

National Water Quality Initiative Siletz River Source Water Assessment



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Lincoln Soil and Water Conservation District in partnership with NRCS

Siletz Source Water Protection Area



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Background and Purpose of the Assessment

General Overview and Location of the Assessment Area

The Siletz River Watershed is located in Western Oregon in the Coastal Mountain Range. The Source Water Protection Area (SWPA) is composed of nine 12-digit HUCs: Big Rock Creek- Rock Creek 171002040602, a portion of Dewey Creek-Siletz River 171002040703, Little Rock Creek 171002040601, Lower North Fork Siletz River 171002040402, Mill Creek-Siletz River 171002040502, Sam Creek-Siletz River 17100-2040701, South Fork Siletz River 171002040403, Sunshine Creek-Siletz River 171002040501, and Upper North Fork Siletz River 171002040401. The primary human uses are fishing, aquatic recreation, agricultural, industrial timber, and public water supplies. The outline of the 12-digit HUCs can be viewed on page 2.

The Siletz Watershed is located in Lincoln and Polk Counties, covering approximately 373 square miles. The river is just over 73 miles in length with public water intakes at approximately mile 40. The North Fork Siletz begins near the Valley of the Giants, a remnant stand of old growth forest. The South Fork Siletz begins East of the former town of Valsetz.

Threats to the Source Water Protection Area

The major threats to the SWPA are soil erosion, invasive species and improper riparian vegetation, and nonpoint source nutrient runoff and turbidity. Water extraction is at the highest peak in the Summer months when flow is at the lowest, exacerbating water quality issues.

Nonpoint sources have been identified as the primary source of pollutants in the Siletz Watershed. The impacts to water quality from adjacent agricultural properties is primarily from erosion, nutrient runoff and inputs from livestock, and improper riparian vegetation. Streambank erosion from livestock is a concern year-round with impacts most notable during the rainy season when a lack of vegetation and rising water level allow for increased sediment to enter the water. Additionally, livestock watering in-stream may introduce fecal matter into the river. High nutrient and sediment runoff leads to an increase in algal growth and low dissolved oxygen levels, which impacts fish and other aquatic organisms.

Forestry related concerns are improper riparian vegetation, lack of forestry planning, and degraded roads and culverts. Between 2000 and 2015, 42% of the Siletz watershed was clearcut (Native Fish Society, 2016). Clear Cutting practices on the Siletz's steep slopes may increase sediment loads during rain events due to a lack of soil-stabilizing vegetation. In addition, clearcutting practices increase potential temperatures by removing shade cover from streams and tributaries. While the new Private Forest Accord will mitigate some of these concerns, the legacy impacts of industrial forestry will impact the watershed for decades to come.

Drinking Water Systems, Populations Served, and Socioeconomics

Confederated Tribes of Siletz Indians (CTSI)

The Confederated Tribes of Siletz Indians (CTSI) is made up of many Indigenous tribes originating from all areas of Oregon west of the Cascades Crest. Beginning in 1856, members of these tribes were

forcibly relocated to coastal reservations. Over the intervening years, Tribal land ownership has been reduced to several scattered fragments; one of these remaining pockets is largely located within the SWPA, and the City of Siletz is the present-day location of CTSI Administrative Headquarters. Tribal ownership of these parcels also constitutes a significant portion of the eligible non-industrial timber properties within the focus area.

While exact CTSI membership numbers are not available, according to the *2018-2022 EPA EJScreen Report*, 2,162 people are estimated to reside within the SWPA. Of these, 867 residents have reported to identify partially or wholly as American Indian.

Additionally, CTSI is a prominent agency in water quality monitoring efforts within the Siletz River Watershed, and much of the data discussed in this assessment are provided by the Tribe.

City of Siletz

The City of Siletz has a population of 1,242 according to the 2023 population estimated from Portland State University's Population Research Center. Per the Oregon Health Authority, the City's water system serves a total of 410 connections. According to the *2005 CTSI Comprehensive Plan*, the City of Siletz possesses a 0.25 cfs domestic use water right to the Siletz River. In 1994 this was augmented by a donation of a 0.26 cfs commercial use water right previously owned by CTSI, which was converted for domestic and municipal use, bringing the City's combined domestic and municipal water rights to 0.51 cfs.

The City's average processing rate is 83 gpm, with a Summertime maximum processing capacity of 180.5 gpm during peak demand. Winter processing capacity is lower (83-90 gpm) due to high turbidity slowing filtration.

City of Toledo

The City of Toledo has a population of 3,622 according to the 2023 population estimated from Portland State University's Population Research Center. In addition to providing water within city limits, the City's water system serves 71 residential and 6 commercial connections outside city limits and provides wholesale water to Seal Rock Water District (SRWD) and Wright Creek Water District (WCWD). The water is pumped from SRWD via the SRWD-owned and operated Toledo pump station. The maximum capacity is 1 mgd, or 700 gpm.

The City holds four water rights for use of water from the Siletz. Permit S-12553 has an authorized rate of 1.75 cfs, with the source noted as "often not available" during Winter and Spring due to high turbidity. Permit 9370 has an authorized rate of 2.66 cfs with the source noted as often not available during Winter and Spring due to high turbidity. Permit 58445 has an authorized rate of 4.0 cfs, with the source noted as "often not available" during Winter and Spring due to high turbidity. Permits 58445 and 9370 have a stipulation that "Access to water requires a final order approving the City's WMCP." (Toledo WMCP, 2017). The City primarily uses the Siletz in the Summer and Fall when their alternate source, Mill Creek, is unavailable.

City of Newport

The City of Newport has a population of 11,083 according to the 2023 population estimated from Portland State University's Population Research Center.

The city holds seven water diversion rights, but only three of the sources are utilized, with only one from the Siletz. Permit S-29213 has an authorized rate of 6.00 cfs and is primarily used in the Summer months to fill the Big Creek reservoirs. (Newport WMCP)

Seal Rock

Seal Rock is an unincorporated community, thus detailed census data is not available. Using county averages, the full-time population estimate is 4,107 persons with a seasonal increase to 5,175.

The City has a single water right on the Siletz River under Permit S40277 with an authorized rate of 2.6 cfs. The point of diversion for the permit is located at the Toledo intake near river mile 40.

County Population Data

Approximately 26,804 people rely on the Siletz River for drinking water, accounting for approximately 52 percent of the county population. Additional unincorporated areas within the Siletz watershed that rely on wells or non-public water sources are not included in this estimate.

The Median Household Income in Lincoln County is \$57,794, far below the State average of \$75,657. The poverty level is above State averages by approximately 2.6%, accounting for approximately 14.7% of the population. (US Census Bureau).

Identification of Goal and Objectives

The NWQI goals for the Siletz River are to address the Category 5 Impairments on the 303(d) list within the SWPA by reducing turbidity (sediment) and bacteria (E. coli) and improving native streamside vegetation.

Through the process of the NWQI, the District has worked with partners on the finalization of the Mid-Coast Water Planning Partnership (MCWPP) Water Action Plan and the subsequent early implementation plan for the continuity of the MCWPP. As part of this process the District also worked with land managers, public and private industry, conservation organizations and drinking water providers to develop the City of Toledo Drinking Water Protection Plan, and is providing technical assistance to the City of Newport Drinking Water Protection Plan development. The goals for sediment, bacteria, and temperature reduction reflect the areas the District has committed to assist partners in improving water quality in the SWPA through this process.

Sediment (Turbidity)

Sediment (Turbidity) is an impairment primarily associated in the SWPA with highly erodible soils, lack of riparian vegetation, and lack of livestock exclusion fencing. Some data exists measuring turbidity and total suspended solids; however, it is not enough to use as a baseline for monitoring improvements associated with best management practices.

The agricultural objectives for sediment reduction are livestock exclusion fencing of approximately 5400 linear feet and the conversion of bare ground and grass areas to tree shrub communities within a 50-foot riparian buffer on major waterways in the SWPA (see *Temperature* for metrics).

Objectives for the reduction of sediment from non-industrial timber operations include the coordination with woodland owners to write at least 10 forest management plans and the conversion of

bare ground and grass areas to tree/shrub communities within a 50-foot riparian buffer on major waterways in the SWPA (see *Temperature* for metrics).

The priority area for implementation of forest management plans is the 1100 acres of timber conservation land within 2 miles of the drinking water intakes.

Bacteria (*E. coli*)

The goal is the reduction of bacteria (*E. coli*) and nutrients from livestock manure, compost, and biosolid land applications to surface waters in the SWPA.

The objectives are the development of at least 12 Nutrient Management Plans and 6 compost/manure storage facility designs, in addition to the construction of at least 6 compost/manure storage facilities.

The priority areas for treatment include 2 properties in the Dewey Creek sub watershed due to their proximity to the intake and extensive riparian frontage, 2 properties in the Big Rock Creek sub watershed with bare ground and extensive riparian frontage, and 4 properties in the Mill Creek sub watershed to address biosolid land applications.

The ability to quantify anticipated change in the water quality is unattainable with current data and lack of specific projects, however the Nutrient Management Plans will include information on current practices, soil samples and recommendations to prevent over application of manure and compost that may contribute bacteria and nutrients to surface waters.

Temperature

Data from the Siletz Streamside Vegetation Assessment (SVA) indicates a need for riparian vegetation improvements to provide shade and large woody debris recruitment. The goal to address temperature impairments is to convert areas of bare ground and grass within a 50-foot riparian buffer of major waterways in the SWPA to native tree and shrub communities.

The objective for agricultural lands is the conversion of 41 acres of bare ground and grass to tree shrub communities within a 50-foot riparian buffer on major waterways in the SWPA. The priority areas for treatment include all properties in the Mill Creek and Big Rock Creek sub watersheds to address 303(d) impairments (DEQ 2022)

The objective for non-industrial timber lands is the conversion of 18 acres of bare ground and grass to tree shrub communities within a 50-foot riparian buffer on major waterways in the SWPA. The priority areas for treatment include all properties in the Mill Creek and Big Rock Creek sub watersheds to address 303(d) impairments (DEQ 2022)

Habitat Enhancement

The goal of habitat enhancement is to improve water quality and quantity through ecological solutions that benefit ESA listed species. Within the SWPA at least four ESA listed species persist: Marbled Murrelet, Northern Spotted Owl, and Chinook and Coho Salmon.

One objective in improving water quantity and habitat for Chinook and Coho Salmon is to restore at least 5 acres of beaver pond habitat. Beavers have long been seen as a nuisance and until recently have been legally designated as a predatory species on working lands. However, they also provide the

benefits of increased water storage, stream temperature reductions in beaver-dominated systems, and improved aquatic habitat for Coho and other Salmonids. Beavers can build and maintain habitat and accomplish conservation objectives faster and cheaper than engineered activities and infrastructure. Priority areas for beaver habitat improvement include the CTSI farm property and properties in Big Rock Creek, where partners are currently working on restoration efforts.

Upland forest improvement, especially in timber conservation properties not planned for harvest, could improve habitat for both the Marbled Murrelet and the Northern Spotted Owl. The objective for upland forest improvement is the development of at least 2 forest management plans on timber conservation properties within ¼ mile of critical habitat for the Marbled Murrelet. Priority areas for upland forest improvement include 20 tax lots in the Big Rock Creek sub watershed that are within ¼ mile of critical habitat for the Marbled Murrelet with a goal of 20 acres improved.

NRCS Ability to Help Partners Reach Goals

NRCS has a local District Conservationist who can assist partners in reaching conservation and land management goals. NRCS and the District have a long-standing relationship working through conservation issues together. NRCS also works with the MidCoast Watersheds Council (MCWC), McKenzie River Trust, and others to achieve conservation goals. The District supports the outreach, engagement, and project development of conservation practices on private and public lands in the watershed.

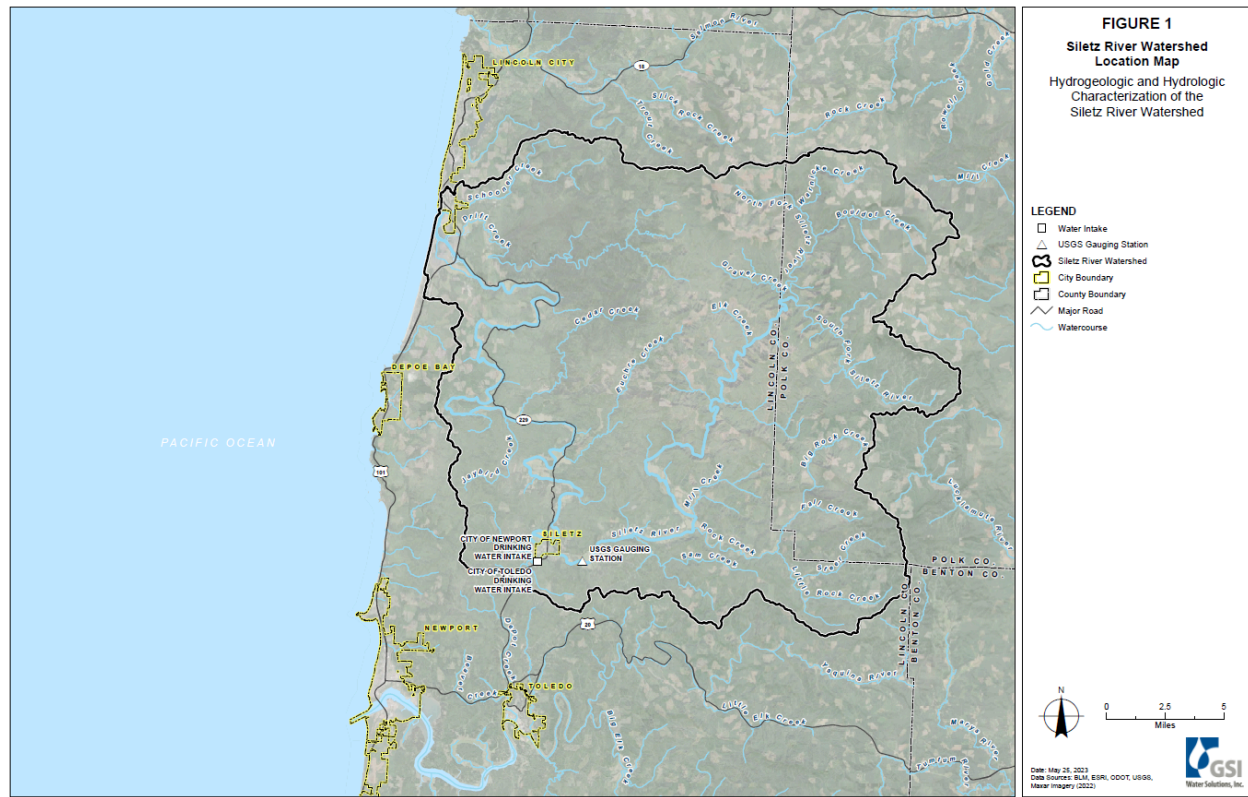
NRCS programming in the area does not currently meet the needs of this project. Additional water quality-focused funding will be required for NRCS to meet the needs of partners.

Current applicable NRCS funding in the area is primarily focused on forestry through the Forest Management Planning and Forest Resistance and Resilience Strategies. Both strategies' primary resource concerns include degraded plant conditions.

NRCS utilizes a team approach to successfully address the workload in Oregon. The local NRCS team relies on a regional Basin Engineer and summer engineering interns located in the Tangent Service Center to assist with inventory and evaluation, planning, and designs for engineering practices. Unfortunately, the high engineering workload in the Basin has necessitated the District and partners use outside engineering services for some projects. Other members of the NRCS team available to assist with planning and implementing projects in the area include the regional Forester, located in the Eugene Service Center, and the Basin Small Farms Specialist, located in the Tangent Service Center. Technical assistance on projects is also available from the State Engineering staff, State Forester, State Grazing Specialist, State Biologist, and State Agronomist, all located in the Portland State Office.

Watershed Characterization

Location of Watershed in Drainage Network and Flooding

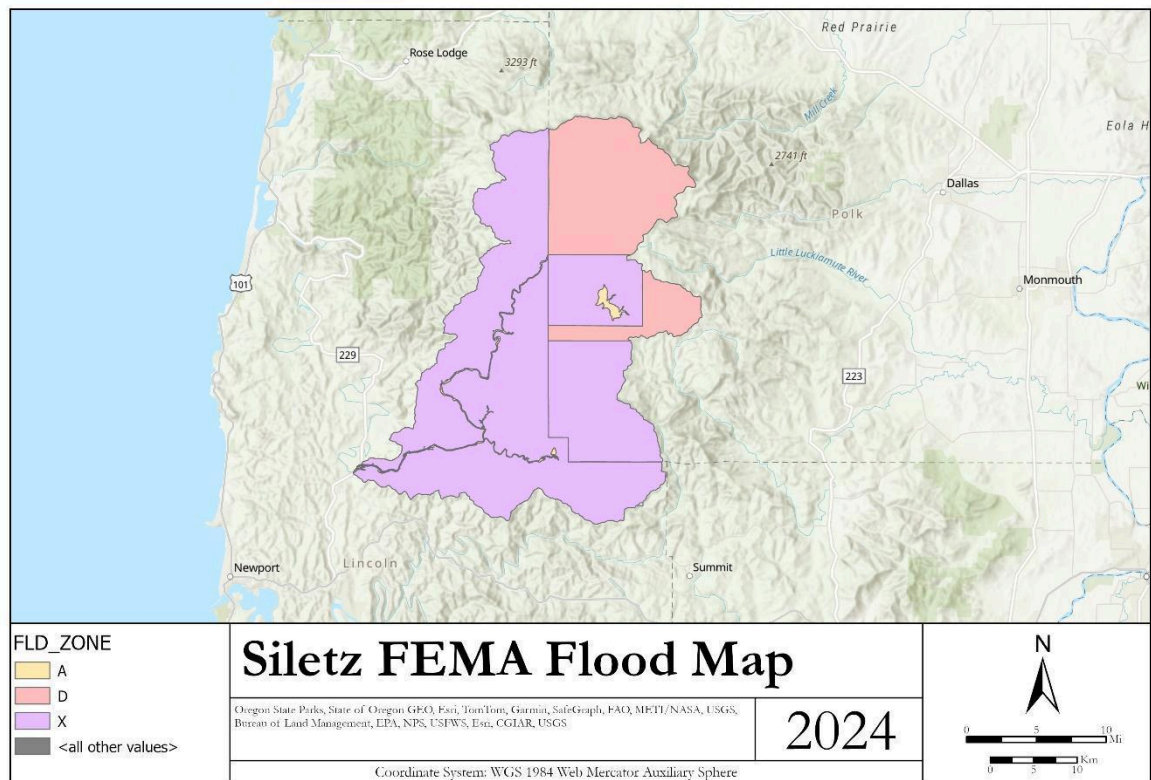


Siletz River Watershed Map

The Source Water Protection Area (SWPA) is composed of nine 12-digit HUCs: Big Rock Creek- Rock Creek 171002040602, Dewey Creek-Siletz River 171002040703, Little Rock Creek 171002040601, Lower North Fork Siletz River 171002040402, Mill Creek-Siletz River 171002040502, Sam Creek-Siletz River 171002040701, South Fork Siletz River 171002040403, Sunshine Creek-Siletz River 171002040501, and Upper North Fork Siletz River 171002040401. The SWPA begins approximately 40 miles upstream from the mouth of the river in Lincoln City, Oregon.

The river is unimpaired by major obstructions and is prone to flash flooding during seasonal rainstorms. Flooding is especially prevalent in the lowland valleys where most of the agricultural operations are located.

The FEMA Flood Hazard is also overlaid onto the SWPA in the map to display the potential flood hazard in the drainage area.

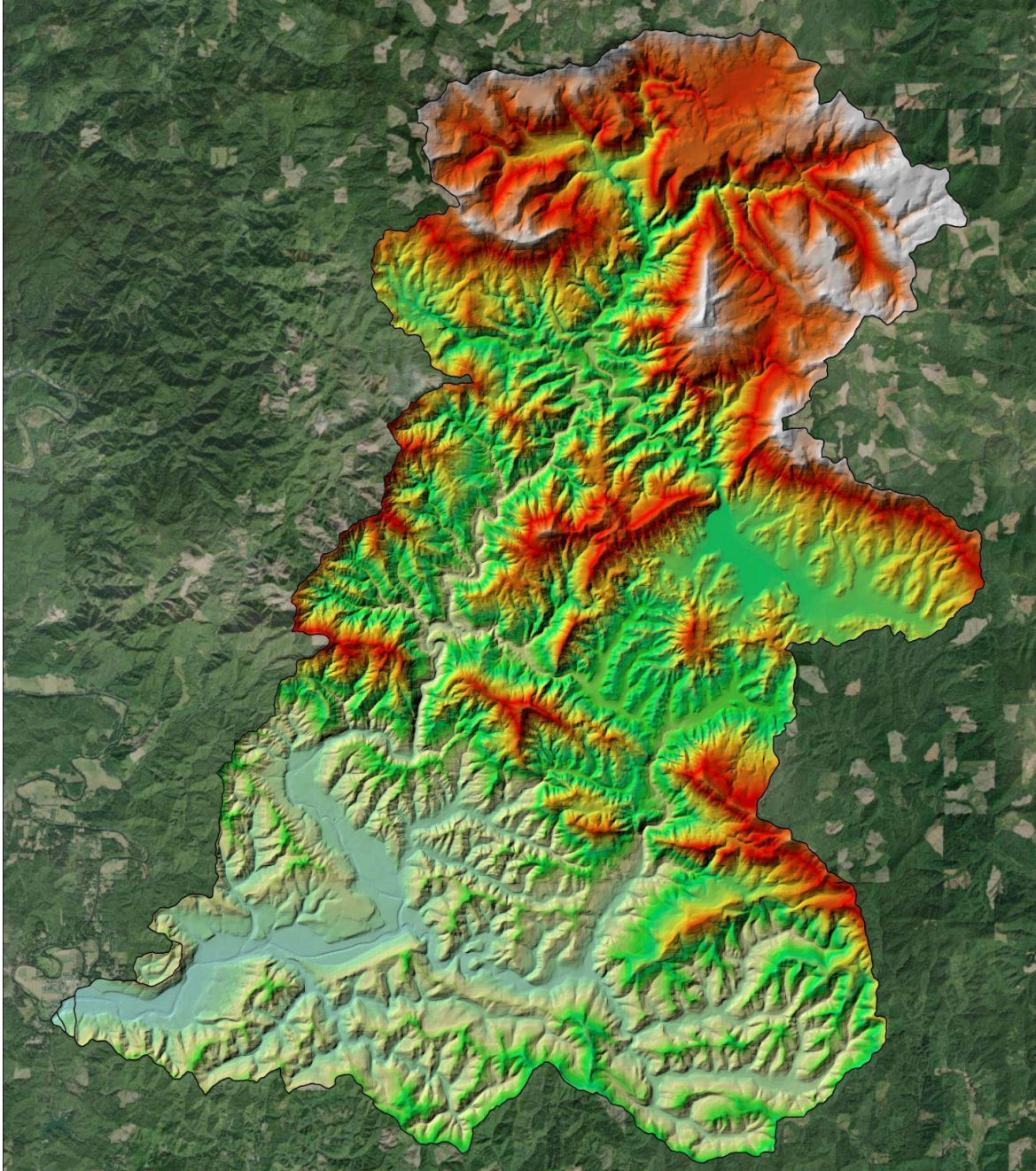


A: 100-year floodplain

D: Areas with possible but undetermined flood hazards.

X: Areas of minimal flood hazard

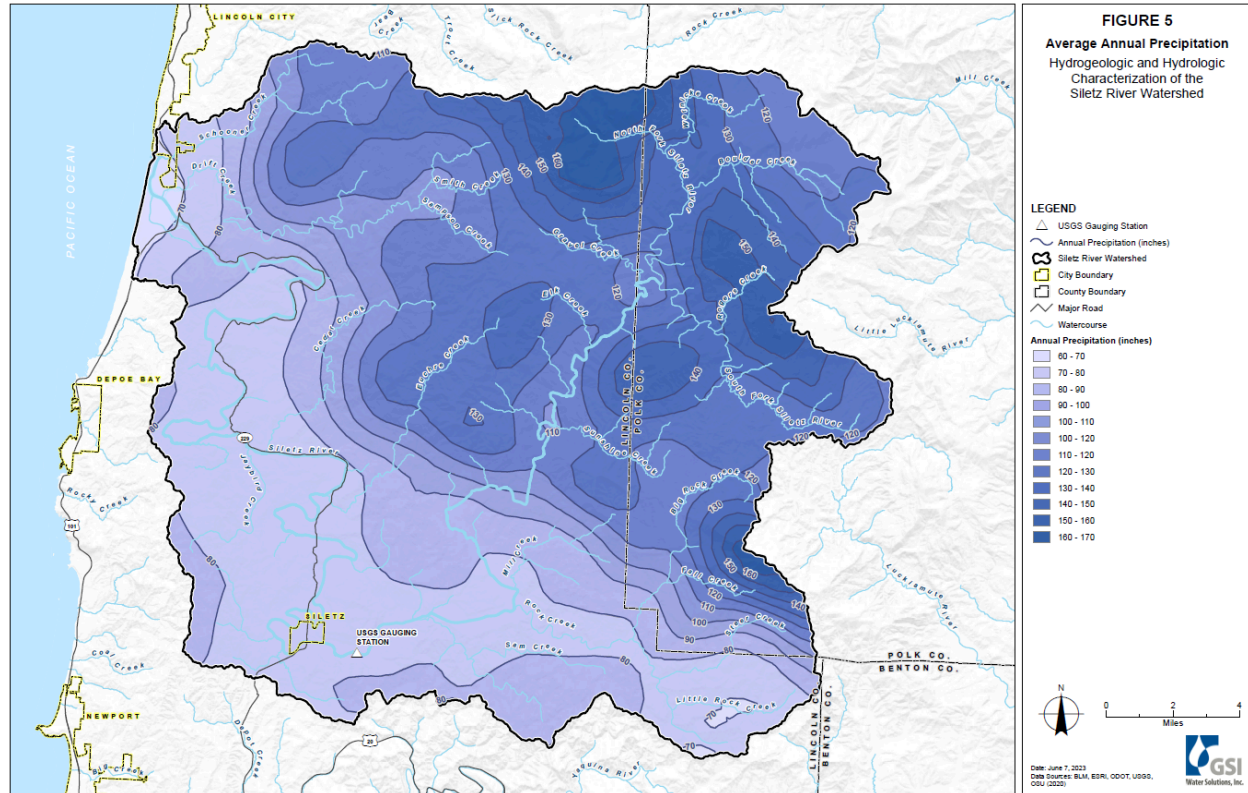
Topography



Topographic Map of SWPA

The Siletz SWPA is located completely in the Siletz River watershed within the Oregon Coastal Mountain Range. The North Fork Siletz headwaters are located at the base of Stott Mountain at approximately 2600 feet in elevation. The South Fork Siletz headwaters are located at the Southeastern end of Fanno Ridge at approximately 1600 feet. The topography of the watershed is contrasted by steep basalt cliffs with deep ravines and relatively low gradient valleys. The river drops to approximately 130 feet in elevation in Siletz, Oregon, the location of the drinking water intakes.

Climate

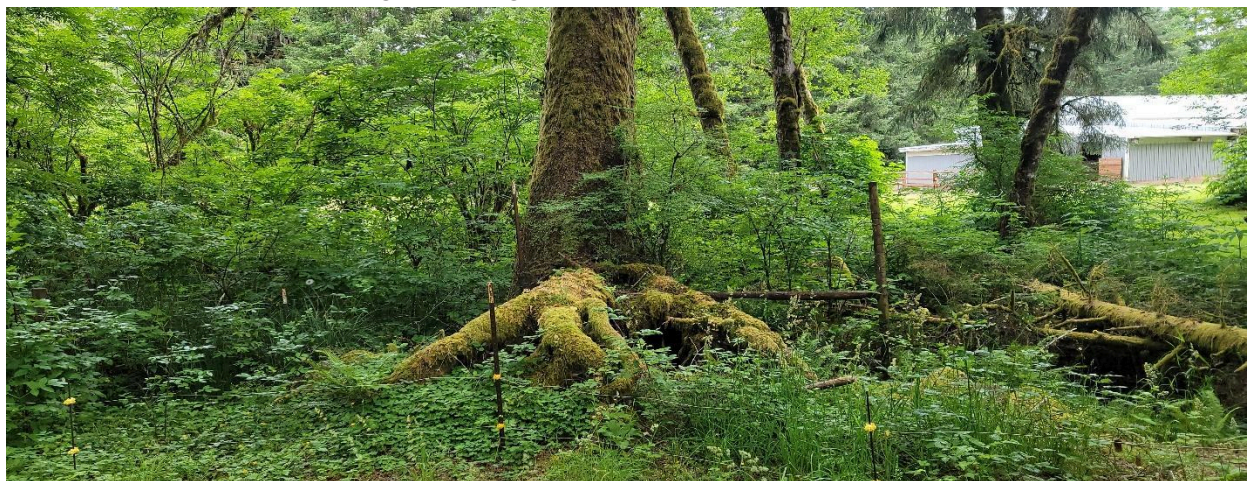


Average Annual Precipitation Map

The area has a temperate climate with extended wet Winters and warm, dry Summers. Average temperature lows in the Winter range from 30-40 F with Summer highs between 70-80 F. The topography and proximity to the ocean makes the climate variable within the Siletz watershed.

Average annual precipitation in the watershed is variable, with areas with over 150 inches a year in the upper watershed, and averages of 70-80 inches in Siletz near the public intakes. Climate data for the Valsetz area below highlights the temperate climate of the area. Some locations in the lower watershed

receive less precipitation and higher average maximum temperatures.



Valsetz, Oregon

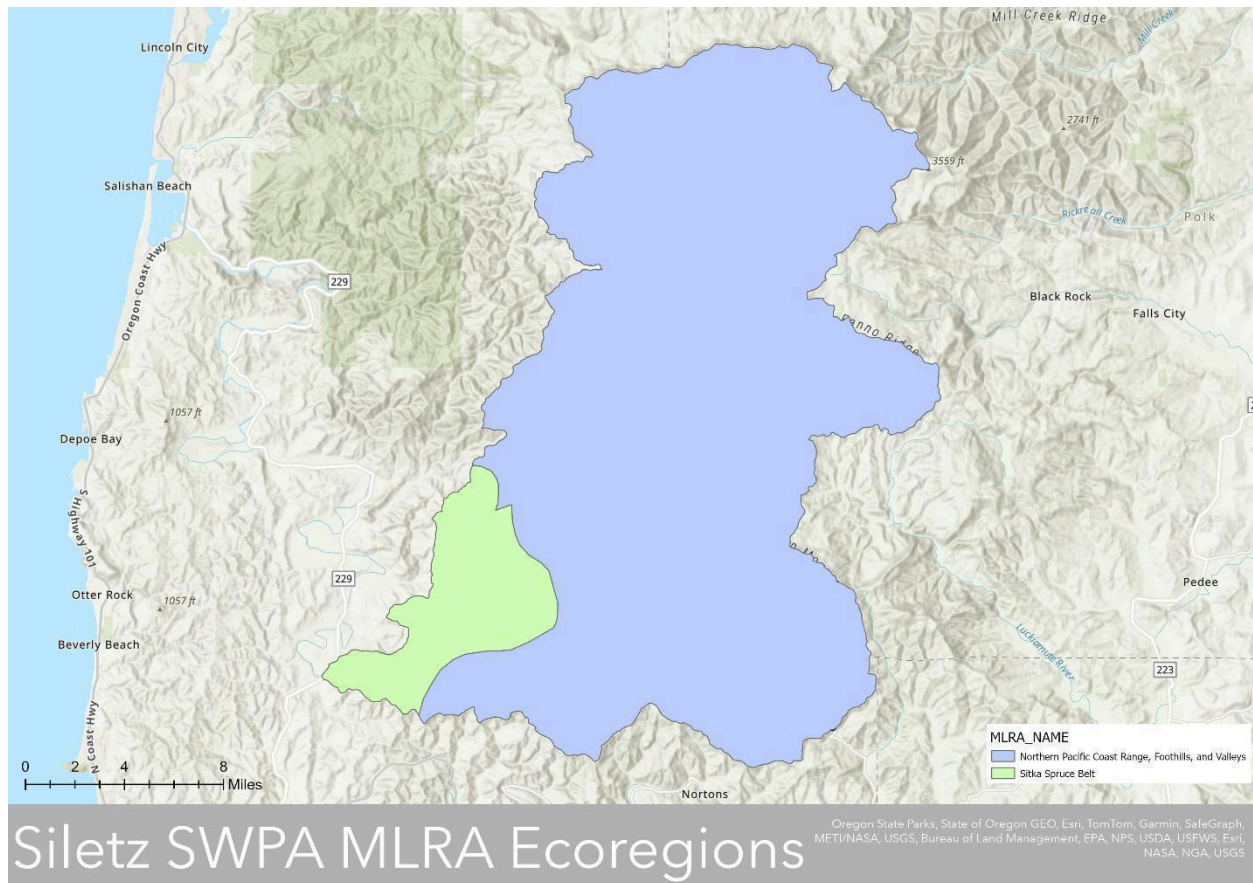
Period of Record Monthly Climate Summary

Period of Record: 10/25/1936 to 10/12/1986

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	45.3	49.7	52.5	57.7	65.3	71.4	77.6	77.5	72.9	63.5	52.4	46.7	61.0
Average Min. Temperature (F)	31.4	33.7	33.9	35.7	39.6	44.5	46.6	47.5	44.4	40.0	35.9	33.6	38.9
Average Total Precipitation (in.)	20.97	17.18	15.07	8.42	4.64	3.28	1.16	1.95	4.54	10.69	19.53	23.14	130.56
Average Total Snowfall (in.)	8.6	2.9	4.1	0.8	0.0	0.0	0.0	0.0	0.0	0.1	1.4	4.4	22.2
Average Snow Depth (in.)	2	1	0	0	0	0	0	0	0	0	0	0	0

Over the last several years measurable precipitation during the Summer months has declined, with an overall trend of longer dryer Summers and overall air temperatures increasing. The impacts of longer dryer Summers include increased risk of wildfire, decreased water availability, irrigation shut offs, decreased yields of current crops, and aquatic species population stress.

MLRA Ecoregion



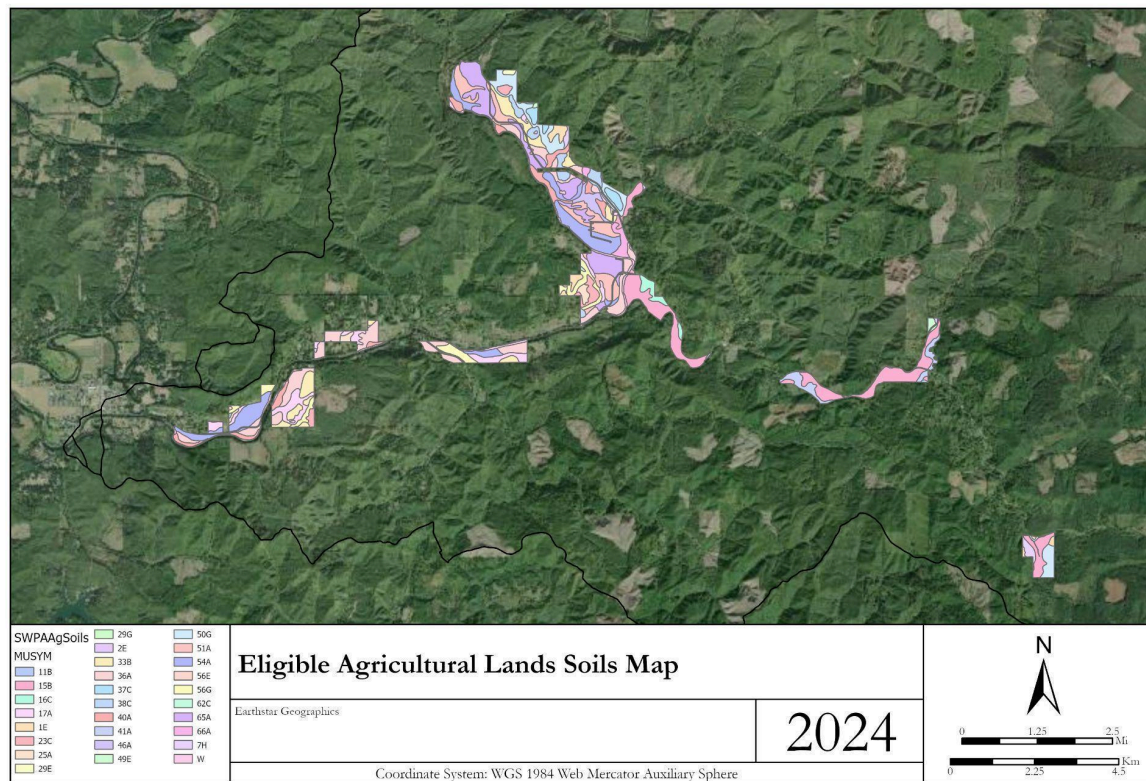
A majority of the SWPA is located within the Northern Pacific Coast Range, Foothills, and Valleys MLRA with the lower portion of the area located in the Sitka Spruce Belt. The MLRA ecoregions impact the vegetation communities present and will be used to determine suitable plant communities for tree and shrub planting and conservation cover.

Geology, Geomorphology, Soils and Hydrologic Characteristics

Soils

There are 93 unique soils in the SWPA according to the USDA Gridded National Soil Geographic Database (gNATSGO).

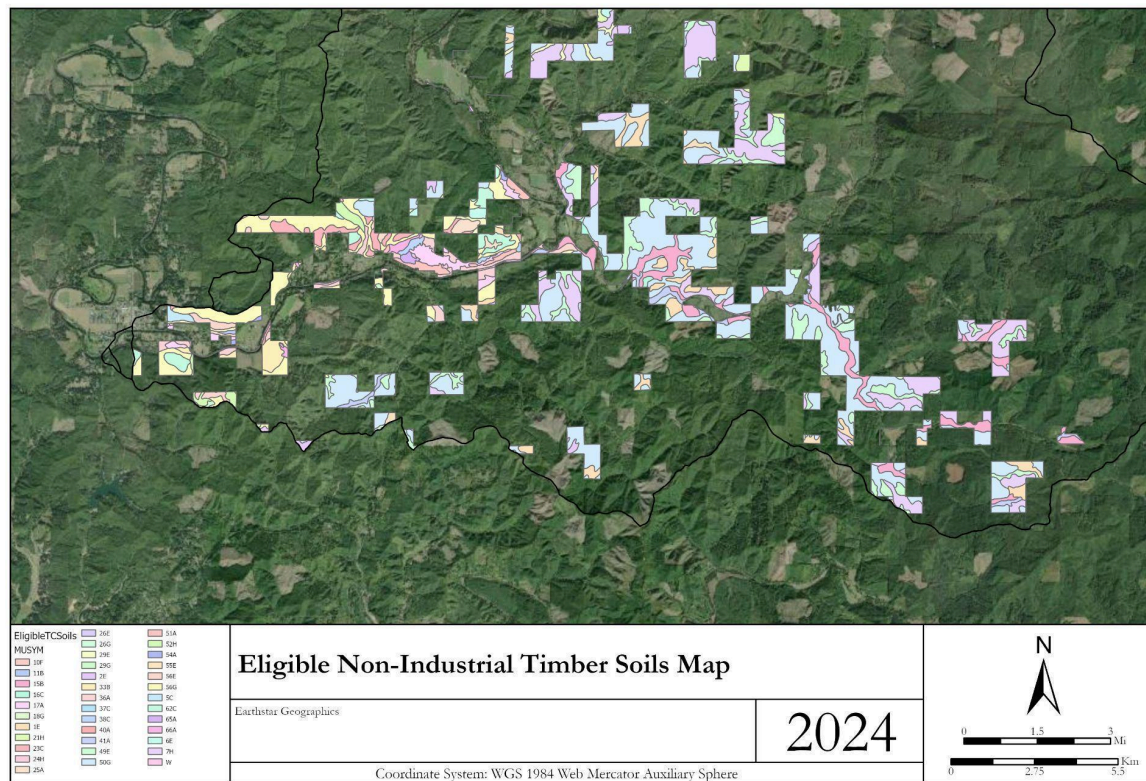
Agricultural Lands



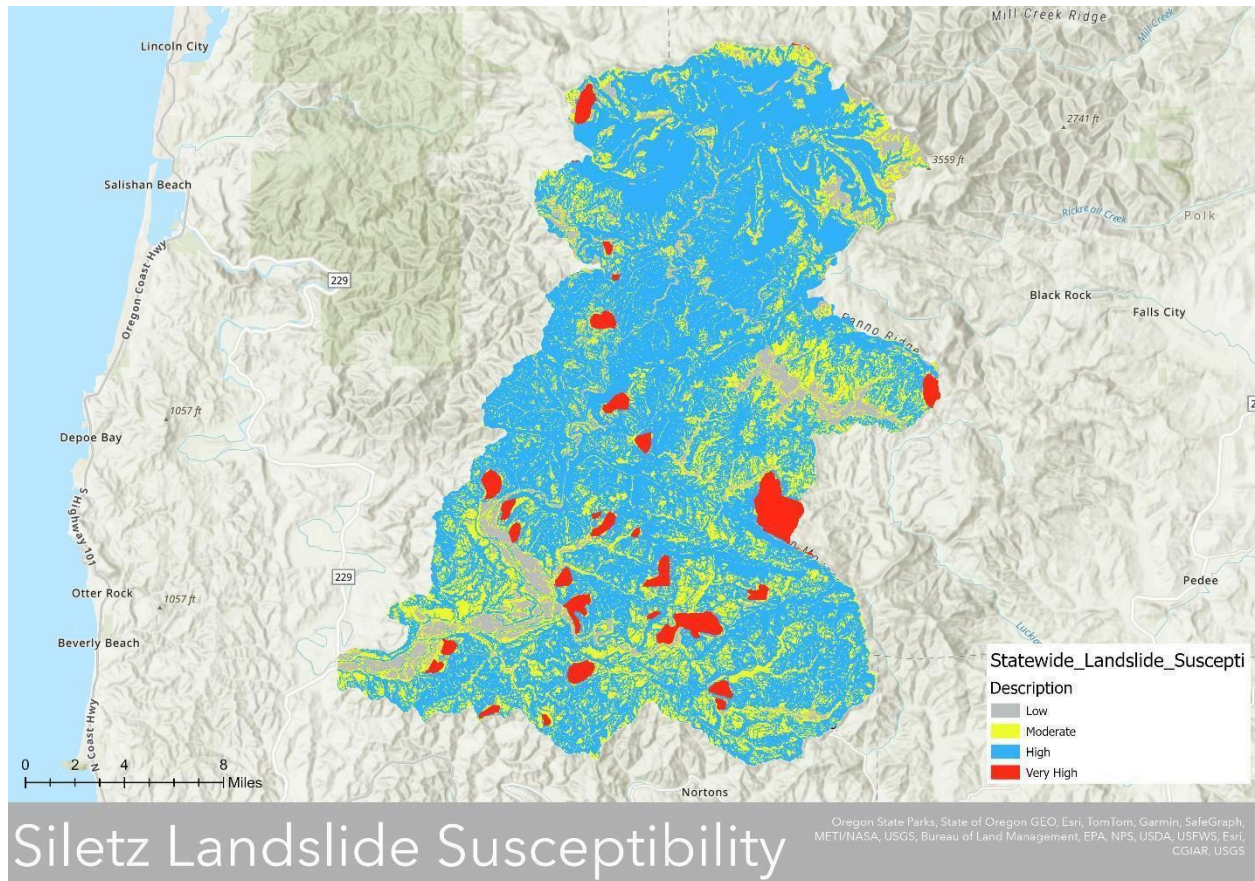
On eligible agricultural lands 28 unique soils are present. The dominant soil type in the area is silty loam with varying degrees of sand and slope. The primary soil type in the area is 36A Logsden Silt Loam. A deep, nearly level, well drained, low ph soil. This soil formed in silty and stratified, loamy alluvium derived from mixed sources. The soil is characterized by moderate permeability and a high-water capacity.

Logsden Silt Loam used for hay and pasture are limited by the susceptibility of the surface layer to compaction and low fertility. Compaction can lead to sheet flow of nutrients, manure, and soil into surface waters. Grazing during wet periods results in compaction of the surface layer and excessive runoff.

Eligible Non-Industrial Timber Lands

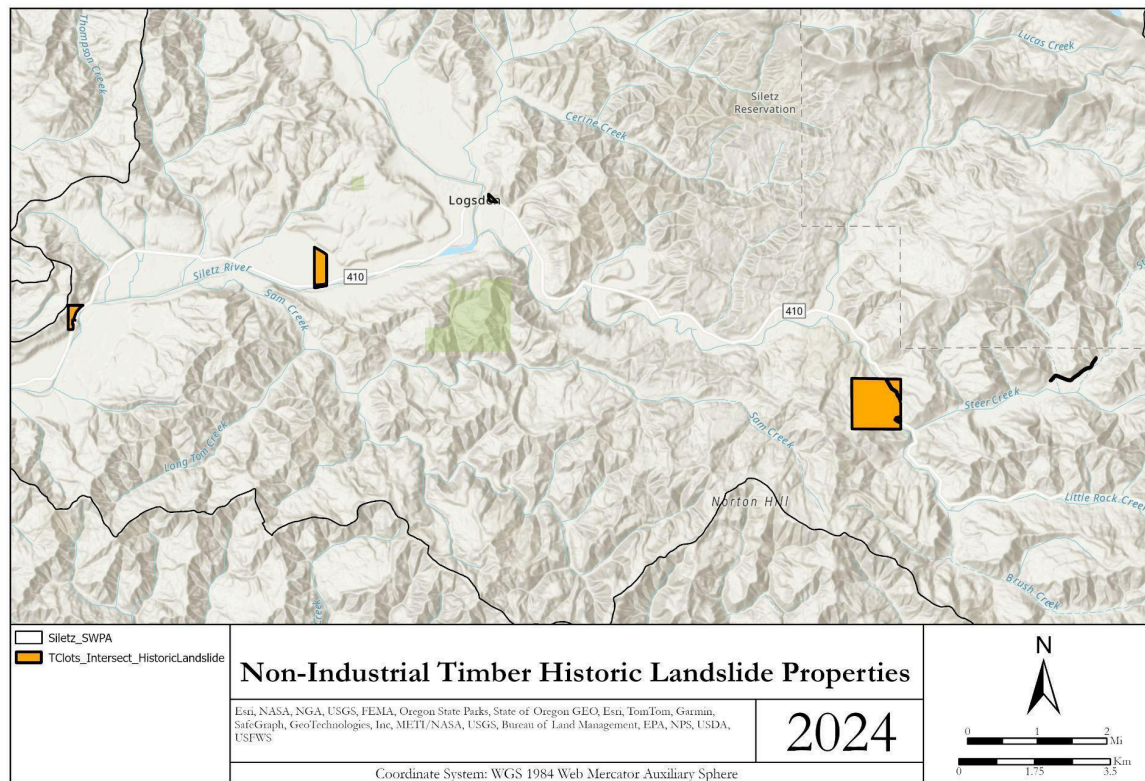


On eligible non-industrial timber lands 38 unique soils are present. The dominant soil type in the area is silty loam with varying degrees of sand and slope. The primary soil type in the area is 49E Preacher-Bohannon. This soil type is found on ridge tops and benches in mountainous areas. A deep and well-drained soil formed by colluvium weathered from sedimentary rock. The soil is characterized by moderate permeability and a moderate water capacity. This soil is highly erodible land.



The statewide landslide susceptibility map indicates the majority of the watershed being in high and very high landslide susceptibility. This is consistent with the topography and soil characteristics of the SWPA.

Historic Landslide Areas



In the SWPA there are five known historic landslide areas that intersect with eligible non-industrial timber properties. These areas are in close proximity to the river and represent an opportunity for forest management planning to prevent mass wasting events that can deposit large amounts of sediment to surface waters.

Major and Minor Aquifers

Geology in the Siletz River Watershed consists of volcanic rocks, marine sedimentary rocks, and alluvium, shown on the geologic map in Figure 2 and the geologic cross section in Figure 3. All of these units are used for domestic water supply purposes, but the productivity of the units varies significantly. The following bullets summarize the primary geologic units in the Siletz River Watershed and their permeability. The geologic units are organized from youngest to oldest (Frank and Laenen, 1977):

- The **Alluvium (Qal)** is a thin (15 to 25 feet thick) and narrow deposit found in the relatively flat areas along the main stem of the Siletz River, and consists of clay, silt, sand and gravel deposited on the river's floodplain. The Alluvium is sufficiently permeable to produce groundwater for domestic purposes, although most domestic wells appear to be completed in the underlying sedimentary rock units.

- The **Siltstone and Sandstone (Tss)** is comprised of several tuffaceous (i.e., ash-rich) siltstone and sandstone formations¹ and collectively ranges from 200 feet thick to 5,000 feet thick. The Siltstone and Sandstone are characterized by a low permeability, with well yields reported to be less than 5 gpm, and many wells being reported to produce no usable water.
- The **Tyee Formation (Tet)** is a 6,000 feet thick deposit of marine sandstones and siltstones. The Tyee Formation is characterized by a low permeability, with well yields reported to range between 1 gpm and 5 gpm.
- The **Siletz River Volcanics (Tsr)** are a 10,000 feet thick deposit of basalt (including basalt flows, pillow basalt, tuff breccia, and lapilli tuff) with interbedded tuffaceous marine siltstone and sandstone. The Siletz River Volcanics exhibit a variable permeability. Well yields generally range from 5 gpm to 10 gpm, although yields of up to 120 gpm have been reported.

Based on a review of depth-to-water measurements at wells in the watershed (OWRD, 2023), the groundwater depths generally range from about 5 feet below ground surface in alluvial material adjacent to the Siletz River or Siletz Bay to over 100 feet below ground surface in the sandstones and siltstones in the upper reaches of the watershed.² The sandstones and siltstones are under confining pressure, and after drilling the static water levels in water wells rise to a level that is above the depth at which groundwater was first encountered. The groundwater levels represented by white-filled triangles in Figure 3 represent the depth at which groundwater was encountered, while the blue-filled triangles in Figure 3 represent the static water levels after a well is drilled. Inferred groundwater flow directions, based on topography and the fact that groundwater discharges to surface water, are provided in Figure 4. Groundwater flows towards the west, from the highlands of the Coast Range to the Pacific Ocean.

Aquifer Recharge and Discharge Processes

Aquifers in the watershed are recharged seasonally by precipitation during the late Fall and Winter, which ranges from about 70 inches per year in the southwestern part of the watershed to over 200 inches per year in the mountains of the Coast Range in the eastern part of the watershed. A rainfall distribution map based on 800 meter 30-year annual normal for precipitation from 1991 to 2020 is provided in Figure 5 (PRISM, 2023). Because rainfall amounts are significantly higher at higher elevations in the mountains of the Coast Range, most of the recharge to the aquifer likely occurs at these higher elevations. In addition, because the Siletz River Volcanics that comprise most of the higher elevations are more permeable than the marine sedimentary rocks, more recharge occurs in the areas where the Siletz River Volcanics are present at ground surface. Groundwater discharges from the aquifers at springs, seeps, and surface water bodies (i.e., the Pacific Ocean, rivers, and creeks); groundwater wells; and by evapotranspiration.

The top panel of Figure 6 is a map showing surface water withdrawals in the Siletz River Watershed. There are about 690 surface water rights on the Siletz River or its tributaries. The surface water rights are for irrigation, stock watering, instream use (to protect stream flows for migration, spawning, egg

¹ Sandstone of Whale Cove, Astoria Formation, Yaquina Formation, Nye Mudstone, Siltstone of Alsea, Nestucca Formation, and Yamhill Formation.

² See LINC 1906 and LINC 53000

incubation, fry emergence, and juvenile rearing), municipal water supply, industrial, domestic, forest management, etc.

The bottom panel of Figure 6 is a map showing groundwater withdrawals (water wells) in the Siletz River Watershed. Water wells were downloaded from the Oregon Water Resources Department (OWRD) online Well Report Query (OWRD, 2023a). Note that some of the water wells in remote sections of the watershed are probably mis-located on the OWRD records. There are a little over 450 groundwater wells in the watershed. About 98% of the wells are domestic wells, with the remaining wells being irrigation or community wells. Based on a search of the OWRD water rights mapping tool (OWRD, 2023b), there are no permitted groundwater rights in the Siletz River Watershed, meaning that all groundwater wells are classified as “exempt”.

Surface Water – Groundwater Interaction

During dry periods with no surface water runoff, rivers in the Siletz Watershed continue to flow. This river flow is maintained by groundwater that discharges to the rivers by seeps and/or springs and is often referred to as “baseflow.” Based on base flow measurements of streams in Lincoln County, the Siletz River Volcanics contribute significantly more groundwater to rivers than the Tyee Formation (i.e., about 0.6 ft³/s/mi² for the Siletz River Volcanics as compared to 0.125 ft³/s/mi² for the Tyee Formation). Overall, because of the low permeability geologic deposits within the Siletz Watershed (see discussion of well yields in Section 2.1.1), rivers in the Siletz River Watershed are characterized by relatively low base flows in the Summer (although they are higher than in the Alsea Basin) (Frank and Laenen, 1977).

Groundwater Chemistry

Table 1 summarizes raw groundwater quality data from Frank and Laenen (1977) (a water resources investigation study prepared by the United States Geological Survey)³ and the Oregon Health Authority (OHA) database (a compilation of water quality data collected by public water supply systems as part of Safe Drinking Water Act Compliance)⁴.

³ Water quality data are only included if the aquifer in which the well is completed is known.

⁴ Water quality data are only included if the aquifer in which the well is completed is known. In addition, because water quality samples in OHA’s database are collected downstream of treatment, data from OHA were excluded if treatment beyond chlorination is occurring.

Table 1. Groundwater Chemistry.

Well ID	Date	Iron (mg/L)	Manganese (mg/L)	Fluoride (mg/L)	Chloride (mg/L)	Nitrate/ Nitrite (mg/L)	Arsenic (mg/L)	Temperature (deg F)
Alluvium								
7S/11W-34ddd ¹	–	2.1	0.02	0.30	19	0.10	ND	–
9S/10W-7dad ¹	–	0.05	0.01	0.20	3.3	2.9	ND	–
10S/10W-4ccb ¹	–	0.01	ND	0.10	1.7	1.0	ND	–
Sandstone/Siltstone								
7S/10W-25acd ¹	6/20/73	0.02	ND	0.10	390	0.05	ND	58
8S/11W-36adc ¹	–	0.08	0.1	1.2	160	ND	–	63
10S/10W-3cbb ¹	6/20/73	0.03	0.01	0.80	530	0.02	ND	56
LINC 231/657 ²	Varies ³	ND	ND	0.28	–	ND	ND	–
Basalt								
8S/10W-8dcb ¹	–	0.05	ND	0.30	17	0.66	ND	58
8S/11W-36ada ¹	6/20/73	0.04	ND	0.50	9.5	0.65	0.001	57
9S/11W-8ccd ¹	3/7/76	–	–	–	35	–	–	–
Notes								
ND = Not Detected		mg/L = milligrams per liter						
(1) Data are from Frank and <u>Laenen</u> (1977)								
(2) Data are from OHA (2023)								
(3) Water quality samples collected on 1/15/85 (iron, manganese, fluoride), 1/1/91 (arsenic), and 12/16/22 (nitrate)								

Given that groundwater discharges to surface water in the Siletz Watershed (see Section 2.1.3), it should be noted that these concentrations do not *currently* appear to pose an impairment risk to surface water because, for the constituents in Table 1, the surface water is considered by DEQ to be in attainment (DEQ, 2022). The following groundwater constituents are characterized by elevated concentrations.

- **Nitrate/Nitrite.** While nitrate is naturally occurring in groundwater, concentrations over 1 milligram per liter (mg/L) are considered to be anthropogenic (Dubrovsky et al., 2010). Nitrate/nitrite is likely related to rural homesteads with associated septic systems and/or biosolids ap. Bacteria generally do not transport far through alluvial sediments (bacteria are large relative to soil pores) but may travel far if fractures in sandstone/siltstone bedrock are encountered. Septic systems associated with rural homesteads were identified as posing a moderate to high risk to the drinking water supply in the Source Water Assessment Report for the City of Newport (DEQ and OHA, 2002).
- **Chloride.** Chloride is elevated in the marine sedimentary rocks (i.e., sandstone and siltstone) due to the occurrence of chloride salts (mostly NaCl). Elevated salinity is a naturally-occurring pollutant in marine rocks of the Coast Range in Oregon.

According to DEQ's 2022 Oregon Integrated Report, surface water in the Siletz Watershed is impaired. Specifically, the Siletz River is impaired for dissolved oxygen, turbidity, elevated temperature, and alkalinity, and Rock Creek is impaired for temperature (DEQ, 2022). Groundwater is non-turbid and low

temperature (see Table 1) and, therefore, discharge of groundwater to the surface water is beneficial to mitigate impairment of the surface water system.

Hydrologic Characterization

This section contains a discussion of the average annual precipitation, an overview of the hydrologic cycle, and a discussion of a flow budget.

Average annual precipitation in inches in the Siletz River Watershed is shown in Figure 5. The Siletz River Watershed is a rain-dominated system (as opposed to a mixed rain-snow system) (Lee, et al., 2020), with a majority of the precipitation occurring during the Winter months (Frank and Laenen, 1977).

Precipitation that falls within the watershed either evaporates, is transpired to the atmosphere by vegetation, runs off to surface water, or infiltrates into the ground and becomes groundwater. Groundwater moves under the force of gravity from the recharge area to downgradient discharge points including seeps, springs, or the Pacific Ocean (see Figure 4). The groundwater discharge forms a stream's baseflow, which is the groundwater contribution to streamflow. Surface water is also removed from the Siletz River by surface water withdrawals, which are shown in the top panel of Figure 6.

Figure 7(a) and Figure 7(b) show Siletz River stage and discharge, respectively, from 2017 to 2023 measured at the USGS gage shown in Figure 1⁵. The gray highlights indicate the wet season (i.e., from November 1 to May 31 of each year). Note that the surface water elevation and discharge of the Siletz River are highly variable, reflecting the seasonal effects of the wet season. During the dry season, inputs from precipitation runoff decrease and flow is due to groundwater discharges.

A flow budget for the Siletz River Watershed is provided in Table 2. Note that this flow budget is for the watershed upstream of USGS Gaging Station 14305500, shown in Figure 1⁶

Flow Budget Component	Value	Column Heading
Average Precipitation	2,825 ft ³ /s	Based on contours of normal annual precipitation from 1991 – 2020 (PRISM, 2020), and presented in Figure 5 of this TM. Specifically, rainfall volumes were determined by multiplying the area between each contour, and multiplied by the midrange precipitation value (e.g., the area between the 140-inch contour and 150-inch contour was multiplied by 145 inches).
Average Groundwater Discharge	131 ft ³ /s to 860 ft ³ /s (midrange=495.5 ft ³ /s)	Range based on monthly mean Siletz River discharge, 1940 – 1974, May to October. Values range from 0.65 ft ³ /s per mi ² of drainage basin (August) to 4.25 ft ³ /s per mi ² of drainage basin (May), over an area of 202 mi ² (see Figure 9 of Frank and Laenen, 1977). The groundwater discharge may be biased slightly low because it does not take into account surface water diversions upstream of the USGS gauge (see footnote 9).

⁵ USGS 14305500 Siletz River at Siletz, Oregon

⁶ Table 2 does not account for irrigation or other consumptive uses in the watershed above USGS Gage 14305500. However, OWRD data indicates that there are only water rights for approximately 250 acres of irrigation. OWRD estimates the consumptive use of water for irrigation in the watershed above the gage amounts to less than 0.5 cfs at peak demand in July, less than 1 percent of the 80 percent exceedance flow.

Runoff and
Transpiration

2,329.5 ft³/s

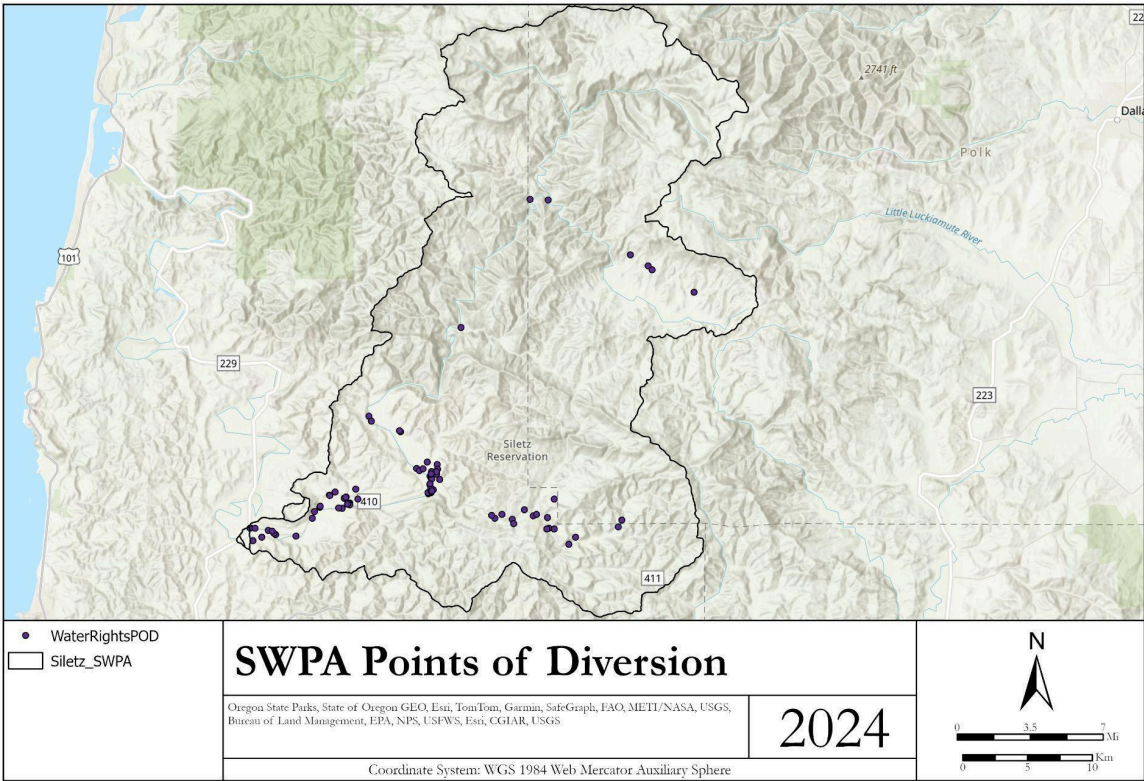
Precipitation that does not infiltrate either runs off to surface water or is transpired by vegetation. Value is calculated by subtracting the midrange groundwater discharge (495.5 ft³/s) from the average annual precipitation (2,825 ft³/year). This runoff and transpiration may be biased slightly high because groundwater discharge may be underestimated [because surface water diversions upstream of the USGS gauge are not taken into account (see footnote 9)].

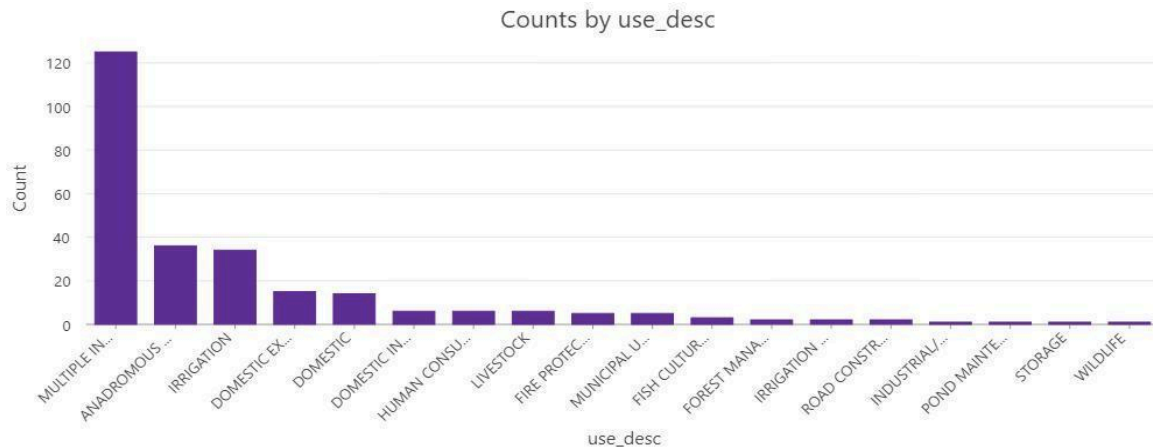
Notes

ft³/s = cubic feet per second

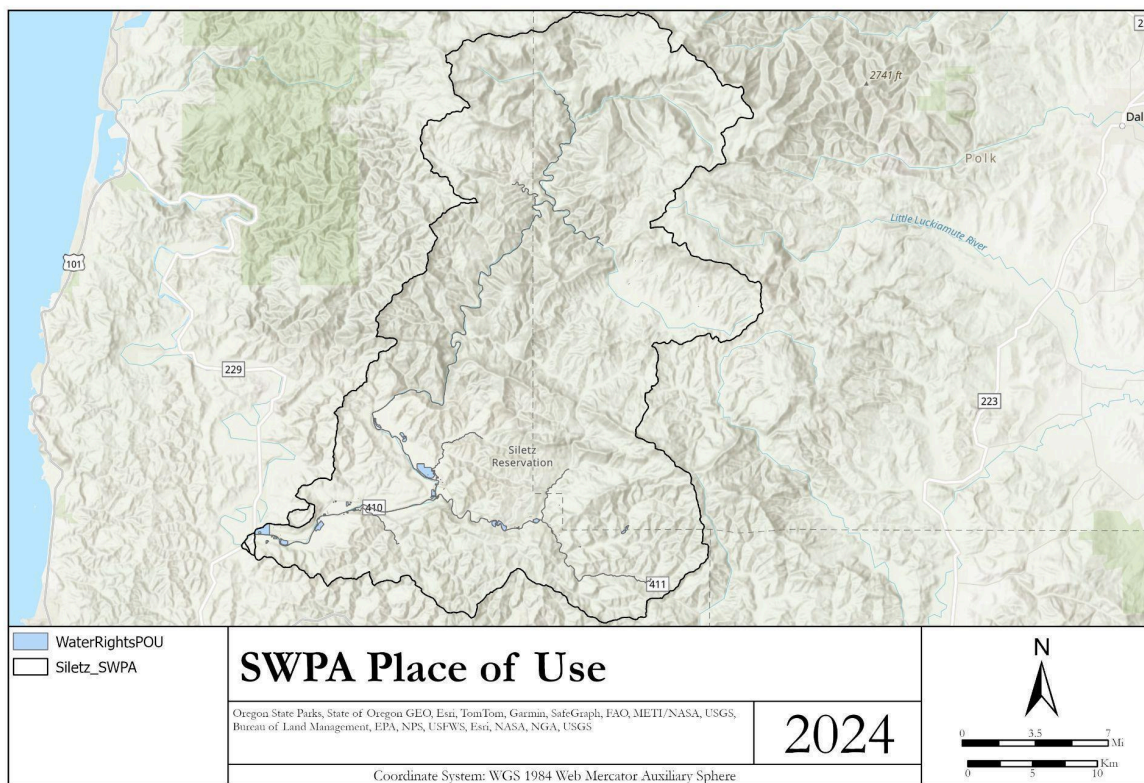
mi² = square miles

Water Rights





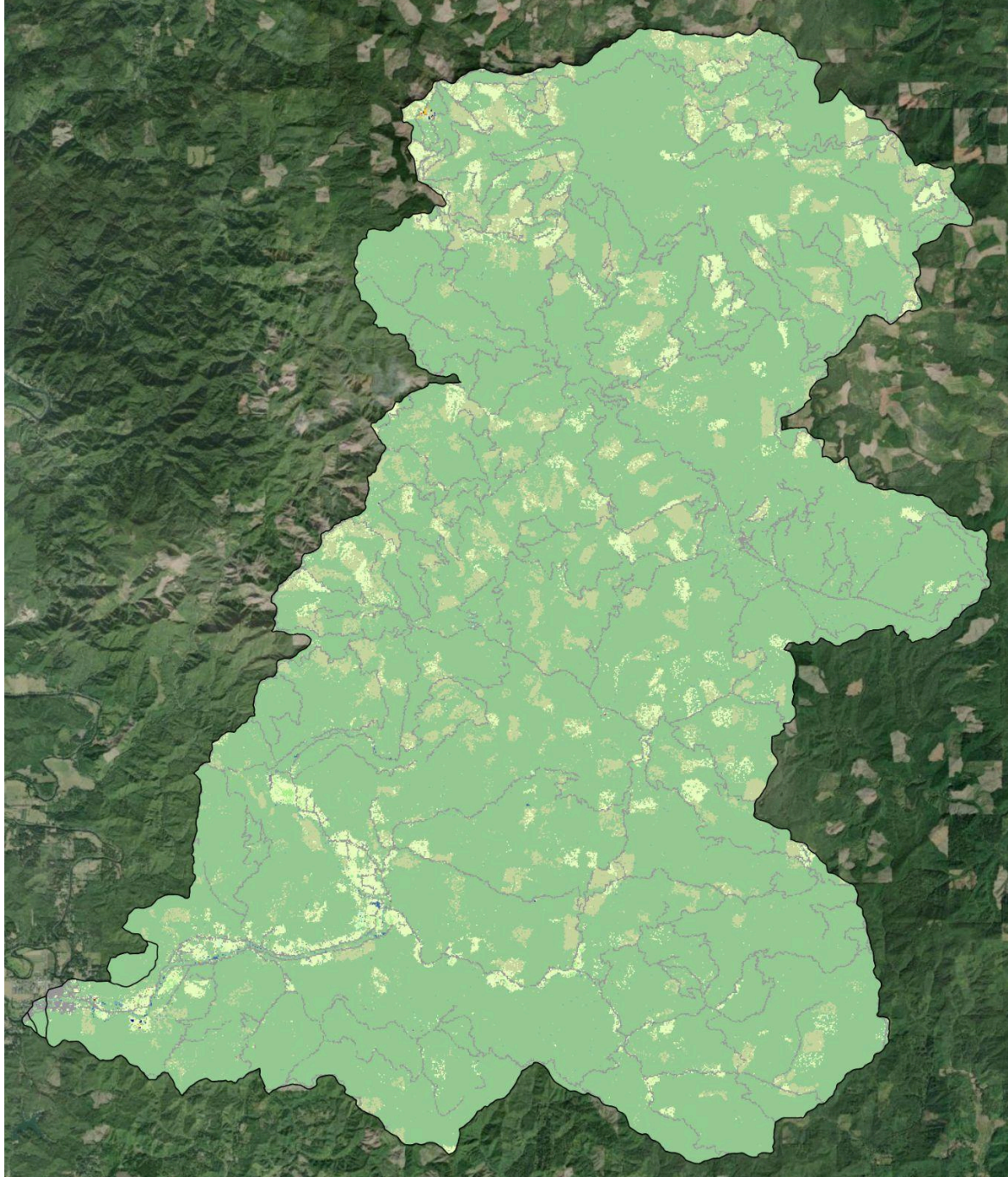
265 points of diversion exist in the SWPA for various needs including domestic, livestock, irrigation, fire protection, and habitat (instream and anadromous fish).



Within the SWPA 102 places of use have been identified from the OWRD. Of these, five have been designated as for livestock use. While this does provide an indication of producers using water for livestock, the exclusion for livestock in-stream watering makes it difficult to understand the exact amount of water being used by livestock.

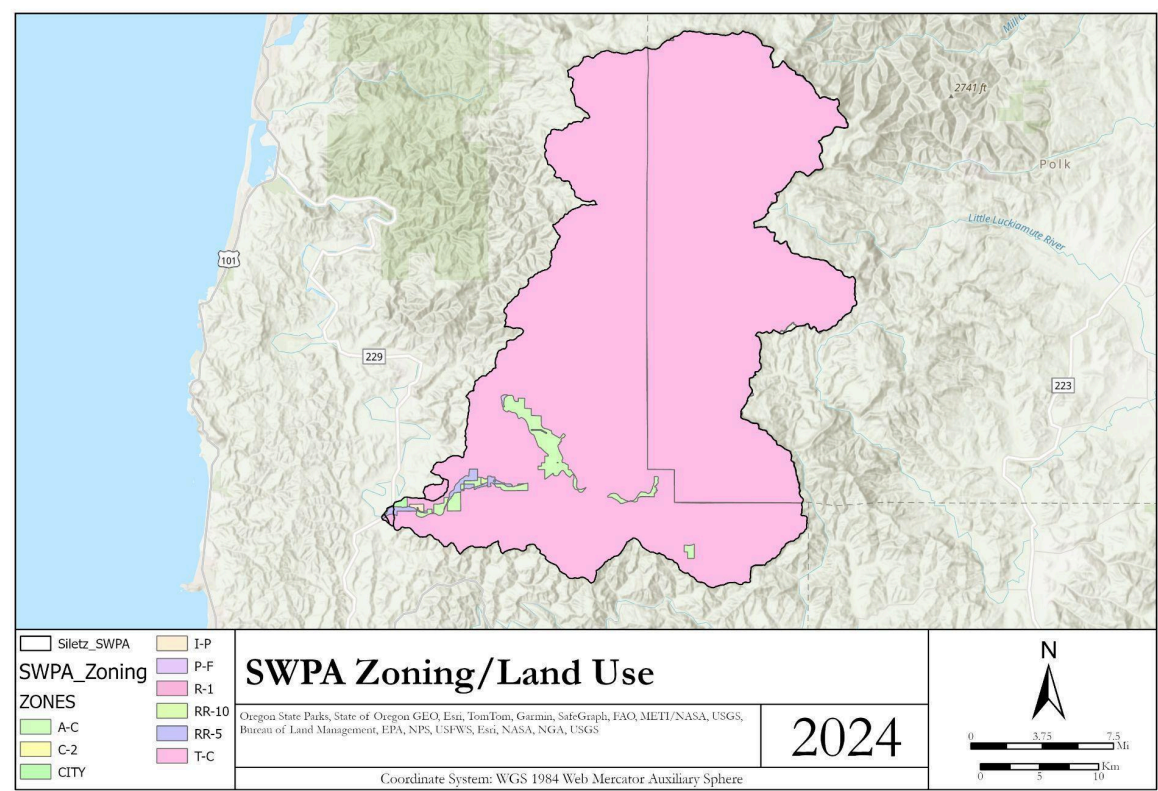
28 places of use are designated for irrigation. The total irrigated acreage is approximately 310 acres. Irrigation systems in the SWPA are limited to stand/tripod style systems.

Land Use/Land Cover



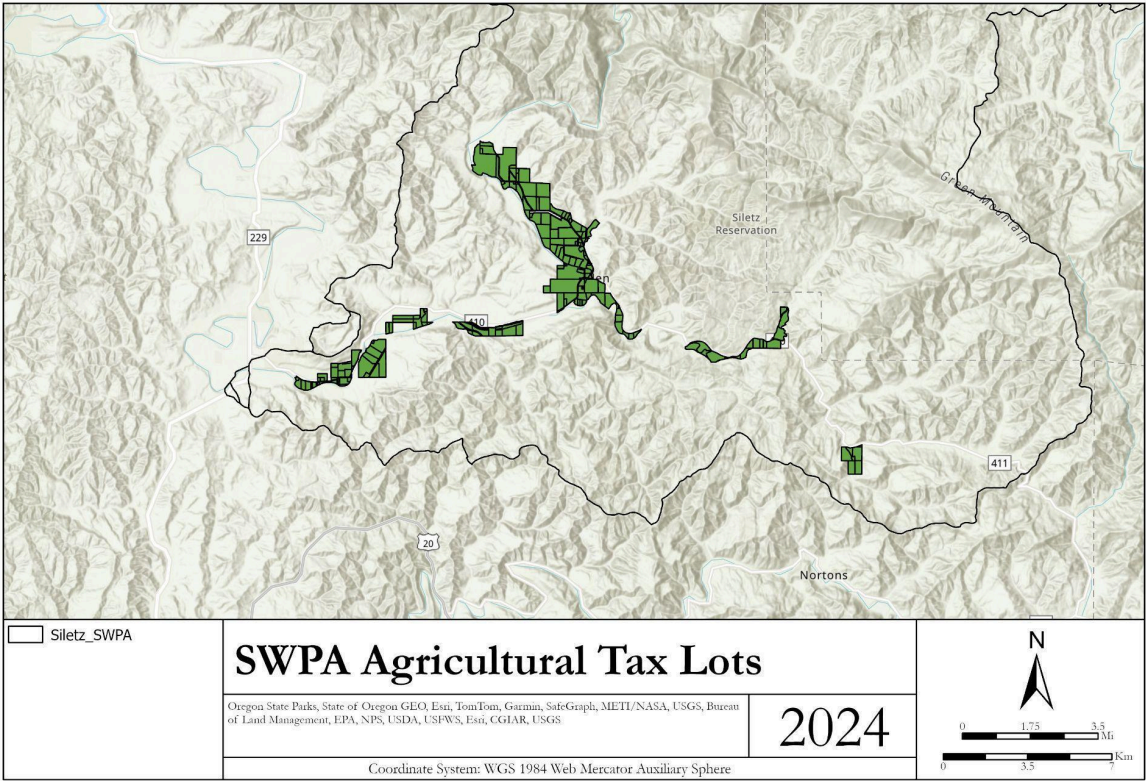
The USDA-NASS Cropland data provides some useful information on the scope of agricultural production within the SWPA. The map above highlights the expanse of timber production throughout the SWPA. For the purposes of this assessment the land use/cover has been refined to focus on eligible areas for practice implementation.

SWPA Zoning



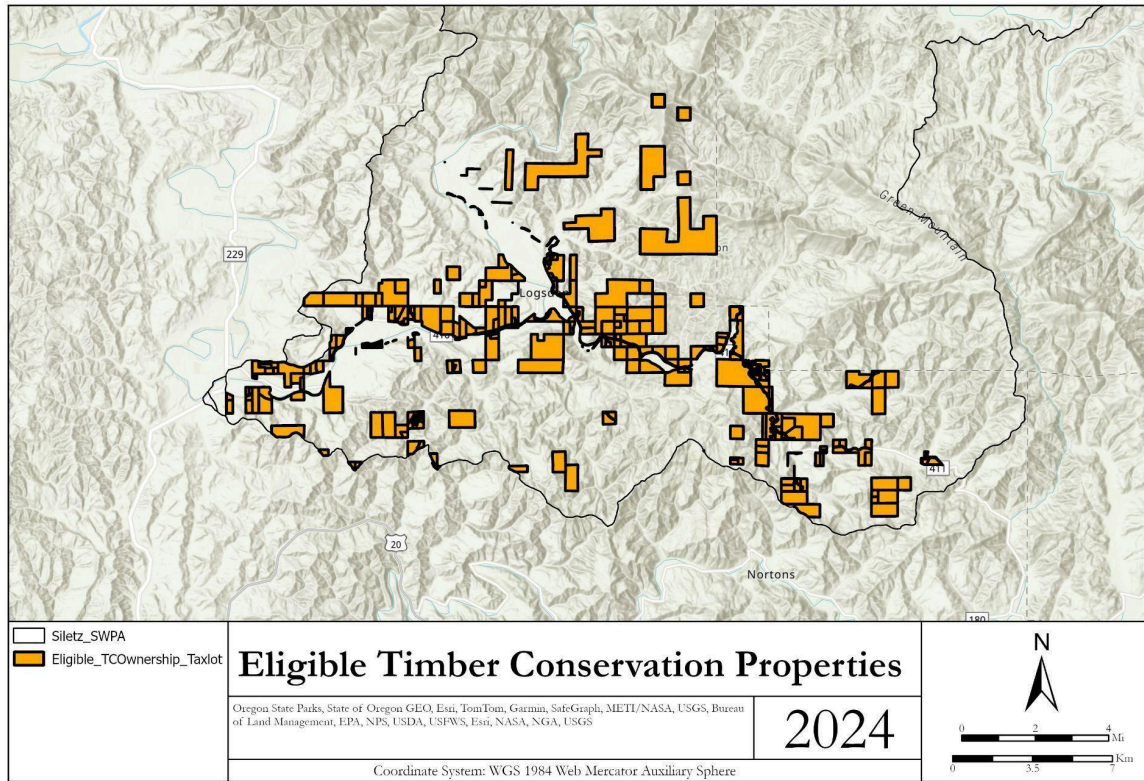
The SWPA contains approximately 37,000 acres of eligible land in ownership by private individuals, companies, and/or tribal entities. A majority of the land in the SWPA is Industrial Timber owned by a few large companies. Near the intakes there are mixed residential and City properties that may impact the SWPA minimally, these have not been included as they are outside of this project.

Agriculture Properties



There are 211 Agricultural Conservation tax lots in the SWPA totaling 4,956.09 acres. This does not represent a comprehensive assessment of rural residential properties in the SWPA that may be conducting “homestead” level agriculture for personal use. While the vast majority of agricultural properties are located in lowlands in valleys, the properties in upland areas have been included in the assessment due to potential surface water interconnections.

Non-Industrial Timber Properties



There are 295 eligible non-industrial timber conservation properties within the SWPA covering over 32,000 acres. A majority of these properties are held by tribal and small woodland landowners.



Water Quality Characterization

Water Quality Conditions in Watershed

An inventory of potential contaminants of concern based on the land uses in the watershed and discussion of the water quality conditions in the Siletz River and its tributaries was conducted by GSI Water Solutions (GSI). GSI has worked on Drinking Water Protection Plans for the City of Toledo and Newport. GSI also serves as a lead in coordinating the Mid-Coast Water Planning Partnership.

Agricultural Contaminant Sources of Concern

The contaminants of concern include excessive sediment, nutrients, and elevated water temperatures. Sources of concern include a lack of livestock exclusion fencing, off-stream watering solutions, and proximity of grazing to surface waters, land application of biosolids and unregistered soil additives including fish plant waste, unmanaged and legacy riparian forest land, low flows during peak seasonal usage, and improper or lack of riparian vegetation.

Table 1. Agricultural Sources of Concern in the Siletz River Watershed.

Agricultural Source	Potential Impacts
Grazing Animals	Animal wastes may impact the river if not managed properly. Livestock may contribute to erosion and reduced riparian vegetation, and therefore, turbidity in surface water.
Managed Forest Land	Yarding and cutting of trees increases erosion, which causes turbidity and chemistry changes in the Siletz River. Improper application of pesticides and/or fertilizers can result in chemicals reaching the river. Lands with reduced tree cover have increased runoff that may reduce infiltration of precipitation into groundwater, which could lower base flows in streams during prior periods.
Agricultural Operations	Improper handling or over-application of pesticides and fertilizers may impact drinking water. Biosolid spreading has the potential to impair groundwater and surface water when not applied in accordance with state and federal guidelines and regulations.

GSI, 2023

Biosolids continue to be a community concern in the watershed. Based on studies by the Environmental Protection Agency (EPA), biosolids pose a small risk to the environment when applied in accordance with state and federal guidelines and regulations (MDEQ, 2014). However, biosolids are considered to pose a potential contamination risk to the watershed due to the potential for application in a manner that is not consistent with state and federal guidelines. There is a growing concern for the potential presence of emerging contaminants as a constituent in biosolids. Table 2 summarizes pollutant concentrations in biosolids from the City of Siletz Wastewater Treatment Plant, which are locally used in the Siletz River Watershed. At the time of the report, there is little to no oversight in the application of biosolids on agricultural lands.

Table 2. Pollutant Concentrations in Biosolids, City of Siletz WWTP (4/30/2008 Samples).

Constituent	Concentration ¹	Units
Arsenic	< 5.0	mg/kg
Cadmium	2.9	mg/kg
Chromium	38.3	mg/kg
Copper	52.3	mg/kg
Lead	36.7	mg/kg
Mercury	4.1	mg/kg
Molybdenum	7.7	mg/kg
Nickel	28.6	mg/kg
Selenium	< 5.0	mg/kg
Zinc	800	mg/kg
Total Kjeldahl Nitrogen (TKN)	6.07	Percent
Nitrate as Nitrogen	< 0.01	Percent
Ammonia	1.14	Percent
Phosphorus	2.60	Percent
Potassium	0.24	Percent
pH	7.0	Standard units

NOTES:

(1) Source: DEQ (2008)

mg/kg = milligrams per kilogram

WWTP = wastewater treatment plant

GSI, 2023

Four biosolid application sites were provided by DEQ in 2023, all of which were in close proximity to the river, and pose a risk of surface water contamination if proper application measures are not taken.

Commercial and Industrial Contaminant Sources of Concern

Commercial and industrial contaminant sources of concern are primarily associated with potential activities in the City of Siletz, mining operations and timber salvage and roofing shingle production operations.

The City of Siletz poses minimal concern as a source for commercial and/or industrial contaminants based on the types of businesses and proximity to the river. However, a new gas station and auto repair shop pose a moderate risk of adverse impact to water quality due to stormwater runoff, potential leaking tanks, spills, and improper disposal of waste. Based on the DEQ Facility Profiler, there are no Leaking Underground Storage Tank (LUST) sites or Environmental Cleanup Site Information (ECSI) sites in the City.

In addition to the sources of concern within the City of Siletz, the City of Toledo's Drinking Water Protection Plan identified two operations upstream of the City's surface water intake (GSI, 2023).

The Mill Creek Pit is an active basalt mine located about 200 feet off the North Fork of Mill Creek, Northeast of Logsdon. Spills, leaks, and leachate from mining operations may introduce chemicals and waste products into source waters. Ground disturbance can also cause erosion and increase turbidity in

nearby streams if measures are not taken to protect water quality. One of Mill Creek Pit's permit conditions requires the operator to prevent turbid water from the site from entering nearby water bodies. Aerial images available from DOGAMI show that 0.7 acres of previously mined lands had been reclaimed and vegetated by 2014. Aerial imagery from 2021 shows some mined areas and a wide vegetated buffer between the mine and Mill Creek.

Historically, the timber salvage facility was a wood and pulp processing mill, where proper handling of chemicals would be a major concern. Now that the facility operates as timber salvage/roofing shingle production, it may pose a lower risk to water quality.

Commercial and Industrial Forestry Contaminant Sources of Concern

Commercial and Industrial forestry practices are also a source of concern of contamination. The City of Toledo's Drinking Water Protection Plan Risk Assessment identified clearcuts as highly likely to occur within the watershed with a moderate impact to the source water. Since this report in 2022, the Private Forest Accord (PFA) has changed the buffer restrictions for forestry activities. These new regulations may reduce the likelihood of significant contaminant inputs into surface waters. However, as the PFA is being implemented, heavy logging in soon to be restricted areas has left riparian buffers lacking proper vegetation to reduce runoff and provide proper shade to cool surface waters.

In 2024, the Valley of the Giants, a 51-acre old growth grove near the headwaters, experienced a massive debris flow destroying roads and depositing sediment into surface waters. While this incident was large, events such as this are not uncommon in areas of high intensity industrial and commercial forestry in the Coastal Range. Clearcutting in the upper reaches of the watershed is still a major concern due to the increased risk of landslides and sedimentation on steep slopes.

Forestry road maintenance is also a concern of contamination from sedimentation. Historically, access roads were built in the valley floor to allow flat access for machinery. Some of these roads have been decommissioned or moved as forestry practices have improved and new technology allows for machinery on ridgelines. These legacy roads in tributary valleys pose a risk of adding dust and sediment to surface waters during the Summer and during use in the rainy season.

Residential Contaminant Sources of Concern

The City of Siletz wastewater is managed at a wastewater treatment plant that discharges treated wastewater to the Siletz River under a National Pollutant Discharge Elimination System (NPDES) permit. The dry season flow was 0.0993 million gallons per day (MGD) and the wet season flow was 0.276 MGD (1989 data). Formerly a lagoon system, the plant was recently upgraded to include a sequencing batch reactor (SBR), ultraviolet disinfection, aerobic digesters, and facultative sludge lagoon (Dyer Partnership, 2023).

Outside of the City of Siletz city limits, domestic wastewater from rural homesteads is managed using septic systems. Septic systems were identified as posing a moderate to high risk to the drinking water supply in the Source Water Assessment Report for the City of Newport (DEQ and OHA, 2002).

No landfills are listed in the Oregon Solid Waste Active Permitted Facilities Database in the Siletz Watershed (GSI, 2023).

No records of underground storage tanks or leaking underground storage tanks were found in the Siletz using the Oregon Records Management Solution website (GSI, 2023).

A single chemical release in the town of Siletz is documented on DEQ's Environmental Cleanup Site Information (ECSI) database. The release (ECSI Site No. 5605) involved pesticide and fuel contamination related to destruction of a Swanson's Pest Management truck during a garage fire in 2011. Soil and groundwater samples were collected to evaluate the extent of the release, and DEQ issued a No Further Action letter in 2013, although low levels of contamination remain in the subsurface soil and groundwater (GSI, 2023).

Rural development and property management are sources of concern of contamination. In particular, removal of riparian vegetation can result in streambank erosion depositing sediment and nutrients into surface waters. The removal of riparian vegetation can also result in increased stream temperatures.

Property management practices for new and existing rural development may also affect water quality. Overuse and improper storage and disposal of household and landscaping chemicals may allow contaminants to enter surface waters. Domestic animals, such as chickens and horses, require proper waste management to avoid impacting water quality. Installation of impervious surfaces, such as rooftops, patios, and driveways can increase runoff of contaminants.

Recreation in the SWPA is common and popular throughout the year. Motorized boat recreation is allowed on most reaches of the Siletz but is only viable during higher flows outside of the Summer months. There are two boat launches upstream of the City of Toledo's water intake in the SWPA. Water quality may be affected by chipping paint, leaks or spills of gasoline and oil from boats, household waste, and fishing waste including lead weights and plastic fishing line.

Aging and new transportation infrastructure is a concern of contamination. Transportation including road building, maintenance, and usage may increase erosion and stream turbidity. Attention to proper siting and construction techniques can reduce these risks.

Water Quality Monitoring

In 2023 Lincoln Soil and Water Conservation District ("the District"), in collaboration with Oregon Department of Environmental Quality (DEQ) and Oregon Department of Agriculture (ODA), established a watershed-monitoring program to assess long-term trends in water quality and evaluate stream reaches to focus implementation of best management practices (BMP). The selected locations have been used in the past by the District and Partners to assess water quality. The current locations include the Confluence of Rock Creek-Siletz, Confluence of Big Rock Creek-Rock Creek, the CTSI hatchery (Rock Creek), Siletz mainstem (Moonshine Park).

Water quality data in the SWPA is fragmented with large gaps in testing. This makes the efficacy of practices difficult to measure using water quality parameters. In 2026 the District will begin the process of the ODA Strategic Implementation Area. This will provide additional monitoring funds to expand the current sampling to include Mill Creek and technical assistance funding for design of BMPs.

Ambient Water Quality Conditions

Several surface water bodies in the Siletz River Watershed are identified as impaired in DEQ's 2022 Integrated Report. The integrated report, which DEQ is required to prepare for the Environmental Protection Agency (EPA) by the Clean Water Act, is a report on surface water quality in the State of Oregon. Impaired parameters for individual stream reaches are shown in Table 2, and the streams are shown in Figure 1. Impaired parameters include temperature, dissolved oxygen, turbidity, alkalinity, and

biological criteria (DEQ, 2022). All of the impairments constitute a Category 5 impairments, meaning that data indicate a water quality standard is not attained and a Total Maximum Daily Load (TMDL) is needed.

Table 2. Impaired Water Quality Parameters in the Siletz River Watershed.

Name	Description	Impaired Parameters ²	Year Last Assessed
Siletz River	Roy Creek to Rock Creek	Dissolved Oxygen, year round Dissolved Oxygen, spawn Turbidity Temperature, year round Temperature, spawn Alkalinity	2022
Siletz River	Rock Creek to Confluence of North and South Forks of the Siletz River	Dissolved Oxygen, spawn Turbidity Temperature, year round Temperature, spawn Alkalinity	2022
South Fork Siletz River	Rogers Creek to Siletz River	Bio Criteria	2010
South Fork Siletz River	Sand Creek to Rogers Creek	Bio Criteria Temperature, year round	2010
Rock Creek	Siletz River to Confluence of Big Rock and Little Rock Creek	Temperature, year round Temperature, spawn	2022

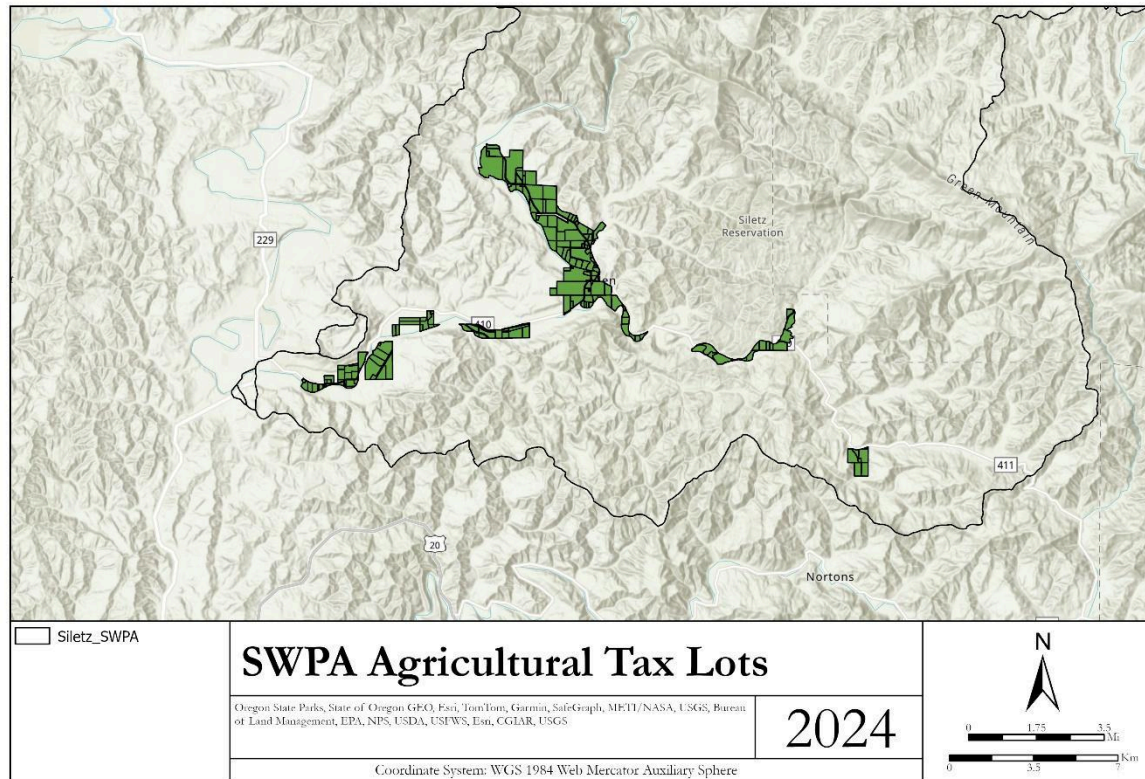
NOTES:

- (1) Source: DEQ (2022)
- (2) "Year round" indicates that the surface water body is impaired for the parameter all year. "Spawn" indicates that the surface water body is impaired during the spawning date range for active salmon and steelhead spawning, or any additional assumed spawning by resident trout species. Violation of the spawning criteria is in effect only during the applicable spawning date range (DEQ, 2020).

The impairments listed in Table 2 affect beneficial uses of the Siletz River, including fish and aquatic life and private/public domestic water supply. Specifically, drinking water intakes are potentially impacted by elevated turbidity. Fish and aquatic life are potentially impacted by temperature, dissolved oxygen, and turbidity. (GSI, 2023).

Resource Analysis and Source Assessment

Extent of Agricultural Commodities in Project Area



The majority of farms in the county are considered small by standards of the region. Farmers in Lincoln County largely have a diversified production system where they manage livestock and crops. County assessor data indicated that 25% of farms in Lincoln County are in the Siletz Watershed.

The 2017 USDA Census of Agriculture for Lincoln County highlighted the top crops by acres as Forage (hay/haylage) with over 2500 acres followed by Cultivated Christmas Trees. The livestock inventory calculated 2,993 cattle and calves with the second most livestock being goats at 621. Exact numbers for the SWPA are difficult to ascertain, however the primary crop and livestock species of the county are representative of the SWPA.

Within the project area agricultural commodities primarily include timber, livestock (cattle), and hay. Fruit production is primarily located below the SWPA, however at the time of this assessment several producers have begun installing orchards. As new farmers from other regions move into the area the commodities may change.

Current Level of Treatment and Producer Participation

Implementation of conservation practices in the MidCoast are largely based on relationships with landowners and with the understanding of the geographic constraints that put practices in conflict with producer needs. Each of the bundles of treatment options below provide current treatment and the balance of treatment with producer participation.

Riparian Tree and Shrub Planting

Current treatment in the SWPA is limited primarily to public (local and state), private industrial, and tribal owned properties. Agricultural and small woodland properties in the SWPA are receiving relatively little treatment due primarily to a lack of funding and gap in outreach for several years.

Outreach and implementation of projects by The District over the last year has increased participation significantly although implementation has been slow due to a lack of funding. The District currently has a Focus Area in the Siletz Watershed that will be transitioning to a Strategic Implementation Area (SIA) in 2026. This shift will provide the District with \$120,000 of Technical Assistance and Outreach funding. The SIA will also provide additional funding opportunities for conservation practices that improve water quality on agricultural lands to match future EQIP contracts.

Current treatment in Little Rock Creek watershed includes 17.9 ac of Tree/Shrub Establishment (612), 16 ac of Brush Management (314), and 1.9 ac of Herbaceous Weed Treatment (315) along a section of stream restoration on Big and Little Rock Creek near the Tribal Fish Hatchery.

A community farm in Sam Creek - Siletz River sub watershed completed installation of a High Tunnel (325) through an NRCS EQIP contract in 2023 and are working on a conservation plan for EQIP or CSP funding to help with planned Cover Crop (340), Mulching (484), and Conservation Crop Rotation (328) on the 5-ac farmed part of the property, as well as Tree/Shrub Establishment (612), Wildlife Habitat Planting (420), beaver dam analogs (643), and Upland Wildlife Habitat Management (645) on the forested/wetland parts of the property that aren't in agricultural production.

One agricultural landowner in the Big Rock Creek - Rock Creek sub watershed has worked with NRCS through EQIP in the last couple years to implement a High Tunnel (325) to help produce more food for local markets. They also have streamside property (pasture/hayland) with degraded riparian areas and may be open to future riparian planting projects.

The District and partners continue restoration activities on state and private lands following large woody debris installations on Long Prairie and Sam Creek. Riparian tree and shrub planting in reed canary grass meadows continues with over 15 acres of restoration to be completed over the next several years.

Producers are reluctant to implement riparian revegetation due to a historic placement of agricultural land on the valley bottom between deeply sloped forested upland that would eliminate a significant portion of the productive acres. While the desired riparian buffer is between 50 and 100 ft., it has been the experience of the District and partners that by allowing as small as a 35 ft. buffer can provide water quality benefit while meeting producer's needs.

Livestock Exclusion Fencing

Currently, the District is requesting funding from the OWEB Small Grant Program to install approximately 2000 linear feet of livestock exclusion fencing that would expand the current exclusion area from 5 feet away from the creek to an average of 30 feet distance.

Producers in the SWPA are familiar with large amounts of seasonal precipitation that provides ample water for livestock watering. Due to the lack of deep wells and consistent groundwater, surface waters are typically used for livestock watering year-round or between the months of June and October when wells and groundwater springs have dried up and not yet been recharged. To allow for the exclusion of livestock from surface waters, to meet desired water quality standards, additional assistance in the form of Spring Enhancement and off-channel watering will be needed as an accompanying practice to fencing.

Nutrient Management Planning and Manure Storage Facilities

Currently, one Nutrient Management Plan is being developed in the SWPA in the Sam Creek sub watershed. Once that plan has been completed the development of a manure storage facility design will be completed by the District.

One agricultural landowner in the Dewey Creek - Siletz River sub watershed has worked with NRCS over the last 20 years on conservation plans through several EQIP and CSP contracts to implement a Comprehensive Nutrient Management Plan (100) and Composting Facilities (317), as well as Roof Runoff Structures (558), Underground Outlet (620), Pumping Plant (533), Watering Facilities (614), Livestock Pipeline (516), Heavy Use Area Protection (561), Fence (382), Prescribed Grazing (528), Pasture and Hay Planting (512), and Tree/Shrub Establishment (612).

Three small agricultural landowners in the Mill Creek - Siletz River sub watershed have worked with NRCS through EQIP in the last couple years to implement High Tunnels (325), Cover Crop (340), Mulching (484), Conservation Cover (327), and/or Hedgerow (422) to help improve soil health, pollinator habitat, and produce more food for local markets.

The desire by other producers to understand and properly manage nutrients is strong. There is little resistance to these practices, however the high cost of plans, designs, and eventual implementation keeps most from moving ahead.

Forest Resiliency and Health

CTSI has 2 active and 3 completed EQIP contracts in the Siletz Basin from the last 11 years, which include a total of 2,787 acres of pre-commercial thinning (666) on Tribal Forest lands.

One priority timber conservation property within 2 miles of the intakes is currently working with NRCS for the development of a Forest Management Plan (106) and Forest Management Practice Design (165) on 70 acres through EQIP.

One timber conservation property in the Little Rock Creek sub watershed is currently working with NRCS on the development of a Forest Management Plan (106) and Forest Management Practice Design (165) on 287 acres through EQIP.

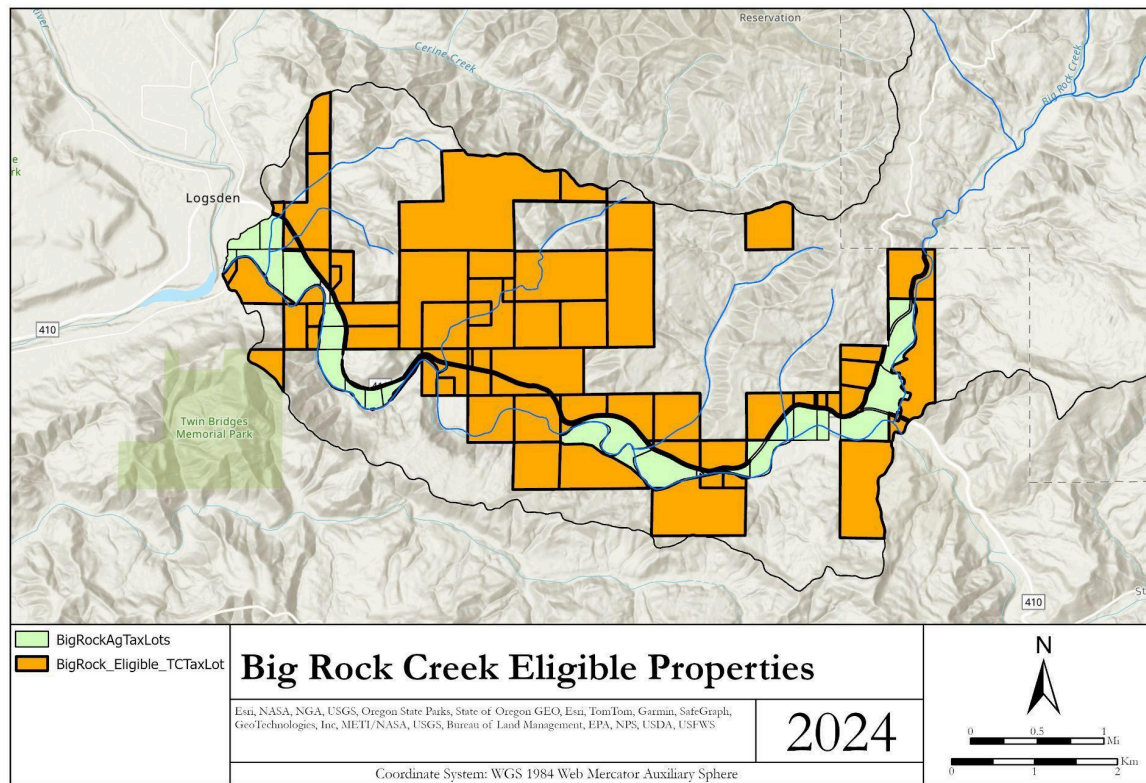
One agricultural landowner in the Mill Creek sub watershed is developing a conservation plan for a hedgerow and conservation cover for habitat improvement through EQIP.

Critical Areas of Concern

AU_Name	HUC_12	HU_12_NAME	Pollutant	Assessment	Period
Rock Creek	171002040602	Big Rock Creek-Rock Creek	Temperature	Temperature - Numeric	year-round
Rock Creek	171002040602	Big Rock Creek-Rock Creek	Temperature	Temperature - Numeric	spawn
Siletz River	171002040502	Mill Creek-Siletz River	Dissolved Oxygen	Dissolved Oxygen	spawn
Siletz River	171002040502	Mill Creek-Siletz River	Turbidity	Narrative Criteria for Turbidity	
Siletz River	171002040502	Mill Creek-Siletz River	Temperature	Temperature - Numeric	year-round
Siletz River	171002040502	Mill Creek-Siletz River	Temperature	Temperature - Numeric	spawn
Siletz River	171002040502	Mill Creek-Siletz River	Alkalinity	Toxic Substances - Aquatic Life	

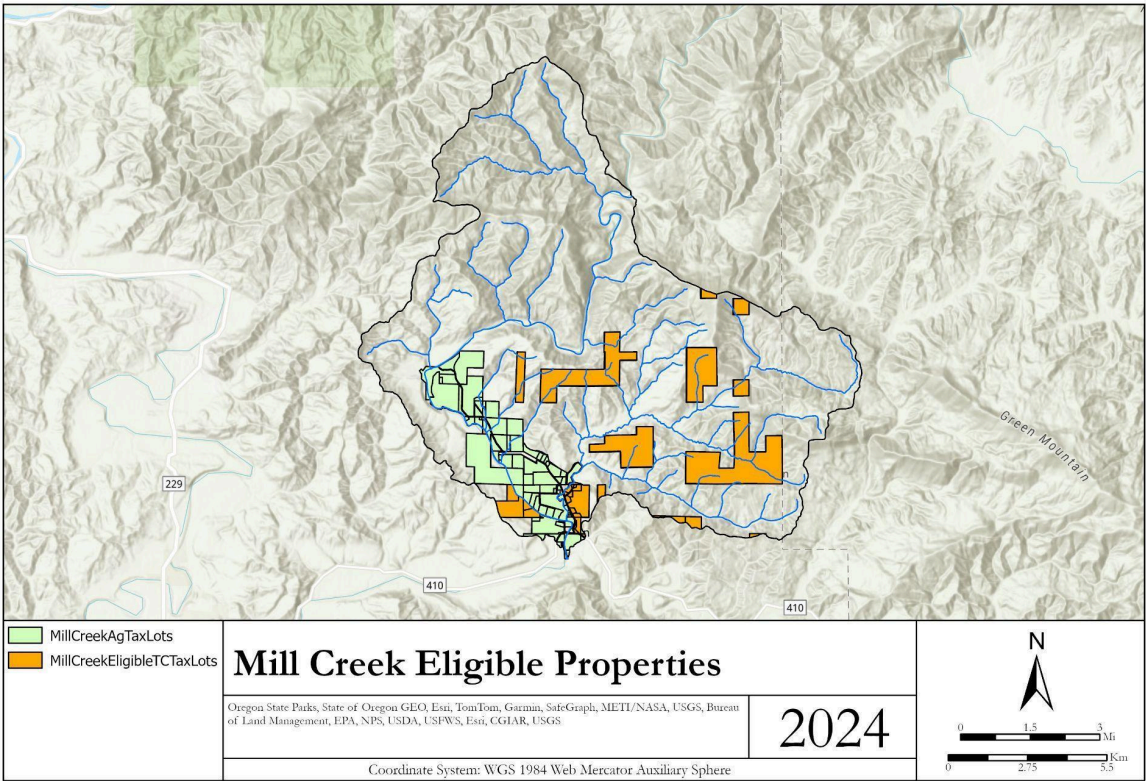
The primary Critical Areas of Concern include the Big Rock Creek-Rock Creek sub watershed and the Mill Creek-Siletz sub watershed. Additional areas of concern include the known biosolids application sites and non-industrial timber properties within 2 miles of the drinking water intakes.

Big Rock Creek-Rock Creek



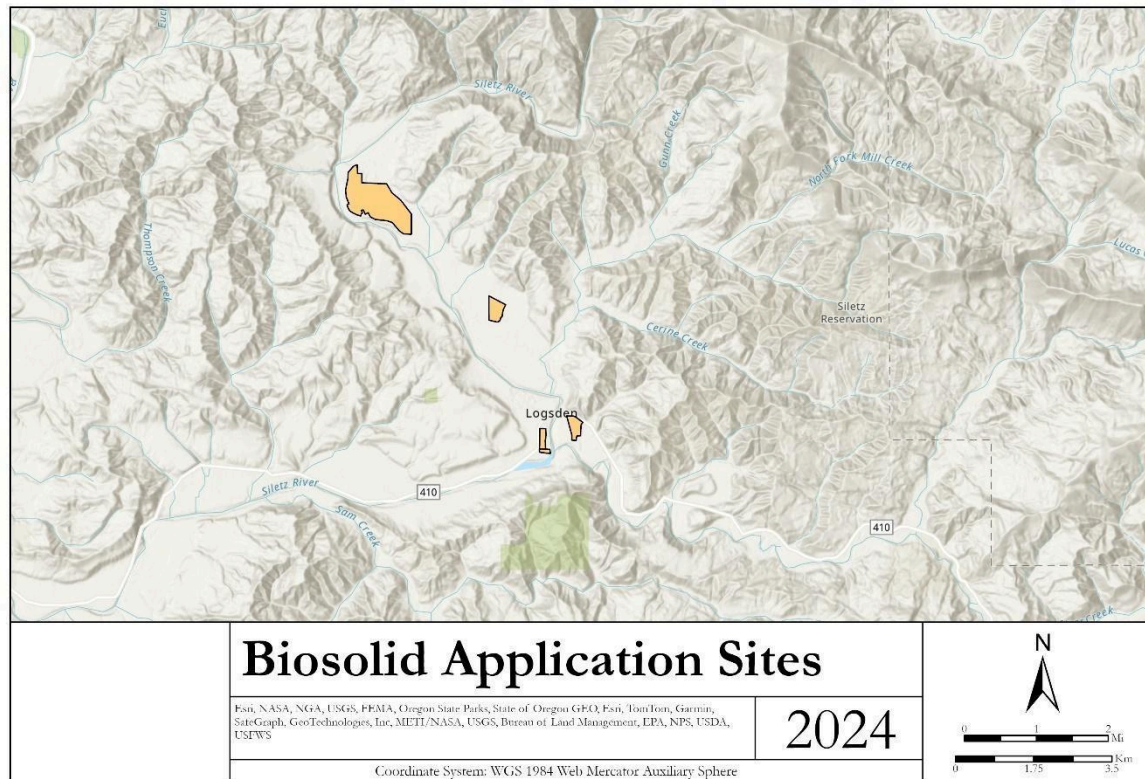
All of the agricultural tax lots within Big Rock Creek have surface water interconnections where conservation practice implementation may improve water quality. The upper watershed is held by industrial timber ownership and is ineligible for this project. In the lower watershed many non-industrial timber properties are eligible for conservation practices.

Mill Creek-Siletz River



The mainstem Mill Creek contains many eligible agricultural properties with riparian frontage. Non-industrial timber properties are more sporadic and have not been individually assessed for potential conservation practice implementation.

Biosolids Application Sites



According to information provided by DEQ, there are four known biosolid application sites within the SWPA, covered by four different permits.

NPDES Permit No. 102497 lists 33 total dry tons applied over 11.9 acres at one site which lies between Baker Creek and an unnamed tributary. Aerial imagery and observations from the road show that Baker Creek, while somewhat lacking in vegetative cover, is not suffering significant erosion based on aerial imagery and is located on the edge of the property. The unnamed tributary has very little vegetative cover, runs approximately 640 feet through the center of the property, and appears to be experiencing heavy erosion. Recommendations for this property include the implementation of a Nutrient Management Plan and planting of erosion-controlling native vegetation along any riparian areas within the property.

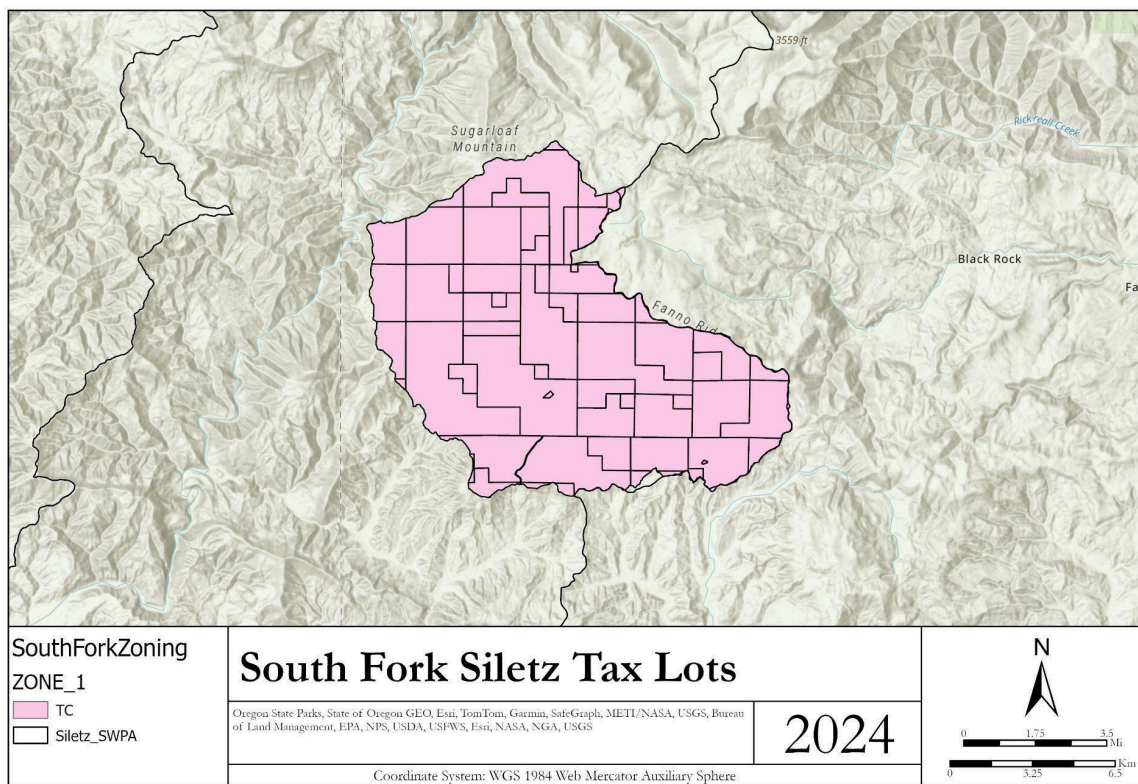
NPDES Permit No. 101383 lists 40.55 total dry tons applied over 35 acres. This property borders the Siletz River for approximately 3,500 feet. Approximately 550 feet of this length appears to be suffering from heavy erosion and lack of vegetation. Recommendations for this property include the implementation of a Nutrient Management Plan and planting of erosion-controlling native vegetation along the 550-foot stretch of streambank suffering from excessive erosion.

NPDES Permit No. 101713 lists 8.84 total dry tons applied over 7.1 acres. The application area borders an unnamed tributary of Rock Creek, which enters into the river 1,480 feet upstream of its confluence with the Siletz. Based on aerial imagery and observations from the road, the 950-foot stretch of this

tributary which runs through the application area is marked by Himalayan blackberry-dominated understory and at least two highly eroded cattle crossings. Recommendations for this property include the implementation of a Nutrient Management Plan, installation of hardened cattle crossings, and riparian restoration along the Rock Creek tributary to replace Himalayan blackberry with erosion-controlling native vegetation.

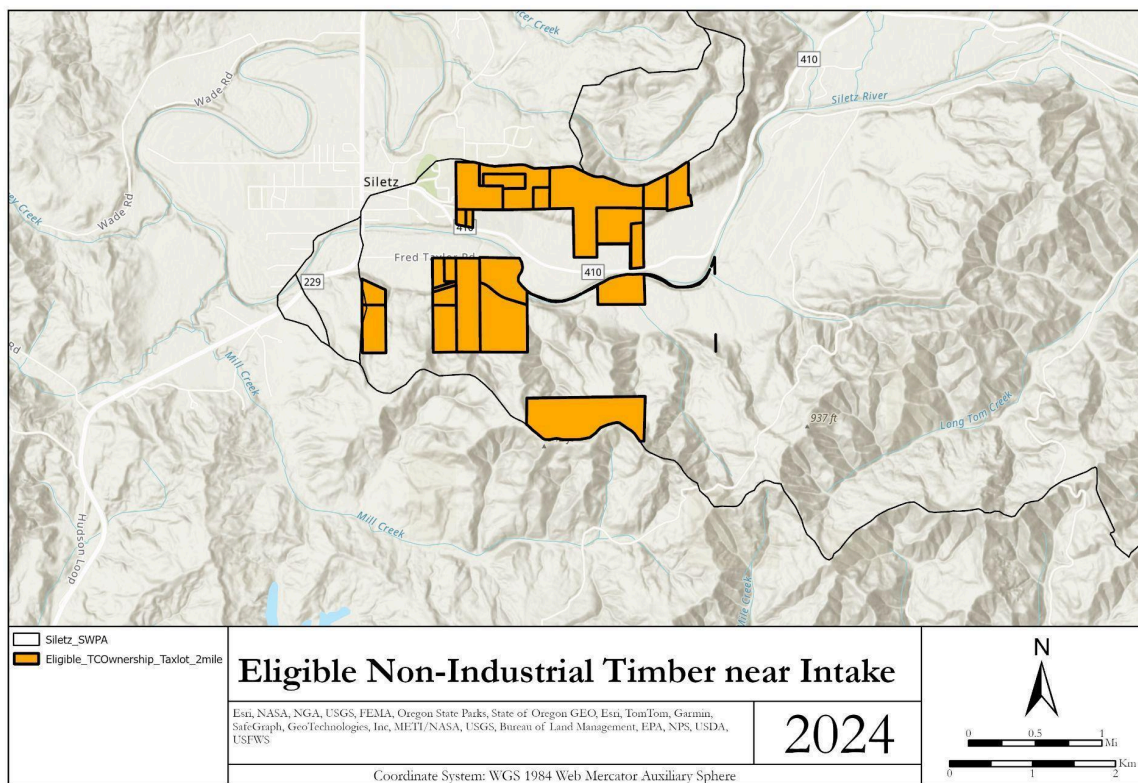
NPDES Permit No. 101269 lists 1.56 total dry tons applied over 1.74 acres. This application site is located on the opposite side of Logsdan Road from the Siletz River and it is unclear if there is direct surface water drainage from the property to the river. However, several retention ponds exist on the property, one of which lies within 230 feet of the Siletz River. Aerial imagery suggests that while the retention pond in closest proximity to the river may be sufficiently vegetated, other ponds on the property appear to lack vegetation buffers. Recommendations for this property include the implementation of a Nutrient Management Plan and ensuring that sufficient vegetation buffers are present around bodies of water on the property to allow for filtration of biosolid runoff.

South Fork Siletz River



A brief assessment of the South Fork Siletz tax lots revealed no non-industrial timber operations. While this area is of critical concern due to water quality impairments outlined in the 2022 DEQ Integrated Report, there are currently no eligible properties for NRCS funding.

Non-Industrial Timber Properties near Intakes



Non-industrial timber conservation properties in close proximity to drinking water intakes are a critical area of concern for forest management planning, riparian buffer planting, and upland habitat management to decrease sediment inputs to surface waters. The proximity of these properties to the intake decreases the available time for the treatment facilities to shut off equipment during high sediment events.

Analysis of Treatment Opportunities

In determining treatment opportunities in the Critical Areas of Concern, the District used a Streamside Vegetation Assessment of riparian conditions completed in 2021. The geospatial analysis of streamside vegetation focused on identifying areas with bare ground, grass, agricultural grass, and tree/shrub within 50 feet of major waterways within the Siletz. Compiled as part of the District's Siletz Focus Area, the assessment primarily targeted agricultural areas of opportunity. Through the use of geospatial analysis of eligible timber conservation properties within the SWPA select timber conservation properties have been identified for forestry related conservation opportunities.

Big Rock Creek-Rock Creek

Agricultural Property Treatment Opportunities

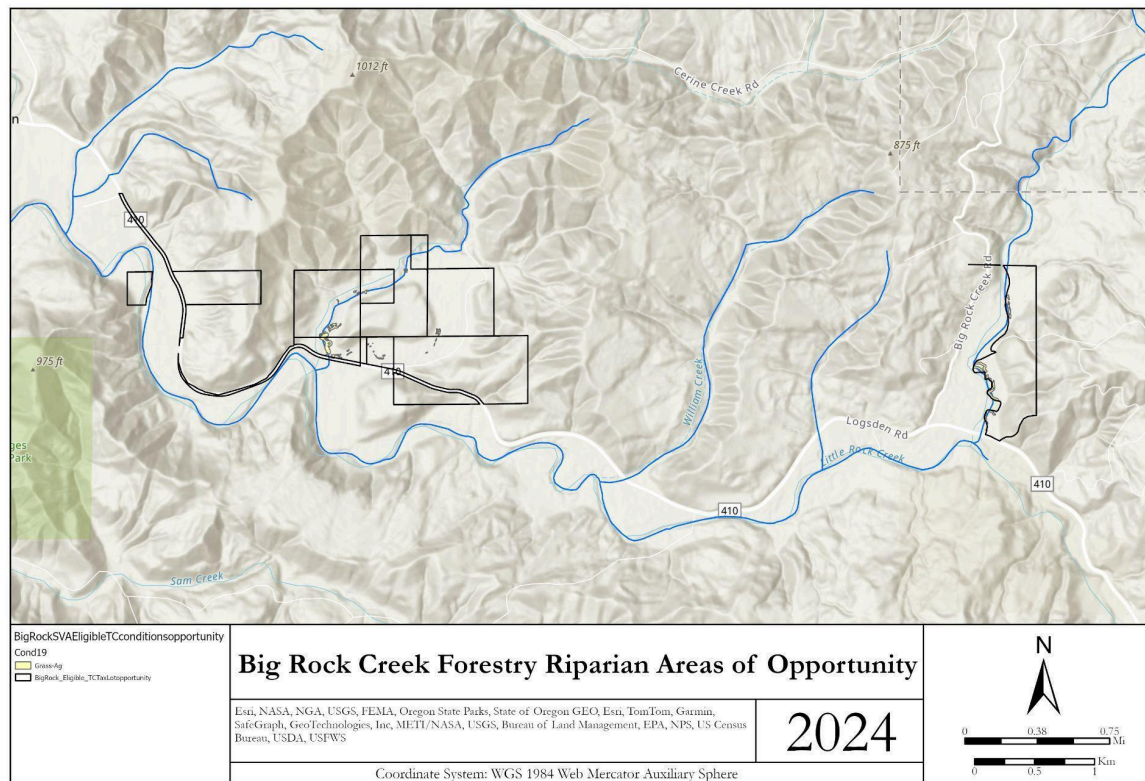


The Big Rock Creek agricultural areas of treatment opportunity for riparian restoration were determined by identifying bare ground, grass, and agricultural grass vegetation cover on eligible agricultural tax lots within the SWPA (SVA, 2021). The 50 ft. riparian buffer utilized in this analysis is consistent in meeting the needs of source water protection while also accommodating producer needs.

Riparian tree and shrub planting on approximately 14.1 acres in Big Rock Creek would be needed to meet the goals of this assessment and partner's needs. The treatment of these areas would provide approximately 2 miles of streamside shade on 17 individual tax lots.

Areas of bare agriculture were used to identify potential locations for livestock exclusion fencing. These areas were then field verified to determine livestock use. Based on geospatial and field site visits approximately 500 linear feet of livestock exclusion fencing would be needed to meet the sediment and bacteria reduction goals for livestock exclusion.

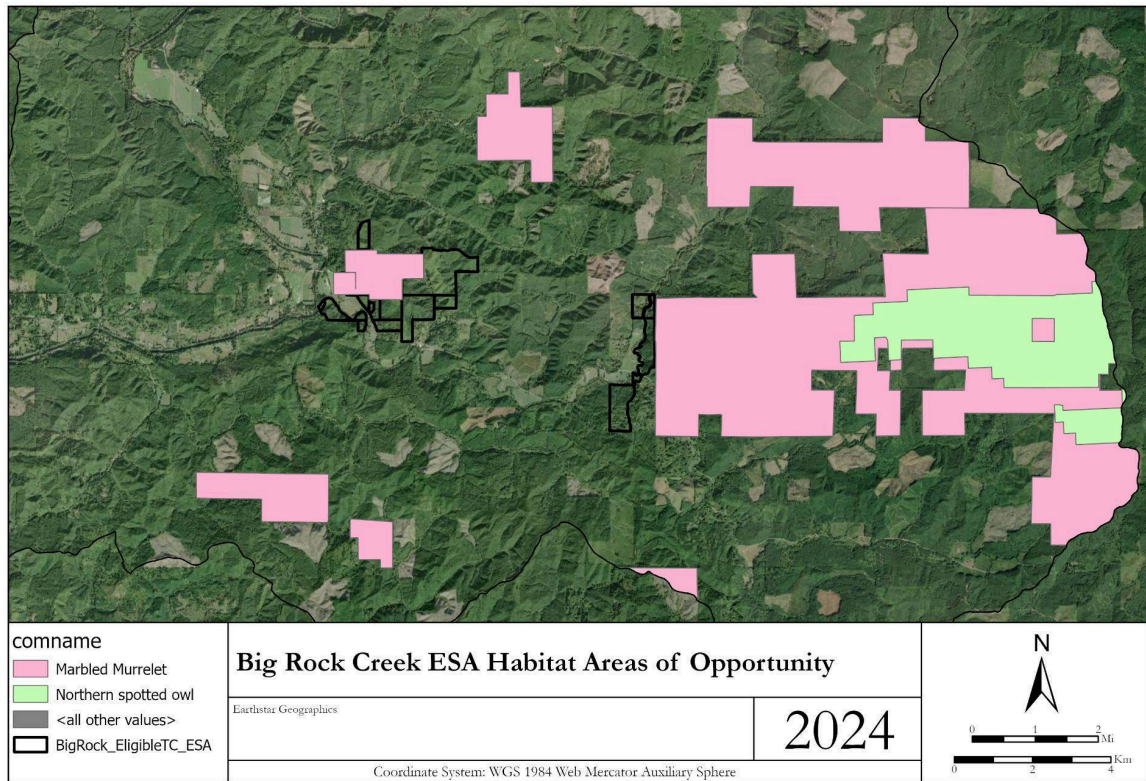
Non-Industrial Timber Property Treatment Opportunities



The Big Rock Creek non-industrial timber areas of treatment opportunity for riparian restoration were determined by identifying bare ground, grass, and agricultural grass vegetation cover on eligible agricultural tax lots within the SWPA (SVA, 2021). The 50 ft. riparian buffer utilized in this analysis may provide low estimates for potential acreage of opportunity. This is in part due to the ongoing implementation of the Private Forest Accord, which will require large riparian buffers and harvesting exclusion zones to improve aquatic habitat.

Riparian tree and shrub planting on approximately 7.5 acres in Big Rock Creek would be needed to meet the goals of this assessment and partner's needs. The treatment of these areas would provide approximately 1.2 miles of streamside shade on 11 individual tax lots.

Upland Forest Improvement Opportunities

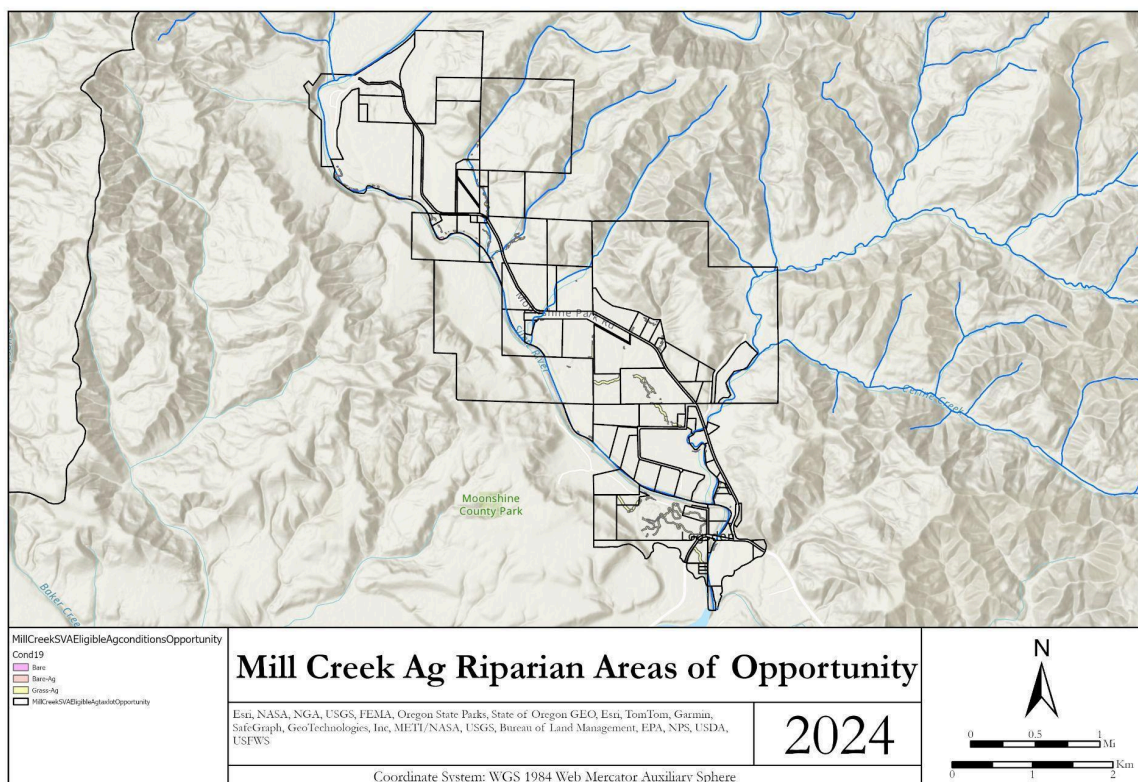


The Big Rock Creek non-industrial timber areas of treatment opportunity for upland forest improvement were determined by selecting eligible timber conservation properties within $\frac{1}{4}$ mile of known critical habitat for ESA listed species (marbled murrelet and northern spotted owl) in the SWPA.

A total of 21 tax lots were identified as potential locations for treatment. The tax lots total approximately 1190 acres.

Mill Creek-Siletz River

Agricultural Property Treatment Opportunities

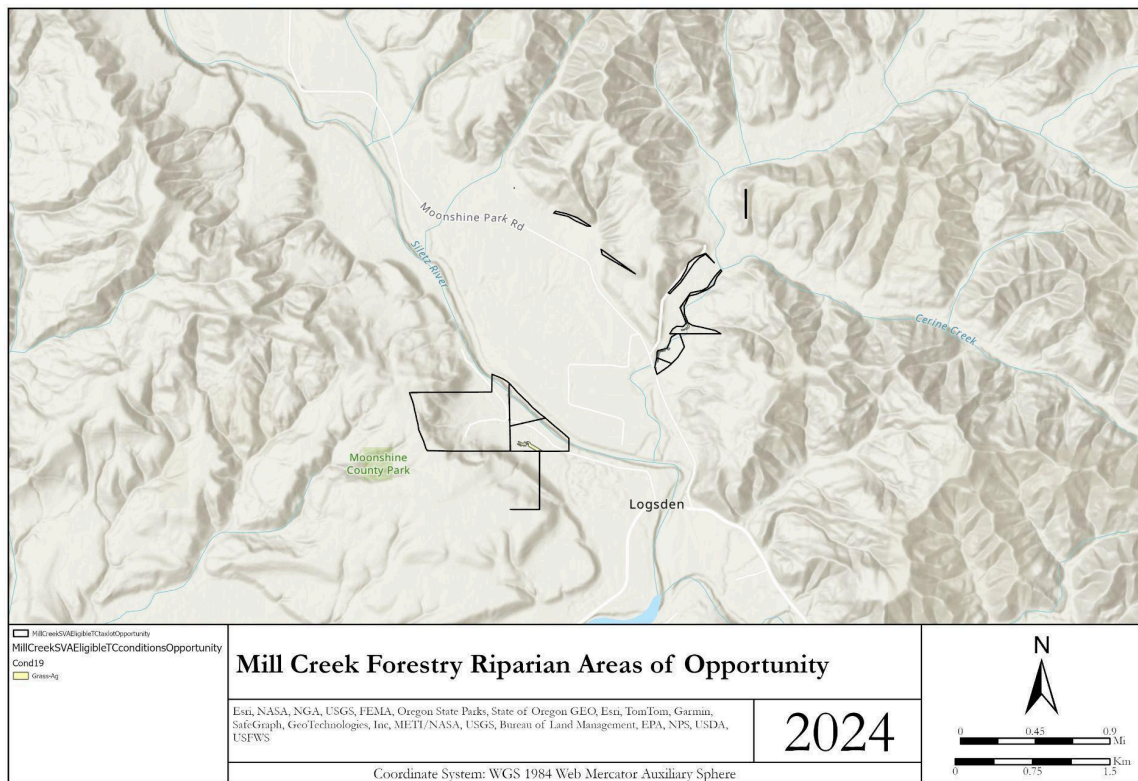


The Mill Creek agricultural areas of treatment opportunity for riparian restoration were determined by identifying bare ground, grass, and agricultural grass vegetation cover on eligible agricultural tax lots within the SWPA (SVA, 2021). The 50 ft. riparian buffer utilized in this analysis is consistent in meeting the needs of source water protection while also accommodating producer needs.

Riparian tree and shrub planting on approximately 22.7 acres in Mill Creek would be needed to meet the goals of this assessment and partner's needs. Approximately 1.5 acres were identified as having bare ground in the riparian buffer. These areas will be the priority for treatment within the CAC. The treatment of these areas would provide approximately 2.4 miles of streamside shade on 51 individual tax lots.

Areas of bare agriculture were used to identify potential locations for livestock exclusion fencing. These areas were then field verified to determine livestock use. Based on geospatial and field site visits approximately 3600 linear feet of livestock exclusion fencing would be needed to meet the sediment and bacteria reduction goals for livestock exclusion.

Non-Industrial Timber Property Treatment Opportunities



The Mill Creek non-industrial timber areas of treatment opportunity for riparian restoration were determined by identifying bare ground, grass, and agricultural grass vegetation cover on eligible agricultural tax lots within the SWPA (SVA, 2021). The 50 ft. riparian buffer utilized in this analysis may provide low estimates for potential acreage of opportunity. This is in part due to the ongoing implementation of the Private Forest Accord, which will require large riparian buffers and harvesting exclusion zones to improve aquatic habitat.

Riparian tree and shrub planting on approximately 3.4 acres in Mill Creek would be needed to meet the goals of this assessment and partner's needs. The treatment of these areas would provide approximately 0.5 miles of streamside shade on 6 individual tax lots.

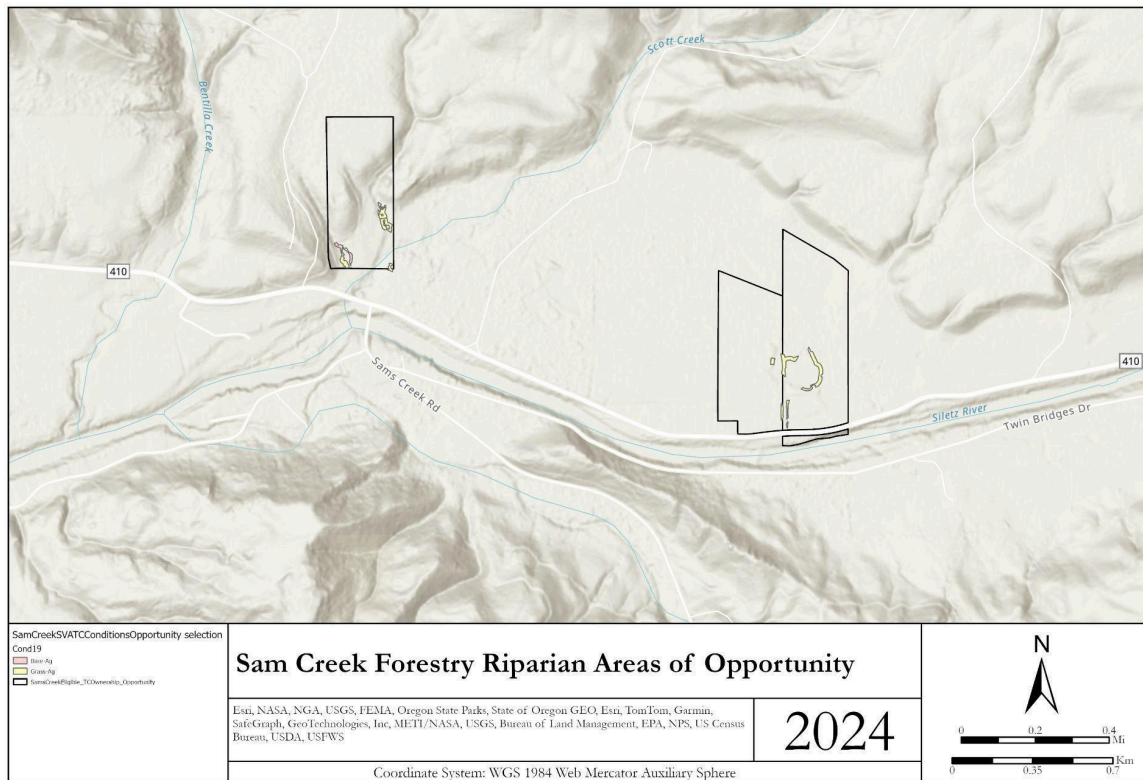
Sam Creek Siletz

Agricultural Property Treatment Opportunities

The Sam Creek agricultural areas of treatment opportunity for riparian restoration were determined by identifying bare ground, grass, and agricultural grass vegetation cover on eligible agricultural tax lots within the SWPA (SVA, 2021). The 50 ft. riparian buffer utilized in this analysis is consistent in meeting the needs of source water protection while also accommodating producer needs.

Within the eligible agricultural areas in Sam Creek Siletz no areas of bare ground, grass, or agricultural grass vegetation cover were identified. Opportunities for improving riparian vegetation cover through diversification of land species and expansion of the buffer size may increase the needs for treatment.

Non-Industrial Timber Property Treatment Opportunities



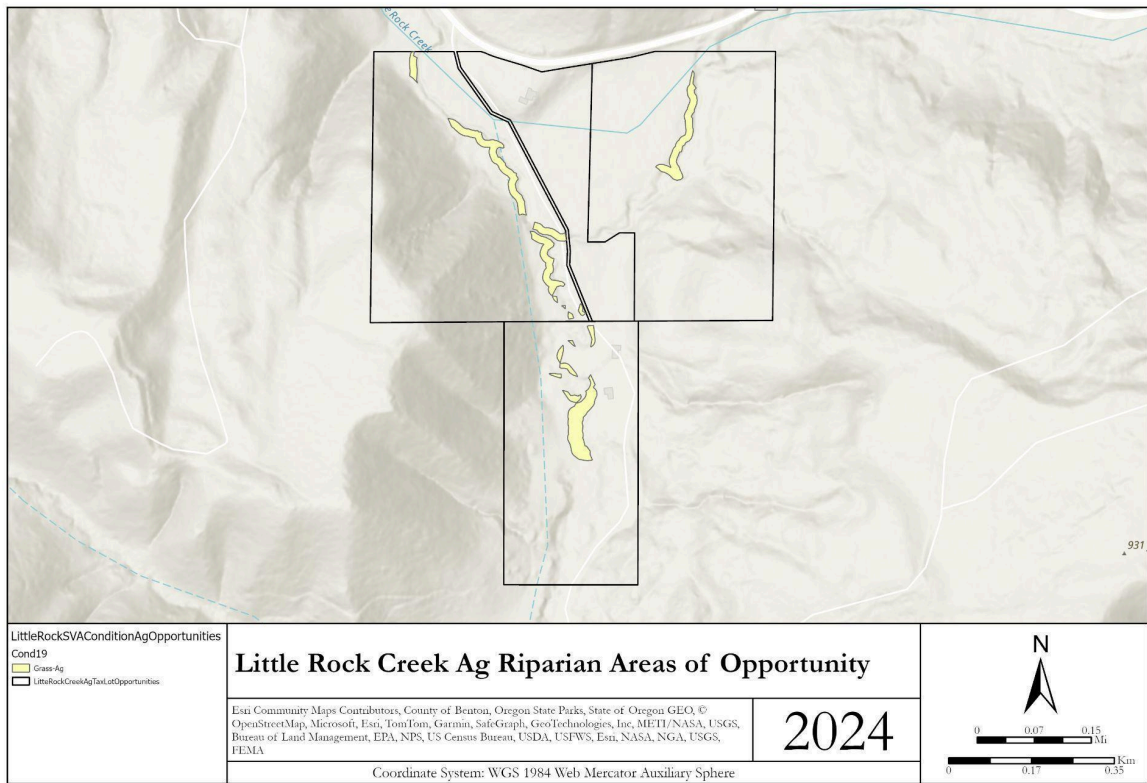
The Sam Creek sub watershed non-industrial timber areas of treatment opportunity for riparian restoration were determined by identifying bare ground, grass, and agricultural grass vegetation cover on eligible agricultural tax lots within the SWPA (SVA, 2021). The 50 ft. riparian buffer utilized in this analysis may provide low estimates for potential acreage of opportunity. This is in part due to the ongoing implementation of the Private Forest Accord, which will require large riparian buffers and harvesting exclusion zones to improve aquatic habitat.

Riparian tree and shrub planting on approximately 3.76 acres in Sam Creek sub watershed would be needed to meet the goals of this assessment and partner's needs. The treatment of these areas would provide approximately 0.5 miles of streamside shade on 3 individual tax lots.

Areas of bare agriculture were used to identify potential locations for livestock exclusion fencing. These areas were then field verified to determine livestock use. Based on geospatial and field site visits approximately 700 linear feet of livestock exclusion fencing would be needed to meet the sediment and bacteria reduction goals for livestock exclusion.

Little Rock Creek

Agricultural Property Treatment Opportunities

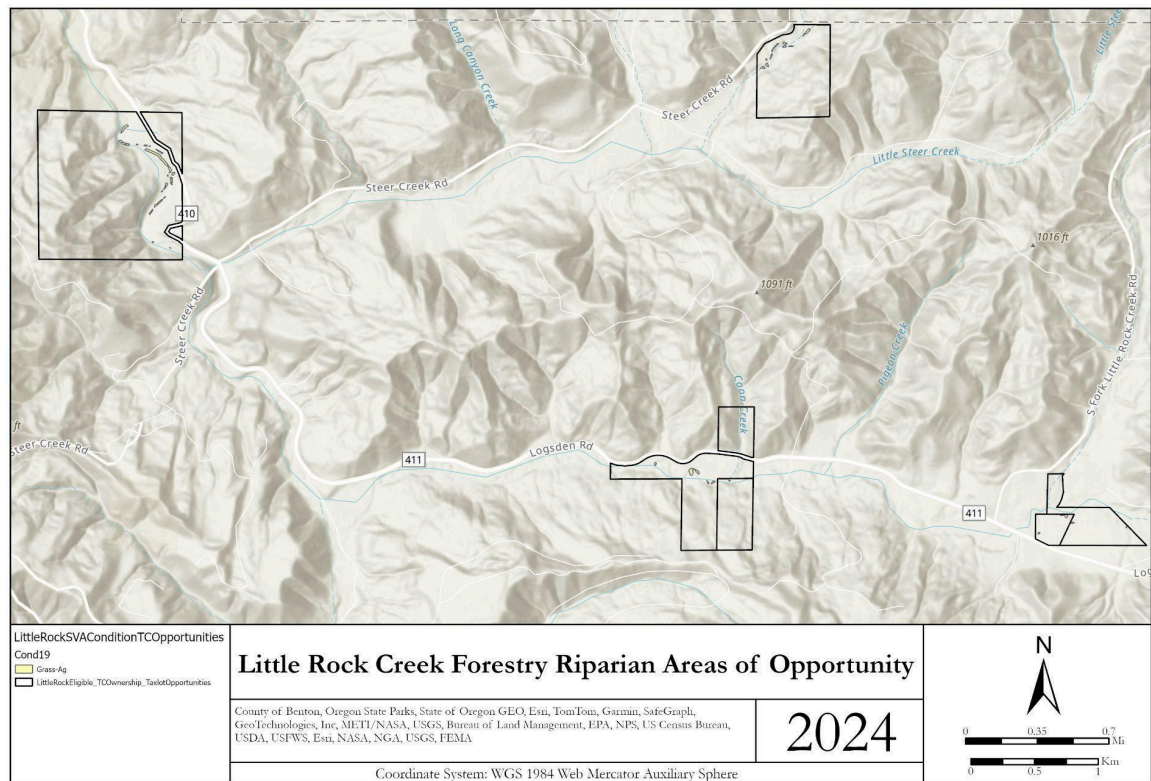


The Little Rock Creek sub watershed agricultural areas of treatment opportunity for riparian restoration were determined by identifying bare ground, grass, and agricultural grass vegetation cover on eligible agricultural tax lots within the SWPA (SVA, 2021). The 50 ft. riparian buffer utilized in this analysis is consistent in meeting the needs of source water protection while also accommodating producer needs.

Riparian tree and shrub planting on approximately 2.7 acres in Little Rock Creek sub watershed would be needed to meet the goals of this assessment and partner’s needs. Approximately 0.5 acres were identified as having bare ground in the riparian buffer. These areas will be the priority for treatment within the CAC. The treatment of these areas would provide approximately 0.94 miles of streamside shade on 3 individual tax lots.

No areas of bare agriculture were used to identify potential locations for livestock exclusion fencing. However, based on geospatial and field site visits, approximately 600 linear feet of livestock exclusion fencing would be needed to meet the sediment and bacteria reduction goals for livestock exclusion.

Non-Industrial Timber Property Treatment Opportunities



The Little Rock Creek sub watershed non-industrial timber areas of treatment opportunity for riparian restoration were determined by identifying bare ground, grass, and agricultural grass vegetation cover on eligible agricultural tax lots within the SWPA (SVA, 2021). The 50 ft. riparian buffer utilized in this analysis may provide low estimates for potential acreage of opportunity. This is in part due to the ongoing implementation of the Private Forest Accord, which will require large riparian buffers and harvesting exclusion zones to improve aquatic habitat.

Riparian tree and shrub planting on approximately 2.9 acres in Little Rock Creek sub watershed would be needed to meet the goals of this assessment and partner's needs. The treatment of these areas would provide approximately 0.8 miles of streamside shade on 6 individual tax lots.

Dewey Creek

Agricultural Property Treatment Opportunities

The Dewey Creek sub watershed agricultural areas of treatment opportunity for riparian restoration were determined by identifying bare ground, grass, and agricultural grass vegetation cover on eligible agricultural tax lots within the SWPA (SVA, 2021). The 50 ft. riparian buffer utilized in this analysis is consistent in meeting the needs of source water protection while also accommodating producer needs.

Riparian tree and shrub planting on approximately 1.9 acres in Dewey Creek sub watershed would be needed to meet the goals of this assessment and partner's needs. Approximately .1 acres were identified as having bare ground in the riparian buffer. These areas will be the priority for treatment within the CAC. The treatment of these areas would provide approximately 0.81 miles of streamside shade on 7 individual tax lots.

Areas of bare agriculture were used to identify potential locations for livestock exclusion fencing. These areas were then field verified to determine livestock use. Based on geospatial and field site visits no livestock are crossing in the bare ground areas.

Non-Industrial Timber Property Treatment Opportunities

The Dewey Creek sub watershed non-industrial timber areas of treatment opportunity for riparian restoration were determined by identifying bare ground, grass, and agricultural grass vegetation cover on eligible agricultural tax lots within the SWPA (SVA, 2021). The 50 ft. riparian buffer utilized in this analysis may provide low estimates for potential acreage of opportunity. This is in part due to the ongoing implementation of the Private Forest Accord, which will require large riparian buffers and harvesting exclusion zones to improve aquatic habitat.

No non-industrial timber properties were identified for riparian restoration treatment based on the SVA.

Within the Dewey Creek sub watershed there are 32 individual non-industrial timber tax lots within 2 miles of the source water intakes. These properties total 1105 acres that could impact the source water intakes due to proximity. Available treatment in these locations should include forest management planning and implementation of riparian and upland restoration.

A geospatial analysis of tributaries within the tax lots near the intakes indicates that over 4400 linear feet of stream run through 6 individual tax lots. Riparian restoration and improvement to stabilize soils with proper vegetation will help to meet the goals of the assessment.



Preferred Practices, Locations, Responsible Parties, Costs, Timelines

An evaluation of project goals and objectives was completed with the District Conservationist to determine the preferred practices. Locations for these practices have been identified in the assessment with priority given to producers and lands within identified Critical Areas of Concern.

Practice Name	Practice Number	No/Ac/Ft	SWPA	Average Cost	Total Need
Comprehensive Nutrient Management Plan	102	Number	12	\$5,008.75	\$60,105.00
Forest Management Plan	106	Number	10	\$1,966.65	\$19,666.50
Forest Management Practice Design	165	Number	10	\$609.03	\$6,090.30
Brush Management	314	Acre	29	\$207.50	\$6,017.50
Herbaceous Weed Treatment	315	Acre	29	\$176.82	\$5,127.78
Composting Facility	317	Cubic Feet	42000	\$8.18	\$343,560.00
Riparian Herbaceous Cover	390	Acre	29	\$813.93	\$23,603.97
Roofs and Covers	367	Square Feet	7000	\$13.14	\$91,980.00
Fence (Woven Wire)	382	Linear Feet	5400	\$5.58	\$30,132.00
Woody Residue Treatment	384	Acres	20	\$91.80	\$1,836.00
Riparian Forest Buffer	391	Acre	59	\$4,453.58	\$262,761.22
Tree/Shrub Site Preparation	490	Acre	58	\$1,251.03	\$72,559.74
Livestock Pipeline	516	Feet	10000	\$3.89	\$38,900.00
Roof Runoff Structure	558	Linear Feet	12000	\$11.28	\$135,360.00
Heavy Use Area Protection	561	Square Feet	10000	\$2.22	\$22,200.00
Nutrient Management	590	Acre	40	\$38.14	\$1,525.60
Watering Facility	614	Gallons	1800	\$9.41	\$16,938.00
Underground Outlet	620	Feet	1000	\$9.82	\$9,820.00
Upland Wildlife Habitat Management	645	Acre	20	\$12.44	\$248.80
Forest Stand Improvement	666	Acre	20	\$496.38	\$9,927.60
Beaver	643	Linear Feet	200	\$39.12	\$7,824.00
Stream Crossings	578	Square Feet	1500	\$22.14	\$33,210.00

Summary and Recommendation

Summary of Resource Concerns and Impairments

Sediment and nutrient inputs to surface waters of the SWPA from agricultural activities provide opportunities for improvement of water quality. Sediment and bacteria (E. coli) inputs from agricultural activities are linked to livestock access to surface waters for drinking and passage. A lack of off stream watering infrastructure and fencing is present across the watershed allowing free passage of livestock.

With over 75% of the total acreage of the SWPA under industrial timber, the acreage of eligible non-industrial timber properties is located toward the lower portion of the watershed. Timber operations in the SWPA are characterized by steep slopes with erodible soils. These areas are susceptible to mass wasting and soil loss from clear cutting practices, improper BMPs, and lack of forest management planning that are common.

The land use of the SWPA provides limited habitat for wildlife such as beaver, Coho Salmon, the Marbled Murrelet, and the Northern Spotted Owl. The aquatic habitat for beaver and Coho Salmon is important ecologically and can provide both economic and water quality benefits. Marbled Murrelet and Northern Spotted Owl require old growth tree habitat. Old growth trees provide shade and decrease the overall loss of water through evapotranspiration.

As listed in the DEQ 2022 Integrated Report, there are several 303(d) Listed Waters in the SWPA impaired for temperature, sediment, and dissolved oxygen. This information frames the critical areas of concern of this report and priority areas for treatment to address impairments. The South Fork Siletz, while on the 303(d) List, does not have eligible properties for NRCS practice implementation at this time.

Description of Project Goals, Practice Efficiencies, and Metrics

Priority for implementation and goals will be in the Mill-Creek and Big-Rock Creek sub watersheds and within 2 miles of the intake. Effectively accomplishing these goals through District and partner outreach such as NGO meetings, conservation field days, community events, and participation in the Siletz Strategic Implementation Area will be critically important in the success of the project. Goals will be tracked through ArcGIS to spatially evaluate successes and continued opportunities. Practices implemented within the SWPA will be tracked and captured through continued District participation in the Mid-Coast Water Planning Partnership Source Water Protection subcommittee. Additional areas of opportunity identified by the Oregon Department of Agriculture through the Strategic Implementation area will be added to the geospatial database.

Goal: Work to implement conservation practices on at least half, 16, of the non-industrial timber properties within 2 miles of the drinking water intake.

Unit of Measure: Number of forestry conservation contracts funded.

Baseline Condition: There are 32 forestry properties within 2 miles of the drinking water intakes. As of the time of this report one of those properties was proceeding with a forest management plan.

How will the goal be assessed? Assessed at the end of the NWQI funding period as the total number of forestry contracts funded.

Goal: Fund and implement twenty forest management plans outside of the two mile radius of the drinking water intakes.

Unit of Measure: Number of forestry conservation contracts funded.

Baseline Condition: There are over 400 forestry properties within the SWPA. As of the time of this report several have or are working with NRCS on forest management plans.

How will the goal be assessed? Assessed at the end of the NWQI funding period as the total number of forestry management plan contracts funded.

Temperature changes in the watershed will likely not be measurable in the short term, however as part of this process the NRCS District Conservationist will conduct the Streamside Visual Assessment Protocol (SVAP2) to determine the change in riparian function over the course of each project. Continuous temperature monitoring at the confluence of Rock Creek and the Siletz, Mill Creek and the Siletz and Moonshine Park will continue from May through October for the foreseeable future to address temperature impairments for Coho salmon spawning.

Sediment reduction efficacy will be determined by the conversion from bare ground and grass in the 50ft. buffer in the 2027-2029 biennium using the same Streamside Vegetation Assessment protocol used to determine vegetation cover in this assessment. Total Suspended Solids (TSS) and Turbidity monitoring at the confluence of Rock Creek and the Siletz, Mill Creek and the Siletz and Moonshine Park monthly from May through October will help assess sediment reduction goals.

Goal: Work with landowners to implement riparian planting contracts to provide shade and streambank stabilization to reduce stream temperatures and sediment inputs from agricultural and forestry lands on 20 acres.

Unit of Measure: Number of acres of riparian planting.

Baseline Condition: There are approximately 40 acres designated as having bare ground based on the SVA on agricultural lands.

How will the goal be assessed? Assessed at the end of the NWQI funding period as the total number of riparian acres planted.

Bacteria (E. coli) reduction goals and practice efficiencies will be determined through bacteria grab sampling at the confluence of Rock Creek and the Siletz, Mill Creek and the Siletz and Moonshine Park will continue from May through October. Nutrient reduction goals and efficiencies will be determined by soil testing for nutrient levels (N-P-K) as part of the Comprehensive Nutrient Management practice to avoid application of excess nutrients.

Goal: Work with at least 10 livestock producers to implement conservation practices that reduce nutrients runoff to surface waters.

Unit of Measure: Number of contracts implemented

Baseline Condition: Currently, the District is unaware of any producers in the SWPA that have a Comprehensive Nutrient Management plan and are aware of the ability of the District to assist with conservation practices that address nutrient management.

How will the goal be assessed? Assessed at the end of the NWQI funding period as the total number of contracts funded that directly contribute to nutrient management reduction to surface waters.

Metrics used to track progress will require a large number of working hours to effectively and continuously track progress of the project. The District and partners participation in the Midcoast Water Planning Partnership will be vital to understanding progress across organizations. The continued monitoring of water quality parameters will be vital in understanding efficacy of installed conservation practices over time.

Evaluation of Practice Scenarios and Alternative to Meeting Water Quality Objectives

Implementation of avoiding, controlling and trapping practices will be vital in the success of meeting goals.

Core practice scenarios and components that will be especially important during the project implementation will include all cover and tree/shrub scenarios that control invasive weeds, reduce erosion, improve plant species diversity, and improve habitat.

Important practices in regard to livestock will be practices such as Comprehensive Nutrient Management Plan, Composting Facility, Roof Runoff Structure, Heavy Use Area Protection, Stream Crossing, and Underground outlet. Providing a plan of manure and nutrients produced with a facility to contain and compost materials will be vital in preventing nutrients from entering surface waters of the SWPA. Fencing, livestock pipeline, and watering facility practices will be necessary to mitigate livestock in-stream watering and passage. These practices will reduce bacteria and sediment inputs.

Forestry practices of importance include Forest Management Plan and Forest Management Practice Design to improve forest stand diversity and health, improve upland habitat, and reduce erosion. Forestry implementation practices of importance include Upland Wildlife Habitat Management, Forest Stand Improvement, Woody Residue Treatment, and Beaver Dam Analogs to increase water storage and build ecological resilience and health.

Refer to Siletz NWQI Budget for estimation of treatment cost.

Documentation of NEPA Concerns

Clean Air Act

The proposed conservation actions are not expected to increase the emission rate of any regulated air pollutants.

Clean Water Act

The proposed conservation actions are not likely to result in the discharge or placement of dredged or fill material or other pollutants into waters of the US. However, if a client is conducting an activity that

requires a 404 permit, then the client must obtain a section 404 permit or determination of exemption from the appropriate Corps office need to be obtained.

Actions are consistent with existing water quality or associated watershed action plans that have been established for the stream segments. The aim is to improve water quality of impaired streams with conservation practices, but temporary harmful impacts caused during implementation of conservation practices should be considered.

Cultural Resources

The SWPA is within the traditional lands of member groups of the Confederated Tribes of Siletz Indians (CTSI). The potential to find archaeological resources is higher in this area. Project design will be finalized only after a response from the NRCS Cultural Resource Specialist has responded and appropriate tribal consultation has been completed.

ESA Listed Species and Essential Fish Habitat

Marbled Murrelet

The Marbled Murrelet is listed as Threatened under the Federal Endangered Species Act (ESA). Because of this, in areas that are designated as close to the nest or known habitat (within ¼ mile) noisy mechanical equipment cannot be used during the breeding period. The nesting season for the Marbled Murrelet is from April 1 to September 15. It is unlikely that the proposed conservation practices will negatively impact this species, however a thorough review of each project will be necessary to evaluate the potential for suitable nesting habitat, designated critical habitat, and known nesting locations. Consultation with USFWS may be necessary. Oregon NRCS is in the process of completing a programmatic consultation that would include this species.

Northern Spotted Owl

The Northern Spotted Owl is listed as Threatened under the Federal ESA. Because of this, in areas that are designated as close to known nest sites, or designated Critical Habitat (within ¼ mile), noisy mechanical equipment cannot be used during the breeding period. The nesting season for the Northern Spotted Owl is from March 1 to September 30. It is unlikely that the proposed conservation practices will negatively impact this species, however a thorough review of each project will be necessary to evaluate the potential for suitable nesting, roosting, foraging habitat, designated critical habitat, and known nesting locations. Consultation with USFWS may be necessary. Oregon NRCS is in the process of completing a programmatic consultation that would include this species.

Coho and Chinook Salmon and Essential Fish Habitat

The Siletz River Basin is designated Critical Habitat under the ESA and Essential Fish Habitat under the Magnuson-Stevens Act for federally Threatened Coho Salmon, Oregon Coast Evolutionarily Significant Unit (ESU), and Chinook Salmon, Oregon Coast ESU. The spawning season for the Oregon Coast Coho ESU is from mid-October to late January. It is unlikely that the proposed conservation practices will negatively impact these species. For projects that include vegetation management near water (including weed management and riparian planting), stream crossings, or livestock water withdrawals from streams, the actions "May Affect" listed salmon, Critical Habitat, and EFH and will likely be covered under NRCS's programmatic biological opinion, the Oregon and Washington NRCS Aquatic Habitat Conservation Programmatic Consultation (ORWAC). All applicable ORWAC Conservation

Measures will be followed. A Project Notification Form will be submitted to NOAA prior to commencement of activities and a Project Completion Form will be submitted at the conclusion of each project.

Environmental Justice

Planned projects will not have disproportionately high or adverse human health or environmental effects on minority populations, low-income populations, and Indian Tribes.

Invasive Species

Invasive species are known and present. Available conservation practices in the project area such as Brush Management and Herbaceous Weed Control will reduce the occurrence of invasive species. Equipment will be cleaned of invasive species upon entering and leaving project areas. Seed and plant mixtures used will be free of invasive species.

Scenic Beauty

The action(s) will not adversely affect the scenic quality of the general landscape or any specifically designated unique or valuable scenic landscape.

Wetlands

Landowners will be guided to choose other measures that will minimize adverse effects to wetlands, including obtaining all necessary permits. Activities will not result in reduction of wetland areas. If a landowner refuses to implement an alternative that avoids adverse impacts, all assistance will be terminated.

Appendix A: Outreach Plan

Goal: Conduct stakeholder engagement and technical assistance, using NRCS and other funding, to connect with 80 landowners over four years. Stakeholder engagement events include quarterly Siletz Watershed Council meetings, (2) annual Siletz River Floats, (1) Living on the Land Educational Series, Fencing workshop, and two workshops on agricultural infrastructure for conservation.

The table below highlights the outreach plan activities, leads, partners, and years the activity will be implemented.

Lead	Partners	Activity	2025	2026	2027	2028
Lincoln SWCD	ODA, OWRD, Lincoln County, OSU Extension Small Farms	Event (2): Siletz River floats will engage landowners on the water with technical assistance providers. Highlights of the float include water quality, invasive species, and conservation programming in the area.	x	x	x	x
MCWC	Lincoln SWCD	Provide technical assistance to the Siletz Watershed Council run by the MidCoast Watersheds Council quarterly.	x	x	x	x
Lincoln SWCD	ODA, NRCS, MCWC	Provide technical assistance to agricultural and rural residential landowners on agriculture conservation practices including project development and grant writing.	X	X	X	X
Lincoln SWCD	ODA, OSU Extension	Fencing Workshop		X		X
OSU Extension	Lincoln SWCD, ODA, ODF, MCWC, MRT, NRCS	Living on the Land Series			X	
Lincoln SWCD	Lincoln SWCD, ODA, ODF, MCWC, MRT	Quarterly Newsletter	X	X	X	X
Lincoln SWCD		Mailers to biosolid land applicators and ag/timber properties within 2 miles of the intakes	X	X	X	X

Appendix B: Figures

Appendix C: References

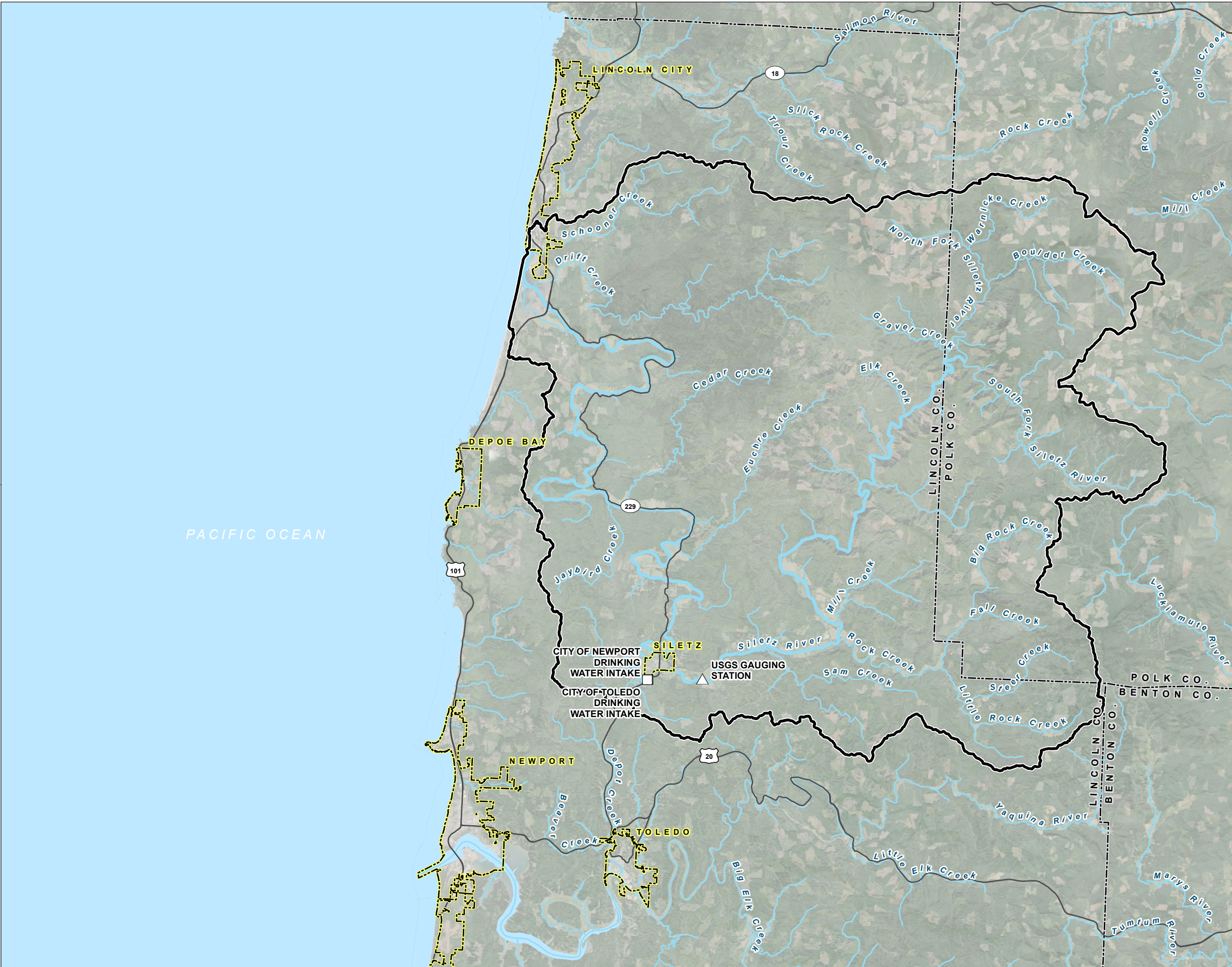


FIGURE 1
Siletz River Watershed
Location Map
Hydrogeologic and Hydrologic
Characterization of the
Siletz River Watershed

- LEGEND**
- Water Intake
 - △ USGS Gauging Station
 - ⬮ Siletz River Watershed
 - ⬮ City Boundary
 - ⬮ County Boundary
 - ⬮ Major Road
 - ⬮ Watercourse

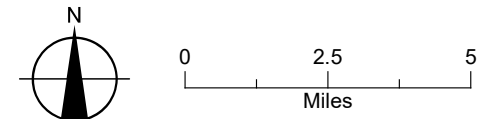
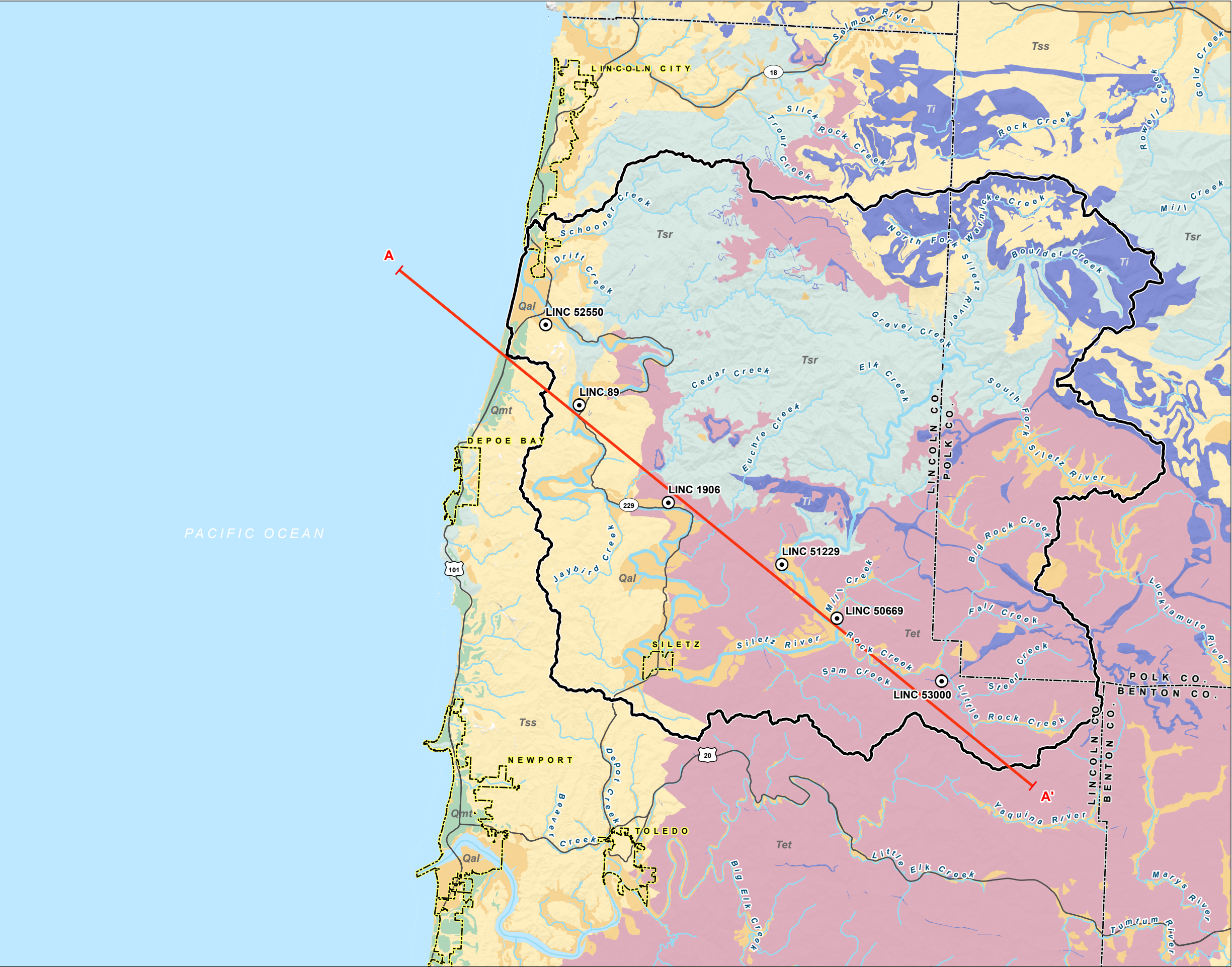
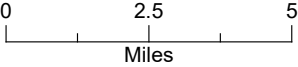
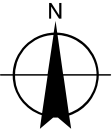


FIGURE 2
Surficial Geology Map
 Hydrogeologic and Hydrologic
 Characterization of the
 Siletz River Watershed



LEGEND

- Water Well
- Cross Section Line
- Siletz River Watershed
- Surficial Geology**
- Alluvium*
 - Alluvium (Qal)
 - Marine Terrace Deposits (Qmt)
- Marine Sedimentary Rocks*
 - Siltstone and Sandstone (Tss)
 - Tyee Formation (Tet)
- Volcanic Rocks*
 - Siletz River Volcanics (Tsr)
 - Intrusive Rocks (Ti)
- All Other Features**
 - City Boundary
 - County Boundary
 - Major Road
 - Watercourse



Date: May 30, 2023
 Data Sources: BLM, ESRI, ODOT, USGS,
 DOGAMI (2022)



FIGURE 3

Conceptual Geologic
Cross Section of the
Siletz River Watershed

Hydrogeologic and Hydrologic
Characterization of the
Siletz River Watershed

LEGEND

Unconsolidated Sediments

- Alluvium (Qal)
- Marine Terrace Deposits

Marine Sedimentary Rocks

- Siltstone and Sandstone (Tss)
- Tyee Formation (Tet)

Water Well

- Well Seal
- Depth at which Groundwater was Encountered
- Open Hole
- Depth at which Groundwater was Encountered
- Screened or Perforated Section

NOTES

- Geology from Frank and Laenen (1977).
- Faults and folds are not shown.
- Cross section is conceptual in nature.

150x vertical exaggeration

BGS: below ground surface
DTW: depth to groundwater
GPM: gallons per minute
Q: pumping rate
TD: total depth

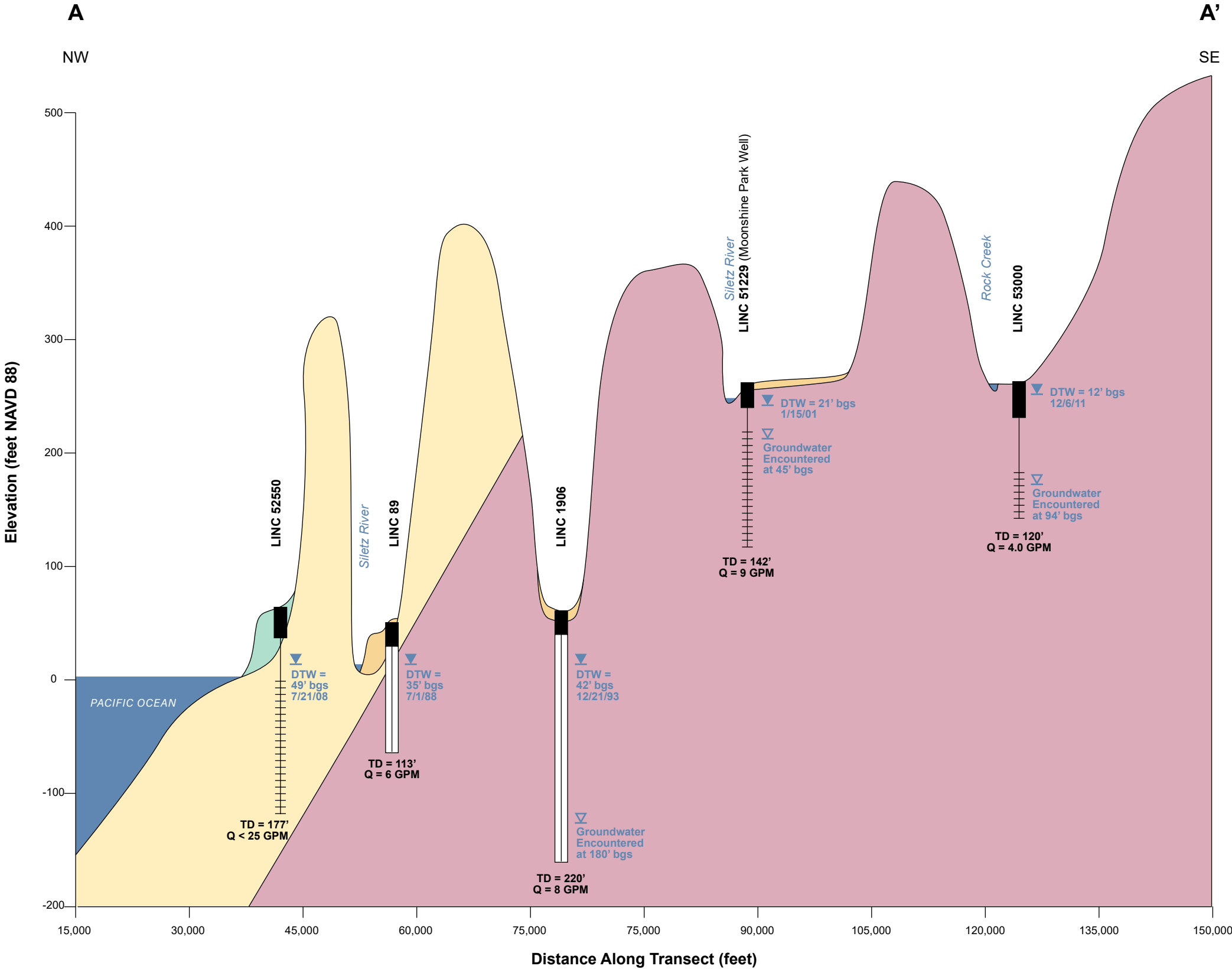


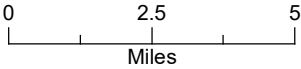
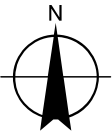
FIGURE 4

Groundwater Flow Map

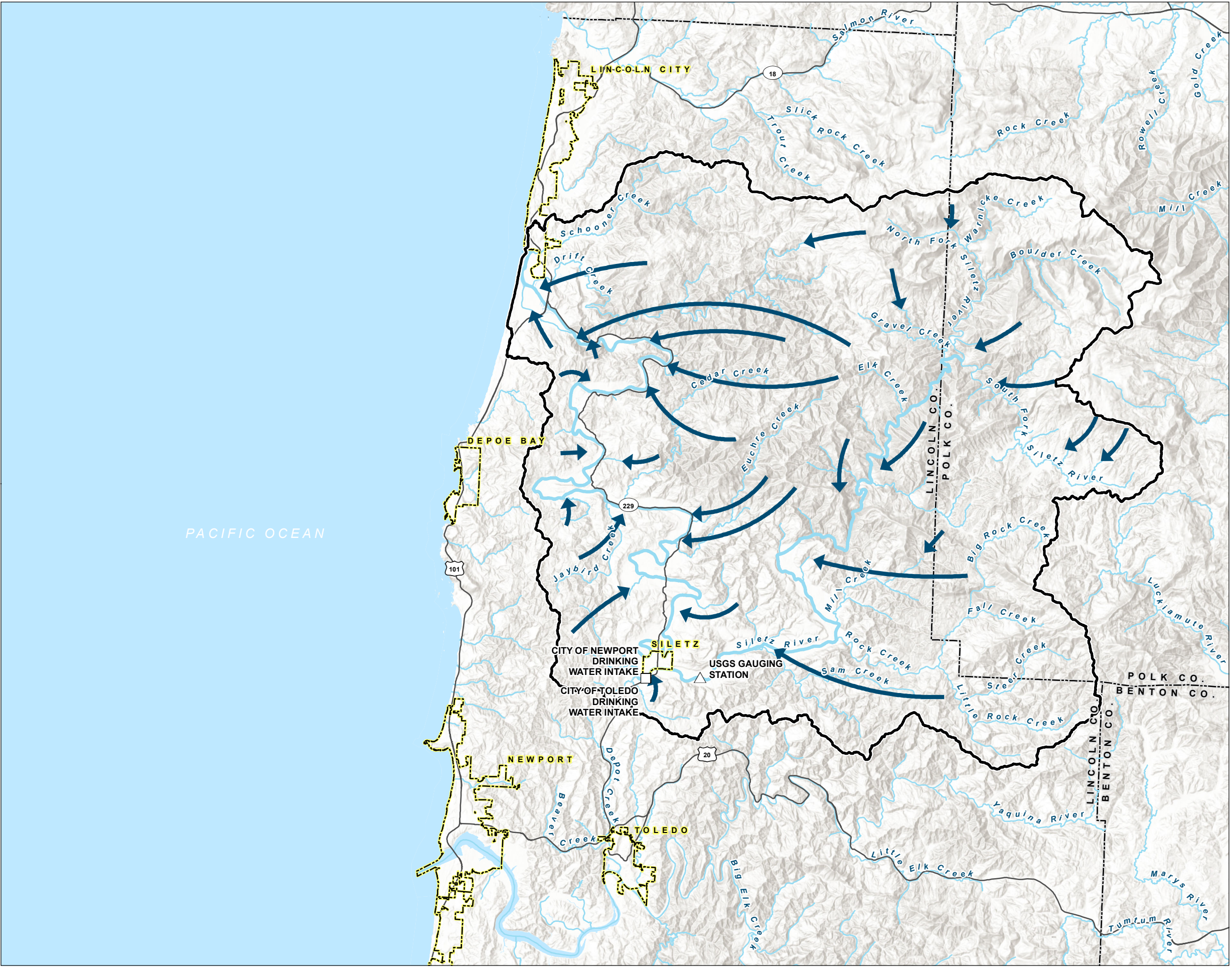
Hydrogeologic and Hydrologic
Characterization of the
Siletz River Watershed

LEGEND

- Water Intake
- △ USGS Gauging Station
- ➔ Groundwater Flow Direction
- ⬭ Siletz River Watershed
- ▭ City Boundary
- ▭ County Boundary
- ⚡ Major Road
- ~ Watercourse



Date: June 7, 2023
Data Sources: BLM, ESRI, ODOT, USGS



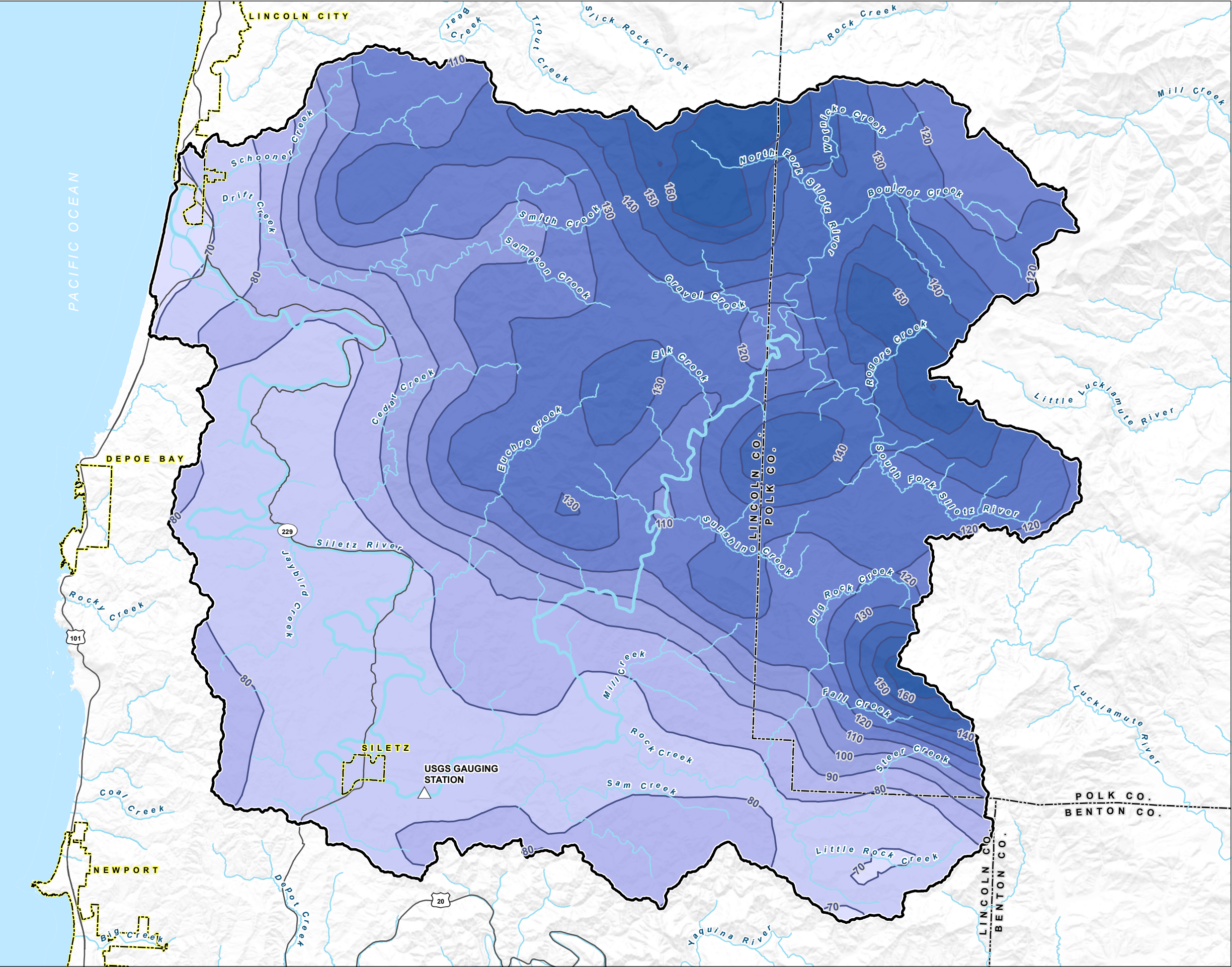
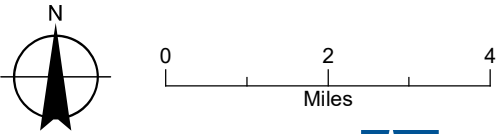


FIGURE 5
Average Annual Precipitation
Hydrogeologic and Hydrologic
Characterization of the
Siletz River Watershed

- LEGEND**
- △ USGS Gauging Station
 - Annual Precipitation (inches)
 - Siletz River Watershed
 - City Boundary
 - County Boundary
 - Major Road
 - Watercourse

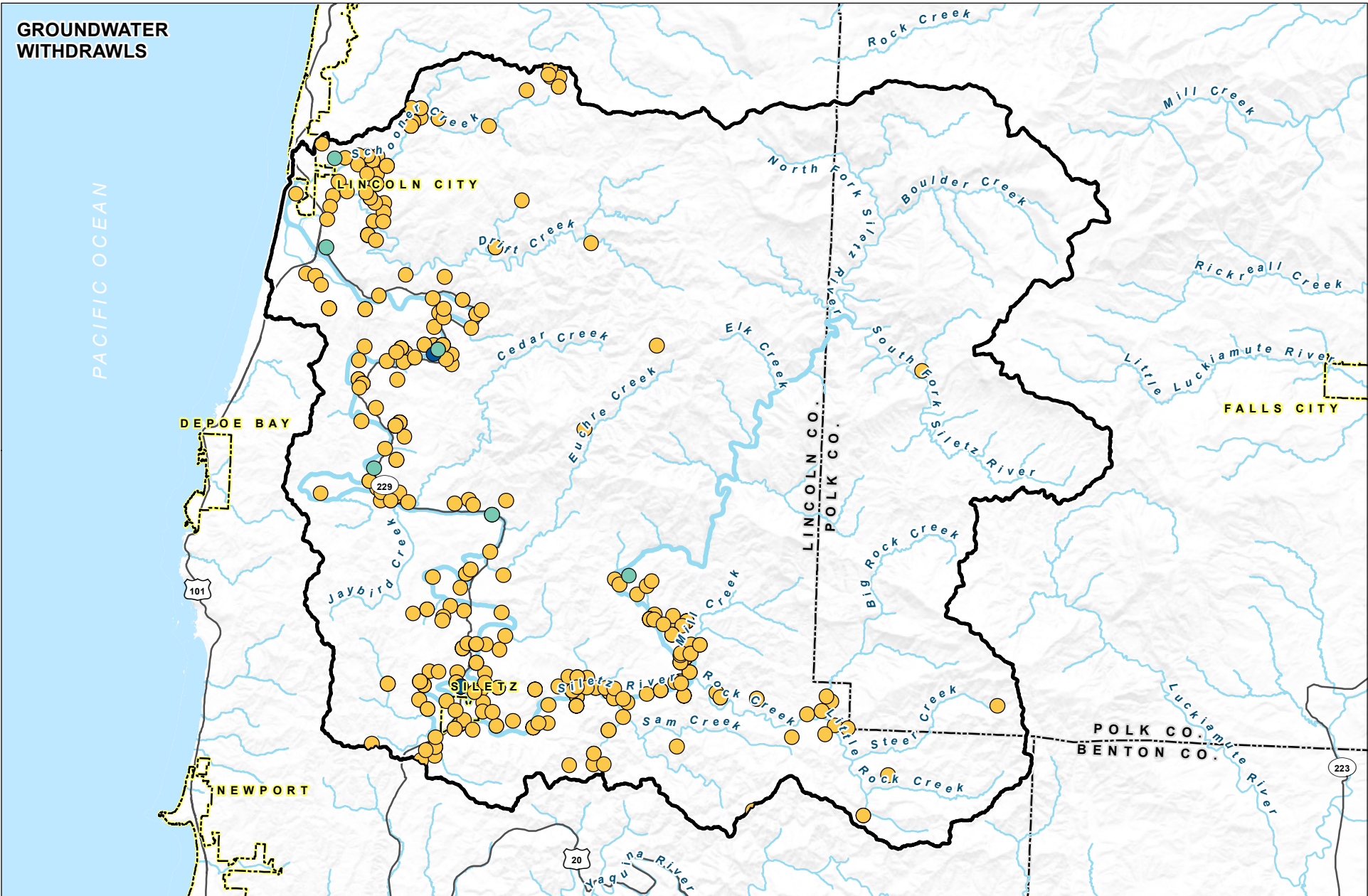
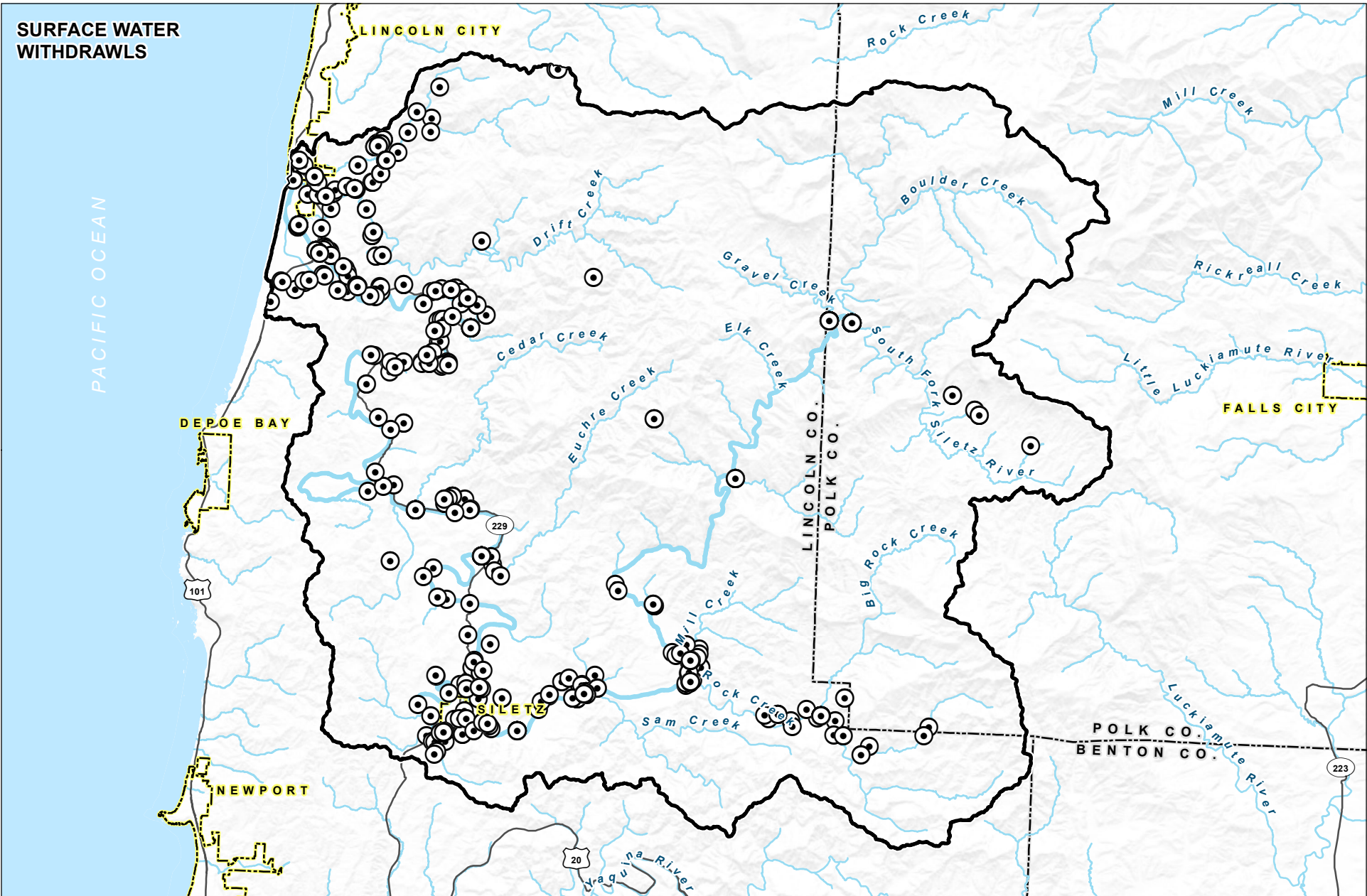
Annual Precipitation (inches)

60 - 70
70 - 80
80 - 90
90 - 100
100 - 110
100 - 120
110 - 120
120 - 130
130 - 140
140 - 150
150 - 160
160 - 170



Date: June 7, 2023
Data Sources: BLM, ESRI, ODOT, USGS,
OSU (2020)





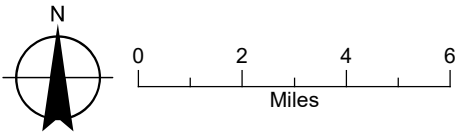
LEGEND

- ⊙ Point of Diversion (POD)
- 🗺️ Siletz River Watershed
- Water Well Use Type**
- Community
- Domestic
- Industrial
- Irrigation
- 🗺️ City Boundary
- 🌊 Watercourse
- 💧 Waterbody

FIGURE 6

**Groundwater and
Surface Water Withdrawals**

Hydrogeologic and Hydrologic Characterization
of the Siletz River Watershed



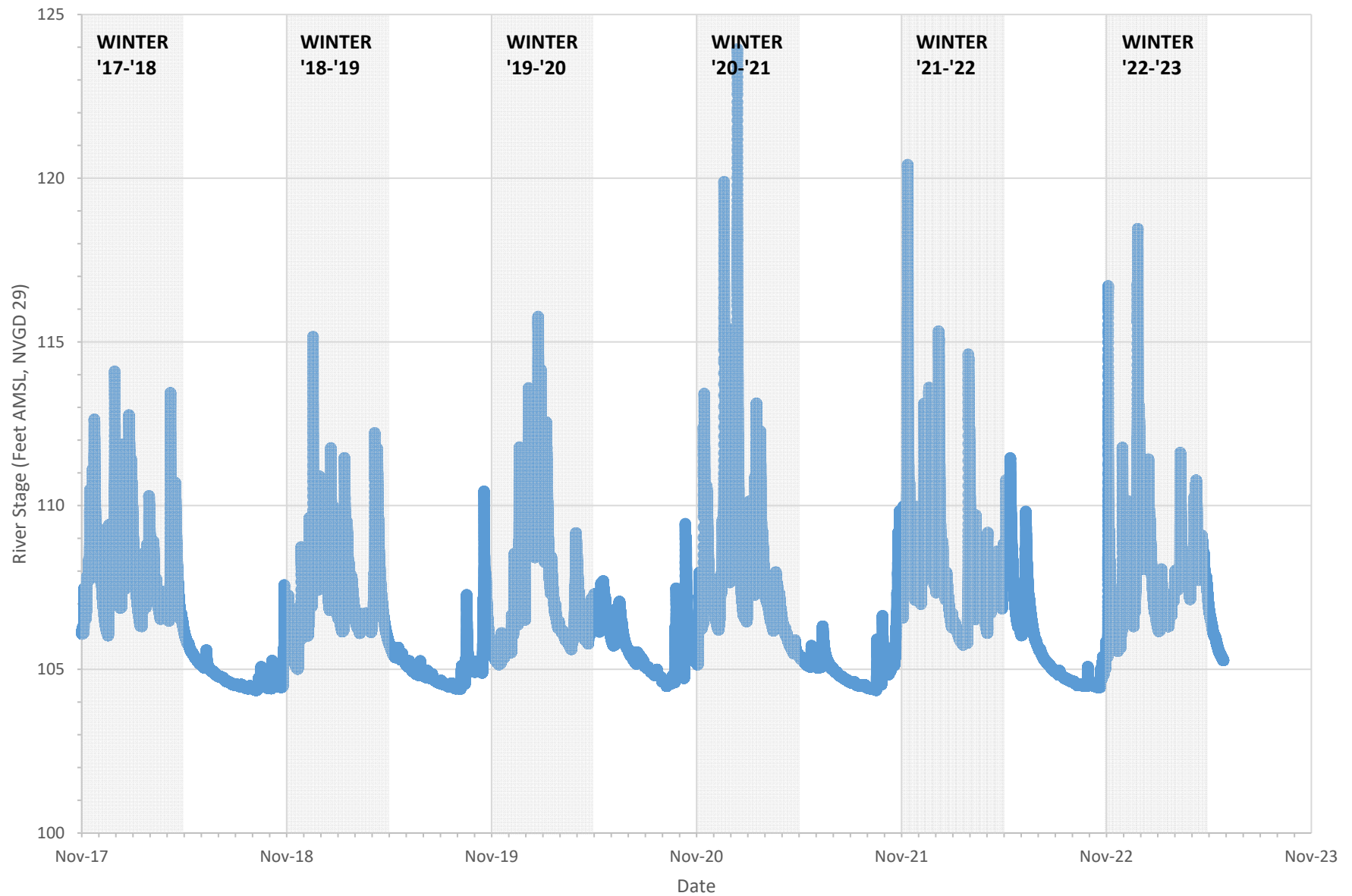


FIGURE 7(a)
Siletz River Stage, 2017 - 2023
Hydrogeologic and Hydrologic Characterization of the Siletz River Watershed

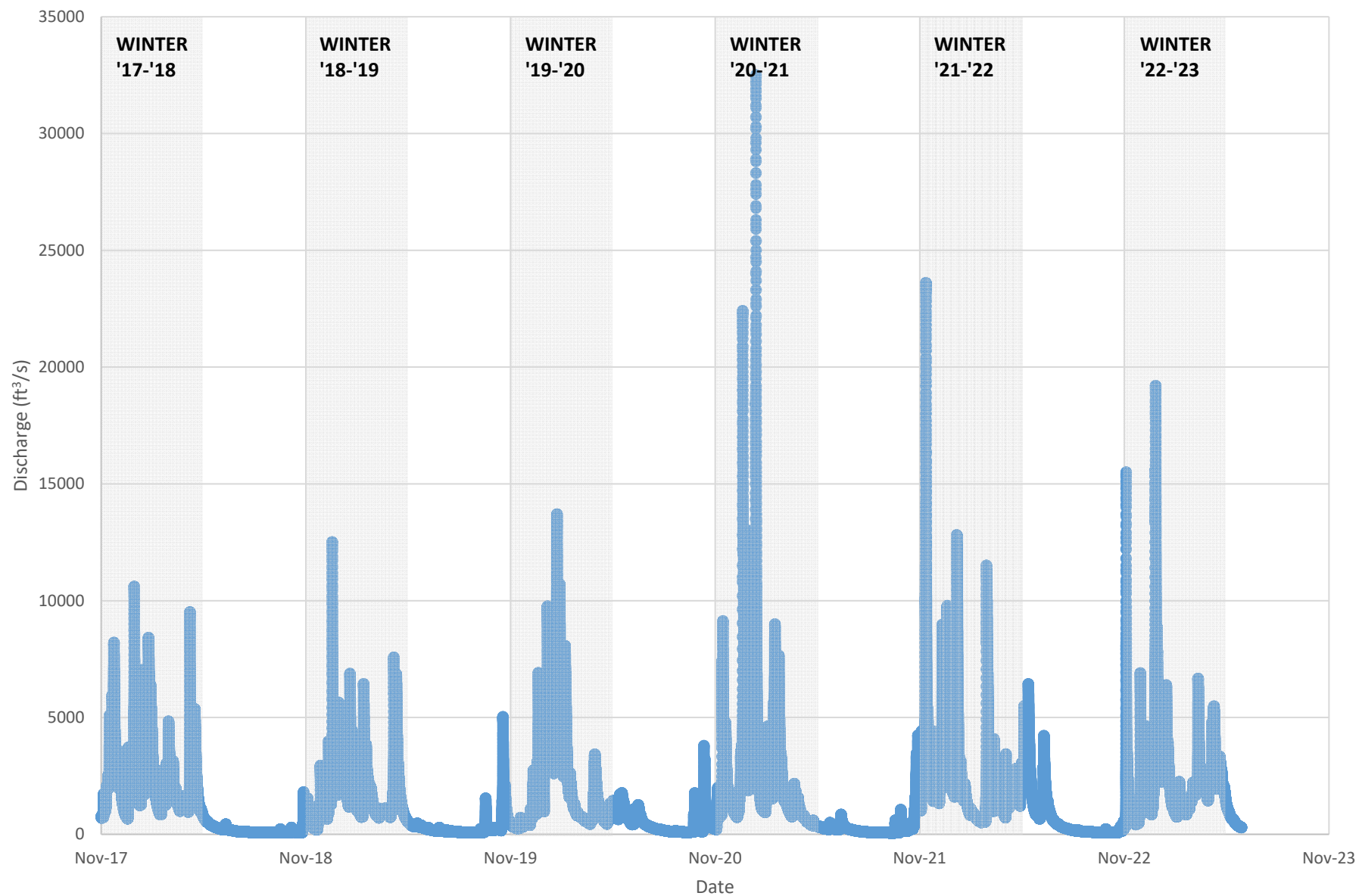


FIGURE 7(b)

Siletz River Discharge, 2017 - 2023

Hydrogeologic and Hydrologic Characterization of the Siletz River Watershed

1. Overview of the SWPA and At-Risk Public Water Supply

a. General Characteristics

i. Contamination Level Violations

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iii. Plans

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b. Population

i. Tribal

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<https://www.ctsi.nsn.us/wp-content/uploads/2020/12/CTSI-Comprehensive-Plan-2005-2015-History-Pt1.pdf>

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a. Landscape Setting

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e. Land Cover and Water Uses

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ii. Misc.

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Banwarth et al. (2022) *Lincoln County Community Health Assessment, 2018-2022*. Lincoln County Health and Human Services. Newport, OR.
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i. Agriculture

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