University of Victoria Sensitive Ecosystems Inventory



Office of Campus Planning & Sustainability Facilities Management School of Environmental Studies/Restoration of Natural Systems Program Department of Geography



University of Victoria Sensitive Ecosystems Inventory

by

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Acknowledgement of the Territories

The creators of this document acknowledge with respect that the University of Victoria is situated on the traditional territories of the Coast Salish and Straits Salish Peoples, specifically the Lekwungen (Songhees), Wyomilth (Esquimalt) and WS'ANEC' (Saanich) Peoples. As the areas addressed in this plan have been an essential component of these peoples' sustenance and way of life since time immemorial, it is essential that this plan be carried out in a manner which supports Indigenous ways of living and extends these words into meaningful actions.

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Executive Summary

The campus still has a legacy of unique natural areas that are valuable to the campus community and are an important resource for teaching and for research. The extent and quality of these natural areas is increasingly compromised by habitat loss from building on campus and from invasive species. The purpose of this project is to use the knowledge we have gained from the Natural Features Study completed in 2008 and the recently completed Invasive Species Management Strategy of 2016 to identify and restore sensitive ecosystems on campus. The results of this study will help to restore and retain the integrity of the remaining sensitive ecosystems on campus for future generations of campus users.

The project relates to the Vision of the Sustainability Action Plan in that it promotes shared responsibility and educates, inspires and motivates students, faculty, staff and community members. In terms of policy, the project promotes stewardship of our natural resources. The project promotes ecological balance.

There are a number of ecosystem types identified. These are: Bowker Creek, Garry Oak Woodland Camas Meadow, the Cunningham Woods, South Woods and Upper Hobbs Creek system, the Mystic Vale, Lower Hobbs Creek and CJVI Property and the Finnerty Ravine and Haro Woods system. The plant associations and dominant tree cover for each of these areas were mapped using data points collected in the Natural Features Study of the University of Victoria. More detailed representative examples of plant communities within these areas were provided to give additional details about species and distribution. Creeks and culverts on the campus were mapped as well.

A Sensitive Ecosystem Management Plan for the campus is provided identifying priority areas for action such as the woodland wetland by Bowker Creek, Garry Oak Ecosystems, mature second growth Douglasfir forests, and all creeks - Hobbs Creek, Bowker, Cadboro and Finnerty. Areas of sensitive ecosystems on campus where eradication of invasive species is advisable are recommended and management practices for other areas where the invasive species will be managed are identified. A monitoring program for early detection and rapid response of invasive species in these sensitive ecosystems is included. Monitoring for Japanese knotweed along the creeks for example.



An Environmental Studies class field trip in Mystic Vale

1. Introduction

The purpose of this report is to highlight the sensitive ecosystems in the natural areas of the University of Victoria campus. The report is building upon several previously studies of the UVIC campus natural areas, in particular Harrop-Archibald's University of Victoria Natural Features Study Phase 1 (2007), University of Victoria Campus Tree Inventory Phase I (2007), University of Victoria Natural Features Study Phase II (2008), University of Victoria Campus Tree Inventory Phase I (2007), University of Victoria Natural Features Study Phase II (2008), University of Victoria Campus Tree Inventory Phase II (Phase II) and more recently Kathrens & Jennings University of Victoria Invasive Species Management Strategy (2016). This report incorporates data from all three of these reports. Unlike these earlier reports, the Sensitive Ecosystem Inventory focuses on the elements of the ecosystems on campus that are particularly valuable and vulnerable and maps out their locations to aid with future management. In addition, this report includes management and monitoring plans for each category of sensitive ecosystems.

The report is structured around detailed maps of the campus. The data for these maps came primarily from the GIS data collected by Harrop-Archibald during her field work for the Natural Features Studies (2007 & 2008). However, the majority of the data that was collected was not described or mapped in these earlier reports. The raw data was processed, analyzed and mapped to create the backbone of this current report. For detailed methodology on how the data was initially collected, see the methodology sections of Harrop-Archibald's 2007 and 2008 reports. The software used to create the maps in this report was a free and open source professional geographic information systems program called QGIS.

In this report data is presented in both polygon data maps and point and line data maps. The polygon data maps provide a visual display of the following data categories: ecosystem types and dominant tree cover. The point and line data maps show creeks and culverts, special features, Arbutus trees, Garry oak trees and wildlife trees. For each of these categories of data there is an overview map of the entire UVIC campus as well as smaller scale maps of each natural area: Bowker Creek; Garry oak woodland and camas meadow; Cunningham Woods, South Woods and Upper Hobbs Creek; Mystic Vale, Lower Hobbs Creek and the CJVI Property; and Finnerty Ravine and Haro Woods. Preceding the overview map for each category are the written descriptions of the type of data and its distribution across the campus.

Brief management plans for each natural area are provided at the end of this report and monitoring recommendations are included. An adaptive management approach is required to incorporate the results of new research and experience.

2. Ecosystem Types

2.1. Description

The University of Victoria campus supports a variety of ecosystem types, ranging from artificial plantings to sensitive mature forest. The types of ecosystems displayed on the following maps are: artificial, orchard, recently disturbed, riparian area, swamp, woodland, strongly fluctuating water table, younger second growth forest, and older second growth forest. The sensitive ecosystems among these categories are riparian areas, swamps, woodlands and older second growth forest.

2.2. Distribution

Riparian areas are ecosystems surrounding the banks of watercourses such as streams that typically support vegetation adapted to these specific environments. Riparian areas are valuable as the vegetation must be able to survive varying levels of soil moisture, possible submersion when water levels rise, filter overland flow and runoff before it reaches the stream, and help stabilize streambanks with their roots. Riparian areas are present in Bowker Creek, Upper Hobbs Creek, Lower Hobbs Creek, and Mystic Vale.

Wetlands are characterized by a water table above or near the surface of the soil as well as a variety of native water loving plants. Wetlands provide rich habitats for a variety of bird, mammal and insect species. Bowker Creek is the natural area on campus that supports the largest area of wetlands. Cunningham Woods also supports wetland ecosystem. Wetlands that support a forest, as in the case of Bowker Creek by Parking Lot 8 by the Fraser Building, are called swamps.

Woodlands are areas of transition between two types of ecosystems, in this case meadow and Douglas-fir forests. They are relatively open areas with a low percentage of tree canopy. Woodland ecosystems mapped on the UVIC campus are sensitive ecosystems due to populations of Garry oaks that support more open environments that provide habitat for wildflowers and other native plants. Patches of woodland are present in Bowker Creek, the Garry oak woodland and camas meadow, Cunningham Woods, South Woods, Upper Hobbs Creek, Lower Hobbs Creek and Mystic Vale. The area of most valuable woodlands is the Garry oak woodland and Camas meadow natural area, as it protects the camas meadow from rapid encroachment by Douglas-fir.

Older second growth forests are among the most common sensitive ecosystems on campus by area covered. These maturing climax ecosystems support unique assemblages of plants and animals and if protected could in time develop into old growth forests. This ecosystem type is found in each of the natural areas on campus, but the largest areas are found in the South Woods, Upper Hobbs Creek, Lower Hobbs Creek and Mystic Vale. The presence of maturing climax forests in Finnerty Ravine and Haro Woods is also worth noting as they provide significant wildlife value in otherwise small and isolated natural areas.

2.2.1. Figure 1. Ecosystem Types Overview Map









The woodland swamp of Bowker Creek has a rich collection of wildlife trees





2.2.3. Figure 3. Garry Oak Woodland Camas Meadow Ecosystem Types



2.2.4. Figure 4. Cunningham Woods, South Woods and Upper Hobbs Creek Ecosystem Types



South Woods with mature second growth Douglas-fir and grand fir. Severe wind storms have broken a number of trees seen in this picture.

Sample Woodland

Site Characteristics: Natural 2		
Date: August 28, 2013	UTM zone: 10 U	
Site type: Natural	Easting: 0477537	
Site number: 2	Northing: 5367578	
Location: Mystic Vale	Slope: 22°	
Site area: 100m ²	Aspect: N (20°)	
Natural area: Mystic Vale	Size of natural area: 15.2 ha	

Map of Site



Site Disturbance		
Maintenance by Facilities Management:	Other disturbance:	
• N/A	• Narrow footpath near site	

Vegetation		
Canopy		
Total cover: 80%		
Dominant species:	Cover:	
• Bigleaf maple (<i>Acer macrophyllum</i>)	75%	
• Scouler's willow (Salix scouleriana)	10%	
Mid-canopy		
Total cover: 0%		
Dominant species:	Cover:	
• N/A	N/A	
<u>Understory/shrub</u>		
Total cover:		
Dominant species: 65%	Cover:	
• Sword fern (<i>Polystichum munitum</i>)	50%	
• English ivy (<i>Hedera helix</i>)	5-10%	
• English holly (<i>Ilex aquifolium</i>)	5%	
Dull Oregon-grape (Mahonia nervosa)	5%	
Additional species		
• Arbutus (Arbutus menziesii)		
Bracken fern (<i>Pteridium aquilinum</i>)		
Douglas-fir (<i>Pseudotsuga menziesii</i>)		
Himalayan blackberry (Rubu discolor)		
• Red huckleberry (Vaccinium parvifolium)		
Salal (Gaultheria shallon)		



Schematic Map Legend			
Polygon label Dominant understory species			
EE	Dull Oregon-grape		
	• Salal		
EE1	Dull Oregon-grape		
	English holly		
	• Salal		
ZZ	Salal		
AAA	Sword fern		
RRR	English holly		
SSS	English ivy		



Large healthy Arbutus are found throughout the campus in natural areas and even in parking lots



2.2.5. Figure 5. Mystic Vale, Lower Hobbs Creek and CJVI Property



Welcoming sign at entrance to trail into Mystic Vale from Parking Lot 1 behind Glover Greenhouse Facility



Canoe Pond in Mystic Vale

Sample Riparian Area

Site Characteristics: Natural 1Date: June 16, 2013UTM zone: 10 USite type: NaturalEasting: 0476433Site number: 1Northing: 5368157Location: Bowker Creek woodsSlope: <5%</td>Site area: 100m²Aspect: NWNatural area: Bowker Creek woodsSize of natural area: 7.9 ha



Site Disturbance		
Maintenance by Facilities Management:	Other disturbance:	
• N/A	• Litter (a few bottles in site)	

Vegetation		
Canopy		
Total cover: 80%		
Dominant species:	Cover:	
• Red alder (Alnus rubra)	60%	
Bigleaf maple (<i>Acer macrophyllum</i>)	40%	
Mid-canopy		
Total cover: 15%		
Dominant species:	Cover:	
Cascara (<i>Rhamnus purshiana</i>)	15%	
Understory/shrub		
Total cover:		
Dominant species:	Cover:	
• Indian plum (<i>Oemleria cerasiformi</i>)	50%	
Red-osier dogwood (Cornus stolonifera)	30%	
Himalayan blackberry (<i>Rubu discolor</i>)	20%	
Common snowberry (Symphoricarpos albus)	15%	
Additional species		
• English holly (<i>Ilex aquifolium</i>)		
• English ivy (<i>Hedera helix</i>)		
Salmonberry (<i>Rubus spectabilis</i>)		
Sword fern (<i>Polystichum munitum</i>)		



Schematic Map Legend		
Polygon label	Dominant understory species	
G	 Common snowberry Indian plum 	
G1	 Common snowberry English holly Himalayan blackberry Indian plum 	
G2	 Common snowberry English holly Indian plum 	
L	Common snowberryIndian plumRed-osier dogwood	
L1	 Common snowberry English holly Indian plum Red-osier dogwood 	
LL	Indian plumSalmonberry	
LL1	 Himalayan blackberry Indian plum Salmonberry 	

Sample Recently Disturbed

Site Characteristics: Natural 9		
Date: June 14, 2013	UTM zone: 10 U	
Site type: Natural	Easting: 0477229	
Site number: 9	Northing: 5367440	
Location: Mystic Vale	Slope: Flat	
Site area: 100m ²	Aspect: N/A	
Natural area: Mystic Vale	Size of natural area: 15.2 ha	



Site Disturbance		
Maintenance by Facilities Management:	Other disturbance:	
• N/A	• Litter (minimal)	

Vegetation		
Canopy		
Total cover: 5%		
Dominant species:	Cover:	
Douglas-fir (Pseudotsuga menziesii)	5%	
Mid-canopy	!	
Total cover: 85%		
Dominant species:	Cover:	
• Bigleaf maple (Acer macrophyllum)	85%	
<u>Understory/shrub</u>	!	
Total cover: 70%		
Dominant species:	Cover:	
Oceanspray (Holodiscus discolor)	50%	
Common snowberry (Symphoricarpos albus)	25%	
Himalayan blackberry (<i>Rubu discolor</i>)	15%	
Rosa cultivar.	10%	
Additional species		
• English ivy (<i>Hedera helix</i>)		
• Grand fir (<i>Abies grandis</i>)		
• Indian plum (<i>Oemleria cerasiformi</i>)		
• Sword fern (<i>Polystichum munitum</i>)		



Schematic Map Legend	
Polygon label	Dominant understory species
F2	Common snowberry
	Himalayan blackberry
F3	Common snowberry
	Himalayan blackberry
	Rosa cultivar.
S	Common snowberry
	Oceanspray
VV	Oceanspray
VV1	Himalayan blackberry
	Oceanspray
VV2	Oceanspray
	• Rosa cultivar.
NNN	• Grand fir
	Himalayan blackberry
	Oceanspray



2.2.6. Figure 6. Finnerty Ravine and Haro Woods

3. Dominant Tree Cover

3.1. Description

The following maps depict the dominant species in the tree canopies of the varying ecosystems across the campus. Across all the ecosystems, the dominant tree species are as follows: *Acer macrophyllum* (bigleaf maple), *Abies grandis* (grand fir), *Arbutus menziesii* (arbutus), *Alnus rubra* (red alder), *Crataegus monogyna* (common hawthorn), *Populus balsamifera* (black cottonwood), *Prunus emarginata* (bitter cherry), *Pseudotsuga menziesii* (Douglas fir), *Populus tremuloides* (trembling aspen), *Quercus garyanna* (Garry oak), *Salix scouleriana* (Scouler's willow), and *Thuja plicata* (Western red-cedar). The tree species indicative of the most sensitive areas are *Arbutus menziesii*, *Populus balsamifera*, *Populus tremuloides*, and *Quercus garyanna*. However, besides the exotic tree species *Crataegus monogyna*, the rest of these are native tree species that provide habitat value and contribute to the ecosystem services of the surrounding natural areas even though they are less sensitive.

3.2. Distribution

Arbutus menziesii is the dominant tree species on three patches across two natural areas of the UVIC campus. The largest patch is in Bowker Creek and it borders on the University Club building. The smaller two patches are in Cunningham Woods.

Populus balsamifera is the dominant tree cover in only one natural area on campus: Bowker Creek. It defines a large, uninterrupted patch of wetland. Multiple trees are over 100cm in diameter at breast height. Though not displayed on the map, this species is also present in South Woods as a codominant species in the tree canopy.

Populus tremuloides is found as a dominant canopy cover in only one small patch in Bowker Creek and in no other natural areas on campus. Of the sensitive trees in this section, this one covers the least area at UVIC. It is quite uncommon in the Greater Victoria Area.

Quercus garyanna is the dominant tree species in small patches across the southern campus. The largest patch dominated by *Quecus garyanna* is in the Garry oak woodland and camas meadow. It is also found in the South Woods, Upper Hobbs Creek and Lower Hobbs Creek. These patches are located in woodlands that border open areas on at least one side and are bounded by forest on the other.

3.2.1. Figure 7. Dominant Tree Cover UVIC Overview Map





3.2.2. Figure 8. Bowker Creek Dominant Tree Cover




3.2.4. Figure 10. Cunningham Woods, South Woods and Upper Hobbs Creek Dominant Tree Cover



Sample Older Second Growth

Site Characteristics: Natural 5	
Date: June 8, 2013	UTM zone: 10 U
Site type: Natural	Easting: 0477109
Site number: 5	Northing: 5367530
Location: Alumni Chip Trail, South Woods	Slope: Flat
Plot area: 100m ²	Aspect: N/A
Natural area: South Woods	Area of natural area: 11.7 ha



Site Disturbance	
Maintenance by Facilities Management:	Other disturbance:
• N/A	• N/A

Vegetation	
Canopy	
Total cover: 15%	
Dominant species:	Cover:
• Black cottonwood (<i>Populus balsamifera</i> subsp. <i>trichocarpa</i>)	15%
Mid-canopy	
Total cover: 10%	
Dominant species:	Cover:
• Garry oak (Quercus garryana)	5%
Saskatoon (Amelanchier alnifolia)	5%
• Bigleaf maple (Acer macrophyllum)	2%
Red-osier dogwood (Cornus stolonifera)	2%
<u>Understory/shrub</u>	
Total cover: 85%	
Dominant species:	Cover:
Nootka rose (<i>Rosa nutkana</i>)	40%
Common snowberry (Symphoricarpos albus)	30%
Oceanspray (Holodiscus discolor)	25%
• Himalayan blackberry (Rubu discolor)	15%
Additional species	
• Bracken fern (<i>Pteridium aquilinum</i>)	
Cascara (<i>Rhamnus purshiana</i>)	
• Indian plum (<i>Oemleria cerasiformi</i>)	
• Pacific ninebark (<i>Physocarpus capitatus</i>)	
• Sword fern (<i>Polystichum munitum</i>)	
• Thimbleberry (Rubus parviflorus)	
Western-trumpet honeysuckle (Lonicera ciliosa)	



Schematic Map Legend	
Polygon label	Dominant understory species
F	Common snowberry
S	Common snowberry
	Oceanspray
S2	Common snowberry
	Himalayan blackberry
	Oceanspray
QQ	Nootka rose
SS	Nootka rose
	Oceanspray
	Sword fern
TT	Nootka rose
	Red-osier dogwood
UU	Nootka rose
	• Thimbleberry
VV	Oceanspray
JJJ	Common snowberry
	Himalayan blackberry
	Nootka rose
	Sword fern

Sample Younger Second Growth

Site Characteristics: Natural 4	
Date: June 14, 2013	UTM zone: 10 U
Site type: Natural	Easting: 0476828
Site number: 4	Northing: 5367614
Location: Medical Sciences Building	Slope: Flat
Site area: 100m ²	Aspect: N/A
Natural area: Cunningham Woods	Size of natural area: 1.5 ha



Site Disturbance	
Maintenance by Facilities Management:	Other disturbance:
• N/A	• N/A

Vegetation <u>Canopy</u>	
Dominant species:	Cover:
• Black cottonwood (<i>Populus balsamifera</i> subsp. trichocarpa)	30%
Mid-canopy	
Total cover: 30%	
Dominant species:	Cover:
• Scouler's willow (Salix scouleriana)	25%
Red alder (Alnus rubra)	10%
Understory/shrub	
Total cover: 90%	
Dominant species:	Cover:
Red-osier dogwood (Cornus stolonifera)	60%
Indian plum (<i>Oemleria cerasiformi</i>)	15%
Common snowberry (Symphoricarpos albus)	15%
Additional species	
Cascara (<i>Rhamnus purshiana</i>)	
• English holly (<i>Ilex aquifolium</i>)	
Himalayan blackberry (<i>Rubu discolor</i>)	
• Nootka rose (<i>Rosa nutkana</i>)	
• Scouler's willow (Salix scouleriana)	



Schematic Map Legend	
Polygon label	Dominant understory species
F	Common snowberry
G	Common snowberry
	Indian plum
U	Common snowberry
	Red-osier dogwood
V	Common snowberry
	Red-osier dogwood
	Sword fern
YY	Red-osier dogwood
YY2	English holly
	Red-osier dogwood
FFF	Cascara
	Himalayan blackberry
	Indian plum
	Nootka rose
	Red-osier dogwood
LLL	English holly
	Indian plum
	Red-osier dogwood
RRR	English holly



3.2.5. Figure 11. Mystic Vale, Lower Hobbs and CJVI Property Dominant Tree Cover



The orchard on the CJVI lands



3.2.6. Figure 12. Finnerty Ravine and Haro Woods Dominant Tree Cover

4. Watercourses: Creeks and Culverts

4.1. Description

The following maps display the watercourses in the natural areas, specifically creeks and culverts. Creeks are natural drainage channels in the watershed whereas culverts are man made storm water management infrastructure. They are both included in this section because they interact with one another to influence water quality, ground water tables, soil moisture, and runoff from storms.

4.2. Distribution

Creeks are present in relative abundance across the UVIC Campus. Bowker Creek is located at the headwaters of the Bowker Creek watershed and sustains multiple branches of its creek. Much of this area is perpetually moist and has adapted to its role as a wetland (the boundary of the wetland ecosystem is depicted in the Ecosystem Types section). Further southeast, Hobbs Creek stretches through Upper Hobbs Creek, Lower Hobbs Creek and Mystic Vale. Beyond the surface water itself, 30m on either side of the bank of the creeks should be considered sensitive ecosystems as they directly influence stream stability, water quality and other variables.

Culverts are present in several natural areas: the Garry oak woodland and camas meadow, South Woods, Lower Hobbs Creek, Mystic Vale and Finnerty Ravine. The culverts intersect the creeks in two areas in Lower Hobbs Creek and Mystic Vale.



UVIC Natural Areas Creeks and Culverts

Watercourses

100

Culvert Creek

0

100

200

300

400 m



Bowker Creek Creeks & Culverts

Garry Oak Woodland & Camas Meadow Creeks & Culverts



Mystic Vale, Lower Hobbs Creek & CJVI Property Creeks & Culverts



Figure 17. UVIC Natural Areas Special Features

UVIC Natural Areas Special Features





Bowker Creek Special Features

Garry Oak Woodland & Camas Meadow Special Features



Cunningham Woods, South Woods & Upper Hobbs Creek Special Features



Mystic Vale, Lower Hobbs Creek & CJVI Property Special Features



Finnerty Ravine & Haro Woods Special Features



UVIC Natural Areas Gary Oak Trees



Bowker Creek Garry Oak Trees



Cunningham Woods, South Woods & Upper Hobbs Creek Garry Oak Trees



Finnerty Ravine & Haro Woods Garry Oak Trees



Figure 27. UVIC Natural Areas Arbutus Trees UVIC Natural Areas Arbutus Trees



6



Bowker Creek Arbutus Trees

Garry Oak Woodland & Camas Meadow Arbutus Trees



Cunningham Woods, South Woods & Upper Hobbs Creek Arbutus Trees



Finnerty Ravine & Haro Woods Arbutus Trees



Figure 32. UVIC Natural Areas Wildlife Trees UVIC Natural Areas Wildlife Trees



'1
Bowker Creek Wildlife Trees



72

Garry Oak Woodland & Camas Meadow Special Features



Cunningham Woods, South Woods & Upper Hobbs Creek Wildlife Trees



Figure 36. Finnerty Creek and Haro Woods Wildlife Trees

Finnerty Creek & Haro Woods Wildlife Trees



Sensitive Ecosystems Management Plan

Priority areas for action are as follows:

Bowker Creek

Much of Bowker Creek is overgrown with growth Himalayan Blackberry and English Ivy. The ivy is also growing on tree trunks in many instances. Eradication of the invasion is not feasible. However, these invasive species need to be contained and not continue their spread. The top priority would be to remove ivy from tree trunks: vertical ivy growth produces berries that are then eaten by birds and dispersed. The high concentration of wildlife trees probably supports a high level of biodiversity and there are probably unique or rare species of interest. We recommend that an inventory for bird and bats be made to better assess any special requirements for management.

Garry Oak Ecosystems

Due to intensive invasive species removals in the past these areas are relatively free of Scotch Broom but new seedlings pose a continued threat. Removal of Scotch Broom seedlings should occur every three years, along with other invasive species that occur on the same site such as Daphne Laurel and Himalayan Blackberry.

Cunningham Woods, South Woods, Mystic Vale

The removal of English Ivy from tree trunks in Douglas-fir mature second growth forestsis a popular activity for some undergraduate classes and this needs to continue. Of concern is the heavy fuel loading on the forest floor in the South Woods due to storm damage to trees. This can pose a serious fire hazard and needs to be a risk assessment and the fuel loading removed if necessary. Mature forests next to residential areas are also vulnerable to the illegal dumping of yard waste and the university can work with Saanich and Oak Bay on an education program for residents living next to campus to discourage illegal dumping.

Hobbs, Bowker, Cadboro, Haro and Finnerty Creeks

Stream bank erosion and siltation are a constant threat to the watercourses of these creeks. Facilities Management has taken steps to ensure that there is a restoration plan for Hobbs Creek in the past. The plan has expired and should be updated. Comparable plans need to be developed for the other creeks on campus. Some classes on campus have planted riparian vegetation along Hobbs and Bowker Creek in particular. The planting of Riparian vegetation along creeks should be encouraged. The major erosion events of Hobbs Creek are due to the large amount of stormwater runoff from impervious surface in the Oak Bay watershed – the university is unable to implement a long-term solution by only working within the watercourse in Mystic Vale itself. The university can work with the City of Oak Bay to reduce the area of impervious surface to support the health of Hobbs Creek. Trails adjacent to watercourses should be assessed for potential damage to creeks and re-designed if necessary to reduce impacts from dogs and mountain bikes.

Monitoring Program

A monitoring program for early detection and rapid response of invasive species in sensitive ecosystems that involves site visits with intervals between visits no longer than five years. Monitoring for species that are particularly aggressive and difficult to eradicate such as Japanese knotweed along creeks, species that transform plant communities such as garlic mustard in woodlands and species that pose a hazard to human health such as giant hogweed and Daphne laurel are particularly important. A monitoring program with regular site visits can also help to contain existing well-established invasions by locating new areas being colonized that can realistically be eradicated.

Regular site visits could also detect new species of interest that may be attracted to the campus and should be supported through environmental stewardship. This is especially the case for species at risk or charismatic species that interest the campus community.

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