

# 2019 REPORT



December 6, 2019

Cariboo Regional District Invasive Plant  
Management Report

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## CARIBOO REGIONAL DISTRICT INVASIVE PLANT MANAGEMENT REPORT

### MANDATE

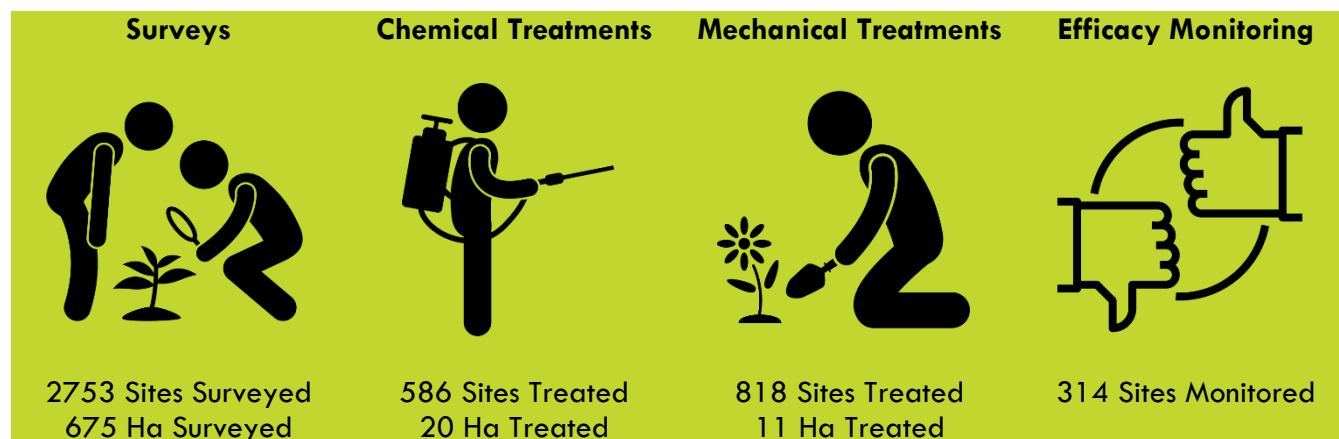
The Cariboo Regional District is strongly committed to operating an invasive plant management program (IPM program) to protect our range and timberlands for the economic and environmental benefit of all British Columbians. The IPM program follows an integrated pest management approach involving public awareness through educational initiatives, chemical control through the application of herbicides, biological control, and inter-agency coordination.

### OPERATIONS

The CRD's invasive plant management program follows an integrated pest management approach in controlling invasive plant populations. This approach is a systematic decision-making process that supports a balanced method to managing different areas of interest for the effective, economical, and environmentally sound suppression of invasive plants.

### 2019 Management Activities Overview

A map of 2019's management activities can be found by clicking on this [map link](#).



## Surveys

An invasive plant survey consists of a general review of the site scheduled for management. Every site that is treated must have a survey completed first. Each survey includes the collection of detailed information about the invasive plant species present, such as its location and distribution across the landscape. Management staff also observe and record the physical characteristics of the site. Information gathered during the survey will assist staff in determining appropriate treatment method selection. The table below outlines surveys conducted over the 2019 season by jurisdiction within the CRD.

<b>Jurisdiction</b>	<b># of Sites Surveyed</b>	<b>Area Surveyed (Ha)</b>
<i>BC Hydro</i>	40.5	18.8676
<i>Ministry of Forests</i>	923.5	102.0651
<i>Ministry of Transportation</i>	1334.5	339.0464
<i>Municipality Owned Land</i>	216.5	30.7456
<i>Private Land</i>	146.5	139.0859
<i>CRD Owned Land</i>	79.5	24.2236
<i>Fortis Energy Inc.</i>	12	21.3943

## Chemical Treatments

Chemical treatments include strategic spot treatments of invasive plants using herbicides. The herbicides used depend on several factors, including the target plant species, as well as site conditions such as soil texture, proximity to aquatic ecosystems, neighboring urban sensitivities, and topography. The Integrated Pest Management Act governs the use of herbicides within BC. This piece of legislation functions to protect human health, non-target species, and the environment. All treatment staff and contractors are certified to use herbicides under this Act. The table below summarizes chemical treatments over the 2019 season within the CRD by jurisdiction.



<b>Jurisdiction</b>	<b># of Sites Treated</b>	<b>Area Treated (Ha)</b>
<i>BC Hydro</i>	7	0.2825
<i>Ministry of Forests</i>	125	2.5794
<i>Ministry of Transportation</i>	369.5	5.9045
<i>Municipality Owner Land</i>	38	1.1033
<i>Private Property</i>	25	9.9002
<i>CRD Owned Land</i>	20.5	0.3971
<i>Fortis Energy Inc.</i>	1	0.005

## Mechanical Treatments

Mechanical treatment of invasive plants includes any physical control, such as hand pulling, digging, targeted grazing by livestock, and weed whacking. These techniques negatively affect the plant's life cycle by cutting the plant at its base, destroying roots, preventing seed production, or depleting seed reserves. It is important to complete mechanical control before seed set and is largely ineffective on creeping rooted plants. The table below depicts mechanical treatments completed over 2019 within the CRD by jurisdiction.



Jurisdiction	# of Sites Treated	Area Treated (Ha)
BC Hydro	4	0.002
Ministry of Forests	208.5	0.9672
Ministry of Transportation	463	7.6482
Municipality Owned Land	83.5	0.2119
Private Property	28.5	0.1997
CRD Owned Land	28.5	1.5602
Fortis Energy Inc.	2	0.0003

## Landowner Assistance Program

Invasive plants grow and spread regardless of invisible borders marking one boundary from the next. To be successful in managing invasive plants on a local or regional scale, everyone who is responsible for land stewardship needs to do their part. Successful management requires knowledge and substantial investments of both time and money. The CRD recognizes that most homeowners are unable to meet these requirements and therefore developed a landowner assistance program to encourage participation and provide support to do so. Services available within the landowner assistance program include spray equipment loans, herbicide dispensing, private property treatments, biological control agent releases, 50/50 cost sharing, heavy-duty disposal bags, and management advice. Only plants listed in the CCCIPC (Cariboo Chilcotin Coast Invasive Plant Committee) Regional Strategic Plan, BC Weed Control Act, or CRD's Invasive Plant Management Regulation Bylaw are eligible for management under this program.

### Equipment Loan-Out

Landowners are welcome to borrow CRD spray equipment from May to October. Truck sprayers, ATV sprayers, and backpack sprayers are available for loan on a first come, first serve basis for a 7-day period.

Equipment continued in 2019 to be available for pick-up at a location within Quesnel, 100 Mile House, and Williams Lake.

### Herbicide Dispensing Program

Participating landowners are eligible to receive a demonstration amount of herbicide to treat invasive plants on their property. Herbicide product and amount dispensed will be dependent on the invasive plant species and site conditions but will not exceed 2L. Landowners are required to attend a dispensing session to receive the herbicide unless they hold a valid BC Pesticide Applicator Certificate.

## 2019 Report

Dispensing sessions occurred in May. There was one session each for north, central and southern area residents. The table below summarizes dispensing totals for each area for 2019.

Area	Number of Participating Landowners
North Cariboo	40
Central Cariboo	48
Chilcotin	1
South Cariboo	18
<b>Total</b>	<b>107</b>



### Private Property Treatments

Landowner's are eligible to receive one free treatment on their property up to the lesser of 10 acres or one full workday. This service is on a first come, first serve basis. Treatments occur between the months of May to October.

The table below summarizes the private properties within the CRD that registered and participated in this service for 2019.

Private Properties Treated (#)	Area Treated (Ha)
20	9.961

### Biological Control Agent Releases



Some invasive plant species have natural organisms that reduce their populations. These organisms are usually natural enemies (such as insects, fungus, or pathogens) of the invasive plant in their native environments. Within the CRD, there are populations of biocontrol agents for spotted and diffuse knapweed, Dalmatian toadflax, and thistle species. Staff can collect biocontrol agents and release them on private land during the operational season upon request. However, the availability of biocontrol agents is variable each year depending on several environmental and biological conditions. Biocontrol agents also require specific site conditions to survive and proliferate. Therefore, this service is dependent upon availability of biocontrol agents and site suitability.

The IPM program received and fulfilled one request for biological control agents from landowners over the 2019 season. 400 insects were released for a knapweed infestation.

### 50/50 Cost Sharing

Landowner's are eligible to apply for a subsidy to assist them in either purchasing herbicide or hiring an invasive plant management contractor to manage invasive plants on their property. Interested landowners need to apply and receive approval before receiving the rebate. This service is on a first come, first serve basis until budgets are exhausted.

The table below summarizes the results of 2019's 50/50 Cost Share service within the CRD.



<b>Program Year</b>	<b># of Applicants</b>	<b># of Approved Applications</b>	<b># of Acres Treated</b>	<b>Total Cost of Treatment</b>	<b>Cost to the CRD</b>
2015	23	17	1315.25	\$53,817	\$14,249
2016	33	21	1184.35	\$92,660	\$30,284
2017	20	16	705.71	\$58,347	\$23,649
2018	26	23	751.56	\$66,157	\$25,458
2019	34	31	619.15	\$38,358	\$13,466

### Heavy-duty Disposal Bags

Landowner's may obtain clear, heavy-duty bags for the disposal of invasive plant material. Landowners can dispose of bagged invasive plant material in the household waste bins at their local transfer station or in the invasive plant bin at the 100 Mile House, Williams Lake, or Quesnel landfill.

Bags are available for pick-up at CRD office locations and all manned landfill/rural refuse sites.

### Management Advice and Property Assessments

Landowners requiring assistance in identifying invasive plant species presence and management recommendations for their property are encouraged to request an assessment by invasive plant management staff. An assessment can especially assist landowners in deciding on which assistance service to participate in.

Staff responded to and conducted 39 property assessments throughout the 2019 operational season.

### Efficacy Monitoring

Monitoring determines the efficacy of treatment and records any treatment affects, such as injury to non-target species. Monitoring is critical in determining the long-term effectiveness of treatment methods and management programs. Efficacy monitoring outcomes assist in strategizing, planning and implementing program elements for future years. A total of 314 unique sites were monitored for efficacy.

### Top 5 Invasive Plants of Concern within the CRD

Based on survey and treatment summaries for 2019 the following table highlights the top five problematic invasive plant species within the CRD. These species continue to increase in number of sites, size of infestations, or impacts to residents. Their collective management consumes a considerable quantity of available resources.

<b>Invasive Plant</b>	<b># of Sites</b>	<b>Total HA Found</b>	<b># of New Occurrences</b>	<b>Total HA New</b>	<b># of Treatments</b>
<i>Common Tansy</i>	1,194	185.9	64	11.4	324
<i>Field Scabious</i>	294	96.6	18	3	109
<i>Hoary Alyssum</i>	185	27.8	33	5.9	114
<i>Spotted Knapweed</i>	2,370	2,149.9	102	33	734
<i>Yellow Hawkweed</i>	1,951	877.9	105	29.5	20

## Common Tansy

### PLANT PROFILE

- Introduced to North America from Europe as a garden herb.
- A perennial plant that can grow up to 1.5 m in height with creeping roots and clusters of bright yellow button-like flowers.
- Common tansy is unpalatable to most livestock and may be mildly toxic in some cases.
- It is especially prone to infesting riparian areas where it can reduce native vegetation, affect stream bank stability and reduce forage quantity and quality for livestock and wildlife.



### THE PROBLEM

There are over a thousand sites of Common Tansy within the CRD. The sheer number of sites makes it difficult from a financial and time perspective to manage Common Tansy effectively. The other aspect that makes Common Tansy a management challenge is the location of infestations. Many infestations near riparian areas are problematic because control options are limited. Many other infestations are located on private land that may or may not be receiving management. Infestations in riparian areas and on private land are providing sources for further spread. Therefore, this species is very widespread within the CRD in alleys, waste areas, vacant lots, roadsides, and industrial and riparian areas.

## Field Scabious

### PLANT PROFILE

- Introduced to North America from Europe as an ornamental garden plant.
- A large, erect plant with a creeping root system and a single main stem.
- The main stem branches into multiple flower stalks that produce purple flowers.
- Infestations of field scabious can reduce the yield and quality of forage in pastures and displace native vegetation.



### THE PROBLEM

This species is scattered throughout the CRD. The heaviest infestations are in the north Cariboo within the Cottonwood area along highway 26 and along the Quesnel Hydraulic Rd. A containment area exists around the infestation in the Cottonwood area because of its severity. Within the containment area, only localized treatment will occur. Outside the area, all infestations will receive treatment as budgets allow. Unmanaged infestations on private land have contributed to its continued spread. Infestations along riparian areas have also played a significant contributing factor to its spread.

## Hoary Alyssum

### PLANT PROFILE

- Introduced to North America from Eurasia in contaminated seed.
- Hoary Alyssum has a slender taproot and small white flowers in short spike inflorescences.
- Hoary alyssum can be a serious problem for horse owners as ingestion of sufficient quantities can cause a number of diseases in horses.
- This species displaces native vegetation and pollinators and reduces forage production for wildlife and livestock.



### THE PROBLEM

Hoary Alyssum is a prolific seed producer because it produces seed from first flower in late spring right up until frost. The seeds also spread by wind, water, and livestock feed, which make this plant tremendously difficult to treat. Additionally, plants appear in random (sometimes very remote) locations far removed from known sites and are very hardy and quick to sprout. Effective control of hoary alyssum sites requires 3 to 4 treatments per season. Consequently, this plant is costly to control. Private landowners further exacerbate control efficacy and costs because some are not actively participating in controlling their infestations.

## Spotted Knapweed

### PLANT PROFILE

- Introduced to North America from central Europe and Eastern Russia in the 19<sup>th</sup> century as a seed and ballast contaminant.
- Spotted Knapweed may grow up to 1.2 m in height and usually has darker red-purple flowers that are thistle-like.
- Its roots exude chemicals that inhibit the growth of other plants.
- It can form near monocultures that degrade desirable plant communities due to its prolific seed production and seed banking abilities.



### THE PROBLEM

There are significant infestations of Spotted Knapweed throughout the region, especially on road rights-of-way, gravel pits, utility corridors, and on public and private land. There are also large infestations within the Thompson Nicola Regional District. Its ability to produce vast numbers of seeds per plant annually (up to 140,000 seeds/m<sup>2</sup>) and the number of years the seeds remain viable (up to 20) make managing knapweed difficult and costly. Private landowners' lack of management and provincial agencies lack of adequate management funding is also contributing to spread and proliferating the difficulty and cost of management.



## Tall Hawkweed

### PLANT PROFILE

- Introduced to North America from Europe.
- There are 12 different invasive yellow hawkweed species in BC, Tall Hawkweed is the most dominant species in the Cariboo.
- Tall Hawkweed stems can grow up to one meter in height with clusters of yellow flowers.
- Tall Hawkweed rapidly forms monocultures that displace livestock forage and native vegetation and wildlife.



### THE PROBLEM

Tall Hawkweed is very widespread within the region. The biology of Tall Hawkweed is similar to Orange Hawkweed except this species prefers drier sites. Tall Hawkweed, like orange hawkweed, can spread very rapidly into areas of disturbance. The disturbed soil at the edge of roads and ditch lines are particularly problematic. Once established, this species can colonize undisturbed sites. A containment area exists for this species, which covers the entire northeastern portion of the CRD. Aggressive treatment outside of the containment area will occur. Inside the containment area, only localized treatment on private land will occur. Inquiries regarding hawkweed account for the bulk of calls received each year because of the extent it has invaded. The IPM program will continue to assist landowners inside and outside of the containment area through the landowner assistance program.



An invasive plant is any non-native plant that has the potential to pose undesirable or detrimental impacts on the environment, economy, and society. Each of the five invasive plant species outlined above possess inherent biological traits that make eliminating or controlling them very difficult. Couple these biological traits with other factors that contribute to their spread and it becomes even more problematic. One of those factors is a lack of proactive management on private properties.

Another factor is a lack of sufficient provincial government funding and utility company participation. It is impossible to eliminate infestations if one still exists on the other side of the fence. Increasing landowner participation will require increased education, management assistance,

and, unfortunately, most likely enforcement. Increasing government funding and utility company participation will require continued dialogue to elevate concerns. All of these require dedicated resources to support. Adequate resources to manage the top five invasive plant species listed above and other high priority species are lacking. Over the past 5 years, program staff and contractors have been able to conduct management activities on an average of 56% of high priority invasive plant sites (priority 1 and 2 sites) within the region.

## **PARTNERSHIPS, OUTREACH, AND AWARENESS**

The successful management of invasive plants across large areas requires a cooperative approach. This can be difficult to achieve with the mosaic of land jurisdictions that exist. Among the jurisdictions, there are differing levels of awareness and financial ability for invasive plant management and differing perceptions

of priorities and urgency. To remedy this, the CRD's invasive plant management program is strongly committed to fostering working relationships with fellow management agencies to facilitate coordination and collaboration. Opportunities to strengthen and improve established relationships as well as forge new ones lie with the IPM program's active participation as a member on the Cariboo Chilcotin Coast Invasive Plant Committee (CCCIPC) board of directors. Therefore, the CRD strongly supports the CCCIPC and adopts the invasive plant priorities laid out in the Invasive Plant Regional Strategic Plan. In addition, inter-agency coordination and collaboration has resulted in fee-based invasive plant management services on behalf of the Ministry of Transportation and Infrastructure (MOTI), Ministry of Forests, Lands, and Natural Resource Operations and Rural Development (MFLNRORD), BC Hydro, Fortis BC Energy Inc., and the City of Quesnel. Furthermore, increased coordination has resulted in partnerships as well with the 108 Greenbelt Commission, Thompson Rivers University, residents of Lac La Hache, landowners, community groups, Indigenous communities, invasive plant contractors in the area, the North West Invasive Plant Council, and the Invasive Species Council of British Columbia (ISCBC). Below are some of the highlights of partnerships that contributed to 2019's successes.

An extremely dedicated member of the 108 Greenbelt Commission assisted the IPM program once again in managing invasive plants on 108 Greenbelt lands. This person has been instrumental in controlling invasive plants on the Greenbelt for over 12 years on a volunteer basis.

The IPM program worked with Dr. Catharine Tarasoff in 2019 to deliver two workshops in the region on the implementation of yellow flag iris benthic barrier treatments. A workshop in Bridge Lake and Lac La Hache occurred in May, with about 15 people in attendance at each session. The workshops were well received, and plans are in place to provide at least two more workshops in 2020. The workshops, if funding is secured, will occur on yellow flag iris sites in Williams Lake and Lac de Roches. The IPM program has provided a letter of support for the funding proposal outlining our interest in assisting with this project over 2020.

The IPM program received additional funding from the MFLNRORD to assist in monitoring and treating eight of the 2017 wildfires in the region. The eight fires identified for invasive plant monitoring and treatment activities included Green Mountain (C10683), Gustafsen (C40621), Plateau (C10784), Kluskoil Lake 1 (C10970), Spokin (C20645), White Lake (C20735), Hanceville Riske Creek (C50647), and Kleena Kleene (C50744). In addition to providing increased monitoring and treatment activities, IPM staff were also directed to install photo monitoring plots on some invasive plant sites within and adjacent to burned areas. The plots will be used to monitor the response of invasive plant species to fire over time. This knowledge will inform invasive plant management practitioners on the behavior of invasive plant species post-fire. This information can then assist in the development of future post-wildfire invasive plant management strategies. As a result, the IPM program enjoyed partnering with the Ministry on this important work and is looking forward to continuing that partnership into 2020 and beyond.

The ISCBC received funding from the MOTI to survey, treat, and develop management plans for high priority gravel pits within our region. The CRD's IPM program has participated in joint planning sessions annually and communicates with ISCBC throughout the operational season to avoid duplications. Therefore, all dollars the CRD's IPM program receives annually from MOTI are for use on roadsides only.

The CRD has continued to retain the services of the Invasive Species Council of BC for the delivery of an invasive species community outreach and education program on our behalf. Initiatives will focus on preventing the introduction and spread of invasive species within the region. It will also complement current outreach programs in place locally and provincially. In addition to providing educational and awareness initiatives, the

program will provide aspects directed at increasing community engagement that lead to partnership opportunities and active participation in invasive species management. The community outreach program targets several different audiences, such as members of the public, community groups and organizations, industry sectors, Indigenous communities, and youth groups and organizations.

## **SUCSESSES AND CHALLENGES**

Weather conditions and newly retained contractor companies challenged management activities this year. Weather conditions over the operational season were less than ideal for invasive plant management. The season was extremely wet, cool, and windy which significantly hampered management activities. The weather especially hindered chemical treatments, which cannot be conducted if wind exceeds 8km/hr or if rain is forecasted. Consequently, more mechanical treatments were conducted which take more time to complete. In addition, the CRD retained the services of two new invasive plant management contractors for the Chilcotin, Central Cariboo, and North Cariboo this year. The contractors faced the challenges of understanding the area, stakeholders, and procedures of a program that was new to them, which affected productivity compared to previous years. Both factors contributed to a slight reduction in the average overall number of sites and amount of area that was treated this year. It is anticipated that the contractor's productivity next year will increase and hoped that the weather will cooperate to enable management activities to align with previous years outputs.

Assisting landowners through the Landowner Assistance Program incentivizes landowners to participate in invasive plant management. Invasive plant management can be a costly and challenging endeavor for most landowners. The services through the Landowner Assistance Program overcome some of those barriers and increase the amount of treatment on private land. The IPM program has been working to diversify services within the Landowner Assistance Program over the last number of years to try to have a multitude of options available to fit the needs of landowners. Consequently, there have been increases in the number of landowners participating each year.

Building and maintaining local partnerships has complimented and augmented the CRD's IPM program. A partnership with the 108 Greenbelt Commission increased the amount of invasive plant sites managed in 2019. In addition, our partnership with the ISCBC in the delivery of outreach and awareness activities within the Cariboo increased efficiencies and exposure. The ISCBC was also able to leverage additional funding to augment the budget and increase the scale of outreach and awareness programming within the region.

While regarded as a success, outreach and awareness programming remains a challenge as well. A continued need exists to improve and increase outreach and awareness regarding invasive plant concerns. It is also difficult to reach audiences that span a broad spectrum. Characteristics of invasive plants make them occur on a diverse range of landscapes maintained and utilized by an equally diverse range of stakeholders. Therefore, awareness messaging and dissemination methods for each stakeholder group will vary. Furthermore, shifting invasive plant threats may require modifications in awareness focus.

Unmanaged infestations on private land is an ongoing challenge that is increasing the spread of invasive plants and the demand on resources. Despite having access to the Landowner Assistance Program, the reality remains that most landowners are not participating. This is evident in the number and size of infestations on private land in many areas of the District. The program recognizes the complexity of this issue and continues to investigate, develop, and implement initiatives that will increase participation.

Funding is already insufficient without the added pressure of unmanaged private land, especially in urban centres and on transportation and utility corridors. Despite our funding requests, we are continually receiving about half of the amount we require to manage priority one and two species on transportation and utility corridors. Consequently, the program is only managing about half of the sites on a yearly basis. Prioritization strategies are necessary to respond to the resource shortages. However, prioritizing sites and plants to reflect the environmental, social, and financial concerns of stakeholders while also successfully meeting management objectives will continue to be challenging.

The effects from 2017's wildfire season are beginning to impact invasive plant infestations within the region. For example, a new and large 2017 post-fire site of knapweed was discovered about two and a half kilometers west of the Klinaklini River in the Chilcotin this year. The site was used as a staging area in the 2017 fires and was approximately 0.08 ha in size. To make matters worse, the site became a road construction project after it was initially discovered and before treatment could occur. It is hoped that much of the infestation got buried before it could be moved to other locations in the Chilcotin through contaminated equipment and that the soil material was left on site. Other recovery work on fence repairs and salvage logging are also exacerbating the problem by further disturbing burned sites and encouraging invasive plant spread. In addition, flooding events and washouts in burn areas are causing disturbance and providing opportunities for invasive plant establishment. This was especially the case for the Big Creek area in the Chilcotin that experienced unprecedented flooding this past summer. Consequently, it was helpful to have added funding from MFLNRORD to provide monitoring and treatment activities within eight of the 2017 wildfire areas this year and hoped that similar funding will be available for 2020.

## **PROPOSED PROGRAM 2020**

### **Operations**

Proposed activities for 2020 invasive plant management on lands governed by those within the invasive plant management function and those procuring our services on a contractual basis:

- Prepare an annual work-plan outlining operational management activities, if required, meet with stakeholder representative(s) to present and discuss the work-plan, complete any edits to the work-plan, and provide the finalized work-plan to the stakeholder if requested.
- Survey all priority one-plant sites and conduct a first-pass treatment (if plants are present).
- Monitor all priority one-plant sites post-treatment and conduct a second-pass treatment (if plants are present).
- Manage as many priority two-sites as the budget allows after priority one treatments.
- Manage lesser priority species as budgets allow and/or as requested by adjacent landowners depending on the reasonableness of the request and budget constraints.
- Manage any provincial or regional EDRR (Early Detection, Rapid Response) plant species that occur during the operational season and provide treatment on consenting adjacent landowners if they are unable to provide funding to conduct management activities themselves.
- Monitor at least 10% of managed sites for treatment efficacy to ensure compliance.
- Follow an integrated pest management approach.
- Upload all management data into IAPP and maintain data integrity.
- Provide annual reports to funding agencies and the CRD Board.

- Continue to offer services within the Landowner Assistance Program to residents within the IPM function and City of Quesnel.

### **Partnerships, Outreach, and Awareness**

The IPM program will continue to foster and develop partnerships with other organizations that provide opportunities to prevent the establishment and spread of invasive plants:

- The invasive plant management program will continue working on outreach and awareness activities in partnership with the ISCBC
- Continue to engage and maintain partners within the region including:
  - Ministry of Transportation and Infrastructure
  - Ministry of Forests, Lands, Natural Resource Operations, and Rural Development
  - Ministry of Environment
  - Invasive Species Agencies
  - BC Hydro
  - Fortis BC
  - Enbridge
  - City of Quesnel
  - City of Williams Lake
  - District of Wells
- Continue to attend and participate in Cariboo Chilcotin Coast Invasive Plant Committee activities.