



**Display at Community Event**



**Common bugloss**



**Hoary cress**



**Bohemian knotweed**



**Black henbane**

*Prepared for: Boundary Invasive Species Society*

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January 2020*

## Acknowledgements

The Boundary Invasive Species Society (BISS) is grateful for the funding support from partners for delivering all programs throughout the year.

We would like to recognise the assistance of:

- Field staff who completed activities this season including a summer student, seasonal Education Coordinator, and the Program Manager;
- The board of directors of the society who donate their time to guide the society and its programs;
- All the society members and partners that operate management programs, provide guidance, or assist with projects.

The programs would not operate without the generous support of partners.

The terrestrial plant awareness and management program was completed with funding received from: Regional District of Kootenay Boundary Weed Function - Electoral Areas D and E; Christina Lake Parks and Recreation Commission; Min. Forests, Lands, Natural Resource Operations and Rural Development; Min. Transportation and Infrastructure; BC Hydro; FortisBC Energy; FortisBC; Canada Summer Jobs Program; Village of Midway; City of Greenwood; Phoenix Foundation of the Boundary Communities.

*"We acknowledge the financial assistance of the Province of British Columbia" for supporting the awareness program.*

In-kind donations from: Christina Lake Stewardship Society, Granby Wilderness Society, Interfor Ltd., Kootenay Boundary Farm Advisors Program, and many volunteers and school classes helping with planting projects.

The aquatic plant surveys and education were completed with Grant-in-aid funding support from the Regional District of Kootenay Boundary Electoral (RDKB) Electoral Area D and E, Christina Lakes Parks and Recreation Commission, Village of Midway, City of Greenwood, and Canada Summer Jobs Program.

Support from the Habitat Conservation Trust Fund and Province of BC enabled elevated sampling for invasive mussels this year along with sampling equipment purchase.

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## 1.0 Personnel

Staff: Program Manager - Barb  
Education Coordinator – Jen  
Seasonal Technician – Cass

Boundary Invasive Species Society (BISS) Officers and Directors: Lisa, Doug N., Glen, Debbie, Janine, Erin and Doug S.

## 2.0 Invasive Species Program Overview

The Boundary Invasive Species Program is in its 20<sup>th</sup> year and continues to work to increase awareness of invasive species, their impacts to our resources, and to coordinate treatment efforts within the Boundary area. The program is making a difference. In spring 2019 a summary report on the *Status of Invasive Plant Species in the Boundary 2018* was generated to assess whether species specific objectives are being met. A similar report will be completed for 2019 giving a snapshot of progress each year.

The program provides residents of the Boundary with a reliable source of information regarding invasive species identification and management and works with land managers to coordinate treatment efforts towards priority invasive plants and areas. Without such a program, residents would not have access to management information, assistance with plant identification, a place to report new infestations, or a contact to direct complaints too. Many people contacted the program this year for help in identifying invasive plants, formulating effective management strategies or to request a release of biological control insects. Some requests received were related to identifying insects. Many individuals contacted this year carried out some level of control on their properties, however some individuals refused to control invasive plants on their properties.

## 3.0 Prevention

Preventing species from being introduced into our area is a focus for the program. To facilitate control prior to reaching the Boundary the program continued the Weeds Cross Borders partnership with Okanogan and Ferry Counties and the Okanogan and Similkameen Invasive Species Society. Within this project the adjacent US counties work to control yellow star thistle (*Centaurea solstitialis*) and crupina (*Crupina vulgaris*), black henbane (*Hyoscyamus niger*), north African grass (*Ventenata dubia*), and jointed goat grass (*Aegilops cylindrica*). The 2020 calendar was handed out in the winter at local offices and businesses throughout the Boundary. The project partners are working on a re-print of the field guide for 2020.

To reduce accidental introductions on watercraft the Society worked with and supported efforts by the Christina Lake Stewardship Society to deliver a Don't Move a Mussel awareness program this summer using one summer student. The Society did some work across the Boundary with water recreation users at boat launches and campgrounds.



Best Management practices are available for a range of industries including roadside maintenance (updated in 2019), parks, forestry and development. Promoting prevention during planning of forest harvesting was done through the local Range Forest Working Group.

#### **4.0 Early Detection and Rapid Response (EDRR)**

The provincial government developed an EDRR plan for BC that includes all plant and animal taxa. One species considered prohibited in BC, dyer's woad, was historically present in the Boundary and has been reported to no longer be grown on the site. The mouse-ear hawkweed site was monitored but no plants were found again this season. In fall 2018 North Africa grass (*Ventenata dubia*) was found in the Gilpin area by staff and treated in fall 2018 and spring 2019. The province completed extent surveys in 2019 locating 3 small new sites north of Rock Creek and many sites in the Pend D'oreille river valley south of Trail. The province is currently re-evaluating the status of this species as Provincial EDRR and may move it to the provincial containment category based on number of locations it has already been found. Black henbane was found in Rural Grand Forks late this summer and provincial staff did some manual removal but did not get permission to remove plants on all the properties.

Research indicates that most new species are present for over 20 years before they are reported, so the program is working on improving staff and partner plant identification skills to recognise new species amongst the diverse native plant communities in our area. A training session with Okanogan county staff to visit sites in BC during July with species on the BC proposed prohibited list or Washington eradicate list. Species included perennial pepperweed (Oroville, WA) giant reed (Osoyoos, BC), wild four O'clock (Osoyoos, BC), North Africa grass (Grand Forks, BC), and annual bugloss (Grand Forks, BC).

#### **5.0 Education**

The focus of the program continues to be raising awareness of the impacts of non-native invasive plants on our resources and encouraging management by everyone. The main themes of *Clean, Drain, Dry* your watercraft and gear, *Grow Me Instead*, *Play Clean Go*, *Work Clean Go*, *Don't Let It Loose*, and *Don't move Firewood* are all messages being promoted. An effort was made to ensure the public understands that invasive species affects us all, and the only way to stem the tide is if everyone assumes responsibility for invasive plant control rather than pointing fingers or waiting until someone else becomes proactive. This section has been organized by target audience including horticulture, aquatics, youth, and general public. The education coordinator delivered most of the public education activities this year (website, Facebook, community events, articles,) while the program manager delivered the presentations and one on one contacts.

### 5.1 Horticulture:

Horticulture is responsible for the introduction of over 60% of the invasive plants that have become problems within Canada. Reducing the number of invasive species sold through retail nurseries locally has been a focus in combination with informing gardeners about alternative non-invasive species that could replace invasive plants in their gardens. In the past few years the program has been promoting the Grow Me Instead program that was developed by ISCBC. Nurseries visits were completed this year along with visiting businesses selling wildflower seed mixes. Some of the stores were no longer selling mixes with invasive species based on information they had received in previous years. Many of the nurseries and greenhouses in this area mainly sell annuals and vegetables. Some of the commercial nurseries in Grand Forks are still growing and selling Russian olive which has triggered complaints from OASISS. We hope to put together an email newsletter to send to the nurseries and greenhouses to keep them updated on any new information. The display was set up at thirteen different fairs, markets and festivals featuring Grow Me Instead materials.



### 5.2 Recreation

The Boundary offers extensive trail systems and camping opportunities resulting in large numbers of recreationalists coming into our area each year. This high use brings with it high potential of introduction of new invasive species and potential for increased spread of existing species. To date a combination of approaches including signage to target people coming from outside the area and presentations and regular contact with local recreation groups has been used. Staff are working with Trails to the Boundary Society to establish boot brush stations and bike wash stations at several locations using gas tax funding.

A full-page ad was put into the 2019 *Boundary Visitors Guide* on Play Clean Go and Clean drain Dry (CDD). Several articles this year in local papers were on Clean, Drain, Dry and also Don't Move Firewood.



Staff were not able to get pamphlets to the hunting licence vendors for stuffing into the hunting and fishing regulations this year. Signs along the KVR and C&W rail trails at access points should be updated with current contact information and the Play-Clean-Go information in 2020.

### 5.3 Aquatics

The main target audiences for aquatics are fisherman and boaters transporting equipment between water bodies. In the Christina Lake area, the Society supported work by the Christina Lake Stewardship Society (CLSS) delivering year eight of an awareness program focusing on preventing introduction of mussels. This included providing a summer student one day per week at the information booth at the Texas Creek Boat launch to hand out printed materials (rack cards and mussel wallet cards) and talking to boaters. CLSS also talked to resorts, updated information packages for vacation rentals, and promoted CDD at local events. A pop-up display is up in the Interpretive Gallery at the CLSS office. For further details contact the Christina Lake Stewardship Society.

BISS delivered aquatic invasive species (AIS) awareness across the Boundary as part of sampling and attending public events. There is a total of 28 CDD signs already installed at high use boat launches and river access points. CLSS is planning to install another 10 CDD signs.



Private campgrounds had been visited in 2015 and should be revisited in 2020. The display was set up at thirteen community events with information on AIS. One article was specifically about Clean Drain Dry this year. Our main activity this year was staff speaking with the public throughout the season as they completed inventory and sampling work. There is a Clean Drain Dry billboard east of Grand Forks that was paid for by BISS, CKISS, CLSS and RDKB Grant in Aid from Electoral Area C.

### 5.4 Youth:

A grade 5/6 class from Hutton learned about invasives and helped restoration maintenance (June 12) and planting 140 shrubs and trees at Boothman's Oxbow Provincial Park (Oct 9). That same class is doing a one day a week outdoor classroom program, so we supported them by providing 10 copies of the plants of the Southern Interior of BC as a class resource to help the kids learn native from non-native. A class from BCSS helped with restoration site maintenance at the Midway trails site (June 3). Handout materials were provided to CLSS for a school class that CLSS lead a field day for.

### 5.5 General Public

#### 5.5.1 Display at Community Events:

In 2019 the display was set up at the Beaverdell River Day (1 day), Christina Lake Homecoming (1 day), Big White Ciderfest (1 day), Big White Huckleberry Festival (1), Rock Creek Fall Fair (2 days), Grand Forks Fall Fair (2 days), Midway Trail Day (1 day), Grand Forks Harvest Festival (1), and Farmer's Markets in Grand Forks (2), Beaverdell (1) Rock Creek (2), Beaverdell (1), and Christina Lake (1). A garden bucket draw was done at the Rock Creek Fall Fair to help track how many people visit the booth a person from Rock Creek won the draw this year. There were 560 people who asked questions at the various fairs and markets and significantly more who took information but did not ask questions so were not recorded. This is 125 less people than last year.

Staff worked hard on getting articles into local papers and submitted 23 articles to 6 different papers resulting in 77 articles printed this year, far exceeding any other year.

Two radio interviews were done on encouraging reporting of longspine sandbur possible locations with CBC daybreak (Aug 14) and a second one with Easy Rock (Aug 19).



### 5.5.2 Field Days

The spring field tour was done in conjunction with the AGM this spring in May in the Rock Creek and Midway areas.

### 5.5.3 Direct Contacts:

Responded to over 70 requests from the public for information ranging from weed identification to management. Most requests were by phone/email again this year and fewer requests for site visits indicating more people want digital information. Several requests were from people who had already contacted the program in previous years who now wanted more information. There were about 20 members of the public that talked to staff doing manual treatment and aquatic sampling this year. It is a good way to connect with the public and educate them on invasive species.

### 5.5.4 Publications

#### New Publications:

The 2020 Weed Cross Borders calendar was distributed through local businesses, partners and municipal and provincial offices. In total 429 were handed out. The cross-border field guide is being updated and should be printed in early 2020. A list of existing publications that were distributed is contained in Table 1.

**Table 1. Number of Publications Distributed during 2019**

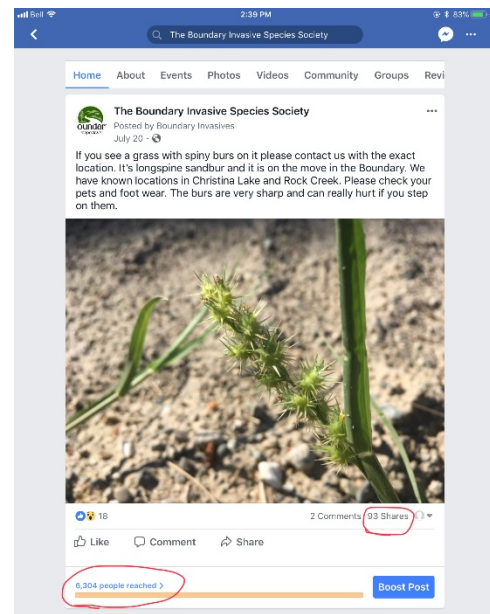
Publication Name	Amount	Publication Name	Amount
Weeds Cross Borders Guide to Identifying Invasive plants Book	10	Prohibited AIS book	0
Field Guide to Noxious Weeds	189	CLSS stop the spread	0
Calendar	429	Water front living	0
TIPS Hunting	4	Zebra and Quagga wallet card	1
TIPS Horse	0	Colouring pages eab	6
TIPS Bike	0	Colouring pages dmf	16
TIPS Motorized	1	Giant Hogweed info card	0
Boundary Invasive Plant Bulletin	17	Flowering Rush info card	1
Prevent Weed Spread rack card	5	NZ mud snail wallet card	2
Noxious and Invasive Weeds of the Boundary	17	TIPS – LO, JK, HA, ST, PV	102
Play Clean Go rack cards	9	Bookmarks	59
Pencils	114	Don't Let It Loose rack card	6
Puncture vine info card	5	Don't Let It Loose sticker	15
AIS wallet	4	Don't Compost sticker	2
Aquatic Invasive Species of the Kootenays	6	Grow Me Instead wallet card	17
DFO Stop the Spread of Aquatic Invasive Species rack card	0	Grow Me Instead snapshot brochure	31
Boot brushes	35	Grow Me Instead booklet	3
Total Distributed			1325

### 5.6 Presentations:

A work clean go presentation and preventing training was complete with a tree planting crew based out of Rock Creek. A short talk was given at the Grand Forks Trails Society meeting in July focusing on identification of Scotch thistle, rush skeletonweed, greater knapweed, puncturevine and longspine sandbur. A presentation to the Village of Midway council on identification and management. A presentation to the Area D advisory planning committee on the legislative framework for invasive plants. A presentation on North Africa grass identification was given at the Kettle River Stockman's Association fall meeting. A update on program activities in the Christina Lake area was give at the Christina Lake Annual Watershed Review Nov 20.

### 5.7 Social Media and Website

The Facebook page had more action again this year with the number of likes increasing to 339 by the end of year. The distribution of posts seems to vary each time and some work was done to increase reach by getting other non-profit organizations to also share the posts. This strategy really increased the reach. We received several reports of new invasive plant sites via Facebook and requests for identification. Overall Facebook has been a good tool to help get out information and engage people from all walks of life.



The website continues to be improved upon with more information being added as time allows. A few people have contacted us through the website. It has been an invaluable tool giving us the ability to easily share publications and information on Facebook as well as with people who visit the website. The average amount of time a person spends on our website is about 1 minute 45 seconds.

### 5.8 Meetings and Workshops Attended

The Boundary Invasive Species Program staff or board members attended many meetings this past season as a representative for the Boundary Invasive Species Society:

- Attended the Kettle River Stockman's Association fall meeting (Nov 14) and Grand Forks Stockbreeders spring meeting (March 21) to provide a program updates and a presentation on North Africa grass;
- Attended the Regional Invasive Species Organisations Summer Field Tour in Harrison Hotsprings, BC (September 23-25);
- Joined 2 calls on Aquatic Invasive Species Program Coordination with the province and other organisations;
- Joined several monthly Regional Invasive Species Organisations calls to share program ideas and work on joint initiatives;
- Joined 1 ISCBC strategic call;
- Attended a Weed Cross Borders Project planning meetings (March);
- Attended a Watershed Planning Meeting in Grand Forks (Sept 26);
- Delivered a joint presentation with OASISS to the Standing Committee on Finance and Government Services in Kelowna (June 12).

### 5.9 Education Program Summary

Each of these components has helped to increase public awareness, support for the program, and increase participation in invasive plant management by private landowners. Information was provided through site visits and by providing fact sheets and treatment information. The number of inquiries from rural Grand Forks regarding hoary alyssum was low again this year and there is a sense of frustration by residents in the area about the overwhelming problem with hoary alyssum and some are expressing desire to establish enforcement.

This year the types of requests from the West Boundary were mainly to report infestations of our priority invasive plant species, requesting enforcement, and asking for management advice or to request information on RDKB treatment programs. There were some repeat calls through the year from people wanting more help with timing of treatments or to refine management approaches. Many questions this year were related to the increase in St. John's wort. Many information requests were to identify plants. More requests were by phone and email again this year and less site visits. The education program by the BISS is working in a positive direction. Since there are so many new people moving into the area efforts to connect with them will need to continue.

### 6.0 Inventory and Monitoring

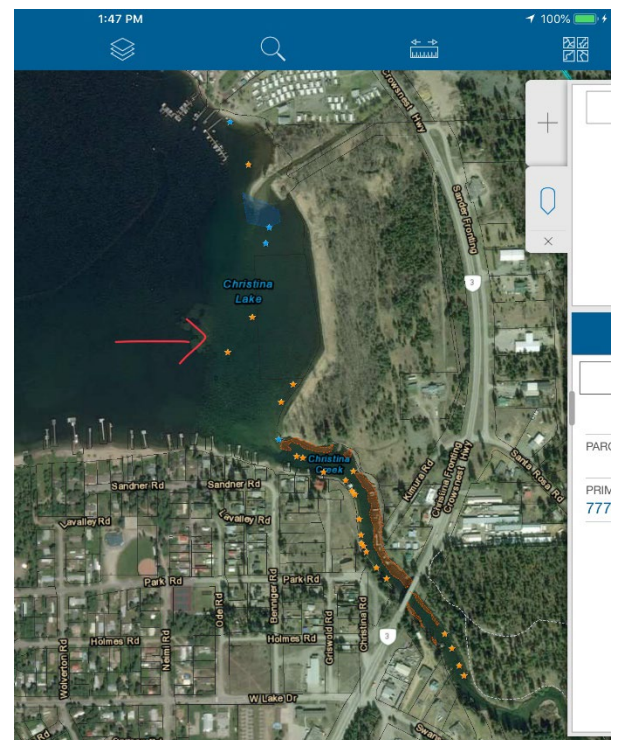
The Boundary Invasive Plant Inventory is contained in the online Invasive Alien Plant Program (IAPP) which contains detailed inventory information on priority species and broad distribution information for widespread species. The society continues to annually update the database and make spatial layers available for use by staff and contractors.

GIS Collector app is used to collect all invasive plant site and treatment information by BISS staff and RDKB contractors. The main advantage of this system is automatic syncing of data amongst all users enabling everyone to see what other staff and contractors have completed. This system enables uploading of digital information layers with an image background to aid in navigation to sites. Historical Invasive plant layers were uploaded along with treatment lists enabling easy navigation to treatment site locations. We have built and are maintaining additional layers including herbicide signs locations, seeding location, well buffers, no spray requests, and site visits.

Ministry of Forests, Lands, Natural Resource Operations, and Rural Development (FLNRORD) maintains the IAPP database, and have started development of a new version of the database that will include all invasive species called SEISMA that is scheduled to come online during summer of 2020. The online mapping component of the IAPP program is available to anyone by going to

<https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/invasive-species/iapp> .

Inventory and monitoring during 2019 continued to focus on priority species (Category 1 and 2) including field scabious, longspine sandbur, plumeless thistle, Scotch thistle, common tansy, common bugloss, blueweed, and plumeless thistle. New inventory was focussed in areas in proximity to known category 1 species. Detailed inventory was done along the FBC gas line and powerline in selected areas. Inventory was done on other jurisdictions through the year as needed. cursory checks for North Africa grass were done



*Snapshot of iPad screen showing fragrant waterlily sites in Christina Lake and creek.*



on other grasslands including Ingram, Nicholson and Johnstone and no additional sites were found. A few new invasive plant sites were reported by forest tenure and range tenure holders this year and verified. There were a few weed reports from the public of species not previously recorded in the area. The program has been promoting use of the Report-A-Weed app however very few reports are being received from our area through the app. Although typically FLNRORD staff do not reply to all report and do not notify BISS of the report, instead they are entered into IAPP if a previous report has not been recorded at that location.

Sampling for invasive mussels was completed in Jewel Lake and Idabel Lake using plankton nets and also substrate samplers. The province reported no zebra or quagga mussels detected from any lakes in BC this season.

Unfortunately, there was not time to update the geo-referenced maps for woodlots and range tenures as planned so this will be a high priority for spring 2020.

A summary of status of priority invasive plants will be included in the *Operational Invasive Species Program Report* to be completed later in February 2020. There is a need to create polygons for larger sites created during the past four years to make site selection in GIS Collector easier. This will be completed winter 2020 if resources are sufficient for staff to complete it.

## 7.0 Biological Control

Bio-control activities in the Boundary are delivered through cooperation with the Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Boundary Invasive Species Program and the Regional District of Kootenay Boundary. The program did some local collecting of *Mogulones crucifer* for hound's tongue and two releases were done locally while the rest were shipped to other regions. FLNRORD was not able to provide any *chrysolina* insects this year for St John's wort. A suitable collections location for collecting *Larinus planus* for Canada thistle was not found this year locally so no new releases were done. This section provides as summary of the status of established insects.

### 7.1.1 *Aceria malherbae* (ACMA)

*Aceria malherbae* is a mite that attacks field bindweed ( *Convolvulus arvensis*). A site was found this year in the Hardy Mountain area with this mite, which may have established from the supposedly unsuccessful release done in 1998. Some plant material was collected and moved to a mowed and irrigated site in City Park in Grand Forks to see if a future collection site could be established.

This agent was released in 1998 east of Grand Forks, but it did not establish at the release location. In 2016 two releases were purchased by the RDKB from a researcher in Alberta and released in the Midway and Grand Forks areas. The release west of Grand Forks was monitored each year since 2017 and there was no evidence of establishment. The release near Midway showed evidence of establishment in 2017, 2018 and 2019 monitoring. Once this foliar feeding mite builds adequate populations the plan is to collect and redistribute the insects.





#### 7.1.2 *Agapeta zoegana* (AGZO)

*Agapeta zoegana*, a root-boring moth for control of diffuse and spotted knapweed was widely distributed in the past and has likely already spread to suitable shady sites with diffuse knapweed. No new releases were done this year.



#### 7.1.3 *Apthona flava* (APFL)

Range Branch, Biocontrol Development Group released *apthona flava* on the Leafy spurge site up Norweigan creek in 2010 and monitored the site in 2011. The release was done at the request of the landowner who would like an increased level of control. No further work was done this year in our area.



#### 7.1.4 *Cyphocleonus achates* (CYAC)

*Cyphocleonus achates* is a root-boring weevil for control of diffuse(*Centaurea diffusa*) and spotted knapweed (*Centaurea stoebe*). Since this large weevil cannot fly, it is slow to spread on its own. No new releases were provided this year. Distribution of this agent will continue as releases become available.



Monitoring of *Cyphocleonus achates* on diffuse knapweed and spotted knapweed was done throughout the Boundary in June 2013. The results of this monitoring indicate that *C. achates* is widely spread throughout the Boundary, along with other biocontrol insects. For details on the results of the 2013 monitoring project contact program staff.

#### 7.1.5 *Larinus minutus* (LAMI)

*Larinus minutus* is a seed-feeding weevil that defoliates diffuse and spotted knapweed and is well distributed in the district. There is speculation that this agent is a major factor in the crash of diffuse knapweed in the hot east west valleys of the West Boundary in 2004. Diffuse knapweed appears to be cycling with the insects now in many areas. Populations of diffuse knapweed increased dramatically this year and monitoring has found insects still present in all areas.



##### 7.1.1 *Larinus obtusus* (LAOB)

*Larinus obtusus* is a seed-feeding weevil that also defoliates both spotted and diffuse knapweed. This agent prefers cooler climates than LAMI. Previous release sites will continue to be monitored to see if the weevils start to build populations. If populations of *L. obtusus* build, it is hoped they will have an impact on spotted knapweed in higher elevation areas in the region. In 2015 FLNRO was doing some monitoring at higher elevations to determine if there is an elevational limit for building populations sufficient to see plant suppression. The results found low establishment levels at locations monitored. A researcher with Agriculture and Agri-Food Canada based out of Summerland, BC is focussing on assessing and



improving spotted knapweed biocontrol.

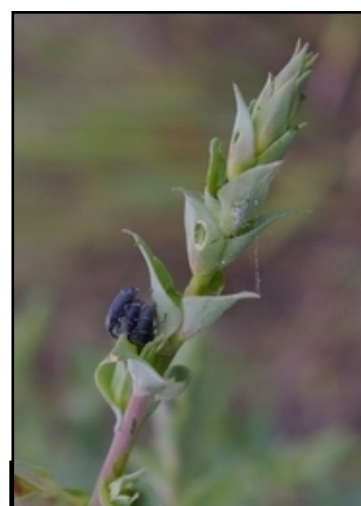
#### 7.1.2 *Larinus planus* (LAPL)

*Larinus planus* is a seed-feeding weevil for control of Canada thistle (*Cirsium arvense*). This agent is effective at reducing seed production and over time may reduce plant height and density of infestations, but it is not expected to control populations. There are very few locations in the district now that do not have the weevil present; most of these are in northern parts of the district in harvested areas or high elevation remote locations. The previous collection site in Grand Forks had very low plant density again this year and stunted plants so it did not support collection needs. The site in Christina Lake Community Park was in a similar situation so no collections were done this year. New collection locations will be sought in 2020. There is a need for LAPL to be collected from a higher elevation cooler site to enable release at higher elevation patches of Canada thistle.



#### 7.1.3 *Mecinus janthiniformis* (MEJA)

*Mecinus janthiniformis* is a stem-boring weevil for control of dalmatian toadflax (*Linaria dalmatica*). The agent is well established and has done well at controlling dalmatian toadflax in the Grand Forks area. There seems to be a trend where plants impacted by the weevils produce multiple flower stalks and still produce seed later in the season after the insects are done for the year. In the Midway area there was poor suppression this year, likely a result of the wet year, enabling the plants to continue growth after the insects completed their life cycle. To date *mecinus janthiniformis* has not been found on yellow toadflax (*Linaria vulgaris*) within the Boundary. Researchers are testing another species, *Mecinus janthinus*, for use on yellow toadflax.



#### 7.1.4 *Mogulones crucifer* (MOCR)

*Mogulones crucifer* is a root and stem-feeding weevil for control of hound's tongue (*Cynoglossum officinale*). During 2005 and 2006 163 releases were completed, putting the insects in almost every major drainage in the district. From 2007 to 2010 releases were done to fill in gaps in distribution. All local potential sites have minor feeding so rather than invest in further releases a decision was made to wait for the insects to build populations and spread further on their own. Many landowners and range tenure holders have noticed a significant decline in hound's tongue over time. They are also reporting hound's tongue showing back up into areas and the insects are still present but in low numbers. Collection was done this year by BISS staff with 787 insects collected.



#### 7.1.5 *Rhinusa antirrhinii* (RHAN)

*Rhinusa antirrhinii* is a seed-eating weevil for control of dalmatian toadflax. The agent was changed to secondary in spring 2007 and distribution began in fall 2007 with two releases. A few primary releases of this agent were done in the Boundary by Range Branch, and monitoring showed establishment. The agent is reported to disperse quickly and was found at two sites in 2007 near Boyer Creek and south of Kettle River Provincial Park. Both sites are a long distance from previous releases. The release on Kettle River East FSR was monitored in 2014 and the population is well established at the site. No targeted monitoring was done in 2019.

### 7.1.6 *Chrysolina* spp. (CHRY)

*Chrysolina* spp. are beetles that defoliate St. Johns-wort and can provide control of a site within five years. No new releases were done this year because no insects were provided by FLNRORD.

Most locations of St. Johns-wort show some level of chrysolina beetles and they usually are visible within a few years of a patch establishing. A few areas showed good populations but not enough to support collections. This insect does not lay eggs until September, so it is important to be careful how many are collected early in the season to ensure there is enough left to enable egg laying and continue population increases. Populations of the weed continue to cycle up at this time overall but there are some pockets where no insects are present. Training was provided by regional staff in 2012 on how to monitor and collect three other agents for St. John's wort including *Aplocera plagiata*, *Agrilus hyperici* and an species of *Aphis*. Due to time limitations no monitoring of the other insects was completed in 2012-2019. More releases are recommended for 2020 to speed up re-establishment and population increase of the insects within the Rock Creek Fire area to address the massive infestations of St. Johns wort growing after the fire.



## Summary

To date, *larinus minutus*, *agapeta zoegana*, *sphenoptera*, and *cyphocleonus* are widespread in the district and impacting populations of diffuse knapweed in the warm dry grassland areas. *Mogulones crucifer* is well distributed on the landscape and future releases could be focussed into areas with particularly dense infestations or restoration areas where new disturbance could enable re-colonisation. The insect for field bindweed has established in Midway and this year a new site capable of supporting a small collection was found in Hardy Mountain area. If this insect builds sufficient populations to enable sustained collections, then it could help to address field bindweed impacts in rural Grand Forks and Midway areas. Further information on biocontrol agents is not currently available on the FLNRORD website but it should be put back up during 2020.

In 2020 the program should work with regional forestry staff to secure sufficient releases of CYAC, CHRY, LAPL, and MOCR to address landowner requests. There are still some gaps in biocontrol insects within the Rock Creek Fire area so monitoring should be done in 2020 to check establishment of releases done in 2016-2018.

## 8.0 Coordination and Partnerships

The Boundary Invasive Species Program staff facilitated coordination between land managers operating treatment programs to achieve effective management and encouraged implementation of prevention strategies.

The *Plan for Invasive Species Management in the Boundary* was developed in the spring of 2014 setting out goals and objectives for the following 5 years. The companion document an *Operational Plan for Invasive Species Management in the Boundary for 2014-2018* containing management priorities for different species was completed in May 2014 and has been updated each spring through a spring planning committee meeting. Both documents have expired and need to be re-developed in 2020.

The Regional District of Kootenay Boundary has developed partnerships with agencies operating treatment programs to create a partnership delivery model for treatment of invasive plants in the Boundary and West Kootenay. The Boundary has been broken up into three contract areas: Electoral Area E West Boundary (Area E), Electoral Area D Rural Grand Forks/Granby (Area D), and Electoral Area C Christina Lake (Area C). A competitive bid process was completed in 2017. In 2019 the RDKB exercised options to extend two of the



contracts for another year. The contract work in area C and D was completed by Kootenay Weed Control while Southern Frontier Forestry Services completed most of the work in Area E. The partners involved included Min. Transportation and Infrastructure, FortisBC, BC Hydro, FortisBC Energy, Ministry of Forests, Lands, Natural Resource Operations, and Rural Development (FLNRORD) – Range Branch, Recreation Sites and Trails management, and Ecosystems for work in restoration project areas. The City of Greenwood and Village of Midway hired the contractors directly to complete work on municipal lands while the City of Grand Forks had municipal staff do some treatment work. Many of the areas treated by these managers were part of a coordinated effort involving multiple partners. All treatment work on crown land was done under the FLNRORD PMP. All work on private land was done under the contractor's service licenses with the written permission of the landowner.

The Boundary invasive species program coordinated the treatment programs for all land managers and received concerns or requests from private landowners for treatment.

All treatment and inventory are recorded using Collector app and stored in an online database. The quality of treatment records submitted by contractors was good this year with only a small amount of data errors found. BISS completed all the monitoring of contractor work and found the quality of work to be acceptable.

### 8.1 Weeds Cross Borders Project

The focus of this project is to address cross border weed problems occurring along highway corridors and waterways to reduce spread of high priority weeds across the border in both directions. Okanogan County Noxious Weed Control Board (OCNWCB) has taken a lead role on this project with the South Okanogan Similkameen Invasive Plant Society (SOSIPS), BISS, Ferry County Noxious Weed Control Board, BC Min. Transportation and Infrastructure (MOTI), Ferry County WSU Extension Program (WSU), and Washington State Department of Transportation (WSDOT) as project partners. The project partners signed a multiyear Memorandum of Understanding (MOU) in 2018. No funding

was received specifically for this project however activities to maintain previous work were still completed. Treatment included nodding thistle was treated on Rock Creek Bridesville Rd. Hoary alyssum was treated in Midway and Sidley areas on roads near the border. The border pull was done in the Myncaster area and Sidley areas. The partners jointly funded a reprint of the field guide and development and distribution of a project calendar for 2020. A joint tour of high priority sites was done with project partners. A new request this year is for annual bugloss to be controlled in the Grand Forks area to prevent its movement down into Washington where it is a federally designated noxious weed.

### 8.2 Adjacent Regions

The program is working with the Central Kootenay Invasive Species Society and the Okanagan and Similkameen Invasive Species Society, and the Min. of Environment on coordinated messaging for the aquatics education program. This year BISS and CLSS partnered with the Central Kootenay Invasive Species Society to maintain the billboard sign east of Grand Forks with Clean, Drain Dry messaging.



*Weeds Cross Borders Team taken in Oroville Washington with Kochia visible in the background.*



## 9.0 Planning and Management

Separate reports have been completed for each partner and this section includes a summary of the activities. Copies of the reports for each partner can be requested from the program manager.

### 9.1 Ministry of Transportation and Infrastructure

The Min. Transportation and Infrastructure (MOTI) program is managed out of Kamloops office. MOTI was able to maintain funding at the same level since 2015. The Regional District of Kootenay Boundary (RDKB) administered the program this year according to a two-year Letter of Agreement covering the Boundary. The program this year focused on containment of high priority species and continued containment along road networks.

Contractors cruised and chemically treated 69.7 ha on 95 km (190 shoulder km) of highways and secondary roads this year and in 21 pits. The treatments occurred between mid July and mid October due to the lateness of the agreement being signed and the PMP hold that occurred until June.

Approximately 2.42 hectares of hand pulling was done to control blueweed, longspine sandbur, common bugloss, teasel, hoary alyssum, orange hawkweed, common tansy, Russian knapweed, baby's breath, Scotch thistle, and scentless chamomile in river/creek/well buffers. The longspine sandbur patches had less plants initially but a late flush of plants in August meant a second treatment pass in September. All sites previously treated manually had lower density again this year so the treatment, although labour intensive and expensive, is working.

Figure 1 shows the cumulative area treated in pits in the Boundary since 2007 when treatments began, and the number of pits treated each year. There was a spike in 2009 when a Job Opportunity Crew was able to inventory and treat in MOTI pits. From 2010 to 2014 there was a decline in area treated in each pit which enabled new pits to be treated each year as control was gained in previously treated pits. This year there was an increase in weeds in some of the pits likely a result of the late treatment in 2017. This year 21 pits were treated. In addition, ISCBC sent a contractor hired with MOTI funding to treat three other pits. With all the progress made in cleaning up active gravel pits it is important to continue to focus and expand the number of pits under treatment to keep the pits clean.

This year many requests for treatment were received from across the region as a result of the increase in invasive plants everywhere. Crews addressed as many complaints as they could with the resources available. This meant that less priority sites were treated as resources were used to address complaints. Complaints are being tracked and those not addressed in 2019 will be carried into 2020. The number of no spray requests is slowly declining since a few of the landowners who did not want treatment adjacent to their land previously are now OK with the treatment. The program manager was able to assist with identifying priority areas, conducting

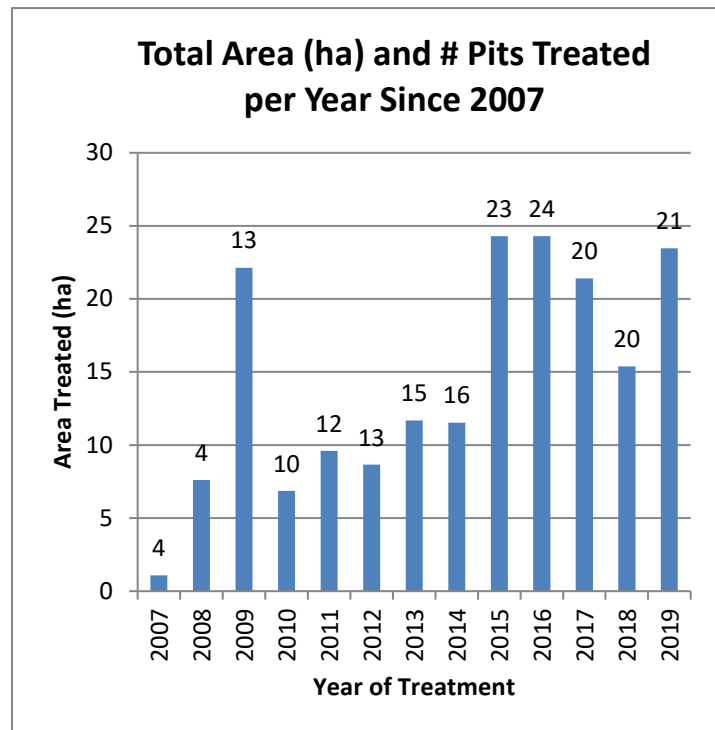


Figure 1. Change in cumulative area treated in pits each year and the total number of pits treated.

inventory, assessing the effectiveness of treatment, coordinating treatments, and will continue to offer assistance as needed. MOTI continued its commitment to the Weeds Cross Borders Project this year by controlling hoary alyssum and nodding thistle on roadsides near the border on Midway, Rock Creek Bridesville Rd, and on Sidley roads.

The ministry has required the maintenance contractors take Weeds and Roads training starting back in 2008 and since then improved ditching practices where back slopes are not disturbed as the ditches are cleaned and most of the waste is being spread out. The maintenance contractor has been consistently reporting locations of ditching waste dumps in the spring and early summer which has been very helpful. Changing policy to require maintenance contractors to reseed disturbed areas is recommended. Particularly with the washouts this spring, getting those areas seeded after rehabilitation is very important. Where possible annual field tours should be done with maintenance contractor supervisors to maintain interest and to further improve their identification skills. With the change in maintenance contractor it would be good to host a weeds and roads workshop in our area.

Overall Hwy 3 is in good shape from Sidley to Eholt and Grand Forks to Christina Lake but needs work from Eholt to Grand Forks and the from Christina Lake east. Hwy 33 between Beaverdell and Westbridge had increases in diffuse and spotted knapweed despite biocontrol insect's presence. Treatment on this highway was for priority species only since there was not enough resources to do larger stretches for all invasive plant species. The Christian valley road has not been treated for several years and needs significant work. There are many secondary roads that are still in need of treatment as well.

## 9.2 Ministry of Forests, Lands, Natural Resource Operations and Rural Development - Range Branch

The program for Range is managed out of the Nelson office. BISS entered into a Transfer Payment Agreement with the Ministry to provide operational services including identifying treatment areas, directing and monitoring contractors, conducting inventory, biocontrol collections, and monitoring. The ministry provided a coordination grant to BISS and the RDKB for their programs.

In the spring a Transfer Payment Agreement was signed with the RDKB to continue a partnership to allow RDKB contractors to complete work for FLNRORD and to enable crown land work by other stakeholders under the FLNRORD PMP. This year funding of \$25,000 for on ground treatment was provided but not all of it was spent due to challenges accessing common bugloss sites. In addition, the province funded treatment of North Africa grass in Gilpin Grasslands Provincial Park and this was done through the RDKB so has been included in this report.

In total 24.7 ha of invasive plants were treated. The program focussed on treatment of priority species then high value grasslands identified by the planning committee. The program began with treatment of common bugloss, hoary alyssum, hoary cress and Leafy spurge in June and July and some common bugloss in August. Then plumeless thistle and common tansy in September and October. Access was limited to the largest common bugloss site on the Rock Creek horses trails, so some containment work was done on lower Almond FSR for all species. Grassland rehabilitation work was done in Gilpin and Johnstone Creek. Work planned in Ingram/Midway grasslands was not completed due to insufficient contractor capacity.

Manual control of 0.08 ha was completed including hand pulling single plants or small patches of common tansy, plumeless thistle, and scentless chamomile. Greater knapweed was deadheaded then sprayed along the Trans Canada Trail (TCT) near Fisherman Creek. BISS staff removed yellow flag iris along Eugene Creek but did not have enough resources to do the lake this year. Very few plants were found in previously treated areas, but some large new patches were found. The repeated treatments for five years have been found very effective and has moved the Saunier sites to a maintenance level. In total 0.03 ha of iris was removed which is way down from previous years.

Selkirk Forest District office was able to fund some restoration treatment work in Gilpin Grasslands Provincial Park involving treatment of hoary alyssum, sulphur cinquefoil and field bindweed. The district

office also provided in-kind donations of colour printing and office space for meetings. The Service BC office helps by distributing information to the public and staff in the office. There is strong support for management at the district level, but they no longer receive annual funding since it is managed through region. Extensive weed infestations have reduced grazing opportunities and wildlife habitat in many areas of the district. Fortunately, the biocontrol insects released by the ministry over the past 30 years are still providing suppression or control of some invasive plant species.

#### Ministry of Forests, Lands, Natural Resource Operations and Rural Development - Habitat

Contracts were set up respectively with the RDKB for treatment and the BISS for inventory, directing and monitoring contractors and data entry.

The restoration project funding was received from the ministry who were successful in receiving a grant from the Habitat Conservation Trust Fund (HCTF) for the fire-maintained ecosystem restoration project work. This included monitoring and/or treatment of invasive plants in active restoration blocks. Most treatment this year was focussed in Rixin Restoration north of Rock Creek (3.2 ha) to control invasives post harvest. Some treatment was done in Centre hill, Gibbs Creek, Bubar, and Johnstone restoration blocks. Boothman's oxbow restoration is also being funded through this project and treatment of 0.9 ha of hoary alyssum and other introduced weeds was complete. In total 5.19 ha of invasive plants were treated with herbicide in restoration areas.

Overall the invasive plants declined in Johnstone, Gibbs, and Bubar restoration blocks. Centre hill blocks have very few weeds inside the forested area however the grassland below has some sulphur cinquefoil that needs work, but access is not easy. The insect for hound's tongue, *mogulones crucifer*, is present in all blocks and should prevent the weed from becoming a problem post logging or burning.

This year some funds were available for treatment of invasive plants on the Grand Forks conservation properties located east of town which focussed on containment of hoary alyssum.

A report on the post fire invasive plant management at the Rock Creek Fire was not completed but should be completed over the winter.

#### 9.3 Ministry of Environment -BC Parks

BC Parks is working with Selkirk District Range program to elevate management of invasive plants in Gilpin Grasslands Provincial Park. In year 2 of the project the south east corner of the park received more treatments to control all species. Treatment of 3 ha was completed in early July targeting all invasive plants including sulphur cinquefoil, hoary alyssum St. John's wort, field bindweed and a small amount of diffuse knapweed.

In Gilpin Park Grasslands Provincial Park there was no regrowth on the Russian knapweed (*Acroptilon repens*) patch near the range enclosure this year but it will likely return next year. The leafy spurge along the highway in Gilpin did not have any plants this year. Nodding thistle plants in Gilpin were deadheaded to prevent expansion in the Gilpin grasslands.

Hand pulling was done by BISS staff to remove hoary alyssum at Texas Creek PP campground and blueweed (*Echium vulgare*) along the creek. The hawkweed site in Jewel Lake Provincial Park was not monitored or treated. There was no treatment in Kettle River Park this year since the ministry did not



have any funds available until October and by then there was no contractors available to do the work.

FLNRO Ecosystems was able to provide funding from the HCTF restoration application for invasive plant treatments in Boothman's Oxbow Provincial Park. This restoration project is re-establishing native grassland on the upper bench and planting shrubs in the lower bench to establish riparian vegetation.

Some spring non-selective herbicide treatment to control creeping rooted grasses in the planted areas was planned but the PMP hold prevent the work from happening and once that was lifted the timing was too late to do the work.

The upper bench was treated with a selective herbicide in July to control broadleaf weeds. BISS summer student watered shrubs weekly from the end of June until mid-August. A class from Hutton Elementary helped with site maintenance in the spring. A fall volunteer planting day was done in early October involving a class from Hutton and many volunteers. The mulch for the fall planting was donated by Interfor Ltd. This habitat restoration project is

funded by Habitat Conservation Trust Fund and Parks enhancement Fund in partnership with the Granby Wilderness Society, Christina Lake Stewardship Society, BC Parks, and FLNRORD.



#### 9.4 Recreation Sites and Trails BC

Responsibility for management of invasive plants along trail networks is under the Ministry of Forests, Lands, Natural Resource Operations, and Rural Development. Ministry staff work with regional trails groups to deliver the maintenance program. Many complaints were received from the landowners adjacent to the trail about the dense invasive plants along the trail. Many are agricultural producers concerned about the dense hoary alyssum, St Johns wort and other invasive plants on the rail trail. Many adjacent farmers in the West Boundary were very upset about the continued spread off the rail trail of hoary alyssum and potential impact of that on their income from decreased hay prices. Some letters have been sent the minister about this situation.

The ministry initially committed funding of \$2,000 this year but then increased that to \$4,000 based on complaints. The funds were used to address six of the complaint areas but was not able to address the rest. Trails had committed more funds for treatment of invasive plants and for treating a strip of grass along the resurfaced edge to prevent damage to the surface from Nursery Trestle east to Christina trestle as part of the capital upgrading project but due to insufficient contractor capacity after the funding was confirmed in September the work was not completed. This work needs to be done very early in the year before the grass dries off for it to be effective, so the timing of budget confirmation mid summer is a problem.

The Boundary Invasive Species Society, Trails to the Boundary Society and the Regional District of Kootenay Boundary have received many other concerns over the past few years that are not being addressed by the recreation sites and trails program, there is not capacity considering the annual treatment budget. This past year landowners were told to direct complaints direct to Recreation Sites and Trails program staff since BISS and RDKB have no control over the budget for management on the recreation trail, the ministry controls the budget.

Inadequate management for the past 6 years has resulted in huge invasive plant problems on the recreation trail and this needs to be addressed. The scope of the program is outlined in a needs document provided to the ministry back in spring of 2018 and again in 2019. Recreation Sites and Trails as land manager has a legal responsibility to control designated noxious weeds on their trail systems so need to fulfill that legal obligation.



### 9.5 FortisBC Inc.

Staff based out of Kelowna manage the right of way vegetation management program for FortisBC for both power and gas line rights-of-way (RW).

During the spring planning meeting, Gilpin area had been identified as a high value area for continuation of intensive treatment beyond just priority species so a large amount of treatment was completed by all partners with jurisdiction in that area. A total of 4.06 ha was treated along the right-of-way in Gilpin Grasslands Provincial Park, a private lot east of the park and through a private lot south of Greenwood, BC. The Kettle Valley substation property was treated with selective herbicide (4.7 ha). The Midway substation was treated with residual selective herbicide in areas with good perennial grass cover and non-selective herbicide on the east side with annual weedy grass in preparation for fall seeding of the portion lot with a weak plant community. Area treated at this substation property was 1.1 ha.

FortisBC Energy Inc. treated a total of 17.7 ha of invasive plants on the gas line RW. Treatment was on the RW along the new gas line at Gibbs Creek, through Gilpin, and many sites up the Santa Rosa. The old 12-inch gas line was treated on the east end of the Gilpin grasslands in and out of the Park. During the spring planning meeting, Gilpin area had been identified as a high value area for more intensive treatment beyond just priority species so a large amount of treatment was completed by all partners with jurisdiction. Southern Frontier Forestry Services completed work in the Rock Creek area to Midway area and south of Kerr Creek. The Midway compressor station was not completed due to poor weather conditions throughout the summer limiting contractor capacity. Target species were common bugloss, hoary alyssum, leafy spurge, yellow hawkweeds and sulphur cinquefoil. Several other species were treated at the sites with priority species. The leafy spurge in the Johnstone Creek area along the new gas line was treated but it was paid for by other partners this year.

The work on crown lands was done under the MFLNRO PMP administered through the RDKB and completed by RDKB contractors. The portions of the RW that are private were treated with the landowner's permission under the contractor's service licence. The BISS coordinator assisted in treatment layout, contractor monitoring and inventory data collection this season.

### 9.6 BC Hydro

Staff manage the program out of the Vernon office. BC Hydro funded chemical treatment of 3.34 ha of invasive plants on main transmission line rights of way through the Sand Creek, Gilpin/Dan Orea, and Santa Rosa areas. The work started later this season because of the PMP hold in the Boundary and once the hold was lifted it was over a month before crews had time to start on the BC Hydro work. Some re-treatment work was planned up Stanhope in October however contractor capacity in the fall was limited due to weather so this stretch was not re-treated. All treatments on crown land were done under the Invasive Plant Pest Management Plan for Provincial Crown Lands in the Southern Interior of British Columbia FLNRO -PMLP 738-0678-19/24 as outlined in an agreement between the Regional District of Kootenay Boundary and the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (MFLNRO). BISS assisted in treatment layout, contractor monitoring and inventory data collection this season.

### 9.7 Telus

Telus has developed a pest management plan for installation properties throughout Southern BC but did not include management of invasives for the distribution system. Currently Telus does not have a contact person identified. In 2018 a telus representative was contacted for information about equipment movements with respect to potential their vehicles introduced longspine sandbur to the site in Rock Creek. The representative indicated they would look into it but have not replied back. Staff checked

many roadside Telus boxes but did not find any other sites of Longspine sandbur this year.

#### 9.8 BC Timber Sales

Soil disturbance associated with logging activities can provide an opportunity for invasive plant establishment. Measures to prevent spread of invasive plants during harvesting activities have been included in the Forest Stewardship Plan. Each spring BCTS staff review the list of priority species for reporting and provide this information to harvest and layout contractors. BC Timber Sales includes language about cleaning equipment and minimising disturbance in logging contracts. Planning staff review inventory information on invasive plant locations in proximity to proposed harvest areas and may include seeding in harvest plan if needed.

#### 9.9 West Boundary Community Forest and Vaagen Fibre Canada Ltd

The community forest has included prevention practices in their management plan. Seeding is regularly done on disturbed areas to compete with invasive plants. Staff are referring harvest plans for comment and are using IAPP as an information source for invasive plants in proximity to new harvest areas. Vaagen Fibre Canada Ltd staff received some identification training and hired a contract to treat invasive plants on the mill property. In addition, Vaagen work with Trails to the Boundary to do some upgrading to the rail trail through the mill property including treatment of invasive plants and revegetation using grass and shrubs.

#### 9.10 Interfor Ltd

Soil disturbance associated with logging activities can provide an opportunity for invasive plant establishment. Interfor staff that are on our board have taken an active role in promoting invasive plant awareness within the company and encouraging prevention. The company completed a lot of harvesting this year and staff did provide updated information on new planned harvest blocks. The company completed training of contractors, promotes reporting through the Report-A-Weed app and is promoting downloading of the new field guide by contractors. Interfor provides in-kind contributions in the form of printing, staff time, and donated another load of mulch towards the Boothman's Oxbow restoration project.

The new Forest Stewardship Plan covering the Forest Licence and TFL in the Boundary was finalised in 2017. Activities that are currently happening include educating contractors and staff and prevention through seeding of exposed mineral soil in areas where invasive plants are known to occur in proximity to harvest areas. Areas for seeding are being identified during development of logging plans. The company has started using the new Tedow mix last year which was recommended by range which has less persistent species than the previously used Carlson mix.

#### 9.11 Weyerhaeuser Canada Ltd.

A new contact has not been assigned from Weyerhaeuser. Weyerhaeuser did develop a Forest Stewardship Plan however did not seek any input from the BISS. At the last contact Weyerhaeuser did indicate they maintain a reseeding program for some disturbed areas to prevent establishment of invasive plants.

#### 9.12 Kettle Falls Railway Co. (OmniTrax Ltd)

Kettle Falls Railway manages the rail line from Carson east to Christina Lake. BISS was contacted by a staff person out of Cranbrook in the spring looking for a list of local contractors to do vegetation management treatments on the rail line. No other communications have occurred. With North Africa grass being found on Hwy 395 near the rail line an inventory of the rail line on the BC side should be done to see if there is spread. This would need to be done in cooperation with the railway so it could be done from a truck on the rails.

### 9.13 Regional District of Kootenay Boundary

The Regional District of Kootenay Boundary continues to take a leading role in invasive plant management in the Boundary. The General Manager of Environmental Services manages the program. Through a weed function the RDKB taxes rural residents in Areas D and E to deliver their program. Last year they received funding from FLNRO for the next three years through a transfer agreement. The RDKB operated the New Invaders Program, 50% Cost Share Program, and Spray Equipment Loan Out Program. They also allocated a portion of the program to manual removal of high priority species in Pesticide Free Zones delivered through BISS. The New Invaders program continues to have many more requests than there are resources and contractor capacity to complete.

The New Invaders program focussed treatments on common bugloss, hoary cress, common tansy, leafy spurge, field scabious and hoary alyssum. Cooperation by landowners remains high, allowing the program to address many of the priority species sites. Unfortunately, the number of requests for treatment by landowners far out-weigh number of requests. Through the program this year 51.3 ha were treated in Areas D & E which down from last year. Less work was done since the contractor did not have capacity to complete all the work resulting in a significant funding carryover to 2020. The manual portion of the program included treatment of priority species in pesticide free zones including common bugloss, field scabious, hoary alyssum, and scotch thistle. The border pull for nodding thistle was completed along the entire 10 km length this year. In total 5.25 ha of invasive plants were dug or pulled at priority sites.

The 50% Cost Share Program was continued this year to help stretch the budget to enable treatment of species other than those covered in the New Invaders program. The intent behind this program is to assist landowners and get them willing to pay for weed treatment. Information on the program was available at the RDKB office in Grand Forks. Under the program 25.4 ha was treated.

The equipment loan-out program was operated by a landowner on Well road west of Grand Forks. The program includes the following equipment: skid mount sprayer, a three-point hitch mount sprayer, two ATV mount sprayers three backpacks. There were eight loan outs this year treating an area of 20.6 ha from Area D and C.

The RDKB completed treatments in two landfills treating 7.6 ha of invasive plants. Species included hoary alyssum, sulphur cinquefoil, dalmatian toadflax, Russian thistle, Canada thistle, and spotted knapweed. There was no blueweed, hawkweed, hoary cress, or common tansy in any landfill or transfer station this year. There was no Scotch thistle found at the Rock Creek transfer station this year so hopefully the seed banked in the soil is now depleted. The Christina valley transfer station was treated but crews were not able to get up the Big White transfer station this year.

The Christina Lake Parks and Recreation Commission funded invasive plant treatments in Christina Lake Community Park covering 0.35 ha with herbicide and 1.12 ha of manual treatment. The herbicide treatment was mainly yellowdevil hawkweed then some hoary alyssum, spotted knapweed, and sulphur cinquefoil totalling 0.26 ha. The manual treatment was mostly removal of yellow flag iris, with a few patches of cut-leaf blackberry, hoary alyssum, and plumeless thistle treated. There was no knotweed regrowth this year in the park.

### 9.14 Village of Midway

The Village of Midway is very concerned about invasive plant problems and supportive of invasive plant management. The public works manager is the main contact with respect to invasive plant management.



The Village maintains a mowing program on all roadways. The municipality issues warning letters to landowners to have mowing done to reduce fire hazard and to control invasive plants on their properties. Hoary alyssum, dalmatian toadflax, sulphur cinquefoil and baby's breath are the highest concern species in the area. Some private yards contain Japanese knotweed but so far it has not moved out onto the municipal roadways. There is one water garden found a few years back that was growing yellow flag iris and the landowners said they would deadhead it to prevent spread and might consider planting a non-invasive iris. The Village provided funding for the aquatic invasive species education this year. No introduced species have been found in the river but the presence of Russian olive on the shore of the Kettle west of the bridge is a concern and it should be removed to prevent spread downstream.

Hoary alyssum continues to spread to new locations around town as the old locations are controlled. Chemical and manual treatments of sites on municipal property were completed totalling an area of 8.18 ha. Hoary alyssum was the main target with some baby's breath and sulphur cinquefoil treated. A second pass was done this year in September since so much had been recently mowed when the first treatment was completed in June. There was a significant increase in area treated as several new large properties being purchased for future development. Pulling was done in the main municipal well buffers by BISS staff covering 0.24 ha. Village staff did two or more passes of mowing on the roadways.

The village is a strong supporter of education and hands out some education materials through their office. The display was set up at the rail trail event at the museum. Three invasive plant signs are located on the Trail near the museum (2007 project) in addition to the information kiosk sign at the Museum and waterproof posters at the community garden.

#### 9.15 City of Greenwood

The public works manager is the main contact with respect to invasive plants. The City maintains a mowing program on most municipal roadways and some limited pulling is done by staff as time allows. The herbicide treatments were done in July and August totalling 4.38 ha. Species treated included yellow hawkweed, wormwood, hoary alyssum, common tansy, spotted knapweed common bugloss and chicory. hoary alyssum, common tansy, common bugloss, orange hawkweed, chicory, and wormwood.

Education activities within the city this year included re-stocking brochures at the city office in addition to regular education activities done through the invasive species program. Staff were not able to attend Founder's Day due to a conflict with an event in another community.

#### 9.16 City of Grand Forks

The City of Grand Forks maintains a mowing program for most roadways. The City has been proactive in replanting disturbed areas and landscaping weedy areas along boulevards. An inventory of trails and selected city lots was completed last year. Two public works staff took training this spring and received pesticide applicator certification for noxious weed treatment so are now able to complete treatment for the city. Staff did a small amount of treatment on Russian knapweed and rush skeletonweed sites this fall. Staff visited the locations of Bohemian knotweed and determined it will take some time to figure out how to recover costs for treatment on the private portion of the multi-jurisdictional sites before treatment begins on the municipal roadways.

The City of Grand Forks supports efforts to educate residents by distributing brochures through their office. The education display was set up at 3 different events this year in Grand Forks this year.

#### 9.17 Teck Resources Ltd. and Teck Metals Ltd.

Teck Resources Ltd owns several decommissioned mines and some legacy properties. An inventory of all invasive plants on the Christina Lake property located off Hwy 395 was completed in 2018 but no information has been shared on whether any work was done this year on any properties.



### 9.18 Summary

The scope of the invasive plant management program in the Boundary was similar to last year (Figure 2). A detailed breakdown of investment in treatment by stakeholder is included in Table 2. Various other programs maintain extensive mowing programs that have not been included in the totals; therefore, the actual investment is higher.

Stakeholders combined treated 276 ha of invasive plants (Figure 3) this season. This area estimate is based on area of plants treated for herbicide treatments while it reflects total area covered for manual treatments. This year there was an increase in area treated manually because the complete border pull was done this year. Details of areas treated by jurisdiction is contained in Table 3.

Expenditures for 2019 were tracked to categories enabling a breakdown of costs by activity type. Figure 4 identifies how resources were allocated by each partner. In total over \$339,276<sup>1</sup> was invested in invasive plant management (herbicide/biocontrol/manual), inventory, planning, implementation and education this year (Table 4). This was a 2% increase in the total investment compared to 2018. There were several partners that did not report invasive plant management investments for 2019 so this is not a comprehensive value.

In-kind contributions have been included in estimates this year for the Boothman's Oxbow Habitat Enhancement Project and for in-kind contributions from partners including meeting room space, printing maps and handouts, and other services. Approximately 60% of the resources went to on the ground activities to treat invasive plants (chemical, manual and biocontrol). The coordination aspect of the program, which includes planning, liaising with program managers, monitoring both contractors and sites, responding to complaints, and report preparation reflected 17% of the resources which is up from last year. Approximately 8% of funding was invested in inventory, data entry and mapping which is decrease over last year. The balance of 11% was spent in providing the education and awareness program and another 5% for special projects

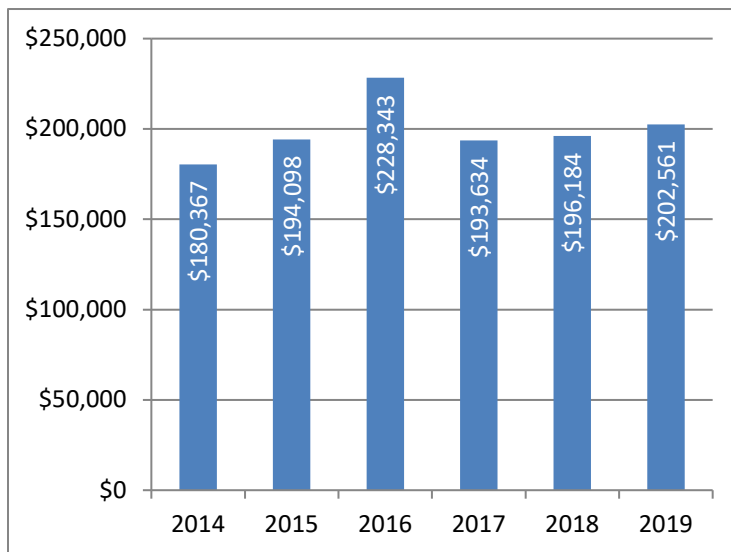


Figure 2. Total Investment in Invasive Plant Treatment for all Stakeholders in the Boundary.

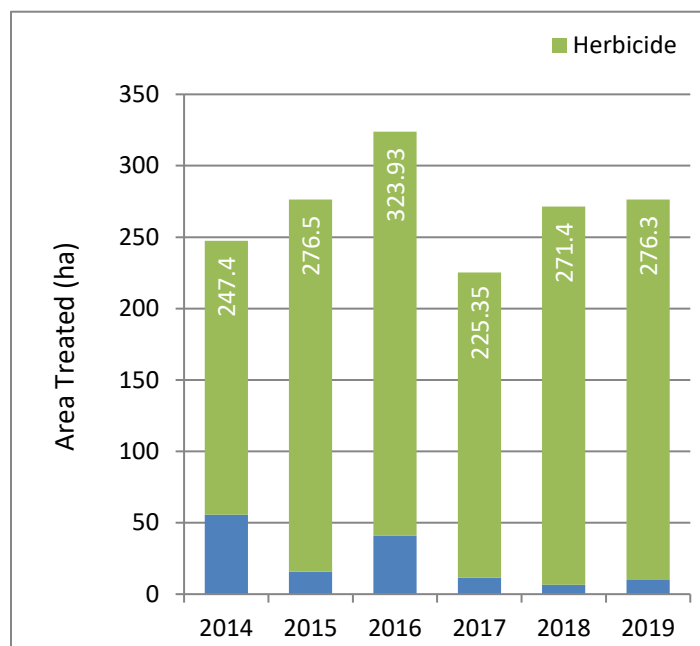


Figure 3. Total Area Treated for all Stakeholders in the Boundary.

<sup>1</sup> This total excludes investment in staff time by government agencies, which is likely a significant amount.

(restoration site maintenance and planting projects) and in-kind contributions.

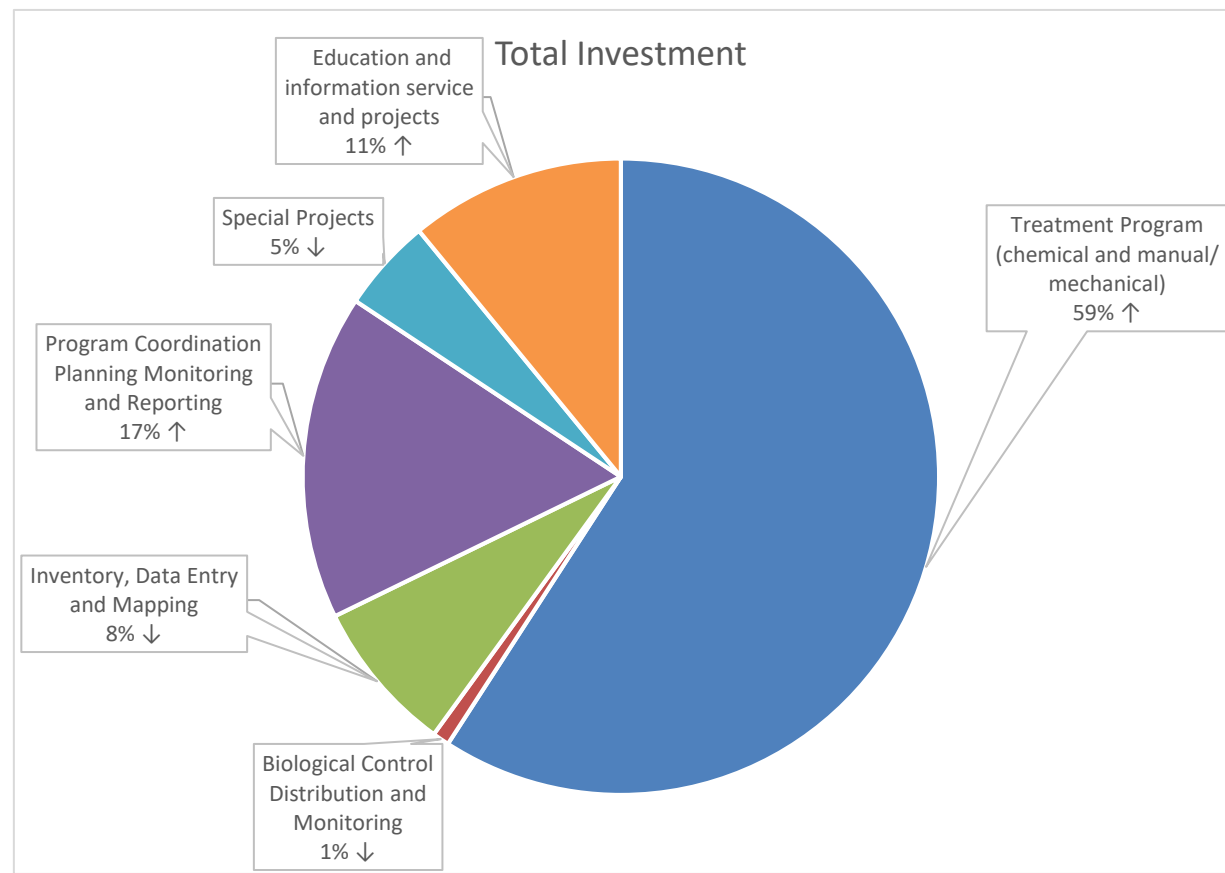


Figure 4. Allocation of Resources for Invasive Plant Management within the Boundary and trend of increasing (↑) or decreasing (↓) compared to last year.

**Table 2. Summary of Expenditures for Invasive Plant Treatment by each Partner from 2014 to 2019.**

Land Manager/Stakeholder	2019 Investment	2018 Investment	2017 Investment <sup>6</sup>	2016 Investment	2015 Investment	2014 Investment
Min. of Forest, Lands and Natural Resource Operations (Range, Ecosystem Restoration, and conservation properties)/Selkirk Forest District <sup>4</sup>	\$39,129.12	\$35,971.50	\$35,157.54	\$35,615.80	\$27,560.52	\$27,121.24
Ministry of Transportation and Infrastructure	\$63,460.76	\$68,783.18	\$70,399.32	\$88,957.78	\$68,917.40	\$50,550.00
MOE- BC Parks	\$258.30	\$4,100.00	\$4,500.00	\$5,696.94	\$1,500.20	\$500.00
BC Hydro	\$2,772.61	\$2,193.28	\$2,947.83	\$4,084.44	\$3,017.40	\$3,667.59
Fortis BC Inc.	\$5,814.89	\$2,884.10	\$3,400.00	\$3,390.50	\$3,544.21	\$5,333.49
Fortis BC Energy	\$13,694.94	\$6,832.40	\$11,156.96	\$9,400.00	\$9,707.47	\$9,700.00
Regional District of Kootenay Boundary <sup>5</sup>	\$62,021.72	\$63,698.14	\$55,862.63	\$66,949.15	\$66,570.07	\$65,986.41
City of Greenwood <sup>3</sup>	\$2,848.95	\$2,300.00	\$2,300.00	\$2,203.00	\$2,286.58	\$2,450.00
Village of Midway <sup>3</sup>	\$5,255.49	\$3,600.00	\$3,600.00	\$3,708.54	\$3,402.39	\$3,450.00
MFLNRO Trails /Tourism BC	\$3,637.94	\$5,364.16	\$1,400.00	\$4,379.71	\$4,513.69	\$2,500.00
Canada Summer Jobs (thru BIS)	\$1,566.28	\$457.00	\$2,909.77	\$3,956.95	\$1,094.79	
Teck Resources Ltd <sup>1</sup>			?			\$7,540.61
IPC BC - Hot spots project						\$0.00
Other <sup>2</sup>	\$2,100.00				\$1,983.45	\$1,568.00
<b>Total Investment</b>	<b>\$202,561.00</b>	<b>\$196,183.76</b>	<b>\$193,634.05</b>	<b>\$228,342.81</b>	<b>\$194,098.17</b>	<b>\$180,367.34</b>
<b>Program size compared to 2018</b>	<b>103.25%</b>					
<b>Program size compared to 2014</b>	<b>112.30%</b>					

<sup>1</sup> - Inventory and planning projects funded but no treatment

<sup>2</sup> -2019- Vaagen Fibre and City Grand Forks; 2015- Midway Community Forest and Emcon Services Ltd;

<sup>3</sup> - Manual costs for Midway & Greenwood est. \$500 for 2007-2012 and 2013-2019 at \$1000 & \$500 respectively.

<sup>4</sup> - Does not include investment in biological control by staff for 2007-2017

<sup>5</sup> - Includes weed grant, Landfill treatment, Christina Lake Parks & Recreation.

<sup>6</sup> - 2017 cost estimated since invoices not all processed at time of report.

**Table 3. Summary of Area Treated by Management Programs from 2014-2019.**

Year  Program	2019		2018		2017		2016		2015		2014	
	Area Chemically Treated (ha)	Area Mechanically treated (ha)	Area Chemically Treated (ha)	Area Mechanically treated (ha)	Area Chemically Treated (ha)	Area Mechanically treated (ha)	Area Chemically Treated (ha)	Area Mechanically treated (ha)	Area Chemically Treated (ha)	Area Mechanically treated (ha)	Area Chemically Treated (ha)	Area Mechanically treated (ha)
Min. of Forests, Lands and Natural Resource Operations <sup>5</sup>	37.25	0.77	40.80	0.41	34.17	0.29	40.43	3.27	27.10	4.61	24.36	1.309
Min. of Transportation and Infrastructure <sup>1,4, 5</sup>	70.16	2.40	79.00	2.56	70.42	4.87	94.39	4.94	84.10	4.52	47.05	8.02
BC Parks <sup>5</sup>		0.12	6.80	0.00	7.51	0.00	10.10	0.01	6.60	0.00	1.1	0.1
BC Hydro <sup>5</sup>	3.33		4.00		4.00		6.97		3.93		3.37	0
Fortis BC <sup>5</sup>	10.89		5.90		4.41		4.95		5.94		14.84	0
Fortis BC Energy <sup>5</sup>	17.70	0.29	9.89	0.06	15.87	1.40	12.01	0.29	16.52	1.19	6.7	0.462
Regional District of Kootenay Boundary	106.77	6.35	101.08	2.92	73.61	2.96	105.09	31.53	105.41	2.92	77.5	38.53
Village of Midway <sup>4</sup>	8.18	0.24	5.30	0.21	3.33	0.23	3.33	0.15	3.24	0.45	1.75	0.976
City of Greenwood <sup>4</sup>	4.38	0.25	3.25	0.01	0.58	0.08	1.06	0.32	2.62	0.28	2.98	0.135
FLNRO Trails	5.66	0.02	8.70	0.45	0.09	1.55	4.52	0.57	2.84	1.78	1.517	6.2
Weeds Cross Borders Project												
Teck Resources Ltd <sup>3</sup>							?		0.00		7.54	0
Other <sup>2</sup>	1.55								2.40		3	0
<b>Total</b>	<b>265.87</b>	<b>10.44</b>	<b>264.72</b>	<b>6.63</b>	<b>213.98</b>	<b>11.38</b>	<b>282.85</b>	<b>41.08</b>	<b>260.70</b>	<b>15.75</b>	<b>191.7</b>	<b>55.73</b>

<sup>1</sup> - 2001 -total area covered since numbers for area sprayed were not available.

<sup>2</sup> - 2019- Vaagen Fibre Canada; 2015 Midway Community Forest and Emcon Services Ltd.

<sup>3</sup> - Operate herbicide program but total area not reported.

<sup>4</sup> - No area was reported for mowing programs by MOTI, Midway or Greenwood.

<sup>5</sup> -includes area for Ecosystem Restoration/conservation 2012-2016



**Table 4. Summary of Invasive Plant Program Resource Allocation by Partners in the Boundary for 2019.**

Source	Treatment Program (chemical and manual)	Biological control Distribution and	Inventory, Data Entry and Mapping	Program Coordination Planning & Monitoring & Reporting	Special Projects or In-kind	Education and information service and projects	Total Investment by Partner
Min. of Forests, Lands, Natural Resource Operations and Rural Development- Range <sup>1, 4</sup>	\$24,392.63	\$1,687.56	\$7,932.43	\$19,534.06		\$2,565.51	<b>\$56,112.19</b>
MFLRNO - Ecosystem, Conservation, and Boothman	\$8,501.16		\$400.00	\$600.00	\$2,200.00		<b>\$11,701.16</b>
Min. of Transportation and Infrastructure	\$63,460.75		\$4,887.78	\$9,212.22			<b>\$77,560.75</b>
BC Parks (Gilpin and KRPP)	\$258.30			\$698.84			<b>\$957.14</b>
Selkirk Forest District	\$4,547.77			\$452.23			<b>\$5,000.00</b>
BC Hydro	\$2,772.61		\$430.75	\$1,769.25		\$150.00	<b>\$5,122.61</b>
Fortis BC Energy	\$13,694.94		\$1,300.00	\$2,800.00			<b>\$17,794.94</b>
FortisBC Inc	\$5,814.89		\$700.00	\$850.00	\$477.66	\$150.00	<b>\$7,992.55</b>
Regional District of Kootenay Boundary(Areas D, E, and landfills ) <sup>2,5</sup>	\$59,825.41	\$1,000.00	\$3,500.00	\$17,036.77	\$200.00	\$12,272.00	<b>\$93,834.18</b>
Regional District of Kootenay Boundary - Areas C (does not include milfoil program)	\$2,196.31			\$189.12		\$1,614.57	<b>\$4,000.00</b>
Village of Midway <sup>3,5</sup>	\$5,255.49		\$300.00	\$304.01	\$100.00	\$640.50	<b>\$6,600.00</b>
City of Greenwood <sup>3,5</sup>	\$2,848.95		\$177.41	\$300.00	\$100.00	\$473.64	<b>\$3,900.00</b>
City of Grand Forks	\$1,000.00			\$200.00			<b>\$1,200.00</b>
FLNRO Trails Management	\$3,637.94			\$400.00			<b>\$4,037.94</b>
Interfor Ltd (inkind Boothman)					\$500.00		<b>\$500.00</b>
Boothman Project (BC Parks Enhancement Fund)					\$3,029.00		<b>\$3,029.00</b>
Canada Summer Jobs	\$1,354.80	\$211.48	\$1,706.64	\$1,064.97	\$2,984.50	\$766.61	<b>\$8,089.00</b>
Community Gaming Grant						\$17,714.76	<b>\$17,714.76</b>
Other sources (Nature Conservancy, HCTF, GWS, Vaagen)	\$1,100.00		\$5,060.84	\$689.57	\$4,513.00	\$766.61	<b>\$12,130.02</b>
Community Groups - Inkind (Boothman Project)					\$2,000.00		<b>\$2,000.00</b>
	<b>\$200,661.95</b>	<b>\$2,899.04</b>	<b>\$26,395.85</b>	<b>\$56,101.04</b>	<b>\$16,104.16</b>	<b>\$37,114.20</b>	<b>\$339,276.24</b>
<b>% of overall program</b>	<b>59%</b>	<b>1%</b>	<b>8%</b>	<b>17%</b>	<b>5%</b>	<b>11%</b>	<b>100%</b>
<b>% change since 2018</b>	<b>104%</b>	<b>73%</b>	<b>74%</b>	<b>116%</b>	<b>87%</b>	<b>108%</b>	<b>102%</b>

<sup>1</sup>- Includes herbicide donation by range and Boothman restoration.

<sup>2</sup>- In-kind for mapping services

<sup>3</sup>- mowing treatment costs estimated

<sup>4</sup>- District staff value for inventory was not included.

<sup>5</sup>- Includes in-kind contributions for printing maps, factsheets, distributing materials through office

## **10.0 Enforcement**

The Village of Midway is currently the only municipality enforcing control of invasive plants under their *Unsanitary premise* bylaw. The RDKB investigated the potential to enforce control in Area D in 2007 and decided not to go ahead with it since the referendum on the bylaw enforcement officer was defeated. Enforcement was discussed again in fall 2014 and a decision was made to wait until after the election. Recent discussions have brought the issue forward again since some agricultural producers are struggling because adjacent landowners are not doing control work. If the RDKB is successful in establishing a municipal ticketing program for other services, there is an opportunity to include invasive plant enforcement. The Peace River Regional District has revised their bylaws and have implemented a municipal ticketing type system. Okanogan County is now using a system where they issue a weed notice and fine landowners for not complying. The benefit of this system is they do not need to go to court to deal with landowners who do not voluntarily comply. After 20 years of education many landowners are aware of their responsibility to control invasive plants and it is time to start requiring control.

## **11.0 Summary**

The Boundary Invasive Plant Program for the 2019 growing season was successful in many key areas. Public awareness about invasive plants and their impact on our resources continues to increase and information on management is now readily available. The awareness work on invasive aquatic species was continued across the Boundary and in partnership with Christina Lake Stewardship Society at the Lake. As the public becomes better informed, invasive plant infestations are being reported in earlier stages of development resulting in increased levels of control and decreased cost of treatment and impacts to our natural resources. The increased awareness about species like common bugloss and hoary alyssum has resulted in recognition, reporting and subsequent treatment by many private landowners who had not recognised the plants. Recognition seems to be a challenge for many landowners who need it pointed out on their property before they recognise it as an invasive plant. There were many complaints regarding the lack of enforcement primarily from Area E this year, but some were received from Area D and C. There are many residents in the rural parts of the Boundary aware of the issue who are encouraging their new neighbours to deal with the problems on their land, but not all neighbours are good neighbours.

The *Plan for Invasive Species Management in the Boundary* was drafted in 2014 and the five-year plan expired at the end of 2018 but was used for 2019 until a replacement plan is complete. The companion document *Operational Plan for Invasive Species Management in the Boundary for 2014-2018* has also expired was still used to guide management priorities in 2019. Many of the new sites found this year were treated, while others were found late in the season and will be addressed next year. A detailed assessment of the status of each invasive plant species will be included in the species summary report for 2019 expected to be completed in late winter. The plans will be re-developed in winter 2020/21.

Through a cooperative effort we are working on cleaning up the main infestation of common bugloss in the Nicholson Creek area and it will take more resources and time than originally estimated due to the continued spread and the previous difficulty achieving effective herbicide control allowing for expansion during the first few years. All areas in the main infestation have been treated at least once and the density of plants has declined over most of the area. Efforts will continue to locate and treat sites of priority species including greater knapweed, field scabious, Russian knapweed, teasel, hoary cress, Scotch thistle, Himalayan blackberry, cut leaf blackberry and leafy spurge. We are progressing on containment of blueweed, spotted knapweed, and hoary alyssum (outside of Rural Grand Forks) and the spread seems to have slowed for these species. Work continued this year to suppress growth of hoary alyssum along roadsides in the core agricultural areas in rural Grand Forks however the short residual nature of the herbicides and the approach of spot treating necessitates repeat treatments. This system

of treating every three to four years upsets some adjacent landowners who would like the weed eradicated on roadsides.

There was an increase in many invasive plants this year, in particular diffuse knapweed, likely in response to climatic conditions last year. Unfortunately, we are seeing very minor impact of insects on spotted knapweed. Remarkable results continue to be seen in control of hound's tongue by *mogulones crucifer* and all previous release sites checked had little to no plants remaining. Many range tenure holders which have commented on how little hound's tongue is left on their range units, except in areas where fresh harvesting has disturbed the ground. The insect, *mecinus janthiniformis* is doing a good job of suppressing dalmatian toadflax in many areas in the south but is not building populations in the northern part of the district and not doing as well as hoped in the Midway area. The new seed-eating weevil *Rhinusus antirrhinii* has dispersed and will hopefully reduce spread of dalmatian toadflax through reducing seed production. Populations remain low of the *chrysolina* beetle which targets St. John's wort, but we have started to see increases in some areas. Some local biocontrol insect collections and releases were done but very few in comparison to other years. In 2020 there should be a focus on re-monitoring insect establishment in the Rock Creek fire area.

This year there was a 2% increase in overall investment in invasive plant management. Overall the weather was very challenging with rain and wind limiting treatment and access to some locations. The Weeds Cross Borders initiative with surrounding jurisdictions involving education, inventory and treatment continued this year focusing mainly on education with producing a new calendar and field guide. The program will continue to assist in coordinating efforts of all groups as needed to maximize effectiveness. The largest land manager, Min. Forests, Lands, Natural Resource Operations and Rural Development continues to have low funding levels for management of invasive plants on crown land in comparison to the amount of land under their jurisdiction. The Recreation Sites and Trails program received many complaints this year from adjacent agricultural producer's, but they have not been able to invest enough to deal with the scope of the problem. The high level of participation by land managers and other groups achieved over the past years is impressive. The successes to date are a direct result of BISS and RDKB efforts to encourage all land managers in the region to address invasive plant problems.

The emphasis on raising public awareness has established a base of support and knowledge by the public for the program. There is still considerable work to be done to keep the momentum going. The *Operational Plan for Invasive Species Management in the Boundary* will be reviewed and revised in winter 2020/21. Work in 2020 will continue to focus on coordinating efforts on priority species, monitoring bio-control insect populations, implementing strategies to prevent spread, encouraging inactive landowners to initiate treatment programs, and continuing the invasive species awareness program as funding allows.

