TILLAMOOK BAY WATERSHED COUNCIL STRATEGIC ACTION PLAN 2025-2035

Prepared by Bierly & Associates LLC and HydroLogic Strategies LLC

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Funding provided by the Oregon Watershed Enhancement Board

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Acronyms

BLM – Bureau of Land Management
CAFO – Confined Animal Feeding Operation
CERP - Computational Ecological Restoration Prioritization
COA - Conservation Opportunity Area
DEQ – (Oregon) Department of Environmental Quality
DO – Dissolved Oxygen
EPA – (United States) Environmental Protection Agency
ESA – Endangered Species Act
ESU - Evolutionarily Significant Unit
FEMA – Federal Emergency Management Agency
FSA – Farm Service Agency
HCP – Habitat Conservation Plan
LWD – Large Woody Debris
NFWF - National Fish and Wildlife Foundation
NHMP – Natural Hazard Mitigation Plan
NMFS – (NOAA) National Marine Fisheries Service
NOAA – National Ocean and Atmospheric Administration
NRCS – (USDA) Natural Resources Conservation Service
ODA – Oregon Department of Agriculture
ODF – Oregon Department of Forestry
ODFW – Oregon Department of Fish and Wildlife
ODOT – Oregon Department of Transportation
OSU – Oregon State University
OWEB – Oregon Watershed Enhancement Board
RCPP – Regional Conservation Partnership Program
RM – River Mile
SAP – Strategic Action Plan
SFISH - Small Forestland Investment in Stream Habitat Program
SSH – Salmon SuperHwy
TBCC – Tillamook Bay Community College
TC – Tillamook County
TCCA – Tillamook County Creamery Association
TCPW – Tillamook County Public Works Department
TCSWCD – Tillamook County Soil and Water Conservation District
TEP – Tillamook Estuaries Partnership
TMDL – Total Maximum Daily Load
TNC – The Nature Conservancy
TU – Trout Unlimited
USACE – United States Army Corps of Engineers
USDA – United States Department of Agriculture
USFS – United States Forest Service
USFWS – United States Fish and Wildlife Service
USGS – United States Geological Survey
WSC – Wild Salmon Center

Table of Contents

Chapter 1 – Plan Content and Background

Introduction and Plan History

This document expresses the goals and strategies of the Tillamook Bay Watershed Council (TBWC) from 2025 through 2035. Bierly & Associates LLC and Hydrologic Strategies LLC were contracted to develop this document with the help of the council's board, staff, and community members. Organizational and ecological priorities were refined during facilitated meetings of the Council Board in April and May of 2025. The focus of the Action Plan is to update the 2015 Action Plan to reflect both the accomplishments of the council over the last decade and to reflect the changing conditions, restoration partners, and policies. The 2025-2035 Strategic Action Plan includes:

- Profiles of the watersheds that flow into Tillamook Bay
- Highlights of Conservation Needs and Opportunities
- Identification of Potential Restoration Partnerships and Priorities

Geographic Scope

TBWC's geographic scope includes approximately 582 square miles of the Tillamook Basin, including the five tributaries that feed into Tillamook Bay (Wilson River, Trask River, Tillamook River, Kilchis River and Miami River), as well as the estuary and tidal lands of the bay (Figure 1).

Purpose and Focus

The focus of the 2025 Strategic Action Plan is to move forward the mission of the Tillamook Bay Watershed Council to "***to build collaborative, voluntary partnership with communities and landowners, to protect, maintain and improve the health of the Tillamook Bay Watershed through on-the-ground restoration projects,***

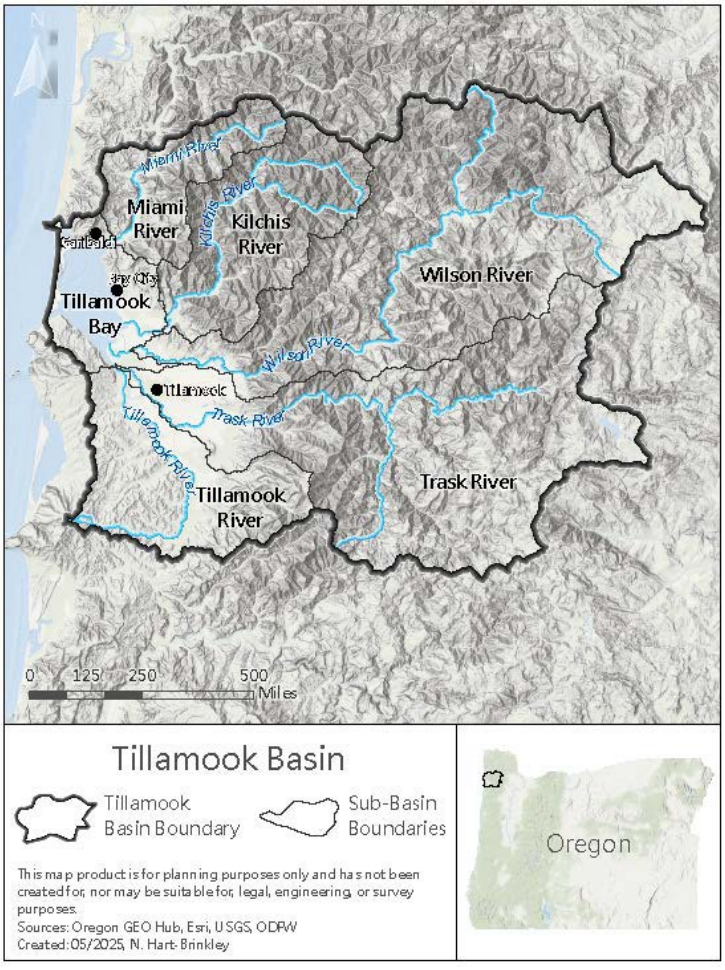


Figure 1: Tillamook Bay Basin Watersheds

community outreach programs, and other community-engagement activities." The activities of the Council are to fulfil the vision of: "***a healthy watershed that supports natural, functioning ecosystems while also providing for a thriving economic base that supports viable communities***."

Accomplishments

The TBWC conducted ten significant projects over the last decade. All of the work was completed in the first five or six years of the decade. Major projects involved large wood placement, fish passage, and riparian enhancement (Table 1). Most of the projects were identified in the 2015 Action Plan.

Table 1: Tillamook Bay Watershed Council Project Accomplishments 2015-2025

Project Name	Activity
Sutton Creek Fish Passage Project	Replacing a failing culvert with a small bridge on private farmland, Tillamook River watershed.
Killam Creek Habitat Enhancement	Placement of 16 LWD structures; planting of 6-acre riparian area (Figure 2).
Mill Creek Habitat Enhancement Project	Placement of 17 LWD structures; planting of 4-acre riparian area and disturbed soils.
Averill Planting Project	Invasive vegetation removal; native tree and shrub plantings over a 2-acre riparian area
Skookum Reservoir - Dam Breach	Notching of Skookum dam; simulated channel reconstruction; plantings across work area.
South Fork Trask Road Obliteration and Large Wood Project	Placement of 17 LWD structures; removal of 6 culverts; removal of road-bed material; planting of riparian area.
Tomlinson Creek Fish Passage	Replacing two small culverts with a single bridge on private lands along Bayocean Road, Tillamook River watershed Figure 3).
Schultz Riparian Planting Project	Planting along the lower Nehalem River in partnership with TEP and TCSWCD.
Pike Fire Restoration and Riparian Planting	Fire Restoration on steep slopes and riparian planting
Holden Creek Surveys, Beaver Dam Removal, Beaver Trapping	Holden Creek Monitoring, Beaver Removal and Beaver Dam Removal
Planning	Development of a 10-year Strategic Plan.
Monitoring	South Fork Trask Large Wood, Skookum Dam, Killam Creek habitat enhancement, Mill Creek habitat enhancement, Upper Tillamook juvenile salmon & lamprey

Figure 2: Killam Creek Large Wood Project

Figure 3: Tomlinson Creek Fish Passage

Chapter 2 - The Tillamook Bay Setting

Nestled between rugged mountains and the Pacific Ocean with over 580 square miles of rivers and creeks and a bay totaling 13 square miles the Tillamook Bay watershed is fed by five major streams. Tillamook Bay is a drowned river mouth estuary that lies at the terminus of five distinct tributary drainages. Tillamook Bay is Oregon's second largest bay, and one of Oregon's treasures. The bay supports a thriving oyster industry and some of the best runs of salmon and steelhead on the West Coast. In addition, broad fertile floodplains play host to rich dairy lands which produce world-class *Tillamook* cheese and other milk products.

The name, "Tillamook", means "land of many waters." The Miami, Trask, Wilson, Tillamook and Kilchis Rivers all drain from the Coast Range to Tillamook Bay. The catchment is nearly square with the Miami and Kilchis Rivers flowing into the Bay from the north and northeast. The Wilson and Trask Rivers have the largest catchments and drain from the northeast and east. The Tillamook River flows into the Bay from the southeast.

The 2020 census lists the City of Tillamook with a population of 5,820, Bay City with 1,456, and Garibaldi with 830 inhabitants. All three communities are on the bay and are directly tied to it. There is a large rural residential population in Tillamook County outside urban areas. The vast 364,000-acre Tillamook State Forest is east of the bay and is a major area for commercial logging and recreation. Much of the land adjacent to the bay is urbanized or agricultural, private forest land abuts the bay to the south, and the spit to the west includes Bayocean Peninsula, a popular recreational destination.

Tillamook Bay and Tributaries is identified as a Conservation Opportunity Area (COA 011) by the Oregon Department of Fish and Wildlife. The COA is characterized as: "A large bay some 6 miles long with five rivers flowing into it. Extensive sand/mudflats provide habitat for migratory and breeding waterfowl and shorebirds. The bay is protected from the open ocean by a the Bayocean Spit, formerly used by nesting Western Snowy Plovers."

The Watersheds in 2025

The Tillamook Bay Watershed lies near the northwest corner of Oregon on the western side of the Coast Range Mountains. Aside from some small creeks and sloughs that drain directly to the Bay, the majority of water entering the Tillamook Bay is carried by 5 large rivers – the Miami, Kilchis, Wilson, Trask, and Tillamook. These Rivers have their headwaters at varying elevations up to nearly 3,700 ft. in the Coast Range.

The watersheds of Tillamook Bay have abundant forest and aquatic resources. The forest lands have a unique history of fire and support a thriving timber industry. The streams that drain to Tillamook Bay support a recreational and commercial fishing industry. The

lowlands support a thriving dairy industry and the estuary and Baylands are critical for the support of the fishery, and support important oyster, clam and crab fisheries.

Miami River

The Miami River watershed is the smallest, at approximately 36.7 square miles in size, and the northernmost of the five primary watersheds that flow into Tillamook Bay. Some 93 percent of the basin consist of densely forested, heavily dissected, steep and rugged mountains that are separated by narrow confined valleys. The elevation rises from sea level on the western margin to a maximum of 2,778 feet on the ridge that defines the far eastern boundary. Much of the higher elevations have been harvested for timber or were burned as a part of the Tillamook Burns and are now second growth forests. There is no solid evidence of historical log drives on the Miami River. The lowlands that comprise the remaining 7 percent of the watershed, is a fertile, broad, low elevation (<100 feet), gently sloping alluvial coastal plain.

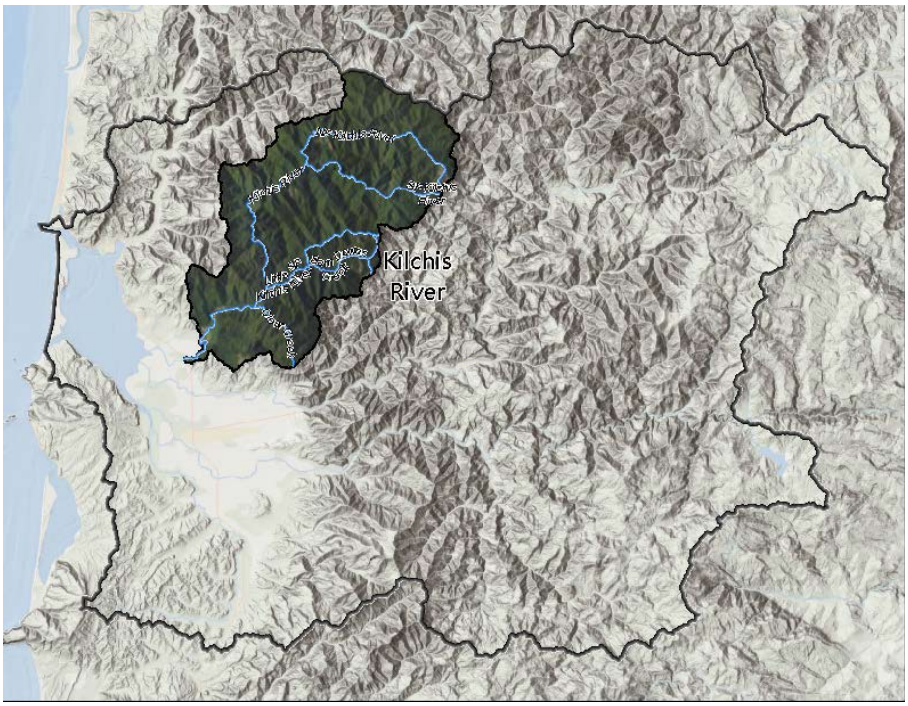
Oregon Department of Forestry manages some 60% of the watershed, private industrial forest lands comprise some 33 percent of the watershed, and there is approximately 4 percent of the watershed as private non-industrial forest land. Agricultural and wet pasture comprise nearly 2 percent of the watershed with the remainder of the watershed rural residential or urban. It is estimated that 39 percent of the stream riparian network is comprised of conifer dominated stands, 27 percent is hardwood dominated, 27 percent mixed, and about 8 percent is non forest (ODF, 2005).

Anadromous fish species occur in the mainstem and most tributaries of the Miami basin include; coho salmon (*Oncorhynchus kisutch*), fall Chinook salmon (*O. tshawytscha*),

chum salmon (*O. keta*), coastal cutthroat trout (*O. clarkii clarkii*), and winter steelhead (*O. mykiss*). Chum and Chinook salmon spawn and rear in the low gradient portions of the Miami River and into the lower reaches of some tributaries. Coho salmon and winter steelhead are found throughout the mainstem and larger tributaries. Juvenile snorkel surveys were conducted in 2005, 2006, and 2007 on all of the tributary streams to Tillamook Bay. The Miami River was the least productive tributary for coho of the five rivers tributary to Tillamook Bay in all three survey years. The mainstem produces the vast majority of the coho, with Moss, Illingsworth, Peterson, and Prouty Creeks having significant populations. The lower river has excellent potential for chum production. Pacific lamprey (*Entosphenus tridentatus*) are found in the Miami but the population is not well documented (USFWS, 2022). The Miami River is unique in the Tillamook Bay Watershed in that the majority of the high-quality habitat is found in the mainstem river. There were19 known fish passage barriers in the Miami watershed when inventoried a decade ago (Bailey, 2012).

The primary limiting factors for salmon production are a lack of habitat complexity (large wood), high temperature (lack of riparian vegetation) especially in the lower mainstem of the Miami River. The Computational Ecological Restoration Prioritization (CERP) prioritization identified the upper Miami mainstem as a priority for coho salmon habitat restoration (Demeter Design Inc., 2008).

Kilchis River



The Kilchis watershed is somewhat larger than the Miami watershed (73 square miles). Lying to the south of the Miami watershed, the Kilchis watershed is similarly some 92 percent forested, heavily dissected, steep and rugged landscape. The western edge is similar to the Miami 5-6 percent agriculture pasture. With only 1-2 percent rural residential or urban developed. Log drives were limited to the tidal area near

the recent tidal restoration area of Kilchis Wetland Preserve that includes Stasek Slough and Porter Slough.

Formerly, the river was tightly connected to its floodplain due to large logjams in the tidal area that reduced the capacity of the river channel to transport flood flows. Every time river flows rose above a moderate level, the river would overflow its banks and spread out through the bottomland forest and other wetland areas. Consequently, the bottomland hardwood forest was flooded for most of every winter, providing ideal habitat for salmonids. The logjams were removed in the late 1800s to facilitate conversion of floodplain lands to agricultural uses.

A series of forest fires (1933, 1939, 1945, 1951) burned much of the natural vegetation of the upland forests. Today, most of the mixed conifer upland forests have been replanted in Douglas fir trees. The forested land in Tillamook County has provided timber harvest for the wood products industry since the 1880s. While the extensive stands of timber were originally viewed as a hindrance to farming, by 1894 the timber industry was considered the County's most important industry. Oregon Department of Forestry manages the greatest percentage of the Kilchis watershed with a small area of BLM managed forest lands lower in the watershed.

The Kilchis watershed supports fall Chinook, spring Chinook, coho, and chum salmon, winter steelhead, cutthroat trout, and Pacific Lamprey. Fall Chinook habitat includes the mainstem, the North and South Forks, Little South Fork, the lower portion of Sam Downs Creek, and the lower portion of Clear Creek. The mainstem of the Kilchis from the estuary to the confluence of the North and South Forks has been identified as spring Chinook habitat.

ODFW has identified priority coho habitat on the main stem of the Kilchis, the lower portions of both the North and South Forks, Little South Fork, Sam Downs Creek, and Clear Creek.

The Kilchis River provides chum habitat in the main fork of the Kilchis to the Little South Fork and up Clear Creek as well as the lower portions of several smaller tributaries. Oregon is near the southern edge of chum salmon distribution which may, in part, account for the large interannual variability in run sizes that have been observed in Tillamook Bay streams over the years.

Winter steelhead habitat is quite extensive in the Kilchis watershed. It includes all of the larger tributaries of the Kilchis and the main stem.

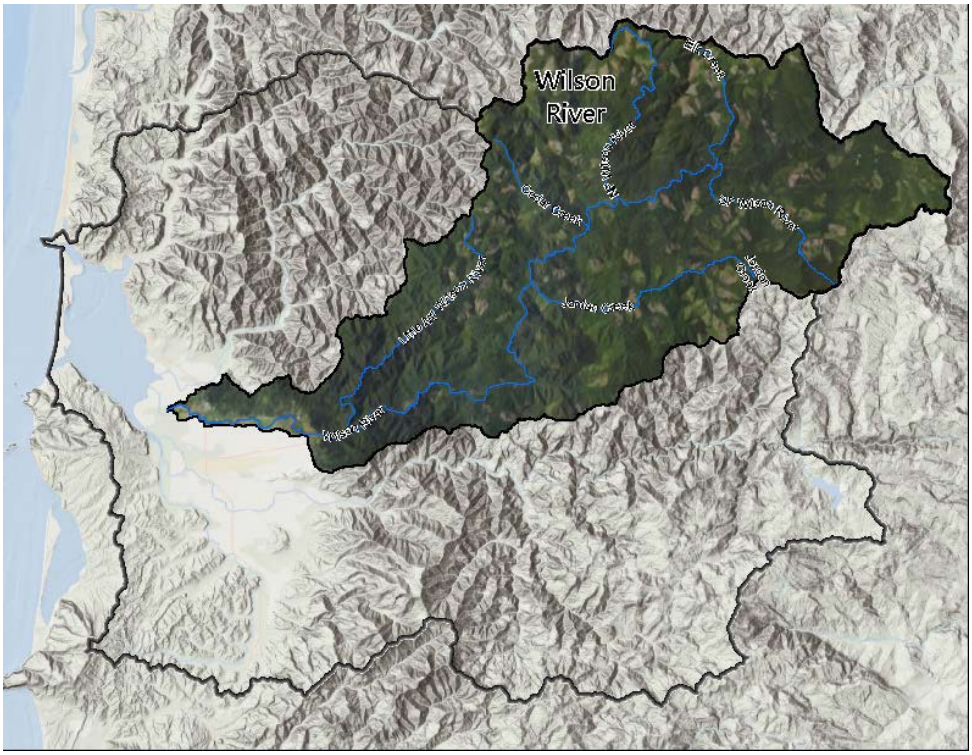
Less is known about the present status of sea-run cutthroat trout than about any of the other anadromous salmonid species in the Kilchis watershed. Sea-run cutthroat trout, the

smallest of the anadromous salmonids present in the watershed but population trends are not well documented. Spawning habitat for Chinook salmon and cutthroat trout is limited by water temperatures, as is rearing for all anadromous salmonids.

The Kilchis River and tributaries are deficient in large woody debris (LWD). The vast majority of the current LWD supply in the Kilchis watershed consists of alder logs, which have relatively small diameters and decay fairly rapidly. Although alder logs may provide valuable pieces of LWD for the smaller tributary streams, their utility in the wider channels of the mainstem and the lower ends of the three forks is limited. The overall status of riparian shading of streams in the surveyed reaches of the Kilchis watershed is mixed. Kilchis Park contains a rare remnant pocket of old growth forest and undisturbed river corridor.

Known distribution of anadromous fish in the Kilchis watershed is mapped in Figure 5. There were 20 known fish passage barriers on the Kilchis River some 13 years ago (Bailey, 2012). The habitat conditions of the Kilchis River, like the Miami River, are limited by habitat complexity and high temperatures. The lower to middle mainstem of the Kilchis River has been identified by the CERP study as a immediate priority for Chinook salmon restoration (Demeter Design Inc., 2008).

Wilson River



The Wilson River drains approximately 194 square miles of land and is the largest watershed of the Tillamook Bay drainage. The watershed is characterized by steep forested uplands and flat alluvial lowlands. Much of the higher elevations have been clear-cut for timber or were burned as a part of the Tillamook Burns. Early logging of the watershed involved log drives

along at least 22.5 miles of the lower river. To conduct log drives to the estuary, existing log jams were dynamited to clear the waterway for drives. Log drives were conducted mainly between 1893 and 1906. While there is no record of splash damming on the Wilson River, there is a legacy effect of straightened and scoured stream conditions due to significant log drives (up to 10,000,000 board feet in a single drive). Some effects have lasted since the drives were halted in the early part of the 20th century.

The lower Wilson River runs adjacent to the City of Tillamook and drains both agricultural and developed areas. The dominant land use in the Wilson River watershed is State (78 percent) and BLM forest (3 percent), accounting for 81 percent of the watershed's total area. Private Industrial and Private Forest landownership accounts for 15 percent of the watershed. The lowland areas of the watershed are dominated by dairy pastures (around 2 percent of the watershed). The lower mainstem is extensively diked and is prone to flooding. The Wilson River floodplain contains the lowest portion of State Highway 101. Commercial development has occupied the majority of this corridor.

The Wilson River watershed supports three salmon species as well as steelhead and coastal cutthroat trout. Pacific lamprey are found throughout the Wilson drainage. Chum salmon requires typical low gradient, gravel-rich, barrier-free freshwater habitats and productive estuaries. Historically, chum were dominant in the lower river, in the lowlands near tidewater, and up the Little North Fork Wilson River. Currently, chum salmon use only the lowest portions of the Wilson River watershed, never extending beyond the Lower Wilson or low elevations of the Little North Fork Wilson tributaries. Spring Chinook use the mainstem Wilson River into the headwaters and the lower portion of the Jordan Creek tributaries. Fall Chinook are found more extensively throughout the watershed including the Little North Fork, Cedar Creek and North Fork tributaries. Spring Chinook remain in the larger streams where deep holding pools are more abundant. In contrast, fall Chinook move directly to spawning areas, reducing the need for these large holding pools. Coho salmon utilize the entire Wilson River watershed, including all of the tributaries. Coho salmon were even identified above waterfalls in the Elk Creek and Jordan Creek tributaries. The Wilson River watershed provides a large proportion of the coho habitat in the Tillamook Basin and is currently extensively used by coho salmon.

The Wilson River supports spawning steelhead and sea-run cutthroat trout. Winter steelhead are found throughout the Wilson River watershed and most tributaries. Coastal cutthroat trout are found in even small streams and abundance is limited by availability of deep pool habitat. Five tributary systems have the potential for immediate restoration priority for coho restoration (Lower Devils Lake, Middle Devils Lake, Lower Cedar, Lower South Fork Wilson, and Lower Little North Fork Wilson). The CERP prioritization also

identified tributary sites in the Wilson River (Lower Little North Fork Wilson) for outreach and steelhead and Chinook salmon restoration (Demeter Design Inc., 2008)

Trask River

The Trask River watershed is approximately 175 square miles and is the second largest watershed in the Tillamook basin. The Trask watershed drains a varied landscape, from steep-sloped, highly-dissected headwaters to low-gradient broad floodplains. Long ridges with steep slopes and numerous rock outcrops characterize the upland terrain. Many small, high-gradient streams with deeply incised channels originate from headwalls at higher elevations.

Barney Reservoir in the Middle Fork of the North Fork tributary is the primary municipal water supply for the cities of Beaverton, Hillsboro, and Forest Grove. Like the other watersheds in the Tillamook basin, The Trask watershed was impacted by the Tillamook Burn and subsequent fires. The majority of forested uplands in the watershed were re-planted with Douglas-fir for timber production. Currently, the forest is dominated by closed canopy, even aged conifer and hardwood stands. Historic logging in the Trask watershed used the river to float logs to mills near the estuary. Log drives from as early as 1879 until 1915 have been documented. At least the lower 10 miles of the Trask River was used for log drives, although there may have been drives from higher in the watershed. Upon leaving the Coast Range, the Trask enters a broad, alluvial floodplain. The lower portion of the mainstem forms an interconnected network of sloughs and tidal wetlands.

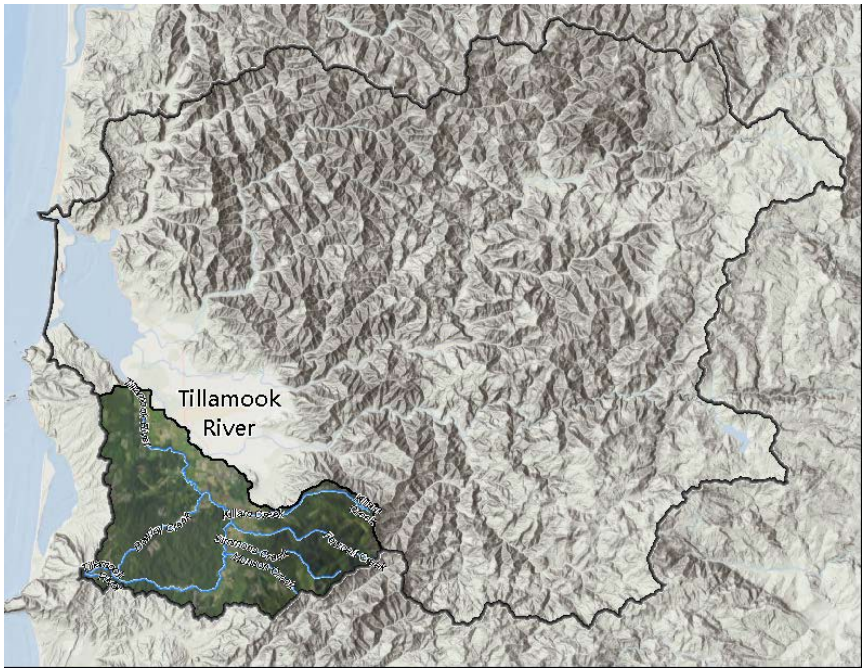
Unique to the Trask River watershed is the Trask Watershed Study, a multi-disciplinary, long-term research project designed to evaluate the impacts of forest harvest on public and private lands to aquatic ecosystems within the harvest areas, as well as downstream. The study began in 2006 and multiple headwater basins in the Trask were clearcut harvested in 2012. Forested riparian buffers along small non-fish bearing streams were retained on public land, but not on private land. The results from this experimental study are providing resource managers with expanded understanding of both direct and indirect effects of forest management on aquatic ecosystems. The objectives of the Trask River Watershed Study are to:

- Quantify effects of forest harvest on the physical, chemical and biological characteristics of small headwater streams
- Examine extent to which harvest in headwaters influences the physical, chemical and biological characteristics in downstream fish reaches
- Increase understanding of the major processes influencing aquatic ecosystems through forest-stream interactions

The study has produced a better understanding of the localized factors that affect cutthroat trout including habitat use, predator exposure and response to climate change and timber management. The study has brought new information on sediment delivery from forest roads. Studies of stream response to increased light on stream food webs has identified complex relationships that were previously unknown.

Like the Wilson River, the Trask supports Chinook, chum, and coho salmon, steelhead, coastal cutthroat trout , and Pacific lamprey. Lower in the Trask watershed the streams support steelhead, coho, Chinook, and chum salmon much like the Wilson River, Demeter Designs Inc. (2008) which identifes four tributaries in the Trask for coho immediate restoration priority (Middle North Fork Trask, Lower North Fork Trask, Middle Elk Horn, and Lower Elk Horn). Outreach to the Middle Trask Mainstem was also recommended by the CERP process.

Tillamook River

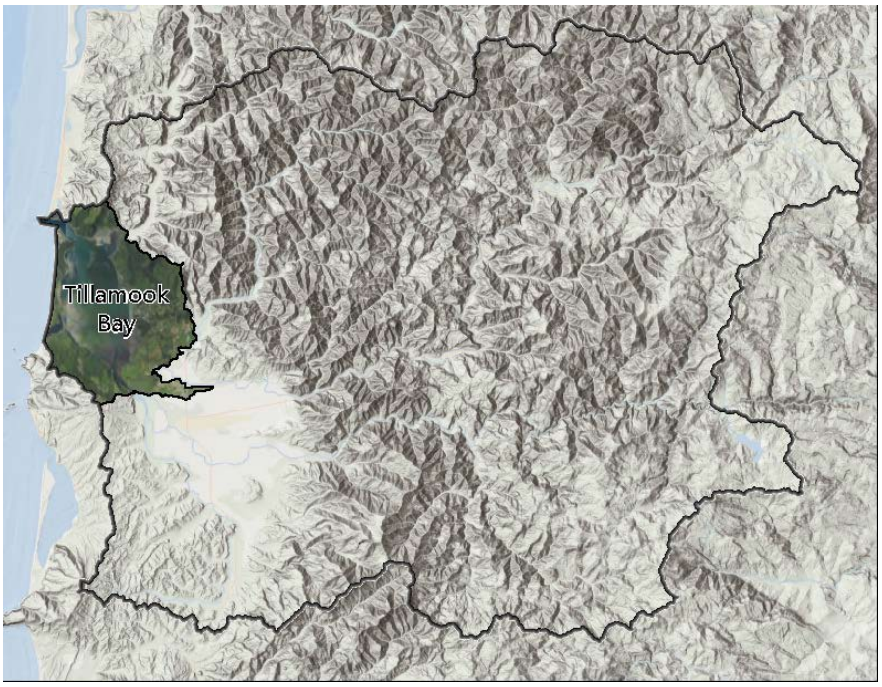


The Tillamook River watershed is approximately 57 square miles and is significantly different from the other watersheds with a dominance of coastal lowlands and uplands with a minority of forested uplands in the watershed. Unlike the other four watersheds entering Tillamook Bay, the Tillamook River was not part of the Tillamook Burn. However, the reach of the Tillamook River below Bewley Creek was used for log drives (approximately 6.7 miles) and the lower 3 miles of Bewley Creek was both splash dammed and subject to log drives. Log drives were made between 1887 and around 1909. Historically the lower portion of the mainstem formed the same interconnected network of sloughs and tidal wetlands as the other four rivers although diking reduced much of this historical network.

The Tillamook watershed supports forestry, which is predominant at higher elevations, dairying, and rural residential land-uses which are both predominant in lower elevations. The majority of the forestry lands are privately owned with Stimson and Green Diamond the majority owners. A small portion of the eastern watershed is managed by ODF and a sliver of the southern border contains USFS lands.

Coho, Chinook, steelhead, cutthroat, sturgeon, chum salmon, and Pacific lamprey utilize portions of the Tillamook River Basin. Steelhead populations are largest within the higher gradient, volcanic streams of the Eastern Basin (Killam, Fawcett, Munson, and Simmons Creeks). Coho populations are largest in the upper Mainstem and Bewley Creek. The Eastern tributaries also support significant populations, albeit at a lower level of abundance. The lower Tillamook River has been extensively diked to allow for expansion of dairy farms throughout the basin. This has resulted in the loss of nearly all off-channel habitat in this portion of the stream network. The result is a highly simplified stream channel with minimal potential to provide over-wintering habitat for juvenile salmonids.

Tillamook Bay and Estuary



Tillamook Bay is Oregon's second largest bay. The bay supports a thriving oyster industry and some of the best runs of salmon and steelhead on the West Coast. In addition, broad fertile floodplains play host to rich dairy lands which produce world-class cheese. A healthy and functioning Tillamook Bay is essential to not only honor the cultural landscape and crucial natural resources, but to the overall vitality of the surrounding communities.

Tillamook Bay is a shallow estuary averaging only 6.6 feet deep over its 13 square miles. At low tide, about half of the Estuary bottom is exposed as intertidal sand/mud flats, presenting navigational challenges similar to those facing the first known European explorers who entered the Bay in 1797. Today, these intertidal flats provide important growing areas for oyster culture and other benthic intertidal species.

Several deep channels, running roughly north-south, represent the geological signatures of river mouths drowned by the rising Pacific Ocean about 9,000 years ago. Boaters and fish, including salmon, depend on these channels. The Oregon Department of Fish and Wildlife (ODFW) rates Tillamook Bay as the State's premier recreational shellfishing area.

Several of the deep channels wind through intertidal mud flats that are exposed at low tide. The Bay receives fresh water from five rivers and exchanges ocean water through a single channel in the northwest corner. Despite large freshwater inflows, especially during the rainy winter months, heavy tidal fluxes dominate the system. Extreme diurnal tides can reach 13.5 feet, with a mean tidal range of 5.6 feet and diurnal range of 7.5 feet. Tidal effects extend various distances up the rivers, ranging from 0.4 miles for the Miami River, to 6.8 miles for the Tillamook River (Komar 1997).

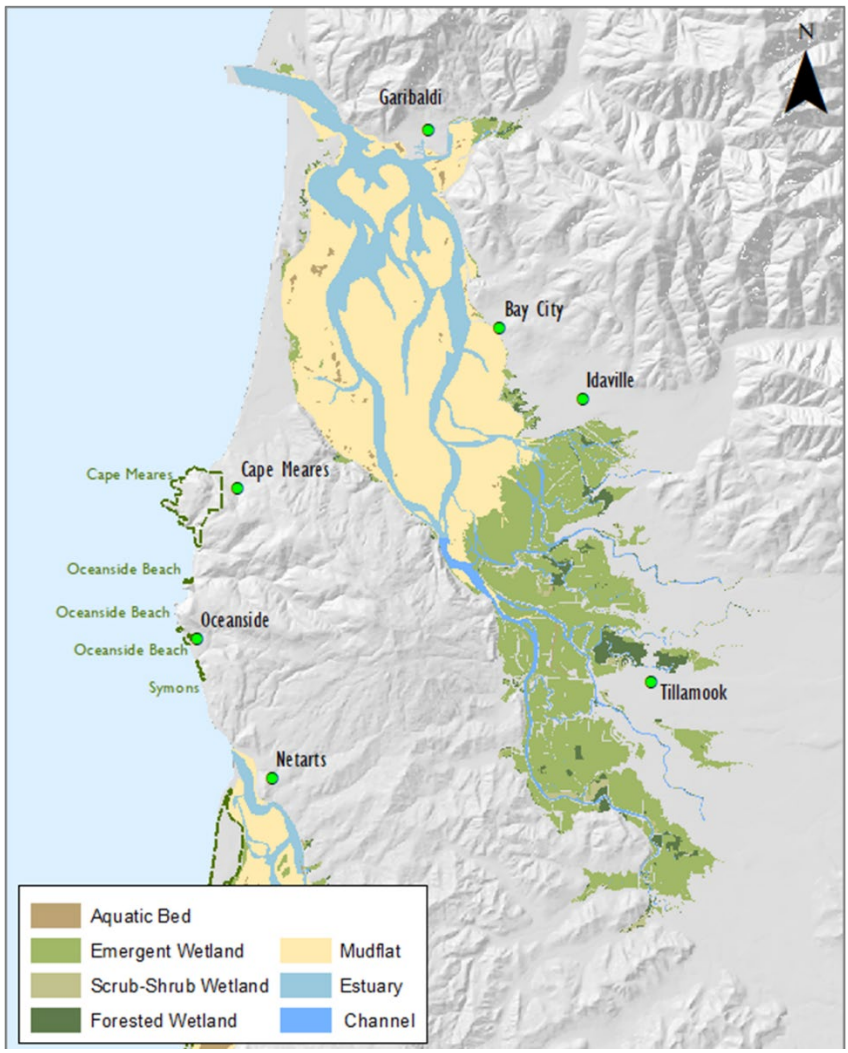


Figure 4: Estuarine habitats of Tillamook Bay (from TEP CCMP, 2019)

The Tillamook estuary is dominated by mudflats with much of the estuarine marshes diked and converted to pasture. Figure 4 shows the distribution of estuarine habitats including: salt marshes, aquatic beds, freshwater emergent wetlands, forested wetlands, and mudflats. In Oregon, 68 percent of estuarine wetlands have been lost to conversion from 1870 to 1970 – the Tillamook Bay estuary lost 79 percent, making it among the most impacted estuaries on the Oregon Coast (Good, 2000).

The estuary provides habitat for numerous fish, shellfish, birds, marine mammals, and sea grasses. Bottom and Forsberg (1978) identified 59 species of fish in the Bay at various times of the year.

Five species of anadromous salmonids use the estuary at some point in their life cycle. A 1996 TBNEP survey (Golden et al. 1998) identified 154 benthic invertebrate species. The prolific benthic community includes rich clam beds dense areas of eelgrass, and abundant burrowing shrimp communities. Clams and Dungeness crabs continue to provide

important commercial and recreational fisheries. The Bay also provides important habitat for many birds migrating on the Pacific flyway. After earlier declines, the seal population has grown in recent years due to marine mammal protection laws. Today, groups of these marine mammals can be seen sunning themselves on intertidal sand flats at low tide.

Tillamook Bay supports commercial shellfish harvesting, and the rivers are used for recreational swimming and wading. Concentrations of bacteria in the waters of the rivers and the Bay are commonly too high to allow safe use for either of these activities. Sources of bacteria in the watershed include rural and urban residential development (many homes have failing septic systems), urban stormwater runoff, livestock management and other agricultural activities, and several wastewater treatment plants that discharge either to the rivers or the Bay. A recent study (Li et al., 2019) have developed methods of identifying fecal coliform sources in Tillamook Bay waters.

The Basin

Land Use and Ownership

Land use of the Tillamook basin is dominated by coastal forest lands. The greatest percentage of forest land is managed by Oregon Department of Forestry. The lowlands of the basin have been converted from salt marsh and spruce swamp to pasture for an important dairy industry. Figure 5 and Table 2 show the distribution of land uses and illustrates the dominance of forest land in the uplands and agriculture in the lowlands. Urban and other uses are only a minor portion of the basin, however the urban areas are near the mouths of rivers and streams draining into Tillamook Bay and therefore subject to flood impacts.

Table 2: Land Us in the Tillamook Basin

Watershed	Forest	Agricultural	Residential	Recreational	Other	Total*
Miami	21,568.00	1,136	318	0	37	23,059.00
Kilchis	39,362.00	674	152	1,021	52	41,261.00
Wilson	117,679	699	1,917	183	496	120,974.00
Trask	99,217	7,999	2,251	202	1,578	111,247.00
Tillamook River	29,091	7,272	1,377	44	1,785	39,569.00
Tillamook Bay	5,674	2,149	2,628	1,325	2,006	13,782.00
Total	312,591.00	19929	8643	2775	5954	349,892.00

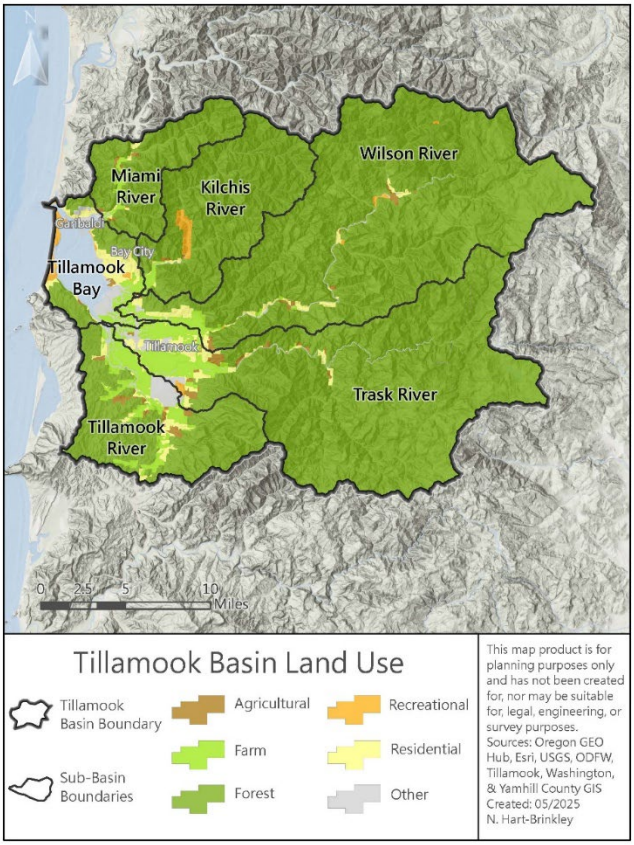


Figure 5: Land use in the Tillamook Bay Basin

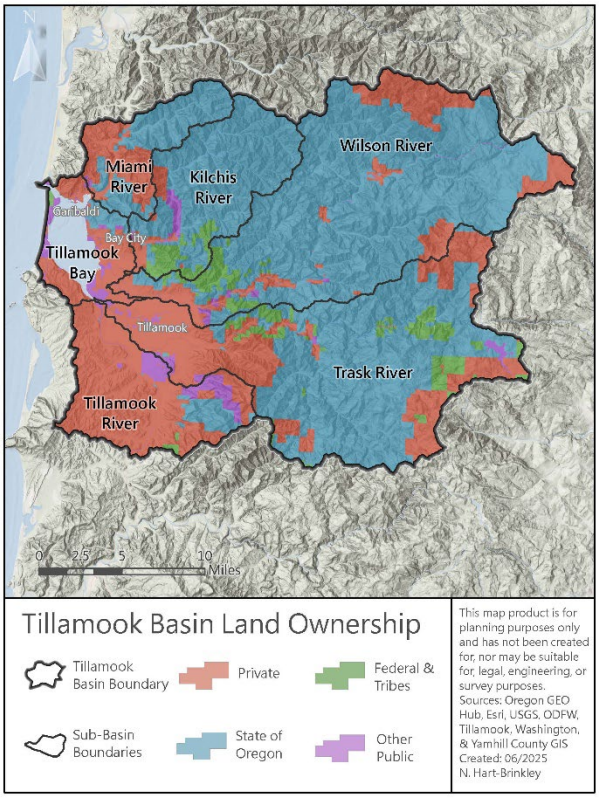


Figure 6: Land Ownership in the Tillamook Basin

Forests of Tillamook Drainages

Large-scale forest fires have affected the Coast Mountain portion of the catchment in 1918,1933, 1939, 1945 and 1951 (Figure 7). The infamous Tillamook Burn torched 244,706 acres in the four drainages (Miami, Kilchis, Wilson, and Trask). Prior to the Tillamook Burn the Cedar Butte fire burned some 40,000 acres north of the Wilson River burning a portion of the Kilchis watershed. The Salmonberry fire of 1945 burned approximately 180,000 acres. The damage from these fires stripped the forest of much of its timber value, forcing many landowners into foreclosure. This loss resulted in land ownership being transferred to the State of Oregon, which initiated a massive reforestation program from 1949 to 1973. The legacy of these fires includes the formation of the Tillamook State Forest and management for timber production.

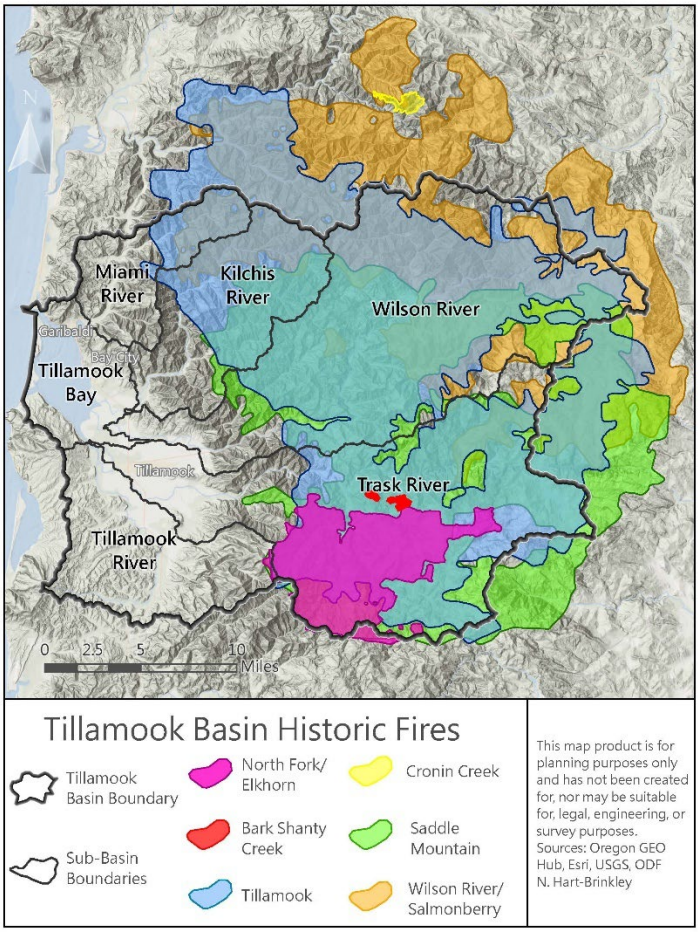


Figure 7: Historic Fires in the Tillamook Bay Basin

Early timber harvest focused on large patches on both the lowlands and uplands around Tillamook Bay. Much of the lowlands had been converted to pasture for rural and agricultural land use by 1890. Lower reaches of the drainages to the bay were logged where access to rivers was present. Logs were transported to mills by rafting on each of the rivers entering the Bay. While there was little splash damming except on the Tillamook River, log drives altered each of the tributary streams to Tillamook Bay (Miller, 2010).

Historic Legacy

The Tillamook Bay watershed conditions reflect a history of large fire and log rafting (Figure 8) that influence current conditions and aquatic habitat restoration needs. The legacy of historic fire and log rafting has simplified stream channels throughout the watersheds that drain to Tillamook Bay. These impacts are seen in the sediments of the bay (Komar and

Styllas, 2006). The disturbance history suggests that riparian habitat restoration and stream habitat complexity are critical for the recovery of aquatic resources.

Western Oregon State Forests Habitat Conservation Plan

The Western Oregon State Forests Habitat Conservation Plan (HCP) covers about 640,000 acres of ODF managed lands west of the Cascades. It provides an integrated, collaborative, ecosystem-based approach to species conservation across the landscape. These conservation measures are designed to offset potential impacts from forest management, ensuring species conservation and stability in harvest levels for a 70-year permit term. The HCP covers the Tillamook Forest species listed in Table 3.

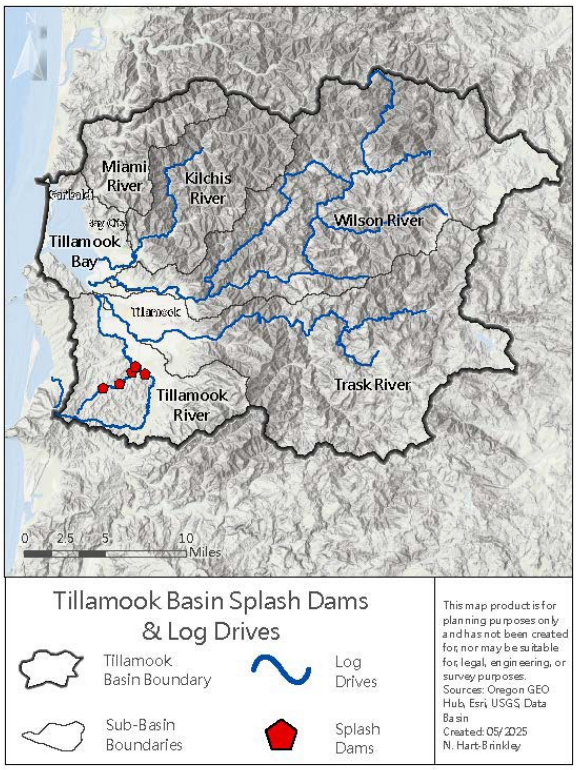


Figure 8: Tillamook Bay Basin Log Drives and Splash Dams

Table 3: Species Proposed to be covered in the Western Oregon State Forest Habitat Conservation Plan that occur in the Tillamook basin.

Species	Federal Status	State Status	Agency
Oregon Coast coho (*Oncorhynchus kisutch*)	FT	FT	NMFS
Oregon Coast spring-run chinook (*O. tshawytscha*)	UR	UR	NMFS
Eulachon (*Thaleichthys pacificus*)	FT		NMFS
Northern spotted owl (*Strix occidentalis caurina*)	FT	ST	USFWS
Marbled murrelet (*Brachyramphus marmoratus*)	FT	SE	USFWS
Oregon slender salamander (*Batrachoseps wrighti*)		ST	USFWS
Columbia torrent salamander (*Rhyacotriton kezeri*)	UR	ST	USFWS
Cascade torrent salamander (*R. cascadae*)	UR		USFWS
Coastal marten (*Martes caurina*)	FT		USFWS
Red tree vole, North Oregon Coast population (*Arborimus longicaudus*)			USFWS

SE = State Endangered; ST = State Threatened; FT = Federal Threatened; UR = Under Review

With the potential of adoption of a Habitat Conservation Plan for the Tillamook State Forest, management will change to include twelve conservation actions to be used to achieve the biological goals and objectives:

1. Establish Riparian Conservation Areas
2. Riparian Equipment Restriction Zone
3. Stream Enhancement
4. Remove or Modify Artificial Fish-Passage Barriers
5. Standards for Road Improvement and Vacating
6. Establish Habitat Conservation Areas
7. Manage Habitat Conservation Areas
8. Conservation Actions Outside Habitat Conservation Areas and Riparian Conservation Areas
9. Strategic Terrestrial Species Conservation Actions
10. Operational Restrictions to Minimize Effects on Covered Species
11. Road and Trail Construction and Management Measures
12. Restrictions on Recreational Facilities

Each of these enhanced conservation actions will change how the Tillamook Forest is managed. Areas of potential cooperation with the Tillamook Bay Watershed Council lie in the efforts to enhance riparian areas, improve stream habitats, improve or replace fish passage barriers, road improvement or abandonment efforts among others. Building on the relationship with Oregon Department of Forestry will allow cooperative efforts to proceed.

Private Forest Accords

Timber and conservation groups agreed to recommend changes to the Forest Practices Act on Oct. 30, 2021. The changes will impact more than 10 million acres of private and non-federal forests. The changes give regulatory certainty and better protect natural resources. In June 2020, the Oregon Legislature held a special session and passed Senate Bill 1602. The law required mediated talks between conservation and timber groups. The bill passed both chambers with broad support. The talks led to the Private Forests Accord Report and legislation to:

- Create a small forestland owner assistance office
- Start development of a habitat conservation plan (HCP) for aquatic species
- Offer tax credits
- Invest in training and outreach
- Set regulatory certainty
- Increase natural resource protections

The adoption of the Forest Accords offers opportunities to work with private industrial and small forest landowners to cooperate on habitat restoration projects. These changes in forest practice regulation creates opportunities for the watershed council to deepen relationships with private forest landowners to help them meet conservation targets.

Agricultural Lowlands of the Tillamook Basin

The lowlands of the catchment have been protected from tidal and river flooding to some extent and converted to dairy pasture to support agriculture. The dairy industry flourished and formed the Tillamook County Creamery Association (TCCA). Tillamook Bay and the rivers that enter the bay are some of the most productive salmon streams along the Oregon coast. Tillamook Bay produces shellfish in its broad, shallow intertidal flats. Tillamook Bay also supports commercial oyster production. The Bay has a popular recreational fishery that is important to the community, the state and the greater fishing world.

Anadromous Fish of Tillamook Bay Watersheds

The Tillamook Bay Watershed rivers, the Tillamook, Trask, Wilson, Kilchis, and Miami, are known as some of the West Coast's most productive fish habitats. These river systems support three species of salmon (Fall Chinook, Spring Chinook, coho, chum), coastal cutthroat, and steelhead and Pacific lamprey (Figure 9, 10, and 11, Table 3). Both fall and spring chinook salmon are present in the Tillamook Bay Watershed. Spring chinook salmon occur primarily in the Trask and Wilson Rivers, with a small population in the Kilchis River. Spring Chinook enter Bay tributaries from April through June. Fall chinook return to all five of the major subbasins of Tillamook Bay from early September through mid-February.

Table 3: Status of anadromous fish occurring in the Tillamook Bay watersheds

Species		**ESU***	**Listing Status**
Coho salmon	*Oncorhynchus kisutch*	Oregon Coast	Threatened
Coastal Cutthroat Trout	*Oncorhynchus clarkii clarkii*	Oregon Coast	Candidate
Chum salmon	*Oncorhynchus keta*	Pacific Coast	Not Warranted
Spring and fall Chinook salmon	*Oncorhynchus tshawytscha*	Oregon Coast	Not Warranted
Steelhead	*Oncorhynchus mykiss irideus*	Oregon Coast	Candidate
Pacific Lamprey	*Entosphenus tridentatus*		Petitioned

* Evolutionarily Significant Unit (ESU) is a distinctive group of Pacific salmon, steelhead, or sea-run cutthroat trout.

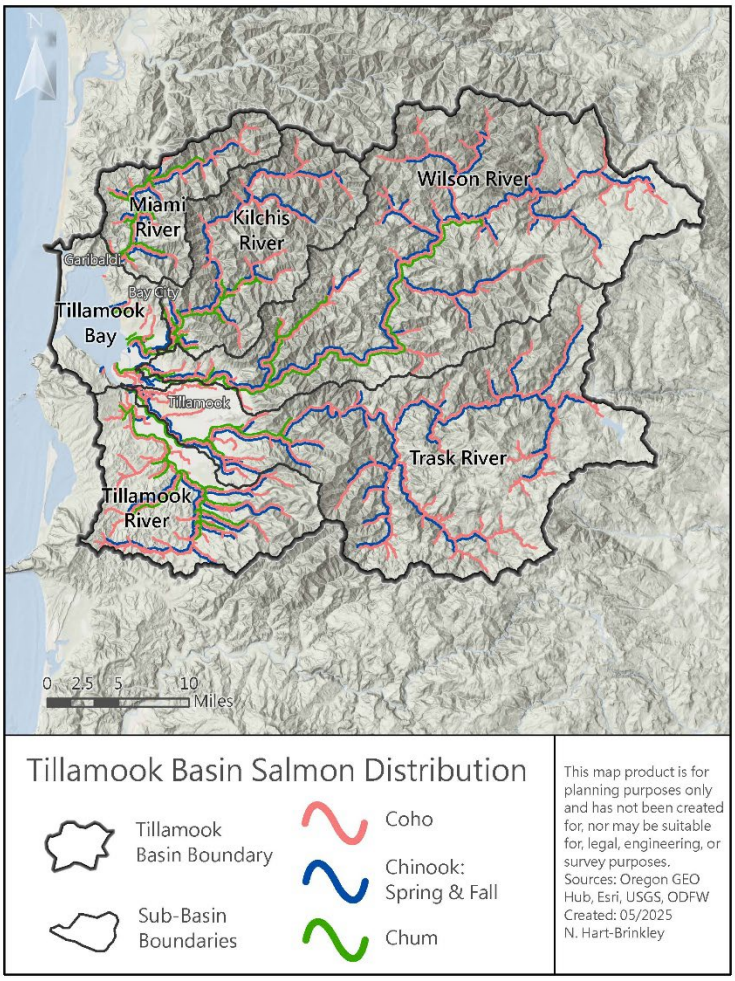


Figure 9: Salmon distribution in the Tillamook Bay Basin

Many of the runs are in decline with the National Marine Fisheries Service (NMFS) listing the North Coast coho salmon as a threatened species in 1998. The five rivers entering Tillamook Bay constitute an "independent" population of coho salmon.

The recovery plan (NMFS, 2016) identifies that: "One of the biggest habitat-related problems in the watershed is the general lack of LWD in the small- to medium-size tributary streams. The generally poor ratings for LWD recruitment from riparian areas indicate that recovery of habitat complexity in many areas will be a long process due to the lag time required to reestablish conifer communities in the riparian zone." The plan also notes that for the Tillamook population: "Insufficient stream juvenile rearing habitat complexity, including lack of large wood debris, pools, and connections to floodplains and off-channel areas,

especially overwintering habitat (all populations). and “Poor water quality, such as high summer temperatures and agricultural runoff.”

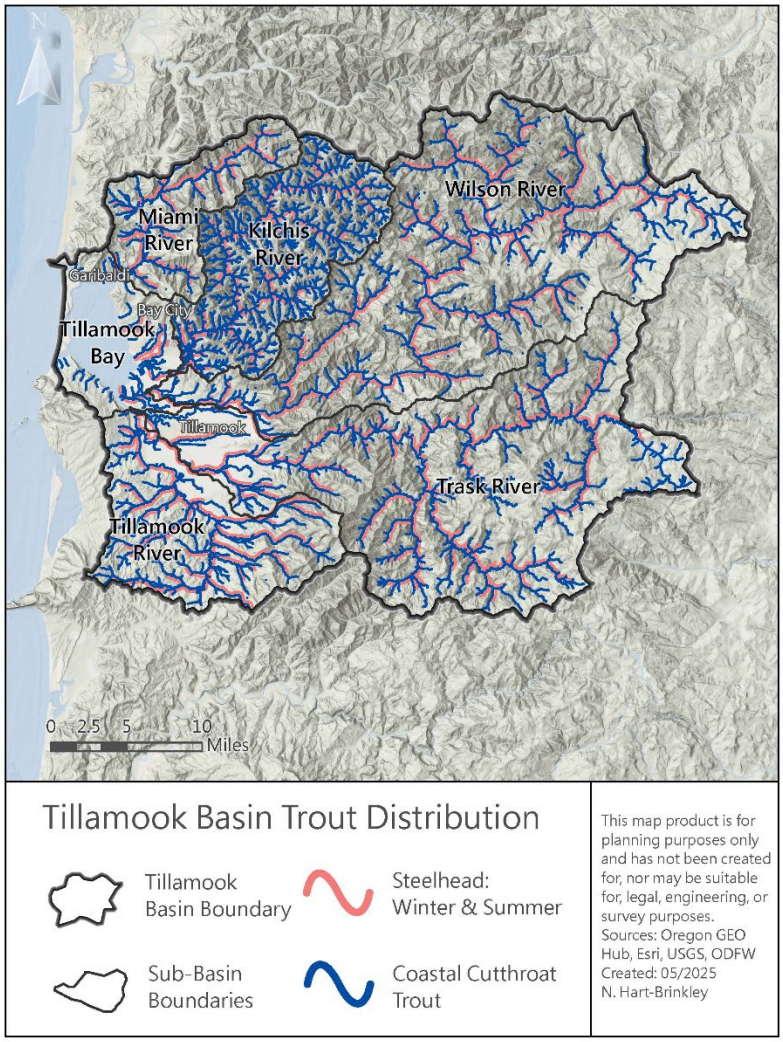


Figure 10: Steelhead and cutthroat distribution in the Tillamook Bay Basin

The latest review of the Oregon Coat Coho Recovery Plan implementation (NMFS, 2022) identifies the Tillamook population as “high to very high certainty” that the population will persist and “moderate to high certainty” that the population will be sustainable into the future.

Populations of chum and steelhead have also been declining. Conditions have been more favorable for Chinook salmon. Each tributary watershed is different but they all support a common suite of anadromous fish (Figures 8, 9, and 10).

A number of factors have been identified as possible contributors to the decline of salmonids, including: over-harvesting, hatchery practices, loss or simplification of habitat (reducing spawning and rearing success), poor ocean conditions, and reduced water quality. Factors affecting population recovery in the Tillamook population of coho salmon include: Loss of beaver pond habitat due to removal of beavers and beaver dams, water quality conditions, especially summer water temperatures and agricultural runoff, and reduced winter rearing habitat behind tide gates.

Pacific lamprey populations on the Oregon coast are "prevalent" and are found throughout the tributaries to Tillamook Bay (Figure 11). Habitat access is a primary limiting factor for the coastal population (ODFW, 2020).

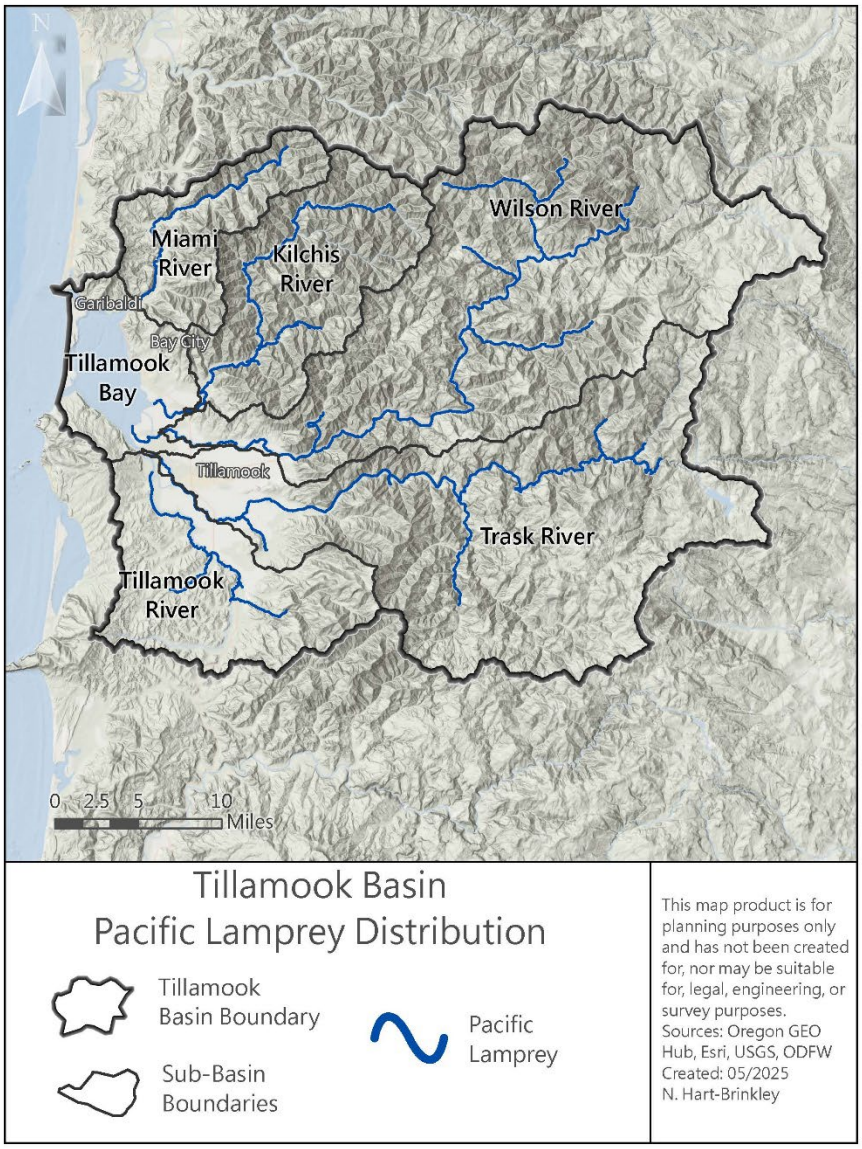


Figure 11: Pacific lamprey distribution in the Tillamook Bay Basin

Chapter 3 - Conservation Needs and Opportunities

Addressing Limiting Factors for Listed Coho Salmon

The forthcoming Tillamook Bay Strategic Action Plan for the Protection & Restoration of Coho Salmon Habitat will provide specific ecological priorities for improving habitat conditions and watershed processes to improve conditions supportive of full coho salmon life cycle. The Plan will include specific locations and restoration actions in a priority fashion. The plan will be an excellent guide for use by the TBWC into the future.

The priorities for outreach, immediate conservation and long-term conservation for coho salmon have been identified by Demeter Design Inc. (2008). The priorities for conservation are listed by subwatershed (Attachment A). Connecting the forthcoming Strategic Action Plan for coho with the previous work will provide even more specific priorities for salmon recovery.

Ensuring Clean Water for Aquatic and Human Life

The Oregon Department of Environmental Quality published the Tillamook Bay Watershed Total Maximum Daily Load (TMDL) that identifies water quality conditions and issues in the Tillamook Bay watersheds (DEQ, 2001). The TMDL identified load allocation for temperature and bacteria (*E. coli*). The water quality management plan identifies forest riparian conditions as critical for the maintenance of cool water and agricultural non-point source control as crucial for controlling bacterial contamination.

The pollutants of primary concern in the Tillamook Bay watersheds are bacteria, dissolved oxygen, sediment, and temperature. Toxics and nutrients have been identified as pollutants of possible concern, while the impacts of ocean acidifcation are also a concern. While there has been progress made on addressing bacteria pollution in the basin, all these parameters remain at levels that are having a negative impact on people and aquatic life.

The TEP has adopted a water quality action plan that involves the five actions in Table 4.

Table 4: Tillamook Estuaries Partnership Water Quality Actions (from TEP CCMP, 2019)

WAQ-01	Improve farm management practices to address water quality
WAQ-02	Improve rural residential and urban infrastructure to address water quality
WAQ-03	Enhance riparian and in-stream areas throughout the watersheds to improve water quality
WAQ-04	Restore channel features and hillslope management to Improve sediment storage and routing to address water quality
WAQ-05	Identify status and trends and quantify changing environmental conditions in water quality to inform adaptive management strategies impacting TEP's priority areas

The TCSWCD is also working to address water quality issues. As the implementation partner for the North Coast Basin Agricultural Water Quality Management Area Plan (ODA, 2024) the TCSWCD is focusing on ensuring confined animal feeding operations (CAFO) meet permit requirements.

The Natural Resources Conservation Service has two programs in the Tillamook Bay watersheds, 1) the Tillamook Watersheds Conservation Partnership (TWCP), and 2) the Tillamook/Nestucca Watershed Function Resource Conservation Partnership Program (RCPP).

The goal of the TWCP is to restore aquatic connectivity and increase the quality and quantity of suitable habitat for native migratory fish and wildlife, including Endangered Species Act listed Threatened Oregon Coast coho, within the Tillamook Bay, Nestucca, and Sand Lake watersheds (NRCS, 2024). The Tillamook/Nestucca Watershed Function (RCPP) is developed to address water quality, methane reduction with a focus area of Tillamook Bay Drainage and South Tillamook County. The program is developed to improve water quality and establish methane-reducing outcomes in Tillamook and Clatsop counties by providing technical assistance to dairy producers interested in adopting NRCS conservation practices focused on manure management (NRCS, 2024).

Participation and cooperation with TEP, DEQ, NRCS, TCSWCD, and ODF in implementing the water quality improvements is a direct way the TBWC can help to address the water quality of Tillamook Bay watersheds. Focus on installing riparian habitat in both forested and lowland landscapes can help protect water quality.

There are more than 100 miles of temperature limited streams in the tributaries to Tillamook Bay (DEQ, 2001). Riparian restoration throughout the watersheds to reduce stream heating will help to address a significant factor affecting water quality.

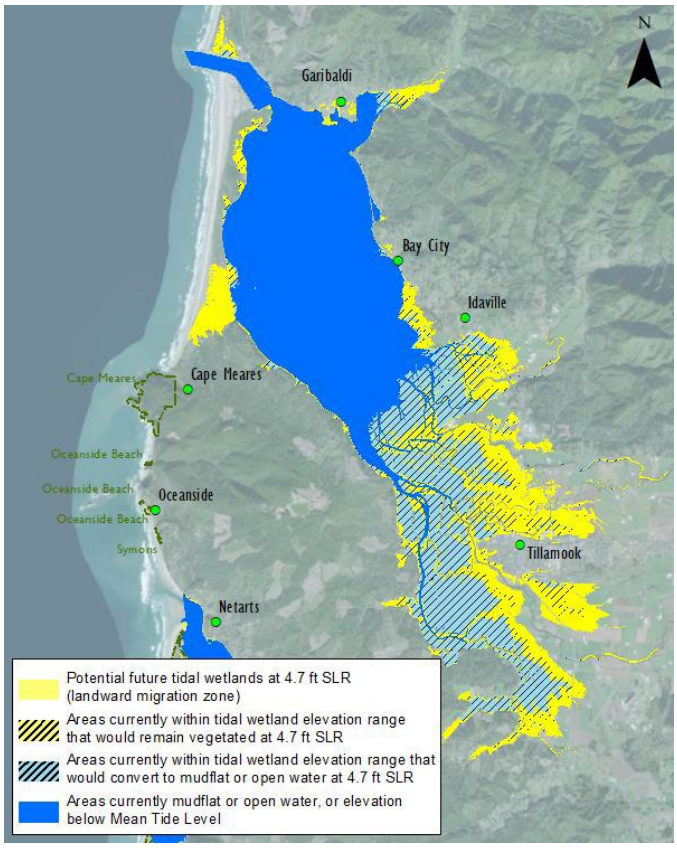
Reducing Hazard Potential

The natural hazards posed to Tillamook County residents and resources have been evaluated in recent years (Tillamook County Multi-Jurisdictional Natural Hazards Mitigation Plan, 2023 and Tillamook County Estuarine Resilience Action Plan, 2023). The Estuarine Resilience Action Plan identifies seven potential projects that could reduce hazard impacts in the Tillamook Bay area. The Tillamook County Multi-Jurisdictional Action Plan also identifies a significant number of activities, some of which the TBWC could help implement.

A hazard common to all coastal areas is sea level rise. Evaluating the potential effects of sea level rise involves evaluating the landscape subject to different levels of projected sea levels. The projections result in estimates of the landward migration of areas subject to

tidal forces or the Tidal Landward Migration Zone. Tidal Wetland Landward Migration Zones (LMZs) are the areas upslope of current tidal wetlands where wetlands may migrate in the future as sea level rises. These areas have been mapped for the Oregon coastal estuaries (Brophy and Ewald, 2017). Figure 12 illustrates the potential sea level rise impacts with a 4.7-foot sea level rise.

Recent analysis of the interaction of sea level rise and subduction zone faulting (Dura et al., 2025) show an expanded area of risk of flooding (Figures 13 and 14).



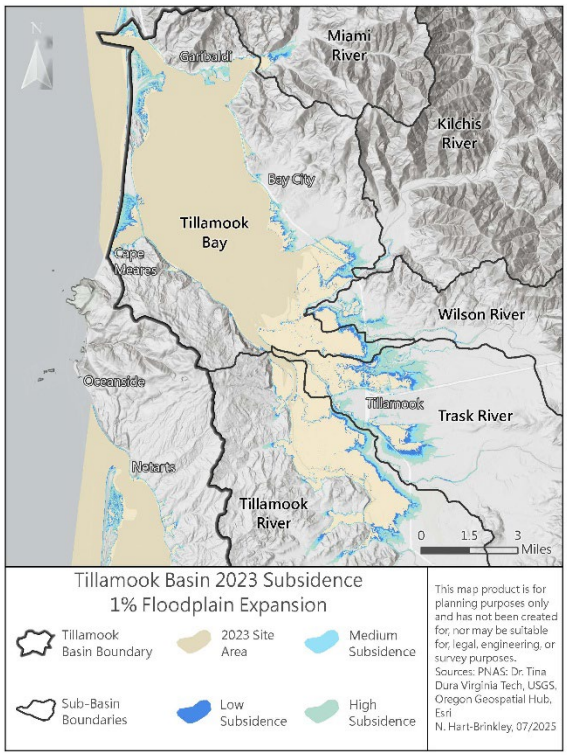


Figure 13: Immediate Earthquake Impacts

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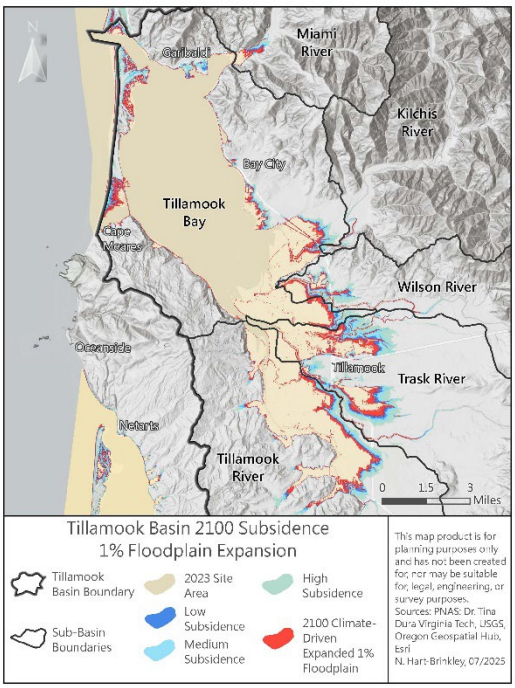

Figure 14: Compound Future Impacts

The Landward Migration Zones and other information can be used to identify estuarine restoration priorities. Previous priority mapping (Figure 15) shows ecologically prioritized estuarine restoration sites (Brophy and Ewald, 2012). While significant estuarine restoration has been conducted (Southern Flow Corridor and The Nature Conservancy Kilchis Preserve), there remain significant locations that have potential. Estuarine restoration, however raises significant potential conflicts with dairy pasture management, requiring careful collaboration and cooperation to ensure off site impacts do not occur.

While many hazard reduction projects may require some governmental authority, there are a few that require partnership and funding for implementation. The TBWC could work with Tillamook County to explore ways to effectively partner to reduce hazard impacts to resources and people in the Tillamook Bay watersheds.

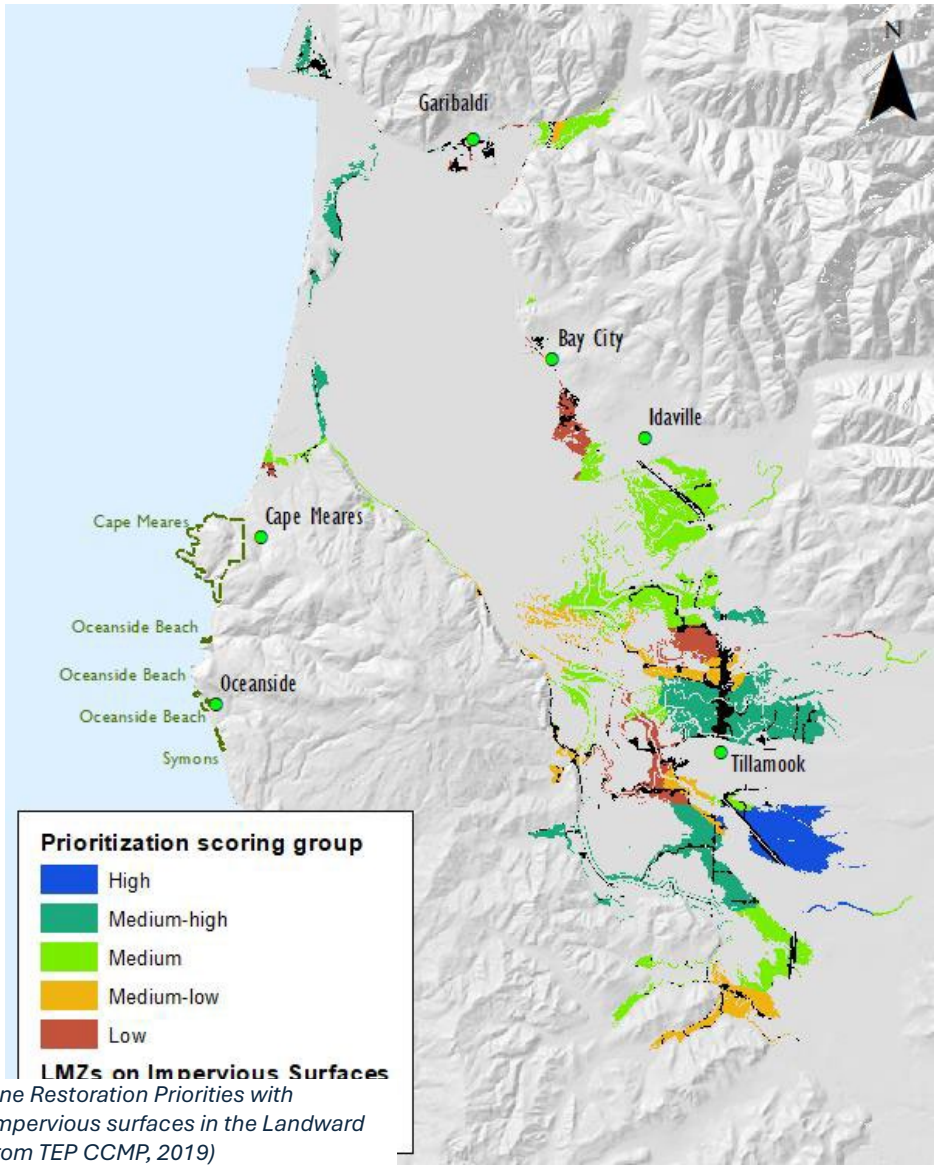

Figure 15: Estuarine Restoration Priorities with identification of impervious surfaces in the Landward Migration Zone (from TEP CCMP, 2019)

Chapter 4 – Programs and Partnerships

Tillamook Bay Watershed Council

TBWC was formed in 1998 and in 2006 became a 501(c)(3) corporation. Its mission and vision statements follow.

Vision

The TBWC's vision is for a healthy watershed that supports natural, functioning ecosystems while also providing for a thriving economic base that supports viable communities.

Mission

The Council's mission is to build collaborative, voluntary partnership with communities and landowners, to protect, maintain and improve the health of the Tillamook Bay Watershed through on-the-ground restoration projects, community outreach programs, and other community-engagement activities.

Goals

The Council's goals remain the same from a decade ago and include:

1. Develop long-range and annual work plans that support the mission and vision of the Council
2. Assess conditions throughout the watershed and identify opportunities to protect or improve those conditions
3. Promote ongoing monitoring of the health of the Tillamook Bay Watershed
4. Provide ongoing project and program management and evaluation for all Council projects
5. Coordinate with and support other organizations in conservation efforts throughout the Tillamook Bay Watershed
6. Encourage coordinated efforts to increase education programs
7. Encourage collaboration and cooperation with other partners in the basin
8. Improve communication among affected private individuals, interested citizens, business/industry, and representatives of local, state, and federal agencies
9. Provide a framework for resolving community problems and conflicts related to the Council's mission, when all parties to the problem or conflict agree to refer the matter to the Council
10. Actively seek the involvement of youth in Council membership and activities
11. Maintain financial transparency and follow Generally Accepted Accounting Principles in all financial matters
12. Increase council capacity to improve management of projects and mission

Restoration Partners

There are a number of restoration partners active in the Tillamook basin. Those programs with on-ground activities include Tillamook Estuaries Partnership (TEP), Salmon SuperHwy (SSH), and Tillamook County Soil and Water Conservation District (TCSWCD). Other partners that provide funding or technical assistance include Oregon Department of Fish and Wildlife (ODFW), Oregon Department of Forestry (ODF), Oregon Department of Environmental Quality (DEQ), Oregon Watershed Enhancement Board (OWEB), Oregon Department of Transportation (ODOT), National Marine Fisheries Service (NMFS), Natural Resources Conservation Service (NRCS), Farm Service Agency (FSA), and US Fish and Wildlife Service (USFWS).

Coho Salmon Restoration Partners

The Coast Coho Partnership (CCP), which includes the Oregon Watershed Enhancement Board (OWEB), ODFW, NOAA Fisheries, NOAA Restoration Center, National Fish and Wildlife Foundation (NFWF), and Wild Salmon Center (WSC), is providing facilitation and technical support for the planning and development of a Tillamook Bay Strategic Action Plan for the Protection & Restoration of Coho Salmon Habitat. Expected to be completed summer of 2025, it will identify focal areas and anchor habitats and connect restoration strategies to site conditions where improved anchor habitats to their optimum conditions will support aquatic life with a focus on coho salmon. This project is led by WSC and participated in by TEP, ODFW, DEQ, ODF, NMFS, TCSWCD and others.

The completed plan will identify specific project areas that the TBWC can identify and develop for implementation or look at strategies that the council wishes to pursue.

Salmon passage in the Tillamook Bay basin

The SSH is implementing a specific strategy to increase salmon access to Tillamook Bay watersheds and Nestucca River watershed. Their approach is described as: “Starting in 2010, fisheries scientists and local habitat professionals began assessing the entire 6-river landscape covering some 940 square miles on the North Oregon Coast that feeds Tillamook and Nestucca bays. The Tillamook-Nestucca watershed and the North Oregon Coast represents some of the richest salmon and steelhead recovery potential anywhere in the lower 48. They identified all 260+ remaining barriers to fish passage throughout the Tillamook-Nestucca, and determined that to fix them all would take about 70 years at current spending levels to achieve. The costs of some of the projects on that list likely simply outweigh the overall benefit. Through a detailed cost-benefit analysis, they then determined the precise portfolio of projects that achieves absolute maximum habitat bang-for-the buck: 93 projects that will result in access for 6 species of ocean-going fish to 95% of the habitat available at a fraction of the cost of a more traditional approach.”

The 2012 inventory of fish passage barriers (Bailey, 2012) identified more than 190 fish passage barriers in the basin affecting some 140 miles of stream habitat. The Trask and Wilson Rivers have the greatest numbers of high priority barriers (Table 5).

Table 5: Tillamook Bay fish passage barriers (from Bailey, 2012)

Basin	No. Culverts in Priority Rating Class					Total Miles of Affected Upstream Habitat
	High	Medium	Low	Unknown	Not Barriers	
Kilchis River Basin	10	4	6		4	12.4
Miami River Basin	7	6	6		2	13.8
Tillamook Bay Tributaries	13	13	9			13.8
Tillamook River Basin	5	3	2		5	35.6
Trask River Basin	17	11	30		6	35.8
Wilson River Basin	12	10	28	2	4	30.9
Totals	**64**	**47**	**81**	**2**	**21**	**142.3**

There are two primary ways to partner with SSH; first participate in grant acquisition to partner on projects in the Tillamook basin, second would be to identify barriers that are not on the SSH list and independently work to address fish passage at those.

Using programs such as SFISH of the Oregon Department of Forestry could address passage barriers higher in the watersheds. The Small Forestland Investment in Stream Habitat Program (SFISH) is a grant program established by the Legislature in 2022 to help small forestland owners implement projects that result in an environmental benefit to fish or mitigate risks to natural resources arising from the construction, operation or maintenance of forest roads or related activities. The program can fund 100 percent of the cost of eligible projects.

The program is administered by the Oregon Department of Forestry, in consultation with the Oregon Department of Fish and Wildlife. The program helps small forestland owners

from project start to finish. TBWC could work with forest landowners to identify projects for consideration by SFISH.

Strategic Opportunities

Ecosystem restoration involves both priority and opportunity. Priorities can be set by scientific evaluation of ecological processes and conditions or by human needs. Both are valid and can be used to identify opportunities for TBWC to provide a service to the community. Ecological strategies for improving water quality have been identified by multiple entities and most recently summarized by TEP (2024). Coho salmon restoration priorities are being developed by WSC and others and will be published later this summer. TBWC will be able to review those efforts and explore how you can match priorities with opportunity. The opportunities may come from current TBWC members that have locations where projects can be developed or through partnership with other entities.

The dominant issues associated with the Tillamook Bay watershed are degraded water quality (temperature and bacteria), chronic flooding, and degraded or lost salmon habitat. While the issues are well known, the causes, and remedies are the subject of significant debate and controversy in the local community. There is abundant documentation of the priority areas for salmon production, tidal marsh restoration, riparian enhancement and stream complexity improvement. The forthcoming Strategic Action Plan for the Protection & Restoration of Coho Salmon Habitat for Tillamook Bay Watersheds will provide both specific project opportunities and priority areas for future work.

The strategy proposed at this time is to continue the recommendations from 2015 and take actions appropriate to the land uses in the catchment that address the factors that adversely affect aquatic habitat forming processes with an emphasis on the connectivity from Tillamook Bay to the areas of high intrinsic productivity in the upper watershed. The other element of the strategy is to take actions that would create and or maintain habitat complexity to allow for a diversity of life history expressions for the focal streams (the reach from high intrinsic potential areas to the Bay).

Priority Actions

The following “rules of thumb” should be applied when considering future opportunities for the Council when addressing salmon habitats:

- Streams with upstream “strongholds” should be prioritized over others.
- Streams with high intrinsic potential should be protected and restored to the extent possible.
- Connectivity to upper watershed high intrinsic potential areas should be a priority.

- Addressing upslope (primarily road related) impacts to high intrinsic potential stream segments should be a priority.
- Look for ways to address habitat complexity from headwaters to the Bay.
- Partner with organizations with similar goals and objectives.
- Build partnership capacity by developing working relationships and understanding of other party capacities, skills, and limitations.

Getting Started

The landscape will also determine potential partners (Figure 14, Table 6). There will be different partners for work in the uplands on forest lands than work on lowland agricultural lands. Potential work in urban or residential centers will also have a different focus and partners. **It will be important to build trust relationships with potential partners which takes time. Talk with people in the basin and determine where the watershed council can make the most difference. Consider starting slow and building capacity with others.**

TEP (personal communication with Colin Jones) has identified potential partnership opportunities for the following activities:

- Large wood placement (as identified in the coho SAP
- Potential for administering the Backyard Planting Program
- Monitoring (Citizen Science) of a variety of attributes of the Tillamook Bay ecosystems (bacteria, pollutants, knotweed, etc.)
- Working on beaver conflict resolution
- Working on erosion control projects

Detailed priority actions by subwatershed have been identified by Demeter Design, Inc. (2008) for the council (Attachment A). The geographic priorities have not changed but the outreach priorities (Attachment A) should be reevaluated.

Short Term Strategy

As the new coordinator becomes more familiar with the council and the landscape they can work with the council to identify the most promising efforts to take. While the number of priorities appears overwhelming, providing focus and dedicated time to develop working relationships will be critical. Two entities may be able to jump start the effort, Oregon Department of Forestry will be critical as they proceed with both the HCP and Forest Accords. The new coordinator needs to familiarize themselves with these efforts and become familiar with ODF staff that will be engaged. Fortunately, the council has excellent representation from ODF that can help.

The second entity that the new coordinator needs to become familiar with is TEP. Working closely with TEP and identifying areas of potential cooperation and joint action is a good way to start renewing the council.

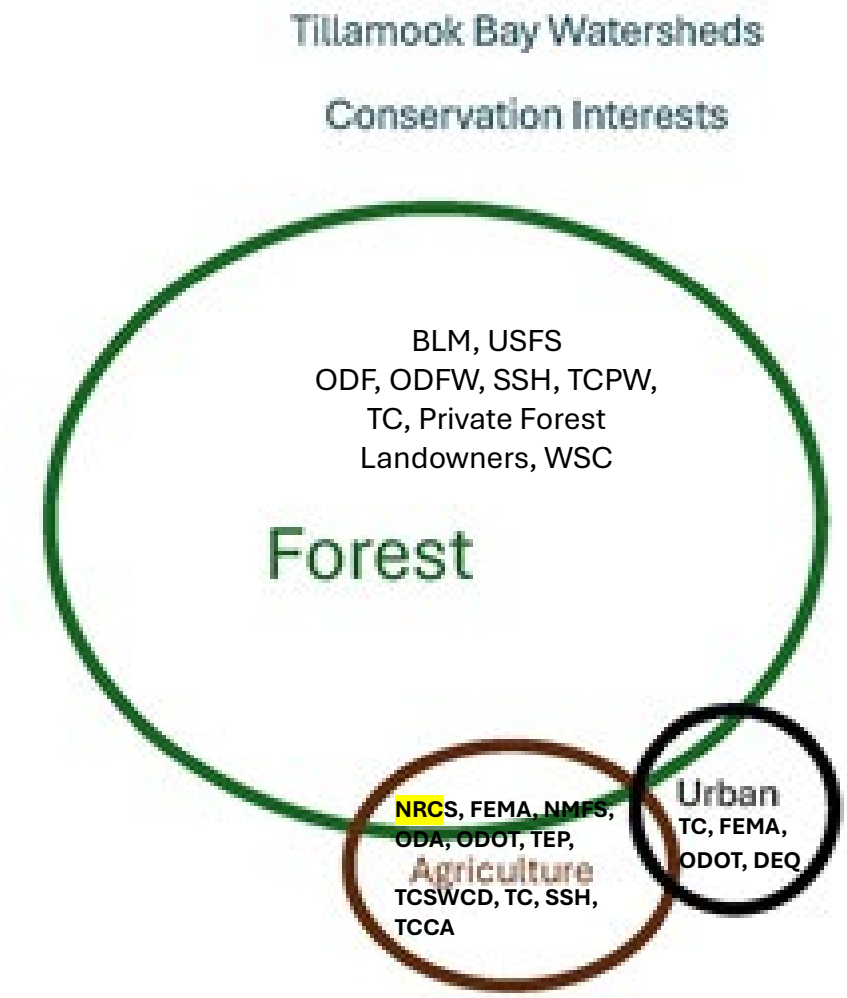

Figure 16: Potential partners by landscape position

Table 6: Restoration Action Opportunities for the Tillamook Bay basin

Potential Restoration Activities for the Tillamook Bay Watershed Council														
Landscape Position	**Forested Uplands**			**Agricultural Lowlands**				**Rural Residential**		**Urban Areas**			**Estuary**	
Restoration Activity	Habitat Complexity	Riparian Vegetation	Beaver Management	Riparian Vegetation	Water Quality	Fish Passage	Beaver Management	Water Quality	Riparian Vegetation	Fish Passage	Riparian Habitat	Water Quality	Marsh Restoration	Hazard Reduction
Miami River	X	X	X	XX	XX	X	X	X	X	N/A	N/A	N/A	?	X
Kilchis River	X	X	X	XX	XX	X	X	X	X	N/A	N/A	X	?	X
Wilson River	X	X	X	XX	XX	X	X	X	X	X	X	X	X	X
Trask River	X	X	X	XX	XX	X	X	X	X	X	X	X	X	X
Tillamook River	X	X	X	XX	XX	X	X	XX	XX	X	N/A	N/A	?	X

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CERP Priorities for the TBW (from Demeter Design Inc., 2008)

Basins for outreach

1)Bewley
2)Coal Murphy
3)Mills Joe
4)Middle Mainstem Wilson
5)Lower Trask Mainstem Holden
6)Middle Trask Mainstem
7)Hoquarton Dougherty Slough
8)Sutton Creek
9)Upper Tillamook Mainstem
10)Hall Slough
11)Lower Tillamook Mainstem
12)Lower Mainstem Wilson
13)Mill
14)Vaughn
15)Myrtle Mapes

Basins for Immediate Coho Restoration (see figure)

1)Middle North Fork Trask
2)Lower Devils Lake
3)Upper Miami Mainstem
4)Lower Little North Fork Trask
5)Middle Devils Lake Fork
6)Lower North Fork Trask
7)Middle Elk Horn
8)Lower Cedar
9)Lower South Fork
10)Lower Elk Horn

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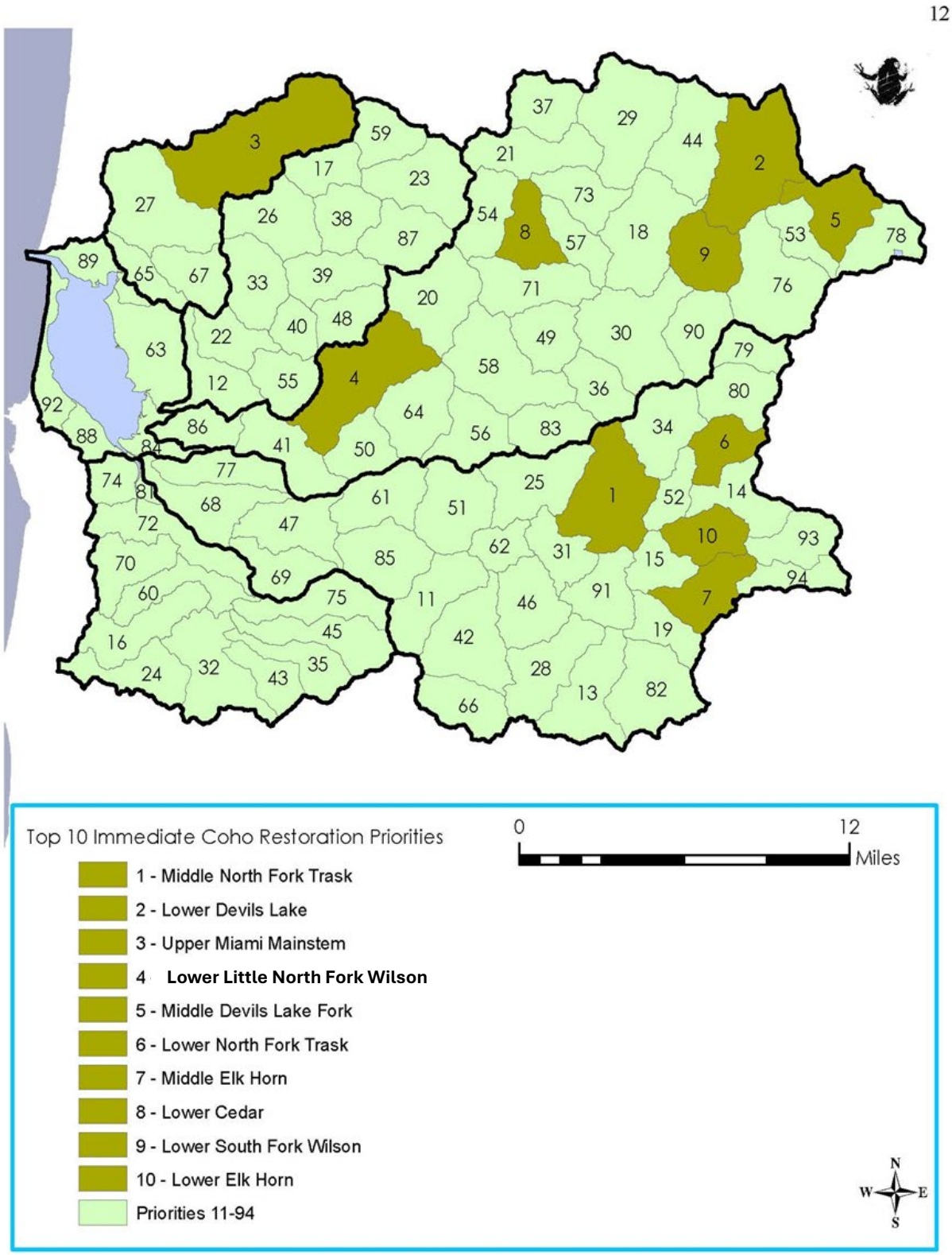
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Top 10 Immediate Coho Restoration Priorities
1 - Middle North Fork Trask
2 - Lower Devils Lake
3 - Upper Miami Mainstem
4 Lower Little North Fork Wilson
5 - Middle Devils Lake Fork
6 - Lower North Fork Trask
7 - Middle Elk Horn
8 - Lower Cedar
9 - Lower South Fork Wilson
10 - Lower Elk Horn
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Basins for Immediate Chinook Restoration
1)Upper Trask Mainstem
2)Bill Rawe Samson
3)Lower North Fork Trask
4)Coal Murphy
5)Myrtle Mapes
6)Middle Trask Mainstem
7)Hatchery
8)Lower South Fork Trask
9)Lower to Middle Mainstem Kilchis
10)Lower Little North Fork Wilson

Basins for Immediate Steelhead Restoration
1)Bill Rawe Samson
2)Minich Samson
3)Coal Murphy
4)Lower Little North Fork Wilson
5)Upper Miami Mainstem
6)Lower to Middle Mainstem Kilchis
7)Upper Trask Mainstem
8)Lower South Fork South Fork Trask
9)Middle South Fork Trask
10)Fox South Wolf

Basins for Immediate Coho Conservation
1)Lower Little North Fork Wilson
2)Lower South Fork Wilson
3)Moore Ben Smith
4)Lower West Fork North Fork Wilson
5)Lower Devils Lake Fork
6)Boundary Stretch
7)Upper Miami Mainstem
8)Middle Elk Horn
9)Middle North Fork Trask
10)Triangulation Fick

Basins for Immediate Chinook Conservation
1)Lower Little North Fork Wilson
2)Upper Trask Mainstem
3)Fox South Wolf
4)Moore Ben Smith
5)Coal Murphy
6)Bill Rawe Samson
7)Myrtle Mapes
8)Wolf
9)Jones Runyon
10)Middle Trask Mainstem

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Basins for Immediate Steelhead Conservation
1)Lower Little North Fork
2)Moore Ben Smith
3)Fox South Wolf Muesial
4)Lower South Fork Wilson
5)Bates Mesabi Steampot
6)Middle South Fork Trask
7)Minich Peterson
8)Upper Miami Mainstem
9)Lower West Fork North Fork Wilson
10)Wolf

Basins for Longterm Coho Restoration and Conservation Efforts
1)Lower Trask Mainstem Holden
2)Lower Mainstem Wilson
3)Hoquarton Dougherty
4)Lower Tillamook Mainstem
5)Sutton Creek
6)Hall Slough
7)Bay Ocean Spit
8)Middle Trask Mainstem
9)Vaughn
10)Mill
11)Bewley

Basins for Longterm Chinook Restoration and Conservation Efforts
1)Lower Mainstem Wilson
2)Lower Trask Mainstem Holden
3)Bear Kansas
4)Middle Mainstem Wilson
5)Myrtle Mapes
6)Fox South Wolf Muesial
7)Middle Trask Mainstem
8)Lower South Fork Trask
9)Hatchery
10)Zig Zag Jack

Basins for Longterm Steelhead Restoration and Conservation Efforts
1)Simmons
2)North Fork Kilchis
3)Lower Bark Shanty
4)Triangulation Fick
5)Lower North Fork North Fork Trask
6)Blue Bus Scotch Pigeon
7)Fawcett
8)Myrtle Mapes
9)Lower Devils Lake

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10)Fitch

Basins for Longterm Chum Restoration and Conservation Efforts
1)Lower Mainstem Wilson
2)Lower Trask Mainstem Holden
3)Lower Tillamook Mainstem
4)Hall Slough
5)Middle Trask Mainstem
6)Middle Mainstem Wilson
7)Bear Kansas
8)Sutton
9)Vaughn
10)Myrtle Mapes

Top Five Recommended 7th Fields for Outreach

(from Demeter Design inc., 2008)

• **Bewley** – *Listed as outreach priority #1, long-term Coho priority #10.* * A Limiting Factors Analysis is taking place within Tillamook River Basin. Coho abundance, intrinsic potential, and land-use data were the primary factors in the outreach determination. Additionally, disturbance scores drove the long-term priority score. Outreach within this basin might focus on long-term actions aimed at restoring Coho populations such as increasing channel complexity and shade. This basin should be part of a broader Tillamook River outreach effort including the mainstem.

• **Upper and Lower Tillamook Mainstem** – *Upper Tillamook Mainstem is #8 on the outreach priorities. Lower Tillamook mainstem is outreach priority # 11, long-term Coho priority #4, long-term Chum priority #3.* A Limiting Factors Analysis is taking place within Tillamook River Basin. Outreach activities within this basin might focus on long-term restorative actions aimed at increasing Coho populations such as increasing channel complexity and shade. Additionally, Chum usage in the lower watershed should be evaluated. Immediate actions could include riparian plantings, wood placement, and wetland reconnection.

• **Coal Murphy** – *Listed as outreach priority #2, immediate Chinook restoration #4, immediate Steelhead #3, and Immediate Chinook Conservation #5.* There has been one known dam removal within basin. Outreach efforts might focus on large wood placement in mainstem channels and set-asides in large wood supply basins. Discussions of natural wood migration might be important within this basin. Riparian set asides and property purchase should also be considered in minimally disturbed areas. Restoration of tidal wetlands will benefit existing Chinook and Chum populations.

• **Lower Trask Mainstem Holden** – *Outreach priority #5, long-term Coho priority #1, long-term Chinook priority #2, long-term Chum priority #2.* There is ongoing water quality testing within the basin. This basin has been severely modified. With the high urban and rural residential development that occurs on the banks of Holden Creek and the significant entrenchment of other

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tributaries within the basin, any restoration efforts within the basin will take many years to complete. Outreach within this basin might be more effective if conducted in multiple stages with the assumption that properties may change hands within the time it takes to complete restoration projects. Additionally, outreach may be most effective by addressing high and low density areas separately. This basin should be addressed as part of the broader Trask outreach efforts which include the Middle Trask Mainstem.

• **Middle Mainstem Trask** – *Outreach priority #6, immediate Chinook restoration #6, immediate Chinook conservation #10, long-term Coho priority #8, long-term Chinook priorities #7, long-term Chum restoration #5.* Outreach efforts should be consistent with restoring habitat function for all Salmonid species. Additionally, mainstem riparian easements or acquisition should be discussed in Chinook spawning areas.

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