

Ivy Place Right-of-way Enhancement Project 2015 Ecosystem Plan

Date: November 2, 2015

Draft: 028

Purpose:

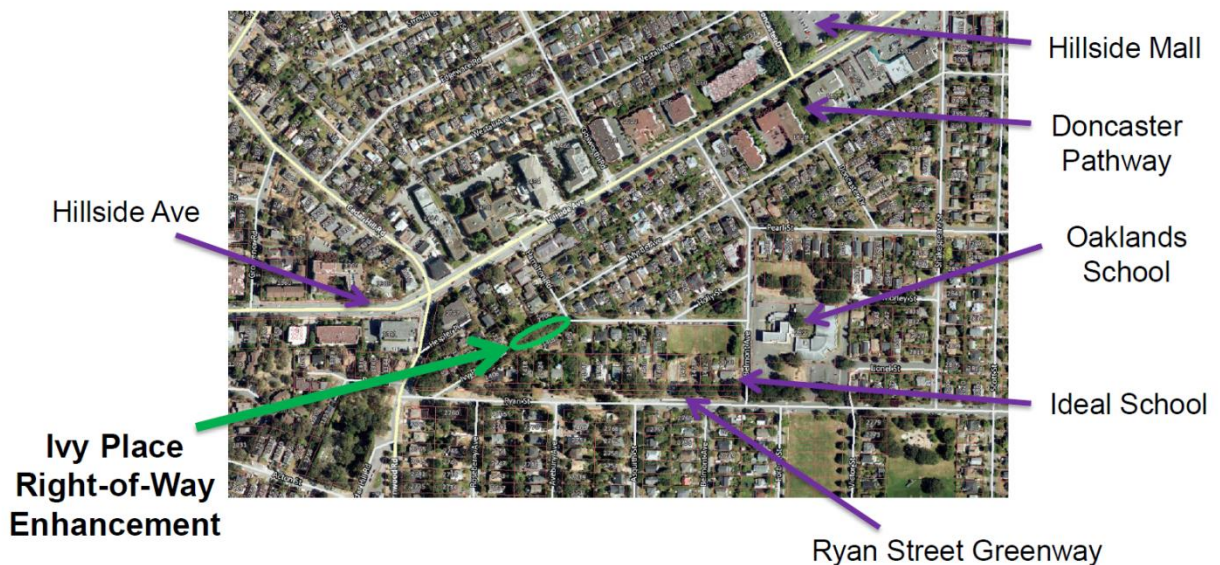
The purpose of this document is to detail the 2015 Ecosystem Plan for the Ivy Place Right-of-way Enhancement Project and to provide an ongoing project report.

Document Summary:

The Ivy Place Right-of-way Enhancement project is driven by neighbours wishing to improve an ill-defined walkway in the midst of a Garry Oak ecosystem. The City of Victoria awarded the project as a strategic plan grant on August 5, 2015.

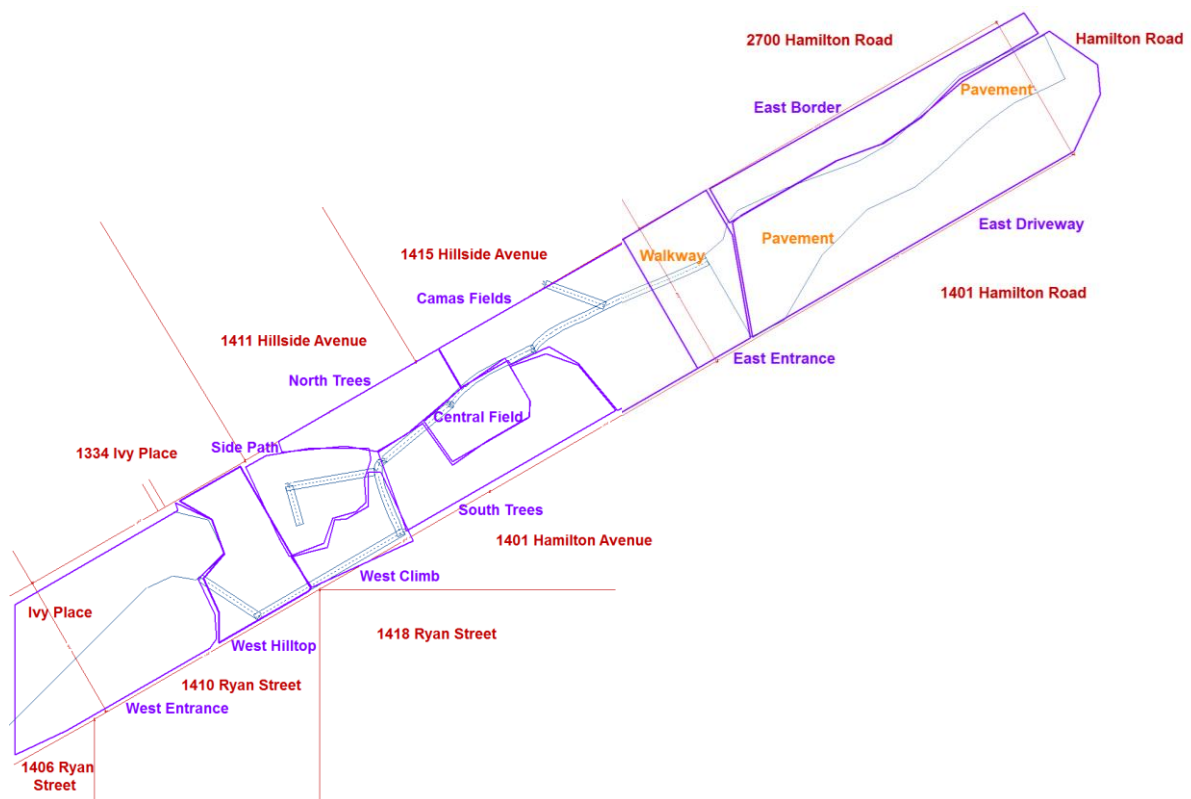
The project is located in the Oaklands neighbourhood in Victoria, B.C.

Surroundings of Ivy Place



Although this project is on a City of Victoria Right-of-way which is not yet a Greenway, the concepts and planting ideas follow those of Greenways, so “Greenway” may be used in many places throughout the remaining document.

Through onsite observations and some measurements, a detailed inventory and mapping was developed of the plants, pathways and pavement areas in the Ivy Place Greenway (see Appendix I and Appendix II). An overview of the mapping is shown below.



Drawing 1 – Overall sections of the Ivy Place Greenway

This document includes the following:

- Upcoming Work:** summary of specific activities planned for the upcoming work
- Consultation and events:** consultation and significant events (past and planned) supporting overall project objectives
- Maintenance and Replacement Program:** overall maintenance agreement and individual itemized activities supporting the maintenance program
- Detailed record:** record of on-site activities accomplished in the past and planned for this year

Long term Improvement Plan: activities planned for future years

Appendix – Mapping of Greenway Objects, Inventory of Greenway Flora, Background material on plants and planting techniques, Liability form from HAT

1. Upcoming Work

a. Review and approval of plans (City)

We suggest this document provides adequate information for the “public consultation”, “detailed design”, “long-term”, and “maintenance” plan conditions required by the City before grant funding could be issued. In order to move ahead, the City will then need to indicate its approval. This is a critical path item, as the next stages need to occur promptly and can only occur after approval by the City.

b. Ordering of plants (Team)

The complete supply and pricing of plants has been meticulously sourced, and need to be ordered as soon as possible as supplies are dwindling. Upon the City’s approval, the plants can be ordered.

c. Final preparation of the site (Team)

After the English Ivy and other invasive plants have been removed, City approval, and ordering of the plants, there may be some final site preparation needed.

d. Summary of November Planting Work Party (Team)

The following is a summary for the Site Preparation Work Party, scheduled for Sunday, November 15, 1-3pm. Detailed information is presented in the *Detailed Report* section within section 4 and can be found by “clicking” on the reference number or name.

The following work plan as noted below for areas G-24, G-26, G-29, G-30 and G-31, plus the ordering of soil and plants are only proposals and are not confirmed until the City staff have reviewed them, incorporated any changes and been approved by City staff because they involve investments.

- Plant shrubs, bulbs and perennials in the West Entrance native plant showcase
- Modify pathway near East Entrance to deal with drainage.
- Continue removing English Ivy from East to West in the South Trees area and plant shrubs
- Plant shrubs and trees to replace English Holly (S-13) at West Hilltop
- Continue to remove English Ivy from all Garry Oaks and other trees
- Cut back St. John's Wort, S-10, along the West Climb.
- Remove other annuals and perennials throughout site.
- Clean up the shrubs and invasives at the Side Path
- Remove remaining English Ivy, G-12, along the top of the hill
- Add remaining trees to inventory survey
- Removal of garbage

2. Consultation and events

The Ivy Place Right-of-way project has developed a working group of interested neighbours, community members and support members. The working group consists of about 15 neighbours immediately adjacent to and in close proximity to the Ivy Place Right-of-way, as well as community members in Oaklands, support organizations (including ITO and HAT) and a well-known native garden consultant, Pat Johnston (see *Picture 1* below).



Picture 1 - Neighbours within the Ivy Place Greenway working group

All members of the working group (approximately 25) are provided regular email and face-to-face updates of the full working documents, ample opportunity to provide feedback, and invitations to all events. Members of the working group have been engaged in onsite mapping, onsite invasive plant removal/work parties, neighbourhood meetings and input into the strategy and direction of the project. New members are encouraged to join the group.

This group has met together on Sept 8 and Oct 3 to consult neighbours on key issues, interests and the opportunity for Ivy Place. This working group has been very effective in organizing event planning and priorities, and has been an integral part in the success of the project thus far.

Habitat Acquisition Trust (HAT) has an active role in the Ivy Place Right-of-way community restoration project as an integral part of the community outreach, stewardship and technical support. HAT has focused on the Ivy

Place Right-of-way project for its 2015 Urban Forest Good Neighbours Project in Victoria. The Good Neighbours program works with private landowners to adopt sustainable land practices through stewardship of their properties. HAT canvassed 160 residential addresses in the Ivy Place area to engage a larger audience to gather interest and support from the neighbourhood as shown in *Picture 2* below. HAT also provides the liability insurances needed for the project.



Picture 2 – Coverage of HAT Good Neighbours Program in Victoria

History

Aug 5-14: onsite mapping work with neighbours (see Appendix I and Appendix II), and gather input from neighbours

Aug 20: onsite work discussion with HAT and Pat Johnston

Aug 25: further onsite work with neighbours

Aug 26: onsite tour and discussion with ITO

Aug 27: document update sent to neighbours

Sept 3: discussions with ITO and HAT

Sept 4: major onsite work on West Entrance with neighbours

Sept 8: neighbour meeting and discussion of the Ivy Place Greenway working group including power point presentation

Sept 14: walk through with Ben Isitt, met some neighbours

Oct 3: neighbour work party with 16 volunteers of the Ivy Place Greenway working group to pull invasive plants and prepare the site

Upcoming

Nov 15, Sunday, 1-3pm; neighbour planting work party with working group

Nov-Dec: if needed, potential bulb and perennial planting event

3. Maintenance and Replacement Program

A maintenance and replacement program to support the Ivy Place Right-of-way Strategic Plan project. Find a summary of the program below:

- ITO is committed to ensure that sufficient volunteers are drawn from the adjacent property owners and neighbours through the Ivy Place Right-of-way working group and are available for 2 years of watering, weeding and natural area maintenance for the planted areas and pathway as detailed in the Ecosystem Plan ensuring plants are established. Water will be supplied from neighbour sites.
- For the first two years, a maintenance report will be produced documenting the progress of the maintenance activities and highlighting any concerns or issues. Plants that have failed will be replaced and the pathway will be regularly maintained.
- A detailed list of yearly scheduled maintenance functions are listed below. This information is summarized from the *Detailed Report* in *Section 4* which can be found by “clicking” on the reference number or name.

Detailed list of schedule maintenance functions

1.a Remove Garbage

A volunteer from the team is tasked with ensuring at least once a week that garbage is picked up throughout the site and will be removed by the team.

1.b.i Remove isolated invasive plants

Each year in late summer, check for return of the following invasive plants Scotch Broom [Side Path, S-22], Himalayan Blackberry [West Hilltop, S-16 and West Entrance], Daphne [West Entrance, S-24; Side Path, G-19], Honesty (Lunaria annua) [Central Field, G-20], Canada Thistles [East Border, G-22], and English Holly [West Hilltop, S-13]. If any invasive plants are found, document location and remove.

1.b.i.1 Remove Bluebells (Camas Fields; G-5)

Each year in spring, as the flowers are blooming check for bluebells in Camas Fields G-5 amongst the camas and remove bluebell bulbs.

Other areas should be checked and if found, document location and remove.

1.b.ii Remove English Ivy from Garry Oaks

Each year in late summer, T-37 Fir Tree and T-43 Garry Oak should be checked that G-13 and G-28 English Ivies have not started to encroach and grow back.

If they have grown back, document and remove. If possible, further efforts should be made to completely remove the root of G-28 English Ivy. All remaining Garry Oaks and large trees should be checked that English Ivy has not returned. If so, document and remove.

1.b.iii Clear Central and East areas completely from English Ivy

Each year in late summer, check that all English Ivy is completely absent from East Border, East Entrance, Camas Fields, Central Field and North Trees sections. If not, document locations, and remove them so that the above areas remain free of English Ivy.

1.b.iv Clear West Entrance completely from English Ivy and other invasive plants

Each year in late summer, check that the English Ivy at G-27 and other invasive plants through the West Entrance have not started to encroach the area. Remove and document as appropriate.

1.b.v Remove or reduce Laburnum and St John's Wort from along West Climb

Each year in late summer, check that the English Ivy at G-27 and other invasive plants through the West Entrance have not started to encroach the area. Remove and document as appropriate.

1.b.vi Maintain Snowberry at the West Entrance

The Snowberry, S-25 should recover, and the plan is to let it continue to grow, but growth kept under control. Each year it should be checked and pruned as necessary, but not cut down.

1.b.vii Remove English Ivy from rocks

Each year, check that English Ivy G-21 has not regrown on the R-5 in the South Tree area and nearby rocks. Remove as necessary.

1.b.viii Remove non-native annuals and perennials throughout site

Each season, a visual scan will be made of the entire site for other non-native annuals and perennials. They will be noted and removed as appropriate.

1.e West Entrance native plant showcase

After the sections G-24, G-26, G-29, G-30 and G-31 have been planted, these sections will need to be monitored each year for return of weeds, including Yellow Archangel.

1.f Clean up Side Path

Each year in late summer, ensure that G-19 and G-17 English Ivy and S-6 and S-7 shrubs are pruned.

1.g Add to inventory survey

Each year check if any new items need to be added to the inventory, add as appropriate (see Appendix I and Appendix II).

1.h Remove English Ivy along the top of the hill

Each year make sure the English Ivy does not grow back along the top of the hill.

1.i Remove English Ivy from East to West around Central Field

Each year make sure the English Ivy does not grow back in section G-7, G-9 and cleared section of G-18.

1.j Walkway drainage considerations

Each year in winter after significant rains have fallen, check that the drainage techniques used to reduce drainage on the trail are working appropriately. Re-enforce as necessary.

4. Detailed Report

References:

Mapping of Greenway Objects: Appendix I
Inventory of Greenway Flora: Appendix II

1. This Year's Plan (2015)

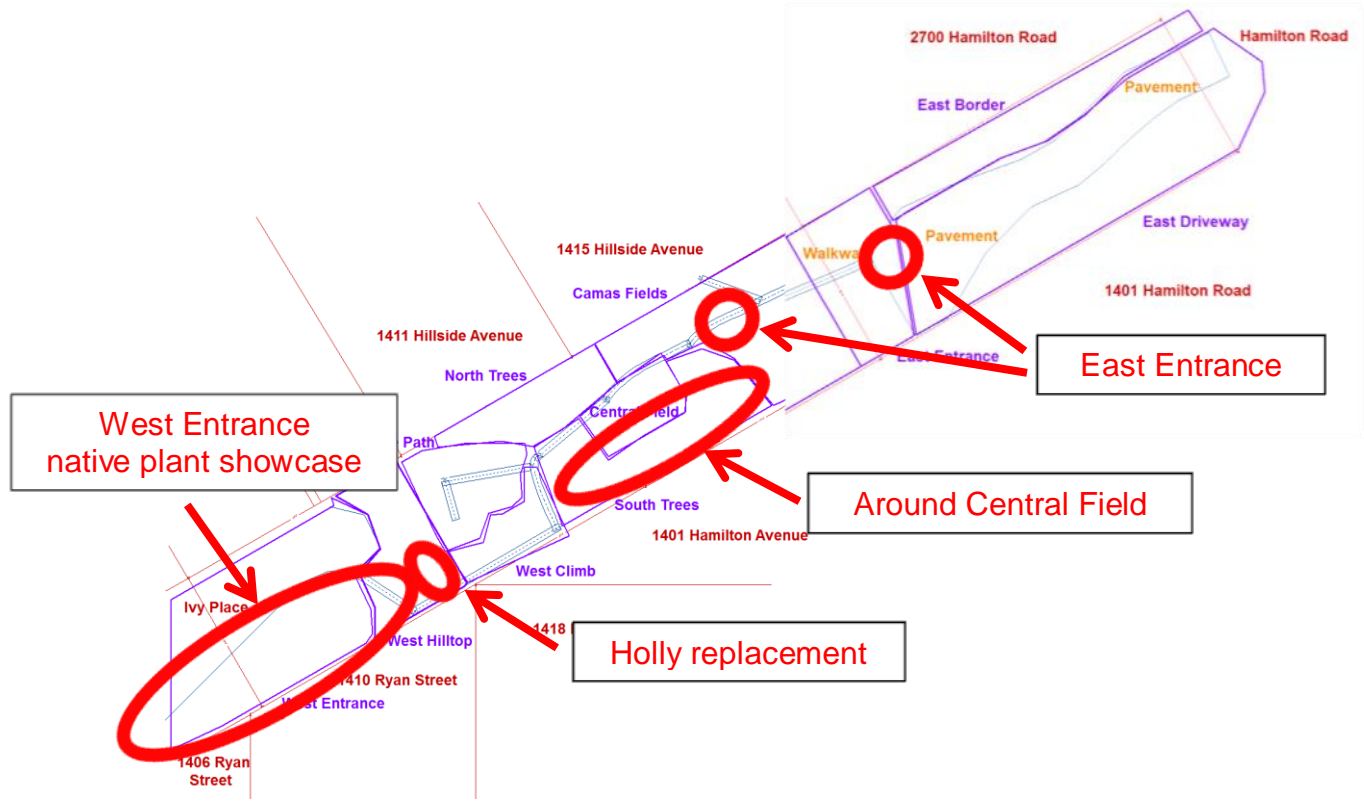
The following section describes details for the following aspects for each area: observations, assigned actions to particular events and maintenance.

Note: The ordering of plants and soil/mulch noted within this document and those reliant on the ordering are only proposals and not confirmed until the City staff have reviewed them, incorporated any changes and been approved by City staff because they involve investments.

Find below a listing of the total number of plants required for new plantings in all sections and the locations as shown in *Drawing 2* (based on final availability, substitutions may be required):

- 10 Evergreen huckleberry (*Vaccinium ovatum*)
- 8 Licorice ferns (*Polypodium glycyrrhiza*)
- 14 Low Oregon Grape (*Mahonia nervosa*)
- 29 Sword fern (*Polystichum munitum*)
- 3 Red Flowering Currant (*Ribes sanguinum*)
- 12 Woodland strawberry (*Fragaria vesca*)
- 3 Ocean Spray (*Holodiscus discolor*)
- 6 Trillium (*Trillium ovatum*)
- 9 Red columbine (*Aquilegia formosa*)
- 16 Fringecup (*Tellima grandiflora*)
- 10 Shooting star (*Dodecatheon hendersonii*)
- 12 Camas (*Camissia quamish*)
- 9 Fawn lily (*Erythronium oregonum*)
- 6 Nodding onion (*Allium cernuum*)
- 6 Yerba beuna (*Satureja douglasii*)
- 4 Pearly everlasting (*Anaphalis margaritacea*)
- 20 Stonecrop (*Sedum spathulifolium*)
- 6 Stonecrop (*Sedum oregonum*)
- 6 Stonecrop (*Sedum lanceolate*)
- 12 Star flower (*Trientalis arctica*)

- 6 Meadowrue (*Thalictrum occidentale*)
- 6 Hooker's fairybells (*Disporium hookeri*)
- 6 Wild bleeding heart (*Dicentra formosa*)
- 6 Salal (*Gaultheria shallon*)
- 10 Assorted other native
- 2 Hardhack (*Spiraea douglasii*)
- 2 Red osier dogwood (*Cornus stolonifera*)



Drawing 2 – Locations for all new plantings

The team has sought price quotes and availability from multiple suppliers to ensure the most efficient use of the available funds.

The liability for work parties are supported by policies of the Habitat Acquisition Trust, see *Appendix IX*.

a. Remove Garbage

Observation: Before this project began, there was garbage found in various places throughout the site. The garbage can interfere with the growth of the natural systems, is unsightly and attracts more garbage. Through this project, the team removed significant amounts of garbage

throughout the site. In the future, from time-to-time there may sporadic further garbage that appears.

Upcoming November 2015 planting work party: Garbage found at any place throughout the site will be removed by the team.

Maintenance: A volunteer from the team is tasked with ensuring at least once a week that garbage is picked up throughout the site and will be removed by the team.

b. Remove Invasive plants and trim plants

Observation: Before this project began, the site had many invasive plants that were choking out the native plants. While completely removing all invasive plants from the site would be beyond the resources available in the 2015 plant, through this 2015 project most of the invasive plants with minimal consequences have been removed.

i. Remove isolated invasive plants

Observation: Before the project began, there were several invasive plants on the site that had only a few, small, isolated specimens. Through this project, many of those isolated plants were removed, therefore, getting closer to eradicating those plants from the entire Greenway. Here is a list of some of the key invasive plants that have been removed: Scotch Broom [Side Path, S-22], Himalayan Blackberry [West Hilltop, S-16 and West Entrance], Daphne [West Entrance, S-24; Side Path, G-19], Honesty (Lunaria annua) [Central Field, G-20], Canada Thistles [East Border, G-22], and English Holly [West Hilltop, S-13].

Maintenance: Each year in late summer, check for return of the following invasive plants Scotch Broom [Side Path, S-22], Himalayan Blackberry [West Hilltop, S-16 and West Entrance], Daphne [West Entrance, S-24; Side Path, G-19], Honesty (Lunaria annua) [Central Field, G-20], Canada Thistles [East Border, G-22], and English Holly [West Hilltop, S-13]. If any invasive plants are found, document location and remove. For the most appropriate time for removal see *Appendix III - Best months to kill invasive plants*.

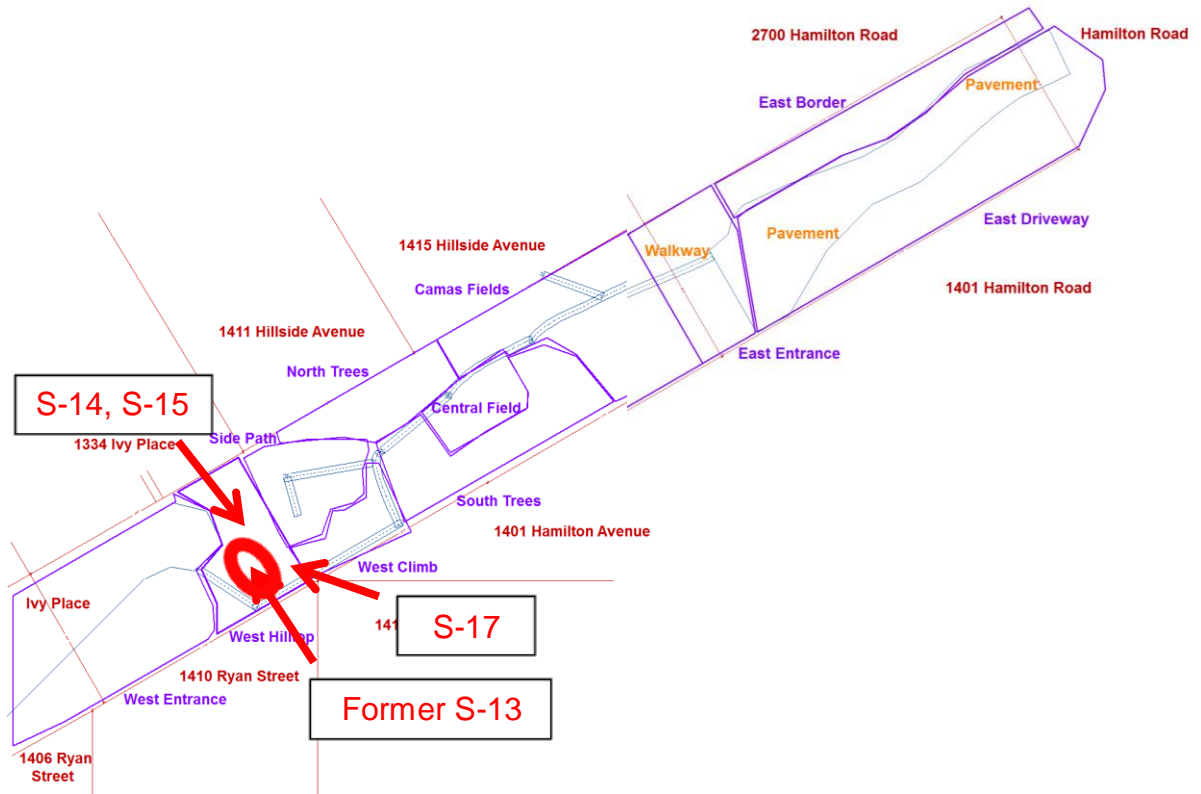
1. Remove Bluebells (Camas Fields; G-5)

Observation: There are numerous bluebells inter mixed with the Camas in the Camas Field, G-5. They are hard to identify until spring.

Maintenance: Each year in spring, as the flowers are blooming check for bluebells in Camas Fields G-5 amongst the camas and remove bluebell bulbs. Other areas should be checked and if found, document location and remove.

2. Replacement of English Holly (West Hilltop; S-13)

Observation: Before this project began there was a wall of invasive, non-native trees at the west end of the pathway. Part of the West Hilltop consists of the one of the few English Hollies (S-13) found in the area, which would draw nutrients and water destined for other plants, including native plants and also preventing light from the other plants. Through this project, this shrub was removed and new native shrubs/trees will need to be planted at the location shown below in *Drawing 3*.

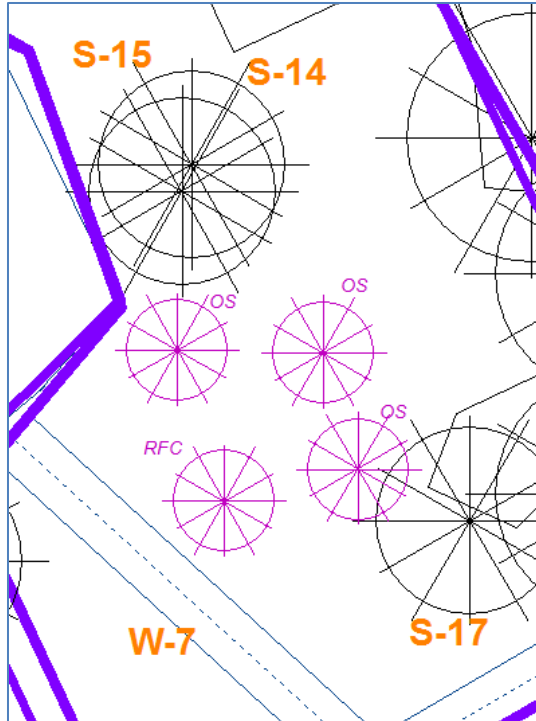


Drawing 3 – Location of new plantings for S-13 replacement

Upcoming On-site Preparation before November 2015 planting: Order plants as listed below after approval from the City staff:

- 1 Red Flowering Currant (*Ribes sanguinum*)
- 3 Ocean Spray (*Holodiscus discolor*)

Upcoming November 2015 planting work party: Add the following new plants according to the planting design as shown in *Drawing 4* below:



Drawing 4 - New planting design for S-13 Replacement

ii. **Remove English Ivy from Garry Oaks and other large trees**

Observation: Invasive English Ivy growing on Garry Oaks (and other trees) if left unchecked can kill the trees. Although English Ivy had previously been removed from almost all Garry Oaks before the project began or at least cut off from the roots and appropriately left to die, a few Garry Oaks and other trees have been found with fresh growing English Ivy on them. Through this project, most of the remaining Garry Oaks have had English Ivy removed. See pictures below, *Picture 3 through Picture 8* **Picture 6:**



*Picture 3 – [Before] G-13
English Ivy growing on T-37
Fir Tree*



*Picture 4 – [After] T-37 Fir Tree
without English Ivy G-13*



*Picture 5 – [Before] G-28
English Ivy growing on T-43
Garry Oak Tree*



*Picture 6 – [After] T-43 Garry
Oak without English Ivy G-28*



Picture 7 - [After] Root of G-28 English Ivy remains



Picture 8 – [After] Close up of G-28 English Ivy remaining roots

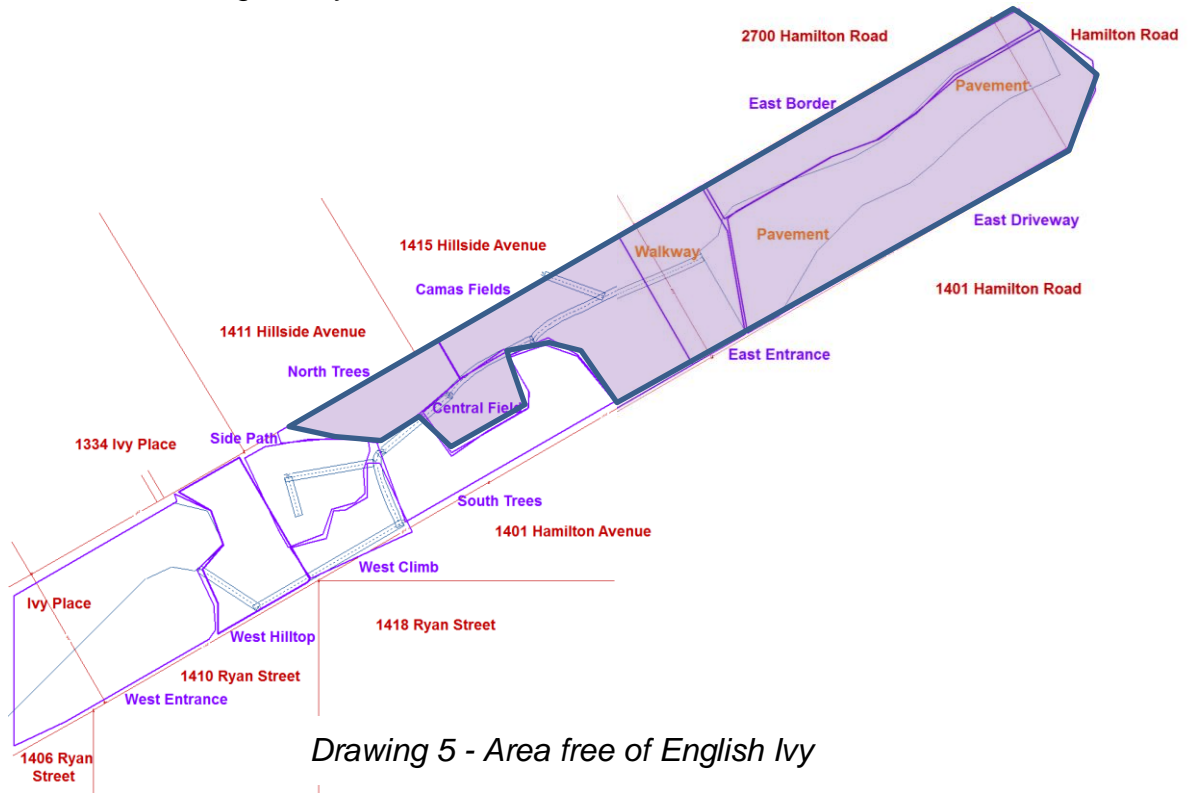
Upcoming November 2015 planting work party: Check that all other Garry Oaks and other large trees have English Ivy removed. If not, document location and remove.

Maintenance: Each year in late summer, T-37 Fir Tree and T-43 Garry Oak should be checked that G-13 and G-28 English Ivies have not started to encroach and grow back. If they have grown back, document and remove. If possible, further efforts should be made to completely remove the root of G-28 English Ivy. All remaining Garry Oaks and large trees should be checked that English Ivy has not returned. If so, document and remove.

iii. **Clear Central and East areas completely from English Ivy**

Observation: Before the project began, invasive English Ivy had overwhelmed quite a few areas of the site. Upon closer inspection, it was discovered that several contiguous areas are free or almost free of English Ivy: East Border, East Entrance, Camas Fields, Central Field and North Trees sections. Through this project, all remaining English Ivy was removed from East Border, East Entrance, Camas Fields, Central Field and North Trees sections to ensure those areas are free from English Ivy, see *Drawing 5* below.

Maintenance: Each year in late summer, check that all English Ivy is completely absent from East Border, East Entrance, Camas Fields, Central Field and North Trees sections. If not, document locations, and remove them so that the above areas remain free of English Ivy.



iv. Clear West Entrance completely from English Ivy and other invasive plants

Observation: The main part of the West Entrance is an “island” surrounded by the walkway and pavement (see *Drawing 6*). Due to diligent work over the years from neighbours, this area has significantly fewer invasive plants than other areas. This makes it a prime candidate to become an area to be completely clear of invasive plants. Through this project, English Ivy and other invasive plants have been removed from G-27 and surrounding areas at the West Entrance to make it essentially invasive plant-free. Caution was taken to ensure native Licorice Fern and other native plants underneath are not damaged. Indeed, after a few weeks, Licorice Fern covered the area where previously there was only English Ivy and other invasives, see *Picture 9* through *Picture 14*.



Picture 9 – [Before] West Entrance rock face with English Ivy G-27



Picture 10 – [After] West Entrance rock face without English Ivy G-27



Picture 11 – [After] Sprouting native licorice fern was revealed after removing the English Ivy G-27 from rock face



Picture 12 – [After] Native licorice fern blossomed a few weeks after English Ivy G-27 was removed



Picture 13 - [Before] West Entrance rock covered with invasives



Picture 14 - [After] West Entrance rock covered with native Licorice Ferns

Maintenance: Each year in late summer, check that the English Ivy at G-27 and other invasive plants through the West Entrance have not started to encroach the area. Remove and document as appropriate.

v. **Remove or reduce Laburnum and St John's Wort from along West Climb**

Observation: Before this project aggressive invasive plants, Laburnum, S-19, and St. John's Wort, S-10 lined the West Climb. Through this project the entire Laburnum, S-19, including its root was successfully removed and the St. John's Wort was trimmed.

Upcoming November 2015 planting work party: Cut back further the St. John's Wort, S-10, along the West Climb.

Maintenance: Each year the West Climb section should be checked for regrowth of Laburnum and return of St. Joh's Wort and removed as necessary.

vi. **Maintain Snowberry at the West Entrance**

Observation: There is a patch of native Snowberry, S-25, within the West Entrance. It has been cut back, but the intention is to allow it to continue to grow.

Maintenance: The Snowberry, S-25 should recover, and the plan is to let it continue to grow, but growth kept under control. Each year it should be checked and pruned as necessary, but not cut down.

vii. **Remove English Ivy from rocks**

Observation: Before the project began, several rock areas were covered by invasive English Ivy, in the vicinity of and including G-21 on top of R-5. Through this project, the English Ivy from G-21 on top of Rock R-5 in the South Tree area and nearby rocks was successfully removed.

Maintenance: Each year, check that English Ivy G-21 has not regrown on the R-5 in the South Tree area and nearby rocks. Remove as necessary.

viii. Remove non-native annuals and perennials throughout site

Observation: Other than the plant species noted throughout this document and larger shrubs/trees, it is recognized that more non-native annuals and perennials may appear throughout the site at different times of year. The native ecosystem may be threatened if they are allowed to grow and spread.

Upcoming November 2015 planting work party: A visual scan will be made of the entire site for other non-native annuals and perennials. They will be noted and removed as appropriate.

Maintenance: Each season, a visual scan will be made of the entire site for other non-native annuals and perennials. They will be noted and removed as appropriate.

c. Remove Mesh Screen at East Border

Observation: There is a mesh screen attached alongside the fence next to the East Border that is unsightly and could cause injuries to birds and other animals. We understand that former residents used it to limit blowing of leaves.

Upcoming Action to be Done: Discussions are ongoing with neighbours to determine if there are any strong objections to removing the mesh from the East Border. If not, then the mesh screen can be removed. At the same time as removing the mesh, the graffiti on the fence could also be removed.

d. Reposition tree log at Side Path

Observation: Before the project began there was a tree log perched and leaning against shrubs and trees in the Side Path area. This interfered with the growth of the natural systems and was unsightly. Through this project we repositioned the log along the trail. It will remain to provide nutrients as a nurse log, see *Picture 15* and *Picture 16* below.



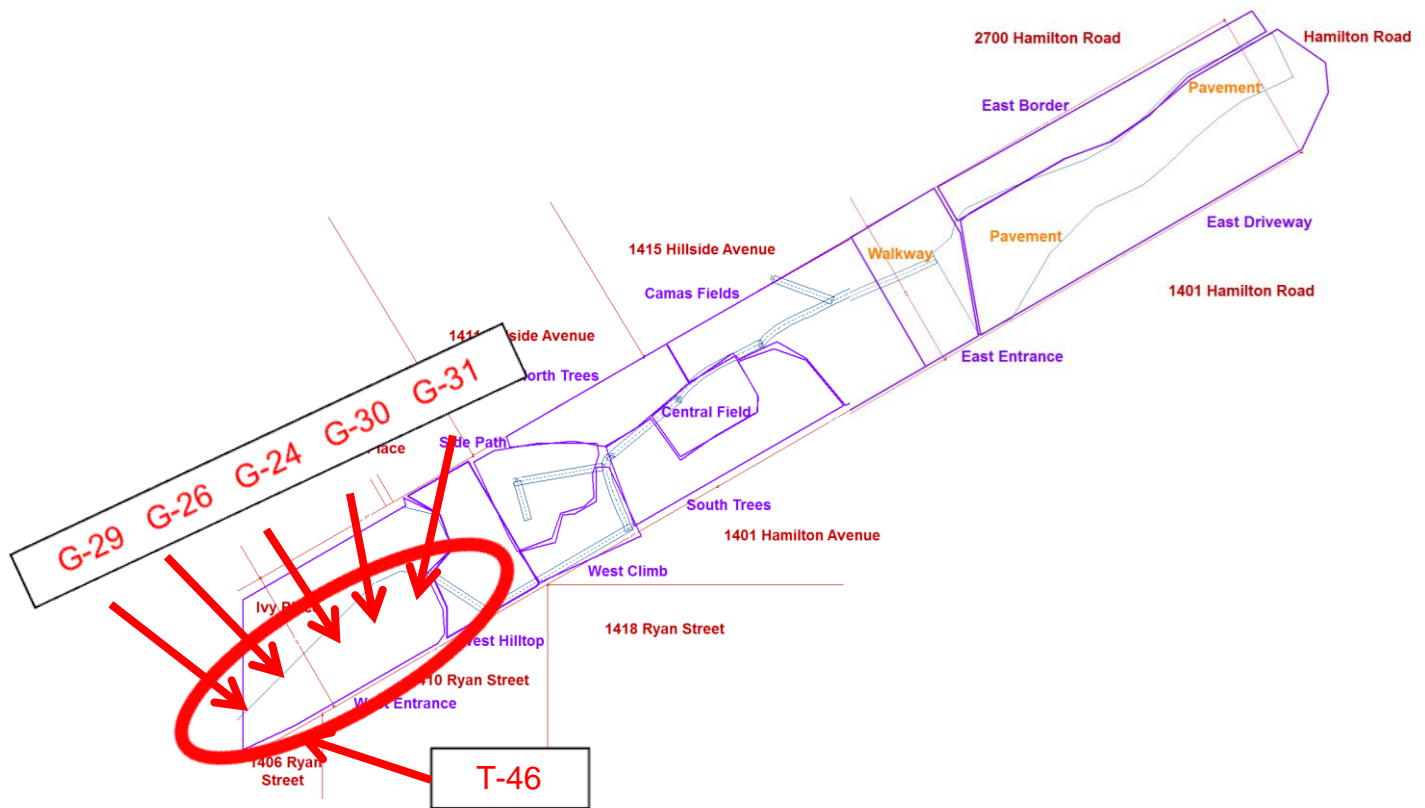
Picture 15 - [Before] Leaning tree log



Picture 16 – [After] Tree log moved along path

e. West Entrance native plant showcase

Observation: Before this project began, the view of the Greenway looking down Ivy Place at the West Entrance was primarily a wall of non-native plants with few native plants. There were overgrown, grassy, weedy sections G-26, G-24, and G-30, with English Ivy. Cotoneaster and other invasives were overwhelming section G-31. Long spindly branches of the bordering Holly Tree, T-46, completely covered section G-29 preventing any growth of other plants. Significant amounts of very invasive Yellow Archangel (*Lamium glaeobdolon*) were prevalent throughout areas G-24 and G-26 (see *Picture 17* below). See *Drawing 6* below for location within the Greenway.



Drawing 6 – Location of West Entrance native plant showcase

Through this project, our team, with active participation of the owners of 1406 Ryan Street, trimmed the Holly tree T-46. The team also removed English Ivy, cotoneaster, Yellow Archangel and other invasive plants resulting in space suitable for a native plant showcase to predominate the area instead of non-native invasive plants. See *Picture 17*, *Picture 18* and *Picture 19* below showing the Yellow Archangel and showing the area before and after the work was done.



Picture 17 - Yellow Archangel in Section G-24



Picture 18 - [Before] Invasive plants overrunning West Entrance



Picture 19 - [After] West Entrance cleaned up

Native plant gardening consultant, Pat Johnston, developed a series of detailed native planting designs for G-24, G-26, G-29, G-30, and G-31. The plant design was developed so that sections G-24, G-30 and G-31 were would be showy through different seasons, shrubs in G-26 would block pedestrian access to rocks and planting at G-29 would provide screening for 1406 Ryan Street. Here are some general concepts and notes relating to the design as noted by Pat Johnston:

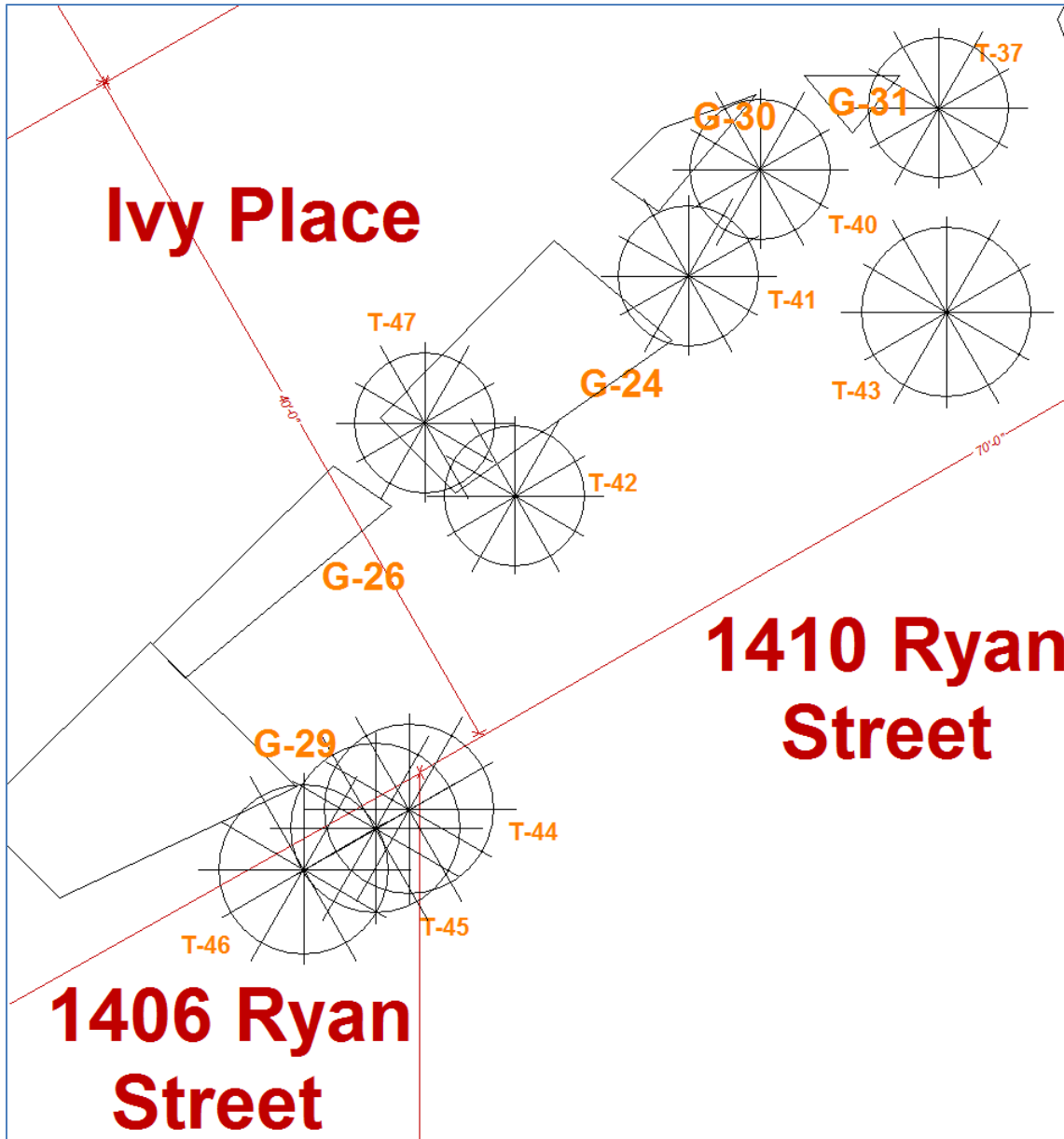
For continuity and to create a flow, the same three shrubs, Evergreen huckleberry, Low Oregon graph and Sword Fern, are planned for each of the four sections, G-24, G-26, G-29 and G-30. These shrubs are reasonably shallow-rooted, evergreen, like shade and are easy to grow.

The selection of the perennials and bulbs fit the conditions well and provide some color and interest for different seasons.

The same ground cover is chosen for each section in order to create continuity and flow to the site.

As the soil depth is quite shallow, plans are in place to add new soil in many of the sections.

The location of the new planting designs, G-24, G-26, G-29, G-30 and G-31 plus trees in the area are shown below in *Drawing 7*.



Drawing 7 – Location of new planting sections (G-24, G-26, G-29, G-30, G-31)

Upcoming Project Preparation before November 2015 planting:

The following work plan as noted below for areas G-24, G-26, G-29, G-30 and G-31, plus the ordering of soil and plants are only proposals and are not confirmed until the City staff have reviewed them, incorporated any changes and been approved by City staff because they involve investments.

The following plants will be ordered for the G-24, G-26, G-29, G-30 and G-31 sections of the West Entrance:

- 10 Evergreen huckleberry (*Vaccinium ovatum*)
- 8 Licorice ferns (*Polypodium glycyrrhiza*)
- 14 Low Oregon Grape (*Mahonia nervosa*)
- 20 Sword fern (*Polystichum munitum*)
- 1 Red Flowering Currant (*Ribes sanguinum*)
- 12 Woodland strawberry (*Fragaria vesca*)
- 6 Trillium (*Trillium ovatum*)
- 9 Red columbine (*Aquilegia formosa*)
- 16 Fringecup (*Tellima grandiflora*)
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- 12 Star flower (*Trientalis arctica*)
- 6 Meadowrue (*Thalictrum occidentale*)
- 6 Hooker's fairybells (*Disporium hookeri*)
- 6 Wild bleeding heart (*Dicentra formosa*)
- 6 Salal (*Gaulthier shallon*)

Soil will be ordered and placed as required for sections G-24, G-26, G-29, G-30 and G-31 to ensure there is appropriately 6" to 8" depth (areas next to curb may be shallower).

Upcoming November 2015 planting work party:

The plants and shrubs according to the general instructions in this section and detailed plans for each area below should be planted.

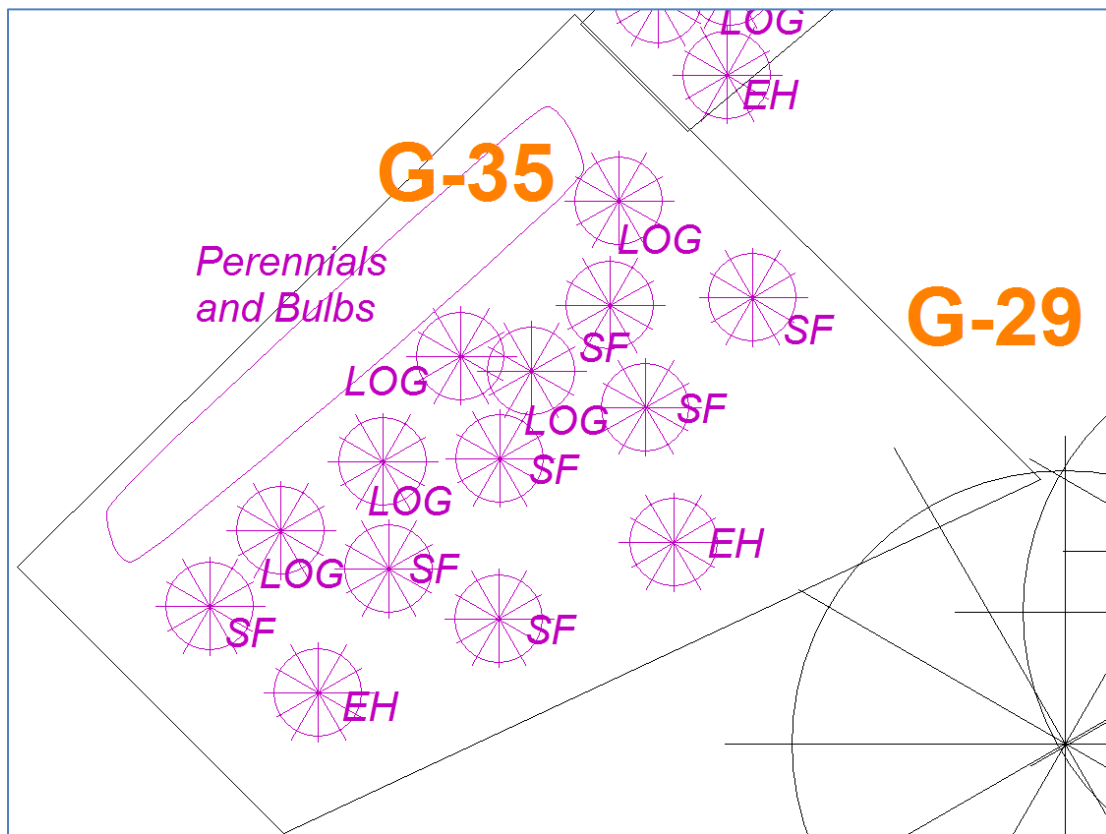
When planting be sure to open up the root ball after it is taken from its pot and dig a deep enough hole for the plant. Water the hole before planting and mulch after planting.

Given these sections consist of rocky outcrops, shallow soil and tree roots; it may be difficult to plant as many shrubs as shown in the design. Exact position of plants may vary according to the local conditions.

Twelve woodland strawberry (*Fragaria vesca*), which are edible, will be used as a ground cover throughout the area. Final placement will be assessed onsite as other plants are placed.

New planting plans for each section are detailed below.

New planting plan for G-29



Drawing 8 - New planting design for G-29

Important considerations for G-29 are:

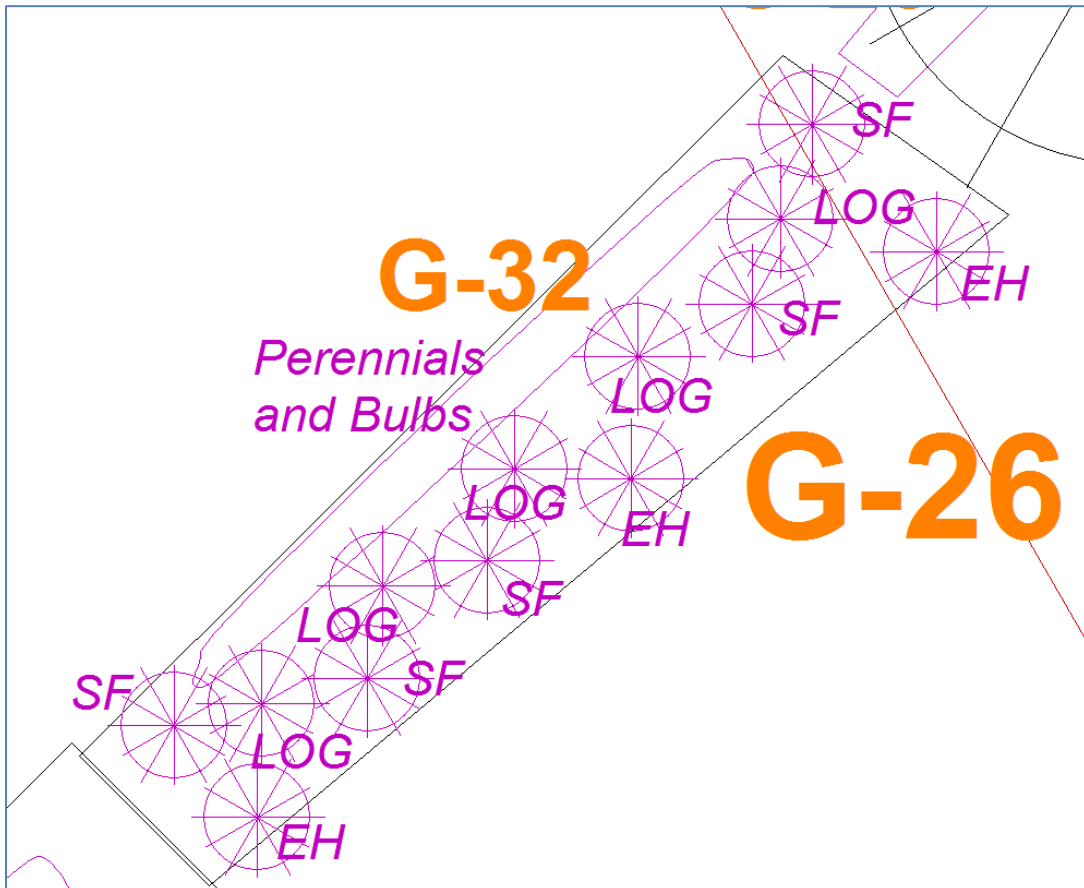
- deep shade
- shallow soil
- ample tree roots
- key is to provide screen for 1406 Ryan Street

Add the following new plants into section G-29 according to the planting design as shown in *Drawing 8* above:

- 2 Evergreen huckleberry (*Vaccinium ovatum*) [EH]
- 5 Low Oregon Grape (*Mahonia nervosa*) [LOG]
- 7 Sword fern (*Polystichum munitum*) [SF]

This section is underneath a large Holly tree. If the roots are particularly overwhelming and there is poor soil conditions, it may be appropriate to use Snowberry (*Symphoricarpos albus*) and Baldhip rose (*Rosa gymnocarpa*) since they do well in those conditions and in the deep shade.

New planting plan for G-26



Drawing 9 - New planting design for G-26

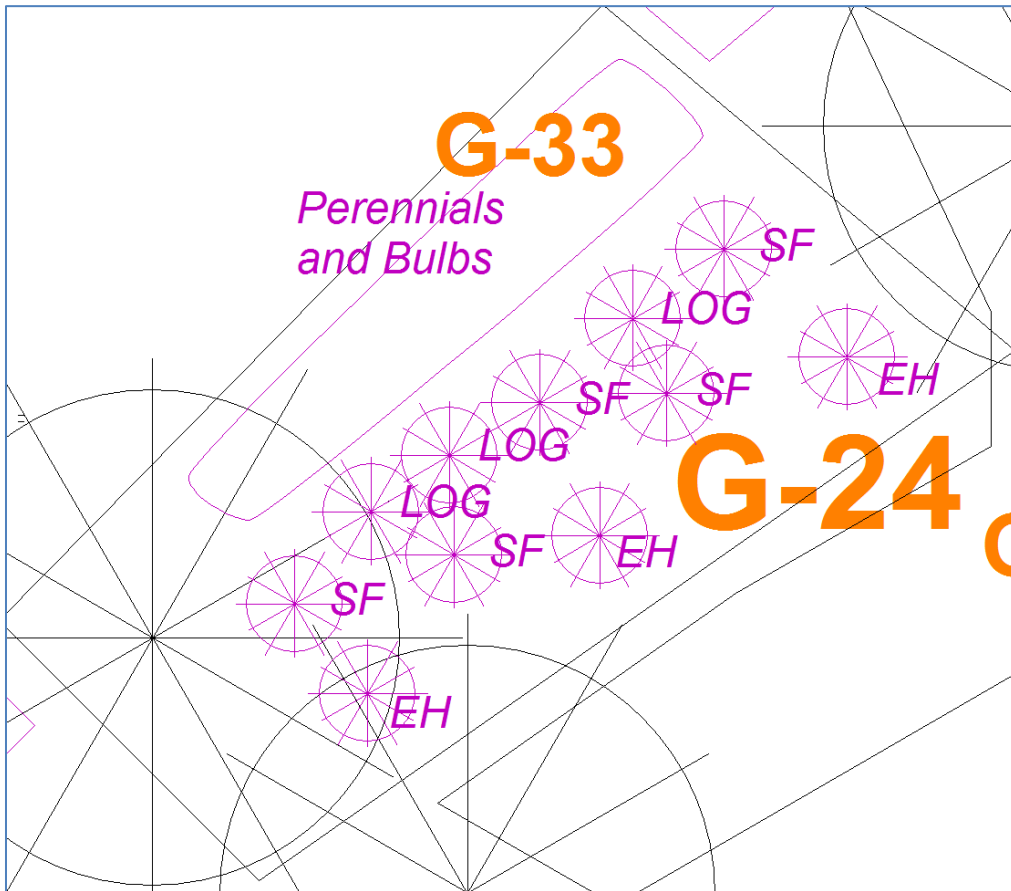
Important considerations for G-26 are:

- shade
- shallow soil
- rocky
- key is to create barrier for walkers that may want to walk onto top of the rocks

Add the following new plants into section G-26 according to the planting design as shown in *Drawing 9* above:

- 3 Evergreen huckleberry (*Vaccinium ovatum*) [EH]
- 5 Low Oregon Grape (*Mahonia nervosa*) [LOG]
- 5 Sword fern (*Polystichum munitum*) [SF]

New planting plan for G-24



Drawing 10 - New planting design for G-24

Important considerations for G-24 are:

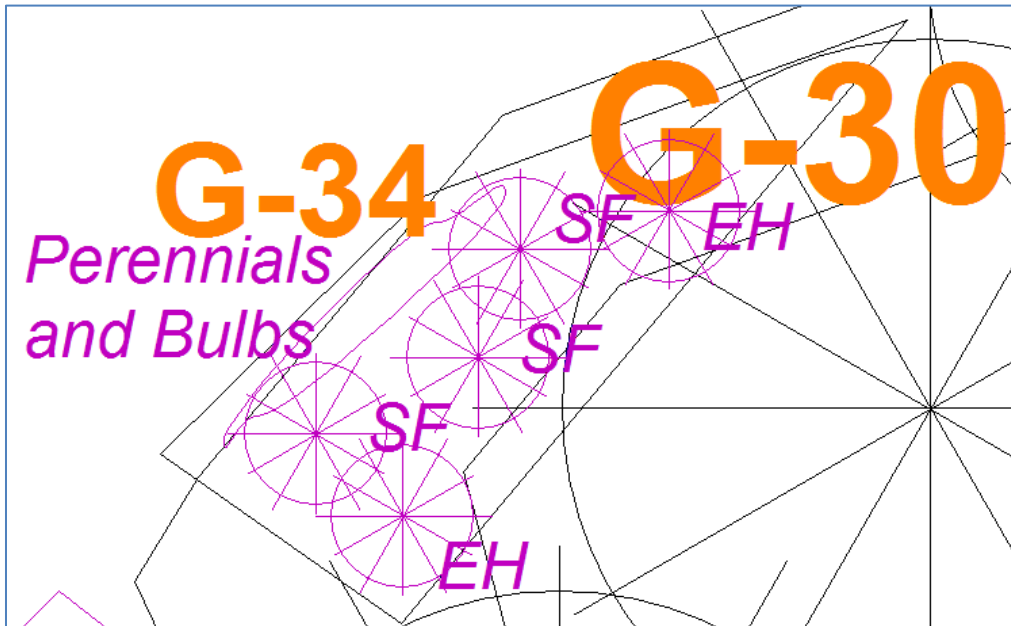
- shade
- shallow soil
- rocky
- key is to provide “showy” plants

Add the following new plants into section G-24 according to the planting design as shown in *Drawing 10* above:

- 3 Evergreen huckleberry (*Vaccinium ovatum*) [EH]

- 3 Low Oregon Grape (Mahonia nervosa) [LOG]
- 5 Sword fern (Polystichum munitum) [SF]

New planting plan for G-30



Drawing 11 - New planting design for G-30

Important considerations for G-30 are:

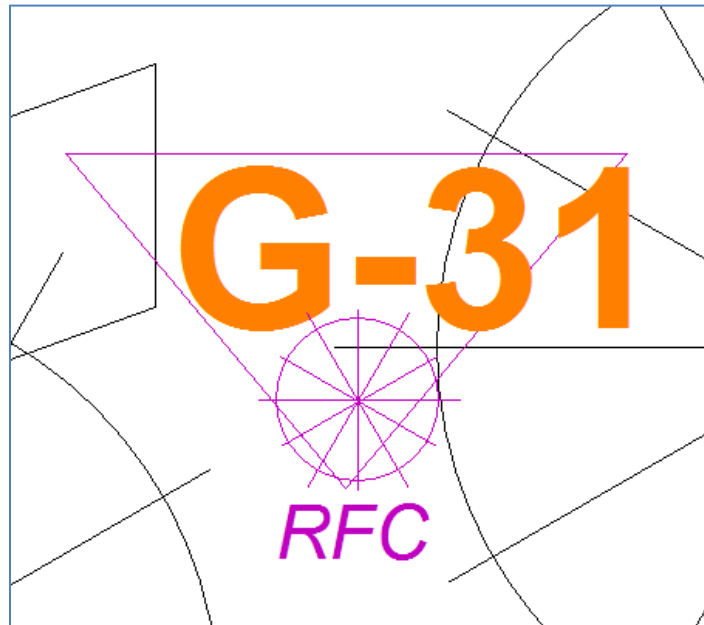
- narrow strip
- shallow soil
- rocky
- next to entrance to pathway

Add the following new plants into section G-30 according to the planting design as shown in *Drawing 11* above:

- 2 Evergreen huckleberry (*Vaccinium ovatum*) [EH]
- 1 Low Oregon Grape (*Mahonia nervosa*) [LOG]
- 3 Sword fern (*Polystichum munitum*) [SF]

Add 3 Licorice fern (*Polypodium glycyrrhiza*) at appropriate locations within G-30.

New planting plan for G-31



Drawing 12 - New planting design for G-31

Important considerations for G-31 are:

- small raised bed
- shallow soil
- rocky
- next to entrance to pathway
- partial sun

Add the following new plant into section G-31 according to the planting design as shown in *Drawing 12* above:

- 1 Red Flowering Currant (*Ribes sanguinum*) [RFC]

Add 5 Licorice fern (*Polypodium glycyrrhiza*) at appropriate locations within G-31.

Soil will be added as necessary. Exact position of plant may vary according to the local conditions.

Placing bulbs and perennials:

After the shrubs have been planted as noted above, the following perennials and bulbs will be placed as shown described below. Time permitting, these may be placed during the November planting work party, or at a later time.

Placing bulbs in section G-29

The following list contains the perennials and bulbs to be placed in area G-35 within overall section G-29 (see *Drawing 8*):

- 3 X Red columbine (*Aquilegia formosa*)
- 5 X Fringecup (*Tellima grandiflora*)
- 5 X Shooting star (*Dodecatheon hendersonii*)
- 6 X Camas (*Camissia quamish*)
- 3 X Fawn lily (*Erythronium oregonum*)
- 3 X Nodding onion (*Allium cernuum*)
- 2 X Yerba beuna (*Satureja douglasii*)
- 2 X Pearly everlasting (*Anaphalis margaritacea*)
- 5 X Stonecrop (*Sedum spathulifolium, oregonum, lanceolate*)

Placing bulbs in section G-26

The following list contains the perennials and bulbs to be placed in area G-32 within section G-26 (see *Drawing 9*):

- 3 X Red columbine (*Aquilegia formosa*)
- 3 X Fringecup (*Tellima grandiflora*)
- 2 X Yerba beuna (*Satureja douglasii*)
- 5 X Stonecrop (*Sedum spathulifolium*)
- 3 X Stonecrop (*Sedum oregonum*)
- 3 X Stonecrop (*Sedum lanceolate*)

Placing bulbs in section G-24

The following list contains the perennials and bulbs to be placed in area G-33 within section G-24 (see *Drawing 10*):

- 3 X Trillium (*Trillium ovatum*)
- 3 X Red columbine (*Aquilegia formosa*)
- 5 X Fringecup (*Tellima grandiflora*)
- 5 X Shooting star (*Dodecatheon hendersonii*)
- 6 X Camas (*Camissia quamish*)
- 3 X Fawn lily (*Erythronium oregonum*)
- 3 X Nodding onion (*Allium cernuum*)
- 2 X Yerba beuna (*Satureja douglasii*)
- 5 X Stonecrop (*Sedum spathulifolium*)

Placing bulbs in section G-30

The following list contains the perennials and bulbs to be placed in area G-34 within section G-30 (see *Drawing 11*):

- 3 X Fringecup (*Tellima grandiflora*)
- 5 X Stonecrop (*Sedum spathulifolium*)
- 3 X Stonecrop (*Sedum oregonum*)
- 3 X Stonecrop (*Sedum lanceolate*)

Placing bulbs in section G-31

The following list contains the perennials and bulbs to be placed within section G-31 (if deeper pockets are found) (see *Drawing 12*):

- 6 X Camas (*Camissia quamish*)
- 3 X Fawn lily (*Erythronium oregonum*)

Placing bulbs in all sections

The following list contains the suitable perennials and bulbs to be placed throughout the West Entrance area:

- 12 X Woodland strawberry (*Fragaria vesca*)
- 12 X Star flower (*Trientalis arctica*)
- 6 X Meadowrue (*Thalictrum occidentale*)
- 6 X Hooker's fairybells (*Disporium hookeri*)
- 6 X Wild bleeding heart (*Dicentra formosa*)
- 6 X Salal (*Gaulthier shallon*)

Maintenance: After the sections G-24, G-26, G-29, G-30 and G-31 have been planted, these sections will need to be monitored each year for return of weeds, including Yellow Archangel.

f. Clean up Side Path

Observation: The shrubs on the north part of the Side Path section (S-6, S-7) and English Ivy (G-19, G-17) are creating a mass of entangled branches that are overwhelming the native plants, are difficult to manage and are an eye-sore. Some preliminary pruning has been done to S-6, S-7, G-19 and G-17.

Upcoming November 2015 planting work party: The G-19 and G-17 English Ivy and S-6 and S-7 shrubs could be further pruned to be more manageable.

Maintenance: Each year in late summer, ensure that G-19 and G-17 English Ivy and S-6 and S-7 shrubs are pruned.

g. Add to inventory survey

Observation: A survey of the locations of the trees, shrubs, ground cover, major rocks, paths and paved areas was done. A few main characteristics such as diameters of trees were documented but not completed.

Upcoming November 2015 planting work party: The diameters of trees T-33 to T-47 are missing in the survey and should be measured, as time permits. This is done by measuring the circumference at a height of 4.5 feet (1.4 meters) and dividing by pi.

Maintenance: Each year check if any new items need to be added to the inventory, add as appropriate (see Appendix I and Appendix II).

h. Remove English Ivy along the top of the hill

Observation: Before the project began, there was a wall of invasive, non-native trees at the west end of the pathway. Part of the West Hilltop consists of English Ivy, G-12, along the top of the hill. During the project, a significant amount of the English Ivy, G-12, was removed from along the top of the hill, but not all of it.

Upcoming November 2015 planting work party: Remove all the English Ivy, G-12, from along the top of the hill.

Maintenance: Each year make sure the English Ivy does not grow back along the top of the hill.

i. Remove English Ivy from East to West around Central Field

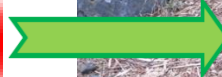
Observation: Before the project began, English Ivy covered most of the South Trees (G-7, G-9 and G-18) area, but was already scarce on the Camas Field (G-4 and G-5). The goal of the project is to remove as much of the English Ivy in G-7, G-9 and G-18 as possible, starting from East to

West, but it is recognized that it may not be possible within the 2015 project to remove it all. During the 2015 project so far, significant progress was made in removing the English Ivy in G-7 and G-9 (see pictures below at *Picture 18* and *Picture 19* for examples of the work done).

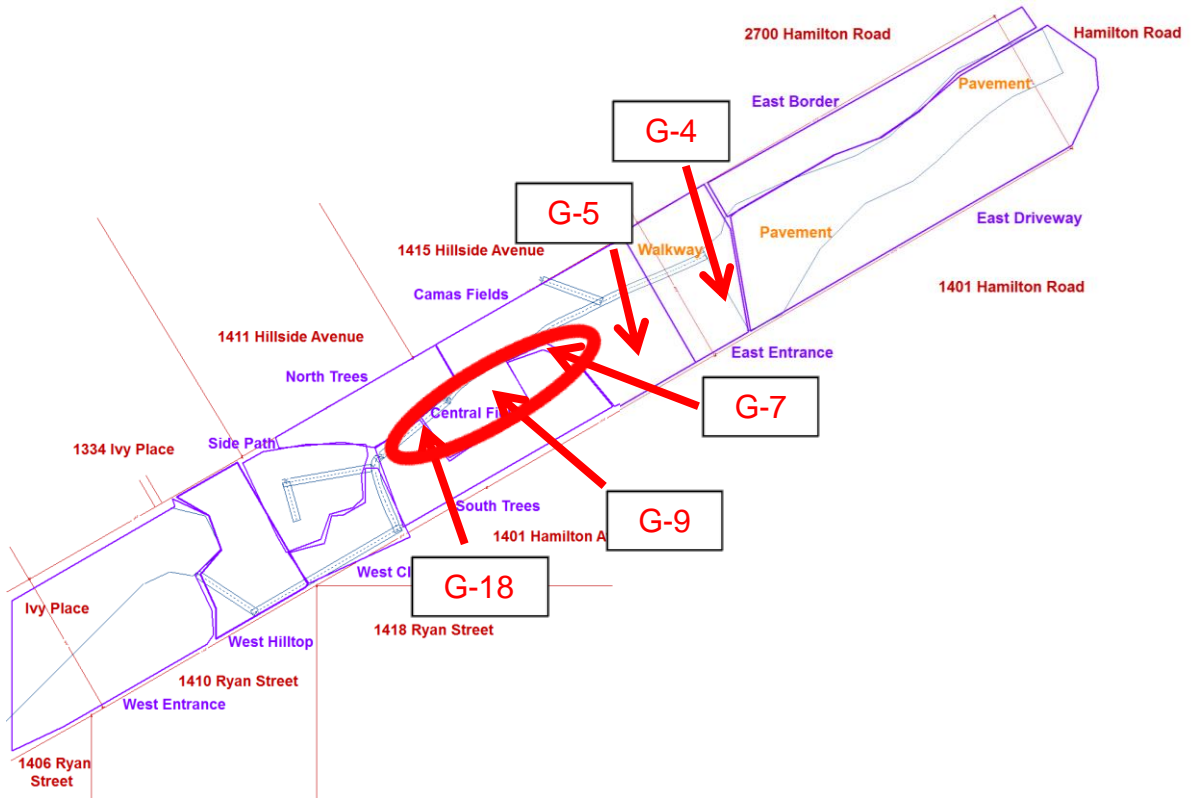
Many pockets suitable for new native plantings were exposed by the removal of the invasive plants. The location of this new area ready for planting is shown in the diagram below at *Drawing 13* below.



Picture 20 - [Before] Invasive plants overrunning West Entrance



Picture 21 – [After] West Entrance cleaned up



Drawing 13 – Location of new plantings around Central Field

Upcoming Project Preparation before November 2015 planting:

As noted earlier, before committing to investments in pathway improvements or plant material, the detailed planting plan will be discussed with City Staff and approved by them. The following plants are required for this section:

- 9 Sword Ferns (*Polystichum munitum*)
- 10 assorted native plants

Upcoming November 2015 planting work party: Continue removing English Ivy from East to West. Plant the 9 Sword Ferns (*Polystichum munitum*) and the 10 assorted native plants throughout G-7, G-9 and G-18 sections.

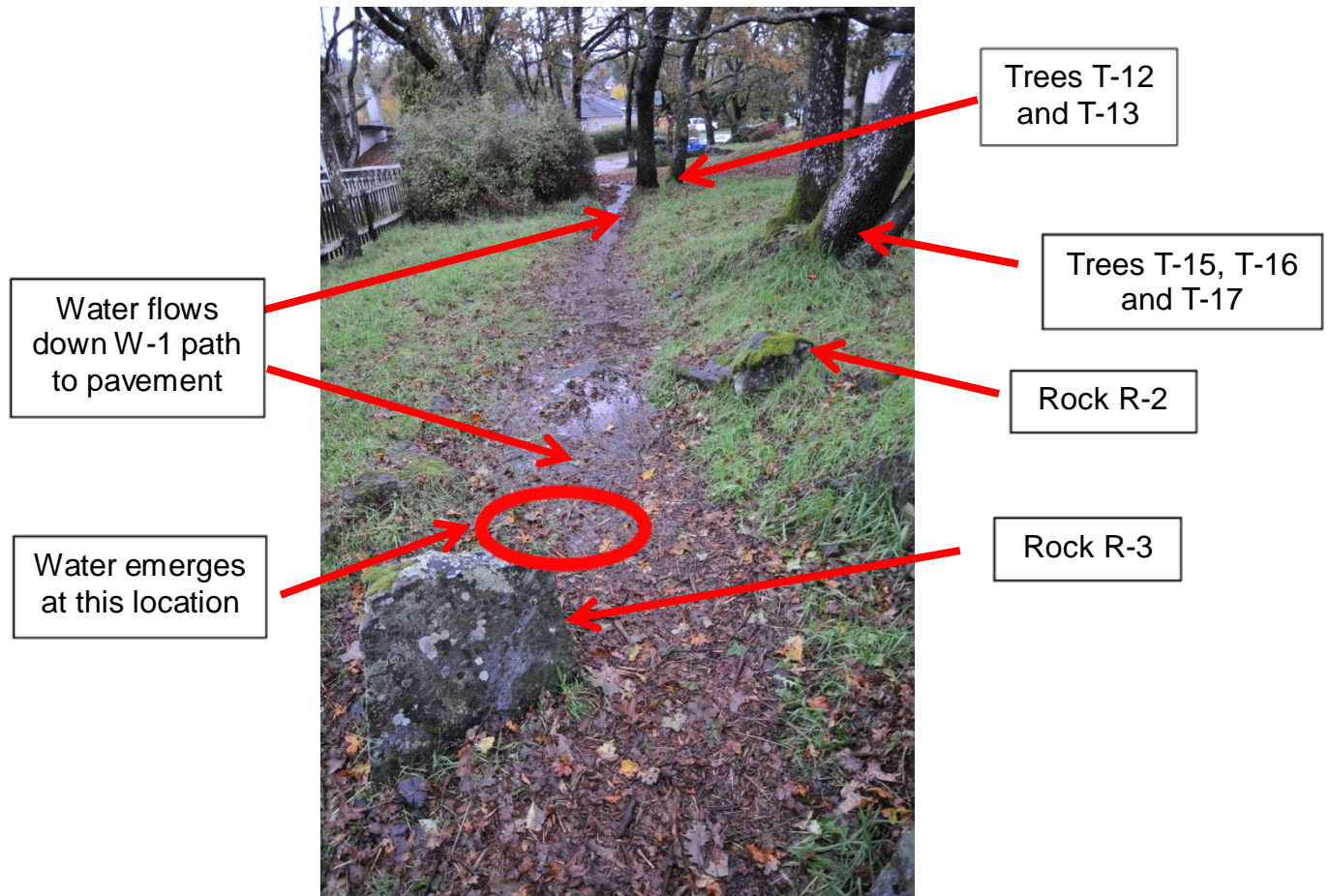
Maintenance: Each year make sure the English Ivy does not grow back in section G-7, G-9 and cleared section of G-18.

j. **Walkway drainage considerations and East Entrance**

Observation: Feedback from neighbours revealed that every year the lower path gets very wet in winter and causes pooling. The walkway W-1 around Camas Fields is particularly affected. Under these wet conditions, pedestrians then tend to walk along the edge of path, making the path wider and wider, and ultimately threatening the ecosystem of the neighbouring field through alternate paths. The water pooling occurs after significant rains have occurred. Of interest, this area feeds into Bowker Creek and is along the watershed boundary.

Over a 12 hour period starting from October 30 9pm, 2015, approximately 35 mm of rain fell (Oaklands School measuring station) providing an opportunity to view and document the drainage issues in action. Water emerged like a spring from just downstream from rock R-3 and ran down along W-1 in a significant stream, then between Snowberry S-1 and Garry Oaks T-12/T-13, and onward down the pavement to Hamilton. In certain places, such as just past rock R-3, the stream is 2 to 3 cm deep. This means that pedestrians are forced to walk on the neighbouring fields causing more damage to the ecosystem. This confirms the reports from the neighbours.

The *Picture 22* below shows the stream that was created in response to the rain. It would be representative of the conditions throughout the winter.



Picture 22 - Drainage issue near East Entrance

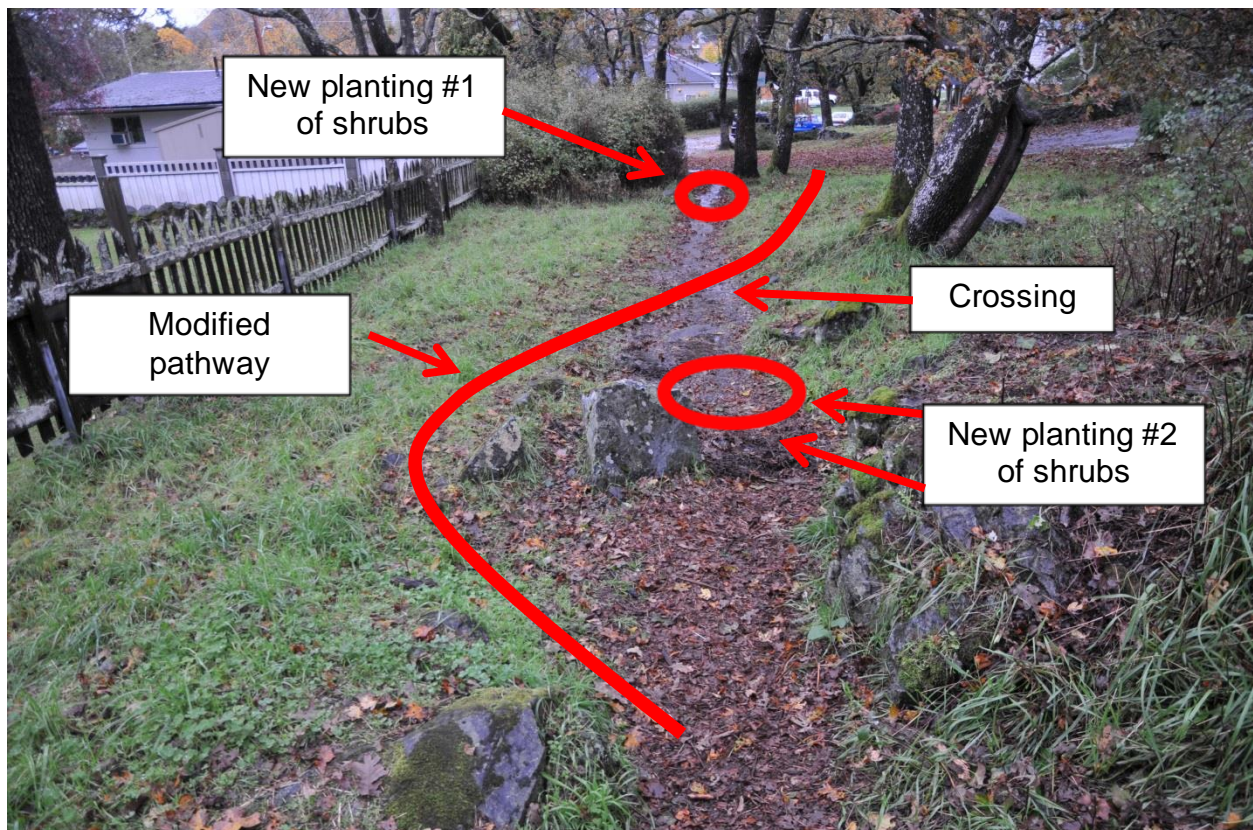
On October 31 while the stream was running, a total of nine members of the team viewed the drainage situation and offered various possible solutions:

1. Add a waterbar to divert the water off the path. Issues: The concerns are that neighbouring areas may see increased drainage issues.
2. Dig a trench along W-1, fill with drainage rock and cover with chips. Issues: The costs and construction complexity of this solution are expected to be higher and there is uncertainty of the surface below which might reveal impenetrable solid rock.
3. Modify the trail path to run to the south of the existing path (running south of T-15, T-16 and T-17). Issues: The path would need to clamor over rocks and would run through a new Camas field.
4. Modify the trail path to run along the south boundary of right-of-way. Issues: This would require major changes to the existing path.

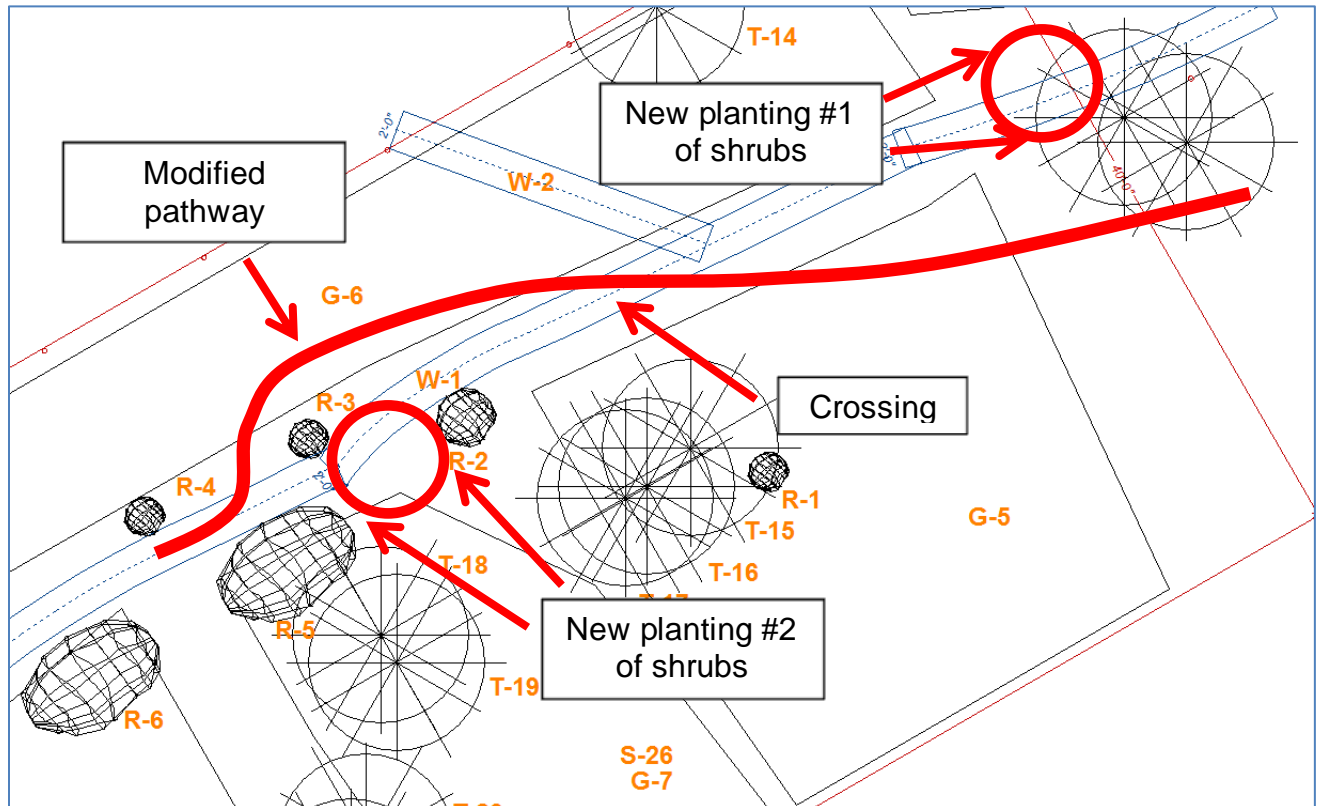
5. Modify the trail path to run just to the north of the existing path on higher ground from rock R-3 to approx. walkway W-2, provide a crossing to the south, and modify trail path south of W-1, T-12 and T-13 to higher ground (see picture below at *Picture 23* and drawing below at *Drawing 14*).

After analyzing the five possible solutions, it was agreed that the most appropriate solution to try at this time is solution #5. This solution provides the least amount of changes, ensures that there would be no change to the water stream, the cost is lower, it can be reversed, and there is minimal effect on the camas fields.

The new plantings will consist of transplanted snowberry plants and a red flowering currant for area #1. Two hardhack (*Spiraea douglasii*) and 2 Red osier dogwood (*Cornus stolonifera*) will be planted at area #2.



Picture 23 - Change path (solution #5) to deal with drainage issue



Drawing 14 – Location of modified path (solution #5) and new planting area

One level of success can be determined by observing if during the wet periods, the new pathway does not pool with water (e.g. substantially less than 2 cm deep).

It is anticipated that the plans outlined here will be reviewed by City Staff and thereafter be implemented at an appropriate time.

Another design concept had been explored by the team to widen the space between the Snowberry S-1 and Garry Oaks T-12/T-13, but with this updated drainage design, it is now recommended that the drainage be the main focus for the East Entrance for the 2015 project.

Maintenance: Each year in winter after significant rains have fallen, check that the drainage techniques used to reduce drainage on the trail are working appropriately. Re-enforce as necessary.

k. Change Name and Designation

Discussion: A significant goal of this project is to eradicate the English Ivy from the site and therefore it does not seem appropriate to call the site, “Ivy Place Greenway”. A number of suggestions were discussed and “Oaklands Greenway” seems to have strongest support. The name “Oaklands Greenway” is the appropriate since this Greenway is the most focused on the Garry Oak ecosystem in Oaklands (and namesake). In addition, it is near another natural area, the “Oaklands Green”. The name “Ivy Place Greenway” has only recently been used so does not have an established meaning.

The site is a “People Only” Greenway with a remnant ecosystem, yet exists on a Road Right-of-Way.

Actions Required: It is suggested to change or initiate changing the name of the site to “Oaklands Greenway” and to investigate the procedures to change its designation from a roadway to a “Greenway”.

l. Directional signs

Observation: The combination of obscure entranceways and lack of signage makes it hard for neighbours to find and discover the Ivy Place Greenway. One method to improving visibility of the Greenway has already been outlined by providing a plant showcase at the West Entrance and improving the East Entrance. In addition, two directional signs will be placed at strategic locations directing pedestrians to the Greenway.

Discussions were held regarding possible sign designs and location. It was suggested to use large graphics depicting a walking person. The use of the word “Greenway” on a sign requires a special process, and the “Ivy Place” name is under discussion and may take some time to finalize. Therefore, it is recommended to use generic words and that the sign should say, “Nature Walk”. It has also been recommended that the sign should also indicate that the path is steep.

Therefore, the following sign design as shown in *Figure 1* is proposed:

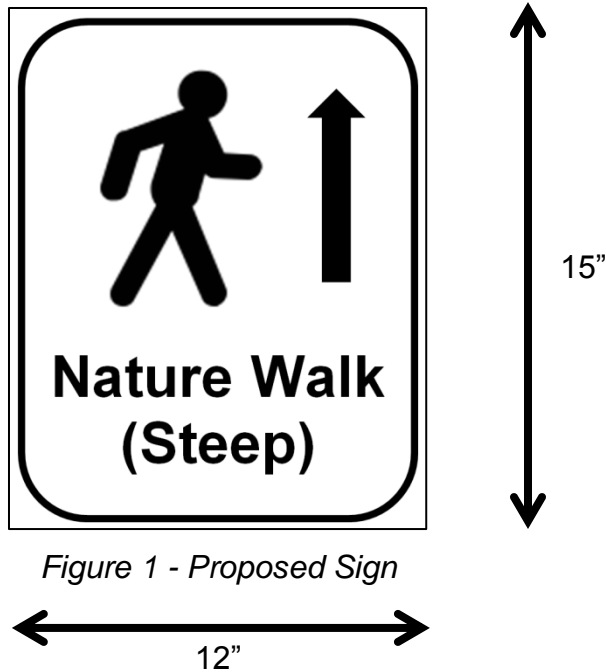


Figure 1 - Proposed Sign

The new signs are the same width (12") as the "No Parking" and "School Loading Zone" signs. The new signs are taller than the "No Parking" signs and shorter than the "School Loading Zone" signs. The new signs are to be made of the same material and mounted the same way as the other signs.

One new "Nature Walk" sign should be placed on its own pole at a height of 78" in the East Border section close to Hamilton Street as shown in red in *Picture 24* below. There was an idea of mounting the sign on the power pole, but it has been discovered that the procedure for doing so would be too time consuming.



Picture 24 - Proposed location for East sign

The second new “Nature Walk” sign for the west end should be attached to an existing sign post near the intersection of Ivy Place and Ryan Street shown as #1 in *Picture 25* below. If for some reason that location is not possible, the secondary location is shown as #2.



Picture 25 - Proposed locations for West sign

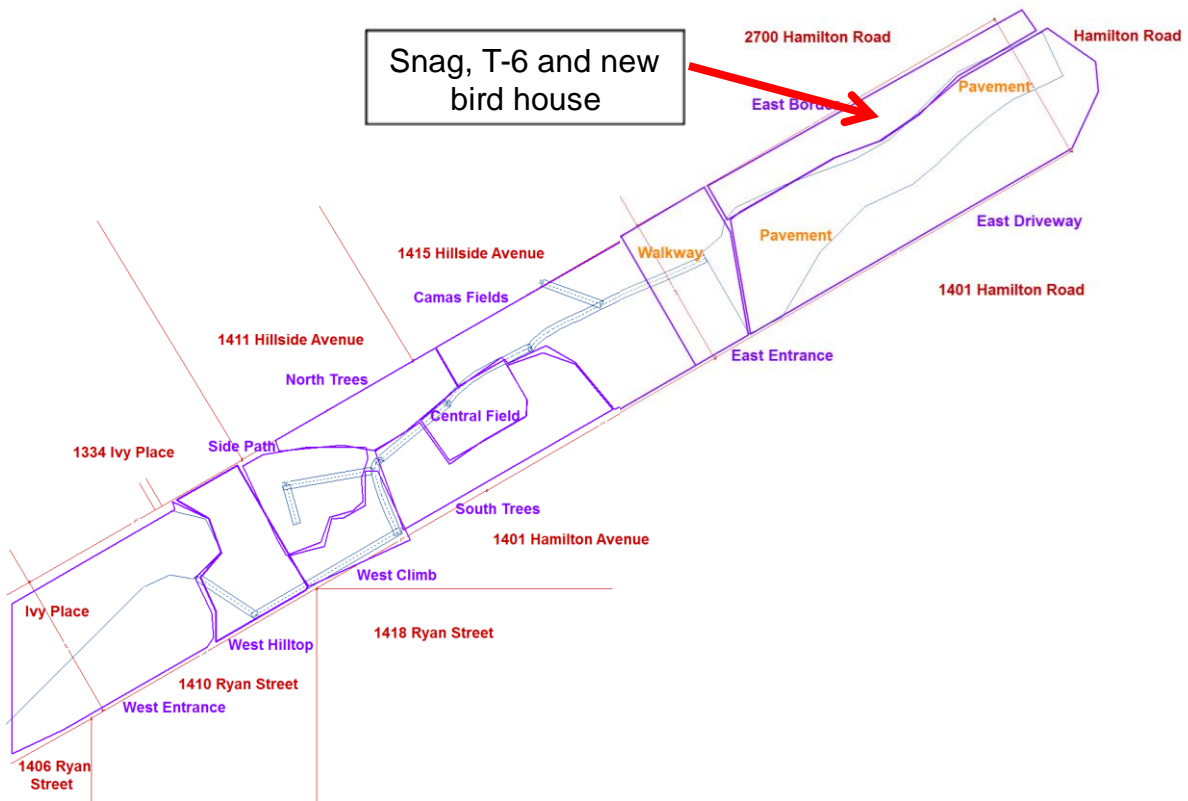
m. Expand beyond vegetation; consider fauna

Discussion: Although the focus of the 2015 project has been the Garry Oak vegetation, feedback from the team has stressed that to have a truly robust and sustainable ecosystem, it will be important to enhance and protect the habitat for the rare and/or endangered fauna associated with Garry Oak ecosystems: birds, bees, bats, invertebrates, amphibians, etc.

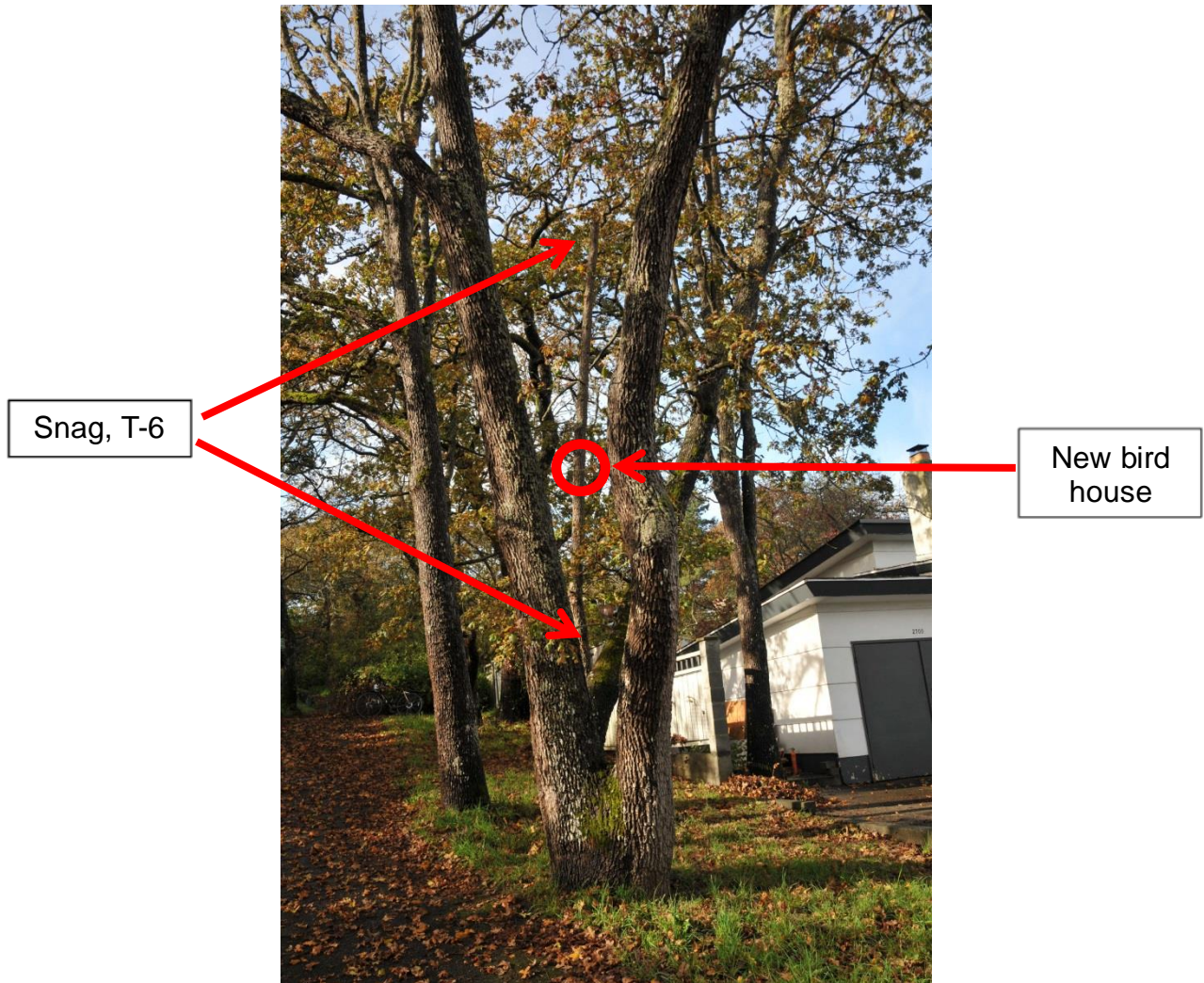
After discussions, it was decided that in this year, 2015, to place a bird house on a snag, T-6, along the East Border at a height of 12'. See location in *Drawing 15* and picture as shown in *Picture 26*. The Habitat Acquisition Trust will supply the bird house and installation as a donation.

On-site considerations for other fauna, such as decaying woody debris, wildlife/nurse logs, will be investigated and provided as appropriate.

Actions Required: The bird house will be installed as time permits.



Drawing 15 - Location of new bird house



Picture 26 - Location of bird house

n. **Initial development of general Greenway and Ivy Place Greenway guidelines**

Discussion: It is suggested that guidelines be developed for Greenways in general and for the Ivy Place Greenway itself.

2. Long term Improvement Plan *(This section describes work anticipated in years beyond the current year's work plan)*

- a. **Maintenance:** A full itemized maintenance plan for use in the long term has been developed to support the Greenway. See *Section 3, Maintenance and Replacement Program*.

- b. **Invasive Plant Removal:** The removal of the following invasive plants is of top priority, but there may be some consequences of removal or particular cautions should be taken. The following will be considered for work in 2016 and subsequent years.
 - i. There are limited Garry Oaks in the West section of the Greenway, so a focus should be on preserving the few that do exist in that area. There is a key Garry Oak (T-34) in the Side Path area. There are quite a few invasives that are invading the area and an analysis should be done to determine which invasives should be removed. Here is a list of invasives to consider:
 - Bamboo (S-11)
 - Viburnum (S-8)
 - English Ivy (G-15)

If any of these are removed, considerations should be made for planting native shrub understory in its place.

 - ii. There is a wall of invasive, non-native trees at the west end of the pathway. Part of the West Hilltop consists of the only Cherry-Laurels (S-14, S-17) found in the area. In order to present a more natural and native ambiance to the Greenway, and to improve the ecosystem for the native species, it is suggested that these trees be considered for removal and replaced with native trees.

 - iii. To the north of the West Climb, there are numerous invasive shrubs and trees (for example, S-12, G-14, S-10, S-9, S-21). These invasive plants ensure that the walkway W-3 and W-4 acts as a dead-end. The invasive plants should be removed in the future, but aligned with their removal new trees and shrubs should be ready to be planted to ensure that the walkway W-3 and W-4 remain as a dead-end.

 - iv. The steep hillside between the West Hilltop and Side Path is covered with invasive plants (G-11) with significant English Ivy. These invasive plants should be removed but considerations

should be given to planting new plants in its place to ensure erosion does not occur.

- c. **Central Field Enhancement:** The Central Field is a grass field without shrubs and, we believe, without substantial camas or other underlying flowers. It is surrounded by shrubs yet is still in a fairly open space creating a unique opportunity for a centrally located bench, sign, or other point of interest. During the spring of 2016, close observation should be made to confirm exactly what resides in the field – are there native flowers? Are there invasive flowers? Based upon the result of that study, a final design could be confirmed.

- d. **East Entrance Enhancements:** There are a number of predominate issues relating to the East Entrance of the Greenway including parking on paved roadway (P-1), presentation as a public Greenway, privacy for 1401 Hamilton Road, and overwhelming use of pavement. For 2015, there will be some work to improve the entrance primarily dealing with drainage and directional signage. In the long term, it is expected there will be a more wholesome approach to redesign of the area by including evaluating the most appropriate use of the pavement, improved signage (potentially educational), further-enhanced showcase gardens, split rail fence and dedicated pedestrian access.

- e. **Drainage:** The path gets very wet in winter, particularly walkway W-1 around Rocks R-3 to R-6. This area feeds into Bowker Creek and is along the watershed boundary. While some initial work is expected to be done in the 2015 plan, the progress will need to be re-evaluated for performance in 2016 in the midst of the wet season – January to March. Additional drainage techniques may be attempted during 2016 and subsequent years based upon the success of those initial approaches.

If drainage techniques are not resulting in satisfactory results, other possible approaches include investigating alternate routes. These alternate routes may be used all the time, or only during wet conditions.

Once there has been success in dealing with the drainage issues, then appropriate public communications, including potentially signage, could be developed together with the Bowker Creek Initiative to help educate about the importance of watershed and drainage considerations.

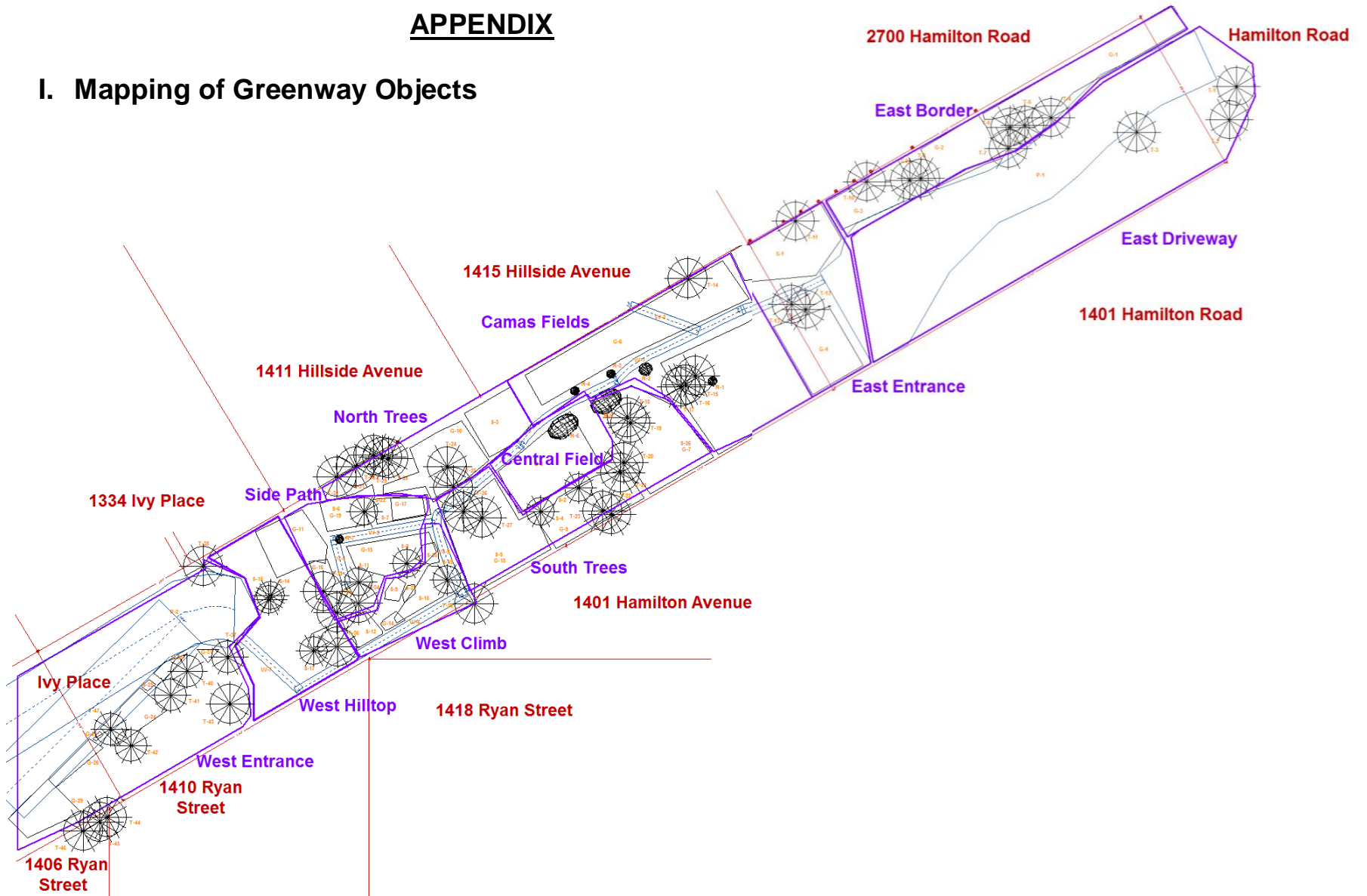
- f. **Watering:** Although the native plants once established require little water, they do require water for the first couple of years after planting. Water will be supplied from a water connection with participating neighbours. It is anticipated that in future years, a fully connected water tap may be added to the project either at the West or East entrances.

 - g. **Expand beyond vegetation:** Although the focus of the 2015 project has been the Garry Oak vegetation, feedback from the team has stressed to have a truly robust and sustainable ecosystem, it will be important to consider the animals: birds, bees and mammals etc. In 2015 some initial steps are planned to be done, and in the future further work will be done to enhance even more opportunities for the fauna. Also, if possible, measures will be done to reduce the non-resident animals.

 - h. **Continued development of Greenway guidelines:** The development of guidelines for Greenways in general and for the Ivy Place Greenway itself was introduced in the 2015 project. In subsequent years, it is expected that such guidelines will continue to be developed.
3. **To Do** *(This section provides a list of the documentation that still needs to be refined or to be developed)*

APPENDIX

I. Mapping of Greenway Objects



II. Inventory of Greenway Flora

G-1		S-1	Snowberry	T-1	Garry Oak
G-2		S-2	Ocean Spray	T-2	Garry Oak
G-3		S-3		T-3	Garry Oak
G-4		S-4	Ocean Spray	T-4	Garry Oak
G-5	Camas	S-5	Snowberry	T-5	Garry Oak
G-6	Camas	S-6	Other	T-6	Garry Oak
G-7	Other	S-7	Snowberry	T-7	Garry Oak
	English Ivy	S-8	Virburnum	T-8	Garry Oak
G-8		S-9	Snowberry	T-9	Garry Oak
G-9	English Ivy	S-10	St John's Wort	T-10	Garry Oak
G-10		S-11	Bamboo	T-11	Garry Oak
G-11	Various	S-12		T-12	Garry Oak
G-12	English Ivy	S-13	English Holly	T-13	Garry Oak
G-13	English Ivy	S-14	Cherry-laurel	T-14	Garry Oak
G-14	English Ivy	S-15	Mock Orange	T-15	Garry Oak
G-15	English Ivy	S-16	Himalayan Blackberry	T-16	Garry Oak
G-16	English Ivy	S-17	Cherry-laurel	T-17	Garry Oak
G-17	English Ivy	S-18	Golden chain tree	T-18	Garry Oak
G-18	English Ivy	S-19	Golden chain tree	T-19	Garry Oak
G-19	English Ivy	S-20	Snowberry	T-20	Garry Oak
G-20	Honesty	S-21	Sedum	T-21	Garry Oak
G-21	English Ivy	S-22	Scotch broom	T-22	Garry Oak
G-22	Thistles	S-23	Cotoneaster	T-23	Garry Oak
G-23	English Ivy	S-24	Spurge Daphne	T-24	Garry Oak
G-24	Other	S-25	Snowberry	T-25	Golden chain tree
G-25	Fall Crocus	S-26	Snowberry and others	T-26	Other
G-26	Other			T-27	Garry Oak
G-27	English Ivy			T-28	Garry Oak
G-28	English Ivy			T-29	Other
G-29	Other			T-30	Other
G-30	Other			T-31	Garry Oak
G-31	Other			T-32	Garry Oak
G-32	New perennials			T-33	Garry Oak
G-33	New perennials			T-34	Garry Oak
G-34	New perennials			T-35	Maple
G-35	New perennials			T-36	Douglas Fir
				T-37	Fir
				T-38	Garry Oak
				T-39	Other
				T-40	Cedar
				T-41	Cedar
				T-42	Fir
				T-43	Garry Oak
				T-44	Fir
				T-45	Fir
				T-46	Holly
				T-47	Fir

III. Best months to kill invasive plants

Source: Garry Oak Ecosystems Recovery Team (GOERT);
http://www.goert.ca/documents/best_time_to_remove_invasive_species.pdf

Best months to kill invasive plants in Victoria

	Birdweed	Bluebells	Broom	Buttercup	Canadian Thistle	Chestnut	Chickweed	Common Velvet Grass	Cork-bark Elm	Cotoneaster	Daffodils	Dandelion	Daphne Laurel	English Hawthorn	English Ivy	Field Mustard	Field Onion	Hairy Cat's Ear	Himalayan Blackberry	Other exotic bulbs	Holly	Or-eye Daisy	Poison Hemlock	Purple Deadnettle	Purple Oysterweed	Sorrel *	Vinca - Periwinkle	
Jan																												
Feb																												
Mar																												
Apr																												
May																												
Jun																												
Jul																												
Aug																												
Sep																												
Oct																												
Nov																												
Dec																												

ideal good ok don't bother

Plants are at their weakest when flowering and seeding, and when they are stressed (e.g., at the end of summer)

* Sorrel: best to cut off at the base in the summer, once the moss has dried

IV. Methods to remove Scotch Broom (*Cytisus scoparius*)

Source: Garry Oak Ecosystems Recovery Team (GOERT); Scotch Broom
http://www.goert.ca/documents/Best_Practices_for_Broom_revised.pdf (1 of 3)



Garry Oak
Ecosystems
Recovery Team

Canada



Best Practices for Invasive Species Management in Garry Oak and Associated Ecosystems: **Scotch Broom (*Cytisus scoparius*)**

Assess the site characteristics and your available resources to help you decide where to take management action, what action to take, and when. These decisions should be made within the context of the overall restoration objectives (and restoration plan, if one exists).

a) Deciding where to take action

Factor 1: Broom density

Survey the areas in the GOE where broom occurs. Outline and label these areas "zone 1", "zone 2" or "zone 3" on your sketch map. Use the following descriptions:

Zone 1 isolated plants, small isolated patches, and low-density edges around larger, denser broom areas

Zone 2 medium-density areas

Zone 3 high-density areas

(Use the density diagrams from Question 2 for guidance.)

Where to focus your effort? Follow the **Priority Principle: contain the invasive species first, then reduce its amount!** The highest priority is to prevent further spread of broom. Only take action to reduce the "footprint" of the broom invasion after it is contained. Therefore Zone 1 areas should be your first priority, and you should only move into Zones 2 areas when broom has been successfully removed from Zone 1. Leave Zone 3 areas for last! Zone 3 will often require the greatest amount of resources and effort. (Sometimes concerns about species at risk should override this zone prioritization. For example if a population of a species at risk is directly and imminently threatened by broom this should be a top priority. Such decisions should be made in consultation with species at risk experts.)

Factor 2: Ecological quality

To help you prioritize areas *within* Zones, consider GOE quality, presence of species of concern, and broom vulnerability. First priority areas should be those of highest ecosystem value, especially where species at risk are threatened by a broom invasion. Within such areas, start where the conditions for broom are marginal and their tolerance is lowest - this is where they will be most vulnerable and most likely to be affected by your control actions. Focus first in dry areas, then areas with deeper soils, and then in Douglas-fir areas.

Factor 3: Accessibility

Broom management will require repeated efforts, as regeneration from re-sprouting and from seeds already in the soil (the "seed bank") is inevitable. Focus action first in areas that can practically be accessed for repeat treatments.

b) Deciding what action to take, and when

Circumstances	Method	When	Caveats
<i>In Low or Medium Density Broom Areas:</i>			
<ul style="list-style-type: none"> Broom stem is smaller than pencil size, AND No rare plants are in immediate vicinity 	Pulling	Late fall (after rains start) to end of January	<ul style="list-style-type: none"> The plant should pop out readily without taking any soil; otherwise choose another method Do not use a regular weed wrench to pull the plant out. You may use a "mini" weed wrench but if that will not work, the plant is too big for this method; consider <i>cutting with loppers</i>
<ul style="list-style-type: none"> Broom stem is bigger than pencil size, OR Rare plants are in the immediate vicinity 	Cutting with loppers	After broom plants flower but before the seed pods ripen	<ul style="list-style-type: none"> If you find it a struggle to cut through the stem, the plant is too big for this method; consider using a hand saw Cut at or slightly below the ground level Be careful; wildflower species may be in bloom at this time and vulnerable to trampling
<i>In High Density Broom Areas:</i>			
<ul style="list-style-type: none"> Broom plants are young No rare annuals present Ground is dry 	Mowing	Dry season, when other plants are not blooming	<ul style="list-style-type: none"> Can only be done where mower access is feasible and where the terrain permits (not too steep or rocky)
<ul style="list-style-type: none"> Any age/size of broom plant 	Brush saw	While seed pods are forming or area still small and green	<ul style="list-style-type: none"> Ensure safety training for saw operators Do not use in rocky terrain (sparks can cause a fire)
<ul style="list-style-type: none"> Dense stands of seedlings (may happen after initial control treatments) 	Weed eater	Fall	<ul style="list-style-type: none"> Only after native forbs and grasses have died back, and after whatever natural mortality may occur to seedlings over the summer
<ul style="list-style-type: none"> Area is very disturbed Patch is very dense (>1000 seedlings/m²) Other methods have been ineffective 	Herbicide	Depends on herbicide; consult expert	<ul style="list-style-type: none"> Only with extreme caution, and by (or advised by) experts May be restricted (legally) in some jurisdictions
<ul style="list-style-type: none"> Explosion of seedlings Low fuel-load on site Small confined area 	Selective flaming	Any time except dry season	<ul style="list-style-type: none"> Only with extreme caution, and by (or advised by) experts Small danger of fire spread May require permission in some jurisdictions
<ul style="list-style-type: none"> No fuel-load on site 	Fire	Before seeds set	<ul style="list-style-type: none"> Only with extreme caution, and by (or advised by) experts Most effective, and risky, in dry season Will trigger germination of seeds in seed bank; therefore requires follow up treatment appropriate for new seedlings May be restricted in some jurisdictions May trigger germination of other weeds May harm some species at risk; get expert advice

In deciding which method(s) to choose, also consider:

- Your budget to acquire the necessary tools and equipment for the methods chosen (e.g. "mini" weed wrenches, loppers, hand saws, brush saws, mower, or weed eater),
- Your budget to acquire the necessary protective clothing and equipment (e.g. gloves, safety goggles),
- The need to comply with Workers Compensation Board regulations, and
- The number and skill level of the people that will be assisting you.

Consider following up on any of these control methods with a planting or seeding treatment in order to speed up re-establishment of native species. The need for this will depend on what bulbs and seeds already exist in the soil, light conditions, and how well they germinate and sprout when the broom is removed. You may wish to first monitor the site after the control methods have been implemented, and then plant or seed later if the desired native plants do not appear or are sparse. If you are going to plant native species, consult with someone knowledgeable about this first, ensure that your plant and seed stock originate from sources that follow ethical guidelines, and take genetic issues into consideration.

c) Deciding how to dispose of dead plant material

If you choose any mechanical removal method, you must think about what to do with the plant material that you have cut or pulled. It is not acceptable to leave large piles of broom on site, as it may be a fire hazard, or may smother native plants underneath. There is also concern that broom contains phytotoxins (poisonous plant chemicals) that may leach into the soil and contaminate it. Consider the following options, based on the amount of dead broom you expect to remove from the areas you plan to target:

Material	Removal from site	Disposal
Large amount of dead broom, OR any volume of dead broom with seeds present, AND burning not feasible or permitted on site	Remove from site on tarps or makeshift "stretchers", being very careful to not spread seeds to other sites en route to nearest access road	<ul style="list-style-type: none"> • Cover and transport to a location where it can be safely burned • Composting is risky, as the seeds may not be destroyed by the composting process
Large amount of dead broom, OR any volume of dead broom with seeds present, AND burning feasible and permitted on site	Move to bonfire or burning barrels on tarps or makeshift "stretchers", being very careful to not spread seeds to other sites en route	<ul style="list-style-type: none"> • Burn safely; transport ash offsite when cool • Consult BC government's <i>Open Burning Smoke Control Regulation</i>. www.toffan.com/clear/OBSCR.pdf
Small amount of dead broom without seeds	Not necessary	<ul style="list-style-type: none"> • Leave on site, scattered or mulched, or deposit in densely shaded area under conifers where there is no ground vegetation

d) Recognizing uncertainty

In making these decisions, there will be things you are unsure about. This is normal, and should not cause undue concern. The important thing is to be *aware* of the things you are most uncertain about, document them, and plan your actions in a manner that will help you learn and reduce this uncertainty.

Acknowledgements: developed with the assistance of Louise Blight, Ron Carter, Adolf Ceska, Patrick Dunn, Tim Ennis, Marilyn Fuchs, Richard Hebda, Laura Hooper, Andrew MacDougall, Willie MacGillivray, Carrina Maslovat, Edo Nyland, Eileen Palmer, Briony Penn, Raj Prasad, Hans Roemer, Andrea Schiller, and Joel Ussery.

V. Methods to remove Himalayan Blackberry (*Rubus armeniacus/dicolor/procerus*)

Source: Garry Oak Ecosystems Recovery Team (GOERT); Blackberry
[http://www.goert.ca/documents/Best Practices for Blackberry revised.pdf](http://www.goert.ca/documents/Best_Practices_for_Blackberry_revised.pdf) (1 of 3)



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Best Practices for Invasive Species Management in Garry Oak and Associated Ecosystems:

Evergreen Blackberry (*Rubus laciniatus*) and Himalayan Blackberry (*Rubus armeniacus/dicolor/procerus*)

Assess the site characteristics and your available resources to help you decide where to take management action, what action to take, and when. These decisions should be made within the context of the overall restoration objectives (and restoration plan, if one exists).

Before proceeding, be aware that it is very important to not confuse Evergreen blackberry (*R. laciniatus*) with the native *Rubus ursinus*. Evergreen blackberry is often found in association with Himalayan blackberry. If Evergreen blackberry is found alone and you are uncertain you have identified it correctly, leave it alone. Also leave it alone if it is in trailing form (rather than upright); you may damage understory vegetation by trying to remove it.

a) Deciding where to take action

Factor 1: Blackberry density

Survey the areas in the GOE where blackberry occurs. Sketch-out and label these areas "zone 1", "zone 2" or "zone 3" on your sketch map. Use the following descriptions:

- Zone 1 satellite patches (from a few canes, to a 5 foot by 5 foot patch)
- Zone 2 edges around larger patches
- Zone 3 larger patches (larger than 5' by 5')

Where to focus your effort? Follow the **Priority Principle: contain the invasive species first, then reduce its amount!** The highest priority is to prevent further spread of blackberry. Only take action to reduce the "footprint" of the blackberry invasion after it is contained. Therefore Zones 1 and 2 should be your first priority, and you should only move into Zones 3 areas when blackberry has been successfully removed from Zones 1 and 2. (Sometimes concerns about species at risk should override this. For example if a population of a species at risk is directly and imminently threatened by blackberry this should be a top priority. Such decisions should be made in consultation with species at risk experts.)

Factor 2: Ecological quality

To help you prioritize areas *within* Zones, consider GOE quality, presence of species of concern, and blackberry vulnerability. First priority areas should be those of highest ecosystem quality, where species at risk are threatened by a blackberry invasion. Within such areas, start in the more open, vigorous fruity blackberry patches, which are likely to be in dry areas where the plants are stressed and often not the most robust.

Factor 3: Accessibility

Blackberry management will require repeated efforts. Focus first in areas that can be accessed more easily for repeat treatments before moving into hard-to-access spots. On some areas where further spread is unlikely, you may actually wish to leave blackberry as an access barrier, if that fits the overall management objectives for the GOE.

b) Deciding what action to take, and when

Circumstances	Method	When	Caveats
Any size of patch	Manual control: loppers (can also be used as tongs to pull the cut cane out), hand clippers, brush saw	August - October before roots form from draping shoots	<ul style="list-style-type: none"> If patch is used as a nesting site for native passerine birds, remove the patch gradually and avoid nesting season Also remove the root crowns or burls, as they can remain viable for a long time (use pick axe, mattock or Pulaski)
Large, thick, patch of just blackberry, with no native species	Back hoe to remove biomass, and scrape down to the soil surface	When risk of damage to GOE (e.g. soil compaction, physical site damage) from machine access is lowest	<ul style="list-style-type: none"> Should only be used on extreme invasions where manual control seems hopeless Be sure hoe will not destroy sensitive areas on its way to the blackberry patch it is targeting
Areas too expansive for manual control AND not concerned about species at risk	Mowing	In the winter, when most native plant species are dormant	<ul style="list-style-type: none"> Is more of a maintenance regime for control rather than eradication, though mowing may sometimes also encourage native species growth Will only work on relatively flat areas where mowers can be operated
Draping tips starting to root	Hand extraction: paring knife	As soon as tips form roots (late October - November)	<ul style="list-style-type: none"> This is a mitigation, not a recommended control method; try to get to the canes before the drooping tips form roots Don't just pull! You'll leave the roots, and have lots of new shoots to deal with later
New growth from root fragments or root crown	Manual control: loppers, hand clippers	2-3 times per year, for 2-3 years following initial control	<ul style="list-style-type: none"> May take 5 years to fully eradicate it
New growth from root fragments or root crown	Herbicide	As soon as new growth appears	<ul style="list-style-type: none"> Only with extreme caution, and by (or advised by) experts May be restricted (legally) in some jurisdictions Only use herbicides such as Glyphosate that do not remain active in the soil 2 treatments will likely be necessary for root fragments on the soil surface 3 treatments will likely be necessary for root crowns or root fragments underground

If unsure which end of a vine is the tip (can be tricky if the tip has drooped and rooted), look at the barbs - they point back to the original root end.

In deciding which method(s) to choose, also consider:

- Your budget to acquire the necessary tools and equipment for the methods chosen (e.g. pick axes, pitch forks, loppers, hand clippers, brush cutters, back hoe and operator),

- Your budget to acquire the necessary protective clothing and equipment (e.g. gloves, hats, thick- and hard-soled boots),
- The need to comply with Workers Compensation Board regulations, and
- The number and skill level of the people that will be assisting you.

Consider following up on any of these control methods with a planting or seeding treatment in order to speed up re-establishment of native species. The need for this will depend on what bulbs and seeds already exist in the soil, vegetation immediately adjacent to the area, light conditions, and how well seeds or bulbs germinate and sprout when the blackberry is removed. You may wish to first monitor the site after the control methods have been implemented, and then plant or seed later if the desired native plants do not appear or are sparse. If you are going to plant native species, consult with someone knowledgeable about this first, ensure that your plant and seed stock originate from sources that follow ethical guidelines, and take genetic issues into consideration.

c) Deciding how to dispose of dead plant material

If you choose any mechanical removal method, you must think about what to do with the plant material that you have cut or pulled. Consider the following options, based on the amount of dead blackberry you expect to remove from the areas you plan to target:

Material	Removal from site	Disposal
Large amount of dead blackberry	Necessary only if being chipped or burned off site; cut canes to manageable length and move on tarps or makeshift "stretchers" Pitch forks can be useful for moving quantities of blackberry on site	<ul style="list-style-type: none"> • Pile on site in area where smothering native vegetation underneath is not a concern OR chip and mulch on site OR burn safely, either at the time of removal or the following spring (Consult BC government's <i>Open Burning Smoke Control Regulation</i>) • Do <i>not</i> pile on blackberry root crowns; you will want access to these for re-treatment • If piling on site, revisit the piles and re-flatten as they break down; do not flatten right away as cut material may root if pressed into soil
Small amount of dead blackberry shoots	Not necessary	<ul style="list-style-type: none"> • Leave on site in small piles; can be used to block "bandit trails"
Blackberry root crowns	Necessary only if being burned off site; no special techniques required	<ul style="list-style-type: none"> • Leave them on a rock or paved surface to dry out OR burn safely (Consult BC government's <i>Open Burning Smoke Control/Regulation</i>)

d) Recognizing uncertainty

In making these decisions, there will be things you are unsure about. This is normal, and should not cause undue concern. The important thing is to be *aware* of the things you are most uncertain about, document them, and plan your actions in a manner that will help you learn and reduce this uncertainty.

Acknowledgements: developed with the assistance of Louise Blight, Ron Carter, Adolf Ceska, Patrick Dunn, Tim Ennis, Marilyn Fuchs, Richard Hebda, Laura Hooper, Andrew MacDougall, Willie MacGillivray, Carrina Maslovat, Edo Nyland, Eileen Palmer, Briony Penn, Raj Prasad, Hans Roemer, Andrea Schiller, and Joel Ussery.

VI. Methods to remove Daphne (Daphne laureola)

Source: Garry Oak Ecosystems Recovery Team (GOERT); Daphne
http://www.goert.ca/documents/Best_Practices_for_Daphne_revised.pdf (1 of 2)



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Best Practices for Invasive Species Management in Garry Oak and Associated Ecosystems: Daphne (*Daphne laureola*)

Assess the site characteristics and your available resources to help you decide where to take management action, what actions to take. These decisions should be made within the context of the overall restoration objectives for the site (and according to the overall restoration plan for the area or site, if one exists).

a) Deciding where to take action

The highest priority in deciding where to take action should be placed on preventing further spread of this invasive plant. If individual plants are appearing in a new area, focus on early removal of those before they seed and spread. If an invasion has already occurred, start on the periphery and move towards the centre, to first contain the invasion and then reduce its footprint.

b) Deciding what action to take, and when

Circumstances	Method	When	Notes or Caveats
Large patches of seedlings	Cutting with a weed-eater	In the summer*, at least 3 years after removing mature plants	<ul style="list-style-type: none"> CAUTION: This method releases vapours that can cause respiratory and skin irritation. Wear protective gear, including gloves, goggles and an adequate breathing mask. Ensure others without protective gear are not in the vicinity. This is less labour-intensive than hoeing or pulling, and causes less soil disturbance than these other methods Damage can occur to native plants, and the duff layer may be swept away, exposing the bare soil Seed or plant afterwards with native species
Medium-sized to smaller-sized patches of seedlings	Cutting the stem with a hand tool (grass whip, weed whip, or hedge shears)	In the summer*, at least 3 years after removing mature plants	<ul style="list-style-type: none"> Wear protective clothing and avoid direct skin contact with the plant This produces less of the toxic vapour than a weed-eater and has less impact on the duff layer, but this is more also labour-intensive Seed or plant afterwards with native species Cut below the lowest point where leaves occur Hedge shears can get at places where the swinging blade of a grass or weed whip cannot (i.e. under dense shrub)
Individual seedlings or shrubs (pre-invasion) to small patches of seedlings or scattered young shrubs	Pulling	When the soil is moist, before the plants go to seed	<ul style="list-style-type: none"> Wear protective clothing and avoid direct skin contact with the plant Try to cause minimal soil disturbance (plants under 30 cm are generally easy to pull and doing so results in little soil disturbance) and avoid breaking the stem off above ground Probably too labour-intensive to be used on large patches of plants unless a large labour pool is available Seed or plant afterwards with native species

Circumstances	Method	When	Notes or Caveats
Mature plants and young shrubs, in any size of invasion (small to large)	Cutting the stem below the soil line	In the summer*	<ul style="list-style-type: none"> Protective clothing should be worn, and avoid direct skin contact with the plant Cut the bottom of the stem where there is an obvious colour change between stem and root. The easiest method: push or kick bypass loppers (these have the sharpest points; others are too blunt) into the ground at the base of the plant and close them to cut the stem below ground. Then inspect the cut stem for the colour change if you are unsure that the cut was low enough (the usual result is a diagonal cut that bisects the area of colour change, made quickly and with minimal soil disturbance). Seed or plant afterwards with native species If the invasion is large, expect dense germination from the seed bank after treatment and refrain from planting native species until after the initial pulse of Daphne germination (which usually occurs within the first two to three years). Treat the initial pulse as described above for seedlings.

* These methods are known to work in the summer. While they may also work at other times, there are currently no data for their success in other seasons.

In deciding which method(s) to choose, also consider:

- Your budget to acquire the necessary tools and equipment for the methods chosen,
- Worker health and safety and the need to comply with WorkSafe BC regulations,
- The health and safety of others nearby (other workers, bystanders, neighbours),
- The number and skill level of the people that will be assisting you, and
- The long term commitment required for successful weed management.

Control methods should be followed by a planting or seeding treatment in order to speed up re-establishment of native species. Consult with someone knowledgeable about this first; ensure that your plant and seed stock originate from sources that follow ethical guidelines; and take genetic issues into consideration. It is advisable to monitor the treated area afterwards to ensure that whatever native species have been seeded or planted have established successfully.

c) Deciding how to dispose of dead plant material

Dead plant material from this species should be removed from the site for safe disposal, and should be transported off-site wrapped in tarps to prevent the seeds from being distributed en route. Never transport Daphne cuttings or plants inside an enclosed vehicle because noxious compounds in the bark, leaves and fruit can cause respiratory irritation. For the same reason, Daphne should never be burned. It may be composted, but be aware that the compost will likely have viable seeds and should be treated appropriately to avoid dispersal to new areas.

d) Recognizing uncertainty

In making these decisions, there will be things you are unsure about. This is normal, and should not cause undue concern. The important thing is to be *aware* of the things you are most uncertain about, document them, and plan your actions in a manner that will help you learn and reduce this uncertainty.

Acknowledgements: developed from Webb et al. 2006,¹ and with the assistance of Conan Webb.

¹ Webb, C., M. Campbell, T. Kohler, D. McPhie and M. MacCarl. 2006. Control Methods for *Daphne laureola* Seedlings. Chapter 3.1, in: Species and Ecosystems at Risk; Fort Rodd Hill and Fisgard Lighthouse National Historic Sites of Canada, Summer 2006. Prepared by the Western and Northern Service Centre, Parks Canada, 38 pp + viii.

VII. Methods to remove English Ivy (*Hedera helix*)

Source: Garry Oak Ecosystems Recovery Team (GOERT); *English Ivy*
http://www.goert.ca/documents/Best_Practices_for_Ivy_revised.pdf (1 of 3)



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Best Practices for Invasive Species Management in Garry Oak and Associated Ecosystems: **English Ivy (*Hedera helix*)**

Assess the site characteristics and your available resources to help you decide where to take management action, what action to take, and when. These decisions should be made within the context of the overall restoration objectives (and restoration plan, if one exists).

a) Deciding where to take action

Follow the **Priority Principle: contain the invasive species first, then reduce its amount!** The highest priority is to prevent further spread of ivy. Only take action to reduce the "footprint" of the ivy invasion after it is contained. Therefore, for any invaded area you should start with the satellite patches on the periphery and move towards the middle. The following factors will help you decide which areas to focus on first.

Factor 1: Ivy maturity

Survey the areas in the GOE where ivy occurs, and identify patches where the ivy has reached its adult phase. The juvenile phase has a triangular, deeply lobed leaf, whereas the adult phase has ovate, unlobed leaves and fruit or flowers may also be visible. The adult phase usually (but not always!) occurs where ivy is spreading vertically (e.g. climbing a fence or tree trunk). Outline and label these areas "juvenile zones" and "adult zones" on your sketch map. Focus on the adult zones first, as the ability of this phase to produce seed increases the chances that it will spread to other areas. (Sometimes concerns about species at risk should override this zone prioritization. For example if a population of a species at risk is directly and imminently threatened by ivy this should be a top priority. Such decisions should be made in consultation with species at risk experts.)

Factor 2: Ecological quality

To help you prioritize areas within zones, consider GOE quality, presence of species of concern, and ivy vulnerability. First priority areas should be those of highest ecosystem quality, where species at risk are threatened by an ivy invasion. Within such areas, start in dry places where the conditions for ivy are marginal and their tolerance is lowest. Within adult zones, start by saving the biggest trees first.

Factor 3: Accessibility

Ivy management will require repeated efforts, due to the difficulty in removing all of the roots from the soil. Focus action first in areas that can practically be accessed for repeat treatments.

b) Deciding what action to take, and when

Circumstances	Method	When	Caveats
Mats of ivy spreading horizontally (usually in juvenile phase)	Dig out roots (using paring knife, dandelion weed fork, or weed wrench) and roll into 2-person-manageable piles	Late fall (Nov)	<ul style="list-style-type: none"> • Lift gently, or roots will break and re-sprout • Lay planks down to work from, to minimize soil compaction • Be cautious of species that are emerging in fall (e.g. licorice fern) • Remind volunteers there are species we are trying to protect; avoid a "just get the ivy" mind set • With weed wrenches, use leverage pads when soils are wet
Steep area OR riparian area OR area where ivy provides important habitat (e.g. nesting site for birds)	Same as above	Same as above	<ul style="list-style-type: none"> • Remove ivy a bit at a time, rather than all at once, so that the "services" the ivy might be providing (e.g. cover, shade) are removed gradually in a manner that allows the ecological community to adjust
Ivy climbing trees (often in adult phase)	Remove a 1 m tall band at waist height all the way around the trunk (using folding saw, loppers, axe, weed wrench with a leverage pad to pry off of, or hand clippers)	Fall	<ul style="list-style-type: none"> • Ivy above the removed band can be left in place to die, but the band must be kept clear as old ivy makes a great ladder for the next invasion • If the tree is dead (a "snag") then pulling to remove ivy may cause it to topple. This presents a serious safety concern, and may also damage important habitat for wildlife. Ivy should be removed from snags by an experienced person who knows the risks and follows proper WCB safety procedures, and after a Hazardous Wildlife Tree Assessment. • Must ensure all contact between roots and upper parts of the ivy plant are severed
Ivy at base of tree following removal of ivy band from tree	Pry roots from base of trunk and soil, using grub hoe, or cable, winch and truck or come-along	Late fall (Nov)	<ul style="list-style-type: none"> • Is hard work; some roots may be over 10 feet long
Ivy at base of tree, following removal of ivy band from tree	Topical application of herbicide (Triclopyr)	When new growth appears	<ul style="list-style-type: none"> • Only with extreme caution, and by (or advised by) experts • May be restricted (legally) in some jurisdictions • Surface applications of Glyphosate and 2-4D may not work on ivy, due to their waxy leaves
Any ivy with a trunk thick enough to drill a ~3/8" hole into	Herbicide (Glyphosate) poured into a hole drilled in the ivy trunk	Spring or summer	<ul style="list-style-type: none"> • Only with extreme caution, and by (or advised by) experts • May be restricted (legally) in some jurisdictions • Drill hole on a downward angle, as far in possible without emerging on the other side • Use concentrated herbicide • Will also work in winter, but more slowly (results not seen until spring)

In deciding which method(s) to choose, also consider:

- Your budget to acquire the necessary tools and equipment for the methods chosen (e.g. folding saws, come-along, clippers, axes),
- Your budget to acquire the necessary protective clothing and equipment (e.g. gloves, safety goggles),
- The need to comply with Workers Compensation Board regulations, and
- The number and skill level of the people that will be assisting you.

Consider following up on any of these control methods with a planting or seeding treatment in order to speed up re-establishment of native species. The need for this will depend on what bulbs and seeds already exist in the soil or in adjacent areas, light conditions, and how well they germinate and sprout when the ivy is removed. You may wish to first monitor the area after the control methods have been implemented, and then plant or seed later if the desired native plants do not appear or are sparse. If you are going to plant native species, consult with someone knowledgeable about this first, ensure that your plant and seed stock originate from sources that follow ethical guidelines, and take genetic issues into consideration.

c) Deciding how to dispose of dead plant material

If you choose any mechanical removal method, you must think about what to do with the plant material that you have cut or pulled. It is not acceptable to leave large piles of ivy on site, as it may re-sprout, or may smother native plants underneath. Consider the following options, based on the amount of dead ivy you expect to remove:

Material	Removal	Disposal
Large amount of ivy, AND no seeds present	Move to disposal area on tarps or makeshift "stretchers"	<ul style="list-style-type: none"> • Pile on tarps, paved or concrete surface where plants can dry and decompose without re-sprouting, OR remove to composting facility
Any volume of dead ivy with seeds present	Move to disposal or transport area on tarps or makeshift "stretchers", being very careful to not spread seeds to other areas en route	<ul style="list-style-type: none"> • Burn on site, if permitted, OR cover and transport to a location where it can be safely burned • Ivy smoke may irritate lungs; keep people upwind • Consult BC government's <i>Open Burning Smoke Control Regulation</i>: www.toffan.com/clear/OBSCR.pdf • Composting is risky, as the seeds may not be destroyed by the composting process
Small amount of ivy without seeds	Not necessary	<ul style="list-style-type: none"> • Leave on site, draped over shrubs where the ivy will dry out without touching bare soil OR deposit in small piles on a path where it can dry and decompose without re-sprouting

d) Recognizing uncertainty

In making these decisions, there will be things you are unsure about. This is normal, and should not cause undue concern. The important thing is to be *aware* of the things you are most uncertain about, document them, and plan your actions in a manner that will help you learn and reduce this uncertainty.

Acknowledgements: developed with the assistance of Louise Blight, Ron Carter, Adolf Ceska, Patrick Dunn, Tim Ennis, Marilyn Fuchs, Richard Hebda, Laura Hooper, Andrew MacDougall, Willie MacGillivray, Carrina Maslovat, Edo Nyland, Eileen Palmer, Briony Penn, Raj Prasad, Hans Roemer, Andrea Schiller, and Joel Ussery.

VIII. Methods to remove St John's Wort (*Hypericum perforatum*)

Source: Garry Oak Ecosystems Recovery Team (GOERT); *St. John's Wort*
<http://www.goert.ca/documents/Hypericum-species.pdf> (1 of 3)

Hypericum species

COMMON ST. JOHNSWORT & AARON'S BEARD

ENGLISH NAMES Common St. Johnswort¹; Aaron's Beard, Creeping St. Johnswort²

SCIENTIFIC NAMES *Hypericum perforatum*¹ and *H. calycinum*²

FAMILY Clusiaceae (Mangosteen)

Common St. Johnswort and Aaron's Beard are rhizomatous yellow-flowering perennials.

RANGE/KNOWN DISTRIBUTION

Both species are native to Eurasia and North Africa. Common St. Johnswort is now widely distributed in the temperate areas of both hemispheres and is considered a weed in its native range. In BC, it grows at low to mid-elevations in coastal areas, grasslands, and open forests. It is widespread along major transportation corridors on Vancouver Island and southwest BC, and in scattered pockets in the Interior. Aaron's Beard is found as a garden escapee, at sites where yard waste has been dumped, and at abandoned homesteads.

IMPACTS ON GARRY OAK AND ASSOCIATED ECOSYSTEMS

Common St. Johnswort and Aaron's Beard can reduce species diversity where they establish. Both do well in Garry Oak habitat conditions. Populations can form dense colonies with extensive creeping rhizomes, growing to 1 m tall. Common St. Johnswort impedes growth and regeneration of native forbs, shrubs, and trees by competing for nutrients and space. It is toxic to animals so is primarily a concern for livestock; however, small burrowing mammals have been observed to avoid it, and birds in general do not eat its fruit. Aaron's Beard is provincially listed as a nuisance weed. It does not yet appear on other invasive species lists in BC but is listed in Australia, New Zealand, and parts of Europe having similar climate regimes.

FIELD DESCRIPTION

Common St. Johnswort grows 30–120 cm tall from a rhizome. Numerous bright yellow flowers are 2 cm in diameter with five separate petals. Flowers are arranged in a flat-topped terminal cluster of 25–100+ per plant. Leaves are opposite, oval shaped, with prominent veins, 1–3 cm long x 0.5–1.5 mm wide, and with numerous tiny, translucent black-edged glands giving a perforated appearance. Stems are erect, two-sided, rust coloured, with numerous branches. Density of stems arising from



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INVASIVE SPECIES IN GARRY OAK AND ASSOCIATED ECOSYSTEMS IN BRITISH COLUMBIA

HYPERICUM SPECIES

Flowers 2 cm across in flat-topped terminal clusters

Leaves with numerous tiny glands, appearing perforated

2 cm

Stems erect with numerous branches

Rhizomatous, with tap-root

Sepals linear-lanceolate, 5 mm long x 1 mm wide

2 mm

Common St. Johnswort, *Hypericum perforatum*; Illustration from Illustrated Flora of British Columbia, G.W. Douglas, G.B. Straley, D.V. Meidinger and J. Pojar (eds.), (1998). © Province of British Columbia

Stamens 300-400 in five bundles

Flowers solitary or in flat clusters of three

Capsules 1-2 cm long, ovoid and dry

Leaves opposite, simple, no glands

Stems four-sided

Aaron's Beard, *H. calycinum*; Illustration by Walter Hood Fitch ca 1860

rhizomes ranges from 12–37 per m². Fruits are membranous sticky capsules, 5–8 mm long, containing numerous dark brownish seeds, 1.0–1.3 mm long; the capsules are pitted in longitudinal rows, and have a gelatinous coating.

Aaron's Beard is a low-growing stoloniferous (rooting at nodes along horizontal creeping stems) semi-evergreen sub-shrub, widely cultivated for its flowers and dense ground covering form. Aerial, four-sided stems grow to 80 cm tall. Leaves are opposite, broadly oval to elliptical, lacking glands, and 3–10 cm x 1.2–3 cm. Bright yellow flowers are 6–9 cm in diameter and are arranged singly or in flat clusters of three. The five petals are egg-shaped and surround a dense tuft of 300–400 protruding yellow stamens (in five bundles) with orange-red anthers. Fruits are capsules 1–2 cm long, ovoid, and dry. Seeds are 1.5–2 mm long, broadly cylindrical, with a network of sculpturing on the surface. *Hypericum anagalloides* is a native species that could be confused with *H. perforatum*, but the former is a species of moist to wet bogs, ditches, and lawns—sites that are more moist than where *H. perforatum* is typically found.

INVASIVE SPECIES IN GARRY OAK AND ASSOCIATED ECOSYSTEMS IN BRITISH COLUMBIA

HYPERICUM SPECIES	
	<p>LIFE HISTORY</p> <p>Common St. Johnswort reproduces by seeds and from short rhizomes. The root system of seedlings grows to 30 cm deep in the first growing season. The mature plant root system extends 1.2 m–1.5 m deep and 1 m laterally, storing energy that allows plant survival through drought. New crowns may be produced from lateral root buds that form in response to disturbance. A mature plant can produce up to 30 flowering stems annually. Flowering occurs from June to September, with capsules persisting to early fall, when seeds are shed. Plants die back to a basal rosette that survives through winter; upright shoot and stem growth occurs in spring. Seed production per inflorescence is 30,000–100,000. Seeds have a gelatinous coat that facilitates dispersal by animals, wind, and water, and which can delay germination for several years until suitable environmental conditions occur. Aaron's Beard reproduces mainly vegetatively from rhizomes. Its flowers are hermaphroditic, having both male and female organs. However, most of the seeds abort before maturing.</p>
	<p>HABITAT</p> <p>Both species can establish quickly on disturbed sites in grasslands, meadows, woodlands and open forests, trails, and roadsides in moist to dry conditions. Both tolerate a variety of soils, from rocky and shallow to deep and fertile, but require a moderately warm and long growing season for life cycle completion. A popular yet invasive ground cover, Aaron's Beard is adapted to coastal exposures, and will grow in full sun to shade in heavy clay soils.</p>
	<p>MANAGEMENT</p> <div style="border: 2px solid orange; padding: 5px;"><p>Develop a long-term, realistic program for invasive species removal before undertaking any work. Before taking action, obtain expert advice. Please refer to the introductory section of this manual.</p></div> <p>PHYSICAL CONTROL: For both species, mechanical control alone is not recommended because buds can arise from parent plants after mechanical damage or disturbance. Taking care to protect native plants, hand-dig small patches, ensuring all stem and rhizome parts are removed and destroyed. Immediately mulch the site and over-plant with suitable native grasses or forbs when seasonally appropriate. Monitor for several years, removing any re-sprouting stem and root fragments and seedlings. For larger infestations, use bio-control.</p> <p>BIOLOGICAL CONTROL: Common St. Johnswort is considered to be under biological control in BC, primarily by Klamath Weed Beetle (<i>Chrysolina quadrigemina</i>), and two other introduced beetle species that</p>
	<p>INVASIVE SPECIES IN GARRY OAK AND ASSOCIATED ECOSYSTEMS IN BRITISH COLUMBIA</p>

IX. Liability form from Habitat Acquisition Trust for work parties

Project: _____ Location: _____ No. of Volunteers: _____
 Date: _____ Start time: _____ End time: _____

RELEASE OF LIABILITY, WAIVER OF CLAIMS, VOLUNTARY ASSUMPTION OF RISKS AGREEMENT

You have agreed to participate in habitat restoration or biological inventory activities on private or public lands associated with Habitat Acquisition Trust.

These activities can be hazardous. Participants are advised that:

- shovels, hoes, and sharp tools used for planting can be dangerous and must be used with caution;
- the site features uneven, rocky terrain, with areas of heavy brush and potentially hazardous trees;
- some vegetation can puncture skin or other body parts (e.g. blackberry) or irritate eyes and skin (e.g. Daphne); and
- numerous unforeseen hazards involved with working in the outdoors are not mentioned here.

Participants must make themselves aware of the risks of their volunteer work. All

participants must abide by the following rules:

- 1) sign a copy of this waiver prior to working on the site (signature by parent or guardian for participants under 18 years of age);
- 2) follow all directions from field marshals or staff;
- 3) work only in designated areas at designated times;
- 4) educate yourself in the local flora and fauna of the area and the associated risks ie: wasps;
- 5) accept personal responsibility for any mishaps occurring on the property; and
- 6) wear protective clothing (protective eyewear, boots, gloves, long pants, and shirts).

The landowner and Habitat Acquisition Trust do not accept any responsibility for your personal safety while you are assisting with volunteer restoration or survey activities. If you do not accept these conditions please do not participate in these activities.

Participants may also provide permission for HAT to use any photos of restoration activities in which they appear, by checking the box below. Photos will be used for HAT publications and website, media release, or by our funders, partners, and supporters for their own promotional purposes.

I understand and accept the above conditions:

NAME (print clearly)	SIGNATURE	ADDRESS	EMAIL	PHONE