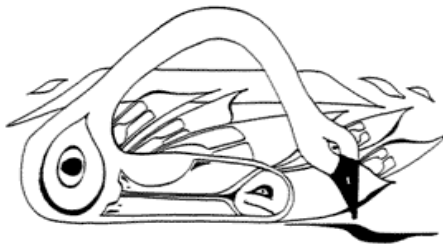


# Wetland Restoration Project Report 2014



Prepared by **Frank Hovenden**  
**Comox Valley Nature** (Comox Valley Naturalists Society)

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# 1 Acknowledgements

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**Comox Valley Regional District**



**City of Courtenay**



**Ducks Unlimited Canada**



**BC Nature**

I would like to thank all our donors. One of our club members has made generous donations to this project for the last two years. A special thank you to Joyce Bainbridge. Your generosity is appreciated. In our organization, as in many volunteer groups, much of the work is done by a small number of stalwarts who you can always count on to lend a hand. Kathleen Hennig, Bill Heidrick, Ernie Stefanik, Murray Little, Gerry Krotz, and Bob Bartsch are members who I can always count on to lend a hand with our field work. I am grateful to all of you. I would also like to thank our Contractor Ernie Sellentin and his employees like Michael McNulty who have taken a personal interest in this project. Lastly a special thanks to our club treasurer Isabella Erni who took care of all the financial details. This report was written by Frank Hovenden of the Comox Valley Naturalists Society and is available on line at <http://comoxvalleynaturalist.bc.ca/>



## 2 Introduction

As the director of this project I have felt a personal responsibility to keep current in the field of Restoration Ecology. To this end several years ago I enrolled in the Native Species and Natural Processes Professional Specialization Certificate Program at the University of Victoria. I have taken three courses in this program to date. The last course titled Invasive Species and Novel Ecosystems was particularly relevant to our project. It has changed many of the outdated preconceptions I held relating to invasive species and ecological restoration in general. I hope to introduce some of the concepts and learning into this report.

It is widely accepted that aside from habitat loss, invasive species are the second leading cause of biodiversity loss on this planet. Unfortunately this problem is increasing in scale. Much of this is due to the increased globalization of our economy and the resulting pathways it affords for invasive species to invade new habitat. Increased transportation networks and the demand for commodities means increased opportunities for invasive species to land or more accurately be carried to our shores. Considering our local history, a little more than 100 years ago an irregular boat service was the only contact between the Comox Valley and the outside world. Now we have a network of highways as well as jet service linking us to the entire planet. We have access not only to the rest of the world but the flora and fauna of the rest of the world. This increases our vulnerability to a vast array of invasive species. Although this report concentrates on invasive plants, invasive species span the spectrum of life forms from insects to birds. A short few years ago Eastern cotton-tail rabbits appeared in our valley, while currently we are witnessing the invasion of the Eurasian collared dove. It is inevitable that there will be more alien species arriving in the near future.

We are not alone in facing the problem of invasive species. The federal government has an Invasive Species Plan as does our provincial Government. On the municipal level I recently had the chance to critique the District of Saanich's [<http://www.saanich.ca/parkrec/parks/natural/invasive.html>]. Invasive Species Management Strategy While not perfect, it sets the bar at what a local government can do to combat a serious problem. Also down Island is the Capital Region Invasive Species Program (CRISP). This gives an example of what communities are capable of doing working cooperatively. The time has come for the various local governments of the Comox Valley to recognize the problems posed by invasive species and get serious in tackling them. A template exists in a nearby similar community that can be built upon and adapted to our local conditions.

The Wetland Restoration Project is an initiative of Comox Valley Nature. We are a membership-based non-profit society with charitable status which has been active in the Comox Valley for close to fifty years. As an affiliated club of BC Nature we share their mandate "to know nature and keep it worth knowing."

The nature of this project and our parent organization gives us a great deal of flexibility and resilience. The importance of community buy-in and participation cannot be understated in judging the success of an invasive control project. I am happy to say that our volunteers continue to step forward to insure the continued success of this project. Last year we started to track the number of volunteer hours donated to the project. From within Comox Valley Nature a small and dedicated group of volunteers have emerged which have taken ownership of the project and the places where we work. The longevity of

the Comox Valley Naturalists Society allows us to take a long-term view, which puts us in line with many of the ecological processes we are working to restore. The majority of our funding goes to the wages of our contractor. This year all the native plantings were done by our volunteers.

This year we have expanded the initiative against the various knotweeds (*Polygonum spp.*). This invasive plant is capable of dominating our riparian zones. We have experimented in "continuous cutting" for many years with some success. As a measure of control has been attained on some of the sites we have expanded to new areas infested with this weed. Working with Project Watershed's intern we have mapped all our current control sites along the Courtenay River.

In 2014 the key species that the crew tackled are purple loosestrife (*Lythrum salicaria*), yellow flag iris (*Iris pseudacorus*), Himalayan blackberry (*Rubus discolor*), Scotch broom (*Cytisus scoparius*) and various members of the Knotweed complex (*Polygonum spp.*). Other invasive species such as Himalayan balsam (*Impatiens glandulifera*) were targeted when found in proximity to our key species.

Public outreach and education has always been a vital component of the Wetland Restoration Project. We participated in several public events and have erected some new signage (Appendix II) as well as distributing brochures pertaining to invasive plants.

This report will document the work completed in 2014. This will include the numbers of plants removed and the time worked in the various areas. The financial details of the project as well as recommendations for the future direction of the project are included. We have worked closely with and have received grants from our local governments at the City of Courtenay and the Comox Valley Regional District. This past year has seen changes in the Parks Managers position at both governments. We welcome and look forward to working with both Dave Snider (Courtenay) and Doug Demarzo (Comox Valley Regional District).

### 3 Background

The Comox Valley possesses great biodiversity in its natural ecosystems. We overlook the water bodies of Comox Harbour and Baynes Sound which are the second most important in all of B.C. for over-wintering waterfowl. It is designated as an Important Bird Area and rated as Globally Significant. As citizens of the Comox Valley it is incumbent on us to be caretakers and stewards of this area and all the flora and fauna that depend upon it.

This map produced by Project Watershed shows very little of the land base is classified as intact ecosystem. It is therefore imperative that these remaining fragments be maintained with the highest level of stewardship. Nature knows no boundary and biodiversity extends into our urban areas as shown in figure 1. Local governments have



Figure 1: Project Watershed's ecosystem map

to recognize that they have an important role to play in ecosystem management.

A relatively new idea in the field of ecological restoration is that of ecological memory. This memory consists of the species and processes which will determine the ecological path in the future. Ecological memory is less in cities where many disturbances have taken place. In relatively intact areas ecological memory remains high and must be strengthened rather than diminished. Comox Valley Nature believes that part of this stewardship is the control of invasive species. The Invasive Plant Council of BC defines an invasive plant as any alien species that has the potential to pose undesirable or detrimental impacts on humans, animals or ecosystems. It has been our goal to reduce invasive species and nurture our native species thus preserving the ecological memory on these sites. This will enable these sites to return in the direction of their historic ecological paths.

The Wetland Restoration Project is a small attempt to limit and control invasive plants on some of our most sensitive sites. The Comox Valley Naturalists have taken an interest in combating invasive plants on a local level. We have identified an area which has high biodiversity value (Courtenay River estuary) and which is threatened by various invasive plants. In this area is found the Henderson's Checker-mallow *Sidalcea hendersonii* which is a blue listed species in British Columbia. In this same habitat is found the invasive purple loosestrife. With our limited resources we have concentrated in keeping invasive plants at a manageable level in this area. At the request of our funders we have worked throughout the Comox Valley, although our focus remains the tidal waters and adjacent areas of the Courtenay River.

The second goal of the Wetland Restoration Project is ecological restoration. The term restoration has been subject to numerous academic debates in recent years. Ecosystems are dynamic and react to current biotic and abiotic conditions. The idea that one can restore an ecosystem to its historic condition is an impossible dream. This was a naive goal for the project in the past. It is unrealistic to think that by removing invasive species and replacing them with native species one can recreate a historic ecosystem. Take for example the Garry oak ecosystem as first documented on Vancouver Island. A driver for this ecosystem was the regular burning regime practiced by aboriginal peoples. This is not really feasible in an ecosystem surrounded by urban development. Another consideration has to be global climate change and increasing CO<sub>2</sub> levels in the atmosphere. These are different from historical levels and will have a direct effect on plant growth and ecosystem function. In light of different current realities it is impossible to return an ecosystem to its historical norm. The world has moved on whether we like it or not and ecosystems will respond and be driven by these new realities. What results has been termed novel ecosystems. These ecosystems have assemblages of species not observed in the past. This gives a great deal of relief to restoration ecologists knowing that their goals are no longer the impossible one of recreating history. Novel ecosystems reflect the present conditions.

For this project this means that we do not have to judge the work we have done in the Courtenay River Airpark comparing it to a reference ecosystems that no longer exists and will not in the future. We have been successful in establishing Garry Oaks on the site and removing Scotch broom. However there still remain many alien introduced plants on the site. Our goal has to be not to recreate an historic Garry oak ecosystem but rather guide it toward a novel Garry oak ecosystem. This would have many of the desirable characteristics of a historic Garry oak ecosystem. It will be a meadow with scattered oak trees and many of the forbs and shrubs traditionally associated with the historic Garry oak

ecosystem. We can guide it toward sustainability but it will never be an exact replica of a historic Garry oak ecosystem.

We are not alone in recognizing the importance of our waterways and estuary. We will continue to work with the many groups such as Project Watershed, BroomBusters, and Mountaineer Avian Rescue Society in making the Comox Valley a better place for everyone and everything to live and thrive.

## 4 Summary of Work Completed

The core areas of concern (except Area 8) surround the Courtenay River estuary and are located in the City of Courtenay and the Comox Valley Regional District (CVRD). Figure 3 is a map of our core areas. Area 8 is south of the core along the shores of Baynes Sound close to Argyle Rd. and contains an infestation of purple loosestrife and yellow flag iris. The core areas are identified as priority because they are areas where historically purple loosestrife has been found and therefore where the project started in its efforts to control it.

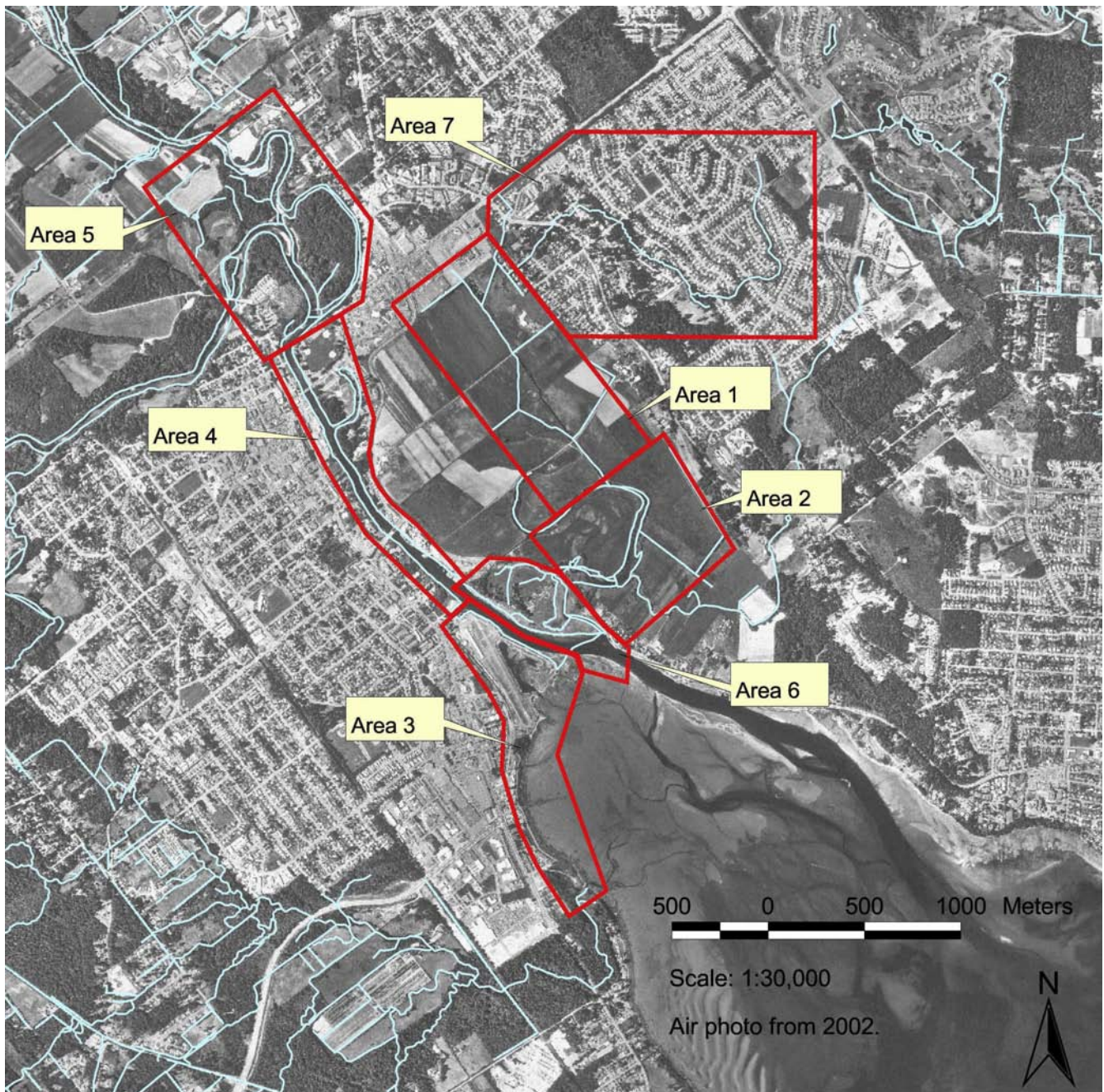
Our species of concern also include Scotch broom, yellowflag iris, knotweed and Himalayan blackberry. In recent years we have put a greater emphasis on knotweed as it seems to be spreading at a greater rate than other invasives and occupying a wider range of sites. These can range from dry upland sites to tidal flats.

Our work is focused primarily on public lands however access to private lands such as the Comox Bay Farm and the Berry farms has been established through informal agreements that must be renewed annually. A high priority is given to lands of high ecological significance such as Area 6 which is commonly called Hollyhock Flats. This area is mapped as an intact ecosystem in figure 1. This area is fairly undisturbed in terms of human modification and also contains the blue-listed plant Henderson's checker-mallow (*Sidalcea hendersonii*). Over 90% of the purple loosestrife removed this year by the project comes from this area. We have been successful in keeping knotweed out of area 6 despite the many infestations on the west bank of the river. The knotweed infestations that we are actively fighting are located in the adjacent areas 3 and 4.



Figure 2: Hollyhock Flats (area 6) is home for the blue-listed Henderson's checker-mallow which is sometimes called marsh hollyhock

Figure 3: Core areas of concern for the Wetland Restoration Project



The project hours were tracked by task (figure 4) and geographic area. This year Sellentin's Habitat Restoration completed a total of 726 hours of field work for the project. This was about 100 hours more than in 2013 which reflects our increased budget. We are tracking the volunteer hours separately this year (see pg. 20) The volunteers were involved with most aspects of the project with the exception of removing purple loosestrife and yellowflag iris. Because this work was located in Hollyhock Flats (Area 6) where there were safety concerns, it was left to our contractor Sellentin's Restoration Services to do this work. This area is tidal and contains many hidden channels and other hazards which makes it unsafe for volunteers.

**CV Nature 2014 Wetland Restoration Hours**

**Sellentin's Habitat Restoration and sub contractor**

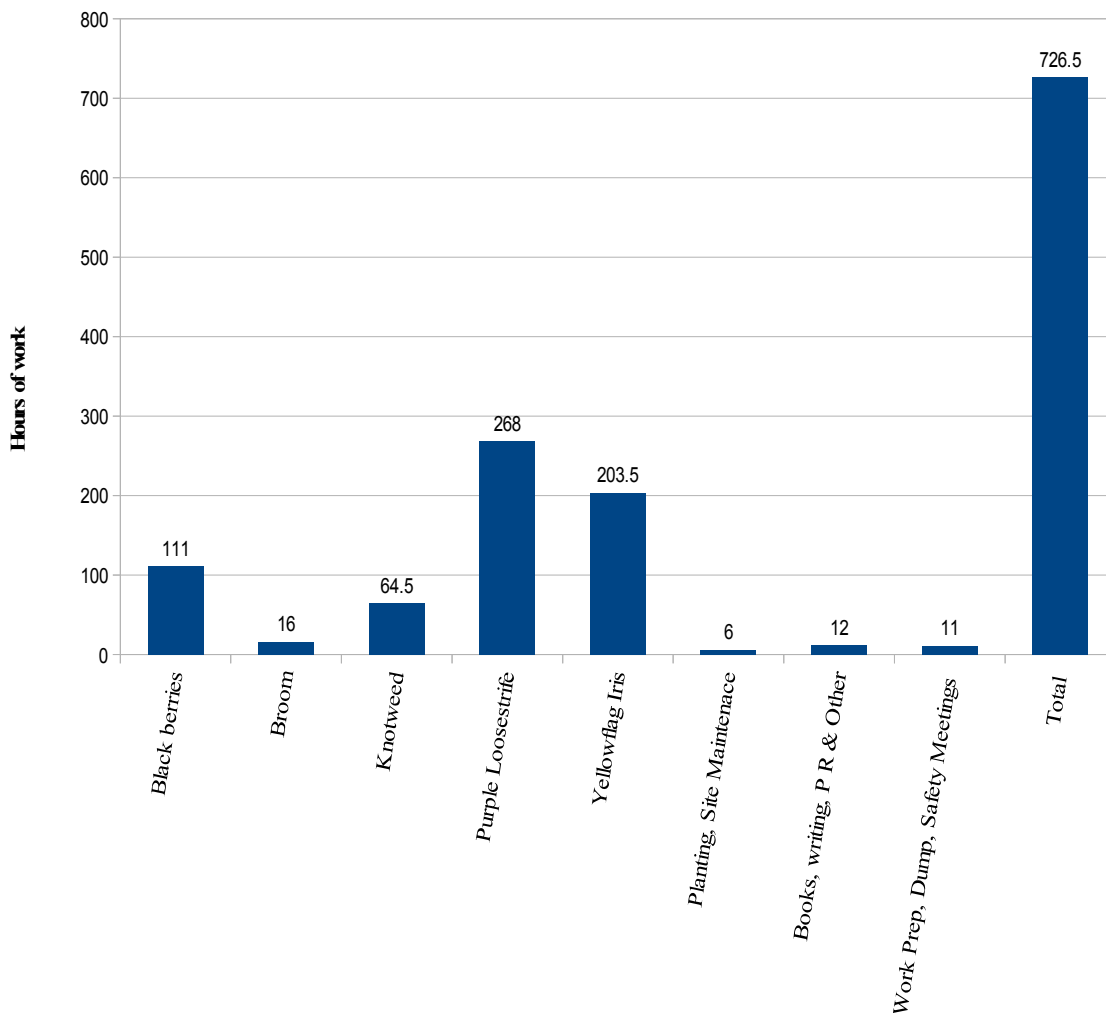


Figure 4

## Weed Control

### Purple loosestrife - *Lythrum salicaria*

The number of purple loosestrife plants removed this year was 1997, which is a large decrease from the number of plants removed for each of the last three years. We hope that this puts us back on a downward trend after the slight increases we have observed in the last few years. As the crew and methodology has been consistent for these years this is a hopeful sign in controlling purple loosestrife in this area. The biggest decrease is from Area 6 (Hollyhock Flats) which is our area of highest priority.

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8	Total
2012	44	11	48	32	35	3194	12	190	<b>3566</b>
2013	7	21	60	41	28	2710	2	229	3098
2014	10	4	28	30	30	1851	4	40	1997

It was speculated in last year's report that many of the new plants were coming from areas where there had been disturbances. The last several winters have seen several severe high water storm events which may have contributed to an increase in the disturbed areas and thus an increase in purple loosestrife plants. It is difficult to attribute with any certainty the blip in 2012 and 2013 in what has otherwise been a steady decrease in purple loosestrife numbers.

Note that Area 8 is the beach area of Argyle Road in Royston and outside the core area of the project. There is a small infestation in this area which was discovered several years ago.

While doing purple loosestrife control a small infestation of Himalayan balsam (*Impatiens glandulifera*) was discovered in Area 4. While not a high priority invasive plant nevertheless a total of 505 plants were removed.

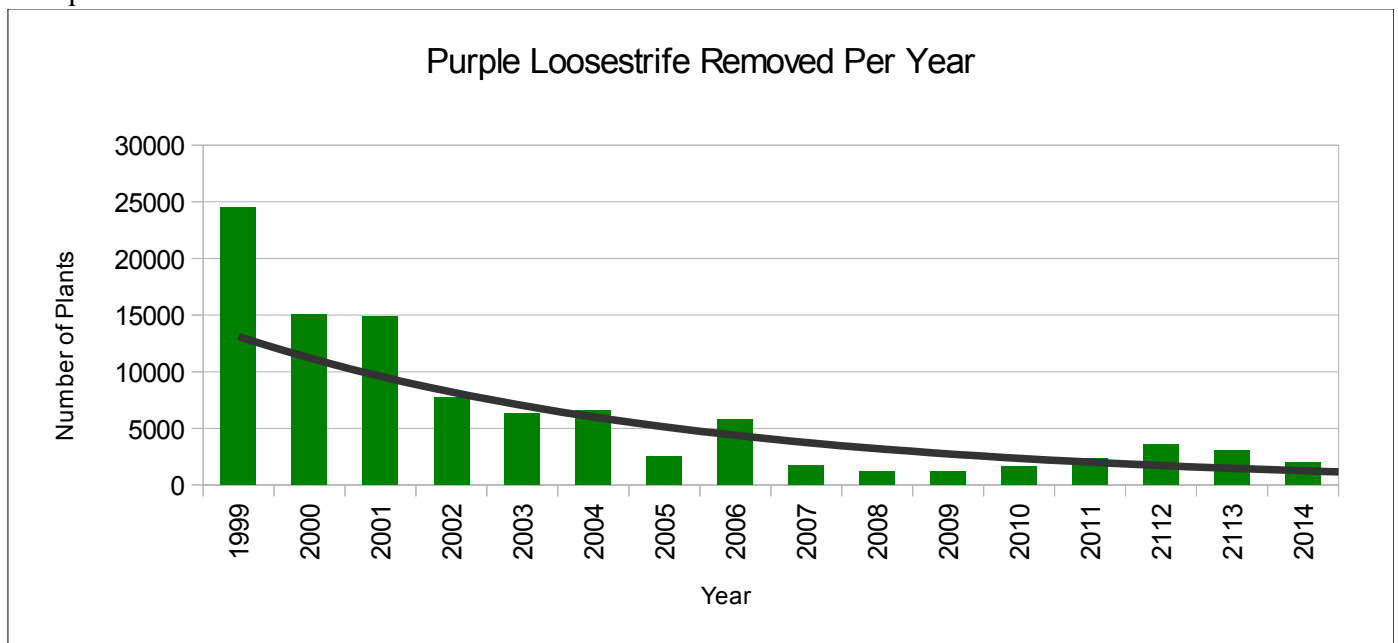


Figure 5: Trend line for purple loosestrife

**Yellow-flag Iris - *Iris pseudacorus***

The second highest amount of time for our contract work is spent removing Yellow-flag iris. This invasive plant is also found in area 6 and therefore not usually dealt with by our volunteers. The contract crew also removed yellowflag from area 8 and in the Morrison Creek headwaters.

This was once a popular and attractive garden plant. However like purple loosestrife, once released into wetlands it can cause real ecological damage by dominating the site to the detriment of native plants such as the cattail (*Typha spp.*). It has a bright yellow-flag flower which makes the mature flowering plant easy to identify. Unfortunately the immature plants very much resemble cattail. As it often grows in the same habitat it can be difficult to separate and remove. It spreads and stores energy in large rhizomes. This is most evident locally in Lazo Marsh, where it constitutes the dominant species in much of the marsh.



*Figure 6: Yellow-flag iris being dug out with cattail in foreground*

We have been removing this plant, which forms large rhizomes, from the Courtenay River estuary for many years. The rhizomes are brought to the CV Waste Management Centre for disposal. Most of the large rhizomes have been removed from Area 6 and the remaining plants are much smaller and lighter according to Sellentin's crew.

Year	Kg. of rhizomes
2012	335
2013	790
2014	1840

**Scotch Broom - *Cytisus scoparius***

Scotch broom was introduced to Vancouver Island in the Sooke area over 100 years ago. Like most of our invasive species it was a deliberate introduction. It is now firmly established and control efforts have to concentrate on select areas. It thrives in disturbed areas with full sun exposure. A long-held belief was the ability of its seeds to remain viable in the soil for extended periods of time (40 years). In fact this was based on an experiment where the seeds were stored inside glass container within controlled atmospheric conditions. Outside in the soil on Vancouver Island the seed remains viable for less than ten years. While this presents a

*Figure 7: Volunteer Gerry Krotz cutting Scotch broom*



challenge to control efforts, it is not insurmountable. However it does mean control efforts must be sustained until the seed bank is diminished in order to be effective.

Scotch broom is controllable by cutting. The key to success is cutting it below the green stem tissue which have epicormic buds capable of re sprouting. The plant often has a long taproot especially in sandy soils. Cuts made below the root-stem junction will kill the plant. Most failures in Scotch broom control is the result of cutting the stems too high which causes regrowth to occur. This can be seen in Figure 8 which shows the stub of an old cut, and the new stem which resulted. The pen is situated where a cut should have been made to kill the plant.



*Figure 8: Poor cutting of Scotch broom will result in its regrowth.*

We have concentrated our efforts to control Scotch broom to several areas which we sweep yearly. The first of these is Courtenay River Airpark (Area 3). This area was dominated by the plant up until 15 years ago when our control efforts started. It is now pretty much broom free. A second area where we control Scotch broom is north of the Courtenay Railway station along the Rotary Trail. This is a small area of about one acre in size where we are in our second year of control. The adjacent areas are controlled by the BroomBusters. The BroomBusters is a volunteer group with several chapters on Vancouver Island and have set a goal of removing broom from roadsides and public places. We support their efforts and coordinate our work with Bev Agur who manages this group in the Comox Valley. This year volunteers from Comox Valley Nature assisted in a broom bash organized by BroomBusters at the Little River Nature Park.

### **Knotweed - *Polygonaceae***

Knotweed species are one of the most aggressive invasive plants threatening our riparian areas. They have several traits which make them very difficult to eradicate or control. They have a broad range of sites that they can occupy. These include inter-tidal zones where herbicides cannot be used due to fisheries concerns.

A second trait is their ability to hybridize which means the plants growing in our areas may have different characteristics from their parent stock in Asia. In this report I shall just refer to the plant as knotweed. It includes Japanese knotweed, giant knotweed, bohemian knotweed and all their various hybrids.

A third characteristic making control difficult is that the plant has large rhizomes capable of storing plant food. This allows the plant to quickly regenerate and restore its vegetative mass once it has been cut.

The adjacent map shows the knotweed sites where we have concentrated our efforts this year. This was made possible with the help of Project Watershed and their summer intern Russel Prentice who GPSed the sites. This area is found within areas 4 and 3 in the fig.3 aerial photograph.

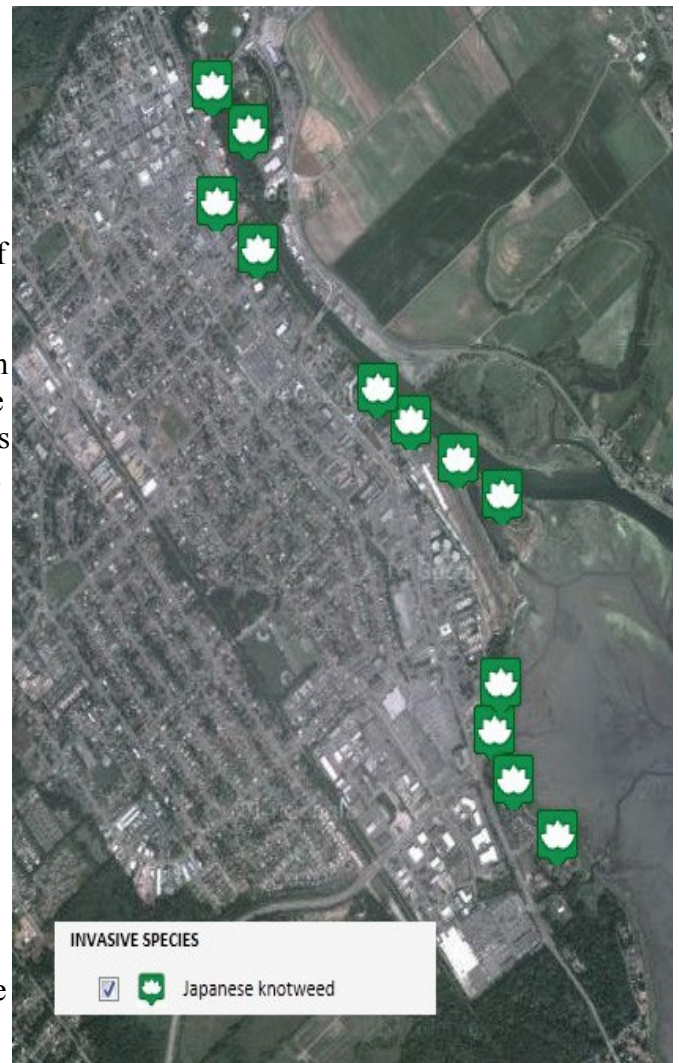
We have controlled knotweed by continuous cutting of the top growth and the removal of the rhizomes. By continuous cutting the energy reserves of the plant are slowly diminished to the point where it can no longer resprout. This plant is easily cut with hand pruners and care was taken to cut all stems within each site. The cut material was left on site to desiccate and die in the summer sun. On some sites the plant was cut every two weeks during the active growing season. This can be reduced to once a month or less once a measure of control has been attained. On some sites the rhizomes were dug up and disposed of where this was feasible. This work was done by volunteers from Comox Valley Nature and Michael McNulty who was working for Sellentin's Restoration. The number of cuts depends upon the vigor of the infestation. This is related to the site where it is found and the length of time it has been allowed to establish itself at that particular location.

In 2014 the number of knotweed control sites increased to 12 as shown in figure 9. This was due to the measure of control being attained over some of the older sites in Table 1, as well as the discovery of some new sites.

The effectiveness of knotweed control using the continuous cutting method seems to be related to the amount of competition, and the shade at a particular site. Five different sites were chosen as test sites in 2012. Control was rated as excellent on the sites with competition and some shade as shown in Table 1. on the next page.

In 2014 the number of cuts were decreased on the sites where the regrowth was weak such as at Simms Park and the Courtenay Airpark. Control is rated excellent after three years of continuous cutting. Less successful control has been achieved at the Courtenay Air Park site. This site was fully exposed to sun and had no competition from native plants. The plant here has established itself in rip rap and the rhizomes are difficult to remove. Although the control is only rated as medium after three years there are nonetheless some hopeful signs at this site. Comparing the photos of the Air Park site (figure 10 and 11) shows that with the removal of the knotweed, natural re-vegetation of the site has begun.

Figure 9: Knotweed sites with active control efforts by this project



This is mainly composed of horsetail (*Equisetum spp.*) and various grasses (*Poaceace*). This has been augmented with the native plants we installed last year on the site.

	<b>Simms Park</b>	<b>Central Builders</b>	<b>19th Street</b>	<b>20th Street</b>	<b>Courtenay Air Park</b>
<b>Shade</b>	heavy	medium	light	medium	none
<b>Competition</b>	heavy	heavy	medium	heavy	none
<b>Substrate</b>	unknown fill	unknown fill	native soil	native soil and rip rap	rip rap
<b>Number of cuts 2012</b>	9	9	9	9	6
<b>Control Effectiveness 2012</b>	good	good	poor	medium	poor
<b>Number of cuts 2013</b>	15	3		8	14
<b>Control Effectiveness 2013</b>	good	good	good	good	medium
<b>Number of cuts 2014</b>	6	2	2	2	12
<b>Control Effectiveness 2014</b>	good	Excellent	Excellent	Excellent	Medium

**Table 1:** Comparison of knotweed control sites.

In 2014 the number of cuts were decreased on the sites where the regrowth was weak such as at Simms Park and the Courtenay Airpark. Control is rated excellent after three years of continuous cutting.

The knotweeds can be controlled by stem injection with herbicide such as glyphosate. This is the preferred methods on dry sites where it is environmentally acceptable. The timing of this is critical so that the herbicide is drawn into the plant and its rhizomes. It must be noted that the knotweed is a difficult plant to kill and even with herbicides several treatments are usually required to kill an infestation. Our contractor has the equipment and is trained in this method, however herbicides are not used for this project.



Figure 10: Airpark knotweed site 2013



Figure 11: Airpark knotweed site 2014

The site in Courtenay River Airpark has been infested with knotweeds for many years. It totally controlled the site so that there was virtually no other vegetation growing on it. The site is in the bank of the Courtenay River and subjected to seasonal flooding as shown in Figure 13. To rehabilitate this site, native wet-site species were planted in 2013. These were ninebark, salmonberry, red-osier dogwood and Scouler's willow. Many of the plants were supplied to the project by the City of Courtenay.

The outlook for knotweed control in the Comox Valley is uncertain. While we have shown that continuous cutting of the plant can be an effective control technique under certain conditions, this method is labour intensive and thus expensive. The problem here is that many of the infestations are large and on private property and certainly beyond the scope of this organization to control. It will fall upon local governments to tackle this problem. Knotweed is not only a threat to the natural environment but is also damaging to infrastructure and can pose a public safety concern as seen in figure 12 where before being cut it was invading the walkway.

As I mentioned in last year's report, the source of the knotweed infestations are easy to track. In the Comox Valley it is often directly related to our development and land use patterns. The pattern that is common is for the developer to buy a large parcel of land. This is often cleared using heavy equipment. This sets up a seed bed which is

Figure 12: Knotweed impinging on Courtenay River Walkway poses a safety risk.



very attractive to early successional invasive species. This cleared lot is then subjected to the uncertainties of the real estate market and may sometimes remain undeveloped for many years. These vacant lots serve as epicentres for invasive plants. There has to be some control exerted on forcing developers to control invasive plants on development parcels. This will spring from a recognition that local governments have an important role to play in ecosystem management. Cities and urban areas are ecosystems. Public Works has to be inclusive of this role and not merely maintaining infrastructure and insuring that the roadsides look attractive. This task is all the more important here in the Comox Valley where urban areas border fish-bearing creeks and rivers, and a globally Important Bird Area.

Because of the time and manpower required, the manual control of knotweed is high. This is an expensive control which requires persistence. However as the equipment expense is low and the required expertise minimal, this is ideally suited for volunteer groups such as ours, provided the infestation site is small. We have concentrated our efforts in the riparian areas adjacent to fish-bearing waters where herbicide can not be used. Most of the knotweed sites are subject to regular flooding (Figure 13) and thus are suited only for manual methods.



*Figure 13: Knotweed site under water*

## Prescribed Burn

In 2013 three small plots were burned in the Courtenay River Airpark. This was an attempt to duplicate the management system employed by First Nations in Garry oak meadows. These plots are being monitored for any changes in species composition or abundance. To date there is little difference observed between the burned areas and the adjacent control areas.

## New Plantings

This year our planting efforts were concentrated at the Courtenay Railway Station site. This land is owned by the Island Corridor Foundation and is adjacent to a trail installed by the local Rotary Club. It is widely used by locals and if the train service is restored would be an attractive feature to welcome visitors to the Comox Valley. A list of the plants installed can be seen in Appendix I. These are all native plants most of which had been raised by our volunteers. There were two planting work parties, one in the Spring and one in the Fall.

*Figure 14: Volunteer planting in at Courtenay Railway Station site*



Bone meal was added to the planting hole and the surrounding ground was mulched. The plantings were then flagged with marking tape. The new plantings were watered every two weeks during the summer drought period. Survival has been excellent this year. After the first year of establishment there will be no watering and just routine maintenance of the plants. Our aim is to make these native gardens self sustaining requiring little or no care over the long term. Once established these plants should not require any water to survive our summer drought period.

All plantings have been placed at least two meters from the Rotary Trail as this strip is mowed in the summer. A fall inspection of the site was done with Nancy Hofer and Dave Snider who are City of Courtenay staff.

## Old Plantings

This year two work parties did clean-up and maintenance around the native plantings in the Courtenay River Airpark. This consisted of weeding and adding a general purpose fertilizer around the plants. Some minor pruning was done to the Garry oak trees to encourage good form. As can be seen in Figure 15 many of the flowering shrubs such as Indian plum (*Oemleria cerasiformis*) and flowering red currant (*Ribes sanguineum*) have started to mature and are putting on good flowering displays. No watering is required to maintain these established plantings.

As noted in the 2011 report, a small amount of seeded camas was observed flowering for the first time since being planted in 2007. This increased to over 70 plants blooming in 2012, 100 camas in bloom by 2013 and 210 blooming plants counted in 2014.



Figure 15: Flowering red currant and Indian plum blooming at the Courtenay River Airpark

## Other Activities

The Courtenay River estuary (Area 6) is an important area where many of our restoration efforts are centered. Due to its accessibility and the seclusion it affords, it has been the site for squatters. As most of this area is subject to periodic flooding, the squatting is always of a temporary nature.

This is always a difficult situation to deal with. It is where ecological restoration meets modern social realities of homelessness in the Comox Valley. There are numerous ethical issues here and the City of Courtenay was helpful in helping us with addressing these.



Figure 16: Abandoned squatter's camp in estuary

This year an abandoned camp was found by our crew. Judging by its condition it had not been used for several months. After confirming that it was in fact abandoned the City of Courtenay supplied a dump truck to assist with the clean-up. The camp was not accessible and garbage had to be removed using a wheel barrow. It was first transported to CVRD Pumping Station on Comox Road where it could be loaded on a dump truck and disposed of.

## Public Outreach

### Signage

Many of the areas where we work are frequented by members of the public. I encourage interaction between our crews and the public who often want to know what we are doing. This is particularly true for Simms Park and the Courtenay River Airpark where knotweed infestations border the public walkway. A new semi-permanent sign (Appendix II) was installed this year along the Rotary Trail close to the Courtenay Railway Station. This offered information on Scotch broom. Temporary signage was again erected at the largest camas planting. Due to the changing weed locations and vandalism we have found this to be a cost effective method of informing the public about our project. In the last two years there has been very little vandalism in the form of tagging done to any of our signage.



Figure 17: Temporary signage at planted camas in Courtenay River Airpark

### Brochures

Last year the Comox Valley Regional District has published a Brochure titled "Toxic Invasive Plants", while the Coastal Invasive Species Committee published "Get to Know Invasive Species". These are both excellent publications which we have been happy to distribute to the public. A plastic weatherproof brochure holder was purchased and attached to the Airpark fence adjacent to a knotweed infestation that we are currently working on. We have distributed close to 1000 brochures this year. The CVRD supplied the brochures at no charge to us.

Figure 18: Volunteers at the Rivers Day

### Community Events

Comox Valley Nature had a display at Earth Day this year which was celebrated at Lake Trail School. As part of the Comox Valley Nature booth, the Wetland Restoration Project displayed invasive plants and distributed brochures on invasive plants and safe alternatives for local gardeners to use.

This year Comox Valley Nature celebrated Rivers Day with a clean up of the shores around the Courtenay



Airpark. Over a dozen members of the public joined us in this endeavour. CV Nature undertakes this event independently without a corporate sponsor.

We had planned an outing with students from Lake Trail School to the Railway station site in June to demonstrate how to plant trees and shrubs. Unfortunately due to an ongoing labour action this had to be canceled.

## Publications

The project tries to make use of the local papers to educate the populace of the Comox Valley about the dangers posed by invasive species. These are printed at the discretion of the publisher. One article was written and submitted on Scotch broom on behalf of the project this year. It can be found along with previous articles on our website <http://comoxvalleynaturalist.bc.ca/> under Nature News, Wetland Restoration.

## Cooperation with other Environmental Groups

The CVNS has existed for close to 50 years and takes pride in our close cooperation with other groups with common interests and shared goals.

The BroomBusters group is a relatively new organization in the Comox Valley dedicated to the removal of Scotch broom. We work closely with Bev Agur the group's local coordinator. This year we supplied volunteers from Comox Valley Nature to assist in a broom bust at the Little River Nature Park.

We also have a close relationship with Project Watershed. This year they had a summer intern Russel Prentice working for them on mapping projects. Russel and myself mapped all the knotweed sites (Figure 9) we are currently working on. We hope to be involved with their future project of breaching the lagoon, in the Courtenay River Airpark.

Over the years the project has purchased various tools for removing invasive plants. This year we were happy to lend our weed wrenches (Pullerbears) to the Mountaineer Avian Rescue Society for work they were doing for the CVRD in Headquarters town site. A small group of local citizens were concerned about the amount of English ivy (*Hedera helix*) growing in Puntledge Park in the City of Courtenay. This park is located at the confluence of Morrison Creek and the Puntledge River and contains good displays of fawn lily (*Erythronium spp.*) and trillium (*Trillium ovatum*) in the spring. These are being threatened by the rampant growth of the ivy. This year we supplied several volunteers in pulling the ivy which the City collected and disposed of.

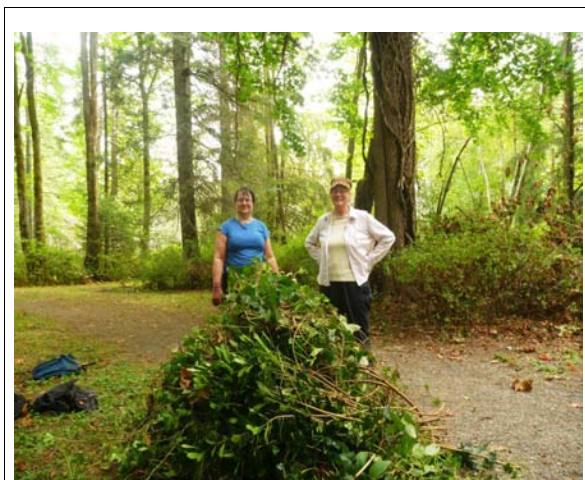


Figure 19: Pulling English ivy in Puntledge Park

## Volunteer Hours

Volunteers represent the community and their support for this project is essential to its success. Last year have started tracking the volunteer field hours donated to the project's work parties. We have not counted the time growing donated plants. There was a very slight decrease in the number of volunteers hours this year from from 140 to 128.

## 5 Financial Summary

The 2014 budget is presented in Table 2. The project is financed through a variety of grants from both local governments and non-profit societies. This diversity of sources has given us a degree of stability over the years. Our biggest expense is the labour component. This limits many of the grants which often won't cover labour costs.

The budget was within our normal averages. We did receive a \$2000 grant from BC Nature this year. We also sold an aluminum boat for \$500 which we had not used for some years. We did have a surplus this year of \$1,344. Surpluses from the project are placed in a Wetland Restoration Project fund and used in future years on this project. This is separate from the general revenues of the CVNS. This gives us a degree of flexibility to operate the project while waiting for grant monies to arrive early in the season.

It should be noted that the Regional District waives the dump charges at the Comox Valley Waste Management Centre for the plant material that we dispose of there. The City of Courtenay supplied a truck and steel bin to help dispose of waste from the Courtenay River Estuary, Airpark and Puntledge Park at no charge.

Labour	Hours	Total
Sellentins Restoration	767	\$15,446.00
CVNS Report	50	\$1,000.00
Subcontracts	12	\$230.00
<b>Labour Total</b>	<b>829</b>	<b>\$16,676.00</b>
Vehicles, transportation, fuel		\$450.00
equipment, plants, mulch		\$372.00
Insurance		\$1,053.00
office supplies, postage, signage, pamphlets		\$67.00
GST Non Refundable		\$413.00
Printing		\$125.00
Equipment and Materials Total		<b>\$2,480.00</b>
<b>Project Total</b>		<b>\$19,156.00</b>
<b>Project Contributors</b>		amount
Comox Valley Regional District		\$13,000.00
City of Courtenay		\$2,500.00
Ducks Unlimited Canada		\$2,000.00
Federation of BC Naturalists		\$2,000.00
Donations and sales		\$1,000.00
<b>Total Project Funds</b>		<b>\$20,500.00</b>
Surplus (2014 Wetland Fund)		<b>\$1,344.00</b>

## 6 Conclusions and Future Plans

Most of the invasive plants that we are combating are well established in British Columbia. Eradication is no longer an option and we are limited to controlling these plants and keeping them at manageable levels. This means the plants can not reach levels where they would cause damage to our ecosystems or economy. Although these are often portrayed as separate entities, they are in fact intrinsically linked. Ecosystems provide us with clean water, air and habitat to harbour the resources required by society. It must never be taken for granted.

Looking at our loosestrife trend line over the years we can see that we have seemed to reach a low level which is being maintained. A level of control has been attained, however to expect eradication is unreasonable. This plant is widely distributed across North America so there will always be new introductions to deal with. The same may be said of yellow-flag, knotweed and most of the other invasives that we are dealing with. Our efforts can control these plants so that they do not dominate our ecosystems causing the extirpation of native species. However to eradicate them is unreasonable.

What we are seeing develop is the novel ecosystem. These differ in composition and function from our historical ecosystems. Introduced plants are now part of these ecosystems. Our concern must be to keep these ecosystems healthy, functioning, and providing us with the ecosystem services that we take for granted. The footprint that humans have made on Vancouver Island is too large and deep to ever return to historic norms in terms of species composition and distribution. However we do have a duty to maintain as much as the natural world as possible, for our future generations. The famous author and ecologist Aldo Leopold is often quoted "To keep every cog and wheel is the first precaution of intelligent tinkering." The whole goal of invasive plant control is to keep all the parts or cogs in our local ecosystems. Restoring ecosystems to their historic norms is impossible. Too much has changed in the world to ever return. Our climate has changed and so has the CO<sub>2</sub> levels in our atmosphere. These all have effects on the growth of plants and the ecosystems which contain them. If we even can return these to historic norms it will take many years.

While there appears to be an increased awareness of invasive species at the local government level most of the problems I pointed out in last year's report still remain. The two biggest problems that I see that lie within the responsibilities of local governments are illegal dumping of garden waste and the empty development lots. The empty development lots serve as epicentres for invasive plants. Many of the sites (figure 12) where we work are adjacent to these empty lots. These sites for the most part are cleared of all vegetation thus forming a perfect seed bed for invasives to establish and spread. The actual developments are dependent upon the vagaries of the market and thus may take many years before these sites are developed and landscaped. In the meantime future development lots are epicentres for the spread of invasive plants. This is not unrelated to the first problem of illegal dumping. As the lots are empty and accessible they are magnets for illegal dumping of garden waste. The owners of these lots surely have a responsibility to the community to ensure their land is not contaminating adjacent areas.

We urge local governments to start the process of invasive species management with a plan and strategy. Once again I will refer them to the work done by the District of Saanich. There have been

some steps taken in the right direction by our local government however there has to be a coordinated effort if any control is to be achieved in controlling invasive species. The cost in delaying this is to increase future funds required to address this problem. As an example is the money the City of Courtenay is spending to repair the damage caused by knotweed along the River Walkway. This will increase as the infestations get larger.

The Wetland Restoration Project is now over 20 years old and its longevity is tied to its connection with Comox Valley Nature. Our parent organization is close to 50 years old and is membership based, therefore representing concerned citizens who live in this community. Paramount in the fight against invasive species is persistence. We plan to carry on in 2015 although our focus can shift and is flexible to reflect our funding.

Although the amount of work required in fighting invasives is endless our manpower in terms of volunteers is limited. We will work strategically and encourage government agencies to step to the plate and play a greater role in this task.

This year we expanded the continuous cutting project on knotweed as some our older sites showed good levels of control. As these sites were restored, more knotweed sites were brought into the project. In this way we hope to expand the areas where we are currently controlling knotweed. I think we have proven that continuous cutting by volunteers can be effective on small sites with a high ecological sensitivity.

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## Appendix I

### Plant List

#### Courtenay Railway Station Rotary Trail 2014

Plant	Spring Planting		Pot Size
		Number	
Broad-leaved stonecrop	<i>Sedum spathulifolium</i>	4	4 in.
Oregon Sunshine	<i>Eriophyllum lanatum</i>	4	4 in.
<b>Autumn Planting</b>			
Great Camas	<i>Camassia leichtlinii</i>	12	bulbs
Red-flowering Currant	<i>Ribes sanguineum</i>	5	1 gal.
Red Columbine	<i>Aquilegia formosa</i>	2	1 gal.
Garry Oak	<i>Quercus garryana</i>	5	1 gal.
Tall Oregon-grape	<i>Mahonia aquifolium</i>	5	1 gal.
Red-osier Dogwood	<i>Cornus stolonifera</i>	2	1 gal.
Yarrow	<i>Achillea millefolium</i>	2	1 gal.

## Appendix II



### Comox Valley Nature

This community restoration project is an initiative of Comox Valley Nature (Wetland Restoration Project).

This site was totally occupied by Scotch broom. This is an introduced invasive species. It was brought to Vancouver Island over 100 years ago and has spread prolifically since that time. It favours disturbed sites with full sun and will dominate a site excluding all other species.

On this site native plants are being reintroduced as the Scotch broom is being removed. These native plants include Garry oak and many other plants one would expect to find in a Garry oak oak meadow.



The Wetland Restoration Project is an initiative of Comox Valley Nature. The project has been ongoing for close to 20 years removing invasive plants and restoring habitat mainly in the tidal waters of the Courtenay River. This is the first upland site on which we have worked.

Find out more about Comox Valley Nature at [www.comoxvalleynaturalist.bc.ca](http://www.comoxvalleynaturalist.bc.ca)

For 2014 our sponsors include the following organizations for whose support we are grateful.

