



Display at Farmer's Market



Inventory Surveys



Common bugloss



Bohemian knotweed



St John's wort

Prepared for: Boundary Invasive Species Society

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- The board of directors of the society who donate their time to guide the society and its programs;
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1. Personnel

Staff: Program Manager - Barb
Education Coordinator - Jen
Seasonal Technicians – Darrin, Jenna

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

2. Invasive Species Program Overview

The Boundary Invasive Species Program is in its 21st 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 2020 a summary report on the *Status of Invasive Plant Species in the Boundary 2019* was generated to assess whether species specific objectives are being met. A similar report will be completed for 2020 giving a snapshot of progress each year.

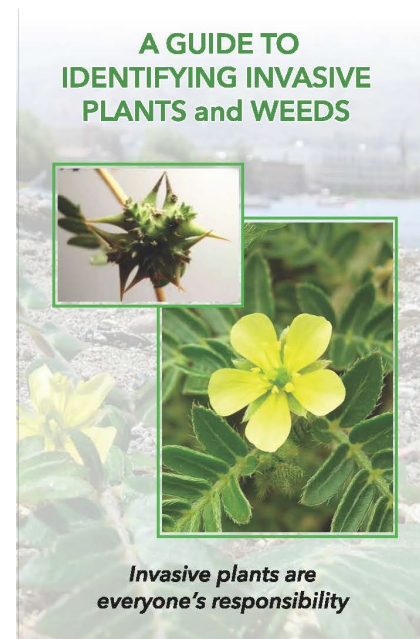
The program provides residents of the Boundary with a reliable source of information regarding invasive species identification and management, and works with land managers to coordinate treatment efforts towards priority invasive plants and areas. Without such a program, residents would have limited 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 for their properties 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. 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 completed the re-print of the field guide and developed a calendar for 2021.

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. Staff were unable to be present at the Texas Creek boat launch due to Covid-19 restrictions, so the program relied on the billboard, articles, and social media this year. There were some public interactions at the Jewel Lake Resort dock as staff were completing invasive mussel monitoring.

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 in 2019 but there was no opportunity to do this again this year.

4. Early Detection and Rapid Response (EDRR)

The provincial government had a provincial 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 not monitored this year since provincial staff consider the site eradicated. In fall 2018 North Africa grass (*Ventenata dubia*) was found in the Gilpin area by staff and treated in fall 2018 and spring 2019 and 2020. Black henbane was found in Rural Grand Forks in 2019, presumably as a result of flooding, and provincial staff did manual removal in 2019 and 2020. BISS staff assisted with monitoring for this species downstream on the kettle river and did not observe any new locations. 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. BISS staff located new patches in the Rock Creek area this year and is working with the affected landowner and the province on management. The province recently re-evaluated the status of this species and has moved it from provincial EDRR to provincial containment.

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 recognize new species amongst the diverse native plant communities in our area. In previous years training sessions have been done with Okanogan county staff visited to visit sites in WA and BC of species on the proposed prohibited list or Washington eradicate list. With the border closure there was no opportunity to do a Washington tour in 2020. The planning committee has requested BISS staff to put together a picture book of watch list species to help train relevant partner staff.

5. 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. Our goal is 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, articles, and a limited number of community events) 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 not completed this year but businesses selling wildflower seed mixes were visited and some stock was voluntarily removed from the shelves. Many of the nurseries and greenhouses in this area mainly sell annuals and vegetables so are not likely to be growing invasives. Some of the commercial nurseries in Grand Forks are still growing and selling Russian olive, salt cedar and Siberian elm which has triggered complaints. We hope to put together an email newsletter to send to the nurseries and greenhouses to keep them updated on any new information.



5.2 Recreation

The Boundary offers extensive trail systems and camping, resulting in large numbers of recreationalists coming into our area each year. Recreation use

increased this year with the travel restrictions in place resulting from Covid-19. 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, 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 but they still have not been built.

A full-page ad was put into the 2020 *Boundary Visitors Guide on Play Clean Go* and *Clean 5rain Dry*. Several articles this year in local papers were on Clean, Drain, Dry and also Don't Move Firewood.

A rack card targeted to recreation users was produced and copies were inserted into the hunting and fishing regulations being distributed by local vendors. Several other Regional Invasive Species Organizations have jointly put an ad into the BC Map book series about prevention using PlayCleanGo messaging. 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 2021.



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) delivered year nine of an awareness program focusing on preventing introduction of mussels board and staff. Due to Covid-19 regulations, staff were not able to be at the boat launch this year and promoted CDD through their regular stewardship activities. CLSS installed seven more CDD signs at lake and river access points this year. A pop-up display is up in the Interpretive Gallery at the CLSS office and one is up at the Riverside Centre in Rock Creek. The society started a northern pike barrier feasibility study. For further details on this work please contact the Christina Lake Stewardship Society.

There are 28 CDD signs already installed at high use boat launches and river access points across the Boundary. CLSS installed another 10 CDD signs this year as part of a partnership with ISCBC.

Campgrounds could not be visited this year so should be targeted in 2021 if Covid-19 rules allow. The display was set up at three farmers markets with information on AIS. There is a Clean Drain Dry billboard east of Grand Forks that was paid for by BISS and CLSS through RDKB Grant in Aid funds from Electoral Area D and C respectively.



5.4 Youth

A grade 5/6 class from Hutton learned about invasives and helped restoration maintenance (October 15). Two grade 9 classes from GFSS assisted with maintenance and planting of forb seeds at Boothman's Oxbow Provincial Park (Oct 3 and Nov 2). These events were made possible with funding support from the BC Parks Enhancement Fund. A primary class from Greenwood Elementary learned about invasives on a field trip Sept 28. All three teachers would like to do more field trips in spring if Covid allows.

5.5 General Public

5.5.1 *Display at Community Events:*

The public health restrictions resulted in cancellation of most events. Staff were able to attend three farmer's markets in September with the display. There were 96 people who asked questions at the markets and significantly more who took information but did not ask questions so were not recorded. This is much less than last year since so few events were attended.

Staff worked hard on virtual information methods including increasing articles, social media and videos. This year 26 articles were submitted to nine different papers/online blogs resulting in 70 articles this year. The program manager received comments from several members of the public about how much they enjoyed the articles this year.

5.5.2 *Field Days:*

No field days were hosted this year.

5.5.3 *Direct Contacts:*

Responded to 60 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 10 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 new cross-border field guide was printed in the summer and distributed to many local business, offices and group. A rack card on prevention during recreation was stuffed into hunting and fishing regulations at the three vendors that sell licences locally. The 2021 Weed Cross Borders calendar was printed in December and distributed in early January 2021 through local businesses, partners and municipal and provincial offices. A list of existing publications that were distributed is contained in Table 1.

Table 1. Number of Publications Distributed during 2020

Publication Name	Amount	Publication Name	Amount
Weeds Cross Borders Guide to Identifying Invasive plants Book	1297	Prohibited AIS book	14
Field Guide to Noxious Weeds	37	Youth colouring pages/invader ranger	45
Calendar 2020	451	Flowering Rush info card	1
TIPS Horse	1	NZ mud snail wallet card	2
TIPS Bike	7	TIPS – LO, JK, HA, ST, PV, NA, RS	70
Boundary Invasive Plant Bulletin	16	Bookmarks	5
Noxious and Invasive Weeds of the Boundary	8	Boot brushes	32
Play Clean Go rack cards	319	Don't Let It Loose sticker	11
Pencils	21	Toxic Plants	4
Puncture vine info card	1	Grow Me Instead wallet card	2
AIS wallet	1	Grow Me Instead snapshot brochure	7
Aquatic Invasive Species of the Kootenays	1	Grow Me Instead booklet	0
DFO Stop the Spread of Aquatic Invasive Species rack card	1		
		Total Distributed	2390

5.6 Presentations:

A presentation was done for the Grand Forks Stockbreeders Association fall meeting focussing on ID of new species – North Africa grass, rush skeletonweed, and nodding thistle.

5.7 Social Media and Website

The Facebook page had more action again this year with the number of likes increasing to 378 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. Focus was put on the increasing blog posts on our website with 17 being done. 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 but there has been issues with the info@ email address only being accessible on one device resulting in delays in responding to the requests. The website 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 summary statistics for 2020 (jan to Dec) tracking website use are included below. There was more use of the website in the summer which correlates with the growing season. The total page visits was 2,551, with 1,087 unique visitors. There has been 70% more unique visits this year compared to last indicating the public is spending more time getting information from the website than they did in previous year, this is likely related to public health and travel restrictions. The staff focus on virtual communication has produced the desired result.

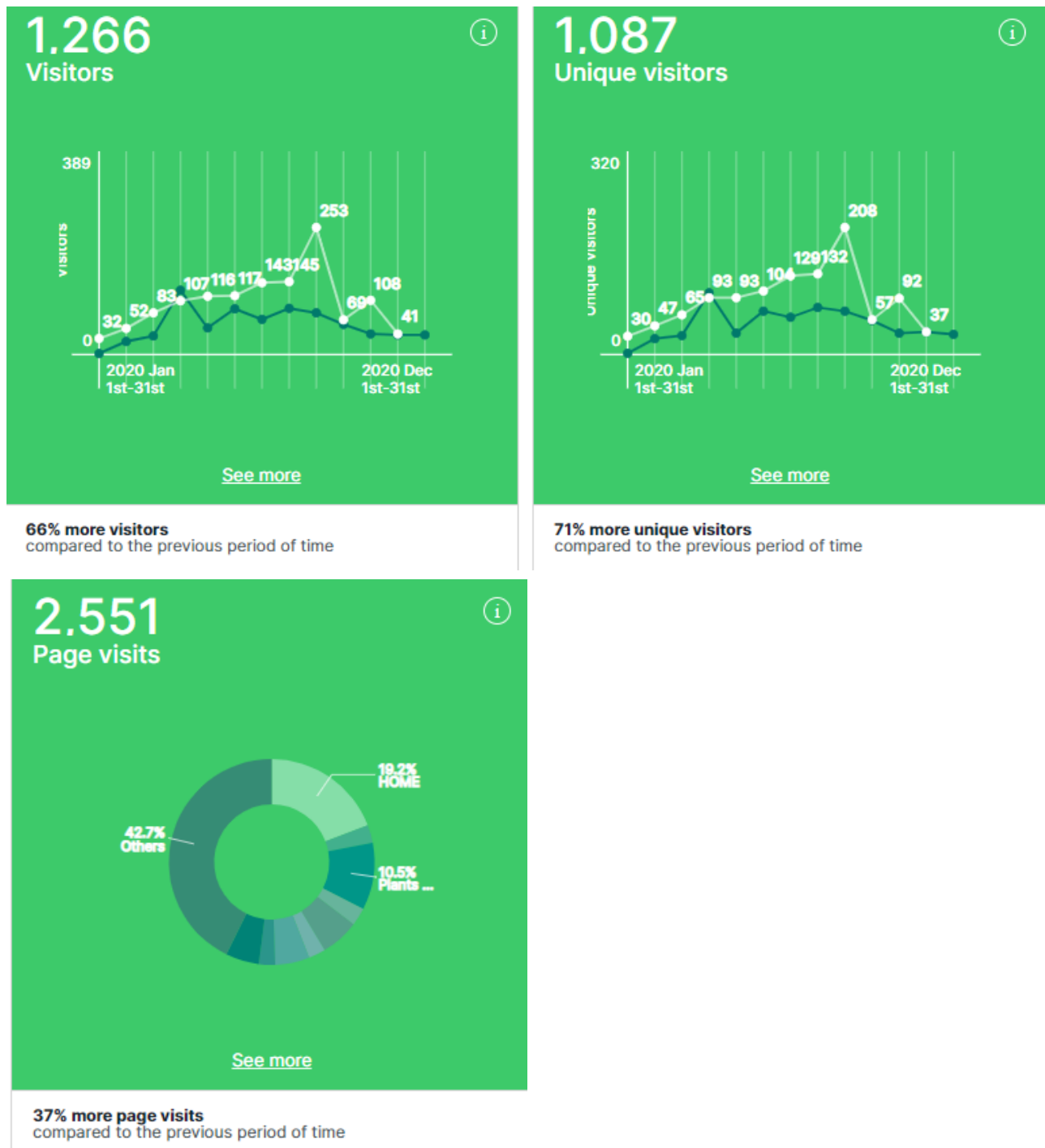


Figure 1. Website visitor details from 2020- www.boundaryinvasives.com.

5.8 Meetings and Workshops Attended

The Boundary Invasive Species Program staff or board members attended very few meetings in person this year due to public health recommendations.

- Hosted a field meeting with affected parties related to new North Africa grass locations (Sept);
- Attended Grand Forks Stockbreeders fall meeting (Nov 19) to provide a program updates and a presentation on North Africa grass;

- Two staff joined the Regional Invasive Species Organisations Virtual training (Nov 17-18);
- Joined two 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;
- Attended a Weed Cross Borders Project planning meeting to plan out calendar (Nov);
- Delivered virtual presentation to the Standing Committee on Finance and Government Services (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 sites 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 continued high levels of St. John's wort. Several information requests were to identify plants and most people sent in photos rather than staff doing site visits. The majority of requests were by phone and email again this year and less site visits. The education program by BISS is working in a positive direction. Since there are so many new people moving into the area every year efforts to connect with them will need to continue.

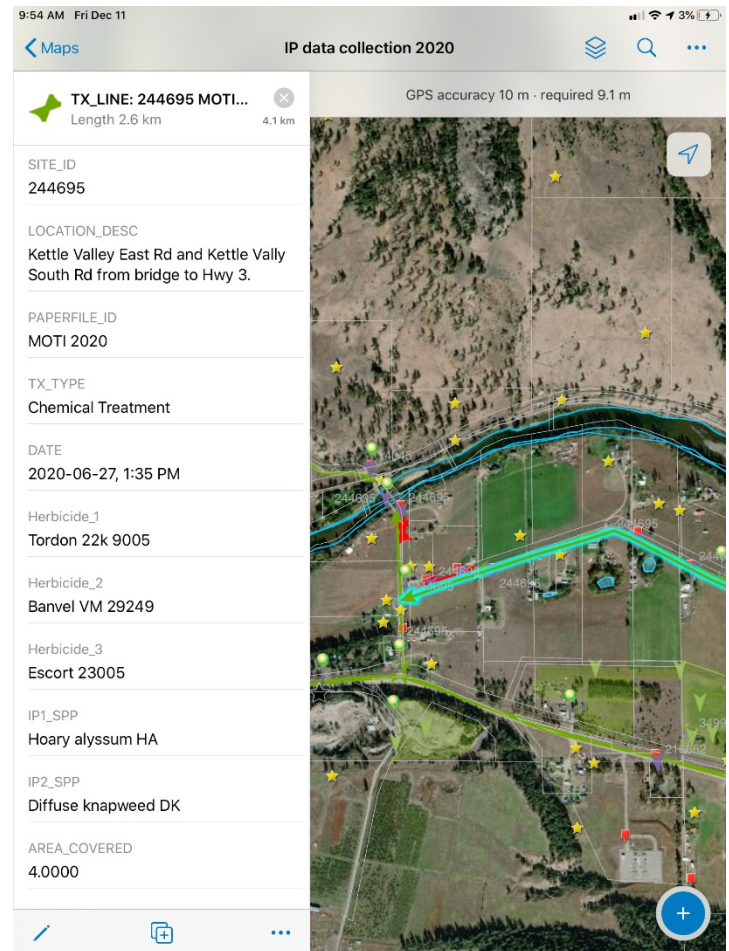
6. Inventory and Monitoring

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 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. Typically, FLNRORD staff do not reply to all reports and do not notify BISS of the report. Instead they are entered into IAPP if a previous report has not been recorded at that same location.

Sampling for invasive mussels was completed in Jewel Lake and Idabel Lake using plankton nets and 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-reference maps for woodlots and range tenures as planned so this will be a high priority for spring 2021.

A summary of status of priority invasive plants will be included in the *Operational Invasive Species Program Report* to be completed later in February 2021. There is a need to create project area polygons for larger sites to make site selection in the new provincial system easier. This will be completed winter 2021 if resources are sufficient for staff to complete it.



7. 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 one releases were done locally. FLNRORD was not able to provide any *chrysolina* insects this year for St John's wort. FLNRORD was able to supply a release of insects for nodding thistle in an effort to ensure continued stable populations in BC. 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 a summary of the status of established insects and there is little change in this section from last year.

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.

In 1998, this agent was released 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 2017-2019 and there was no evidence of establishment. The release near Midway showed evidence of establishment in 2017- 2019 during monitoring. The sites were not monitored in 2020. Once this foliar feeding mite builds adequate populations the plan is to collect and redistribute the insects.

A site in Rural Grand Forks has plants consistent with damage from this insects so samples were collected this summer and sent to provincial staff to get it identified to confirm if it is the same insect. The results were not available at the time of this report.



7.1.2 *Agapeta zoegana* (AGZO)

Agapeta zoegana is a root-boring moth for control of diffuse and spotted knapweed. It 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.



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 in response to favourable weather conditions for seed germination the past two years. 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 sites in Grand Forks and Christina Lake had very low plant density again this year and stunted plants so could not support collection. New collection locations will be sought in 2021. 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.



J. Haynes

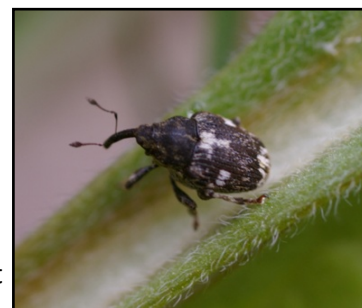
7.1.3 *Mecinus janthiniformis* (MEJA)

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 to make a release in the Grand Forks area to augment populations.



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 2020.

7.1.6 *Chrysolina* spp. (CHRY)

Chrysolina spp. are beetles that defoliate St. John's 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. John's 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. 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 a species of *Aphis*. Due to time limitations, no monitoring of the other insects was completed from 2012 to 2020. More releases are recommended for 2021 to speed up re-establishment and population increase of the insects within the Rock Creek Fire area to address the massive infestations of St. John's 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 focused into areas with particularly dense infestations or restoration areas where new disturbance could enable recolonization. The insect for field bindweed has established in Midway and a new site capable of supporting a small collection is in Grand Forks, but a positive identification is needed prior to moving the insect. 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 available on the FLNRORD website.

In 2021 the program should work with regional forestry staff to secure sufficient releases of CYAC, CHRY, and LAPL to address landowner requests. There are still some gaps in biocontrol insects within the Rock Creek Fire area so monitoring should be done in 2021 to check establishment of releases done in 2016-2018.

8. 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 2021.

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 2020 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 Village of Midway hired a contractor directly to complete work on municipal lands while the City of Grand Forks had municipal staff do a small amount of removal and awareness 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 multi-year Memorandum of Understanding (MOU) in 2018. No funding



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

was received specifically for this project however activities to maintain previous work were still completed. Treatment included all weeds on roads leading to border crossings including in Midway, Hwy 41 and some work on Hwy 395. 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 project calendar for 2021. Due to Covid-19 restrictions, the partners were not able to meet in person but did have one virtual meeting. BISS was not able to complete the inventory for annual bugloss in rural Grand Forks which had been requested by US partners based on concerns about potential 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 Okanogan 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.

9. Planning and Management

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

9.1 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 204 ha of invasive plants this season. This area estimate is based on area of plants treated for herbicide treatments while it reflects total area covered for manual treatments. Details of areas treated by jurisdiction is contained in summary reports for each partner.

Expenditures for 2020 were tracked to categories enabling a breakdown of costs by activity type. Figure 3 identifies how resources were allocated by each partner. In total over \$352,447¹ was invested in invasive plant management (herbicide/biocontrol/manual), inventory, planning, implementation, and education this year (Table 3). This was a 4% increase in the total investment compared to 2019. There were several partners that did not report invasive plant management investments for 2020 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 62% 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 15% of the resources which is up from last year. Approximately 9% of funding was invested in inventory, data entry and mapping which is an increase over last year. The balance of 2019 was spent in providing the education and awareness program and another 7% for special projects (restoration site maintenance and planting projects) and in-kind contributions.

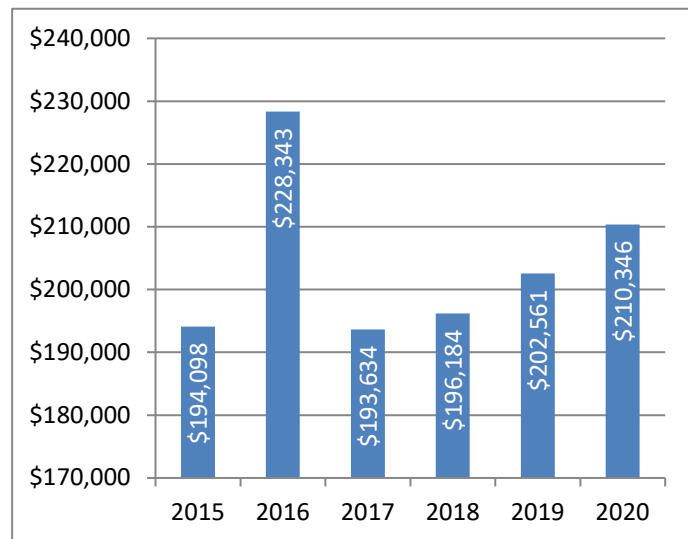


Figure 2. Total Investment in Invasive Plant Treatment for all Stakeholders in the Boundary.

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

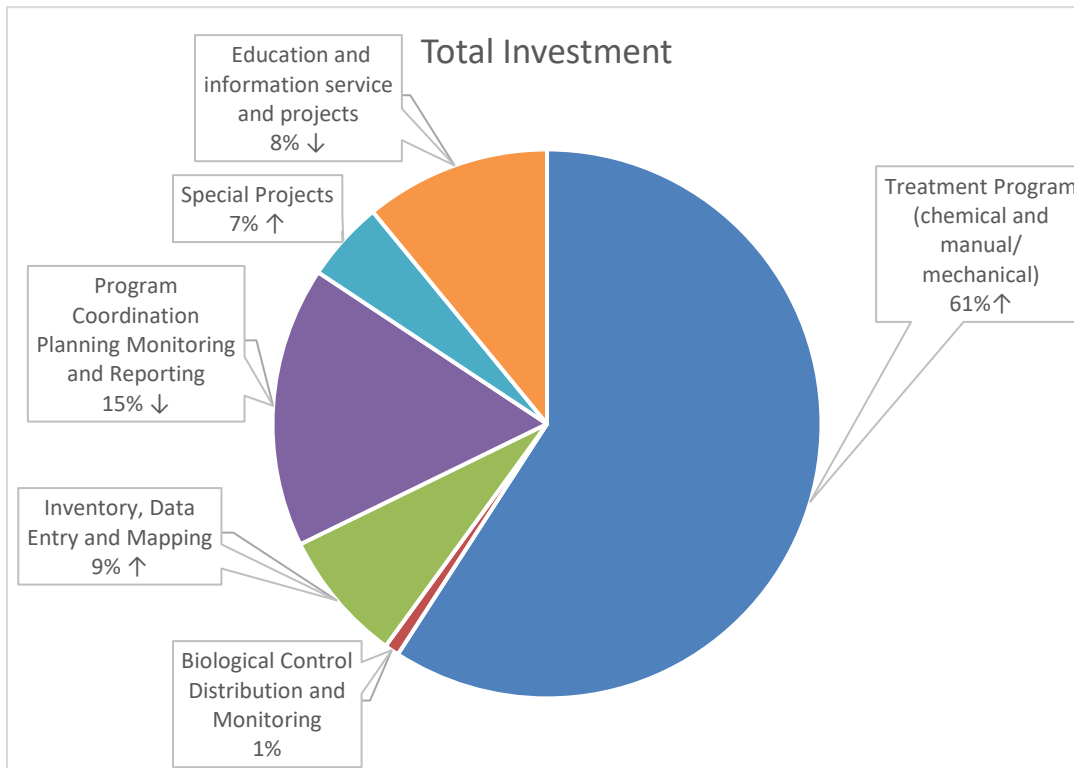


Figure 3. Allocation of Resources for Invasive Plant Management within the Boundary and trend of increasing (↑) or decreasing (↓) compared to last year.

Table 2. Summary of Expenditures for Invasive Plant Treatment by each Partner from 2015 to 2020.

Land Manager/Stakeholder	2020 Investment	2019 Investment	2018 Investment	2017 Investment ⁶	2016 Investment	2015 Investment
Min. of Forest, Lands and Natural Resource Operations (Range, Ecosystem Restoration, and conservation properties)/Selkirk Forest District ⁴	\$44,285.40	\$39,129.12	\$35,971.50	\$35,157.54	\$35,615.80	\$27,560.52
Ministry of Transportation and Infrastructure	\$69,476.67	\$63,460.76	\$68,783.18	\$70,399.32	\$88,957.78	\$68,917.40
MOE- BC Parks	\$4,640.25	\$258.30	\$4,100.00	\$4,500.00	\$5,696.94	\$1,500.20
BC Hydro	\$3,584.95	\$2,772.61	\$2,193.28	\$2,947.83	\$4,084.44	\$3,017.40
Fortis BC Inc.	\$2,706.37	\$5,814.89	\$2,884.10	\$3,400.00	\$3,390.50	\$3,544.21
Fortis BC Energy	\$16,429.83	\$13,694.94	\$6,832.40	\$11,156.96	\$9,400.00	\$9,707.47
Regional District of Kootenay Boundary ⁵	\$64,433.06	\$62,021.72	\$63,698.14	\$55,862.63	\$66,949.15	\$66,570.07
City of Greenwood ³	\$500.00	\$2,848.95	\$2,300.00	\$2,300.00	\$2,203.00	\$2,286.58
Village of Midway ³	\$3,289.62	\$5,255.49	\$3,600.00	\$3,600.00	\$3,708.54	\$3,402.39
MFLNRO Trails /Tourism BC	\$1,000.00	\$3,637.94	\$5,364.16	\$1,400.00	\$4,379.71	\$4,513.69
Canada Summer Jobs (thru BIS)		\$1,566.28	\$457.00	\$2,909.77	\$3,956.95	\$1,094.79
Teck Resources Ltd ¹				?		
IPC BC - Hot spots project						
Other ²		\$2,100.00				\$1,983.45
Total Investment	\$210,346.15	\$202,561.00	\$196,183.76	\$193,634.05	\$228,342.81	\$194,098.17
Program size compared to 2019	103.84%					
Program size compared to 2015	108.37%					

¹ - Inventory and planning projects funded but no treatment

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

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

⁴ - Does not include investment in biological control by staff for 2007-2017

⁵ - Includes weed grant, Landfill treatment, Christina Lake Parks & Recreation.

⁶ - 2017 cost estimated since invoices not all processed at time of report.

Table 3. Summary of Invasive Plant Program Resource Allocation by Partners in the Boundary for 2020.

Source	Treatment Program (chemical and manual)	Biological control Distribution and Monitoring	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 ^{1, 4}	\$30,626.65	\$1,224.81	\$11,116.00	\$8,387.30		\$1,299.51	\$52,654.27
MFLRNO - Ecosystem, Conservation, and Boothman	\$8,890.48		\$5,400.00	\$1,073.00	\$1,000.00		\$16,363.48
Min. of Transportation and Infrastructure	\$69,480.67		\$3,282.76	\$10,617.24			\$83,380.67
BC Parks (Gilpin and KRPP)	\$10,111.00			\$1,931.80	\$9,785.00		\$21,827.80
Selkirk Forest District	\$0.00			\$0.00			\$0.00
BC Hydro	\$3,584.95		\$266.92	\$1,833.08		\$150.00	\$5,834.95
Fortis BC Energy	\$16,429.83		\$600.00	\$3,465.06	\$465.79		\$20,960.68
FortisBC Inc	\$2,706.37		\$600.00	\$1,000.00		\$150.00	\$4,456.37
Regional District of Kootenay Boundary(Areas D, E, and landfills) ^{2,5}	\$66,088.55	\$963.07	\$2,857.00	\$13,627.83	\$4,138.71	\$5,772.40	\$93,447.56
Regional District of Kootenay Boundary - Areas C (does not include milfoil program)	\$207.31		\$300.00	\$1,392.69		\$2,100.00	\$4,000.00
Village of Midway ^{3,5}	\$3,289.67		\$200.00	\$650.00	\$100.00	\$550.00	\$4,789.67
City of Greenwood ^{3,5}	\$500.00		\$200.00	\$350.00	\$100.00	\$450.00	\$1,600.00
City of Grand Forks	\$500.00						\$500.00
FLNRO Trails Management							\$0.00
Interfor Ltd (inkind Boothman)					\$500.00		\$500.00
Boothman Project (BC Parks and PEF)				\$1,646.00	\$3,035.00		\$4,681.00
Canada Summer Jobs	\$1,957.54		\$1,673.65	\$5,375.90	\$3,396.50	\$344.65	\$12,748.24
Community Gaming Grant						\$16,500.00	\$16,500.00
Other sources (Nature Conservancy, HCTF, GWS, Vaagen)			\$3,777.67		\$3,425.10		\$7,202.77
Community Groups - Inkind (Boothman Project)	\$735.75				\$264.25		\$1,000.00
	\$215,108.77	\$2,187.88	\$30,274.00	\$51,349.90	\$26,210.35	\$27,316.56	\$352,447.46
% of overall program	61%	1%	9%	15%	7%	8%	100%
% change since 2019	107%	75%	115%	92%	163%	74%	104%

¹ Includes herbicide donation by range and boothman restoration.

² Inkind for mapping services

³ mowing treatment costs estimated

⁴ District staff value for inventory was not included.

⁵ Includes in-kind contributions for printing maps, factsheets, distributing materials through office

10. Enforcement

The Village of Midway is currently the only municipality enforcing control of invasive plants under their *Unsightly 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 21 years of education, many landowners are aware of their responsibility to control invasive plants and it is time to start requiring control.

11. Summary

The Boundary Invasive Plant Program for the 2020 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 recognized 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 and 2020 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 2020. 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 is included in the species status report for 2020 available from www.boundaryinvasives.com.

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, common bugloss, , and hoary alyssum (outside of Rural Grand Forks). 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 2021 there should be a focus on re-monitoring insect establishment in the Rock Creek fire area.

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 2021. Work in 2021 will continue to focus on coordinating efforts on priority species, monitoring biocontrol insect populations, implementing strategies to prevent spread, encouraging inactive landowners to initiate treatment programs, and continuing the invasive species awareness program as funding allows.

