

City of Rockaway Beach Forest Stewardship Plan Advisory Committee (FSPAC) Meeting Agenda



Date: Tuesday, March 17, 2026

Time: 3:00 PM

Location: Rockaway Beach City Hall, 276 Hwy 101 - 2nd Floor Conference Room

Watch meeting here: rockawaybeachoregon.gov/meetings

Join here to participate remotely on Zoom:

<https://us06web.zoom.us/j/88658019306?pwd=74kbtsFLZyr7Mls9Xad3ZC5ZAQIzns.1>

Meeting ID: 886 5801 9306

Passcode: 899940

Dial by your location

253 215 8782 US (Tacoma)

How to Provide Public Comment:

- Written Comments may be submitted electronically by sending an email no later than 48 hours prior to the meeting to CityHall@Corb.us
- In Person – sign-up sheet and instructions will be located on the table inside the meeting room.
- Virtually on Zoom – use the “raise hand” feature when the Chair announces it is time to do so.

1. CALL TO ORDER

2. ROLL CALL

3. APPROVAL OF MINUTES

- a. January 16, 2026 Meeting Minutes

4. PUBLIC COMMENT

5. NEW BUSINESS

- a. Review of Final Draft of Jetty Creek Forest Resources Stewardship Plan
- b. Consideration to Approve the Jetty Creek Forest Resources Stewardship Plan and Recommend its Adoption to

Rockaway Beach City Hall is accessible to persons with disabilities. A request for an interpreter for the hearing impaired or for other accommodations for persons with disabilities should be made at least 48 hours before the meeting to the City Recorder Melissa Thompson at cityrecorder@corb.us or 503-374-1752.

the City Council

- c. Consideration to Select Two Members to Review & Approve the Final Meeting Minutes

6. COMMITTEE COMMENTS

7. ADJOURNMENT

NOTICE OF POSSIBLE QUORUM:

A quorum of the **City Council and/or Planning Commission** may attend this meeting.
No deliberations or decisions will be conducted by either body at this meeting.

City of Rockaway Beach Forest Stewardship Plan Advisory Committee (FSPAC) Meeting Minutes



Date: Friday, January 16, 2026

Location: Rockaway Beach City Hall, 276 Hwy 101 - 2nd Floor Conference Room

1. CALL TO ORDER

- Maxfield called the meeting to order at 11:00 a.m.

2. ROLL CALL

Committee Members Present: Sandra Johnson, Jason Maxfield, Lydia Hess, Nancy Lanyon, Darlene Johnson (Darlene Johnson jointed remotely at 11:05 a.m.)
Council Members Present: Charles McNeilly, Mary McGinnis (guest)
Staff Present: Luke Shepard, City Manager; Melissa Thompson, City Recorder; Mary Mertz, Public Works Director
Consultants Present: Daniel Wear, Sustainable Northwest; Ben Hayes and Brandy Saffell, Springboard Forestry

3. APPROVAL OF MINUTES

a. November 13, 2025 Meeting Minutes

Motion by Lydia Hess, seconded by Sandra Johnson, to approve the November 13, 2025 meeting minutes as presented.

Motion Passed by the following vote:

Yes: 4 (Sandra Johnson, Jason Maxfield, Lydia Hess, Nancy Lanyon)

No: 0 (None)

4. PUBLIC COMMENT

- Maxfield invited public comment. No guests were present to comment.

5. NEW BUSINESS

a. Review Feedback on Draft Forest Stewardship Plan from Committee Members and Priority

Partners (Sustainable Northwest)

- Wear gave a presentation summarizing committee and partner recommendations and questions on the draft Forest Resources Stewardship Plan.
- Hayes and Wear confirmed questions that would be clarified and language adjustments that would be made in the final plan.
- Discussion regarding insurance coverage.
- Discussion regarding options related to recreation and public access. There was consensus to maintain the status quo and steer the public away from the watershed area with signage and direct them to the existing road system.
- Discussion regarding holly and consensus to not make any changes to the draft plan.

b. Discuss Proposed Changes for Draft Plan to Move Towards a Final Plan (Springboard Forestry)

- Additions to plan will include cost estimates and stewardship recommendations conclusion.

c. Next Steps to Finalize Stewardship Plan (Springboard/City)

- Shepard introduced options for approving a final plan.
- Suggestion to hold one more FSPAC meeting to approve and recommend to City Council.
- Steps to finalize include final draft from Springboard Forestry, Department of Environmental Quality (DEQ) approval, final FSPAC meeting and committee approval, and Council adoption.
- McNeilly commended Wear for the committee survey process.

d. Discuss Future Management Costs (Springboard Forestry)

- Hayes explained they will include an annual average management cost in the plan.
- Consultants are negotiating road maintenance with Stimpson.
- Brief discussion regarding possible entities to assist with thinning.

6. COMMITTEE COMMENTS

- Darlene Johnson impressed by committee members.
- Lanyon happy about options for recreation and proposed naming connecting path in honor of Shepard.
- Hess happy to be here.
- Maxfield commented on marketing the area as the "Rockaway hills."

7. ADJOURNMENT

Motion by Sandra Johnson, seconded by Lydia Hess, to adjourn the meeting at 12:16 p.m.

Motion Passed by the following vote:

Yes: 5 (Darlene Johnson, Sandra Johnson, Jason Maxfield, Lydia Hess, Nancy Lanyon)

No: 0 (None)

MINUTES APPROVED THE
17TH DAY OF MARCH 2026

Jason Maxfield, Chair

ATTEST

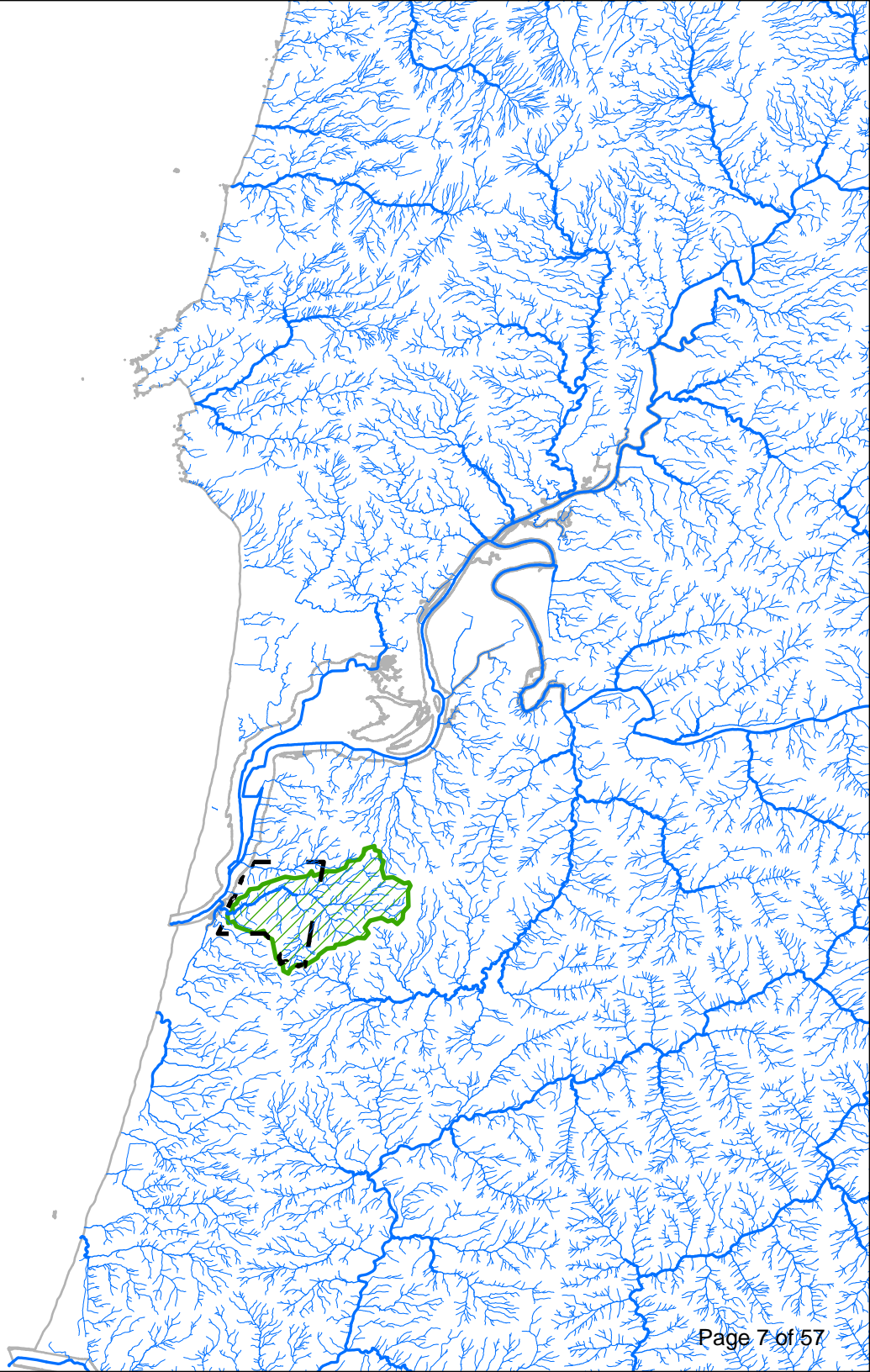
Melissa Thompson, City Recorder

DRAFT

CITY OF ROCKAWAY BEACH
JETTY CREEK

FOREST RESOURCES STEWARDSHIP PLAN
FEBRUARY 2026

- ▣ ▣ Subject Property
- Jetty Creek DWSA
- ▨ Watershed Boundary
- Stream Size
 - Small
 - Medium
 - Large
 - NA - No Channel
 - <all other values>



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SIGNATURE PAGE

4

This plan has been adopted by the City of Rockaway Beach this _____ day of _____, 2026.

_____ Signature

Charles McNeilly, Mayor

City of Rockaway Beach

This plan was written by Ben Hayes and Brandy Saffell of Springboard Forestry LLC, and hereby submitted to the City of Rockaway Beach.

_____ Signature

Ben Hayes, Forester

Springboard Forestry LLC -- www.springboardforestry.com -- 971-678-9464



ACKNOWLEDGMENTS

This plan was written with the assistance of the City of Rockaway Beach Forest Stewardship Plan Advisory Committee, which includes: Position 1: Sandra Johnson, Position 2: Jason Maxfield, Position 3: Lydia Hess, Position 4: Darlene Johnson, Position 5: Nancy Lanyon, Mayor: Charles McNeilly, City Council Liaison: Kiley Konruff

In addition, assistance was provided by City of Rockaway Beach staff, including: City Manager: Luke Shepard, Public Works Director: Mary Mertz, City Recorder: Melissa Thompson. Additional appreciation to the City of Rockaway Beach City Council and the Drinking Water Protection Plan Advisory Committee. Project coordination was provided by Daniel Wear of Sustainable Northwest, and Morgan deMoll, Mark McLaughlin, and Jon Wickersham of North Coast Land Conservancy.

Funding support was provided by the Oregon Watershed Enhancement Board, Oregon Department of Environmental Quality, and through a Drinking Water Source Protection grant received by the City of Rockaway Beach from the Oregon Health Authority Drinking Water Services and administered by Business Oregon / IFA.

Additional resource information was provided by Mike Sinnott from the Oregon Department of Fish and Wildlife and Bryce Rogers from the Oregon Department of Forestry. Property data and forest inventory was provided by Nuveen Natural Capital. Particular thanks to Kevin Brown with Lewis and Clark Timberlands / Nuveen.



INTRODUCTION

The organization and contents of this forest resources stewardship plan reflect the vision and management goals for the City of Rockaway Beach (the City) fee simple ownership in and around the Jetty Creek watershed (hereafter, the subject property).

BACKGROUND

The City's main surface water supply comes from Jetty Creek, which originates from and flows through a 1,326 acre forested watershed primarily owned and managed by two timber companies, Nuveen Natural Capital and Stimson Lumber Company. Jetty Creek experiences consistent water supply shortages during the summer months along with water quality issues due to elevated turbidity following intense storm events. These impacts stem from past forest and road management focused on timber production rather than water quality and quantity.

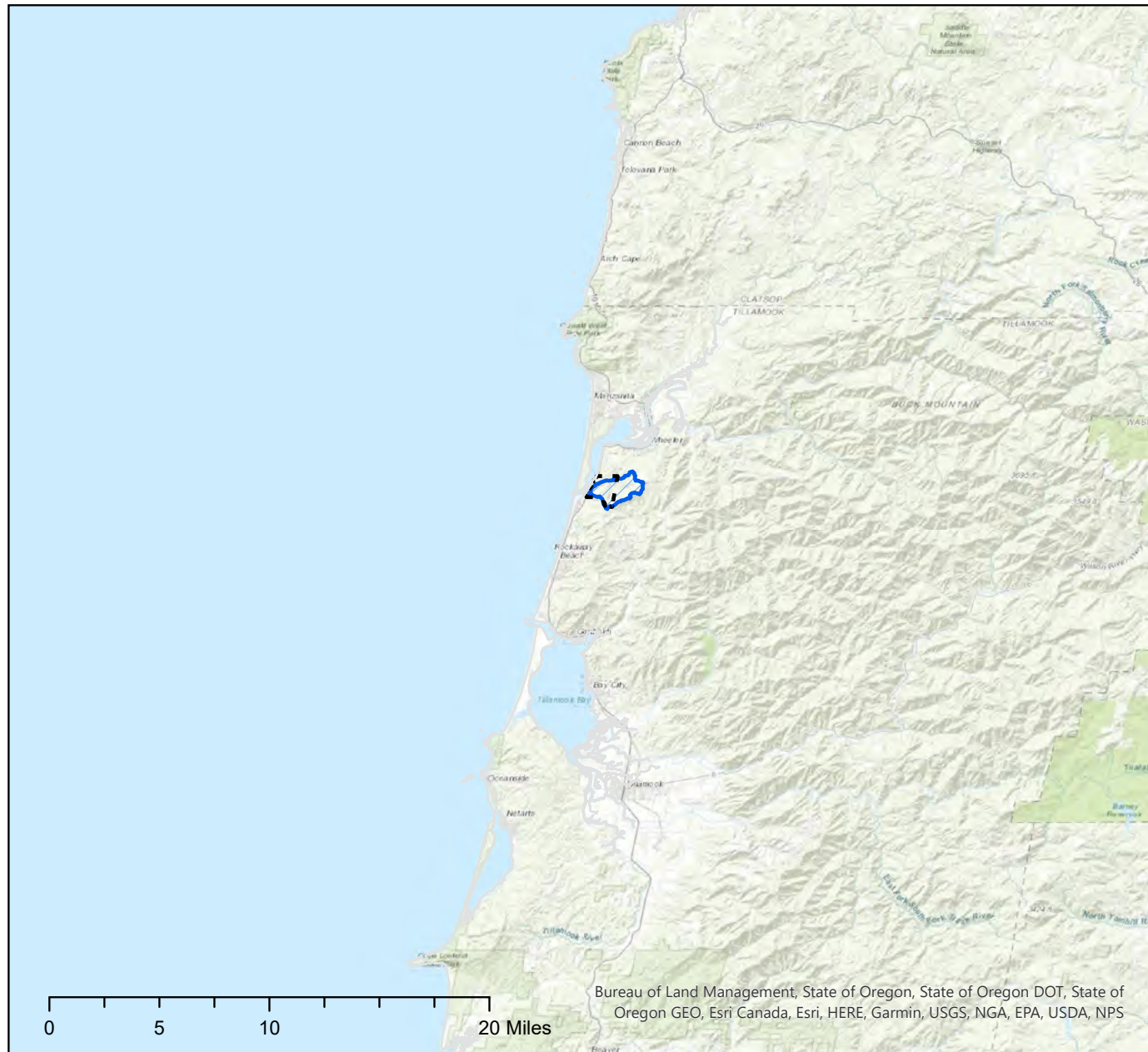
The City recently set a goal in its 2025 Drinking Watershed Protection Plan to protect the Jetty Creek Watershed through acquisition, easement, and/or adjusted forest management through agreements with current landowners. The City and Nuveen Natural Capital are working on a proposed 800-acre acquisition by the City, which includes 595 acres (45%) of the Jetty Creek Watershed. The proposed timeline has the acquisition completed before December 31, 2026. The City applied to the US Forest Service Forest Legacy Program to cover a portion of the acquisition cost of the 800-acre subject property and secured funding through the Oregon Health Authority Drinking Water Services (administered by Business Oregon / IFA) to develop a forest management plan with community input. In addition, the City

was awarded land acquisition funding through the Oregon Watershed Enhancement Board's Drinking Water Source Protection Grant Program (grant number 225-8016-24164). The City also secured a loan to support land acquisition through the Clean Water State Revolving Loan Fund administered by the Oregon Department of Environmental Quality.




Once the planned acquisition is complete, the City intends to manage the forest with a focus on forest stewardship and watershed protection. The goal of management is to maintain or improve the quality of drinking water arriving at the drinking water intake. The City's management objectives include developing a forest structure and composition that reduces potential risks of sedimentation, while increasing the reliability of long-term water supply in Jetty Creek. Through the acquisition and ongoing stewardship, the City will remain able to provide clean water to customers while reducing reliance on alternative water supplies.

This plan is structured to satisfy the requirements of the Oregon Watershed Enhancement Board, the State of Oregon's Forest Management Planning standards, and Forest Stewardship Council certification. The Oregon Watershed Enhancement Board Notice of Grant Requirements (NOGR) is the controlling document in the event of any inconsistencies between the forest resources stewardship plan and the NOGR. Public access will be allowed on portions of the property (see Purpose and Goals for more information).

PROPERTY LOCATION

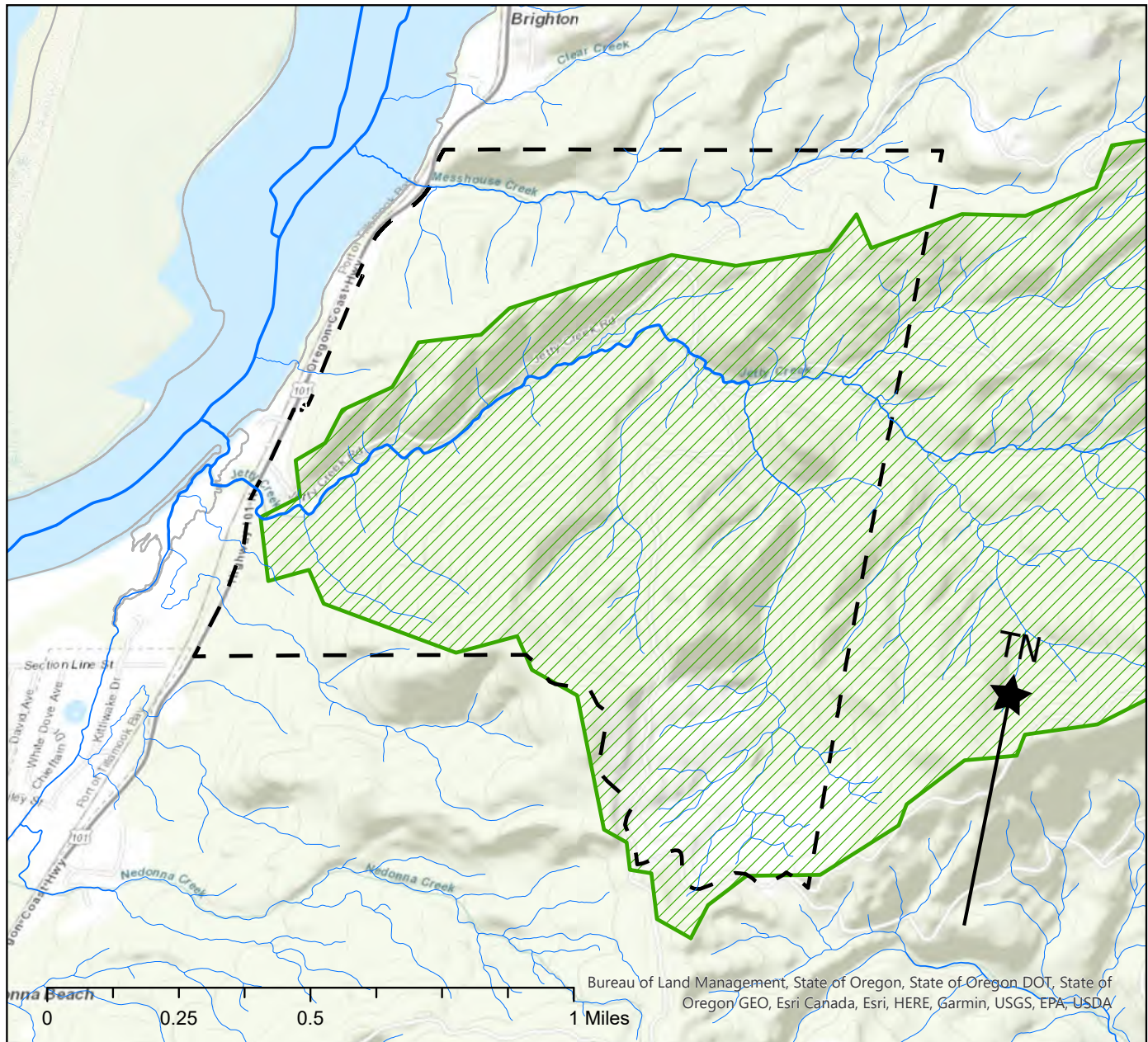


Legend

-  Watershed Boundary
-  CORB Proposed Purchase
-  Coastline



PROPERTY MAP



- ### Legend
- Subject Property
 - Watershed Boundary
 - FPA Stream Size
 - Small
 - Medium
 - Large
 - NA - No Channel
 - <all other values>



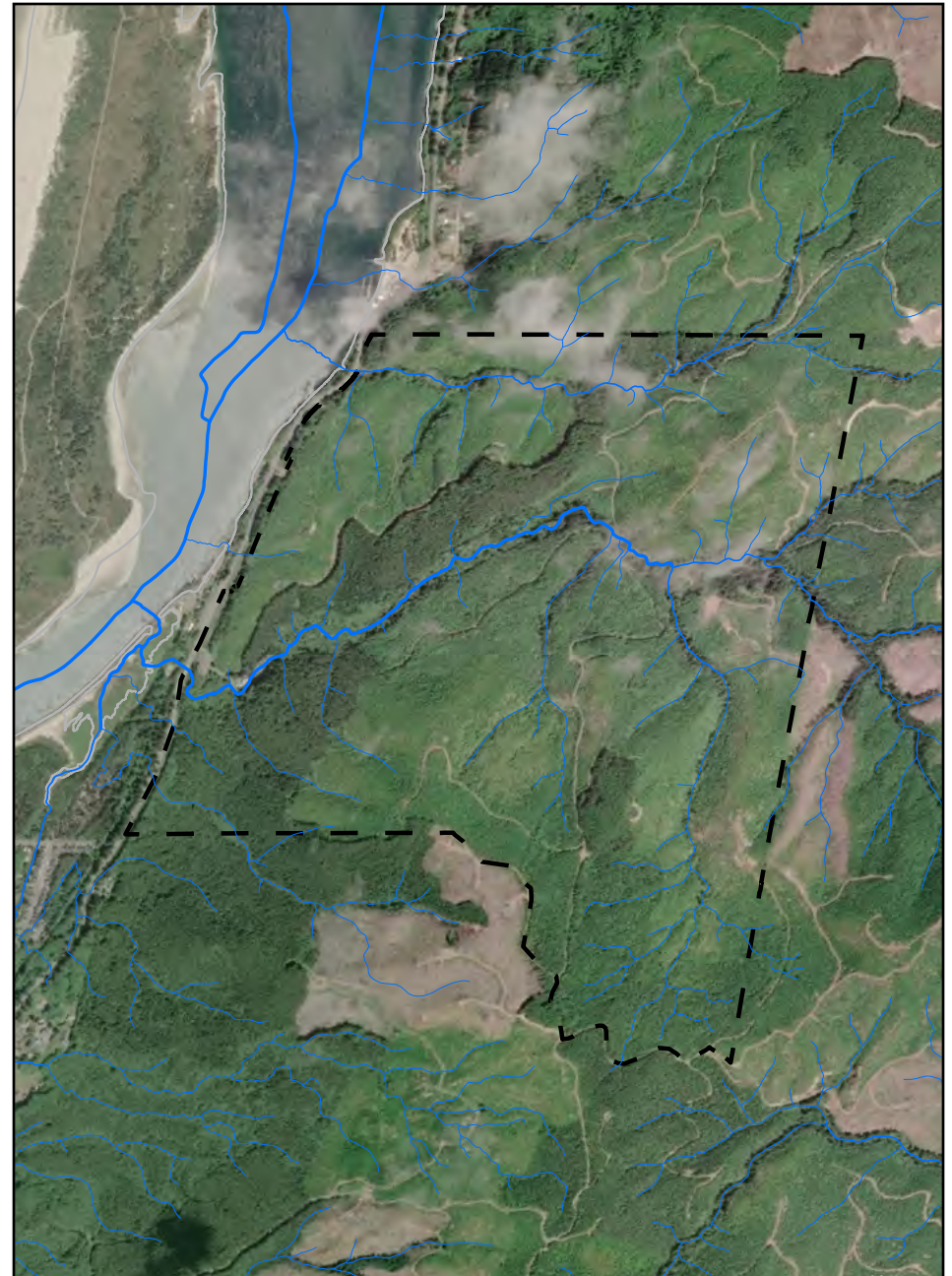
Bureau of Land Management, State of Oregon, State of Oregon DOT, State of Oregon GEO, Esri Canada, Esri, HERE, Garmin, USGS, EPA, USDA

PROPERTY OVERVIEW AND HISTORY

The Jetty Creek watershed is located about three miles north of the City of Rockaway Beach and contains roughly 1,300 acres of forestland. Access to the subject property is by a private road (Jetty Creek Mainline) off Highway 101 north of Nedonna Beach and near the Jetty Creek Bridge. The terrain is steep, reaching nearly 900 feet above sea level, and drains from east to west into the Nehalem River where it meets the Pacific Ocean. The property is currently bordered by private forests primarily managed by Nuveen Natural Capital and Stimson Lumber Company. Nuveen is an investment management company owned by TIAA, while Stimson is a 175-year-old vertically integrated private timber company based in Portland.

The subject property is classified as forestland and has been continuously managed for timber production. The current owner, L&C Tree Farms (managed by Nuveen Natural Capital), acquired the property on January 13, 2017, from Olympic Resource Management. Previous ownership includes Green Diamond Resource Company, which sold to Olympic Resource Management in 2009, and Simpson Timber Company, which owned the property beginning in 1988.

While the title report does not include ownership prior to 1988, interviews indicate that the property was most likely part of a larger timberland holding owned and managed by Publishers Paper as part of their long-term timber supply for a sawmill in Tillamook. Publishers Paper is better known for their long-term ownership of the Blue Heron paper mill at Willamette Falls in Oregon City.



PURPOSE AND GOALS

VISION STATEMENT

The City's vision is to provide reliable quantities of high-quality, and affordable drinking water for the Rockaway Beach community for generations through managing an ecologically complex and resilient forest.

PRIMARY GOALS

1. Provide reliable quantities of high-quality drinking water.

The subject property includes roughly half of the drinking water source area. A combination of steep slopes, erodible soils, roads, and past management practices has resulted in high turbidity throughout the watershed, driving up water treatment costs. All management practices will prioritize protecting and improving both the quality and quantity of source water, now and in the future. This includes mitigating impacts from sediment, nutrients, temperature fluctuations, large-scale disturbances such as pest outbreaks, and human activities. Additionally, forest structure and stand composition significantly affect low-flow and peak-flow conditions—factors that are becoming increasingly critical as weather patterns grow more unpredictable. Stewardship activities will work to develop forests that provide reliable quantities of high-quality drinking water.

2. Build long-term forest resilience through stewardship that promotes species diversity and structural complexity while mitigating risks from fire and other disturbances.

This goal recognizes that diverse and complex forests have increased capacity to store and filter water, as well as higher ecological resilience in the face of disturbance. Policies relating to stewardship, stream buffers, and invasive species management all work to support natural forest processes, accelerating the forest's ability to provide essential ecosystem services while preparing for the anticipated variability and severity of future disturbances.

3. Foster community engagement and stewardship through public access and education.

The subject property provides valuable aesthetic, recreational, and cultural benefits to the Rockaway Beach community and visitors, supporting activities such as hiking, wildlife viewing, and education. While protecting water quality and quantity remains the primary management priority, management actions promote public access and community connection to the forest where possible.

4. Support and enhance habitat for native wildlife, consistent with drinking water objectives.

The Jetty Creek watershed provides important habitat for a wide range of wildlife species. The mosaic of forest stand characteristics on the subject property currently supports adequate

habitat with significant potential for future improvement. Steep slopes and large riparian buffers have created natural barriers to harvest, resulting in de facto reserve areas across the subject property. Over time, managing for historical forest succession patterns will restore habitat conditions that have become increasingly rare on the Northern Oregon Coast.

5. Ensure long-term financial sustainability by managing the forest to protect water quality and minimize rising treatment costs while optimizing operational efficiency within the City's budget.

Maintaining forest health directly protects the City's water supply and reduces treatment costs. An intact, well-managed forest acts as a natural filter, stabilizing soils and minimizing sediment runoff that causes turbidity spikes. By prioritizing ecological forest management, the City avoids costly water treatment infrastructure upgrades and expanded chemical treatment regimes that could become necessary if increased soil disturbance and erosion degrade water quality.



PROPERTY DESCRIPTION

12

REGIONAL CONTEXT

The City of Rockaway Beach is located in Tillamook County in northwest Oregon. Formally founded in 1909 as a seaside resort and connected to Portland by passenger train in 1912, the destination has grown into a small coastal community with a population of 1,459 (2020 Oregon Blue Book) spanning approximately 1.7 square miles. Rockaway Beach maintains a tourism-driven economy with seasonal visitation significantly increasing water demand during peak season (June through October). During this period, more than 5,000 daily users rely on municipal water supplies at a time of year when water availability is naturally at its lowest. The Jetty Creek watershed serves as the primary municipal water source for the City, making forest stewardship of the watershed critical for protecting water quality and quantity.

CLIMATE AND TOPOGRAPHY

The subject property within the Jetty Creek Watershed is characterized by a temperate maritime climate with mean annual temperatures ranging from 46 °F to 52 °F, between 120 to 210 frost free days, and mean annual precipitation of 80 to 110 inches. The landscape exhibits features typical to the Oregon Coast Range: moderate to steep slopes, deeply incised stream valleys, and complex topography shaped by millions of years of marine sedimentation, tectonic uplift, and erosion.

Elevations across the property range from near sea level along Jetty Creek (about 96 feet) to 867 feet on the surrounding ridge-

lines. Slope gradients frequently exceed 30% to 40% on hillsides and approach 60% or greater in headwall areas and along incised stream channels. Gentler slopes (20% or less) are limited to ridgetops, benches, and the valley floor adjacent to Jetty Creek.

ECOLOGICAL SIGNIFICANCE

The forested watershed provides critical habitat for diverse wildlife species characteristic of the northern Oregon Coast Range. Jetty Creek and its tributaries support anadromous salmonids, which depend on cold, clean water and the large woody debris and shade provided by riparian forests. The forest ecosystem plays a vital role in regulating stream temperatures, intercepting rainfall, stabilizing steep slopes, and reducing sediment delivery to streams. Maintaining forest health and structural diversity enhances ecological resilience while supporting the watershed functions that underpin municipal water supply and community wellbeing.

FOREST MANAGEMENT HISTORY

The northern Oregon Coast Range has a long history of timber harvest dating to the late 19th century, with multiple generations of logging occurring across the region. Old-growth forests were largely harvested by the mid-20th century, and most forestlands have been managed on rotations of 40 to 80 years since that time. Harvest activity intensified in the 1980s and 1990s, followed by continued active management through the 2000s as private and public landowners responded to market conditions

and changing regulatory frameworks. Forestry and the wood products industry has supported the economics of the North Coast for over a century, with two large sawmills continuing to operate in Tillamook County (a third is currently mothballed). The property reflects this history, with stands of varying ages representing different harvest periods and regeneration strategies.

PRESENT FOREST CONDITIONS

Oregon's coastal forests sit at the far southern extent of a coastal rainforest type that extends north to Alaska's Prince William Sound. These forests typically contain creek-bottom western redcedar and red alder stands at lower elevations, transitioning to mid-elevation western hemlock, Sitka spruce, and occasional Douglas-fir and Pacific silver fir, and finally to high-elevation western hemlock and Sitka spruce forest. The primary ecological disturbances in the area include winter storms and wind events, landslides, flooding, disease and insects, and infrequent, severe wildfire regimes.

Forest productivity and health are generally excellent across the property, with most stands showing signs of vigorous growth. There is moderate species diversity, dominated by western hemlock and Sitka spruce with some smaller stands of western redcedar, red alder, and Douglas-fir. Structural complexity is low as a result of even aged forest management.

The steep topography on the subject property has historically presented challenges to timber harvest, allowing some stands (roughly 25% of the property) to grow beyond the industrial

timber rotation age of around 40 to 45 years. However, nearly 70% of the forest on the property is younger than 50 years, and half is younger than 22 years. Each successional stage presents distinct opportunities and challenges for watershed protection, from managing erosion risk in early seral areas to maintaining the resilience of older forests.

Early Seral - 55% Property Area (~443 acres)

Early seral forests are initiated by a disturbance such as a timber harvest, wildfire, or storm. These sites are characterized by an open canopy, with the successional stage ending upon canopy closure and the beginning of competition induced mortality. Dominant vegetation includes tree seedlings, shrubs, grasses, and forbs. Early seral forests, with their limited canopy cover and exposed soils, are most vulnerable to erosion and sediment delivery to streams, particularly on steep slopes. These young forests have considerable water demands based on evapotranspiration and high soil temperatures during hot weather, while also lacking the ability to weather extreme heat events. Having large areas of early seral forest can lead to a water deficit and low stream flows during dry months. Successful reforestation (or supporting seedlings by managing competing vegetation and animal browse) and erosion control measures during this stage are critical for protecting water quality. However, these open areas also support important biodiversity and provide browse for wildlife.

Closed Canopy - 13% Property Area (~100 acres)

At this stage, trees have reached free-to-grow status and fully occupy the site to form a single canopy layer. Canopy shading limits development of understory shade-tolerant species such as sword fern, bracken fern, Oregon grape, and salal, resulting in low vegetation diversity. Trees begin to show decreasing limb sizes, diameter growth rates, and crown height. Later in this stage, less competitive trees decline and die, creating small openings where understory vegetation can reestablish. Stewardship at this stage focuses on density management and setting the trajectory for future forest structure and diversity goals. From a watershed perspective, closed canopy forests provide excellent canopy interception of rainfall, reducing erosion potential and moderating peak flows. However, dense, single-layered stands may be more vulnerable to catastrophic disturbances like windthrow or disease outbreaks that could compromise watershed stability. Strategic thinning can enhance both structural diversity and forest resilience.

Older Forest Structure - 14% Property Area (~112 acres)

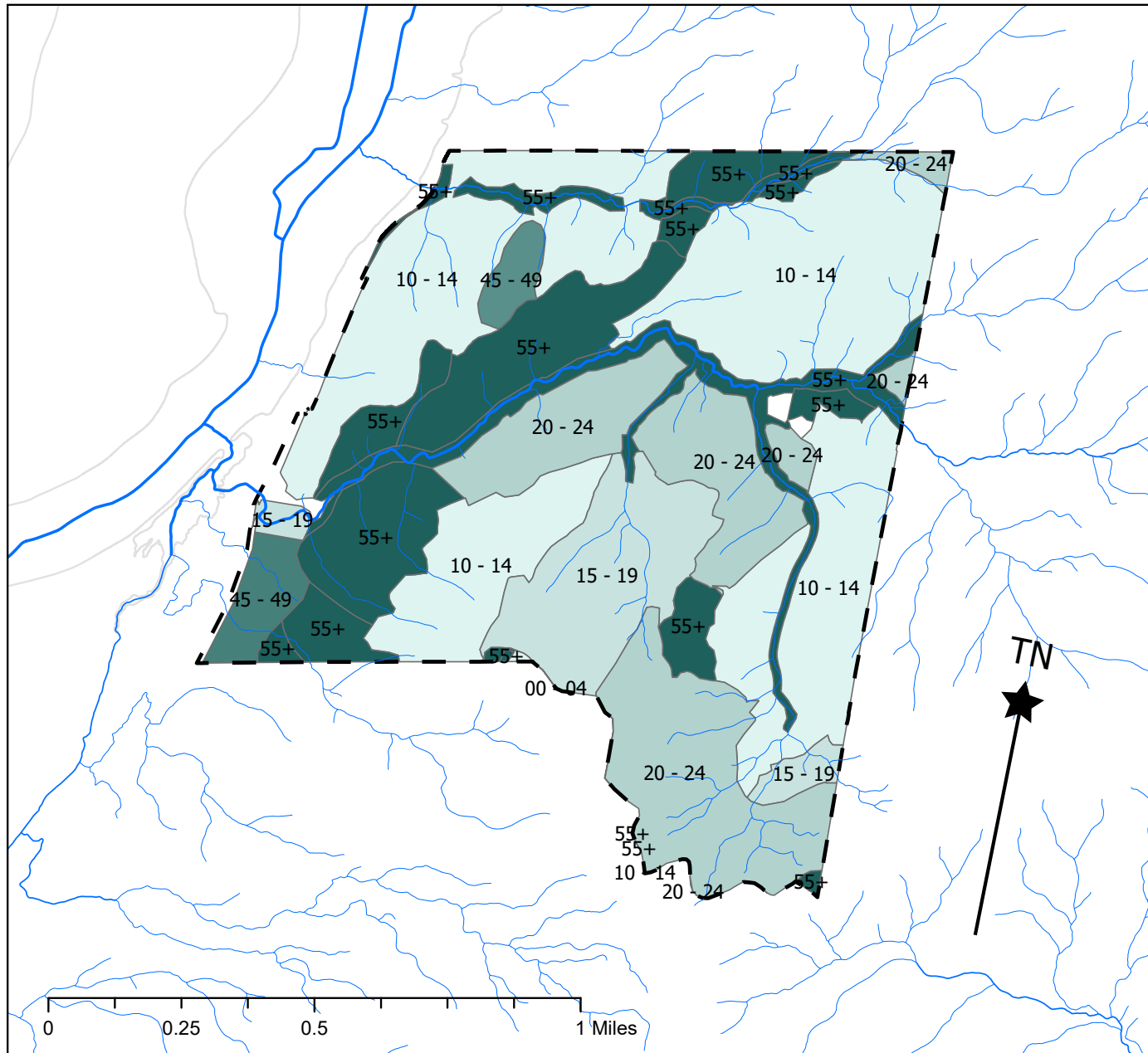
Older forests typically include eight or more large living trees (greater than roughly 32 inches in diameter) per acre and two or more canopy layers including mid-canopy shade-tolerant species. Two or more tree species are present along with a diverse understory layer including tree seedlings, shrubs, grasses, and forbs. There is a minimum of four to five snags per acre, half of which are over 24 inches in diameter, and substantial amounts of downed wood (around 600 to 900 cubic feet per acre). These

complex forest structures provide superior watershed protection through deep organic soil layers that enhance water infiltration and storage, extensive root systems that stabilize slopes, and diverse canopy layers that intercept precipitation and moderate streamflow. The variety of tree sizes and ages also increases resilience to disturbances, reducing the risk of widespread forest loss that could impair water quality. This stage presents management opportunities such as variable retention harvesting and canopy gap creation to continue developing forest complexity while maintaining the ecological values these forests provide.

Riparian Zones - 12% Property Area (~93 acres)

Riparian forest areas are characterized by greater moisture availability, cooler microclimates, and distinctive vegetation including western redcedar, red alder, bigleaf maple, willow species, and salmonberry. Riparian canopies moderate stream temperatures through shading, while root systems stabilize streambanks and filter sediment and nutrients before they reach waterways. Large trees that fall into streams create pools, slow water velocity, trap sediment and organic matter, and provide cover for salmonids. Riparian management priorities include maintaining or developing multi-layered canopy structure, protecting large conifers that will become future large woody debris, controlling invasive species, and ensuring adequate buffers along all stream channels to protect water quality and aquatic habitat while meeting Oregon Forest Practices Act requirements.

STAND AGE CLASS



Legend

- CORB Proposed Purchase

AGE

- 4 - 14
- 15 - 19
- 20 - 24
- 25 - 29
- 30 - 34
- 35 - 39
- 40 - 45
- 46 - 49
- 50 - 54
- 55+

FPA Stream Size

- Small
- Medium
- Large
- NA - No Channel
- <all other values>



GEOLOGY AND SOILS

The underlying geology consists primarily of Tertiary-age marine sedimentary rocks, including sandstones, siltstones, and mudstones of the Tyee and Yamhill formations. These bedrock types weather to form deep, clay-rich soils that are highly productive for tree growth but also prone to instability when saturated. Soil depths vary considerably, with shallow soils (less than three feet) on steep upper slopes and ridges, and deeper accumulations in swales and lower slope positions.

The primary soils on the subject property are Klootchie-Necanicum complex on 30-60% slopes (20E); Necanicum-Ascar-Klootchie complex on 60-90% slopes (21F); and Templeton-Klootchie complex on 5-30% slopes (29D) and 30-60% slopes (29E).

Klootchie-Necanicum complex 30-60% slopes (20E)

This soil type occurs at elevations between 50 and 1,800 feet and is well drained with virtually no flooding or ponding. Available water capacity is moderate to very high (about 7.8 to 19.1 inches), with more than 80 inches to a restrictive layer.

For forest productivity and operations, the listed site indices for a base age of 50 are 111 to 120 feet for Douglas-fir (King 1966) and 104 to 115 feet for western hemlock (Wiley 1978). There are no values listed for red alder, Sitka spruce, or western redcedar. This soil is moderately well suited to hand planting, with moder-

ate potential for seedling mortality. The potential for fire damage to the soil is low. However, it is highly susceptible to rutting and poorly suited to mechanized harvesting and site preparation, primarily due to steepness. Road suitability is low with a severe erosion hazard on roads and trails.

Necanicum-Ascar-Klootchie complex 60-90% slopes (21F)

This soil type occurs at elevations between 50 and 1,800 feet and is well drained with virtually no flooding or ponding. Available water capacity is low to very high (about 5.0 to 19.1 inches), with more than 80 inches to a restrictive layer.

For forest health and operations, the listed site indices for a base age of 50 are 111 to 120 feet for Douglas-fir (King 1966) and 104 to 115 feet for western hemlock (Wiley 1978). There are no values listed for red alder, Sitka spruce, or western redcedar. This soil is unsuitable for hand planting, mostly due to slope and rock fragments, with moderate potential for seedling mortality. The potential for fire damage to the soil is low. Like Klootchie-Necanicum complex, it is highly susceptible to rutting and poorly suited to mechanized harvesting and site preparation due to steep slopes. Road suitability is low with a severe erosion hazard on roads and trails.

Templeton-Klootchie complex 5-30% and 30-60% slopes (29D, 29E)

This soil type occurs at elevations between 50 and 1,800 feet and is well drained with virtually no flooding or ponding. Avail-

able water capacity is moderate to very high (about 14.9 to 19.1 inches), with 40 to 60 inches to a restrictive layer.

For forest health and operations, the listed site indices for a base age of 50 are 120 to 125 feet for Douglas-fir (King 1966) and 115 to 116 feet for western hemlock (Wiley 1978). There are no values listed for red alder, Sitka spruce, or western redcedar. This soil is moderate to well suited for hand planting, with low potential for seedling mortality. The potential for fire damage to the soil is low. Mechanized harvesting and site preparation are better suited to gentler slopes, as the soil is highly susceptible to rutting. Road suitability is low with a severe erosion hazard on roads and trails.

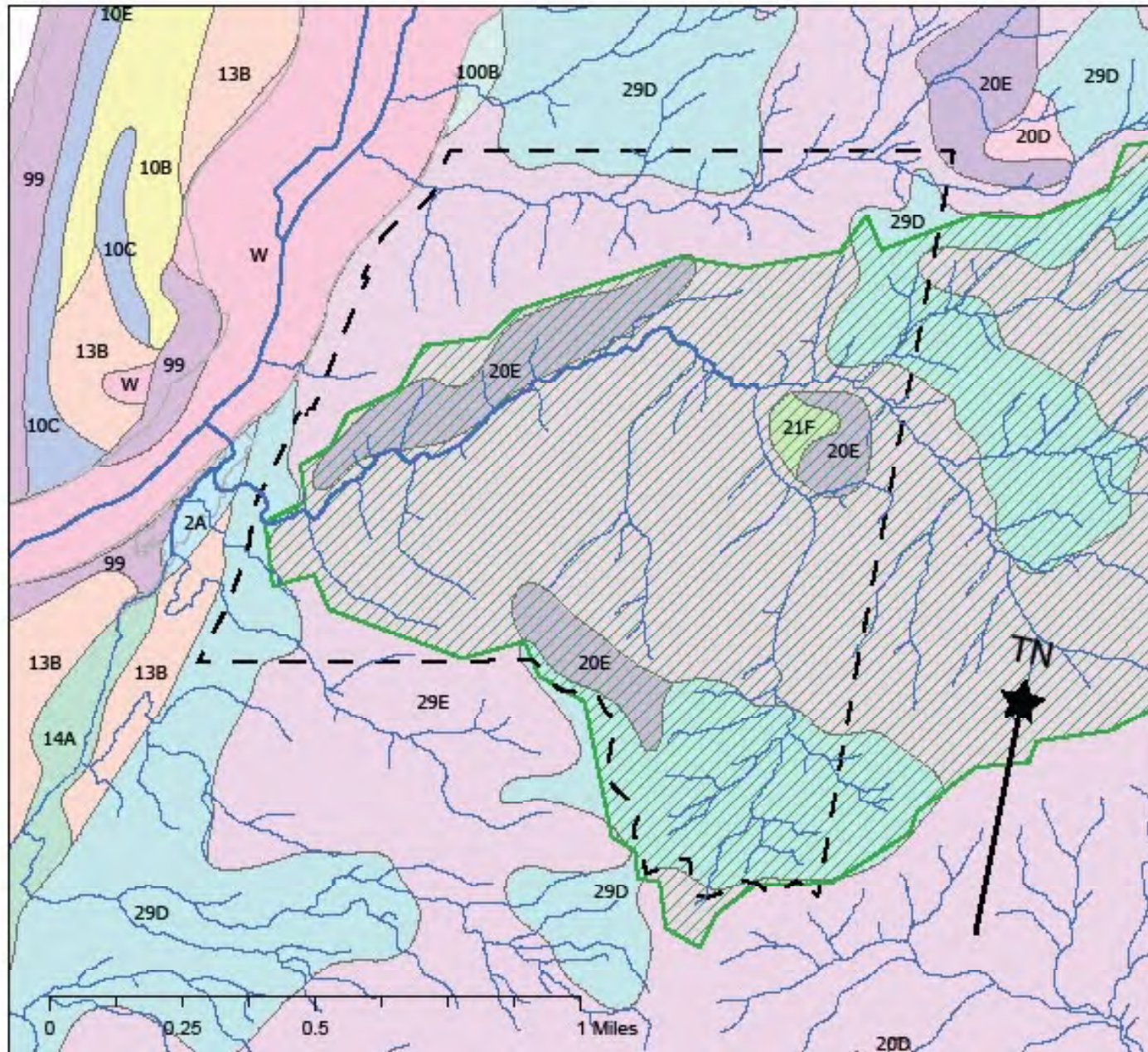
High Landslide Hazard Locations

The entire property has moderate to high landslide hazard, both for shallow and deep landslides, as well as multiple documented landslide locations along the western property boundary bordering Highway 101. Deep landslides are of particular concern due to both the catastrophic nature of failures, and long term or potentially permanent damage to source water quality and systems. All forest stewardship must be planned with an awareness of landslide and slope instability risk. Shallow landslides are of particular concern on and surrounding road systems, with the Jetty Creek mainline, running parallel to Jetty Creek, of particular concern. This is noted in the roads section.

In addition to Oregon Department of Geology and Mineral Industries (DOGAMI) Statewide Landslide Information Database

for Oregon (SLIDO), the Oregon Department of Forestry has a separate geodatabase to identify debris flow traversal areas and sediment source areas. This database does not show any traversal or source areas on the subject property, however any future forest stewardship activities planned on the property could trigger a review by Oregon Department of Forestry to determine if downhill public safety risk exists due to recorded landslides in the area. The management recommended in this plan is designed to avoid creating new issues for soil erosion and landslide risk, while managing existing risk, particularly relating to roads.

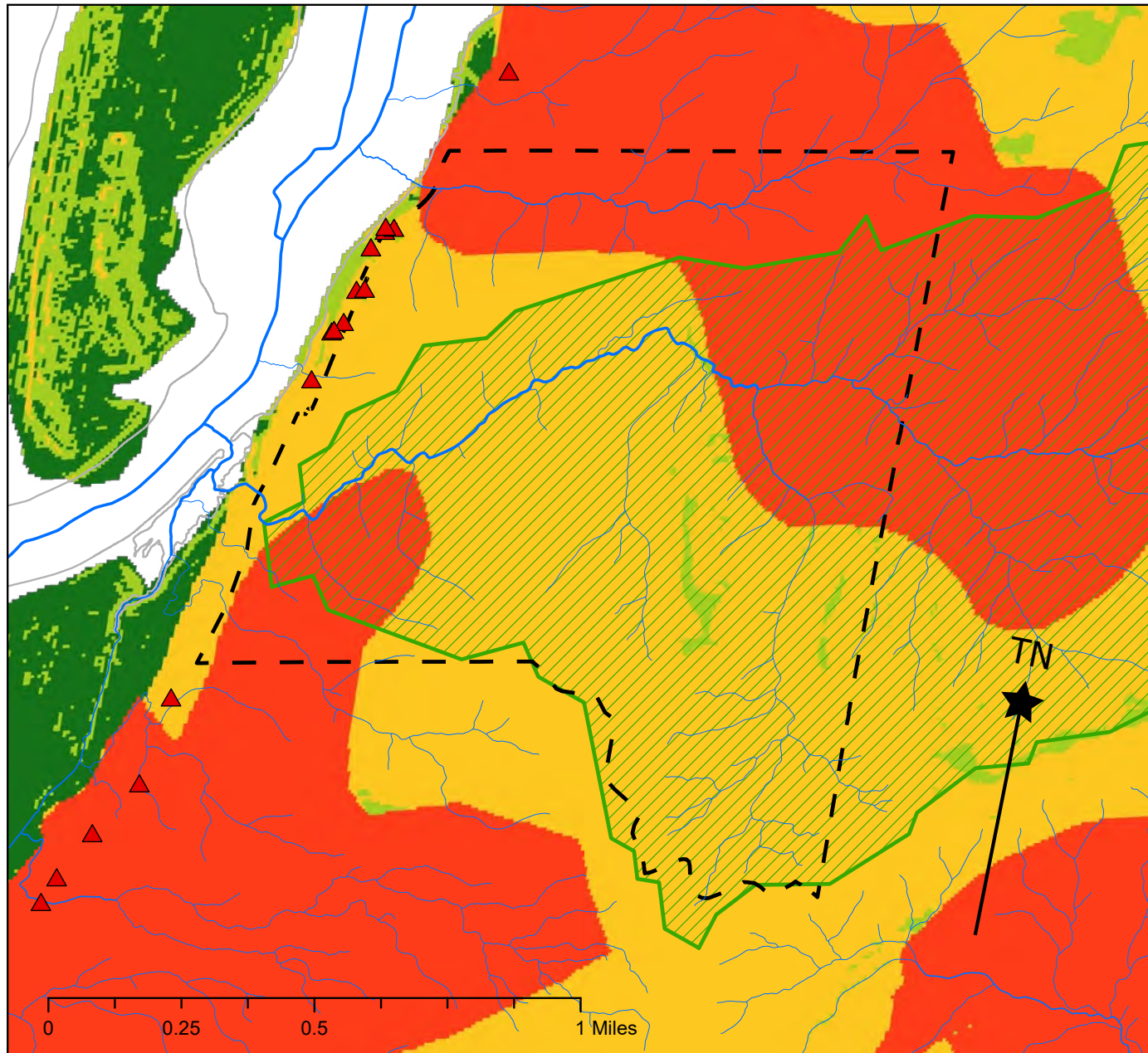
Soil Symbol	Soil Name	Acres / % of Property	
20E	Klootchie-Necanicum complex, 30-60% slopes	80.8	10%
21F	Necanicum-Ascar-Klootchie complex, 60-90% slopes	6.9	1%
29D	Templeton-Klootchie complex, 5-30% slopes	151.6	19%
29E	Templeton-Klootchie complex, 30-60% slopes	560.2	70%



Legend

- Subject Property
- Watershed Boundary
- FPA Stream Size
 - Small
 - Medium
 - Large
 - NA - No Channel
 - <all other values>
- Soil Type
 - 100B
 - 102A
 - 103A
 - 100
 - 10C
 - 10E
 - 118B
 - 119B
 - 11B
 - 11D
 - 11E
 - 12B
 - 13B
 - 144F
 - 145F
 - 14A
 - 157E
 - 15B
 - 162D
 - 162E
 - 163F
 - 164F
 - 166F
 - 16F
 - 170A
 - 170B
 - 174C
 - 178B
 - 17B
 - 192A
 - 1A
 - 20D
 - 20E
 - 21F
 - 22F
 - 29D
 - 29E
 - 2A
 - 30D
 - 30E
 - 3A
 - 43F
 - 44F
 - 45B
 - 48E
 - 51C
 - 55A
 - 56B
 - 57B
 - 57C
 - 58C
 - 59B





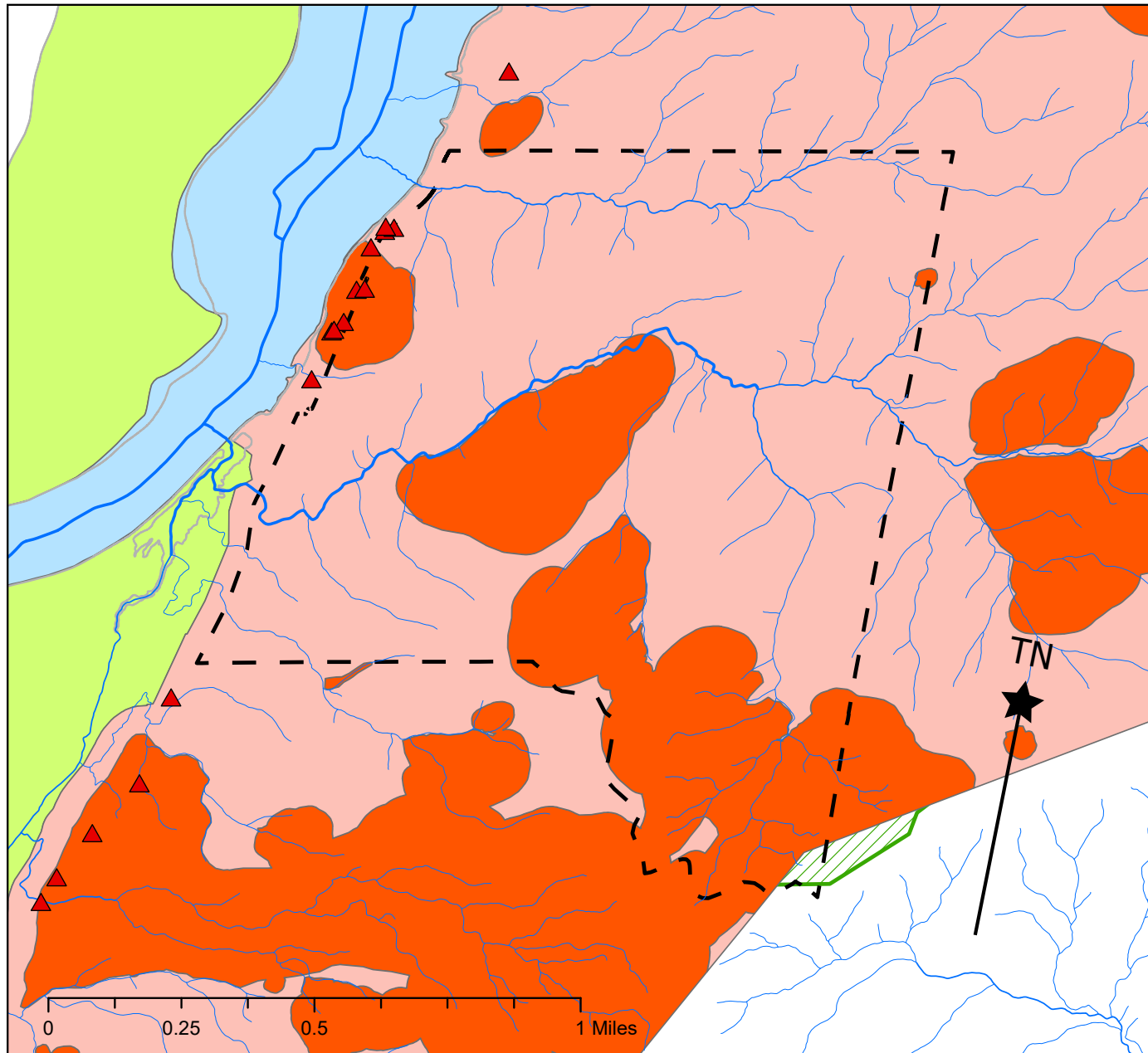
- Legend**
- Subject Property
 - Watershed Boundary
 - FPA Stream Size
 - Small
 - Medium
 - Large
 - NA - No Channel
 - <all other values>
 - Historic Landslide Points

Statewide Landslide Susceptibility Overview (SLIDO 4.5)

- Low
- Moderate
- High
- Very High



DEEP LANDSLIDE SUSCEPTIBILITY



- ### Legend
- Subject Property
 - Watershed Boundary
 - FPA Stream Size
 - Small
 - Medium
 - Large
 - NA - No Channel
 - <all other values>
 - Historic Landslide Points
 - Deep Landslide Susceptibility (SLIDO 4.5)
 - High
 - Low
 - Moderate
 - Water
 - <all other values>



WATER RESOURCES

Jetty Creek, Messhouse Creek, and their tributaries form an extensive network of perennial and seasonal streams throughout the subject property. There are approximately 14.2 total miles of streams and tributaries on the property, with 10.3 miles within the Jetty Creek watershed. This represents a drainage density of about 11.4 miles per square mile in the source water area, which contributes to a relatively rapid runoff response.

Stream channels range from low-gradient, alluvial reaches in the lower watershed to steep, confined channels in headwater areas. Groundwater seeps and springs are common on hillslopes, particularly at the contact between soil layers or soil and bedrock. These wet areas contribute to year-round stream flow but also represent zones of potential slope instability.

Jetty Creek is registered as a domestic Point of Diversion intake with the Oregon Water Resources Department. Oregon Forest Practices Act rules govern forest management surrounding all streams, with fish-bearing streams (Type F) receiving stronger protection requirements. There are about four miles of Type F streams across the property. Jetty Creek is classified as a large Type F stream supporting Salmon, Steelhead, and Bull Trout (SSBT), while Messhouse Creek is a medium Type F SSBT stream. Most tributaries are small seasonal non-fish streams (Type N), though some are classified as seasonal or perennial fish streams (Type Np).

The City holds a water right to collect 2.0 cubic feet per second

collectively from Jetty Creek. The water is treated with rapid sand filtration and rapid mix at the City's water treatment plant. The City completed construction of enhanced treatment with pressurized sand filters in 2014 to address total trihalomethanes (a disinfectant byproduct) violations. In addition to the water treatment plant with rapid sand filters, infrastructure components include an off-channel settling pond upstream of the water treatment plant and a fish screen at the intake. Treatment capacity is 861,120 gallons per day (1.3 cubic feet per second).

The City supplements its Jetty Creek supply in late summer when flows are low with groundwater from the East and West Wells (Nehalem Bay Basin) and Manhattan Well (McMillan Creek Basin). However, both sources have water quality issues and are only used to supplement supply during peak summer demand.

A high-priority operational challenge is the management of high source water turbidity events. High turbidity can trigger required temporary shutdowns of the water treatment plant and fish screen. Between 2020 and 2023, the City was forced to stop diverting water from Jetty Creek for eight days due to high sediment and turbidity. Chemical treatment (aluminum chlorohydrate and chlorine) is used during periods of elevated turbidity.

WILDLIFE AND FISH

The subject property provides habitat for many wildlife species that are ubiquitous in northwestern Oregon forests, including Roosevelt elk, black-tailed deer, black bear, and numerous bird and amphibian species. No formal abundance or activity surveys for these relatively common species have been conducted on the property. However, anecdotal evidence from Oregon Department of Fish and Wildlife suggests a history of moderate animal browse and damage in and around the Jetty Creek watershed, particularly affecting conifer regeneration in recently harvested or replanted areas.

Fish

Fish activity in Jetty Creek is well documented. According to Oregon Department of Fish and Wildlife, Jetty Creek supports a healthy run of wild coho salmon and steelhead trout, as well as coastal cutthroat trout and Pacific lamprey. Records indicate excellent coho spawning habitat and high-quality gravel, with observations of adult coho in 1991 and 1993, and redds documented in 2003 and 2004.

Anadromous fish populations are a key indicator of watershed health and underscore the importance of maintaining cold, clean water and intact riparian habitat. Oregon Coast coho salmon are also considered a threatened species by the Endangered Species Act, and a state sensitive species along with winter steelhead. The presence of a federally threatened species is important and can significantly affect management plans and decisions.

Oregon Forest Practices Act rules have specific streamside protection requirements for fish-bearing streams. However, these rules are very compatible with management objectives for water quality, and any plans to improve riparian and in-stream conditions can result in multiple resource benefits beyond the watershed. The policies adopted by the City exceed state, federal, and certification requirements for stream protection.

Several efforts have improved fish habitat in Jetty Creek in recent years. Tillamook Estuaries Partnership, Oregon Department of Fish and Wildlife and Nuveen Natural Capital completed a large woody debris placement project on the subject property. The Oregon Department of Forestry Forest Activity Electronic Reporting and Notification System (FERNS) records show that roughly 35,000 board feet (35 MBF) of woody material were harvested and installed in September 2025. The City also addressed fish passage barriers at the water treatment facility around 2017, improving access to upstream spawning and rearing habitat. The project involved constructing a natural channel that would bypass the raw water storage pond and intake, expanding the City's raw water storage pond, and installing a fish screen at the site of the City's point of diversion.

Game Species and Other Wildlife

Future forest management strategies are likely to influence the diversity and abundance of species on the property. Both elk and black-tailed deer benefit from a variety of forest habitat types, though deer populations are more frequently observed using early seral conditions (such as recent clearcuts). If even-

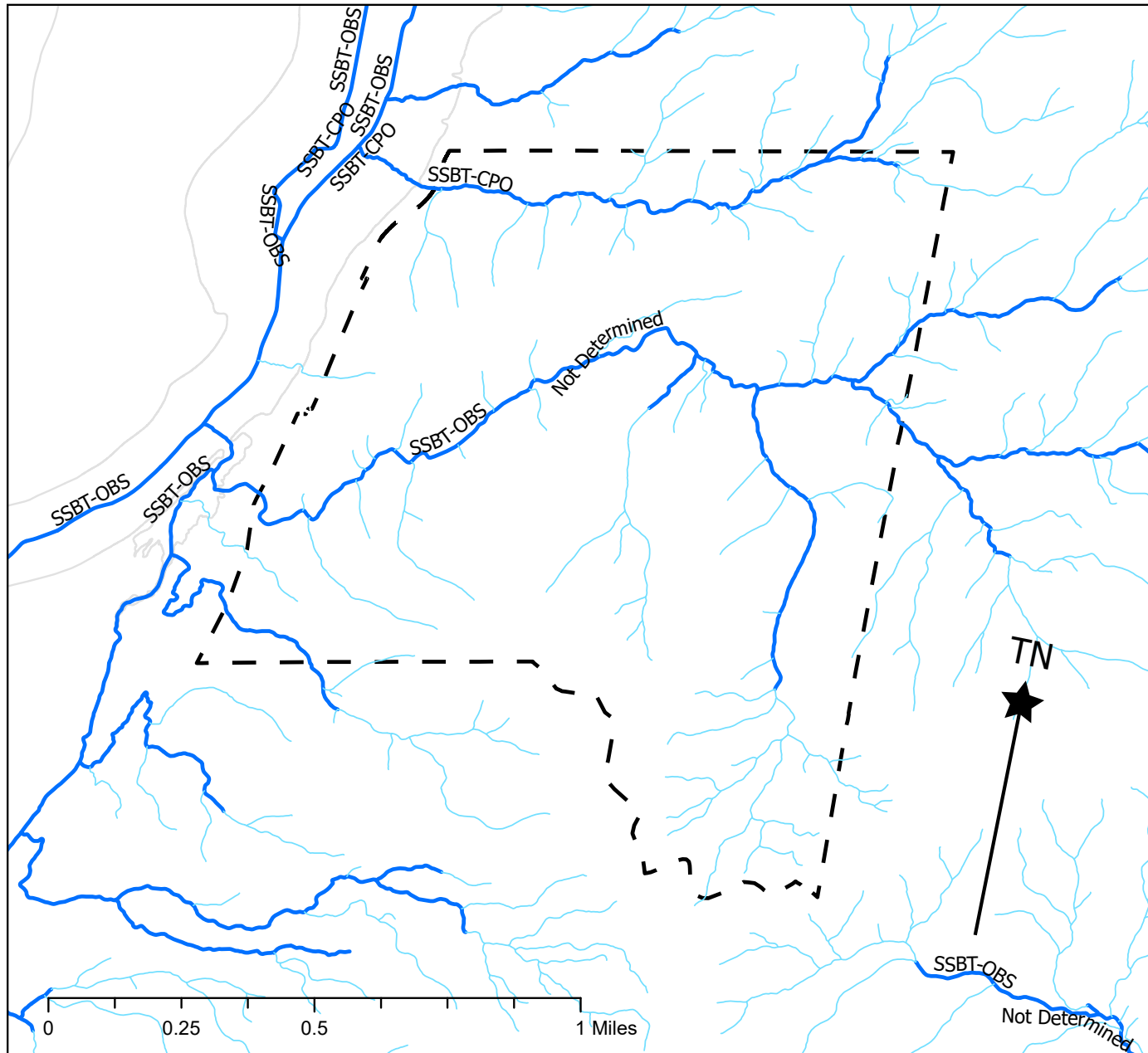
aged management is reduced and/or rotation ages are lengthened, resulting in fewer acres of young vegetation, there could be a reduction in game species on the property. However, the watershed is large enough (and ownership diverse enough) that there will likely always be nearby clearcuts and other disturbed areas to maintain some level of deer presence on the property.

A notable concern with wildlife in domestic watersheds is potential contamination of water supply by pathogenic organisms. Beaver and other mammals can contaminate streams and other surface water with *Giardia lamblia*, a protozoan that causes severe gastrointestinal discomfort when ingested by humans. Wildlife may also contaminate water with harmful strains of *Escherichia coli*, *Salmonella*, and other pathogens. To mitigate these risks, water managers can implement several strategies, including establishing protective buffers or fencing around vulnerable infrastructure, managing wildlife presence in areas where pathogens are most likely to be introduced to the water supply, and conducting regular monitoring for indicator organisms.

* Note on Fish Habitat Nomenclature:

The Oregon Department of Fish and Wildlife classifies streams as Salmon, Steelhead, and Bull Trout fish streams (SSBT) both in terms of observed populations (SSBT-OBS) or certified perennial occupancy (SSBT-CPO). These are both indicated in the state database, as well as non-occupied stream segments.

FISH PRESENCE



- Legend**
- CORB Proposed Purchase
 - Fish Presence
 - Fish
 - Non-Fish
 - NA - No Channel
 - <all other values>



INTEGRATED PEST MANAGEMENT

Integrated pest management is a decision-making strategy and set of actions that addresses pest control (including weeds, insects, and disease) in an environmentally and economically sound manner to meet pest management goals. This includes preventing invasions, regular monitoring, establishing a threshold for pest tolerance, treating pests, and evaluating treatment effectiveness. The following is a list of integrated pest management strategies to help control specific invasive weeds and forest health concerns known to occur on the subject property.

Invasive Weeds

While invasive weed pressure is relatively low on the property, Himalayan blackberry (*Rubus bifrons armeniacus*), scotch broom (*Cytisus scoparius*), English holly (*Ilex aquifolium*), and tansy ragwort (*Jacobaea vulgaris*) are present along roadsides, on abandoned roads and trails, and on landings.

Himalayan blackberry is most efficiently treated mechanically (mow, hand cut, or chainsaw) followed by chemical spot treatment, although it can be managed with regular mowing or brush cutting and development of canopy shade. Cut blackberry to the ground any time of year, taking care to not disturb songbirds during nesting season (April to July) and/or manual dig up root corms (or root ball). After removal, monitor and mow or brush cut, as needed.

English holly is typically treated mechanically (mow, hand cut, or chainsaw) and chemically (immediately after cutting on the stump surface). Cutting without stump treating is also an option, though stumps will likely resprout. It is also possible to use a weed wrench on smaller diameter stems (smaller than two inches) while soil is moist in winter and spring. Make sure to burn or place cut or pulled plants on a tarp to dry out as they can re-root from the branches laying on the ground

Larger diameter Scotch broom stems (greater than about two inches) can be cut without the threat of suckering or growing back from the root crown. Weed wrenches can completely remove smaller diameter plants when the soil is moist in winter and spring. However, disturbing the soil will inevitably stir up the seeds and create more plants. Like Himalayan blackberry, development of canopy shade will eventually significantly reduce Scotch broom on the property.

Tansy ragwort is toxic to livestock, so do not allow grazing as a control method. Mowing is not recommended as it can cause the plant to flower shorter, potentially avoiding the mower blade, and spread seeds. Small patches can be hand-pulled, ensuring the entire root system is removed. May to June is the best time for manual removal. If flowers are present, dispose of them by cutting, bagging, and disposing off-site or burning.

Disease and Insects

White pine weevil (or Sitka spruce weevil) damage is present in some young stands of Sitka spruce on the property. Larvae kill

or severely impair current- and previous-year terminal growth of young spruce by girdling the terminal stem. As a result, the leader will often appear wilted by mid-summer and then die. Impacts include reduced height growth, forked tops, and crooked stems. Weevil populations seem to become less damaging once trees reach around 20 years old. Best management practices for stands with significant weevil pressure include prioritizing protective planting practices (avoid poor planting sites and improper planting), planting densely to force upward growth and reduce bushiness, reducing competing plants, and training a new leader from lateral stems (if the terminal leader dies).

Western hemlock looper has not been present in the area for a while but has caused significant damage during outbreaks in nearby areas. Young larvae feed on new hemlock foliage and later larval stages feed on both new and old foliage. Larvae are present on foliage from late June through September. Signs and symptoms of infestation include chewed foliage that turns yellowish red to brown in one season; portions of chewed green needles at the base of the tree; and strands of loose webbing. Heavy feeding can lead to growth loss, and top kill. Mortality is uncommon, though can occur when 75% or more of the crown is defoliated. Outbreaks can last about three years. Diverse stands with a variety of age classes and healthy spacing appear to be more resilient to western hemlock looper outbreaks.



ACCESS AND ROADS

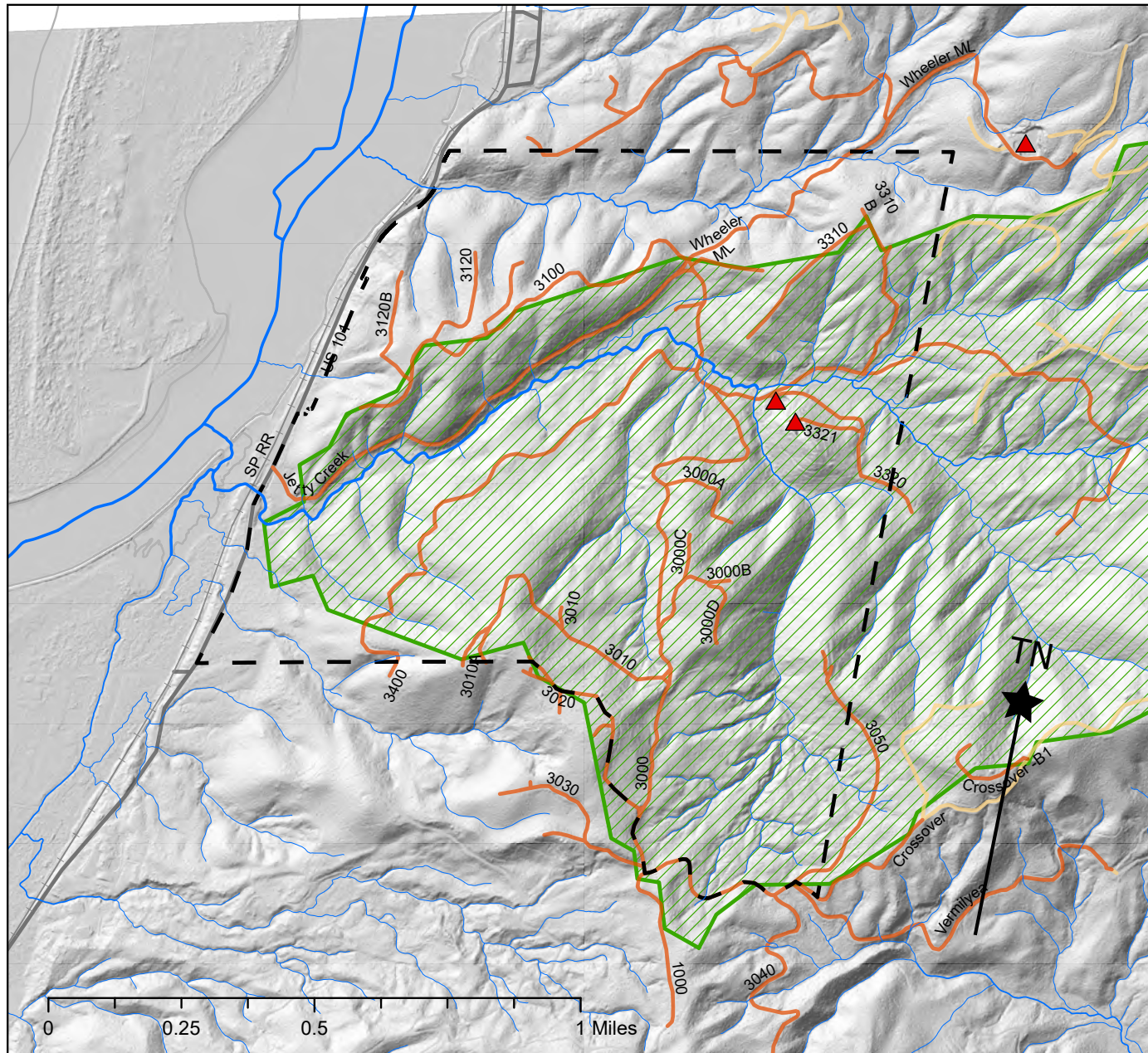
The subject property is primarily accessed from Highway 101, immediately north of the Jetty Creek Bridge. Current access is controlled by a locked gate and limited to the City, Nuveen Natural Capital, Stimson Lumber Company, and Oregon Department of Forestry. Property boundaries are marked with signage along roads.

The road network throughout the property includes about 20 miles (104,323 feet) of mainlines, secondary roads, spurs, and abandoned roads. Most roads are currently well maintained, however the road system will require ongoing maintenance to support forest stewardship and maintain long-term access. The mainline road (2.7 miles; 14,517 feet) is rocked and drivable. Of the remaining spur roads (17 miles; 89,806 feet), all are rocked, but some spurs have become overgrown.

Regular inspections are essential, particularly during winter months, to identify and address water damage and erosion before minor issues escalate into costly repairs. Implementing proper drainage features, surfacing, and seasonal maintenance will be critical to preserving road integrity and preventing sedimentation impacts to nearby streams.

A small rock pit is located near the center of the property, accessed by a dead-end spur from the Jetty Creek Mainline. This rock pit has recently been used as a spoils dumping area and it is unclear whether it could currently generate usable rock. A second abandoned rock pit exists at the base of the spur.





Legend

Road Surface

- Dirt
- Paved
- Railway
- Rock
- <all other values>

FPA Stream Size

- Small
- Medium
- Large
- NA - No Channel
- <all other values>

- Watershed Boundary
- Subject Property
- ▲ Rock Pit



ROADS AND EROSION RISK

The subject property is in an area of moderate to high shallow landslide risk with highly erodible soils and a history of landslides in the area. A number of recorded landslides exist along Highway 101 to the north of Jetty Creek, while small historic road slumps are present along the Jetty Creek Mainline where it runs parallel to Jetty Creek upstream from the water intake.

The design of the road system, with a large mainline running parallel to Jetty Creek, creates long term risks, however alternative access or road re-alignment are not feasible or recommended at present. In the future, the City of Rockaway Beach could work with neighboring landowners to explore alternate access options to the north or south.

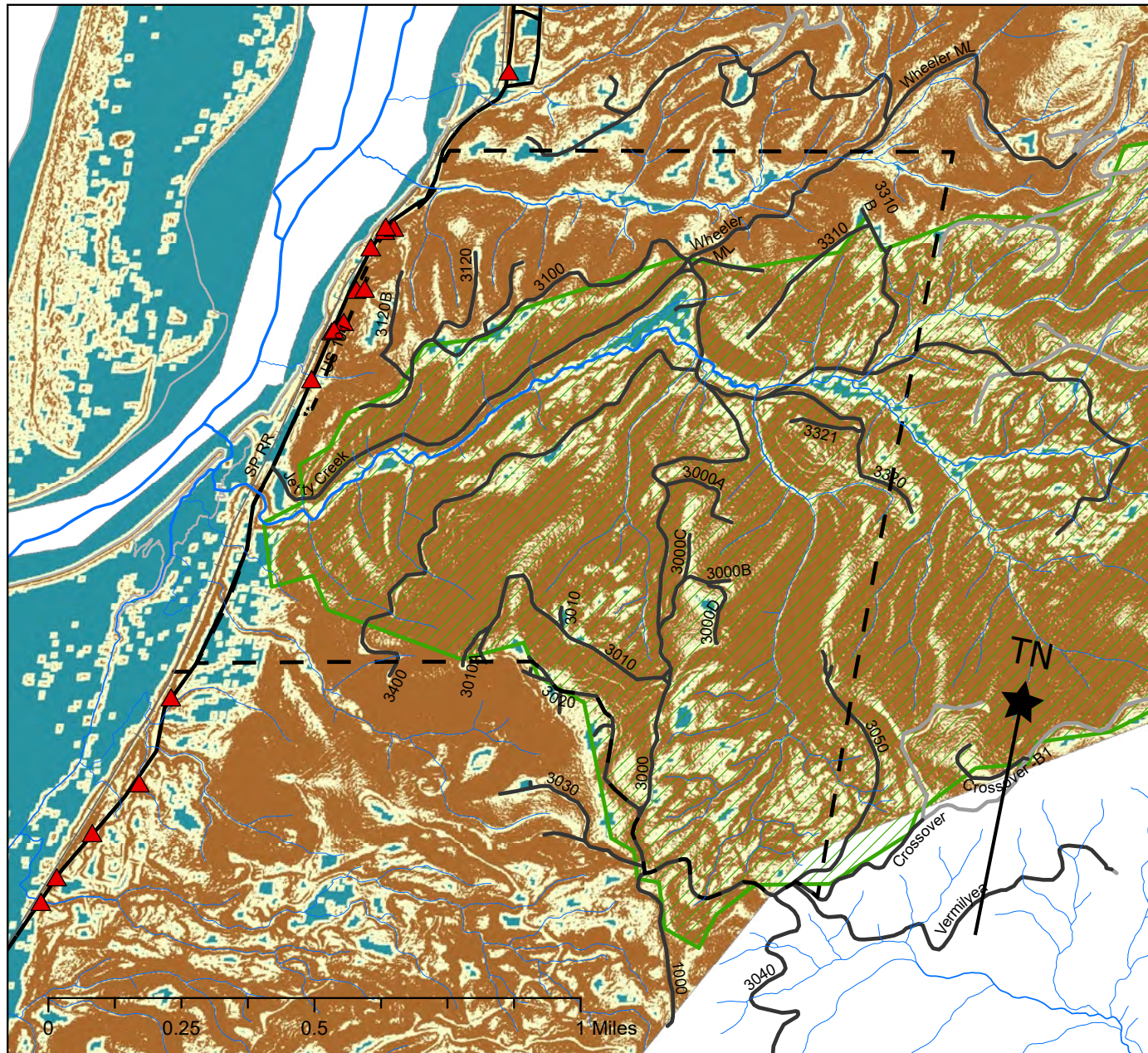
The road system is well maintained, with new cross drain culverts and ditches that have been disconnected from the stream system. Even with adequate drainage and well maintained road surfaced and ditches, erosion risk does exist within the road system, and a shallow landslide could develop on the Jetty Creek Mainline. The large road crossings on Jetty Creek were not analyzed in the road assessment and should be evaluated by a professional engineer.

Forest stewardship recommended in this plan poses minimal erosion or landslide risk, since no commercial harvests of any type are included. Young stand thinning will promote understory plant communities, which are important for managing runoff and stabilizing soils, particularly on steep slopes.



SHALLOW LANDSLIDE RISK + ROADS

30



Legend

- Subject Property
- Watershed Boundary
- Road Surface**
 - Dirt
 - Paved
 - Railway
 - Rock
 - <all other values>
- FPA Stream Size**
 - Small
 - Medium
 - Large
 - NA - No Channel
 - <all other values>
- Historic Landslide Points
- Shallow Landslide Susceptibility (SLIDO 4.5)**
 - Low
 - Moderate
 - High



RECREATIONAL AND CULTURAL RESOURCES

Recreation

The subject property is currently open for recreation through a permit system and is clearly valued by the community. An existing network of roads and informal trails provides access for walking, hiking, biking (non-motorized) and hunting throughout the site. Opportunities exist to expand and improve these routes to enhance access to scenic viewpoints, accommodate year-round use, and create more formalized recreational amenities. The recommended weed management strategies outlined in this plan will further improve both accessibility and the overall aesthetic experience for visitors.

Scenic Highways

Highway 101, designated as a scenic highway by the Oregon Legislature, borders portions of the property's western edge. Scenic highway designations establish protective buffers to minimize the visual impact of forest management activities. A visually sensitive corridor extends 150 feet from the highway, with an adjacent buffer zone of 150 to 300 feet. Any management activities within these areas must comply with Oregon Forest Practices Act requirements for tree retention and slash management to maintain the scenic character of the corridor.

Historic and Cultural Sites

No significant historic or cultural sites have been identified on the property to date. Should the City pursue federal funding for forest management activities in the future, consultation with the State Historic Preservation Office will likely be required as part of a formal review and to ensure compliance with cultural resource protection requirements.

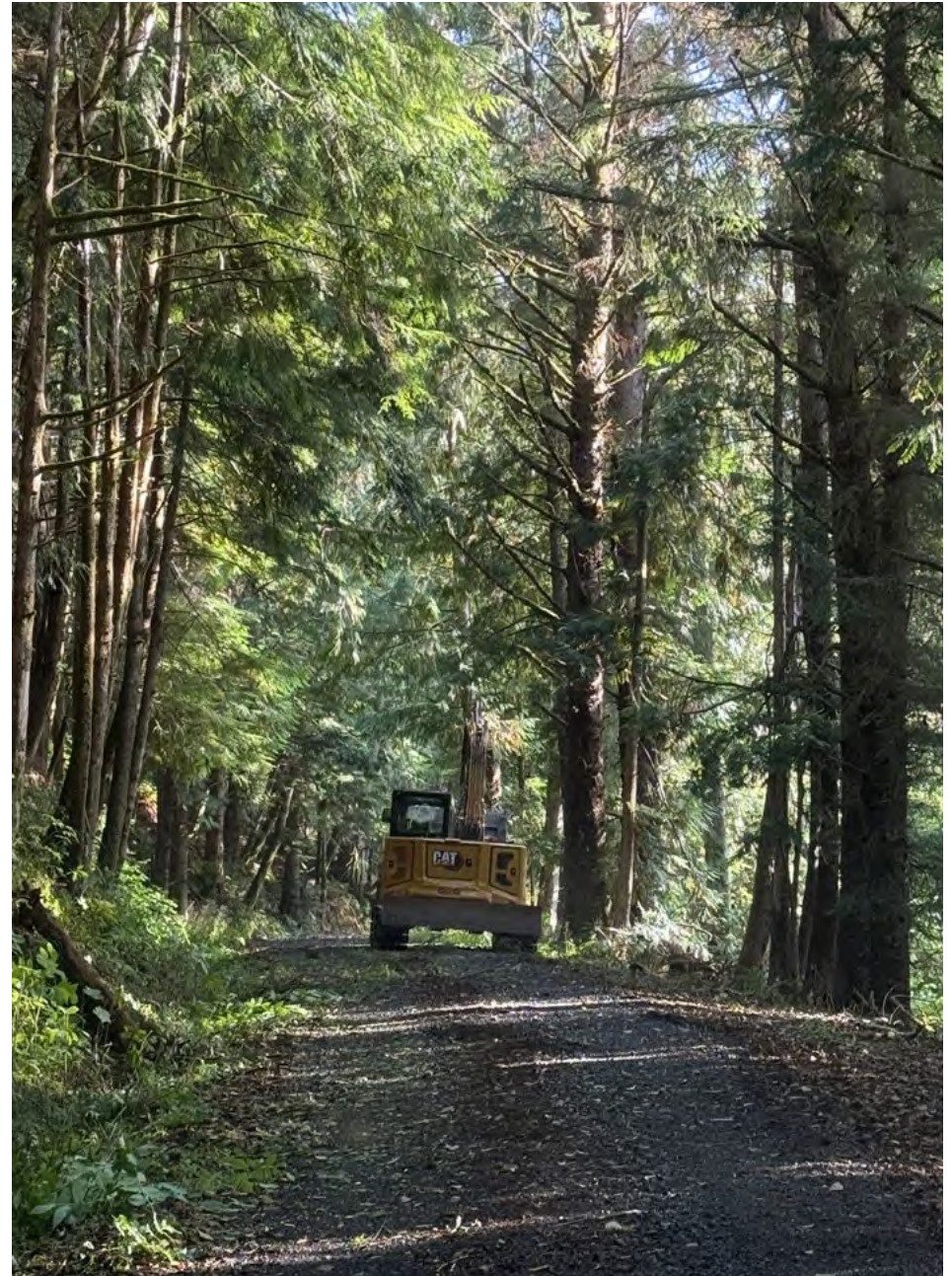
FOREST MANAGEMENT POLICIES

32

In order to achieve the goals and objectives of the City, the subject property will be managed in accordance with the following five policies. These policies create a framework for determining operational plans across the ownership. The policies are designed to meet or exceed the requirements of the Oregon Watershed Enhancement Board, the Oregon Department of Forestry, and the Forest Stewardship Council Pacific Standard; and are in line with the purposes of the Drinking Water Source Protection Grant Program - to protect, restore, or enhance sources of drinking water. Each individual stewardship project will require analysis to guarantee compliance and alignment both with these policies and with funding requirements. The management of the Jetty Creek watershed must also comply with state and federal regulations pertaining to forest management, threatened and endangered species, and source water protection.

These policies include background as well as requirements and recommendations related to:

- **Forest Stewardship**
- **Stream Buffers**
- **Road Maintenance**
- **Invasive Species and Chemical Use**
- **Recreation and Public Access**



FOREST STEWARDSHIP

Forest Stewardship Discussion

The primary goal of stewardship within the Jetty Creek watershed is the provision of reliable quantities of high-quality water. Central to this goal is stewardship of the forest, which covers the entirety of the watershed. The structure, species composition, understory plant community, and extent of this forest will determine the landscape's ability to function in two ways - as a sponge and as a filter.

The Forest as a Sponge: A primary function of forested landscapes is to mitigate high-rainfall events and to increase base flow during dry conditions. Forests accomplish this to varying degrees depending on age, species and structural composition, and soil conditions. The most absorbent forests are those with uncompacted, highly porous, loamy soils; a diverse and healthy plant understory; multiple canopy layers or strata; and older trees. These types of forests weather dry conditions by minimizing evapotranspiration and decreasing the temperature within the forest. In wet conditions, the multiple canopy strata; healthy understory plant community; and deep, loamy soils with high organic content will store water, slowly releasing it into both surface and hyporheic flow. In this way, the forest serves as a sponge, decreasing peak flow events while increasing summer-time base flows.

The Forest as a Filter: In addition to storing and releasing water, forests filter out particulates including airborne matter and runoff

from roads and soil surfaces within the forest. Of particular importance in managed forests is the ability to filter fine sediment runoff from road surfaces. A forest with multiple canopy layers and a healthy understory both serves as a good filter above the forest floor but also decreases the velocity of rain as it moves through the forest, diminishing erosive potential. A diversity of native plant species creates an excellent filter today while also mitigating the future risk of mortality from any single species dramatically altering the forest's functional characteristics.

In addition to serving as a sponge and a filter, diverse, complex, and older forests provide mitigation and adaptation services, grow a range of high-value wood species over the long term, and provide habitat and recreational benefits.

Forest Stewardship Policy

The subject property will be managed to increase species diversity, develop forest structural complexity, and maintain canopy cover (extent). This will be done with a long-term planning horizon and in a manner that prioritizes water quality and quantity.

STREAM BUFFERS

Stream Buffer Discussion

Riparian areas within a forest are the first line of defense in stream protection. The buffers on these areas are measured in feet from the bank-full width of a stream. For the purposes of this plan, all buffers will be measured as horizontal distance, as opposed to slope distance. Buffers can vary in width, and regarding activities allowed within the buffer. In many cases, regulations or policies define an inner buffer, where activities are more heavily limited than in the outer buffer. Both state laws and forest management certifications specify where buffers should be applied and what activities are permitted within the buffer. The Oregon Department of Forestry administers a statewide streams geodatabase that foresters use to determine stream size and fish presence, although unlisted streams will also require protections.

Stream protections provide a wide range of water quality, ecological, and landscape resilience benefits. Stream buffers serve as a high-quality filter, using intact riparian vegetation to remove sediment. Protecting these near-stream areas decreases the risk of sediment mobilization, particularly from exposed mineral soil. Any management activity that exposes mineral soil both creates a potential source of sediment for streams and also invites invasive plants to develop.

Stream Buffer Policy

The City will manage the subject property to exceed the Oregon Forest Practices Act and Forest Stewardship Council Pacific Standards requirements for stream buffers. All streams will require a 150-foot equipment limitation zone, measured as horizontal distance. Non-commercial stewardship activities may take place to accomplish restoration and resilience goals within this 150-foot buffer.

ROAD MAINTENANCE

Road Maintenance Discussion

Road maintenance includes all activities associated with the road system, including vegetative control (mowing), grading, cross drainage repairs and additions, addition of rock, or realignment and replacement. Road maintenance relies on regular monitoring of the road system condition, needs, and uses. Mainline roads will require more maintenance than dead-end spur roads. A lack of maintenance on mainline roads can lead both to severe water quality issues as well as issues for property access. Small spur roads may simply be allowed to regrow vegetative cover, while roads with drainage issues require decommissioning. Decommissioning activities range from minor excavation and drainage to complete excavation and revegetation, returning the road to the surrounding slope and understory vegetation.

The forest road network provides essential access throughout the subject property for stewardship activities, fire suppression, monitoring, and recreation.

Road maintenance is critical to source water management for the following reasons. First, well maintained roads decrease the risk of catastrophic failure, which create both source water and access issues. Secondly, adequately maintained and drained road surfaces minimize the mobilization of fine sediment, which presents severe water treatment issues.

Road Maintenance Policy

The City or their contractors will monitor and evaluate the condition of roads on the subject property on an annual basis and following extreme weather (atmospheric river or high wind) events to prioritize maintenance and repair activities. Road maintenance and monitoring will include communication and partnership with neighboring landowners. Mainline and essential spur roads will be maintained on an annual basis with repairs as needed. All current mainline roads should be kept open in order to provide fire, emergency, and neighboring landowner access. This includes the removal of downed trees and regular brush mowing to keep roads open during fire season. Small spur roads may be decommissioned or temporarily abandoned if deemed appropriate by the consulting forester, City staff, neighboring landowners, and the Oregon Department of Forestry stewardship forester. The subject property is part of the Oregon Department of Forestry fire protection program and long-term coordination with the Department is essential for their fire patrol and suppression efforts.

Strategies for road maintenance include out-sloping roads where possible, building frequent and oversized cross drains, and disconnecting ditches and culverts from streams. Routing road runoff into forest understory vegetation provides the best fine sediment filter available for forest roads.

INVASIVE SPECIES AND CHEMICAL USE

Invasive Species and Chemical Use Discussion

Invasive plants can present a competitive challenge to native vegetation. This includes a significant risk that invasives can overwhelm all native species and create a monoculture thicket. By competing aggressively for light and moisture, invasive plants such as Scotch broom and Himalayan blackberry will either overtop and exclude native species that currently occupy a site, or preclude the establishment of native plant communities.

Invasive species can create challenges for forest stewardship, land conservation, and recreation. In order to grow a healthy and resilient forest, native trees must outcompete invasive species present on the site during stand establishment. If invasive weeds pose a risk to forest regeneration, foresters typically consider mechanical and chemical site preparation and post-planting vegetation management.

Forest chemicals include pesticides and fertilizers. The most common form of chemical use in Oregon forests is broadcast and spot herbicide application. These applications focus on either decreasing herbaceous competition, maintaining vegetation free road surfaces, or treating specific invasive species issues.

Invasive Species and Chemical Use Policy

The City will work with partners and the other watershed landowners to utilize the best available science and treatments for the management of invasive species. Invasive species are an inevitable component of forested ecosystems, but management will always strive to develop healthy native forests and ecologically functional plant communities.

The City will not use any pesticides or fertilizers on their ownership within the watershed and will work with other watershed landowners to encourage alternatives to pesticide and fertilizer.



RECREATION AND PUBLIC ACCESS

Recreation and Public Access Discussion

The Jetty Creek watershed provides a unique recreational access opportunity, with the potential for easily accessible trails, wonderful views of Nehalem Bay and Neahkahnie Mountain, and opportunities to encounter many of the region's charismatic wildlife species. Recreational access also includes considerable risk to source water, primarily from contamination and wildfire ignition. While water contamination from recreational access is not well tracked, wildfire ignition in northwest Oregon is predominantly caused by humans (an estimated 97% in Tillamook and Clatsop County), with a significant proportion of those ignitions caused by recreational users.

Recreation and Public Access Policy

Establishing a long-term balanced and managed approach to recreation will be critical in the Jetty Creek watershed. The subject property is currently open to public access by Nuveen, with some restrictions relating to permits and seasonal or operational closures. Public access will continue to be allowed under ownership by the City of Rockaway Beach, with efforts made to develop new recreational access trails outside of the drinking water source area. Recreational access will be managed to minimize impacts to the property while also exposing residents and tourists to the wonders of the Jetty Creek property. The City intends to complete a Recreation Development Plan within three years from the date of acquisition.



FOREST MANAGEMENT ZONES

The proposed management approach relies on dividing the watershed into three zones. These zones would allow varying degrees of management, road maintenance, public access, and ongoing monitoring. Each zone is described as follows, including both a description of the zone and a description of allowed activities.

ZONE 1 - 307 ACRES

Location: Zone 1 is the inner zone, closest to source water and most sensitive to exogenous impacts from recreational access or stewardship activities. Zone 1 includes a 150-foot buffer on all seasonal and perennial streams within the drinking water source area, measured as a horizontal distance from the bank-full width. This protection may be expanded in some areas to include steep slopes and areas with high landslide potential directly adjacent to Zone 1 or between a road and Zone 1.

Activities: Zone 1 should be managed for long term development of species diversity, forest structural complexity, and old-forest functional characteristics. Prohibited activities within Zone 1 include the following: commercial timber harvest, heavy equipment use (with the exception of for road repairs or stream restoration activities), recreational development, and construction of new roads. Recreational access to roads or trails may occur in Zone 1, as identified in the Recreation Development Plan. New trail / stream crossings may be approved in Zone 1 on a case by case basis.

ZONE 2 - 407 ACRES

Location: Zone 2 falls outside of Zone 1 and includes the remainder of the drinking water source area as well as a 150-foot buffer on streams outside of the drinking water source area. Zone 2 covers the largest area within the property and has significant long-term impacts relating to forest composition and functional characteristics.

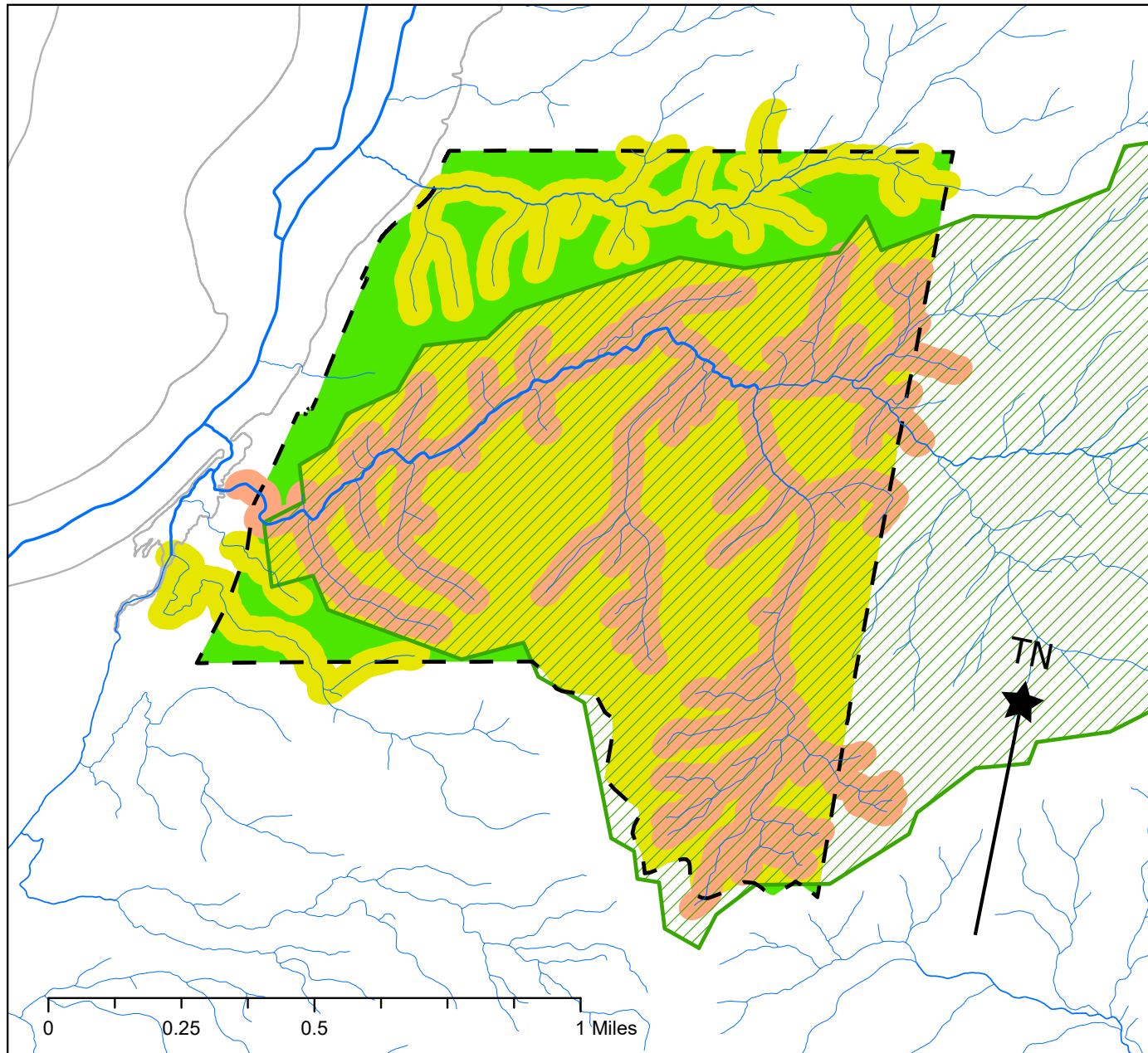
Activities: Zone 2 should be managed for long term development of species diversity, forest structural complexity, and old-forest functional characteristics. Within this zone, stewardship activities can take place as long as they comply with the forest management policies. Prohibited activities include fires, livestock, and hunting. Limited recreational development is allowed within Zone 2 as identified in the Recreation Development Plan, with the understanding that seasonal closures may take place both during high rainfall events and at level two or above fire restrictions.

ZONE 3 - 85 ACRES

Location: Zone 3 includes all forestland owned by the City outside of the drinking water source area that is more than 150 feet from a stream.

Activities: Zone 2 should be managed for long term development of species diversity, forest structural complexity, and old-forest functional characteristics. Recreational development is encouraged in zone 3, in compliance with policies.

FOREST MANAGEMENT ZONES



Legend

FPA Stream Size

- Small
- Medium
- Large
- NA - No Channel
- <all other values>
- Watershed Boundary
- Subject Property
- Zone 1
- Zone 2
- Zone 3



DESIRED FUTURE CONDITIONS

This section describes the desired future conditions for the subject property at the end of this 10-year forest resources stewardship plan (2026-2036). The vision centers on transforming the property from a timber production-focused landscape into a resilient, ecologically complex forest that prioritizes drinking water quality and quantity while providing enhanced habitat, recreational opportunities, and community benefits. By 2036, the City expects to achieve:

Expanded and protected riparian zones: All streams have protective buffers that are 150 feet or wider, with multi-layered canopy structure and high species diversity from natural regeneration of native trees, shrubs, and herbaceous plants.

Controlled erosion and sedimentation: Roads have adequate drainage and surfaces. Slopes greater than 60% and in High Landslide Hazard Locations are undisturbed and adequately vegetated. Any exposed soil or areas prone to erosion have erosion control measures (wattles, mulch, seeding).

Enhanced complexity in closed canopy stands: Young stands have a multi-layered structure, high species diversity (or higher proportion of currently underrepresented species like western redcedar), and canopy gaps with a developing younger age cohort and understory. Soils are moist and nutrient-rich from dispersed, decomposing slash and woody debris.

Accelerated establishment in early seral areas: All regenerating stands are vigorous and free-to-grow. Steep slopes and other erosion prone areas have ample protective ground cover.

Maintained and enhanced older forest structure: Older stands are preserved and serve as ecological anchors on the property, with notable late-successional complexity from natural succession of midstory and understory development.

Desired species composition shifts: Invasive weed cover is lower than 20% on roads, trails, and landings, and proactively monitored and treated to prevent seed production and spread.

Connected community and visitors: The trail system on the subject property provides year-round access to scenic viewpoints, along with recreational amenities like trailhead parking, information kiosks, and trail markers.

Vibrant wildlife and high habitat value: Stream temperatures are kept below 60 °F in the summer through adequate canopy shading and spawning gravel quality is improved due to reduced sediment inputs. The multi-layered forest structure with various age and species arrangements across the property provides diverse nesting and foraging opportunities for a variety of local wildlife species.

FOREST STEWARDSHIP RECOMMENDATIONS 42

The following sections provide recommendations for forest stewardship activities on the subject property. These recommendations cover a 10-year planning horizon. There are four categories of stewardship activities: 1) young stand thinning, 2) road maintenance, 3) invasive species management, and 4) recreation planning and development. Overall, the property has been well maintained and is in good condition. Accordingly, there is not an urgent need to make up for deferred stewardship (for instance, restoring roads or tackling considerable invasive species issues).

Each section includes a description of the recommended stewardship activities, followed by a timeline and cost estimate. Some of these activities, such as young stand thinning, are a one-time cost that would occur in the first three years of property ownership. Other activities, such as road maintenance, will be ongoing with both scheduled costs (such as road brushing) and contingency costs (such as addressing road failure and reconstruction). This plan anticipates that most if not all forest stewardship will be conducted by a third-party professional consulting forester, although some minor road maintenance could be completed by City staff.

In addition to stewardship recommendations, the City will need to account for regular property patrols every two to four weeks, particularly during fire season. Paying into the Oregon Department of Forestry fire patrol assessment will provide additional patrols during fire season.



YOUNG STAND THINNING

Zones: 2 & 3

Relevant Policies: Forest Stewardship, Stream Buffers

The subject property includes 410 acres under the age of 19. These stands have very high tree densities (often upwards of 800 trees per acre). It is common practice to thin dense young stands before there would be any commercially viable product to harvest. This type of young stand thinning is often referred to as pre-commercial thinning due to the size and age of the trees. In these young stands the thinning work is completed by a crew using chainsaws and all the cut material is left on site. This material is typically cut into smaller pieces and scattered so that it is no deeper than three feet, which creates conditions for relatively quicker decomposition. This young stand thinning is important for a number of reasons, including the following:

Thinning reallocates light, moisture, and soil nutrients to the remaining trees, increasing individual tree vigor and growth rates.

Thinning reallocates more energy to tree defenses and decreases tree stress at the stand level, managing the risk of pest or pathogen outbreaks.

The remaining trees will be more windfirm as a result of increased exposure to wind and improved tree vigor and live crown ratio (the percent of the tree with green branches).

Thinning allows for selection of preferred tree species, often increasing the species diversity in the residual stand.

Thinning can create skips (no cutting) and gaps (small openings), which provide important wildlife habitat.

Of the 410 acres under the age of 19, 38 acres were thinned in 2017 with a residual stand density of 300 trees per acre. It is recommended that the remaining 372 acres be thinned to a variable density between 180 and 220 trees per acre.

Two approaches exist for young stand thinning in coastal stands with high wind exposure. Foresters either elect to thin very heavily, with residual densities around 200 trees per acre (14- to 16-foot tree spacing), or they thin lightly, with residual densities around 300 trees per acre (12-foot tree spacing), anticipating an ongoing need for additional thinning. With a light initial thinning, the stand may require a second young stand (pre-commercial) thinning.

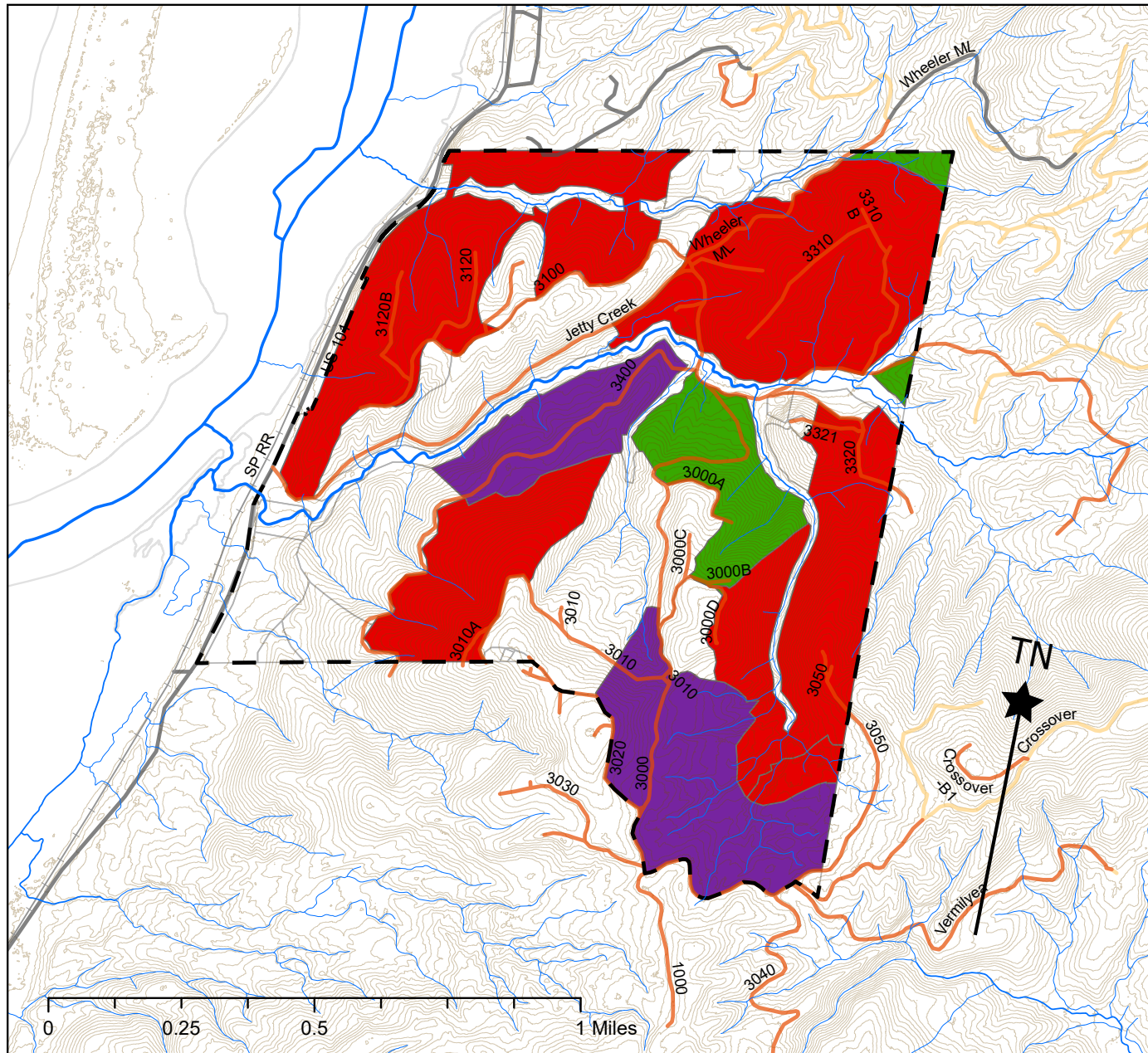
Our recommendation is to thin young stands to 180 to 220 trees-per-acre with variable density throughout the stand and small skips and gaps (less than ¼ acre). Tree selection for retention should prioritize retaining (in order of importance) western redcedar, Sitka spruce, and western hemlock. Western redcedar and Sitka spruce are relatively rare on the property, and the residual stands will remain hemlock dominated. Douglas-fir is a minor species on the property, but should be removed due to Swiss needlecast, which affects tree growth in the area.

Based on recent thinning project costs, thinning of the 372 acres under the age of 19 would cost between \$220 and \$350 per acre, depending on tree size, density, and slope. This cost is higher than the regional average due to the age of the stands. Contractor cost for this project would range from \$82,000 to \$130,200 total. Management of the project by a professional consulting forester would add an additional \$8,000 to \$13,000.

In addition to the 410 acres of forest under 19 years old, there are 107.5 acres between 20 and 24 years old. Some small areas of these stands may have been thinned, but the density remains very high. These stands should be evaluated further and thinned if funding is available. These stands will have a high cost of thinning due to the large tree size (\$400 to \$600 per acre). These stands are a lower priority than the stands under 19 years old.



RECOMMENDED THINNING



- ### Legend
- Thinning Status**
- Completed 2017
 - Evaluate - High Cost
 - Recommended
 - <all other values>
- Road Surface**
- Dirt
 - Paved
 - Railway
 - Rock
 - <all other values>
- FPA Stream Size**
- Small
 - Medium
 - Large
 - NA - No Channel
 - <all other values>
- Other Symbols**
- Subject Property
 - 20' Contour
 - Topography



ROAD MAINTENANCE

Zones: All Zones

Relevant Policies: Road Maintenance

The subject property includes 20 miles of mapped roads, including mainline, secondary, and spur roads. All currently usable roads, including spurs, appear to have rock base. Some small spurs are overgrown, but could be reopened with a brush mower. Currently, 16.3 miles of road are open and usable.

The existing road network is sufficient for ongoing stewardship, and there are no roads that are recommended for decommissioning. The road system is well maintained with surface rock, adequate drainage, and most roads have a brushed road prism extending 12 feet at a minimum from the road center. The condition of the roads is standard to better than standard.

Road maintenance falls into two categories: regular maintenance and contingencies for road failure.

Regular road maintenance includes brushing and mowing, drainage maintenance, and surface upkeep. Brushing should occur every two to four years. With minimal property access and no anticipated commercial activity, brushing every four years should be adequate. Anticipated per mile brushing cost is \$1,050 to \$1,200. If all roads are maintained, the basic brushing cost is approximately \$19,560 every four years.

Roads on the property will require additional surface rock (1 ½ minus) to maintain a clean, well-drained running surface. The roads are well rocked, and no major road rock projects are anticipated. Rock is expensive and should be sourced as close to the property as possible. The subject property has a small rockpit and stockpile located in the center of the ownership. This pit could possibly provide rock for the property, although further investigation would be required to understand the quality and quantity of rock available. Another option might be to source rock from the Stimson rock pit on the adjacent ownership through a cooperative road use agreement.

Culverts on the property appear to be well maintained. The culverts should be monitored on a regular basis as well as evaluated for function following major winter rain events. Regular maintenance and monitoring can help to minimize the risk of a major blowout or emergency culvert replacement.

If any cross drains are out of compliance with the Oregon Forest Practices Act based on Nuveen's Forest Road Inventory and Assessment, the cost of bringing the road system into compliance should be accounted for in the purchase price or addressed prior to acquisition. The Forest Road Inventory and Assessment for the subject property was not available during the planning process.

INVASIVE SPECIES MANAGEMENT

Zones: 2 & 3

Relevant Policies: Invasive Species and Chemical Use

The subject property has small areas of Scotch broom, English holly, and Himalayan blackberry. In addition, but of less concern, are patches of tansy ragwort. Invasives appear to be limited to road areas and recently disturbed areas adjacent to the stream restoration projects.

Due to limitations on herbicide use, all invasives must be treated with mechanical means. This includes pulling and cutting. The largest area of invasives exists along spur road 3100, which extends up the ridge to the north of the water treatment plant (see road map on page 25). This road is not currently open. Heavy brushing with a masticator or mower would be sufficient both to open the road and to decrease the extent of invasives. Over time, the invasives along this road will be shaded out by the vigorously growing young stand to the north. The cost to brush this road is estimated at \$2,500, assuming that the equipment is being utilized elsewhere on the property.

Other areas of Scotch broom exist along mainline roads. These will also be shaded out and are not of concern.

Areas of blackberry exist adjacent to the stream restoration completed in 2025. The blackberry is outside of the riparian zone

and will eventually be shaded out by young hemlock.

Invasives should be monitored on a regular basis, especially in younger forests and along roads where they are less likely to be shaded out. Gorse, knotweed and English ivy were not observed on the property, but all three species are present in Tillamook County and may establish on the property in the future. A monitoring plan should include early detection and rapid response for these species. All equipment must be cleaned, sawshed, and inspected before entering the property to ensure that it is free of invasive weed seeds.

RECREATION PLANNING

Zones: 2 & 3

Relevant Policies: Recreation and Public Access

The subject property has the potential to provide recreational opportunities to residents and visitors to the Oregon coast. At present, the property is open for non-motorized recreation. Low-impact recreation is anticipated to continue into the future.

In addition, there is some interest in developing additional recreational opportunities that align with source water protection goals. While most walking will likely continue to occur on gravel roads, short connector trails could be constructed to allow for hiking loops. There are two recommended options for hiking trail connectors:

Option 1: Construct a short switchback trail starting at the Jetty Creek gate and extending up the ridge to the north of Jetty Creek. This trail would be approximately 1,800 feet long and would meet the end of the first spur north of the Jetty Creek mainline. This is a particularly appealing option since the trail would be almost entirely outside of the drinking water source area and would provide excellent views of the Nehalem Bay Estuary and Neahkahnie Mountain. With minor brushing, the spur could be opened for hikers and allow for a loop walk starting and ending at the Jetty Creek gate.

Option 2: Construct a connector trail between the end of spur 3010 and spur 3020 on the south side of the property. This would allow for a longer loop hike with views down into Rockaway Beach and towards Barview. While this hike would likely attract fewer users and is entirely within the drinking water source area, the connector would be very short (520 feet), relatively flat, and not located near any streams. A future project could connect spur 3010 to spur 3400, creating a longer loop option.

With both proposed trail options, additional planning should be completed to guarantee adequate parking, signage, and sanitary facilities. While inviting recreational uses within the watershed does present some downsides, it also provides an educational opportunity. When visiting the watershed and encountering effective signage, the public would better understand where their water comes from and the forest stewardship required to protect source water quality.

Additional recreational trail development could be completed in Zone 3, outside of the drinking water source area. These trails would be entirely new construction and fall outside of the scope for this plan.

Planning, design, construction and maintenance of recreational trails was not included in the sample stewardship budget presented on page 45 of this plan. Any trail development will come with both up-front as well as long-term maintenance costs.

ESTIMATED FOREST STEWARDSHIP BUDGET 50

The acquisition and ownership of the Jetty Creek Watershed will include both initial and long-term costs for the City of Rockaway Beach. The budget provided in this report is limited to the stewardship and maintenance of the property, and is divided into three types of cost. These costs are A) initial costs, B) recurring maintenance costs and C) contingency costs.

Initial Stewardship Costs

While the subject property has been well maintained, a considerable portion of the property is due or overdue for young stand thinning. This type of thinning is a common practice for forest stewardship in dense, hemlock dominated coastal forests, regardless of ownership type. While some small areas of the property have previously been thinned, approximate 410 acres are due or overdue for thinning. These areas should be thinned within the first four years of ownership.

Recurring Maintenance Costs

Recurring maintenance costs include a range of on-the-ground and administrative costs associated with forest ownership. These costs include road maintenance, insurance, monitoring, fire protection, and audits.

Contingency Costs:

A contingency cost has been included to account for high-cost road repairs that the City could be responsible for. This would include washouts or major stream crossing replacements. The road system is well maintained, accounting for the relatively low budgeted contingency cost. If, during acquisition, it is found that the subject property's road system does not meet Oregon Department of Forestry standards in the Forest Road Inventory and Assessment, these costs should be either A) deducted from the acquisition price and budgeted for separately or B) paid for by the seller prior to acquisition.

FOREST STEWARDSHIP BUDGET

ACTIVITY	UNITS	COST	TOTAL	TIMELINE
ONE TIME COSTS			\$158,000.00	
YOUNG STAND THINNING	410 ACRES	\$350.00	\$143,500.00	WITHIN 4 YEARS
YOUNG STAND THINNING ADMIN	100 HOURS	\$145.00	\$14,500.00	WITHIN 4 YEARS
ONGOING COSTS (ANNUALIZED)			\$25,245.00	
ROAD BRUSHING (PER MILE)	16.3 MILES	\$1,200.00	\$19,560.00	EVERY 4 YEARS
ROAD MAINTENANCE (PER MILE)	16.3 MILES	\$250.00	\$4,075.00	ANNUAL MAINTENANCE
SOURCE WATER PROTECTION PLAN MONITORING			\$5,000.00	
FOREST MONITORING / ADMIN			\$5,000.00	
LIABILITY INSURANCE			\$840.00	
ODF FIRE ASSESSMENT	800 ACRES	\$1.80	\$1,440.00	
FEDERAL COMPLIANT AUDIT			\$4,000.00	
CONTINGENCY				
CATASTROPHIC ROAD FAILURE CONTINGENCY			\$50,000.00	

