Washington Forest Stewardship Plan

I. Cover Page

Landowner Information

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Property Information

Acreage: 8.8 acres

County: Snohomish

Legal Description: NE 1/8 NW 1/4 of SW 1/4 Section 11 and SE 1/8 of SW 1/4 of NW 1/4 of Section 11 Township 27 N Range 5

Parcel Number: 27051100202000

Street Address or Location Description: 7019 Interurban Blvd, Snohomish, WA 98296

GPS Coordinates: 47.8409, -122.1380

Plan Preparer

Name: Lauren Heitmann and Tom Stork

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Assisted By

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Plan Preparation Date: **March 2020 - Present**

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II. Landowner Objectives

Specific Objectives:

- Keep the forest healthy and productive, with a primary emphasis on growing trees for wildlife habitat, aesthetics and recreation
- Mitigate and prevent invasive species including Himalayan blackberry, English holly, European mountain ash, and Yellow archangel
- Maintain a healthy long-term tree population by planting appropriate species as trees die or are harvested
- Live on the property in a single-family residence and share the property with family and friends
- Increase forest diversity by planting native species not currently present or under-represented
- Maintain a healthy and diverse wildlife habitat especially for owls, eagles, songbirds, bears, coyotes, deer, and other native wildlife
- Encourage the diversity of understory shrubs in the forest for both wildlife use and aesthetics
- Develop a trail system throughout the property to provide maintenance of the forest and for recreational use
- Harvest edible plants and tap maple trees for syrup production
- Maintain a sustainable supply of firewood
- Protect sensitive areas including streams and wetlands

III. General Property Description and Overview

We are second generation property owners of the Stork family forest, purchased by James and Barbara Stork in 1978 and used as a primary residence during that time while raising their four sons. The property is 8.8 acres located in the Clearview area of unincorporated south Snohomish County, west of Highway 9 and north of 180th St SE. The property is accessed by a short driveway off of Interurban Boulevard, with the home site and sole developed area of the property on the southern border of the property adjacent to the road.

The area around the house consists of a small single family residence, a detached garage, a detached shed, a woodshed and a treehouse. There is one acre of combined pasture (grassy field) and garden-yard area around the house containing a raised goldfish pond and a fire pit area. Previously having been home to horses, cows, goats, sheep, and pigs, an approximately one acre area north of the yard has been overtaken by Himalayan blackberries.

The property is roughly rectangular, approximately 900 feet on a north-south axis. Running east-west the northern two-thirds of the property is approximately 440' wide and the lower

(southern) third of the property is 580' wide. Topographically it rises from the road northwards and the home is perched upon a knoll. Proceeding northwards the property slopes downward and meets with Trout Creek, a tributary of Little Bear Creek, which transects the property and flows in an East-West direction. North of the stream the property again ascends uphill with a downhill slope on the north western perimeter.

Trout Creek emerges out of a poorly designed culvert from our neighbor's property and flows freely through its channel in our property. At the western edge of our property it enlarges into a small freshwater pond (Wet Paws Pond) after which it again enters a culvert to pass through our neighbor's property. Our creek and the pond are most active in late fall through spring, generally not flowing in the summer. There is also a large bog area (Schadenfreude Swamp) in the upper northwest part of the property which leaves in a tiny stream that runs down the north western hillside and disappears into the ground midway down the hill. Schadenfreude Swamp is mostly wet year round.

The eight acres that are forested on our property consist of one stand of mixed conifer-hardwood trees including western hemlock, western redcedar, Douglas-Fir, alder, Pacific yew, vine maple, and bigleaf maple. Our property had been historically owned by the Snohomish Logging Company and had been logged at some point about 100 years ago. There are a number of historic stumps with springboard notches and some charring. After Barbara Stork's horse, Bannock, died in 2009, the property in the back has been left untouched as well as unimproved, allowing for native understory regrowth including six species of fern, and elderberry, salmonberry, salal, oregon grape, and a variety of fungi.

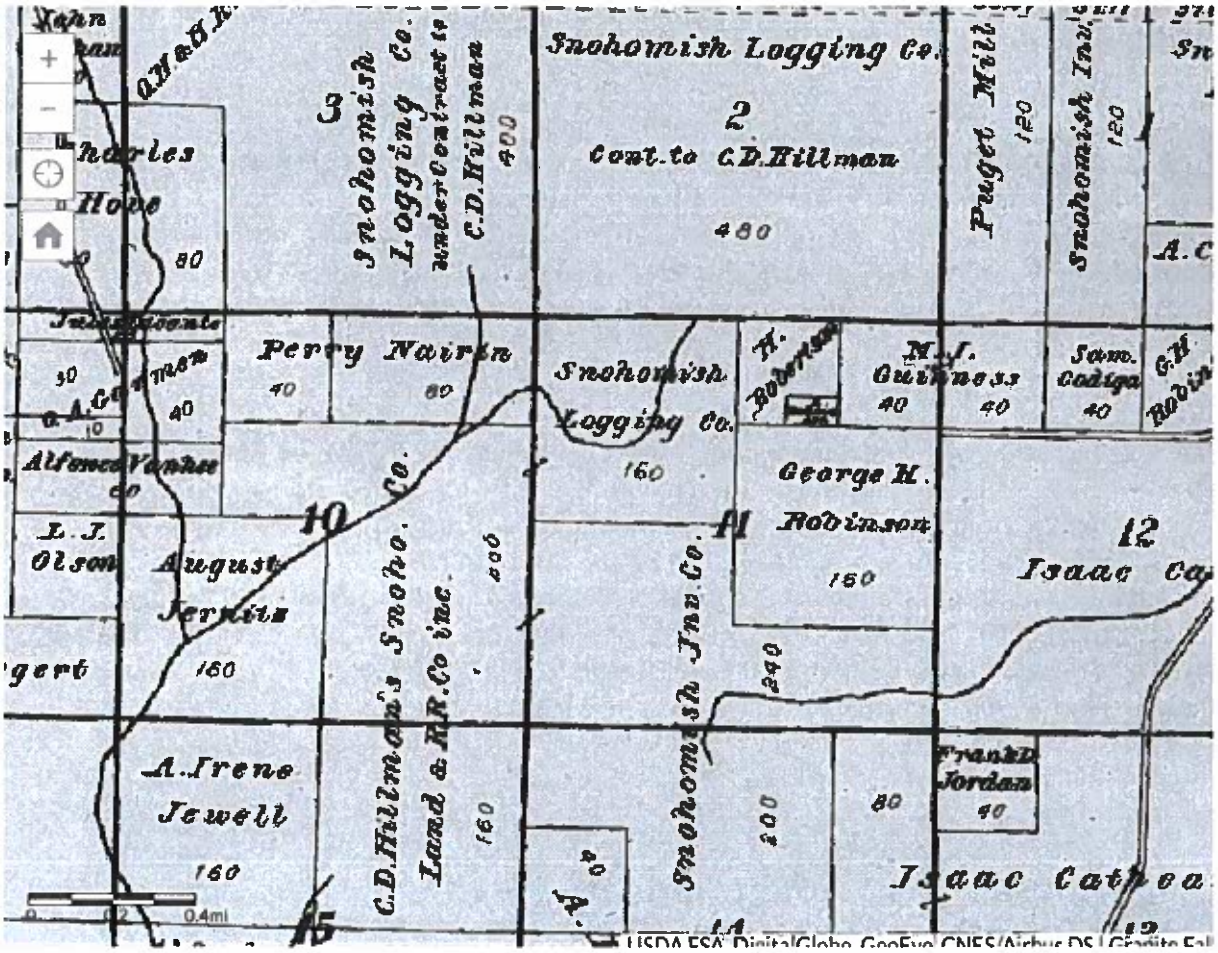
Properties in the area are primarily residential with the Highway 9 business corridor located one mile to the east.

The climate is temperate. The warmest month of the year is August with an average maximum temperature of 74 degrees Fahrenheit, while the coldest month of the year is January with an average minimum temperature of 35 degrees Fahrenheit. Rainfall is fairly evenly distributed throughout the year, with an annual average precipitation of 46 inches, and on average six inches of snow per year.

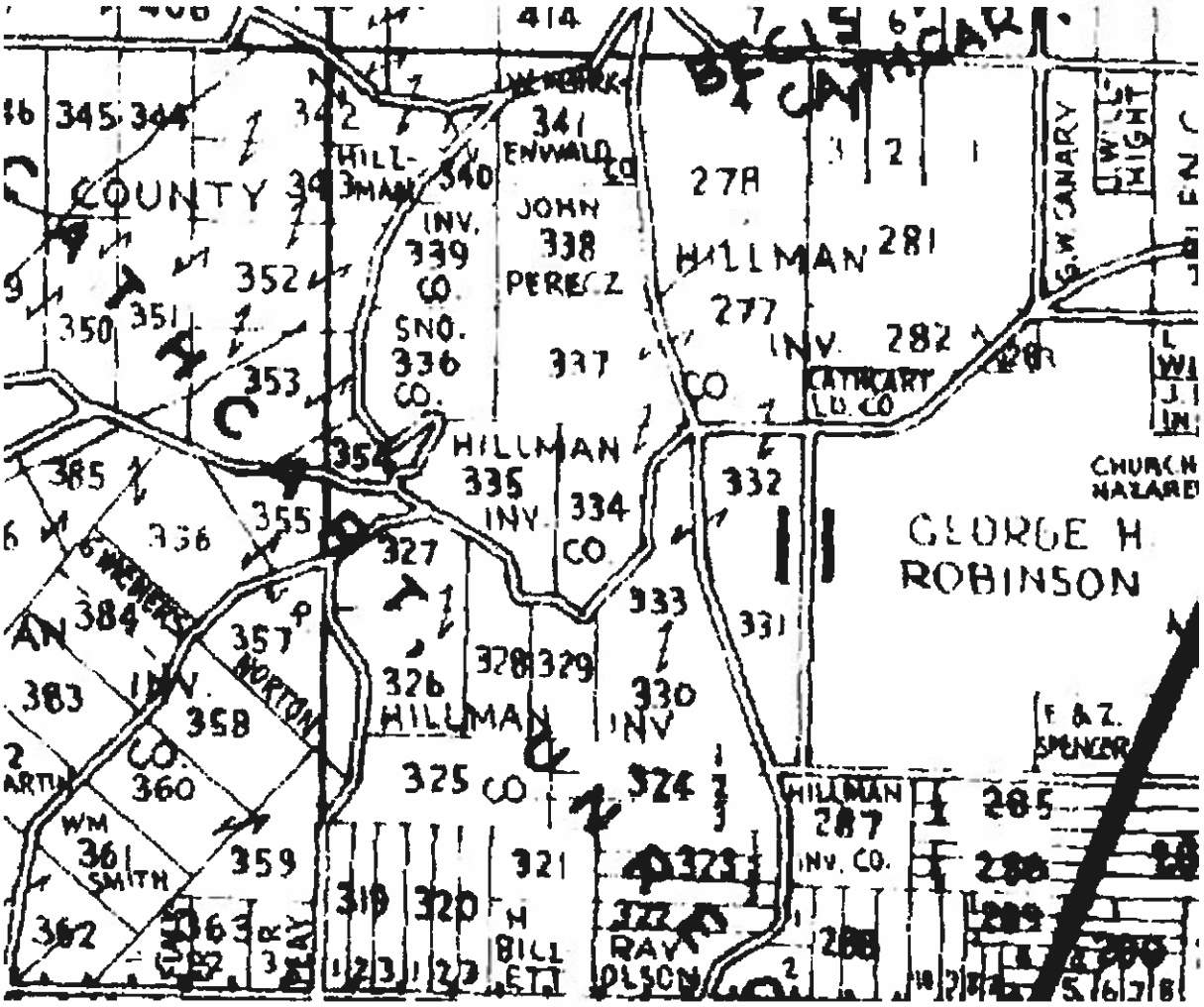
Our property is one of the larger parcels in the area; the surrounding lots having been previously subdivided in spite of R-5 zoning. To the northwest there is currently an 18.8 acre property which is in similar condition; it was recently put up for sale unsuccessfully with a proposed possible development of up to six houses. Across the street to the south there is a wooded area with an abandoned house which is a favorite hangout of coyotes; the Trout Creek watershed area is a well-traveled passageway of our local black bears. Generally the surrounding area is being increasingly developed with wild areas being cleared and developed for schools, housing developments and roadways.

In historic Snohomish County maps from 1927-1940, the property and its surrounding parcels are marked as owned by Hillman Investing Company of Seattle, which took over the properties

from the Cathcart Land Company. Prior to that it was owned by Snohomish Logging Company as per the 1910 area maps.



Above: 1910 Map



Above: 1940 Map

"Snohomish Investment Company sold most of their holdings to Robert and Margaret Henry. This was 3,800 acres of Isaac Cathcart land that had been or was being logged. It was wrested from them through a 1908 lawsuit initiated by Clarence Dayton Hillman (1870-1935) doing business as C. D. Hillman's Snohomish County Land and Railway Company, incorporated on August 6, 1908.

Isaac Cathcart's sons were often in financial difficulty. Isaac Jr. died in 1914 and William became heavily indebted to Clarence Hillman, who took over the ranch. Mr. Hillman had been convicted of fraud in a real-estate deal in Seattle in 1905. Again he was convicted of fraud in connection with land transactions in Snohomish County and was sentenced to jail. While on appeal, he announced establishment of a new office in Seattle and vowed to surround himself with only upright honest employees. By then, the estate had somehow doubled to 7,000 acres, of which 300 acres had already been sold, according to publicity. The estate was legally platted as Cathcart in October 1913 by Clarence Dayton Hillman and Bessie Olive Hillman.

The Hillman Company financed construction of houses, commercial buildings, and gas stations. These were sold to enterprising settlers. The houses were of wood construction, about 20 x 25 feet, and were built directly onto the ground. Settlers were hired to do the clearing, leveling, and construction. They were encouraged to raise rabbits, chickens, pigeons, berries, and produce on their small plots. Periodically, the company distributed free plants and vines to the homeowners. "

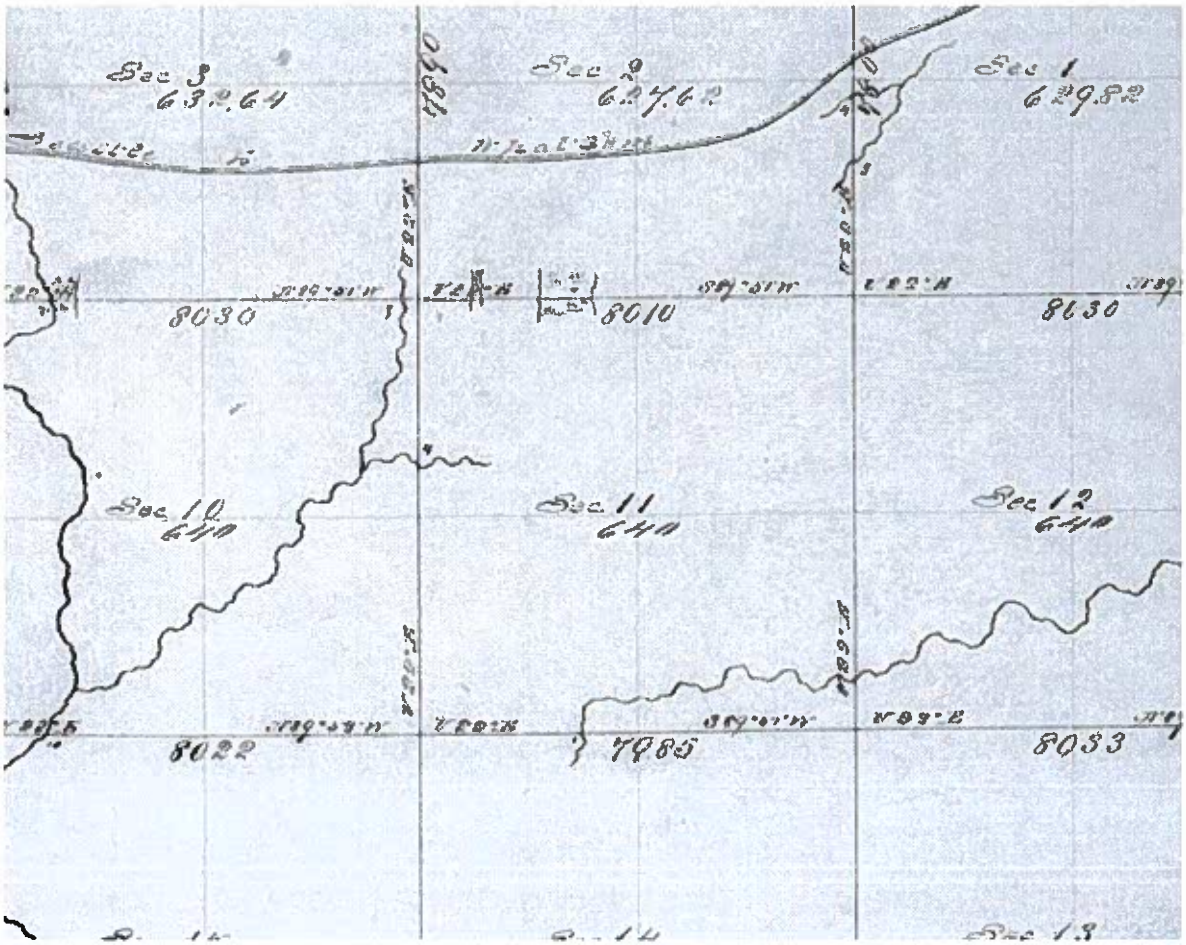
Maltby and Neighbors

- By Elsie L. Mann
- Posted 12/09/2015
- HistoryLink.org Essay 11149

https://historylink.org/File/11149

Above: Original homestead plots

This map represents the junction of four original homestead plats -- to the NW the John Fredericks Homestead, granted on 01/20/1883 (6446); Hans Robertson to the NE, granted in 01/30/1892 (15087); to the SW the Benjamin Stretch homestead, granted on 01/20/1883 (6407); and to the SE, Albert C. Folsom, granted on 03/14/1887 (8087).



Original survey map, 7/1/1874 Our Trout Creek spur is the squiggle extending into the west part of the NW 1/4 of Section 11

"Atheneum Society

Shortly after Snohomish was officially named and a school begun, a meeting was held "to organize what was one of the most unique and noteworthy literary associations in the early history of Washington territory" (Whitfield). Most likely, the inspirational leader of the Atheneum Society was Dr. Albert C. Folsom (1827-1885), a former army surgeon with experience in the Civil War, who, now in his 40s, arrived in town with a scientific collection of more than 100 fossils, gems, and bones; plus, it seems, the first doctor of Snohomish County arrived with a broken heart from a failed marriage back in Wisconsin -- so it was explained upon his death in a moving elegy written by his friend

Eldridge Morse (1847-1914), who looked upon Folsom, with his two degrees from Harvard, as a mentor."

Snohomish — Thumbnail History

- By Warner Blake
- Posted 3/10/2008
- HistoryLink.org Essay 8508

https://historylink.org/File/8508

IV. Resource Descriptions and Management Practices

Resource Category 1: Forest Health/Wildfire/Invasive Species

Insects, Diseases, Abiotic/Environmental Stress:

A. Current resource conditions, issues, needs, and opportunities

No major forest health problems associated with insects or diseases were observed. There is occasionally a Gypsy moth trap posted on a bigleaf maple tree near the driveway. There are generally no current issues with drought stress due to the canopy and existing water available on the property, excepting the "heat dome" episode in Summer 2021 which resulted in some parch blight on some of our conifers.

B. Any management practices which the owner plans to protect, enhance, or restore these resources

Due to increased global concern for water conservation, prioritizing stream health and general riparian canopy will be paramount. Current vehicle access to the property north of our creek is reliant upon making improvements to the current road crossing area so as not to impede stream flow or water quality. We would also like to build up the western area of the lower pond to provide more water retention and perhaps a longer-lasting standing water as a resource for wildlife.

Stands will be monitored for insects and disease, and dead trees will be investigated to determine if there were preventable causes.

Animal Damage:

A. Current resource conditions, issues, needs, and opportunities

Our property accommodates black bears, coyotes, rabbits, deer, two species of owl, raptors, amphibians, and snakes. Predominantly damage to fruit trees comes from rabbits and other varmints; there is limited damage to vegetation from deer and bear.

B. Any management practices which the owner plans to protect, enhance, or restore these resources

We have installed three wood duck boxes along Trout Creek; the ones near Wet Paws Pond will be kept and another will be installed in Schadenfreude Swamp after having cleared a flight path into the area by falling select trees. We will continue to plant a variety of mast-producing understory plants including hazelnut, salmonberry, elderberry, and oregon grape to support area wildlife.

Future plantings of conifers and hardwoods, especially in the blackberry remediation area, will be monitored and covered as needed to protect from deer browse. Fallen trees not usable for firewood will be left to provide animal habitat as well as brush piles of branches; existing snags will be kept as habitat trees as possible. Bat boxes are considered near the house; hummingbird feeders are available year round.

Fire Hazard:

A. Current resource conditions, issues, needs, and opportunities

Currently fire threats are predominantly from within buildings on the property spreading to adjacent vegetation. Our home was fully rewired and brought up to code in 2019 to decrease the likelihood of this happening. The chimney was also rebuilt which should prevent escaping brands via the top mesh as well as fire spread through cracks in the prior deteriorated masonry blocks. Concern for fire load in the woodshed and detached shed as well as flammable liquids stored in the shed are known risks. No neighbors have properties which would easily spread fire into our yard or home. We also use the fire pit outside during all seasons (excepting burn bans) but follow fire code for recreational burning so as to minimize hazards.

Errant sparks from fireworks set off by our neighbors could also be a source of wildfire, as well as lightning.

Fire protection is provided by Snohomish County District #7, the nearest fire station is 1.5 miles away. There is a fire hydrant opposite our house on Interurban Blvd. Our home is monitored by Nest fire alarms which alert us via cell phone of alarms; the intention is to have as rapid a response as possible by fire crews due to the small, predominantly wood construction of our home which would be rapidly destroyed by fire.

B. Any management practices which the owner plans to protect, enhance, or restore these resources

We are planning the landscaping of our yard to maintain a healthy tree cover for shade near the house to keep nearby plants moist, with the addition of mulching and watering during summer. Tree branches will be trimmed to minimize fuel contact near the house and tree debris will be cleaned from the roof on a seasonal basis. Irrigating planting areas near the house via soaker hoses and drip irrigation will keep plants lush and the ground moist. Further improvements to the property include surplus water storage of up to 5,000 gallons for general yard watering, animals, and emergency use including drinking and fire protection.

Invasive Species:

A. Current resource conditions, issues, needs, and opportunities

An approximately one acre area in an east-west axis north of the developed home area is nearly completely overtaken with Himalayan blackberries. One-third to one-half has been cleared, but the vines are still in large piles.

English holly is scattered throughout the property in patches of both smaller plants and mature trees. These plants have been marked and labeled via GPS and plotted on our house map and will be addressed on a site-by-site basis. Most have been cut and painted with Triclopyr, but many areas need continued work.

The groundcover yellow archangel was found in the upper north east part of the property and recently determined to be a highly concerning invasive species.

Tansy ragwort, herb robert, European mountain ash, and English ivy have also been found on the property and will be removed by hand pulling as time permits.

B. Any management practices which the owner plans to protect, enhance, or restore these resources

The intention is to remove the Himalayan blackberries throughout by using a combination of manually removing vines and roots, as well as planting fast growing conifers and hardwoods in an eight foot grid spacing to shade out the area over a series of years. Further blackberry remediation will be attended to throughout the property as available, with emphasis on stream and pond perimeters.

Current strategies for removing English holly include cutting down large trees (all known trees are currently cut down except one), painting stumps with triclopyr, manually pulling up all smaller surrounding plants including all root systems as possible, and monitoring sites for new growth. This process began in October of 2019 with an emphasis on controlling berry-producing plants first to prevent the development and spread of new seeds.

Addressing the issue of Yellow archangel is of top importance and will consist of manually pulling up and properly disposing of plants and roots. Plots will be marked with string lines and labeled to assure an organized, evaluable approach. Sheet mulching and selective use of the herbicide triclopyr will be used as needed.

Resource Category 2: Soils

Considerations: Soil types, parent materials, horizons, site index, slope stability, erosion, compaction, structure, operability, seedling mortality potential, windthrow hazard, restrictive layer, water table, use restrictions, etc. What management activities and considerations will address protection of soils, slopes and water quality impact from surface disturbances?

A. Current resource conditions, issues, needs, and opportunities

Our property consists of Alderwood soil type.

Snohomish County Area, Washington (WA661)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Alderwood gravelly sandy loam, 0 to 8 percent slopes	2.5	23.4%
3	Alderwood gravelly sandy loam, 15 to 30 percent slopes	8.1	76.6%
Totals for Area of Interest		**10.5**	**100.0%**

Site Index 111

Landscape--glacial drift plains
Landform--glacially modified hills and ridges
Slope--0 to 65 percent
Parent material-- glacial drift and outwash over dense glaciomarine deposits
Mean annual precipitation--about 1000 mm
Mean annual temperature--about 10 degrees C
Depth class--moderately deep to densic contact
Drainage class--moderately well drained
Soil moisture regime--xeric
Soil temperature regime--mesic
Soil moisture subclass--aquic

On either side of the Trout Creek basin the property slopes upwards with steep areas with greater than 33% slope. The northwest slope of the property sloping down to the west is equally steep.

The property at its southern border at Interurban Blvd is 550' above sea level; the house sits on a knoll at 570' elevation. The property descends in the Trout Creek channel to 530' elevation, and then rises to 585' above sea level at two points in the north central area of the property. None of the adjacent properties extend above 595' above sea level.

B. Any management practices which the owner plans to protect, enhance, or restore these resources

To protect the soil we will limit vehicle travel to existing roads and trails in the back 8 acres of the property. We will also not range livestock in the woods or the pasture to prevent soil compaction. Steep slope areas will be maintained with tree and shrub plantings to prevent erosion. The steepest roads will be traveled by UTV only when dry.

Resource Category 3: Water Quality/Fish Habitat/Wetlands

Considerations: Stream types, fish or aquatic species use, riparian areas, wetlands, buffers, fish blockages, sedimentation, stream bank stability, domestic water sources, contamination concerns, etc. What management activities are recommended to maintain/restore/ enhance riparian and wetland buffer function, water quality and quantity?

A. Current resource conditions, issues, needs, and opportunities

The property is bisected by Trout Creek, which is classified as a Non-Fish Habitat Seasonal Stream. Trout Creek feeds into the Little Bear Creek sub-basin and is a part of the Cedar-Sammamish watershed. The bank on either side of trout creek is low with little concern for erosion or variation in channel direction.

Riparian areas include Trout Creek, the freshwater pond, the upper bog area, and the stream leaving there and flowing down the west side of the property. Domestic water is secured from the Cross Valley Water District, which is purchased from the City of Everett source, namely the Sultan River via the Spada Lake Reservoir at the Culmback Dam, located 30 miles east of Everett.

Historically catfish had been planted in the freshwater pond but there are no known fish living in the pond area at this time. A few goldfish swim in a pond located over the existing pump house near the house which also exists as a year round water source for animals. Northwestern salamanders have been found in the basement floor drains and lower stairwell during winter months.

A Snohomish Conservation District employee evaluated the wetland on the southern edge of the property where Trout Creek crosses into the next parcel. The culvert in this area is small and water pools on the parcel boundary, creating a small and seasonal wetland. In its current state, the wetland is providing good habitat for aquatic species. To increase flows, a large culvert would need to be installed which would be expensive and time intensive. Until this wetland becomes an issue, such as if the water were to wash out the road on the neighboring property, no immediate action is needed.

B. Any management practices which the owner plans to protect, enhance, or restore these resources

A vehicle crossing at the stream junction over Trout Creek was multiple crushed galvanized garbage cans infiltrated with mud. The fill was dug out via excavator to establish a narrow, deep stream corridor, and the water flows much better in this new and improved stream bed. We have casual footpath bridges by planks over the stream at various sites.

We will also protect the seeps by keeping equipment and noxious weeds out and by maintaining a vegetated border around these areas. These small water sources can serve as amphibian breeding pools and provide drinking water for small animals. The vegetated borders will continue to provide forage and hiding cover.

Our neighbor to the west has been backfilling the area of his property to the west of our freshwater pond over the culvert to provide a solid substrate for vehicle traffic to the north part of his property and ours. We would like to improve water retention in our pond by working with this backfill and raising the culvert fill height to retain more water on our property before it flows westwards. Trees that have fallen over the stream will be maintained in place to provide a more challenging flow path for water and create small ponds for animals.

We will maintain the existing riparian buffer area of both streams and ponds by limiting tree harvest from the banks and promoting healthy canopy of existing larger trees.

Washington Department of Fish and Wildlife will be consulted prior to any management actions that lie within or around the stream that alter stream morphology.

Resource Category 4: Forest Inventory/Timber/Wood Products

Considerations: Species composition, age, size, quality, trees per acre, understory vegetation, operability, silvicultural alternatives, etc.

Discuss each stand in terms of species composition, age, size, quality, trees per acre, understory vegetation, operability, silvicultural alternatives, etc. What management activities are recommended to maintain a healthy, free-to-grow forest? What stand enhancement activities do you plan? Will you harvest, and if so when and how?

A. Current resource conditions, issues, needs, and opportunities

Our forest consists of one mixed hardwood and conifer stand. Based upon a plot survey performed during a site visit with Forester Stacey Dixon, we determined that our forest averages 150 trees per acre. Some of the larger trees average 120' tall with healthy crown ratios at 80% or greater. The forest is in the vertical diversification stage of forest development. As the trees get older, some start to break down, and new seedlings are coming up in the understory, creating a healthy mixed size and age class.

There is a diversity of understory plants including free-growing salal and Oregon grape, trailing blackberry, foxglove, ferns, piggyback plant, and trillium.

1/50th acre plot data			
Tree #	**Species**	**Diameter**	**Height**
1	Douglas-fir	25	
2	alder	18	
3	hemlock	27.8	100
Trees per acre =	150		
Avg Diameter =	23.6		
Average Live Crown Ratio =	85%		

We plan to harvest trees only for firewood or as needed for safety, to allow free growth of healthy trees and replant a diversity of species to maintain a multi-generational forest. We encourage habitat trees (snags) and also some fallen trees to stay on the forest floor as nurse logs.

B. Any management practices which the owner plans to protect, enhance, or restore these resources

The conditions of the forest allow for minimal intervention or harvesting to support forest health. We will be planting trees yearly to fill larger canopy openings, while still maintaining light enough for larger tree growth. All large trees will be left as "no touch" trees with the intention of creating an old growth forest structure.

Resource Category 5: Property Access/Roads/Skid Trails

Considerations: Current and planned roads and skid trails, vehicle access, road maintenance, access restriction (e.g. gates, trespass prevention) and improvement needs, etc.

Discuss Current and planned roads and skid trails, vehicle access, road maintenance, access restriction (e.g. gates, trespass prevention) and improvement needs, etc. What management practices are you proposing to maintain/limit/enhance property access via roads and trails?

A. Current resource conditions, issues, needs, and opportunities

The property is bound on the southern perimeter by Interurban Blvd, a paved two-lane rural road which is notable for heavy bypass use by commuters with unnecessarily high speeds. Access to the home site is via a steep gravel driveway turning north from this street, heading up the hill 200' to a parking area at the top of the knoll. Turning left near the road from the driveway will direct you into the detached garage and, past a gate, into the pasture.

From the southwest area of the property a trail enters into the forest and follows the southern bank of Trout Creek in an east-west direction for approximately 560'. Another trail crosses Trout Creek at the aforementioned barrel-built bridge, heading up the hill in a NE direction and circling around south of the upper bog to head down the steep western side.

B. Any management practices which the owner plans to protect, enhance, or restore these resources

Both trail-roads should be improved with downed tree removal and further brush clearing to allow passage for a small ATV for project use and firewood hauling. The trail should also be improved with concern for steep terrain on the western descent, especially of concern during wet weather.

A perimeter trail has been established for foot travel by brush cutting near our fenceline. Our western neighbor has been vigilant by clearing the fence adjacent to his property to maintain a clear, blackberry free area approximately 6-8' into our property. He is also backfilling the area of culvert around his eastern section of Trout Creek which will allow vehicular travel up to the upper NW area of our property. Our farthest neighbors to the NE allow vehicular travel into their driveway and foot traffic from their property into the upper area of our yard.

We have concern for trespassing into the eastern area of our property with our easternmost neighbors dumping yard waste over the property line, throwing rubbish over the fence line, and storing sundry goods on our land without permission. One management practice for this will be to monitor the area and photodocument to establish a presence in this area which may curtail behavior.

Resource Category 6: Wildlife

Considerations: Common species in the area, specific species observed, key habitat elements (snags, coarse woody debris, understory vegetation, mast-producing vegetation), enhancement opportunities, etc.) animal damage control, etc. What management practices are you proposing to maintain/enhance wildlife habitat? Would thinning speed growth and promote structural complexity? Is additional plant species diversity desirable? Are you considering snag development or nest boxes?

A. Current resource conditions, issues, needs, and opportunities

Current wildlife that have been identified on the property by sight, sound, or scat, include:
Mammals: coyotes, black bear, douglas squirrel, gray squirrel, deer, rabbits, bats
Birds: Barred owl, Great horned owl, Western tanager, Bald Eagle, Red tailed hawk, ruby throated hummingbird, mallard duck, pileated woodpecker, house finch
Insects: Painted lady butterfly, cinnebar moth, dragonfly, horntail,
Reptiles and amphibians: garter snake, northwestern salamander, Pacific tree frog, rough-skinned newt

Key Habitat Elements include:

Coarse Woody Debris. Coarse woody debris includes large and small diameter fallen trees and branches. More than 100 vertebrate wildlife species including large and small mammals, birds, and a small number of amphibians, as well as a myriad of insects and other invertebrate species, use coarse woody debris for shelter, behavioral displays, feeding sites, nesting and denning, reproduction, or a combination.

Snags. There is a moderate snag component within the stand. Most of the snags are red alder, which have fairly short functional lives. As trees come down naturally, they will be left as is and only moved if they present a safety issue or block access.

Understory Vegetation. A very important wildlife habitat component includes hardwood trees and shrubs that produce mast as well as grasses and forbs. Salmonberry, huckleberry, and Oregon grape are present as berry-producing shrubs, and these will be protected by avoiding overplanting.

B. Any management practices which the owner plans to protect, enhance, or restore these resources

Concern will be taken to maintain existing cavity trees and snags for wildlife. Fallen trees that are not needed for firewood will be left on the ground to provide nurse logs. Larger diameter branches from other fallen trees will be piled to create habitat spaces, and concern will be made to maintain a canopy over wetlands areas to provide water to wildlife. Understory vegetation will be improved by planting native mast-producing shrubs including crabapple, hazelnut, and salmonberry.

Resource Category 7: Protection of Special Resources and Biodiversity

Considerations: State or federal threatened or endangered wildlife or plant species, priority habitats, cultural resources, historical sites, forests of recognized importance (FORI), elements that support biodiversity, sites or features that are important to you as the landowner (e.g. old growth stumps or special places), etc.
What management practices will be needed to protect special features?

A. Current resource conditions, issues, needs, and opportunities

Sites that are important to us as landowners include first and foremost our home, which is our primary residence. It is an old cabin finished on the interior with western redcedar milled at the historic Seattle Cedar Lumber Manufacturing Company and possibly logged from old growth stands in the Clearview area. It holds a special place for many as a family home over the past four decades as well as a temporary home to those in need.

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SEATTLE

Seattle Cedar Lumber Manufacturing Co. began employing women early in May to pile lumber in its yard, and found the results so satisfactory that the number of women employes has been much increased. Stimson Mill Co., a neighbor of the big cedar plant, has replaced with women all the men thus far who have left its employ either through the draft or for other reasons.

Further features that are important to us include the old growth stumps with springboard notches, many of which are fully rotted out on the inside. The interior of these stumps shows signs of charring indicative of broadcast burning typical of historic old-growth logging practices. These will provide cover for wildlife until they fully degrade.

Elements that support biodiversity include the existing understory and habitat trees for birds and other critters. Having a large piece of property that is protected and intended to provide sanctuary to many wildlife species increases the ecosystem health of the area, especially when combined with adjacent parcels, if they are able to be kept in a less developed state.

The property does not have any known cultural resources or historical sites, and is not considered a Forest of Recognized Importance (FORI).

B. Any management practices which the owner plans to protect, enhance, or restore these resources

To protect, enhance and restore our home we have engaged in a multiphase approach to upgrading the home while maintaining its historic aesthetic, including new wiring, insulation,

windows, a furnace, and the replacing of some manufactured, dated wood paneling with sheetrock. Asbestos as well as lead-painted siding was removed and disposed of appropriately.

To protect the old growth stumps they will be cataloged on our house map.

If we undertake a regulated forest practice, we will consult with the DNR and follow all applicable rules.

Resource Category 8: Aesthetics and Recreation

Considerations: Aesthetically important areas, public views, personal recreation, walking trail access, education/outreach opportunities, etc.
What do you recommend to maintain/enhance the aesthetic and recreational opportunities listed above? Are you planning any trails for your use? Will thinning and or pruning make the forest more accessible and aesthetically pleasing?

A. Current resource conditions, issues, needs, and opportunities

We have bushwhacked a trail along the perimeter of the property to evaluate the integrity of the fenceline and monitor incursion. We also have many walkable roads circling the interior of the property which are currently passable via our UTV (Polaris Ranger EV)

B. Any management practices which the owner plans to protect, enhance, or restore these resources

We will maintain and upgrade the existing road-trails to allow for UTV access while being mindful of erosion and slope instability especially on the western hillside. We will restore and evaluate the fenceline to hopefully minimize dumping by our neighbors.

The stream crossing will be redesigned as a formal bridge to function as both a stream culvert and a structural element to allow small vehicle traffic into the back acreage.

The recommended native plantings cited in previous sections of the plan will also move the forest to a more natural and diverse state, which will further enhance forest aesthetics.

Resource Category 9: Carbon Sequestration & Resilience to Climate/Weather-Related Influences

Considerations: Weather stress, stand vigor, species diversity, right species for the site, drought tolerance, reforestation, stocking levels, growth rates, land conversion, fire/burning, etc.

Discuss your forest's potential for carbon sequestration include stocking and growth rates. Evaluate your forest's resilience to climate and adverse weather (especially drought) in terms of stand vigor and species diversity. Are trees losing vigor due to overcrowding? Are the tree species present appropriate for the site, especially in terms of drought tolerance? What management activities do you propose maintain/increase carbon sequestration? How will you help your forest become more resilient to climate stresses?

A. Current resource conditions, issues, needs, and opportunities

We plant 100 trees per year. Many, but not all, have survived. Our forest has the advantage of multiple water features which, while not flowing in the peak of summer, may still provide moisture to deeper root systems and/or evaporative cooling. We try to plant species in appropriate microclimates for maximum health and stand success.

B. Any management practices which the owner plans to protect, enhance, or restore these resources

We plan to maintain the stand at or near full-stocking levels. The new tree species that will be planted to maintain full stocking will be long-lived conifer species that will provide long-term ecosystem services and carbon storage far into the future. If carbon banking or credit opportunities become available, we may explore those options.

Resource Category 10: Specialized Forest Products (Optional)

A. Current resource conditions, issues, needs, and opportunities

We currently harvest our annual Christmas tree from smaller conifers on the property, most of which are already found to be growing in inopportune locations. We will continue this practice using it as a casual thinning process for the next 5-6 years as those trees have been identified. Further conifers will be planted in the interim period which will provide for later Christmas trees.

We harvest nettles in the spring and blackberries in the summer. We will not be using herbicides on the blackberries so we can continue to eat the fruit while we are working at removing their stranglehold on our property.

We have tapped our big leaf maple trees for two winters and have produced almost three pints of maple syrup for our personal use.

Our firewood consumption has decreased with the installation of an electric furnace; nevertheless we need to harvest up to three cords of firewood per year from our property in a sustainable fashion using trees either removed due to hazards, natural windfall, or thinning.

B. Any management practices which the owner plans to protect, enhance, or restore these resources

We will continue to expand our maple sap collection in subsequent years by installing more taps and spreading our collection area from the maples immediately adjacent to Trout Creek up the hill to the Maple Grove in the northwest corner of the property.

We have taken advantage of the need to remove 19 trees from the perimeter of our property which we identified as hazards to our neighbors; some of these we will leave on the ground for wildlife and others we will harvest for firewood.

We plan to protect the Pacific Yew trees by preventing them from broken branches that may fall from nearby trees.

V. Conservation Based Estate/Legacy Planning

Considerations: What do you want to happen to your property after you're gone? What do you want the legacy to be for you and your property? What have or will you do for succession and estate planning? Who is your local land trust and is a conservation Easement right for you?

Legacy planning is a complex and multifactorial issue. We would desire this property to be kept in the family or with a known person who embraces our version of forest stewardship. We value the "wildness" of the property and the joy and ecological value that that provides.

We do not have a succession plan written out at this time. It is in our 1-3 year plan to accomplish this and other estate-planning goals. We will be contacting the Snohomish County Assessor's Office to inquire about obtaining Open Space General status.

VI. Additional Information and Resources (Optional)

VII. Management Plan Implementation Timetable

Below are the stewardship management activities that we hope to implement over the next twenty years. Those in bold are the ones which we feel are the most important, and intend to make a priority of accomplishing them.

Year	Management Practice or Activity	Location (Stand)	Extent (#, acres, etc.)	NRCS Practice Code	Comments
	Complete a Forest Stewardship Plan				
	Holly Remediation Phase 1				Identify, number and cut trees
	Move Cascara on east border				
	Tree and shrub planting				
	Fire preparedness work				
	Make signs for forest locations				Max can label and burn wood signs to hang
	Reclaim hazard tree wood				Currently up-to-date
	Holly Remediation Phase 2				Apply triclopyr, tag sites
	Holly Remediation Phase 3				Hand pull smaller shoots and bag
	Holly Remediation Phase 4				Monitor sites for regrowth
	Move duck box to Swamp				
	Set up game cam				
	Obtain drone imagery				
	Improve trails/roads for ATV passage				Done.
	Improve culvert on W side to increase water holding				Deferred
	Yellow archangel Phase 1				Grid sections 02, 04, 06 with string line
	Yellow archangel Phase 2				Begin hand pulling and bagging
	Yellow archangel Phase 3				Triclopyr if necessary, replanting with native groundcover

	Himalayan blackberry Phase 1				Mark planting sites with stakes/paint - N/A
	Himalayan blackberry Phase 2				Remove vines to ground in areas - halfway done
	Himalayan blackberry Phase 3				Plant with mixed conifers

VIII. Aerial Photo(s)/Property Map(s)

Maps are attached to the signed version of this document.

IX. Landowner Signature(s)

I/we approve of the contents of this plan and intend to implement the described management activities to best of my/our ability and to manage the property in a manner consistent with applicable regulatory requirements.

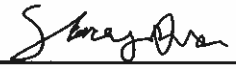
Landowner Signature Date

Landowner Signature Date

X. Approval Signatures

DNR Forest Stewardship Plan Approval (if applicable)

This plan meets the requirements for a Forest Stewardship Plan.



1/18/2022

WA State Department of Natural Resources Authorized Representative — Date

Stacey Dixon

Print Name

Forester

Title

528 91st Ave NE, Suite A, Lake Stevens, WA 98258

Address

360-453-7163

Phone

sdixon@snohomishcd.org

E-mail

USDA-NRCS Conservation Activity Plan Approval (if applicable)

This plan meets the requirements for a USDA-NRCS Conservation Activity Plan.

Signature of USDA-NRCS Authorized Representative Date

Print Name

Title

Address

Phone

E-mail

Washington Tree Farm Management Plan Approval (if applicable)

This plan meets the requirements for a Tree Farm Management Plan.

Signature of Washington Tree Farm Program Authorized Representative Date

Print Name

Title

Address

Phone

E-mail

3243

Current Use Timber Management Plan Approval (if applicable)

This plan meets the requirements for a Timber Management Plan for current use property tax programs.

Signature of Authorized County Government Representative Date

Print Name

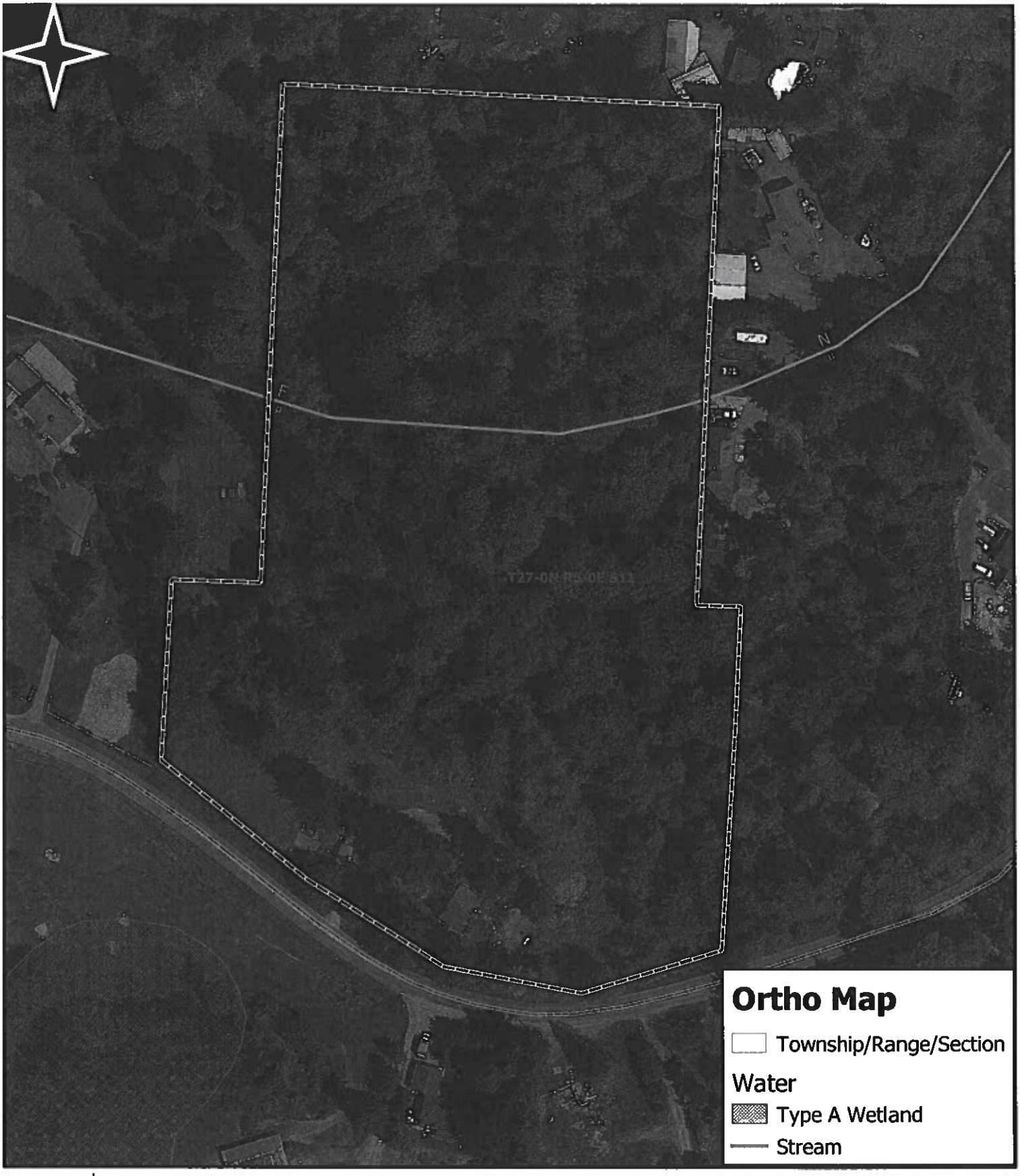
Title

Address

Phone

E-mail

OPEN SPACE
Assessor's
Application No.
3243



Forestry

WASHINGTON STATE UNIVERSITY
EXTENSION

Property: Heitmann Parcel

60 0 60 120 180 240 ft

OPEN SPACE
Assessor's
Application No.
3243

Note: Some alignment shifting may take place, due to county data projections.

Location Map

220 110 0 220 440 Feet

1:2,643

N

12/1/2021

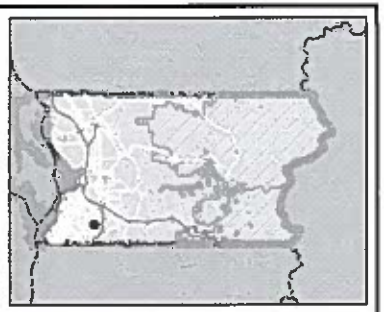
Cartographer: Stacey Dixon

Document Path: H:\MXD_Templates_LocaidLetterLandscape.mxd

PDS Map Portal
Snohomish County Planning & Development Services

Heitmann Critical Areas

12/1/2021



Legend

- Snohomish County Tax Parcels
- Snohomish County Streams
  - Shoreline of Statewide Significance
  - Fish Habitat
  - Non-fish Habitat Perennial
  - Non-fish Habitat Seasonal
  - Unknown, Untyped
- Snohomish County Water Bodies
  - Shoreline of Statewide Significance
  - Fish Habitat
  - Non-fish Habitat Perennial
  - Non-fish Habitat Seasonal
  - Unknown, Untyped
- National Wetland Inventory
  - No Data
  - Estuarine and Marine Deepwater
  - Estuarine and Marine Wetland
  - Freshwater Emergent Wetland
  - Freshwater Forested/Shrub Wetland
  - Freshwater Pond
  - Lake
  - Other
  - Riverine
- Snohomish County Wetland Inventory
- Tulalip Wetlands
  - Critical
  - High
  - Moderate
- Planning Development and Services Wetland Inventory
- Steep Slopes (Greater than 33 percent)

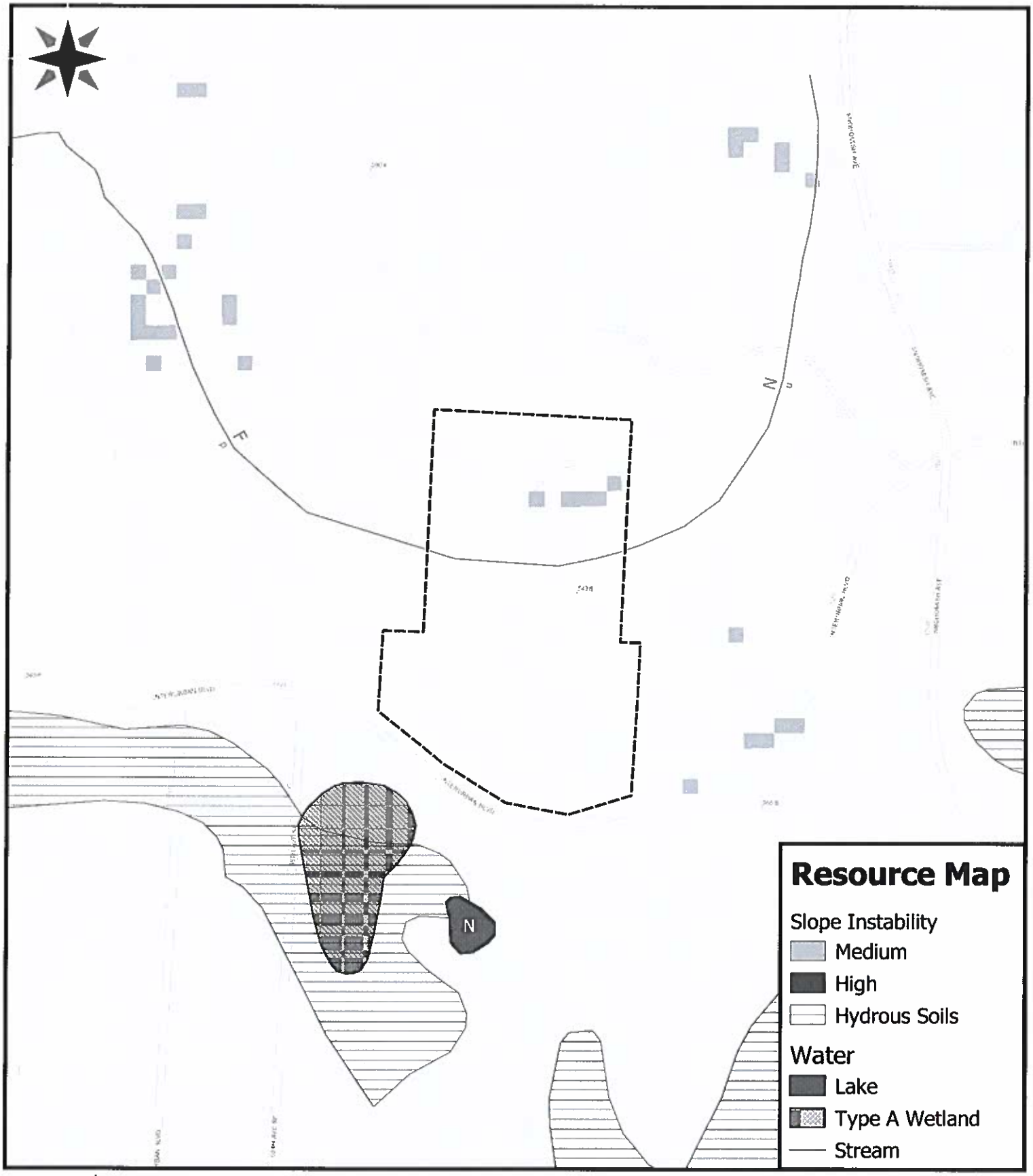
1: 2,400

-400.0 0 200.00 400.0 Feet

Projection: NAD_1983_StatePlane_Washington_North_FIPS_4601_Feet
Planning and Development Services, Snohomish County

Notes

This map was automatically generated using Geocortex Essentials.



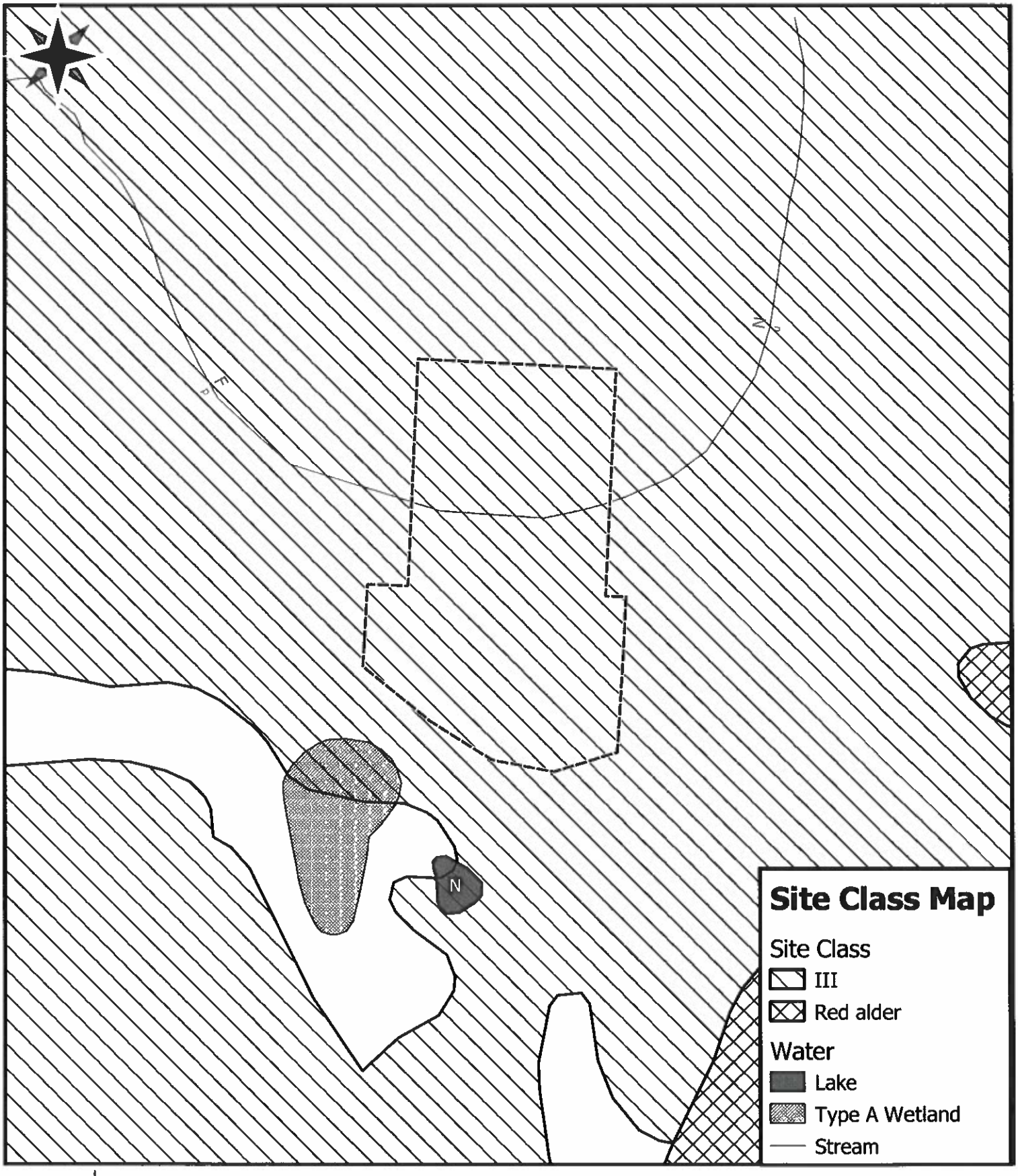
Forestry

WASHINGTON STATE UNIVERSITY
EXTENSION

Property: Heitmann Parcel

140 0 140 280 420 560 ft

Note: Some alignment shifting may take place, due to county data projections.



Forestry

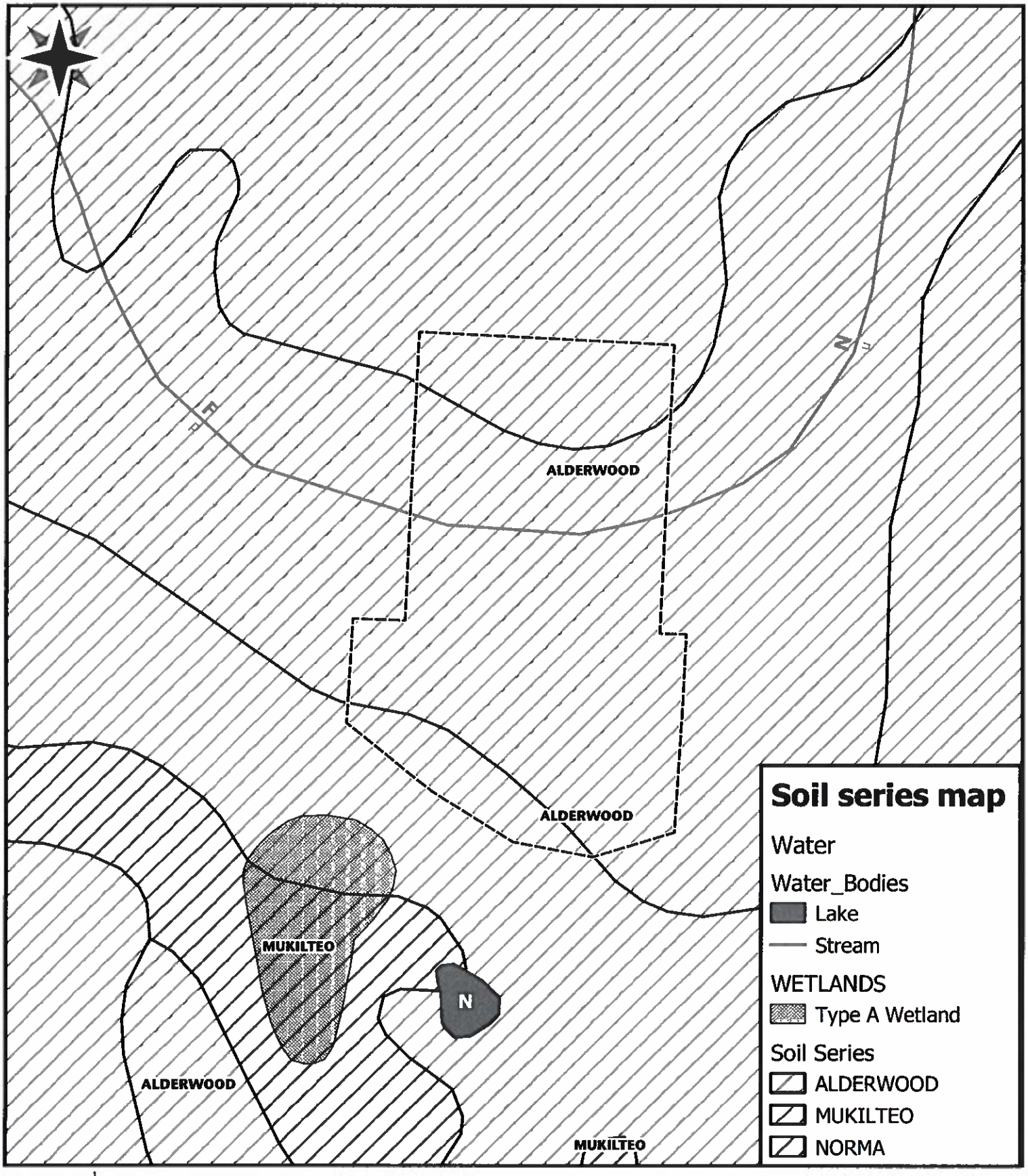
WASHINGTON STATE UNIVERSITY
EXTENSION

Property: Heitmann Parcel

140 0 140 280 420 560 ft

OPEN SPACE
Assessor's
Application No.
3243

Note: Some alignment shifting may take place, due to county data projections.



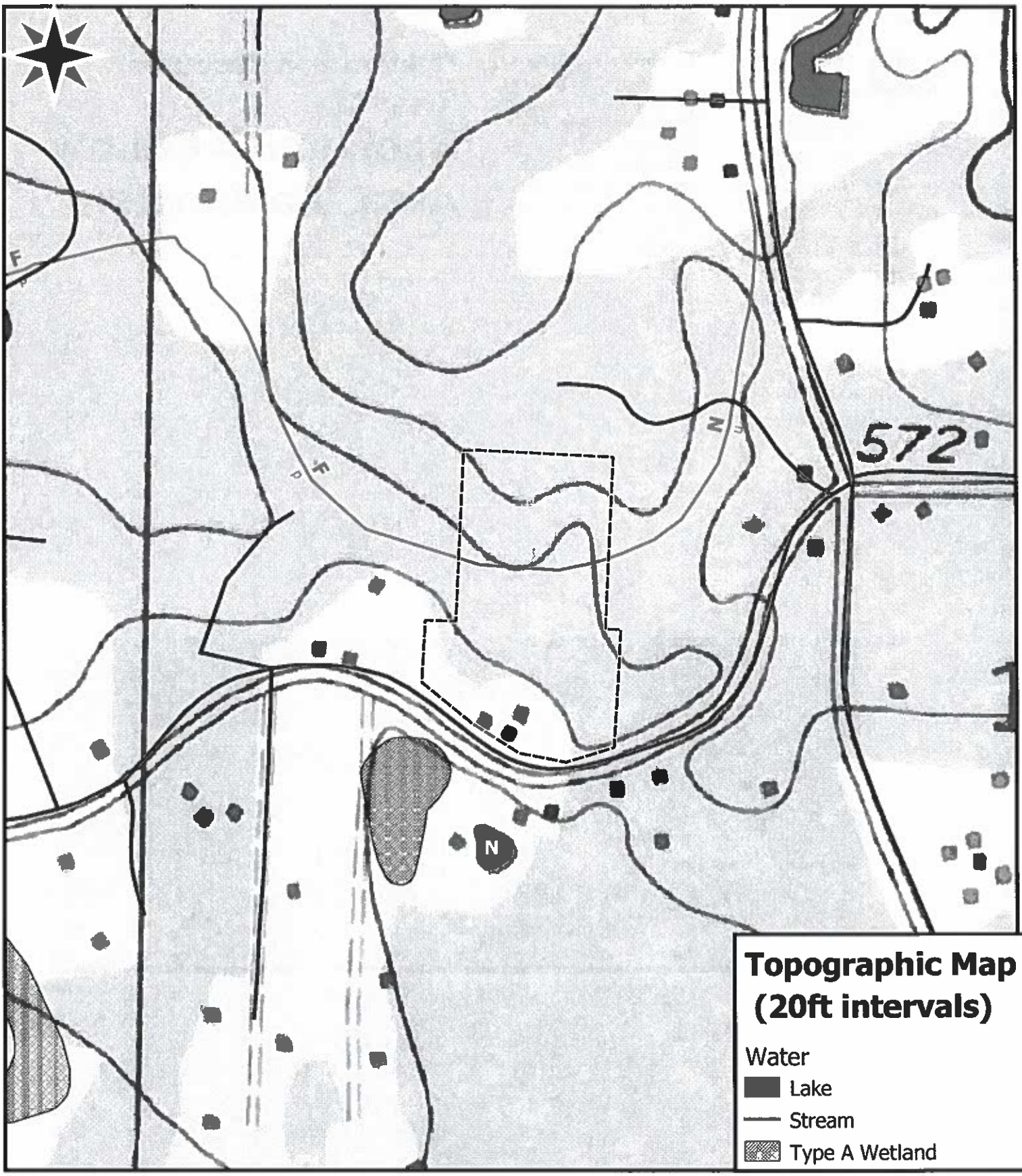
Forestry

WASHINGTON STATE UNIVERSITY EXTENSION

Property: Heitmann Parcel

100 0 100 200 300 400 ft

Note: Some alignment shifting may take place, due to county data projections.



Forestry

WASHINGTON STATE UNIVERSITY
EXTENSION

Property: Heitmann Parcel

190 0 190 380 570 760 ft

OPEN SPACE
Assessor's
Application No.
3243

Note: Some alignment shifting may take place, due to county data projections.

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Snohomish County Area, Washington

December 27, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,590 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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

Soil Survey Area: Snohomish County Area, Washington
Survey Area Data: Version 23, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 26, 2018—Oct 16, 2018

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Alderwood gravelly sandy loam, 0 to 8 percent slopes	2.3	25.2%
3	Alderwood gravelly sandy loam, 15 to 30 percent slopes	6.8	74.8%
Totals for Area of Interest		9.1	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Snohomish County Area, Washington

1—Alderwood gravelly sandy loam, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2t625
Elevation: 50 to 800 feet
Mean annual precipitation: 25 to 60 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 240 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Alderwood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alderwood

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest, talf
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Glacial drift and/or glacial outwash over dense glaciomarine deposits

Typical profile

A - 0 to 7 inches: gravelly sandy loam
Bw1 - 7 to 21 inches: very gravelly sandy loam
Bw2 - 21 to 30 inches: very gravelly sandy loam
Bg - 30 to 35 inches: very gravelly sandy loam
2Cd1 - 35 to 43 inches: very gravelly sandy loam
2Cd2 - 43 to 59 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: B
Ecological site: F002XA004WA - Puget Lowlands Forest
Forage suitability group: Limited Depth Soils (G002XN302WA), Limited Depth Soils (G002XF303WA), Limited Depth Soils (G002XS301WA)

Other vegetative classification: Limited Depth Soils (G002XN302WA), Limited Depth Soils (G002XF303WA), Limited Depth Soils (G002XS301WA)
Hydric soil rating: No

Minor Components

Mckenna
Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

Everett
Percent of map unit: 5 percent
Landform: Moraines, eskers, kames
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Shalcar
Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Norma
Percent of map unit: 2 percent
Landform: Drainageways, depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

3—Alderwood gravelly sandy loam, 15 to 30 percent slopes

Map Unit Setting
National map unit symbol: 2t627
Elevation: 0 to 1,000 feet
Mean annual precipitation: 25 to 60 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 160 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Alderwood and similar soils: 85 percent

Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alderwood

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope, talf
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Glacial drift and/or glacial outwash over dense glaciomarine deposits

Typical profile

A - 0 to 7 inches: gravelly sandy loam
Bw1 - 7 to 21 inches: very gravelly sandy loam
Bw2 - 21 to 30 inches: very gravelly sandy loam
Bg - 30 to 35 inches: very gravelly sandy loam
2Cd1 - 35 to 43 inches: very gravelly sandy loam
2Cd2 - 43 to 59 inches: very gravelly sandy loam

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F002XA004WA - Puget Lowlands Forest
Forage suitability group: Limited Depth Soils (G002XN302WA), Limited Depth Soils (G002XF303WA), Limited Depth Soils (G002XS301WA)
Other vegetative classification: Limited Depth Soils (G002XN302WA), Limited Depth Soils (G002XF303WA), Limited Depth Soils (G002XS301WA)
Hydric soil rating: No

Minor Components

Everett

Percent of map unit: 5 percent
Landform: Moraines, eskers, kames
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Indianola

Percent of map unit: 5 percent

Landform: Terraces, kames, eskers
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Shalcar

Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Norma

Percent of map unit: 2 percent
Landform: Drainageways, depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Land Management

Land management interpretations are tools designed to guide the user in evaluating existing conditions in planning and predicting the soil response to various land management practices, for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture, and rangeland. Example interpretations include suitability for a variety of irrigation practices, log landings, haul roads and major skid trails, equipment operability, site preparation, suitability for hand and mechanical planting, potential erosion hazard associated with various practices, and ratings for fencing and waterline installation.

Compaction Potential (WA)

This interpretation is designed to predict the potential for soil compaction from operation of ground-based equipment for forest harvesting and site preparation activities when soils are moist. Soil compaction reduces porosity and increases bulk density by reducing the interaggregate pore space.

Compacted soils are less favorable for good plant growth because of high soil bulk density and hardness, reduced pore space, and poor aeration and drainage. Root penetration and growth is decreased in compacted soils because the hardness or strength of these soils prevents the expansion of roots. Supplies of air, water, and nutrients that roots need are also less favorable when compaction decreases soil porosity and drainage.

Interpretation ratings are based on soil properties in the upper 12 inches of the profile. Factors considered are soil texture, soil structure, and rock fragment content. Initial ratings are based on the following soil texture groups:

Low compaction potential: loamy sand, loamy fine sand, loamy coarse sand, sand, fine sand, coarse sand

Medium compaction potential: silty clay, clay, sandy clay, sandy clay loam, sandy loams with less than 15 percent clay

High compaction potential: loam, silt, silt loam, silty clay loam, very fine sandy loam, sandy loams with 15 percent or more clay.

Ratings are reduced by one class, such as from "high" to "medium" for strong soil structure grade. Ratings are reduced by one class for rock fragment content of 35 to 60 percent by volume, and are reduced by two classes for rock fragment content of greater than 60 percent.

The ratings are both verbal and numerical. Rating class terms indicate the soil compaction potential.

A "High" rating indicates that the potential for compaction is significant. The growth rate of seedlings will be reduced following compaction. After initial compaction, this soil is still able to support standard equipment, but will continue to compact with each subsequent pass. The soil is moisture sensitive, exhibiting large changes in density with changing moisture content.

A "Medium" rating indicates that the potential for compaction is significant. The growth rate of seedlings may be reduced following compaction. After the initial compaction (i.e., the first equipment pass), this soil is able to support standard equipment with only minimal increases in soil density. The soil is intermediate between moisture insensitive and moisture sensitive.

A "Low" rating indicates that the potential for compaction is insignificant. This soil is able to support standard equipment with minimal compaction. The soil is moisture insensitive, exhibiting only small changes in density with changing moisture content.

Numerical ratings indicate the soil compaction potential The ratings are shown in decimal fractions ranging from 1.00 to 0.00. They indicate gradations between the point where compaction potential is highest (1.00) and the point at which compaction potential is lowest (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil

Survey. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Compaction Potential (WA)

Map Scale: 1:1,590 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- High
- Medium
- Low
- Not rated or not available

Soil Rating Lines
- High
- Medium
- Low
- Not rated or not available

Soil Rating Points
- High
- Medium
- Low
- Not rated or not available

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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

Soil Survey Area: Snohomish County Area, Washington
Survey Area Data: Version 23, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 26, 2018—Oct 16, 2018

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.

Tables—Compaction Potential (WA)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
1	Alderwood gravelly sandy loam, 0 to 8 percent slopes	Medium	Alderwood (85%)	Rock fragments, 0-12 inches (1.00)	2.3	25.2%
				Soil structure grade, 0-12 inches (1.00)		
				Soil texture, 0-12 inches (0.50)		
			Everett (5%)	Soil texture, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Rock fragments, 0-12 inches (0.50)		
			Shalcar (3%)	Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Soil texture, 0-12 inches (0.50)		
3	Alderwood gravelly sandy loam, 15 to 30 percent slopes	Medium	Alderwood (85%)	Rock fragments, 0-12 inches (1.00)	6.8	74.8%
				Soil structure grade, 0-12 inches (1.00)		
				Soil texture, 0-12 inches (0.50)		
			Everett (5%)	Soil texture, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Rock fragments, 0-12 inches (0.50)		
			Shalcar (3%)	Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Soil texture, 0-12 inches (0.50)		
Totals for Area of Interest					**9.1**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Medium	9.1	100.0%
Totals for Area of Interest	**9.1**	**100.0%**

Rating Options—Compaction Potential (WA)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Displacement Potential (WA)

This interpretation is designed to predict the potential for soil displacement from operation of ground-based equipment for forest harvesting and site preparation activities when soils are dry or moist. Displacement is the horizontal movement of soil caused by scraping or machine gouging. Displacement can remove the organic forest litter and upper portions of the mineral surface layer, reducing plant nutrient availability and water-holding capacity. This results in a loss of site productivity for forest vegetation.

Displacement most commonly occurs during slash disposal and site preparation activities when a blade is used on equipment rather than a brush rake attachment. Tractor maneuvering on dry, loose soil can also cause displacement.

Interpretation ratings are based on soil properties in the upper 12 inches of the profile. Factors considered are soil texture, rock fragment content, and thickness of surface layers with at least one percent organic matter. Initial ratings are based on the following soil texture groups:

Low displacement potential: silty clay, clay, sandy clay, silty clay loam

Medium displacement potential: silt, silt loam, loam, sandy clay loam, very fine sandy loam

High displacement potential: sandy loam, loamy sand, sand, ashy loam, ashy silt loam, medial loam, medial silt loam

Ratings are reduced by one class, such as from "high" to "medium" if the surface layers with one percent or more percent organic matter are more than 6 inches thick. Ratings are reduced by one class for rock fragment content of 35 to 60 percent by volume, and are reduced by two classes for rock fragment content of greater than 60 percent.

The ratings are both verbal and numerical. Rating class terms indicate the soil displacement potential.

A "High" rating indicates that the soils can be readily displaced by equipment operations. They have little resistance to movement. Unless protective measures are implemented, detrimental displacement is probable.

A "Medium" rating indicates that the soils can be displaced by equipment operations but are intermediate in their resistance to movement.

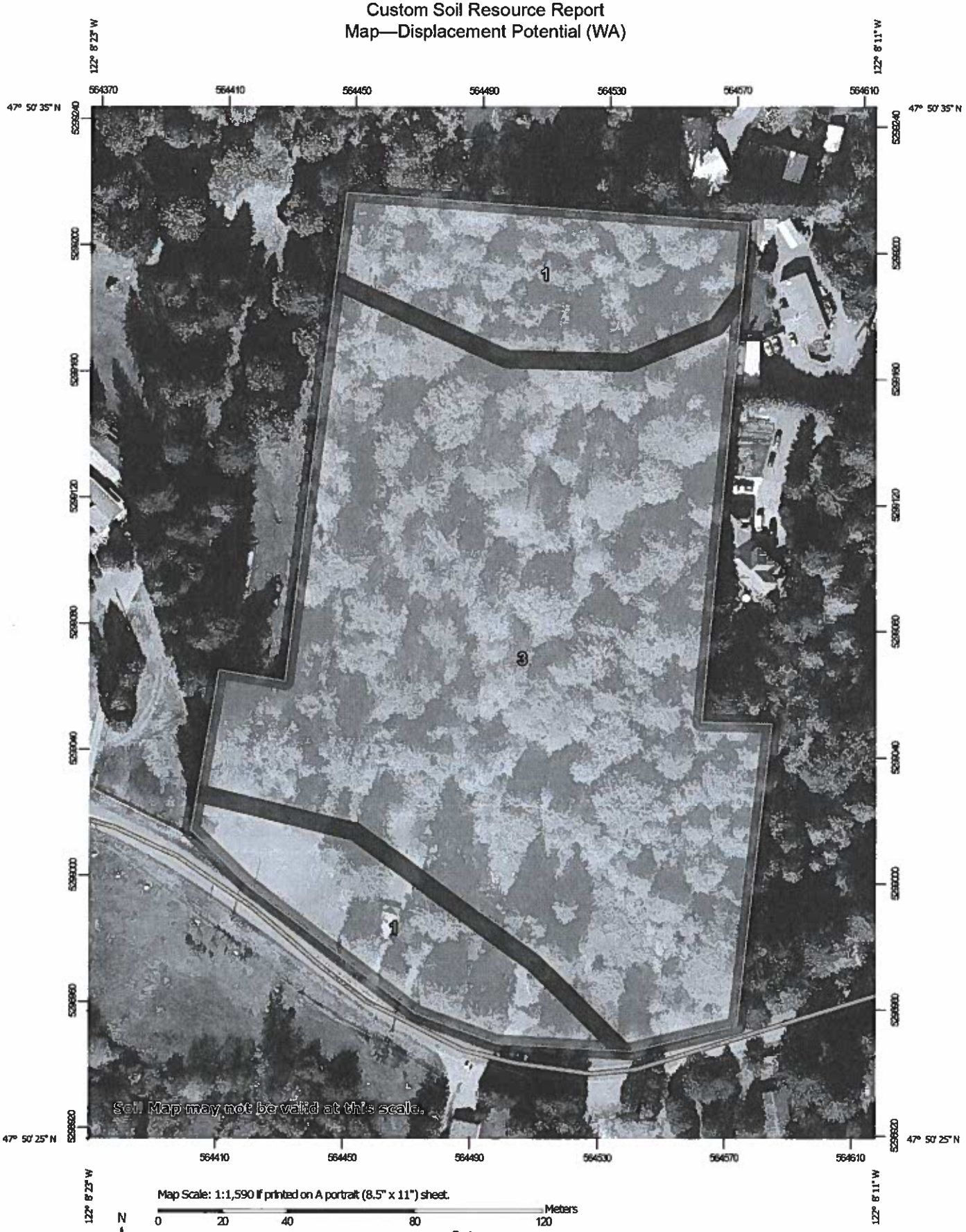
A "Low" rating indicates that soils are resistant to displacement. Detrimental displacement is not likely to occur during equipment operations.

Numerical ratings indicate the soil compaction potential The ratings are shown in decimal fractions ranging from 1.00 to 0.00. They indicate gradations between the point where displacement potential is highest (1.00) and the point at which displacement potential is lowest (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Displacement Potential (WA)



Map Scale: 1:1,590 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Background
- Aerial Photography

Soils

Soil Rating Polygons
- High
- Medium
- Low
- Not rated or not available

Soil Rating Lines
- High
- Medium
- Low
- Not rated or not available

Soil Rating Points
- High
- Medium
- Low
- Not rated or not available

Water Features
- Streams and Canals

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

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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

Soil Survey Area: Snohomish County Area, Washington
Survey Area Data: Version 23, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 26, 2018—Oct 16, 2018

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.

Tables—Displacement Potential (WA)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
1	Alderwood gravelly sandy loam, 0 to 8 percent slopes	Medium	Alderwood (85%)	Soil texture, 0-12 inches (1.00)	2.3	25.2%
				Rock fragments, 0-12 inches (1.00)		
				Organic matter content (0.50)		
			McKenna (5%)	Soil texture, 0-12 inches (1.00)		
				Rock fragments, 0-12 inches (1.00)		
				Organic matter content (0.50)		
			Everett (5%)	Soil texture, 0-12 inches (1.00)		
				Rock fragments, 0-12 inches (1.00)		
				Organic matter content (0.50)		
			Norma (2%)	Soil texture, 0-12 inches (1.00)		
				Rock fragments, 0-12 inches (1.00)		
				Organic matter content (0.50)		
3	Alderwood gravelly sandy loam, 15 to 30 percent slopes	Medium	Alderwood (85%)	Soil texture, 0-12 inches (1.00)	6.8	74.8%
				Rock fragments, 0-12 inches (1.00)		
				Organic matter content (0.50)		
			Everett (5%)	Soil texture, 0-12 inches (1.00)		
				Rock fragments, 0-12 inches (1.00)		
				Organic matter content (0.50)		
			Indianola (5%)	Soil texture, 0-12 inches (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Rock fragments, 0-12 inches (1.00)		
				Organic matter content (0.50)		
			Norma (2%)	Soil texture, 0-12 inches (1.00)		
				Rock fragments, 0-12 inches (1.00)		
				Organic matter content (0.50)		
Totals for Area of Interest					**9.1**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Medium	9.1	100.0%
Totals for Area of Interest	**9.1**	**100.0%**

Rating Options—Displacement Potential (WA)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Erosion Hazard (Road, Trail)

The ratings in this interpretation indicate the hazard of soil loss from unsurfaced roads and trails. The ratings are based on soil erosion factor K, slope, and content of rock fragments.

The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," or "severe." A rating of "slight" indicates that little or no erosion is likely; "moderate" indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and "severe" indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Erosion Hazard (Road, Trail)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Soil Rating Lines
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Soil Rating Points
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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

Soil Survey Area: Snohomish County Area, Washington
Survey Area Data: Version 23, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 26, 2018—Oct 16, 2018

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.

Tables—Erosion Hazard (Road, Trail)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
1	Alderwood gravelly sandy loam, 0 to 8 percent slopes	Slight	Alderwood (85%)		2.3	25.2%
3	Alderwood gravelly sandy loam, 15 to 30 percent slopes	Severe	Alderwood (85%)	Slope/erodibility (0.95)	6.8	74.8%
Totals for Area of Interest					**9.1**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Severe	6.8	74.8%
Slight	2.3	25.2%
Totals for Area of Interest	**9.1**	**100.0%**

Rating Options—Erosion Hazard (Road, Trail)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Potential for Seedling Mortality

The ratings in this interpretation indicate the likelihood of death of naturally or artificially propagated tree seedlings, as influenced by soil characteristics, physiographic features, and climatic conditions. Considered in the ratings are flooding, ponding, depth to a water table, content of lime, reaction, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope.

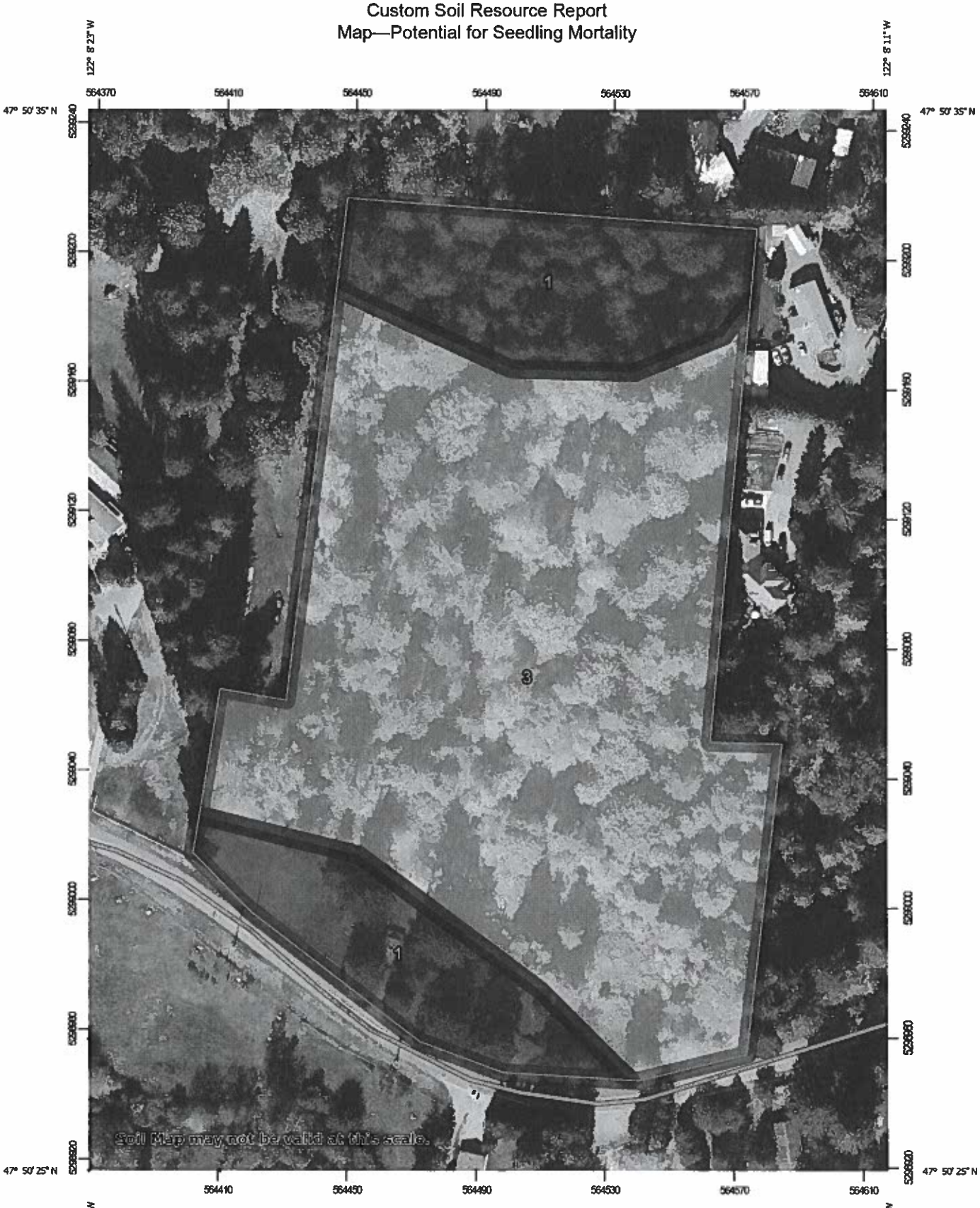
The ratings are both verbal and numerical. The soils are described as having a "low," "moderate," or "high" potential for seedling mortality. "Low" indicates that seedling mortality is unlikely. Good performance can be expected, and little or no maintenance is needed. "Moderate" indicates that seedling mortality can occur because one or more soil properties are less than desirable. Fair performance can be expected, and some maintenance is needed. "High" indicates that seedling mortality can occur because of one or more soil properties and that overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration.

Numerical ratings indicate gradations between the point at which the potential for seedling mortality is highest (1.00) and the point at which the potential is lowest (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Potential for Seedling Mortality



Map Scale: 1:1,590 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Background
- Aerial Photography

Soils

Soil Rating Polygons
- High
- Moderate
- Low
- Not rated or not available

Soil Rating Lines
- High
- Moderate
- Low
- Not rated or not available

Soil Rating Points
- High
- Moderate
- Low
- Not rated or not available

Water Features
- Streams and Canals

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

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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

Soil Survey Area: Snohomish County Area, Washington
Survey Area Data: Version 23, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 26, 2018—Oct 16, 2018

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.

Tables—Potential for Seedling Mortality

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
1	Alderwood gravelly sandy loam, 0 to 8 percent slopes	High	Alderwood (85%)	Available water (1.00)	2.3	25.2%
3	Alderwood gravelly sandy loam, 15 to 30 percent slopes	Moderate	Alderwood (85%)	Available water (0.50)	6.8	74.8%
Totals for Area of Interest					**9.1**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Moderate	6.8	74.8%
High	2.3	25.2%
Totals for Area of Interest	**9.1**	**100.0%**

Rating Options—Potential for Seedling Mortality

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Suitability for Log Landings (WA)

This interpretation shows the suitability of soils for use as log landings in forested areas. Ratings are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification of the soil, depth to a water table, ponding, flooding, and the hazard of soil slippage.

The ratings are both verbal and numerical. Rating class terms indicate the degree to which the soils are suited to this aspect of forestland management. The soils are described as "well suited," "moderately suited," or "poorly suited" to use as log landings. "Well suited" indicates that the soil has features that are favorable for log landings and has no limitations. Good performance can be expected, and little or no maintenance is needed. "Moderately suited" indicates that the soil has features that are moderately favorable for log landings. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. "Poorly suited" indicates that the soil has one or more properties that are unfavorable for log landings. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen, which is displayed on the report. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the Selected Soil Interpretations report with this interpretation included from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Suitability for Log Landings (WA)

Map Scale: 1:1,590 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

OPEN SPACE
Assessor's
Application No.
3243

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Poorly suited
- Moderately suited
- Well suited
- Not rated or not available

Soil Rating Lines
- Poorly suited
- Moderately suited
- Well suited
- Not rated or not available

Soil Rating Points
- Poorly suited
- Moderately suited
- Well suited
- Not rated or not available

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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

Soil Survey Area: Snohomish County Area, Washington
Survey Area Data: Version 23, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 26, 2018—Oct 16, 2018

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.

Tables—Suitability for Log Landings (WA)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
1	Alderwood gravelly sandy loam, 0 to 8 percent slopes	Well suited	Alderwood (85%)		2.3	25.2%
3	Alderwood gravelly sandy loam, 15 to 30 percent slopes	Moderately suited	Alderwood (85%)	Slope (0.50)	6.8	74.8%
Totals for Area of Interest					**9.1**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Moderately suited	6.8	74.8%
Well suited	2.3	25.2%
Totals for Area of Interest	**9.1**	**100.0%**

Rating Options—Suitability for Log Landings (WA)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Windthrow Hazard (WA)

This interpretation is designed to predict windthrow hazard for commercial forest tree species when the soils have a high moisture content. Wind is a major cause of damage in North American forests. In addition to lost timber revenue, windthrow creates a number of problems for forest managers. Windthrown trees provide bark beetle habitat, increase fuel loading, and limit the mobility of wildlife and recreationists. Salvage of windthrow is dangerous and costly, and disrupts silvicultural and integrated resource management planning. Freshly exposed stand edges and partially cut stands are particularly prone to wind damage.

Factors considered in the ratings include depth to root-restricting layers such as bedrock and dense glacial till, depth to a seasonal high water table, landform positions that are exposed to high winds such as mountain ridges, and content of volcanic cinders and pumice. Rating classes for windthrow hazard are "Low", "Medium" and "High", based on the following criteria:

- Depth to root-restricting layer

Low - Greater than or equal to 100 cm

Medium - 50 to 99 cm

High - Less than 50 cm

• Depth to seasonal high water table

Low - Greater than or equal to 100 cm

Medium - 50 to 99 cm

High - Less than 50 cm

• Landform positions exposed to high winds

The following term are used to identify these landform positions. Rating classes are increased by one class, such as from "Low" to "Medium" if these landform positions are associated with a soil map unit component and depth to root-restricting layer or water table is less than 100 cm.

Landform - ridge

Hillslope profile - summit

Geomorphic component, mountains - mountaintop

Geomorphic component, hills - interfluve

• Cindery or Pumiceous Taxonomic Particle-Size Class - The rating classes are increased by one rating class, such as from "Medium" to "High" for soils in these particle-size classes. These soils have weak cohesion between soil particles, which makes them more susceptible to windthrow.

The ratings are both verbal and numerical. Rating class terms indicate the windthrow hazard. Numerical rating are shown in decimal fractions ranging from 1.00 to 0.00. They indicate gradations between the point where windthrow hazard is highest (1.00) and the point at which windthrow hazard is lowest (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil

Survey. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Map—Windthrow Hazard (WA)

Map Scale: 1:1,590 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Background
- Aerial Photography

Soils

Soil Rating Polygons
- High
- Medium
- Low
- Not rated or not available

Soil Rating Lines
- High
- Medium
- Low
- Not rated or not available

Soil Rating Points
- High
- Medium
- Low
- Not rated or not available

Water Features
- Streams and Canals

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

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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

Soil Survey Area: Snohomish County Area, Washington
Survey Area Data: Version 23, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 26, 2018—Oct 16, 2018

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.

Tables—Windthrow Hazard (WA)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
1	Alderwood gravelly sandy loam, 0 to 8 percent slopes	High	Alderwood (85%)	Depth to root-restricting layer (0.50)	2.3	25.2%
				Depth to seasonal high water table (0.50)		
				Exposed landform position (0.50)		
			McKenna (5%)	Depth to seasonal high water table (1.00)		
				Depth to root-restricting layer (0.50)		
			Shalcar (3%)	Depth to seasonal high water table (1.00)		
			Norma (2%)	Depth to seasonal high water table (1.00)		
3	Alderwood gravelly sandy loam, 15 to 30 percent slopes	High	Alderwood (85%)	Depth to root-restricting layer (0.50)	6.8	74.8%
				Depth to seasonal high water table (0.50)		
				Exposed landform position (0.50)		
			Shalcar (3%)	Depth to seasonal high water table (1.00)		
			Norma (2%)	Depth to seasonal high water table (1.00)		
Totals for Area of Interest					**9.1**	**100.0%**

Rating	Acres in AOI	Percent of AOI
High	9.1	100.0%

Rating	Acres in AOI	Percent of AOI
Totals for Area of Interest	9.1	100.0%

Rating Options—Windthrow Hazard (WA)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Windthrow Hazard (WA)

This interpretation is designed to predict windthrow hazard for commercial forest tree species when the soils have a high moisture content. Wind is a major cause of damage in North American forests. In addition to lost timber revenue, windthrow creates a number of problems for forest managers. Windthrown trees provide bark beetle habitat, increase fuel loading, and limit the mobility of wildlife and recreationists. Salvage of windthrow is dangerous and costly, and disrupts silvicultural and integrated resource management planning. Freshly exposed stand edges and partially cut stands are particularly prone to wind damage.

Factors considered in the ratings include depth to root-restricting layers such as bedrock and dense glacial till, depth to a seasonal high water table, landform positions that are exposed to high winds such as mountain ridges, and content of volcanic cinders and pumice. Rating classes for windthrow hazard are "Low', "Medium" and "High", based on the following criteria:

• Depth to root-restricting layer

Low - Greater than or equal to 100 cm

Medium - 50 to 99 cm

High - Less than 50 cm

• Depth to seasonal high water table

Low - Greater than or equal to 100 cm

Medium - 50 to 99 cm

High - Less than 50 cm

• Landform positions exposed to high winds

The following term are used to identify these landform positions. Rating classes are increased by one class, such as from "Low" to "Medium" if these landform positions are associated with a soil map unit component and depth to root-restricting layer or water table is less than 100 cm.

Landform - ridge

Hillslope profile - summit

Geomorphic component, mountains - mountaintop

Geomorphic component, hills - interfluve

• Cindery or Pumiceous Taxonomic Particle-Size Class - The rating classes are increased by one rating class, such as from "Medium" to "High" for soils in these particle-size classes. These soils have weak cohesion between soil particles, which makes them more susceptible to windthrow.

The ratings are both verbal and numerical. Rating class terms indicate the windthrow hazard. Numerical rating are shown in decimal fractions ranging from 1.00 to 0.00. They indicate gradations between the point where windthrow hazard is highest (1.00) and the point at which windthrow hazard is lowest (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

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Custom Soil Resource Report
Map—Windthrow Hazard (WA)

Map Scale: 1:1,590 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Background
- Aerial Photography

Soils

Soil Rating Polygons
- High
- Medium
- Low
- Not rated or not available

Soil Rating Lines
- High
- Medium
- Low
- Not rated or not available

Soil Rating Points
- High
- Medium
- Low
- Not rated or not available

Water Features
- Streams and Canals

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

MAP INFORMATION

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Tables—Windthrow Hazard (WA)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
1	Alderwood gravelly sandy loam, 0 to 8 percent slopes	High	Alderwood (85%)	Depth to root-restricting layer (0.50)	2.3	25.2%
				Depth to seasonal high water table (0.50)		
				Exposed landform position (0.50)		
			McKenna (5%)	Depth to seasonal high water table (1.00)		
				Depth to root-restricting layer (0.50)		
			Shalcar (3%)	Depth to seasonal high water table (1.00)		
			Norma (2%)	Depth to seasonal high water table (1.00)		
3	Alderwood gravelly sandy loam, 15 to 30 percent slopes	High	Alderwood (85%)	Depth to root-restricting layer (0.50)	6.8	74.8%
				Depth to seasonal high water table (0.50)		
				Exposed landform position (0.50)		
			Shalcar (3%)	Depth to seasonal high water table (1.00)		
			Norma (2%)	Depth to seasonal high water table (1.00)		
Totals for Area of Interest					**9.1**	**100.0%**

Rating	Acres in AOI	Percent of AOI
High	9.1	100.0%

Rating	Acres in AOI	Percent of AOI
Totals for Area of Interest	9.1	100.0%

Rating Options—Windthrow Hazard (WA)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Soil Health

Soil health interpretations are designed to be used as tools for evaluating and managing a soil's capacity to function as a vital living ecosystem that sustains plants, animals, and humans. Example interpretations include compaction, surface sealing, carbon sequestration, resistance and resilience, management systems and practices, and cover crops.

Soil Susceptibility to Compaction

Soils are rated based on their susceptibility to compaction from the operation of ground-based equipment for planting, harvesting, and site preparation activities when soils are moist. Soil compaction is the process in which soil particles are pressed together more closely that in the original state. Typically, the soil must be moist to be compacted because the mineral grains must slide together. Compaction reduces the abundance mostly of large pores in the soil by damaging the structure of the soil. This produces several effects that are unwanted in agricultural soils since large pores are most effective at transmitting water and air through the soil. Compaction also increases the soil strength which can limit root penetration and growth. The ability of soil to hold water is adversely affected by compaction since the large pores hold water. The degree of compaction of a soil is measured by its bulk density, which is the mass per unit volume, generally expressed in grams per cubic centimeter.

Compacted soils are less favorable for good plant growth because of high soil bulk density and hardness, reduced pore space, and poor aeration and drainage. Root penetration and growth is decreased in compacted soils because the hardness or strength of these soils prevents the expansion of roots. Supplies of air, water, and nutrients that roots need are also less favorable when compaction decreases soil porosity and drainage.

Interpretation ratings are based on soil properties in the upper 12 inches of the profile. Factors considered are soil texture, soil organic matter content, soil structure, rock fragment content, and the existing bulk density. Each of these is thought to contribute to resisting the susceptibility of a soil to compaction when present. Organic matter in the soil provides resistance to compaction and the resilience to ameliorate the effects with time. Soil structure adds strength as

discrete aggregates and it is the aggregates that are deformed or destroyed by compactive forces, thus strong soil structure lowers the susceptibility to compaction. Similarly, rock fragments in the soil can bridge and provide a framework to resist compaction. Finally, if a soil is already fairly dense causing further compaction is more difficult.

Definitions of the ratings:

Low - The potential for compaction is insignificant. This soil is able to support standard equipment with minimal compaction. The soil is moisture insensitive, exhibiting only small changes in density with changing moisture content.

Medium - The potential for compaction is significant. The growth rate of seedlings may be reduced following compaction. After the initial compaction (i.e., the first equipment pass), this soil is able to support standard equipment with only minimal increases in soil density. The soil is intermediate between moisture insensitive and moisture sensitive.

High - The potential for compaction is significant. The growth rate of seedlings will be reduced following compaction. After initial compaction, this soil is still able to support standard equipment, but will continue to compact with each subsequent pass. The soil is moisture sensitive, exhibiting large changes in density with changing moisture content.

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

References:

Adams, P.W. 1998. Soil Compaction on Woodland Properties. Oregon State University Extension Publication EC 1109.

Adams, P.W. 1981. Compaction of Forest Soils. Oregon State University Extension Publication PNW 217.

Boyer, Don. 1997. Guidelines for Soil Resource Protection and Restoration for Timber Harvest and Post-Harvest Activities. U.S Forest Service, Pacific Northwest Region, Watershed Management.

Geist, J.M.; Hazard, J.W.; Seidel, K.W. 1989. Assessing Physical Conditions of Some Pacific Northwest Volcanic Ash Soils After Forest Harvest. Soil Science Society of America Journal 53:946-950.

Froehlich, Henry A and David H. McNab. 1983. Minimizing Soil Compaction in Pacific Northwest Forests. Proceedings of Sixth North American Forest Soils Conference, University of Tennessee.

Page-Dumrose, Deborah S. 1993. Susceptibility of Volcanic Ash Influenced Soils in Northern Idaho to Mechanical Compaction. U.S. Forest Service Intermountain Research Station. Research Note INT-409.

Custom Soil Resource Report
Map—Soil Susceptibility to Compaction

Map Scale: 1:1,590 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 20 40 80 120

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

OPEN SPACE
Assessor's
Application No.
3243

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- High
- Medium
- Low
- Not rated or not available

Soil Rating Lines
- High
- Medium
- Low
- Not rated or not available

Soil Rating Points
- High
- Medium
- Low
- Not rated or not available

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Snohomish County Area, Washington
Survey Area Data: Version 23, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 26, 2018—Oct 16, 2018

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Tables—Soil Susceptibility to Compaction

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
1	Alderwood gravelly sandy loam, 0 to 8 percent slopes	Low	Alderwood (85%)	Rock fragments, 0-12 inches (1.00)	2.3	25.2%
				Soil structure grade, 0-12 inches (1.00)		
				Subaerial (1.00)		
				Bulk density-compactibility to 30cm (0.54)		
				Soil texture, 0-12 inches (0.50)		
			McKenna (5%)	Soil texture, 0-12 inches (1.00)		
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Subaerial (1.00)		
				Bulk density-compactibility to 30cm (0.40)		
			Shalcar (3%)	Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Subaerial (1.00)		
				Soil texture, 0-12 inches (0.50)		
			Norma (2%)	Soil texture, 0-12 inches (1.00)		
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Subaerial (1.00)		
3	Alderwood gravelly sandy loam, 15 to 30 percent slopes	Low	Alderwood (85%)	Rock fragments, 0-12 inches (1.00)	6.8	74.8%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Soil structure grade, 0-12 inches (1.00)		
				Subaerial (1.00)		
				Bulk density-compactibility to 30cm (0.54)		
				Soil texture, 0-12 inches (0.50)		
			Indianola (5%)	Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Bulk density-compactibility to 30cm (1.00)		
				Subaerial (1.00)		
			Shalcar (3%)	Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Subaerial (1.00)		
				Soil texture, 0-12 inches (0.50)		
			Norma (2%)	Soil texture, 0-12 inches (1.00)		
				Rock fragments, 0-12 inches (1.00)		
				Soil structure grade, 0-12 inches (1.00)		
				Subaerial (1.00)		
Totals for Area of Interest					**9.1**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Low	9.1	100.0%
Totals for Area of Interest	**9.1**	**100.0%**

Rating Options—Soil Susceptibility to Compaction

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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SD **Stacey Dixon** Yesterday
To: Lauren Heitmann >

Re: Contact a forester!

Hi Lauren,

If you need more proof, I believe someone from DNR will come out and map the area so that it shows up on their layers. Let me know if you'd like me to connect you.

Thank you,
Stacey

> On Wed, Aug 3, 2022 at 10:09 AM Stacey Dixon <sdixon@snohomishcd.org> wrote:
> Hi Lauren,
>
> Considering there was standing water on site in your forest, I can attest that this area is a forested wetland, meeting the criteria of the DNR forest practices definition (pg 92): A wetland with a tree crown closure of 30 percent or more, if trees are mature.
>
> I hope this helps.
> Stacey

DOCUMENT 1