

UW-REN 9 North Creek Forest Proposal

University of Washington-Restoration Ecology Network

Capstone Course 2020 - 2021



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SITE DESCRIPTION: The restoration site for North Creek Forest is located in Bothell, a suburb of Seattle in the Puget Sound Region. To the west of UW-REN 9 lies a buffer between it and a residential neighborhood in the form of North Creek Forest proper. To the east is I-405, separated from 112th Avenue only by a physical sound barrier. To the north lies more forest stretching northwesterly as it's bordered by a curving freeway. To the south is an extensive commercial area which transitions into the UW-Bothell campus. The entirety of the area lies in historic wetlands, providing ecosystem services consistent with such. UW-REN 9 proper is an eastward facing, sloped section of forest containing some native vegetation, but dominated by invasive species over much of the area.

Location

Perched within the Bothell Metropolitan area, the North Creek Forest is a 64-acre lot in Bothell, Washington. The UW-REN 9 site features a total area of 1141.3 m or .28 acres, with the drainage ditch excluded.

Figure 1: The location of the North Creek Forest within the greater metropolitan Bothell & Woodinville area.

Our site location is near the entrance road into North Creek Forest. Inserted between Bothell's residential area and I-405, the Forest experiences high levels of disturbance and noise pollution.

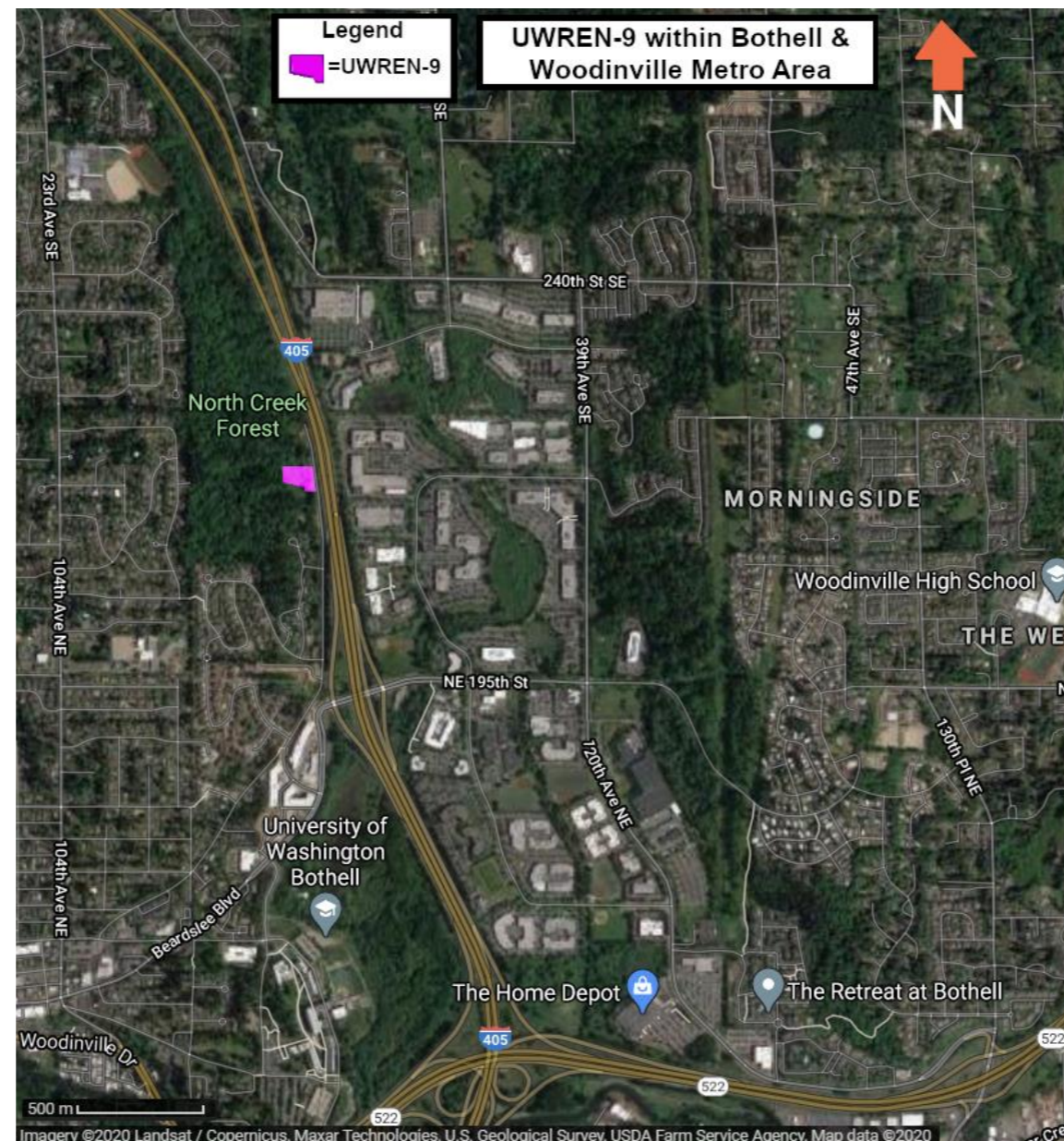
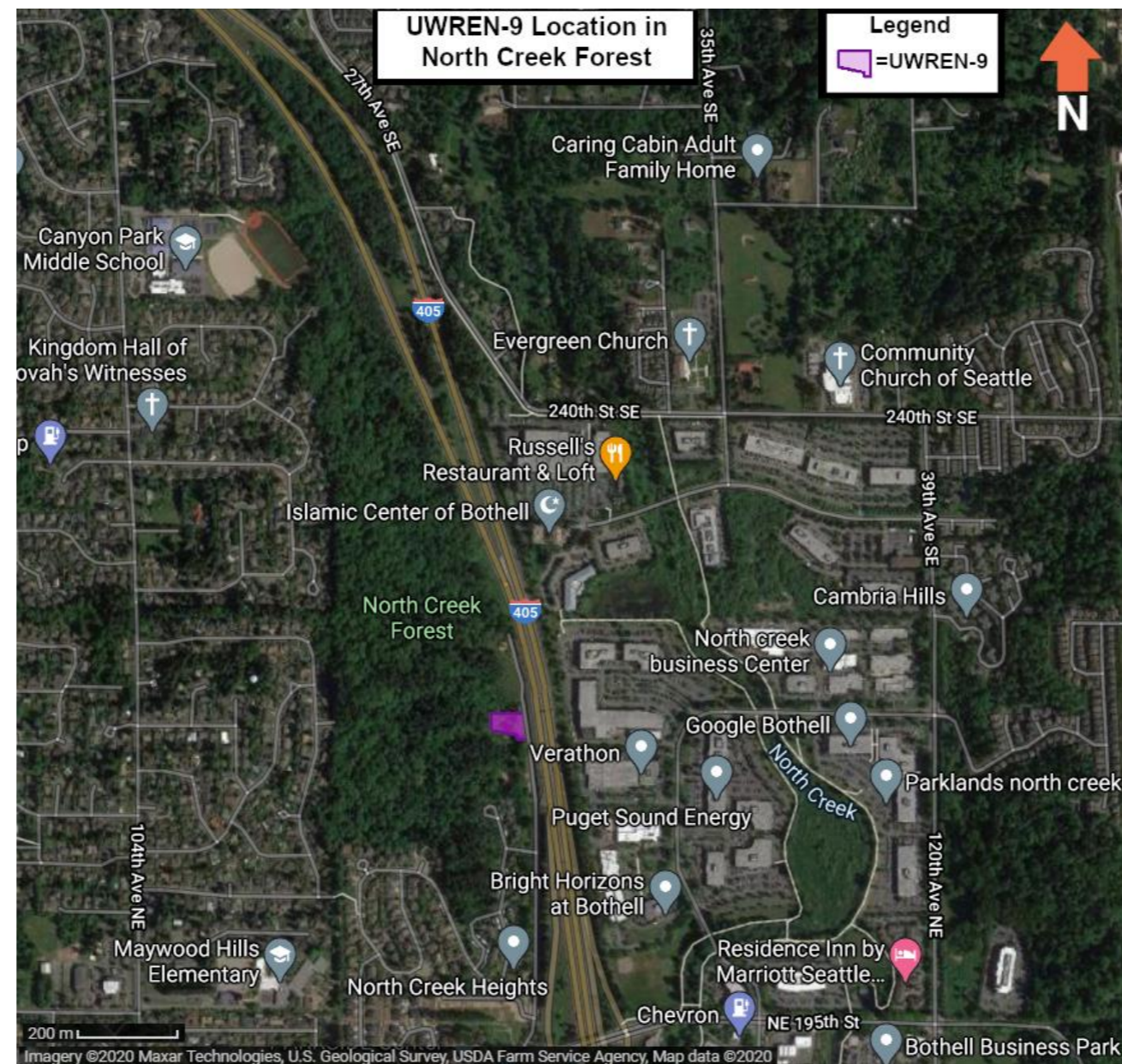


Figure 2: The location UW-REN 9 within the North Creek Forest



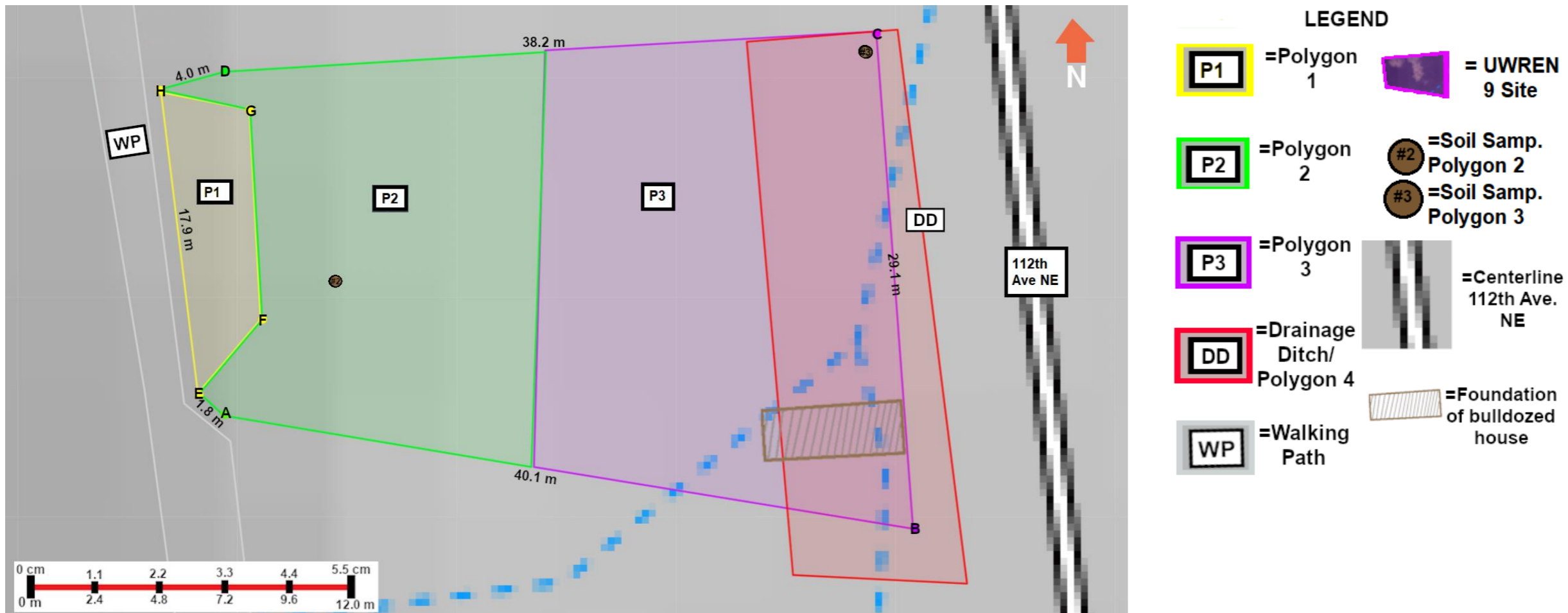
Site Polygons

The group delineated the borders of the polygons for the restoration site based on topography and slope aspect as well as vegetation and the proximity to threatening disturbances like social trails, noise pollution, and the tracking in of invasive species by trail-users. Polygon 1 features the steepest slope spanning from Points E to H (**Figure 3**) with a northern aspect and steepness of 17 degrees in addition to a cluster of relatively distinctive vegetation like paper birch (*Betula papyrifera*) growing between the lower elevated points of E and F toward the southeastern corner of Polygon 1 (**Figure 7**). Polygon 2 features the densest ground cover, but also the least biodiverse vegetation, with blackberry overrunning around 80% of the polygon (**Figure 8**). Unofficial walking paths spanning through the center of Polygon 2 contribute to additional disturbance and the proliferation of invasive species.

The lowest elevated land along with the highest canopy cover from native tree species distinguishes Polygon 3 from the rest; land ranging from Points B to C (**Figure 3**) has the lowest elevation while the greatest concentration of red alder (*Alnus rubra*), Douglas-fir (*Pseudotsuga menziesii*), and big leaf maple (*Acer macrophyllum*), and western redcedar (*Thuja plicata*), grows in this portion of the site (**Figure 7**). However, Polygon 3 arguably features the most disturbance with the remnants of a foundation located in the southeastern corner of the polygon along with runoff flowing from the nearby 112th Avenue NE and

noise pollution from I-405. The group delineated the drainage ditch at the southeastern border of the site as a separate polygon (polygon 4) as the group cannot alter this polygon without permission from the city of Bothell (Figure 3).

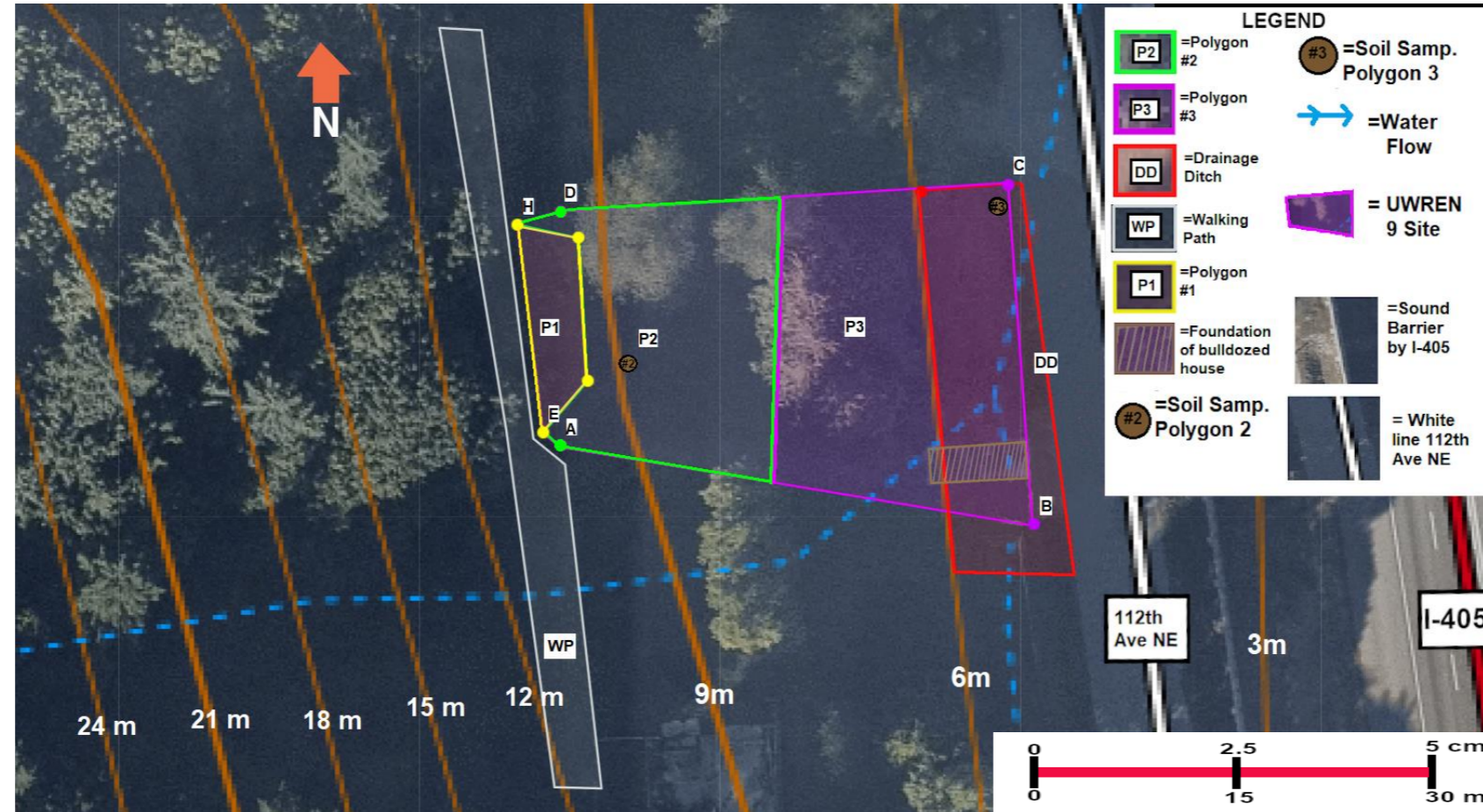
Figure 3: The map below depicts the arrangement of the polygons for the UW-REN 9 Site with the length of the perimeter denoted in black font. The drainage ditch (a.k.a. Polygon 4) overlaps with Polygon 3 and does not pertain exclusively to the ditch.



Topography

UW-REN 9 is at the bottom of an eastward facing slope on the east side of North Creek Forest. As can be seen in our topographic map (**Figure 4**), the polygons themselves do not experience significant elevational changes, but at the western border and beyond is a steep consistent climb by polygon 1. The fourth polygon is a drainage ditch that also marks the border between the paved road and the site.

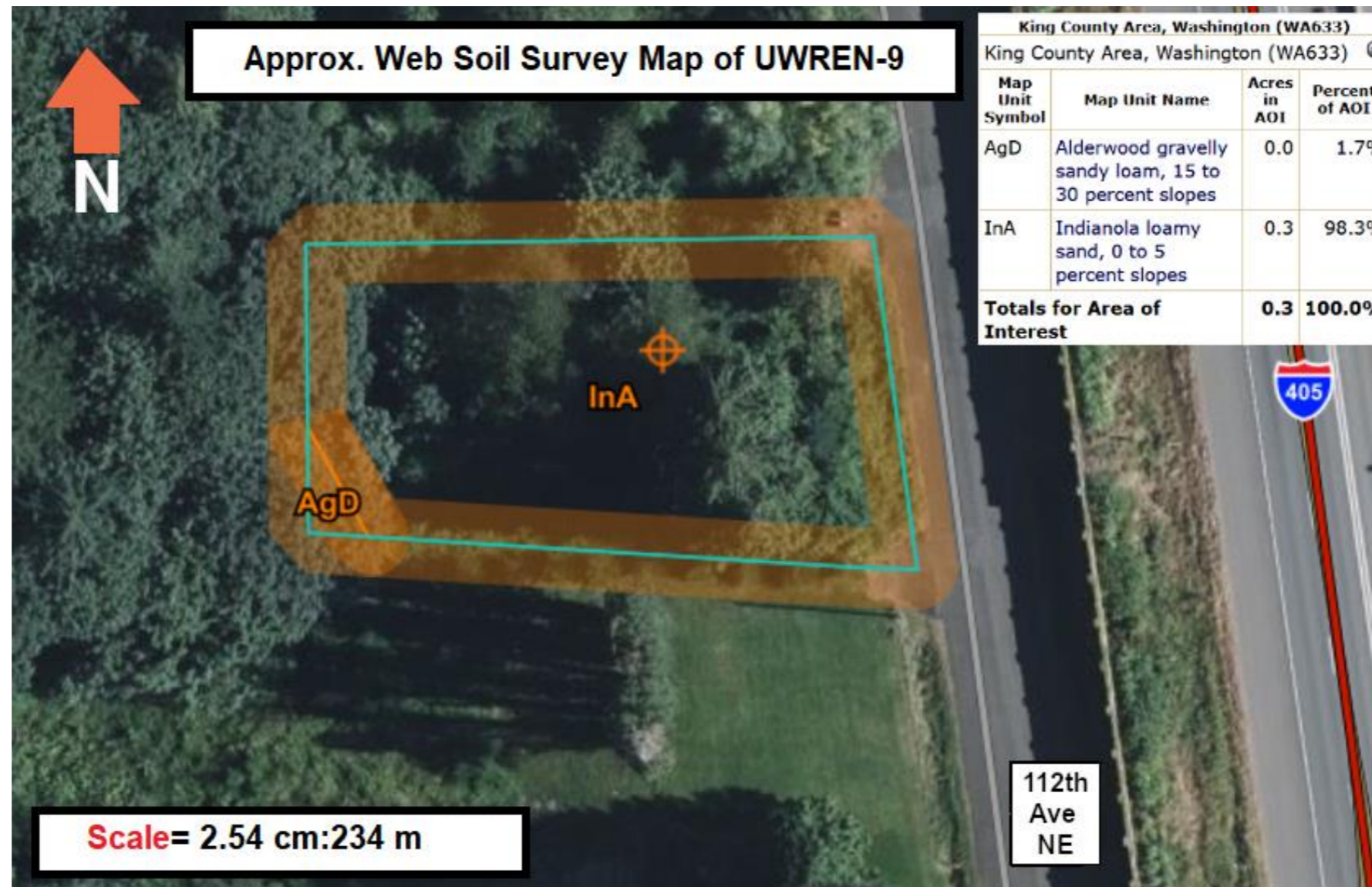
Figure 4: The topography of UW-REN 9 is gently sloping with points E to H constituting the steepest slope measuring 17 degrees.



Soils

No macroinvertebrates were found in the site's Indianola loamy sand soil. Little topographic or hydrologic variation in the site manifests in the uniformity of the polygon's soil. Heavy sand and gravel content in the soil is the result of the geologic history of glacial outwash deposits in the North Creek Forest³. With sufficient soil moisture but high soil compaction, planting and digging are expected to be difficult.

Figure 5: The figure below shows the soil series found at an approximation of the UW-REN 9 site according to the USDA Web Soil Survey of 2020. The Indianola Loamy sand series comprises the vast majority of the site, although relatively higher elevations (like Points E and A) (**Figure 3**) may contain the Alderwood gravelly sandy loam series¹². The group only managed to take two soil samples from Polygons 2 and 3 (**Figures 3,4, and 6**), and these samples most likely constituted Indianola Loamy Sand due to the lower elevation of the sampling sites.

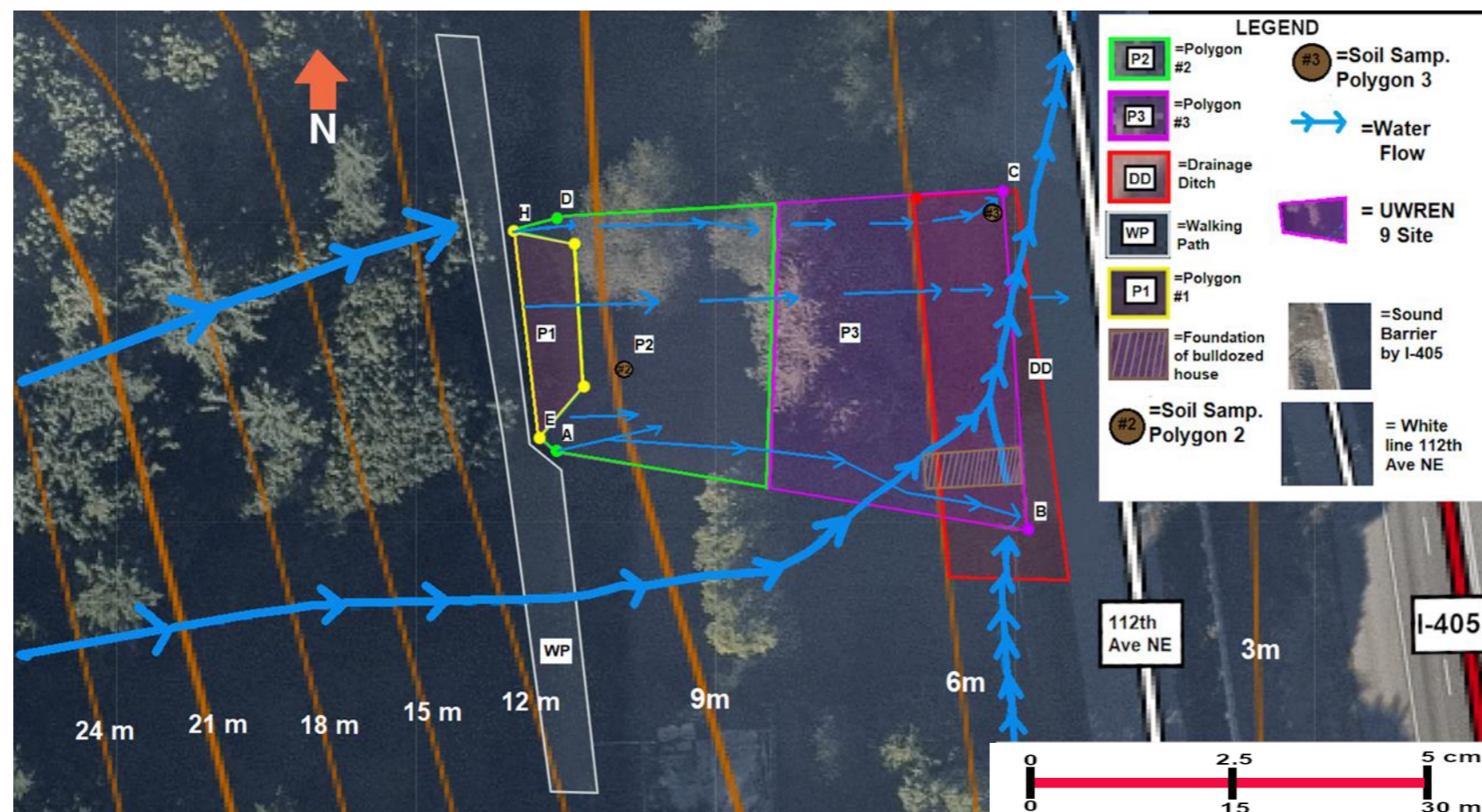


Hydrology

The UW-REN 9 site exists in upland forests nearby a formerly extensive wetland. Loggers and developers drained and filled in the wetland and restricted the North Creek floodplain through straightening and diverting the path of the river with a series of levees and culverts⁷. Consequently, water from North Creek now flows under I-405 and North Creek Forest filters that water instead of the stream water getting filtered through the preexisting wetland and floodplain⁷. Runoff and sediment transport come from catch-basins by roadsides located adjacent to developments to the west of North Creek Forest while runoff and sediment from the west gather at the eastern edge of the forest, where culverts transport the runoff and sediment under I-405 to North Creek and its surrounding wetlands⁷. The runoff which passes through the sandy soils characterizing North Creek Forest ultimately flows into the Sammamish River and Lake Washington⁷. Previous restoration projects determined that a lack of drainage infrastructure underneath North Creek Forest contributes to excess runoff and sediment deposition at the eastern edge of the forest⁷. Planting native vegetation to control sediment transmission and discharge (particularly at the low-lying eastern edge of the site bordering the drainage ditch) would mitigate water pollution by reducing peak discharge during high precipitation events or the spring ice melt. Greater vegetation cover especially is significant considering the low water holding capacity of the sandy and gravelly soils characterizing North Creek Forest; sandier soils have a much more limited capacity to filter rapidly infiltrating water compared to soils with a greater silt and clay content.

Regarding the UW-REN 9 site specifically, the relatively level elevation of the site combined with the well-drained soils is anticipated to minimize the likelihood of excessive erosion and runoff water pooling at the site. However, surface and groundwater will likely flow from higher elevations like Points E to H at the western boundary of the site (**Figure 6**) to the lower lying eastern edge of the site ranging from Points C to B (**Figure 6**). This lower elevated segment of the site represents the drainage ditch and there is a possibility major precipitation events or greater spring melting may cause the culvert to overflow and street water runoff to be transmitted from the south through 112th Ave NE and the western housing developments. Planting stabilizing vegetation like slough sedge (*Carex obnupta*) and Pacific willow (*Salix lucida*) will be necessary to mitigate erosion during succession.

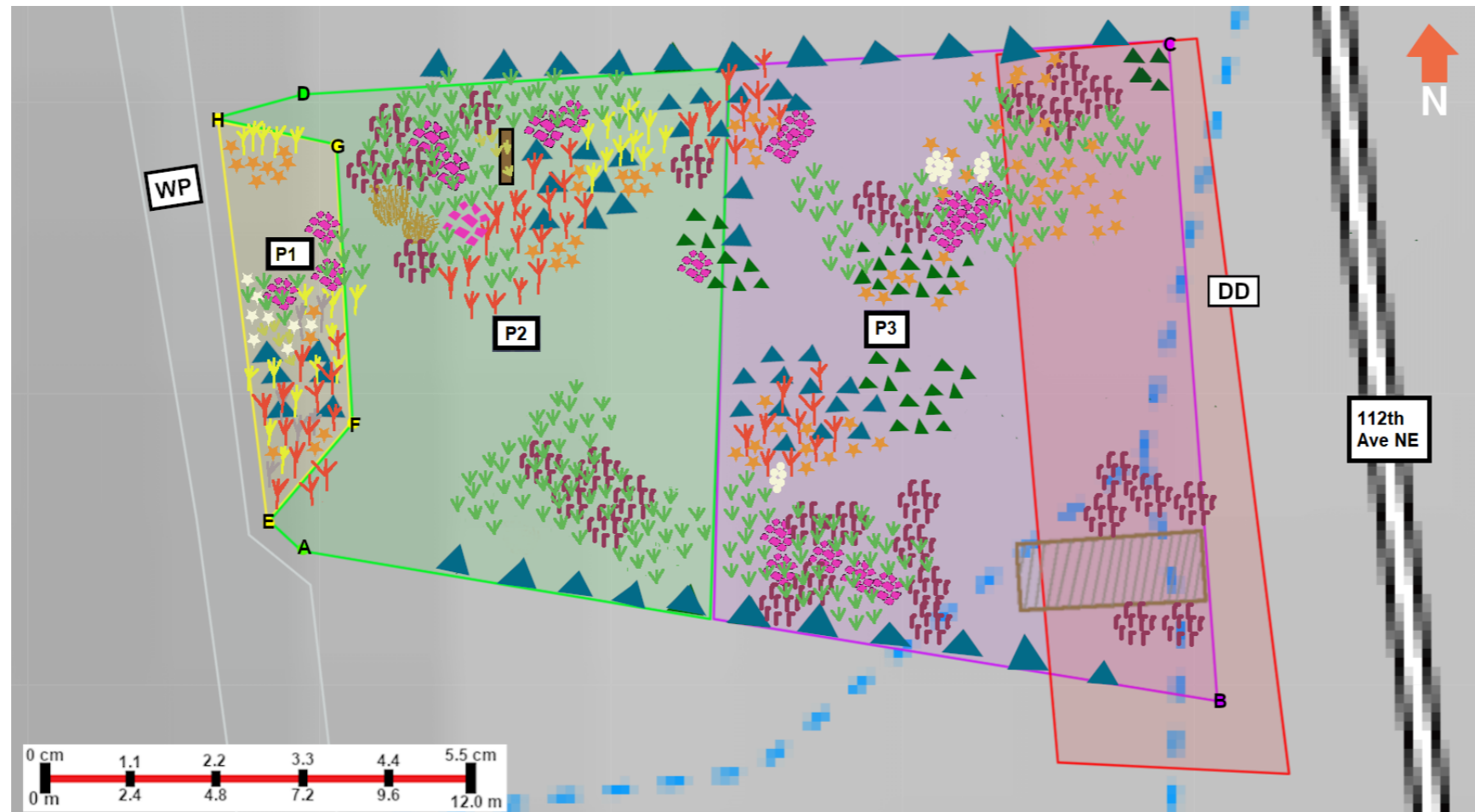
Figure 6: Immediately outside the site, water flows from a plateau situated to the west down relatively steeper hillsides before collecting at low points like B and C located adjacent to the drainage ditch. Internally, water flows from higher points like E, A, and H to lower segments of land situated to the east like points B to C. The thicker blue arrows outside the site indicate the greater waterflow from developments to the west and south of the site while the thinner blue arrows denote the smaller amount of surface runoff internally.



Vegetation

Himalayan blackberry (*Rubus armeniacus*) dominates most of the site. It is particularly dense in polygons 1 and 2 (Figure 8). Woven amongst the invasive blackberry are native species including Youth on Age (*Tolmiea menziesii*), Nootka rose (*Rosa nutkana*), and vine maple (*Acer circinatum*). Invasive species are less prevalent in polygon 3 due to native western redcedar (*Thuja plicata*) providing significant shade. Polygon 4 contains some Himalayan blackberry, but is comprised mostly of invasive reed canary grass (*Phalaris arundinacea*). Native vegetation in the form of sword fern (*Polystichum munitum*), licorice fern (*Polypodium glycyrrhiza*), western redcedar, paper birch, red alder (*Alnus rubra*), and various native maples are present on site (Figure 7) and could potentially thrive again.

Figure 7: The map depicts the distribution of native species throughout the site. Native shrubs appear to cluster adjacent to native conifer and deciduous trees. Rows of Douglas-fir planted by a previous restoration project delineate the northern and southern site boundaries. The vegetation symbols denote generally located clusters & not a specific number of individuals.



Native Species Legend

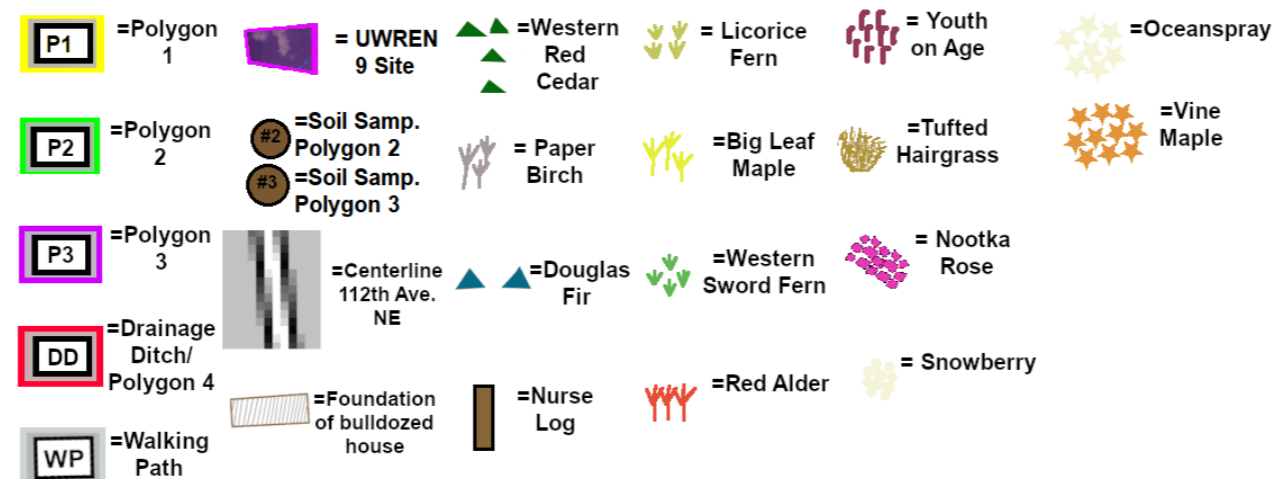


Figure 8: Invasive species like Himalayan blackberry clearly overwhelm the site and crowd out space for native seedlings. Polygon 2 is dominated the most by invasives plants percentage-wise out of all the other polygons. Polygon 3 features the least biodiverse groundcover because of shade provided by the Western Red Cedars. Segments of the site immediately bordering human activity remain overrun with invasive species while the center contains more indigenous species. General clusters of vegetation are shown and not individuals.

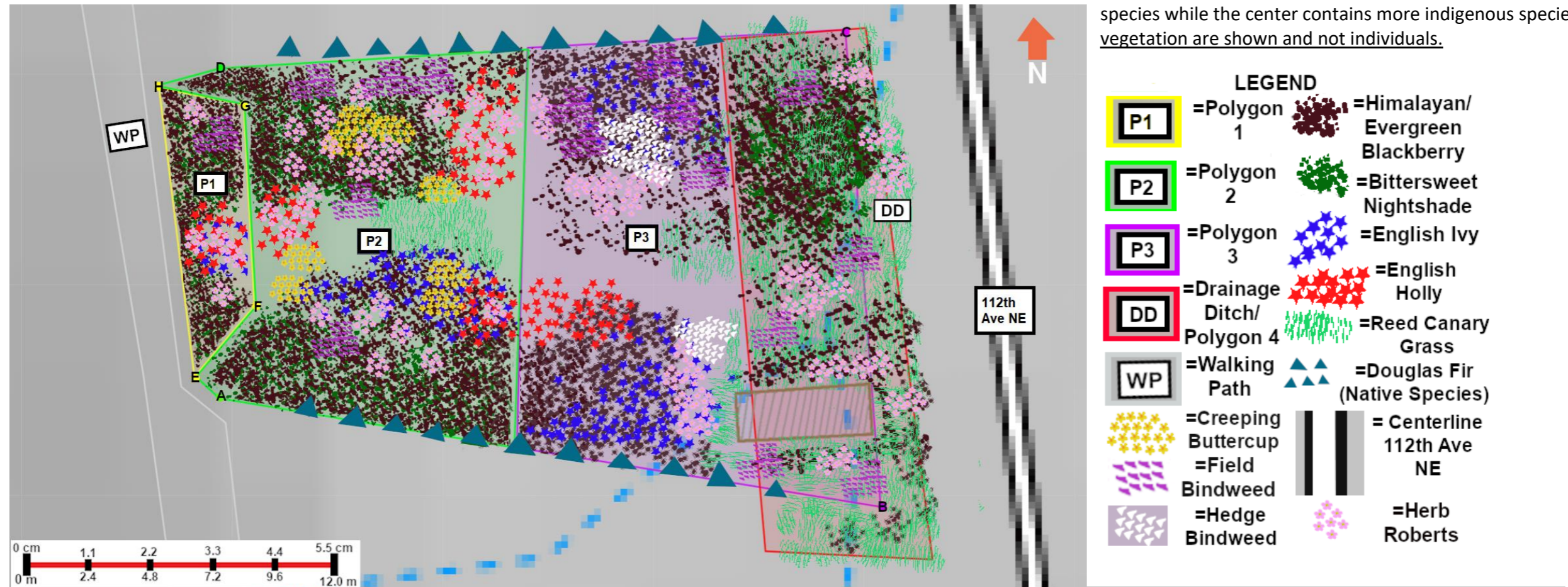


Table 1: Native & Invasive Species Found at UW-REN 9

Species' Common Name	Species' Scientific Name	Polygon(s) Species Found	Native or Invasive?
Big Leaf Maple	<i>Acer macrophyllum</i>	1,2	Native
Douglas-fir	<i>Pseudotsuga menziesii</i>	1-3	Native
Licorice Fern	<i>Polypodium glycyrrhiza</i>	1,2	Native
Nootka Rose	<i>Rosa nutkana</i>	1-3	Native
Ocean spray	<i>Holodiscus discolor</i>	1	Native
Paper Birch	<i>Betula papyrifera</i>	1	Native
Red Alder	<i>Alnus rubra</i>	1-3	Native
Snowberry	<i>Symphoricarpos albus</i>	3	Native
Sword Fern	<i>Polystichum munitum</i>	1-4	Native
Tufted Hairgrass	<i>Deschampsia cespitosa</i>	2	Native
Vine Maple	<i>Acer circinatum</i>	1-4	Native
Western Red Cedar	<i>Thuja plicata</i>	2,3	Native
Youth on Age	<i>Tolmiea menziesii</i>	1-4	Native
English/Common Ivy	<i>Hedera helix</i>	1-3	Invasive

Species' Common Name	Species' Scientific Name	Polygon(s) Species Found	Native or Invasive?
Creeping Buttercup	<i>Ranunculus repens</i>	2	Invasive
English/Common Holly	<i>Ilex aquifolium</i>	1-3	Invasive
Field Bindweed	<i>Convolvulus arvensis</i>	1-4	Invasive
Hedge Bindweed	<i>Calystegia sepium</i>	3	Invasive
Herb Roberts	<i>Geranium robertianum</i>	1-4	Invasive
Himalayan Blackberry	<i>Rubus armeniacus</i>	1-4	Invasive
Reed Canary Grass	<i>Phalaris arundinacea</i>	3,4	Invasive

Disturbances & Landscape Context

Polygon 1 has trails bordering its north and south edges. In Polygon 1, any groundcover could be trampled by walkers. The slope polygon 1 is situated on allows water to flow from its uppermost points down to polygon 3.

Polygon 2 contains an unofficial footpath leading to the trail. Runners and dog walkers traffic this area extensively. Species planted here run the risk of being crushed by people and pets. Polygon 2 also has the most litter of the polygons, including the remnants of a structure's concrete foundation.

Polygon 3 lies underneath the shade of western redcedars. Contrasting with the topographically higher polygon 1 and 2, this polygon should experience relatively less foot traffic than the others.

Polygon 4 is a drainage ditch managed by the City of Bothell which is mowed biannually. This repeated disturbance will make any planting dependent on what can survive through mowing. Polygon 4 also borders the road, so littering and foot traffic is a daily potential disturbance. Authorization from the city is required to modify this polygon.

Project Challenges

The most significant challenge is also the primary objective: removal of Himalayan blackberry. Due to its pioneering nature, even after removal this species can repopulate quickly. Care must be taken to ensure blackberry is unable to regain a foothold until succession has reached a shady stage that is anathema to its growth. The removal of all invasive species presents an arduous physical challenge. Manual removal methods must be employed, as the North Creek Forest drains ultimately into salmon habitat preventing the use of herbicide.

The continually changing societal landscape caused by the current pandemic presents variable and unforeseeable challenges. In addition to the uncertain nature of the pandemic, organizing the necessary manpower to carry out the physical labor necessary will be problematic, but still vital to project success.

STAKEHOLDERS

Community Partner(s)

Friends of the North Creek Forest (FNCF)

The UW-REN- (work plan will be approved, supported, and facilitated with the assistance of the FNCF. Over the years, the stewardship plan will be executed by FNCF's volunteers. Sarah Witte, the president of FNCF's board, has stated that Polygon 1 and 2 should display pacific Northwest diversity. Areas of invasive species should be removed and mulched. The selection of native vegetation will be based on the plant success of past FNCF and UWREN collaborative projects. The community group has also requested we close off possible trails throughout the site to decrease human disturbance of newly planted vegetation.

Other Stakeholders

1. UW-REN Capstone Course:

Our capstone program has developed Covid-19 safety measures of working parties of 5 or less, wiping down all tools after singular use, and other procedures to prevent the potential spread of the virus. Along with matching professionalism and planning efforts of previous UW-REN North Creek Forest teams, the team will be held to a standard of quality, timeliness, and completion at all phases of the project.

2. City of Bothell

Hydrogeology efforts of the site should support erosional standards set in place by the city. Ultimately, the City of Bothell is the landowner and manager of the North Creek Forest. Any project design and implementation will need to be approved by the City of Bothell because they have final say over what happens to our site.

3. Neighbors, Park-users, and Educators

People who use the site for dog walking, trails, and educational purposes also dictate the planning choices we make for the site. The view of the site from trails and the functionality of the site for education depend on the needs of park-users. The neighboring homes also have communal opinion on the eventual restoration outcomes of the entire site.

FUNCTIONAL REQUIREMENTS and CONSTRAINTS

Functional Requirements

Functional Requirement 1: Improve biodiversity and potential growth of native vegetation typical of North Creek forest.

- **FR 1-1:** Install understory of native understory plants in successional advanced shaded microsites.

Functional Requirement 2: Suppression of non-natives in the North Creek Forest.

- **FR 2-1:** Removal of invasive species.
- **FR 2-2:** Implementation of invasive suppressing mechanisms.

Functional Requirement 3: Control erosion of soil.

Functional Requirement 4: Plant and display collection of species native to the Puget trough ecoregion throughout most visible portion of site.

Constraints

1. Constraints of the drainage ditch in Polygon 4 include the inability to plant species that would impede the processes of drainage. We are also constrained by the ability of any species planted in Polygon 4 to be able to survive the bi-annual mowing by the city of Bothell.
2. In other polygons, mulching would follow the removal of invasive species. Any removal performed in and around the drainage ditch can not be followed up with mulching, as it would prevent the drainage.
3. Time constraints control what we can accomplish with quality and completeness during winter and spring academic quarters.
4. Following the UW-REN and FNCF Covid-19 standards, groups cannot contain more than 5 people, including volunteers.
5. The dilapidated foundation seated in Polygon 2 and 3 poses planting, mulching, and safety constraints.
6. To avoid exceeding the project budget careful reclamation of viable native plants from other NCF UW-REN will be necessary to meet vegetation density goals.

RESTORATION APPROACH

Our goal is to restore UW-REN 9 to a state that is indistinguishable from an untouched section of North Creek Forest (FR 1-1). The area is currently dominated by Himalayan blackberry with significant populations of English ivy and common holly (*Ilex aquifolium*) as well. These species will be removed by hand, including below ground where possible to avoid herbicide use (FR 2-1), with their remnants covered by a thick, coarse wood chip mulch layer (FR 2-2). Due to the slope of the site, jute cloth will be used underneath the wood chip mulch in the more steeply sloped southern area of polygon 2 to mitigate erosion displacement of the mulch. Native short growth form salal (*Gaultheria shallon*) will be planted to combat erosion but require the mulch until they become established (FR 3). A handful of native species present on site represent climax species for the area: western redcedar and red alder. To encourage the success of these species' reproductive processes, native pioneer species like salmonberry (*Rubus spectabilis*) and paper birch will be planted to combat re-establishment of invasive species² (FR 4).

The successional stage each polygon is in differs, making species selection polygon dependent. Native "showy" plants will be installed along the community-facing southern border of the site to encourage stewardship of the site and bar access to its interior (FR 1-1) such as Nootka rose and western bleeding heart (*Dicentra formosa*). Additional native species will be selected with these characteristics in mind (FR 4).

The combination of invasive removal with native, succession minded plantings should allow currently present fauna to persist, as well as provide future sources of features to ensure a diverse habitat.

ENVIRONMENTAL FUNCTIONS

North Creek Forest is an upland forest ecosystem, which are "vital components that regulate the water regime of entire landscapes." Climax tree species act as an invaluable carbon sink and provide habitat for native fauna as well as shade tolerant flora (FR 1-2). Large woody debris deposited from the tree community provides habitat diversity necessary to support an array of native creatures from Douglas squirrels (*Tamiasciurus douglasii*) to red-tailed hawks (*Buteo jamaicensis*). Detoxifying and cooling water prior to its arrival in stream systems is equally crucial to local fish, salmon in particular. A thriving upland forest provides shade to help keep water temperatures down, and the soils enriched by nutrients from the forest's flora and fauna act as a filter.

In addition to the above services, the North Creek Forest lies directly in the Pacific Fly-way, "one of four major North American migration routes for birds, especially waterfowl, and extends from Alaska and Canada, through California, to Mexico and South America."⁸ Wood ducks (*Aix sponsa*) and UW-Bothell's very own crow population are among the birds that make use of this ecosystem. Reparation and maintenance of this site will ensure crucial migration habitat is available to avian species.

RESTORATION OUTCOMES

The FNCF's representative has indicated that efforts to reduce blackberry spread have been ineffective in most UWREN sites. Unless every root is sought out and removed, the invasive species will inevitably take hold of an area even after it's dugout and mulched. Since by June our team will have left the site in the care of others, it will be someone else's responsibility to look after it. If the FNCF observes the regrowth of blackberries after June, there's a potential that having volunteers act quickly will curb the development. Within the first few years after the restoration it is not expected for the site to be brimming with native life, as whatever will be planted will not have had a chance to grow into adulthood yet. The first few years may look rather bland and empty, but that is only because of the extensiveness of what was removed.

SHORT-TERM PROSPECTS

Estimating how Puget Trough ecoregion will respond to climate change in the future will partially dictate the success of our site. The North Creek Forest is seated next to a system of highways, indicating pollution will inevitably affect the niche ecosystem of the North Creek Forest's hydrological processes. As the city of Bothell develops, the North Creek Forest's foot traffic will also increase to match the growing number of people searching for an inner-city nature park.

LONG-TERM PROSPECTS

In the next few hundred years, we expect the conifers we plant to become mature. Introducing the North Creek forest to successional advanced hardwood and softwood canopy will increase biodiversity compared to the current forest. The dense understory of shrubs, ferns, and salal will hopefully outcompete non-natives like blackberries. Any non-native grasses trampled by trail-use will hopefully be maintained by the FNCF to prevent domination over native grasses.

PROJECT CHALLENGES

The difficulties of having personal space restrictions and total occupant limits are likely to continue through the Spring. Constraints on transportation, time spent on site, and access to the community help are present that did not exist during the previous years. These factors along with the changing colder weather to be expected during the winter will hinder any amount of significant work to be accomplished. In the worst case, there is a potential that one of the team members or someone from the community could get infected with Covid-19. On the less severe side, invasive roots could be overlooked that needed to be removed, native plants may get mistaken for invasive ones and get removed accidentally, and the site could be disturbed during restoration by park-users.

PROJECT SCHEDULE

Table 2:

Gantt Chart for North Creek Forest									
Total Hours in Capacity = 1,000									
TASK NAME	Effort (in hours)	November	December	January	February	March	April	May	June
Removing invasives									
Removing Him. Blackberries	475	10	15	100	150	200			
Removing Holly	15			15					
Removing Nightshade	15		5	5	5				
Removing Ivy	15		5	5					
<i>Schedule volunteers</i>	20		5	5	5	5			
Planting native plants that assist with erosion control									
Plant following vegetation:									
Slough sedge(<i>C. obnupta</i>)-Early successional planting	90			30	30	30			
Shallon(<i>G. shallon</i>)	90			30	30	30			
Henderson's sedge (<i>C. hendersonii</i>)	60			20	20	20	20		
False lily of the valley (<i>M. dilatatum</i>)	50			25	25				
Introduce large woody debris	50					25	25		
<i>Schedule volunteers</i>									
Prevention of invasives									
Adding Wood mulch	30			15	15				
Planting Native Understory Species	50			25	25				
<i>Schedule volunteers</i>	10			5	5				
Address stormwater runoff									
Install filtering-capable plant species (i.e salmonberry)	20						10	10	
<i>Schedule volunteers</i>	10						5	5	
Color indication:									
	Follow along for progress (monitoring)								
	Native plants of interest for erosion control								
	Invasive plant of the highest interest/priority								

The timeline for this project began in September 2020 and would see its completion in June 2021. Due to extreme events—particularly a large-scale pandemic—project timelines would need to be adjusted along with precautionary measures. Regardless, the North Creek Forest UW-REN team plans to move with full capacity in restoring the integrity of this forested site within a realistic timeframe. The primary tasks in relation to North Creek Forest rely on cutting out invasive species and replacing them with native vegetation. Further tasks, as listed in the Gantt chart, involve scheduling and coordinating with volunteers, keeping

out invasive species (using mulching, planting understory trees etc.), and addressing stormwater runoff. Upon coordination with Friends of North Creek Forest and scheduling volunteers to start work parties, the process of removing invasive species will start at the end of December. This would focus mainly on the removal of Himalayan blackberry through January. Removal of other invasive plants such as common holly and ivy will be accomplished in the same time frame. The end of December is also when the final proposal will be tendered. Scheduling volunteers occurs primarily from December to February and with adjustments made as necessary in the months following. Planting of native plants such as salal will be focused in the months of January to April; plants that prevent erosion will be given highest planting priority. Coarse wood chip mulch will be utilized in conjunction with all planting to aid erosion prevention. During Spring quarter most of the focus will be on planting understory trees. Following these plantings during the months of April and May, stormwater runoff would be addressed by the introduction of filtering capable plant species like salmonberry. The end of this quarter will mark project's end, prior to which an "as-built" report and stewardship plan will be completed. The finishing touches of the project involving poster and presentation will be completed during June.

PROJECT BUDGET

Table 3:

Tentative Project Budget – Established Fall Quarter 2020

Expenditures November 2020 – June 15, 2021

	Cash	In-kind	Total
1. Plants	\$300	\$400	\$700
2. Gardening Tools	\$130	\$625	\$755
3. Mulch	\$200	\$400	\$600
4. Professional Student-staff		\$25,000	\$25,000
5. Volunteer Labor		\$2,100	\$2,000
6. Presentation Materials	\$100		\$100
7. Work party supplies	\$20	\$100	\$120
Total	\$750	\$ 28,525	\$29,275

Notes:

1. Plants will be purchased from UW-REN nursery, and further plants would be provided by the Friends of North Creek.
2. Gardening materials are donated from UW-Ren, taken from a shed belonging to Friends of North Creek, purchased by team member Nicole, purchased by team member Rachael, and donated by team member Anisha's dad.
3. Mulch would be donated by Friends of North Creek, but more can be purchased with direct cash, delivery would have to be paid with direct cash as well.
4. 5 student associates X 200 hrs. (targeted goal) X \$25. Field hours are subjective to change per Covid-19 guidelines.

5. \$10 per hour X 5 people team X 3hr events X 2work-party events per month X 7 months= 2,100 (subject to change per Covid guidelines).
6. Necessary funds set aside for the presentation in early June (funds to be used in creating presentable workspace for our annual capstone project).

Table 4:

Revenue November 2020 – June 15, 2021

	Cash	In-kind	Total
1. UW-REN	\$600	\$25,125	\$25,725
2. Friends of North Creek Forest		\$1,400	1,400
3. Volunteers		\$2,000	\$2,000
4. Donation	\$110	\$40	\$150
Total	\$710	\$28,565	\$29,275

Notes:

1. \$600 direct cash provided, in-kind contribution of UW-REN team via work hours (5 student associates X 200 hrs. X \$25), and \$125 of in-kind contribution provided as work-site tools (pruners, buckets etc.).
2. \$500 worth of various gardening tools provided (gloves, wheelbarrow, pruners, buckets, shovel etc.), \$400 dollars for plants, \$400 dollars for Mulch, and \$100 for worksite parties (food and drink).
3. Volunteer hours provided via 5 team volunteer party, subjective to change per Covid-19 guidelines. (Summation of volunteer hours [per estimate] = 5 people team X \$10 per hour X 4 hr events X 10 work-party events= 2,000)
4. \$20 for beverages and \$40 for advanced pruner provided by team member Nicole. \$10 for flags and \$40 dollar another advanced pruner provided by team member Rachel. Further, \$40 in-kind donation of regular pruners provided by team member Anisha’s father.

TEAM QUALIFICATIONS

Nicole Knuebel is a military veteran with 10+ years of supervisory experience. She is an accomplished hiker and wildlife enthusiast, currently in the junior year of a BS in biology at the University of Washington Bothell. She is well-versed in Pacific Northwest botany and Pacific salmon biology.

Prasis Pandey is currently doing his BS in Environmental Science at University of Washington Tacoma while working as a student officer at its International Student Club. He has maintained many student-officer positions in the past through numerous student body organizations, and has experience with public outreach, public relations and marketing.

Kevin Hakala is a UW Seattle senior majoring in Environmental Science & Terrestrial Resource Management. He currently has Associates degrees in Arts & Sciences from Bellevue College and Aviation Maintenance Technology from the Community College of the Air Force. Kevin has spent most of his life in Woodinville which neighbors the North Creek Forest and wishes to preserve the PNW.

Anisha Azad is currently a senior finishing her BS in Environmental Science: Conservation and Restoration Ecology. While attending UWB, she also works as health care aid for the Washington State Department of Social and Health Services. After interning for the Washington Environmental Council and Feeding America, Anisha has experience in coordinating volunteers and community outreach for ecological efforts.

Rachel Kay is currently a senior in the process of completing her BS in Earth System Science at the University of Washington Bothell campus. She additionally is almost finished completing her BA in the interdisciplinary major Law, Economics, and Public Policy. She worked in retail at various pharmacies for the past five years and intends to pursue graduate school related to environmental law and political economy.

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