

# LBA Woods Stewardship Master Plan



*Photo by M.M. Ruth*

Landowner: City of Olympia Parks, Arts and Recreation

222 Columbia St NW

Olympia, WA 98501

Property: LBA Woods

3333 Morse Merryman Rd SE

Olympia, WA 98506

Prepared Fall 2022 by:

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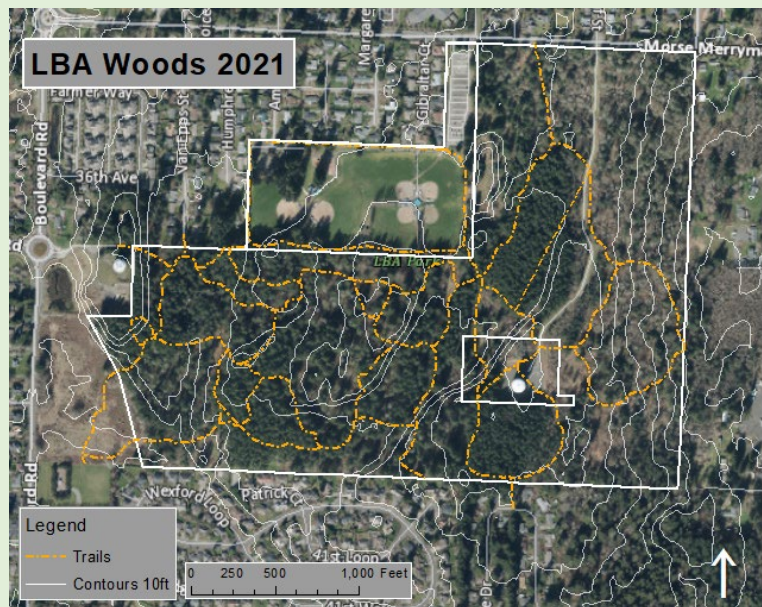
# 1. Introduction

LBA Woods, like many forested parks in our region, faces problems that negatively affect the long-term health of the forest, wildlife habitat, biodiversity, and the ecosystem services the forest provides. The primary problem the park faces is invasive plants that inhibit native plant species from thriving and/or regenerating. To ameliorate these problems, LBA Woods requires active management to remove invasive species, restore plant diversity, increase regeneration, and maintain the structure and function of a healthy forest and several small wetlands.

Notably, the 133-acre park sits atop the convergence of three local watersheds, magnifying the benefits of restoration. A Stewardship Planning Guide will guide efforts and improve efficacy restoration activities to increase forest health; enhance ecosystem services such as retaining storm water to recharge groundwater and reduce flooding events, improve water quality, sequester carbon, and cool and purify our air; increase wildlife habitat and wildlife diversity; and enhance aesthetics of this woodland for park users.

## 1.1 Site Description

The LBA Woods is a 133-acre forested section of LBA Park and is ceded territory of The Squaxin Island Tribe. The 22 acres of LBA Park that is not forested is a community park featuring ballfields, playground equipment, tennis courts, picnic shelters, and restroom facilities. This stewardship plan will focus solely on the LBA Woods portion of the park.



Owned by the City of Olympia, LBA Woods is located in the SE quadrant of the city. Its southern border aligns with the boundary between the City and the Urban Growth Area. Where it is not abutted to the rest of LBA Park acreage, the LBA Woods are surrounded by residential areas, primarily single-family homes. It boasts a well-established network of primitive trails that wind through second-growth

ecosystems classified as upland coniferous forests, mixed-deciduous-coniferous forests, forested wetlands, and a wet shrubland. The relatively unfragmented habitat is a haven for a large variety of birds and refuge for forest-dwelling creatures, such as North American Porcupines (*Erethizon dorsatum*).

## 1.2 Site History

The LBA Woods is part of the traditional territory of The Squaxin Island Tribe. Tended by the Squaxin until ceded to the United States in the Medicine Creek Treaty of 1854, history post-treaty through the 1970s is not well known. In the 1890s, the old-growth forest became two parcels, each roughly 75 acres, and was mostly likely clear-cut between 1910 and 1935. Both parcels were then left unmanaged. Former unimproved access roads became popular walking trails for the community and grew narrower with time. Footpaths developed and the surrounding community began to use the space for recreation, stewarding the land themselves.

Over the years, the woods have served as a multi-use self-policing common of sorts—a *de facto* park, with members of the community using it for various purposes: walking, jogging, cross-country running training, cross-country skiing, snowshoeing, biking, off-road-vehicle (ORV) recreation, dog walking (on and off leash), building of log forts, and bird watching. The woods were also used briefly for logging, maple-sugar tapping, fiddle-head fern harvesting, marijuana growing, illicit beer drinking, hangout for teenagers, illegal campfires, paintball-and pellet-gun playing, dump site, and a “homeless” encampment. Community members have always taken care of the park—picking up trash, removing debris (e.g., dumped kitchen appliances), removing fallen trees from the trails, cutting back overgrown trails, signing trails, and distributing trail maps.

Housing plans were eventually developed for the parcels, eventually named Trillium and Bentrige, in the 2000s. Community opposition to the development began and focused around the impacts of the development on the Chambers Lake Basin and surrounding neighborhoods—flooding, damage to sensitive wetlands and aquifers, to native salmonids, to overcrowded local schools, to public transportation infrastructure. Permitting issues and the 2008 Recession resulted in planning delays of both Trillium and Bentrige. In 2012, a community-based coalition launched the Save the LBA Woods campaign, which was supported by many local organizations and more than 6,000 residents of the greater Olympia area. In 2016-2017 the City of Olympia voted unanimously to acquire 133 of the 150 acres of the LBA Woods for public parkland. The city acquired 10 acres for residential/commercial development (yet to be built), 5 acres to build the Morse-Merryman Reservoir and related infrastructure (completed in 2019, and 4.91 acres as right-of-way for the proposed Log Cabin Extension Road. In response to

concerns from the parks stewards and community members about the impact of the road to habitat and aesthetic values, the Log Cabin Extension Road was removed from the City's Comprehensive Plan in 2021; the road will be reassessed in 2030).



*Community members who campaigned to save the LBA Woods celebrate the opening of the woods as public parkland in 2017. (Photo by M.M. Ruth).*

Since 2017, the Friends of LBA Woods have been working with the Olympia Parks Stewardship Program to remove several invasive species from the property with the goal of opening space for native plants to thrive and restore wildlife habitat. Since August 2016, the Friends of LBA Woods has hosted or co-hosted 45 work parties focusing on the removal of these plants.



*Olympia Parks Stewardship Program and the Friends of LBA Woods host frequent volunteer work parties to restore natural habitat in the LBA Woods. (Photos by M.M. Ruth)*

The City of Olympia Parks Department and Public Works have also participated in and

supported restorative planting projects. As part of the permitting of Morse-Merryman Reservoir, the city has been required by the Department of Ecology to maintain wetland mitigation plantings near the water tank.

In March 2020, the Parks Department approved the LBA Woods Trail Improvement Plan which will accomplish the following goals: add structure to the existing trail network (define trails, establish hierarchy), add missing connections to make the trail network more cohesive, add trail signage to help with wayfinding, improve access to and through the park from surrounding neighborhoods, create a low barrier trail and increase recreational options.

### **1.3 Plan Goals and Objectives**

The purpose of this stewardship plan is to establish a long-term plan to assist Friends of LBA Woods Stewards with the ongoing restoration and management of natural areas in the LBA Woods.

The ultimate goal of restoration at LBA Woods is to cultivate a resilient forest, resistant to climate instability. Through planting and stewarding a biodiverse understory with regenerating conifers, the cohesive ecosystem will be better able to adapt to increased threats of extreme weather, fire, invasive species, disease, and drought while providing a sustained refuge for wildlife.

Simultaneously, the restoration of LBA Woods will enhance the land's ecosystem services of stormwater retention, flooding reduction, carbon sequestration, noise buffering, and recreation.

Stewardship objectives include:

- 1) Continued removal of invasive plant species
- 2) Re-population of Pacific NW vegetation with added diversity
- 3) Ongoing monitoring and maintenance of restored areas
- 4) Establishment of a living laboratory for learning about forest health and stewardship

## 2. Site Assessment

### 2.1 Organization and Methods

LBA Woods has been subdivided into 11 Vegetation Management Units (VMUs) to provide spatial reference and support stewardship efforts. VMUs were defined based upon habitat type, vegetation, soil moisture, and physical features. The area surrounding the water tower was not included as a VMU because it is managed by Olympia's Public Works Department. Figure (1) shows the location and extent of the VMUs relative to trails and aerial imaging.



Figure 1. Vegetation Management Units in LBA Woods. (Map by C. Kerwin)

## **2.2 Social Inventory**

LBA Woods is situated in a neighborhood of single-family homes. It is within walking distance of Washington Middle School, Margaret McKenny Elementary School, and two preschools. The park boasts a well-established network of unpaved trails popular for walking, running, dog walking, and biking. The trails of LBA Woods are relatively flat and suitable for visitors with mobility challenges as well as those pushing baby strollers. The trails are especially beloved by bird watchers (with 80 species listed to date) and those seeking a quiet experience of a forested park. It is popular not only with surrounding neighbors but also with residents of Thurston County who visit the park to enjoy the woods and the adjacent baseball fields, playground, and picnic shelter, tennis courts, and basketball court.

A social assessment was completed in the fall of 2019 by Evergreen State College Students with the support of Mike Ruth, member of faculty, Masters of Environmental Studies. About 120 participants were interviewed while at LBA Woods and provided information as to their personal use, experience, and recommendations for park improvements. Of those interviewed, 64% lived within 2 miles of LBA woods and most used the park for walking, trail running, nature viewing, and walking dogs. Suggested trail improvements included signage that is visible but not too intrusive, maintenance on trails that are seasonally flooded, and classifying trails for various uses. A kiosk featuring park history, context, and a map was also proposed, as well as more trashcans and benches along trails. Participants had conflicting opinions on mountain bike infrastructure and dog leash rules.

### **Access:**

LBA Park has two parking lots on its north side where LBA Woods-goers park. There are two main entrances to the woods: one directly across from the NW parking lot and one next to the NE parking lot. There are also a number of walking entrances to the trails from the surrounding neighborhoods.

## **2.3 Ecological Inventory**

### **2.3.1 Site Characteristics**

A rapid assessment accounting was done by Evergreen State College Environmental Studies Graduate Program students in 2021. The group divided the park by creating a survey grid, with each study area approximately 9-14 acres. They accounted for aspect, slope, sun exposure, average tree diameter at breast height, habitat type, average coarse woody debris cover, average snag density, and any special features. Tree and shrub species were also recorded.

VMUs were delineated by referencing the students' site assessment, aerial imagery, and ground truthing.

The entirety of LBA Woods is classified as historically Coastal Western Hemlock Zone. LBA Woods is primarily mixed deciduous/coniferous forest, dominated by the native trees red alder (*Alnus rubra*), Bigleaf Maple (*Acer macrophyllum*), Western Redcedar (*Thuja plicata*), Douglas fir (*Pseudotsuga menziesii*), and Western Hemlock (*Tsuga heterophylla*). Interspersed are areas of dense Douglas fir trees with minimal regeneration and sparse understory (VMUs 3, 6, and 10). In the NW corner of the site, there is an old gravel pit, now a heavily sloped, disturbed, seasonally wet meadow/shrubland prone to invasive species colonization (VMU 9). Native shrubs such as willow (*Salix sp.*), Beaked Hazelnut (*Corylus cornuta*), Snowberry (*Symphoricarpos albus*), and Osoberry (*Oemleria cerasiformis*) are prominent in this VMU and coniferous trees have recently been planted.

The SE area of LBA Woods houses a large water tank (Morse-Merryman Reservoir) managed by City of Olympia Public Works. A maintenance access road, inaccessible to public vehicles, runs north-south through the E side of the woods. Directly to the east of the tank is a wetland mitigation site that the City is in the process of restoring (VMU 7). To the east of the access road, the woods are primarily young, mixed deciduous trees on relatively flat ground (VMU 8 and 11). The center of LBA Woods is a mixed deciduous/coniferous forest interspersed with uncanopied, semi-disturbed areas susceptible to invasive plants (VMU 5). The western portion of the site is home to a more mature mixed deciduous/coniferous forest and is gently sloped throughout, with seasonally wet areas (VMU 1 and 2).

Laminated root-rot infects susceptible trees throughout LBA Woods. Vulnerable species such as Douglas fir, Western hemlock, and Grand fir should be monitored, and signs of laminated root-rot should be reported to Parks.

Invasive species of concern inhabit all VMUs. They include Himalayan Blackberry (*Rubus armeniacus*), Cutleaf Blackberry (*Rubus laciniatus*), Scotch broom (*Cytisus scoparius*), Reed Canary Grass (*Phalaris arundinacea*), English Ivy (*Hedera helix*), English Holly (*Ilex aquifolium*), One-seed Hawthorn (*Crataegus monogyna*), Herb Robert (*Geranium robertianum*), Yellow Archangel (*Lamium galeobdolon*) and Bird Cherry (*Prunus avium*). There are also three known noxious weed species present at the site, mostly in VMU 9: Tansy Ragwort (*Jacobaea vulgaris*), Spurge-Laurel (*Daphne laureola*), and Poison Hemlock (*Conium maculatum*).

*Appendix A* contains a comprehensive list of flora observed in LBA Woods.

VMU	Dominant Habitat	Exposure	Slope	Snag Dens	CWD Dens	Acres	Invasive Plants	Noxious Weeds	Basin/Watershed	Soil Type	Notes	NVCS Group Code
	Conifer dominant, 1 Mixed Decid/Conifer	shade	low- med	med-high	51-75 %	14.6	Scotch Broom, H Blackberry, Ivy	none	Kettles/Budd Inlet	Everett GSL; Alderwood GSL;	densely Dfir to W	North Pacific Red Alder-Big Leaf Maple- Douglas Fir Forest
	2 Mixed Decid/Conifer	Partial Shade- Shade	med	low-med	51-75%	9.0	Ivy, Scotch Broom	none	Kettles/Budd Inlet	Everett GSL; Alderwood GSL;	bare areas to W and S dense Dfir;	North Pacific Red Alder-Big Leaf Maple- Douglas Fir Forest
	3 Conifer dominant, Densely planted Dfir	Partial Shade- Shade	low- med	low-med	51-75%	10.3		none	Kettles/Budd Inlet	Everett GSL	low regenerati on with lack of diverse fields;	North Pacific Red Alder-Big Leaf Maple- Douglas Fir Forest
	4 Heavily maintained park/recreation					19.4		none	Kettles/Budd Inlet		playgroun d, facilities, parking lot partial shade with open areas; heavily disturbed area in E; some plantings	North Pacific Red Alder-Big Leaf Maple- Douglas Fir Forest
	5 Mixed Decid/Conifer	Partial Shade	low- med	low-med	51-75%	33.9	Scotch Broom, H Blackberry, Holly, Reed canary	none	Kettles/Budd Inlet	Everett GSL	low regenerati on with lack of diverse Log Cabin Reservoir	North Pacific Red Alder-Big Leaf Maple- Douglas Fir Forest
	6 Conifer dominant, Densely planted Dfir	Partial Shade	low	med	51-75%	4.4	Holly, Ivy	none	Kettles/Budd Inlet; Chambers/Deschute s	Everett GSL	low regenerati on with lack of diverse Log Cabin Reservoir	North Pacific Red Alder-Big Leaf Maple- Douglas Fir Forest
	7 Wetland					3.1		none	Chambers/Deschute s	Everett GSL; Alderwood GSL	bare areas throughout heavily sloped old gravel pit, compact soil; seasonally wet in base dense Dfir;	North Pacific Red Alder-Big Leaf Maple- Douglas Fir Forest
	8 Young mixed decid/conifer	Partial Shade	low	low	26-50%	22.0	H Blackberry, Holly, Ivy	none	Chambers/Deschute s	Everett GSL; Alderwood GSL	low regenerati on with lack of diverse	North Pacific Red Alder-Big Leaf Maple- Douglas Fir Forest
	9 Seasonally wet meadow; Young mixed decid/conifer	Sun	med- high	low	26-50%	5.1	H Blackberry, Holly, Reed canary grass	Kansy ragwort, daphne laurel, poison hemlock	Kettles/Budd Inlet	Everett GSL	low regenerati on with lack of diverse	Western North American Rudeal Shrubland, Meadow, and Marsh
	10 Conifer dominant, Densely planted Dfir	Partial Shade	low	low-med	52-75%	9.0	Holly, Ivy	none	Kettles/Budd Inlet	Everett GSL	low regenerati on with lack of diverse	North Pacific Red Alder-Big Leaf Maple- Douglas Fir Forest

VMU Characteristics

### 2.3.2 Soils

The soils have been mapped as primarily Vashon Glacial Till (Qgt). Glacial Till is a highly compacted, unsorted, unstratified, mixture of clay, silt, sand, gravel, and boulders deposited directly by glacial ice. Locally, the site may contain outwash sand and gravel both within and overlying till. Soil unit Qgt is typically highly resistant to infiltration. (Geologic Map of the Lacey 7.5-minute Quadrangle, Thurston County, 2003)

The soil classification of LBA Woods is primarily Everett very gravelly sandy loam with Alderwood gravelly sandy loam, Kapowsin silt loam, and Yelm fine sandy loam present as well (Figure 2). Below is a table further describing these classes. Note that this information may or may not be locally applicable.

*Appendix B* lists specific soil type information. *Appendix C* describes historical soils information.

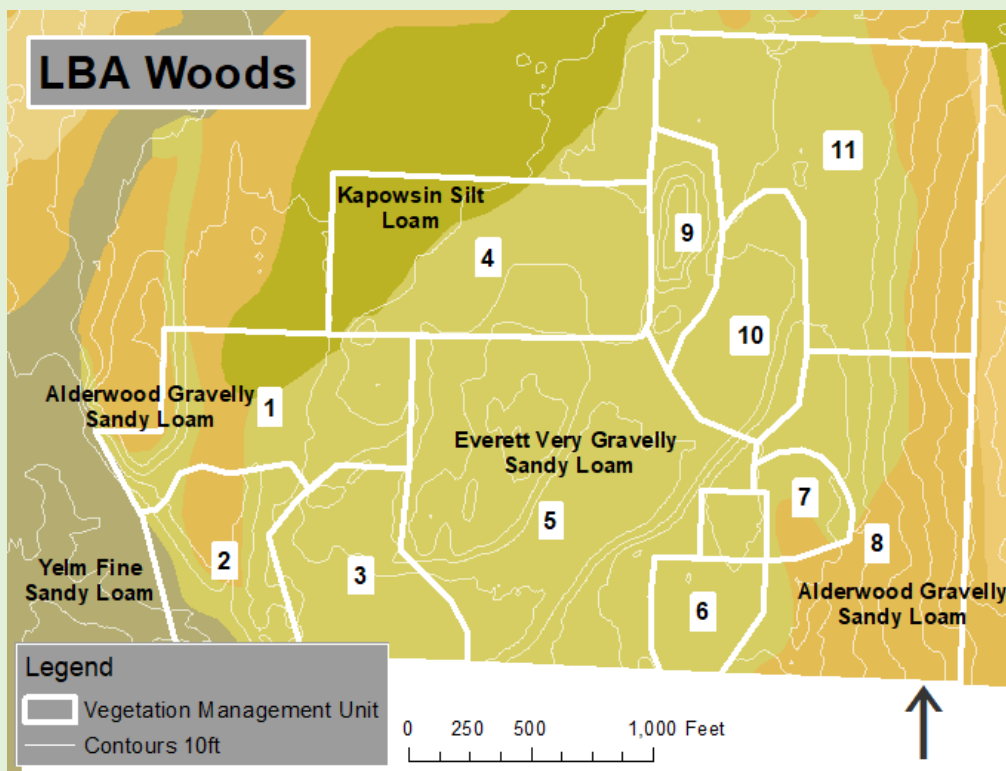


Figure 2: Soils in the LBA Woods (Map by C. Kerwin)

### 2.3.3 Hydrology

LBA Woods is located in three basins and watersheds: Chambers Basin in the Deschutes Watershed, Kettles Basin in the Budd Inlet Watershed, and Woodard Basin in the Henderson Inlet Watershed (Figure 3). The quality and sustainment of the ecosystems in LBA Woods is important to the water quality of these basins and watersheds. There are no year-round ponds or running streams on the site, but non-ephemeral water features are prevalent during rainy seasons. In addition, there are several small, non-jurisdictional wetlands, including to the east of the Morse-Merryman Reservoir, which has been signed for protection and is under restoration by the City of Olympia Public Works (VMU 7).

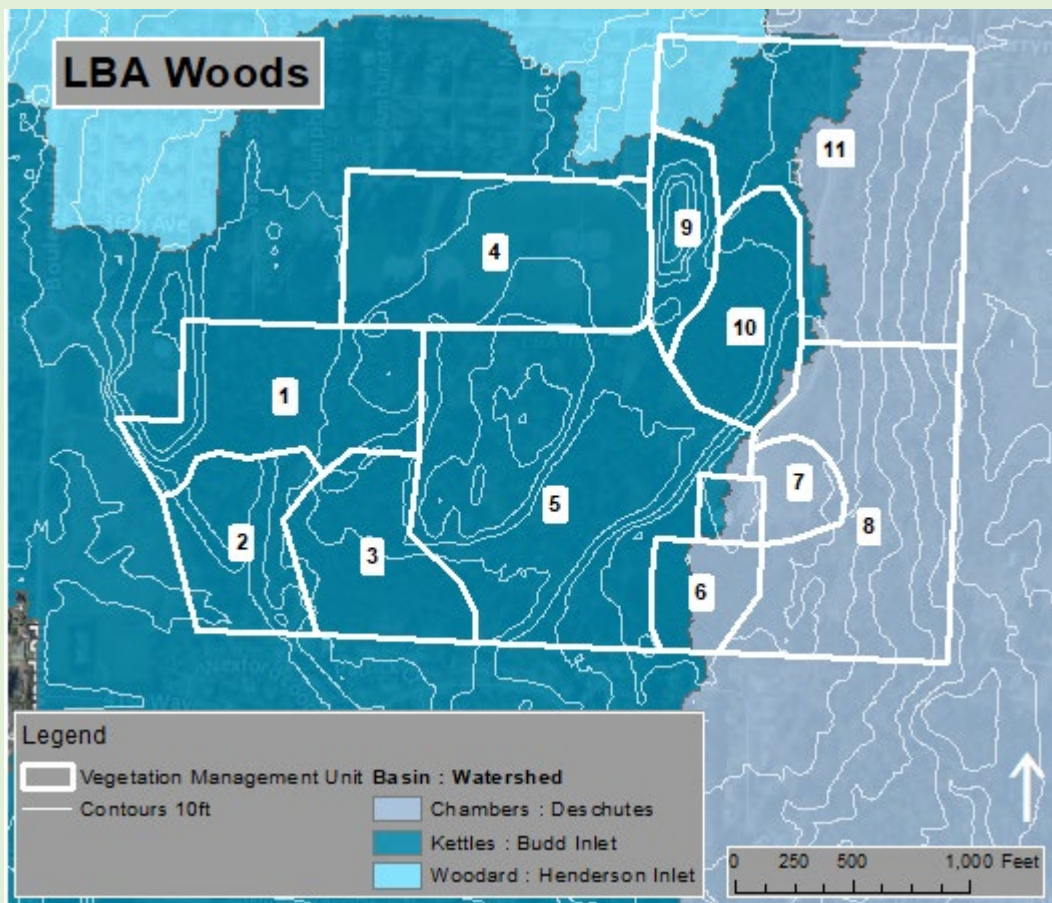


Figure 3: Vegetation Management Units in relation to watersheds in the LBA Woods (Map by C. Kerwin)

### 2.3.4 Wildlife Habitat

The forested areas of the park provide hiding, forage, and nesting opportunities for a variety of birds, amphibians, and mammals. More than 80 species of birds have been documented to date (*Appendix D*). LBA Woods is relatively unfragmented and is large enough to support over 80 species of birds including the Pileated Woodpecker (North America's largest woodpecker), small to medium sized mammals such as porcupines and mountain beavers, and larger mammals like coyotes and deer (*Appendix E*). Other organisms include a variety of fungi (*Appendix F*). As the City of Olympia and its Urban Growth Area are undergoing rapid population growth and development, the LBA Woods has become an increasingly important urban forest refugia for a diverse assemblage of wildlife species.

## **3. Stewardship Recommendations**

### **3.1 Restoration and Enhancement**

Since the purchase of LBA Woods by the City of Olympia Parks Department (and before), dedicated Stewards have been working diligently towards habitat restoration. Restoration priorities are listed below and are aligned with a four-phase approach.

Restoration Priorities:

Phase 1. Invasive plant removal

Phase 2. Planting with Pacific NW trees, shrubs, and groundcovers

Phase 3. Continued invasive removal and mulching in planted areas

Phase 4. Monitoring

Short term restoration project planning will be guided by the *potential, prepped, and planted* mapping system developed by the City of Olympia Public Works/Parks Habitat Working Group, who will provide technical support and materials for site-specific planting plans

Planning Guide:

1. Potential: Areas that have been designated as priorities for restoration
2. Prepped: Invasive species have been removed (Phase 1) and planting plan has been completed

3. Planted: Planting has been completed (Phase 2), continued stewardship (Phase 3) and monitoring (Phase 4) has begun



Figure 3 Planted areas to date in the LBA Woods. (Map by C. Kerwin)

### ***Phase 1: Invasive plant management***

Invasive plant management is often labor intensive and may involve many people. Take care to compact soil as little as possible so that native seeds may establish, the soil can heal, and future plantings will be successful. Generally, removal of plants prior to flowering is recommended in order to not disturb pollinators or let the plant fruit and potentially spread its seeds. Hand removal of species is easiest when the ground is saturated, typically October-April.

Management of plants when young or sparsely present will help to maintain the woods with less effort in the long run while minimizing disturbance.

When removing a plant, make sure that the entirety of the plant is removed. Many invasive species, ie. Himalayan and Cutleaf Blackberry, English Ivy, and American Holly will resprout from cuttings. Additionally take care to not leave root cuttings behind. Plants can be left on site in discreet areas to decompose if layers of cardboard (at least 2) or burlap sacks are placed under them. This provides habitat for animals and food for bacteria and fungi while creating mulch for future plantings. When composting is not possible, Parks staff will remove the gathered material for disposal.

### ***Phase 2: Planting***

Planting of trees and shrubs is best done when the ground is saturated as well. Doing this will make sure that the plants are not stressed for water while they are establishing. Mulching around the plants will prevent weed competition, keep the area moist, and improve soil conditions as the mulch decomposes. It is also recommended to protect the plantings from grazing and deer rubbing in some fashion, whether by fencing, plastic protection, or establishing a constant rotational guard of stewards.

Thoughtful selection of the right tree or shrub for the location results in better survival and success of restoration projects. Several native plant selection tools are available online, including Washington Native Plant Society ([www.wnps.org](http://www.wnps.org)) and Sound Native Plants ([www.soundnativeplants.com](http://www.soundnativeplants.com)).

### ***Phase 3: Continued Invasive Removal and Mulching***

Newly cleared and planted areas should be monitored for regrowth of invasive plants. If possible, water vulnerable plants during the first one or two summers and continue to mulch and weed the area around the base of plants until they are well established.

### ***Phase 4: Monitoring***

Monitoring is an important part of the restoration process. Through monitoring, lessons will be learned about invasive plant regrowth, native plant survival and prioritization of work. In addition, larger changes, such as increased animal sightings due to habitat improvement or impacts of new trail development, can be documented and analyzed.

A basic method of monitoring is walking through sites and conducting a visual inspection, at least twice per year. Categorizing areas into *prepped*, *planted* and *potential* will keep consistency with the approach used by the Parks/Public Works group. Noting any regrowth of invasive plants, new plant mortality and any other negative impacts should be noted and added to an ongoing priority list.

Photo monitoring is helpful to track changes with a visual record. Establishing photo points for each work site at the beginning of a project will help best show the changes, both short and long term. Photo monitoring engages park visitors, especially if wooden photo stations can be installed for consistent camera placement and signage can provide directions for submitting/uploading photos for possible creation of a time-lapse video. Several conservation organizations use this method. Locally, the Capitol Land Trust uses photo monitoring at their publicly accessible sites around Olympia.



Scientific monitoring is another option, by establishing plots and collecting data specific to the restoration project. This could be done through a simple survey tool linked to GIS mapping, using interns or volunteers. The data collected will also tell the story of the restoration process and support priorities.

### **3.2 Best Management Practices**

It is important to the success of volunteer efforts to follow current best management practices when removing invasive vegetation and re-planting. See *Appendix G* for seasonal recommendations, *Appendix H* for information about disposal of invasive plant species and *Appendix I* for planting standards.

Re-planting will be accomplished primarily in cooperation with Parks or Public Works staff, including plant and site selection.

### 3.3 Wildlife Habitat Enhancement

When considering wildlife habitat enhancement, all components of an ecosystem must be taken into account. Key elements are food, shelter, and water for wildlife. A plethora of flowering and berry producing shrubs support pollinators, birds, and mammals. Decomposing material, such as coarse woody debris (CWD) and large woody debris (LWD) are food for fungi and bacteria as well as shelter for insects, birds, and small mammals. In areas that are not heavily trafficked so as not to pose a safety hazard, tree snags should be kept to provide food and shelter for birds such as the Pileated woodpecker. Medium sized trees, such as Red alders and Bigleaf maples, ensure future CWD, LWD, and snags while contributing food and shelter for wildlife. Conifers secure shade and water retention for the plants below and planting young conifers beneath older ones will aid in regeneration of the trees for years to come. A healthy forest will both retain and purify water for wildlife.



#### Ten-Acre Shrubland Mitigation:

A ten-acre parcel to the west of LBA Woods was recently mowed and prepped for development. This area had a unique vegetation composition, not commonly found in Olympia, of shrubland with interspersed trees. The coverage provided by these shrubs and the abundance of berry and seed producing plants made this area a haven for over 35 resident and migratory bird species. The ecosystem maintained year-round sources of food for birds, with trees, shrubs, forbs, and grasses that seeded and fruited at different times. Furthermore, the

size of the site allowed many species of birds to establish their own territories and compete less for food.

With the loss of the critical habitat, it is imperative that a habitat comparable in size and ecosystem composition be established nearby. To this end, we propose that a large shrubland be included in the restoration plan of the LBA Woods. (See *Appendix J* for a full account of the services this habitat provided and a restoration plan)

### **3.4 Special Considerations**

#### **3.4.1 Public Safety**

The feeling of safety is an important factor in whether people use and enjoy a space. One strategy to decrease illicit activity and increase the feeling of safety is Crime Prevention Through Environmental Design (CPTED). The CPTED principles include access control, natural surveillance, territoriality, and maintenance.

As applied to forested parks and trails, CPTED is mainly focused on creating opportunities for sight lines and the feeling that the space is used and cared for, implying that behavior outside the established social expectations would be noticed and confronted.

CPTED can be accomplished along trails by ensuring good visibility along the edges and intersections of trails. Pruning lower branches of trees and selecting low-growing plants for re-planting are both effective strategies.

Using clear signage to establish expectations and as wayfinding tools will also help establish a feeling of safety. In addition, Stewards and other park users can contribute by being nurturing a welcoming and considerate culture in the park. Involving new people in the restoration efforts will assist in this goal and create more community ownership in the LBA Woods.

#### **3.4.2 Herbicide Application**

While the Parks Department does not use herbicides to eradicate invasive vegetation, the Public Works Department may use them on noxious weeds. Noxious weeds are classified by Thurston County and are primarily located in VMU 9: Poison Hemlock, Tansy Ragwort, and Spurge-laurel. A few Poison Hemlock plants are located on the eastern edge of VMU 9 and have been treated with triclopyr and vaslan. The area is physically labelled whenever the herbicides are applied. (City of Olympia Public Works, 2022)

## **4. Volunteers and Public Engagement**

Even before the LBA Woods was protected as public parkland, community members who walked the trails on the privately owned parcels served as stewards of the land by picking up trash, clearing fallen trees from trails, and serving as eyes and ears on the property.

In 2012, a group of volunteers concerned about the future of the forest organized a petition drive to ask Olympia City Council to work toward acquiring the forest for parkland. More than 5,000 people signed the petition. In 2014, the volunteers formed the LBA Woods Coalition, a (501)(c)(3) organization that launched the Save the LBA Woods campaign. In 2016, the Trillium parcel was acquired as parkland; in 2017 the Bentrige parcel was acquired as parkland.

Soon after the purchases, the coalition morphed into The Friends of LBA Woods and began organizing habitat restoration work parties and recruiting volunteers from the community. In addition to work parties, the Friends hosts popular guided bird walks, walking tours to study trees, understory plants, geologic history and formations, tree identification workshops, and forest-bathing events.

The Friends also maintain an iNaturalist project page where park visitors can record and collect data on the flora in the LBA Woods. Currently, iNaturalist users have contributed photo and data for 108 species of trees, flowering plants, and fungi.

<https://www.inaturalist.org/projects/lba-woods>

The Friends of LBA Woods uses its extensive mailing list of volunteers and social media to recruit volunteers, post events, share news of wildlife sightings and blooming plants, and provide action alerts for meetings pertaining to the future of the LBA Woods.

## 2021-2022 Adopt A Park Work Plan

2021-2022 Work Plan of Friends of LBA Woods						NOTES:
EST. DATE	PROJECTS and TASKS	Friends of LBA Woods COMMITMENT	OPARD COMMITMENT (proposed)	Water Resources	Department / Contact	
Year-round 2021-2022	Plan and conduct community citizen-science project to document biodiversity of flora and fauna in the LBA Woods through "bioblitzes" and other events as Covid guidelines allow	Promote iNaturalist collector app for individual/family use during COVID restricted times. Organize and direct group biodiversity surveys when feasible. Record results on sharable databases such as iNaturalist and eBird to allow for public access to data.	Be aware of biodiversity survey results and possibly incorporate them into park plans and on the ground activities. Amy will work with interns to contribute to the LBA Woods Stewardship Plan	Kym can contribute as a Naturalist. Can Maria provide the iNaturalist project name?	Parks Stewardship/ Jennifer Gessley Gayman & Amy Stull, Water Resources/Kym Foley	Observations on iNaturalist have tapered off since June 2020. An effort to encourage individuals/family groups to use app during winter begun in December 2020 to increase observations to LBA Woods project
Year-round 2021-2022	Gather and respond to public feedback on trail improvements as they are completed to support adaptive management of park amenities such as new trails, trail signage, off-leash dog trail. Collect visitor/neighbor preferences for park amenities and facility planning. Participate in the various efforts to develop plans and make decisions relative to LBA Woods Park.	Serve as "ears on the ground" to gather responses of park users to trail improvements via Facebook page and in-person conversations with users on the trails. Observe use patterns, problems, etc opportunistically while visiting the park. Provide feedback to OPARD. Propose improvements to park amenities.	Provide public planning documents as requested, consider incorporating comments into future work plans.		Planning/Sarah Giannobile	Comments from public surveys during Trail Improvement planning are being addressed by OPARD through plans for trail signage, trail improvement, barrier-free trail development, off-leash dog trail. Friends group will continue working on removal of invasive species--one of the comments repeated during survey--for this 2021-2022 work plan.
2021-2022	Implement habitat management plans (actions to maintain wetland, shrub and forest habitats to meet wildlife conservation needs). Complete Restoration Planning document and recommendations. Plan restoration activities based on this plans to maintain wildlife habitat values.	Work with OPARD staff to complete Restoration Planning document and recommendations. Begin plan for scheduling priority actions following recommendations. Propose ways to maintain habitat diversity to support park wildlife.	Coordinate efforts to complete plan, identify and survey management units, and integrate recommendations into Work Plan post June 2021.	Provide expertise to develop habitat management plans. Assist with habitat planning on losing 10 acres of Westside bushy habitat. Kym is happy to meet with the group to answer questions and/or help with any part of the planning process.	Park Stewardship/ Amy Stull Environmental Services/Kym Foley	Not quite sure how to time the completion of the plan and the work recommended in it given COVID-related restrictions on restoration work parties.
Year-round 2021-2022 except May thru August	Organize and carry out volunteer work parties to remove invasive plants (American Holly, English Ivy, Himalayan Blackberry, Scotsbroom, Laurel, Hawthorne), plant native species. Refer to trail improvement plan prior to work party.	Cooperate with OPARD staff to recruit volunteers, identify work needs and work areas, propose work methods, lead activities during work party. Submit any trail improvements 2 weeks prior to work for approval.	Cooperate with Friends of LBA Woods to identify work needs and work areas in line with recommendations in Restoration Planning document; propose work methods; lead activities during City lead or sponsored work party. Provide tools, including tool trailer (as available) and supplies for the work party.	Provide labor, tools, and possibly native plants for landscape modifications; vegetation removal/planting in cases where Water Resources is involved in habitat improvement	Parks Stewardship Jennifer Gessley Gayman	
Year-round 2021-2022	Help visitors to appreciate the park. Increase equity and inclusion practices.	When feasible according to COVID restrictions, offer guided walks of the park to introduce park users to existing trail network, new trails,	Help publicize walks with flyers at volunteer work parties.		Parks Stewardship Jennifer Gessley Gayman	
Year-round 2021-2022	Manage communication with LBA Woods park visitors and neighbors.	Keep up Friends of LBA Woods Facebook and data bases. Communicate news and event dates.	Communicate LBA Woods work parties to the public through the normal media of OPARD within City policies & guidelines		Parks Stewardship Jennifer Gessley	
Year-round 2021-2022	Provide eyes and ears services to help protect park amenities and flora and fauna	Report trail obstructions, vandalism and other needs for repair. Take action to remedy small problems such as branches across trails.	Respond to reported problems.		Parks Stewardship Jennifer Gessley Gayman	

## **5. Appendices**

### **Appendix A:**

#### **Flora of the LBA Woods**

Compiled by Theodore Thomas, MSc. (Updated April 28, 2020)

##### **Trees:**

Big-leaf maple (*Acer macrophyllum*)  
Black cottonwood (*Populus trichocarpa*)  
Cascara (*Frangula (Rhamnus) purshiana*)  
Bitter Cherry (*Prunus emarginata*)  
Douglas-fir (*Pseudotsuga menziesii*)  
Grand fir (*Abies grandis*)  
Noble fir (*Abies procera*)  
Pacific crabapple (*Malus fusca*)  
Paper birch (*Betula papyrifera* var.  
*subcordata*)  
Red alder (*Alnus rubra*)  
Western hemlock (*Tsuga heterophylla*)  
Western redcedar (*Thuja plicata*)

##### **Invasive Trees:**

Bird Cherry (*Prunus padus*)  
Choke Cherry (*Prunus virginia*)  
Holly (*Ilex spp.*)  
One seeded hawthorn (*Cretagus  
monogyna*)

##### **Shrubs:**

Bald-hip Rose (*Rosa gymnocarpa*)  
Beaked Hazel (*Corylus cornuta*)  
Blackcap Raspberry (*Rubus  
leucodermis*)  
Common Snowberry (*Symphoricarpos  
albus*)  
Evergreen Huckleberry (*Vaccinium  
ovatum*)

Short Oregon Grape (*Mahonia nervosa*)  
Nootka Rose (*Rosa nutkana*)  
Oceanspray (*Holodiscus discolor*)  
Osoberry (*Oemleria cerasiformis*)  
Pacific Dogwood (*Cornus nuttallii*)  
Red Elderberry (*Sambucus racemosa*)  
Red Huckleberry (*Vaccinium parvifolium*)  
Red-osier Dogwood (*Cornus sericea*)  
Salal (*Gaultheria shallon*)  
Salmonberry (*Rubus spectabilis*)  
Serviceberry (*Amelanchier alnifolia*)  
Spirea/Hardhack (*Spiraea douglasii*)  
Tall Oregon Grape (*Mahonia aquifolium*)  
Thimbleberry (*Rubus parviflorus*)  
Vine Maple (*Acer circinatum*)  
Sitka Willow (*Salix sitchensis*)  
Scouler's Willow (*Salix scouleriana*)

**Invasive Shrubs:**

Himalayan Blackberry (*Rubus discolor*)  
Cutleaf Blackberry (*Rubus laciniatus*)  
Scotchbroom (*Cytisus scoparius*)

**Noxious Shrubs:**

Spurge-laurel (*Daphne laureola*)

**Understory/Forbes:**

Trailing blackberry (*Rubus ursinus*)  
Common Horsetail (*Equisetum arvense*)  
Miner's-Lettuce (*Claytonia perfoliata*)  
Northern Starwort (*Stellaria calycantha*)  
Cleaver (*Galium aparine*)  
Sweet Cicely (*Osmorhiza chilensis*)  
Hedge Nettle (*Stachys cooleyae*)  
Self-heal (*Prunella vulgaris*)  
Piggy-back Plant (*Tolmiea menziesii*)  
Starflower (*Trientalis latifolia*)  
Large-leaved Avens (*Geum macrophyllum*)

Spotted Coral root (*Corallorhiza maculata*)  
Pearly everlasting (*Anaphalis margaritacea*)  
Pacific Bleeding Heart (*Dicentra formosa*)  
False Lily-of-the-Valley (*Maianthemum dilatatum*)  
Tiger Lily (*Lillium columbianum*)  
Star-flowered Solomon's seal (*Smilacina stellata*)  
Western Trillium (*Trillium ovatum*)  
Fireweed (*Epilobium angustifolium*)  
Evergreen Violet (*Viola sempevirens*)  
Yellow Violet (*Viola glabella*)  
Oregon Honeysuckle (*Lonicera ciliosa*)  
Starry Solomonplume (*Smilicina stellata*)  
Siberian Miner's Lettuce (*Claytonia sibirica*)  
Enchanter's-nightshade (*Circaea alpina*)  
Small-fruited Woodrush (*Luzula parviflora*)  
Sword Fern (*Polystichum munitum*)  
Lady Fern (*Athyrium filix-femina*)  
Deer Fern (*Blechnum spicant*)  
Licorice Fern (*Polypodium glycyrrhiza*)  
Bracken Fern (*Pteridium aquilinum*)

**Non-native :**

Chickweed (*Cerastium spp*)  
Baby Blue Eyes (*Nemophila spp.*)  
Bittercress (*Cardamine oligosperma*)  
Canada thistle (*Cirsium arvense*)  
bittersweet nightshade (*Solanum dulcamara*)  
Foxglove (*Digitalis purpurea*)

**Invasive:**

Creeping Buttercup (*Ranunculus repens*)  
Herb Robert (*Geranium robertianum*)

**Noxious:**

Poison Hemlock (*Conium maculatum*)  
Tansy Ragwort (*Jacobaea vulgaris*)

**Grasses/Sedges:**

Dewey's Sedge (*Carex deweyana*)

Henderson's Sedge (*Carex hendersonii*)

Nodding Trisetum (*Trisetum cernuum*)

**Invasive:**

Orchard grass (*Dactylis glomerata*)

Reed Canary Grass (*Phalaris arundinacea*)

**Appendix B**

**Soil Classes**

<b>Soil Class</b>	<b>Parent material</b>	<b>Drainage</b>	<b>Avg pH</b>	<b>Depth</b>	<b>Typical Vegetation</b>
Alderwood gravelly sandy loam	Glacial drift and/or glacial outwash	moderately well drained	5.1-6.5	moderately deep	Douglas fir, western hemlock, western redcedar, red alder, salal, Oregon grape, brackenfern, swordfern, Pacific rhododendron, red huckleberry, evergreen huckleberry, Oregon honeysuckle
Everett very gravelly sandy loam	Sandy and gravelly glacial outwash	somewhat excessively drained; low flooding/ponding potential	4.5-6	very deep	Douglas fir, western hemlock, western redcedar, red alder, bigleaf maple, salal, Oregon grape, red huckleberry, ocean spray, Nootka rose, Oregon honeysuckle
Kapowsin silt loam	Compact basal till	moderately well drained	5.5-5.8	limited	Douglas fir, western hemlock, western redcedar, red alder, bigleaf maple, salal, trailing blackberry, Oregon grape, red huckleberry, evergreen huckleberry, ocean spray, brackenfern, swordfern, vine maple

Yelm fine sandy loam	Glacial outwash	moderately well drained; seasonally wet	5- 5.7	very deep	Douglas fir, western redcedar, red alder, bigleaf maple, salal, trailing blackberry, Oregon grape, red huckleberry, brackenfern, swordfern, salmonberry, vine maple
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Source: Soilseries.sc.egov.usda.gov

## Appendix C

### **Soil and Wood in The LBA Woods**

By Stephen J. Rutkowski

In 1891, Joshua Thayer received a federal patent to the property we now know as the Bentrige Parcel. In 1896, he received one to the Trillium Parcel. The area was cut and utilized during the earlier stages of settlement of Thurston County. The vegetation regenerated into what we now see. As you walk the trails, you see that most of the growth is maturing toward the original Douglas Fir and Alder type noted by the original land surveyors in the 1850s, including typical forest understory plants that extend into adjacent openings. When you go downhill into the southwestern portion of the Bentrige Parcel, things change. Before the recent development there were no forest trees. In addition to the ubiquitous Scot's Broom and blackberries, there were species more closely associated with open disturbed areas. The scattered trees include crabapple and cascara. This has always been a source of wonder. A clue to this anomaly may lie in the Soil Survey of Thurston County, Washington published in 1990 by the US Department of Agriculture. The purpose of the survey was to provide information as to the suitability of the soil for various uses including farming, timber, and homesites. It also touched on current usage. The Ice Age floods sculpted the landscape as it twisted, braded and deposited rock, gravel, sand and other debris. Most of the LBA Woods is within the series labeled Everett very gravelly loam and Alderwood gravelly sandy loam. This area corresponds to the forested portion. The open southwestern portion of the Bentrige Parcel (which approximates the 10 acres involved in development) is within the series described as Yelm fine sandy loam. This resulted in a different pattern of usage. The main use of land in the Everett and Alderwood series appears to be timber, some planted, some regrown or not used at all. Agricultural use seemed to be the main activity in the Yelm series. An old domestic apple tree supports the idea of heavy grazing. An aerial photo of this area in the late 1930's by the county public works department shows most of this area still forested. Photos from the 1950's onward show the characteristic open area that we see on the present map of the 10 acres of Bentrige. Recovery of large recently disturbed parcels usually takes longer than those that are much older with brush communities persisting for a long time. Other open portions of the woods usually have been encroached by forest associated plants. In general, much open area in the LBA Woods is associated with major trails. These trails were once primitive roads used to access the property and extract timber. Future management can take advantage of soil conditions to develop successional plant regimes that will enhance wildlife diversity.

## Appendix D

### RECORDED BIRD SPECIES: As of April 2020

American Crow	European Starling	Red-breasted Nuthatch
American Goldfinch	Evening Grosbeak	Red-breasted Sapsucker
American Robin	Fox Sparrow	Red-tailed Hawk
Anna's Hummingbird	Glaucous-winged Gull	Red-winged Blackbird
Bald Eagle	Golden-crowned Kinglet	Rock Pigeon
Band-tailed Pigeon	Golden-crowned Sparrow	Ruby-crowned Kinglet
Barn Swallow	Great Horned Owl	Rufous Hummingbird
Barred Owl	Hairy Woodpecker	Sharp-shinned Hawk
Bewick's Wren	Hammond's Flycatcher	Song Sparrow
Black-capped Chickadee	Hermit Thrush	Spotted Towhee
Black-headed Grosbeak	House Finch	Steller's Jay
Black-throated Gray Warbler	House Sparrow	Swainson's Thrush
Brown Creeper	Hutton's Vireo	Townsend's Warbler
Brown-headed Cowbird	Lincoln's Sparrow	Tree Swallow
Bushtit	Mallard	Turkey Vulture
Cackling Goose	Mourning Dove	Varied Thrush
California Quail	Northern Flicker	Vaux's Swift
California Scrub-Jay	Olive-sided Flycatcher	Violet Green Swallow
Canada Goose	Orange-crowned Warbler	Warbling Vireo
Cassin's Vireo	Osprey	Western Tanager
Cedar Waxwing	Pacific Wren	Western Wood-Pewee
Chestnut-backed Chickadee	Pacific-slope Flycatcher	White Crowned Sparrow
Common Raven	Pileated Woodpecker	White Throated Sparrow
Cooper's Hawk	Pine Siskin	Willow Flycatcher
Dark Eyed Junco	Purple Finch	Wilson's Warbler
Downy Woodpecker	Purple Martin	Yellow Warbler
Eurasian Collared-Dove	Red Crossbill	Yellow-rumped Warbler

## Appendix E

### Mammal List

Mule Deer (*Odocoileus hemionus*)

Common Porcupine (*Erethizon dorsatum*)

Coyote (*Canis latrans*)

Douglas Squirrel (*Tamiasciurus douglassii*)

Eastern Gray Squirrel (*Sciurus carolinensis*)

Eastern Cottontail (*Sylvilagus floridanus*)

Long-tailed Weasel (*Neogale frenata*)

Mountain Beaver (*Aplodontia rufa*)

Townsend's Chipmunk (*Tamias spp*)

## Appendix F

### Fungi List

Artist's Bracket (*Ganoderma applanatum*)  
Club-like Tuning Fork (*Calocera cornea*)  
Blackfoot Polypore (*Polyporus leptocephalus*)  
Broom Moss (*Dicranum scoparium*)  
Cat's Tail Moss (*Isoethecium stoloniferum*)  
Farinose Cartilage Lichen (*Ramalina farinacea*)  
Oregon Beaked Moss (*Kindbergia oregana*)  
Sulphur Tuft (*Hypholoma fasciculare*)  
Jewelled Amanita (*Amanita junquillea*)  
Velvet-footed Pax (*Tapinella atrotomentosa*)  
Shellfish-scented Russula (*Russula xerampelina*)  
Wood Woolly-Foot (*Collybiopsis peronata*)  
Pale Brittlestem (*Candolleomyces candolleanus*)  
Oyster Mushroom (*Pleurotus ostreatus*)  
Turkey-Tail (*Trametes versicolor*)  
Western Panther ([Amanita pantherinoides](#))  
Bleeding Bonnet (*Mycena sanguinolenta*)  
Fiber Caps (*Inocybe sp.*)  
Smoky-gilled Hypholoma (*Hypholoma capnoides*)  
Mossy Maze Polypore (*Cerrena unicolor*)  
Plagiomnium sp.  
*Rhodocollybia sp.*

## Appendix G

### Seasonal Best Practices

<b>WINTER</b>	<b>SPRING</b>
<p>Invasive plant removal is easiest in damp soils.</p>	<p>Invasive plant removal is easiest in damp soils.</p>
<p>If invasive plant removal results in large amount of bare soils, cover with mulch or organic debris.</p>	<p>Maintenance weeding in planted areas.</p>
<p>Native plant installation should be wrapped up by March.</p>	<p>Avoid removing brushy invasive plants from April to July to respect nesting birds.</p>
<p>Live stake plant propagation and installation.</p>	<p>Wetland species can be planted in wet areas after flooding has receded (April to June).</p>
<p>Watch for early bird nesting and avoid working in areas of high avian nesting activity.</p>	<p>Plan for fall planting by identifying planting location and organizing a species list.</p>
	<p>Submit herbicide requests for applicable invasive species for summer treatment.</p>
<b>SUMMER</b>	<b>FALL</b>
<p>Remove invasive plants.</p>	<p>Remove invasive plants.</p>
<p>Break down dried-up compost piles.</p>	<p>If invasive plant removal results in large amount of bare soils, cover with mulch or organic debris.</p>
<p>Water plants if available and/or appropriate (May to September).</p>	<p>Plants that will be installed in saturated or seasonally wet sites should be planted in September to October or March to April, outside of the wet season as much as possible.</p>
<p>Professional crews conduct herbicide treatment.</p>	<p>Install native plants once rain is regularly falling (October to March).</p>
<p>Restoration pruning occurs (mid-July to September).</p>	

## Appendix H

### Composting Option for Invasive Plant Species

#### BUILDING AN ONSITE COMPOST PILE

Onsite composting is cost effective, helps to leave organic material and nutrients where they belong, and provides excellent habitat for wildlife. There are two basic forms of compost piles:

**SQUARE** Should not exceed 4 feet by 4 feet in area on the ground.

**WINDROW** Should not exceed 3 feet wide, but can be as long as necessary. Windrows can be strategically placed along informal boundaries or run parallel to gradual slope contours to provide simple erosion control.

#### Steps for building onsite compost piles are as follows:

**Step 1** Find or create an area free of native plants and remove all invasive plants and roots. Clear the area thoroughly before you build your compost piles. Place compost piles out of sight from walking trails and roads as much as possible. Never build a compost pile against the trunk of a living tree.

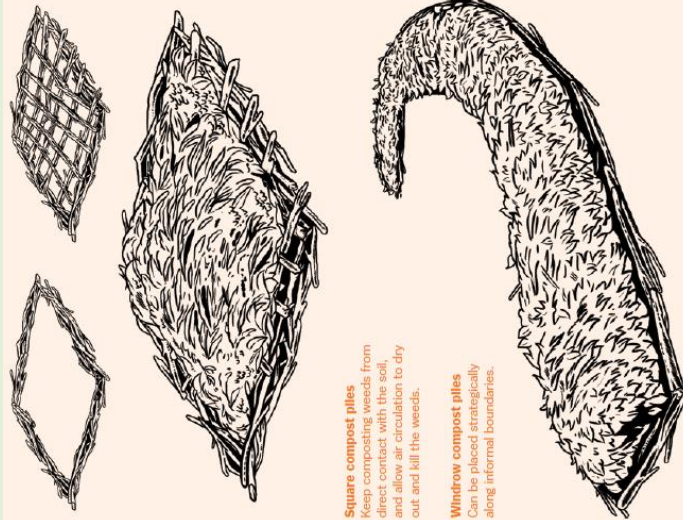
**Step 2** Collect and lay out a frame of downed sticks and branches from your park that will define the edges of your compost pile. If you are using burlap, lay the burlap down first, then put the frame of branches on top of the burlap edges.

**Step 3** Fill in the frame with dead branches and sticks found on site. Place them in both directions to form a grid. This helps prevent the composting weeds from having direct contact with the soil and allows for air to circulate under the pile.

**Step 4** Put pulled weeds on top of the compost rack. For square, compost piles, do not stack weed debris taller than 4 feet. For windrow compost piles, do not stack weed debris taller than 2 feet. Do not let weed debris spill over beyond the frame. Separate invasive woody material, such as laurel or holly branches, into a different pile from herbaceous weeds when creating piles. The herbaceous material breaks down faster and can be redistributed sooner. Only weed debris should go in compost piles. Resist the urge to clean up the forest floor of all sticks and leaves. Not only does this create more compost piles than necessary, but decaying logs and sticks are an important component of healthy forest ecosystems.

**Step 5** Check piles throughout the year. Turn or maintain them as needed to ensure that weeds do not re-sprout.

**Step 6** Pull compost piles apart when all the material has dried out. This can take



**Square compost piles**  
Keep composting weeds from direct contact with the soil, and allow air circulation to dry out and kill the weeds.

**Windrow compost piles**  
Can be placed strategically along informal boundaries.

as little as three months to more than a year depending on temperature, moisture, and weed species. Dried-out weed debris can be used like mulch across your site, spread across the ground or concentrated around new plants. Redistribute sticks and logs throughout the site. Do not

deconstruct piles during bird nesting season if you observe bird activity as some ground-nesting species use compost piles for nesting, foraging, and refuge. Feel free to leave some compost piles so wildlife can continue to use them.

## Appendix I

### Planting Best Practices

#### **INSTALLING PLANTS**



##### **Potted Plant**

Loosen roots outward and place the root collar level with the ground.



##### **Bareroot Plant**

Atop a cone of soil, arrange the roots pointing outward from the plant.

## Appendix J

### **Restoring Lost Shrubland Habitat in the LBA Woods By Bob Wadsworth**

In 2017, 10-acre portion of the former Bentrige parcel was acquired by the City of Olympia for future high-density housing. Until it was cleared by the developers in 2022, the site had a unique vegetation composition for Olympia. It was almost entirely covered by grasses, small trees, and shrubs, which produced berries and seeds in sequence throughout the year and which was ideal for birds who need food and cover during all seasons of the year.

More specifically, the main shrubland plants beneficial for birds and that were growing on the 10-acre were elderberry and cascara that produce berries early in the summer, crab apple and Hawthorne that produce berries later in the summer. Thistle and grasses produce seed later in the summer.

Over 35 species of birds were documented using this site throughout the year. Some species were residents year-round; others are migrants only for the winter or only for the summer. Nesting occurred in the early spring through summer where birds raise their young and then prepare for migration or for spending the winter if it is a resident.

Now that the site has been cleared and mowed in preparation for the future housing to be built on this 10-acre site, the birds have lost an important and increasingly rare habitat in an urban/suburban area. While this shrubland habitat cannot be restored, the loss of it can be mitigated by planting similar bird-friendly plants in selected smaller open locations within the LBA Woods.

Recreating some of the shrubland habitat should include providing fruit- and seed-bearing shrubs and trees that will help resident birds survive the lean time in winter either by storing calories in their bodies or stashing food on the site. Plantings should also help migrating birds store fat that will provide enough energy to migrate south to Mexico or central or south America.

The shrubland plants should also provide late-season berries and insects to birds arriving in the fall and winter from north in Canada or Alaska or the Cascade mountains. Some birds stop in the shrubland habitat to refuel and continue south while others remain for the winter.

Of the 39 bird species known to use the site throughout the year here are groups of bird species and their food preference:

Quail, native Bandtail Pigeons, and doves – seed eaters, tree, and shrub flowers. Have seen 100 band tail pigeons when elderberry are ripe

Hummingbirds – nectar, insects

Red tailed hawks – small mammals.

Flickers and woodpeckers – insects

Flycatchers – flying insects

Jays – fruit, nuts (hazelnut)  
Ravens – carrion  
Chickadees – fruit and seeds  
Swallows – flying insects  
Wrens – insects, fruit  
Thrushes (robins, varied thrush, Swainson’s thrush) – worms, insects, fruit  
Cedar waxwings – fruits, insects  
Finches and sparrows (9 species) – seeds, insects, thistle seed  
Warblers and vireos – insects  
Tanagers, Grosbeaks (very colorful birds) – fruit, insects

What is needed to mitigate the loss of the 10-acre shrubland:

1. Existing sites without trees but with native shrubs that produce berries
2. Candidate shrubs include (native):
  - a. Red elderberry
  - b. Blue elderberry (not common in the location)
  - c. Cascara
  - d. Crab apple
  - e. Hawthorne (native)
  - f. Salal
  - g. Oregon grape
  - h. Beaked Hazel (native)
  - i. Huckleberry (evergreen, red)
3. Manage mountain beavers to prevent eating of seedlings. Some of the potential sites have mountain beaver towns, which mean protecting plants from being eaten [what does “manage” entail? I hope not eradication.
4. Do not plant conifers but do plant a few of certain broadleaf trees [such as??] – trying to avoid shading shrubs that require sunny sites to produce fruit. There are patches of root rot that attack conifers and is impossible to eradicate.
5. Seedling production needs to be organized and implemented. May need a nursery or purchase from a reliable supplier. Maybe the annual Thurston Conservation District plant sale. [Olympia Parks Stewardship has a nursery at the Yelm Highway Community Park site]
6. After planting it may be 10 years or more before shrubs are productive. Seedlings need proper site choice, winter planting, summer watering.

Possible locations:

1. Several possibilities are near the recently built Morse-Merryman water tower. They are mostly free of trees but may have Mountain Beaver colonies which may eat planted seedlings.
2. There could be sites near the older water tower near Boulevard Rd. in the northwest corner of the LBA Woods.
3. These sites would need preparation as some existing plants are desirable and others are not.
4. None of the existing open sites are very large.