

Hubbard Creek Watershed Forest Stewardship Plan City of Port Orford

December 2022



This page left intentionally blank.

CONTENTS

CONTENTS	3
ACKNOWLEDGMENTS	5
ABOUT THIS FOREST STEWARDSHIP PLAN	7
SECTION 1 UMBRELLA STEWARDSHIP PLAN	
MANAGEMENT OBJECTIVES	10
Primary Objectives	10
Climate Change Adaptation	11
Climate Change Mitigation	12
WATERSHED DESCRIPTION	14
REGIONAL CONTEXT	16
WATER RESOURCES	18
FOREST MANAGEMENT POLICIES	20
Stream Buffers	21
Commercial Timber Harvest	24
Road Maintenance	25
Invasive Species	29
Chemical Use	32
High Conservation Value Forest	33
STAKEHOLDER AND PUBLIC INVOLVEMENT	34
Public Access & Fire Risk Mitigation	35

SECTION 2 PROPERTY SPECIFIC DESCRIPTIONS AND STEWARDSHIP

CITY OWNERSHIP	40
Description	40
Current Forest Conditions	42
Resource Concerns	47
Stewardship Recommendations	48
THE CONSERVATION FUND OWNERSHIP	49
Description	49
Current Forest Conditions	52
Resource Concerns	53
Stewardship Recommendations	55

SECTION 3 MANAGEMENT RECOMMENDATIONS

TOPIC AREAS	57
Public Access	58
Invasive Plant Treatment	59
Fire Risk Reduction	60
Road Maintenance and Monitoring	62
Forest Stewardship	64

SECTION 4 PRIVATE LANDOWNERSHIP

TOPIC AREAS	66
Retain Forested Areas – Manage for Old Forest	68
Limit Herbicide Use and Runoff	69
Maintain Driveways and Impervious Surfaces	70
Protect Against Wildfire – Don't Start Fires	71
Limit Additional Development	72

DATA CONSULTED	73
-----------------------	-----------

CONTENTS

LIST OF MAPS

Hubbard Creek Watershed	6
Watershed Context	9
Landslide Hazard	13
Regional Context	17
Drinking Water Source Areas	19
Stream Buffers	23
Roads	28
Property Boundaries	38
Topography	39
City Ownership	41
Conservation Fund Ownership	50
Road Maintenance	63
Private Ownership	67

ACKNOWLEDGMENTS

This Forest Stewardship Plan was written for the City of Port Orford with the support of the Oregon Health Authority and Business Oregon. In addition, assistance was provided by the staff of the Wild Rivers Land Trust and Port Orford Watershed Council.

Special Thanks To:

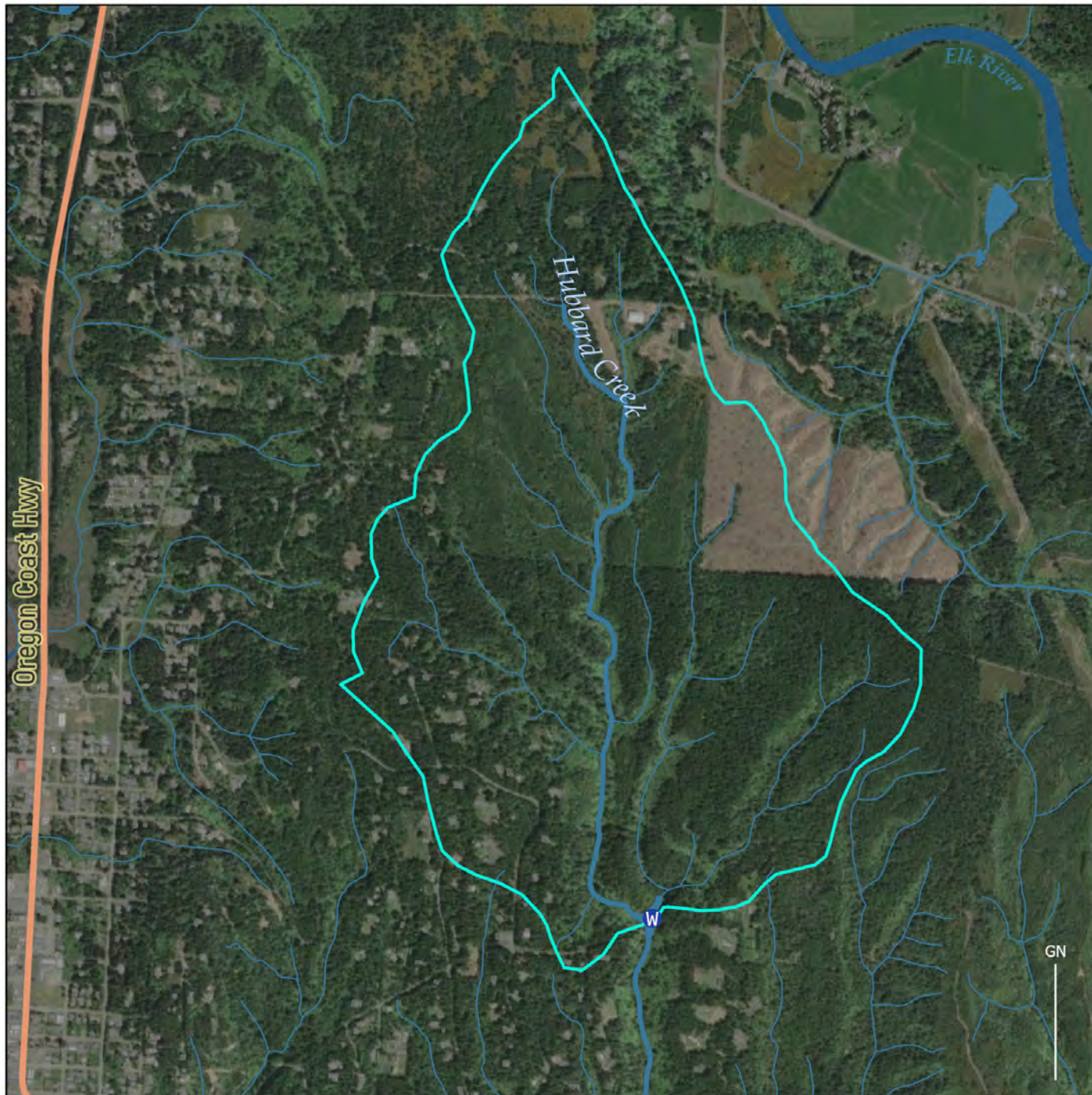
- City of Port Orford: Jessica Ginsburg, Ann Vileisis
- Port Orford Watershed Council: Linda Tarr
- Wild Rivers Land Trust: Max Beeken
- Business Oregon: Heather Stevens
- Oregon DEQ: Julie Harvey, Alexis Cooley, Josh Seeds, Jacqueline Fern
- Curry Watershed Partners / Curry SWCD: Erin Minster


Plan Authors:


Ben Hayes, Lead Author, Springboard Forestry LLC
Oliver J. Curtis, Cartography and Design



HUBBARD CREEK WATERSHED



 Port Orford Water Source Area

 Surface Water Intakes

Streams

 Large

 Medium

 Small

0 $\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{4}$ 1 Miles

ABOUT THIS FOREST STEWARDSHIP PLAN

The Forest Stewardship Plan reflects the vision, goals and objectives for the City of Port Orford's Hubbard Creek Watershed. In addition, this plan has been structured to satisfy the requirements of the State of Oregon's Forest Management Planning standards.

The City of Port Orford relies entirely on the 629-acre Hubbard Creek Watershed for surface water supply, flowing from the forested watershed to an intake located in the small reservoir at the foot of the watershed. While the City has acquired and stewarded the core of the watershed, peripheral parcels remain in private ownership. These include large areas of developed property as well as larger parcels historically managed as industrial timberland.

This plan takes an all-lands approach to forest stewardship. Given the high reliance on the forest as a natural component of the City's water filtration process, forest stewardship and health is of utmost importance. This plan combines best practices with an adaptive management planning and implementation model, which can be applied to forest stewardship regardless of the City's present or future forest ownership. The policies and procedures adopted in this plan will apply to all current and future city-owned parcels within the drinking water source area.

Watershed and forest management research continues to expand and evolve at a rapid pace. When combined with advancing equipment technology and techniques for management, an adaptive approach to management planning seems prudent when compared to one that is rigid. Such an approach can be facilitated with regularly scheduled management plan reviews, as well as reexamining plans when new impactful knowledge or experience emerge.

This plan provides a watershed overview, clear management objectives, management policies and practices, and adaptive recommendations to meet the needs and concerns at this time.

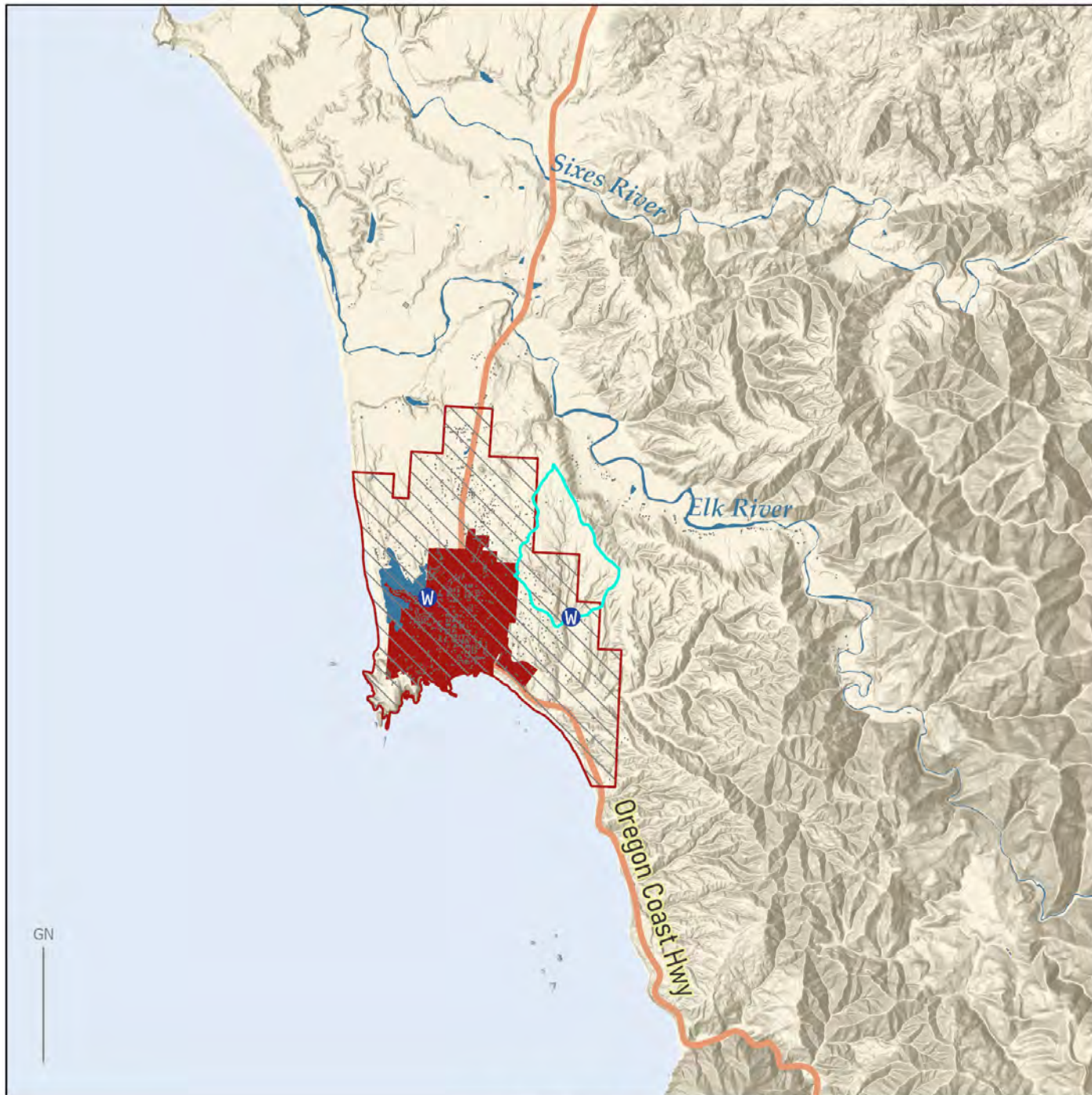
The plan is organized into three primary sections:





1. Umbrella stewardship plan for the Hubbard Creek Drinking Water Source Area.
2. Parcel specific descriptions and stewardship actions for portions currently owned, or likely to be purchased, by the City of Port Orford.
3. Stewardship considerations and actions for non-City owned parcels within the watershed.



Section 1 – Umbrella Stewardship Plan

WATERSHED CONTEXT



-  Port Orford Water Source Area
-  Surface Water Intakes
-  Urban Growth Boundary
-  Port Orford City Limit

0 1½ 3 4½ 6 Miles

MANAGEMENT OBJECTIVES

Primary Objectives

The City of Port Orford owns and operates the Hubbard Creek Watershed, and influences management on adjacent parcels, for the primary objective of protecting source water. These management objectives steer all subsequent management decisions

1. The watershed will be managed to provide the very best quality and quantity of potable water for the customers it serves for the foreseeable future.
2. The forest will be managed to retain or increase the diversity of native trees and plant species and forest structural compositions, to develop greater ecological and climate resilience.
3. Unique areas of High Conservation Value Forest will be identified, managed and protected.
4. The watershed will contribute to the economic and social vitality of the communities and industries it serves through its primary resource of reliable quantities of high quality source water.
5. The production of forest products or the sale of carbon offsets will only occur if they contribute to forest health, fire safety and diversity and will be completed in a manner that minimizes any near or long-term impacts to source water quality or quantity.
6. The watershed will support and enhance habitat for native wildlife, consistent with water quality objectives.

MANAGEMENT OBJECTIVES

Climate Change Adaptation

Climate change is rapidly becoming the greatest risk to source water for municipal systems drawing from surface water sources. The scale of ecological disturbance is anticipated to increase with climate change, while the predictability of these events will decrease. Examples of disturbances that are likely to affect the Hubbard Creek Watershed include extreme weather events with wind and/or rain, pathogen outbreaks such as Spruce budworm or Hemlock looper, and wildfire.

A forest manager focused on resilience will manage towards a more diverse and complex forest. Pests and pathogens typically only attack certain species, with various tree species and ages having differing susceptibility to windthrow. A diverse forest stands will also have an increased likelihood of green-tree survival following wildfire- a probable disturbance in the Hubbard Creek Watershed. Following a disturbance, some species of trees and stand types will continue to provide high quality water filtration when others are unable to do so. This resilience is key to managing for long-term water quality in a drinking watershed.

The present stands on the Hubbard Creek Watershed display relatively high levels of spatial heterogeneity and relatively high species diversity or structural complexity on a watershed level. There are exceptions to this, with even-age plantation type forests existing on some parts of the watershed. Over time, active management can select for increased species diversity and complexity particularly in these areas. An example of this management would be commercial thinning that selects trees to increase diversity. Over time, light-touch management interventions will create a forest more capable of providing high quality drinking water despite the challenges of climate change and pre-existing ecological disturbance risk.

MANAGEMENT OBJECTIVES

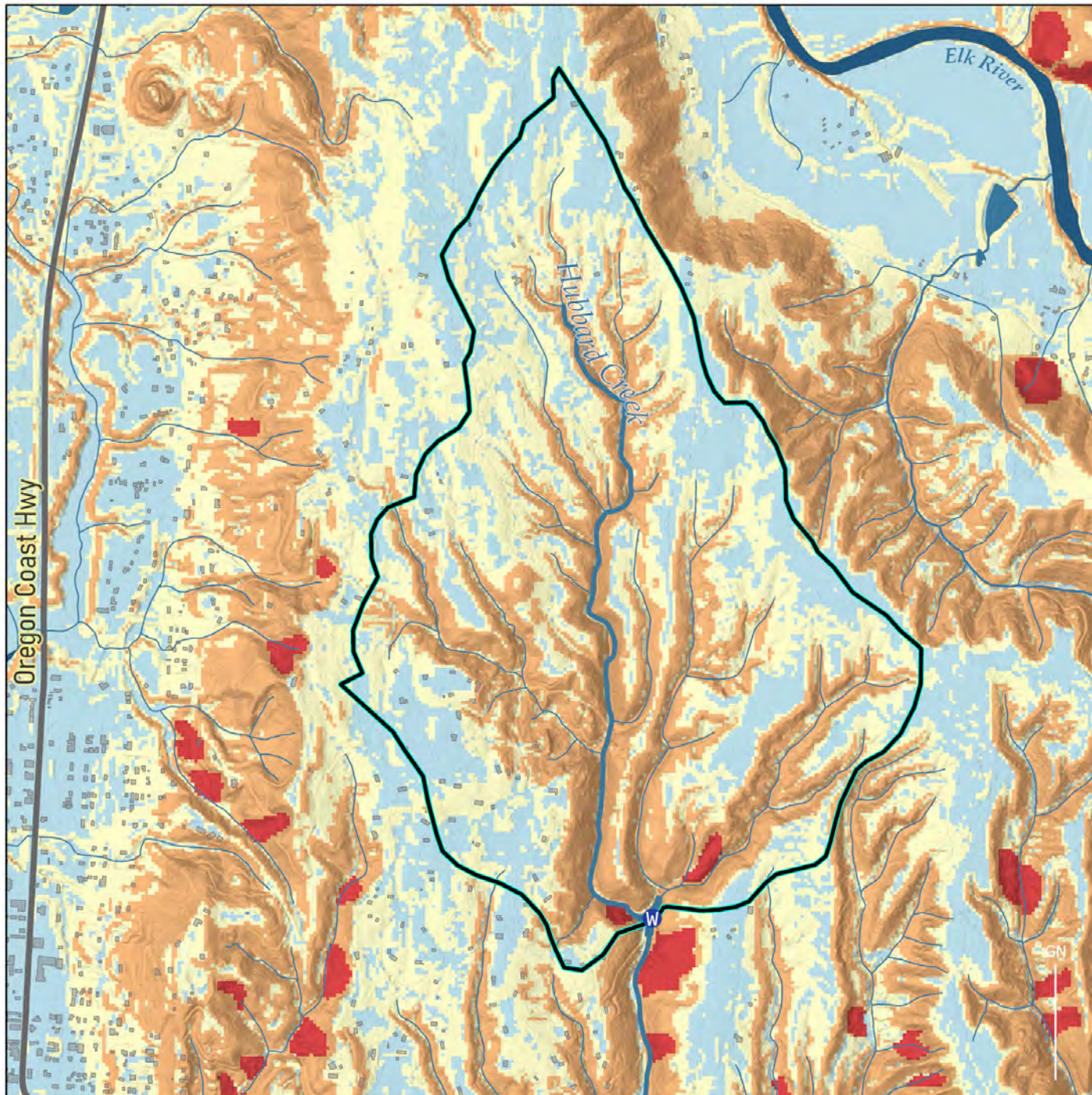
Climate Change Mitigation

While forests will change and adapt to climate change, they also play a critical role in mitigating carbon emissions. Approximately 50% of the dry weight of a tree is carbon, which can be converted into carbon dioxide through a ratio of atomic weights (44/12). Both during a tree's life, and following harvest or natural mortality, carbon is stored in the bole, branches, needles, roots, and soils surrounding the tree. These different components have different residence times, with carbon in roots and the bole stable for many years, and needles breaking down relatively quickly. The processes of decomposition and burning both emit carbon dioxide, however decomposition within a mature forest occurs at a relatively slow rate.

Due to historically low harvest levels following the City of Port Orford's acquisition of the core parcels in the Hubbard Creek Watershed, the forests on these parcels are old, complex, and have high levels of carbon sequestration. The result is that the property exceeds the average stocking in the region, with old forest and very high species diversity / structural complexity. These forests store a high level of carbon per acre when compared to the average acre of regional forestland.

The management of the Hubbard Creek Watershed in a manner that stores carbon has positive implications for the citizens of Port Orford. A number of climate-related risks exist on the Southern Oregon coast. These include sea level rise, extreme weather events, and associated hazards including floods, landslides, wildfire, and drought. While the storing of carbon in the Hubbard Creek forest is a minor step towards mitigating climate change, it presents a tangible example of the positive impacts of sustainable forest management.

LANDSLIDE HAZARD



Port Orford Water Source Area

Surface Water Intakes

Waterbodies

Buildings

Streams

Large

Medium

Small

Landslide Susceptibility (SLIDO-4.4)

Low

Moderate

High

Very High

0 1/4 1/2 3/4 1 Miles

WATERSHED DESCRIPTION

The Hubbard Creek Watershed extends from the water intake on Hubbard Creek, just north and east of Highway 101, north along the eastern boundary of the Port Orford Urban Growth Boundary. The watershed is a unique mix of large lot residential development, protected forestland, and industrial forestland. For the purposes of this plan, the Drinking Water Source Area, or all areas of the forest draining into the Port Orford Hubbard Creek reservoir, will be considered “the watershed.”

The City of Port Orford is the largest individual owner of land in the watershed, followed by The Conservation Fund (previously Wilson Timber) and other private landowners. The total watershed area is 629 acres calculated from GIS elevation data, of which the City of Port Orford currently owns 250 acres.

The primarily forested watershed is made up of shallow, deep ravines with broad, flat terraces between. The soils in the watershed appear highly erodible, as evidenced by heavily silted stream channels and active visible stream bank erosion. A legacy of erosion and road maintenance issues led in the past to both filtration issues and heavy siltation of the small reservoir at the water intake location.

With the exception of gates and signs around the access road to the water intakes, public access is allowed, although not encouraged, throughout the watershed. Numerous neighbors appear to walk frequently throughout the City owned portions of the watershed, although much of the property has extremely thick brush, limiting the ability to move cross-country.

The eastern ¼ and northern boundary of the watershed are heavily developed with large residential lots. Many of these lots front onto Vista Dr. and Old Mill Rd., directly above and to the west of the reservoir and water intake. Vista Dr. is the primary paved road in the watershed with numerous small gravel driveways extending to dispersed homes. The forest in these parts of the watershed tends to have high diversity and a wide range of ages. Some homes have large yards, but for the most part the properties are well forested with minimal impermeable surface.

WATERSHED DESCRIPTION

Active forest management has primarily occurred on the eastern and northern portions of the property. These areas are even-age monoculture forest or recent clearcuts. A 134-acre parcel owned by the City appears to be about 20 years old with low structural complexity but relatively high species diversity due to failed planting following a large clearcut. The 154-acre parcel owned by The Conservation Fund is similarly an even-aged plantation, with two primary stands of 45-65 years old. Tree density is exceptionally high on both parcels and thinning could accelerate the development of older forest functional characteristics.

Logging roads run throughout the watershed, primarily abandoned or actively decommissioned. Historic roads up Hubbard Creek from the reservoir are completely non-functional and largely removed. A large road entering from Vista Dr and running north, between two forks of Hubbard Creek to the 134-acre parcel, is abandoned but still has culverts and cross drains in place. These culverts present a significant risk to source water in the case that they might become plugged.



A large culvert in Hubbard Creek shows signs of instability, with both bend and a broken section in the center of the road fill. Failing culverts like this present a significant risk to source water quality.

REGIONAL CONTEXT

Port Orford is a small town on the southern Oregon coast with a 2010 population from the US Census of 1,133. Port Orford is the westernmost incorporated town in Oregon (the furthest west physical point is Cape Alava in WA). Port Orford is in Curry County and has been incorporated since 1911. Port Orford is one of only three incorporated cities in Curry County, with the other two being Brookings and Gold Beach.

Prior to the arrival of Europeans, the region was settled by the Tututni people, closely related linguistically to the Upper Coquille (both are Athabascan and quite distinct from the lower Coquille). The Tututni people were relocated to the Siletz Reservation in the 1800s, where the language merged with other regional tribes and rapidly vanished. Between 1851 and 1856, the Tututni people in and around Port Orford were actively involved with the Rogue River Wars, with one of the initial conflicts taking place in Port Orford.

Port Orford and Cape Blanco were first mapped in 1543 by Spanish Explorer Bartoleme Ferrelo. The coast north of Cape Blanco wasn't mapped until 1778, when George Vancouver named Port Orford and came into contact with Tututni people.

Port Orford has served as an important port since the mid 1800s, although it has limited natural protection. Over this time, Port Orford became a key shipping

port for logs and lumber, including the namesake Port Orford Cedar. Today, Port Orford still relies heavily on fishing, agriculture, ranching and forestry, although there is no longer any wood products infrastructure in Port Orford. Recreation and retirement have taken a growing role in the economic basis of the community, which sits directly on Hwy 101 and the Pacific Ocean.

Recreational activities in the immediate vicinity of Port Orford include sport fishing, whitewater trips, jet boating, rafting, siteseeing, golfing, windsports, surfing, beach exploring, hiking, bicycling, and many more. As a result, the region has seen a massive influx of second home and retirement home buyers. There is no wood products infrastructure in Port Orford, with the closest domestic and export log markets about an hour north in Coos Bay / North Bend.

REGIONAL CONTEXT



WATER RESOURCES

The City of Port Orford draws water from the North Fork of Hubbard Creek. The intake is located in a small reservoir at the confluence of two major tributary streams. The westernmost tributary is the largest. The eastern tributary in turn splits into two smaller, relatively equal sized tributaries.

The City has also drawn water from Garrison Lake. While Garrison Lake has a large watershed, that water source has not been considered for this stewardship plan. Garrison Lake was primarily utilized as source water following a catastrophic road failure on the westernmost fork of Hubbard Creek, which led to exceedingly high turbidity levels. The stream crossing structure that caused the historic road failure is still in place and presents a significant risk to water quality going forward.



Port Orford draws its water from an intake in the small reservoir on the southern terminus of the watershed. Two separate forks of Hubbard Creek feed the reservoir.

DRINKING WATER SOURCE AREAS



- Port Orford Water Source Area
- Garrison Lake Water Source Area
- W Surface Water Intakes
- Waterbodies
- Buildings
- Urban Growth Boundary
- Streams
 - Large
 - Medium
 - Small

0 1/2 1 1 1/2 2 Miles

FOREST MANAGEMENT POLICIES

In order to achieve the objectives of the City of Port Orford, City-owned portions of the Hubbard Creek Watershed will be managed in accordance with the following 6 policies. These policies create a framework for determining operational plans and financial feasibility.

These policies meet or exceed the requirements of the Oregon Forest Practices Act and Forest Stewardship Council Pacific Standard and align with historic management practices on the core City-owned watershed parcels. The Hubbard Creek Watershed also must comply with state and federal policies pertaining to both forest management and source water. The relevant policies for forest practices can be found in the Oregon Forest Practices Act, which is available from the Oregon Department of Forestry's website.

The policies include specific requirements and tolerances related to:

- Stream Buffers
- Harvest
- Road Maintenance
- Chemical Use
- Invasive Species
- High Conservation Value Forest

These policies are intended as the minimum level of watershed protection intended. Each section begins with a description of the policy question. An outline of policy function follows. Then, the section concludes with the policy adopted for the specific resource issue.

- Definition
- Purpose
- Policy

FOREST MANAGEMENT POLICIES

Stream Buffers

STREAM BUFFER DEFINITION:

Stream buffers represent the first line of defense in stream protection. Technical terms for stream buffers include riparian management zones (RMZs) or riparian areas. Buffers are typically measured in feet of distance from bank full width of a stream, with various activities allowed in “inner” versus “outer” buffers. Inner buffers generally allow no logging operations while outer buffers require a specific basal area retention and / or equipment limitations for ground-based logging. Both state laws and forest management certifications specify both where buffers should be applied, and how large buffers must be. Oregon’s system relies on the size of the stream as well as fish presence. Streams can be identified through a statewide streams geodatabase administered by the Oregon Department of Forestry, although streams not listed in the database also require survey and protections.

STREAM BUFFER PURPOSE:

Stream protections provide a range of water quality, ecological, and resilience benefits. Water filters through intact riparian vegetation, removing sediment and decreasing the velocity of rainfall-runoff patterns. The protection also decreases the

potential of sediment mobilization, particularly from exposed mineral soil in the riparian area. This filtration and limits on soil disturbance are most important immediately adjacent to the stream channel, however the full extent of a riparian buffer has been shown to decrease sediment transport and provide filtration. The decreased runoff velocity is particularly important for decreasing peak flow events and retaining soil moisture to maintain base flows. While less of an immediate concern for water filtration, the long-term impacts are significant and there are direct benefits of increased buffer widths.

In addition to filtration, stream buffers provide shade and have the potential of increasing hyporheic, or sub-surface flow. Both shade and hyporheic flow serve to cool warm water or maintain already cold-water temperatures. This has habitat benefits but also can dramatically influence filtration costs. Water temperature has become a significant summertime issue for most surface water filtration systems in Western Oregon. As a general rule, colder water tends to decrease both filtration costs and the need to add chlorine to filtered water through the transmission system, accordingly, decreasing the risk of disinfectant bi-product (DBP) issues.

FOREST MANAGEMENT POLICIES

Finally, stream buffers benefit natural forest structure and species diversity, as well as wildlife habitat. The presence of increased species diversity and structural complexity surrounding streams creates greater system resilience. In practice this means that a specific disturbance, whether endogenous or exogenous, has a decreased probability of fully replacing a stand of trees. Instead, the riparian areas may be retained post disturbance, or some component or species of the riparian area may survive. This was exhibited during the 2020 fires in western Oregon when some riparian areas with older, more complex, and moister forest types exhibited lower mortality levels than surrounding even-age plantation forests. As a result, stream buffers apply to both young and old forests, which both require protection.

Older forests, particularly near streams, have been shown to have an array of additional benefits in terms of water quantity. In coastal forests, these old stands serve as an effective sponge, storing water during the dry season and slowly releasing it over the summer. In addition, older forests have been shown to decrease peak stream flows during winter rain events, in turn decreasing erosion and water turbidity. In the case of Port Orford, this would be particularly important for siltation in the intake reservoir.

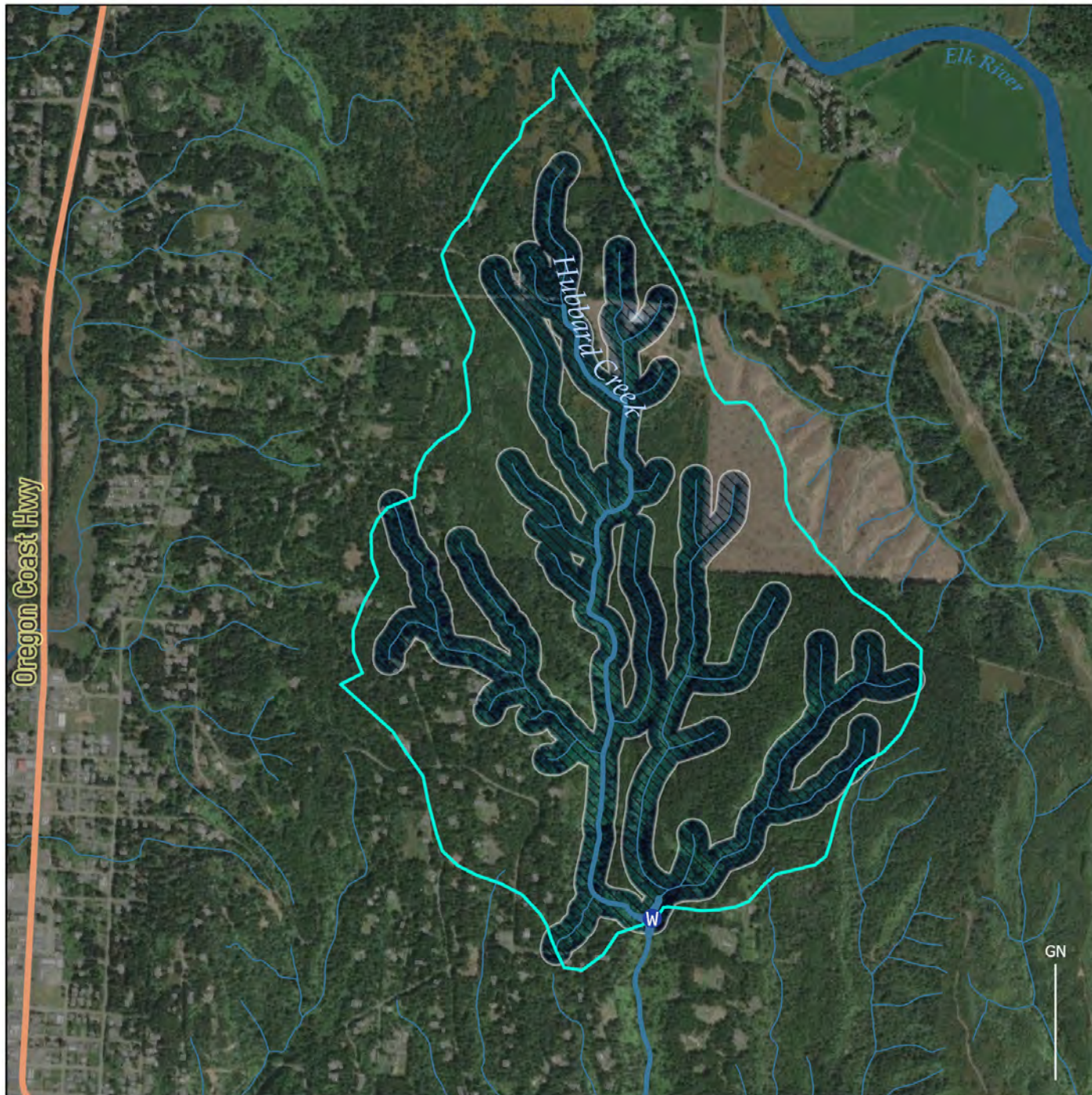
STREAM BUFFER POLICY:


The City of Port Orford will manage with riparian buffers designed to comply with both the Oregon Forest Practices Act (OFPA) and the Forest Stewardship Council (FSC) certification (FSC Pacific Standards available through the Forest Stewardship Council website). In addition, all perennial streams (type N and F) contributing to drinking water will receive a 150 ft. no-harvest zone in absolute (non-averaged) horizontal distance. The total riparian management zone on these streams will be 150 ft. or comply with the FSC or OFPA standards, whichever provides a higher level of protection.


Streams not contributing drinking water, ponds and wetlands must comply with the higher of FSC or OFPA standards. Seasonal streams will be treated as a small non-fish streams (Type N) under OFPA standards.

These standards and additional protections have been designed based on the risk presented by soil disturbance in the inner buffer zone, as well as the benefits provided by increased species diversity and forest structural complexity afforded by thinning in the outer zone.

STREAM BUFFERS




 Port Orford Water Source Area

 Surface Water Intakes

 150 ft. Stream Buffers

Streams

 Large

 Medium

 Small

0 1/4 1/2 3/4 1 Miles

FOREST MANAGEMENT POLICIES

Commercial Timber Harvest

HARVEST DEFINITION:

Commercial timber harvest is the act of cutting down trees to generate logs, which are sold for commercial use. End uses include lumber production, pulp and paper, or biomass heat and power generation. Harvests range from clearcutting to thinning, with a wide range of treatments in between. These harvests could take place from 1-2 acres up to hundreds of acres. Tree retention following harvest also ranged from no trees retained in the opening (retention clumped near borders) to very high tree retention with thinning or selective harvest. In all cases of commercial timber harvest, trees removed are sold for commercial purposes. This differentiates commercial harvest from pre-commercial thinning, where no material is sold from the site.

HARVEST PURPOSE:

The harvest of timber is typically undertaken to accomplish financial goals. In addition, some timber harvests, such as thinning, may be completed to improve forest health, mitigate fire risk, or to achieve other goals or objectives. In all of these cases, the harvest of timber would generate a financial return, making it “commercial.”

HARVEST POLICY:

Given the relative sensitivity of the Hubbard Creek watershed, commercial timber harvest for financial return would have immediate and significant negative implications for water quality, as well as present potential long-term ongoing issues. Small areas exist, such as the dense monoculture stands on the Conservation Fund parcel, where light thinning could decrease fire risk and improve forest health. This must be balanced with the significant risk of invasive species.

Any harvests that are proposed should be undertaken to improve long term forest health, species diversity, fire risk, and forest structural complexity. The alternative silvicultural practices (thinning, variable retention harvests, selective harvesting) required for these goals will not be designed for a specific removal volume, but instead to achieve ecological desired future conditions. Overstory removal harvests will occur only if there is an immediate threat to forest health, such as a pest or pathogen outbreak.

FOREST MANAGEMENT POLICIES

Road Maintenance

ROAD MAINTENANCE DEFINITION:

Road maintenance includes all activities associated with the road network, as well as the prioritization and monitoring of roads. At a basic level, scheduled maintenance includes vegetative control (brushing or herbicide application), grading and possibly rolling, addition of crushed rock as necessary, cleaning of cross-drain structures, and removal, replacement, or addition of drainage infrastructure as needed.

Road maintenance relies on an iterative prioritization of needs and uses. Mainline roads require maintenance in addition to what smaller spur roads may require. Small spurs may simply be allowed to re-grow while roads with drainage issues may require decommissioning. Decommissioning ranges from relatively minor excavation to complete re-grading and revegetation of abandoned road surfaces.

ROAD MAINTENANCE PURPOSE:

A forest road network provides essential access throughout a property for a multitude of tasks. These range from harvest activities to fire suppression, monitoring, forest health treatments, and recreation. A well-maintained road network improves the feasibility of harvest activities while decreasing the risk of high-cost repairs or road damage.

Road maintenance is also critical to source water management for two primary reasons:

1. To decrease the risk of catastrophic failure events and associated erosion issues; and
2. To minimize the fine sediment mobilization in runoff from road surfaces. These issues are critical to the quality of source water and accordingly the cost of water treatment.

FOREST MANAGEMENT POLICIES

1. **Catastrophic Failure Risk:** Road systems both run parallel to streams and perpendicular to streams at existing crossings. Roads additionally interrupt sub-surface runoff and transfer it to surface runoff in roadside ditches. This concentration of water combined with active erosion in and around streams creates a significant risk of catastrophic road failure. This could be as minor as a blocked culvert overtopping the road surface or as significant as a landslide or major slump. These events are almost always attributable to either poor initial road design or a lack of maintenance. Regular maintenance and monitoring protect against the risk of catastrophic failure. Catastrophic failure presents a source water risk in terms of large quantities of mobilized sediment, although they often occur as a short pulse and larger particles may settle out if the failure is sufficiently far from intakes.
2. **Fine Sediment Mobilization:** While catastrophic road failure events are noticeable and usually fixable, fine sediment mobilization from road surfaces are an ever present and significant cause of source water contamination and increased filtration costs. Roads, particularly when heavily used, generate fine sediment and concentrate it in roadside ditches. These ditches contribute the fine sediment directly to streams. Fine sediment remains suspended in the water column through the stream and source water intakes, creating significant water filtration issues. Any logging activity will generate increased sediment through any road system. Accordingly, a challenge exists in building and maintaining a road system with minimal risk from fine sediment.

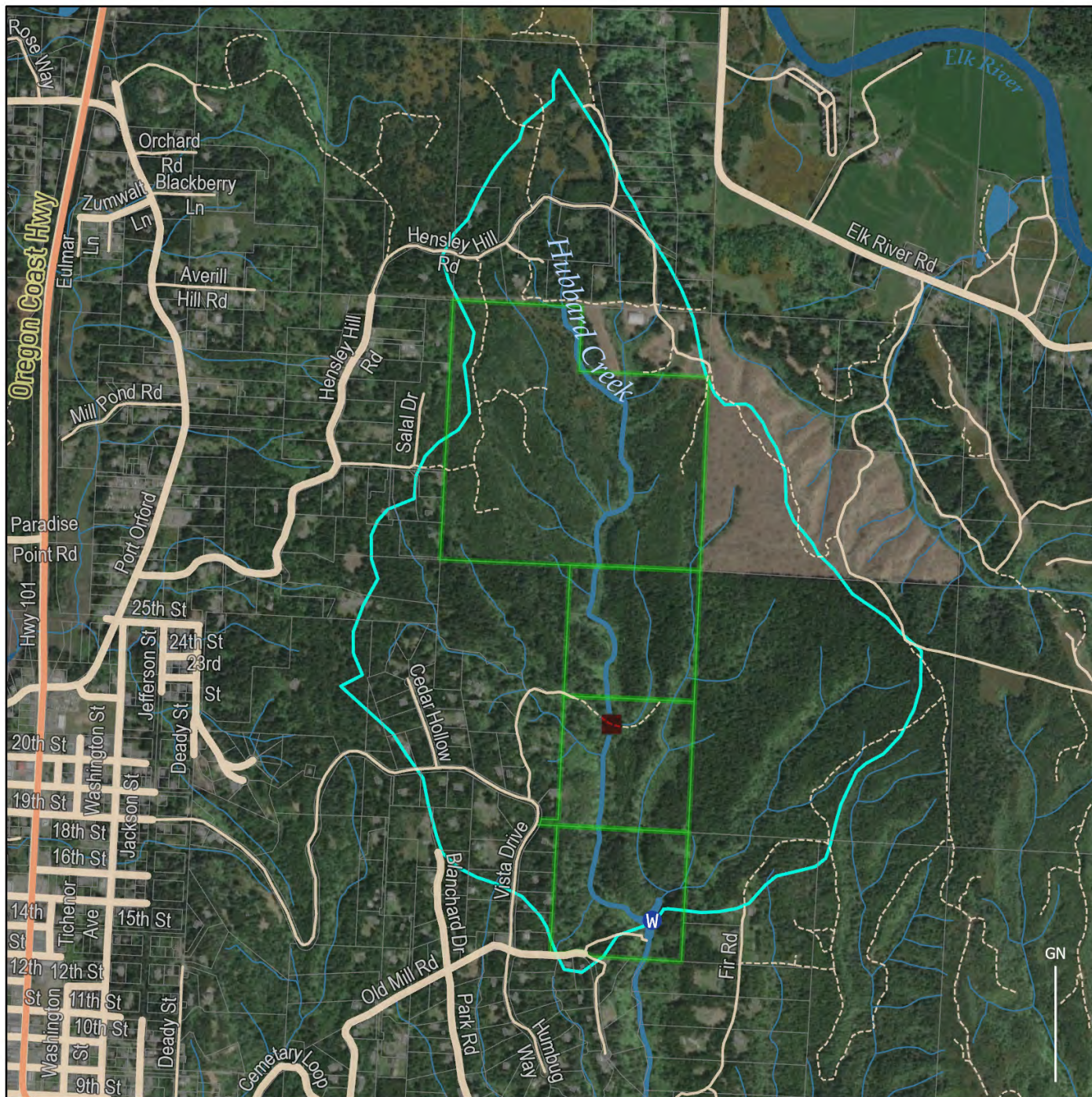
FOREST MANAGEMENT POLICIES

ROAD MAINTENANCE POLICY:

An up-to-date map of roads and inventory of condition is critical to prioritizing maintenance activities. Smaller or less frequently used roads either require decommissioning or have been / will be abandoned. Mainline and essential spurs are to be maintained on a scheduled basis with repairs as needed. In the unique case of the Hubbard Creek Watershed, a number of relatively large roads and driveways run through the western quarter of the property for access to residential properties.

Road maintenance will focus on updating roads to current watershed best management practices, or removing unnecessary roads. These practices focus on transferring water to the downhill side of all roads while minimizing the potential of water concentrating in roadside ditches. Strategies include out-sloping roads where possible, frequent cross drains, and disconnecting culverts from active stream channels. Natural forest understory vegetation provides the best sediment filter available for forest roads.

No road inventory exists for the Hubbard Creek Watershed. A prioritized road maintenance plan should be completed with a strong emphasis on roads with the potential for critical failure. Primary among these would be the un-mown primary access road from the west. A large fill and culvert on this road has the potential for near-term catastrophic failure (discussed in the property-level sections). In addition, no new roads should be built in the City owned watershed parcels unless existing issues are dealt with and sufficient funding is in place for long-term road maintenance.



ROADS

ADD NEW MAP
ZOOMED OUT VIEW

Port Orford Water Source Area

City of Port Orford

Roads (ODF)

Paved

Surfaced

Unsurfaced

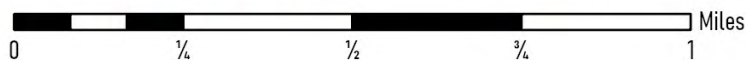
Road Failure

Streams

Large

Medium

Small



FOREST MANAGEMENT POLICIES

Invasive Species

INVASIVE SPECIES DEFINITION:

Invasive plant species such as Gorse, Scotch broom, Himalayan and evergreen blackberry, English and Cape ivy, English holly, Cotoneaster and Jubata grass, are found in many parts of the watershed. These species have successfully invaded the region because they seed or sprout prolifically and are strong competitors with native vegetation, including tree seedlings.

Many watershed activities or events have the potential to promote the spread of exotic plants by transporting seeds, opening areas to light, or exposing mineral soil (e.g., vehicle traffic, road clearing, timber harvest, wildfire). A separate Wildfire Hazard Reduction and Gorse Infestation Management Plan has been completed by the Curry Soil and Water Conservation District, and should be consulted for questions related to fire and Gorse management.

Major diseases of South Coast conifer forests include pathogenic fungi that cause stem rots, root rot and needle diseases which can each individually drastically reduce stand vigor and can lead to blowdown or tree death.

Primary among these are *Phytophthora literalis* and *Phytophthora cinnamoni*. These soil-borne root fungi are present in the area and can also be transported by soil (including on shoes and boots). Trees with root rot can be identified by thinning canopies, followed by red needles, lesions around the root collar, and eventual tree death.

Although not yet widely evident, root rots present a hazard to forest management, particularly along the southern and eastern boundary of the watershed. The core area of the watershed does not show signs of root rot. Careful monitoring can help identify and control problems before they become widespread. Control measures for root rots include managing for non-susceptible species such as western red cedar and red alder, and transport of the fungus on equipment, shoes and boots.

INSECTS:

Most tree species have developed effective resistance and tolerance mechanisms to help ensure their reproduction and long-term survival when faced with common pests. However, this may not be the case with exotic insects and diseases.

FOREST MANAGEMENT POLICIES

Sitka spruce tip weevil (*Pissodes strobi*) is commonly associated with young Sitka spruce. It is present on young spruce on the watershed, causing stem deformity and leader dieback. It is not fatal except where the attacks are frequent and severe enough to retard height growth, allowing the trees to be overtopped by competing species. Tip weevil is likely to be present as long as there are young spruce present. As the current stands age and the trees reach a height no longer favorable to the insect, the infection levels are expected to decline. For example, recent studies show that beyond about 25 years of age, infection levels decline to about 10 percent infected at age 45.

Significant damage from Douglas-fir bark beetle (*Dendroctonus pseudotsugae*) is primarily a hazard after major windthrow occurs. The downed trees provide good rearing habitat and allow insect populations to reach a level where successful attacks are made on standing trees. Strategies to prevent windthrow, prompt salvage of windthrown Douglas-fir, and use of beetle pheromone attractants can minimize risk from bark beetles. Regular, careful monitoring can help identify changes and points of concern.

Massive defoliation of western hemlock by hemlock looper (*Lambdinn fzscllaria lugubrosa*) occurs periodically in this region. Conditions that favor hemlock looper outbreaks are not well understood.

INVASIVE SPECIES PURPOSE:

Invasive plants present a competitive challenge to native vegetation. This includes significant risk from Gorse, blackberry and Scotch broom, which can overwhelm all native species and create a monoculture thicket. By competing aggressively for light and moisture, these invasive species will either kill native species that occupy a site or preclude the establishment of native plant communities.

Invasive species can create challenges for working forestry and source water. In order to grow a healthy forest, native trees, primarily conifers, must outcompete any invasive species present on a site during stand establishment. If a risk exists of failure to establish a forest, foresters typically consider mechanical and chemical treatment of invasive at significant expense. Many commercial forest managers proactively broadcast treat harvest units in order to decrease the risk of invasive and to decrease competition from invasive and native herbaceous plants.

Invasive species also present a range of risks to source water. Some of these species, such as Reed canary grass, change stream channel patterns and present erosion risk either in the stream channel or from cutbanks. Others may establish along riparian

FOREST MANAGEMENT POLICIES

corridors and outcompete native vegetation. These plants can increase overall evapotranspiration, decreasing overall soil moisture. Over time, this condition will lead to decreased base flow and less reliable summertime source water.

INVASIVE SPECIES POLICY:

The City of Port Orford will work with partners to utilize the best available science and treatments for the management of invasive species. Invasive species are an inevitable component of ecosystems on the Oregon Coast, but forest managers will strive to manage for native species and diverse ecological communities.

The most viable and permanent treatment for most sun-loving invasive species is shade. The establishment of mature stand structure across the property and, where possible, retaining a component of overstory trees through harvest rotations, has the potential of shading out most invasive species.

The Curry Soil and Water Conservation District's Gorse Infestation Plan for the Port Orford DWSA should be consulted for all treatments relating to Gorse or other invasives.

FOREST MANAGEMENT POLICIES

Chemical Use

FOREST CHEMICALS DEFINITION:

Forest chemicals include herbicides, pesticides, and fertilizers. A wide range of products exist and are applied through a variety of methods. The most common forms of chemical use in coastal Oregon forests are broadcast and spot herbicide application. These applications are either focused on decreasing herbaceous competition or treatment for specific invasive species issues. Pesticide use is rare and fertilizer application varies between landowners. Fertilizer use is extremely rare on public lands.

FOREST CHEMICALS PURPOSE:

Forest chemical treatments generally focus on three forest stewardship goals.

1. Controlling plant competition during regeneration in order to improve seedling survival and growth.
2. Treatment of invasive species that pose a risk of spread or competition with native plants.
3. Maintenance of road systems to control grass, invasive plants, and brush. Road spraying allows for less frequent brushing and retains rock surfaces.

Some extreme circumstances, such as widespread Scotch broom, exist with few alternatives to herbicide treatment. These circumstances do not currently exist on the Hubbard Creek Watershed and efforts will be taken to avoid future invasive species issues.

FOREST CHEMICALS POLICY:

The City of Port Orford will not use any herbicide, pesticide, or fertilizer for any type of treatment on the Hubbard Creek Watershed without unanimous City Council approval. The City will work proactively with neighbors to establish agreements for herbicide use adjacent to or within the watershed. The northern parcels are also subject to an easement which constrains the ability to use herbicide. In addition, operating plans will include roadside mowing and manual treatment as needed to maintain the road network.

FOREST MANAGEMENT POLICIES

High Conservation Value Forest

HIGH CONSERVATION VALUE FOREST DEFINITION:

The Forest Stewardship Council and other conservation non-governmental organizations provide guidance for the identification of high conservation forest. The standard methodology identifies six criteria: 1) species diversity, 2) landscape level ecosystems, 3) ecosystems and habitats, 4) critical ecosystem services, 5) community needs and 6) cultural values. The HCV methodology then relies on a standards adaptive management framework for identifying a value, assessing the value, developing management plan, plan implementation, monitoring, and adaptive long-term management. At a tangible property scale, this process includes a range of discovery tasks to determine high conservation value forest, incorporation into existing or new plans, followed by long-term iterative management, monitoring, and adaptation with the goal of providing an additional level of protection for the underlying conservation value.

HIGH CONSERVATION VALUE FOREST PURPOSE:

High Conservation Value Forest provide protection for unique values, such as drinking water, as well as an additional layer of decision-making oversight

for ecologically unique landscapes. In the case of a drinking watershed, designation as High Conservation Value draws attention to the importance of the landscape in providing reliable quantities of clean, safe drinking water. Other areas that will receive an additional level of scrutiny include forests with unique tree species or legacy areas of old growth forest.

HIGH CONSERVATION VALUE FOREST POLICY:

The City of Port Orford exists in a unique position where roughly 90% of the City-owned property in the Hubbard Creek Watershed is considered High Conservation Value Forest under FSC standards. These are all of the areas within the Drinking Water Source Area. Of the potential watershed acquisition from The Conservation Fund, approximately 70% of the new parcel would be considered High Conservation Value forest. As a result of this high designation of HCV, all of the city-owned parcels with areas within the Hubbard Creek Watershed will be managed as if they were HCV, meaning that active management activities require City Council review and approval.

STAKEHOLDER AND PUBLIC INVOLVEMENT

The City of Port Orford as a public entity provides an open process related to all decisions impacting the management of the Hubbard Creek Watershed.

This Forest Stewardship Plan is maintained on the City of Port Orford website and can be accessed by any person or entity for review. Any interested party can contact the City and obtain access to the management plan if they do not have web access.

City Council meetings serve as an important public forum for conversations about the watershed and all management decision go through a process with the City Council, allowing for public stakeholder input.

All stewardship projects are submitted to City Council for review at a regularly scheduled meeting of the council. The information relative to the project is published for review prior to the meeting on the City website and notice of the meeting agenda is posted in the local paper prior to the meeting. In addition, stewardship projects should be reviewed by the Watershed Council and Curry Soil and Water Conservation District, as well as the local ODF stewardship forester. Council must accept and review public comment prior to any decision regarding the project. The project is distributed to qualifying parties for review and opportunity to bid on the project. The project notice is also posted in the local paper.

All responses are brought before Council for review and decision to award a contract. Public involvement is considered in all phases of the decision making process.

STAKEHOLDER AND PUBLIC INVOLVEMENT

Public Access & Fire Risk Mitigation

As noted in the property description, the Watershed has some desirable attributes for recreation. Interest in public access and recreation on the Hubbard Watershed is likely to grow as the population of and visitorship to the southern Oregon coast increases. This raises a number of important questions, challenges and opportunities for management of the Watershed, including recreational use and risk of human-caused wildfire.

Humans are the primary exogenous force acting on the Hubbard Creek Watershed. From forest management decisions to recreational activities, human actions have and will continue to shape this landscape. Human impacts can have positive and negative in terms of water quality. Positive impacts would include invasive species treatments and resilience-oriented forest management decisions. Negative impacts are far more varied and include fire ignition, erosion, and source water contamination. This section focuses on the three latter issues.

While fire ignition is not fully tracked, anecdotally and from conversations with the Oregon State University fire resilience extension staff, most fire ignitions in Western Oregon are human-caused. Typically, fires start because of a poor understanding

of fire propagation risk and careless behavior, or a combination of the two. The primary method to limit human-caused fire ignition is to exclude humans from a landscape. This human exclusion has become an annual occurrence, with most private forestland owners closing all public access during periods of high fire risk. Other measures can be taken including limitations on vehicle and power-driven machinery use, campfire bans, smoking bans, limitations on slash burning, and improved signage and public education.

Fires in western Oregon have historically been large and stand replacing with moderate return intervals. With hotter, drier summer seasons, and a number of fire adapted species present on the site, it is likely that the return interval of fire on the watershed will decrease, as will severity. More recently, a number of fires on and around the subject property have ignited due to slash burning, specifically along the eastern boundary. Improved slash treatment practices are mandatory for fire management, including considerations of chipping, small piles, and an outright ban on slash burning on City-owned property. This again would be in-line with comparable watersheds on the coast that do not burn slash.

STAKEHOLDER AND PUBLIC INVOLVEMENT

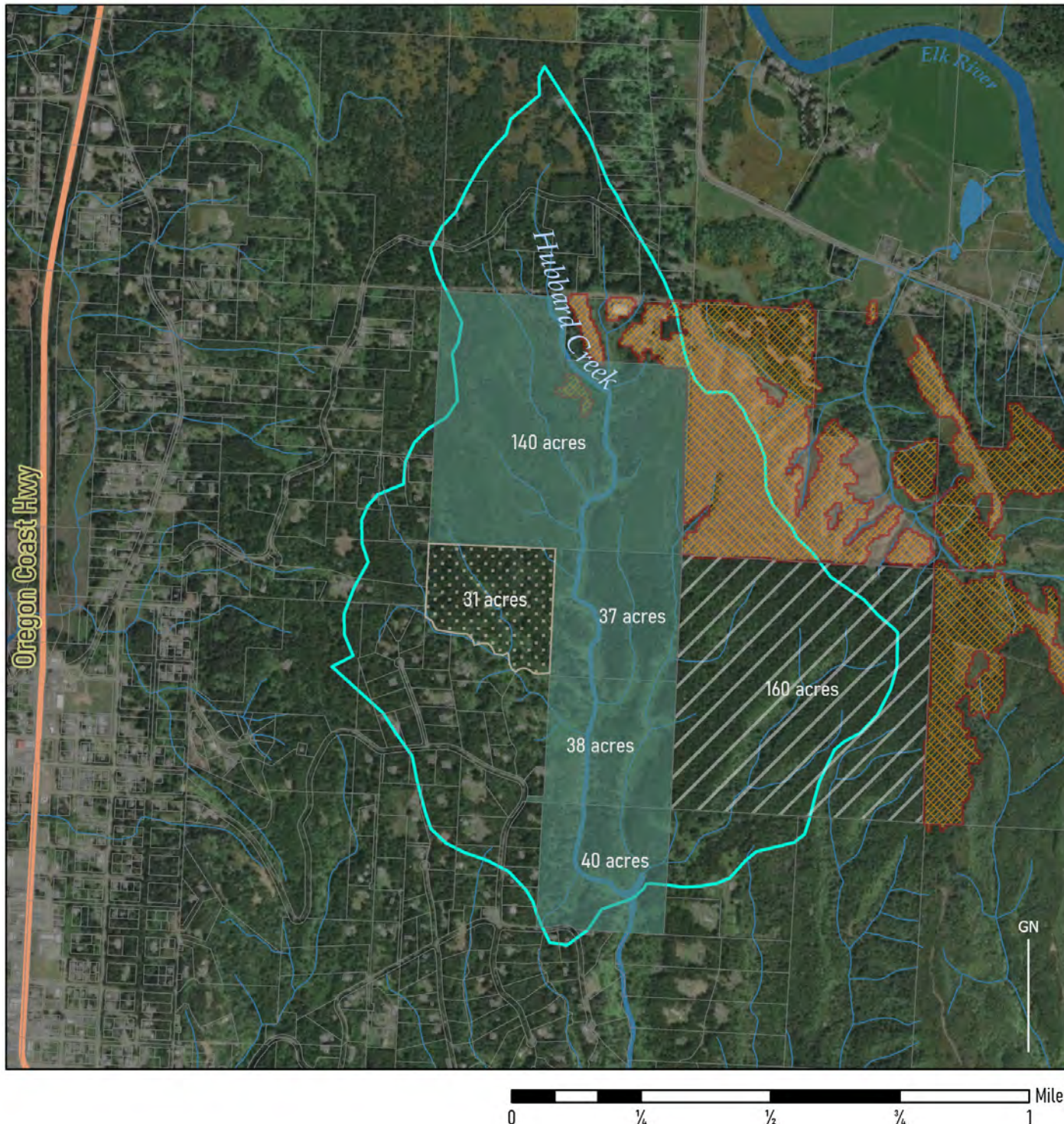
Activities that would decrease fire ignition risk on the watershed include:

- Limits on recreational use (improved signage at minimum, full closure of property)
- Landowner education on fire risk (primarily to limit pile burning)
- Fuel reduction treatments in high-risk areas
- Consideration of shaded fuel breaks along east and south property boundaries
- Maintain old and complex forest structure throughout the watershed
- Maintain priority access roads



Section 2 – Property Specific Descriptions and Stewardship

PROPERTY BOUNDARIES



 Port Orford Water Source Area

 Parcels

Owner Name

 City of Port Orford

 Mary Largess Lee

 The Conservation Fund

 Harvested / Nonforest

Streams

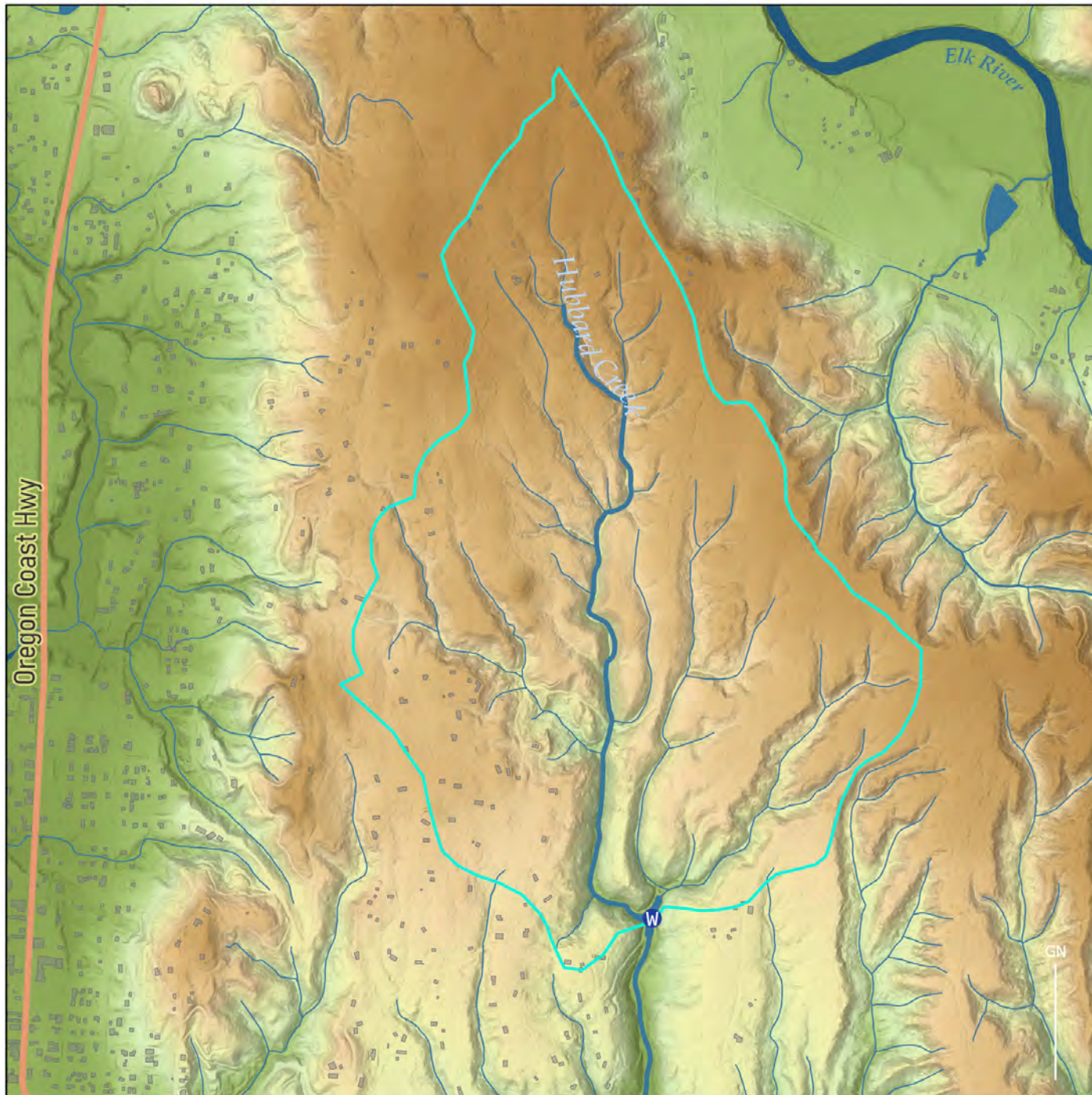
— Large


— Medium


— Small

Note: Imagery differs from actual conditions due to acquisition date. Harvested/nonforest areas are approximate.

TOPOGRAPHY




 Port Orford Water Source Area

 Surface Water Intakes

 Buildings

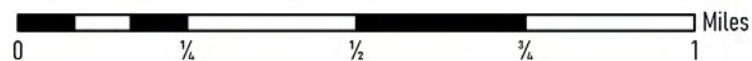
Streams

 Large

 Medium

 Small

Elevation (ft.)



CITY OWNERSHIP

Description

The City of Port Orford currently owns 250 acres of the Hubbard Creek Watershed in 4 parcels. The largest of these parcels is 134 acres and was acquired using a conservation easement in 2000 after it had been recently harvested. The history of the remaining parcels (38, 38, and 39 GIS acres) is unclear, but the City has owned them for an extended period. These parcels show minimal history of harvesting, with logging limited to small patches, primarily along roads.

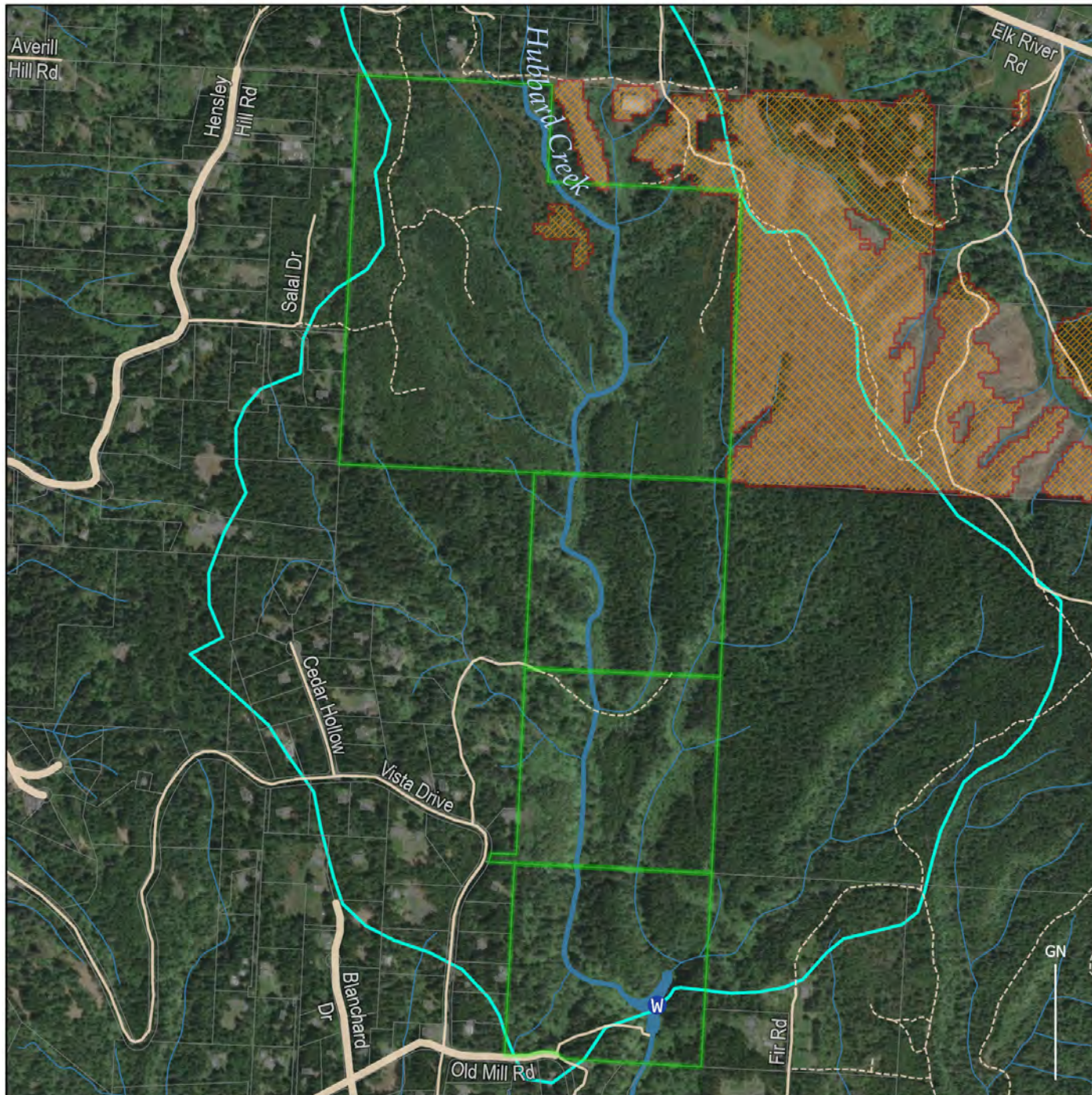
The City ownership extends north through the core of the watershed. The reservoir and water intake are on City owned property accessed from Old Mill Rd. Hubbard Creek splits on the southernmost parcel, with the eastern fork extending onto the current Conservation Fund property. The western fork runs north, terminating to the north of the 134 acre parcel in private residential developments.

Access to the core city ownership is primarily from four locations. These are the reservoir access road from Old Mill Rd., two through easements from private property via a gated and abandoned road on Vista Drive, and from a locked gate at the end of Salal Lane. Maps show additional access from the north via Hensley Hill Rd, but this could not be confirmed.

The City ownership is primarily made up of steep ravines down to shallow creeks with large, broad ridges in between. The entire ownership is heavily forested and has minimal access. Small walking and game trails indicate some minor level of public access, but this appears isolated. For the most part, the heavy growth, lack of road maintenance, and wealth of recreational opportunities in the area have led to very limited use of the property.



PORT ORFORD OWNERSHIP



- ▬ Port Orford Water Source Area
- W Surface Water Intakes
- ▨ Harvested / Nonforest
- ▬ City of Port Orford
- Roads (ODF)
 - ▬ Paved
 - - - Surfaced
 - . . . Unsurfaced
- Streams
 - ▬ Large
 - ▬ Medium
 - ▬ Small

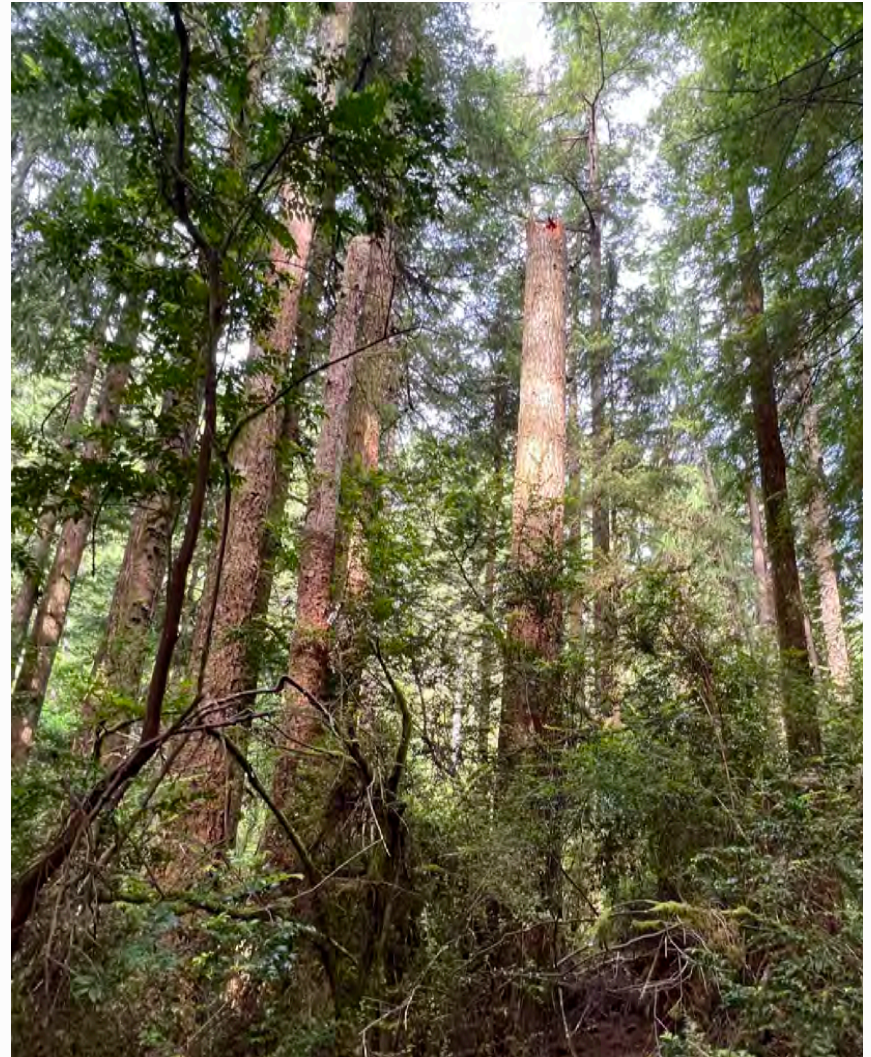
CITY OWNERSHIP

Current Forest Conditions

The entire 250 acres owned by the City of Port Orford are forested, with three primary forest types. The core of the watershed, across the southernmost three parcels, are old forest, with some trees estimated over 250 years old. Intermixed with this are small patches of alder and mixed conifer forest, indicating small patch cuts that were conducted 30-50 years ago. These areas total about 15 acres. The northernmost 134-acre parcel is entirely 20-22 year old mixed conifer. Following harvest this stand was replanted with limited success. The result is a relatively complex forest structure with high species diversity and rapidly increasing stratification. Stratification occurs when competition excludes or suppresses some trees, evidenced by varying tree height and diameter, natural mortality, and small canopy gaps / windthrow. Each forest type is discussed in the following sections:

TYPE 1: OLD FOREST

Approximately 100 acres through the lower reaches of the Hubbard Creek Watershed are what would be considered functional old forest. While this forest has seen some harvesting in the past and is a mix of older forest and second growth, the structure and species composition of this forest function similarly to a very old forest. A combination of natural mortality, fire, and



CITY OWNERSHIP



Old forest in the City of Port Orford exhibits high species diversity as well as patch openings and a variety of tree sizes. This type of forest both serves as an effective sponge for water, and has relatively high resilience in the face of ecological disturbances such as windstorms, pest and pathogen outbreak, and drought.

CITY OWNERSHIP

logging have lead to high heterogeneity, meaning that there are a combination of small trees, large trees, and a wide array of other plants. In addition, the forest has very high species diversity, with three clear strata within the forest. Large trees, primarily Douglas fir, constitute the main canopy. These trees range in age from an estimated 100 to over 250 years, and often have large scaffold branches, broken tops, or other wind damage. Below these trees are a second strata of conifers, often Hemlock, Cedar and Douglas fir. This second strata is clumped into small gaps, often created when a large tree fell down, clearing a significant opening in the canopy. Beneath this strata are hemlock and other shade tolerant species that exist within 20-30' of the forest floor. Unique to this coastal forest, you also find Madrona and Alder mixed into old forest conifer stands.

The old forest has a complex and unique understory, with Salal, Oregon grape, Madrona, and a wide array of other understory plants. The ground is covered by a thick duff layer with active mycorrhizal fungus networks visible within the upper layers of the soil.

In terms of water filtration and watershed forest health, an old forest such as the 100 acres in the core of the City ownership provides enormous benefits. The multiple layers of the forest canopy serve to decrease peak runoff, while also functioning as a sponge

during dry summer months. Paired basin studies have shown that these forests not only decrease sediment contribution to streams, but have a more significant landscape-scale hydrological impact. This is particularly important for watersheds where both source water capacity issues exist, and where other portions of the watershed may be degraded for a variety of reasons (land development and recent harvest primarily). Both land development and harvesting / young forest have the potential impact of increasing peak flow by decreasing the ability of the forest to serve as a sponge and decreasing base flow through increased evapotranspiration.

The old forests in the core of the City ownership appear to continue to develop in terms of structure and diversity. Small areas of windthrow created gaps, which will become occupied by smaller or younger trees. At present, the best management approach for protecting water resources is to protect these core areas, minimize the impacts of any roads extending into them, and consider limitations on public access to areas around the reservoir and immediate vicinity.

CITY OWNERSHIP

TYPE 2: ALDER GAPS

A number of small gaps exist within the older forest, some of which appear to have resulted from logging, while others may be the result of windthrow events. These small alder gaps are generally 15-45 years old and are not immediately adjacent to streams. As a species, Alder tends to quickly occupy sites with exposed mineral soil, and fully occupies that site during its relatively short lifespan, typically under 60 years. This is a natural part of plant succession, and as the Alder begin to age, the site will typically become occupied by longer-lived conifers.

Some municipal watersheds have elected to artificially transition deciduous stands to conifer stands, especially near water. The thinking behind this is threefold- first: conifers are longer lived and provide a more stable natural form of filtration, second: deciduous trees are bare during the winter and may lead to higher winter time runoff / lower summer base flows and third: leaf litter may contribute additional tannins / nutrients in the water, possibly leading to disinfectant biproduct issues. In general however, alder removal has not been shown to have significant source water impacts, and the Alder patches in the Hubbard Creek Watershed are not immediately adjacent to streams.

Following natural plant successional pathways, the alder patches will likely transition to a mixed conifer forest over the next 20-50 years on their own. Thus, unless other logging is planned in the immediate vicinity, there would be no argument for active management of Alder patches. In addition they total only about 15 acres, which is smaller than a practical management unit in this forest.

CITY OWNERSHIP



TYPE 3: YOUNG FOREST

The largest area of the City ownership is the 134-acre northern parcel, which is almost entirely young forest, between 20 and 22 years old. This area was harvested around 2000 and re-planted. Some areas, such as those immediately along the southern parcel boundary, regenerated very successfully and are even age Douglas fir monoculture stands. The majority of the parcel appears to have limited success with artificial regeneration and regenerated naturally over the follow 5-10 years. The result is high species diversity, irregular tree spacing, and the existence of large gaps. Many of these gaps are occupied by Salal or Oregon grape, however Gorse has occupied one significant area of the parcel.

The areas of the parcel that did regenerate following planting are now dense, young forest. These forests are in a challenging state, where they are too old to be pre-commercially thinned (thinning by hand where all material is left on site), but too young for commercial thinning. The stands have clearly begun to stratify and will continue to do so. The City may want to consider commercial thinning in approximately 10 years.

CITY OWNERSHIP

Resource Concerns

The forest resources on the City ownership within the watershed appear healthy, growing well, relatively diverse, with high structural complexity. The old forest is what many cities wish that they had- a functional sponge and filter in the core of their watershed. These forests are able to maintain high base streamflow while decreasing peaks during winter storms, and in turn decreasing the contribution of sediment to the source water.

The primary concern within the City ownership are the roads, particularly the unmaintained road accessed from Vista Drive. The culverts in this road were left in place, with a large (~5') culvert appearing broken and an adjacent culvert extending steeply down a hillside directly into the creek. The stream forks directly above this, with the eastern fork appearing to run in another culvert, and then parallel to a steep section of logging road. It is unclear when this road was built, but it appears to have been used during logging of the northern 134-acre parcel.

The risk with this road is that one or multiple of these culverts could fail. A failure might be slow, in the case of erosion or a rusted pipe, but it also could be catastrophic, in the case of a plugged culvert blowing out the road fill. The City should immediately evaluate these structures and consider removal and reconstruction. The road has no current functional need and could be fully removed.



Culvert on the access road from Vista Drive showing odd drainage structures and partially failed primary culvert in Hubbard Creek.

CITY OWNERSHIP

Stewardship Recommendations



Beyond road stewardship and / or removal, there are no forestry related stewardship recommendations for the City ownership in the Hubbard Creek Watershed. In 10-15 years, the City may consider thinning the northernmost 134 acres. This area of young forest appears to be stratifying and self thinning however, and may stay healthy and quickly growing with no further intervention.

Small areas of invasives, most notably Gorse and Scotch broom, exist in areas of the watershed. These are relatively isolated and are being actively managed. Continued work to manage invasives are a definite positive and will help to limit spread to other areas of the property.

THE CONSERVATION FUND OWNERSHIP

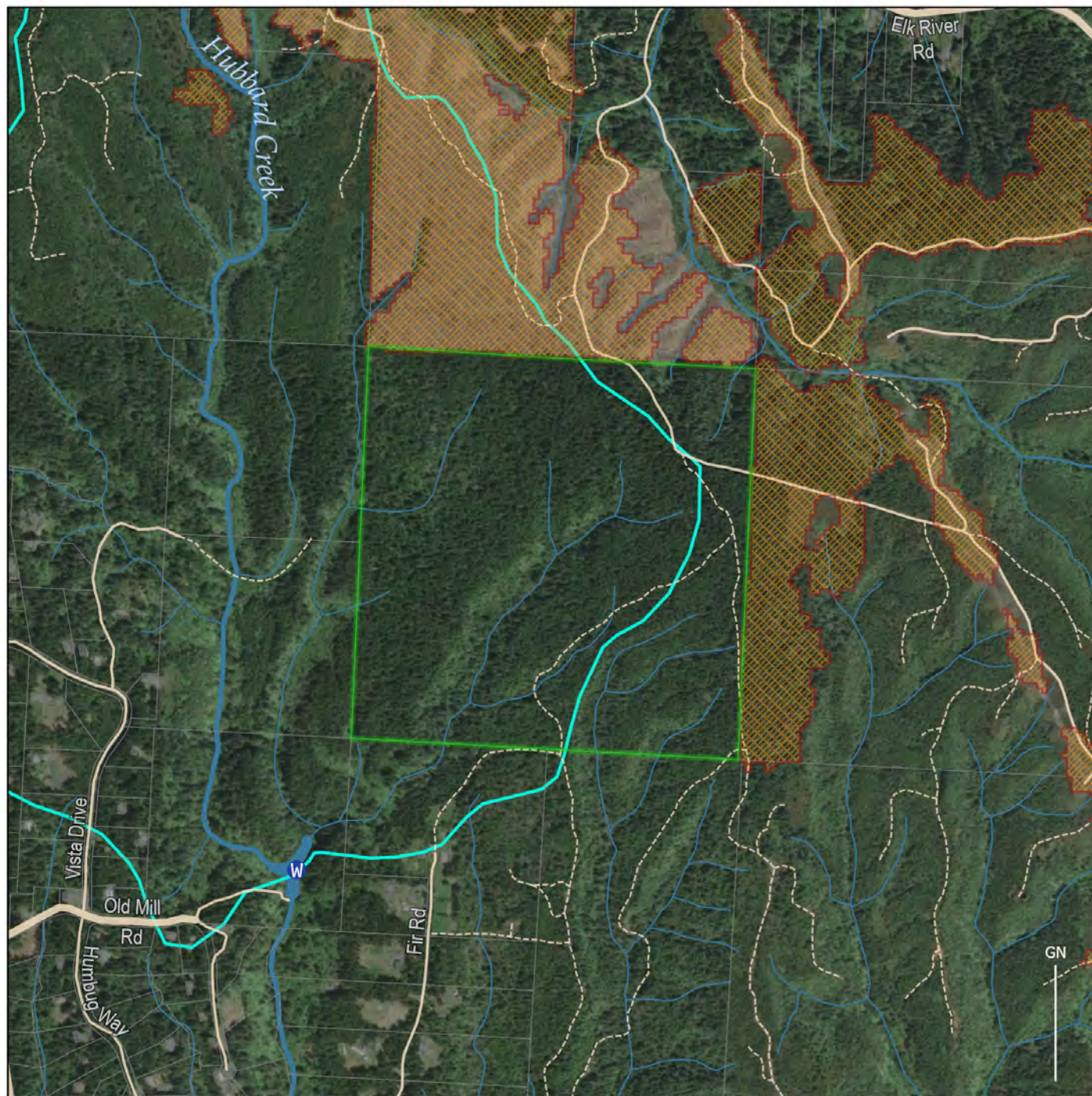
Description

The Conservation Fund ownership is located immediately adjacent to the City ownership, and outside of the Port Orford Urban Growth Boundary. The parcel is 154 GIS acres, or 160 deeded acres. The property is entirely square, constituting a quarter section, and is zoned Forestry Grazing (FG). The property has a history of forest management, and was purchased from Wilson Operations of Lyons, OR in 2021 with the intention of transferring it to City ownership.

The property has two access points- from the South via Fir Lane, and from the north from a spur road off of Hubbard Creek Rd. Both accesses are in good condition, although the southern, legal access, comes through numerous private, residential properties. Both access points have small wooden bridges of unknown capacity.

A small SSB / Type D stream, which is a tributary to Hubbard Creek, extends through the property. This stream would have a 60' buffer under current Oregon Forest Practices Act protections, or a 150' buffer according to the policies of this stewardship plan. This stream is categorized as highly erodible, as exhibited by slumping banks and significant fine sediment deposits visible in the stream bed. Any active logging near the streams could have dramatic source water impacts for the Port Orford reservoir and water system.

CONSERVATION FUND OWNERSHIP



Port Orford Water Source Area

W Surface Water Intakes

The Conservation Fund

Harvested / Nonforest

Roads (ODF)

— Paved

- - - Surfaced

. . . Unsurfaced

Streams

— Large

— Medium

— Small

0 Miles
1/4 1/2

THE CONSERVATION FUND OWNERSHIP



Dense, 50-60 year old timber on the Conservation Fund ownership. This specific area was not thinned, although some of the property shows signs of light thinning in the last 20 years.

THE CONSERVATION FUND OWNERSHIP

Current Forest Conditions

The Conservation Fund ownership is well forested with dominant trees between 50 and 60 years old. An inventory was completed in February 2021 that found the property to have two stand types. Type 1 is 135.3 acres of well-stocked Douglas fir, western hemlock, Sitka spruce, and Port Orford cedar. The average stocking was 19.4 mbf / acre. Type 2 is 16.4 acres of poorly stocked Douglas fir and western hemlock which averaged 3.3 mbf / acre. Since the inventory, an estimated additional 10 acres of the property burned due to slash burning on an adjacent ownership. The burned area was of the well stocked type 1 and now could be added to the acreage of type 2.



The parcel was clearcut sometime around 1960 and naturally regenerated to a mixed conifer stand. Some areas of the property were commercially thinned, it appears around 20 years ago. This thinning was done along the eastern half of the property, on flat sites with good road access. Areas further west were not thinned.

The property has very thick undergrowth. The undergrowth is primarily a mix of native bushes and shrubs, however some small patches of Gorse exist adjacent to the southern access road. In the case of fire, the thick undergrowth and dense stand structure could lead to a rapidly moving crown fire. It is unclear whether thinning would dramatically improve these conditions given the rate at which underbrush would re-occupy the site.

THE CONSERVATION FUND OWNERSHIP

Resource Concerns

The Conservation Fund ownership has a very dense stand structure with thick underbrush and relatively low species diversity. In addition, the property borders on developed residential property to the south, and a large property that has been recently harvested and could be developed to the north. The fire that burned onto the property in 2022 started on the recently harvested property to the north. Luckily this fire occurred in relatively mild fire weather and a rapid response limited its extent to a few hundred feet onto the property.

Any logging on the property has the potential to impact source water running from the eastern-most fork of Hubbard Creek into the reservoir. This area is highly erodible, steep, and close to the reservoir. If any operations were to occur, they should be kept a minimum of 150' from any flowing water and 50' from ravine or gully edges. No culverts or roads were seen crossing streams or creeks.



Soils along the SE fork of Hubbard Creek in the Conservation Fund are highly erodible and covered with a dense brush layer, excluding understory plants that could help to further stabilize soils.

THE CONSERVATION FUND OWNERSHIP



A fire recently burned onto the Conservation Fund ownership from an adjoining property. This fire was patchy and quickly stopped. The fire line shown here is approximately 50' into the property and was created with a small bulldozer.

THE CONSERVATION FUND OWNERSHIP

Stewardship Recommendations

General property maintenance would include controlling access, working with neighbors to limit the risk of fire on the property, and considering thinning on flat stands near roads. Many of these areas were thinned 20-25 years ago and could be thinned again. Commercial thinning with appropriate logging equipment could improve forest health and increase the rate of development for old forest functional characteristics. This type of activity should only be considered on moderate (less than 20%) slopes over 150' from water. In addition, this type of treatment might generate a modest financial return to help with ongoing property stewardship costs.

Any management activities on the property should include negotiations with neighbors to secure legal access either to the north, or to the east via Hubbard Creek Rd. In addition, stewardship projects that generated log sales would need to evaluate bridge strength for hauling.



Section 3 – Management Recommendations

TOPIC AREAS

The document raises a number management opportunities for the City of Port Orford. These management opportunities include:

1. Public Access
2. Invasive Plant Treatments (Gorse)
3. Fire Risk Reduction
4. Improve Road Maintenance and Monitoring
5. Consider future forest stewardship (thinning)

MANAGEMENT RECOMMENDATIONS

Public Access

The watershed is currently open for public access with very few posted closures. It appears that members of the public access much of the property by foot. There is some risk to this, primarily in terms of fire ignition risk. This level of public access on a small drinking watershed is relatively unusual. At minimum it is recommended that the City post new signs at all access points with the following conditions:

- Property open from sunrise to sunset only
- No camping, open flames, or smoking
- Foot traffic only, please stay on existing roadways, no motorized us
- Leave no trace - please pack out everything that comes in with you
- If you see something of concern, please let us know! (Post signage with City emergency contact)

MANAGEMENT RECOMMENDATIONS

Invasive Plant Treatment

Gorse, a highly flammable and aggressive invasive plant, has a presence in the Hubbard Creek Watershed. There are two primary locations – one on existing city ownership and the other on Conservation Fund ownership. The Curry Soil and Water Conservation District has prepared a separate plan for Gorse management and fire risk mitigation in the Hubbard Creek Watershed. This plan should be considered for all issues relating to Gorse

Other, minor invasive plants do exist in the watershed. These plants have minimal presence and do not currently present a risk to source water. In the case that any of them increase in prevalence or spread rapidly, treatment should occur in consultation with the Curry Soil and Water Conservation District and other partners.

WILDFIRE HAZARD REDUCTION: PORT ORFORD DWSA

Gorse Infestation Management



Prepared for:
City of Port Orford

Prepared by:
Erin Minster
Curry Soil and Water Conservation District

1

MANAGEMENT RECOMMENDATIONS

Fire Risk Reduction

Fire risk is significant in the Hubbard Creek Watershed and any fire would likely burn with relatively high intensity, leading to significant source water issues. Thinning and fuel reduction in these forests may have some limited fire risk reduction benefits, but also run the risk of introducing or providing sunlight to Gorse and other highly flammable plants. Any thinning or fuel reduction should be done in close collaboration with the Curry Soil and Water Conservation District to minimize the risk of invasives.

The primary measure for fire risk reduction is to decrease the risk of human-cause ignition. This includes education of neighboring private landowners, particularly related to backyard or slash burning. Holdover slash piles that appear to be out but re-ignite following wind or dry weather are an annual risk on the Oregon coast, particularly in the early fall and late spring. Recreation users also generate some ignition risk and public access is discussed earlier in this section.

MANAGEMENT RECOMMENDATIONS



Small areas of the Conservation Fund ownership and much of an adjoining property were heavily disturbed both by the fire, and by fire fighting efforts that removed much of the understory vegetation.

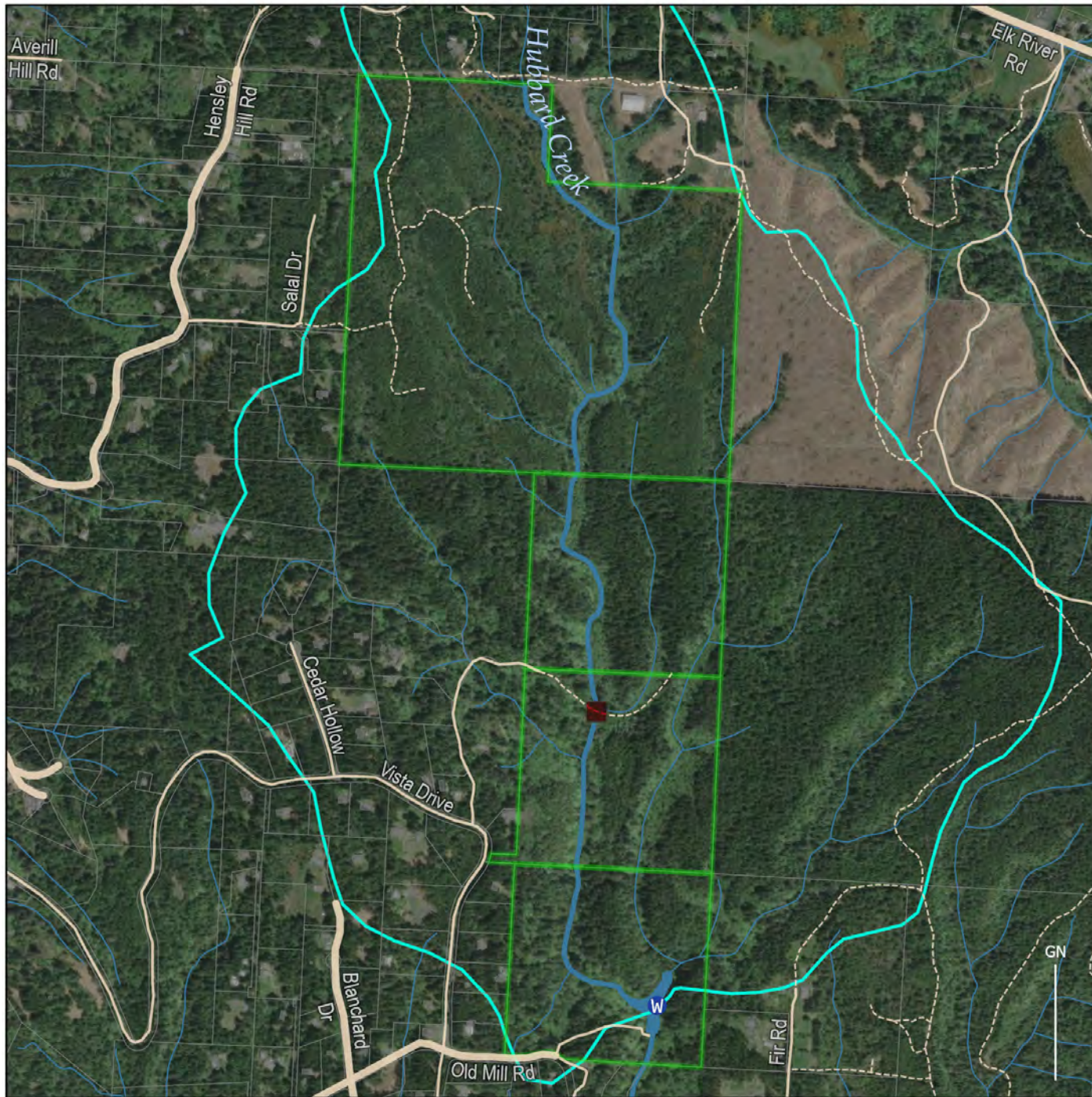
MANAGEMENT RECOMMENDATIONS

Road Maintenance and Monitoring

The Hubbard Creek Forest includes a number of unused or lightly used forest roads. Many of these roads include historic culverts that were not removed following active use. In particular, a large culvert on the north-most fork of Hubbard Creek requires regular monitoring and eventual removal or replacement. A catastrophic failure of a plugged culvert would generate long-term water quality issues.

Roads should be categorized by public works staff for 1) staying open or 2) closure. Any roads in category 1 should have the primary road surface mowed on a 3-year basis and a 24' road prism brushed as needed (every 3-6 years might be appropriate). Roads in category 2, slated for closure, may be abandoned in their current condition except for the large culvert discussed previously and the road extending SE from that culvert.

ROAD MAINTENANCE



Port Orford Water Source Area

City of Port Orford

Roads (ODF)

Paved

Surfaced

Unsurfaced

Road Failure

Streams

Large

Medium

Small

0 Miles
0 1/4 1/2

MANAGEMENT RECOMMENDATIONS

Forest Stewardship

The forests on Port Orford's ownership in the Hubbard Creek Watershed are generally healthy, diverse and growing well. The forests have developed structural complexity and have relatively high diversity when compared to actively managed forests in the region. Over time, these forests will continue to develop additional diversity and structural complexity.

Forest stewardship opportunities do exist in the form of commercial thinning on the Conservation Fund ownership. This area could be thinned using a low impact cut-to-length harvesting system within the next 10 years. A thinning of this area would remove 20-30% of the total stems, targeting smaller and suppressed trees for removal. A treatment of this type would break even or generate modest revenue. Target removal would be approximately 3,500 - 5,500 board feet per acre.

Any treatment must balance the forest health and fire risk reduction benefits against the high probability of increased Gorse in the forest. Additional discussions would need to take place prior to planning any thinning treatments. Similar harvest units visited in this area do show an increase in Gorse and the benefit of the thinning would likely be outweighed by the risk of Gorse.

No other areas are identified for forest stewardship or harvest activities in the next 10 years.

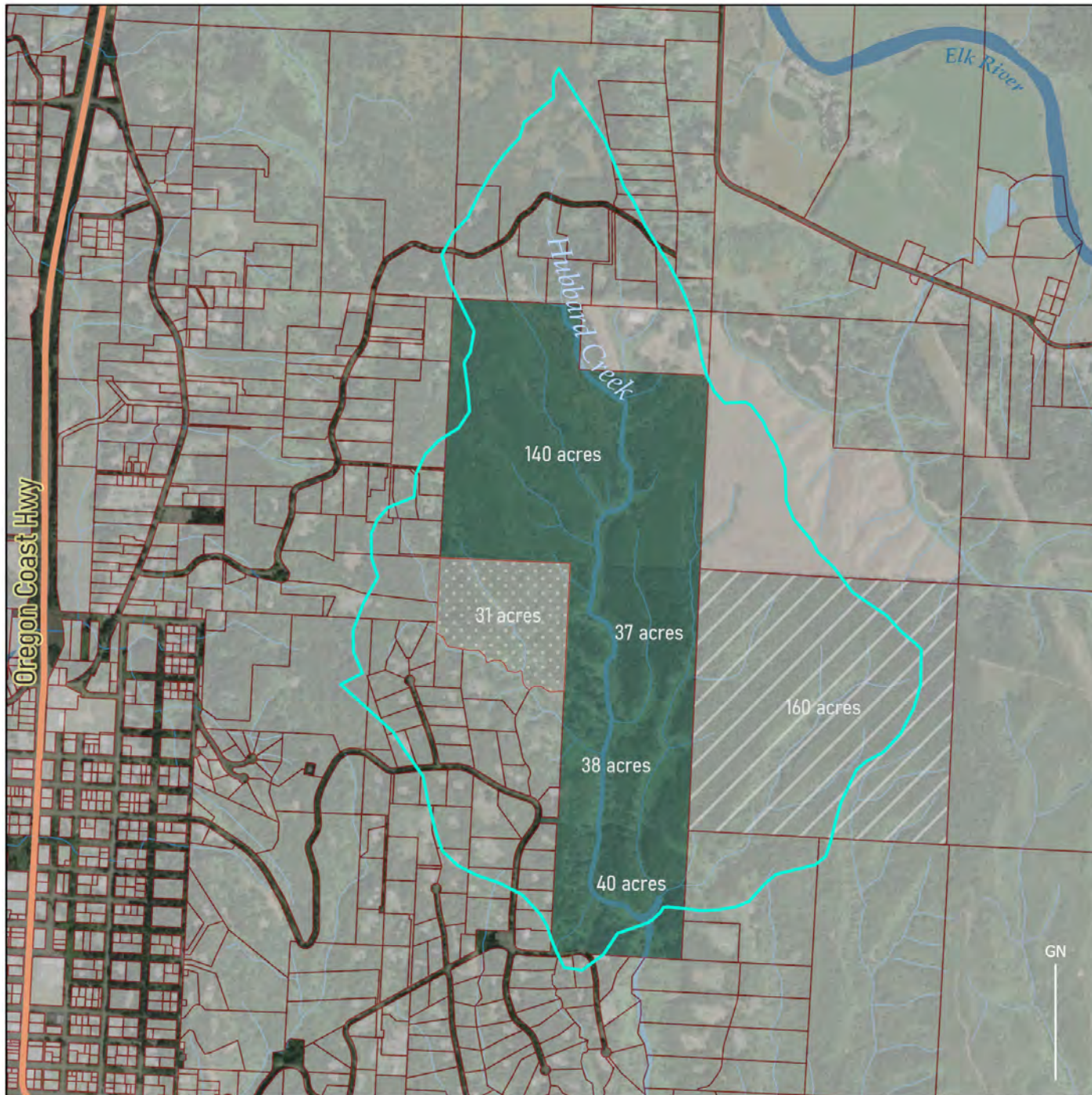
Section 4 – Private Landownership

TOPIC AREAS

Port Orford's Hubbary Creek watershed includes 90 individual privately owned parcels. Many of these parcels include homes, driveways, lawns, gardens, outbuildings, wells and septic systems, among other developed uses. These developed properties have significant impacts on both forest composition and rainfall - runoff patterns in the watershed. While property development will have ongoing negative water quality implications, active steps can be taken by property owners to protect the watershed. These are described in the following section:

1. Retain Forested Areas - Manage for Old Forest
2. Limit Herbicide Use and Runoff
3. Maintain Driveways and Impervious Surfaces
4. Protect Against Wildfire - Don't Start Fires
5. Limit Additional Development

PRIVATE OWNERSHIP



Port Orford Water Source Area

Private Landowners

Owner Name

City of Port Orford

Mary Largess Lee

The Conservation Fund

Streams

Large

Medium

Small

0 $\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{4}$ 1 Miles

PRIVATE LANDOWNERSHIP

Retain Forested Areas – Manage for Old Forest

Forests in the Hubbard Creek Watershed generate both a natural filter, and a natural sponge. As a filter, the forest slows the runoff of water, allowing it to percolate through the soil. This filtering process decreases turbidity in the source water and helps to mitigate runoff of pesticide, fertilizer, or other potentially harmful substances. As a sponge, the forest soil stores moisture, decrease peak stream flow and increasing base flow. This is important for decreasing erosion in the winter and maintaining reliable quantities of source water in the summer.

Both functions, filtering and storing water, are enhanced with older and more complex forests. Private landowners in the watershed can manage for old forest by limiting harvest, thinning, and retaining an intact native plant understory. These actions have the added co-benefits of increasing climate resilience and mitigating climate change while also providing wildlife habitat.



PRIVATE LANDOWNERSHIP

Limit Herbicide Use and Runoff

Herbicide use in the drinking water source area presents the potential risk of source water contamination. If used properly, herbicide can also be an essential and relatively safe tool for fighting invasive plants, such as Gorse and Scotch broom.

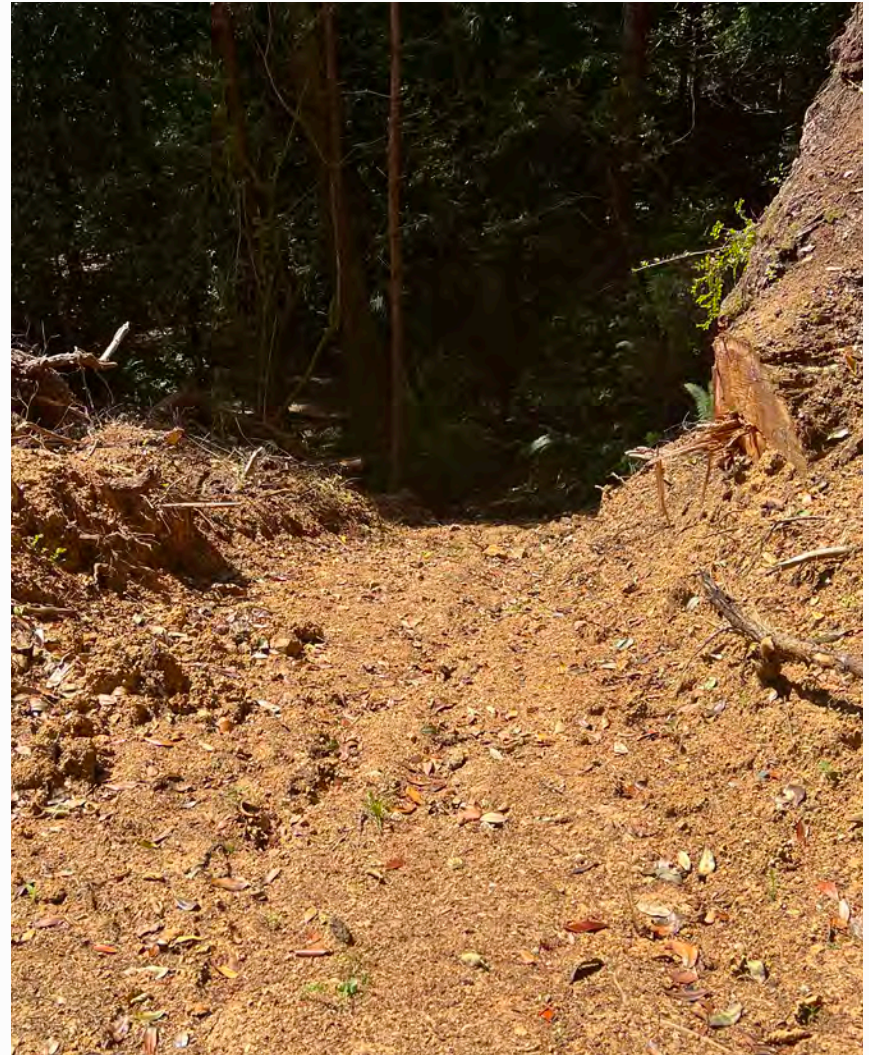
Private landowners should carefully consider any herbicide treatment, use only appropriate herbicides for the necessary treatment, and limit use as much as possible. The Curry Soil and Water Conservation District has excellent resources for herbicide use, and is able to consult with landowners looking to fight invasives or keep areas clear with herbicide.

PRIVATE LANDOWNERSHIP

Maintain Driveways and Impervious Surfaces

Driveways and other impervious surfaces have the potential to concentrate water flow, mobilize fine sediments, and increase turbidity or other contamination of source water. To mitigate these risks, private landowners can take a few simple steps:

1. Maintain natural vegetation up to and fully surrounding any driveway or impervious surface.
2. Make sure that roads are surfaced with clean, 1.5" minus or similar crushed rock. Renew the road gravel on a regular basis.
3. Watch for any signs of erosion or incision, particularly in ditches or around culverts. If you see it, re-route the water away from the incised area and / or use strawbales to protect the soil.
4. If erosion continues, contact a skilled road contractor or forester to come up with a plan for the road or driveway.



A severely eroded driveway on private land on the Hubbard Creek Watershed.

PRIVATE LANDOWNERSHIP

Protect Against Wildfire – Don't Start Fires

Fire presents a significant risk to the Hubbard Creek Watershed. The most likely cause of wildfire is a careless human starting a fire in or around the watershed. While forest thinning and fuels reduction can help decrease the severity of fire in the watershed, the best approach is to limit ignition of fire. This relies on the thoughtfulness of neighboring private landowners. These few simple steps can help to decrease wildfire ignition risk.

1. If it's dry or windy, don't burn! Before doing any backyard burning, check with the Port Orford Fire Department, Oregon Department of Forestry, and / or the Coos Forest Protective Association for current burn restrictions.
2. If it has a flame or is smoking, it can start a fire! Be careful with anything that could start a fire, including barbeques, backyard fires, cigarettes, and target shooting.
3. Don't park in tall grass- the hot mufflers on cars, ATVs, and motorcycles can start a fire.
4. If you see smoke, call 911. Small fires caught quickly can be easy to put out – the bigger it is, the harder it will be to control.



A fire on private forestland within the Hubbard Creek Watershed.

PRIVATE LANDOWNERSHIP

Limit Additional Development

Forested landscapes provide excellent drinking water source areas thanks to their ability to filter and store water. By limiting development in the watershed, the Port Orford source water will be cleaner and more reliable.

Future developments in the watershed should limit disturbance to native forest vegetation, minimize conversion to grass, and build well-drained, stable road and driveway systems. In addition, development increases the risk of damaging runoff and wildfire.



A potential development property in the Hubbard Creek Watershed.

DATA CONSULTED

1. Oregon Department of Geology and Mineral Industries. 2009. Lidar Data Quadrangle Series. Oregon Department of Geology and Mineral Industries, Portland, Oregon, Raster Digital Data, accessed August 2022. <http://www.oregongeology.org/sub/lidardataviewer/>
2. Oregon Department of Forestry. 2022. Statewide Streams FP. Oregon Department of Forestry, Salem, Oregon, Vector Digital Data, accessed August 2022. <https://www.oregon.gov/odf/aboutodf/Pages/mapsdata.aspx>
3. Oregon Department of Geology and Mineral Industries. 2021. Statewide Landslide Information Database for Oregon, release 4.4 (SLIDO-4.4). Oregon Department of Geology and Mineral Industries, Portland, Oregon, Vector Digital Data, accessed August 2022. <https://gis.dogami.oregon.gov/maps/slido/>
4. Oregon Department of Forestry. 2022. ODF Statewide Roads. Oregon Department of Forestry, REST API, Vector Digital Data, accessed August 2022. <https://oregon-department-of-forestry-geo.hub.arcgis.com/>

