Eagle Creek Community Forest Management Plan

Clackamas Soil and Water Conservation District

July 10, 2019

Introduction

The Clackamas Soil and Water Conservation District (District) has acquired a tract of forestland to create the Eagle Creek Community Forest along Eagle Creek in Clackamas County, Oregon. The Forest has been established with a Community Forest Grant from the USDA Forest Service.

The District is a unit of local government with an elected board of directors. Its mission is to provide technical and financial support to conserve and use natural resources sustainably today and for future generations. The District serves landowners, organizations, agencies, and local communities within Clackamas County, providing assistance with land management practices, supporting conservation projects involving multiple landowners and partners, and helping citizens conserve the vital natural resources that support the county's communities and drive its economy.

In establishing the Eagle Creek Community Forest, the District is responding to community interest in locally-led, sustainable natural resources management, balancing the environmental, recreation, health, and economic benefits a community forest can provide — with a priority on long-term forest and ecosystem health. The primary aim of this Plan is to establish a framework for managing this community asset. This includes defining the desired future conditions, establishing the means by which these conditions will be achieved, and facilitating coordination with neighboring landowners to maximize forest benefits across a larger landscape of adjacent conserved and public lands. While it will establish long-term goals for the forest, it is intended to guide action and decision making over a 10-year initial period.

This plan was written by Barry Sims of Trout Mountain Forestry, with the review and input of the Advisory Committee. Some sections originate from grant application documents authored by Tom Salzer of Clackamas SWCD and Dave Bugni of the Friends of the Eagle Creek Watershed.

Community involvement

The District has convened a Community Forest Planning Advisory Committee to help establish the management objectives and implementation strategies for this plan. Table 1 shows the agencies, organizations, and individuals that make up the committee.

Table 1. Advisory committee members

Name	Representing
Ahrens, Glenn	Oregon State University Extension Service – Clackamas County, Forestry & Natural Resources
Bugni, Dave	Community member and president of the Friends of the Eagle Creek Watershed
Collier, Gwen	US Forest Service, and Community member
Esler, John	Portland General Electric
Harshman, Victor	Clackamas County Parks & Forests
McGinnis, Cheryl	Clackamas River Basin Council
Peterschmidt, Caroline	Eagle Creek National Fish Hatchery, US Fish & Wildlife Service and Community member
Salzer, Tom	Clackamas Soil & Water Conservation District
Stewart, David	Oregon Department of Fish & Wildlife
Soll, Jonathan	Metro Regional Government
Wozniak, Owen	Trust for Public Land

The community that this forest serves includes several components. First, there is the immediate community of neighboring landowners, which include Eagle Fern County Park, Portland General Electric, Bureau of Land Management, and numerous small private forest tracts owned by local families. Weyerhaeuser, which sold the property to the District, retains a number of larger forest parcels in the local area. The local rural communities of George, Bissell, Tracy, and Dover are nearby. The broader community includes the city of Estacada and the unincorporated community of Eagle Creek. The District and Clackamas County Parks serve the entire county, as well as more broadly the Portland metropolitan area. These various layers both complicate and enrich the definition of community for purposes of this plan.

The District engaged county residents through two public meetings in 2018 and targeted outreach to key partners. Emphasis has been on reaching out to:

- Education-related organizations, e.g. the Estacada Public School District, Estacada Public Library, and Mount Hood Community College;
- Community groups whose members might benefit from the forest but may not be aware of the project, e.g. Todos Juntos, a countywide organization serving youth with an emphasis on the Spanish speaking population;

- Landowners near the property and the Friends of the Eagle Creek Watershed. This organization has agreed to extend its semiannual litter and trash pickup along Eagle Fern Road) the additional three quarters of a mile along the boundary of the community forest This group has conducted outreach to the surrounding community, educating neighbors about the benefits of the proposed Eagle Creek Community Forest.
- Organizations focused on habitat conservation, including the Clackamas River Basin Council, which coordinates and supports habitat restoration across the Clackamas Basin, and the Metro Regional Government, which owns and manages significant natural areas along the Clackamas River and several tributaries.

The District has launched a website for communicating about the community forest with the public: https://forest.conservationdistrict.org

History and landscape context

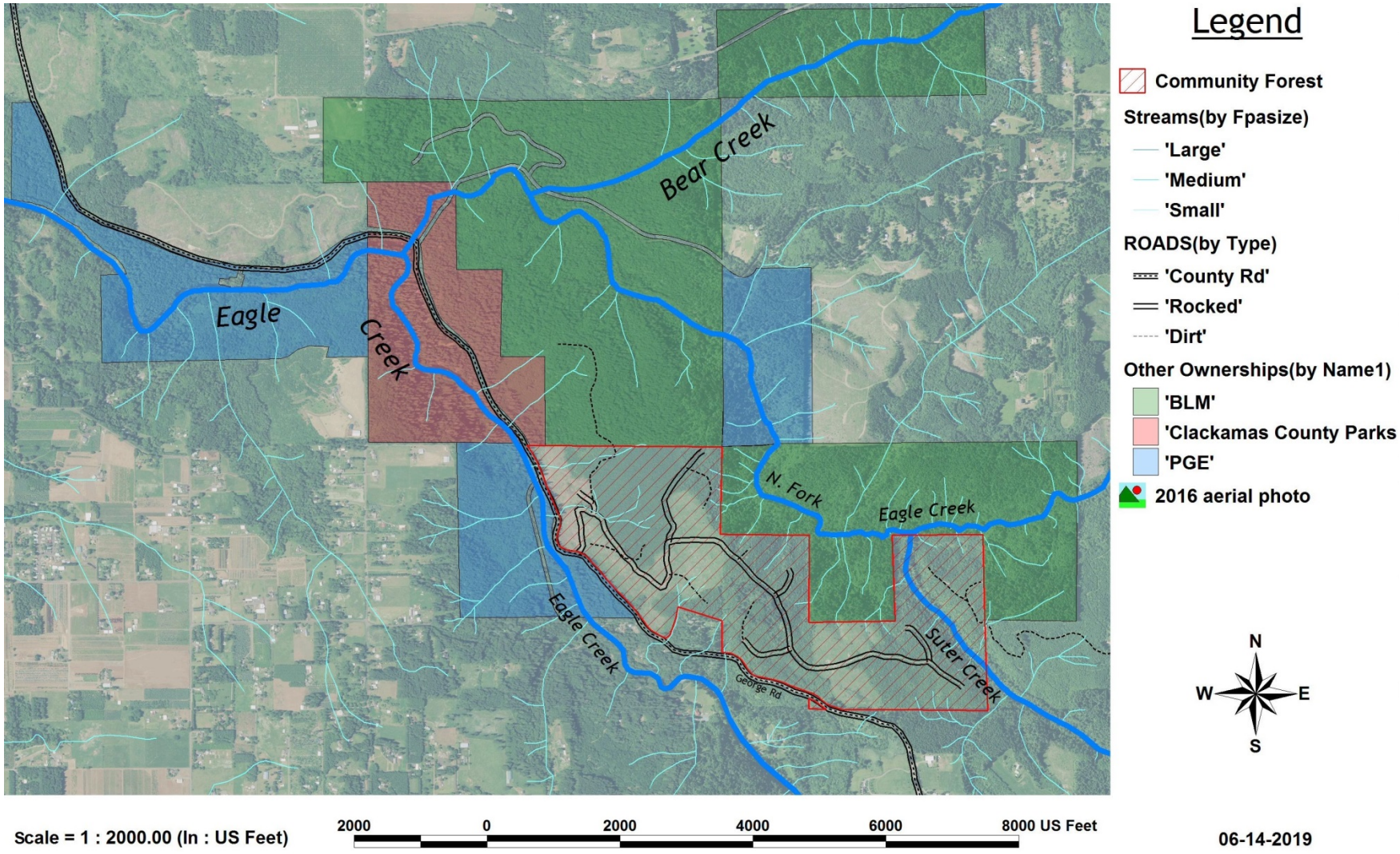
The property is located in the Eagle Creek Watershed in rural Clackamas County, with a population density of about 35 persons per square mile (2010 Census, tract 243.02, blocks 2018 and 2034). The majority of land in the watershed is privately owned. Weyerhaeuser is the largest private landowner. According to the Clackamas River Basin Action Plan prepared for the Clackamas River Basin Council, land use breakdown within the entire North Fork of Eagle Creek watershed is as follows: 0.4% urban, 93.6% forest, 6.0% agriculture and 0.1% water.

Historically, the Clackamas (also known as the Guithla'kimas, or Tltkimish) or the Molalla (also Molala, Molale, or Molele) Nations (Chinookan-speaking peoples) utilized, and possibly resided in this area of Clackamas County. Beginning in about 1871, the George/Bissell area began to be settled predominantly by German/Prussian immigrants. These immigrants proceeded to convert this forested area to farmland by burning large tracts, and the area came to be known as "German Burn". Fire scars on some large, old stumps and snags can still be seen today.

The Eagle Creek Community Forest lies within one of the 640-acre (one square mile) tracts (section 13 of T3S, R4E) that was once a portion of the Oregon and California Rail Road Company (O&C) lands. The O&C lands in this area were granted by the federal government to the O&C on May 9, 1871.

In 1916, Congress reclaimed the title on about 2.2 million acres of the O&C lands throughout Oregon and California, including lands in the George area after the railroad company violated the terms of the grant. This allowed those O&C parcels to be purchased by other private landowners, often logging companies. The community forest is part of one such parcel that was purchased for timber; the Bear Creek Logging Company may have been the first to acquire it. Subsequently, Longview Fibre acquired the property, possibly as early as the 1950s. Longview's timberlands were acquired by Weyerhaeuser in 2013.

Figure 1. Landscape context



Landowner objectives

The objectives of the community forest are to:

1) Permanently protect this important forest property from residential development.
2) Protect and enhance fish and wildlife habitat, water quality and other environmental benefits.
3) Expand and enhance recreational benefits, including connections with adjacent conserved lands.
4) Create opportunities for forest-based learning and community involvement in active forest management that can inform and support private forestland stewardship in Clackamas County.
5) Generate periodic income from sustainable forest management to meet maintenance and restoration needs for the property and to support additional conservation efforts.

Community benefits

The community forest will provide timber-related economic benefits from continued forest management. This includes providing work for local loggers, foresters, tree planters, and other forest workers, as well as providing logs to local sawmills. The District will use the income from timber management to fund maintenance and restoration of this property, as well as to support conservation efforts more broadly.

The community forest will provide environmental benefits by transitioning a young, single species commercial forest to a more diverse set of habitats, including older forest with multiple species. The intended management approach, prioritizing fish and wildlife habitat, is aligned with the Oregon Conservation Strategy, which identifies the confluence of Eagle Creek and the North Fork as a Conservation Opportunity Area. It will also advance salmonid (winter steelhead and coho) recovery plans, which identify Eagle Creek as a key Clackamas River tributary and zero in on the North Fork, and its tributary Suter Creek, as especially significant for recovery efforts. Located at a confluence of streams with strong existing salmon and steelhead runs, historic distribution, and high intrinsic habitat potential, the community forest will directly support these efforts.

The community forest will also benefit water quality in the basin by conserving the property and averting residential development in a sensitive area. Forest management will go above and beyond minimum legal requirements for protective riparian buffers to minimize delivery of sediment and maximize shading of streams. This will buffer temperature increases that are harmful to native cutthroat trout and salmonids and deleterious to water quality in the Clackamas River basin.

The community forest will also provide recreation benefits by expanding on existing, adjacent nature-based recreational opportunities and supporting new ones. Eagle Fern County Park

contains a network of hiking trails that could be expanded into the community forest and adjacent BLM lands with the appropriate planning, design, and cooperation among the landowners.

Finally, the community forest will provide benefits from forest learning by showcasing sustainable forestry and multi-aged management techniques to a community whose historically strong ties to forestry have weakened as the economy diversifies, local mills close, and harvests on public forests decline. Located a short school bus ride from schools throughout the populous northern half of Clackamas County, the community forest will provide educational opportunities related to forest restoration and management. The Estacada School District and Mount Hood Community College have already been approached about potential use of the site for hands-on education.

As one of Clackamas County's principal providers of technical assistance to small forestland owners, the District is well poised to demonstrate replicable forest stewardship techniques to local private forestland owners. This is especially significant given the high percentage of smaller, family-owned forestlands in Clackamas County. To this end, the District will organize educational site tours featuring local forestry consultants and District staff engaged in land management. The District plans to partner with the Clackamas River Basin Council, which is already engaged in public education in the Eagle Creek basin, to maximize the visibility and impact of these landowner-focused trainings.

Planned public access

The District will welcome public access to the community forest and will facilitate access by developing a trail network. All access will be non-motorized, except for certain organized educational activities sponsored or sanctioned by the District. These will include class visits, forest learning workshops, and "open land" days targeting individuals and groups who experience barriers, e.g. physical conditions, to access the forest. The District will take measures to limit access to sensitive riparian areas. Trail design, location, and connections with adjoining landowners will be developed over time with professional input. The District will work with the Advisory Committee to develop a plan for recreational development, including which uses (hiking, mountain biking, equestrian, ADA-accessible) the trails will be able to support. This will include decisions around security – there is currently a locked gate on the only access road – and parking. Signage will be another important element in communicating with the public about allowed uses and regulations.

Collection of forest products such as mushrooms, berries, basketry materials, and the like will be allowed, subject to the limitation that it be for personal, not commercial use.

No overnight camping or hunting will be allowed on the community forest.

Structures and other improvements

There are no structures on the property. The only improvements are the rocked roads and the locking gate at George Rd. While no additional permanent roads are going to be necessary for forest management, a new trail system, signage, parking area, and related amenities will be necessary to facilitate and manage public access. The District will work with the Advisory Committee to develop plans for these improvements.

Forestry regulations and other management restrictions

This plan and all management recommendations must comply with the Oregon Forest Practices Rules as administered by the Oregon Department of Forestry (ODF). Most forest operations require filing Notifications of Operations with the local ODF Stewardship Forester and a 15-day waiting period. Some operations require filing a written plan, particularly when working near streams or other sensitive resources (OAR 629-605).

Beyond this regulatory framework, management of the forest is intended to be in accord with the spirit and intent of the community forest designation and the Community Forest Grant from the U.S. Forest Service.

Forest resources inventory

Property location and taxlots

The property includes three taxlots totaling 317.7 acres, according to the Clackamas County Assessor's Office. The taxlots and legal descriptions are shown in Table 2.

Table 2. Taxlots and legal descriptions

Taxlot	Acres	Legal	Zoning
#101	133.43	T3S, R4E, Section 14	TBR
#200	119.60	T3S, R4E, Section 13	TBR
#302	64.67	T3S, R4E, Section 13	TBR

The property is adjacent to several other parcels that are protected from development and/or are being managed with conservation objectives. These include Eagle Fern County Park, properties owned by Portland General Electric (PGE), and BLM lands. The Community Forest and the surrounding parcels are shown in Figure 1.

Soils and topography

The site contains a range of soil types characteristic of the Cascade foothills of Clackamas County. Slopes range from relatively flat to gently rolling to very steep. Soils are generally deep

and well drained with a clay component. The soil map and list of all soil types is included as Figure 2. Lidar data was used to develop topographic and slope steepness maps. These are included as Figures 3 and 4.

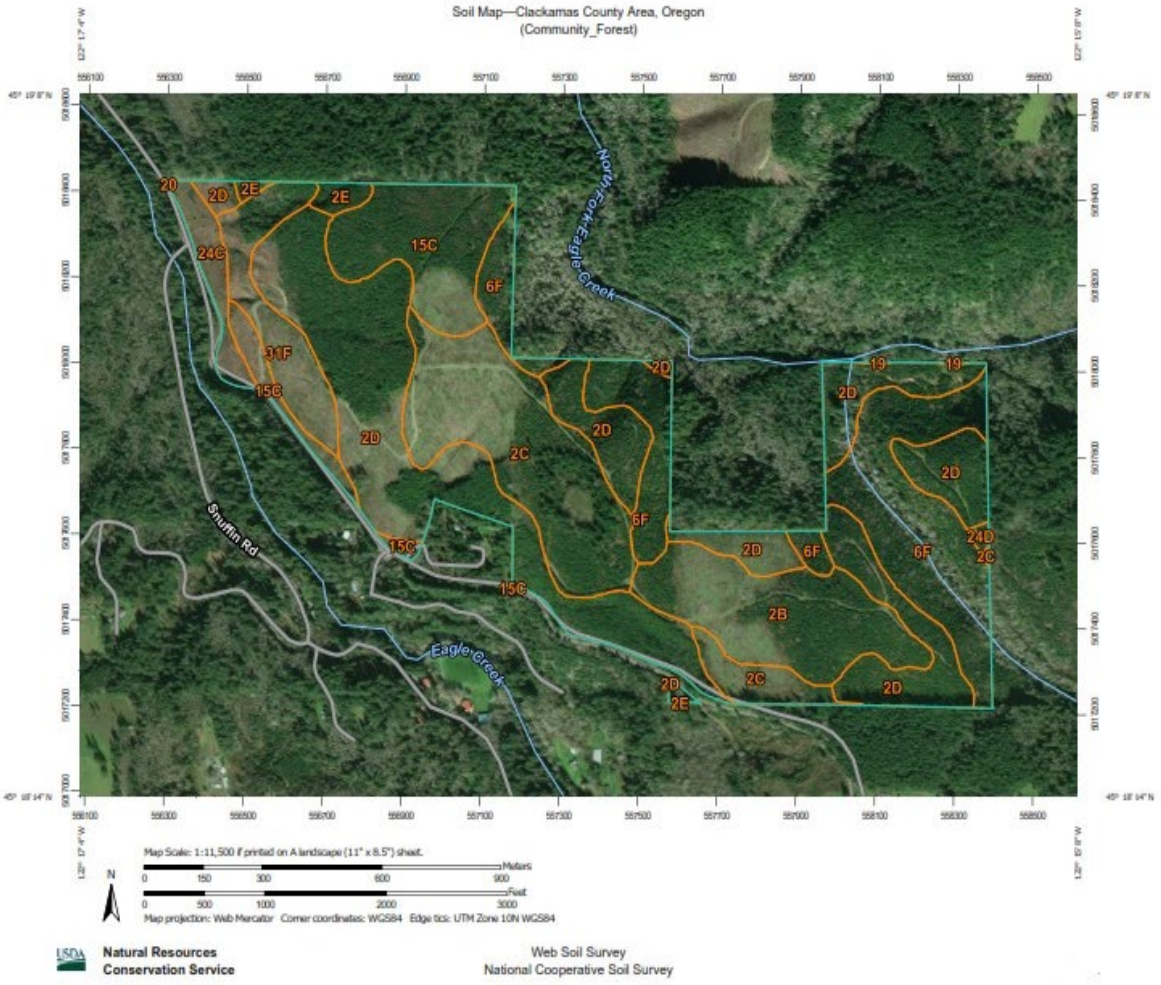
The soils are very productive for forest management purposes (see Table 3).

Table 3. Forest soils and potential productivity

Soil type	Acres	% of total area	Site index*
Alspaugh clay loam	204.2	64%	126
Aschoff-Brightwood complex	57.1	18%	112
Cazadero silty clay loam	31.6	10%	139
Other types	24.8	8%	125

* Expected height of Douglas-fir, in feet, at age 50.

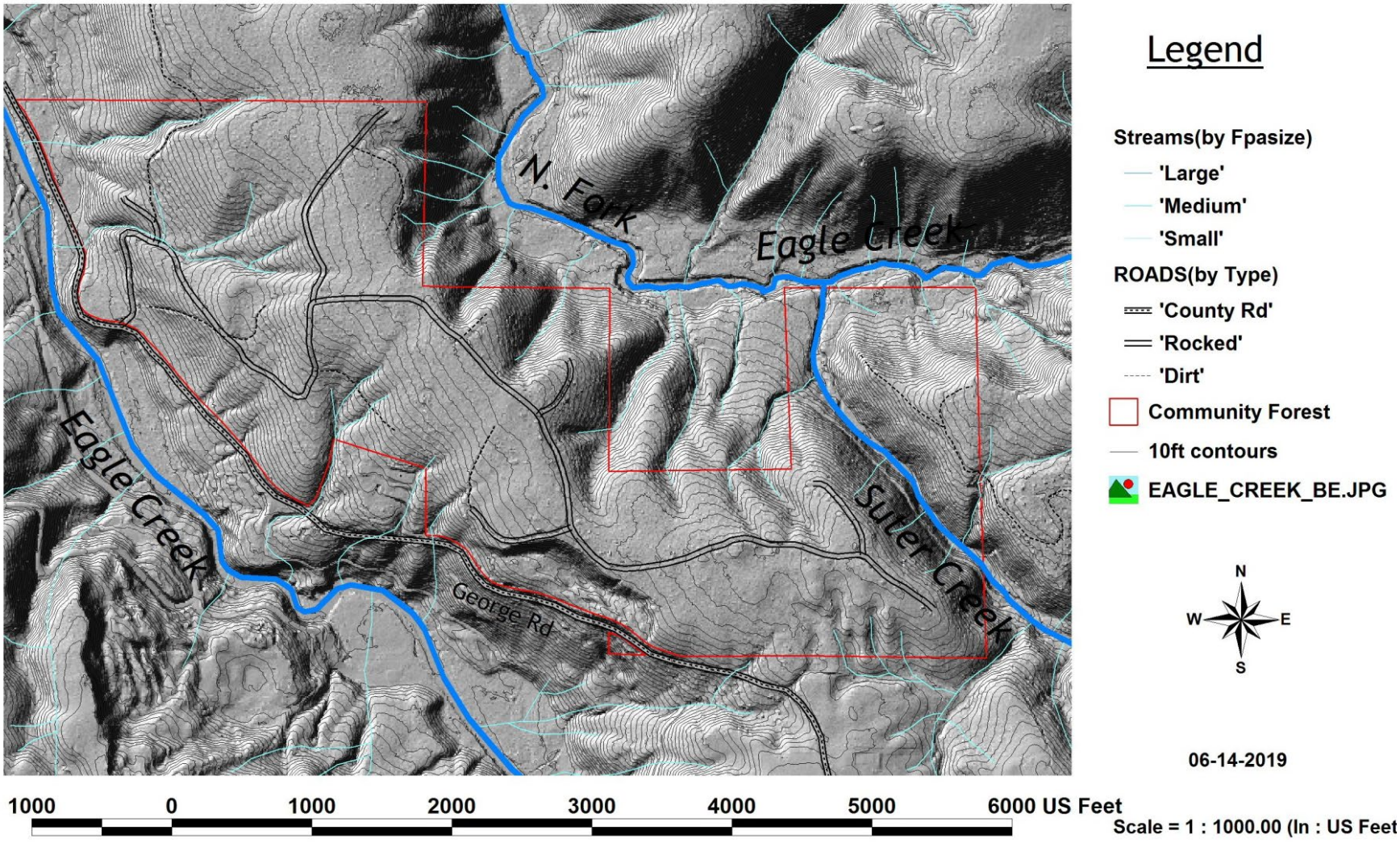
Figure 2. Soils map



Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2B	Alspaugh clay loam, 2 to 8 percent slopes	34.0	10.7%
2C	Alspaugh clay loam, 8 to 15 percent slopes	51.7	16.3%
2D	Alspaugh clay loam, 15 to 30 percent slopes	115.1	36.2%
2E	Alspaugh clay loam, 30 to 50 percent slopes	3.4	1.1%
6F	Aschoff-Brightwood complex, 60 to 90 percent slopes	57.1	18.0%
15C	Cazadero silty clay loam, 7 to 12 percent slopes	31.6	10.0%
19	Cloquato silt loam	0.1	0.0%
20	Coburg silty clay loam	0.1	0.0%
24C	Cottrell silty clay loam, 8 to 15 percent slopes	7.2	2.3%
24D	Cottrell silty clay loam, 15 to 30 percent slopes	0.6	0.2%
31F	Dystrochrepts, very steep	16.9	5.3%
Totals for Area of Interest		317.7	100.0%

Figure 3. Topography



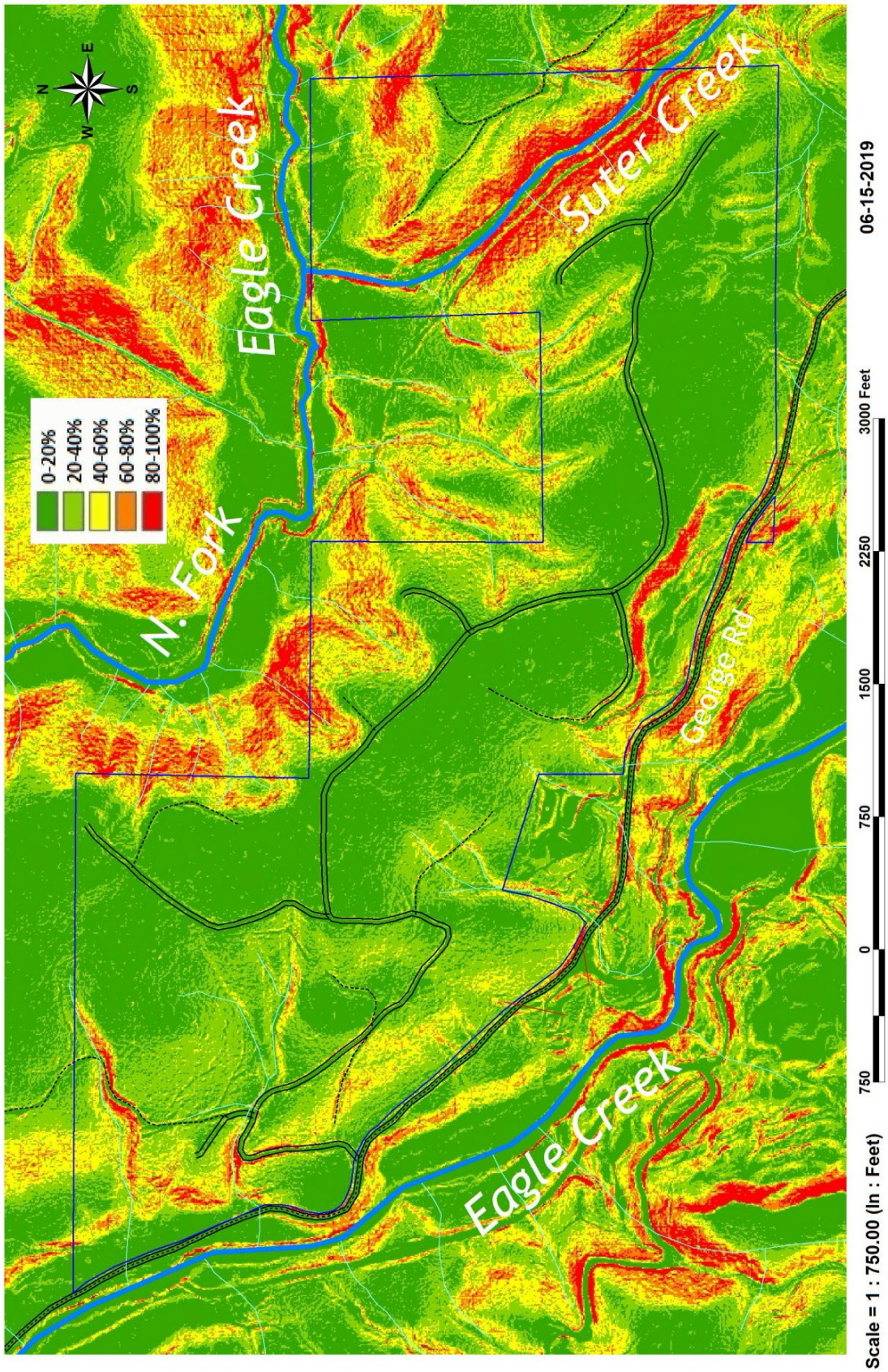


Figure 4. Slope steepness (%)

Vegetation

The forest has been managed for timber production for many decades. Consequently, most of the area consists of Douglas-fir plantations that are relatively young. In addition to these plantations, there are some small scattered older stands (50 years +) that were required leave trees from previous harvests. Along Suter Creek is a stand of mixed hardwood and conifer that is at least 50 years old. The various stands are mapped and described in detail in the Forest Management section below.

Besides Douglas-fir, tree species present include bigleaf maple, red alder and black cottonwood in riparian areas, bigleaf maple stump sprouts in young plantations, and some western redcedar and western hemlock natural regeneration. Near the center of the property, at the location of an old homestead is an area of black locust. These were commonly planted by early settlers to produce material for fenceposts.

The younger plantations (<15 years) have a mix of native shrubs and forbs, along with invasive species such as thistles, blackberry, and scotch broom. The older plantations (15-25 years) have achieved crown closure and tend to have very little understory. It is likely that native understory shrubs will reappear from the seed bank and from adjacent older forest stands over time.

Native shrubs observed during the inventory include vine maple, willow, hazel, salal, red huckleberry, cascara, salmonberry, sword fern, bracken fern, Oregon grape, dogwood, serviceberry, oceanspray, snowberry, sorrel, and bleeding heart.

The primary invasive species of concern are Scotch broom and Himalayan blackberry, discussed in the Forest Health section below.

Water resources

There are no ponds or other standing bodies of water on the property. The primary stream is Suter Creek, classified by ODF as a medium fish-bearing stream. There are numerous small, unnamed streams, many of which are seasonal, that flow either through culverts under George Road and then into Eagle Creek, or down steep slopes to the North Fork of Eagle Creek, or into Suter Creek. Suter Creek is an important tributary to the North Fork of Eagle Creek, which contains important salmonid habitat.

Stream flows on Suter Creek range from about four cubic feet per second (cfs) during the driest summer months to about 450 cfs in a 100 year peak flow, 159 cfs in a 2 year peak flood, and an average fall/winter/spring flow rate of about 20 to 25 cfs. Mean annual basin precipitation is about 64 inches.

Fish and wildlife habitat

According to local residents, Suter Creek supported a very productive fall run of wild coho salmon (late November/early December) and a winter run of winter steelhead (late March/early April) up until the 1940s or so, which is corroborated by historic distribution maps compiled by the Oregon Department of Fish & Wildlife.

Recent stream surveys by ODFW have documented significant coho redd presence in Suter Creek, suggesting that it may play an important role in salmon production potential within the Eagle Creek system. In addition, recent studies have suggested that the North Fork Eagle Creek and its tributaries, including Suter Creek, could play an important role in winter steelhead recovery, essentially because this sub-basin has been relatively free of the influence of hatchery fish.

The habitat quality has been degraded by past management practices, especially by the removal of most large conifer trees and logs from the riparian area. As a result, the habitat complexity that existed prior to initial logging has been greatly simplified. This is evidenced by the lack of stable, long-term woody debris jams and associated pools; exposed bedrock and lack of suitable spawning gravels due to decades of scour by unimpeded stream flows; and a lack of conifers along the stream banks that could provide natural recruitment of large woody debris over time.

Fish habitat restoration work has been recently completed on Suter Creek upstream of the Community Forest. Additional restoration work on the Community Forest would complement these efforts and further the goal of improving water quality and fish habitat. Work would likely include strategic placement of large woody debris within the stream channel, as well as conifer planting to accelerate the availability of potential wood for the future.

Much less is known about wildlife habitat on the forest. The current vegetation types are notably lacking in diversity. The forest is likely home to typical bird and mammal species of the area. Recent trailcam images have documented black bear, bobcat, and mountain lion on the property. In addition, deer and elk are present. Adjacent older forest habitats on County, BLM, and PGE properties are likely home to a variety of species dependent on large old snags and down logs, including woodpeckers, owls, bats, etc.

Monitoring of wildlife use will be ongoing with both trailcams and observations by hikers and other visitors. Over time, diversification of the current habitat types will occur in order to encourage wildlife abundance and diversity.

Roads and access

The property is fairly accessible via a good main road that was built for forest management purposes. This road is gated at George Rd. The road climbs up into the property on a steady 10% grade, and traverses the height of land to the east, where it ends above the Suter Creek canyon. This road is approximately 1.7 miles in length, is well rocked and graded, and is well designed to minimize stream crossings and the need for cross drain culverts. Although the heavy roadside brush prevents a thorough culvert inventory at this time, it appears that there is only one cross-drain culvert and one live stream culvert along the entire length of this road. Numerous spur roads branch out from this main road. Some of these are rocked and well graded, and others are presumably dirt; again, heavy brush prevents access for a thorough assessment.

The portion of the property lying east of Suter Creek is only accessible via a road through the neighboring property. It appears that the taxlots acquired did not come with any legal easement to cross the neighboring property. The Suter Creek canyon is generally very steep and not accessible with ground-based equipment.

Trails and recreation

There are presently no defined trails on the property. Previous recreation uses of the property appear to be limited to hunting. Weyerhaeuser had leased the hunting rights to a private hunting club, which utilized the property primarily during deer and elk seasons.

The existing network of rocked roads provides some limited opportunities for hiking and wildlife viewing. At present there is no parking area for visitors to use, and the gate is kept locked, preventing vehicular access.

The adjacent eagle Fern County Park has a modest hiking trail system, consisting of approximately 4 miles of trails. The possibility of expanding this trail network onto the Community Forest has been discussed and is an important goal. The inclusion of adjacent BLM lands in this trail network would be desirable, and BLM representatives have indicated the possibility of a Recreation and Public Purposes (RPP) lease agreement, which would facilitate this.

The integrated trail system, if approved by all adjoining landowners, should be developed with input from professional recreation planners or landowners/agencies with experience designing and constructing trails, as well as with input from the Advisory Committee.

Timber management

Logging history

Most of the area was logged in the early 20th century. The area was settled, and this property was homesteaded. It eventually passed into industrial timberland ownership and was changed hands several times. Weyerhaeuser began selling some of these parcels that were closer to residential areas with real estate development potential, including this property, which they put on the market in 2017.

Because of this history, all of the trees on the property are relatively young. The oldest are perhaps 60 to 70 years old, along the difficult to reach banks of Suter Creek and in scattered "leave tree" groups required by the Oregon Forest Practices rules. The current distribution of age classes is presented in Table 4.

Table 4.

Each age class represents the previous 5 years (i.e., "5" = 1-5 years old)

Stand inventory

The stands were delineated using current and historical aerial photography with some ground truthing. The stand map is included as Figure 5. Table 5 presents a summary of key stand attributes. Additional information about the stands is provided in narrative form

Table 5. Stand summary table

Stand	Description	Acres	Notes
1	Douglas-fir plantation 2000	61.3	Shrub diversity patch in NW corner
2	Douglas-fir plantation 2004	52.3	
3	Douglas-fir plantation 2012	48.2	Bigleaf maple sprouts
4	Douglas-fir plantation 2004	42.8	Shrub diversity patch in SW corner, weeds
5	Douglas-fir plantation 2002	28.3	
6	Douglas-fir plantation 2013	21.6	
7	Douglas-fir plantation 2017	16.2	Hazel and vine maple resprouts OK
8	Douglas-fir plantation 2000	15.6	
9	Mixed species riparian forest	13.5	Maple, alder, with limited conifer
10	Douglas-fir plantation 1994	6.9	Ready for thinning in next 5 yrs
11	Mixed age Douglas-fir	7.5	Trees 15-50 yrs old; fuels treatment
12	Locust	1.2	17 yr old coppice
13	Older mixed species patches	2.2	Scattered leave tree groups
Total		317.7	

Stands 1-8

These young Douglas-fir plantations are all well stocked, “free to grow” stands with good survival of the planted trees. The previous owners applied aggressive vegetation management practices to control competing species and allow the planted trees to thrive, likely including at least two herbicide applications per stand. As a result, biodiversity within the stands is, by design, relatively low. There are significant blackberry and scotch broom infestations along the roads and within some of the younger stands, but it doesn’t appear that there are any significant non-stocked areastherefore the Douglas-fir is expected to eventually shade out both of these species.

Stands 1 and 4 each contain a patch of approximately ½ acre dominated by diverse early seral assemblages of native shrubs that were apparently skipped over in the herbicide treatments. Stand 4 contains a group of old conifer snags that were left after the previous harvest. These features are providing important habitat elements that are generally lacking throughout most of the plantations. Stand 4 also includes an area of about ¼ acre of pure blackberries where a log landing may have been located.

Some of the older plantations in this group contain occasional western hemlock, bigleaf maple, or western redcedar stems, although these will be relatively minor components of the stands. Nevertheless, these species are all tolerant enough of shade that they should persist as these stands mature and can be retained in future thinnings to enhance diversity over the long-term.

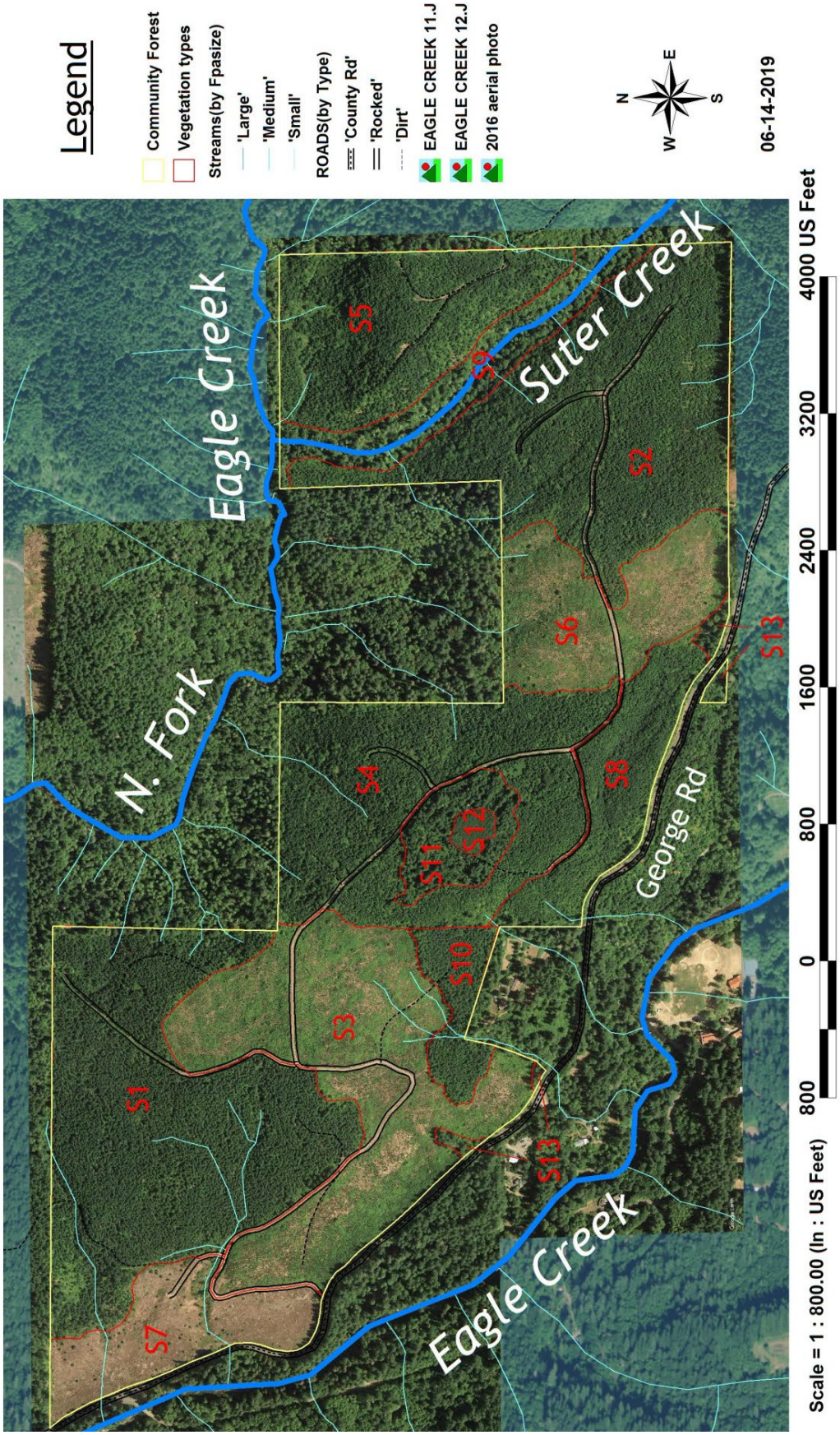


Figure 5. Current vegetation types

Stand 9

This is a mixed species, more mature stand along Suter Creek. It is dominated by bigleaf maple and red alder along most of its length. Toward the north end near the confluence with the North Fork of Eagle Creek, there is a small area (< ½ acre) of older second-growth Douglas-fir with some western hemlock and western redcedar.

Stand 10

This is the oldest of the Douglas-fir plantations on the property, and is approximately 25 years old. It is just entering the stage where commercial thinning becomes feasible. It is generally well stocked with some areas currently overstocked and in need of thinning. Access is via an old road grade, presumably with a dirt surface, that crosses through Stand 3 (currently overgrown).

Stand 11

This area appears to be part of or near the original homestead. It is notable mainly for containing a mix of different age classes, although it is primarily occupied by Douglas-fir. There are a few western hemlock and red alder trees in the mix. The Douglas-fir ranges in age from about 15 years to greater than 50. The younger trees appear to have been planted at the time the adjacent Stand 4 was planted. The older age classes appear to be natural regeneration because the spacing is highly irregular, and there are pockets of very high density. The older trees in the stand are generally very limby, indicating they developed in an open-grown condition. This area contains scattered blackberry infestations that limit access by foot, as well as high fuels concentrations and fuel ladders that present a wildfire risk.

Stand 12

This is a pure coppice stand of black locust, about 17 years old. Black locust is native to portions of the Eastern United States but has been planted around the world. Early settlers planted it because its wood is incredibly dense, hard, and rot resistant and therefore made good fencing material. It is widely considered the most durable wood in North America. It also fixes nitrogen in the soil and grows very rapidly and has been used throughout the world for erosion control and disturbed site reclamation.

The stand was likely planted by the original homesteaders on this property (precise date unknown). Subsequently, the mature trees have been cut several times. Black locust reproduces asexually by root and stump sprouting. It does not appear that there are large stumps here and so it seems likely that the area has been coppiced repeatedly over the years. The understory is a very thick layer of trailing blackberry. There are a few old, decadent fruit trees along the edge of the locust coppice, further confirming the past cultural use of this area by early settlers.

Stand 13

These several small scattered areas are remnants of the previous stand, retained at harvest to satisfy leave tree requirements under the Forest Practices Act. They include Douglas-fir and bigleaf maple and are generally 50 to 70 years old.

Management zones

An important component of conservation-based forest management is identification of areas where habitat, recreation, or other objectives take priority over active timber management. By developing forest management zones with different levels of management intensity, each area of the property can be managed to develop toward its own target conditions.

The proposed zones are:

- Active management areas
- Late-successional forest
- Aesthetic buffer on George Rd
- Steep-slope habitats

The initial proposed boundaries for these zones, as well as the management standards for each, are described in the map and in the following paragraphs. These are subject to change as the District and the community gain experience in owning, managing, and restoring this property.

The largest zone on the property is the Managed Forest zone. This area will be actively managed for timber while accommodating other objectives, such as aesthetics, recreation, and habitat. The initial standards for forest management are set forth in the next section and can be described as a mix of even-age and uneven-age management, with longer rotations, more species diversity, and more retention of old trees, snags, and down wood than what is standard practice in western Oregon.

The main block of late-successional forest zone – located in the eastern portion of the property and comprising 57 acres – is the Suter Creek canyon and associated uplands. This area is dominated by very steep slopes leading down to Suter Creek. Protection and restoration of fish habitat on Suter Creek is an important objective for this forest, and given the steep slopes present, long-term development of older forest is desired. One of the objectives of restoration on Suter Creek is to re-establish large conifers to provide long-term natural recruitment of long-lasting woody debris into the stream channel. There are about 5 acres on the east side of Suter Creek canyon that have relatively gentle terrain, and a young Douglas-fir plantation. This area has an existing road, yet it appears the District does not have a deeded easement to cross neighboring properties to access this road.

A second late-successional forest area is desirable along the property line with Eagle Fern County Park. This will enhance habitat connectivity with the older forest types in the park. A preliminary suggested boundary for this area is shown in the map, but further ground-truthing and modification of the boundaries may be warranted during the next plan update. The proposed area includes some steep slopes associated with a seasonal stream, as well as an area currently dominated by diverse early seral habitat.

The desired future conditions for this zone are late-successional forests with large trees of a variety of species, numerous snags and down logs, and natural regeneration of shade tolerant species, such as western hemlock and western redcedar. Natural disturbance, such as windthrow and minor native insect and disease outbreaks, will be generally allowed to run their course to enhance diversity of habitat. Such events create gaps in the canopy, contributing to native shrub development, an important component of biodiversity. They also contribute down wood to the forest floor, recycling nutrients and building soil health.

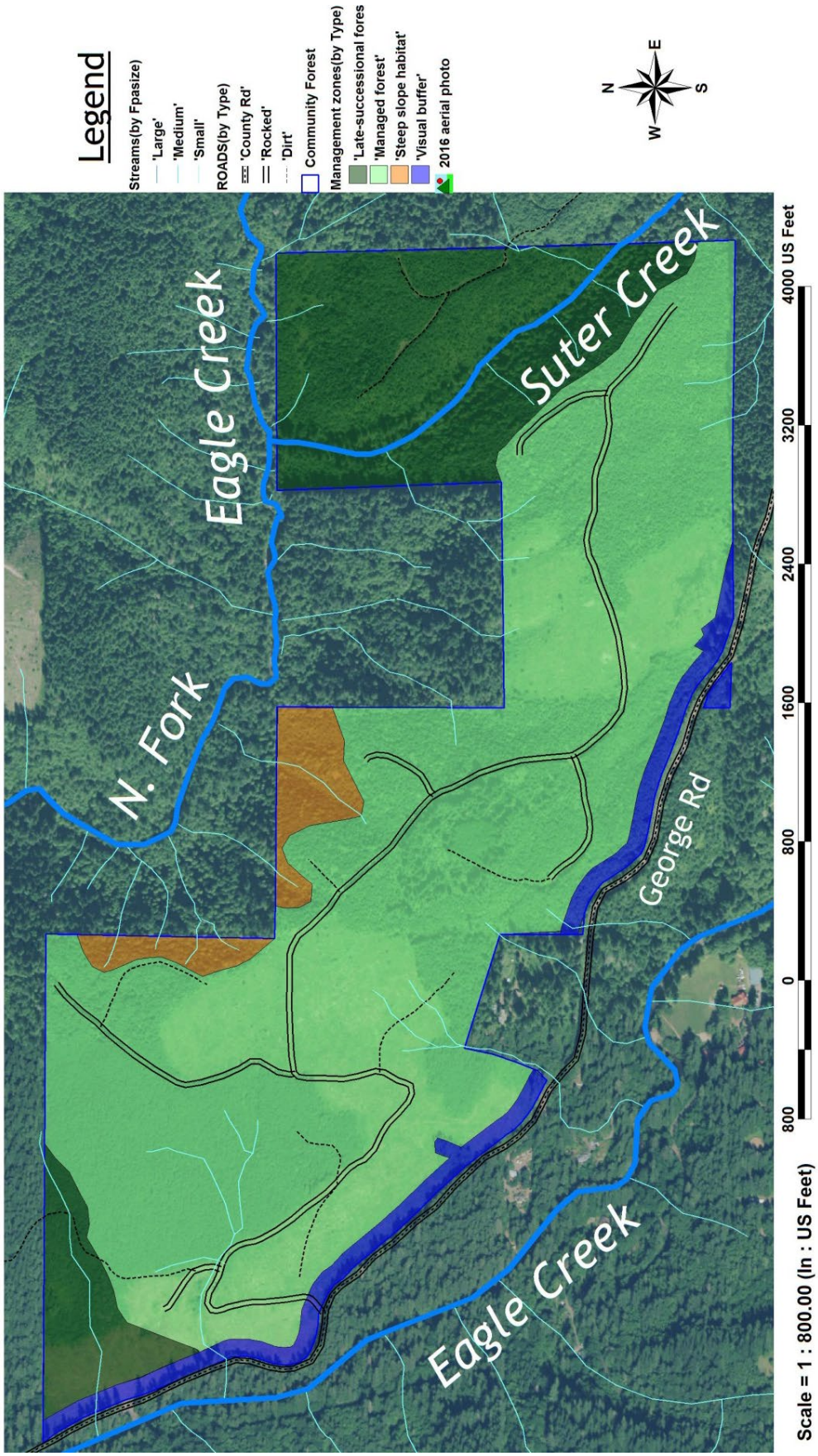
Within the late-successional forest zone, thinning is allowed and may be recommended to reduce wildfire risk, enhance forest health, and promote species diversity. In addition, weed control, trail construction, and other stewardship activities may be conducted in this zone.

Other zones include a 100’ visual buffer along George Rd, to be maintained in mature forest to enhance the aesthetics from this county road. Scattered existing older patches of forest (Stand 13 from the vegetation types map) are added to slightly expand this zone. Finally there are two portions of very steep ground that drain directly into the North Fork of Eagle Creek, totaling about 12 acres. These areas could potentially be cable logged; this would require rigging a skyline across the North Fork Eagle Creek and finding suitable tailhold trees on the other side. Given the small areas involved and the potential disturbance this presents to the creek, these areas are proposed as special steep slope habitats, to receive minimal management treatments.

In the areas along George Rd, snags may be removed for safety reasons.

Table 6. Proposed management zones

Zone	**Size (ac)**	**% total**
Managed forest	221	69%
Late-successional forest	70	22%
Visual buffer on George Rd	15	5%
Steep slope habitat	12	4%
Total	318	100%



Figutre 6. Management zones

Forest management standards

The overall approach to silviculture is derived from the landowner objectives and the forest types. The strategies outlined below will assist the District in achieving its objectives for the forest.

The Douglas-fir plantations which make up the vast majority of the managed forest zone can be treated in two ways. Douglas-fir is generally managed using even-aged techniques. However, the District wishes to diversify the forest conditions and species composition and will set an initial goal of managing 1/3 of the managed forest area using uneven-aged techniques.

Even-aged

Stands can be periodically thinned until they achieve a target rotation age, at which point they can be harvested and replanted. Harvests can be designed to retain scattered biological legacies (standing healthy trees, snags, and down wood). Openings will be large enough to plant Douglas-fir, but generally smaller than industrial clearcuts to limit the aesthetic and ecological impacts. Based on these parameters, regeneration harvests will range from 2 to 10 acres in size. The target rotation age for Douglas-fir will be 70 years. This is sufficiently old to provide for some older forest habitat in the managed forest.

Uneven-aged

In uneven-aged management, partial cutting is used to stimulate natural regeneration, with the goal being the establishment of at least three distinct age classes of timber. Natural regeneration of shade tolerant conifers is preferred, but this can be supplemented by planting as needed. For example, natural regeneration of hemlock and cedar within a Douglas-fir plantation can be supplemented by additional plantings after a thinning. Subsequent harvests can focus on “releasing” the shade tolerant species to recruit them into the main canopy over time. Uneven-age management can consist of individual tree selection or group selection harvest, or some combination. It is important to recognize that uneven-aged and even-aged are two ends of a continuous spectrum of harvest design. Hence modified even-aged techniques, with retention and smaller openings, can begin to appear and function almost like group selection under uneven-age management.

Diversity enhancement

Due to past management practices, biodiversity throughout the property is somewhat limited. Douglas-fir is by far the dominant species. Future forestry work will seek opportunities to retain and enhance biodiversity. This can be accomplished by favoring alternative species, such as western redcedar, western hemlock, and bigleaf maple during thinnings. This practice can even extend to shrubs and non-commercial trees such as willow and cascara. In addition, some snag

creation and woody debris placement can help create these habitats, which are used by a great variety of bird, mammal, and amphibian species.

Stream protection

Most of the important stream habitat is being protected by placing the Suter Creek canyon in the late-successional forest one. However, additional protections can be provided for the small streams that occur on the property. Current forest practices rules do not require the retention of any merchantable conifers along small non-fish bearing streams, and allow for removal of vegetation to within 10' of the stream. For this community forest, the standard will be 20' retention of vegetation along each side of any small perennial stream, including merchantable conifers.

Herbicides

Herbicide use is widespread in both agriculture and industrial forestry. While herbicides can be a helpful tool in forestry in controlling invasive weeds and helping establish productive stands after harvesting, some landowners choose to minimize herbicide use or substitute manual vegetation control methods.

The Eagle Creek Community Forest will minimize the reliance on herbicides through the following policies.

- No aerial spraying of herbicides. Targeted backpack spraying will be used.
- Site preparation spraying – done before planting – will be conducted where deemed necessary for successful reforestation following regeneration harvests.
- Release spraying – done after planting to "release" planted trees from competing vegetation – will be done sparingly to allow more diverse native shrubs to persist in the young stands. This will result in somewhat lower timber production from these stands.
- Herbicides will be used as needed to control invasive plants.
- Rocked roads will be kept free of vegetation through spraying. This greatly reduces wildfire risk by preventing tall vegetation from coming into contact with car and truck engines.

Sustained yield and harvest plan

The forest will be managed in a sustainable manner. Specifically, harvest levels will not exceed estimated growth in the active management portion of the forest. Because the age classes present are heavily skewed to young stands, allowance must be made for the long period during which no commercial harvest is possible or advisable. The calculated sustained yield

figures represent a theoretical average annual harvest level over a period spanning at least one even-age rotation of 45 years.

Table 7. Estimated annual growth and potential harvest yield

	Acres	Volume age 45 (bf/ac)	Growth (bf/ac/yr)	Adjustment factor	Yield (bf/ac/yr)	Total yield (bf/yr)
Even-aged	147.3	29,633	659	0.9	593	87,319
Uneven-aged	73.7	29,633	659	0.5	329	24,255
Total	221.0					111,574

Notes and assumptions

1. Average volume at age 45 is based on the appraisal of the property conducted by Atterbury Consultants, and their normal yield tables.

2. It is assumed that even-age management, with some retention of standing live timber, snags, and down wood, will be practiced on 2/3 of the area available for active management, and uneven-age management will be practiced on the remainder.

3. The adjustment factor addresses retention and potential decreased productivity under the proposed management practices. For example, retention within even-age units will reduce actual harvest yield, in this case it is assumed that 90% of potential growth will be captured in harvest. Uneven-age management is complex and requires successful natural or artificial (planted) regeneration; tree growth is slower in much older trees, as well as trees under partial canopy shade. As a result of these factors, it is assumed that 50% of potential growth will be harvested.

Forest Health

Generally, the forest appears to be relatively healthy. Recent years have seen unusually high levels of mortality in low elevation conifer plantations in the Willamette Valley and foothills. This has been primarily due to drought stress after several particularly hot and dry summers. The Eagle Creek Community Forest appears to be just high enough in elevation and associated climate to have avoided that phenomenon.

As the climate changes, more severe drought or other unusual weather may lead to an increase in tree mortality and associated risk of wildfire. The District plans to begin thinning stands once they reach an age of 25-30 years. This thinning program will reduce fuel loads, improve growing conditions and health of remaining trees, and favor species other than Douglas-fir, if present, to begin diversifying the species composition in the stands. In younger stands, pre-commercial thinning may be undertaken to accomplish these objectives as well, if conditions warrant.

Invasive plant species present on the property include Scotch broom and Himalayan blackberry. Both of these species are aggressive and persistent invaders and will displace native vegetation and reduce habitat quality. However, they are both intolerant of shade, and as the young plantations grow in height and achieve canopy closure, they will gradually recede. Roads and other open areas will need regular control measures to contain the problem and maintain good access.

Although root rot does not appear to be a major concern on the property, it is worth noting that species diversity contributes to overall disease resistance. Retention and inclusion of hardwoods in Douglas-fir stands can help prevent the spread of root rotting pathogens. This is most applicable to the young plantations.

Adaptive management

Owning and managing forest property is a new endeavor for the District. While it has a staff, managers, and board with considerable expertise across a range of ecological and management disciplines, it is to be expected that management of the Eagle Creek Community Forest will involve learning and adapting. The model of adaptive management is by now fairly well known. The basic principle, conveyed in Figure 7, is that management strategies may evolve over time as we learn more about a specific ecosystem. The feedback loop encourages evolution of management practices as monitoring reveals results over time, rather than rigid pursuit of pre-conceived goals.

Figure 7. *Adaptive management* (after Bormann et al. 1994)

Therefore this forest management plan will be re-assessed periodically. Annual monitoring will be conducted and recorded, and the entire plan is subject to revision every five years, or as conditions warrant.