Comox Valley Naturalists Society
Wetland Restoration Project Report 2011

Prepared by Frank Hovenden

Comox Valley Naturalists Society

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1 Acknowledgements

Our efforts to remove invasive plants and restore habitat would not be possible without the generous grants from our donors and sponsors. On behalf of the Comox Valley Naturalists Society I would like to thank the following organizations.

Comox Valley Regional District

City of Courtenay

Ducks Unlimited Canada

Federation of BC Naturalists

I would also like to thank our Contractor Ernie Sellentin and his field crew of Brain Hay and Graham Hilliar. Ernie brings a vast body of experience and expertise to the project and we were happy to have him take on the contract on short notice.

From within the CVNS, a special thanks to Al Schut who took care of all the financial details and was always available for advice. Also a special thanks to Lisa Zervakis for her help with designing our latest sign.

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

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

The Wetland Restoration Project was started when the invasive introduced purple loosestrife (*Lythrum salicaria)* was discovered to be spreading in the Courtenay River estuary 20 years ago. The Project was spearheaded by a past president of the society, Betty Lunam, as a volunteer effort, to preserve the last remaining natural areas of the estuary. Over the years the project has expanded both in scope and scale as more invasive plants have been introduced to our area. The volunteer effort has been augmented by a paid contract crew, and the project has taken on a more holistic approach. This includes public out reach and education, planting of native plants, and contact with higher level organizations such as the Coastal Invasive Plant Committee. Much of our funding comes from local governments and reflects our shared concern for protecting our environment and insuring the Comox Valley retains a healthy environment for its citizens.

At the heart of the project are the volunteers from within and outside our society. This year volunteers from our society helped with native plantings in the new Little River Nature Park and broom bashing in the Courtenay River Airpark. Assisting in the Airpark was a group of English-language students from Spain who were attending nearby Excel College. In past years volunteers have come from the Katimavik program, Boy Scouts and the Youth for Ecological Restoration.

Figure 1: Foreign language students and the author working in the Courtenay River Airpark.

This year the project started with Juniper Environmental as our contractor. We were required to change our contractor on short notice. We are grateful that Sellentin's Habitat Restoration was able to step in and make a seamless transition. Ernie Sellentin was familiar with the work from past associations with the project.

In 2011, crews continued to tackle purple loosestrife, yellow flag iris (*Iris pseudacorus),*Himalayan blackberry (*Rubus discolor),*Scotch broom (*Cytisus scoparius)* and various members of the Knotweed complex. At the request of funders, some work was done in the newly established Little River Nature Park. Although this was outside our traditional geographic area of concern (Courtenay River Estuary) the work fitted our project aims and goals.

This report will document the work completed in 2011. This will include the numbers of plants removed and the time worked in the various area. The financial details of the project as well as recommendations for the future direction of the project are included.

3 Background

Invasive species have caused large environmental and economic impacts throughout British Columbia. 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. These plants usually have the ability to establish quickly and dominate sites, sometimes forming monocultures which exclude other species and thus reduce biodiversity.

It is often wondered why invasive plants are so successful in their new habitats. One reason is the lack of biological controls that they have in their new environment. However of of equal importance is their new environment itself. Much of this is the result of our settlement and resource extraction patterns. For example, Scotch Broom and the various knapweeds often follow new roads. Along roadsides, we create and maintain disturbed sites, preventing natural plant secession which would shade these invasive species out over time. Instead we attempt to maintain a static ecosystem where conditions for many invasives are optimized. Needless to say our infrastructure is here to stay and we will have to learn to live with many invasives. However there are places and situations where invasive plants can not be allowed to establish.

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. 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.

In BC the fight against invasive species has historically been centred on those species causing economic loss to a resource. The fight against them has been divided among the various provincial ministries such as the Ministry of Agriculture, Ministry of Natural Resources Operations, Ministry of the Environment as well as lower levels of government.

Biology seldom recognizes jurisdictional boundaries of a political nature which makes tackling a biological problem extremely difficult. The Coastal Invasive Plant Committee is an attempt to take a broader geographic view of the problem and is registered non-profit society serving our geographic area. This organization has provided training and an inventory data base, as well as sponsoring weed removal crews. The problem is immense, and limited funding has meant limited success.

This year the author attended the Annual General Meeting and workshop of the Coastal Invasive Plant Committee which was held in Deep Bay and the CVNS has taken out a membership in the committee. This will help keep us up to speed with the changing tools and methods in the fight against invasive plants.

4 Summary of Work Completed

This year, work was conducted in seven core control areas as well as the newly established Little River Nature Park. The core areas are identified as priority because they are areas where Purple Loosestrife has been found. They are either tidally influenced or are along watercourses that connect to the estuary. The work is focused 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. The areas are described below and displayed in Figure 2.

·Area 1: Comox Bay Farm to Barry Farm
·Area 2: Dyke Road Slough (Simpson and Barry Farms)
·Area 3: Courtenay River Estuary West (the west side of the Courtenay River and Estuary from the Airpark Marina to Millard/Piercy Estuary)
·Area 4: Courtenay River Channel (both sides of the Courtenay River from the bend at Lewis Park, to the Airpark Marina)
·Area 5: Courtenay River North (from the bend in the Courtenay River at Lewis Park up past the confluence of the Puntledge and Tsolum Rivers - includes the Old Tsolum Channel)
·Area 6: Courtenay River Estuary East (the east side of the Courtenay River and Estuary, south of the old sawmill site and extending to the bird viewing platform on Dyke Road)
·Area 7: Glen Urquhart Creek Watershed (from Williams Road, to the storm water detention pond below Malahat Drive).

Responding to requests from local governments the following work was done outside the core areas of the project.

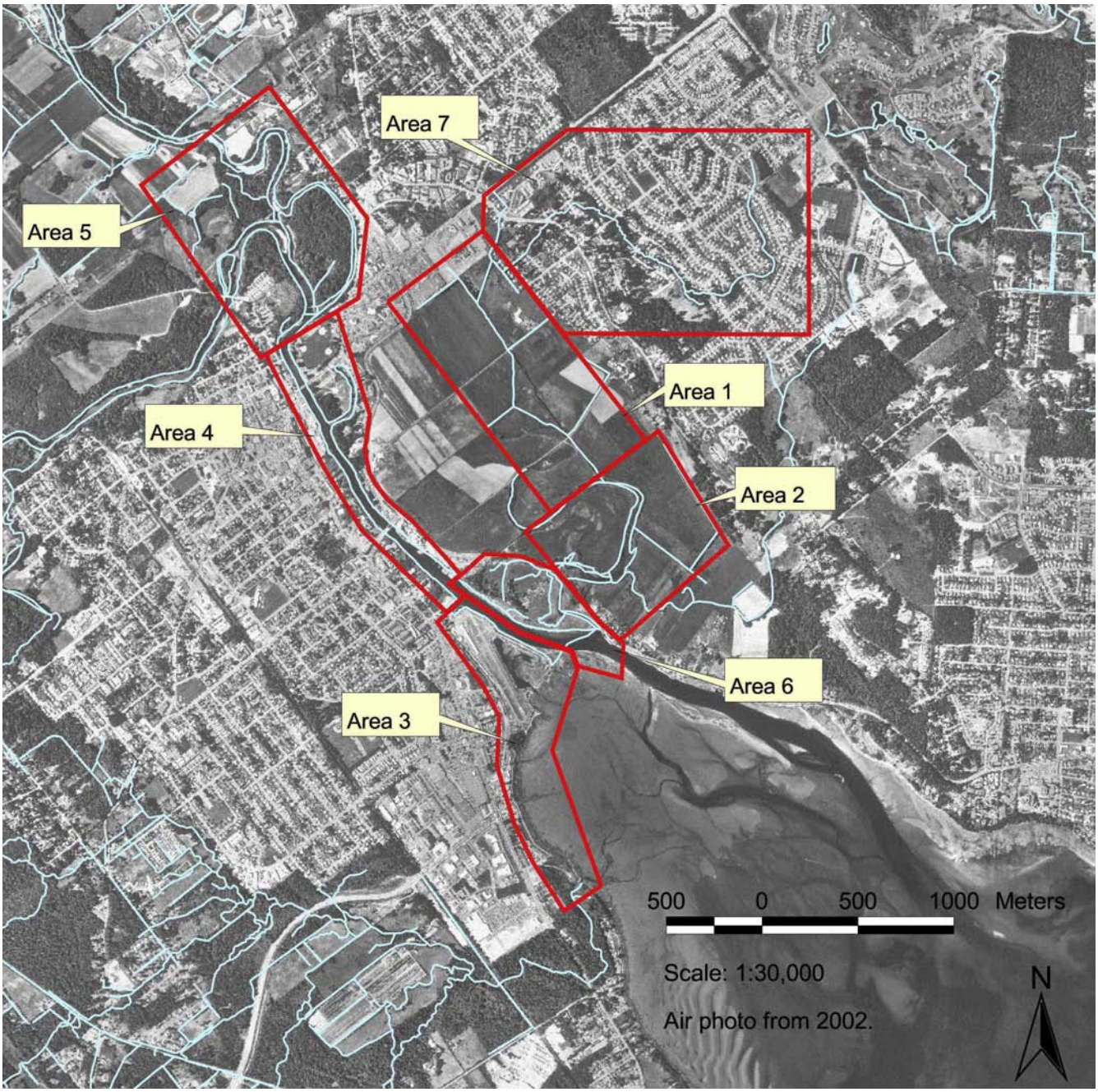
Mayfair Road
Gorse removal alongside Mayfair Road was done on request by Debi Lister from Comox Valley RD. 200 kgs of gorse came from this site.

Argyle Road
This site had seed heads from purple loosestrife removed last year and the plants dug out this year. Many large plants were removed.

Hardy Road
A single large plant of purple loosestrife was found by Brian Hay, in full bloom 2nd week of September and removed.

Lake Trail Road
A large yellow flag iris was removed from Morrison Creek . Morrison Creek Streamkeepers were made aware by Brian Hay that there are plants in stream and wetland. A neighbour has a pond which runs into the site and is the likely seed source for the area.

Figure 2: Core areas of the Wetland Restoration Project



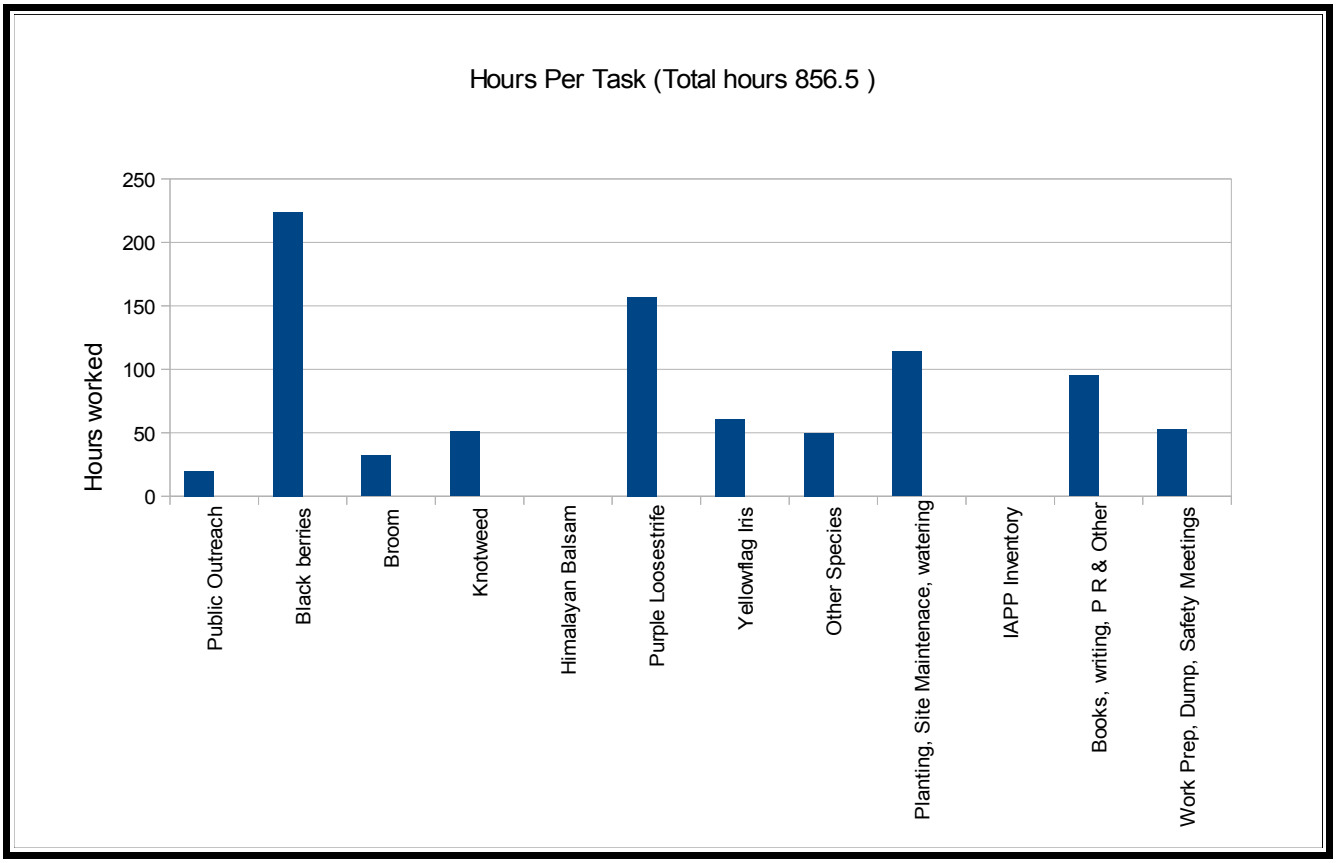


Table 1: Project hours by task

The project hours by our contract crew were tracked by task. Table 1 shows the total hours worked by both Juniper Environmental and Sellentin's Habitat Restoration In addition I would estimate a further 150 hours were spent by volunteers chiefly on Scotch broom control and and signage.

Weed Control

Purple Loosestrife *(Lythrum salicaria)*

The number of purple loosestrife plants removed this year was 2328 which is an increase from the 1663 plants found the previous year. This is disturbing as it is the second year of increasing numbers. The vast majority of these plants continue to come from Area 3. It was speculated in last years report that many of the new plants were coming from areas where there had been disturbances. The last two winters have seen several severe high water storm events which may have contributed to the disturbed areas.
Outside of our core area a small infestation off of Argyle Road in Royston was dug up this year. It was discovered in 2010 when time only permitted the removal of the seed heads.

Figure 3. Brian Hay holding purple loosestrife plant

The seeds of purple loosestrife remain viable for many years. It maybe possible that we have reached the nadir of the trend and what we are now seeing is the ongoing germination of the residual seed bank within the area.

Overall the trendline (Figure 2) shows a decreasing population, however we must continue our efforts to prevent a reversal of this trend.

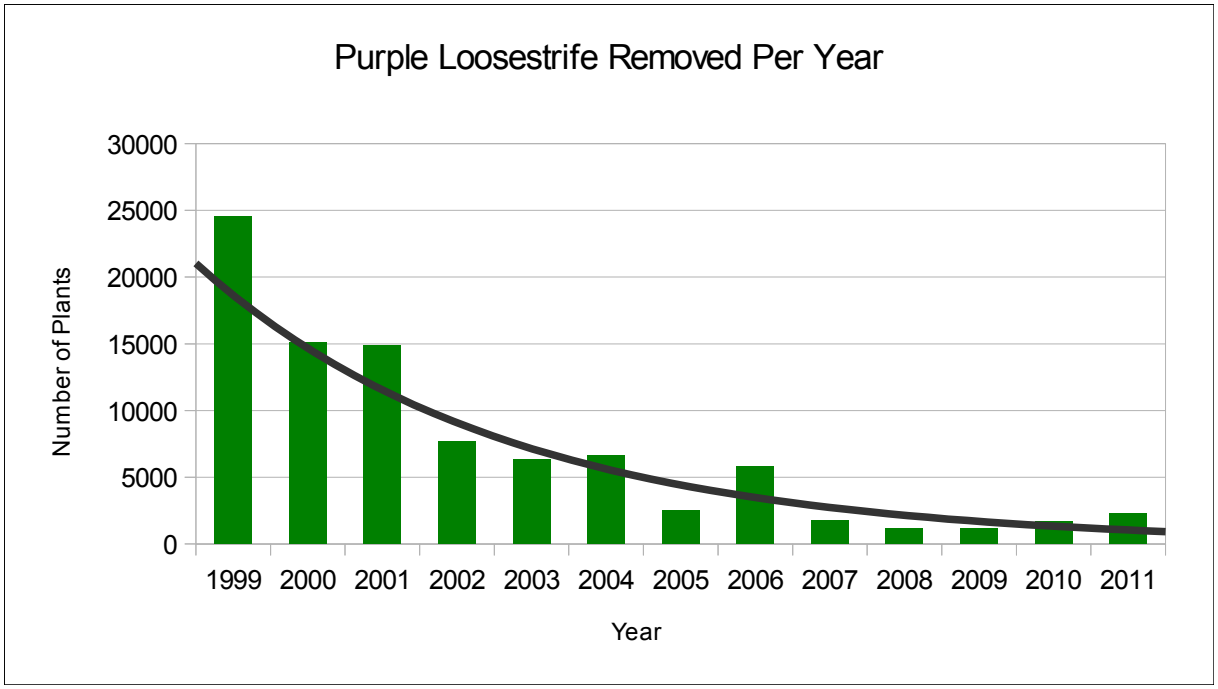


Table 2.

Yellow Flag Iris *(Iris pseudacorus)*

The yellow flag iris is native to Europe and was imported to this area as a garden plant. Unfortunately it is extremely prolific in our local wetlands where it can out-compete native plants like the bull rush (*Typha spp.)* a species important for bird habitat. A local example of an infested wetland is the Lazo Marsh where it was introduced intentionally and now dominates the site.

Sixty hours were spent on Yellowflag Iris control. About 50 Kg. of the plant were removed from Morrison Creek with the rest coming from the Courtenay River estuary (Area 3). The large rhizomes have to be transported to the landfill site to prevent further spread.

Knotweeds *(Fallopia spp.)*

This year 31 hours were spent controlling Knotweed. One large clump in area 3 south of the Floatplane ramp was dug up.

As seen from the adjacent photo the infestation is growing on the banks of the Courtenay River and is embedded in the rip rap which forms the bank. The clumps north of the ramp were cut

Figure 4.Knotweed growing beside the Courtenay River

back several times and covered with plastic tarps. This has not killed the plant but hopefully is keeping it in a weakened condition. These clumps had been torched using a tiger torch in 2010. It was found that this was not effective due to the high moisture content in the stems. We had hoped to use a stem injection of herbicide this year on these clumps however it was determined that the patch was too close to the water line for this method to be implemented.

Himalayan Blackberry *(Rubus discolor)*

The blackberry is widely naturalized in our area although its origins are from Asia. It spreads prolifically on disturbed sites both through seeds which are widely distributed by birds and through vegetative rootings. Our goals have been to control and limit its spread. In parts of the Courtenay River Airpark the blackberry actually provides a useful role in limiting public access to sensitive areas. Its dense growth and thorns discourage the public and dogs from the shores of the lagoon, giving more security to overwintering wildfowl. However if allowed to spread it could limit access to the entire site. The plant's spread in the upland areas is being controlled however its presence along the shoreline is acceptable. This year 224 hours were spent controlling blackberry. Much of this was in the Courtenay River Airpark (Area 3) with the remainder around the Dyke Road viewing platform (Area 6).

Figure 5. Himalayan blackberry

Scotch Broom (*Cytisus scoparius)*

Scotch Broom is an introduced garden ornamental shrub which was brought to Vancouver Island over 100 years ago. It is firmly established in the region and thrives in full light on disturbed sites. The Courtenay Airpark (Area 3) has been the focus of our efforts as it was initially dominated by Scotch broom. This area is now largely broom free though the volunteer efforts of the Comox Valley Naturalists which continue to hold an "annual broom bash" in this park.
Beside the volunteer efforts, 32 hours were spent controlling broom by our contract crew.
The Comox Valley Regional District has employed the Bridges Crew to pull and cut broom in their newly established Little River Nature Park.

Other Invasive Species

Over 200 kg of gorse *(Ulex europaeus)* was removed from Mayfair Road at the request of the Comox Valley Regional District staff.

New Plantings

The Courtenay River Airpark is located in the centre of the Courtenay River estuary. It was constructed as a rehabilitation project and was formerly the site of the Courtenay Sewage lagoon (see Appendix II). Much of the material trucked in to construct the upland portions of the site consisted of fill from construction sites. As a result the area is lacking in organic matter and the soils are extremely hot and dry during the summer months. This moisture deficit presents a challenge to establishing vegetation. In restoration terms this is known as a filter and must be removed if the site restoration is to be successful. In an attempt to moderate the soil conditions, large organic debris was scattered around the site this year and especially around recent plantings. This is meant to shade the soil and thus help preserve moisture in it during our summer drought period. There is a convenient source of this material along the trail at the south end of the Airpark. Winter storm surges from the south east deposit shore logs in this area which have to be removed to keep the trail open. These shore logs provide a readily available source of large organic debris (LOD) which is easily accessible.

This debris scattered on the site acts to shade the soil and thus maintain more moisture in it. The LOD with new plantings can also be used to discourage the use of unauthorized trails in the park. This has met with limited success as the public quickly removed any debris scattered over the unauthorized trails.

Figure 5. Large woody debris

50 native plants were put into the Courtenay River Airpark this year. These plants are all compatible with the Garry Oak meadow ecosystem as noted in the Garry Oak Gardener's Handbook The plants were mulched and then watered by hand, weekly throughout the summer months. The first year survival was over 90%. The plants are listed in appendix I.

These plants were watered on a weekly basis during July and August using a fibreglass tank which was donated by the City of Courtenay, in conjunction with a battery operated pump.

Old Plantings

In 2007 Camas *(Camassia quamash)* seed was collected from area 6. It was spread and covered with mulch in the Courtenay River Airpark (Area 3). This was done as an experiment, as in the past we had only planted the mature bulbs. It should be noted that the young camas plants are rather inconspicuous especially when mixed with grasses. This year we noticed mature camas plants in bloom for the first time in the area where the seed had been spread. It appears that speading camas seed under mulch is at least moderately successful.

Figure 6. Camas plant grown from seed

A readily available source of wild camas seed is available within the Hollyhock flats area of Area 6. This is much cheaper than purchasing the bulbs. This year we collected the seed heads from the maturing camas plants. The seed has been separated and it is our intention to spread this in the Courtenay River Airpark in the late winter of 2012.

Public Outreach

Signage

The CVNS started installing Signage in the Courtenay River Airpark several years ago. We started by installing temporary signs identifying the native plantings. As these were well received by the public we replaced these with more permanent signs installed on 4x4 posts.
This year 3 signs had to be reinstalled after being vandalized and knocked over during the winter months. In addition some signs had to be cleaned of tagging graffiti during the summer months.
A larger sign (appendix 3) explaining the history of the Airpark and our role was erected this year. This was a recommendation from a previous year's Wetland Restoration Report. The CVNS designed and installed the sign at the north end viewing platform.
At the request of our contractor several temporary signs were installed around invasive species which were being worked upon. These were the common tansy and Japanese knotweed.

Community Events

Earth Day celebrations were held in Simms Park on April 23rd. The CVNS display provided information on the Wetland Restoration Project. Example of invasive plants were displayed and brochures were distributed to the public. Volunteers staffed the tables and answered questions by the public.

Newspaper Articles

One article was written by myself and submitted to the local press and our sponsors. It discussed the successful return of camas to the Courtenay River Airpark. It was published in the Comox Valley Record as well as BC Nature.

5 Financial Summary

The 2011 budget is presented in Table 3. The project was slightly larger than the previous years. This was offset with a slight increase in contributions. This came as a result of a grant from the CVRD for the volunteer planting done by the CVNS in their newly established Little River Nature Park. Extra monies were also received from the City of Courtenay to pay for the new sign installed in the Airpark. Our funding has been stable for last few years. Surpluses from the project are placed in a Wetland Restoration fund and not general revenues of the CVNS. This gives us a degree of flexibility to operate the project while waiting for grant monies.

It should be noted that the Regional District waives the dump charges at the Pidgeon Lake Landfill for the plant material that we dispose of there.

Table 3. 2011 CVNS Wetland Restoration Project Budget			
Labour	**Hours**		**Total**
Juniper Environmental	170		4533
Sellentins Restoration	688		17639
CVNS Report	50		1000
Labour Total	908		**23172**
Vehicles, transportation			1060
Plants			364
Insurance			994
Soil amendments			130
Signs			253
Equipment			219
Equipment and Materials Total			**3020**
Project Total			**26192**
Project Contributors			**amount**
Comox Valley Regional District			18000
CVRD Planting Project			1500
BC Nature			1300
City of Courtenay			2500
City of Courtenay Airpark sign			145
Ducks Unlimited Canada			2000
Comox Valley Naturalists Society Wetland Fund			747
Total Project Funds			**26192**

6 Conclusions and Future Outlook

The Comox Valley Naturalists Society had a successful year for the Wetland Restoration Project. We were able to recruit a new contractor (Sellentin's Restoration) on short notice and carry on. We installed new signage in the Courtenay River Airpark which has been well received.

Unfortunately the task in controlling invasive plants remains daunting. While purple loosestrife numbers remain relatively low, the knotweeds are proving to be problematic. Much of the infestation is deeply embedded in the rip rap which now forms the bank of the Courtenay River. This makes it next to impossible to dig out. Efforts at continual cutting have proved fruitless. As a last resort we have considered herbicide. The accepted treatment is a stem injection with glyphosate. However most of this plant is too close to the water for this method to be used on the sites in our area. Until an environmentally acceptable method is devised we will continue to limit its spread though continual cutting.

New opportunities to tackle this problem may present themselves in the near future. The Estuary Working Group associated with Project Watershed is examining an option of opening up the Airpark lagoon to the Courtenay River. This is still at an early study phase for which funding is being sought. A support letter has been sent by the Comox Valley Naturaists Society. The goal is to complex the estuary and thus help fish survival. To this end the rip rap which forms the river bank would be breached. This may provide an opportunity to remove the knotweed found here. In the meantime we will continue to maintain contact with the Estuary Working Group and monitor this possible project.

On a provincial scale invasive plants seem to be getting more attention from government. This year 18 more species were added to the Weed Control Act (Appendix III). These include many of the species we have been battling in our project such as purple loosestrife, yellow flag iris and Japanese knotweed. This puts a legal onus on land managers to address these species when found on their land. How this will affect our project is uncertain, however it does seem to give us some vindication for the work we have done over the years.

The areas we work in are surrounded by an increasing urban landscape. The potential for more introduced invasives remains high. Many of the invasive plants are rampant in the adjacent landscapes. It is only through a steady and continual effort that these invasive plants can be excluded from our increasingly valuable native landscapes.

It is our intention to continue the project in 2012. In addition to planting nursery-grown native plants we will be direct seeding camas. If successful we hope to see the results in 4 to 5 years. In addition we will continue to seeks ways to control the knotweeds embedded in the rip-rapped banks of the Courtenay River.

7 Literature Cited

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Appendix I

Plant List
Courtenay Riverway Airpark 2010

Plant	Number	Size
Nodding Onion *Allum cernuum*	20	4"
Kinnikinnick Arctostaphylos uva-ursi	10	4"
Shore PIne *Pinus contorta*	5	1gal
Red -flowering current *Ribes sanguineum*	10	1 gal
Indian Plum *Oemleria cerasiformis*	*5*	2 gal
Black Hawthorn *Crataegus douglasii*	5	2 gal
Trailing Blackberry *Rubus ursinus*	10	1 gal

Appendix II

A History of Transformation

The transformation of the Courtenay River estuary at the Courtenay Riverway Airpark is an example of the changes to lands and waterways that have occurred since Europeans settled this area in the 1800s, and reflects our changing relationship with the land.

This part of the Courtenay River estuary was once tidal wetland similar to the area across the Courtenay River. In 1963-64 the area was developed as a sewage lagoon to service Courtenay's population. An earthen dyke was constructed, cutting off the lagoon from the rest of the estuary *(photo below)*.

The sewage lagoon was abandoned in 1981-1982 and between 1988-1991, the six-hectare Park was built and the lagoon was opened to the ocean *(photo below right)*. A portion of this work was compensation for intertidal habitat lost during expansion of the Comox Marina.

In 1991-92 the Courtenay Riverway Airpark was opened, and the Park has become a key feature of the trail.

From its beginnings, the Comox Valley Naturalists Society have been working to steward this Park by re-establishing native species.

The Comox Valley Naturalists Society ~ *Restoration and Stewardship*

The Naturalists provided input into the construction and design of the Courtenay Riverway Airpark and have made a long-term commitment to restoring the area. Since much of the Park was composed of fill, it started off with very little vegetation. The Naturalists have planted and tended native tree, shrub and grass species and have monitored the natural influx of native species. With help from their funding partners, they remove invasive non-native plants which compete with native plants, threatening valuable habitat.

Garry Oak Meadow Ecosystems ~ *Rare and Valuable*

The Naturalists have identified this Park as a location to recreate a piece of Vancouver Island's most threatened ecosystem: *Garry Oak meadow*.

Garry Oak trees are suitable for the dry upland areas of the site, and the meadow ecosystem is ideal for preserving the open views of the Park. It is hoped that the Garry Oak trees will provide the structure for other native fauna and flora to take hold. Garry Oaks and their associated ecosystems are considered to be especially well adapted to the types of conditions that are predicted in response to climate change.

Courtenay Airpark and Restoration Area ~ *A Vision for the Future*

The Naturalists expect that their work will be ongoing for many years as natural succession proceeds on the site. Their work assists natural processes to attain a specific goal: a Garry Oak meadow that offers valuable habitat potential for many species of birds and plants, as well as enjoyment by the community for years to come.

Please help us steward the Courtenay Airpark by staying on the designated paths.

As you walk, look for interpretive signs that highlight some of our native plants.

Photos by Kristin Kaptein

The following organizations are partners in this restoration work:

Comox Valley Regional District

Ducks Unlimited Canada Conserving Canada's Wetlands

Nature Canada

BCnature Federation of B.C. Naturalists

Comox Valley Naturalists Society

Appendix III

18 NEW IP SPECIES ADDED TO THE WEED CONTROL ACT. As of July 21, 2011, an Order in Council was completed to amend Schedule A, Part 1 of the Weed Control Act regulations. 18 species (listed below) have been added to the Provincial list of Noxious weeds and most are Priority Coastal Invasive Plants. What this means is all land managers are now legally required to manage species like Cordgrass, Knotweed and Giant Hogweed. Amending the Act re-instates BC commitment to addressing invasive species and communicates to property owners and land managers that the province is paying attention to invasive species management.

List of 18 new invasive plants added to Weed Control Act:

- Chervil, Bur (Anthriscus caucalis)
- Common Reed (Phragmites australis subsp. australis)
- Cordgrass, Dense flower (Spartina densiflora)
- Cordgrass, Salt Meadow (Spartina patens)
- Cordgrass, Smooth (Spartina alterniflora)
- Cordgrass, Common (Spartina anglica)
- Flowering rush (Butomus umbellatus)
- Giant Mannagrass/Reed Sweetgrass (Glyceria maxima)
- Garlic Mustard (Alliaria petiolata)
- Giant hogweed (Heracleum mantegazzianum)
- Knotweed, Bohemian (Fallopia bohemica)
- Knotweed, Giant (Fallopia sachalinensis)
- Knotweed, Himalayan (Polygonum polystachyum)
- Knotweed, Japanese (Fallopia japonica)
- Loosestrife, Purple (Lythrum salicaria)
- North African Grass (Ventenata dubia)
- Thistle, Milk (Silybum marianum)
- Yellow flag Iris (Iris pseudacorus)