many of the pioneers came by land from the Willamette Valley to Mapleton, by boat to Glenada, overland to Woahink, then by boat to places off Siltcoos. Others also came up the beach from the Umpqua. The land the settlers found was "an endless expanse of dead, charred, big trees remaining from terrible forest fires" that raged in the mid 1800's. They had cleared the land by drilling holes in snags, and inserting burning coals so that in a few days snags burned through and fell over. For years they burned to clear the land of brush, logs, and stumps, established orchards, and farmed small berries and grains. Some of them were able to bring a few head of livestock (Siuslaw Pioneer, 1947, 1951, 1954). Pioneer Dan Miles wrote that gardening was easy just "plant a seed and it grows, no insects. There were no worms in apples west of the Coast Range Mountains" (Siuslaw Pioneer, 1979).

In the 1890's pigeon, grouse, and ducks were plentiful and "by 1898 deer were beginning to show up around the burned over country". Raccoon, bear, and cougar were hunted. Salmon ran up all the creeks that flow into Fiddle Creek. Dan Miles recalled "Every gravel bar would just be alive with 'Silverside' salmon trying to lay their eggs. Not just during the first freshets in the fall, but there would be a big run each freshet for about four more freshets." Trout fishing was also good, with catches of 200 under 10" and about 30 of the big ones after an afternoon's effort (The Siuslaw Pioneer, 1979). Martin Christiansen recalled trapping beaver and fishing on Siltcoos Outlet. "We set nets down there near the outlet." He had seen 40 nets across the outlet, some staked well above the water (The Siuslaw Pioneer, 1984). Dairy farms were the predominant industry in the small valleys of Maple, Fiddle, and Fivemile Creeks with products packed on horseback to Glenada for shipping to markets. The main creamery was in Cushman until the 1940's. In the 1940's-50's the Soil Conservation Service offered a cost share service to straighten out the creeks by dragline to increase pastureland. Electric power arrived in 1948 at Fiddle Creek, in 1951 at Fivemile. Silos were built to store feed for the winter feeding, cows were "time bred" so they could be milked year around. In the 1980's many dairies switched to beef operations and/or were sold to timber companies (personal communication, John Smith).

Commercial logging operations began soon after settlement but intensified during the 1940's. From the turn of the century through about the 1950's several small to medium mills operated intermediately. Larger operations included a sawmill, logger boarding house, and resort on Siltcoos Lake near the present Fish Mill Lodge. The company town of Booth operated a box mill and logging camp from 1933-1943. On Tahkenitch Lake Crown Zellerbach had a big logging camp and log landing where Tahkenitch campground is now.

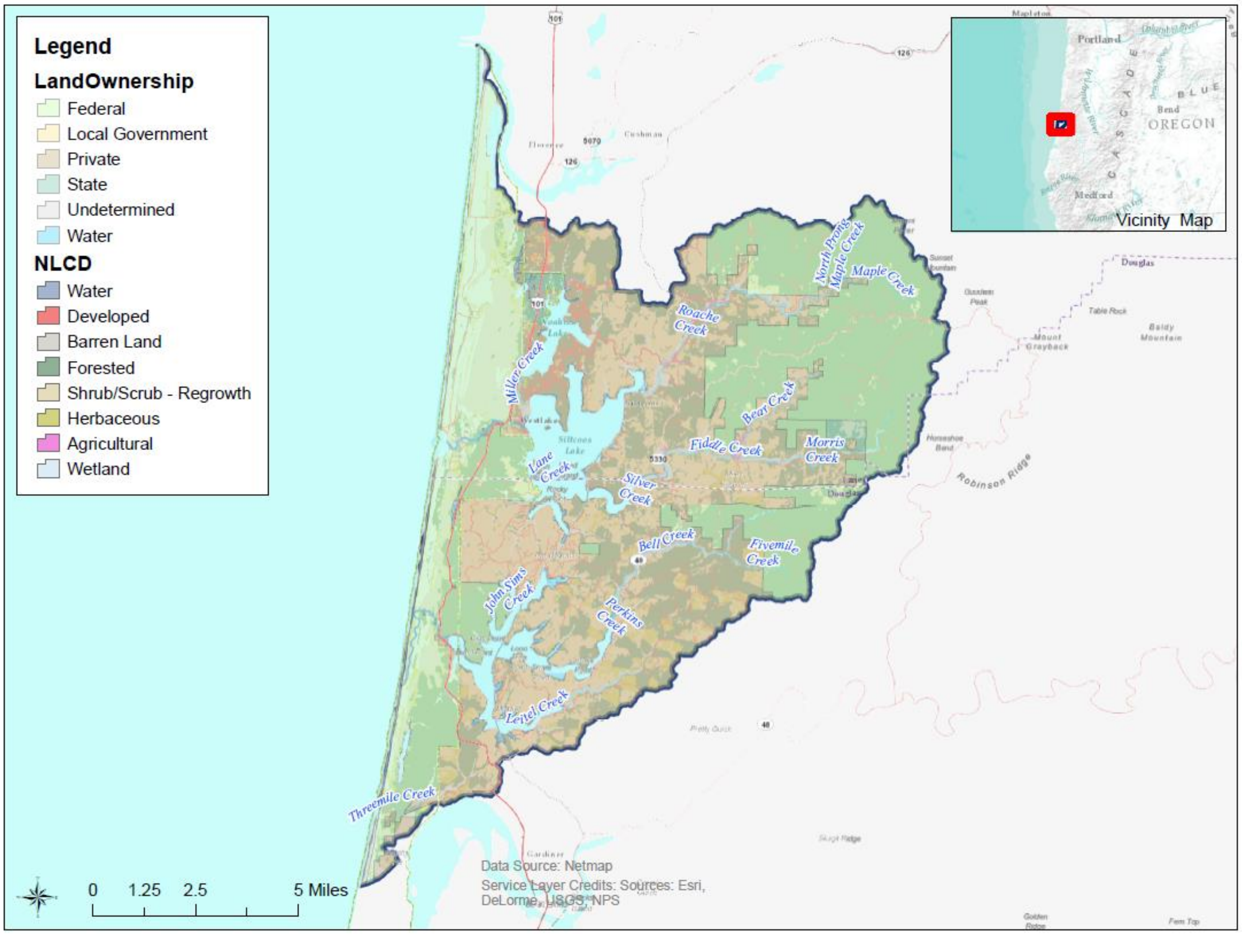


Figure 4 Land Ownership in the Coastal Lakes

3.6 The Coastal Lakes Economy today

Farming, dairy, beef, and logging as major industries have been replaced by residential homes for people working in Florence and elsewhere, tourist related businesses, stores, and resorts along 101 and in Westlake. Dunes City was incorporated in 1963, in part to avoid pressure for the area to be set aside as a national park. Dunes City, Westlake area, and the commercial district along Highway 101 have shown a steady growth in population and development. From the initial countryside that the pioneers encountered, human use has proceeded from pioneering, to grazing, to timbering, and more recently to urbanization.

Forestry, agriculture, and both consumptive and non-consumptive forms of recreation provide the key sources of revenue for the local economy surrounding the Siltcoos and Tahkenitch Lake watersheds. A significant portion of the uplands are in industrial timber ownership and currently managed on 30-40 year harvest rotations, to maximize timber production. Agriculture occurs mainly on the floodplain habitats along the major tributaries (Fiddle, Maple, and Fivemile) of the watersheds. The primary agricultural practice is livestock (cattle) grazing, though there are a few organic farm operations that produce limited fruits and vegetables for local co-ops and food shares. Both lakes are utilized year round by recreationalists, which significantly contributes to the local economy. Siltcoos is used as much as any other lake on the Oregon coast, with fishing being the main draw (2). For decades both lakes have carried well deserved reputations as two of the premiere warm water fisheries in the Pacific Northwest, carrying: bass, yellow perch, catfish, and many more introduced exotic species (2). Both lakes also support healthy populations of Coastal Cutthroat Trout and Steelhead, and are renowned for having some of the healthiest native Coho Salmon runs in all of Oregon. Other notable recreational activities include but are not limited to: swimming, water skiing, sail boating, kayaking, bird watching, trapping, and various types of hunting.

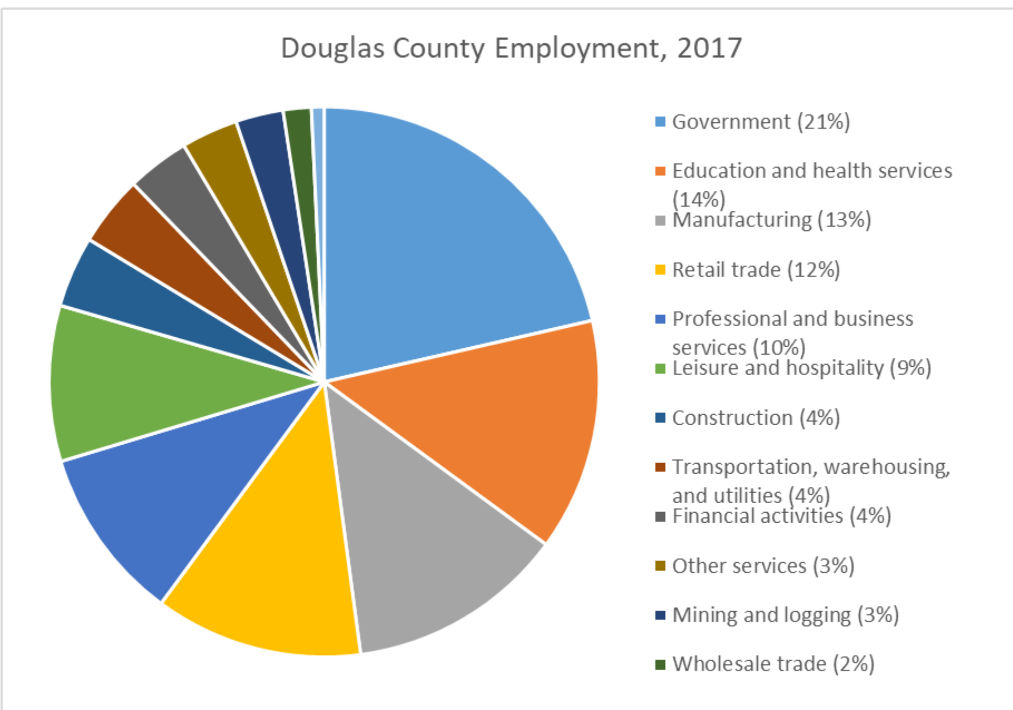


Figure 5 Douglas County Employment Data Source: Oregon Employment Department QualityInfo.org

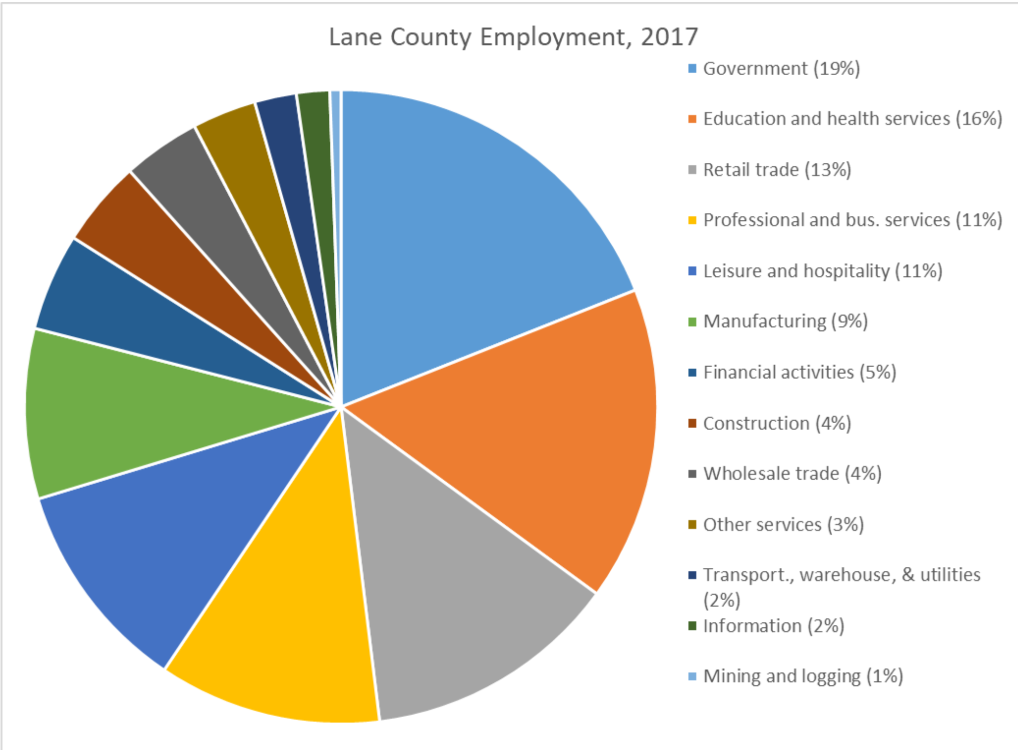


Figure 6 Lane County Employment Data Source: Oregon Employment Department QualityInfo.org

3.7 Advancing the Restoration Economy

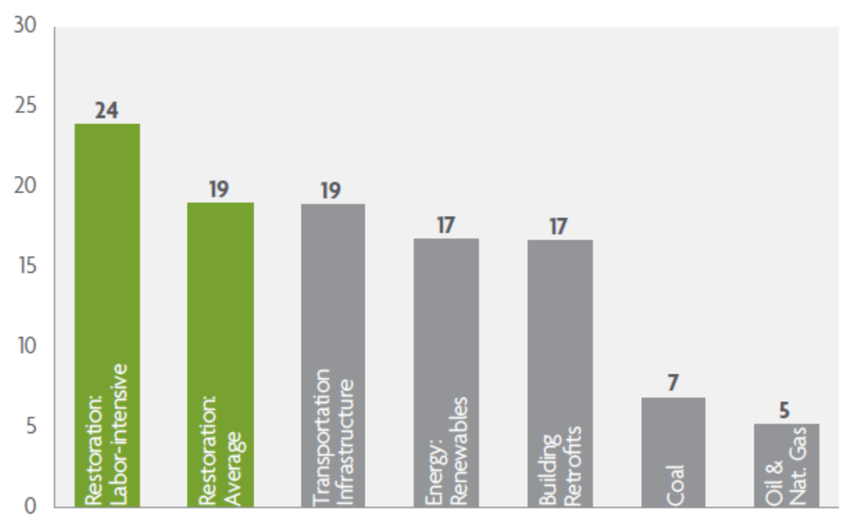
Opportunities for economic growth in the Coastal Lakes Basin have ebbed and flowed since European settlement, thriving during the success of the timber industry, but falling with their respective declines. This SAP lays out a framework to ensure the long-term viability of coho salmon in the Coastal Lakes Basin. The plan's implementation also provides a unique opportunity to contribute to the economic well-being of the community. This section explores how investments in habitat restoration projects in the Coastal Lakes watershed can advance a local restoration economy that supports local jobs, business, and industry.

Restoration investments benefit the local economy

While the concept of a restoration economy is relatively new, research in the past few years has begun to quantify the impacts of restoration investments on local economies. Studies completed across the country have found that the restoration economy has directly generated $9.5 billion in economic output nationwide, with an additional $15 billion in economic output through indirect linkages and increased spending by employees (BenDor et al. 2015). Closer to home, these analyses show promise for Oregon's rural communities where, on average, $0.80 of every $1.00 invested in restoration projects stays within the county, and $0.90 of every $1.00 spent invested stays in Oregon (Kellon 2012). The Ecotrust study found that between 2001 and 2010, $411.4 million invested in restoration work in Oregon generated an estimated $752.4 to $977.5 million in economic output.

In 2010, the University of Oregon completed a Restoration Economy study with similar results; for every $1 million invested in restoration, the economic output was between $2.2 and $2.5 million (Nielsen-Pincus and Moseley 2010). They found that output multipliers for restoration projects range from 1.9 to 2.4, meaning that for every $1.00 spent on forest and watershed restoration projects in Oregon, $0.90 to $1.40 is generated in additional economic activity. This is a result of restoration investments being multiplied throughout the local economy as project materials and services are purchased from local suppliers, and new jobs provide wages that are spent in local stores, restaurants, and service industries (Nielsen-Pincus and Moseley 2010). The study found that equipment-intensive restoration projects (such as culvert replacements, earth moving projects, or large wood placements) tend to have greater economic output because of the additional jobs created to meet the need for equipment maintenance (Nielsen-Pincus and Moseley 2010; BenDor et al. 2015).

Restoration investments create local jobs



Average number of jobs created per $1 million of investment by sector (Kellon 2012).

Investment in restoration demands a local labor force. This is especially meaningful in rural communities, where job opportunities are often limited as a result of businesses being concentrated in urban centers. The restoration economy is unique in that the demand for project labor focuses almost exclusively on rural or remote area work forces. The number of jobs created fluctuates depending on the type and scale of the restoration project; some actions are more labor intensive and, therefore, require more workers. Ecotrust found that between 2001 and 2010, the total investments in 6,740 restoration projects completed in Oregon supported between 4,628 and 6,483 jobs. Of those jobs created throughout the state, approximately 355 jobs were created in Lane County and 426 in Douglas County (Kellon 2012).

Generally, restoration practitioners in Oregon prefer to hire locally and contract between 95 percent and 99.5 percent Oregon-based businesses (Nielsen-Pincus and Moseley 2010). The bulk of the work contracted to out-of-state services tends to be for highly specialized tasks that are outside of the expertise of local Oregon contractors. This strong local bias in the restoration economy is due in part to the large role that nonprofit and nongovernmental organizations play, their flexibility in contracting, and their dedication to local communities and economies.

As shown in Figure 3-6, the restoration industry is competitive with other industries in the state of Oregon, and is nearly equal with job creation in the transportation and infrastructure sectors (Kellon 2012). The University of Oregon found that between 15.7 and 23.8 jobs are created per $1 million of public investment in restoration. This results in an additional 1.7 to 2.6 times the amount of economic activity, as every dollar cycles through Oregon's economy (Nielsen-Pincus and Moseley 2010). This figure accounts for both direct employment (e.g., project managers, contracted employees) supported by the restoration investment, and indirect employment (e.g., maintenance workers, local business staff) that results from increased economic output from the initial investment.

These results are consistent with national estimates for the restoration economy that suggest the creation of as many as 33 jobs per $1 million invested in restoration, with an employment multiplier of 1.5 to 3.8 (the number of jobs created for every restoration project). Furthermore, national research shows that restoration projects also tend to create localized employment benefits, creating well-paying local jobs similar to the construction industry. There are significant inter-annual fluctuations and seasonality in the habitat restoration economy, however, with restrictions on when projects can occur, such as Oregon's summer "instream work window" (BenDor et al. 2015).

Restoration investments are Investments in Our Community

Investments in restoration projects that provide living-wage jobs for local residents and boost local economies also help build communities that are desirable places to live. The value of the investments accrue over time. They provide recreational opportunities, improve water quality, and help restore other ecosystem functions that are fundamental to our health and quality of life.

This SAP provides a Strategic Framework for increased investment in restoration projects throughout the Coastal Lakes Basin. This increased investment will provide a multitude of benefits to coho salmon and the many other species that rely on a resilient, complex, and dynamic environment. Restoration investments will increase employment opportunities and stimulate the economies to benefit the communities that call this watershed home.

4. Coastal Lakes coho and their habitat needs

Coho seek out different types of habitat during their residency in the Coastal Lakes Basin. The availability of key habitat conditions to support coho during different life stages – as eggs in the gravel, small juveniles in tributary streams, and then as larger migrating fish – is essential to their ability to survive and produce. This chapter describes the habitat types that support coho during different life stages. It also summaries coho distribution, abundance, and production in the watershed.

4.1 The coho lifecycle

Coho salmon generally return to the Coastal Lakes from the Pacific Ocean as 3-year-old adults, arriving at the river's mouth's from October to November and migrating to their natal streams. The returning coho typically spawn in small tributary streams between November and January before dying. They lay their eggs in gravel nests, known as "redds," in reaches with suitable substrate, water velocity, depth, and temperature.

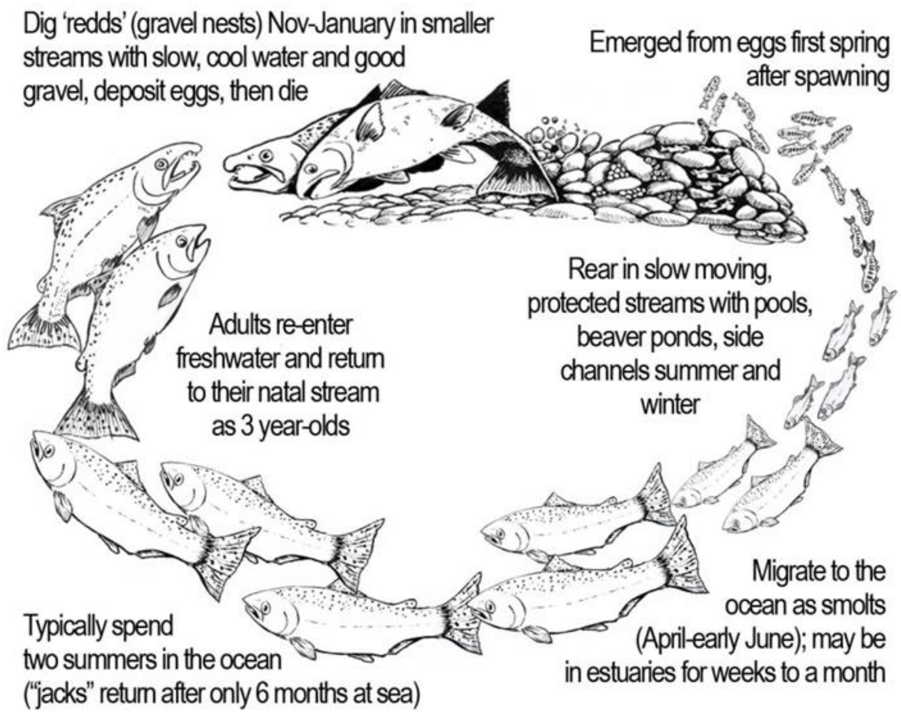


Figure 7 The coho salmon life cycle (NMFS 2016).

Spring marks the beginning of a new coho life cycle. After an incubation period of 1.5 to 4 months as eggs, "alevins" (newly hatched fry still attached to a yolk sac) emerge from the gravel between March and May. Most coho remain in their natal stream through their first year, feeding largely on insects. During their freshwater juvenile life stage, the fish seek out quiet areas such as side channels, alcoves, and scour pools resulting from log jams and boulders, and backwater pools created by beaver dams. The shelter and calm water provided by these and other off-channel areas is particularly important for the survival of juvenile coho in the winter, when high water flows and velocities are common and food supplies limited (ODFW 2007). These complex habitats also provide critical cold-water refuge in the summer months, when low water and high stream temperatures are prevalent in many parts of the system. In summary, the distribution of low gradient stream reaches with suitable flow, temperature, cover, and forage is essential for the survival of juvenile coho (NMFS 2016).

Most juvenile coho begin moving to the estuary and ocean after 12 to 18 months in freshwater rearing areas, typically migrating in the spring from as late as March into June. The coho smolts often reside in lower mainstem and estuarine reaches for a period of days or several weeks to a month, feeding, growing and adapting to saltwater, before moving on to the nearshore ocean environment (NMFS 2016).

It's important to note, however, that not all coho follow this general life-history strategy. Research shows that substantial numbers of coho leave their natal streams much earlier (as fry) and emigrate downstream into tidally influenced lower river wetlands and estuary habitats (Chapman 1962; Koski 2009; Bass 2010: in NMFS 2016). A NMFS biological review team of scientists reported at least three discrete life-history strategies involving coast coho fry and pre-smolt migrations into lower river habitats: (1) late fall migration into side-channel or pond habitats connected to lower mainstem reaches from mainstem summer rearing habitats, (2) lower mainstem and estuarine summer rearing followed by upstream migration for overwintering, and (3) lower mainstem and estuarine rearing followed by subyearling outmigration to ocean (Stout et al. 2012). These alternative life-history pathways contribute to the species' resilience and ability to adapt in a changing environment.

While in the lower rivers, these "nomads" seek out tidal wetland habitats with many of the same qualities as those rearing areas found in the upper watershed – quiet areas that provide cold water, shelter, and abundant food. Small freshwater tributaries in the lower watershed can provide particularly important habitat to support the diverse life-history strategies. When the mainstem corridors heat up in the summer, small cold-water seeps and tributaries become life boats where juveniles can escape potentially lethal high water temperatures in the mainstem and larger tributaries.

An additional life history path available to OC coho in the Coastal Lakes zone involves a variable rearing period within a system's given lake. These lakes are positioned below (downstream) of the key spawning habitats available and above additional freshwater stream rearing habitats. Lake habitat is therefore available to recently emerged OC coho fry as well as all life stages up through the smolting process. Various age class OC coho have been observed in Tahkenitch Lake during past sampling efforts but it is unclear to what extent various life stages benefit from the lake habitat and thus what overall role the lake habitat(s) play in the success of a given run.

Once OC coho salmon enter the Pacific Ocean, they travel along a narrow coastal band from Oregon north to Alaska. Upon reaching these northern waters, they migrate into the open ocean before turning back to the south and migrating home to their natal streams. During this migration, coho migrate through variable nearshore ocean currents that provide cool, nutrient-rich water (through upwelling) that stimulates production of food (Hall et al. 2012, in NMFS 2016). While in the ocean, coho are subject to predation and fishing pressure. Coho normally spend two summers at sea before returning as three-year-old adults, except for some precocious males (jacks) that return to spawn after only six months. The return of coho spawners to the Coastal Lakes watershed starts in October or November, coinciding with fall freshets that trigger upriver movement.

4.2 Watershed Components and Coho Habitat Types

Coho salmon seek out different habitat types during their various life stages that contain key physical attributes that help sustain them. The habitat types vary in salinity, hydrology, geomorphology, stream size and type, and biological attributes essential for survival. These habitat elements are shaped and maintained by combined watershed processes that together influence hydrologic, sediment, riparian, channel, biological, floodplain, and estuarine habitat functions. A measure of intrinsic potential (IP) is often used to describe potential high quality coho rearing habitat, such as for juvenile coho salmon, based on stream attributes including mean annual flow, channel size, gradient, and valley constraint. Generally, coho prefer low gradient, unconfined reaches with an IP of greater than 0.75 (Burnett 2007). The majority of high intrinsic potential (HIP) off-channel areas are low in the watershed, but many have been blocked or disconnected by levees. Low gradient pool/riffle reaches, sometimes called “flats,” remain within most tributaries, but some may be isolated by downstream barriers to fish passage, such as culverts.

Several physical biological features form high quality and quantity coho habitats: stream corridors with unimpeded passage; connected side channels; connected floodplains; off-channel habitats (overflow channels, tidal marshes and swamps, alcove or ponds); groundwater channels; seasonally flooded wetlands; low gradient pool/riffle sequences; suitable-sized gravel substrate free of excess fine sediment; backwater pools and beaver ponds; abundant large wood; extensive riparian vegetation armoring streambanks and providing shade to maintain cool summer stream temperatures; suitable streamflows and duration; excellent water quality; and abundant forage (Lestelle 2007).

The common framework (see Chapter 2) categorizes this complex, inter-connected system according to several components, defined below. Chapter 5 discusses how the watershed processes operating within these components produce and maintain the specific habitats that coho rely on.

- The Mainstem River includes portions of rivers above head of tide (Coastal and Marine Ecological Classification Standard [CMECS] definition); typically 4th order, downstream of coho spawning distribution, non-wadeable. The mainstem river component also includes associated riparian and floodplain habitats. Mainstem areas support upstream migration for adults and downstream migration and rearing for juveniles.

- Tributaries include all 1st to 3rd order streams with drainage areas > 0.6 km2. This includes fish-bearing and non-fish-bearing, intermittent streams; the full aquatic network includes headwater areas, and riparian and floodplain habitats. Tributaries support spawning, incubation and larval development, fry emergence, and juvenile rearing.

- Freshwater Non-Tidal Wetlands include those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support – and under normal circumstances do support – a prevalence of vegetation typically adapted for life in saturated soil conditions. Habitats include depressions, flat depositional areas that are subject to flooding, broad flat areas that lack drainage outlets, sloping terrain associated with seeps, springs and drainage areas, bogs, and open water bodies (with floating vegetation mats or submerged beds). This component is restricted to those wetlands that are hydrologically connected to coho streams. (Estuarine associated wetlands are addressed in the estuarine section.) Wetlands are essential to capturing sediment and other contaminants before they enter surface waters, and to maintaining and regulating cold water flows.

- Off-channel areas include locations other than the main or primary channel of mainstem or tributary habitats that provide a velocity and/or temperature refuge for coho. Off-channel habitats include alcoves, side channels, oxbows, and other habitats off of the mainstem or tributary. As described above, these off-channel habitats are essential to the survival of juvenile coho, providing refuge from high flows in winter and high water temperatures in summer.

- Estuaries include areas historically available for feeding, rearing, and smolting in tidally influenced lower reaches of rivers that extend upstream to the head of tide and seaward to the mouth of the estuary. Head of tide is the inland or upstream limit of water affected by a tide of at least 0.2 feet (0.06 meter) amplitude (CMECS). This includes tidally influenced portions of rivers that are considered to be freshwater (salinity <0.5 ppt). Estuaries are considered to extend laterally to the uppermost extent of wetland vegetation (mapped by CMECS). Habitats include saltmarsh, emergent marsh, open water, subtidal, intertidal, backwater areas, tidal swamps, and deep channels. This includes the ecotone between saltwater and freshwater and the riparian zone.

- Uplands include all lands that are at a higher elevation than adjacent water bodies and alluvial plains. They include all lands from where the floodplain/riparian zones terminate and the terrain begins to slope upward forming a hillside, mountain-side, cliff face, or other non-floodplain surface.

- Lakes include inland bodies of standing water. Habitats include deep and shallow waters in the lakes, including alcoves, and confluences with streams.

4.3 Wild Coho Distribution, Abundance, and Productivity

Distribution

Historically a great amount of fish rearing habitat occurred in the lower unconfined areas of the major tributaries that empty into the Coastal Lakes. This included approximately 8 miles of Maple and Fiddle Creeks, 10 miles of Fivemile Creek, and 5 miles of Leitel Creek. The lakes, however, probably provided the greatest rearing habitat for coho. Since the stocking of warm water fish that prey on the anadromous fish in Siltcoos Lake beginning in the 1920's (ODFW reports), the rearing conditions in the lower unconfined tributaries have become even more important. In the late 1800s the low gradient, wide valley bottoms with highly sinuous streams moving back and forth were some of the first areas settled. With settlement came stream modification to accommodate agriculture and primarily livestock grazing. Diking, draining of wetlands, straightening of creeks and removal of large wood all contributed to the loss of rearing habitat in these homesteaded areas. Longtime residents of the area interviewed for the watershed analysis described willows extensively lining the stream channels in the past on Maple and Fiddle Creeks, some 40 years after initial homesteading.

The lake systems supported commercial fisheries of about 5,000 adult coho salmon each in Siltcoos and Tahkenitch Lakes around the turn of the century. The adult coho that escaped the commercial and recreational fisheries spawned in the gravels of the upper reaches of the streams. These spawning areas were generally where the stream gradient increased, the valley bottom became more confined and large wood was present in greater quantities to hold and sort the gravels from the finer sediments. Some coho salmon spawning continued in reaches greater than 4% gradient, but these areas were generally steelhead and cutthroat spawning reaches.

The Bulletin of the United States Fish Commission (1897) describes an evaluation of Siltcoos, Tahkenitch and Woahink Lakes by a Dr. Meek to determine if they should stock the lakes with bass and other warm water species. Dr. Meek concluded that it was not advisable for the commission to stock these fish in the lakes. He said that stocking the bass would be detrimental to the silver salmon fishery and he had concerns that the bass would potentially spread to the Siuslaw and Umpqua River systems. Dr. Meeks' advice was not taken and a non-native warm water fishery was created. By the 1920's a very popular bass fishery was created.

An estimate of coho spawner escapement for escapement of the last 4 decades (ODF&W) shows that populations in Siltcoos and Tahkenitch are well below levels that existed in the late 1890's that averaged 5,000 fish just in the commercial catch.

Table 1 Average estimated spawning coho salmon stock size by decade.

Lake basin	1960's	1970's	1980's	1990's

Siltcoos	5055	3015	3475	3397
Tahkenitch	1845	2144	3198	1607
Ten Mile	30919	16724**	4764	5917

**Lake treatment and bass re-establishment occurred after 1971 when the bass reestablished was 5,500.

Coho in the lakes have an inherent high productivity (Zhou, 2000). The freshwater habitats remain productive, particularly in the unconstrained tributaries near the lakes. As freshwater habitat improves additional life history characteristics will more fully express themselves and add to the productive capacity of the lakes.

The effect of warm water species introduction on the coho salmon population of a coastal lake is exemplified in Tenmile Lake just North of Coos Bay, Oregon. Tenmile lake was treated with a piscicide to rid the lake of its warm water species. In the years following the treatment, numbers of coho salmon dramatically increased for two years until the bass, bluegill and brown bullhead became established in the lake again. Subsequently the numbers of coho salmon again began to drop over the last 25 years and are about 19% of the coho stock size estimate of the 1950's and 6% of those estimated around the turn of the century (ODF&W Tenmile Basin Fish Management Plan 1991). It is likely that the warm water fish have similarly limited the coho salmon populations in Siltcoos and Tahkenitch Lakes basins.

Historically, Siltcoos and Tahkenitch lakes and associated watersheds provided a tremendous amount of high quality rearing habitat for juvenile Coho Salmon. While still productive, these habitats have become highly altered which reduced their ability to produce large numbers of smolts. Distribution of juvenile Coho Salmon remains throughout suitable habitat in Siltcoos and Tahkenitch basins. While there is little change in overall distribution, habitat modification basin wide and stocking of warm water fish in the lakes has reduced abundance.

Beginning in the 1920's Siltcoos and Tahkenitch lakes were stocked with non-native warm water fish that prey on juvenile Coho Salmon. This predation reduced the lake rearing potential for coho Salmon and has been identified as the primary limiting factor for Coho in the lakes (OCCCP, 2007). Recovering a complete lake rearing component will be difficult due to social issues as there is a large angling community that favors warm water fisheries in the lakes.

Understanding what role lake habitat plays in the overall success of OC coho runs will assist us with our understanding of the success of our coastal lakes restoration efforts. How the warm water fish community affects OC coho survival and run success will inform evaluations of restoration actions and help us understand what improvements to lake management and habitat should be made to increase OC coho abundance. Understanding the life history strategies of those OC coho attempting to use the lake habitats and the success of those relative to all life history strategies will inform our approach to basin wide restoration prioritization across decades.

Abundance of Coho in the lakes basin has high annual variability. Some of the variations are attributed to impacts to freshwater habitat, harvest in ocean and freshwater fisheries and releases of non-native warm water species. Annual spawning surveys in the major tributaries have some of the highest counts on the Oregon coast. These high counts show the resilience of wild Coho salmon in the lakes basins. Spawning surveys in some stream have exceeded 1,000 fish per mile in recent years. Overall Coho populations in Siltcoos and Tahkenitch lakes have increased with reductions in harvest and improved marine survival since the 1990's (Figures 8 and 9). Abundance in the lakes is generally good but El Nino events and poor marine survival can have dramatic effects on adult returns.

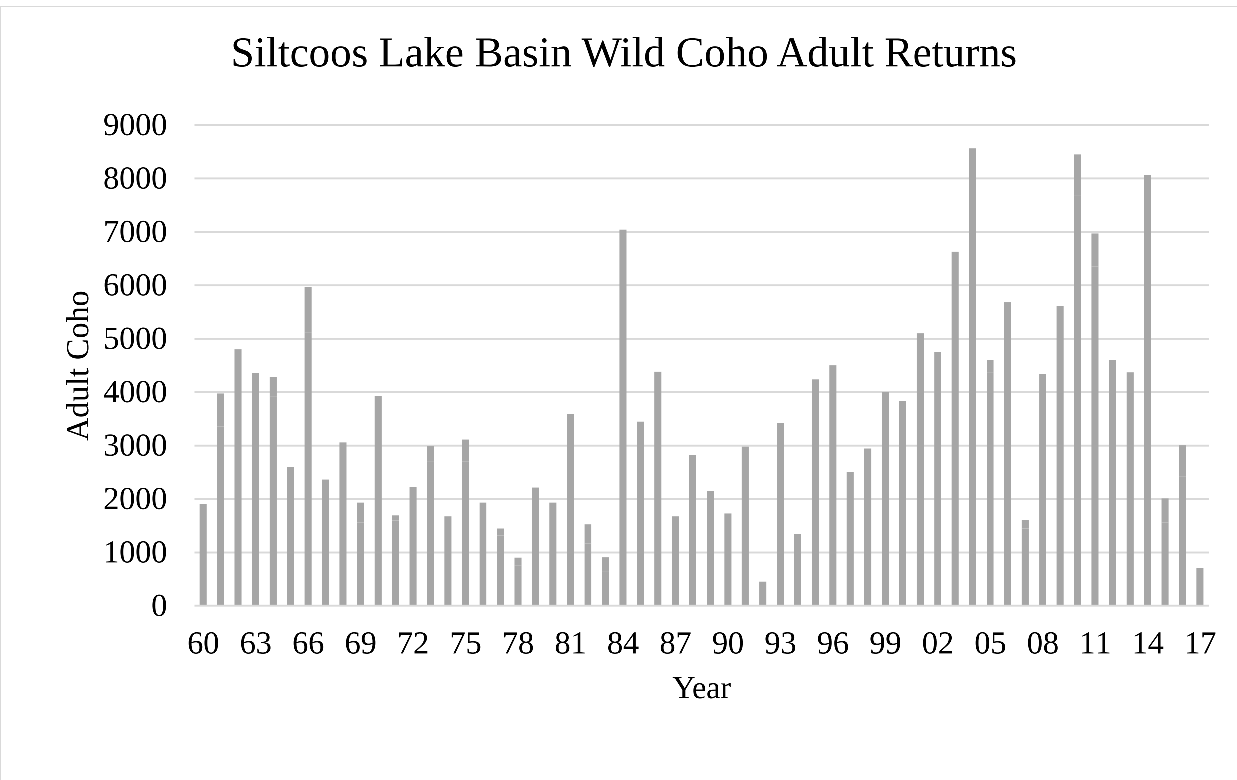


Figure 8 Siltcoos Basin Wild Coho Returns

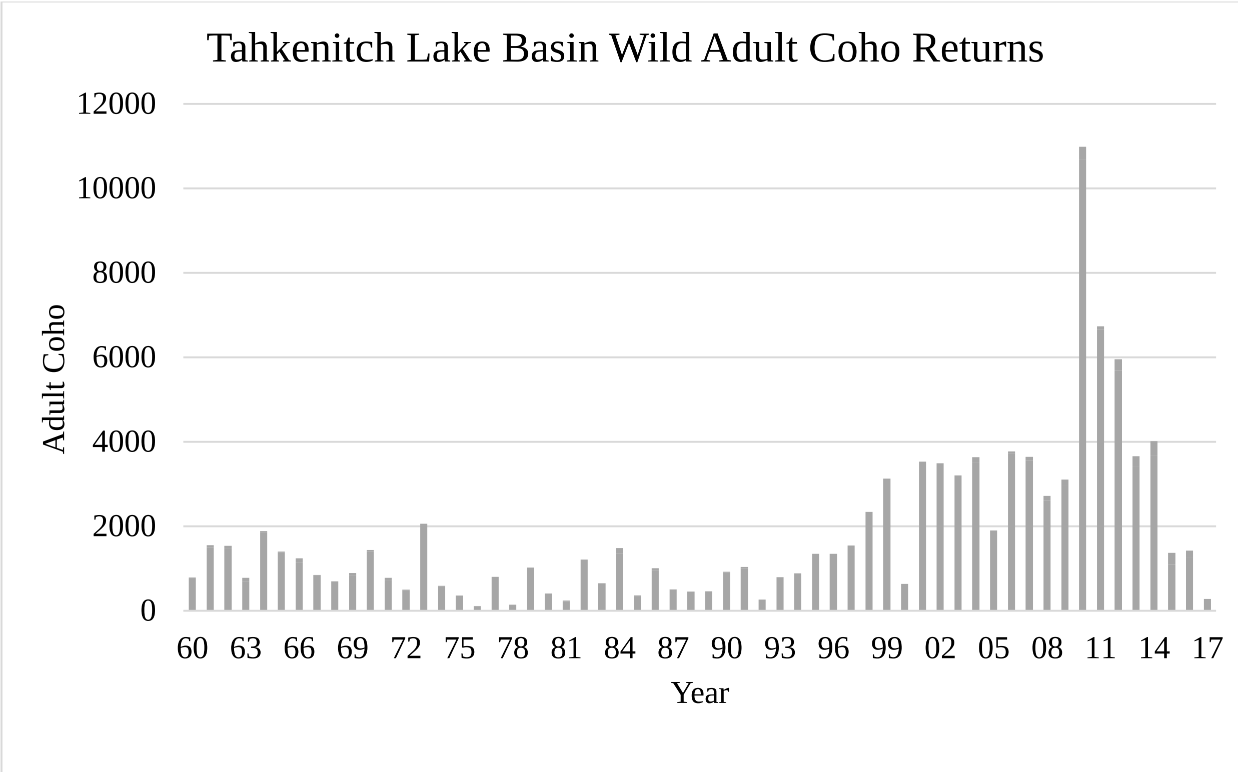


Figure 9 Tahkenitch Basin Wild Coho Returns

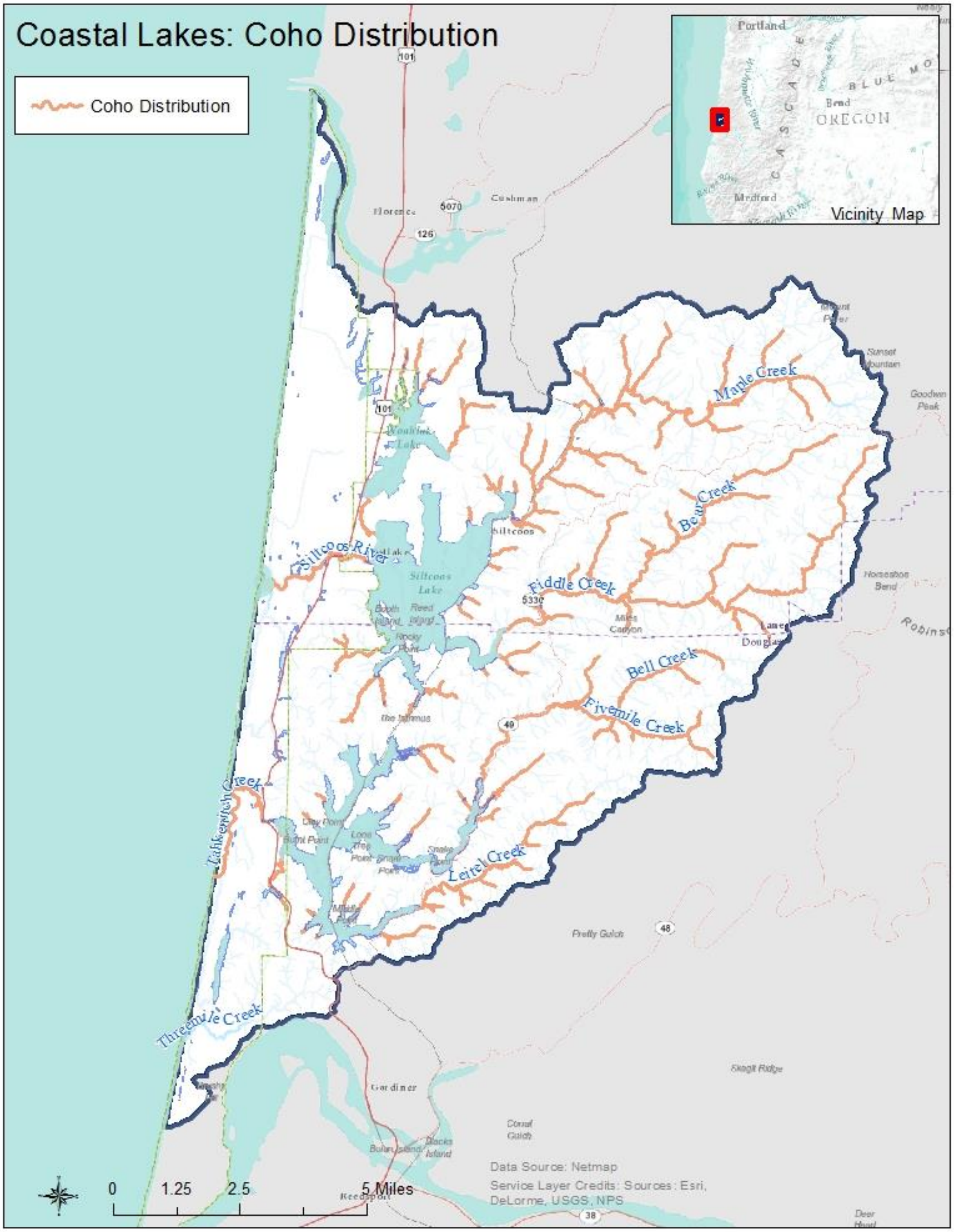


Figure 10 Coho distribution in the Coastal Lakes Watersheds

5. Impaired Watershed Processes and Stresses on Coho Habitats

The watershed processes that create and maintain coho habitats have been considerably altered in the last 150 years. This has been due largely to the resource extraction activities described in Chapter 3, including the creation and use of splash dams to transport timber downstream. Together, these resource extraction activities have reduced the quality and quantity of coho habitat in the Coastal Lakes watershed and, coupled with historical overharvest of the fish, severely diminished the viability of the Coastal Lakes OC coho population.

The core planning team identified the following coho habitat-forming watershed processes as the highest priority for protection and restoration:

- flows (hyporheic and base flows),
- large woody debris delivery,
- channel migration,
- floodplain function/channel interaction (including estuaries),
- riparian community diversity and function,
- bedload transport and gravel supply,
- suspended sediment production,
- dunal processes,
- longitudinal connectivity, and
- estuarine mixing.

The discussion below characterizes how these watershed processes have been altered in the Coastal Lakes Basin, according to the watershed components identified in the Coastal Lakes common framework.

5.1 Modified Watershed Processes in the Uplands, Tributaries, and Off-channel Habitats

According to NMFS (2016), properly functioning tributaries include the following characteristics: low gradient pool/riffle sequences, suitable gravel substrate free of excess fine sediment, instream habitats with plunge pools, lateral scour pools, trench pools, dammed pools, alcoves, backwater pools and beaver ponds, edge habitats, abundant large wood, and strong connections to floodplains. Extensive riparian vegetation stabilizing streambanks and providing shading for cool summer stream temperatures is also essential for coho. The ability of tributary habitats in the Coastal Lakes watershed to create and maintain these habitat characteristics through watershed processes is discussed below.

Headwater Tributaries Channel morphology and habitat for aquatic resources has been greatly altered as streams above the lakes were relocated, straightened, and confined with dikes. Maple, Fiddle, and Fivemile Creeks have been modified for a majority of their mainstem lengths (94%, 89%, and 69% respectively) while Bear Creek has been moderately modified (44%) and

Leitel none at all. Much of these modified areas are either currently being grazed or were abandoned for grazing sometime in the past after lake levels were modified by the dams.

Straightened channels are more efficient at transporting sediment than the meandering channels they replaced. Eroding stream banks in diked portions provide a steady source of sediment which can eventually be transported to the lakes below these streams.

Water quantity and quality issues in headwater tributaries due to channel modification and lack of riparian cover have degraded habitats for coho salmon. The duration and magnitude of low and high water events have been altered by changes in channel morphology, especially down-cut (incised) channels that have been disconnected from their floodplains. In addition to limiting habitat availability, the removal of beaver dams and large wood, which historically created instream pools and extensive networks of wetlands and off-channel habitat, has further impaired watershed processes in tributaries. Water that is slowly released from this complex system of in-channel and floodplain storage areas is essential to maintaining suitable flows and temperatures downstream. Reductions in floodplain connectivity and instream complexity in the headwaters have, therefore, had major cumulative effects on temperatures in the mainstem rivers (Figure 11). These conditions, coupled with riparian shade that is often below effective levels, has led to high, sub-lethal and lethal temperatures to juveniles in many tributary and mainstem reaches. Water withdrawals may further depress already low summer stream flows. Water temperatures in several tributaries are expected to increase in the future with predicted climate change (Figure 12).

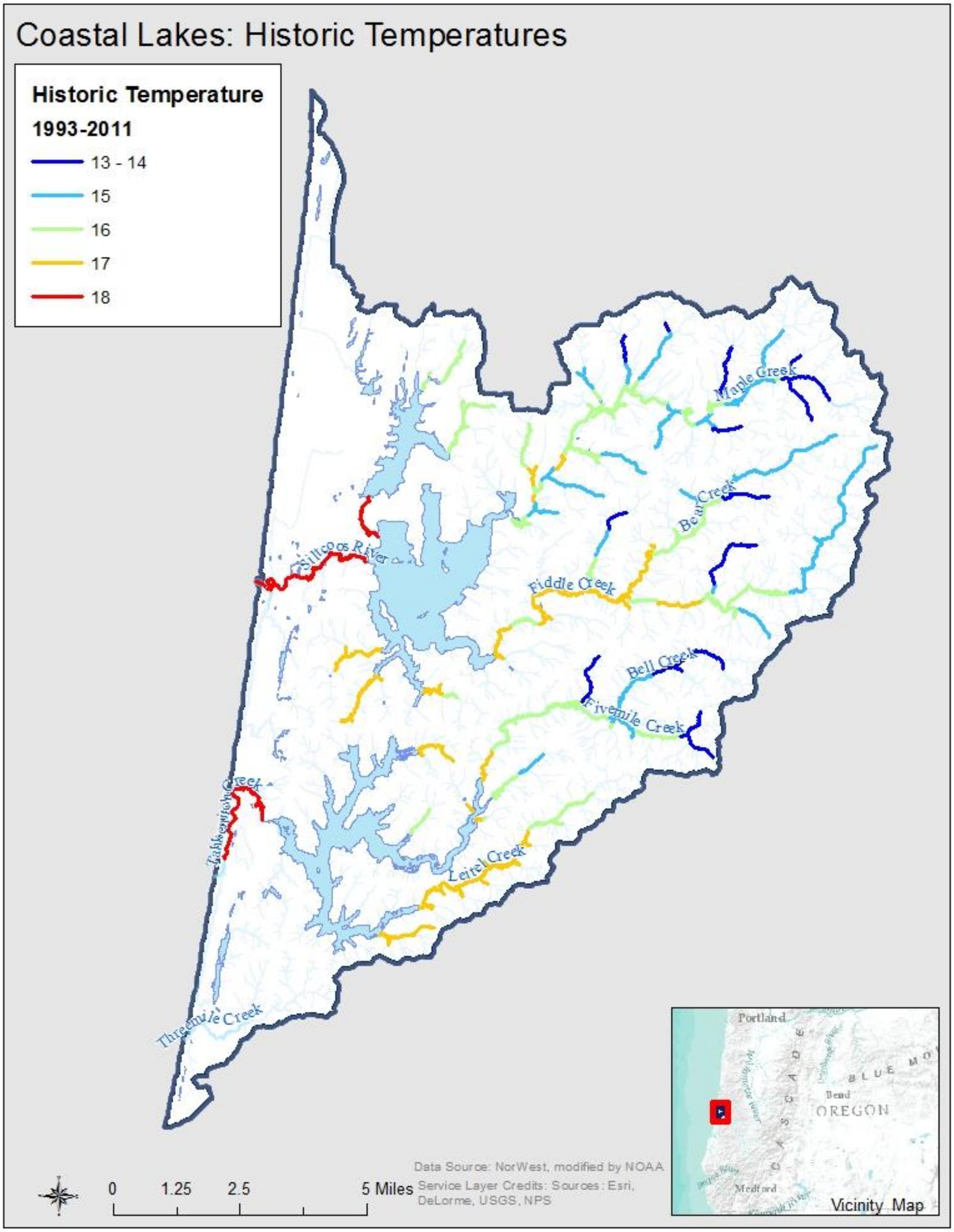


Figure 11 Modeled historic surface temperatures in the Coastal Lakes Watershed

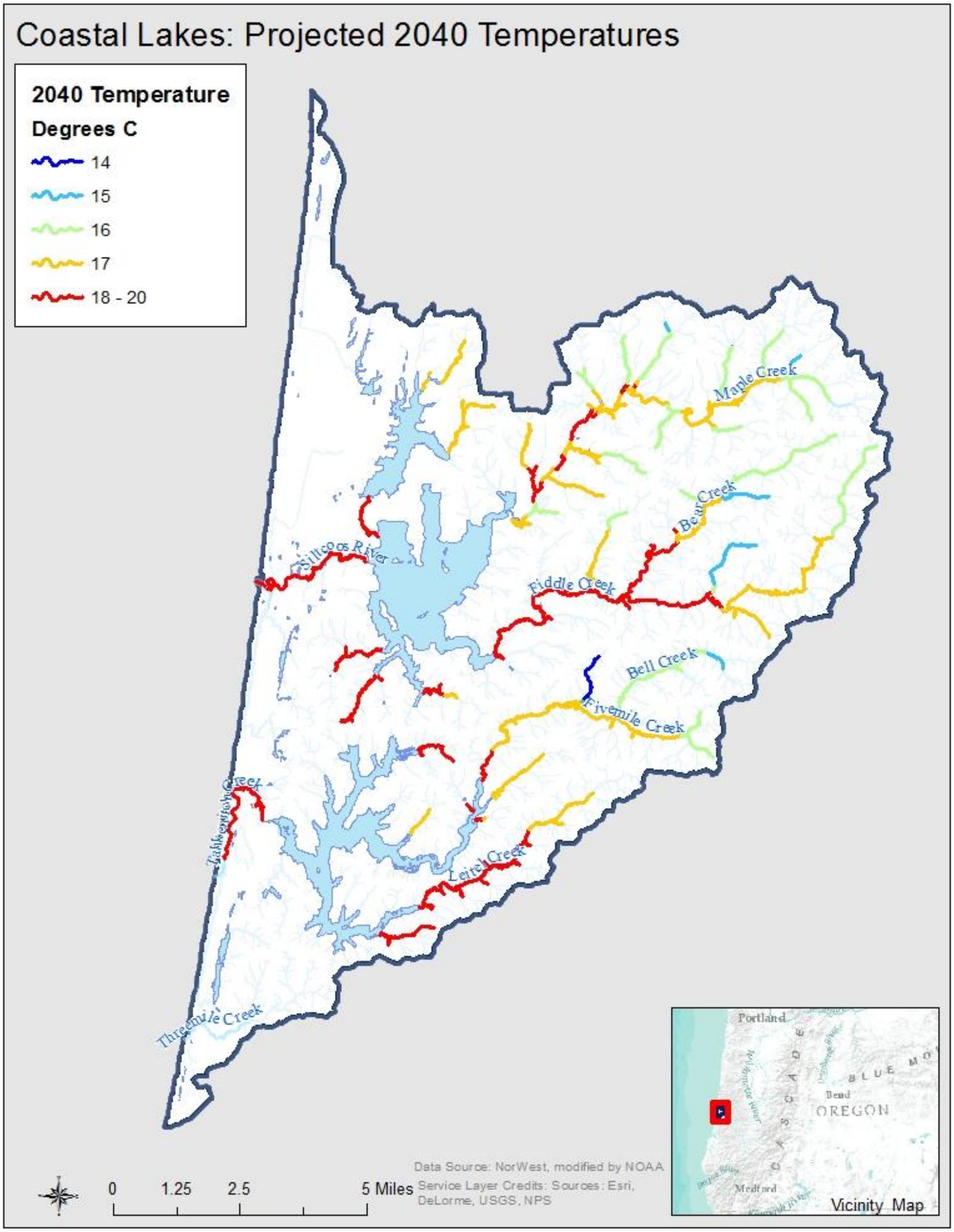


Figure 12 Projected surface water temperature in the Coastal Lakes (2040)

5.2 Modified Watershed Processes in Mainstem, Estuary, and Off-channel Habitats

Estuarine habitats are essential to facilitate the physiological changes that occur in adult and juvenile coho as they migrate between salt and freshwater. Suitable tidal exchange, water flow, salinity, and water quality is required to support the acclimation of downriver migrating coho smolts. Juvenile growth and maturation also require good to excellent water quality, forage, and natural cover. Forage includes aquatic invertebrate and fish species that support growth and maturation. Natural cover includes aquatic vegetation, side channels, undercut banks, brush and trees providing shade, large wood and log jam complexes, large rocks and boulders, beaver ponds, and freshwater wetlands (NMFS 2016). Key off-channel estuarine habitats include sloughs, side channels, overflow channels, tidal marshes and swamps, alcove or ponds, groundwater channels, and seasonally flooded wetlands (Lestelle 2007).

The modification of watershed processes has substantially reduced the quality and area of estuarine rearing habitat for coho salmon. A variety of anthropogenic practices – including agriculture, urbanization, and rural residential development – have led to the construction of barriers that have substantially reduced the availability of tidally connected off-channel habitats, both spatially and temporally. Channel form and connections to side channels, overflow channels, marshes and swamps, alcoves, backwater ponds, and floodplains have been heavily altered or disconnected in many components of the Coastal Lakes watershed. Many side channels have been hydrologically modified or obstructed by the installation of levees, and the relocation, filling and dredging of complex channels.

Large wood delivery has decreased along the main rivers/creeks of the Coastal Lakes due to land clearing and development, riparian harvest, salvage operations, intentional river cleaning, and the creation of road/stream barriers that prevent the movement of floatable debris during high flows. Forest shade has substantially decreased along the Coastal Lakes due to land clearing for agriculture and cutting of riparian trees. This has led to a low density and wide spatial distribution of remaining riparian forest, which is now largely dominated by early successional disturbance species such as red alder.

Channel migration has been retarded in certain reaches by bank hardening with rip rap, or has been promoted in other reaches by the removal of riparian trees, which reduced bank stability and increased lateral channel movement. The removal of riparian trees in the stream corridor and building of roads in floodplains have also reduced shade, edge habitat, and wood recruitment. Land clearing for agriculture and insufficient application of BMPs have led to water quality issues, including increased water temperatures, late summer oxygen depletion, and nutrient loading. Invasive species are also a concern as they often disrupt native plant communities and degrade edge habitats.

6. Development of the Coastal Lakes River Strategic Action Plan

This chapter overviews the major steps used to generate this strategic action plan for the Coastal Lakes basin following a process set by the Coast Coho Partnership, and used in the Siuslaw River SAP which helped to guide the creation of the Coastal Lakes SAP. The approach is based on OWEB guidance provided in the 2017 document, *Components of a Strategic Action Plan for participation in the Focused Investment Partnerships Program*.

As described in Chapter 2, the Siuslaw SAP was one of three pilot SAPs that contain a prioritized list of habitat protection and restoration projects to support the recovery of an independent Oregon Coast coho population. The SCP then used the Siuslaw SAP to develop the Coastal Lakes SAP. The public-private Coast Coho Partnership is overseeing development of the Business Plan, and using it as a marketing tool to recruit partners to fund the highest-priority projects in the SAPs. Development of the Siuslaw River SAP was facilitated by the Wild Salmon Center, with technical support provided by the other members of the Coast Coho Partnership and project consultants. The SCP adapted the Siuslaw Framework to the Coastal Lakes environment to create this Coastal Lakes SAP, thanks in large part to the guidance by the Wild Salmon Center in the creation of the Siuslaw SAP. Projects were ranked for the Siuslaw River SAP and for the Coastal Lakes within a short time frame, meaning the partnership was familiar with the process and adapted the prioritization framework and guidance knowledge developed in the Siuslaw SAP for the Coastal Lakes SAP.

6.1 Visioning

The Coastal Lakes SAP process began with a discussion of shared partnership values and priorities to guide the planning process and inform development of a long-term vision statement for the SCP. The exercise explored ways in which coho conservation aligns potentially competing social, economic, and ecological priorities among local stakeholders. The resulting vision statement not only guided development of the SAP, but has also informed the longer-term role of the SCP within the Coastal Lakes watershed community. In addition to a vision statement, the discussion yielded guiding principles for the planning process, as well as three outcome statements to clearly define the SCP's long-term coho conservation priorities. These vision and outcome statements are presented in Chapter 2.

6.2 Creating the Coastal Lakes Common Framework

The SCP developed the Coastal Lakes common framework based on a "common framework" model in the Coast Coho Business Plan. The Coast Coho Partnership developed the common framework to establish a consistent language that could be used in the SAPs and future coast coho conservation efforts. Following the Business Plan model, the SCP reviewed and tailored the framework to incorporate social and ecological conditions unique to first, the Siuslaw and then the Coastal Lakes Watershed.

The Coastal Lakes common framework classifies habitat types (called "components"); identifies the "key ecological attributes" (KEAs) of each component for Coastal Lakes coho; describes potential indicators for each KEA; and lists the stresses and threats that could undermine population viability over the long term. Terminology adopted through this framework is included throughout this plan, and key terms are defined in Chapters 3 and 4. The full Coastal Lakes common framework is contained in the Appendix.

6.3 Evaluating Habitat Stresses

The SCP's core planning team evaluated conditions within each of the 4 sub-watersheds (6 field HUC) and identified the major habitat stresses limiting coho production based on available information. The team agreed upon the major stresses following interviews with ODFW, other agency field staff, and various nonprofit and governmental restoration practitioners, and a review of existing information, including habitat and water quality data, salmonid population data, and watershed plans and assessments. The SCP has described the process, including available information and data used in these evaluations, anticipating that results may change over time, as new data and methods are considered through the adaptive management program described in Chapter 10. Table 2 summarizes the major stresses identified by the core planning team for each habitat component in the high-ranked sub-watersheds.

6.5 Locating and Prioritizing Projects

With the priority sub-watersheds determined and major stresses agreed upon for each area, the core planning team undertook a multi-step process to determine site-specific protection and restoration actions. The first step was an expert opinion process in which facilitators projected maps and aerial images of each of the high-ranked sub-watersheds and "walked" participants down each perennial tributary and mainstem reach present in the sub-watershed. Team members who were uniquely familiar with a high-ranked sub-watershed discussed protection and restoration priorities and opportunities along each reach. Where there was consensus among the team, facilitators recorded project recommendations. These recommendations were presented at both the tributary and reach scale depending on participants' knowledge of the system. It is important to note that this step did not consider whether a project was socially feasible and/or had the support of the landowner(s). Instead, the purpose was simply to identify locations where limiting factors could/should be addressed through a protection or restoration project. Team members often recommended particular projects based on existing plans or assessments, especially on BLM and USFS lands where such assessments were more likely to have been completed.

Prioritization Criteria. The process above yielded over 100 potential projects across the 4 high-ranked 6th field sub-watersheds. Projects advanced five conservation strategies, including enhancing instream complexity, restoring fish passage, reconnecting floodplains (including restoring off-channel habitat), enhancing riparian function, and protecting critical habitats through land acquisitions and easements.

The core planning team prioritized projects using several criteria that evaluated: (1) the relative importance of the location in which the project is to be implemented, and (2) the relative importance/benefit of the project. Criteria included the following:

- Importance of the location where restoration is occurring: Criteria evaluate life stages utilizing the site; habitat value; and restoration potential (measured by Intrinsic Potential). Additional "bonus" points were also provided to any sites that contained unique conditions or habitat types (e.g., a tidal spruce swamp) or was a known source of temperature refugia.
- Importance of the project: Criteria evaluate limiting factors being addressed; watershed processes that benefitted from the project type; anticipated longevity of the project; and assurance of success. Bonus points were given to any projects that benefitted working lands and/or had a significant focus on landowner and/or public education.

The scoresheet used to apply these criteria – along with a worksheet to quantify ecosystem processes benefited by different project types – is provided in Appendix. In addition to using this scoresheet to prioritize the projects generated for this SAP, the SCP will use the scoresheet as a tool to evaluate future project opportunities and their consistency with the goals of the SAP. Project scores by criteria and other project information are shown in the Coastal Lakes SAP Project Summary and Rankings spreadsheet, contained in Appendix.

Netmap as a Tool to Test and Refine Project Locations. Following this initial prioritization process, the SCP commissioned TerrainWorks to evaluate the core planning team's findings using its Netmap tool to model the optimal locations for numerous restoration strategies. Netmap develops a 'virtual watershed' based on a LiDAR generated digital elevation model (DEM) (merged with 10m DEMs where LiDAR is unavailable) and enumerating multiple aspects of watershed landforms and processes, and human interactions within them over a range of scales (Benda et al. 2015; Barquin et al. 2015). NetMap's virtual watershed contains six analytical capabilities to facilitate optimization analyses: (1) delineating watershed-scale synthetic river networks using the merged LiDAR and 10m DEMs; (2) connecting river networks and terrestrial environments, and with other parts of the landscape; (3) routing of watershed information downstream (such as sediment) and upstream (such as fish); (4) sub-dividing landscapes and land uses into smaller areas to identify interactions and effects; (5) characterizing landforms; and (6) attributing river segments with key stream and watershed information.

This exercise had three goals: The first goal was to provide an objective evaluation of the locations determined as priorities for restoration by the core planning team. Where project sites recommended by the team were not selected by the model, the team determined the cause of the inconsistency and, in some cases, refined or added project sites. In others, the model was recalibrated to better reflect actual known site conditions. In effect, the Netmap analyses provided a check on "at-the-table bias" and provided further justification for selected project locations.

The second goal of running Netmap was to provide managers with modeled priority sites in cases where information or participant expertise was limited, and team members were unable to recommend specific project locations. In these cases, a modeled priority site was adopted as the project site by the team and incorporated into the SAP, or it will be used as a starting point for managers in the field to consider when locating future restoration project sites. In the latter case, the project location remains broadly defined in the SAP (e.g., an entire tributary, rather than a particular reach).

The third goal of using Netmap was to provide a long-term modeling tool and data layers for future prioritization exercises. The USFS and SWC both retain a license to use the Siuslaw Netmap data, as well as access to the Netmap software. The complete Siuslaw Netmap analysis can be found at http://www.siuslaw.org/

TerrainWorks' analyses included a range of outputs that were considered during the process (including runs that prioritized sites for riparian restoration, beaver re-introduction, thermal refugia protection, road maintenance/decommissioning, and fish passage improvement). In addition, the team also used Netmap as part of an extensive analysis to identify anchor habitats and prioritize upland timberlands for protection. Because these analyses are the basis of numerous projects selected for this SAP, the methods are summarized below.

Identifying Anchor Habitats. To further refine locations for habitat protection and restoration, the SCP adopted an "anchor habitat" approach. An anchor habitat is a stream reach that provides all of the essential habitat features necessary to support the complete coho freshwater life history. An anchor site supports all of the seasonal habitat needs of coho salmon from egg to smolt outmigration, including optimal gradient, potential for floodplain interaction, and accumulation of spawning gravels." Thus, the protection and restoration of these sites – or sites exhibiting a high *potential* to be anchor habitats – provides the greatest opportunity to increase coho production. Current and potential anchor sites, therefore, represent excellent sites in which to augment instream complexity, reconnect floodplains, restore off-channel habitats, and protect upland areas for large wood and gravel recruitment.

The SCP identified coho anchor habitats in the Coastal Lakes Basin's high-ranked sub-watersheds by using the Netmap tool to model several watershed parameters. These parameters were correlated with anchor habitats that were identified through extensive physical habitat and population surveys. Generally, these parameters included: channel gradient, temperature, floodplain width and connectivity, and valley constraint. Appendix contains more details on the anchor habitat identification methodology. Figure 7-2 presents the modeled anchor habitats in the high-ranked sub-watersheds.

The core planning team used the results from the anchor habitat identification process to guide the selection of high-priority locations for short-term instream, wetland, and off-channel restoration. The process also led to an analysis of upland forested areas that could be protected to provide for long-term wood and gravel delivery. The team used Netmap to determine which upslope areas in the Coastal Lakes watershed have the greatest potential to deliver wood and gravel into identified anchor habitats. To analyze the likelihood that a location had a high probability of sliding and delivering these inputs into an anchor, Netmap results were combined with Landscape Ecology, Modeling, Mapping & Analysis (LEMM A) 2012 Structure Data to identify high probability debris flow / shallow landslide areas capable of delivering late seral vegetation on private lands directly into and upstream of anchors.

Results generated by the analysis of upslope areas in the Coastal Lakes watershed identified 220 acres across 25 sites where the protection of standing timber is likely to generate the greatest long-term benefit to instream habitat quality. Allowing watershed processes to deliver wood and gravel to the locations where these inputs can have the greatest benefit represents a powerful restoration tool. If implemented, this strategic and cost effective approach greatly enhances the likelihood of maintaining a viable Coastal Lakes coho population over the long term. The locations of these upland sites are presented in Chapter 7, Goal 6.

6.6 Monitoring and Indicators

The SCP developed a list of indicators that can be used to monitor the pace and effectiveness of SAP implementation. This action is a modest, but essential, step towards addressing one of the main concerns leading to the development of the Coast Coho Business Plan and its constituent SAPs: that managers were struggling to detect the cumulative benefits of restoration at a sub-watershed or population scale. During development of the “Coastal Lakes framework” the SCP identified a list of indicators that they hoped to improve through SAP implementation. This list was revisited and revised at the conclusion of the SAP process to incorporate information generated and lessons learned during the process. Chapter 10 presents the final list of indicators for the Coastal Lakes SAP and the associated monitoring required to assess those indicators.

6.7 Estimating Costs

The Siuslaw Coho Partnership’s final step in drafting the Coastal Lakes SAP was to estimate the anticipated costs of projects selected for the plan. Costs were generated by reviewing the OWEB Oregon Watershed Restoration Inventory (OWRI) database and by reviewing costs from projects that have been implemented in the Coastal Lakes and Siuslaw River area by local partners. The McKenzie River Trust also provided cost data for potential acquisition and protection projects in the Coastal Lakes watershed. The OWRI database was queried to focus on projects that were implemented within the Oregon Coast Coho ESU from 2010 to 2014. Project costs are presented in Chapter 9.

6.8 Community Outreach

Community outreach played a critical role throughout the planning process. The Siuslaw Coho Partnership includes local, state, and federal partners, tribes, and NGOs. Throughout the SAP development process, participants on the core planning team maintained consistent communication with the boards and managers of the groups they represented in the process. This ensured broad outreach to community stakeholders and an opportunity for input at key junctures in the process. This feedback loop ensured that questions and concerns raised by local stakeholders were considered and acted upon during plan development, limiting any surprises upon release of the draft plan to the community. Public review of the plan took place through an open house convened by SWC, and then during a public 45-day plan review period during which time members of the public could offer comment to the plan, which was available on the SWC website.

Additionally, the SCP contracted with Solid Ground Consulting (Portland, OR) to conduct interviews with stakeholders to SAP implementation to provide feedback on the plan, and the SCP's vision and goals. Solid Ground Consulting also created a Communication Plan to help the SCP further engage stakeholders in restoration projects across the watershed. This will increase the capacity of the SCP to collaborate with willing private landowners in the future. Results of the interview process and the communications plan are located in the Appendix.

7. The Strategic Framework: Restoration Strategies and Key Geographies

Chapter 6 provided a summary of the process the SCP used to decide the specific types of habitat restoration to occur within the high priority stream reaches, and how the core team selected and prioritized projects for implementation. Chapters 7 and 8 state the results of the process. This chapter presents the "Strategic Framework," which the SCP plans to utilize in guiding its work over the long-term. The framework identifies the locations prioritized highest for restoration, as well as the key strategies the SCP will use to pursue implementing them. The maps displayed in this chapter show the priority locations where the strategies are proposed for implementation. Also presented are the associated tables summarizing our targeted measurable objectives. Chapter 8 presents the site-specific projects proposed for implementation within these priority areas over the next six years.

7.1 The High Ranked Sub Watersheds

In total, there are four 6th field H.U.C's within the Coastal Lakes. The SCP worked through the process described in Chapter 6 which identified each of the four sub-watersheds within the Coastal Lakes as "high ranked," in order to adequately provide "a connected assemblage of diverse habitats sufficient to foster a broad expression of life-history strategies in the Coastal Lakes Stratum." The "high ranked" sub-watersheds include (not in any order of preference):

- Fiddle Creek
- Maple Creek
- Siltcoos Lake Pacific Frontal
- Tahkenitch Lake Pacific Frontal

Table 2 Habitat Stresses by Component

Reach Name	Estuary	Mainstem	Lakes	Tributaries	Off-channel and Wetlands	Upland
Siltcoos HUC	**Stabilized dunes-lack of lateral connectivity & complexity**	**lateral connectivity, lack of veg diversity, stream complexity, temperature, flow modifications**	**Invasive fish and plants Water quality & HABS, Temp**	**habitat complexity, winter habitat, altered riparian vegetation**	**vegetation, lateral connectivity**	**fragmentation**
Siltcoos River (Outlet to Mouth)	Reduced tidal wetland connectivity European beachgrass stabilized dunes Bi-directional Regulated Flows Altered function -Invasives species invasive Aquatic sp Invasive sp-fish	European beachgrass stabilized dunes Bi-directional Regulated Flows Altered Riparian function -Invasives species invasive Aquatic sp Invasive sp-fish	NA	NA	Same as estuary	Same as estuary
Siltcoos Lake			Invasive fish & plants, regulated lake level, HABS, > Temp, <DO, > nutrients-failing septic systems, altered riparian, > sediment,			Forest fragmentation, reduced LWD delivery & yield

			overwater structures -docks, water withdrawals			
Maple Creek	NA	Decreased lateral connectivity, altered riparian function, reduced riparian wood input, reduced instream complexity, > temp, < veg complexity, invasive sp, nutrient problems, >fine sediment, <bank stability, reduced beaver activity, entrenched system	NA	Decreased lateral connectivity, altered riparian function, reduced riparian wood input, reduced instream complexity, > temp, < veg complexity, invasive sp, nutrient problems, >fine sediment, <bank stability, reduced beaver activity, entrenched system	<beaver ponds, reduced sp diversity, invasive sp	Forest fragmentation, reduced LWD delivery & yield, road related sediment delivery
Fiddle Creek		Decreased lateral connectivity, altered riparian function, reduced riparian wood input, reduced instream complexity, > temp, < veg complexity, invasive sp, nutrient	NA	Decreased lateral connectivity, altered riparian function, reduced riparian wood input, reduced instream complexity, > temp, < veg	<beaver ponds, reduced sp diversity, invasive sp	Forest fragmentation, reduced LWD delivery & yield, road related sediment delivery

		problems, >fine sediment, <bank stability, reduced beaver activity, entrenched system		complexity, invasive sp, nutrient problems, >fine sediment, <bank stability, reduced beaver activity, entrenched system		
Frontal Trib's		Decreased lateral connectivity, altered riparian function, reduced riparian wood input, reduced instream complexity, > temp, < veg complexity, invasive sp, nutrient problems, >fine sediment, <bank stability, reduced beaver activity, entrenched system		Decreased lateral connectivity, altered riparian function, reduced riparian wood input, reduced instream complexity, > temp, < veg complexity, invasive sp, nutrient problems, >fine sediment, <bank stability, reduced beaver activity, entrenched system	<beaver ponds, reduced sp diversity, invasive sp	Forest fragmentation, reduced LWD delivery & yield, road related sediment delivery
Tahkenitch HUC	**Stabilized dunes-lack of lateral connectivity & complexity**	**lateral connectivity, lack of veg diversity, stream complexity, flow modifications**	**Invasive fish and plants, Temperature**	**habitat complexity, winter habitat, altered riparian vegetation**	**vegetation, lateral connectivity**	**fragmentation**

Tahkenitch Creek (Outlet to Mouth)	Reduced tidal wetland connectivity					
Tahkenitch Lake			Invasive fish & plants, regulated lake level, HABS, > Temp, <DO, > nutrients, altered riparian, > sediment, over water structures e.g. houseboats			
Lietel Creek		altered riparian function, reduced riparian wood input, reduced instream complexity, > temp, < veg complexity, invasive sp, >fine sediment, <bank stability, reduced beaver activity,		altered riparian function, reduced riparian wood input, reduced instream complexity, > temp, < veg complexity, invasive sp, >fine sediment, <bank stability, reduced beaver activity,	<beaver ponds, reduced sp diversity, invasive sp	Forest fragmentation, reduced LWD delivery & yield, road related sediment delivery
Fivemile Creek		Decreased lateral connectivity, altered riparian function, reduced riparian wood input, reduced instream		Decreased lateral connectivity, altered riparian function, reduced riparian wood input, reduced	<beaver ponds, reduced sp diversity, invasive sp	Forest fragmentation, reduced LWD delivery & yield, road related

		complexity, > temp, < veg complexity, invasive sp, nutrient problems, >fine sediment, <bank stability, reduced beaver activity, entrenched system		instream complexity, > temp, < veg complexity, invasive sp, nutrient problems, >fine sediment, <bank stability, reduced beaver activity, entrenched system		sediment delivery
Frontal Trib's		Decreased lateral connectivity, altered riparian function, reduced riparian wood input, reduced instream complexity, > temp, < veg complexity, invasive sp, nutrient problems, >fine sediment, <bank stability, reduced beaver activity, entrenched system		Decreased lateral connectivity, altered riparian function, reduced riparian wood input, reduced instream complexity, > temp, < veg complexity, invasive sp, nutrient problems, >fine sediment, <bank stability, reduced beaver activity, entrenched system	<beaver ponds, reduced sp diversity, invasive sp	Forest fragmentation, reduced LWD delivery & yield, road related sediment delivery

7.2 Habitat Stresses, Limiting Factors, and the Anchor Habitat Approach

The Federal Recovery Plan For Oregon Coast Coho (NMFS, 2016) identified the primary habitat related limiting factors as lost habitat (especially floodplain habitat and blocked passage), reduced complexity, degraded water quality, and highlighted global climate change as another emerging issue. Oregon's Coastal Coho Conservation Plan (ODFW, 2007) identified exotic fish species as the primary limiting factor, and the secondary limiting factors specific to the Coastal Lakes Stratum as stream complexity (loss of rearing habitat) and poor water quality. Fiddle and Fivemile Creeks are listed under section 303(d) of the Clean Water Act as being water quality limited by temperature, year round (ODEQ, 2012). Fivemile and Bell Creeks are also listed as being water quality limited by biological criteria, year round (ODEQ, 2012). Both Siltcoos and Tahkenitch Lakes are on the 303(d) list as being water quality limited by aquatic weeds (ODEQ, 2012). The Coastal Lakes SAP determined the major stresses limiting Coho production to be lateral connectivity, reduced wood inputs, and altered riparian function.

To assist in focusing habitat protection and restoration activities, the SCP identified anchor habitats within the four priority sub-watersheds. As previously described, anchor habitats provide all of the critical habitat features necessary to support the complete Coho life history in freshwater. The protection and restoration of these sites provides the greatest opportunities to generate a sustained increase in Coho production. Thus the anchor habitat approach provides the SCP a high degree of confidence that the strategies presented represent the optimal opportunities to produce the greatest returns on our future investments.

7.3 Strategies to Conserve Critical Coho Habitats in the Coastal Lake Watersheds

Throughout the life of this SAP, the SCP will follow several strategies that seek to repair and improve watershed function, and to address the major stresses limiting Coho production. The strategies are summarized below, with the associated maps and tables stating where specifically the SCP recommends implementing these strategies, along with the extent of habitat (acres, miles, etc.) recommended for distinctive treatment types. The Strategic Framework presented is intended to guide outreach, project implementation, and monitoring over the next few decades. The SCP realizes the strategies presented here do not represent all of the opportunities available in the Coastal Lakes watersheds. They simply represent those the SCP believe have the highest likelihood of enhancing watershed function and increasing the productive capacities of habitats for Coho in the long term. The Strategic Framework will be evaluated over time, and local priorities may change as new information becomes available. This is further discussed in detail in Chapter 9.

Strategy 1) Add LWD to identified anchor habitats and other reaches to increase stream complexity and restore stream interaction with off-channel habitats.

The installation of LWD structures in a stream increases pool area and depth, slows water velocity, traps and sorts gravel and fine sediments, and facilitates floodplain inundation. This large wood will also supply habitat and nutrients for aquatic invertebrates, increasing the food supply for fish and wildlife. Beavers also need large wood to anchor dams in larger streams and may utilize small wood trapped in the larger structures which will foster the development of beaver ponds and associated off-channel rearing habitats.

Table 7.1 Miles of Stream Proposed as High Priority for LWD by Sub-Watershed

Sub-Watershed	Netmap Modeled Anchor Habitats (Miles)	Team Identified Priority Reaches (Miles)
Fiddle Creek	9.3	4
Maple Creek	9.1	1.9
Siltcoos Lake Pacific Frontal	14.4	1.8
Tahkenitch Lake Pacific Frontal	18.1	7.7

Strategy 2) Plant riparian vegetation to reduce stream temperatures and/or ensure future LWD recruitment into anchor habitats.

Riparian vegetation plays an essential role in producing and maintaining coho habitat. Riparian vegetation along tributaries, off-channel habitats, and some mainstem and wetland habitats can provide shade to reduce stream temperature, create cover for coho rearing, provide a source of food and nutrients, help stabilize sediment supply, filter out pollutants and provide a source of stream complexity. Riparian vegetation therefore addresses the primary and secondary limiting factors for coho production, lack of stream complexity and reduced water quality (especially temperature and sediment).

Table 7.2 Miles of Riparian Habitats Proposed for Enhancement by Sub-Watershed

Sub-Watershed	Netmap Modeled Priorities (Miles)	Team Recommended Sites (Miles)
Fiddle Creek	2.3	3
Maple Creek	2.6	0
Siltcoos Lake Pacific Frontal	1.5	2.3
Tahkenitch Lake Pacific Frontal	5.1	9.7

Strategy 3) Reconnect and protect disconnected floodplains to promote the availability of off-channel rearing habitats.

Lateral connection is integral to winter rearing habitats, projects which would reconnect this access include LWD installation, levee removal, beaver recruitment and other approaches that promote greater interaction between a stream and its floodplain.

Strategy 4) Reconnect tidal channels to promote the availability of estuarine rearing habitats. The estuary is vitally important to coho life history strategies and provide for many of the habitat needs of coho salmon. Since the beginning of the SCP, the estuary has been a focus for restoration. Numerous large estuary restoration projects have occurred throughout the history of the Partnership with significant additional opportunities anticipated in the near future.

Strategy 5) Upgrade culverts and other working land infrastructures to increase longitudinal connectivity of instream habitat, while improving water quality.
Upgrading working lands infrastructure could open additional coho habitat above passage barriers and improve access to spawning and rearing habitats throughout the Siuslaw and Coastal Lakes basins. Sediment reduction strategies on native surface and gravel roads can often provide valuable benefits to juvenile coho salmon.

Table 7.3 Miles of Channel and Acres of Floodplain Reconnected by Sub-Watershed

	Strategy 3: Lateral Reconnection	Strategies 4 & 5: Longitudinal Reconnection
Sub-Watershed	**Acres of Floodplain Reconnected**	**Miles of Channel Reconnected Above Replaced Dams & Culverts**
Fiddle Creek	533	1.6
Maple Creek	322	2.2
Siltcoos Lake Pacific Frontal	119	101.2 (+)
Tahkenitch Lake Pacific Frontal	306	100 (+)

Strategy 6) Engage public and private forest landowners to identify opportunities to protect standing timber within non-fish bearing, debris-flow prone tributary corridors that can deliver large wood into identified anchor habitats.
As part of the modeling exercise the Partnership completed, we determined areas that could deliver LWD to streams in the future. We can now use this dataset to talk to landowners about what specific stands of large trees exist within the watershed today that could be the most cost-effective way of ensuring future LWD recruitment to anchor habitat areas.

These strategies aim to address the primary limiting factor as well as habitat stresses listed above, which when implemented will have the over-arching benefits listed as the main goals of the plan. Projects listed in the SAP are meant to restore and protect natural habitat-forming processes in the watershed to sustain a viable and resilient ecosystem that supports coho in the future.

Table 7.4 Acres of Tier 1 and Tier 2 Timber Stands by Sub-Watershed

	Tier 1 Sites		Tier 2 Sites	
Sub-Watershed	**# of Sites**	**Acres**	**# of Sites**	**Acres**
Fiddle Creek	9	74	196	2,328
Maple Creek	6	66	101	1,180
Siltcoos Lake Pacific Frontal	1	12	2	28
Tahkenitch Lake Pacific Frontal	9	68	101	1,140

8. SCP Implementation Plan: Goals & Actions (2019-2025)

By working through the Strategic Framework, the SCP identified 50 plus projects in the Coastal Lakes watersheds. Over 30 of the projects were included in our six year work plan. This chapter presents the highest-priority projects, which the SCP believes are ready to proceed toward on the ground implementation. Basically, these projects represent the convergence of need, opportunity, and the highest expected results relative to costs. The SCP selected a six-year timeline specifically to align with OWEB's Focused Investment Partnership (FIP) grant program, which the SCP will seek to accelerate SAP implementation. Securing OWEB FIP funding will be crucial for timely and successful execution of the SAP, by providing a stable basis to initiate the effort, as well as the means to leverage the substantial matching funds required. The goals presented for each of the four priority sub-watersheds reflect the extent of project implementation that the SCP believes it can accomplish with supporting OWEB FIP dollars, supplemented with additional funds leveraged through this SAP from NOAA, NFWF, and/or other public and private partners. The SCP is confident that by accomplishing these proposed short term goals, we can attain the long-term outcomes described in this SAP's introduction, which are:

- an increase in the quality and quantity of summer and winter rearing habitats in the Coastal Lakes watersheds sufficient to anchor population viability;
- a connected assemblage of diverse habitats sufficient to foster a broad expression of life-history strategies in the Coastal Lakes Stratum; and
- a healthy restoration economy that is viewed as an important source of income in the Coastal Lakes watersheds.

Table 8.1 Summary of Habitat Restoration Outputs by Strategy in Priority Sub-Watersheds

Sub Watershed	LWD Installation (Stream Miles)	Riparian Enhancement (Stream Miles)	Floodplain Reconnection (Acres)	Instream Reconnection (Stream Miles)	Road Upgrade (Stream Miles)
Fiddle	4	3	533	1.6	0
Maple	1.9	0	322	2.2	0
Siltcoos	1.8	2.3	119	101.2 (+)	.5
Tahkenitch	7.7	9.7	306	100 (+)	0
Total	15.4	15	1,280	205	.5

Goal 1) Restore and protect instream, riparian, and floodplain habitats on 17.8 miles within the Fiddle Creek 6th Field H.U.C.

- Objective 1.1 Reconnect **533** acres of disconnected floodplains to promote the availability of off-channel rearing habitats.
    - Project 1.1-A **(GIS ID 11+12)** Reconnect **209** acres of floodplains along 3.3 miles of mainstem Fiddle Creek and tributary confluences, upstream to Bear Creek (pending acquisition or protection).
    - Project 1.1-B **(GIS ID 13+14)** Reconnect **220** acres of floodplains along 7.2 miles of mainstem Bear Creek and tributary confluences (pending acquisition or protection).
    - Project 1.1-C **(GIS ID 15+16)** Reconnect **30** acres of floodplains along 3 miles of mainstem Fiddle Creek and tributary confluences, from Big Canyon upstream to USFS lands (1 of 5).
    - Project 1.1-D **(GIS ID 21+22)** Reconnect **44** acres of floodplains along 1.2 miles of mainstem Alder Creek and tributary confluences (pending acquisition or protection).
    - Project 1.1-E (**GIS ID 18**) Reconnect **30** acres of floodplains along 1.6 miles of mainstem Morris Creek and tributary confluences (pending acquisition or protection).
- Objective 1.2 Add LWD and/or Beaver Dam Analogs (BDA's) to **4** miles of anchor and other priority reaches to increase instream complexity and restore stream interaction with off channel habitats.
    - Project 1.2-A **(GIS ID 51+53)** Add LWD and/or BDA's to **3** miles on mainstem Fiddle Creek and tributary confluences, from Big Canyon upstream to USFS lands (2 and 5 of 5).
    - Project 1.2-B **(GIS ID 19+20)** Add LWD and/or BDA's to **1** mile on unnamed tributary at lower end of Fiddle Creek.
- Objective 1.3 Enhance **3** miles of riparian vegetation to reduce stream temperatures and promote future LWD recruitment into anchor habitats.
    - Project 1.3-A **(GIS ID 52)** Enhance **3** miles of riparian vegetation on mainstem Fiddle Creek and tributary confluences, from Big Canyon upstream to USFS lands (3 of 5).
- Objective 1.4 Reconnect **1.6** miles of instream spawning and rearing habitat.
    - Project 1.4-A **(GIS ID 16)** Remove one undersized culvert from unnamed tributary upstream from Morris Creek, to reconnect **.5** mile of stream. (4 of 5).

- Project 1.4-B **(GIS ID 17)** Remove or upgrade one undersized culvert from Tributary C on Bear Creek, to reconnect **1.1** miles of stream.

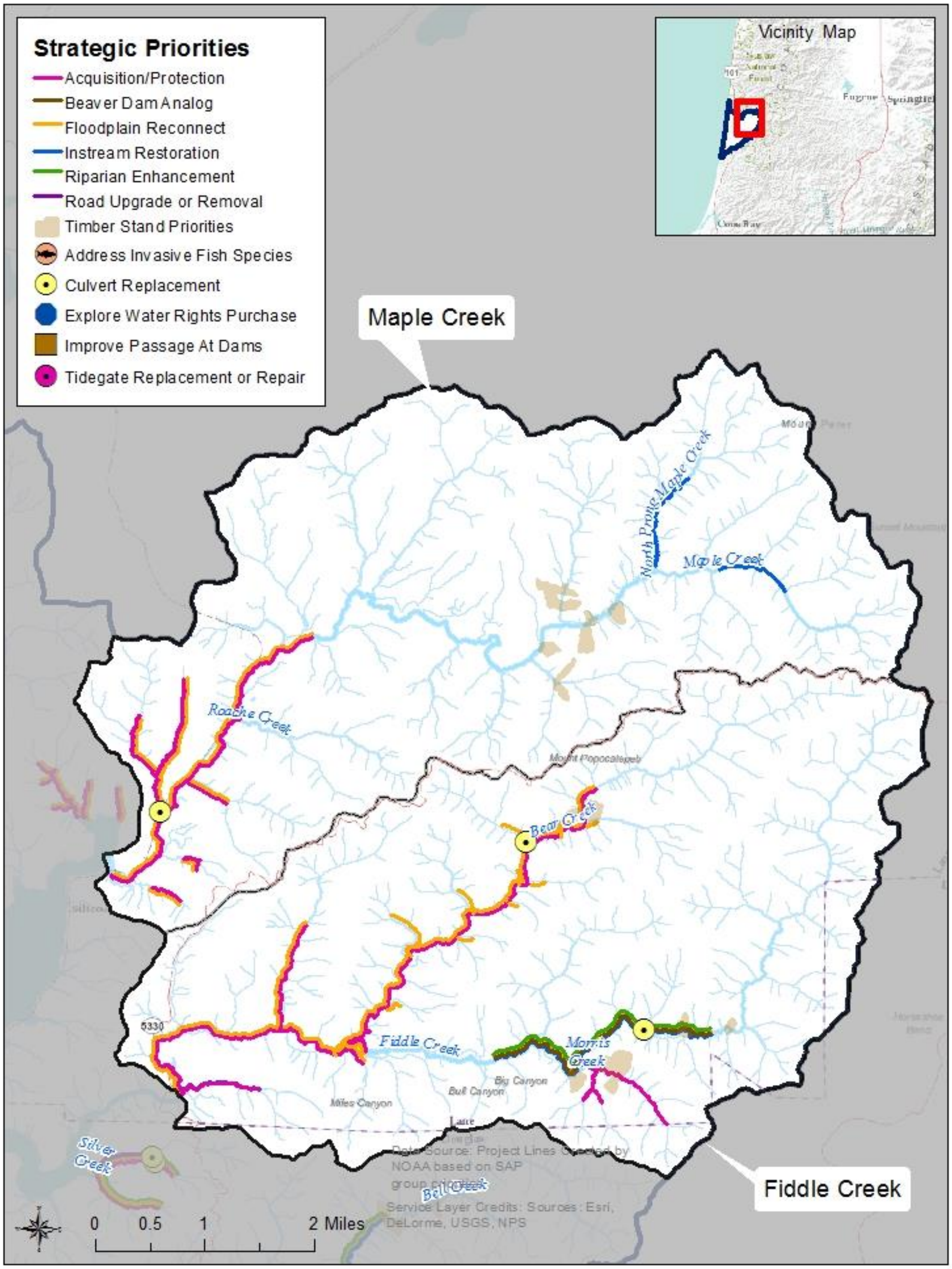


Figure 13 Location of restoration projects in the Maple and Fiddle Creek watersheds.

Goal 2) Restore and protect instream, riparian, and floodplain habitats on 8.8 miles within the Maple Creek 6th Field H.U.C.

- Objective 2.1 Reconnect **322** acres of disconnected floodplains to promote the availability of off-channel rearing habitats.
    - Project 2.1-A **(GIS ID 1+7+8+100+103+106)** Reconnect **252** acres of floodplains along 4.2 miles of mainstem Maple Creek and tributary confluences, from Lake upstream to Grant Creek (pending acquisition or protection).
    - Project 2.1-B **(GIS ID 2+4)** Reconnect **51** acres of floodplains along 2.3 miles of Schrum Creek (pending acquisition or protection).
    - Project 2.1-C **(GIS ID 5+6)** Reconnect **19** acres of floodplains along .4 mile Carle Creek (pending acquisition or protection).
- Objective 2.2 Add LWD and/or BDA's to **1.9** miles of anchor and other priority reaches to increase instream complexity and restore stream interaction with off channel habitats.
    - Project 2.2-A **(GIS ID 9)** Add LWD to **.8** mile on mainstem Maple Creek upstream from Coleman Creek on USFS lands.
    - Project 2.2-B **(GIS ID 10)** Add LWD to **1.1** miles on North Prong Maple Creek on USFS lands.
- Objective 2.3 Reconnect **2.2** miles of instream spawning and rearing habitat.
    - Project 2.3-A **(GIS ID 3)** Replace one undersized railroad culvert with a bridge at the mouth of Schrum Creek, to reconnect **2.2** miles of stream.

Goal 3) Restore and protect instream, riparian, floodplain and estuarine habitats on 101.2 (+) miles within the Siltcoos Lake Frontal Pacific 6th Field H.U.C.

- Objective 3.1 Reconnect **119** acres of disconnected floodplains to promote the availability of off-channel rearing habitats.
    - Project 3.1-A **(GIS ID 23+29+30)** Reconnect **69** acres of floodplains along 1.8 miles of Silver Creek (pending acquisition or protection, 1 of 6).
    - Project 3.1-B **(GIS ID 99+102)** Reconnect **50** acres of floodplains along 2.1 miles of Miller Creek and adjacent tributaries (pending acquisition or protection).
- Objective 3.2 Add LWD and/or BDA's to **1.8** miles of anchor and other priority reaches to increase instream complexity and restore stream interaction with off channel habitats.
    - Project 3.2-A **(GIS ID 54)** Add LWD and/or BDA's to **1.8** miles on Silver Creek (pending acquisition or protection, 2 of 6).
- Objective 3.3 Enhance **2.3** miles of riparian and estuarine vegetation to reduce stream temperatures, promote future LWD recruitment into anchor habitats, and/or to restore dune process and function.
    - Project 3.3-A **(GIS ID 24+28)** Enhance **1.8** miles of riparian vegetation on Silver Creek (pending acquisition or protection, 5 of 6).
    - Project 3.3-B **(GIS ID 35)** Remove exotic beach grass from **.5** mile of Siltcoos Outlet.
- Objective 3.4 Reconnect 101.2 **(+)** miles of instream spawning and rearing habitat.
    - Project 3.4-A **(GIS ID 25)** Replace one undersized culvert on Silver Creek, to reconnect **.3** mile of stream (pending acquisition or protection, 3 of 6).

  - Project 3.4-B **(GIS ID 26)** Remove one undersized culvert on Silver Creek to reconnect **.9** mile of stream (pending acquisition or protection, 4 of 6).
  - Project 3.4-C **(GIS ID 33)** Improve AOP to **100 (+)** miles of stream at Siltcoos Dam.
- Objective 3.5 Upgrade of road infrastructure along .5 mile of stream.
  - Project 3.5-A **(GIS ID 27)** Road decommissioning and upgrade treatments along **.5** miles of Silver Creek (pending acquisition or protection, 6 of 6).

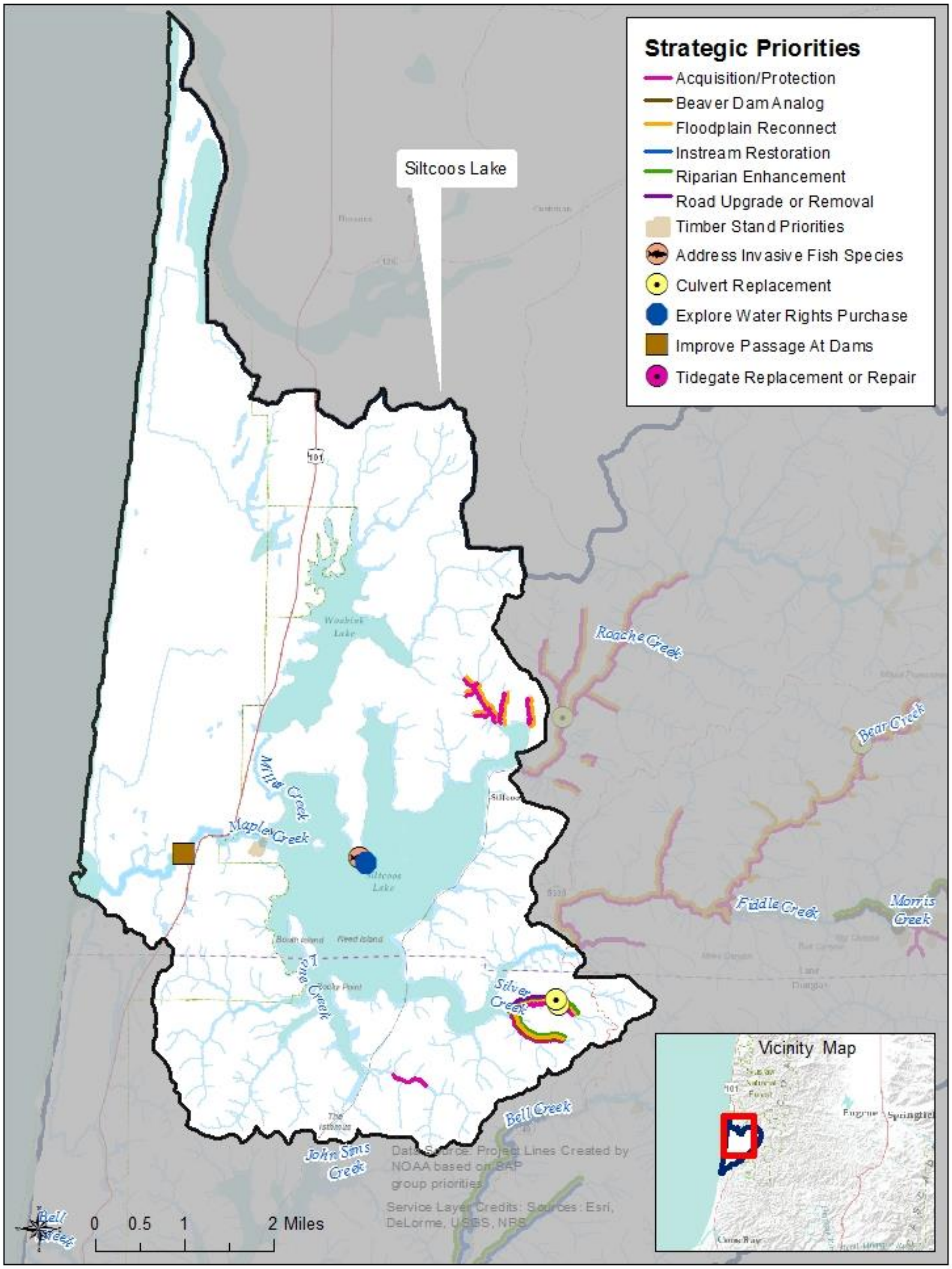


Figure 14 Location of restoration projects in the Siltcoos Frontal sub-watershed.

Goal 4) Restore and protect instream, riparian, floodplain and estuarine habitats on 100 (+) miles within the Tahkenitch Lake Frontal Pacific 6th Field H.U.C.

- Objective 4.1 Reconnect **306** acres of disconnected floodplains to promote the availability of off-channel rearing habitats.
  - Project 4.1-A **(GIS ID 42)** Reconnect **167** acres of floodplains along 3.3 miles of lower Fivemile Creek (Siletz Property, 1 of 3).
  - Project 4.1-B **(GIS ID 45)** Reconnect **72** acres of floodplains along 2.5 miles of Perkins Creek (partially owned by Siletz Tribe, 1 of 3).
  - Project 4.1-C **(GIS ID 48)** Reconnect **67** acres of floodplains along 1.9 miles of Fivemile-Bell (Phase 5).
- Objective 4.2 Add LWD and/or BDA's to **7.7** miles of anchor and other priority reaches to increase instream complexity and restore stream interaction with off channel habitats.
  - Project 4.2-A **(GIS ID 43)** Add LWD and/or BDA's to **3.3** miles on lower Fivemile Creek (Siletz Property, 2 of 3).
  - Project 4.2-B **(GIS ID 46)** Add LWD and/or BDA's to **2.5** miles on Perkins Creek (partially owned by Siletz Tribe, 2 of 3).
  - Project 4.2-C **(GIS ID 49)** Add LWD and/or BDA's to **1.9** miles on Fivemile-Bell (Phase 5).
- Objective 4.3 Enhance **9.7** miles of riparian and estuarine vegetation to reduce stream temperatures, promote future LWD recruitment into anchor habitats, and/or to restore dune process and function.
  - Project 4.3-A **(GIS ID 37)** Remove exotic beach grass from **2** miles of Tahkenitch Outlet.
  - Project 4.3-B **(GIS ID 44)** Enhance **3.3** miles of riparian vegetation on lower Fivemile Creek (Siletz Property, 3 of 3).
  - Project 4.3-C **(GIS ID 47)** Enhance **2.5** miles of riparian vegetation on Perkins Creek (partially owned by Siletz Tribe, 3 of 3).
  - Project 4.3-D **(GIS ID 50)** Enhance **1.9** miles of riparian vegetation on Fivemile-Bell (Phase 5).
- Objective 4.4 Reconnect **100 (+)** miles of instream spawning and rearing habitat.
  - Project 4.4-A **(GIS ID 38)** Improve AOP to **100 (+)** miles of stream at Tahkenitch Dam.

Goal 5) By 2025, engage all public and private landowners with lands in the 4 high ranked watersheds containing habitats identified as high priority for protections and restoration.

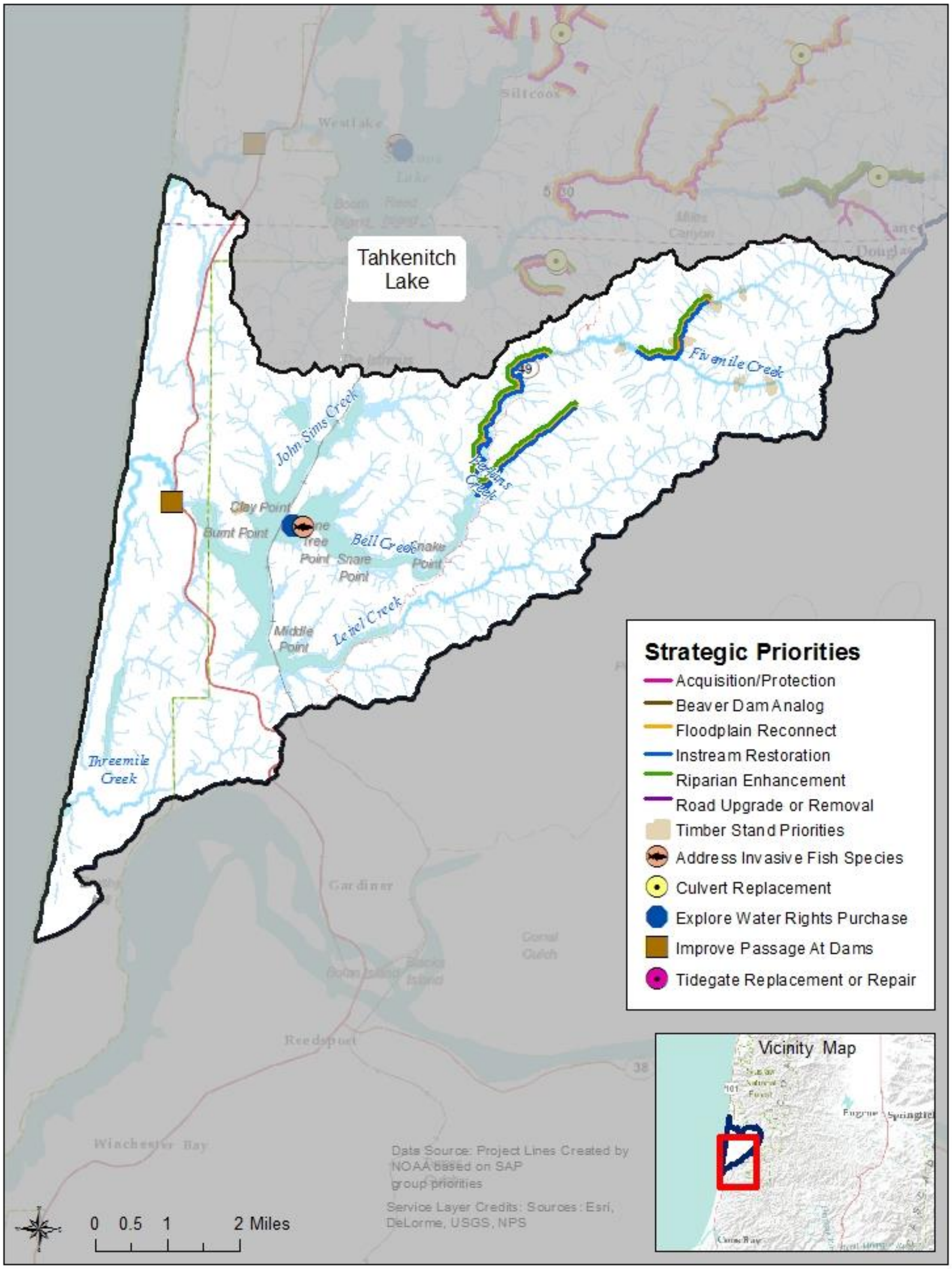


Figure 15 Location of restoration projects in the Tahkenitch frontal sub-watershed.

Table 8.2 Habitat Restoration Project Implementation Schedule by Sub-Watershed and Biennium

Sub-Watershed	Project	2019-2021	2022-2023	2024-2025
Fiddle	Project 1.1-A		X	X
Fiddle	Project 1.1-B		X	X
Fiddle	Project 1.1-C	X		
Fiddle	Project 1.1-D		X	X
Fiddle	Project 1.1-E			X
Fiddle	Project 1.2-A	X		
Fiddle	Project 1.2-B		X	X
Fiddle	Project 1.3-A	X		
Fiddle	Project 1.4-A	X		
Fiddle	Project 1.4-B			X
Maple	Project 2.1-A		X	X
Maple	Project 2.1-B		X	X
Maple	Project 2.1-C		X	X
Maple	Project 2.2-A			X
Maple	Project 2.2-B			X
Maple	Project 2.3-A			X
Siltcoos Lake	Project 3.1-A			X
Siltcoos Lake	Project 3.1-B			X
Siltcoos Lake	Project 3.2-A			X
Siltcoos Lake	Project 3.3-A			X
Siltcoos Lake	Project 3.3-B	X	X	X
Siltcoos Lake	Project 3.4-A			X
Siltcoos Lake	Project 3.4-B			X
Siltcoos Lake	Project 3.4-C			X
Siltcoos Lake	Project 3.5-A			X
Tahkenitch Lake	Project 4.1-A	X		
Tahkenitch Lake	Project 4.1-B			X
Tahkenitch Lake	Project 4.1-C	X		
Tahkenitch Lake	Project 4.2-A	X		
Tahkenitch Lake	Project 4.2-B			X
Tahkenitch Lake	Project 4.2-C	X		
Tahkenitch Lake	Project 4.3-A	X	X	X
Tahkenitch Lake	Project 4.3-B	X		
Tahkenitch Lake	Project 4.3-C			X
Tahkenitch Lake	Project 4.3-D	X		
Tahkenitch Lake	Project 4.4-A			X

9. Funding Needs: Estimated Costs

This chapter estimates the costs associated with executing the SCP implementation plan proposed in Chapter 8. Tables 3 through 6 provide the estimated costs to implement all of the projects contained in Chapter 8 according to the SCP's six-year goals established for the priority sub-watersheds. Table 7 summarizes the overall estimated costs according to restoration project type in each of these priority sub-watersheds.

These estimated costs shown in Tables 3 through 6 are summarized by sub-watershed goal and associated objective, and project type. The tables also identify the lead implementers and describe the stream reaches and proposed action associated with each project. These costs were generated through a review of the OWEB Oregon Watershed Restoration Inventory (OWRI) database, as well as the costs associated with implementing similar projects in the Siuslaw and Coastal Lakes area by the Siuslaw SWCD, USFS, BLM, and the SWC. The OWRI database was queried to focus on projects that were implemented within the OC Coho ESU from 2010 to 2014. Several data points for maximum costs were left out of the OWRI results because they were not relevant to the Coastal Lakes watershed.

Where projects were far enough along in the planning process to have verified cost estimates, these cost estimates were used in the cost summary (see Table 7). Where project-specific costs estimates were not available, estimates were made based on project type. For floodplain reconnection and off-channel restoration projects, estimates from other projects with a similar level of complexity were scaled to the size of the proposed project. For instream complexity projects, estimates were generated by multiplying mileage calculated from GIS by an average cost per mile. For riparian enhancement projects, estimates were made by multiplying acreage by a mid-range cost per acre estimate. The riparian enhancement acreages were estimated by multiplying stream miles (calculated using GIS) proposed for treatment times 50 feet, which approximates the average buffer width treated watershed wide over the last several years. Riparian enhancement and instream complexity estimates were increased by approximately three percent each biennium to adjust for inflation.

Table 3: Costs Associated with Implementation of Goal 1 Projects in Fiddle Creek Sub-Watershed

Project ID	Lead Implementer	Project Type	Project	Cost
Objective 1.1 Reconnect and/or protect 533 acres of disconnected floodplains to promote the availability of off-channel rearing habitats.				
1.1-A	SWCD/USFS	Acquisition/Protection	Acquire floodplain habitat owned by Roseburg Resources along mainstem Fiddle Creek (upstream to Bear Creek)	$413,050
1.1-A	SWCD/USFS	Floodplain Reconnection	Valley wide floodplain restoration along mainstem Fiddle Creek (upstream to Bear Creek)	$2,640,000
1.1-B	SWCD/USFS	Acquisition/Protection	Acquire floodplain and upland habitat along Bear Creek owned by MBG (approx 4 miles plus tribs potentially including the upland areas)	$432,300
1.1-B	SWCD/USFS	Floodplain Reconnection	Valley wide floodplain restoration along Bear Creek	$5,760,000
1.1-C	SWCD/USFS	Floodplain Reconnection	Reconnect off-channel habitat along mainstem Fiddle Creek (Big Canyon upstream to USFS land)	$450,000
1.1-D	SWCD/USFS	Acquisition/Protection	Acquire floodplain habitat along Alder Creek from Roseburg Resources	$124,300
1.1-D	SWCD/USFS	Floodplain Reconnection	Valley wide floodplain restoration along Alder Creek	$336,000
1.1-E	SWCD/USFS	Acquisition/Protection	Acquire property along Morris Creek from Roseburg Resources	$99,800
Objective 1.2 Add LWD and/or Beaver Dam Analogs (BDA's) to 4 miles of anchor and other priority reaches to increase instream complexity and restore stream interaction with off channel habitats.				
1.2-A	SWCD/USFS	instream complexity	LWD placement in mainstem Fiddle Creek (Big Canyon upstream to USFS land)	Cost is included in 1.1-C
1.2-A	SWCD/USFS	Beaver Dam Analogs	Beaver dam analogs in mainstem Fiddle Creek (Big Canyon upstream to USFS land)	Cost is included in 1.1-C

1.2-B	SWCD/USFS	instream complexity	LWD placement in Unnamed Creek at lower end of Fiddle Creek	$38,000
1.2-B	SWCD/USFS	Acquisition/Protection	Acquire floodplain habitat along Unnamed Creek at lower end of Fiddle Creek from Roseburg Resources	$91,050
Objective 1.3 Enhance 3 miles of riparian vegetation to reduce stream temperatures and promote future LWD recruitment into anchor habitats.				
1.3-A	SWCD/USFS	Riparian Enhancement	Riparian revegetation along mainstem Fiddle Creek (Big Canyon upstream to USFS land)	Cost is included in 1.1-C
Objective 1.4 Reconnect 1.6 miles of instream spawning and rearing habitat.				
1.4-A	SWCD/USFS	Fish Passage	Culvert removal from small trib to fiddle upstream of Morris	Cost is included in 1.1-C
1.4-B	SWCD/USFS	Fish Passage	Culvert removal and replacement from Bear Creek (Trib C unamed)	$117,000

Table 4: Costs Associated with Implementation of Goal 2 Projects in Maple Creek Sub-Watershed

Project ID	Lead Implementer	Project Type	Project	Cost
Objective 2.1 Reconnect 322 acres of disconnected floodplains to promote the availability of off-channel rearing habitats.				
2.1-A	SWCD/USFS	Acquisition/Protection	Acquire land along mainstem Maple Creek from lake upstream to Roache Creek where there are Anchor Habitats	$343,050
2.1-A	SWCD/USFS	Floodplain Reconnection	Velley wide floodplain restoration along mainstem Maple Creek from lake upstream to Roache Creek where there are Anchor Habitats	$1,920,000
2.1-A	SWCD/USFS	Floodplain Reconnection	Valley wide floodplain restoration mainstem Maple Creek from Roache to Grant where there are Anchor Habitats	$336,000
2.1-A	SWCD/USFS	Acquisition/Protection	Acquire or protect floodplain habitat along mainstem Maple Creek (Roache to Grant Creek)	$185,550
2.1-A	SWCD/USFS	Floodplain Reconnection	Floodplain reconnection along Lower Maple	$96,000
2.1-A	SWCD/USFS	Acquisition/Protection	Acquire lands along Lower Maple	$54,300
2.1-B	SWCD/USFS	Floodplain Reconnection	Valley wide floodplain restoration along Schrum Creek	$644,000
2.1-B	SWCD/USFS	Acquisition/Protection	Acquire Roseburg property along Schrum Creek near confluence and upstream	$136,550
2.1-B	SWCD/USFS	Acquisition/Protection	Acquire floodplain habitat along Carle Creek	$80,550
2.1-B	SWCD/USFS	Floodplain Reconnection	Valley wide floodplain restoration along Carle Creek	$64,000
Objective 2.2 Add LWD and/or BDA's to 1.9 miles of anchor and other priority reaches to increase instream complexity and restore stream interaction with off channel habitats.				
2.2-A	SWCD/USFS	instream complexity	LWD placement on USFS land along mainstem Maple (upstream of Coleman Creek)	$30,400

2.2-B	SWCD/USFS	instream complexity	LWD placement on USFS land along North Prong Maple Creek	$41,800
Objective 2.3 Reconnect 2.2 miles of instream spawning and rearing habitat.				
2.3-A	SWCD/USFS	Fish Passage	Replace railroad barrier at the mouth of Schrum Creek and the confluence of Maple Creek with bridge	$1,000,000

Table 5: Costs Associated with Implementation of Goal 3 Projects in the Siltcoos Sub-Watershed

Project ID	Lead Implementer	Project Type	Project	Cost
Objective 3.1 Reconnect and/or protect 119 acres of disconnected floodplains to promote the availability of off-channel rearing habitats.				
3.1-A	SWCD/USFS	Floodplain Reconnection	Channel reconstruction and floodplain/off-channel reconnection on Silver Creek by creating small pilot channels.	$450,000
3.1-A	SWCD/USFS	Acquisition/Protection	Establish a conservation easement on land adjacent to Silver Creek	$49,000
3.1-A	SWCD/USFS	Acquisition/Protection	Establish a conservation easement on land adjacent to South Fork Silver Creek	$20,000
3.1-B	SWCD/USFS	Floodplain Reconnection	Reconnect floodplain along Miller Creek	$588,000
3.1-B	SWCD/USFS	Acquisition/Protection	Acquire or protect land along Miller Creek	$134,800
Objective 3.2 Add LWD and/or BDA's to 1.8 miles of anchor and other priority reaches to increase instream complexity and restore stream interaction with off channel habitats				
3.2-A	SWCD/USFS	Beaver Dam Analogs	Add beaver dam analogs to Silver Creek to give existing beavers more stable building sites	Costs included in 3.1-A
Objective 3.3 Enhance 2.5 miles of riparian and estuarine vegetation to reduce stream temperatures, promote future LWD recruitment into anchor habitats, and/or to restore dune process and function.				
3.3-A	SWCD/USFS	Riparian Enhancement	Riparian and wetland revegetation/invasives removal along Silver Creek	Costs included in 3.1-A
3.3-A	SWCD/USFS	Riparian Enhancement	Reed canary grass removal and native revegetation along Silver Creek (South Fork)	$73,636
3.3-B	SWCD/USFS	Invasives Removal	Remove non-native beach grass from dunes in the Siltcoos Estuary	Costs not available at this time

Objective 3.4 Reconnect 101.2 (+) miles of instream spawning and rearing habitat.				
3.4-A	SWCD/USFS	Fish Passage	Culvert removal and replacement on Silver Creek	Costs included in 3.1-A
3.4-B	SWCD/USFS	Fish Passage	Culvert removal and replacement on Silver Creek	Costs included in 3.1-A
3.4-C	SWCD/USFS	Fish Passage	Improve aquatic organism passage on Siltcoos Dam	Costs not available at this time
Objective 3.5 Upgrade road infrastructure adjacent to 0.5 miles of stream.				
3.5-A	SWCD/USFS	Road Upgrade or Removal	Road decommission and replace upper end with ford in Silver Creek.	Costs included in 3.1-A

Table 6: Costs Associated with Implementation of Goal 4 Projects in Tahkenitch Lake Sub-Watershed

Project ID	Lead Implementer	Project Type	Project	Cost
Objective 4.1 Reconnect 306 acres of disconnected floodplains to promote the availability of off-channel rearing habitats.				
4.1-A	Siletz	Floodplain Reconnection	Siletz Tribe property - floodplain reconnect on lower Fivemile Creek	$924,000
4.1-B	SWCD/USFS	Floodplain Reconnection	Floodplain reconnection on Perkins Creek	$700,000
4.1-C	SWC/USFS	Floodplain Reconnection	Phase 5 of the Fivemile/Bell project - Channel reconstruction and floodplain	$532,000
Objective 4.2 Add LWD and/or BDA's to 7.7 miles of anchor and other priority reaches to increase instream complexity and restore stream interaction with off channel habitats.				
4.2-A	SWCD/USFS	instream complexity	Add large wood to Lower Fivemile Creek	$125,400
4.2-B	SWCD/USFS	instream complexity	Add large wood to Perkins Creek	$95,000
4.2-C	*SWCD/USFS*	instream complexity	Phase 5 of the Fivemile/Bell project - Large wood placement	$72,200
Objective 4.3 Enhance 7.7 miles of riparian and estuarine vegetation to reduce stream temperatures, promote future LWD recruitment into anchor habitats, and/or to restore dune process and function.				
4.3-A	SWCD/USFS	Invasives Removal	Remove non-native beach grass from dunes in the Tahkenitch Estuary	Costs not available at this time
4.3-B	SWCD/USFS	Riparian Enhancement	Riparian planting and invasives removal Lower Fivemile Creek	$270,000
4.3-C	SWCD/USFS	Riparian Enhancement	Riparian planting and invasives removal along Perkins Creek	$204,545
4.3-D	SWCD/USFS	Riparian Enhancement	Phase 5 of the Fivemile/Bell project - Riparian revegetation	$155,455

Objective 4.4 Reconnect 100 (+) miles of instream spawning and rearing habitat.				
4.4-A	SWCD/USFS	Fish Passage	Improve aquatic organism passage on Tahkenitch Dam	Costs not available at this time

Table 7 summarizes the costs for implementation of the high-priority projects in the Siuslaw Basin from 2019 to 2025. Together, the estimated cost for implementation of all the proposed high-priority projects in the Siuslaw Basin from 2019 to 2025 is approximately $19.8 million. However, significant uncertainty remains about the actual costs for implementing many of the actions described in the table. Because of this uncertainty, the cost summary information presented in the table is likely to change. The cost summary is intended to provide a magnitude of the costs for the Siuslaw Coho Partnership to use while seeking funding to support project implementation.

Project Type	Fiddle Creek	Maple Creek	Siltcoos Lake and Frontal Pacific Ocean	Tahkenitch Lake and Frontal Pacific Ocean	Grand Total
Acquisition/Protection	$1,160,500	$800,000	$203,800		$2,164,300
Beaver Dam Analogs	$0		$0		$0
Fish Passage	$117,000	$1,000,000	$0	$0	$1,117,000
Floodplain Reconnection	$9,186,000	$3,060,000	$1,038,000	$2,156,000	$15,440,000
instream complexity	$38,000	$72,200		$292,600	$402,800
Invasives Removal			$0	$0	$0
Riparian Enhancement	$0		$73,636	$630,000	$703,636
Road Upgrade or Removal			$0		$0
Grand Total	**$10,501,500**	**$4,932,200**	**$1,315,436**	**$3,078,600**	**$19,827,736**

10. Evaluation and Adaptive Management

The Coastal Lakes Coho SAP is a living document. While the Strategic Framework presented in Chapter 7 puts forth the approach for how the SCP will determine project priorities and allocate resources over the long term, the core planning team acknowledges that gaps exist in our collective understanding of the Siuslaw watershed and its coho population. Accordingly, as new information is generated, the SCP will update and revise this plan as needed.

For example, both the Strategic Framework and the short-term project priorities presented in Chapter 8 rely heavily on the "anchor habitat strategy" described throughout this plan. While the core planning team is confident that this approach provides a cost effective and scientifically sound conservation strategy, participants recognize that it does not capture all of the habitats in the watershed that support coho production. Most notably, it may not capture some habitats that are key to the expression of unique life histories (lower basin tributaries for nomadic coho, for example). These life histories may be an important contributor to the population's overall resilience. As new information becomes available on unique life histories present in the basin, managers may choose to revise the Strategic Framework and re-prioritize projects to address habitat types and locations that are not currently given priority in this plan.

Similarly, climate change is prompting physical changes in the watershed (geomorphology and hydrology, for example) that will likely generate significant biological and ecological responses from the Siuslaw's plant and animal communities. While modeling exists to help predict changes in variables like air and water temperatures and stream flow, modeled outputs are uncertain and highly variable. As a result, it is difficult to predict how and when changes will occur in the region's biological systems, and the degree to which these changes will impact coho. The SAP gives priority to projects that maintain and restore natural watershed processes, which the core planning team believes provides the greatest opportunity to buffer against climate change impacts. It must be emphasized, however, that climate change makes an already dynamic system even more unstable in ways that are not yet fully understood. Partners agree that this SAP must be responsive to these changes as they are observed.

10.1 The Monitoring Framework

The SCP recognizes that an adaptive management approach is essential to the long-term success of this plan, and the SCP's ability to reach its stated goals. Thus, this section presents a monitoring framework that the SCP will use to evaluate (1) the rate at which the SAP is being implemented and (2) whether implementation is generating the anticipated benefits.

The Monitoring Framework below presents a draft framework that will be further developed over time to address the two monitoring priorities. The framework is constructed around six statements that summarize the cumulative objectives described in Chapter 8. Next to each statement, the table defines two types of monitoring that will be conducted: Implementation monitoring, which will evaluate whether the SAP is being implemented, and effectiveness monitoring, which will help determine whether an action is effective and should be continued.

The columns to the left of each statement in the Monitoring Framework are associated with implementation monitoring and provide a list of project tracking metrics. These metrics are intended to help the SCP assess the pace and extent of SAP implementation. Broadly, these metrics are intended to answer the question, "Is the SAP being implemented at the desired pace and scale?"

The columns to the right of each statement in the Monitoring Framework are associated with effectiveness monitoring and define the KEAs that the SCP seeks to improve through SAP implementation. Beside each KEA is one or more indicators of KEA health. By tracking these indicators over time, managers can evaluate whether SAP implementation is having the intended effect(s). In short, these indicators help us answer the question, "Are we moving towards our desired outcomes?"

The KEAs and indicators presented in the Monitoring Framework were derived from the common framework (described in Chapters 2 and 6), but represent only those deemed by the core planning team as highest priority and most likely to reflect improving (or declining) watershed conditions for coho. For a complete list of KEAs and indicators considered in this process, please refer to the common framework in the Appendix.

The purpose of the monitoring framework is not to produce a full monitoring plan, but to suggest the skeleton of a plan that can be developed over time. The core planning team acknowledges the considerable limitations on funding available for monitoring and will develop specific plans for each of the KEAs as priorities dictate and funds allow. The core planning team also recognizes the magnitude of the challenge faced in trying to detect habitat responses at the sub-watershed scale from the implementation of the SAP. As stated in the Oregon Coast Coho Conservation Plan (ODFW 2007), "restoration of ecological processes that support high quality habitat requires time and is constrained by patchwork landownership patterns, different regulatory structures, and historical land use practices. Even given an expected increase in the level of non- regulatory participation in habitat improvement work, it will take time to: (1) produce detectable improvements in habitat quality, and (2) restore the biological and ecological processes across the ESU."

This monitoring framework is intended as a first step toward this lofty – but essential – goal.

Coastal Lakes Strategic Action Plan Monitoring Framework.

SAP Monitoring Framework						
Implementation Monitoring – *Is the SAP being implemented?*		**Goals (1 -4) and Objectives**	**Effectiveness Monitoring –** *Is SAP implementation having the intended effects? Are we moving towards our stated outcomes?*			
Implementation Locations	**Project Tracking Metrics**		**Key Ecological Attribute (component)**	**Indicator**	**Monitoring Sites**	**Lead**
Priority reaches in Fiddle, Maple and Tahkenitch watersheds	• # of miles of anchor habitats treated with LWD • # of miles of non-anchor habitat treated with LWD • # of acres of floodplain reconnected	**Restore instream, riparian, and floodplain habitats on 126.6 (+) miles within the Fiddle, Maple and Tahkenitch 6th Field H.U.C.**	Habitat complexity (tributaries and mainstem creeks)	• Temperature Monitoring • ODFW and USFS AQI metrics[1] • % of stream reaches with HabRate model rating of "good" for winter rearing, summer rearing, and spawning/emergence • % of area accessible during majority of flows	Temperature monitoring locations in Fiddle, Maple and Tahkenitch AQI survey locations within project reaches Project reaches	SWCD SWC USFS ODFW

[1] Coastal Lakes Common Framework included the following list of AQI metrics

- Miles of high quality habitat: produce 2,800 smolts/mile.
- % stream reach that is pool habitat
- % of stream reach that is slack-water pool habitat
- % pools greater than 1 meter in depth (pools with LWD pieces > or equal to 3 pieces per pool)
- # of wood pieces per 100m of stream
- # of key wood pieces (>12m long, 0.60 m dbh)
- Volume of LWD per 100 m
- # alcoves per reach

Priority reaches in Fiddle, Maple and Tahkenitch watersheds	• Acres planted • % of high priority sites planted	**Restore instream, riparian, and floodplain habitats on 126.6 (+) miles within the Fiddle, Maple and Tahkenitch 6th Field H.U.C.**	Temperature (tributaries and mainstem creeks)	• Total # of days where monitoring locations exceed temperature standards (DEQ 7-day running average max) • Number of consecutive days meeting DEQ temperature criteria at sampling locations	Maple, Fiddle and Tahkenitch watersheds Others to be determined	SWCD SWC Tribes
			Riparian function (tributaries and mainstem creeks)	• % of selected riparian areas with conifers > 20" dbh in 164' buffer • # of conifers >50'' dbh • % of 6th fields basins with > 50% of riparian area in late seral • % of conifer present in riparian zones • % of riparian zone native species composition	AQI survey locations within project reaches Individual project reaches Remote sensing	USFS SWCD SWC Tribes ODFW

Priority locations in Maple, Fiddle, Siltcoos Frontal and Tahkenitch watersheds	• Linear extent of levees removed • Acres of floodplain reconnected to channel • Fish passage barriers replaced	**Restore instream, riparian, and floodplain habitats on 227.8 (+) miles within the Fiddle, Maple Siltcoos Frontal and Tahkenitch 6th Field H.U.C.**	Longitudinal connectivity (tributaries) Lateral connectivity (tributaries and mainstem creeks) Landscape array of habitats (wetlands and estuary) Connectivity (tributaries, mainstem creeks, dunal mainstem rivers and estuary)	• % of accessible flood prone area (2x bankfull mean depth). • Acres of connected wetlands • Acres of wetland relative to historic condition	Project Reaches within Maple, Fiddle, Siltcoos Frontal and Tahkenitch watersheds	USFS SWCD Tribes SWC
Priority roads identified in Siltcoos Frontal and Tahkenitch watersheds	• Miles of road decommissioned and storm-proofed	**Upgrade XX miles of forest roads.**	Sedimentation (tributaries and mainstem creeks	Miles of road hydrologically disconnected from stream network	Project Locations	USFS SWCD Tribes

[2] Entrenchment indicator references:

- Aquatic and Riparian Effectiveness Monitoring Program (AREMP) Staff. 2005. Watershed Monitoring for the Northwest Forest Plan, Data Summary Interpretation 2005, Oregon/Washington Coast Province. USDA Forest Service, Pacific Northwest Regional Office; Bureau of Land Management, Oregon State Office; 4077 S.W. Research Way, Corvallis, OR 97333.
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All high ranked sub-watersheds	• Percent of landowners contacted • Private landowners voluntarily participating in restoration projects	**By 2025, engage all public and private landowners with lands in the high ranked sub-watersheds containing habitats identified as high priority for protection or restoration (goal 5).**	NA	• Number and acres of tier 1 and tier 2 sites protected (Table 7-4)	All high ranked sub-watersheds	SWCD
All high ranked sub-watersheds	• Total number of restoration projects implemented • Funding leveraged for SAP implementation • Local contractors hired	**Create and support ## local jobs and generate $ #### in economic output to the local restoration economy by hiring local contractors and promoting local businesses (goal 6).**	NA	• Estimated jobs created • Estimated economic output	Coastal Lakes watershed	SWC

10.2 Data Gaps and Priorities for Data Collection

As stated in the introduction to this chapter, the SCP recognizes the uncertainties in identifying conservation priorities for coho. These uncertainties are due largely to: (1) gaps in our current understanding of coho and the habitats they rely on, and (2) the projected impacts of climate change. During the course of developing this SAP, the core planning team identified several data gaps that should be addressed in the short term to begin addressing these uncertainties. These include:

- Locations of cold-water refugia in the Basin;
- Routine updates of flow and temperature models generated by USFS; and
- Description of any lake rearing life-history strategies present in the population(s), and the role that expression of these strategies plays in promoting the viability of the population(s);
- The habitat needs of any lake rearing life histories present in the population(s), and an assessment of the KEAs required to maintain them;
- Assessment of predation rates on any lake rearing life histories present in the population(s);
- Assessments of potential efficacy of proposed habitat restorations actions for those life history types showing significant use of lake habitats

10.4 Sustainability

The SCP will sustain the ecological outcomes generated through the implementation of this SAP by: (1) developing a coordinated multi-agency/organization monitoring plan based on the monitoring framework above; (2) continuing to undertake habitat assessments and fill the data gaps descry bed above; and (3) by building on our strong relationships with local landowners and funding partners to ensure project implementation continues to accelerate.

Towards this third point, the SCP has developed Governance Documents that clarify the roles and responsibilities of SCP members. As described in these documents, the SCP will convene quarterly to discuss emerging science; adjust restoration priorities based on new information and lessons learned; and coordinate outreach and grant writing. One meeting a year will be devoted to a restoration project tour where partners will visit a restoration site to share lessons learned. The Governance Documents can be found in the Appendix.

In addition, the SCP has recently drafted a plan to strategically engage new stakeholders and funders as a continuation of the capacity building process enabled by the creation of this SAP (see Appendix). These two documents establish the foundation for collaboration among SCP members and compelling outreach to landowners and the community at large. Together these consensus-driven documents will help ensure a strategic, effective, and broadly-supported restoration effort that can be sustained long into the future.

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Appendix

1. Coastal Lakes Framework

2. SCP Communications Plan

3. SCP Governance Documents

4. Full Project List for Coastal Lakes

5. Coastal Lakes Project Scoring Sheet

SIUSLAW LOCAL FRAMEWORK
Coastal Lakes (Siltcoos and Tahkenitch)
High Ranked KEAs and Stresses

The following table indicates the “key ecological attributes” (KEAs) by component (habitat type) that the Siuslaw Lakes Coho Partnership identified as highest priority to meet the goals identified for the Siuslaw Coastal Lakes Coho Strategic Action Plan. These goals include:

1. Protect and restore the watershed processes that promote high quality spawning and rearing habitats.

2. Protect and restore the watershed processes that support sufficient habitat diversity to foster a broad expression of life history diversity in the Lakes coho population.

The third column identifies potential indicators of these high priority KEAs. Indicators in bold reflect those which can be (or are) assessed with existing data, and data is expected to be available in the future. Indicators in italics reflect those that would effectively assess the health of a KEA, but: 1) either data does not exist or is unlikely to exist in the future; OR 2) current sampling is insufficient to characterize the indicator at the desired scale; or 3) the analysis of available data is not likely to be repeated in the future.

KEA Definitions from Common Framework

Water Quality: The biological, chemical, and physical conditions of a waterbody. It is a measure of a waterbody's ability to support beneficial uses. (EPA, CWA). In tributary and mainstem habitats of coastal watersheds good water quality reduces potential health impacts to coho adult and juvenile life stages. Poor water quality can have direct mortality impacts, make them more susceptible to disease, impair their swimming ability, create a tendency for avoidance of habitat, alter the timing of migration, and delay hatching and emergence and rate of maturation.

High Flows: In mainstem, tributary, and off-channel habitats, peak high flows for channel maintenance are important to create diversity of habitat and move sediments through the system. Sustained high flows reconnect the stream to floodplain and trigger adults to return to freshwater to spawn. High flows provide physical access to smaller tributaries to spawn. In tributary and mainstem habitats spring high flows are important for smolt survival. Wetlands need high flows to maintain their health and recharge the associated groundwater. High flow transfers nutrients and food sources from the wetlands into stream habitats.

Low Flows: In tributary, mainstem, and off-channel habitats it is important that low flows are sufficient enough to allow access to habitats and sustain good water quality. Low flows create conditions where wetlands are able to discharge their stored water and are important for salmonid food web production.

Habitat Complexity: Stream complexity is important for wintering habitat for juveniles in some areas of the mainstem and in tributaries, wetlands, off-channel habitats, and lakes. Complexity includes the following features: large wood, pools, connected off-channel alcoves, beaver ponds, connected floodplains and wetlands.

Riparian Functions (overlaps with connectivity): Streamside vegetation in tributaries, off-channel habitats, and some mainstem and wetland habitats can provide shade to regulate stream temperature, create cover for coho rearing, provide a source of food and nutrients, help stabilize sediment supply, filter out pollutants, and provide a source of in-stream.

Geomorphic processes: The land forming aspects of erosion and deposition.

Lateral connectivity (within): The periodic inundation of the floodplain and the resulting exchange of water, sediment, organic matter, nutrients, and organisms. This is the lateral extent of the streams connectivity to the adjacent riparian, floodplain, and off-channel habitats.

Longitudinal process connectivity: the pathways along the entire length of a stream, marsh, lakes, and estuary.

Hydrologic Regime: Patterns of seasonal and interannual hydrology changes. Wetlands need water inputs to maintain their health and recharge the associated groundwater. High stream flow transfers nutrients and food sources from the wetlands into stream habitats.

Hydraulic Connectivity: This is the lateral extent of the streams connectivity to adjacent wetlands through a surface and/or subsurface connection.

Sediment Dynamics: The movement of sediments throughout the system that create and maintain habitat. Depositional and erosion processes contribute to sediment dynamics.

Habitat Diversity: The assemblage of functioning habitat types for streams, marshes, lakes, and estuaries that provide biologically productive areas that support diverse coho life history types.

Channel morphology: Channel systems created through erosional and depositional processes.

Inundation regime: The frequency, duration, and depth of water flowing into aquatic habitats.

Connectivity (uplands): The lateral extent of uninterrupted physical pathways that facilitate the transport of organic and inorganic materials from an upland area into a surface water body, and/or its riparian zone and floodplain.

Landscape Array of Structural Diversity (upland forests): The range and distribution of forest stand size, type, age, and composition within a defined uplands area.

COMPONENT	KEY ECOLOGICAL ATTRIBUTES (KEAs)	INDICATOR OF KEA HEALTH **Bold = Sufficient data exists to evaluate the indicator with a reasonable/replicable amount of analysis.** *Italics = Aspirational indicator. Data is not readily available (i.e no monitoring program exists or is planned); OR current sampling is not sufficient to characterize at appropriate scale; OR available data requires extensive (not easily replicated) analysis to assess.*
<u>Dunal Mainstem Rivers:</u> Portions of rivers that are typically outflows from lake systems to the ocean. Primarily sand bottom rivers withhigh bedload movement due to actively moving sand dunes and inherent erodibility of dunal sheet; typically 4th order and used as transition area for coho smolts prior to salt water entrance , Estuary habitats exist at river /ocean transition	Water Quality	• **Temperature** • **Dissolved oxygen** • **Presence/Absence of Toxins**
	Habitat complexity	• *Extent of edge habitat (littoral)* • *Amount and volume of wood* • *Number of large pieces of wood* • *Reaches with connected off-channel alcoves, flood plains, and wetlands*
	Riparian Function	• **Native plant and animal species diversity and distribution** • **Presence of Wetlands**
	Geomorphic processes	• *Entrenchment* • *% intact estuary habitats* • *% Loss of channel diversity due to dunal stabilization*
	Lateral connectivity (include but less important in mainstem)	• *# side channels that are connected* • **Amount of side channel and wetland reconnected/recreated/restored**

	Longitudinal Connectivity	• *Unrestricted Aquatic organism movements into and out of Lakes* • *Flow regulation*
COMPONENT	**KEY ECOLOGICAL ATTRIBUTES (KEAs)**	**INDICATOR OF KEA HEALTH** **Bold = Sufficient data exists to evaluate the indicator with a reasonable/replicable amount of analysis.** *Italics = Aspirational indicator. Data is not readily available (i.e no monitoring program exists or is planned); OR current sampling is not sufficient to characterize at appropriate scale; OR available data requires extensive (not easily replicated) analysis to assess.*
Mainstem Creeks: Portions of rivers above lakes(based on named streams – i.e. Fiddle Creek, Fivemile Creek. Leitel Creek); typically 4th order, downstream of majority of coho spawning distribution, non-wadeable. This includes riparian and floodplain.	Water Quality	• **Temperature** • **Dissolved oxygen** • **Presence/Absence of Toxins**
	Habitat complexity	• *Extent of edge habitat (littoral)* • *% pool habitat* • *Amount and volume of wood* • *Number of large pieces of wood* • *Reaches with connected off-channel alcoves, flood plains, and wetlands*
	Riparian Function	• **Tree height** • **Shade** • *Number of conifers >50cm dbh* • *Number of conifers >90cm dbh* • *% channel shade* • *Width* • *Dominant over story*

		• **Native plant and animal distribution and diversity**
	Beaver Ponds	• **Number and area of beaver ponds** • **Presence of non-native animals**
	Geomorphic processes	• **Potential landslide locations** • *Entrenchment* • *% of stream channel in natural stream alignment*
	Lateral connectivity	• *# side channels that are connected* • **Amount of side channel and wetland reconnected/recreated/restored**
	Longitudinal Connectivity	• *Barrier inventory (Indicator of extent of fish passage)*
COMPONENT	**KEY ECOLOGICAL ATTRIBUTES (KEAs)**	**INDICATOR OF KEA HEALTH** **Bold = Sufficient data exists to evaluate the indicator with a reasonable/replicable amount of analysis.** *Italics = Aspirational indicator. Data is not readily available (i.e no monitoring program exists or is planned); OR current sampling is not sufficient to characterize at appropriate scale; OR available data requires extensive (not easily replicated) analysis to assess.*
<u>Tributaries:</u> All 1st – 3rd order streams with drainage areas > 0.6 km2. This includes fish-bearing and non-fish-bearing, intermittent streams, and the full aquatic network including headwater areas. This includes	Water quality	• **Temperature** • **Dissolved Oxygen** • **Presence/Absence of Toxins**
	Habitat complexity	• **Miles of high quality habitat: produce 2,800 smolts/mile.** • **% stream reach that is pool habitat**

riparian and floodplain. Majority of coho spawning sites are located in these streams		• **% of stream reach that is slackwater pool habitat** • **% pools greater than 1 meter in depth** • **# of wood pieces per 100m of stream** • **# of key wood pieces (>12m long, 0.60 m dbh)** • **Volume of LWD per 100 m** • **# alcoves per reach**
	Riparian Function	• **# of conifers >50cm dbh** • **# of conifers >90cm dbh** • **Tree height** • *Width* • *Dominant over story* • *Native plant diversity and distribution*
	Beaver ponds	• **# and area of beaver ponds**
	Geomorphic processes	• **% of riffle that is sand/silt/ organics** • **% fine sediment across stream reach** • **% fine sediment in fast water habitat** • **% gravel within a reach** • **% bedrock in stream reach** • **Potential landslide locations and composition**
	Lateral connectivity	• **Amount of side channel and wetland reconnected/recreated/restored** • **Terrace height** • **Flood prone width**
	Longitudinal connectivity (physical and thermal/flow)	• **Barrier inventory (indicator of extent of fish passage)**

COMPONENT	KEY ECOLOGICAL ATTRIBUTES (KEAs)	INDICATOR OF KEA HEALTH **Bold = Sufficient data exists to evaluate the indicator with a reasonable/replicable amount of analysis.** *Italics = Aspirational indicator. Data is not readily available (i.e no monitoring program exists or is planned); OR current sampling is not sufficient to characterize at appropriate scale; OR available data requires extensive (not easily replicated) analysis to assess.*
<u>Freshwater Non-tidal Wetlands:</u> Includes lake influenced wetlands at transition from mainstem creeks to the Lakes as well as wetlands in smaller lake tributaries(coho rearing emphasis) Includes floodplain wetlands adjacent to stream channels in these extremely low gradient valleys	Landscape Array of Habitats	• *Distribution of different wetland types compared to historic* • *Change in wetland acres* • *(Note: Group - these are priority data gaps)*
	Lateral connectivity	• **Amount of side channel and wetland reconnected/recreated/restored** • **Terrace height** • **Flood prone width**
	Beaver ponds	• **# and area of beaver ponds**

	Water Quality	• **Temperature** • **Nutrients** • **Flow** • **Presence/Absence of Toxins**
	Riparian Function	• **Native Plant Distribution and Diversity** • **Water Availability and Storage**
COMPONENT	**KEY ECOLOGICAL ATTRIBUTES (KEAs)**	**INDICATOR OF KEA HEALTH** **Bold = Sufficient data exists to evaluate the indicator with a reasonable/replicable amount of analysis.** *Italics = Aspirational indicator. Data is not readily available (i.e no monitoring program exists or is planned); OR current sampling is not sufficient to characterize at appropriate scale; OR available data requires extensive (not easily replicated) analysis to assess.*
Off-channel: Any area other than the main or primary channel of mainstem or tributary habitats that provides a velocity refuge for coho. This includes off-channel habitats such as alcoves, side channels, and oxbows. This includes riparian and floodplain.	Habitat complexity	• **% of stream reach that is pool habitat** • **% of stream reach that is slackwater pool habitat** • **% pools greater than 1 meter in depth** • **# and area of beaver ponds** • **#of wood pieces per 100m of stream** • **# Key wood pieces (>12m long, 0.60m dbh)** • **Volume of LWD per 100 m** • **# alcoves per reach**
	Riparian Function	• *Width* • *Dominant overstory* • **Native plant Distribution and Diversity**
	Beaver ponds	• **# and acres of beaver ponds**

	Connectivity (lateral/longitudinal)	**Miles/acres of off-channel area connected to mainstem or tributary**
COMPONENT	**KEY ECOLOGICAL ATTRIBUTES (KEAs)**	**INDICATOR OF KEA HEALTH** **Bold = Sufficient data exists to evaluate the indicator with a reasonable/replicable amount of analysis.** *Italics = Aspirational indicator. Data is not readily available (i.e no monitoring program exists or is planned); OR current sampling is not sufficient to characterize at appropriate scale; OR available data requires extensive (not easily replicated) analysis to assess.*
Estuaries: The areas historically available for feeding, rearing, and smolting in tidally influenced lower reaches of rivers that extend upstream to the head of tide and seaward to the mouth of the estuary. Head of tide is the inland or upstream limit of water affected by a tide of at least 0.2 foot (0.06 meter) amplitude (CMECS). This includes tidally	Landscape Array of Habitats	**Acres of connected tidal wetland** **Acres of wetland relative to historic condition** **Distribution and migration of habitat types relative to historic condition** **Riparian condition** **Native Plant Diversity and Distribution** **Freedom of movement of mouths and rivers in dunal systems**

influence portions of rivers that are considered to be freshwater (salinity <0.5 ppt). We are extending the definition laterally to the uppermost extent of wetland vegetation (mapped by CMECS). Habitats include saltmarsh, emergent marsh, open water, subtidal, intertidal, backwater areas, tidal swamps, and deep channels. This includes the ecotone between saltwater and freshwater and the riparian zone. Overlap with Dunal Mainstems	Water Quality	• **Temperature** • **Toxins** • **Connectivity/Salinity**
	Connectivity (lateral and longitudinal)	• **Barrier inventory (indicator of extent of fish passage)** • **Inundation**
	Habitat Complexity	• **LWD for cover/complexity**
COMPONENT	**KEY ECOLOGICAL ATTRIBUTES (KEAs)**	**INDICATOR OF KEA HEALTH** **Bold = Sufficient data exists to evaluate the indicator with a reasonable/replicable amount of analysis.** *Italics = Aspirational indicator. Data is not readily available (i.e no monitoring program exists or is planned); OR current sampling is not sufficient to characterize at appropriate scale; OR available data requires extensive (not easily replicated) analysis to assess.*
<u>Uplands</u>: All lands that are at a higher elevation than adjacent water bodies and alluvial plains. They include all lands from where the floodplain/riparian zones terminate and the terrain begins to slope upward forming a hillside,	Connectivity	• *% high debris flow areas intersected by roads* • *% riparian corridors intersected by roads* • *Sediment delivery (fine, coarse)* • *Road density*

mountain-side, cliff face, or other non-floodplain surface.	Landscape Array of Structural Diversity	• *% of forest classified as: regeneration, closed single canopy; understory; layered; older forest.* • *% high risk landslide areas with forest stands in layered structure or older forest.* • *% of watershed in EFU*
COMPONENT	**KEY ECOLOGICAL ATTRIBUTES (KEAs)**	**INDICATOR OF KEA HEALTH** **Bold = Sufficient data exists to evaluate the indicator with a reasonable/replicable amount of analysis.** *Italics = Aspirational indicator. Data is not readily available (i.e no monitoring program exists or is planned); OR current sampling is not sufficient to characterize at appropriate scale; OR available data requires extensive (not easily replicated) analysis to assess.*
Lakes: Inland bodies of standing water. Habitats include deep and shallow waters in the lakes, including alcoves, and confluences with streams.	Habitat complexity	• *% natural shoreline* • *Native aquatic plant diversity and distribution* • *Native fish species diversity and distribution* • *Bathymetry* • *Percent of shoreline with down wood/100m*
	Water Quality	• *Native Plant Diversity and Distribution* • *Presence/Absence of Toxins* • *Bathymetry* • *Nutrient Levels and composition of nutrients* •

	Riparian Function	• *Native Plant Diversity and Distribution* • *Sediment Deposition Rates* • *Wood Recruitment Potential*
	Geomorphic Processes	• *Sediment Depostion* • *Water Flow Timing*

Common Framework Definition

Threats. Threats are defined as human activities that have caused, are causing, or may cause the destruction, degradation, and/or impairment of components and/or their KEAs. Threats deliver stresses directly to components. The Common Framework includes a list of threats with definitions and common stressors. This list is based on threats listed (sometimes using different terms) in existing coho recovery plans (NOAA, ODFW). The definitions are based on previous classifications (IUCN 2001; Salafsky et al, 2008) with minor modifications reflecting the work of the regional coho Steering Committee.

Common Framework Threats & Definitions

Code (not priority)	**Threat**	**Definition**
1	Levees, dikes and bank armoring	These threats refer to shoreline hardening practices and the creation of hard linear surfaces along a beach or stream bank. Erosion and flooding in these areas are reduced, but an unnatural riparian area is created that reduces habitat use by salmonids. These structures disrupt shoreline processes, flow regimes, and reduce habitat extent.
2	Tidegates, culverts and other fish passage impairments	These threats taken together refer to structures that impede the movements and migrations of fish. These can include structures in, along-side, and across water bodies. Structures that impede fish movements cause habitat fragmentation resulting in loss of rearing habitat and prevent successful spawning. Dams are included in a different category of threats.
3	Removal of beavers and beaver ponds	The loss of ponds created by beaver dams has resulted in significant loss of rearing habitat for coho salmon. The removal of beavers and beaver ponds can alter stream flow, raise water temperature, and removes important feeding and resting habitat.
4	Conversion	Conversion represents changes in land management or development to practices and uses that are less compatible with healthy salmon ecosystems than those that existed previously. Conversion may be viewed as a spectrum with intact and functioning ecosystems on one end and heavily modified areas (such as urban areas, industrial feedlots etc.) on the other. As conversion takes place and lands move down this spectrum, watershed health declines due to increased impervious surfaces, altered flow regimes and stream structure, increased pollutant and effluent loading, and/or other adverse impacts to habitat and water quality. Conversion

		typically reduces both the extent and quality of habitats, while impairing the processes that can restore and create them.
5	Incompatible/poorly managed roads/railroads	Both paved and unpaved roads including logging roads can all be considered threats to salmon habitat. The general expansion of roads causes' terrestrial habitat fragmentation, increased fine sediment, impervious surfaces, and causes debris and pollution impacts.
6	Water withdrawals (urban, ag and potential for future water storage)	Water withdrawals can create a threat to salmonid populations by reducing stream flow, changing stream structure, and increasing water temperature. All types of water withdrawals fit into this category, which includes water for private use, agricultural use, and water storage. Water withdrawals from groundwater can also impact surface water availability. This category also includes future water storage projects (dams to store water in winter for use by communities during the summer) which will alter hydrology and water availability.
7	Incompatible/poorly managed stormwater/wastewater	Stormwater and wastewater become threats to salmon populations when they cause toxins and other pollutants to enter salmon habitats. These can be from both point and non-point sources and include runoff, wastewater discharge, persistent chemical cycling, historic (legacy) sources, non-persistent toxics, and discharge through stormwater conveyance systems. The threat from stormwater and wastewater generally depends on the toxicity and quantity of the discharge or runoff that enters habitats.
8	Dredging	Activities that excavate or remove substrate from estuaries, sloughs, and tidally-influenced river reaches to maintain channels for navigation, prepare an area for development, and support other economic uses. Dredging can cause sedimentation and reduce habitat availability and complexity. This action could be a future threat.
9	Dams and off-channel water storage	Dams and off-channel water storage fall under the same threat category. These threats deal with water storage concerns and are similar in impact to water withdrawal in that flow regimes are modified. Dams and water storage threats can also impede the movements and migrations of fish. Flashy flow regimes can also be caused by dams and off-channel water storage.
10	Incompatible/poorly managed agricultural practices	Incompatible/poorly managed agricultural practices include ongoing and historic agricultural practices that result in higher water temperature, increased effluents, simplified stream structure, and other adverse impacts on habitats and watershed function.

11	Fertilizers/pesticides	Threats from fertilizers and pesticides can impact water quality and introduce pollutants into salmonid habitat.
12	Incompatible/poorly managed timber practices	Incompatible/poorly managed timber practices includes current and legacy (especially splash damming) silvicultural practices that result in higher water temperature, increased effluents, simplified stream structure, and other adverse impacts on habitats and watershed function.
13	Invasive species	Plants, animals, or pathogens that are non-native (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause harm. Invasive aquatic species can cause increased predation and competition for salmonid populations, as well as displacement of native fish and the introduction of non-native genetic material. Invasive non-native plants can negatively impact riparian habitat by displacing native species.
14	Climate change	Climate change can threaten salmon populations by contributing to sea level rise, increased water temperatures, changes in the patterns of upwelling events, changes in nutrient and oxygen levels, pH decreases, and precipitation changes.
15	Recreation	Recreation includes activities that rely on the passive or active use of natural resources. Such activities are many and varied and may produce a variety of impacts such as wood removal, disturbance to flora and fauna, degraded water quality and others.

Priority Stresses – Stresses are impaired attributes of an ecosystem. Stresses are equivalent to altered or degraded KEAs. Stresses are not threats, but rather degraded conditions or "symptoms" that result from threats. In the Common Framework, stresses are *symptoms of limitations on coho recovery*, such as decreased low flows or reduced off-channel extent. The following list includes stresses identified by the local core team as high priority and the associated threats.

Component	Stresses Identified as High Priority	Related threats
Mainstem River	Increased water temperature	12 (legacy and current), 10, 14, 5, 4
	Increased flashy flows	12 (legacy and current), 10, 5, 14
	Decreased lateral connectivity (primarily due to downcutting)	3, 12 (legacy), 10, 5
	Bed coarsening (at bedrock)	12 (legacy timber practices including splash dams)
	Reduced extent of habitat	12 (legacy), 10, 4, 5, 13 (knotweed, RCG, blackberry)
	Increased velocity that reduces winter rearing habitat	12 (legacy and current), 10, 5, 14 , 4
Tributary	Increased water temperature	12 (legacy and current), 10, 14, 5, 4
	Increased velocity that reduces winter rearing habitat	12 (legacy and current), 10, 5, 14, 4, 3
	Decreased longitudinal connectivity (fish Passage)	2 (culverts on roads), 5
	Lack of pools (Complex/deep)	12 (legacy and current), 10, 3, 4, 5, 13
	Reduced riparian wood inputs (frequency and size/composition of wood in streams, recruitable wood)	12 (legacy and current), 10, 4, 5, 13
	Altered riparian function (species of complexity, age complexity, width of buffer)	12 (legacy and current), 10, 3, 4, 5, 13, 14
	Reduced extent of habitat	12 (legacy and current), 10, 3, 4, 5, 13, 14
Freshwater Non-tidal Wetlands	Reduced quantity for access (acres)	10, 1, 3, 4, 5
	Decreased connectivity (flow and physical barriers)	10, 1, 3, 4, 5
	Decreased beaver ponds	10, 1, 3, 4, 5
	Reduced extent of habitat (diversity of types)	10, 1, 3, 4, 5
Off-Channel	Increased velocity that reduces winter rearing habitat	12 (legacy and current), 10, 4, 5, 14, 3
	Decreased beaver ponds	12 (legacy and current), 10, 4, 5, 3

	Reduced riparian wood inputs (frequency and size/composition of wood in streams, recruitable wood)	12 (legacy and current), 10, 4, 5, 13
	Altered riparian function (species of complexity, age complexity, width of buffer)	12 (legacy and current), 10, 4, 5, 14, 13, 3
	Decreased lateral connectivity	12 (legacy and current), 10, 4, 5, 3
	Reduced extent of habitat	12 (legacy and current), 10, 4, 5, 3, 13, 14
Estuary	Increased water temperature	4, 10, 5, 14, 7, 2
	Reduced tidal wetland connectivity (includes subsidence)	4, 1, 5, 10, 2, 8, 14, 13, 3
	Reduced habitat diversity	4, 1, 5, 10, 2, 12 (legacy), 7, 8, 14, 13, 3
	Reduced riparian species complexity	10, 4, 5, 1, 13, 2
	Reduced extent of habitat	4, 1, 5, 10, 2, 9, 14, 13, 3
Uplands	Fragmentation (forest)	13, 12, 10, 5, 4
	Altered connectivity to stream networks	13, 12, 10, 5, 4
	Altered forest composition	13, 12, 10, 5, 4
	Increased sediment and modified hydrology	13, 12, 10, 5, 4
Lakes	Reduced habitat availability (edge habitat)	4, 5, 1, 9, 10, 12, 13, 14
	Altered riparian species complexity	1, 4, 5, 10, 12, 13
	Invasive species	4, 5, 10, 12, 13

Siuslaw Coho Partnership
Communications and Outreach Campaign Plan
May 3, 2018

Introduction

The ultimate vision of the Siuslaw Coho Partnership is to engage the community in the recovery of Coho salmon, which are listed as threatened in the Endangered Species Act, in the watersheds of the Siuslaw River and its tributaries in Oregon's Coast Range.

To achieve this vision, the Partnership aims to put a variety of restoration projects on the ground in key drainages across the basin. This communications and outreach plan describes a campaign concept, strategies, and tactics aimed at supporting the successful implementation of these restoration projects by voluntary participants including small and large landowners.

The plan was developed by consultant Amy Stork of Solid Ground Consulting, and is grounded in findings from research conducted in the fall of 2017 and presented to the Siuslaw Coho Partnership group on November 30, 2017.

As more information becomes available, the campaign will be dialed in to connect with the time-bound nature of implementation funding through the Focused Investment Partnership (FIP) funds from Oregon Watershed Enhancement Board (OWEB) and other funders.

Campaign Overview

Overarching goal

The overarching goal of the campaign is that landowners in the targeted basins take Coho recovery actions on their lands.

Overarching strategies

To reach this goal, we must:

- Build buy-in and credibility with key audiences.
- Build awareness and interest with key audiences.
- Motivate specific, likely actions on the part of key audiences.

Timeline

The campaign can begin anytime, but specific tactics will be tied to seasonal opportunities. A full campaign timeline can be created once we understand the likely dates of hiring for a funded communications and outreach staff member, and/or the timing of a FIP implementation grant.

Core campaign concept

The campaign will be based around a core concept and campaign name, e.g.:

Siuslaw Basin Partnership: Healthy Streams for Everyone

Siuslaw Stream Connection

Siuslaw Streams: Forever, For Everyone

Siuslaw Stream Link

Siuslaw Sustainable Streams

Siuslaw Coho Connection

Key audiences

While the engagement of the entire community is beneficial to the ultimate vision of Coho recovery, certain audiences are more critical to implementation success. These include:

Implementation audiences

- Landowners with riparian property in specific identified basins
- Agricultural property owners and small timber operators
- Timber companies and their employees
- CTCLUSI and Confederated Tribes of Siletz Indians
- Federal and state agencies owning land
- Local governments (who can integrate with other actions)
- Other funding agencies and foundations

Influencer audiences

- Community leaders such as elected officials
- Small business owners, particularly fishing and tourism dependent businesses
- Community organizations including conservation groups, business groups, community service groups, and faith organizations

- K-12 students and their families
- Long-time community members
- Visitors / recreators

Key messages

While messages need to be refined for each key audience, the basic message framework includes the following concepts:

- **Here in the Siuslaw, Coho salmon – strong, vital, wild – are part of who we are.** For many of us, the fish are our heritage and our livelihoods. For others, a source of food and a chance to spend time in nature. For all of us, they are a symbol of the blessings of this special place we call home. Fundamentally, it is our love of this place that ties us all together.
- **Together we can create a pathway to restoring Coho in the Siuslaw Basin**. If these fish can be saved anywhere, it's here.
- **Together we can create a pathway to restoring Coho runs.** The key is to create conditions—on the land and in and along the rivers and streams—that allow Coho to thrive.
- **Coho are important to our economy.** Fishing and tourism sustain many of us, and restoration activities themselves put money directly in local pockets.
- **Each of us can play a role in Coho recovery, and each of us will benefit from it**. Anyone from age 6 to 106 can do something to support this effort. And recovery actions in turn support us all, with clean water, recreational opportunities, and economic gains.

Each message needs to be supported by elements that matter to the audience, such as sub-messages, stories, facts and figures, etc. See attached messaging matrix for examples.

Key calls to action

The campaign concept will play out in three key calls to action designed to encourage people from throughout the community to connect to each other and to the vision of Coho recovery.

Celebrate

- Join others in the community as we recognize and take pride in the ways Coho salmon represent our heritage, our sense of place, and our hopes for the future.

Learn

- Connect hearts to minds, with opportunities to understand Coho and the ecosystem that supports them.

Act

- Take concrete actions on private and public lands to contribute to Coho recovery and watershed health.

Tactics will support each call to action, matched with the audiences described below.

Communication strategies and tactics

Strategy #1: Build general awareness, support, and credibility with a broad-based campaign that touches people throughout the community.

Tactics	***Tools***
<u>Endorsements</u> Seek endorsements from a wide variety of supporters. Consider: ▪ Asking local governments for a resolution of support. Connect to other local government efforts such as Siuslaw Vision, Vision Florence ▪ Asking service clubs and other voluntary or community organizations for an endorsement ▪ Forming a small business council of businesses dependent on fishing and tourism or other aspects of a healthy ecosystem. ▪ Asking the editors of local newspapers for an editorial endorsing the effort List endorsements in promotional materials for the effort.	▪ Overview of the plan ▪ List of recognition/ endorsement exposure ▪ All publications and grant narratives ▪ Website ▪ Social media ▪ High quality graphic symbol replicated on stickers, t-shirts, and window decals
<u>Community Coho celebration</u> Develop or enhance a large-scale annual community event that attracts a broad cross section of people coming together to eat, talk, dance, and learn. ▪ Create celebrations inclusive of many traditions including the tribes, farming and logging families, and more recent arrivals. ▪ Include children through a school-based connection that ensures people from many backgrounds will participate. ▪ Include interactive opportunities to learn more about salmon ecosystem components and how restoration works. ▪ Have information available about how to care for the land. ▪ Build deeper buy-in by including volunteers in planning and executing the event. ▪ Collect contact information. ▪ Sign people up for opportunities for action such as: ✦ Buying or ordering native plants. ✦ Having someone from the SWC or SWCD come to your land.	▪ News releases ▪ Direct outreach to media ▪ Partnership outreach ▪ E-blasts ▪ Social media

✦ Volunteering on a restoration project. ▪ Consider specific educational materials that examine different perspectives on large wood placement. ▪ Document the event with professional or high quality photos and video	
School / kids' programs Connect directly to schools and other learning opportunities to engage students inside and outside the classroom. ▪ Sponsor a science fair, art contest, essay contest, etc. and award prizes to winning students. Recognize publicly. ▪ Lead as many field trips as possible with classes of all ages. ▪ Recruit interns or summer field employees from high school, with a focus on kids from target watersheds. ▪ Produce videos and handouts appropriate for various grade levels. ▪ Create a mobile model of the river showing what helps fish. ▪ Document these activities with professional or high quality photos and video.	▪ Specific project plans ▪ Curricula for field trips ▪ Videos ▪ Handouts ▪ News releases ▪ Direct outreach to media ▪ Partnership outreach ▪ E-blasts ▪ Social media
General outreach Use all normally available means to share updates about the plan. Placement ideas include: ▪ Newspapers: Eugene Register Guard and Local weeklies ▪ Radio stations: Request Public Service Announcements as well as opportunities to be interviewed ▪ Community publications: Request placement of news items in partners' newsletters, club newsletters, HOA newsletters, etc. ▪ Website designed for the campaign, with colorful and effective images and very simple navigation ▪ E-blasts using graphic treatment from website to all contacts in database (which is growing thanks to events and outreach) ▪ Social media using extensive video and photos showing faces of supporters. ▪ Tabling at other community events	▪ Overview of the plan – brochure/8 page glossy with nice photos ▪ Website ▪ News releases ▪ Direct outreach to media ▪ Partnership outreach ▪ E-blasts ▪ Social media ▪ Table top display for events

Social media / non-traditional ▪ To create additional social media interest, consider developing a fun social media campaign. (One example would be having people take a cardboard Coho around to different parts of the watershed, and take selfies with it.) ▪ Facebook may be particularly relevant in the area, according to interviewees in our research. ▪ Consider seeking sponsorship / promotional relationships with brands that connect to clean water such as breweries. ▪ Create toolkits for other organizations to use to promote key concepts	▪ Symbols and hashtags ▪ Photos ▪ Video ▪ Co-branded materials with key sponsors ▪ Toolkits for partners to share

Strategy #2: Move people to action with hands-on opportunities to engage in conservation.

Tactics	**Tools**
Native plant distribution / Project tour ▪ Widely publicize the distribution, branded with the campaign ▪ Hold distribution events in key basins ▪ Coordinate with project tours as possible ▪ Distribute additional materials about restoration opportunities ▪ Offer speakers/videos/educational activities ▪ Engage students to be part of the distribution ▪ Create atmosphere of celebration with food, drink, music, etc. ▪ Document the distribution with professional or high quality photos and video ▪ Per previous practice, consider delivering plants to homeowners for a chance to connect with them on their land. Prioritize key watersheds.	▪ All general tools listed above ▪ Materials with instructions for planting and caring for trees, that also highlight other best practices and restoration approaches
Volunteer activities Offer volunteer activities that enhance habitat and engage community members. Consider: ▪ Neighborhood-based activities such as cleaning out a culvert, or a work party on the land of an elderly or low income neighbor ▪ Volunteer activities to create or maintain trails and recreation access points ▪ Document with professional/ high quality photos and video	▪ General outreach tools ▪ Event-specific information
Organized outdoor activities, learning, and tours Sponsor opportunities for people to engage with the land. Consider: ▪ Public tours of previous restoration projects ▪ Hikes and boating expeditions along the key rivers ▪ Events to view Coho runs from public viewing spots or private lands with permission ▪ Opportunities to learn outdoor skills in settings that evoke the potential for restoration. Consider partnering with non-partisan	▪ General outreach tools ▪ Event-specific information

groups such as the CTLUSI, UofO, Audubon, etc. to provide educational programs in key basins	
Internships and summer field crews As mentioned above, consider hiring local young people interested in natural resource careers, for seasonal field work or internships	▪ Job announcements, etc.

Strategy #3: Build and nurture a pipeline of prospects for restoration projects.

Tactics	***Tools***
Database and prospect tracking ▪ Create a database of properties in targeted basins ▪ Cross reference contact information from events, etc., with database, creating opportunities to follow up ▪ When a contact occurs, record notes on the conversations and ways to follow up, such as send links to videos, send sketches of possible work on their land, answer any questions, etc. ▪ Follow up consistently over time.	▪ Database
Property transfer outreach ▪ At regular intervals, look at county records for recent sales. ▪ Send information about the plan and types of restoration projects. ▪ For key prospects, include a personal note offering to visit the property and walk around with them.	▪ Overview of the plan – brochure/8 page glossy with nice photos ▪ Other helpful information about managing your property
House parties/neighborhood gatherings ▪ Recruit members of the Council, boards, etc., to host neighborhood gatherings to discuss the plan and possible projects in the area ▪ Ask people who have implemented projects to attend and speak ▪ Secure attendance from key "influencers" in the neighborhood ▪ Provide demonstrations, videos, etc.	▪ Overview of the plan – brochure/8 page glossy with nice photos ▪ Detailed descriptions of project types for that basin ▪ Videos of results of project

One-on-one outreach When appropriate, reach out to specific landowners within a basin. Consider: ▪ Personal invitations to events, tours, etc. ▪ Asking agency representatives with good community rapport to make the initial contacts ▪ Bringing students/interns along on visits when appropriate ▪ Provide workers with training in "getting to yes" or similar dialogue techniques ▪ Research background information, and practice conversations in advance to prepare for contact with key prospects	▪ TBD
Institutional connections For institutional landowners (timber companies, government, etc.): ▪ Understand the decision makers in the organization and the background interests of the organization. ▪ Understand any ways in which public recognition is helpful to their efforts ▪ Make contact with key decision-makers or influencers within the organization. ▪ Personal invitations to events, tours, etc. ▪ Prepare proposals etc. in formats that are meaningful and helpful to them.	▪

Celebrate success
Recognition of accomplishments creates more buy in. Consider:
▪ Honor key prospects for whatever they do, no matter how small, by showcasing them in other communications materials
▪ Create signage where feasible, recognizing project partners, landowners, etc. – and showcasing restoration value.
    ✦ Use simple signs to celebrate what people have done on their land.
    ✦ Use more complex signs to celebrate the organizational efforts and those who contributed.
    ✦ More complex signage opportunities also include information about ecosystem science and best practices, as well as the Coho lifecycle and history of recovery.
▪ Have some swag that is only for people who do a project on their land – sweatshirts or caps or water bottles or mugs etc.
	▪ All communication materials
	▪ Signage
	▪ Promotional "swag"
	▪ Award
	▪ Additional methods TBD

▪ Enhance annual meetings / awards with more publicity and sponsorships to grow the audience. ▪ Recognize good efforts on all parts, from large timber companies down to 6th graders	

Additional general guidance

Whenever possible, follow these core principles:

- **Use key messages.** The power of a campaign comes from the collective and consistent use of the same ideas and language.
- **Highlight faces and voices** of community members who can share their perspectives. People trust people and respond to people.
- **Invest in images**. Consider investing in quality professional photography and video.
- **Find ways to partner with diverse groups** – churches, schools, tribes, clubs. Go where they are, and design specific ways that they can engage with your opportunities that also meet their own goals and needs.
- Place **agency representatives with good community rapport** at the center of your outreach.
- **Get people onto the land and the rivers**. Volunteer projects, hikes, paddling, and other ideas.
- **Get people together** to learn, create, and celebrate. Be intentional about these gatherings.

Summary of tools needed for campaign

- Logo/Graphic symbol
- Overview of the plan (4-8 page document describing the goals and how they are achieved)
- Fact sheets for specific project types (detailed info on what will happen on your land)
- Project-Specific Handouts (detailed info on a particular project of interest beyond the landowner)
- Website (general information, photos, stories, event info, and how to reach out for technical assistance)
- E-news and e-blasts (Monthly e-newsletter and occasional alerts)
- Videos (Crisp, 30-second videos showing key faces, voices, and images)
- Social media posts (reflect same content as e-news, website)
- Stickers, t-shirts, decals etc using logo (Give as prizes, give out at events, etc)
- Table top display for events (Information for adults; possible interactive for kids)

- News releases
- Sponsorship Packet
- Endorsements list (For use on sponsorship, website, other outreach)
- Curricula for field trips (Branded with campaign info)
- Toolkits for other organizations to use in support of the campaign

Partnership acknowledgement

Whenever possible, follow these core principles:

- **Focus mostly on the campaign not individual organizations.** Again, the power of a campaign comes from the collective and consistent use of the same branding—the simpler this can be, the better.
- **Consider avoiding use of partner logos** and resulting "logo soup." If you're going to the expense of designing and using a campaign logo, it will be stronger when it's not mixed in with a dozen other logos.
- **Whenever partners are listed**, ensure that all partners are included.
- **When speaking or writing about the effort,** partners consistently acknowledge the partnership using shared language approved by the group.

Key messages

Here in the Siuslaw, Coho salmon – strong, vital, wild – are part of who we are.

For many of us, the fish are our heritage and our livelihoods. For others, a source of food and a chance to spend time in nature. For all of us, they are a symbol of the blessings of this special place we call home. Coho connect the people living in our community today—and they connect us to past and future generations. Fundamentally, it is our love of this land that ties us all together.

Key audiences	***Voices***	***Facts and stories***
▪ Landowners, ag, small timber operators ▪ Timber companies and their employees ▪ Tribal leadership/members ▪ Small business owners ▪ Community organizations ▪ K-12 students / their families	▪ Long-time community members ▪ New generation of landowners ▪ Kids ▪ Other timber companies (examples) ▪ Tribal members ▪ Community leaders ▪ Small business owners, e.g. resort owners	▪ Stories from people in key communities about the importance of Coho - real and symbolic. These stories should center on the WHY of why we want to restore salmon ▪ Stories of why people love the Siuslaw and how it matters to them personally ▪ Archival photos help establish sense of connection to the place and the past

Together we can create a pathway to restoring Coho in the Siuslaw Basin.
The key is to create conditions—on the land and in or near the rivers and streams—that allow Coho to thrive.

Audiences*	***Voices***	***Facts and stories***
■ Landowners; ag; small timber operators ✦ *Your land is special – it is part of this unique and promising landscape for Coho and other species* ✦ *Potential special focus on new generation land owners* ■ Timber and Agriculture Communities ✦ *Not antithetical to timber harvest and/or agriculture- here is how they can fit together* ✦ *Timber and agriculture company employees live and work here* ✦ *Here is what you can do in a specific place* ■ Other funding agencies and foundations ✦ *Depth of the partnership and why the Siuslaw* ■ Local government ■ Tribal leadership/members ■ Small business owners ■ Community organizations ■ K-12 students / their families ✦ *This is an opportunity to learn science and other key concepts in this special place*	■ Credible landowners of target types with direct experience – here and elsewhere ■ Key influencers ■ Scientists ■ Teachers ■ Long-time community members	■ Historic abundance ■ Specific characteristics compared to other locales ■ Projected potential for recovery ■ Specific facts about the conditions that matter and why, and how they exist here ■ Other supporting scientific facts ■ Stories from successful recovery efforts here and elsewhere ■ "non-success" stories, learning and adapting ■ Detailed information about the value of specific activities and how they related to the important watershed conditions ■ Stories of hope – why people care about Coho recovery

***Sub-messages are suggested for some audiences.**

Coho matter to our economy.

Clean water and air are priceless, and they bring economic benefit. Fishing and tourism are part of many livelihoods here. The forests and rivers sustain us with food, firewood, and more. Restoration work puts money directly in local pockets. We all want to see the local economy thrive--these activities make a difference for everyone.

Audiences	***Voices***	***Facts and stories***

▪ Landowners
▪ Ag/small timber operators
  ✦ *Costs of flooding and erosion*
▪ Timber companies
▪ Local government
  ✦ *Leverage opportunities*
▪ Tribal leadership/members
▪ Small business owners
  ✦ *Fishing-commercial and recreational*
  ✦ *Business owners in general can support campaign*
▪ Community organizations
▪ K-12 students / their families
	▪ Community leaders
	▪ Chambers of commerce
	▪ Tribal leaders
	▪ Small businesses
	▪ People employed in related industries
	▪ Tourism leaders
		▪ Dollar figures for how much money comes into the economy from fishing, tourism, and recovery
		▪ Economic multiplier information
		▪ Stories from people who depend on fishing for their living
		▪ Stories and voices of those who do restoration work
		▪ Ecosystem services
		▪ Mitigation funding

Each of us can play a role in Coho recovery, and each of us will benefit from it.

Anyone from age 6 to 106 can do something to support this effort. And recovery actions in turn support us all, with clean water, recreational opportunities, and economic gains.

Audiences (design specific messaging for each)	***Voices***	***Facts and stories***
▪ Landowners, ag, small timber operators, conservation landowners ▪ Timber companies ▪ Local government ▪ Federal and state agencies ▪ Funders ▪ Tribal leadership/members ▪ Other institutional partners (school districts, universities, etc) ▪ Small business owners; community organizations ▪ K-12 students / their families	▪ All – tailored to the audience	▪ Recreation opportunities ▪ Clean water benefits ▪ Specific actions that individuals of different types can take to support the campaign

Lead Implementer	Sub-watershed	Stream or Reach	Project ID	Project	Project Type
SWCD/USFS	Fiddle Creek	Morris Creek (left fork and right fork)		Acquire from Roseburg Resources	Acquisition/Protection
SWCD/USFS	Fiddle Creek	Mainstem Fiddle Creek and tributary	1.1-A	Valley wide floodlain restoration	Floodplain Reconnection
SWCD/USFS	Fiddle Creek	Mainstem Fiddle Creek and tributary	1.1-A	Acquire floodplain habitat owned by Roseburg	Acquisition/Protection
SWCD/USFS	Fiddle Creek	Bear Creek (including tributary confluences)	1.1-B	Acquire floodplain and upland habitat owned by Roseburg (approx 4 miles plus tribs potentially	Acquisition/Protection
SWCD/USFS	Fiddle Creek	Bear Creek (including tributary confluences)	1.1-B	Valley wide floodlain restoration	Floodplain Reconnection
SWCD/USFS	Fiddle Creek	Mainstem Fiddle Creek (Big Canyon upstream to USFS land)	1.1-C	Off channel reconnection (1 of 5)	Floodplain Reconnection
SWCD/USFS	Fiddle Creek	Alder Creek	1.1-D	Acquire from Roseburg	Acquisition/Protection
SWCD/USFS	Fiddle Creek	Alder Creek	1.1-D	Valley wide floodlain restoration	Floodplain Reconnection
SWCD/USFS	Fiddle Creek	Mainstem Fiddle Creek (Big Canyon upstream to USFS land)	1.2-A	LWD placement (2 of 5)	instream complexity
SWCD/USFS	Fiddle Creek	Mainstem Fiddle Creek (Big Canyon upstream to USFS land)	1.2-A	Beaver dam analogs (5 of 5)	Beaver Dam Analogs
SWCD/USFS	Fiddle Creek	Unnamed Creek at lower end of Fiddle Creek	1.2-B	LWD placement	instream complexity

SWCD/USFS	Fiddle Creek	Unnamed Creek at lower end of Fiddle Creek	1.2-B	Acquire from Roseburg	Acquisition/Protection
SWCD/USFS	Fiddle Creek	Mainstem Fiddle Creek (Big Canyon upstream to USFS land)	1.3-A	Riparian revegetation (3 of 5)	Riparian Enhancement
SWCD/USFS	Fiddle Creek	Culvert on small trib to fiddle upstream of Morris	1.4-A	Culvert removal - road has already be decomissioned (4 of 5)	Fish Passage
SWCD/USFS	Fiddle Creek	Bear Creek (Trib C unamed)	1.4-B	Culvert removal and replacement	Fish Passage
SWCD/USFS	Maple Creek	Mainstem Maple Creek	2.1-A	From lake upstream to Roache Creek where there are Anchor Habitats	Acquisition/Protection
SWCD/USFS	Maple Creek	Mainstem Maple Creek (Roche to Grant Creek)	2.1-A	Valley wide floodlain restoration	Floodplain Reconnection
SWCD/USFS	Maple Creek	Mainstem Maple Creek (Roche to Grant Creek)	2.1-A	Acquire or protect floodplain habitat owned by MBG	Acquisition/Protection
SWCD/USFS	Maple Creek	Schrum Creek	2.1-B	Roseburg property near confluence and upstream	Acquisition/Protection
SWCD/USFS	Maple Creek	Schrum Creek	2.1-B	Valley wide floodlain restoration	Floodplain Reconnection
SWCD/USFS	Maple Creek	Carle Creek	2.1-B	Acquire floodplain habitat owned	Acquisition/Protection
SWCD/USFS	Maple Creek	Carle Creek	2.1-B	Valley wide floodlain restoration	Floodplain Reconnection

SWCD/USFS	Maple Creek	Mainstem Maple (upstream of Coleman Creek)	2.2-A	LWD placement on USFS land for 1 mile	instream complexity
SWCD/USFS	Maple Creek	North Prong Maple Creek	2.2-B	LWD placement on USFS land for 1 mile	instream complexity
SWCD/USFS	Maple Creek	Schrum Creek	2.3-A	Railroad barrier at the mouth of Schrum Creek at the confluence of Maple Creek replace with bridge	Fish Passage
SWCD/USFS	Siltcoos Lake - Frontal Pacific Ocean	Silver Creek	3.1-A	Channel reconstruction and floodplain/off-channel reconnection be creating small pilot channels (1 of 5).	Floodplain Reconnection
SWCD/USFS	Siltcoos Lake - Frontal Pacific Ocean	Silver Creek	3.1-A	Landowner has expressed interest in a conservation easement	Acquisition/Protection
SWCD/USFS	Siltcoos Lake - Frontal Pacific Ocean	Silver Creek (South Fork)	3.1-A	Landowner has expressed interest in a conservation easement	Acquisition/Protection
SWCD/USFS	Siltcoos Lake - Frontal Pacific Ocean	Silver Creek (South Fork)	3.2-A	Add beaver dam analogs to give existing beavers more stable building sites	Beaver Dam Analogs
SWCD/USFS	Siltcoos Lake - Frontal Pacific Ocean	Silver Creek	3.3-A	Riparian and wetland revegetation/invasives removal (4 of 5)	Riparian Enhancement
SWCD/USFS	Siltcoos Lake - Frontal Pacific Ocean	Silver Creek (South Fork)	3.3-A	Reed canary grass removal and native revegetation	Riparian Enhancement
SWCD/USFS	Siltcoos Lake - Frontal Pacific Ocean	Siltcoos Estuary	3.3-B	Remove non-native beach grass from dunes	Invasives Removal
SWCD/USFS	Siltcoos Lake - Frontal Pacific Ocean	Silver Creek	3.4-A	Culvert removal and replacement (2 of 5).	Fish Passage

SWCD/USFS	Siltcoos Lake - Frontal Pacific Ocean	Silver Creek	3.4-B	Culvert removal (3 of 5)	Fish Passage
SWCD/USFS	Siltcoos Lake - Frontal Pacific Ocean	Siltcoos Lake outlet	3.4-C	Improve aquatic organism passage on Siltcoos Dam	Fish Passage
SWCD/USFS	Siltcoos Lake - Frontal Pacific Ocean	Silver Creek	3.5-A	Road decommission and replace upper end with ford (5 of 5).	Road Upgrade or Removal
Siletz	Tahkenitch Lake - Frontal Pacific Ocean	Fivemile Creek (lower)	4.1-A	Siletz Tribe property - floodplain reconnect (1 of 3)	Floodplain Reconnection
SWCD/USFS	Tahkenitch Lake - Frontal Pacific Ocean	Perkins Creek	4.1-B	Floodplain reconnection (partially owned by tribe) (1 of 3)	Floodplain Reconnection
SWC/USFS	Tahkenitch Lake - Frontal Pacific Ocean	Fivemile Creek (extends to Bell Creek)	4.1-C	Phase 5 of the Fivemile/Bell project - Channel reconstruction and floodplain	Floodplain Reconnection
SWCD/USFS	Tahkenitch Lake - Frontal Pacific Ocean	Fivemile Creek (lower)	4.2-A	Add large wood to stream (2 of 3)	instream complexity
SWCD/USFS	Tahkenitch Lake - Frontal Pacific Ocean	Perkins Creek	4.2-B	Add large wood to stream (2 of 3)	instream complexity
SWCD/USFS	Tahkenitch Lake - Frontal Pacific Ocean	Fivemile Creek (extends to Bell Creek)	4.2-C	Phase 5 of the Fivemile/Bell project - Large wood placement	instream complexity
SWCD/USFS	Tahkenitch Lake - Frontal Pacific Ocean	Tahkenitch Estuary	4.3-A	Remove non-native beach grass from dunes	Invasives Removal
SWCD/USFS	Tahkenitch Lake - Frontal Pacific Ocean	Fivemile Creek (lower)	4.3-B	Riparian planting and invasives removal (3 of 3)	Riparian Enhancement

SWCD/USFS	Tahkenitch Lake - Frontal Pacific Ocean	Perkins Creek	4.3-C	Riparian planting and invasives removal (3 of 3)	Riparian Enhancement
SWCD/USFS	Tahkenitch Lake - Frontal Pacific Ocean	Fivemile Creek (extends to Bell Creek)	4.3-D	Phase 5 of the Fivemile/Bell project - Riparian revegtation	Riparian Enhancement
SWCD/USFS	Tahkenitch Lake - Frontal Pacific Ocean	Tahkenitch outlet	4.4-A	Improve aquatic organism passage on Tahkenitch Dam	Fish Passage
	All Subwatersheds			Assessment, surveys and feasibility work to support priority acquisitions	Assessment

Coastal Lakes SAP
Project Prioritization Criteria

Importance of the Tributary or Reach						
Criteria / Score ->	**0**	**1**	**2**	**3**	**4 - 6**	
• <u>Life Stages</u>: Which stage(s) of the life cycle does the trib support? (spawning, over-wintering, summer rearing, all)	none	spawning	Summer rearing	Over-wintering	More than one stage: score is cumulative	
• <u>Habitat Value:</u> What is the *current* value of the habitat?	Poor/Low	Medium	High			
• <u>Habitat Potential:</u> Is site high IP? (use percent of trib)	No		Yes			
• <u>Bonus</u>: Does the tributary support a unique life history or habitat type? (e.g. estuary, nomadic)	No		yes			
• <u>Bonus</u>: Is the tributary a cold water source?	No		yes			
Total Score for tributary or reach:						

Biological / Ecological Benefit of the Project						
Criteria / Score ->	**0**	**1**	**2**	**3**	**4**	**5**
• <u>Limiting factors:</u> Which stresses and/or limiting factors does this project address?	None	Addresses a stress but not the limiting factor(s) (e.g. bedload transport)	Addresses Temperature	Prevents loss of complexity (e.g. prevent mass wasting)	Has a high likelihood of increasing complexity or winter habitat	High likelihood of significantly addressing temp and complexity)
• <u>Processes</u>: How many high priority, altered processes does it address? 1) Suspended sediment production, 2) flows (hyporheic and base flows), 3) LWD delivery, 4) channel migration,	None	One point per process enhanced. See accompanying score sheet.				

5) floodplain interaction (inc estuaries), 6) riparian function, 7) Bedload transport and gravel supply, 8) Longitudinal connectivity ***Notes: Make these compatible with common framework.***						
• <u>Longevity</u>: How long will benefit last?	0-4 years	5 – 10 years	10-25 years	> 25 years		
• <u>Assurance of success</u>: has approach worked before? Is location suitable?	No / unknown	No / yes	Yes / yes			
Total Score for the Project:						
			Other Considerations (Bonuses)			
Criteria / Score ->	**0**	**1**	**2**	**3**	**4**	**5**
• <u>Bonus: Working Lands</u>: Is there an opportunity to demonstrate a working lands approach? Other benefits as well.	No		Yes (points based on scale)		Yes (points based on scale)	
• <u>Bonus: Education Value -</u> Does the project present an opportunity to educate the public and/or demonstrate an innovative restoration approach?	No		Yes			
Total Bonuses for Additional Considerations = **<u>TOTAL (Trib + Project + Bonuses) =</u>**						

Others (not used)

Criteria / Score ->	**0**	**1**	**2**	**3**	**4**	**5**
Social Support for the Project						
• Community Support: Is there likely to be local concern over project implementation?	Yes, high	Yes, moderate	Unknown or not much expected	None expected	No and landowner championing	No and many local champions
• Cost: (Can also ask about affordability; ie, can we get it funded?)	>1 million	400k – 1 mil	250-400k	50-250k	0-50k	
• Bonus: Does this project complete the work in the watershed?	No		Yes			
Total Score: (Support and Cost)/2 + Bonus = **TOTAL (Trib + Project) =**						