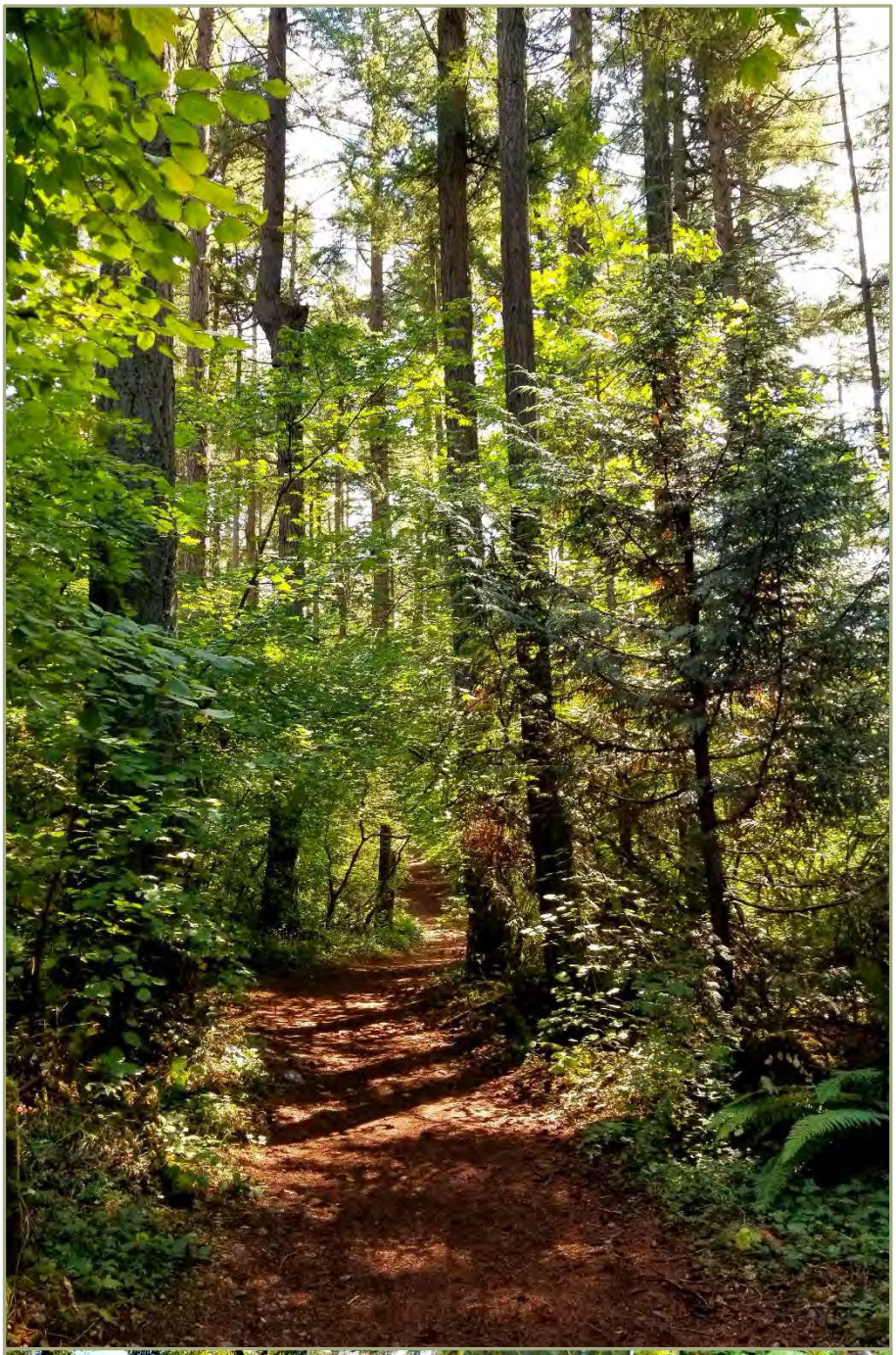
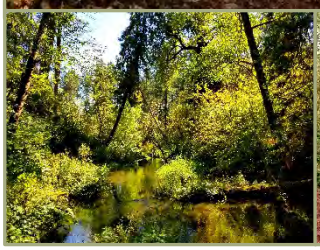
April 2019

Bresemann Forest Vegetation Assessment

Pierce County, WA





LOCAL RESTORATION
EARTH CORPS
GLOBAL LEADERSHIP

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Bresemann Forest Vegetation Assessment

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Parks and Recreation Services Department

Pierce County

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April 2019

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All photos and maps in this report by Nelson Salisbury - EarthCorps 2019

1. Introduction

Pierce County contracted with EarthCorps in 2018-2019 to provide habitat and vegetation assessments for the Bresemann Forest Natural Area. Through this agreement, EarthCorps mapped Bresemann Forest and created habitat Management Zones based on forest type, existing vegetation communities, and topography. In addition, invasive plant species cover or density was estimated for each Zone. The following report summarizes these findings and displays maps for Bresemann Forest.

2. Habitat Mapping and Resource Assessment

The purpose of the forest assessment and analysis was to:

- Create Management Zones for Bresemann Forest based on existing conditions, topography, and species associations
- Assess each Management Zone for dominant invasive species locations and extents

2.1. Management Units

Bresemann Forest was partitioned into areas of similar habitat types based on dominant plant species associations, topography, or other existing features during GPS (global positioning system) assisted field surveys.

These habitat types were adapted from the ecological classification system developed by NatureServe and utilized by the Washington Dept. of Natural Resources (WADNR) and the Washington Natural Heritage Program (WNHP) (Rocchio and Crawford, 2015). These broad habitat types were then further separated based on general or unique species associations within these typings, topography, or other pertinent features. Other park areas that represent developed or landscaped habitat types were also mapped and quantified but were not assigned as Management Units. In Bresemann Forest, these areas include portions within the property boundaries that include paved street rights-of-ways.

The WNHP Ecological Systems describe the general characteristics of forests and natural areas occurring within our region. These typings were developed primarily to describe relatively undisturbed natural areas and therefore do not always correspond to our fragmented and disturbed urban open spaces. The WNHP indicates that ecological system typings should be inferred based on the "conifer species that once comprised the canopy" or on the current shrub or other dominant vegetation composition present (Rocchio and Crawford, 2015).

During this inventory, Zones were also designated a general forest type classification based on the existing vegetation structure and species composition present on site. These general forest and habitat types are displayed in the tables and on the maps below. In this way, we can describe both the existing general conditions as well as make inferences to how active management could affect the future trajectory of the forest.

The WNHP ecological system classifications descriptions (that can be found in the Natural Heritage Report "Ecological Systems of Washington State - A Guide to Identification" (Rocchio and Crawford, 2015)) include U.S. National Vegetation Classification Groups and Associations for each system. These associations could be used in the future to further describe, classify, or create target forest type systems or species associations for restoration objectives.

Tables and maps for Bresemann Forest that show a summary of these broad habitat types are included below. In addition, this information is provided as a GIS feature class layer that includes these data directly associated with each Management Unit. These general Management Unit delineations can be used to plan, prioritize, and track management and restoration efforts throughout the property.

2.2. Assessment Procedures

Each Management Unit was inventoried using a rapid visual assessment procedure to provide a general understanding of the composition of the existing vegetation present throughout the Park. Information collected for each area included dominant native plant species (trees, shrubs, groundcovers), presence of dominant non-native invasive plant species, and the presence of other habitat features or general site characteristics. All field surveys were conducted in November and December of 2018 by an EarthCorps ecologist.

3. Habitat Types and Management Units

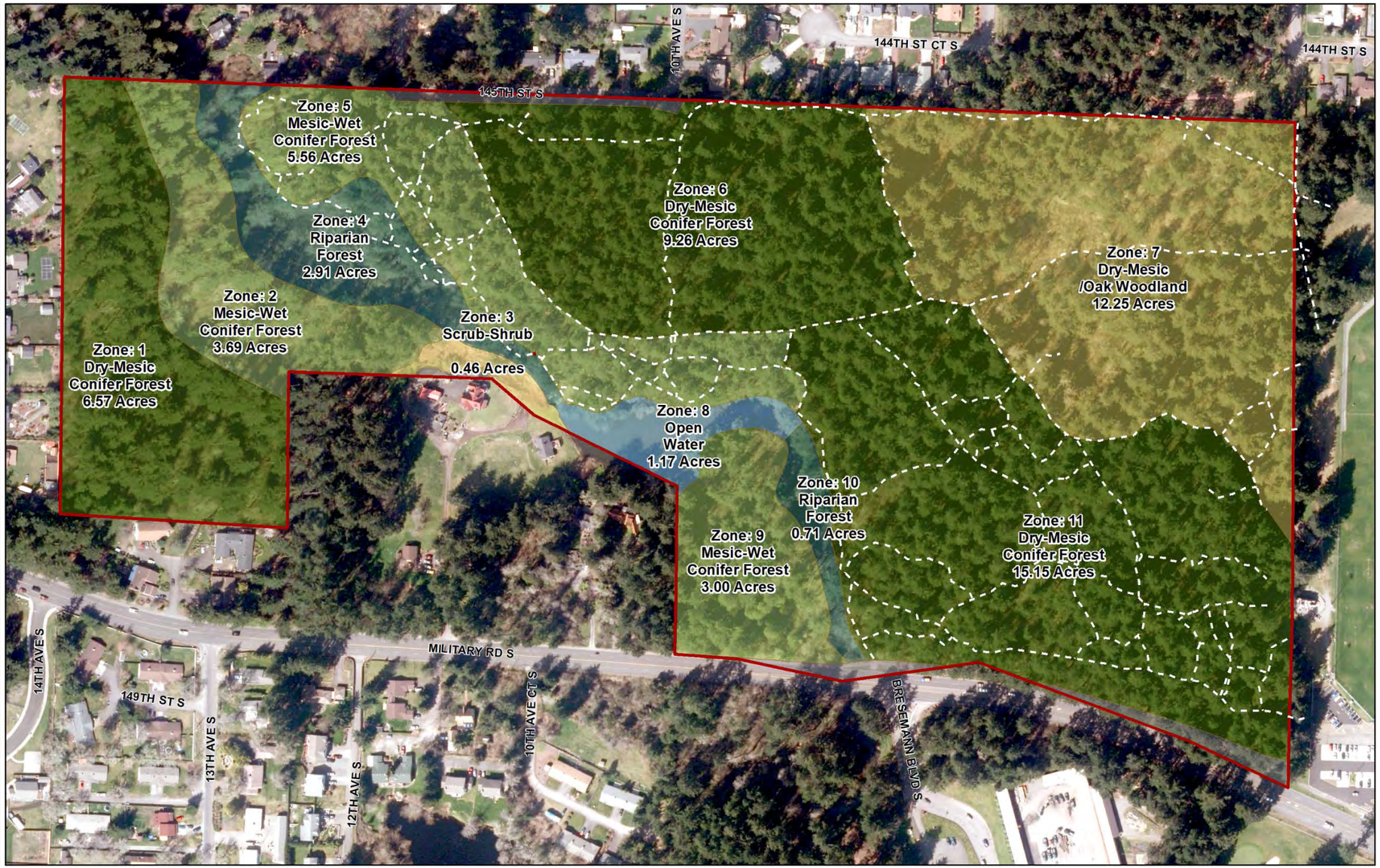
The tables and maps below show a summary of the habitat management units that were created for Bresemann Forest. The table shows the management Unit number, the general habitat type, the Ecological System (adapted from WNHP), dominant species associations, estimated invasive tree density, estimated invasive shrub cover, estimated invasive herbaceous cover, and acres. Dominant species associations are presented as Trees/Shrubs/Herbs with co-dominant species included after a hyphen (-) and notable species indicated in parenthesis. Invasive tree density was estimated as Low (0-50 stems/acre), Medium (50-150 stems/acre), and High (>150 stems/acre). **Appendix A** provides a key to the four letter species codes used in these tables.

3.1. Habitat Management Zones, Species Associations, and Invasive Species - Maps and Tables

Bresemann Forest

Habitat Management Zones and Ecological System Types

Map 1



Legend

- Park Boundary - 61.7 Acres
- Trails

System Type (Acres)

Upland/Forested

- Dry-Mesic Conifer Forest (31.0)
- Dry-Mesic/Oak Woodland (12.2)
- Mesic-Wet Conifer Forest (12.2)

Wetland/Riparian

- Open Water (1.2)
- Riparian Forest (3.6)
- Scrub-Shrub (0.5)

Developed

- Developed (1.0)

N
W E
S

Meters
0 70 140 280

Feet
0 150 300 600 900

1 inch = 230 feet

Pierce County

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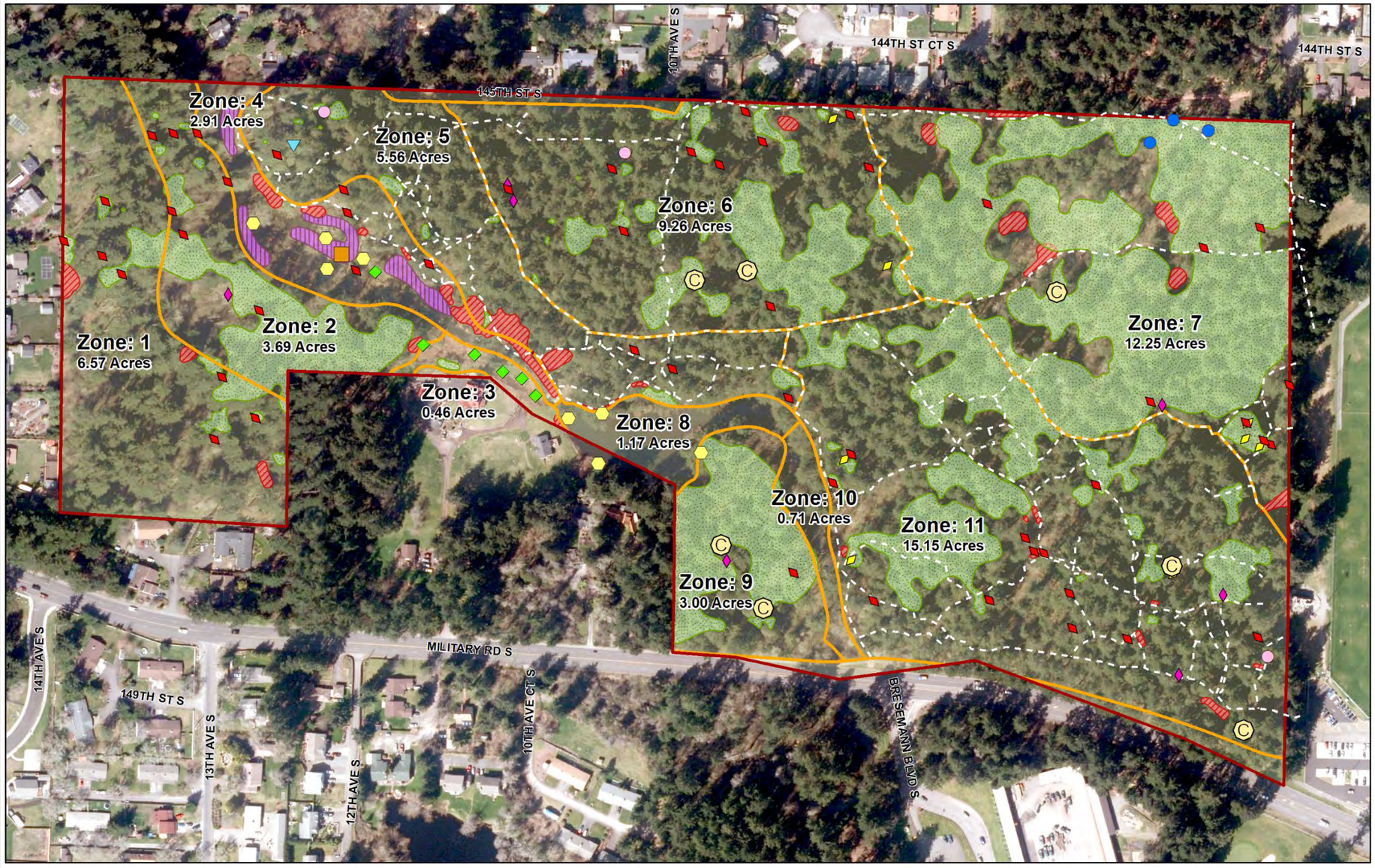
Bresemann Forest

Selected Invasive Species Locations

Map 2



Legend

- Park Boundary - 61.7 Acres
- MGMT Zones
- Trails

Invasive Species Areas (Acres)

- English Ivy - 18.0
- Blackberry - 0.88
- Nightshade - 0.46

Invasive Herbaceous Plants

- Clematis
- Herb Robert
- Knotweed
- Spotted Jewelweed
- Yellow Archangel
- Yellow Flag Iris

Invasive Trees

- English Holly
- Cherry Laurel
- Portugal Laurel

Human Impacts

- Known Encampments

N
W E
S

Meters
0 70 140 280

Feet
0 150 300 600 900

1 inch = 230 feet

Pierce County

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Bresemann Forest

English Ivy Cover by Habitat Management Zone

Map 3

Legend

- Site Boundary - 61.7 Acres
- MGMT Zones
- Trails
- English Ivy - 18.0 Acres

Total appx. percent of Property invaded: **30%**

Pierce County

N
W E
S

LOCAL RESTORATION EARTH CORPS GLOBAL LEADERSHIP

Meters
0 50 100 200

Feet
0 100 200 400 600

1 inch = 230 feet

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Table 1. Bresemann Forest Management Zones and Habitat Types

MU	Habitat Type	Ecological System	Species Association	Invasive Trees	Invasive Shrubs	Invasive Herbs	Acres
Zone 1	Conifer Forest	North Pacific Maritime Dry-Mesic Douglas-Fir Western Hemlock Forest	PSME/COCO-AMAL/RUUR-PTAQ	Low (ILAQ)	0-5% (RUAR, CYSC, BUDA, DALA)	6-25% (HEHE)	6.57
Zone 2	Conifer Forest	North Pacific Maritime Mesic-Wet Douglas-Fir Western Hemlock Forest	PSME-THPL (TABR)/ACCI/POMU-RUUR	Low (ILAQ, PRLU)	0-5% (RUAR)	26-50% (HEHE)	3.69
Zone 3	Scrub-Shrub	North Pacific Lowland Riparian Forest and Shrubland	PSME (Open)/SARA (knotweed)/POMU			26-50% (HEHE, POBO, JAVU)	0.46
Zone 4	Riparian Forest	North Pacific Lowland Riparian Forest and Shrubland	ALRU-THPL (FRLA)/ACCI(PHCA)/ATFI-GLEL	Low (ILAQ)	0-5% (RUAR)	51-75% (SODU, NAOF, IRPS, IMCA)	2.91
Zone 5	Conifer Forest	North Pacific Maritime Mesic-Wet Douglas-Fir Western Hemlock Forest	PSME-THPL/ACCI-OECE (PAMY-VAPA)/POMU-RUUR	Low (ILAQ, AEHI)	0-5% (RUAR)	0-5% (HEHE, GERO, CLVI)	5.56
Zone 6	Conifer Forest	North Pacific Maritime Dry-Mesic Douglas-Fir Western Hemlock Forest	PSME (TABR)/ACCI-MANE (COCO-GASH)/POMU-RUUR (MAST)	Med (ILAQ, PRLU, PRLA)	0-5% (RUAR)	6-25% (HEHE, CLVI, SODU)	9.26
Zone 7	Conifer Forest/Oak Woodland	North Pacific Oak Woodland	PSME (QUGA-ACMA)/COCO (ACCI)/POMU-RUUR	Low (ILAQ, PRLA)	0-5% (RUAR, DALA)	51-75% (HEHE, LAGA)	12.25
Zone 8	Open Water	North Pacific Lowland Riparian Forest and Shrubland			0-5% (RUAR)	0-5% (IRPS)	1.17
Zone 9	Conifer Forest	North Pacific Maritime Mesic-Wet Douglas-Fir Western Hemlock Forest	PSME (TABR-ACMA)/ACCI-MANE (PAMY)/POMU	Low (ILAQ, PRLU)		51-75% (HEHE)	3
Zone 10	Riparian Forest	North Pacific Lowland Riparian Forest and Shrubland	ACMA (PSME)/ACCI-SYAL (RUSP)/POMU-RUUR			0-5% (HEHE)	0.71
Zone 11	Conifer Forest	North Pacific Maritime Dry-Mesic Douglas-Fir Western Hemlock Forest	PSME (TABR)/COCO-ACCI (MANE-PAMY)/POMU-RUUR (MAST)	Med (ILAQ, PRLU, PRLA)	0-5% (RUAR)	26-50 % (HEHE, CLVI)	15.15

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4. Habitat Type and Ecological System Summary

The following sections describe the general characteristics of each habitat type and Ecological System classifications mapped in Bresemann Forest. In addition, general management recommendations follow.

4.1. Bresemann Forest Vegetation Overview

The natural areas at Bresemann Forests are generally comprised of relatively intact, early to mid-successional conifer forests. Spanaway Creek flows through the western portion of the property and associated riparian forests are present along the waterway. This riparian forest represents a relatively narrow band along the banks of the creek where western red cedar and red alder trees generally dominate with a smaller component of Oregon ash trees present. The upland forests are made up predominantly of relatively even-aged Douglas fir trees with smaller components of Western red cedar, big-leaf maple, Oregon white oak, and western yew trees. The understory is generally well developed and made up mainly of vine maple and beaked hazelnut, with salal, Oregon boxleaf, oceanspray, and serviceberry also present and often locally prevalent. The groundlayer is also generally well developed (where English ivy does not dominate) and includes sword fern, low Oregon grape, trailing blackberry, western starflower, and star-flowered Solomon's seal. Licorice fern is common both on the trunks and branches of trees and occasionally on the ground. In addition, various lichens and bryophytes are common and prevalent throughout the forest floor and as epiphytes on tree trunks and branches. Numerous species of fungi were also observed during the inventory.

Generally, the forests transition from a slightly more dry and mesic habitat in the northeast towards wetter and more riparian conditions towards the creek to the southwest (Map 1). The very western portion of the park (west of Spanaway Creek) again rises to drier conditions on the bench above the riparian forest. The drier type forests are typified by Douglas fir dominated canopy with a smaller but substantial component of Oregon white oak. The understory is mainly comprised of typical mesic forest type species including beaked hazelnut, swordfern, low Oregon grape, and trailing blackberry. As the forest transition towards wetter conditions, more western yew and western red cedar are present in the overstory, as well as an understory more dominated by vine maple and other wetter adapted species. Oregon boxleaf is prevalent especially in the central and southern portion of the park on either side of Spanaway Creek. More detailed information on species associations are presented below for each Ecological System type.

The majority of the natural areas at Bresemann Forest are mostly intact, exhibit relatively high native species richness, and have a generally well-developed forest structure and composition. However, invasive species are prevalent and pose a substantial threat to the structure and function of these habitats. Of particular concern is the very high cover of English ivy throughout much of the understory (Map 3). Other concerns include heavy infestations of bittersweet nightshade and yellow flag iris (and lesser amounts of Japanese knotweed) in the

riparian corridor and sparse to sometimes dense invasive tree density throughout (Map 2). The most common invasive tree is English holly with lesser amounts of cherry and Portugal laurel also present. Another concern is the relatively low density of native tree regeneration. Low native conifer tree regeneration is likely a result of heavy English ivy cover, the even-aged nature of the Douglas fir dominated overstory, and the relative lack of coarse woody debris.

4.1.1. Dry-Mesic Douglas Fir Forest

A large portion of the forests at Bresemann Forest were categorized into the North Pacific Maritime Dry-Mesic Douglas-Fir Western Hemlock Forest Ecological System classification and include Management Zones 1, 6, and 11 (Map 1). These forests are generally made up of a somewhat dense, relatively even-aged young conifer forest with a canopy made up predominantly of Douglas fir. The most common shrub in these forests is vine maple, which dominates the understory throughout much of these areas (Photo 1). Other prevalent species include beaked hazelnut, low Oregon grape, and Oregon boxleaf. The groundlayer is generally diverse and comprised of numerous species including sword fern (generally less than 30% cover), trailing blackberry, and star-flowered Solomon's seal. Of particular note in these areas is the relatively high occurrence of mature western yew trees, especially prevalent in the lower, wetter portions of Zone 6 and Zone 11. Oregon boxleaf is also locally common in these areas.

Photo 1: Trail between Zone 6 and Zone 11 showing a well-developed tall shrub layer of vine maple with scattered sword fern.

Zones 6 and 11 make up the central forested area of the property and transition to wetter conditions west towards Spanaway Creek and the related riparian corridor. Zone 1 is generally a drier-type forest situated on the bench along the western edge of the property. In this zone, understory and groundlayer plants include serviceberry, orange honeysuckle, and often dense bracken fern. Scouler's willow and occasional Oregon ash are also present in the mid story here as the forests transition east towards Spanaway Creek. Parts of these forests, especially in the wetter portions of Zones 6 and 11, exhibit transitionary tendencies to the closely related Mesic-Wet system type.

Photo 2: Zone 1 showing relatively open canopy and high cover of bracken fern

English ivy is prevalent in Zones 6 and 11 at 21-23% cover, while Zone 1 is only marginally invaded at this time (Map 3). Other management concerns include small amounts of Himalayan blackberry throughout, some Scotch broom and butterfly bush in Zone 1, and localized occurrences of clematis and bittersweet nightshade in Zones 6 and 11 (Map 2). Some of the highest densities of invasive trees were found in these forests (Map 2 and Table 1). In addition, some localized indications of laminated root rot (or other root rot) were noted on fallen Douglas fir trees in the central portion of Zone 11. Four temporary encampments were noted in Zones 6 and 11 (Map 2).

4.1.2. Mesic-Wet Douglas Fir Forest

The wetter forested areas in the vicinity of the riparian corridor are made up of Douglas fir dominated conifer forests with a substantial component of Western red cedar in the overstory. These areas include Zones 2, 5 and 9 and represent the relatively abrupt transition from the riparian corridor towards more upland conditions. The northern portion of Zone 5 is comprised of large-diameter western red cedars which dominate the canopy here (Photo 3), with an understory of swordfern, osoberry, vine maple, red huckleberry, thimbleberry and patches of vanilla leaf. The southern portion of Zone 5 in contrast is dominated by Douglas fir with more drier-type species present including beaked hazelnut, ocean spray, salal, and trailing blackberry. Zone 2 is located on the relatively steep slopes rising west from Spanaway Creek. This Zone also has some large diameter western red cedar trees in the canopy, as well as some of the

largest western yew trees noted on the property. Zone 9 makes up a somewhat isolated pocket of forest just south of the ponded portion of Spanaway Creek. This area is mostly Douglas fir dominated with some bigleaf maple trees in the canopy. Oregon boxleaf is locally common in this Zone, and a patch of twinflower and rattlesnake plantain were noted here.

Photo 3: Northern portion of Zone 5 showing large western red cedar trees

Zone 2 and Zone 9 are both heavily invaded with English ivy, with 45% and 61% cover estimated respectively. Zone 5 currently has low amounts of ivy (estimated at 3%) scattered throughout the understory (Map 3). Other concerns include scattered Himalayan blackberry throughout and an isolated patch of clematis and herb Robert in Zone 5 (Map 2). Invasive trees are present in relatively low densities with some scattered English holly noted throughout. Two relatively minor encampments were identified in Zone 9 (Map 2). The southeast portion of Zone 5 also includes the Spanaway Creek fish bypass channel and associated habitat restoration.

4.1.3. North Pacific Oak Woodland

Photo 4: Canopy gap showing Oregon white oak and Douglas fir overstory with heavy cover of Himalayan blackberry in the shrub layer.

The forests that make up the northeast portion of the property share many characteristics with the Dry-Mesic system type. This area however has a slightly more open canopy and a much more substantial component of Oregon white oak trees. For this reason, it was separated out as a unique Oak Woodland habitat type. Oak woodlands are becoming an increasingly

rare forest type and have been designated by the Washington Department of Fish and Wildlife as a Priority Habitat (Larsen & Morgan, 1998). Douglas fir is the dominant overstory tree in Zone 7, with smaller amounts of Oregon white oak, bigleaf maple, and western yew. Several large-diameter Oregon white oak trees area scattered throughout the canopy in the central portion of this Zone, with some mid-story and regenerating trees also noted. The shrub layer is generally well developed and made up predominantly of beaked hazelnut and vine maple, with lesser amounts of cascara, snowberry, low Oregon grape, and baldhip rose. The groundlayer is dominated by trailing blackberry with smaller components of sword fern and bracken fern.

Zone 7 has the highest cover of English ivy with an estimated cover of 69% of the zone (Map 3). In addition, there are several patches of dense Himalayan blackberry along the trails and in open canopy gaps (Photo 4). Also of high concern is the well-established patch of yellow archangel on both sides of the trail in the northeast portion of the property (Map 2). English holly, Cherry laurel, and Portugal laurel are also present, especially towards the southeast. A single encampment was noted to be located in the center of Zone 7 (Map 2).

4.1.4. Riparian Forest and Shrubland

The Zones that are directly associated with Spanaway Creek have been designated as the Riparian Forest and Shrubland System Type and are made up of Zones 3, 4, 8, and 10. Zone 8 is primarily made up of open water caused by the ponding of the creek (Photo 5) behind the man-made dam at the juncture between this Zone and Zone 4. Zone 10 is a relatively narrow band including the creek and directly adjacent riparian corridor. The largest portion of the System is made up by Zone 5, which includes the lower-elevation riparian corridor within the floodplain of Spanaway Creek (Map 1). This Zone is comprised of relatively sparse red alder and western red cedar overstory, with some Oregon ash also present. A single large black cottonwood tree was noted along the border with Zone 5 in the west. Native shrubs are generally sparse in this Zone and made up of vine maple and Pacific ninebark, while the groundlayer is comprised of lady-fern with isolated patches of mana grass.

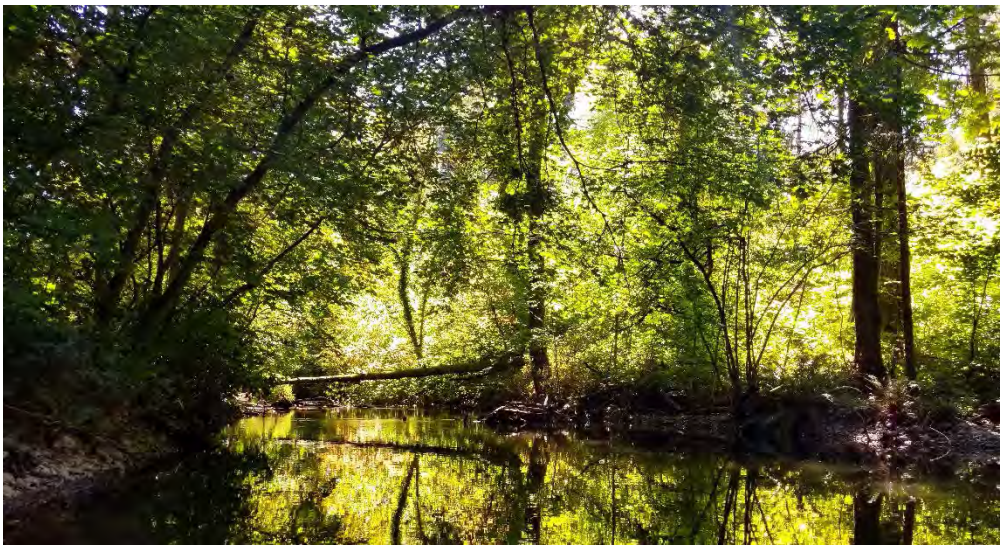

Photo 5: Zone 8 looking south along the riparian corridor of Spanaway Creek.

Much of the understory vegetation in Zone 4 is comprised of non-native and invasive species. The most prevalent is bittersweet nightshade which has invaded substantial portions of the creek corridor and adjacent areas of the riparian zone (Photo 6). Areas of slow moving water have become heavily invaded with watercress. Yellow flag iris and reed canarygrass are also present within the stream corridor, as well as what appeared to be spotted jewelweed. Together, these species can dramatically alter sediment transport and can negatively affect fish access and habitat. Himalayan blackberry is also well established in several places along the edges of this zone and along the banks of Zone 8 (Map 2).

Photo 6: Central portion of Zone 4 showing heavy cover of bittersweet nightshade, scattered yellow flag iris, and watercress in the foreground.

Zone 3 consists of a denuded hillside with little canopy cover and substantial invasive species presence including Bohemian knotweed, English ivy, and tansy ragwort. Some active restoration was noted in this area including some riparian shrub plantings. Over time, this Zone should be actively transitioned towards a more forested system with continued restoration and active management.

5. Management Recommendations

The natural areas that make up Bresemann Forest provide important natural, social, and economic services. These services include: storm water mitigation, flood and erosion control, improved air quality, carbon sequestration, enhanced wildlife habitat, as well as the many other documented benefits to the health and wellbeing of our communities. Forests and wetlands clean and store stormwater runoff, retain sediment, provide groundwater recharge and discharge services, and provide important habitat for a variety of plant and animal species. In addition, these areas also present recreational and education opportunities available to everyone within our community.

The forests and wetlands found on the property represent relatively healthy natural systems with a diversity of habitats and forest types. However, maintaining and improving these natural areas amidst ongoing pressures of disturbance will require a long-term commitment to active resource management.

Encroachment of invasive species, habitat fragmentation, human impacts, and other disturbances make active stewardship vital to maintaining and increasing the natural function of the forests and wetlands on the property. These pressures have hindered natural tree regeneration and compromised the structural integrity and expected successional trajectory of

the forests. Invasive species reduce the overall biodiversity and ecosystem functions of these forests and inhibit native plant growth and establishment. Without active management, invasive species and habitat fragmentation will continue to degrade the health and structure of these natural areas. The following section provides an overview of broad-scale management recommendations to help guide efforts to maintain and increase the health and resiliency of the natural areas at Bresemann Forest.

5.1. Management Priorities

Much of the upland forests and riparian corridor has been heavily invaded with non-native and invasive plant species (Map 2). The highest priority should be to reduce the pressure of these species and work to incrementally remove them from the system over time. High priority consideration should be given to listed invasive species and those species that are directly compromising the function of the riparian habitat.

The following is a recommended list of restoration priorities:

- Removal of tansy ragwort (Class B control required) from Zone 3.
- Treatment of Bohemian knotweed (Non-regulated weed) from Zone 3.
- Targeted reduction and removal of bittersweet nightshade (Non-regulated weed) from the riparian corridor of Zone 4.
- Removal of yellow flag iris (Non-regulated weed) from all areas of the riparian corridor (primarily Zone 4 and Zone 8).
- Removal of yellow archangel (Non-regulated weed) from Zone 7.
- Targeted removal of isolated patches of bittersweet nightshade and clematis (Non-regulated weed) from noted upland areas.
- Targeted control of Himalayan blackberry (Non-regulated weed) from the riparian corridor (Zone 4, Zone 5, and Zone 8).
- Targeted treatment of all invasive trees (English holly, cherry laurel, and Portugal laurel) throughout the property.
- Targeted removal of English ivy (Non-regulated weed) from the trunks and canopies of all trees throughout the property.
- Phased reduction of English ivy from the ground of all zones:
    - Consider first targeting isolated patches (Zones 3, 5, 6 (east), and 11), then systematically removing contiguous areas over time.
- Removal of Himalayan blackberry from all upland areas (Zones 1, 6, 7, and 11).

All areas where invasive species are controlled or removed should be re-planted with site-appropriate plants native to the Pacific Northwest.

In addition, a strategy for reducing the impacts of human disturbance from off-trail use and illegal camping should be considered.

6. References

Larsen, E. M., and J. T. Morgan. 1998. Management recommendations for Washington's priority habitats: Oregon white oak woodlands. Wash. Dept. Fish and Wildl., Olympia. 37pp. http://wdfw.wa.gov/publications/00030/wdfw00030.pdf

Rocchio, F.J. and R.C. Crawford. 2015. Ecological Systems of Washington State: A Guide to Identification. Washington State Department of Natural Resources. http://file.dnr.wa.gov/publications/amp_nh_ecosystems_guide.pdf http://www.dnr.wa.gov/NHPecologicalsys

Appendix A: Species Reference List

List of all plant species noted in the report, red shading and an "X" in the Invasive column indicates that the species is not native to western WA and has invasive tendencies.

Code	Scientific Name	Common Name	USDA Symbol	Invasive
Tree Species				
ACMA	*Acer macrophyllum*	bigleaf maple	ACMA3	
AEHI	Aesculus hippocastanum	horse chestnut	AEHI	X
ALRU	*Alnus rubra*	red alder	ALRU2	
FRLA	*Fraxinus latifolia*	Oregon ash	FRLA	
FRPU	*Frangula purshiana*	cascara	FRPU7	
ILAQ	*Ilex aquifolium*	English holly	ILAQ80	X
POBA	*Populus balsamifera ssp. trichocarpa*	black cottonwood	POTR15	
PRLA	*Prunus laurocerasus*	cherry laurel	PRLA5	X
PRLU	*Prunus lusitanica*	Portugal laurel	PRLU	X
PSME	*Pseudotsuga menziesii*	Douglas fir	PSME	
QUGA	*Quercus garryana*	Oregon white oak	QUGA4	
TABR	*Taxus brevifolia*	western yew	TABR2	
THPL	*Thuja plicata*	western red cedar	THPL	
ACMA	*Acer macrophyllum*	bigleaf maple	ACMA3	
AEHI	*Aesculus hippocastanum*	horse chestnut	AEHI	X
ALRU	*Alnus rubra*	red alder	ALRU2	
FRLA	*Fraxinus latifolia*	Oregon ash	FRLA	
FRPU	*Frangula purshiana*	cascara	FRPU7	
ILAQ	*Ilex aquifolium*	English holly	ILAQ80	X
Shrub Species				
ACCI	*Acer circinatum*	vine maple	ACCI	
AMAL	*Amelanchier alnifolia*	serviceberry	AMAL2	
BUDA	*Buddleja davidii*	butterflybush	BUDA2	X
COCO	*Corylus cornuta*	beaked hazelnut	COCO6	
CYSC	*Cytisus scoparius*	scotch broom	CYSC4	X
DALA	*Daphne laureola*	Spurge Laural	DALA11	X
GASH	*Gaultheria shallon*	salal	GASH	
HODI	*Holodiscus discolor*	oceanspray	HODI	
MAAQ	*Mahonia aquifolium*	tall Oregon grape	MAAQ2	
MANE	*Mahonia nervosa*	low Oregon grape	MANE2	
OECE	*Oemleria cerasiformis*	indian plum	OECE	
PAMY	*Paxistima myrsinites*	Orebon boxleaf	PAMY	
PHCA	*Physocarpus capitatus*	Pacific ninebark	PHCA11	
ROGY	*Rosa gymnocarpa*	baldhip rose	ROGY	
RUAR	*Rubus armeniacus*	Himalayan blackberry	RUAR9	X
RUPA	*Rubus parviflorus*	thimbleberry	RUPA	
RUSP	*Rubus spectabilis*	salmonberry	RUSP	

Code	Scientific Name	Common Name	USDA Symbol	Invasive
RUUR	*Rubus ursinus*	creeping blackberry	RUUR	
SARA	*Sambucus racemosa*	red elderberry	SARA2	
SASC	*Salix scouleriana*	Scouler's willow	SASC	
SYAL	*Symphoricarpos albus*	snowberry	SYAL	
Herbaceous Species				
ATFI	*Athyrium filix-femina*	lady fern		
CAOB	*Carex obnupta*	slough sedge	CAOB3	
CLVI	*Clematis vitalba*	evergreen clematis	CLVI6	X
GLEL	*Glyceria elata*	tall managrass	GLEL	
HEHE	*Hedera helix*	English ivy	HEHE	X
IMCA	*Impatiens capensis*	spotted jewelweed	IMCA	X
IRPS	*Iris pseudacorus*	yellow flag iris	IRPS	X
JAVU	*Jacobaea vulgaris*	tansy ragwort	SEJA	X
LAGA	*Lamiastrum galeobdolon*	yellow archangel	LAGA2	X
LOCI	*Lonicera ciliosa*	orange honeysuckle	LOCI3	
MAST	*Maianthemum stellatum*	star-flowered Solomon's seal	MAST4	
NAOF	*Nasturtium officinale*	watercress	NAOF	X
PHAR	*Phalaris arundinacea*	reed canarygrass	PHAR3	X
POBO	*Polygonum ×bohemicum*	Bohemian knotweed	POBO10	X
POGL	*Polypodium glycyrrhiza*	licorice fern	POGL8	
POMU	*Polystichum munitum*	sword fern	POMU	
PTAQ	*Pteridium aquilinum*	bracken fern	PTAQ	
SODU	*Solanum dulcamara*	bittersweet nightshade	SODU	X
TRLA	*Trientalis latifolia*	western starflower	TRLA6	