Iverson Preserve Noxious Weed Management Plan
2013-2020

Photo courtesy of Friends of Camano Island Parks (FOCIP)

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EXECUTIVE SUMMARY

In 2012, the Island County Noxious Weed Control Board (ICNWCB) received a Maintenance and Operations Funding grant of $14,145 from the Island County Conservation Futures Program to support noxious weed control activities in the Iverson Preserve on Camano Island. A portion of the funds were designated for preparing a long term management plan for controlling noxious weeds in the Preserve. This document is the plan that satisfies that requirement.

Island County purchased the 197 acre Iverson Preserve with Conservation Futures Funds in 1999. It is a minimally developed area consisting of three distinct ecosystems: marine waters, uplands and freshwater river deltas and includes former agricultural land, salt marshes, scrub land and forest. The diversity of habitat supports a wide diversity of wildlife and birds, and the area is a popular recreation site with residents and visitors. Sixty eight acres are currently leased for agriculture and used to grow tall fescue seed. A site management plan was developed for Iverson Preserve in 2011 (Northwest Ecological Services, 2011). The vision developed for the Preserve is: "To provide a site where citizens can come to enjoy the beauty of the natural environment through limited, low-impact activities while exhibiting stewardship to ensure the health of sensitive ecosystems."

The Iverson Preserve Site Management Plan lists noxious weeds as one of the ecological challenges at Iverson Preserve and recognizes the need for development of long term management options for noxious weed control. Although several independent efforts have been made to control noxious weeds at the Preserve since the property was purchased, none of the efforts have been guided by a noxious weed management plan and therefore have been only marginally effective. In addition, no comprehensive survey for noxious weeds has ever been conducted to document the actual number of species present and their levels of infestation.

As a first step in the preparation of the Iverson Preserve Noxious Weed Management Plan a comprehensive noxious weed survey was conducted during the summer of 2013. Fifteen species currently on the Washington State Noxious Weed List were found during the surveys. Four of the species (poison hemlock, Canada thistle, bull thistle, common fennel) are regulated noxious weeds in Island County meaning that control is legally required.

The purpose of the "Iverson Preserve Noxious Weed Management Plan: 2013 – 2020" is to present effective long term noxious weed management strategies guided by a detailed implementation schedule using species specific integrated control methods. The primary goals of the Plan are to:

- Eliminate over 95% of the Scotch broom (the most prolific noxious weed) in the Preserve
- Reduce the levels of Canada thistle, bull thistle, and poison hemlock by at least 95% through treatment efforts
- Eliminate common teasel, common fennel, herb-Robert, English ivy, English holly, and oxeye daisy completely in the Preserve.
- Control the spread of Himalayan blackberry, common St. Johnswort, wild carrot, common catsear, and reed canarygrass into any new areas and reduce existing infestations using mechanical, chemical, and cultural methods.

- Re-vegetate areas cleared of noxious weeds with native species as necessary.
- Conduct annual monitoring to assess infestations and success of previous control efforts.
- Conduct early detection and rapid response (EDRR) and eradicate any new infestations of noxious weeds discovered in the Preserve as soon as possible.

INTRODUCTION

In February 2012, the Island County Noxious Weed Control Board submitted a grant proposal for Conservation Futures Program maintenance and operations funding to develop and implement a long term noxious weed management plan for Iverson Preserve. The funding request was for $43,350 to be spent over eight years: $7,200 per year for the first five years and $7,350 for years six through eight. After consideration of the grant proposal by both the Conservation Futures Technical Advisory Committee (TAG) and the Conservation Futures Citizen's Advisory Board (CAB), it was recommended that one year of funding, totaling $14,145 be granted. Part of this funding was to be used for the preparation of a long term noxious weed control management plan. The following document fulfills this contract obligation and presents a detailed plan for a long term integrated and sustainable noxious weed management plan for Iverson Preserve.

BACKGROUND

Iverson Preserve (Figure 1) is located on the eastern shore of Camano Island, south of Livingston Bay and North of Barnum Point (Section 32, Township 32 N, Range 3 East and Section 5, Township 31 North, Range 3 East, W.M.). Island County purchased the 120 acre Iverson Preserve with Conservation Futures Funds (CFFs) in 1999. A site management plan was developed for the Preserve in 2001 (Northwest Ecological Services, 2011). The management plan describes the Preserve's several habitat types as: managed agriculture, open water/ditches, emergent/herbaceous, scrub shrub, forest, salt marsh, mud flat, nearshore, and eelgrass. The variety of habitats is a reflection of the diversity of hydrology, landforms, soils, and land uses. Iverson Preserve supports a wide range of fish and wildlife species. The variety of species is due in part to the presence of several habitat types and the Preserve's location at the intersection of three distinct ecosystems: marine waters, uplands, and freshwater river deltas. Infrastructure within the Preserve is limited, but includes important features such as a small (14-vehicle) parking area, emergency turn-around, information kiosk, trails, dike, tide gate, seasonal portable toilet (porta-potty), and an active agricultural field.

Two studies to determine alternatives for restoration and enhancement of the marsh habitat and shoreline processes for the Iverson farm property were prepared for the Island County Public Works Department subsequent to the acquisition (Sheldon & Associates, Inc., 2001; Williams and Associates, 2001). Historically, the Iverson Preserve property was dominated by a low-energy salt marsh (USGS 2011; US Coastal and Geodetic Survey, 1886; Williams & Associates, Ltd., 2001). Historical maps (US Coastal and Geodetic Survey, 1886) depict the property as consisting of salt marsh with multiple tidal channels at the base of a relatively steep upland bank. By 1943, the property was drained and protected by a dike, most likely for the purpose of converting the land to agricultural use (USGS, 2011 and Sheldon & Associates, Inc., 2001). The dike and associated tide gate remain to this day. When Island County purchased the property in 1999, the shoreline was undeveloped with the exception of the dike and tide gate. Island County currently leases the 68 acres of agricultural land for commercial seed farming. No plans for restoring the Iverson marsh are presently being undertaken.

Iverson Preserve is a unique public space with broad community support. Called Iverson "Preserve", the area's name differentiates its function from that of a more traditional, improved parkland. When the property was acquired it was assumed that it would be used for low-impact recreation. The site management plan proposed the following vision statement for consideration by Island County, citizens, and key stakeholders: "Iverson Preserve is a site where citizens come to enjoy the beauty of the natural environment through limited, low-impact activities while exhibiting stewardship to ensure the health of

sensitive ecosystems. Low impact activities are those activities that do not degrade the surrounding waters, habitats, and vegetation communities and are compatible with the available facilities and surrounding land uses."

IMPACT OF NOXIOUS WEEDS

Noxious weeds are undesirable non-native plants that have economic, ecological, or aesthetic implications. The impact of noxious weeds can be quite extensive. Noxious weeds are often extremely competitive with native flora, making them very difficult to control. A proliferation of noxious weeds can disrupt or permanently alter native habitats. For the farmer noxious weeds can reduce crop yields, lower the quality of grazing lands, reduce the value of land, poison cattle, and plug waterways. In the urban garden noxious weeds can outgrow and dominate the desired flora, poison pets, and decrease the value of land. Other effects of noxious weeds include land erosion, high risk of wild fires, reduced outdoor recreational activities (e.g. hunting, fishing, hiking, mountain biking), and destruction of native plant and animal habitat (Island County Noxious Weed Control Board, 2013).

The Iverson Preserve Site Management Plan recognizes noxious weeds as one of the ecological challenges at Iverson Preserve and presents some near and long term options for controlling the problem. Near term options include continuing existing efforts that are yielding concrete results. These include WSDA's *Spartina* control work, Friends of Camano Island Parks (FOCIP) volunteer efforts as coordinated with the Island County Noxious Weed Control Board (ICNWCB), and the ICNWCB's efforts in the upland area (i.e. continuing chemical and mechanical control as well as monitoring of biocontrol efforts and working with the agricultural leaseholder to increase efforts on edges of farm fields. The long term options listed include implementing comprehensive weed surveys/mapping efforts targeting existing weeds, especially giant hogweed, and to look for other noxious weeds not yet known from the Preserve but found in the area (e.g. hairy willow-herb, *Epilobium hirsutum*) with seasonal visits (e.g. early spring, late spring, summer and fall).

HISTORICAL NOXIOUS WEED CONTROL WORK AT IVERSON PRESERVE

Since the purchase of the property there have been several independent efforts to control the spread of noxious weeds in the Preserve. The following is a summary of the weed management activities and the entities that have been involved:

<u>Washington State Department of Agriculture</u>
The majority of the noxious weed control work at Iverson has been the *Spartina* control effort funded through the Washington State Department of Agriculture (WSDA) since 1996. In 1996 there were approximately 20 solid acres of *Spartina* in the mudflats off Iverson. In 2013, only 0.105 acres were found and treated with herbicide and an additional 13 square feet of plant material were dug up and removed. Island County's current contract with WSDA for *Spartina* control extends through June 30, 2015. The goal is to have all of the *Spartina* eradicated by this time.

<u>Island County Parks</u>
In 2008 Island County Parks applied for an Iverson Operations and Maintenance Project Grant from the Island County Conservation Futures Program for $20,500.00. The application included a request that $5,500 of this amount be designated for noxious weed control on "3 acres currently impacted by noxious weeds." The application states "We are asking for up to $5,500 to accomplish this effort as overseen by our County Weed Board and staff over a two-year period with a five-year monitoring of the

site. In consultation with our County Weed Board and staff, we are proposing a two-year plan to control Canada thistle and Himalayan blackberry that consists of cutting the invasive vegetation, then applying an herbicide (Garlon 4 or something similar). On the hill near the trees the invasives would be cut and the herbicide painted on the stalks of the plants. This will keep the herbicide on target. In other areas the plants would be cut followed by spray application of the herbicide." Attached to this application was a Draft Iverson Property Vegetation Management Plan. This Draft plan is attached as Appendix A. A total of $18,500 was granted to fund the preparation of the Site Management Plan (2011) and included $5,500 for noxious weed control.

In 2011 the Island County Noxious Weed Program (ICNWP) Coordinator was contracted by the Public Works Department to initiate the noxious weed control work at Iverson Preserve. The $5,500 grant extended from April 1, 2011 until October 31, 2011. Thane Tupper, who served as the ICNWP Coordinator during this period, was responsible for the noxious weed control efforts completed under the contract obligations. His efforts targeted mechanical removal of Scotch broom, introduction of biological controls for Scotch broom, using herbicides to control poison hemlock and Canada and bull thistles, and initiating weed mapping. A summary of his work is presented in "Iverson Preserve Current and Future Noxious Weed Management Plan" (Tupper, 2011) and is attached as Appendix B.

Currently there is one Island County Parks' employee that is responsible for servicing all sixteen parks on Camano Island. This employee's time is primarily focused on the maintenance of park infrastructure but has on occasion included assistance with noxious weed control.

Camano Island Road Shop

Personnel from the Camano Island Road Shop have on occasion mowed the dike to keep noxious weeds and other vegetation from encroaching onto the dike trail. In addition, herbicide treatment of the poison hemlock growing along Iverson Beach Road was conducted by personnel from the Camano Island Road Shop during the summer of 2013.

Friends of Camano Island Parks

FOCIP has been actively involved at Iverson Preserve since its inception in 2000. Currently FOCIP has one dedicated site steward who is a local resident and is on site regularly, focusing on trail maintenance. FOCIP also has irregularly scheduled work parties for trail maintenance and also weed control, especially mechanical control of Scotch broom.

FOCIP and ICNWCB member, Tom Eisenberg (2014), provided the following list of projects that FOCIP has sponsored or partnered:

1. Trail system development and maintenance 1999 thru 2013.
2. Replaced the bridge over the drainage ditch.
3. Scotch broom removal in 2000 and again in 2013.
4. Re-vegetation with Earth Corps: 1500 plants along the dike and in reclaimed areas.
5. Created the picnic area
6. Installed the informational kiosk.
7. Purchase, install, and update posters and information at the kiosk.
8. Installed uniform signage with Island County Health Dept.
9. Gravel applied and 4"x4" curb on west side of Loop Trail.
10. Carved wooden signs at the Park entrance and the Hobbit Trail
11. Installed 500' of planked walkways in sensitive areas.

12. Installed two benches.
13. Installed interpretive signs at viewing areas.
14. FOCIP hosts public Winter Walk annually at Iverson Spit.
15. FOCIP developed Adopt-a-Park system to maintain trails and pick up trash from public use areas and the beach at Iverson and other Island Parks.
16. Publish, print, and distribute trail guides to Iverson and other Island Parks.
17. Prepared the area for a new expanded parking area.

Agricultural Leaseholder

Marine View Farms currently leases the 68 acres of farm fields at Iverson Preserve. The primary objective of the lease is for noxious weed control. They grow tall fescue for seed production. After harvest they flail chop the straw and in October they spray 1.5 lbs of Diron for weed control. In the spring they spot spray noxious weeds, primarily poison hemlock, with glyphosate (Christianson, 2014).

NOXIOUS WEED SURVEY

The first step in the development of the noxious weed management plan for Iverson Preserve was to complete a comprehensive noxious weed survey. The ICNWP Coordinator contracted with Island Botanical Services to complete a noxious weed survey during the summer of 2013. The contract's scope of work included documenting the species, GPS locations and numbers of listed noxious weed species within Iverson Preserve and mapping infestation areas on aerial photos. Only noxious weed species that were on the 2013 Washington State Noxious Weed and the 2013 Island County Noxious Weed list were included in the survey results. As mentioned previously, *Spartina* monitoring and control work is being conducted as part of Island County's contract with WSDA and was not included in this contract's scope of work.

Each year, the State Noxious Weed Control Board adopts, by rule (WAC 16-750), the State Noxious Weed List. This list determines which plants will be considered noxious weeds and where control will be required in Washington State. There are three classes of noxious weeds on the state noxious weed list:
Class A noxious weeds are non-native species that are limited in distribution in Washington. State law requires that these weeds be eradicated.
Class B noxious weeds are non-native species that are either absent from or limited in distribution in some portions of the state but very abundant in other areas. The goals are to contain the plants where they are already widespread and prevent their spread into new areas.
Class C noxious weeds are non-native plants that are already widespread in Washington State. Counties can choose to enforce control, or they can educate residents about controlling these noxious weeds.
Once the State Noxious Weed list is adopted, county and district weeds lists are created from the updated State Noxious Weed List. County weed lists include all State Class A weeds and Class B weeds designated by the state for control in their area according to WAC 16-750. Counties and districts can then select additional Class B weeds and Class C weeds that they will require control of in their area. Some noxious weeds may be too abundant to require control, but counties and districts still recommend landowners control these weeds and provide information and advice on the best control methods to use.

Fourteen listed noxious weeds were confirmed during the 2013 surveys (Appendix C): *Cirsium arvense* (Canada thistle), *Cirsium vulgare* (bull thistle), *Conium maculatum* (poison hemlock), *Cystisus scoparius* (Scotch broom), *Daucus carota* (wild carrot), *Dipsacus fullonum* (common teasel), *Foeniculum vulgare* (common fennel), *Geranium robertianum* (herb-Robert), *Hedera helix* (English ivy), *Hypericum*

perforatum (common St. Johnswort), *Hypochaeris radicata* (common catsear), *Ilex aquifolium* (English holly), *Leucanthemum vulgare* (oxeye daisy), and *Rubus armeniacus* (Himalayan blackberry). In addition, *Phalaris arundinacea* (reed canarygrass) was suspected but could not be confirmed due to the post flowering stage of the grass during the time of the survey. The presence of reed canarygrass at Iverson Preserve is mentioned in the Site Management Plan (2011) and has also been documented by the ICNWP Coordinator so it is included in the following list.

Giant hogweed (*Heracleum mantegazzianum*) was documented at Iverson Preserve by the previous ICNWP Coordinator, Thane Tupper, during the summer of 2011. His summary report (Appendix B) states that a single occurrence of giant hogweed was found and was controlled with herbicide prior to seed set. It is possible that the plant may have been misidentified. Giant hogweed may be confused with our closely related native cow parsnip (*Heracleum maximum*). Other giant hogweed sites that were mapped during 2011 were revisited by the current ICNWP Coordinator with the assistance of a WSDA researcher in 2012 and were confirmed to be cow parsnip. No giant hogweed was found during the 2013 surveys, although cow parsnip was plentiful in the Preserve.

Following is a brief description of each of the weeds that were documented during the 2013 surveys, their class designation, location and abundance information provided from the 2013 surveys, and any historical control information at Iverson that was available for each species. Photos of these noxious weeds are shown in Figure 2.

<u>Scotch Broom</u>
Scotch broom is a loosely branched woody shrub with green slender ribbed branches and small, simple leaves up to half an inch long. It grows from three to 10 feet in height. The bright yellow flowers are pea-like, about three-quarters of an inch long. Its seeds are borne in dark brown to black hairy, flattened pea-like pods, which when ripe, burst and scatter seeds for yards. Seeds can stay viable in the soil for over 50 years. Originally introduced from Europe as an ornamental and for erosion control, it is highly aggressive and forms dense, monotypic stands which reduce wildlife habitat and hinder re-vegetation of upland sites and wetland buffers.

Scotch broom is a Class B noxious weed in Washington, first listed in 1988. Due to its widespread distribution, it has not been designated for required control in the county by the Washington State Noxious Weed Board or been selected for required control by the ICNWCB. This lack of required control in many areas in the Pacific Northwest has resulted in the prolific and detrimental spread of the plant and prompted the formation of a Regional Scotch Broom Working Group during the summer of 2013.

Control of Scotch broom at Iverson Preserve has been where most of the historical noxious weed control effort has been expended. In the Iverson Property Vegetation Management Plan submitted as an attachment to the 2008 Maintenance and Operations grant application (Appendix A), the author states "There has been an ambitious volunteer effort to eradicate Scotch broom from this site. Ninety-five percent of this infestation has been successfully removed, but the seed bank is a source for concern." Friends of Camano Island Parks were likely the volunteers responsible for this work. According to a summary of FOCIP Involvement at Iverson Spit Preserve provided by FOCIP member and ICNWCB member, Tom Eisenberg, FOCIP volunteers worked on Scotch broom removal at Iverson in 2000 and again in 2013. The 2013 work is summarized in a later section of the report. Without annual control between 2000 and 2013 the Scotch broom recolonized the area from the residual seed bank. This will continue to be the case until a long term noxious weed plan is funded and annual monitoring and removal of new plants is completed.

Thane Tupper also spent a considerable amount of time managing Scotch broom at Iverson during the summer of 2011. According to the report he authored in 2011 (Appendix B), he introduced biological control agents for Scotch broom during the summer of 2011. No information is presented in the report on the species or quantities of the biological control agents that were released. Although the exact locations of the release sites were not reported, he indicates that they were released along the southeast dike where mechanical removal of the plants might have compromised the stability of the dike. Further investigation that was conducted in preparation of this management plan, revealed that 200 *Bruchidius villosus* were released on June 2, 2011. In addition to the release of the biological control agents, he mechanically removed 1,420 lbs of scotch broom during eight work days from May through October 2011 on the opposite side of the Preserve.

During the summers of 2012 and 2013, Scotch broom seed pods were collected at Iverson Preserve and sent to the WSU Biological Research Station for examination. Of the 739 seeds examined in 2012, 39.78% had been attacked by a biological control agent. *Bruchidius villosus* and *Exapion fuscirostre* were responsible for 90.14% and 9.18% of the attacks respectively. Of the 806 seeds examined in 2013, 83.87% had been attacked. In 2013 *Bruchidius villosus* and *Exapion fuscirostre* were responsible for 89.87% and 5.03% of the attacks respectively.

Poison Hemlock

Poison hemlock is a biennial. First year plants form low clumps of lacy leaves with reddish or spotted stems. Second year stems are stout, hollow, hairless, ribbed, with reddish or purple spotting/streaking and can reach eight to 10 feet tall. Flowering plants are covered with numerous small, umbrella-shaped clusters of tiny white flowers that have five petals. Poison hemlock reproduces by seed. Seeds form in green, ridged capsules that eventually turn brown. Up to 40,000 seeds per plant are produced. Seeds fall near the plant and are moved by erosion, animals, rain and human activity. Seeds are viable up to six years and germinate throughout the growing season.

Poison hemlock is acutely toxic to livestock, wildlife, and humans causing death by respiratory paralysis after ingestion. It is an aggressive invader and can crowd out desirable vegetation.
It can be found along roadsides, and in riparian areas, ravines, fields, ditches, un-managed yards and vacant lots.

Poison hemlock is a Class B noxious weed in Washington. Due to widespread distribution, it has not been designated for required control in the county by the Washington State Noxious Weed Board but because of the health hazard it poses and the negative economic impact it can have on the local agricultural industries, it has been selected for required control by the ICNWCB.

At Iverson, poison hemlock was documented at 10 different locations (see Appendix C maps). The most problematic areas for poison hemlock at Iverson are along the northwestern side of Iverson Beach Road and the eastern edge of the agricultural area, along the staircases crossing the dike area that provide public access to the beach, and a fill dirt area that was deposited by the Camano Island road crew a few years ago. At the time the road department thought that they could later use this dirt to re-enforce the dike area. The dirt ended up being a seed bank for weeds, the most abundant being poison hemlock.

Control of poison hemlock at Iverson has been sporadic to date. There is no mention of poison hemlock in the draft Iverson Property Vegetation Management Plan that was submitted as part of the 2008 Maintenance and Operations grant proposal (Appendix A). This leads one to believe that it was not

present at this time, at least in very large numbers. It is a plant that was targeted for control by the ICNWP Coordinator during 2011. Tupper (2011) reported that all of the poison hemlock within the boundaries of the Preserve was treated with herbicide in the early season and that the treatment was 95% effective. He reports that the plants in the public access area were controlled but that a large amount on the north edge of the agricultural area went to seed before it was controlled by the farmer.

More aggressive control for poison hemlock was initiated in 2013 and is described in the Implementation Schedule section of this report.

Canada Thistle and Bull Thistle

Canada thistle is a perennial. It grows from three to six feet in height and has an extensive underground root system. Flowers are small, numerous and are lavender to white in color. The flower heads grow on the tips of branches, male and female flowers are found on different plants and both must be present to produce viable seeds. Leaves are long and narrow, deeply lobed with sharp, yellow spines on the edges. Canada thistle spreads by seed and aggressive, creeping, horizontal roots (rhizomes) that can extend 15 feet and vertical roots six to 15 feet deep. Nearly all parts of the root can produce buds that develop into shoots and grow and form new plants. Root segments as small as 1/8 to 3/8 inch in length and 1/16 inch in diameter can produce new plants. Each plant can produce thousands of air-borne seeds that can remain dormant in the soil for up to 20 years. Canada thistle is highly aggressive. It can spread quickly to form dense patches, crowding out forage grasses by up to 60 percent. Canada thistle competes with crops, reducing yield by as much as 90%. Most grazing animals avoid thistle infested areas due to spiny leaves that can lead to mouth irritations and infections. It also harbors insects and is an alternative host for some disease causing organisms.

Bull thistle is a biennial that grows two to six feet tall. Rosettes form in the first year, flowering stems the second. Like Canada thistle, pink-magenta flower heads top each stem. Bull thistle can be differentiated from Canada thistle by the hairy leaves. There are coarse hairs on the leaf tops, making them feel rough to the touch, and woolly hairs on the underside. Spines are found on the leaves at the midrib as well as the tips of the lobes. Bull thistle only reproduces by seed. It does not reproduce vegetatively by rhizomes. Although individual plants can get quite large and be intimidating in appearance, bull thistle is not as challenging to control as many other weeds and is mainly a problem in hay fields and pastures.

Canada thistle and bull thistle are both Class C noxious weeds in Washington. Due to their widespread distribution, they have not been designated for required control in the county by the Washington State Noxious Weed Board, but because of the negative impacts they pose to the local agricultural industries, they have been selected for required control by the ICNWCB.

At Iverson Preserve Canada thistle is common along the open trails, roads, canals and especially along the dike trail (see Appendix C maps). Bull thistle can be found in the same areas as Canada thistle but individual plants are far less numerous. Control of thistles at Iverson has been sporadic to date. The Camano Island Public Works Road Crew has used roadside mowers to cut back the vegetation that grows along the dike trail and this has prevented seed dispersal in some years. Thane Tupper (ICNWP Coordinator from August 2010 until November 2011) reports having chemically treated the Canada and bull thistle during the summer of 2011; however, no exact records of treatment dates could be located. He did report that any plants that were treated on the waterside or top of the dike were treated with an aquatic herbicide, Aquaneat.

The current maintenance of the 68 acres in agricultural production effectively helps control thistles and other noxious weeds from becoming established in that portion of the Preserve by keeping the ground covered with a thick cover crop that prevents weed seeds from being able to find bare ground and germinate. The agricultural leaseholder also uses herbicides to help control noxious weeds in the farmed fields.

Himalayan Blackberry

Himalayan blackberry is the largest and possibly most invasive, non-native variety of blackberry in the Pacific Northwest. It was first introduced from Europe to the area as a crop plant in the 1800's. Since then, it has invaded large areas throughout the west coast. It is a perennial plant that can reproduce from seed, root crowns, root pieces, and stem cuttings. A root crown is located at the base of a stem cane where nutrients are stored and numerous roots and shoots will emerge. Canes are green or green and red, stiff, angular, and have numerous large thorns. Canes have green leaves that are in groups of three or five, have jagged edges, and are round or oval shaped with a slightly pointed tip. In the second year of growth, a cane develops small white or whitish pink flower clusters that produce edible blackberries. The cane dies at the end of the second year although the plant will continue to live by producing new canes each year from root crowns.

Himalayan blackberry grows very rapidly and can cover and replace native habitat that is important for plant and animal diversity. Once established, it will out-compete native vegetation and cover more ground with each season. The fast growing thorny canes make removal difficult and often painful. The canes of Himalayan blackberry can grow 10 feet tall and over 20 feet long in a single year.

Himalayan blackberry is a Class C noxious weed in Washington. Due to its widespread distribution, it has not been selected for required control by the ICNWCB.

Some historical efforts have been made to control the spread of Himalayan blackberry at Iverson Preserve. In the 2008 Island County Parks Iverson Operations and Maintenance Project grant proposal, a two-year plan to control Canada thistle and Himalayan blackberry was proposed. The method proposed was to cut the invasive vegetation, then apply an herbicide such as Garlon 4 or something similar. It is unclear whether this work was ever completed. FOCIP have helped develop and maintain the trail system at Iverson Preserve since it was initially acquired in 1999 and part of this maintenance has included cutting back Himalayan blackberry where it encroaches onto the trails.

Common Fennel

Common fennel is a large, aromatic, perennial herb. It can grow up to 6.7 feet tall and has a very large taproot. Foliage, stems, roots and seeds are hairless and all have a very strong licorice scent. Flowers are small and yellow and form an umbrella shaped cluster. Plants bloom from May to September. The leaves have an overall triangular shape and are many times divided into thin, featherlike leaflets and are dark green or bronze. Leaf stems are swollen and fleshy and have a widened base. Stems are upright and branched. Seeds are about 0.15 inches long and have small ridges. Common fennel reproduces from seed. It can also reproduce from pieces of the root crown. Common fennel can be found along roadsides, in pastures, prairies, streamsides, coastal bluffs as well as wetland areas. Common fennel escapes cultivation and quickly establishes dense infestations that crowd out native plants that are critical to wildlife habitats. Infestations are becoming more common in Western Washington and may pose a threat to native grasslands.

Common fennel is a Class B noxious weed in Washington. Due to its limited distribution, it has been designated for required control in the county by the Washington State Noxious Weed Board and is listed on the Island County Noxious Weed List as a regulated Class B noxious weed.

Although common fennel has not been mentioned in previous Iverson Preserve reports, it was found in one location during the 2013 surveys (see Appendix C map).

Common Teasel

Common teasel is a tall spiny, short-lived perennial or biennial that dies after it goes to seed. It grows for one or more years as a low-growing rosette, then produces tall flowering stems topped by flower heads. The flowering stems can be from 1.5 to 6.5 feet tall and the flowers are light purple to white and tend to grow in bands or rings on large, egg-shaped, spiny heads. The distinctive flower heads are popular in floral arrangements.

Teasel can create large, dense stands and is a highly competitive plant in open, grassy habitats. It has a negative impact on pastureland, hay and other agricultural fields and can overwhelm native grassland species.

Common teasel was added as a Class C noxious weed on the Washington State Noxious Weed list in 2013. It has not been selected for control by the ICNWCB and is listed as a non-regulated Class C noxious weed in Island County.

Common Teasel was found in one location during the 2013 survey in small numbers. No mention of common teasel has been reported in previous management plans or reports for Iverson Preserve. Mechanical control was initiated in 2013 (see Implementation Schedule below).

Oxeye Daisy

Oxeye daisy is a perennial herbaceous plant that reaches one to three feet tall. It has shallow, branched rhizomes and adventitious roots. The entire plant has a disagreeable odor when crushed. Single flowerheads at the ends of stems have brown-edged, green bracts at their base. Each 'daisy' is a cluster of many flowers. The ray flowers are white and look like petals. The disk flowers are small and yellow and make up the center. Leaves are alternate and lance shaped with coarse teeth or lobes. Basal leaves have petioles (leaf stalk) and stem leaves become sessile (no stalk) and smaller in size moving up the stem. Stems are unbranched or have some branches near the tip. Seeds are small and have 10 small ridges. Many plants are referred to by the common name "daisy" so it is important to be able to distinguish oxeye daisy from other non-listed species.

Oxeye daisy can reproduce both vegetatively and from seed. It aggressively invades fields where it forms dense populations and decreases plant species diversity. Oxeye daisy decreases crop yields and is a particular problem in pastures. Oxeye daisy was changed from a Class B to a Class C noxious weed in 2013. It has not been selected for control by the ICNWCB and is listed as a non-regulated Class C noxious weed in Island County.

Oxyeye daisy was found in two locations (see Appendix C map) during the 2013 survey in relatively small numbers. No mention of oxeye daisy has been reported in previous management plans or reports for Iverson Preserve.

Common St. Johnwort

Common St. Johnswort is an upright perennial herbaceous plant which typically grows one to 2.5 feet in height. It has tap roots and short rhizomes and its stems are freely branched. The flowers are yellow, star-like and have five petals with tiny black dots on the margins. Flowers occur in clusters at the ends of stems with 25 to 100 flowers per cluster. Leaves are oppositely arranged on stems, narrow, lance shaped and one to two inches long. They are opposite, stalkless, and have pointed tips. Each leaf is spotted with tiny translucent or purplish-black dots. Stems are reddish, single or multiple, smooth, somewhat two-edged, woody at the base, and branching out toward the top of the plant. Flowers form capsules that contain small (0.04 inch) dark brown seeds. St. Johnswort spreads both by underground rhizomes, above-ground creeping stems, and by seeds that are dispersed by wind and animals. One plant can produce up to 100,000 seeds per year that are viable for 10 to 30 years. Infestations spread rapidly on disturbed, well drained sites such as roadways, trails, meadows, grasslands, overgrazed range, logged areas, and similar type sites. St. Johnswort spreads easily to new sites. Over-exposure to St. Johnswort can cause various animal health problems including severe skin lesions and necrosis when their skin becomes hypersensitive to sunlight.

Common St. Johnswort is listed as a Class C noxious weed on the Washington State Noxious Weed list. It has not been selected for control by the ICNWCB and is listed as a non-regulated Class C noxious weed in Island County.

Common St. Johnswort was found in seven locations (see Appendix C maps) during the 2013 survey in relatively small numbers. No mention of common St. Johnswort has been reported in previous management plans or reports for Iverson Preserve.

Wild Carrot

Wild carrot is an upright, taprooted herb, reaching one to four feet tall. It may occur as an annual or short-lived perennial. The species is often a biennial that bears a rosette of leaves its first season. The entire plant is covered with coarse, stiff hairs. Flowers are small, white and borne in compound flat-topped umbels. The umbels are two to four inches in diameter. They have purple or pinkish flowers in the center. Leaves are fern-like with small toothed leaflets. The segments are linear or lance shaped. Wild carrot may be confused with other plants in the Apiaceae (carrot) family when young. From a distance wild carrot may be confused with poison hemlock, although wild carrot is smaller and doesn't have purple blotches on the stems.

Wild carrot reproduces by seed. Estimates of seed production vary from 1,000 to 40,000 seeds per plant. It out competes native grasses for resources. It can taint milk if dairy cows ingest large amounts. It may be mildly toxic to livestock. Wild carrot may cause poor seed production for commercial carrot varieties through hybridization. Wild carrot (except where commercially grown) was changed from a Class B to a Class C noxious weed in 2013. It has not been selected for control by the ICNWCB and is listed as a non-regulated Class C noxious weed in Island County.

Wild Carrot was found in eight locations during the 2013 survey (see Appendix C maps). The largest infestations were documented near the main entrance to the Preserve around the established parking areas and informational kiosk as well as along the main trails providing beach access. No mention of wild carrot has been reported in previous management plans or reports for Iverson Preserve.

Common Catsear

Common catsear is a perennial with rosettes of leaves, a clump of basal leaves growing from a woody base. It has upright to somewhat upright stems typically leafless and branched. The stems are hollow and exude white milky sap when broken or cut. There are several flowerheads at the ends of stems. Flowerheads are dandelion-like, made up of all yellow ray flowers, one to 1.5 inches in diameter. Each flowerhead has many green bracts at its base. The leaves are rough, hairy with lobed or wavy-margins. Leaves are 1.2 to 13.8 inches long by 0.2 to 2.8 inches wide. The seeds have hairy bristles on one end to aid with wind dispersal. Common catsear may be confused with the common dandelion, *Taraxacum officinale*; however, common catsear has hairy leaves with rounded lobes and dandelions have smooth leaves with pointed lobes.

Common catsear reproduces by seed, crown and root sections. It grows in disturbed areas, lawns, roadsides, pastures, waste areas, gardens and seed fields. Common catsear is a serious weed in lawns, pastures and waste areas. It is extremely aggressive in lowland pastures and lawns. It is also thought to be poisonous and is believed to be the cause of Australian Stringhalt in horses. Common catsear was changed from a Class B to a Class C noxious weed in 2013. It has not been selected for control by the ICNWCB and is listed as a non-regulated Class C noxious weed in Island County.

Common catsear is common throughout Island County and, as expected, large numbers were found throughout the Preserve. No mention of its occurrence in the Preserve has been mentioned in previous reports, although it has likely always been present.

Herb-Robert

Herb Robert is both a winter and a spring annual or biennial. It is a low growing plant that is hairy and shallowly rooted. Plants have a pungent odor when crushed, the reason for the common name “stinky-Bob”. It has pink flowers with five petals. The leaves are deeply dissected and light green. The foliage turns red in late fall. The stems are upright to spreading, hairy and turn red in high light conditions. The fruit is a capsule. Seeds are brown and about 0.08 inch in length. Herb-Robert reproduces by seeds. The seeds are ejected in response to drying of the capsule. Reports indicate that they may be ejected as far as 15 to 20 feet from the mother plant.

Herb-Robert is highly adaptable. It is found in moist forests with canopy closure and on dry rocky outcrops. It is also becoming a significant garden pest in some areas. It is found from sea level to mid-mountainous areas in both the Cascades and Olympics. It poses a threat to the forest understory and to plant diversity in the forests of Western Washington. It is capable of growing under a full, closed canopy. Where it occurs, there appears to be fewer native herbaceous species.

Herb-Robert is a Class B noxious weed in Washington. Due to its widespread distribution, it has not been designated for required control in the county by the Washington State Noxious Weed Board or been selected for required control by the ICNWCB.

Although herb-Robert has not been mentioned in previous Iverson Preserve reports, it was found in one location during the 2013 surveys (see Appendix C map).

English Ivy

English ivy is a woody evergreen perennial. It can grow as a vine (juvenile form) or a shrub (adult form). Vines can grow up to 99 feet. In its juvenile form, the plant produces adventitious roots that allow vines to anchor to vertical surfaces. English ivy only matures to produce flowers when it begins to grow

vertically. The small (0.2 to 0.3 inch), bisexual, greenish-white flowers occur in umbrella-like clusters in the fall. Leaves are alternate and leathery, with long petioles. Juvenile leaves are deeply 3 to 5 lobed and 1.6 to four inches long and wide. Flower stem leaves have primarily un-lobed leaves that are egg-shaped to diamond shaped. Only young leaves are hairy. Stems are climbing vines, shrub-like or groundcovers. Young stems have hairs while older stems are hairless. The dark colored fruits (dark blue to black, berry-like drupes) mature in the spring. Each fruit produces four to five seeds.

During its juvenile stage, ivy spreads rapidly by vegetative stem growth while mature plants can also spread by seed. On average, 70% of ivy seeds are viable. Ivy grows in a variety of landscaped areas, escaping to disturbed forests at a range of elevations. It can grow in a variety of soil types and light conditions. Other habitats include forest edges, fields, hedgerows and coastal areas. Ivy can out-compete native plants, reducing animal foraging habitat. It inhibits regeneration of understory plants and kills understory and overstory trees by shading them out. Ivy can cause storm damage to trees due to its added weight in the canopy.

Four cultivars of English ivy (Hedera helix 'Baltica', 'Pittsburgh', and 'Star'; H. hibernica 'Hibernica') are listed as Class C noxious weeds on the Washington State Noxious Weed List. They have not been selected for control by the ICNWCB and are listed as non-regulated Class C noxious weed in Island County.

Fortunately only one location of small English ivy plants was documented during the 2013 survey (see Appendix C map). No mention of English ivy has been reported in previous management plans or reports for Iverson Preserve.

<u>Reed Canarygrass</u>

Reed canarygrass is a rhizomatous, perennial, cool season grass that can reach three to six feet in height. It forms dense monotypic stands in wetland ecosystems. Flowers are densely clustered in panicles with 3 florets per spikelet, one floret is fertile while the other two are sterile. Plants bloom May to mid-June. They are green to purple and change to beige over time. Leaf blades are flat and hairless, 0.25 to 0.75 of an inch wide with ligules 0.16 to 0.39 inch (4 to 10 mm) long. Stems can reach 3 to 6 feet in height. The sturdy, often hollow stems can be up to 0.5 inch in diameter, with some reddish coloration near the top.

Reed canarygrass can spread by seeds or by creeping rhizomes. The species will also produce roots and shoots from the nodes of freshly cut stems. It typically occurs in soils that are saturated or nearly saturated for most of the growing season. Established stands can tolerate extended periods of inundation. It grows in roadside ditches, river dikes, shallow marshes, wetlands and meadows. Reed canarygrass is a major threat to natural wetlands. It out competes most native species as it forms large, single species stands. Dense stands have little wildlife habitat value. Its invasion can cause siltation in irrigation ditches.

Reed canarygrass is listed as a Class C noxious weed on the Washington State Noxious Weed list. It has not been selected for control by the ICNWCB and is listed as a non-regulated Class C noxious weed in Island County.

Reed canarygrass is mentioned in the Site Management Plan (2011) as being present at Iverson Preserve but there have been no known efforts to control it to date.

English Holly

English holly is a large, dense, slow-growing evergreen tree or shrub. It can reach 15 to 50 feet tall and up to 15 wide, growing as either a single tree or a multi-stemmed thicket. The leaves are thick, glossy, dark green and wavy, one to three inches long. The leaves usually have sharp spines along the edges, although they may be smooth on older branches. The flowers are small, whitish, sweetly scented and produce red, yellow or orange berries in the winter. English holly has both male and female plants that are bee pollinated. They reproduce mainly by seeds that are contained within the berries. Holly berries are toxic to humans, but birds eat the berries and disperse the seeds to new areas. Holly can also spread vegetatively through suckering and layering.

Although it makes a festive holiday decoration, holly invades native forest habitats where dense thickets suppress germination and growth of native trees and shrubs. A glutton for water, holly can prevent surrounding plants from obtaining sufficient moisture.

English holly is not currently listed as a noxious weed on the Washington State Noxious Weed list; however, the ICNWCB recognizes this plant as a weed of concern and recommends prevention of its spread into natural areas and forests.

INTEGRATED WEED MANAGEMENT

Integrated weed management (IWM) is important to the ultimate success against noxious weeds. IWM is based on the fact that strategies that are combined for weed management are better than one strategy that is applied alone. IWM is based on the following four categories of management options:

I. Cultural: Methods that manage the level of competition between desired plants and weeds. Examples of cultural methods include mulching, planting cover crops or other desired vegetation on bare soil areas to prevent the invasion of noxious weed seeds, reducing grazing to allow for increased competition from beneficial vegetation, and cleaning equipment that has worked in a noxious weed infested area before moving it to a weed free area.

Examples of cultural control methods used at Iverson include maintaining the 68 acres in the production of grass seed which prevents the spread and establishment of noxious weeds in that area and the recent hydroseeding of the cleared poison hemlock area with annual rye to provide some cover and suppression of poison hemlock seed germination.

II. Biological: Management that uses living agents to suppress the vigor and spread of weeds. Examples of biological control include using goats to control weeds or introducing an insect that feeds specifically on that weed but not on native plants or beneficial crop species. Biological controls work best in a situation where the infestation of the noxious weed is large and the goal is not complete eradication.

As mentioned previously, biological controls for Scotch broom were introduced at Iverson Preserve on June 2, 2011. Although the biological controls seem to be working to suppress the production of viable seeds, they will never eliminate the Scotch broom entirely.

III. Mechanical: Methods that kill or suppress weeds through physical disruption. Examples include hand pulling and digging weeds, using heavy equipment to clear noxious weed infested areas, or control by burning.

Mechanical control has been the primary method used for controlling Scotch broom at Iverson. Weed wrenches are special tools that were designed specifically to pull Scotch broom plants, roots and all, from the soil. The majority of the 4.4 tons of Scotch broom removed from Iverson during the summer of 2013 was pulled by FOCIP volunteers using weed wrenches. Another example of mechanical control used at Iverson was the use of the tractor to clear poison hemlock in the fill dirt area.

IV. Chemical: Management that uses chemical components to suppress the vigor and spread of weeds. The use of herbicides to directly kill noxious weeds or fertilizers that may reduce noxious weeds by increasing the competition from important plant species are examples.

Herbicides have been and will continue to be used as part of the IWM plan at Iverson. Herbicides have been applied by spraying the thistles and poison hemlock. Most of the herbicide application was done using a backpack sprayer, although the county road crew sprayed the poison hemlock along Iverson Beach Road and the fill dirt area using a truck with a mounted portable sprayer during the summer of 2013. Herbicide has also been painted on the cut stumps of Scotch broom that were too large to pull with weed wrenches.

Detailed IWM plans for future noxious weed control at Iverson Preserve are presented in the implementation schedule section later in this report.

MONITORING AND EARLY DETECTION RAPID RESPONSE

Annual and seasonal monitoring will be conducted by the ICNWP Coordinator or equally qualified persons. Visits to Iverson Preserve will be conducted throughout all four seasons to assess the growth chronology of the documented weeds and to determine the best timing for treatment. Depending on annual climatic variations, noxious weeds may mature and set seed at different times from one year to the next, so frequent monitoring is advisable to ensure that treatments, especially herbicide applications, are done at the most effective times. Ideally, weekly visits throughout the months of February through November during years 2014 through 2016 will be conducted to allow for frequent monitoring and to conduct the necessary control work. Frequent monitoring during the initial years will also allow the ICNWP Coordinator to assess how effective previous control efforts have been and to readjust as appropriate. During years 2017 through 2020, when less effort will be needed for control, visits could be reduced to twice per month in April through September to allow for continued monitoring and maintenance.

In addition to monitoring previously known sites, all trails will be walked at least once each season to look for any new infestations that were not previously located. Sites where the risk of regrowth and potential for spread are higher, such as heavily visited recreation sites, will receive more frequent monitoring than those sites where those risks are low due to, for example, overstory shading and lack of human disturbance.

Early detection and rapid response (EDRR) is key to successful weed management. When new infestations are discovered, control work will begin immediately using the most effective methods to prevent any vegetative spread or any seed formation and dispersal from occurring.

RESTORATION

Another important component to a successful noxious weed control program is restoring areas where the noxious weeds have been removed. The ICNWP Coordinator contracted with Noah Booker from Shelterbelt Inc. to provide restoration alternatives in the Iverson Preserve Noxious Weed Control Management Plan. The Scope of Work identified in the contract included: 1. Prepare a written document to be included in the Iverson Preserve Noxious Weed Management Plan that would provide information about restoration alternatives for areas in the Preserve where noxious weeds were removed during 2013 and are planned for removal in the future; 2. Submit aerial photos showing locations of the restoration areas, with restoration areas delineated by polygons; 3. Provide specific revegetation/restoration guidelines for a site at the north end of weed management areas that had noxious weed infested fill dirt; and 4. Provide maintenance recommendations to ensure survival and success of revegetation/restoration efforts.

His report "Noxious Weed Management Plan: Restoration Alternatives" is included as Appendix D. Restoration strategies are presented for five zones that were delineated during a joint meeting between the ICNWP Coordinator and Noah Booker on Dec. 13, 2013 (see Appendix D maps). A brief description of these zones and the suggested restoration alternatives follows:

Zone 1: This zone, located west and north of the parking lot, is approximately 3.9 acres. This large area consists mostly of shrub-scrub along with herbaceous plant communities. This area was the focus of most of the Scotch broom control efforts in 2013. The large stands of Nootka rose have been mostly freed of Scotch broom. Little to no replanting is necessary. There will likely be a very large flush of broom in 2014 due to the soil disturbance and increased light to the soil surface. Continued efforts to hand pull Scotch broom as new plants germinate will be necessary in coming years or else the work areas will quickly revert to Scotch broom.

Zone 2: This zone, located approximately 0.2 miles northwest of the parking area is approximately 0.13 acre. A large pile of fill dirt was deposited in this zone at some point in the recent past. This pile quickly turned into a massive colony of poison hemlock. The pile was leveled out in October 2013 and the disturbed area was hydroseeded with annual ryegrass in early November 2013. There is a large poison hemlock seed bank in and around this zone, as well as thousands of seedlings currently coming up.

This is the one zone at the Preserve that requires active revegetation/replanting work, to prevent the poison hemlock from overwhelming this area. The work area is approximately 5500 square feet.

The following management practices are recommended for Zone 2:

A. Spray this zone, including edges where poison hemlock has germinated, twice in the spring with a broadleaf herbicide. Avoid dune grass and Nootka rose where it is resprouting in a few places. Mow winter ryegrass at first flowering, before it goes to seed and/or treat with herbicide before flowering to prevent seed set.
B. Cover entire disturbed area with >6" of clean hog fuel biomulch or arborist chips (no holly or other weeds seeds) in spring or summer. Approximately 110 cubic yards of mulch will be needed.

C. Plant native shrubs to colonize disturbed area. Encourage existing Nootka rose to colonize from the southeast edge, do not install new plants within about 8' of that existing Nootka rose colony edge (the rose will quickly spread into the disturbed area). Also encourage existing native trailing blackberry to spread from the south trail edge. Use 300 bareroot or container native shrubs including Nootka rose, snowberry, red flowering currant (*Ribes sanguineum*) and oceanspray. Plant on approximately 4' centers in a triangular pattern and flag each plant with 1' of florescent orange plastic flagging tape to aid with maintenance. When planting, take great care to ensure that no soil is brought up and spilled on top of the mulch. The soil will be filled with innumerable poison hemlock seeds which will readily germinate if brought to the soil/mulch surface. This is critical.

D. Maintenance: Keep a vigilant eye for poison hemlock seedlings and other weeds. Hand pull or treat any weeds coming up around the native shrubs, again emphasizing avoiding bringing any soil up to the mulch surface. After about 5 years the shrubs should be suckering profusely and will close canopy, preventing weed seed germination and establishment. The orange plastic flagging can be removed after plants are large, typically about year 3.

Zone 3: This zone, located between Zone 2 and Zone 4, is approximately 1.1 acres. This area is predominantly shrub-scrub, with large colonies of Nootka rose as well as open areas of Pacific dunegrass. Broom is sporadically present but not bad in this area. After initial broom removal, there will likely be a large flush of broom seedlings due to the soil disturbance and increased light to the soil surface. Continued efforts to hand pull Scotch broom as new plants germinate will be necessary in coming years or else the work areas will quickly revert to Scotch broom. Significant amounts of Himalayan blackberry are closer to the dike at its' northern end. Over time it would be good to start controlling the blackberry. Little replanting will be necessary in this zone.

Zone 4: This zone, located north and east of the parking area, is approximately 1.2 acres. This area includes the wooden stairs and deck/viewpoint on top of the dike. This area has cyclone fencing that extends from the parking lot to the north. Strong populations of Nootka rose and Pacific dunegrass are present but this is currently the most heavily Scotch broom infested area at the Preserve. There will likely be a very large flush of broom after initial removal due to the soil disturbance and increased light to the soil surface. Continued efforts to hand pull Scotch broom as new plants germinate will be necessary in coming years or else the work areas will quickly revert to Scotch broom. Also significant amounts of Himalayan blackberry are present, especially at the southern end. Little replanting will be necessary in this zone.

Zone 5: This zone, established along the dike trail, is 0.2 miles long and approximately 0.7 acres. This area includes the top and steep banks on both sides of the dike, approximately 30' total width. The trail and dike is mostly dry and disturbed. Scotch broom is dominant in places and Himalayan blackberry is also widespread along the dike. The dike trail is currently infrequently mowed by the County to keep it open. Consultation with the responsible engineer at the County to find out what their preferences are for dike vegetation is recommended. In order to avoid soil disturbance and possible damage to the dike, it is probably best not to grub or pull the weeds on the dike. A better method would be to do cut stump herbicide applications. There will likely be a very large flush of broom following initial removal due to the soil disturbance and increased light to the soil surface. Continued efforts to hand pull Scotch broom

as new plants germinate will be necessary in coming years or else the work areas will quickly revert to Scotch broom. There may be significant open areas that will need replanting after initial weed control efforts. Good plants for the dike would include aggressive, rhizomatous shrubs like snowberry and Nootka rose. Oceanspray would also be excellent.

MANAGEMENT ACTION IMPLEMENTATION SCHEDULE

Year 1 – 2013

The following noxious weed control work was completed in 2013:

Scotch Broom

- Conducted Scotch broom removal in Zone 1. Over 4.4 tons of Scotch broom were removed from this area. The majority of this work was conducted during three organized work parties with help from FOCIP (Figure 3). The ICNWP Coordinator also worked individually on the Scotch broom removal in this area on several days during the year. The primary method of control was mechanical removal using weed wrenches; however, larger shrubs were stump cut and painted with undiluted Garlon3A (triclopyr). The cut and pulled plants were removed from site and taken to the Camano Transfer station for disposal.
- Seed pods were collected from 10 plants on August 1, 2013 and sent to the WSU Puyallup Research and Extension Center for examination. Seed pods were also collected at the Preserve in 2012. Results from the seed pod examinations were presented earlier in this report.

Poison Hemlock

- The ICNWP Coordinator dug out poison hemlock plants that were growing along the staircases that allow visitors to access the beach over the dike.
- Camano Island Road Shop personnel sprayed the poison hemlock growing along Iverson Beach Road and the poison hemlock growing in the fill dirt area on June 6, 2013. They used a 1.5% application rate of Crossbow sprayed from a truck mounted portable tank.
- The ICNWP Coordinator cut seed heads off some of the poison hemlock plants in the fill dirt area that were not killed by the herbicide spray. The seed heads were bagged and disposed of at the Camano Transfer Station.
- Camano Island Road Shop personnel cleared and leveled the poison hemlock fill dirt area (Zone 2) on October 24, 2013 (Figure 4).
- Camano Island Road Shop personnel and the ICNWP Coordinator hydroseeded the cleared area with annual rye on November 12, 2013 (Figure 4). After consulting with LeFeber Turf Farm and Allstar Hydroseeding, annual rye was chosen because of its ability to germinate at such a late date.
- Prior to hydroseeding the area, the ICNWP Coordinator collected several thousand seeds from adjacent Pacific madrone (*Arbutus menziessi*) trees and scattered them on the surface of the restoration area.

Agricultural Production

- Christenson farms continued farming the 68 acres. The current crop of tall fescue was planted in 2010 and the grass seed has been harvested annually in mid-July.

Other 2013 weed management

- Common teasel plants were dug up in the area around the kiosk and picnic table.
- Himalayan blackberry was cut back from main trail areas.

Year 2 – 2014

Scotch Broom

- Complete Scotch broom removal in Zone 1. Monitor and remove any new Scotch broom plants that have germinated in areas cleared of Scotch broom in 2013.
- Begin Scotch broom removal in Zone 3 and along the dike trail (Zone 5). To ensure stability of the dike the primary method for removing plants on the dike surface and sides will be by cutting and painting with herbicide. A triclopyr product such as Garlon 3A will be used. On the level areas within Zone 3 on the west side of the dike, pulling plants with weed wrenches as well as cut stump and painting with herbicide will be the methods used.

Poison Hemlock

- Continue restoration work in Zone 2: Spray poison hemlock seedlings in the early spring using a broadleaf herbicide such as Crossbow. Mow annual ryegrass before it has a chance to go to seed in late spring. Repeat herbicide spray of any new or surviving poison hemlock plants in late spring. Mulch area with >6" of biofuel or other weed seed free mulch. Begin planting native plants in restoration in the fall prior to rainy season.
- Spot spray and/or dig out additional poison hemlock plants in other locations mapped during survey.
- Arrange for Camano Island Road Shop personnel to spray poison hemlock growing along Iverson Beach Road in early spring. Repeat spray as needed in summer before any surviving plants have a chance to go to seed.
- Cut flowerheads off any surviving plants before they have a chance to go to seed.

Himalayan blackberry:

- Begin more aggressive control of Himalayan blackberry by cutting back and digging up plants encroaching on main walking trails.
- Treat cut stems by painting with herbicide such as Crossbow.

Canada and bull thistles:

- Spray young Canada thistle plants in early spring with a broadleaf herbicide such as Milestone. Spray and/or dig up bull thistle plants in early spring.
- Repeat spray of surviving plants as needed throughout spring and summer before plants go to seed.
- Cut flower heads off any plants that were not killed by early season spray. Bag and dispose at Camano transfer station.

Other weed species:

- Confirm locations of reed canarygrass. Initiate control on some test plots. Control methods tested will include mowing, digging, covering with black plastic, and spraying with herbicide.
- Remove English ivy and English holly at known survey locations. English ivy will be completely removed by digging out. Small English holly plants will be pulled up with weed wrenches. Larger plants will be cut and stump painted with triclopyr (Garlon 3A).
- Begin control of wild carrot, common teasel , common fennel, herb-Robert, common St. Johnswort, and oxeye daisy at known survey locations using integrated pest management methods. Where not abundant, weeds will be removed by mechanical methods including digging or pulling up with weed wrenches. In areas where weeds are abundant or where digging would disturb soil and adjacent native plants, spot spraying with the appropriate broadleaf herbicide will be done in early spring and repeated as necessary throughout spring and summer.
- Conduct early detection rapid response to new weed locations found. Eradicate any new weeds discovered at new locations.

Year 3 – 2015

Scotch Broom

- Complete Scotch Broom removal in Zone 3 and along the dike trail (Zone 5). Monitor and remove any new Scotch broom plants that have germinated in areas cleared of Scotch broom in 2013 and 2014.
- Begin Scotch broom removal in Zone 4.
- Replant any large cleared areas with native plants as suggested in restoration plan.

Poison Hemlock

- Continue restoration work in Zone 2. Spot spray any poison hemlock seedlings in the early spring using an appropriate broadleaf herbicide. Mechanically remove any hemlock plants growing within 5’ of any native plants to prevent possibility of harm from any herbicide drift. Apply more mulch to ensure a thick layer of 6”. Repeat herbicide spray of any new or surviving poison hemlock plants in late spring/summer. Monitor survival of native plants planted in fall of 2014. Complete plantings of additional natives in restoration area in fall 2015 prior to rainy season, emphasizing use of those plants that showed best survival from 2014 to 2015.
- Spot spray and/or dig out other poison hemlock plants in other locations mapped during survey.
- Request Camano Island Road Shop personnel spray poison hemlock growing along Iverson Beach Road in early spring. Repeat spray as needed in summer before any surviving plants have a chance to go to seed.

Himalayan blackberry:

- Continue more aggressive control of Himalayan blackberry by cutting back and digging up plants encroaching on main walking trails and other areas where plants have spread.
- Treat large cut stems by painting with herbicide such as Crossbow.

Canada and bull thistles:

- Spray young Canada thistle plants in early spring with a broadleaf herbicide such as Milestone. Spray and/or dig up bull thistle plants in early spring.
- Repeat spray of surviving plants as needed throughout spring and summer before plants go to seed.
- Arrange for Camano Road Shop personnel to mow along dike trail and cut any remaining thistles before they go to seed.
- Cut flower heads off any plants that were not killed by early season spray and could not be reached by mowing. Bag and dispose at Camano transfer station.

Other weed species:

- Monitor reed canarygrass control areas. Expand control efforts using methods that proved most effective in 2014.
- Monitor English ivy and English holly locations that were treated in 2014. Mechanically remove any surviving plants.
- Monitor and continue control of wild carrot, common teasel , common fennel, herb-Robert, common St. Johnswort, and oxeye daisy at known survey locations using integrated pest management methods. Where not abundant, weeds will be removed by mechanical methods including digging or pulling up with weed wrenches. In areas where weeds are abundant or where digging would disturb soil and adjacent native plants, spot spraying with the appropriate broadleaf herbicide will be done in early spring and repeated as necessary throughout spring and summer.
- Conduct early detection rapid response to new weed locations found. Eradicate any new weeds discovered at new locations.

Year 4 – 2016

Scotch Broom

- Complete Scotch broom removal in Zone 4 and along the dike trail (Zone 5). Monitor and remove any new Scotch broom plants that have germinated in areas cleared of Scotch broom in 2013-2015.
- Replant any large cleared areas with native plants as suggested in restoration plan.

Poison Hemlock

- Continue restoration work in Zone 2. Spot spray any poison hemlock seedlings in the early spring using an appropriate broadleaf herbicide. Mechanically remove any hemlock plants growing within 5’ of any native plants to prevent possibility of harm from any herbicide drift. Apply more mulch to ensure a thick layer of 6”. Repeat herbicide spray of any new or surviving poison hemlock plants in late spring/summer. Monitor survival of native plants planted in fall of 2014 and 2015. Complete plantings of additional natives in restoration area in fall 2016 prior to rainy season, emphasizing use of those plants that have showed best survival.
- Spot spray and/or dig out other poison hemlock plants in other locations.

- Request Camano Island road crew to spray poison hemlock growing along Iverson Beach Road in early spring. Repeat spray as needed in summer before any surviving plants have a chance to go to seed.

Himalayan blackberry:

- Continue more aggressive control of Himalayan blackberry by cutting back and digging up plants encroaching on main walking trails and other areas where plants have spread.
- Treat large cut stems by painting with herbicide such as Crossbow.

Canada and bull thistles:

- Spray young Canada thistle plants in early spring with a broadleaf herbicide such as Milestone. Spray and/or dig up bull thistle plants in early spring.
- Repeat spray of surviving plants as needed throughout spring and summer before plants go to seed.
- Mow, brush cut, or string trim along dike trail and cut any remaining thistles before they go to seed.
- Cut flower heads off any plants that were not killed by early season spray and could not be reached by mowing. Bag and dispose at Camano transfer station.

Other weed species:

- Monitor reed canarygrass control areas. Expand control efforts using methods that proved most effective in 2014 and 2015.
- Monitor English ivy and English holly locations that were treated in previous years. Mechanically remove any surviving plants.
- Monitor and continue control of wild carrot, common teasel, common fennel, herb-Robert, common St. Johnswort, and oxeye daisy at known survey locations using integrated pest management methods. Where not abundant, weeds will be removed by mechanical methods including digging or pulling up with weed wrenches. In areas where weeds are abundant or where digging would disturb soil and adjacent native plants, spot spraying with the appropriate broadleaf herbicide will be done in early spring and repeated as necessary throughout spring and summer.
- Conduct early detection rapid response to new weed locations found. Eradicate any new weeds discovered at new locations.
- Conduct an assessment of the results to date of management actions conducted under plan. Revise plan as needed.

Years 2017 – 2020

- Recheck all areas and remove any new Scotch broom plants.
- Conduct herbicide spraying of poison hemlock and thistles in early spring and summer as needed.
- Monitor and continue control of other noxious weeds at known locations using integrated weed management methods. Where not abundant, weeds will be removed by mechanical methods including digging or pulling up with weed wrenches. In areas where weeds are abundant or where digging would disturb soil and adjacent native plants, spot spraying with the appropriate

broadleaf herbicide will be done in early spring and repeated as necessary throughout spring and summer.

- Conduct early detection and rapid response to any new noxious weeds infestations discovered.
- Continue to coordinate with FOCIP and engage volunteers to help with noxious weed removal days.
- Continue to coordinate with personnel from Camano Island Road Shop and engage help with herbicide spraying of noxious weeds along Iverson Beach Road and within the Preserve when needed.
- Continue to coordinate with agricultural leaseholder to ensure that appropriate noxious weed control is being conducted in lease area.
- Continue to coordinate with Camano Island Parks Maintenance personnel to insure that noxious weed control is compatible with other planned Parks activities at site.
- At end of contract period conduct an assessment of the results to date of management actions conducted under plan. Submit new grant request and new revised plan for continued monitoring and control of noxious weeds at Iverson Preserve.

CONCLUSIONS

The diversity of habitat types at Iverson Preserve and its location at the intersection of three distinct ecosystems (marine waters, uplands, and freshwater river deltas) make it an important area for a wide range of fish and wildlife species. The Preserve also provides access to the beach and other recreational activities such as fishing, hiking, and bird watching that are enjoyed by residents and visitors alike. Although Iverson Preserve has excellent habitat diversity and strong populations of native plants, noxious weeds threaten the ecological integrity of the property. Over time, aggressive weeds like Scotch broom, Himalayan blackberry and thistles can out-compete existing native plants, create monocultures and drastically reduce habitat value for songbirds and other wildlife. This situation is already occurring in the northeastern section of the reserve where scotch broom has invaded and is now the predominant plant in many areas. In addition, species such as poison hemlock are a potential health hazard to visitors.

Since its purchase in 1999 there have been several independent efforts to control the spread of noxious weeds in the Preserve; however, to date there has been no long term noxious weed management plan to give guidance and direction to the efforts. Controlling noxious weeds requires multiple years of effort using a combination of control methods. This is only possible when there is sufficient funding to provide for the necessary resources over the long term. To illustrate, historical records suggest that the Scotch broom was almost entirely removed by FOCIP volunteers shortly after the Preserve was acquired, but due to the lack of a long term management plan and funding, the Scotch broom was able to reestablish. Likewise, without an early detection rapid response procedure in place, noxious weeds such as poison hemlock were allowed to become established and spread into new areas of the Preserve.

The Iverson Preserve Site Management Plan recognizes noxious weeds as one of the ecological challenges at Iverson Preserve, but also notes that a long term noxious weed management plan is lacking. The Site Management Plan also recommends that comprehensive surveys and mapping efforts for existing weeds be implemented. Before multiple years of maintenance and operations funding are granted for noxious weed control, both the Conservation Futures TAG and CAB requested that a long term management plan be completed. Now that this requirement has been fulfilled and a significant start on controlling the scotch broom, poison hemlock, and other noxious weeds has been completed in 2013, it is hoped that long term funding will be granted so that Iverson Preserve can stand as an

example of an Island County Park where noxious weeds no longer threaten the ecological diversity and the enjoyment and health of its visitors.

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Figure 1. Map showing location of Iverson Preserve

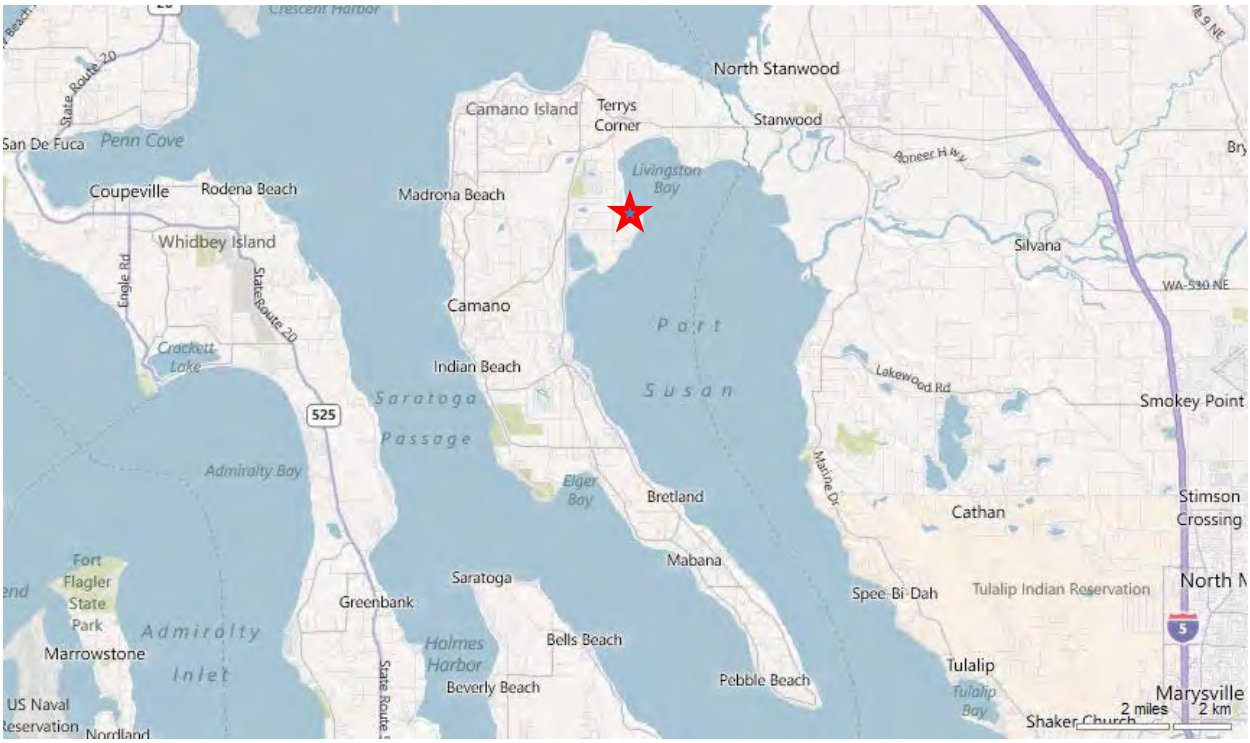


Figure 2. Photographs of Listed Noxious Weeds Known to Occur at Iverson Preserve

Spartina anglica: Class A

Poison Hemlock: Class B Reg.

Common Fennel: Class B Reg.

Herb-Robert: Class B Non Reg.

Scotch Broom: Class B Non Reg.

Canada Thistle: Class C Reg.

Bull Thistle: Class C Reg.

Wild Carrot: Class C Non Reg.

Common Teasel: Class C Non Reg.

English Ivy: Class C Non Reg.

Common St. Johnswort: Class C Non Reg.

Common Catsear: Class C Non Reg

Oxeye Daisy: Class C Non Reg.

Himalayan Blackberry: Class C Non Reg.

Reed Canarygrass: Class C Non Reg

English Holly: Weed of Concern

Figure 3. Iverson Preserve Scotch Broom Removal

A total of 4.4 tons of Scotch broom was removed with the help of Friends of Camano Island Parks during 3 volunteer work days in 2013 (May 29, June 25, and October 8).

The focus of the removal in 2013 was west of the main walking trail in the restoration area identified in the Management Plan as Zone 1. Note the absence of Scotch broom to the west (left) of the fence in the middle photo.

The Scotch broom was piled and then taken to the Camano Island Transfer Station for disposal.

Figure 4. Iverson Preserve Restoration of Poison Hemlock Fill Dirt Area

Before clearing (upper photo); clearing with tractor (middle left); applying hydroseed (middle right); completed hydroseeded area (bottom photo)

Appendix A

DRAFT

Iverson Property
Vegetation Management Plan

INTRODUCTION

The Iverson Property has both a marine and upland environment. It is conservation land and Island County is responsible for its management. The upland area for the most part is leased for farming. There is a transitional zone with trails running through it where most of the invasive plants can be found. On the other side of the transitional zone is the marine environment. Here you find both high marsh and mudflats. There is an invasive plant found in this environment but is being controlled in a state funded eradication program. All surrounding property is privately owned and zoned residential.

This property will be managed for recreation, agriculture and conservation. Much of the property is prime bird habitat therefore a good place for bird watching. There are trails to facilitate this and public access to quite a large bay. Approximately 40 acres of land is currently being leased for farming. It is the hope that this property will continue to be leased for this purpose for many years to come. If farming practices stop then this segment of the property will probably be used for recreation. The remainder of the property is difficult to access and will be held in conservation.

GOALS

The weed management goal for this property is the reduction of noxious weed populations. The objective is to enhance this property for the animal communities already found there being particularly mindful of the birds. Some areas we want the public to access with relative ease for bird watching, hiking and accessing the beach. Other areas are a bit more sensitive and will not encourage its use. Here a vegetative barrier will separate the sensitive areas from the public trails.

Below is a list of weed and conservation species that are present in the management area.

Weeds

- Circium arvense (Canada thistle)
- Circium vulgaris (Bull thistle)
- Cytsus scoparius (Scotch broom)
- Rubus discolor (Himalayan blackberry)

Conservation Species

- Rosa nutkana (Nootka rose)
- Arbutus menziesii (Madrone)
- Bald Eagle
- Great blue heron
- Large population of migratory birds

The thistles are a satellite of a naturalized population. Currently, the populations are relatively small though there are many open niches in the immediate area increased invasion. The blackberry is naturalized and being held to a modest population by the nootka rose. The Scotch broom is also naturalized but is being eradicated through volunteer efforts using mechanical means. With this species it is important to be mindful of its seed bank.

Invasibility is high here. A segment of this property is currently being leased for farming. A long term lease is not certain. There is a parking area with quite a large open space at the trail head.

All of the weed species have invasive qualities. They are non-native and produce many seeds. Most have rhizomes and can be found growing in many different native plant communities.

The blackberry and C. thistle have the greatest potential to threaten management goals. There is quite a large area where these species could invade with the marine environment being the only barrier that will inhibit their spread if left uncontrolled. This forecast is intuitive and knowledge based having investigated other infestations of these same species in the local area and having read information pertaining to these species and their invasiveness. The species chosen for control for the most part comes from the state noxious weed list. The state Weed Board publishes

written findings on listed species. I use the written findings, other web-based resources that I deem credible as well as books written about weeds and native plants for information gathering on target species. There has been an ambitious volunteer effort to eradicate the Scotch Broom from this site. Ninety-five percent of this infestation has been successfully removed, but the seed bank is a source for concern. If the desirable species continue to thrive in healthy populations and the management area for the most part goes undisturbed then the seeds will not have the opportunity to germinate. The Scotch broom seed bank is secondary in priority, but one that will be monitored over the years.

To conserve this property in its most natural state removal of the noxious weed species and containment of the blackberry population ought to be undertaken. We will use mechanical, chemical and biological methods to remove and control these species. We will monitor the progression of the blackberry infestation by marking it perimeter. For the Canada thistle and Scotch broom we will estimate density and percent cover as well as determine area using the compass/tape measure method to track progress.

All IPM methods are available and effective in use against the species of interest. Mechanical removal of Scotch broom is currently under way and this same method will be used against the thistle species and blackberry as well. If the populations expand then biological and chemical control will be considered. As the NIS are removed native species growth will be encouraged. Friends of Camano Island Parks will work with the Island County Parks Department to implement the management plan. Island County Noxious Weed Control Board will serve as project manager and technical advisor.

Area of each infestation will be measured and density and percent cover will be estimated before control work begins. These measurements will be taken again at the end of the growing season. If reduction is seen then the same methodology will be used the following year. If the populations increase then other control methods will be incorporated.

The site will be monitored twice yearly for expansion of populations. Observations will be documented when control work is performed. If anything unusual is detected then methodology will be evaluated

otherwise the area, density and percent cover measurements taken twice yearly will be used to determine the efficacy of methods used.

APPENDIX B.

Iverson Preserve Current and Future Noxious Weed Management Plan

Island County Noxious Weed Control Board

By: Thane Tupper, Program Coordinator

Current Noxious Weed Management Work:

The area known as Iverson Preserve was purchased by Island County Parks in 2007. Since the purchase there have been several independent efforts to control the spread of noxious weeds in the preserve. There are two areas within the preserve; the southern area that is currently being leased out to a local farmer which consumes the majority of acreage, the north area in a natural area that has several trails that run throughout the acreage.

The majority of the noxious control effort has been the extensive *Spartina* control effort that is funded through the Washington Department of Agriculture (WSDA). The infestation was in the mudflats north of the dike, this effort will continue with the usage of the funds from WSDA. When the WSDA control program started this tidal land was one of the worst infestations in the Puget Sound area, the current population should be eradicated within the prescribed time frame of the WSDA, 2015.

The area of concern is the north section of the preserve with the trail system. The southern section that is actively being farmed, the noxious weeds are controlled by the farmer that is holding the lease. The species of listed noxious weeds are Canada Thistle, Scotch Broom, Bull Thistle, Poison Hemlock, and Giant Hogweed. With any infestation of noxious weeds, it isn't an eradication plan; it is a management plan to start. Several of the plants can have seeds that will be viable in the soil up to 30 years. In this first year of control there were several different methods of control that were implemented, biological, mechanical, and chemical.

Before any of the control work was started by the Island County Noxious Weed Control Board (ICNWCB), the area was surveyed and all of the infestations were marked with a GPS unit. Once the data was collected the first step was to introduce biological control agents for the Scotch Broom. This is the most prolific species of noxious weed within the boundaries of the preserve. The challenge of the presence of this plant is twofold; the first major concern is that it will overtake the whole preserve if allowed to grow unchecked. The second concern is that the largest infestation is along the south east dike, if the plants are physically removed there is the chance that the stability of the dike will be compromised. The biological control agents will attack the seeds of the plants, within 5 years it is estimated that 80% of the seed set will be destroyed before they become viable. The insects won't kill the plant but they will reduce the amount of seed and deter the spread of the plant. The biological control was accompanied

with mechanical control, hand pulling, on the plants on the opposite side of the preserve working towards the release site of the biological control agents.

The other terrestrial species of plants that are present within the preserve are species that are widely distributed throughout Island County; Canada Thistle, Bull Thistle, and Poison Hemlock. There was one species that had a singular account within the preserve, Giant Hogweed. These areas were treated with a chemical control prior to seed set. While the chemical treatment was being performed GPS data was taken to show all of the treatment areas. Any plants that were treated on the water side or top of the dike were treated with an aquatic rated herbicide, Aquaneat, just in case there was any chance that the herbicide could run off into the water. All treatments were applied by Thane Tupper, who is a WSDA Pesticide Applicator, license number 80617. All applications were also covered under a NPDES permit from the Washington Department of Ecology. The areas that were treated with herbicide were controlled completely. All of the Poison Hemlock within the boundaries of the preserve was treated in the early season, treatment was 95% effective. Although the plants in the public access area have been controlled there is a large amount that is on the north edge of the agricultural area that went to seed before it was controlled by the farmer.

The expanse of Canada and Bull Thistle were primarily within the boundaries of the public access area of the preserve. The plants present on the dike were controlled at 100% through the usage of chemical control efforts. There was also two large grow areas of Canada thistle. The larger of the two was located just east of the entrance of "Hobbit Trail". This stand was growing on both sides of the large trail/road, was treated with herbicide and the plants were controlled at a rate of 100%. All of the plants were killed from the herbicide but an estimated 3% had started to go to seed at the time of treatment. The second infestation of thistles wasn't present at the time when the other treatments were occurring. This infestation was along the north side of the access road/trail adjacent to the agricultural field. Although it didn't receive treatment, the late growth cycle created stunted plants that have been unable to produce seed heads.

Unfortunately the populations of Blackberries weren't able to be treated with chemical methods to cripple the growth. The areas that are infested are located along the inland side of the dike and mechanical remove could reduce the structural integrity of the dike. Where the blackberries are growing they have started to impede into the trail system that is highly used by the community. Currently this issue is being addressed by the dedicated volunteers that are currently managing the trail systems. They have continually gone in and cut back the expanding blackberries before they have the opportunity to overrun the trail system. Every fall the road crews bring in the roadside mowers and cut back the vegetation that grows along the trail that runs down the dike.

Recommendations for Future Weed Management:

There has been a substantial amount of success in managing the amount of weeds that are present in the terrestrial area of Iverson Preserve this initial year. Between the chemical treatment that was performed on the thistles and Poison Hemlock in conjunction with the mechanical and biological controls that were used on the Scotch Broom population, it has been a good start to managing the plant

populations. With these species of plants, the seeds have the ability to sit in the soil and remain viable for multiple years to come. The other worry is that in the areas that the mature Scotch Broom has been removed has opened up soils for other species and seeds to develop. There is an extensive amount of native vegetation that is present and should be able to re-colonize in these areas and reduce the risks of new infestations. If there is development of seedlings, this is the best time for mechanical removal. This is also the best time for the usage of chemical control, with a smaller plant the amount of herbicide that is required to achieve control is drastically reduced compared to what is needed for a mature plant.

As stated earlier, the amount of blackberries is being contained but not reduced. With the current population along the dike the volunteer efforts have been successful at containing the population. Along with the concern of destabilizing the dike from removing blackberries, the plants have started to grow over the Madrone Trees. Currently there are only a couple of vines that have started to grow into the canopy of the trees along the dike so the there isn't an imminent threat to the tree being killed off. But over time the blackberries will overtake the native vegetation.

With all of the noxious weeds that have had control work performed on them this season there is a continual need for weed management work at Iverson Preserve. In the concurrent seasons there are several different things that need to be accomplished. If there are available funds the first step would be early season monitoring. This will allow documentation of re-growth of any weeds that escaped treatment or from the existing seed bank. At the same time monitoring will also include the search for the biological control agents that were introduced to control the seed production of Scotch Broom. Currently the bio-control has spread throughout the preserve, but they weren't present in all seed pods examined, 80% of the seed pods examined contain biological control agents. From past research that has been conducted the biological control agents will achieve 80% control on all seeds produced within a couple of years after release. Once monitoring has been completed, a continued focus on the reduction of infestations will become the priority. This effort should continue on the same path as what has been done in the preceding year. A mixture of mechanical and chemical control efforts, the chemical control will be focused on thistles and Poison hemlock, where the mechanical control will be used on the outlying stands of Scotch Broom.

Within the next year of work on the preserve there needs to be an addition of cultural control efforts, to reintroduce and reinforce the native and desired vegetation. This step will be most critical in the areas where the satellite stands of Scotch Broom have been removed. Reseeding will also be performed in the areas were large stands of thistle have been treated. Any revegetation will need to be delayed until any recommended time frame from the herbicide has been exceeded. There is currently several large stands of Oregon grape and Nootka rose along with other native grasses. The grasses should be able to spread reasonably quickly, but the other species will take time to naturally colonize exposed areas. By using a commercial seed blend and transplanting more developed plants into the area it will decrease the amount of time for the establishment of desired species. The revegetation will be initially focused on the areas where Scotch Broom has been removed and the new plants will have the highest success rates. Attempts to revegetate will be relatively expensive but it will stabilize the native ecosystem and suppress the noxious weeds.

Budget:

Below is an estimated budget that could be put into play for an aggressive weed management plan for Iverson Preserve. The first year would be focused on early control efforts paired with extensive revegetation. The monitoring would be occurring much earlier in the spring in an attempt to find the plants and control them before they get past the rosette stage. With every year of successful treatment the cost will decrease. This budget is focused primarily on the next year of work, if this level of funding can be obtained through Conservation Future Funds, the subsequent years of work will be at a lower cost. Ideally this project would continue for at least five years of heavy management efforts. After the initial five years the program would shift focus to more of a monitoring program. If there was still a need for active control efforts there would be funding available to proceed forward. The following years of monitoring would need to take place for at least three subsequent years.

Purposed Budget for Subsequent Five Years of Control:

Control Staff Salary Per Year:	$ 5,000.00
Administration Overhead Per Year:	$ 1,000.00
Materials and Supplies Per Year:	$ 700.00
Revegetation Per Year:	$ 500.00
Total Cost Per Year:	$ 7,200.00
Total Cost for the First Five Years:	$36,000.00

Purposed Budget for Subsequent Three Years of Monitoring

Control Staff Salary Per Year:	$ 1,500.00
Administration Overhead Per Year:	$ 500.00
Materials and Supplies Per Year:	$ 250.00
Revegetation Per Year:	$ 200.00
Total Cost Per Year:	$ 2,450.00
Total Cost for Three Years of Monitoring and Follow up Control:	**$** 7,350.00

Purposed Budget for Full Integrated Weed Management at Iverson Preserve:	**$**43,350.00

APPENDIX C.

Iverson Preserve Noxious Weed Inventory

Conducted by:

Russell Holmes
Island Botanical Service
P. O. Box 1463
Stanwood, WA 98292

For
Island County Noxious Weed Control Board

August 2013

Iverson Preserve Noxious Weed Inventory
Russ Holmes, Island Botanical Service
August 2013

Scientific Name	Common Name	State Class	Site Number	Latitude	Longitude	Size (acres)	Estimated Number of Plants	Estimated Density[1] (plants/ac)	Density Characterization	Growth Conditions	Management Recommendations	Treatment Recommendations	Comments
Cirsium arvense &C. vulgare	Canada & Bull Thistle	Regulated C	Cirsium1	48° 12' 40.2"	122° 26' 32.6"	2.7	10,000 +	3,700	Moderate with dense patches	Scenecent stalks from current year, new growth from rootstalks	Control, Monitor annually	Mechanical, Chemical	Common along open trails, dike, road, canals
Cirsium arvense &C. vulgare	Canada & Bull Thistle	Regulated C	Cirsium2	48° 12' 46.5"	122° 26' 53.1"	0.04	11-100	1,400	Moderate with dense patches	Scenecent stalks from current year, new growth from rootstalks	Control, Monitor annually	Mechanical, Chemical	Common along open trail
Cirsium arvense &C. vulgare	Canada & Bull Thistle	Regulated C	Cirsium3	48° 12' 44.7"	122° 26' 44.0"	0.01	1-11	500	Sparse	Scenecent stalks from current year, new growth from rootstalks	Eradicate, Monitor annually	Mechanical, Chemical	Small infestation along Hobbit trail
Conium maculatum	Poison Hemlock	Regulated B	COMA1	48° 12' 38.9"	122° 26' 32.9"	0.01	11-100	5,500	Moderate	Dead stalks, new growth from rootstalks	Eradicate, Monitor annually	Chemical	EDRR[2] in rest of preserve, eradicate any new infestations
Conium maculatum	Poison Hemlock	Regulated B	COMA2	48° 12' 45.8"	122° 26' 40.2"	0.01	11-100	5,500	Moderate	Dead stalks, new growth from rootstalks	Eradicate, Monitor annually	Chemical	EDRR in rest of preserve, eradicate any new infestations
Conium maculatum	Poison Hemlock	Regulated B	COMA3	48° 12' 47.7"	122° 26' 45.3"	0.07	100-1000	7,900	Dense	Dead stalks, new growth from rootstalks	Eradicate, Monitor annually	Chemical	EDRR in rest of preserve, eradicate any new infestations
Conium maculatum	Poison Hemlock	Regulated B	COMA4	48° 12' 48.4"	122° 26' 47.2"	0.01	11-100	5,500	Moderate	Dead stalks, new growth from rootstalks	Eradicate, Monitor annually	Chemical	EDRR in rest of preserve, eradicate any new infestations
Conium maculatum	Poison Hemlock	Regulated B	COMA5	48° 12' 37.9"	122° 26' 33.4"	0.26	100-1000	2,100	Moderate	Dead stalks, new growth from rootstalks	Eradicate, Monitor annually	Chemical	EDRR in rest of preserve, eradicate any new infestations
Conium maculatum	Poison Hemlock	Regulated B	COMA6	48° 12' 29.7"	122° 26' 37.6"	0.04	100-1000	13,800	Dense	Dead stalks, new growth from rootstalks	Eradicate, Monitor annually	Chemical	EDRR in rest of preserve, eradicate any new infestations
Conium maculatum	Poison Hemlock	Regulated B	COMA7	48° 12' 43.9"	122° 26' 32.8"	0.02	11-100	27,800	Moderate	Dead stalks, new growth from rootstalks	Eradicate, Monitor annually	Chemical	EDRR in rest of preserve, eradicate any new infestations
Conium maculatum	Poison Hemlock	Regulated B	COMA8	48° 12' 42.3"	122° 26' 31.9"	0.01	11-100	5,500	Moderate	Dead stalks, new growth from rootstalks	Eradicate, Monitor annually	Chemical	EDRR in rest of preserve, eradicate any new infestations
Conium maculatum	Poison Hemlock	Regulated B	COMA9	48° 12' 44.4"	122° 26' 39.4"	0.01	11-100	5,000	Moderate	Dead stalks, new growth from rootstalks	Eradicate, Monitor annually	Chemical	EDRR in rest of preserve, eradicate any new infestations
Conium maculatum	Poison Hemlock	Regulated B	COMA10	48° 12' 51.9"	122° 26' 51.7"	0.01	1-11	500	Sparse	Dead stalks, new growth from rootstalks	Eradicate, Monitor annually	Chemical	EDRR in rest of preserve, eradicate any new infestations
Cytisus scoparius	Scotch Broom	Non-regulated B	CYSC1	48° 12' 39.7"	122° 26' 31.2"	0.49	1000-10000	11,200	Mostly Dense	Mostly large mature plants, young plants & seedlings also present	Control, Monitor annually	Manual, Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Cytisus scoparius	Scotch Broom	Non-regulated B	CYSC2	48° 12' 42.2"	122° 26' 32.6"	0.06	100-1000	8,000	Mostly Dense	Mostly large mature plants, young plants & seedlings also present	Control, Monitor annually	Manual, Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Cytisus scoparius	Scotch Broom	Non-regulated B	CYSC3	48° 12' 44.6"	122° 26' 33.5"	0.04	100-1000	13,800	Mostly Dense	Mostly large mature plants, young plants & seedlings also present	Control, Monitor annually	Manual, Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Cytisus scoparius	Scotch Broom	Non-regulated B	CYSC4	48° 12' 44.9"	122° 26' 35.6"	0.1	100-1000	5,500	Mostly Dense	Mostly large mature plants, young plants & seedlings also present	Control, Monitor annually	Manual, Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Cytisus scoparius	Scotch Broom	Non-regulated B	CYSC5	48° 12' 45.8"	122° 26' 38.2"	0.09	100-1000	6,100	Mostly Dense	Mostly large mature plants, young plants & seedlings also present	Control, Monitor annually	Manual, Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Cytisus scoparius	Scotch Broom	Non-regulated B	CYSC6	48° 12' 44.4"	122° 26' 35.6"	0.98	1000-10000	5,600	Sparse with dense patches	Mostly large mature plants, young plants & seedlings also present	Control, Monitor annually	Manual, Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Cytisus scoparius	Scotch Broom	Non-regulated B	CYSC7	48° 12' 44.4"	122° 26' 43.6"	0.01	1-11	500	Sparse	Mostly large mature plants, young plants & seedlings also present	Eradicate, Monitor annually	Manual, Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Daucus carota	Wild Carrot	Non-regulated C	DACA1	48° 12' 40.2"	122° 26' 32.9"	0.24	1000-10000	22,900	Moderate	Mature plants in flower and fruit	Control, Monitor annually	Mechanical, Chemical	

Daucus carota	Wild Carrot	Non-regulated C	DACA2	48° 12' 43.0"	122° 26' 33.3"	0.4	1000-10000	13,800	Moderate	Mature plants in flower and fruit	Control, Monitor annually	Mechanical, Chemical	
Daucus carota	Wild Carrot	Non-regulated C	DACA3	48° 12' 45.4"	122° 26' 37.9"	0.01	11-100	5,500	Spase	Mature plants in flower and fruit	Control, Monitor annually	Mechanical, Chemical	
Daucus carota	Wild Carrot	Non-regulated C	DACA4	48° 12' 46.1"	122° 26' 42.3"	0.01	1-11	500	Sparse	Mature plants in flower and fruit	Control, Monitor annually	Mechanical, Chemical	
Daucus carota	Wild Carrot	Non-regulated C	DACA5	48° 12' 48.3"	122° 26' 45.6"	0.42	100-1000	1,300	Moderate	Mature plants in flower and fruit	Control, Monitor annually	Mechanical, Chemical	
Daucus carota	Wild Carrot	Non-regulated C	DACA6	48° 12' 52.2"	122° 26' 56.4"	0.04	11-100	1,400	Sparse	Mature plants in flower and fruit	Control, Monitor annually	Mechanical, Chemical	
Daucus carota	Wild Carrot	Non-regulated C	DACA7	48° 12' 44.5"	122° 26' 40.1"	0.04	11-100	1,400	Sparse	Mature plants in flower and fruit	Control, Monitor annually	Mechanical, Chemical	
Daucus carota	Wild Carrot	Non-regulated C	DACA8	48° 12' 29.7"	122° 26' 37.6"	0.12	100-1000	4,600	Moderate	Mature plants in flower and fruit	Control, Monitor annually	Mechanical, Chemical	
Dipsacus fullonum	Common Teasel	Non-regulated C	DIFU1	48° 12' 40.3"	122° 26' 32.5"	0.01	11-100	5,500	Moderate	Dead stalks, new growth from rootstalks	Eradicate, Monitor annually	Chemical	
Foeniculum vulgare	Common Fennel	Regulated B	FOVU1	48° 12' 36.2"	122° 26' 33.8"	0.01	1-11	500	Sparse	Mature plants in flower and fruit	Eradicate, Monitor annually	Chemical	
Geranium robertianum	Herb-Robert	Non-regulated B	GERO1	48° 12' 38.3"	122° 26' 58.3"	0.01	1-11	500	Sparse	Mature plants in flower and fruit	Eradicate, Monitor annually	Manual, Chemical	
Hedera helix	English Ivy	Non-regulated C	HEHE1	48° 12' 47.0"	122° 26' 47.0"	0.01	1-11	500	Sparse	Small vegetative plants	Eradicate, Monitor annually	Manual, Chemical	EDRR in rest of preserve, eradicate any new infestations
Hypericum perforatum	Common St Johnswort	Non-regulated C	HYPE1	48° 12' 39.7"	122° 26' 31.8"	0.01	1-11	500	Sparse	Vegetative	Control, Monitor annually	Manual, Chemical	Likely more abundant in open areas of preserve
Hypericum perforatum	Common St Johnswort	Non-regulated C	HYPE2	48° 12' 42.5"	122° 26' 33.3"	0.01	1-11	500	Sparse	Mature plants in fruit	Control, Monitor annually	Manual, Chemical	Likely more abundant in open areas of preserve
Hypericum perforatum	Common St Johnswort	Non-regulated C	HYPE3	48° 12' 48.8"	122° 26'47.0"	0.01	1-11	500	Sparse	Mature plants in fruit	Control, Monitor annually	Manual, Chemical	Likely more abundant in open areas of preserve
Hypericum perforatum	Common St Johnswort	Non-regulated C	HYPE4	48° 12' 45.0"	122° 26' 36.5"	0.01	1-11	500	Sparse	Mature plants in flower and fruit	Control, Monitor annually	Manual, Chemical	Likely more abundant in open areas of preserve
Hypericum perforatum	Common St Johnswort	Non-regulated C	HYPE5	48° 12' 46.6"	122° 26' 43.1"	0.01	1-11	500	Sparse	Mature plants in flower and fruit	Control, Monitor annually	Manual, Chemical	Likely more abundant in open areas of preserve
Hypericum perforatum	Common St Johnswort	Non-regulated C	HYPE6	48° 12' 49.6"	122° 26' 49.1"	0.01	1-11	500	Sparse	Vegetative	Control, Monitor annually	Manual, Chemical	Likely more abundant in open areas of preserve
Hypericum perforatum	Common St Johnswort	Non-regulated C	HYPE7	48° 12' 42.6"	122° 26' 37.4"	0.01	1-11	500	Sparse	Mature plants in flower and fruit	Control, Monitor annually	Manual, Chemical	Likely more abundant in open areas of preserve
Hypochaeris radicata	Common Catsear	Non-regulated C	HYRA1	48° 12' 40.3"	122° 26' 32.5"	not calculated	10000 +	not calculated	Moderate to Dense	Plants vegetative, flowering & fruiting	Control in select areas consistent with preserve objectives	Chemical	Plants ubiquitous in all open areas of preserve
Ilex aquifolium	English Holly	Weed of Concern	ILAQ1	48° 12' 45.4"	122° 26' 54.2"	0.01	1-11	500	Sparse	Small trees up to 10 feet tall	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Ilex aquifolium	English Holly	Weed of Concern	ILAQ2	48° 12' 46.9"	122° 26' 47.5"	0.17	1-11	500	Sparse	Small trees up to 3 feet tall, seedlings	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Ilex aquifolium	English Holly	Weed of Concern	ILAQ3	48° 12' 47.4"	122° 26' 41.6"	0.01	1-11	500	Sparse	Small tree approxiately 6 -8 feet tall	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Leucanthemum vulgare	Oxeye Daisy	Non-regulated C	LEVU1	48° 12' 39.7"	122° 26' 31.8"	0.06	11-100	900	Sparse	Vegetative	Control, Monitor annually	Mechanical, Chemical	Likely more abundant in open areas of preserve
Leucanthemum vulgare	Oxeye Daisy	Non-regulated C	LEVU2	48° 12' 42.5"	122° 26' 33.1"	0.14	1-11	35	Sparse	Vegetative	Control, Monitor annually	Mechanical, Chemical	Likely more abundant in open areas of preserve
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR1	48° 12' 39.8"	122° 26' 30.8"	0.02	11-100	2,800	Moderate	Mature fruiting plants	Control, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR2	48° 12' 43.3"	122° 26' 34.0"	0.03	100-1000	18,300	Dense	Mature fruiting plants	Control, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR3	48° 12' 45.9"	122° 26' 39.5"	0.99	10000 +	10,000	Dense	Mature fruiting plants	Control, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations

Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR4	48° 12' 46.8"	122° 26' 43.9"	0.01	1-11	500	Sparse	Mature fruiting plants	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR5	48° 12' 49.6"	122° 26' 49.1"	0.01	1-11	500	Sparse	Mature fruiting plants	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR6	48° 12' 52.3"	122° 26' 54.0"	0.01	1-11	500	Sparse	Mature fruiting plants	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR7	48° 12' 47.4"	122° 26' 57.9"	0.08	100-1000	6,900	Dense	Mature fruiting plants and vegetative plants	Control, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR8	48° 12' 43.9"	122° 26' 58.3"	0.01	11-100	5,500	Moderate	Mature vegetative plants	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR9	48° 12' 42.3"	122° 26' 58.1"	0.06	100-1000	9,200	Dense	Mature vegetative plants	Control, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR10	48° 12' 38.0"	122° 26' 33.5"	0.14	100-1000	3,900	Dense	Mature fruiting plants and vegetative plants	Control, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR11	48° 12' 43.2"	122° 26' 56.5"	0.06	100-1000	9,200	Dense	Mature fruiting plants and vegetative plants	Control, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR12	48° 12' 46.9"	122° 26' 52.5"	0.02	11-100	2,800	Moderate	Mature fruiting plants and vegetative plants	Control, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR13	48° 12' 48.1"	122° 26' 49.9"	0.11	100-1000	5,000	Dense	Mature fruiting plants and vegetative plants	Control, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR14	48° 12' 47.2"	122° 26' 47.6"	0.01	1-11	500	Sparse	Mature vegetative plants	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR15	48° 12' 44.7"	122° 26' 44.0"	0.06	11-100	900	Sparse	Mature fruiting plants and vegetative plants	Control, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR16	48° 12' 13.4"	122° 26' 55.6"	0.45	1000-10000	12,200	Dense	Mature fruiting plants and vegetative plants	Control, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RIAR17	48° 12' 16.8"	122° 26' 49.4"	0.01	1-11	500	Sparse	Mature vegetative plants	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR18	48° 12' 19.0"	122° 26' 47.4"	0.01	1-11	500	Sparse	Mature vegetative plants	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR19	48° 12' 20.2"	122° 26' 46.3"	0.01	1-11	500	Sparse	Mature vegetative plants	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RIAR20	48° 12' 21.7"	122° 26' 44.9"	0.01	1-11	500	Sparse	Mature vegetative plants	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR21	48° 12' 23.0"	122° 26' 43.8"	0.01	1-11	500	Sparse	Mature vegetative plants	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR22	48° 12' 24.4"	122° 26' 42.4"	0.01	1-11	500	Sparse	Mature vegetative plants	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR23	48° 12' 27.2"	122° 26' 39.8"	0.01	1-11	500	Sparse	Mature vegetative plants	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR24	48° 12' 28.7"	122° 26' 38.6"	0.01	1-11	500	Sparse	Mature vegetative plants	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR25	48° 12' 32.3"	122° 26' 36.4"	0.01	1-11	500	Sparse	Mature vegetative plants	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR26	48° 12' 34.0"	122° 26' 35.7"	0.01	1-11	500	Sparse	Mature vegetative plants	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR27	48° 12' 37.1"	122° 26' 33.7"	0.01	11-100	5,500	Moderate	Mature fruiting plants and vegetative plants	Control, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations

Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR28	48° 12' 38.9"	122° 26' 32.7"	0.01	11-100	5,500	Moderate	Mature fruiting plants and vegetative plants	Control, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR29	48° 12' 40.2"	122° 26' 33.5"	0.01	1-11	500	Sparse	Mature vegetative plants	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations
Rubus armeniacus	Himalyan Blackberry	Non-regulated C	RUAR30	48° 12' 44.6"	122° 26' 39.6"	0.01	1-11	500	Sparse	Mature vegetative plants	Eradicate, Monitor annually	Mechanical, Chemical	EDRR in rest of preserve, eradicate any new infestations

[1]Estimated density calculated by dividing the mid point of the estimated number of plants by the estimated acreage

[2]EDRR=Early Detection Rapid Response

Major Survey Routes
Iverson Preserve
Russ Holmes, Island Botanical Service
August 2013

Scotch Broom

Cytisus scoparius

Russ Holmes, Island Botanical Service

August 2013

Poison Hemlock

Conium maculatum

Russ Holmes, Island Botanical Service

August 2013

Poison Hemlock

Conium maculatum

Russ Holmes, Island Botanical Service

August 2013

Canada & Bull Thistle

Cirsium arvense & Cirsium vulgare

Russ Holmes, Island Botanical Service

August 2013

Canada & Bull Thistle

Cirsium arvense & Cirsium vulgare

Russ Holmes, Island Botanical Service

August 2013

Canada & Bull Thistle

Cirsium arvense & Cirsium vulgare

Russ Holmes, Island Botanical Service

August 2013

Himalayan Blackberry

Rubus armeniacus

Russ Holmes, Island Botanical Service

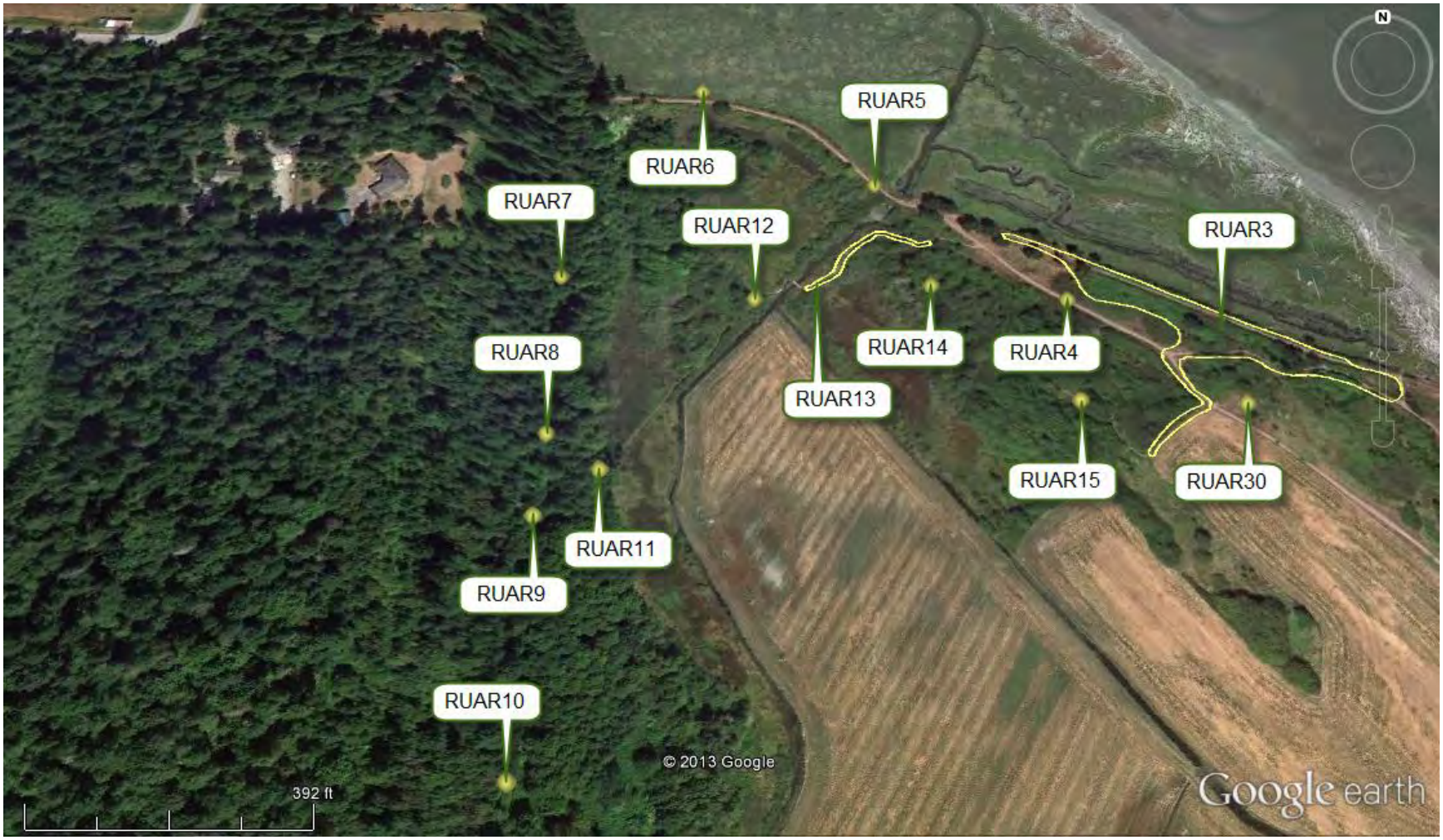
August 2013

Himalayan Blackberry

Rubus armeniacus

Russ Holmes, Island Botanical Service

August 2013



Himalayan Blackberry

Rubus armeniacus

Russ Holmes, Island Botanical Service

August 2013

Himalayan Blackberry

Rubus armeniacus

Russ Holmes, Island Botanical Service

August 2013

Himalayan Blackberry

Rubus armeniacus

Russ Holmes, Island Botanical Service

August 2013

Common Fennel

Foeniculum vulgare

Russ Holmes, Island Botanical Service

August 2013

Common Teasel

Dipsacus fullonum

Russ Holmes, Island Botanical Service

August 2013

Oxeye Daisy

Leucanthemum vulgare

Russ Holmes, Island Botanical Service

August 2013

Common St. Johnswort

Hypericum perforatum

Russ Holmes, Island Botanical Service

August 2013

Common St. Johnswort

Hypericum perforatum

Russ Holmes, Island Botanical Service

August 2013

Wild Carrot

Daucus carota

Russ Holmes, Island Botanical Service

August 2013

Wild Carrot

Daucus carota

Russ Holmes, Island Botanical Service

August 2013

Herb-Robert

Geranium robertianum

Russ Holmes, Island Botanical Service

August 2013

English Ivy

Hedera helix

Russ Holmes, Island Botanical Service

August 2013

Reed Canarygrass
Phalaris arundinacea
Suspected-Identity Unconfirmed
Russ Holmes, Island Botanical Service
August 2013

PHAR1 (non-regulated C): 48° 12’ 43.6”, 122° 26’ 42.5”, 1000-10,000, 0.1 acres, 550,000/ac, dense, eradicate &EDRR, manual, chemical
PHAR2 (non-regulated C): 48° 12’ 47.2”, 122° 26’ 51.7”, 1000-10,000, 0.1 acres, 550,000/ac, dense patches, eradicate &EDRR, manual, chemical

English Holly

Ilex aquifolium

Russ Holmes, Island Botanical Service

August 2013

APPENDIX D.

Noxious Weed Management Plan: Restoration Alternatives

Iverson Preserve
Camano Island, Washington
19 December 2013

Prepared for:

Janet Stein, Program Coordinator
Island County Noxious Weed Control Board
Island County, Washington

Prepared by:

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Section II: Definitions

Section III: Overview of Current Conditions

Section IV: Restoration Alternatives

Section V: Weed Control Strategies and Recommendations

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Section I: Introduction

In November 2013 Shelterbelt was hired by Janet Stein of the Island County Noxious Weed Control Board ("Weed Board") to develop restoration alternatives and guidelines as part of its' Iverson Preserve Noxious Weed Management Plan. As per the Weed Board's Scope of Work: "Recommend restoration alternatives for sites where noxious weeds have been and will be removed within Iverson Preserve."

A site visit was undertaken with Janet Stein on 13 December 2013.

As per the Scope of Work, tasks include preparation of a written document to be included in the Iverson Preserve Noxious Weed Management Plan that would provide information about restoration alternatives for areas in the Preserve where noxious weeds were removed during 2013 and are planned for removal in the future. Include maps utilizing aerial photos showing locations of the restoration areas, with restoration areas delineated by polygons. Provide specific revegetation/restoration guidelines for a site at the north end of weed management areas that had noxious weed infested fill dirt. Provide maintenance recommendations to ensure survival and success of revegetation/restoration efforts.

Section II: Definitions

Invasive plants are non-native, establish in wildlands and can substantially displace native species, alter biological communities and/or alter ecosystem services or values.

Non-native or exotic plants are species introduced to wildlands after European contact as a direct or indirect result of human activity.

Definitions adapted from CalIPC's and Carla D'Antonio's Invasive exotic plant species in Sierra Nevada Ecosystems definitions.

Noxious weeds are undesirable non-native plants that have economic, ecological, or aesthetic implications. Noxious weeds are often highly destructive and extremely competitive with native flora, making them very difficult

to control. The impact of noxious weeds can be quite extensive. To the farmer noxious weeds can reduce crop yields, lower the quality of grazing lands, reduce the value of land, poison cattle, and plug waterways. For the urban gardener noxious weeds can outgrow and dominate the desired flora, poison pets, and decrease the value of land. Other effects of noxious weeds include land erosion, increased risk of wild fires, reduce outdoor recreational activities (e.g. hunting, fishing, hiking, mountain biking), and destroy native plant and animal habitat.

From Island County Noxious Weed Control Board web site.

Ecological restoration is defined as "the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed."

From the *Society for Ecological Restoration*.

"**Native plant restoration** is weed control." Charli Danielsen, Restoration Expert, California Native Plant Society.

Section III: Overview of Current Conditions

Iverson Preserve habitat types consist of eelgrass, managed agriculture, marine, mudflats, saltmarsh/nearshore, emergent herbaceous, shrub-scrub, deciduous shrub forest and mixed forest. The vast majority of the Weed Board's efforts are concentrated in the NNE corner of the Preserve, where Scotch broom and other weeds threaten the integrity of the native plant communities on site. The plant community represented in the work area consists of predominantly shrub-scrub. The recommendations of this report will therefore focus on this NNE corner of the Preserve.

Iverson Preserve has a variety of noxious weeds common to the region. The current infestation level could be characterized as "average" compared to other sites on Camano Island. The primary noxious weeds at Iverson Preserve targeted for control by the Weed Board consist of:

bull thistle	*Cirsium vulgare*
Canada thistle	*Cirsium arvense*

poison hemlock	*Conium maculatum*
Scotch broom	*Cytisus scoparius*
Himalayan blackberry	*Rubus armeniacus*

From Draft Site Management Plan, page 12:

"Scrub shrub communities are common in the Preserve, but vary in character, structure, and species composition depending on the location and underlying hydrology. These communities are characterized by woody plants that do not exceed 30 feet in height. Shrub communities fringe the site ditches and beaver ponds. These communities are dominated by species tolerant of wet conditions and can also be described as palustrine scrub-shrub (PSS) wetlands. Typical dominant species include hardhack (*Spiraea douglasii*), black twinberry (*Lonicera involucrata*), and Nootka rose (*Rosa nutkana*). A well- established, nearly pure stand of western crabapple (*Malus fusca*) is located along the "Hobbit Trail".

Scrub shrub vegetation dominates between the dike and the agricultural field. Vegetation in this area includes a range of shrub and herbaceous species. The greatest concentration of non-native/invasive plant species is present in this area. Native dominants include western crabapple, Nootka rose, red elderberry (*Sambucus racemosa*), tall Oregon grape (*Mahonia aquifolium*), western snowberry (*Symphoricarpos albus*), oceanspray (*Holodiscus discolor),* cow parsnip (*Heracleum lanatum*), and trailing blackberry (*Rubus ursinus*). These areas include both wetland and upland features and are best described as a complex.

Invasive species, particularly Scotch broom are well established in this area and extend onto the dike. Scotch broom is the dominant plant cover on the dike. The dike is very well drained and native plants that occur in this area are composed of species often found in marine sand dune communities including dunegrass (*Elymus mollis*), tall Oregon grape, Nootka rose, and madrone (*Arbutus menziesii*).

History of recent weed control efforts:

Former Weed Board Program Coordinator's summary of previous weed control efforts (Thane Tupper, pers. comm., Fall 2011):

"There has been an extensive effort by the Island County Noxious Weed Control Board in controlling the noxious weed populations in the Iverson Preserve area over the years. The largest amount of control was focused on the Spartina population that was present in the mud flats…the species of noxious weeds that are prevalent in the area are Scotch

Broom, Canada Thistle, Poison Hemlock, Himalayan Blackberry, Giant Hogweed, and Bull Thistle. The current work has been a mixture of mechanical, biological, and chemical control. There has been about 700 lbs of Scotch Broom removed from the site and more will be getting removed in the weeks to come. The biological control was the seed beetles and weevils that will attack and reduce the seed set of the Scotch Broom, they were introduced in the spring in the south east corner of the Preserve, along the dike at the observation deck. The populations of Giant Hogweed, Canada Thistle and Poison Hemlock were controlled with the usage of spot spray of herbicide. All plants that were treated were killed off before there was any seed set."

More recently, current Weed Board Program Coordinator, Janet Stein, has been working with the Friends of Island County Parks (FOCIP) to remove large quantities (4.4 tons so far this year) of Scotch broom from the NNE area of the Preserve. Large areas have been cleared of this noxious weed, and the work effort continues as of the time of the writing of this report. Janet and FOCIP should be commended on this excellent progress on the Scotch broom control. Also, it should be said that volunteer site steward, Bob Brown, is taking superb care of the Preserve. I could not find a piece of garbage in the trail areas of the Preserve and Bob was working on trail maintenance at the time of my visit in mid-December.

Section IV: Restoration alternatives for areas where weed control efforts have been or will be implemented

In general, Iverson Preserve has excellent habitat diversity and strong populations of native plants. What is primarily needed to get the Preserve to a healthier state is not additional plantings, but rather to control the noxious weeds that threaten its' ecological integrity. Over time, aggressive weeds like Scotch broom, Himalayan blackberry and thistles can outcompete existing native plants, create monocultures and drastically reduce habitat value for songbirds and other creatures. This is the restoration challenge at Iverson Preserve: to maintain existing rich native plant habitat values by working to reduce the existing populations and spread of noxious weeds.

When is replanting necessary? When noxious weeds are removed, resulting in a bare area that is denuded of native plants and larger than 10’X 10’, replanting with native shrubs should be considered. Planting on 3-5’ centers, with a triangular, naturalistic pattern is recommended. Transplanting Nootka rose from adjacent areas is a good way to get new colonies going where planting is needed. Or if other plants are desired, container stock/bareroot plants to consider for dry areas include snowberry, red flowering currant and tall Oregon grape. For moist areas, twinberry, Nootka rose and hardhack would be good choices. It is best to give each plant a 2’ diameter, 4-6” deep ring of mulch if possible. Tying on a 1’ piece of florescent orange flagging greatly helps with future maintenance. For two to three years it will be important to hand weed a 2-3’ diameter area around these plants, until well established.

1). Zone 1: West and North of the parking lot. Size: 3.9 acres. This large area consists mostly of shrub-scrub along with emergent herbaceous plant communities. This area was the focus of most of the broom control efforts in 2013 and is looking really good. The large stands of Nootka rose have been mostly freed of Scotch broom. Little to no replanting is necessary. There will likely be a very large flush of broom in 2014 due to the soil disturbance and increased light to the soil surface. Continued efforts to hand pull Scotch broom as new plants germinate will be necessary in coming years or else the work areas will quickly revert to Scotch broom.

2). Zone 2: Poison hemlock fill-dirt area. Size: 0.13 acres. A large pile of fill dirt was deposited in this zone at some point in the recent past. This pile quickly turned into a massive colony of poison hemlock. The pile was leveled out in October 2013 and the disturbed area was hydroseeded with annual ryegrass in early November 2013. There is therefore a large poison hemlock seed bank in and around this zone, as well as thousands of seedlings currently coming up.

This is the one zone at the Preserve that requires active revegetation/replanting work, to prevent the poison hemlock from overwhelming this area. The work area is approximately 5500 square feet.

The following management practices are recommended:

A. Spray this zone, including edges where poison hemlock has germinated, twice in the spring with a broadleaf herbicide. Avoid dune grass and Nootka rose where it is resprouting in a few places. Mow winter ryegrass at first flowering, before it goes to seed and/or treat with herbicide before flowering to prevent seed set.

B. Cover entire disturbed area with >6″ of clean hog fuel biomulch or arborist chips (no holly or other weeds seeds) in spring or summer. Approximately 110 cubic yards of mulch will be needed.

C. Plant native shrubs to colonize disturbed area. Encourage existing Nootka rose to colonize from the southeast edge, do not install new plants within about 8′ of that existing Nootka rose colony edge (the rose will quickly spread into the disturbed area). Also encourage existing native trailing blackberry to spread from the south trail edge. Use 300 bareroot or container native shrubs including Nootka rose, snowberry, red flowering currant (*Ribes sanguineum*) and oceanspray. Plant on approximately 4′ centers in a triangular pattern and flag each plant with 1′ of florescent orange plastic flagging tape to aid with maintenance. When planting, take great care to ensure that no soil is brought up and spilled on top of the mulch. The soil will be filled with innumerable poison hemlock seeds which will readily germinate if brought to the soil/mulch surface. This is critical.

D. Maintenance: Keep a vigilant eye for poison hemlock seedlings and other weeds. Hand pull or treat any weeds coming up around the native shrubs, again emphasizing avoiding bringing any soil up to the mulch surface. After about 5 years the shrubs should be suckering profusely and will close canopy, preventing weed seed germination and establishment. The orange plastic flagging can be removed after plants are large, typically about year 3.

Zone 3: Polygon southwest of Zone 3 and north of Zone 1.

Size: 1.14 acres. This area is predominantly shrub-scrub, with large colonies of Nootka rose as well as open areas of Pacific dunegrass. Broom is sporadically present but not bad in this area. After initial broom removal, there will likely be a large flush of broom seedlings due to the soil disturbance and increased light to the soil surface. Continued efforts to hand pull Scotch broom as new plants germinate will be necessary in coming years or else the work areas will quickly revert to Scotch broom. Significant amounts of Himalayan blackberry are closer to the dike at its' northern end. Over time it would be good to start controlling the blackberry. Little replanting will be necessary in this zone.

Zone 4: East and north of the parking area. Size: 1.2 acres. This area includes the wooden stairs and deck/viewpoint on top of the dike. This area has cyclone fencing that extends from the parking lot to the north. Strong populations of Nootka rose and Pacific dunegrass are present but this is currently the most heavily Scotch broom infested area at the Preserve. There will likely be a very large flush of broom after initial removal due to the soil disturbance and increased light to the soil surface. Continued efforts to hand pull Scotch broom as new plants germinate will be necessary in coming years or else the work areas will quickly revert to Scotch broom. Also significant amounts of Himalayan blackberry are present, especially at the southern end. Little replanting will be necessary in this zone.

Zone 5: Dike Trail. Size: 0.2 miles long, approximately 0.7 acres. This area includes the top and steep banks on both sides of the dike, approximately 30' total width. The trail and dike is mostly dry and disturbed. Scotch broom is dominant in places and Himalayan blackberry is also widespread along the dike. The dike trail is currently infrequently mowed by the County to keep it open. Consultation with the responsible engineer at the County to find out what their preferences are for dike vegetation is recommended. In order to avoid soil disturbance and possible damage to the dike, it is probably best not to grub or pull the weeds on the dike. A better method would be to do cut stump herbicide applications. There will likely be a very large flush of broom following initial removal due to the soil disturbance and increased light to the soil surface. Continued efforts to hand pull Scotch broom as new plants germinate will be necessary in coming

years or else the work areas will quickly revert to Scotch broom. There may be significant open areas that will need replanting after initial weed control efforts. Good plants for the dike would include aggressive, rhizomatous shrubs like snowberry and Nootka rose; oceanspray would also be excellent.

Section V: Weed Control Strategies and Recommendations

Specific, general mechanical and/or herbicide control techniques are presented for noxious weeds that pose a particular threat to the Iverson Preserve. Please note that these recommendations are general in nature. More detailed prescriptions can be found in the Pacific Northwest Weed Management Handbook, through The Nature Conservancy, the King County Weed Board and other online resources.

There may be a need for an aquatic herbicide application permit from the Washington Department of Ecology (DOE). Before any herbicide treatments take place, contact WA DOE to inquire about whether or not they will want an aquatic permit for this site. Even if an aquatic permit is not required, it is highly recommended that only herbicides appropriate for aquatic use (eg glyphosate products such as Glypro and Aquamaster; broadleaf herbicides such as imazypyr/Habitat and triclopyr/Garlon3A) be used due to the close proximity to wetlands and water.

Scotch broom: It is best to hand pull/grub out when soils are moist in winter/spring. If the plant is flowering, it is critically important to dispose of it in the garbage due to the thousands of seeds that can easily be spread to new areas. These seeds can lay dormant in the soil for decades. After initial broom clearing, there is typically a huge flush of new seedlings due to soil disturbance and increased light to the soil surface. Continued efforts to hand pull Scotch broom as new plants germinate will be necessary in coming years or else the work areas will quickly revert to Scotch broom. Scotch broom can also be controlled with glyphosate-based herbicides or broadleaf herbicide. Cut-stump treatments are effective and minimize soil disturbance.

Himalayan blackberry: Blackberry can be grubbed out around native plants. There are excellent opportunities for manual control by volunteers. Himalayan blackberry can be treated with glyphosate-based herbicide in fall or broadleaf herbicides such as triclopyr in summer. Cut-stump treatments can be effective. However, if plants are drought stressed, the effectiveness of herbicides can be significantly impaired. Due to edible fruit, with fall applications it is important to flag off sprayed plants to prevent fruit-picker exposure.

Canada thistle: Mow, hand pull or treat with a broadleaf herbicide at first flowering. Canada thistle is a perennial. Its' seeds have airborne dispersal.

Bull thistle: Hand pull basal rosettes or treat with a broadleaf herbicide before flowering. Bull thistle is a biennial. Its' seeds have airborne dispersal.

Poison hemlock: Hand pulling (wear gloves, plant is highly toxic) in winter/spring, or spot herbicide treatment before flowering are both good techniques. Plant is a biennual. It is important to control before flowering to prevent seed set.

Section VI: References

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Stein, Janet, 2013. Coordinator, Island County Noxious Weed Control Board. Site meeting with Noah Booker on 13 December 2013.

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12/13/2013 2:06:57 pm
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Zone 1
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© 2013 Google
Google earth
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Google earth
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Google earth
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© 2013 Google
Google earth
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