Forest Stewardship Plan

for

Mill Creek Forest

Located in Lincoln County, Oregon

Prepared for

City of Toledo

Prepared by

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TROUT MOUNTAIN FORESTRY

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Data Summary Page

Landowner name:
City of Toledo

Landowner address:
206 N. Main Street
P.O. Box 220
Toledo, OR 97391

Landowner phone:
541.336.2247

Tract name:
Mill Creek Forest

Tract location:
Sunnyridge Road, 4 miles south of Toledo, Oregon (Main Unit)
National Forest Development Road 5083, 5 miles southeast of Toledo (Sub Unit)

Total acreage:
390 acres (Main Unit: 270 acres, Sub Unit: 120 acres)

Tract legal descriptions:
Main Unit: T11S R10W WM, Section 33, Tax Lots 7900, 8100
Sub Unit: T12S R10W WM, Section 3, Tax Lot 300

Latitude and longitude:
Main Unit: 44°34'13", -123°54'32"
Sub Unit: 44°33'33", -123°53'17"

Land use classification:
LCF1- Forestry-Timber Conservation Zone

Fire Protection District:
Main Unit: Toledo Rural Fire Protection District
Sub Unit: Oregon Department of Forestry- Toledo (541) 336-2273

Watershed in which tract is located:
Mill Creek Watershed within the Yaquina River Watershed (Mid-Coast Watersheds Council)

FSC certification registration number:
SCS-FM/COC-00062G

Seed zone:
Douglas-fir 4, Grand fir 2, Western hemlock 1, Western redcedar 1, Red Alder 1, Other species 2

Elevation:
Main Unit: 200-600', Sub Unit: 480-1120'

Executive Summary

The 390-acre Mill Creek Forest is located 6 miles south of Toledo in the Mill Creek drainage. Wholly owned by the City of Toledo, the ownership comprises 15 percent of the Mill Creek watershed, which has been a primary source water supply for the City of Toledo since 1920. Nearly 85 percent of the 2,652-acre watershed is comprised of other ownerships, including the Siuslaw National Forest, various industrial forest owners, and a charitable foundation.

The moderate to steeply sloping site is typical of Lincoln County forestlands, with good to excellent productivity for forest growth. Forest stands range from 30 to 40 years old, and are comprised of predominately even-aged stands of Douglas-fir and red alder.

Current timber volume totals just less than 3 million board feet, of which 51.8 percent is Douglas-fir, 46.8 percent is red alder, and 2.5 percent is western hemlock. Western red cedar, Sitka spruce, bigleaf maple, and cherry are minor species. Annual growth is estimated at approximately 288,000 board feet, or 800 board feet per acre (9.5 percent).

Average stocking over the Toledo ownership is 8,330 board feet per acre. Most of the property will be ready for harvesting within the next 10-20 years.

A network of all-weather and dirt-surfaced roads provides access to most of the ownership. Construction of the Mill Creek reservoir in 1969 submerged a main haul road, blocking access to more than 60 acres. This access could be regained by extending an existing road spur from private lands to the south.

Primary management concerns include harvesting timber before quality declines, enhancing forest structure through habitat improvement projects, thinning stands when needed and as markets allow, replacing an plugged culvert, and replanting following planned harvests. Recommendations to address these concerns are presented.

A conservation-based silvicultural approach is outlined, with a schedule of harvests that uses thinning to improve tree quality and growth, and patch openings or variable retention harvesting to create favorable conditions for new seedlings. The proposed harvest schedule is flexible to accommodate shifting markets and financial needs. Practices to improve wildlife habitat, control invasive species, and foster forest health are included.

This plan should be updated by 2022, or as situations or needs change.

Background

The 390-acre Mill Creek Forest is located 6 miles south of Toledo off Elk City Road. It is the only City-owned portion of the 2,652-acre Mill Creek watershed, which comprises a primary source water supply for the City of Toledo. Other owners in the watershed include Siuslaw National Forest (1,692 acres), industrial forest investors (529 acres), and VanEck Forest Foundation (53 acres).

The City first began using water from Mill Creek in 1920, when the US Congress designated the drainage as a municipal watershed. An 85 million gallon reservoir was constructed in 1969. Water quality for domestic use is the first priority for all management practices within the Forest. The City also draws water from the Siletz River, but relies heavily on the Mill Creek watershed during the winter months when high turbidity renders the Siletz source costly to treat.

The City of Toledo has harvested timber on the property since 1970 or before. Harvesting was not directed by any particular plan, but on an "as-needed" basis dictated by needs for funding water system capital improvements. A timber management plan was developed in 1980 by Publishers Paper Company, primarily addressing timber harvest and management practices. The last timber harvest occurred in the 1980s. In 2010 the City Council authorized development of a new forest stewardship plan.

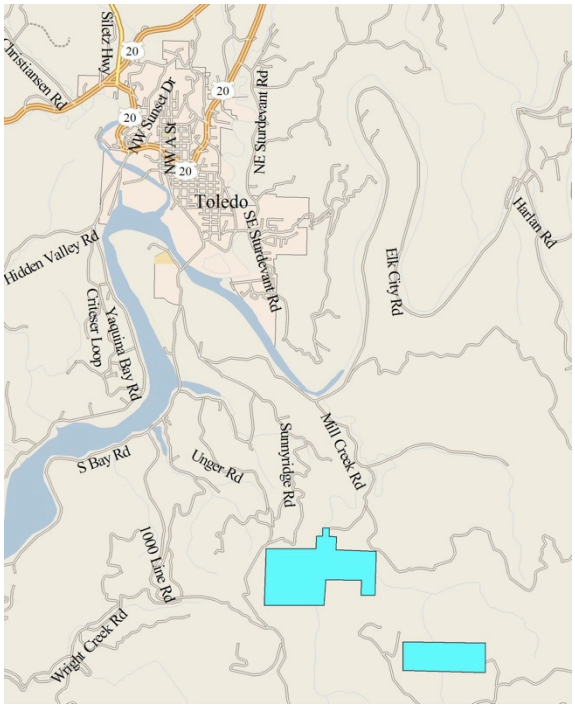


Figure 1: Vicinity map of Mill Creek Forest

Management Objectives

The Toledo City Council adopted the following objectives for the 390-acre Mill Creek Forest in 2010:

- Manage forestlands that maintain and promote the production of high quality, treatable water for the City of Toledo.
- Manage forestlands that produce a significant and sustainable amount of revenue over time for the City of Toledo.

- Manage forestlands in a science based sustainable method that includes a wide variety of natural resource values consisting of water, timber, fisheries, and wildlife.

- Consider value added marketing activities that provide opportunity for local craft people, artisans and others to specialize in unique forest products that might include: burls, edible forest plants, floral greens, or other specialty products that may develop over time.

- Consider recreational opportunities that allow citizens to enjoy this property, consistent with other goals.

Forest Resources

The following sections briefly describe some of the resources known to occur on the property, and set the stage for some of the stand-specific management recommendations found later in this plan. **Appendix A** contains forest management maps.

Soils

The following descriptions are summarized from the USDA Web Soil Survey. Maps and related information are found in **Appendix B**.

Four principal soil types are found across the two units (Main and Sub):

Table 1: Mill Creek Forest Soils

Symbol	Description	Acres	% of Total	Site Index	Hazards
2E	Astoria silt loam, 5 to 30 percent slopes	~0.4 (Main)	0.1 (Main)	130 (II+)	Erosion Compaction
7H	Bohannon-Preacher complex, 60 to 90 percent slopes	~87.5 (Main)	31.9 (Main)	117 (II–)	Erosion Compaction
49E	Preacher-Bohannon complex, 5 to 35 percent slopes	~16.7 (Main) ~26.8 (Sub)	6.1 (Main) 22.6 (Sub)	128 (II)	Erosion Compaction
50G	Preacher-Bohannon-Slickrock complex, 35 to 60 percent slopes	~155.0 (Main) ~91.9 (Sub)	56.5 (Main) 77.4 (Sub)	126 (II)	Erosion Compaction

Coast Range soils are highly productive, but fine-textured soils on steep slopes are prone to erosion. Precautions to limit erosion include: proper siting of haul roads, skid trails,

and log landings; surfacing permanent roads with rock; closing temporary roads by grading, waterbars, and seeding; maintaining ditches and water bars; and establishing generous riparian buffers.

Vegetation

Vegetative composition on the two sites is highly variable due to a lack of vegetation management after reforestation. Coast Range plant communities are well known for their intense competitiveness when attempting to regenerate conifer forests. Naturally-seeded red alder often outcompetes planted Douglas-fir seedlings due to its rapid height growth, particularly in areas with heavy soil disturbance. Clonal shrub species such as salal and salmonberry are also intense competitors due to their ability to rapidly re-sprout from dense networks of underground rhizomes.

Most of the forest in both units is 30-40 years old, originating after the sites were clearcut and replanted to Douglas-fir (hereafter referred to as "fir"). The eastern half of the main tract (Stands 3 and 4) is a little older, originating around 1968 or 1969, just prior to the construction of the Mill Creek Reservoir. Although fir was planted after harvesting, survival has generally been limited to steep, southwest facing slopes where it is better suited than alder to the intense solar radiation during summer months. In the main unit, some small patches of fir have also done well on gently-sloped, ridge tops where access roads and landings were located for cable yarding. The remainder of the two units is comprised primarily of alder and under-stocked brushy areas with scattered residual fir.

Understory vegetation in the alder stands is dominated by salmonberry, but also includes vine maple, sword fern, red huckleberry, elderberry, and dogwood. In fir-dominated stands, understory species include salal, Oregon grape, vine maple, sword fern, and red huckleberry.

Water Resources

The property is located within the Mill Creek watershed. Mill Creek flows into the Yaquina River approximately 2.9 river miles north of the Mill Creek reservoir. Both units of the Mill Creek Forest are located within the City of Toledo's municipal watershed, making water quality management the highest priority. Timber harvesting operations will utilize low impact techniques to minimizing soil disturbance. Log hauling will be closely monitored during wet-weather periods to protect the road system and minimize water quality impacts. All temporary logging roads and log landings will be water-barred and revegetated with grasses and forbs to minimize runoff.

Wildlife Habitat

The Mill Creek Forest contains a variety of habitat types, including abundant young hardwoods, young conifers, extensive brush patches, riparian forests, and a small reservoir. Wildlife sightings while timber cruising near the reservoir included a river otter, kingfishers, Canada geese, and various ducks including hooded mergansers.

As a result of past harvesting practices, there are few structural legacies from the previous old-growth forest. Little downed woody debris remains and there are few, if any residual snags. Snags provide necessary nesting, caching, roosting, and hiding sites for a variety of birds, mammals, and amphibians. Presence of snags is correlated with biological diversity, because more than 50 species of birds and mammals use snags for nesting, feeding, and shelter (Logan 2002). In general, larger snags have greater opportunities for use by a variety of wildlife species. Down logs are also important habitat elements for a range of species.

Creation and retention of large snags and large woody debris will enhance the wildlife habitat on the property. At the time of any harvesting activities, large trees to be designated for retention for wildlife habitat will be marked in paint with a large "W," and cull logs should be left in the woods rather than sold for pulp or firewood. The southwest facing Stand 3 in the Main Unit contains patches of larger, residual conifers that will be important for recruiting these older forest habitat features.

Although the City's ownership is generally lacking in old-forest characteristics, most of the Mill Creek Watershed is held by the USDA Forest Service, whose ownership contains extensive mature stands and whose objectives include the creation and protection of late-successional and old-growth forests.

Fish Habitat

The Mill Creek drainage supports several healthy runs of native fish, particularly Coho Salmon. This is considered significant, especially as dams and human disturbance are generally seen as degrading fish habitat. Maintaining stream shading, preventing sedimentation, and providing large logs for in-stream structure are critical to ensuring quality fish habitat.

The Mill Creek Forest contains two medium-sized, fish-bearing streams: Mill Creek and East Fork Mill Creek. Of the two creeks, only the East Fork of Mill Creek has been surveyed for fish presence. Fish presence in Mill Creek is assumed based on predictive models that take into account the area drained, slope and aspect, and other factors.

Headwater streams in the Mill Creek Forest are classed as either small-sized fish, or non-fish bearing, and few have been surveyed. The Sub Unit contains a stretch of

surveyed small stream and is classified as fish-bearing through most of the parcel. Due to the steep topography in the watershed, fish presence is generally limited to the main channels and tributaries with gentle gradients.

Threatened and Endangered Species

According to Oregon Department of Forestry (ODF) records, there are no known occurrences of endangered species on the property. Suitable habitat for spotted owls is generally lacking on the property due to young stand age and lack of large snags or woody debris. No formal surveys for threatened and endangered species on the property itself have been conducted. ODF records indicate the presence of spotted owls within the Mill Creek Watershed on Forest Service property, south of the Sub Unit, where older forests are more extensive. The protective, circular buffer placed around active owl nest sites does not overlap with the City's ownership and therefore will not affect management activities in the near term. Monitoring for owls and other species that depend on late-successional forests will likely need to be done in the future as conifer stands in the Mill Creek Forest mature.

High Conservation Value Forests

The Forest Stewardship Council (FSC) defines High Conservation Value Forests (HCVF) as those that possess one or more of the following attributes[1]:

1. *High biodiversity value:* containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia), including listed Rare, Threatened, and Endangered species and their habitats
2. *Landscape-level forests:* containing globally, regionally or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance
3. *RT&E species:* contain rare, threatened or endangered ecosystems (includes old growth, roadless areas <500 acres, primary forests)
4. *Critical services:* provide basic services of nature in critical situations (e.g., watershed protection, erosion control, local drinking water)

[1] FSC-US National Standard, August 2010.
[2] The FSC-US National Standard defines two types of old growth forests. **Type 1 Old Growth:** three acres or more that have never been logged and that display old- growth characteristics; **Type 2 Old Growth**: 20 acres or more that have been logged, but which retain significant old-growth structure and functions.

5. *Local needs areas:* fundamental to meeting basic needs of local communities (e.g., subsistence, health)
6. *Local cultural identity:* HCV forest areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance)

The entirety of the Mill Creek Forest is considered a Type 4 High Conservation Value Forest due to its location in the physical watershed of the Toledo municipal water source. There are no stands meeting the FSC definition of Old Growth on the property.

Archaeological and Cultural Resources

During the timber cruise of the Mill Creek Forest, no historic structures or building sites were encountered. With the exception of an old railroad grade, there are no known archaeological or cultural resources present on the property. If any sites or artifacts are discovered, activities will be delayed until the significance of the site can be ascertained. As part of its Forest Stewardship Council (FSC) certification, Trout Mountain Forestry is in contact with regional tribal groups to inform them of forestry activities on these lands. As part of this process, tribal groups have an opportunity to identify any culturally significant sites within the ownership.

Public Access

The Mill Creek Forest is closed to the public to protect water quality, to avoid liability, and to minimize the introduction of invasive species. Public viewing of the properties by local citizens can be facilitated through guided tours for educational purposes, particularly following management activities. Similar public tours are led by Trout Mountain Forestry and city officials in the watersheds of Corvallis and Forest Grove following annual harvests. These events are typically well-attended and appreciated by local citizens. Although aesthetics are typically a lesser concern in the Mill Creek Forest, harvest layout should keep in mind aesthetic concerns to maintain trust in the management of such a valuable public resource.

Landscape Level Context

In a landscape dominated by industrial forestland and National Forest, the Mill Creek Forest occupies a unique niche. The City of Toledo's management objectives are balanced between drinking water, sustainable timber production, and fish and wildlife habitat. The Mill Creek Watershed covers approximately 2,652 acres, 390 (15%) of which is owned by the City of Toledo and 1,693 (64%) by the US Forest Service. As

previously mentioned, approximately 582 acres (22%) of the Mill Creek Watershed is in private industry ownership, much of which is likely to be harvested in the next 10 years.

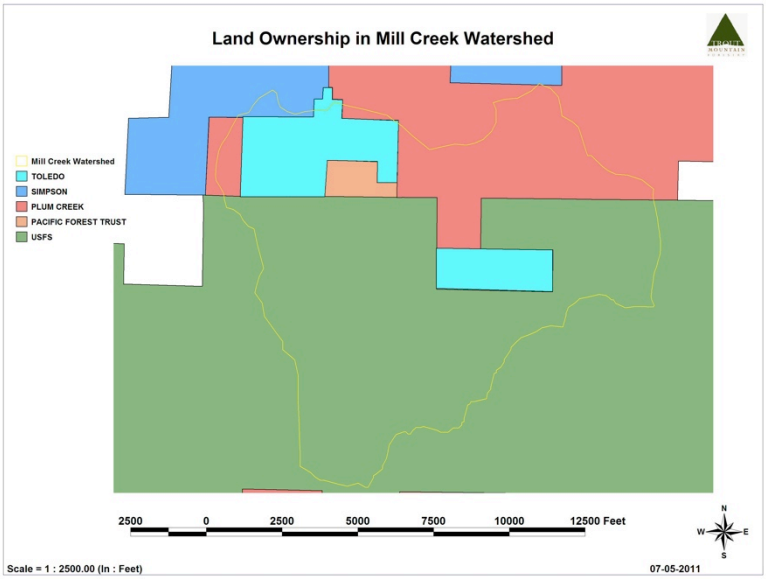


Figure 2: Land Ownership in Mill Creek Watershed

To better meet its source water protection objectives, the City may consider the acquisition of additional acres within the watershed, starting with strategic parcels to improve management logistics or perhaps with recently harvested parcels that would sell for less than if fully stocked with standing timber. Alternatively, property trades may accomplish some of the same strategic purposes.

Forest Health

Insects and Disease

Generally, the forest is healthy and free of insect or disease problems. Species diversity contributes to overall insect and disease resistance. There is limited evidence of problems with root rot or Swiss needle cast. Swiss needle cast has caused moderate to severe growth impacts in young fir plantations throughout the western Coast Range. Some fir on city-owned property have light to moderate needle loss, but overall growth impacts are slight. Root rot risk may increase over time in stands with high stem densities in even-aged Douglas-fir.

Thinning may help to prevent Swiss needle cast levels in dense conifer stands. Inclusion of hardwoods and cedar in Douglas-fir stands helps prevent the spread of root rotting pathogens since these species are either immune to or resistant to these diseases. Hardwood and shrub diversity encourages diverse bird populations, which serve as important insect bio-controls.

Invasive Species

The property is generally free of invasive species threats, owing to vigorous native understory vegetation, high site productivity and relative lack of disturbance. Non-

native Himalayan blackberry is present in limited amounts, mostly around old skid trails and log landings. Scotch broom or false-brome were not observed.

Regular monitoring and early control is important to preventing spread of invasive weeds. Seeding roads, trails, and landings can help prevent weed establishment. Competition in new plantations can be limited by thorough site preparation and early weed control. Dense young conifer plantations and vigorous native understory vegetation can shade out and kill understory blackberry.

Fire Plan

The property Main Unit is located in the Toledo Rural Fire Protection District. The Sub Unit is in the Oregon Department of Forestry- Toledo District.

Given the property's location in the moist western Coast Range and gates that restrict public access, fire risk is a relatively minor concern. The primary objective of forest fuels management is to minimize the potential for catastrophic fire. Forest fuels will be managed through periodic thinning that removes trees in overly dense stands and ensures vigorous and healthy timber conditions. The greatest risk of fire is from escaped brush fires on abutting lands. Hardwood in mixed stands serves as a natural "fire break", and should be encouraged.

Further information on what to do in the event of a forest fire is included in Appendix 4.

Forest Practices Rules

This plan and all management recommendations must comply with the Oregon Forest Practices Rules as administered by the Oregon Department of Forestry. Most forest operations require filing of Notifications of Operations and a 15-day waiting period. Some operations require filing of a written plan (OAR 629-605). Notifications should be filed with the Stewardship Forester at the Oregon Department of Forestry, contact information listed in the Assistance section.

Oregon Department of Forestry classifies Mill Creek and East Fork Mill Creek as Medium Type-F streams (fish-bearing). Tributary streams are a combination of Type-F and Type-N (non fish-bearing) Small streams. Medium Type-F streams have a mandatory Riparian Management Area (RMA) of 70 feet[2], and Small Type-F of 50 feet. Small Type-N streams have a 25-foot Riparian Management Area (RMA), but no tree retention requirements for harvesting. Understory vegetation must remain undisturbed during harvesting.

[2] Slope distance

Marketing & Ecosystem Services

Log Marketing

A key management objective for the forest is to produce a significant and sustainable amount of revenue over time for the City, with a planned harvest approach that spreads income over time and balances revenue flow with aesthetic concerns and provisions for a variety of wildlife habitat. Frequent, smaller harvests are preferable to large block clearcuts, for both environmental and cash flow reasons. Harvest scheduling should emphasize the sale of timber during favorable market periods rather than on a strict schedule.

To the extent possible, the City encourages the concept of "local source, value added" specialty wood products that might provide a premium value and support local employment opportunities. Examples include utilizing defective log segments such as discolored or "spalted" logs, forks, and crook butts as "artisan wood" for carving or turning. Consider leaving short butt-log segments on site to develop character features.

As a public landowner, the City is legally precluded from log exporting.

Non-timber Forest Products

Opportunities to market floral greens and mushrooms are limited by small acreage, steep slopes, difficult access, and liability concerns. Floral greens are generally poor quality, with a low stocking of desirable species in most stands. Providing and managing access for sport hunting and mushroom collectors conflicts with the City's water system security needs.

FSC Certification

With a management plan and appropriate management goals, small family forest ownerships are eligible for "green certification" with the Forest Stewardship Council (FSC). This international forest certification system has developed forest management principles and standards for the Pacific Northwest to assure consumers that the wood certified under this system meets the highest standards for environmentally and socially responsible forestry. Trout Mountain Forestry has been a FSC certified resource manager since 1997. With a current plan and forest inventory, participating landowners are automatically certified under our company certificate at no extra cost. This gives

family forestland owners access to the green market in forest products, which has led to premiums on logs sales in the past year.

Ecosystem Services

Mill Creek Forest's highest value resource is high quality water for domestic distribution. The Forest will be managed with every consideration made with regard to protecting water quality. The City maximizes the value of this ecosystem service by providing clean water to its service area at a low cost.

Salmonid habitat and carbon storage are the other primary ecosystem services produced on the ownership. There is currently no ecosystem credit accounting system available for salmon habitat, although a pilot program developed by the Willamette Partnership may soon be available statewide. Carbon credit accounting programs have been developed by Oregon Woodlands Carbon Company, Voluntary Carbon System, and Climate Action Registry. Low carbon offset market values makes developing a carbon-offset project not advantageous at this time. Protocols for at least one program (Climate Action Registry) are more stringent for public than private ownerships.

Roads & Access

Both the Main and Sub Units of Mill Creek Forest are accessed via rocked county and US Forest Service roads. Mill Creek Road offers access to the reservoir and Stand 3 in the Main Unit; however, most of the Main Unit must be accessed via Sunnyridge Road. The Sub Unit may be accessed via National Forest Development Road 5083. Due to the pattern of land ownership surrounding the Mill Creek Forest, the existing road network provides limited access for management.

Reestablishing a number of old road grades that are present, particularly on the Main Unit, will be necessary prior to harvesting and will require access agreements with adjacent landowners. Some new road construction is also recommended to access Stands 4 and 5 and is noted on the stream buffer and road network maps. No new stream crossings are anticipated.

Timber Management

Forest inventory methods

Forest types were delineated from aerial photographs, then ground-truthed. Sample transect lines were laid out in a systematic fashion, and variable radius sampling was carried out at fixed intervals along the sample transects. Seventy-five (75) sample points were taken. Tree measurements included species, diameter, height, crown depth, age, and timber defect. Trees smaller than five inches in diameter at breast height (DBH)

were measured using fixed radius plots to assess seedling numbers and size. To assess the distribution and abundance of wildlife habitats, snags, woody debris, and invasive species were also measured at each sample point. Measurements were made in January and February 2011 (indicating 2010 volume). The data were entered into FPS (Forest Projection System) software, and a copy of the data files is maintained at the Trout Mountain Forestry office. This software program allows for growth and yield analysis and other useful functions. The error of the cruise was 7.0 percent.

Timber inventory summary

The property is presently well stocked from a timber management standpoint. Total sawtimber volume is 3.95 million board feet (MMBF), for an average stocking over the 59.2 acre forested portion of the property of 11.9 thousand board feet (MBF) per acre. Volumes by species are presented in Table 2.

Table 2. *Total net timber volumes by species, April 2011*

Species	**Net board feet**	**% of total**
Douglas-fir	1,531,000	51.8%
Red alder	1,348,000	45.6%
Western hemlock	75,000	2.5%
Total	2,954,000	100%

All sawtimber volumes are in west-side Scribner scale. Volumes are to a 5" top scaling diameter, with a preferred length of 36 feet and a minimum length of 12 feet.

Growth and yield analysis

There has been no recent timber harvesting. All stands of trees are growing well. Tree growth is estimated at 9.5 percent over the next decade. In subsequent decades growth will slow as trees mature, unless new seedlings are added.

Table 3. *Estimated net timber volumes, 2012-22*

Species	**Net board feet**	**Harvests**	**% growth**
Year 2012	2,954,000		
Year 2017	3,942,000	450,000	9.5%
Year 2021	4,882,000	650,000	8.5%

Sustainable harvest level

To ensure forest sustainability harvest levels must not exceed growth during any rolling 10-year period. New seedlings must be added periodically to balance the age of the forest. To maintain biodiversity a balance between various tree species should remain in relative balance. Care must be taken to prevent the decline of minor species.

Annual growth is estimated at approximately 288,000 board feet, or 800 board feet per acre. To build a more mature forest harvests should be conservative, no more than 50 percent of growth, or 144,000 board feet per year (369 bd. ft./ac).

Silvicultural approach

The general approach to timber management on the property will be as follows:

Timber management

- Balance maintenance of forest health and ecological integrity with efficient timber management as the primary objective of forest management.
- Use natural disturbance regimes as a model for silvicultural treatments. In this location most stand openings are created by wind, ranging from several trees to tens of acres. Few to many snags and standing green trees are left standing even after major winds. Root rot acts to create gaps ranging in size from 0.1-0.25 acres or more, which often fill with hardwoods or shrubs.
- Maintain a mix of forest types and tree age for flexibility against changing market conditions and a hedge from potential pest and pathogen outbreaks. In general, manage as even-aged stands.
- Manage for older, high-quality trees, using rotations that approach the culmination of mean annual increment, or 50-60 years for alder and 80-90 years for conifers.
- Maintain a regular cutting cycle, with harvest activity somewhere on the ownership every 4-8 years. Return to each stand no sooner than every 15 years, more for hardwoods, on steep ground, or as stands mature. Skip over areas if no harvesting is needed. Keep timing flexible to accommodate shifting markets and financial needs.
- For thinning use a variable-density approach, with a combination of single-tree and small group selection (4-8 trees). Thinning may be from above (cutting larger trees), below (cutting smaller trees), or balanced, based on stand condition. Protect conifer seedlings, saplings, shrubs and ground cover during harvesting to the greatest extent feasible.
- For regeneration use variable retention harvesting or patch cuts. Maximum regeneration block size of 25 to 40 acres, with at least 10 percent of the prior stand retained as legacies, including older trees, the largest individuals, hardwoods, uncommon species, snags, and other wildlife trees. Minimum opening size for replanting should be 0.5 acre on south aspects and 1 acre on north aspects.
- Specify tower and tail hold location for cable logging to minimize site impacts and damage to residual trees. Specify equipment and designated skid trails for ground logging to protect soil and vegetation.

- Use tree marking guidelines that favor vigorous, healthy, and larger trees, while removing diseased, poorly formed, and smaller trees. Mark and designated wildlife trees for retention.
- At maturity, trees will be either harvested or retained for wildlife habitat.

Plantation management

- Coast Range sites are typically highly productive, with aggressive vegetation competition from understory shrubs, especially salmonberry, elderberry, and salal. As overstory stands mature they admit more light to the understory, allowing shrub populations become more established.
- Site preparation for replanting must be thorough and well-timed to assure planting success. A combination of manual and chemical methods are typically needed.
- Prepare a regeneration plan prior to harvesting. Identify target species to control. Evaluate treatment methods to balance risks to water quality, efficacy, and treatment cost. For example, to establish conifers in riparian zones where shrub competition is most aggressive, scarification may reduce the need for herbicides, but may result in a temporary increase in sedimentation. A low cost/low impact approach may be to establish wide buffers and delay or eliminate the need for regeneration and site preparation.
- Plant a mix of native species, including western hemlock, Sitka spruce, western redcedar, red alder, and Douglas-fir. Evaluate benefits of each species mix; for example, red alder has rapid growth and a short period to maturity, but requires pre-commercial thinning and its leaves leach more tannins into the water system. Douglas-fir is high value, but susceptible to Swiss needle cast disease. Consider mixed species plantings to capitalize on micro-site differences. Enhance minor species such as Sitka spruce and western redcedar.
- Monitor plantings annually until free to grow; control animal damage and competing vegetation as needed.
- Monitor for the spread of invasive species, and control their spread by pre-harvest treatment, washing equipment before moving to the site, seeding disturbed areas, thorough site preparation, and regular weed control in new plantations.

Wildlife

- Manage for greater structural complexity in the forest to develop diverse wildlife habitat, including multi-age and multi-species stand structure.
- Retain some areas in shrub and open stands to promote migratory bird habitat.
- Retain and protect snags and large woody debris. Where lacking, actively create snags and woody debris by tree topping and leaving cull log segments in the woods.

Riparian Zones

- Maintained wide riparian buffers to meet or exceed ODF requirements and protect and enhance stream health.

Old Growth

- Recruit old trees across the property to develop into old growth. Mark trees for retention in perpetuity. As younger trees grow up around these older trees, thin as needed to develop the deep crowns typical of old growth trees.

Stand Analysis & Recommendations

The following section contains detailed data, description, and recommendations for each of the timber stands identified on the **Forest Management Map (Appendix A)**.

Key to the data summary tables:
Area – mapped area, in acres
Soils – primary soil map units
Site index – Douglas-fir site productivity class; based on height at age 50
Aspect – primary direction sloping land faces
Slope – general range of slopes found, in percentages
Access – assessment of existing or potential road access
DBH – average diameter-breast-height
TPA – average number of trees per acre
BA – basal area; the cross-sectional area of all trees in a stand, measured at breast height and expressed per unit of land area
Net volume – total log volume after deductions for defect and breakage, Scribner log scale.
Mbf – One thousand board feet, a common unit of timber volume. One board foot is equivalent to a board 1 ft x 1 ft x 1 in.
Snags – number of standing dead trees per acre, with breakdown by diameter
Regeneration – notes on seedling and sapling composition
Wildlife – notes on wildlife structure and usage

Stand 1	Alder, Douglas-fir, shrubs, ca. 1974						
Site							
Area		Soils			Site Class		
143.1 acres		Bohannon, Preacher, Slickrock			II (117-126)		
Aspect		Slope			Access		
varies		Varies, 5-75%			Cable yarding, using existing spur roads and landings		
Timber volumes							
Species	DBH	HT	TPA	BA	Gross Mbf/acre	Net Mbf/acre	Total Mbf
Red alder	11.5	63	64	47	3.45	2.17	310
Douglas-fir	18.6	86	7	12	1.44	1.30	186
Total (average)*	12.5	65	81	70	5.62	3.66	524
Stocking (RDI)	Low (0.22)		Regeneration		Minimal (14.3/acre)		
Wildlife habitat indicators							
Snags/acre	Wildlife observations						
1.9	Multiple game trails; heavy shrub layer favors songbirds						

*Includes minor species

Description

This large stand is highly variable in tree quality and stocking. Although fir was planted after harvesting over 30 years ago, it was out-competed by red alder and shrubs in most areas due to a lack of follow up treatments. Along ridges, scattered fir and poor-quality alder and dense brush dominates, while higher quality alder with a salmonberry understory dominates lower slopes and riparian areas. Although timber value and potential are the lowest of the ownership, wildlife values are high, with ample hardwood and shrub habitat that is generally lacking in surrounding industrial forest landscape.

Recommendations

Manage to emphasize wildlife habitat. In clumps of conifer create snags by topping or girdling; create woody debris by non-commercial felling around future legacy trees. Reassess thinning opportunities in 10 years.

Stand 2	Douglas-fir, ca. 1974						
Site							
Area		Soils			Site Class		
12.6 acres		Preacher-Bohannon complex			II (128)		
Aspect		Slope			Access		
North, northeast		5-15%			Ground logging, using existing dirt roads, access from south		
Timber volumes							
Species	DBH	HT	TPA	BA	Gross Mbf/acre	Net Mbf/acre	Total Mbf
Douglas-fir	13.3	95	179	171	25.09	20.62	260
Hemlock	21	98	2	6	0.88	0.84	11
Total (average)	13.4	95	181	177	25.97	21.45	270
Stocking (RDI)	Optimal (0.48)		Regeneration		none		
Wildlife habitat indicators							
Snags/acre	Wildlife observations						
none	Dense overstory limits understory development; some thermal cover for deer/elk						

Description

This well-stocked stand of Douglas-fir is comprised of two small ridge top areas in the southern portion of Stand 1. Although this stand is the same age as Stand 1, fir seedling survival was much better. Timber volumes are the highest per acre on the ownership. The understory is relatively open, typical of dense, dark, young fir stands. Infrequent canopy gaps have a more developed understory that includes vine maple, salmonberry, elderberry, and sword fern.

Recommendations

Manage as an even-aged fir stand. Thin to increase growth, timber quality, and crown structure. Manageability is hampered by small acreage and the need to open or redevelop long haul spurs. Combine with operation elsewhere on the ownership for economy.

Stand 3	Douglas-fir, Alder, ca. 1970						
Site							
Area		Soils			Site Class		
40.7 acres		Bohannon-Preacher complex			II- (117)		
Aspect		Slope			Access		
Southwest		60-90%			Cable yarding. Must yard across recent plantings to landings on Plum Creek land		
Timber volumes							
Species	DBH	HT	TPA	BA	Gross Mbf/acre	Net Mbf/acre	Total Mbf
Douglas-fir	20.9	117	37	87	16.44	15.41	627
Red Alder	10.5	64	77	46	3.31	2.40	98
Total (average)[3]	15.0	80	123	150	21.06	17.96	731
Stocking (RDI)	Good (0.42)		Regeneration		Minimal		
Wildlife habitat indicators							
Snags/acre	Wildlife observations						
2.1	Some game trails						

Description

This southwest-facing stand is well stocked with fir, with alder along the draws. Patches of older residual fir are also scattered throughout the stand, providing important structural diversity to an ownership otherwise dominated by young forests. Logging access to this stand is from ridgetop roads and landings on adjacent Plum Creek property. Yarding corridors would have to cross portions of a young Plum Creek plantation.

Recommendations

Manage to enhance structural diversity. Use variable retention harvesting, retaining 20-25% of existing stand, including pockets of older conifer, wide riparian buffers, inaccessible areas, and other groups in wind-firm locations. Develop reforestation plan before harvesting to address site preparation and planting options. While the stand is currently growing well, early harvesting is warranted to minimize damage to planted trees on adjacent Plum Creek land. Time operations for favorable markets. Assess opportunities for large wood placement in East Fork Mill Creek.

Stand 4	Alder, ca. 1970

[3] Includes minor species

Site		
Area	Soils	Site Class
55.1 acres	Preacher-Bohannon-Slickrock complex	II (126)
Aspect	Slope	Access
Northwest to Northeast	5-25%	Cable or ground larding. Requires new access road from south via VanEck, USFS land

Timber volumes							
Species	DBH	HT	TPA	BA	Gross Mbf/acre	Net Mbf/acre	Total Mbf
Red Alder	12.0	74	164	129	11.92	9.86	543
Douglas-fir	25.7	115	2	6	1.23	1.17	64
Hemlock	23.0	103	1	3	0.55	0.49	27
Total (average)	12.3	75	167	138	13.70	11.52	634
Stocking (RDI)	Good (0.46)		Regeneration		none		

Wildlife habitat indicators	
Snags/acre	Wildlife observations
0.8	Some game trails, especially on old roads

Description

Well stocked even-aged alder originated from natural seeding after clearcutting. Timber quality is generally high; trees are growing well. The peak of timber volume and quality is expected within 5-15 years. Variation in stocking and tree size is based on differences in site quality. Legacies from the prior stand include scattered residual trees, and unstocked openings with older vine maple and elderberry. Rocked roads cross the stand, but access was blocked by construction of the reservoir in 1970. Prior to logging new access will be needed from VanEck and USFS lands to the south. A partially plugged culvert on the old road near the east border should be replaced at the earliest convenience.

Recommendations

Reassess harvest need in 5-10 years. Develop road access prior to logging; remove or replace plugged road culvert. Regenerate using variable retention harvest. Retain 10-pockets of older conifer/alder, wide riparian buffers, and some groups in wind-firm locations. Prepare site by scarification and herbicide treatment after green-up period. Plant to conifer; consider alder on enriched sites and in elk concentration areas.

Stand 5	Alder, ca. 1980

Site		
Area	Soils	Site Class
72.1 acres	Preacher-Bohannon-Slickrock complex	II (126)
Aspect	Slope	Access
Northeast	15-40%	Cable yarding; potential ground yarding with new road spurs

Timber volumes							
Species	DBH	HT	TPA	BA	Gross Mbf/acre	Net Mbf/acre	Total Mbf
Red Alder	10.6	71	155	94	8.48	5.38	388
Douglas-fir	10.3	75	22	13	1.44	1.03	74
Hemlock	12.2	83	4	3	0.40	0.34	25
Total (average)	10.6	72	181	110	10.31	6.75	487
Stocking (RDI)	Good (0.43)		Regeneration		Minimal (21.4/acre)		

Wildlife habitat indicators	
Snags/acre	Wildlife observations
1.4	Some game trails

Description

Variably stocked even-aged alder stand originated from natural seeding after clearcutting. Scattered conifer suggest the stand was planted after harvest, but failed due to inadequate site preparation or follow-up brush control. Variation in stocking and tree size is based on differences in site quality. Growth rate and potential timber quality is highly variable. There are few legacies from the prior stand, limited to a few widely scattered residual trees, and a few unstocked brush-dominated openings. The stand is past the effective window for pre-commercial thinning, and commercial harvest opportunities are at least 10 years off. The prior harvest unit included substantial acreage on adjacent USFS land. New landings and an undetermined amount of road will need to be constructed.

Recommendations

Wait. Reassess in 10 years.

Stand 6	Douglas-fir, ca. 1980

Site		
Area	Soils	Site Class
46.9 acres	Preacher-Bohannon-Slickrock complex	II (126)
Aspect	Slope	Access
Southwest	45-110%	Cable yarding from existing spur roads and landings

Timber volumes							
Species	DBH	HT	TPA	BA	Gross Mbf/acre	Net Mbf/acre	Total Mbf
Douglas-fir	11.6	72	160	118	12.52	6.80	319
Red alder	12.7	70	11	10	0.89	0.49	23
Hemlock	13.0	74	3	3	0.30	0.28	13
Total (average)	11.7	72	174	130	13.70	7.58	355
Stocking (RDI)	Good (0.43)		Regeneration		Minimal (21.4/acre)		

Wildlife habitat indicators	
Snags/acre	Wildlife observations
1.4	Abundant mountain beaver burrows

Description

This young stand of fir faces primarily southwest and is well stocked. Minor amounts of alder are present along draws. Soils are very gravelly and the terrain is extremely steep, exceeding 100 percent slope (or 45 degrees) in many areas. Cut at the same time as adjacent stand 5, regeneration efforts here were more successful due to soils better suited for conifers. Despite the tough terrain, logging in this stand will be relatively straightforward. Access is via a short spur road to a central yarder landing.

Recommendations

Cable thinning in 7-10 years when the stand reaches sufficient volume for economic operations.

Forest Management Schedule

All dates flexible (±2 years) to allow for contingencies such as market conditions, weather, access, etc.

Year	Stand	Prescribed activity	Income/(cost)
2011/12	3	Variable retention harvest (35±ac @; 400-450 mbf)	$100-150,000
	1, 2	Seek stewardship grant funds for snag/woody debris creation and riparian projects (4 days @ $720/day)	($3,000)
2012/13	1, 2	Create snags/woody debris[4]	($20-25,000)[5]
	1, 3	Riparian restoration	($10-15,000)[6]
	3	Site preparation (28 ac @ $150/ac)	($4,200)
	3	Plant seedlings (28 ac @ 300 TPA @ $1.20 ea)	($10,000)
2014/15	2	Determine road improvement needs	TBD
	2	Evaluate thinning need (est. 115 mbf @$350/mbf)	$40-50,000
	3	Monitor seedling survival/growth	n/c
		Control competing vegetation as necessary	($100-150/acre)
2017-22	4	Construct new road, replace culvert (1,200' @ $4-6/ft)	($6-8,000)
	4	Thinning harvest (45 ac @ ±12 MBF/ac)	±$200,000
2022	all	Update plan	($3-5,000)

[4] specifications to be developed
[5] anticipate grant funding to cover 75-85% of total project costs
[6] anticipate grant funding to cover 75-85% of total project costs

Assistance

Agencies and individuals that can provide assistance to the landowners are as follows:

Bill Mohr
Stewardship Forester
Oregon Department of Forestry, Toledo Unit
763 Forestry Road
Toledo City, OR 97391
Tel: 541-336-2273

ODF is responsible for ensuring that forest practices comply with the law.

Kami Ellingson
Watershed Program Manager
Siuslaw National Forest
2514 Sykes Road
Corvallis, OR 97330
Tel: 541-750-7101

Siuslaw National Forest is member of the Alsea Stewardship Group, which provides grants for restoration and stewardship for properties near National Forest lands.

Wayne Hofman, coordinator
MidCoast Watersheds Council
23 Northcoast Highway
Newport, OR 97365
MCWC@midcoastpartners.org
Web: www.midcoastwatershedscouncil.org

The watershed council may have cost-share programs for stream restoration work and other conservation projects.

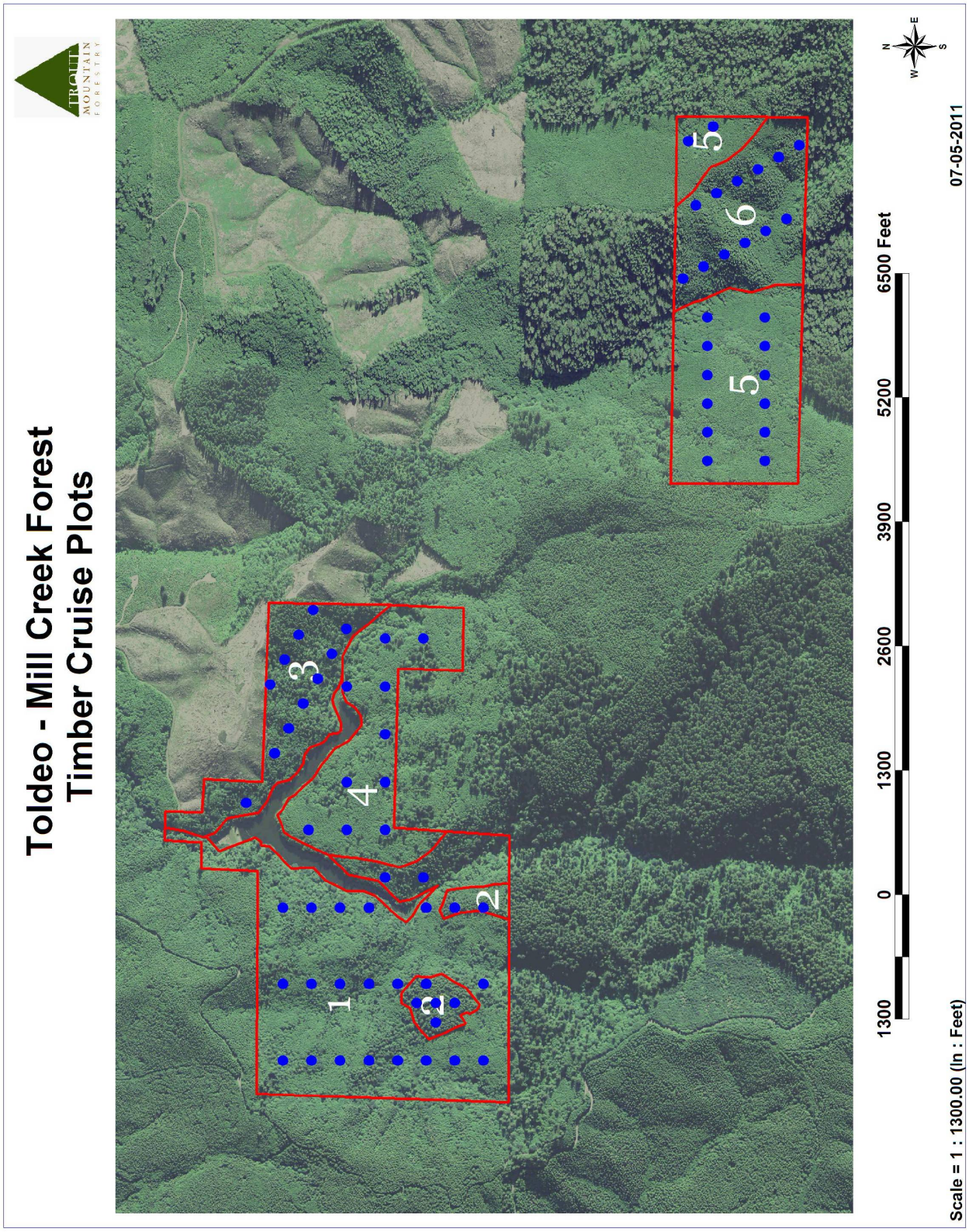
References

Web Soil Survey of Lincoln County Area, Oregon. USDA Natural Resource Conservation Service. http://www.websoilsurvey.nrcs.usda.gov/

Helms, J., ed. 1998. The Dictionary of Forestry, The Society of American Foresters, Washington, DC.

Logan, R. 2002. Oregon's Forest Protection Laws. Oregon Forest Resources Institute, Portland, OR.

Appendix A: Forest Management Maps


Toldeo - Mill Creek Forest
Timber Cruise Plots
TROUT MOUNTAIN FORESTRY
1
2
3
4
5
6
1300
0
1300
2600
3900
5200
6500 Feet
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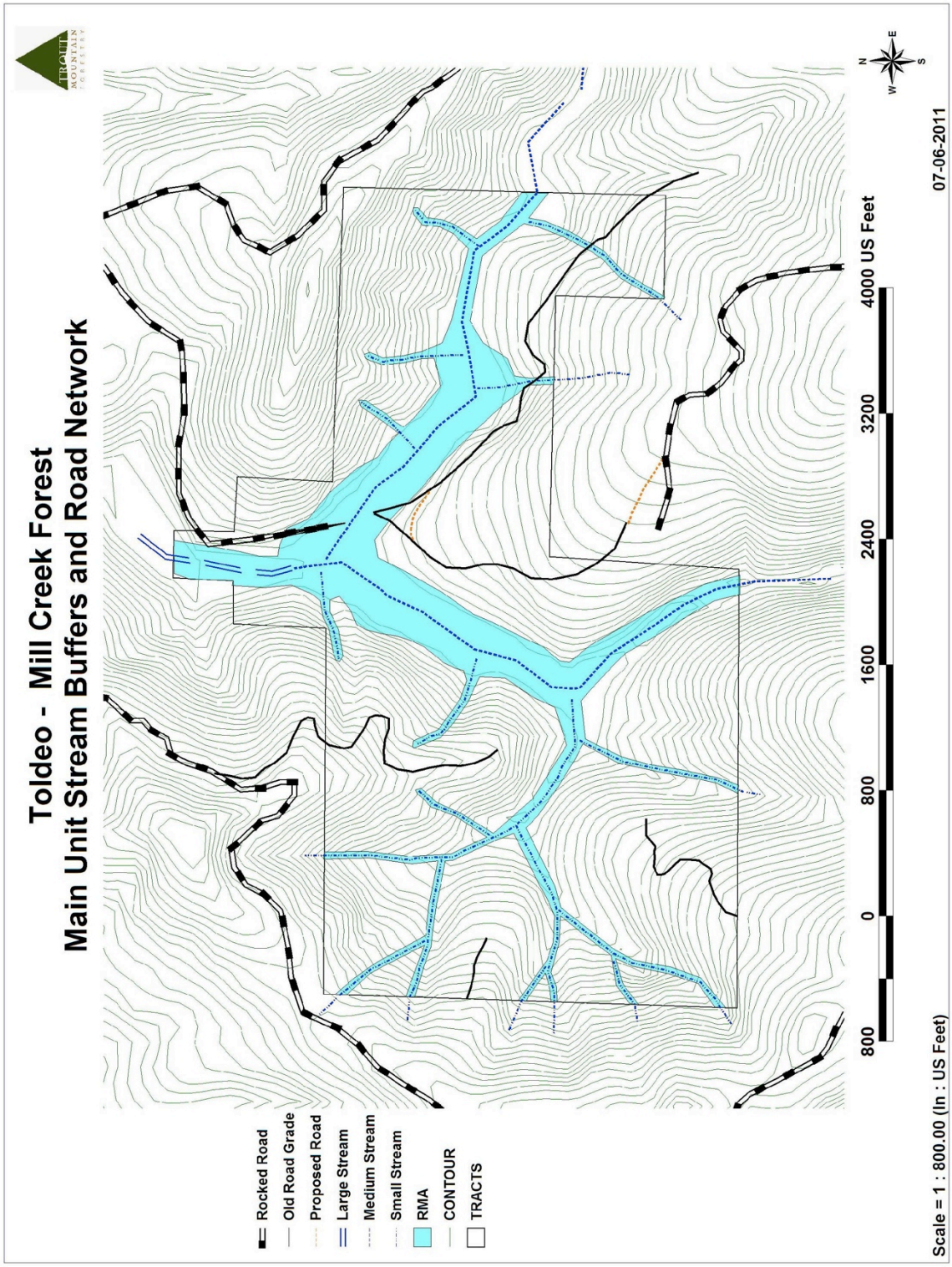
W
07-05-2011
Scale = 1 : 1300.00 (In : Feet)


Toldeo - Mill Creek Forest
Main Unit Stream Buffers and Road Network
Rocked Road
Old Road Grade
Proposed Road
Large Stream
Medium Stream
Small Stream
RMA
CONTOUR
TRACTS
800
0
800
1600
2400
3200
4000 US Feet
N
E
S
W
07-06-2011
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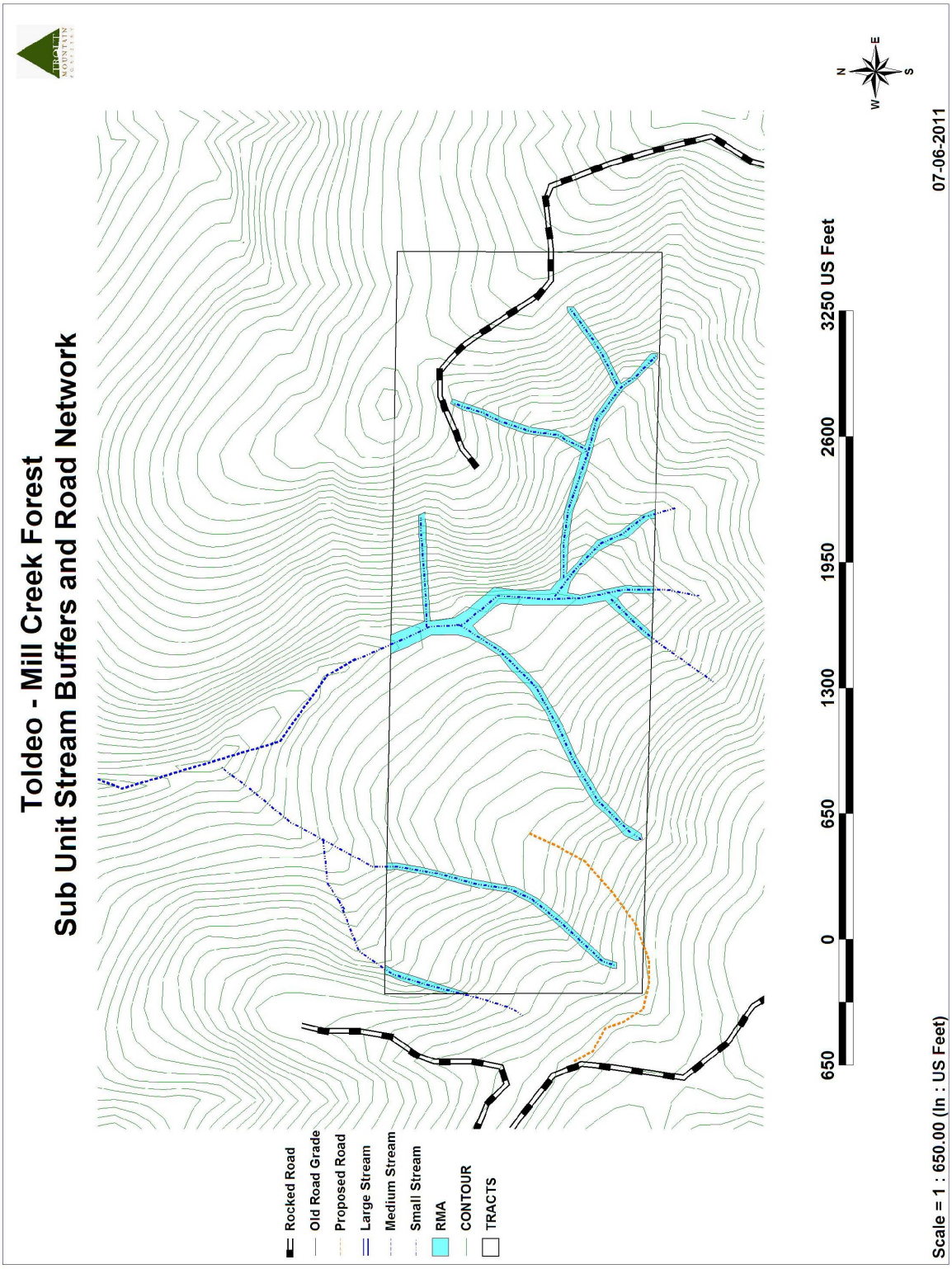
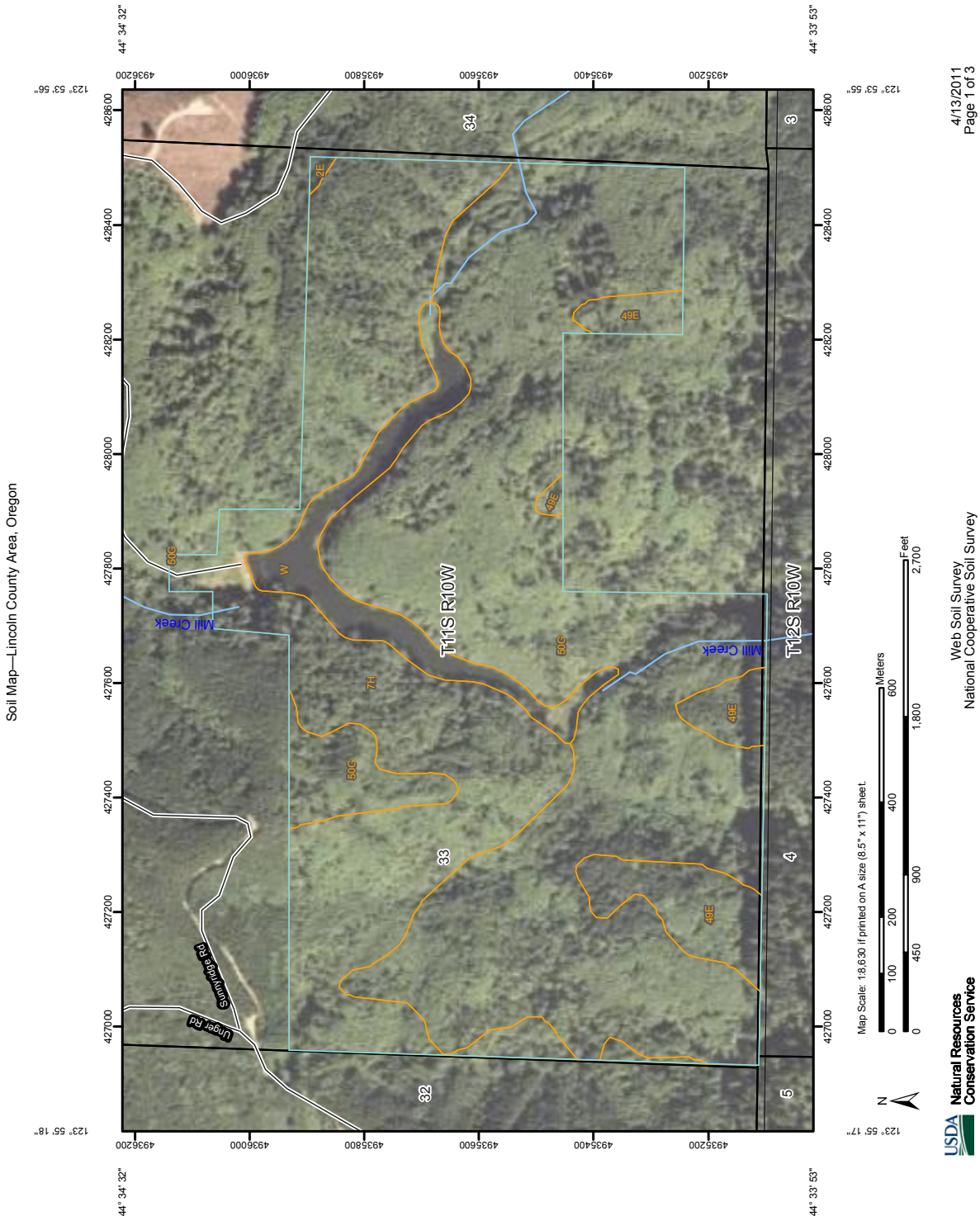

Toldeo - Mill Creek Forest
Sub Unit Stream Buffers and Road Network
Rocked Road
Old Road Grade
Proposed Road
Large Stream
Medium Stream
Small Stream
RMA
CONTOUR
TRACTS
650
0
650
1300
1950
2600
3250 US Feet
N
E
S
W
07-06-2011
Scale = 1 : 650.00 (In : US Feet)

Appendix B: Soils Information


Soil Map—Lincoln County Area, Oregon
4/13/2011
Page 1 of 3
44° 34' 32"
44° 33' 53"
123° 53' 56"
123° 55' 18"
123° 55' 17"
493200
493600
493800
494000
494400
494600
494800
427000
427200
427400
427600
427800
428000
428200
428400
428600
T11S R10W
T12S R10W
Mill Creek
Sunnyridge Rd
Unger Rd
32
33
34
3
4
5
2E
49E
50G
7H
W
Map Scale: 1:8,630 if printed on A size (8.5" x 11") sheet.
Meters
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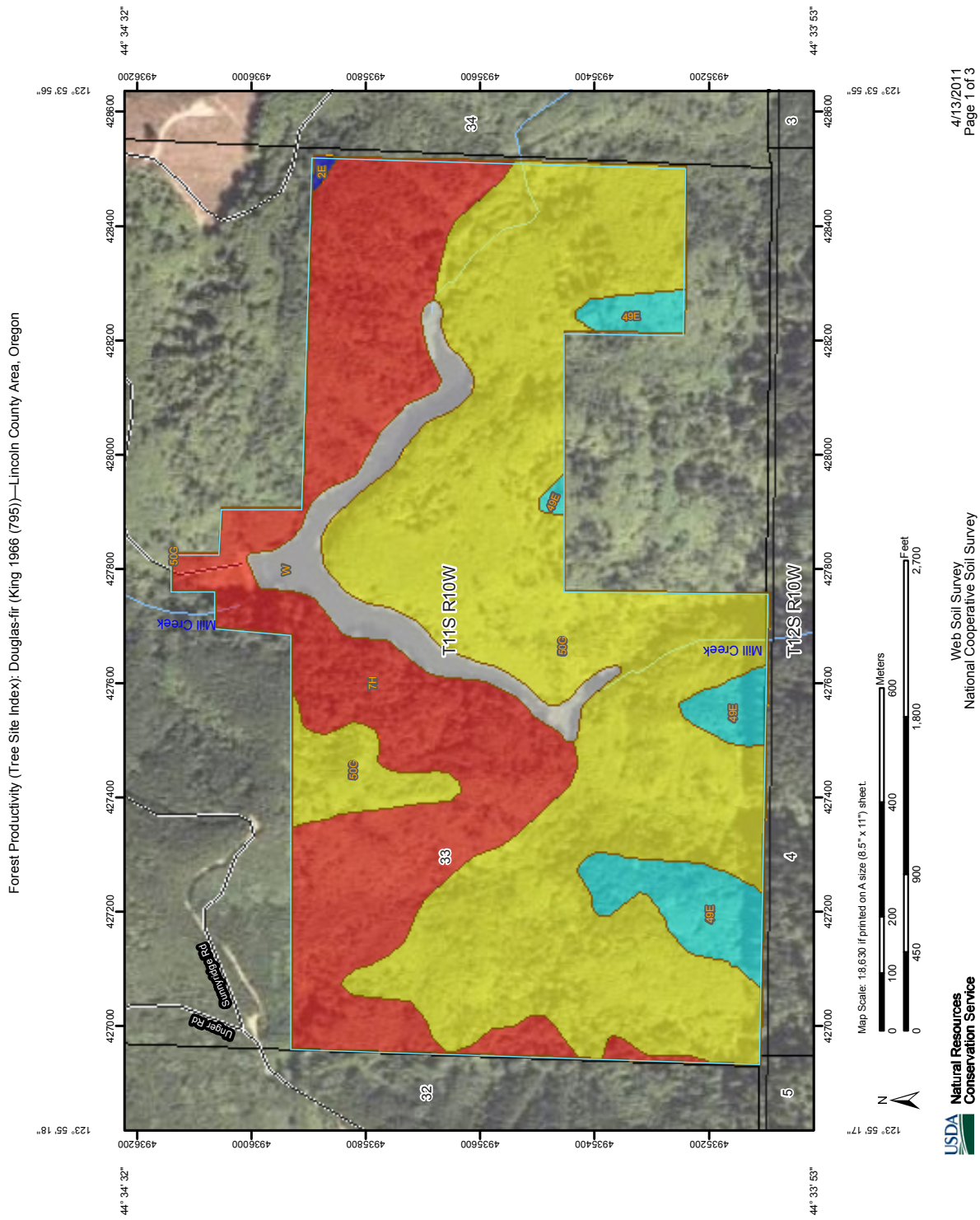
Feet
0 450 900 1,800 2,700
N
Natural Resources Conservation Service
USDA
Web Soil Survey
National Cooperative Soil Survey


Forest Productivity (Tree Site Index): Douglas-fir (King 1966 (795))—Lincoln County Area, Oregon
44° 34' 32"
44° 33' 53"
123° 53' 56"
123° 53' 55"
123° 55' 18"
123° 55' 17"
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493520
427000
427200
427400
427600
427800
428000
428200
428400
428600
T11S R10W
T12S R10W
Mill Creek
Sunnyvale Rd
Unger Rd
32
33
34
3
4
5
2E
49E
60C
7H
W
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Map Scale: 1:8,630 If printed on A size (8.5" x 11") sheet.
Meters
0 100 200 400 600
Feet
0 450 900 1,800 2,700
Web Soil Survey
National Cooperative Soil Survey
USDA
Natural Resources
Conservation Service
4/13/2011
Page 1 of 3

Forest Productivity (Tree Site Index): Douglas-fir (King 1966 (795))–Lincoln County Area, Oregon

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- <= 117
- > 117 AND <= 126
- > 126 AND <= 128
- > 128 AND <= 130
- Not rated or not available

Political Features

- Cities
- PLSS Township and Range
- PLSS Section

Water Features

- Oceans
- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:8,630 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lincoln County Area, Oregon
Survey Area Data: Version 8, Feb 9, 2010

Date(s) aerial images were photographed: 7/17/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Forest Productivity (Tree Site Index): Douglas-fir (King 1966 (795))

Forest Productivity (Tree Site Index): Douglas-fir (King 1966 (795))— Summary by Map Unit — Lincoln County Area, Oregon				
Map unit symbol	**Map unit name**	**Rating (feet)**	**Acres in AOI**	**Percent of AOI**
2E	Astoria silt loam, 5 to 30 percent slopes	130	0.4	0.1%
7H	Bohannon-Preacher complex, 60 to 90 percent slopes	117	87.5	31.9%
49E	Preacher-Bohannon complex, 5 to 35 percent slopes	128	16.7	6.1%
50G	Preacher-Bohannon-Slickrock complex, 35 to 60 percent slopes	126	155.0	56.5%
W	Water		14.9	5.4%
Totals for Area of Interest			**274.5**	**100.0%**

Description

The "site index" is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this attribute, only the representative value is used.

Rating Options

Units of Measure: feet

Tree: Douglas-fir

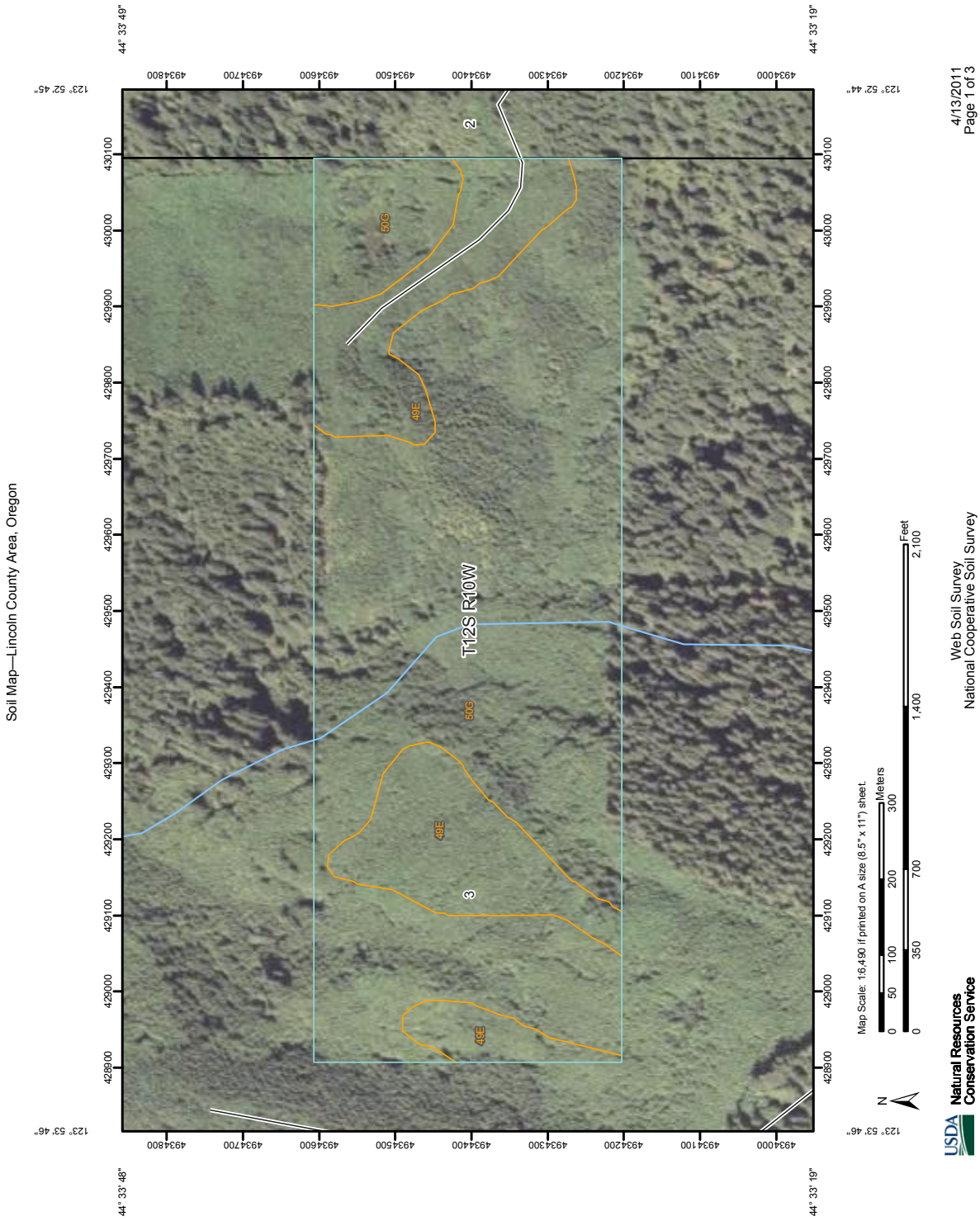
Site Index Base: King 1966 (795)

Aggregation Method: Dominant Component

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Interpret Nulls as Zero: No


Soil Map—Lincoln County Area, Oregon
4/13/2011
Page 1 of 3
44° 33' 49"
44° 33' 19"
123° 52' 45"
123° 52' 44"
123° 53' 46"
44° 33' 48"
44° 33' 19"
123° 53' 46"
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493470
493480
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429100
429200
429300
429400
429500
429600
429700
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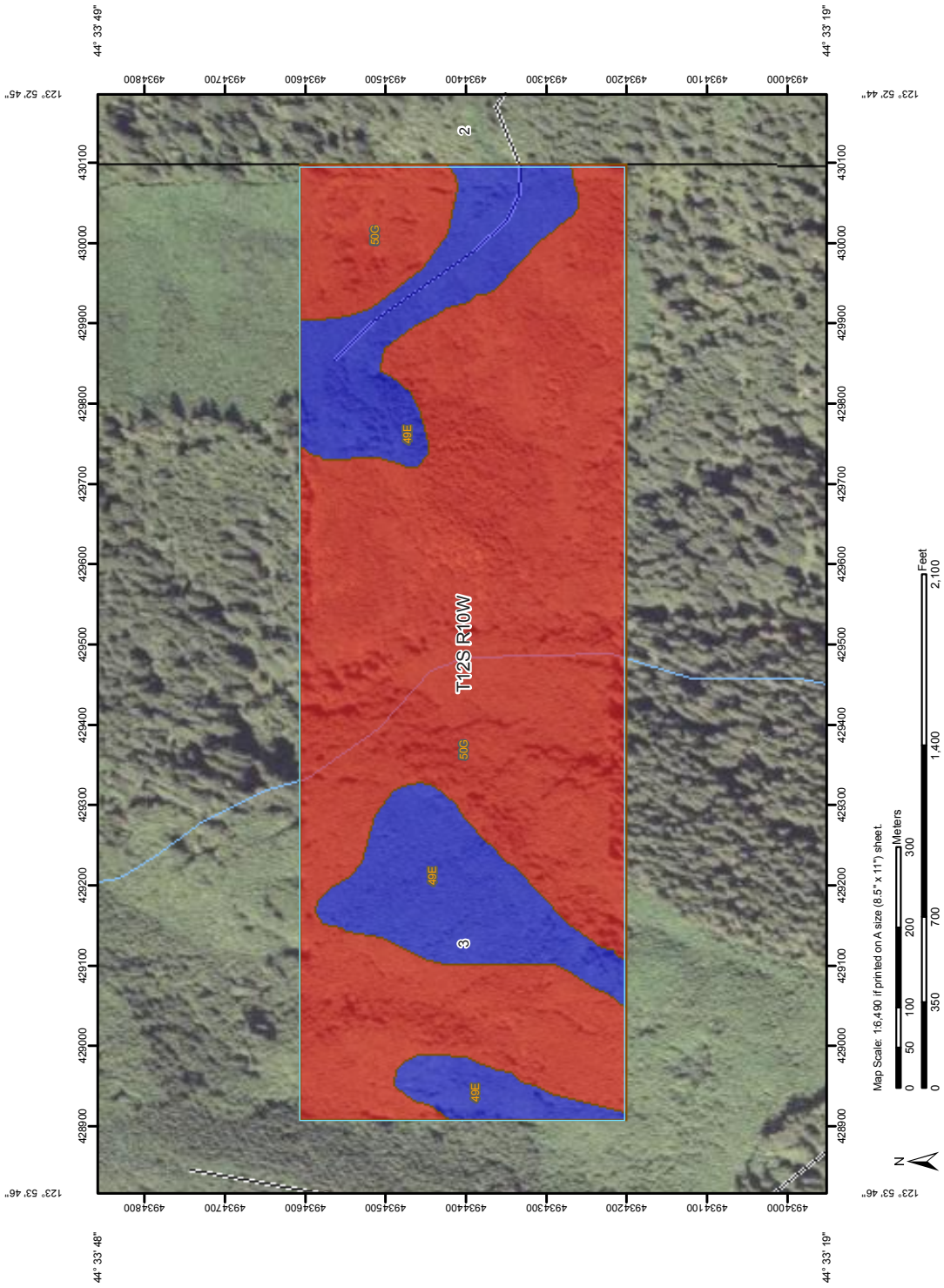
430000
430100
T12S R10W
2
3
50G
49E
50G
49E
49E
N
Map Scale: 1:6,490 if printed on A size (8.5" x 11") sheet.
Meters
0 50 100 200 300
Feet
0 350 700 1,400 2,100
Web Soil Survey
National Cooperative Soil Survey
USDA
Natural Resources
Conservation Service

Forest Productivity (Tree Site Index): Douglas-fir (King 1966 (795))—Lincoln County Area, Oregon



4/13/2011
Page 1 of 3

Web Soil Survey
National Cooperative Soil Survey

USDA Natural Resources Conservation Service

Forest Productivity (Tree Site Index): Douglas-fir (King 1966 (795))–Lincoln County Area, Oregon

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- <= 126
- > 126 AND <= 128
- Not rated or not available

Political Features

- Cities
- PLSS Township and Range
- PLSS Section

Water Features

- Oceans
- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:6,490 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lincoln County Area, Oregon
Survey Area Data: Version 8, Feb 9, 2010

Date(s) aerial images were photographed: 7/17/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Forest Productivity (Tree Site Index): Douglas-fir (King 1966 (795))

Forest Productivity (Tree Site Index): Douglas-fir (King 1966 (795))— Summary by Map Unit — Lincoln County Area, Oregon				
Map unit symbol	**Map unit name**	**Rating (feet)**	**Acres in AOI**	**Percent of AOI**
49E	Preacher-Bohannon complex, 5 to 35 percent slopes	128	26.8	22.6%
50G	Preacher-Bohannon-Slickrock complex, 35 to 60 percent slopes	126	91.9	77.4%
Totals for Area of Interest			**118.7**	**100.0%**

Description

The "site index" is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this attribute, only the representative value is used.

Rating Options

Units of Measure: feet

Tree: Douglas-fir

Site Index Base: King 1966 (795)

Aggregation Method: Dominant Component

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Interpret Nulls as Zero: No

Appendix C: Fire Safety Information

It is important for landowners to be prepared for fires. The following items may serve to assist in being prepared for fire events.

1) **Know your resources**. Understand how the fire fighting agencies work. During fire season, the Interagency Dispatch centers of ODF, BLM, and USFS compare situations and update each other every morning. Local agencies call in with changes in their situations only.

The USFS and ODF have daily weather (and safety) briefings during fire season, at both local and regional levels. (This also happens during non-fire periods.)

During a large fire event, a larger, dedicated dispatch center for that fire is often set up, allowing the regular dispatchers to go back to their normal duties. Dispatch operations may expand to meet the needs of a situation that is increasing in severity. This enables the regular dispatchers to more effectively prepare for and deal with new emergencies.

Dispatch centers are not a place for obtaining public information. The first few hours of a wildfire event are not the time to be trying to get information. Over 90% of all fires in this area are contained to less than 10 acres and are out within the first two hours. Scanners are a good way to obtain information on where a fire is and who's on it.

All agencies and communities work together during a wildfire event trying to balance the amount of resources needed to suppress the fire while maintaining some protection for new starts, but without overspending. Fire suppression is never free; we all pay for it the following year through our tax dollars.

2) **Evacuation**. Understand the meaning of an evacuation order. The decision to recommend an evacuation is made by the fire's Incident Commander and may be enforced by local law enforcement. It is always a hard call to balance the liability of possible loss of life or property with a desire to warn but not unnecessarily displace residents. Once an area is evacuated, road blocks will be maintained to prevent people from entering. If an evacuation center is established, it is important to check in there, so you can be accounted for. Should power and phones be disrupted, this check-in list becomes an official record for friends and family to confirm your safety. If residents follow a contingency plan of going to a neighbor's house, they should still check in at the evacuation center so they can be accounted for and not considered MIA. If the evacuation will be for a substantial period of time, the agency ordering the evacuation will often contact the Red Cross, who will make shelter arrangements for displaced residents until the danger passes.

Fire safety information modified from the Applegate Valley Fire Plan, Applegate Partnership