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# Akisqnuk First Nation

Invasive Plant  
Management Plan

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## Invasive Plant Management Plan

**Prepared for:**

Akisqnuq First Nation  
Lands Department  
#3050 Highway 93/95  
Windermere, BC V0B 2L2

**Prepared by:**

Tracy Kaisner  
West Fork Resource Management  
1289 Ponderosa Drive  
Sparwood, BC V0B 2G2  
[www.westforkrm.com](http://www.westforkrm.com)

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## Executive Summary

Invasive plants are an increasing concern for all landowners, and in order to achieve the goal of maintaining biodiversity and vigorous, dynamic landscapes, it requires strategic collaborative management between individuals, organizations, landowners and government.

This Invasive Plant Management Plan presents the justification for initiating efforts, as well as outlines specific actions to prevent, reduce, and mitigate the effects of invasive plants on Akisqnuk land while protecting identified values including traditional practices, recreation and agriculture.

Integrated management is the key is in controlling and preventing the spread of invasive plants. To ensure the most effective, efficient and environmentally sound results are attained, multiple treatment methods will be required.

This document includes all aspects of managing invasive plants on Akisqnuk lands, from prevention to treatment and evaluation. Following an extensive survey of invasive plant sites on the Band lands, a comprehensive site list has been developed as well as digital files for conducting future management activities. Each method of treatment has been outlined with advantages and disadvantages. The most recommended method for each site has been provided after considerable analysis of site and species data. Many resources and recommendations have been included to aid the Akisqnuk managers in the next steps of the management process.

## Background

The Akisqnuq First Nation lies in the Columbia Valley, BC between the town of Fairmont Hot Springs on the southern end and Windermere on the northern end. Lake Windermere and the Columbia River serves as the Reserve's western boundary and the base of the Rocky Mountains serves as the western boundary, encompassing the single largest private land base in the Columbia Valley at 3272 ha. The Band consists of about 300 members, and a Council of five members that governs the operations of the First Nation.

Invasive plants have been recognized by the Band as a topic of concern, and they have consequently focused actions on addressing this concern. The Akisqnuq have recently been working in conjunction with the East Kootenay Invasive Plant Council (EKIPC) as well as the Columbia Shuswap Invasive Species Society (CSISS) to promote awareness and initiate management activities on Band lands. The Akisqnuq hosted a local invasive plant workshop in the summer of 2015.

West Fork Resource Management (WFRM), based in Sparwood BC was contracted in 2015 to develop an Invasive Plant Management Plan for the Akisqnuq First Nation.

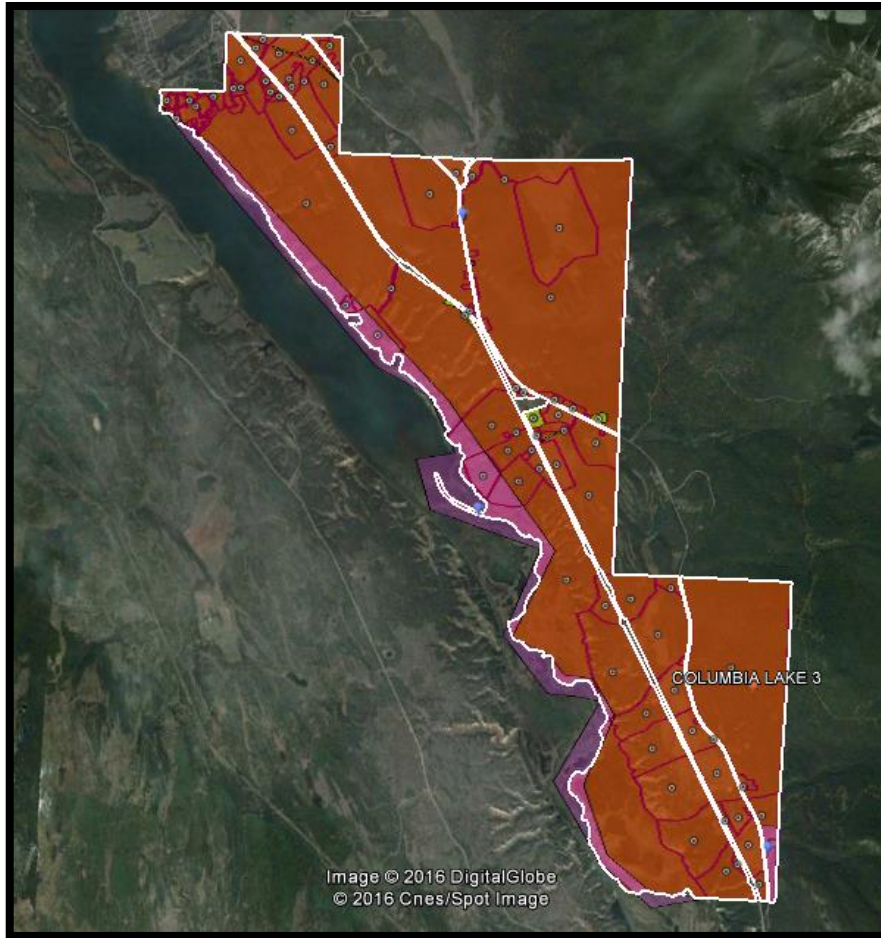
West Fork Resource Management devised the following strategy for the development of the Invasive Plant Management Plan:

- Outline the management land base using a combination of maps and Google Earth photos
- Perform an inventory of invasive plants on the identified land base
- Establish management objectives for the land base
- Prioritize all inventoried sites and invasive plant species
- Select control strategies for an integrated management approach for general and specified areas
- Using the above information, develop the integrated Invasive Plant Management Plan (IPMP)

## Scope

The land discussed in this management plan refers to all Akisqnuq First Nation land, as shown in *Figure 1*. For the inventory, West Fork Resource Management targeted all priority areas, as identified by the Lands Department. These areas included Naked Sands Beach, Indian Beach Estates, residential subdivision, Band yards, Lakeshore Resort & Campground and the ecosystem restoration area; secondary areas included general Band land. WFRM used a 2009 site inventory list, collected by the East Kootenay Invasive Plant Council, to base the 2015 survey from, all 2009 sites were visited and observation data was collected. In addition, WFRM also inventoried all main roads as well as other areas found to be high vectors for seed travel, i.e. trails. [Appendix II](#) includes overview maps of all sites identified. WFRM conducted the survey on Akisqnuq lands only, and did not survey Highway 93/95 right of way. The highway falls under the jurisdiction of BC Ministry of Transportation and Infrastructure and is treated by the local area controller for the East Kootenay Invasive Plant Council.

Only a small portion of individually held land was surveyed at this time, some infestations were identified from the road, fence lines, etc.



*Figure 1 Akisqnuq First Nation Lands, Columbia Valley*

## Purpose

This plan is designed to guide the Akisqnuq First Nation in managing invasive plants on their land. The objective is to have healthy landscapes with minimal impacts of invasive plants while protecting ecological, social and economic values. In striving to achieve this objective, this management plan will outline ways to prevent, reduce, and mitigate the effects of invasive plants on Akisqnuq land. The primary values for protection have been identified by the Akisqnuq First Nation below:

- Landscape preservation and rehabilitation
- Maintaining and enhancing the biodiversity of the area
- Protecting the traditional hunting and gathering way of life
- Recreational opportunities
- Agricultural practices

The recommendations and methods in this Plan will address these values and their associated activities on the Akisqnuq land including development, recreation, forestry, hunting, agriculture, etc. and how they relate to invasive plant management.

## Why Is Invasive Plant Management Important?

Invasive plants, also referred to as noxious weeds in this document, are considered a significant threat to the integrity of our ecosystems. They are typically non-native plants that have been introduced to British Columbia without the insect predators and plant pathogens that help keep them in check in their native habitats. They are legislated under the B.C. Weed Control Act and possess some or all of the following characteristics which allow them to be invasive and difficult to control:

- Aggressive, prolific seed producers
- Produce seeds which can lie dormant for decades
- Have extensive root systems, thorns or burrs for protection
- Produce chemicals which inhibit growth of surrounding vegetation

Communities are particularly complimentary to the problem of spreading invasive plants, as they are the center of a network of roads, pathways, railways, utilities and waterways that are often a gateway into natural environments. Weeds tend to thrive in these travel corridors, with seeds being carried by unsuspecting pedestrians, ATVs, vehicles, pets, livestock and wildlife.

Once they are established, the invasive plants have economic, environmental as well as social impacts. Unlike other disturbances associated with development, their effects are often subtle and incremental. They pose the following threats to values in natural areas and communities:

- *Increased economic costs*  
The most noticeable economic impact from invasive plants is in agricultural crop production. Substantial crop economic losses are reported damage in Canada each year due to weed damage and weed control costs. Livestock can also be affected, with increased weeds there is reduced edible forage available, therefore reducing weight gain and compromising health.

Invasive plants can also increase land management costs in terms of surveys, treatments, monitoring, and operational costs. As well, new development projects may require extensive weed removal which can increase future management and control costs. Large infestations can negatively affect property values.

- *Impacts on ecosystem biodiversity*  
Invasive plants dominate resources such as light, moisture, and soil nutrients that are required by native plants to establish and grow. Invasive species can essentially outcompete native species by depriving them of access to these resources. This can decrease the overall health of the native species population, making them more susceptible to disease, etc. They can also impact species at risk, pushing them to elevated levels of risk and potentially endangerment.
- *Impacts on ecosystem function*  
Invasive plants can create fierce competition for native plants, spreading very quickly and densely. Lower productivity of native plants, animals and micro-organisms can have adverse effects on ecosystem function. Decreased nutrient cycling, decreased soil stability and increased erosion can negatively affect water bodies. A disruption in natural fire cycles



can occur when invasive plants alter the fuel properties on a landscape, adversely changing the frequency, intensity, type and timing of fires.

- *Risks to human health*  
Some invasive plants pose direct risks to human health, with effects such as skin irritation, or toxic ingestion of berries or leaves.
- *Interference with traditional lifestyles*  
Large infestations of invasive plants decrease forage and habitat for wildlife as well as outcompete native plants, which can have a negative impact on traditional hunting and gathering practices. Though some invasive plants can be used for traditional medicinal practices, it is likely that these practices utilize only a small amount of plants and the overall negative effects of large infestations outweigh the benefits of medicinal uses.

### *Tobacco Plains Project*

WFRM conducted work on the Tobacco Plains Indian Reserve near Grasmere, BC in 2015 in partnership with Keefer Ecological Services Ltd. and the Tobacco Plains Indian Band. The project involved chemical treatments of Leafy Spurge, Spotted Knapweed and Yellow Hawkweed on identified priority sites, with the intent of protecting the federally endangered Spalding's Campion plant. The project was funded under the Fish and Wildlife Compensation Program for the "Tobacco Plains Grasslands and Open Forest Ecological Restoration" project. The project is scheduled to be ongoing, dependent on funding.

## Integrated Management

Managing invasive plants is a long term commitment, requiring ongoing monitoring and adaptive approaches. In order to achieve success, it involves a strategic process and implementation of the following key elements:

- Prevention
- Identification and early detection
- Site and species prioritization
- Treatment and control options
- Monitoring
- Evaluation

The Akisqnuk Lands Department will be responsible for implementing and overseeing all activities related to invasive plant control on Band lands.

### Prevention

Preventing the spread of weeds is the most important strategy, it involves an active awareness of all activities that have the potential to spread and establish weeds in new locations. There are numerous ways that seeds can travel and spread very easily; they thrive in disturbed or degraded soil; therefore, prevention is about interrupting this succession.

A primary value for the Akisqnuk is to support landscape preservation and rehabilitation, as well as maintaining biodiversity. With this in mind, **preventative actions** should include:

- Minimizing soil disturbance, especially close to areas with weed infestations, as to prevent new infestations from establishing.
- Ensuring proper movement and disposal of soil and plant waste as to prevent seed transfer.
- Use certified weed-free nursery stock or seed mixture to prevent the importation of invasive seeds to new planting areas or disturbed sites.
- Implement practices of inspecting and cleaning all equipment (mowers, forestry equipment, etc.) and vehicles after driving through and working in infested areas, prior to moving to different work locations.
- Keeping equipment yards and storage areas free of invasive plants.
- Reviewing and implementing standard invasive plant management practices for new developments.
- Conducting native species inventories and identification of key native species to protect and enhance.

The Akisqnuk land is accessed for recreational purposes, as well as traditional practices of hunting and gathering. The following **preventative actions** can be implemented in an effort to preserve these values:

- Signs should be posted at access points where identified infestations occur, educating land users of the invasive species present and measures to assist in the prevention of spread.
- Explore the option of restricting vehicle access in some heavily infested, or sensitive areas, at least until the infestation is under control.

- The Ecosystem Restoration area is gated at the main entrance, but is accessible via various trails off Kootenay Rd #3, all of which are infested with Knapweed. These trails should be posted with noxious weed signs and even potentially gated to restrict access to this sensitive area.
- The gravel pit on Kootenay Rd #3 and Alpine Rd is heavily infested with Spotted & Diffuse Knapweed, and it is recommended that access to this area be restricted using a gate, and no material be removed until the infestation is under control in order to prevent spread to other areas.
- The education of Band members on the potential impacts of invasive plants on these core values, and the reasoning behind potentially restricted access areas.
- Continue to work with other local communities and organizations to identify new invasive plants before they establish.
- Explore the potential to implement a bylaw that requires residents of individually held lands to control invasive plants on their property.

Agriculture and grazing plays a small role on the Akisqnuk lands, and has the potential to significantly contribute to the spread of invasive species. The following **preventative actions** should be considered for agricultural activities:

- Cut weed infested crops prior to seed formation to avoid seed spread.
- Keep machinery weed free by washing prior to transporting to new areas.
- Remove weeds from equipment storage areas, irrigation ditches, stockyards, etc.
- Remove burrs and weeds from livestock prior to moving them to another location.
- Avoid overgrazing, as this removes vital native species competition, leading to soil degradation and providing a prime opportunity for invasive plants to establish.
- Avoid grazing in weed infested areas, for many reason such as cattle will target grasses, allowing weeds to become even more densely infested; there is less palatable feed and nutritional value available on these sites for livestock.

## Early Detection and Identification

Early detection of invasive plants within a landscape requires identification and documentation skills, which then provides a base for management decisions. Educating staff and residents with these necessary skills is proven invaluable to early detection and reporting. Understanding the biology of the plant will concentrate the further support the efforts and provide the necessary information for treatment.

The Invasive Plant Identification and Control Guide in [Appendix IV](#) highlights descriptions of each plant species found on Akisqnuk lands during the 2015 survey. Though these are the only species that have been identified on the lands currently, future findings are not limited to these species and crews should be familiar with other species found in the Columbia Valley.

The survey conducted by West Fork Resource Management provides a comprehensive site list, which will should serve as a basis for all future surveys, treatment and monitoring. The Invasive Plant Site List 2015, as shown in [Appendix I](#), is a table displaying all identified sites, some information such as UTM and distribution and density has been omitted for optimal viewing

purposes. The comprehensive spreadsheet, along with digital files will be provided to the Akisqnuq Lands Department. The criteria collected for each site includes:

- UTM
- Location Description
- Date
- Weed Species (all weed species present)
- Approximate area of infestation (ha)
- Distribution (for each species)
- Density (for each species)
- Treatment recommendation
- Treatment priority rating
- Comments

An annual inventory of existing sites and adjacent areas will increase the likelihood of new invaders being found. Any new sites should be added in sequence to the current list. The most efficient method of tracking sites and species and their associated criteria is in a GIS based program, which will allow for annual tracking, as well as tracking of infestation trends over many years. Another data management option is the BC government Invasive Alien Plant Program (IAPP) application<sup>1</sup>. All 2009 inventoried sites are viewable under this application; their original site numbers have been kept in a separate column on the 2015 Site List.

**Actions to support early detection include:**

- Educate residents on the importance of early identification in the control and mitigation of weed populations. Have brochures and/or identification booklets available.
- Implement a weed reporting tool, or use the BC government IAPP Report-A-Weed application, for more information visit their website<sup>2</sup>.
- Managers and contractors directly involved with the invasive plant program should be competent in invasive plant identification and plant physiology in order to identify emerging species and infestations.
- Continue to work in partnership with the East Kootenay Invasive Plant Council (EKIPC) and Columbia Shuswap Invasive Species Society (CSISS) holding annual workshops, etc. to keep residents informed
- Engage local guide outfitters in invasive plant identification and prevention measures, this will serve as a frontline tactic for identifying and avoiding infestations in the backcountry.
- Engage and educate industrial workers performing forestry, restoration or other work on Akisqnuq lands in the importance of best practices, see ISCBC website under [More Resources](#) for pocket guidebooks.

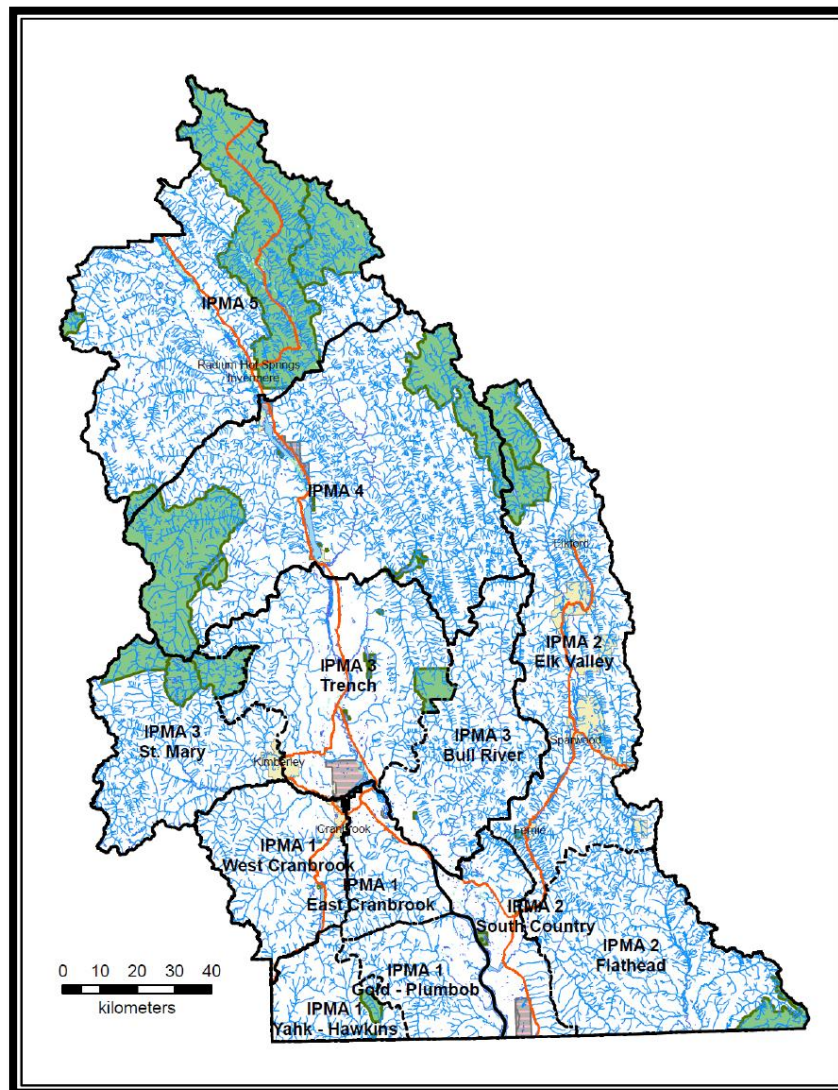
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<sup>1</sup> <https://www.for.gov.bc.ca/hra/plants/application.htm>

<sup>2</sup> <http://www.reportaweedbc.ca/>

## Site and Species Prioritization

The East Kootenay Invasive Plant Council (EKIPC) is responsible for directing invasive plant management activities on crown land in the East Kootenay Region. The program goals of the EKIPC are on par to those of the BC Inter-Ministry Invasive Species Working Group (IMISWG) and the Invasive Species Council of British Columbia (ISCBC). One of their main goals is to act as the centralized organization for the coordination of invasive species management in the East Kootenay, promoting a coordinated approach across all jurisdictions, landowners and individuals. The Regional District of East Kootenay has been divided up into five Invasive Plant Management Areas (IPMA), as shown in *Figure 2* below. The EKIPC has prioritized invasive species for management in each of these IPMAs based on many factors. WFRM has utilized this information from the neighboring IPMAs 4 (includes the region from Canal Flats north to Invermere, and all Akisqnuik lands), as shown in *Table 1*, and IPMA 5 (Invermere north to Spillimacheen) as shown in *Table 2*, in determining species prioritization on the Akisqnuik lands.



*Figure 2* Map of IPMA Boundaries within the Regional District of East Kootenay

**Table 1** Species Prioritization IPMA 4

<b>Priority 1 Watch list</b>	<b>Priority 2 Eradication or Annual Control</b>	<b>Priority 3 Containment</b>	<b>Priority 4 Established biocontrol or site specific approach</b>
Black Hembane	Baby's Breath	Annual Sowthistle	Hounds Tongue
Blueweed	Common Toadflax	Burdock	
Common Tansy	Dalmatian Toadflax	Canada Thistle	
Hoary Alyssum	Diffuse Knapweed	Chicory	
Hoary Cress	Meadow Knapweed	Oxeye Daisy	
Leafy Spurge	Orange Hawkweed	Perennial Sowthistle	
Perennial Pepperweed	Plumeless Thistle	Russian Thistle	
Rush Skeletonweed	Russian Knapweed	Sulphur Cinquefoil	
Sun Spurge	Scentless Chamomile	St. John's Wort	
	Spotted Knapweed	Wild Caraway	
		Wormwood Absinthe	

**Table 2** Species Prioritization IPMA 5

<b>Priority 1 Watch list</b>	<b>Priority 2 Eradication or Annual Control</b>	<b>Priority 3 Containment</b>	<b>Priority 4 Established biocontrol or site specific approach</b>
Blueweed	Baby's Breath	Annual Sowthistle	Hounds Tongue
Hoary Alyssum	Common Toadflax	Burdock	
Hoary Cress	Dalmatian Toadflax	Canada Thistle	
Leafy Spurge	Diffuse Knapweed	Chicory	
Wild Caraway	Meadow Knapweed	Oxeye Daisy	
	Orange Hawkweed	Perennial Sowthistle	
	Plumeless Thistle	Russian Thistle	
	Russian Knapweed	Sulphur Cinquefoil	
	Scentless Chamomile	St. John's Wort	
	Spotted Knapweed	Wild Caraway	
		Wormwood Absinthe	

After assessing the species priority according to the areas, the next step was to determine the site risk, using the characteristics and size of the sites as well as other influencing factors such as:

- Ecological value
- Community value
- Recreational value
- Historical value
- Accessibility
- Feasibility of control

Table 3 displays characteristics and examples of highest to lowest risk sites.

**Table 3** Site Risk

Priority	Characteristics	Examples
<b>Extremely High Risk 1</b>	<ul style="list-style-type: none"> <li>• Areas with a size of 0.25ha or less</li> <li>• Remote sites</li> <li>• Highly susceptible areas with little to no other infestations</li> <li>• High probability of control</li> </ul>	<ul style="list-style-type: none"> <li>• Small infestations on backcountry trails or remote areas</li> </ul>
<b>High Risk 2</b>	<ul style="list-style-type: none"> <li>• Areas with a size of 0.5ha or less</li> <li>• Highly susceptible areas</li> <li>• Good probability of control</li> </ul>	<ul style="list-style-type: none"> <li>• Small –medium infestations on trails leading to backcountry</li> <li>• Infestations in riparian areas</li> <li>• Infestations along roads/trails</li> </ul>
<b>Moderate Risk 3</b>	<ul style="list-style-type: none"> <li>• Areas greater than 0.5ha</li> <li>• Moderately susceptible risk</li> <li>• Good probability of control</li> </ul>	<ul style="list-style-type: none"> <li>• Large areas with moderate public use</li> <li>• Riparian areas with low public use</li> </ul>
<b>Low Risk 4</b>	<ul style="list-style-type: none"> <li>• Areas greater than 0.5ha</li> <li>• Low-moderate susceptibility</li> <li>• Moderate probability of control</li> </ul>	<ul style="list-style-type: none"> <li>• Inactive, low public use areas</li> </ul>

The final component to establishing an overall priority system is the site and species combination matrix, taking the previously examined plant species priority and site risk will provide an overall treatment priority rating for management, as outlined in Table 4 below. Sites containing highly invasive species will contribute to a higher ranking for treatment priority. Sites that are newly established and small in size will also rank higher, as they have a better chance of rapid containment than larger sites. For instance, Sun Spurge, is a rare species in the Kootenays, designated as a Priority 1 species and was found on Akisqnuk land in a small single patch, a high risk site, therefore has been classified as very high priority, and should be targeted for mandatory control. Essentially, as the environmental site risk decreases and the extent of invasiveness decreases, the management strategy becomes less aggressive and there is less opportunity to control the species.



**Table 4** Species and Site Prioritization Matrix for Establishing Control Level

Site Priority	Invasive Plant Species Priority			
	1	2	3	4
1				
2				
3				
4				

<b>Very High</b>	Targeted for mandatory control/eradication to prevent spread to any other areas
<b>High</b>	Targeted for mandatory control or containment, assessing habitat or other high risks
<b>Moderate</b>	Targeted containment to a level based on cost/benefit analysis
<b>Low</b>	Control/monitoring will be based on cost/benefit analysis, potential for biological control

The 2015 site survey conducted by WFRM on Akisqnuq lands indicated that the species found to be in the highest concentrations were Spotted Knapweed and Diffuse Knapweed. Other species found mainly in lower concentrations were Leafy Spurge, Canada Thistle, Russian Thistle, Burdock, Baby’s Breath, Perennial Sowthistle, Chicory, Sun Spurge and Bluebur. The general recommended control levels, in keeping with EKIPC classifications for each of these species, are as follows. (WFRM has assigned each site surveyed on Akisqnuq land with an overall priority classification based on an analysis of species and site factors, see Invasive Plant Site List 2015 [Appendix I.](#))

**Leafy Spurge and Sun Spurge** are on the Priority 1 watch list, and should be targeted for eradication. Leafy Spurge was found in a few isolated patches on Akisqnuq land, but is found in many areas north of Windermere, therefore, should be a priority to treat all sites on Band land. Budgeting should include two pass system of treatments on these sites.

**Spotted Knapweed, Diffuse Knapweed and Baby’s Breath** are identified as a priority 2 in IMPA 4 and 5, which indicates eradication or annual control. Baby’s Breath was only found in one area, and though it is a fairly large patch, management efforts should focus on eradicating this species. Budgeting should include at least one pass for treatment on these species.

**Canada Thistle** is classified as Priority 3, but was not found to be plentiful, therefore efforts should ensure the prevention of any new infestations, and treats existing infestations if budget allows.

**Russian Thistle** is classified as Priority 3, it was found in only small patches, but in high foot traffic areas. Efforts should focus on containment and removing plants before the seed stage.

**Burdock** is classified as Priority 3 and was found in limited distribution and density. Some Burdock plants were found in riparian zones, which is a higher priority and should be removed prior to the seed stage.



**Chicory** is only found in one location along the Subdivision road, it a Priority 3 species and efforts should focus on containment. Minimal efforts towards roadside mowing and/or chemical treatment would prevent spread.

**Perennial Sowthistle** is also a Priority 3 species and efforts should focus on containment. It was found in small patches at and near the Indian Beach Estates Marina. With minimal efforts, these areas could be contained by mowing or trimming.

**Bluebur** is not considered a priority species, there was very little found, so if budget allows, containment efforts can be directed towards these sites.

## Treatment and Control Options

A variety of treatment options are available for the control of invasive plants; some sites may benefit from a combination of control methods. Substituting biological, physical or cultural controls for chemicals is promoted wherever feasible to reduce impacts on the environment, if these non-chemical alternatives have lower potential environmental impacts. When pesticides are used, a thorough understanding of all methods, limiting factors, safety and the environment is paramount.

WFRM has included a general guide outlining the most recommended control methods for each invasive species found on the Band lands, in [Appendix IV](#). As well, the control method most recommended for each site has been identified in the Invasive Plant Site List 2015, [Appendix I](#). These recommendations are considered to be the most efficient or effective method based on analysis of each site and species, but circumstances or management may decide on alternative methods.

### Cultural Control

Cultural control can include grazing, seeding, irrigating, fertilizing and crop rotation to encourage the establishment of healthy ground cover to resist invasive plants. When natural vegetation or soil is disturbed, cultural control can be an effective tool in invasive plant management. Seeded or intensively managed plant communities can offer competition for invasive plants. When non-selective herbicides are used on a wide area, or the burning of brush/slash piles is conducted, these practices will leave bare ground. In these cases, cultural control (i.e. seeding) should be used in combination with chemical control as part of a long-term management strategy. Re-vegetation can assist in preventing the return of an invasive plant or the introduction of new invasive species in an area.

**Seeding** burn piles in the ecosystem restoration area with a certified weed-free mix will help to discourage weed establishment in this area and promote native grasses.

**Grazing** can be an effective alternative to other control methods, and can have many advantages including reduced weed control costs, excellent public acceptance over alternative herbicide use and reduced damage to native plants.

**Goats** are preferred over cattle for grazing invasive weeds, due mostly to the fact that the digestive system of a goat can breakdown seeds completely, with very little viable seed material being left behind, where as cattle do not breakdown the seeds and therefore spread

seed-filled fertilizer. Goats also tread much more lightly on the ground; they do not leave extensive soil compaction as compared to cattle. They can also tend to target weed material as opposed to native grasses; after the weed material is eaten down, the native grasses then begin to flourish. Goat grazing can be especially beneficial on areas that cannot be treated by herbicides, such as riparian zones or sensitive habitats, and also steep slopes where chemical treatments are inefficient. Cost estimates start from around \$300-600/ha, and project findings have reported that it can be up to 30% less expensive than the cost of using herbicides. The use of goats requires subsequent annual treatments over a period of at least 3 years, at which time infestations may begin to recede to a manageable level. This is due to the fact that large infestations generally carry large seed banks in the soil, which can germinate years into the future. By grazing annually, this allows for native grasses to re-establish and provide healthy competition for the weeds.

Recently there has been several projects in BC using goats for targeted grazing on invasive weeds, including the City of Kamloops, Ministry of Transportation in Interior BC and the Aq'am First Nation on the St. Mary's Band lands. All of these projects have reported significant results in the reduction of weeds.

Specifically, the Aq'am Goat Grazing Project in 2015 consisted of grazing a herd of 300 goats on 1000 acres (404ha) of Band land infested with Sulfur Cinquefoil over a three week period. The goats 'treated' an average of four to five hectares per day and yielded remarkable results. The project was funded through the Columbia Basin Trust, and is planned again for 2016. Rocky Ridge Vegetation Control based in Kamloops, BC, was contracted for this project. These goats are accompanied by herders and trained dogs for control at all times. The Tobacco Plains Indian Band is also currently investigating the use of goats for controlling large infestations on Reserve lands.

This method would be effective and feasible on knapweed infestations along Kootenay Rd #3. The estimated area of knapweed infestation in this area is at least 32ha; preliminary calculations indicate a minimum of approximately 8 days of treatment using the herd of 300 goats. It should be noted that some of these large infestations extend onto individually held properties, so owner consent would be required prior to proceeding.

## **Biological Control**

Biocontrol agents are insects that are intentionally propagated because of their ability to target a specific plant species, and decrease the population density of that plant species by surviving off its seeds or other plant structures vital for reproduction. The goal of biological control is not to eradicate infestations, but to reduce population levels down to an acceptable, manageable level where environmental damage does not occur.

When considering biocontrol, one or more of the following conditions should exist:

- Targeted invasive plant infestations that are large and well established
- Other treatment options have proven not to be feasible, i.e. site is remote and not accessible

- Targeted infestations should be in a low traffic area, as plants will continue to grow and reproduce normally until the bioagent is well established, therefore viable seeds can still be spread via pedestrians, animals and vehicular traffic.
- Targeted infestations will be in natural areas, where vegetation is not maintained by mowing, trimming, fertilizing, irrigation, etc.

In consideration of these factors, there are few sites currently found that meet ideal conditions for biocontrol on the Akisqnuk land. Many of the infestations are in close proximity to roads or trails, which are high vectors for spread, and would therefore promote more spread rather than containment over time. Areas that may benefit are the trails that lead up into the ecosystem restoration area from Kootenay Rd #3, but it would be recommended that vehicle use be restricted in these areas in order to ensure infestations are not being further spread over time. The fields at the south end of the Akisqnuk lands, some of which are individually held lands, may benefit from biocontrol if chemical control is not acceptable.

Biocontrol is regulated through the BC Provincial Government, and are distributed mainly on crown land weed infestations, and can also potentially be distributed on private land, such as the Akisqnuk lands. This would require the assistance of the BC Ministry of Forests, Lands and Natural Resource Operations. More information is available by visiting their Invasive Plant Program website<sup>3</sup>.

## Mechanical Control

Examples of mechanical controls are as follows:

- Pruning and cutting
- Mowing
- Tilling or cultivating
- Hand pulling, digging/excavating
- Burning

Mechanical control is feasible on small sites where herbicide cannot be used (i.e. infestations in close proximity to environmentally sensitive features or endangered species and where geographical features limit equipment access). Alternatively, mechanical control can be an effective primary step, followed by herbicide treatment to control re-growth. The characteristics of individual invasive plant species influence whether mechanical control methods are appropriate. For example, mowing can increase the growth of some species, and timing of treatment is critical. Rhizomatous rooted species may not respond as well to mechanical treatments unless 100% of the plant material has been removed from the site. Physical treatment such as manual weeding, pruning and cutting are most appropriate on smaller, more intensively managed sites, as these labour intensive activities become more inefficient on large sites.

Practices for mechanical treatment of a site include:

- Conducting treatments prior to plants setting seed

<sup>3</sup> <https://www.for.gov.bc.ca/hra/plants/biocontrolHome.htm>

- Multiple treatments throughout the season
- Proper disposal of invasive plants by bagging, burying or burning it on site to prevent wind dispersal. Do not compost weed materials. (Bagging requires a 3mm bag thickness, labelled “noxious weeds” and disposed of in household waste in an RDEK landfill or transfer station.)
- Re-seeding disturbed areas immediately with a certified weed free mixture

**Sites where mechanical methods would be of benefit include:**

- **The Akisqnuk Band office grounds** - keeping weeds trimmed, mowed or pulled around buildings, skating rink, will help to prevent seed spread by the high pedestrian and vehicle traffic in the area.
- **Kootenay Rd #3** - continuing to mow roadsides at least 1-2 times per year will prevent weed growth and seed spread
- **Subdivision** - mow roadsides frequently, where weeds are prolific along road edges in order to contain infestations and reduce seed spread.
- **Indian Beach Estates Marina** - mowing or weed whipping the parking lot to reduce spread, as well as hand pulling weeds or weed whipping along the trail to Naked Sands Beach.
- **Naked Sands Beach** – hand pulling Russian Thistle and Baby’s Breath along trails on hillside.
- **Lakeshore Resort & Campground** – hand pull Russian Thistle and Canada Thistle in around the campground, and on trails near the beach. Also hand pull, clip or dig Burdock beside the marsh. Most high traffic areas are currently mowed and will help to prevent weed growth. The maintenance/dumping area should also be mowed along roadsides, and checked regularly for new invasive weeds patches.

These sites have been identified for mechanical (or manual) control on the Invasive Plant Site List 2015 [Appendix I](#).

**Chemical Control**

When selecting the most effective method, there are many factors to consider, including species, infestation size, location and accessibility, and cost. If it decided that chemical control is the most suitable, the appropriate chemical must be selected, as well as the equipment used to apply the treatment; the prioritization of sites and the most effective time to treat the invasive species at each site must also be established. It important to note that chemical controls have restricted use within close proximity to: species at risk, domestic water intakes, water licenses, agricultural food production systems, environmentally sensitive or riparian areas, and public use areas. They should be carefully selected with these variables in mind, more specific information is detailed in the [Safety and Environmental Guidelines During Pesticide Use](#) section of this document.

If chemical controls are necessary, the least toxic, effective herbicide should be used. In order to maximize efficiency and effectiveness, treatments should be carefully timed according to species growth and specific to the herbicide being applied.

The benefits of herbicide treatments include:

- A larger treatment area can be controlled
- Soil disturbance is minimized
- Residual chemical can control new plant growth for a year or two before degrading (depending on soil texture; coarse gravelly soils enable more permeation and less chemical persistence, where as fine textured soils enable encourage more chemical residual.)
- Costs are significantly lower than mechanical methods on large infestations

Preferred herbicides:

- Pre-emergent herbicides - should be applied before weed seeds germinate as they will not kill established plants.
- Post-emergent herbicide – these selective herbicides can be effective in controlling annual, biennial and perennial material while in an actively growing stage, before seed heads form.
- Post-emergent, non-selective, herbicides - may be appropriate for use as spot treatments on deep rooted or rhizomatous perennial weeds in open ground, where there is no desirable vegetation present. These should be applied to actively growing weeds before seed heads form.

See [Appendix III](#) for examples of herbicides and their targeted uses. Note that these a just a few of the many herbicides available.

It has been determined that a majority of the sites on the Akisqnuuk lands would benefit most from chemical treatment, as it would provide more efficient control and containment over other methods, unless the cultural method of goat grazing was employed. Goat grazing would likely be very effective as well, but mainly on large accessible sites. Feasibility may be reduced if goats are to be moved to smaller, more isolated sites. Theoretically, when following an annual treatment program, chemical control costs should decrease each year as infestations become contained.

## Monitoring

Monitoring is performed to determine the population and ground cover of pests and their location. This includes regular inspections, counts and recording information to decide whether treatments are necessary. These records track pest problems and measure the effectiveness of the treatment or preventative efforts. Maintaining records in a database over time provides valuable figures for making future management decisions.

**Monitoring actions:** Monitoring can be as basic as having a qualified crew, which can also be the weed treatment contractor preform an annual invasive plant survey, recording consistent data each year on standard survey forms, as shown in [Appendix V](#), from the BC Ministry of Forests, Lands & Natural Resource Operations website<sup>4</sup>. This data can also be collected at the time of treatment for efficiency and budget conservation.

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<sup>4</sup> <https://www.for.gov.bc.ca/hra/plants/IAPPforms.htm>

## Evaluation

Evaluation is an essential part of a pest management program, it helps managers to determine what methods worked well, what aspects may need improvement and can assess the long term costs and benefits of the program. Program success will be dependent upon the participation, support and accountability of managers and contractors directly involved with the implementation of a management plan.

### Evaluation Actions:

- Review of the current year's treatment records to determine if the timing for treatments was optimal
- Review any limiting factors to treatments, such as proximity to residential areas, or sensitive habitat
- Review any historical databases, monitoring reports and annual evaluations to determine trends
- Producing an annual report including overall findings as well as specific aspects of the program that were successful, and others that require improvement.
  - Valuable criteria to measure is the total amount of each herbicide used (L), as well as total size of areas treated (Ha) annually.

Once the evaluation is complete, the operating plan should be adapted to optimize future program success. This may include trying different treatment methods, varying the timing of treatments, integrating more educational programs, and widening the scope to include more sites, etc.

Communication between managers, contractors and other partners is also a key element to the evaluation process. All participants should have an understanding of their role in the program, for instance, managers should provide a realistic model of their ideal landscapes; this will enable the development and evolution of the program, using joint efforts to meet these goals and expectations.

## Consideration of Endangered Species

Scarlet Globemallow is a perennial herb spreading from rhizomes with some shrubby characteristics. It has red listed status in BC, which indicates that it has been flagged for having the potential to become threatened or endangered.

Scarlet Globemallow (*Sphaeralcea coccinea*) is found on the Akisqnuk land, and efforts were made to protect this species when the central water system was installed in 2009. The water system along Kootenay Rd #3 has since had a knapweed infestation follow, and is found in large patches along the water line. These infestations are close to the road and present a threat of spreading onto adjacent yards and via road traffic. Therefore, treating these infestations is important, however, it is recommended that considerations on the management of Scarlet Globemallow be made prior to determining treatment method. There is a chance that this species may not be affected by some selective herbicides; i.e. Milestone at the lowest rate may not cause injury, but should be tested prior to a full-scale treatment.

## Aquatic Invasive Species

This Plan is specifically geared towards terrestrial invasive plants on Akisqnuk lands, however, it is of importance to note the concern of aquatic invasive species as these lands border the Columbia River, which originates in the Crown of the Continent at Columbia Lake. This vital river ecosystem supports a vast array of species as well as activities such as ranching, farming, recreation and hydroelectricity. Without this abundance of clean water, life would be adversely affected in all regions of the Columbia Basin. Aquatic invasive species are the greatest threat to this ecosystem and all it provides for. Aquatic invasive species can include plant, fish and invertebrates that live in aquatic or riparian environments. Examples of species that have been identified as a threat in the Kootenay Region include (but are not limited to):

- Zebra/Quagga Mussels
- Purple Loosestrife
- Yellow Flag Iris

The Akisqnuk land has two main points of entry into Lake Windermere, which is part of the Columbia River system, at the Lakeshore Resort & Campground and Indian Beach Estates Marina, used mainly for recreational purposes. Prevention and early detection is the best defense in avoiding in introducing aquatic invasives into water bodies:

- Promoting the “Clean-Drain-Dry” all equipment, boats, motor, trailer, bait buckets, and pets of aquatic debris before leaving. Never transport plants, sediment, or live bait among bodies of water.
- Post signs to educate recreational users at boat launches.
- Continue to collaborate with EKIPC and CSISS for updates and information regarding aquatic invasives.
- Report aquatic invasive sightings to EKIPC
  - Report all Zebra/Quagga Mussels to RAPP 1-877-952-7277

For more information and resources, visit the ISCBC website under [More Resources](#).

## Awareness, Education and Communication

Successful invasive plant management requires the involvement of many different participants and partners. The Akisqnuq First Nation can work to achieve this goal through internal department training, community education, and working to encourage owners of individually held lands and to incorporate these principles in their activities. Education and communication are critical for increasing awareness, building momentum and increasing capacity.

### Development and Training

One of the most important factors in establishing a successful approach to invasive plant management is increasing knowledge and awareness from within the governing body.

Training and utilizing staff in the following aspects will provide a direct hands-on approach in conjunction with regular maintenance activities:

- Invasive plant identification
- Detection and documentation of new infestations
- Assistance in surveying and monitoring programs
- Support for stewardship projects
- Ensuring proper movement and disposal of soil and plant waste

The Council can aid in the legal aspects of managing invasive plants by:

- Reviewing development applications to avoid or restrict the use of invasive plants
- Integrating invasive plant management into policies and initiatives

### Engage and Educate the Community

The residents of a community are a crucial resource in the successful management of our ecosystems. By providing residents the knowledge, a widespread information base is created. These are some **actions** to involve the community:

- Annual community weed pulls
- Advertisements/articles in local paper or newsletters regarding Band initiatives for invasive plant management
- Notifications of planned treatments in specified areas using advertisements in local paper, and posting signs in affected areas prior to planned treatment
- Provide public/community forums on invasive plant management
- Engaging local conservation and stewardship groups (i.e. Wildsight) in planning and participating in projects such as weed pulls
- Provide information on the Akisqnuq First Nation website
- Provide informative materials (obtained from provincial government or EKIPC) at Band Office, School or any other appropriate community locations, in the form of brochures, invasive plant identification guides. For more ideas see ISCBC under [More Resources](#).
- Post signs at on gates and entrance points to lands where infestations are present to inform recreational and other users of the invasive plant concerns present and how they can help stop the spread.



- Engage and educate residents using agricultural practices of prevention and best practice methods.
- Engage and educate owners of individually held lands to inspect or have their properties inspected for invasive plants. Offer the assistance of Lands staff or invasive plant contractors to provide guidance on prevention and control.

### **Engage Land Users and Industrial Workers**

The Akisqnuq lands have many land use activities including guide outfitting, forestry and reclamation projects. Encouraging workers to adopt Best Practices for preventing the spread of invasive plants is crucial. This is especially important for activities in the ecosystem restoration area. The start of Alpine Road has a large knapweed infestation, which is a priority for treatment, but workers should also recognize this area as a potential for spread. All vehicles and equipment should be checked prior to continuing on into the restoration area.

### **Working with Developers**

It is important to consider all avenues of possible introduction or spread of invasive plants when implementing a management plan. Any new development or redevelopment on Akisqnuq lands presents the potential for the spread of invasive plants. Some areas to consider when working with external business:

- Consultation with developers to create awareness and ensuring invasive plant management practices are followed, especially where known infestations exist.
- Consultation with contractors to avoid the use of invasive plants, ensure the use of clean soil and proper management of soil and plant waste to prevent dispersal.

### **Continuing Education and Collaboration**

Because invasive plants know no boundaries, move across municipal borders, between public and private lands, effective management requires collaboration. This includes sharing information and experience, coordinating strategic planning and co-funding projects. Workshops, conferences and meetings with local invasive plant organizations are an important part of collaboration.

## Safety and Environmental Guidelines During Pesticide Use

When using pesticides, certified applicators and license holders must conform to specific guidelines that are set out by the Ministry of Environment. The applicator must be aware of pesticide use procedures required to protect human health and the environment and take precautions to prevent unprotected human exposure to pesticide. They must perform an inspection of a proposed treatment area to ensure that the applicable regulatory requirements and standards can be met in carrying out the pesticide use. Particular care must be taken when treating large areas, using hazardous chemicals, near bodies of water, or close to sensitive fish and wildlife habitat.

Understanding the product is the key to appropriate application precautions including methods, treatment, and specific regulatory guidelines. Each herbicide is unique in respect to appropriate application precautions for both the applicators safety and the protection of the environment.

### Storage and Handling

- Pesticides must be stored and locked in a designated storage facility/compartment, and labeled in accordance with the Workplace Hazardous Materials Information System (WHMIS)
- Pouring or mixing pesticides is only done by certified applicators
- While mixing the applicator must wear appropriate personal protective equipment
- Applicators will follow proper spill procedures in the event of a spill
- Provide an air gap between the water source, and the product when mixing
- When emptying pesticide containers, they are to be drained into the designated spray unit or backpack for 30 seconds and triple rinsed. After each rinse the mixed material will be poured into the spray unit
- Empty rinsed containers are to be punctured and disposed of at the landfill

### Transportation

- Inspect containers for defects before transporting
- Pesticides should not be transported in the passenger area of a vehicle, or along with food or persons in the back of the truck
- Pesticides shall be secured before transport
- Any backpack or handheld sprayers are to be depressurized before securing and transporting in a vehicle or storage compartment

### Application

- Applicators will review the label prior application and ensure the appropriate personal protective equipment is worn
- Assistant applicators are to be in visual and hearing distance from the certified applicator during application
- Wind speed should be *less than 8km/hour*
- Temperature is not to exceed *28 degrees Celsius* during application, or as specified on the product label
- Do not mix or apply within *30m of domestic well* or ponds used for domestic water supply

- Most pesticides require a *10 m pesticide free zone* around bodies of water and dry streams, with the exception of selective application of Glyphosate, which may be applied for the purpose of invasive plant management between 1m and 10m above the high water mark. The pesticide free zone is to exclude direct application, drift, runoff or leachate. A *buffer zone of 5m* is required between the pesticide free zone and the treatment area while using a backpack sprayer or truck sprayer
- If not specified on the label herbicides should not be applied *no closer than one meter* out from the drip line of a tree
- Non-selective residual herbicides should not be applied closer than *double the tree height* from the base of the trunk
- Applicators applying herbicides for the purpose of noxious weed or invasive plant management must apply the herbicide *not more than 1.5 m from a targeted weed or plant*
- Applicator must make reasonable efforts to *identify sites where biological weed control organisms have been released* and prevent harm to those organisms
- Select appropriate nozzle for the equipment, to reduce drift with larger droplet size
- When using back/hose sprayers hold nozzle level and close to the ground while applying herbicides
- The application equipment will be in good working order and is calibrated to conform to the application rates on the pesticide label.

### Spill Procedures

- Keep other people or animals away from the spill site
- If further information is required for spill cleanup consult the product label or Ministry of Water, Land and Air Protection or CANUTEC
- If the spill is sufficiently small begin clean up procedures immediately
- Put on adequate personal protective gear
- Do not try to wash away spilled material
- Provide a barrier to the spread of the pesticide consisting of soil, sawdust, or any absorbent material to soak up the pesticide
- Place waste material into a water proof container and treat as hazardous material
- A larger spill can be cleaned up with a vac truck and contents will be disposed and rinsed at a landfill
- Contact the nearest Ministry of Water, Land and Air Protection to report the spill for disposal information

### Environmental Protection Strategies

- Ensure that domestic water sources, agricultural water sources and soil used for agricultural crop production are protected for their intended use
- Avoid the use of pesticide over vertebrate wildlife or domestic animals that are visible to the applicator
- Prevent erosion of a stream bank
- Prevent debris that would cause an unreasonable adverse effect from entering a stream
- Maintain slope stability, particularly in areas with potential for landslides
- Identify and mark pesticide free zones along waterways, etc. during pre-treatment inspection

- Ensure that equipment is calibrated and maintained regularly, to avoid leaks and contamination
- Follow proper mixing and application rates specific to each chemical, to avoid damage to non-targeted vegetation

## Legislative Context

The following list includes all legislation that governs activities related to pest management in BC:

**Table 5** *Legislation Governing Pest Management*

Canada Federal Legislation	British Columbia Provincial Legislation
Pest Control Products Act	Integrated Pest Management Act
Fisheries Act	Environmental Management Act
Migratory Birds Convention Act	Transportation of Dangerous Goods Act
Food and Drugs Act	Weed Control Act
Pesticide Residue Compensation Act	Wildlife Act
Plant Protection Act	Workers' Compensation Act

## Implementation the Invasive Plant Management Plan

In order to achieve the identified objective of having healthy landscapes with minimal impacts of invasive plants while protecting ecological, social and economic values, efforts must ensue. The following are **recommended actions** for the Akisqnuq First Nation to encourage a successful invasive plant management program.

- Present the Invasive Plant Management Plan to Akisqnuq Council, requesting support for the implementation of strategies identified within the Plan.
- Hold a forum/open house for residents to become familiar with plans for invasive plant treatments, provide informative materials and encourage landowners of individually held lands to participate in the program.
- Hire a reputable and knowledgeable invasive plant control contractor to conduct chemical and/or grazing treatments on Akisqnuq lands using the site survey data provided in this Plan. Contractors must hold a Pesticide Use License from the BC Ministry of Environment and have certified pesticide applicators performing the treatments. All treatment records should be requisitioned by Lands Department upon treatment completion.
- Mechanical or hand pulling treatments can be performed by maintenance staff, summer students, volunteer groups, etc.
- For all chemical and mechanical treatments, use standardized BC Government Invasive Alien Plant Program (IAPP) Field Forms to collect data. These can be downloaded for digital use from the iTunes App Store, or printable forms are also available on IAPP website <https://www.for.gov.bc.ca/hra/plants/IAPPforms.htm>
- Explore the opportunity to enter sites into the IAPP database and update sites that already have an assigned IAPP site ID with current survey and treatment info, this requires an ID/password to access & knowledge of the program. Potential to hire contractor to upload data. <https://www.for.gov.bc.ca/hra/plants/application.htm>
- Integrate invasive plant survey and treatment data into a Geographic Information System (GIS); this will provide a consistent base for monitoring program success year to year.
- Develop an initial reporting program, or use the IAPP Report-A-Weed application for staff and contractors <http://www.reportaweedbc.ca/>
- Coordinate volunteer based projects, such as community weed pulls, perhaps in conjunction with local organizations (EKIPC, Wildsight, etc.) to enhance awareness and education.
- Collect and utilize reference materials such as identification guides and various websites as listed in [More Resources](#).

## Conclusion

Overall, the Akisqnuk First Nation lands that were surveyed are not currently heavily infested with invasive plants, it is estimated at this time that approximately 1-2% of the total land base contains invasives. The lands are essentially composed of native plant species, but are still threatened by the existing infestations of invasive species. Current large and dense infestations of Knapweed are located in areas of moderate to high atv, vehicle and wildlife traffic and are very easily spread, increasing the potential for new infestations. There are also small infestations of high priority weeds such as Leafy Spurge and Sun Spurge that are currently fairly contained, but have the potential for spread in the future if not actively controlled. Other species of concern such as Baby's Breath, Chicory and Russian Thistle are currently found to have low distribution, making management efforts relatively minor at this point, but if left to propagate, will require more substantial efforts for control in the future.

Chemical control has been recommended on a majority of the sites based on species and site prioritization, and will likely prove the most efficient use of budget. A discussion on goat grazing has been presented as an option for controlling the large Knapweed infestations, which may be an even more budget friendly option. An assessment by a specialized goat company will be required to offer an accurate cost estimate.

Some small sites can be effectively controlled by mechanical means including mowing, weed whipping, clipping, or hand pulling, but may require subsequent treatments in a season for optimal effectiveness. After a site analysis, biological control may be an option for a few sites, but most do not meet the suggested criteria, and would likely have greater benefit from an alternative control method.

Though this document focuses on terrestrial invasive plants, aquatic invasive species were touched on, with the intent to promote responsible water recreation on the adjacent Lake Windermere and prevent introduction of aquatic invasive species.

The majority of surveyed sites are located on Band lands, as most individually held lands were not surveyed at this time. It is recommended in the future to engage and educate owners of individually held lands to inspect their properties for invasive plants and offer the assistance of Lands staff or invasive plant contractors to provide guidance on prevention and control. Program success relies on the collaboration of multiple jurisdictions, landowners and individuals.

Prevention is the fundamental key in invasive plant management. All current infestations have the potential to be controlled and contained. Education and awareness are the essential tools in preventing new species from invading and new infestations from taking hold.

## More Resources

East Kootenay Invasive Plant Council (EKIPC)  
1.888.55EKIPC, [coordinator@ekipc.com](mailto:coordinator@ekipc.com)

Invasive Species Council of British Columbia (ISCBC) – Resources, Publications (for Identification Guides, Best Practices Guides, Aquatic Invasives, brochures, posters, etc.)  
<http://bcinvasives.ca/resources>

Field Guide to Noxious Weeds in BC – can order through ISCBC  
[http://bcinvasives.ca/documents/Field\\_Guide\\_to\\_Noxious\\_Weeds\\_Final\\_WEB\\_09-25-2014.pdf](http://bcinvasives.ca/documents/Field_Guide_to_Noxious_Weeds_Final_WEB_09-25-2014.pdf)

BC Weed Control Act  
[http://www.bclaws.ca/Recon/document/ID/freeside/00\\_96487\\_01](http://www.bclaws.ca/Recon/document/ID/freeside/00_96487_01)

Integrated Pest Management Act Regulation  
[http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/604\\_2004](http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/604_2004)

Invasive Species Toolkit for Local Government  
[http://bcinvasives.ca/documents/Govt\\_Toolkit\\_Final\\_WEB\\_09\\_10\\_2014.pdf](http://bcinvasives.ca/documents/Govt_Toolkit_Final_WEB_09_10_2014.pdf)

Grow Me Instead – recommended horticultural plant alternatives to invasive species  
[http://bcinvasives.ca/documents/GMI-Booklet\\_2013\\_WEB.pdf](http://bcinvasives.ca/documents/GMI-Booklet_2013_WEB.pdf)

Goat Grazing – Project by the Southern Interior Weed Management Committee  
<https://www.youtube.com/watch?v=oqf9MI9DrgM>

Rocky Ridge Vegetation Control, Kamloops, BC. Phone: (780) 380-3061  
<https://www.facebook.com/RockyRidgeVegetationControl2000/?fref=nf>

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## Appendix I Invasive Plant Site List 2015

Site ID	Location Description	IP1 SPP	IP1 Area (Ha)	IP2 SPP	IP2 Area (Ha)	Treatment Plan	Treatment Priority Rating	Comments
1	South end of reserve, east side extensive in field. West side field patches close to fence	SK	7.400			Chemical	Moderate	Potential for biocontrol, with chemical treatments close to the road, or goat grazing
2	Rd connecting Kootenay Rd #3 & Hwy 95	DK	1.100	SK	1	Chemical	Moderate	Good access for atv/truck treatment, goats
3	Kootenay Rd #3, west side	DK	0.040			Chemical	Moderate	Patch on west side of fence
4	Kootenay Rd #3	SK	1.720			Chemical	Moderate	sporadic patches both sides of road around fence, some areas extend past fence. Potential for goats
5	Kootenay Rd #3	SK	2.500			Chemical	Moderate	A few patches both sides of road. Infestation extends onto individually held land on both sides. Infestation follows water line on east side. Potential for goats
6	Kootenay Rd #3 at intersection to Hwy 95 connector	BD	0.002			Chemical	Low	
7	Kootenay Rd #3	SK	9.500			Chemical	High	Infestation both sides of road, polygon includes large patches from site 7 to 9. Potential for goats
8	Large field on east side of Kootenay Rd #3 with driveways.	SK	2.000			Chemical	High	Large infestation in open area, extends up trail on east side. look at access restriction in this area. Driveways for future lots, important that infestation be controlled prior to any development. Potential for goats
9	Kootenay Rd #3 opening on east side	SK	1.000			Chemical	High	Large infestation in open area, extends up trail to the east. Potential for goats
10	In field north of Akisqnuq offices	BB	0.010			Chemical	Low	
11	Land just south of Akisqnuq Band hockey rink, on south side of ravine (individually held land?)	SK	0.100			Chemical	Moderate	
12	Akisqnuq Band office lands, areas around hockey rink, horseshoe pits	SK	0.100			Manual	High	Mowing and weed whipping all weeds around rinks, horseshoe pits, and parking areas will help to prevent spread.
13	Akisqnuq Band office lands, south end in ravine & piles	SK	0.100			Chemical	High	Trail present, atv, pedestrian use. Higher potential for spread.
14	Kootenay Rd #3 near northern junction with Hwy 95	SK	0.100			Chemical	High	Potential for goats
15	Kootenay Rd #3 near house 2051. Large patches both sides of road	SK	0.500			Chemical	Moderate	Potential for goats

Site ID	Location Description	IP1 SPP	IP1 Area (Ha)	IP2 SPP	IP2 Area (Ha)	Treatment Plan	Treatment Priority Rating	Comments
16	Kootenay Rd #3	SK	0.400			Chemical	High	Potential for goats
17	Kootenay Rd #3 east side between fence and trees	SK	2.500			Chemical	Moderate	Potential for goats
18	start of Alpine Rd at junction from Kootenay Rd #3.	SK	0.100			Chemical	High	entrance road into ecosystem restoration areas. Potential for goats
19	Gravel pit adjacent to alpine rd	SK	1.500			Chemical	High	Potential for goats
20	Sawmill property adjacent to Alpine Rd	CT	1.500			Chemical	Moderate	Potential for goats
21	Branch road north off of Alpine Rd, SK sporadic patches along road	SK	1.700			Chemical	High	no Leafy Spurge found (from 2009 inventory)
22	Ecosystem Restoration area	SK	0.600			Chemical	High	Sporadic patches of SK along road to gate, possible hand pull
23	Trail up to ecosystem restoration area from Kootenay Rd #3	SK	0.600			Chemical	High	sporadic SK along road, and large infestation in open area on hillsides. Potential for goats
24	Ecosystem restoration area	SK	0.400			Chemical	High	Sporadic small patches along road. Possible hand pull. Monitor annually
25	Ecosystem restoration area, by old burnt out car	SK	0.010			Chemical	High	
26	Trail to Naked Beach	PS	0.020	CT	0.02	Manual	Moderate	Hand pull weeds along trail, 50m up trail
27	Road/trail to Naked Beach at top of cliffs	BY	1.500			Manual	High	Hand pull or chemical. Has deep tap root, hand pull has potential for some soil disturbance. Very dry, sandy area, not much ground cover. Potential for goats
28	Trail from Subdivision Rd to cliffs above Naked Beach	SK	0.003			Chemical	High	Very small patch of a few plants
29	Trail from Subdivision Rd to cliffs above Naked Beach	SK	0.010			Chemical	High	A few sporadic plants from Subdivision Rd
30	Sandy trail down hill to Naked Beach	RT	0.020	BY	0.01	Manual	High	Heavy use trail, hand pull weeds to prevent spread to upper bench
31	Indian Beach Marina parking lot	PS	0.050			Manual	Moderate	Weed whip or mow weeds in parking lot
32	Indian beach Estates on bank above road, just north of turnaround	PS	0.005			Manual	Moderate	Clip or hand pull
33	Subdivision Rd, both sides	CT	0.200	PS	0.2	Chemical	Moderate	Roadsides should be mowed with follow up chemical treatment
34	Subdivision Rd south end at turnaround	SK	0.300	CY	0.3	Chemical	High	Mow or chemically treat road sides in Subdivision

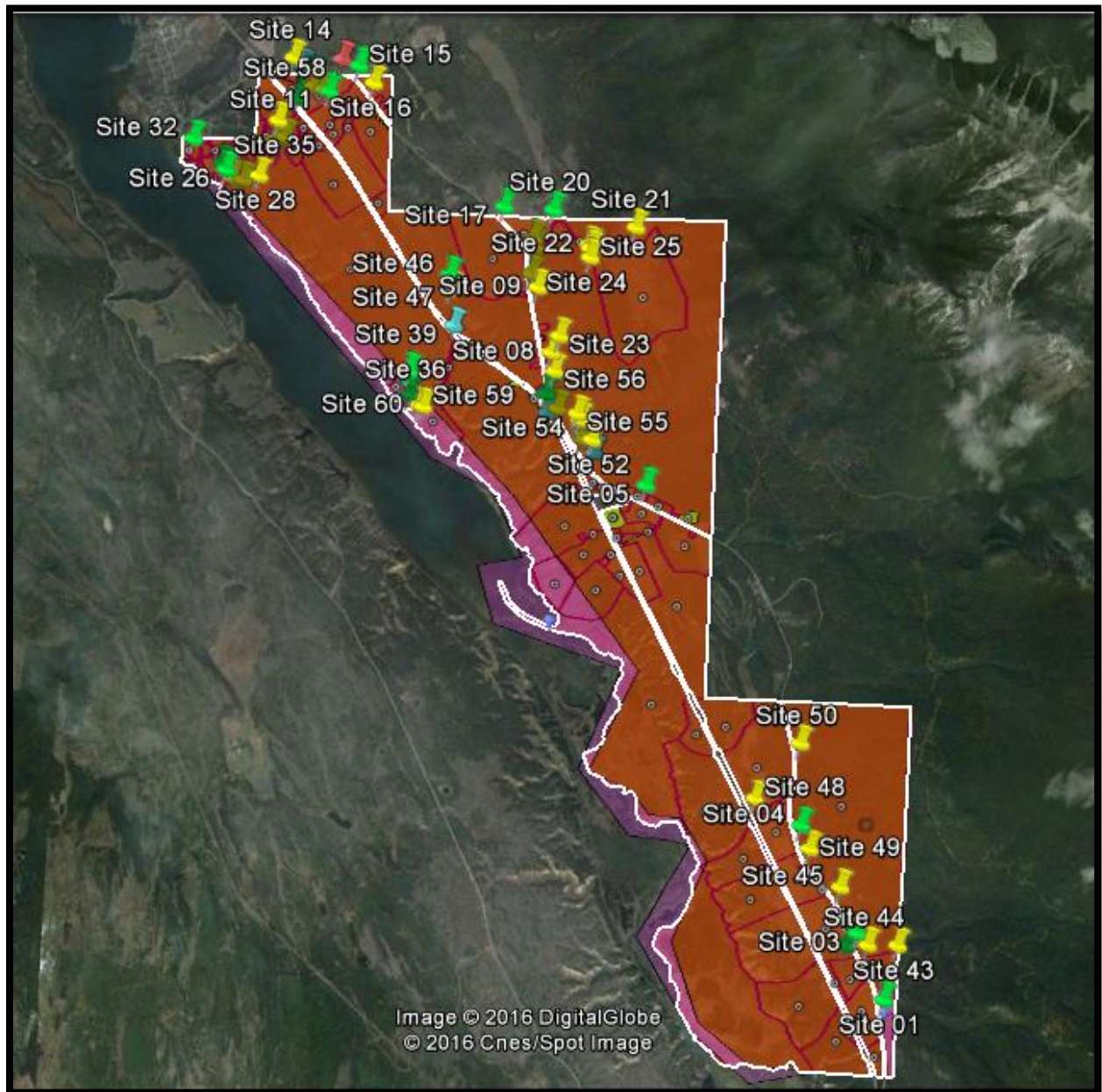
Site ID	Location Description	IP1 SPP	IP1 Area (Ha)	IP2 SPP	IP2 Area (Ha)	Treatment Plan	Treatment Priority Rating	Comments
35	Subdivision Rd at junction to trail	SK	0.020			Chemical	High	Or can be hand pulled 2x per year
36	Lakeshore campground	RT	0.200	CT	0.2	Manual	Moderate	Sporadic plants on north side, hand pull or mow.
37	Lakeshore campground boat launch road beside marsh	BD	0.005	BT	0.005	Manual	Moderate	Dig, clip or hand pull plants
38	Lakeshore campground along trail above beach on south end of marsh	RT	0.020			Manual	Moderate	Hand pull plants
39	Lakeshore campground Rd	PS	0.200			Manual	Low	Sporadically along entrance road and campground area. Mow or trim PS around campsites to prevent anymore spread
40	Old Rd west of Hwy 95, runs west down into ravine	CT	0.300			Chemical	Low	Also Lamb's quarters along road. Area is low priority, treat if budget allows.
41	Old road parallel to highway on west side	SK	0.230			Chemical	Moderate	Dense infestation on trail, access is good for atv treatment.
42	Old road on west side of highway	SK	0.050			Chemical	High	Good access for atv/truck treatment
43	Gated road heading east from Kootenay Rd #3, just past 4way junction	SK	0.020			Chemical	High	Good access for atv/truck treatment
44	Gated road heading east off of Kootenay Rd #3	DK	0.100			Chemical	High	Sporadic plants along road for 200m, good access for atv/truck treatment
45	Kootenay Rd #3, patches on both sides of road inside fences. Private land on west side side has patches.	DK	0.200			Chemical	High	Site continues with sporadic patches north for 100m.
46	Branch road from hwy 95	BD	0.600	SK	0.6	Chemical	Moderate	Most BD is contained behind fence around sludge pond. Treat BD & SK along road and gravel piles.
47	Branch road east of hwy 95	SK	0.020			Chemical	High	Small patch at road junction with trail
48	Gated road on east side of hwy 95	DK	0.050			Chemical	High	Good access for atv/truck treatment
49	Game trail running parallel on east side of Kootenay Rd #3	DK	0.100			Chemical	High	Treat plants along game trail to prevent spread into upper areas. Potential for goats
50	Kootenay Rd #3 east side	SK	0.010	CT	0.01	Chemical	High	
51	Dump site on west side	CT	1.500	DK	0.5	Chemical	Moderate	Not Akisqnuq Land
52	On hillside east of Kootenay Rd #3 just north of junction connector to hwy. isolated patch.	DK	0.040			Chemical	High	Backpack accessible only. Potential for goats

Site ID	Location Description	IP1 SPP	IP1 Area (Ha)	IP2 SPP	IP2 Area (Ha)	Treatment Plan	Treatment Priority Rating	Comments
53	East side of Kootenay Rd #3, 50m up hillside near garbage (old couch)	SK	0.100			Chemical	High	Backpack accessible only. Potential for goats
54	Up hillside 80 m east of Kootenay Rd #3, garbage site	SK	0.010			Chemical	High	Backpack accessible only. Potential for goats
55	Old trail up hillside 100m east of Kootenay Rd #3.	SK	0.100			Chemical	High	Infestation extends above and below trail on hillside, sporadic plants up trail from site 54. Potential for goats
56	South of house	BD	0.020	SK	0.05	Chemical	High	SK extends onto private land, extensive in mowed area around house. Potential for goats
57	Individually held land on east and west side of Kootenay Rd #3	SK	2.000			Chemical	High	Dense infestation on private land. Appears to be overgrazed. Potential for goats
58	Kootenay Rd #3 just west of Junction with Windermere Loop Rd.	Sun Spurge	0.010	SK	0.25	Chemical	Very High	one patch found on south side of road. High priority to pull, clip or spray. SK found sporadically along roadsides to Hwy 95
59	Lakeshore Campground south end	LS	0.100			Chemical	High	priority species, access for atv/truck treatment
60	Lakeshore Campground south end	LS	0.010			Chemical	High	priority species, access for atv/truck treatment

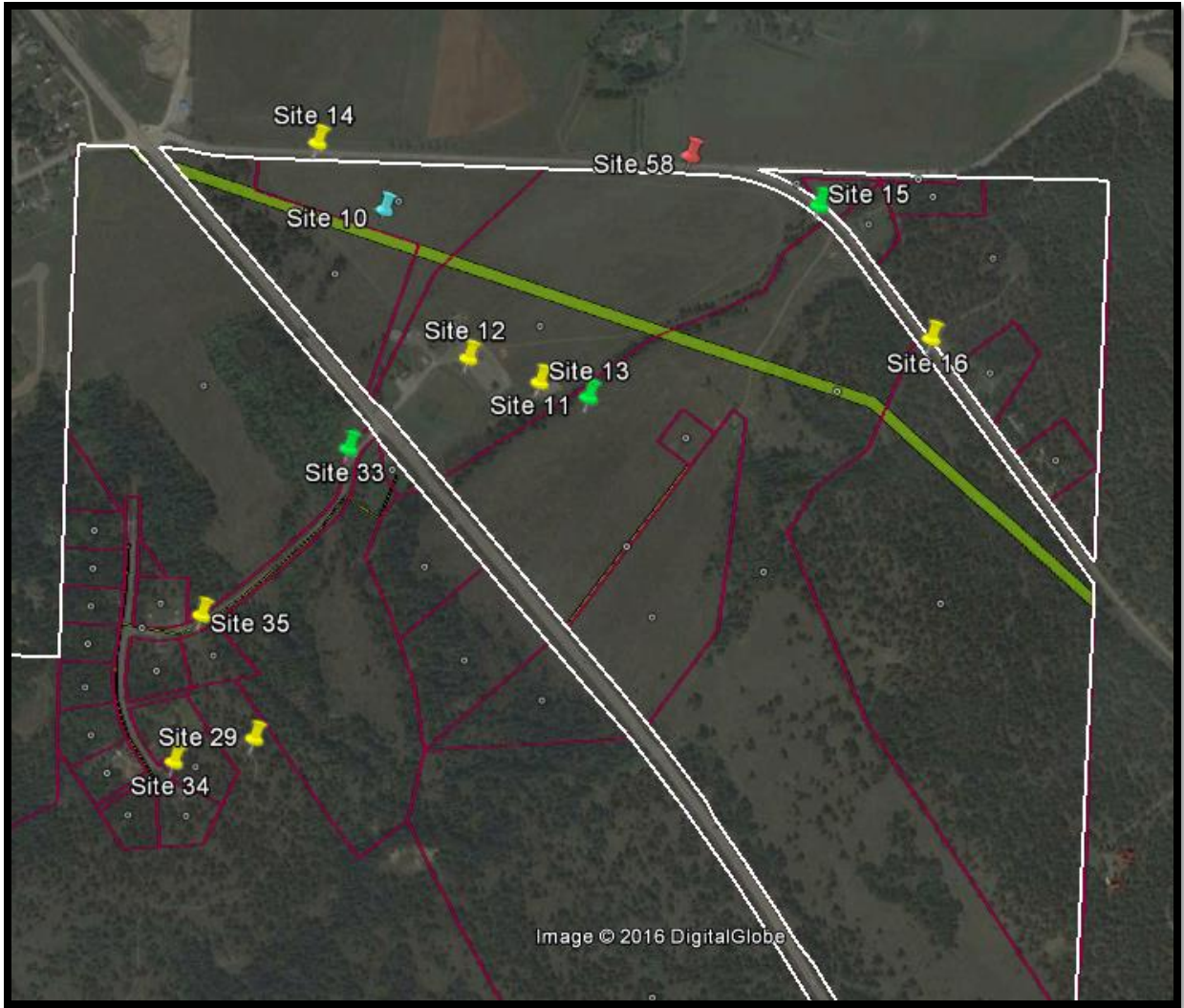
## Target Species

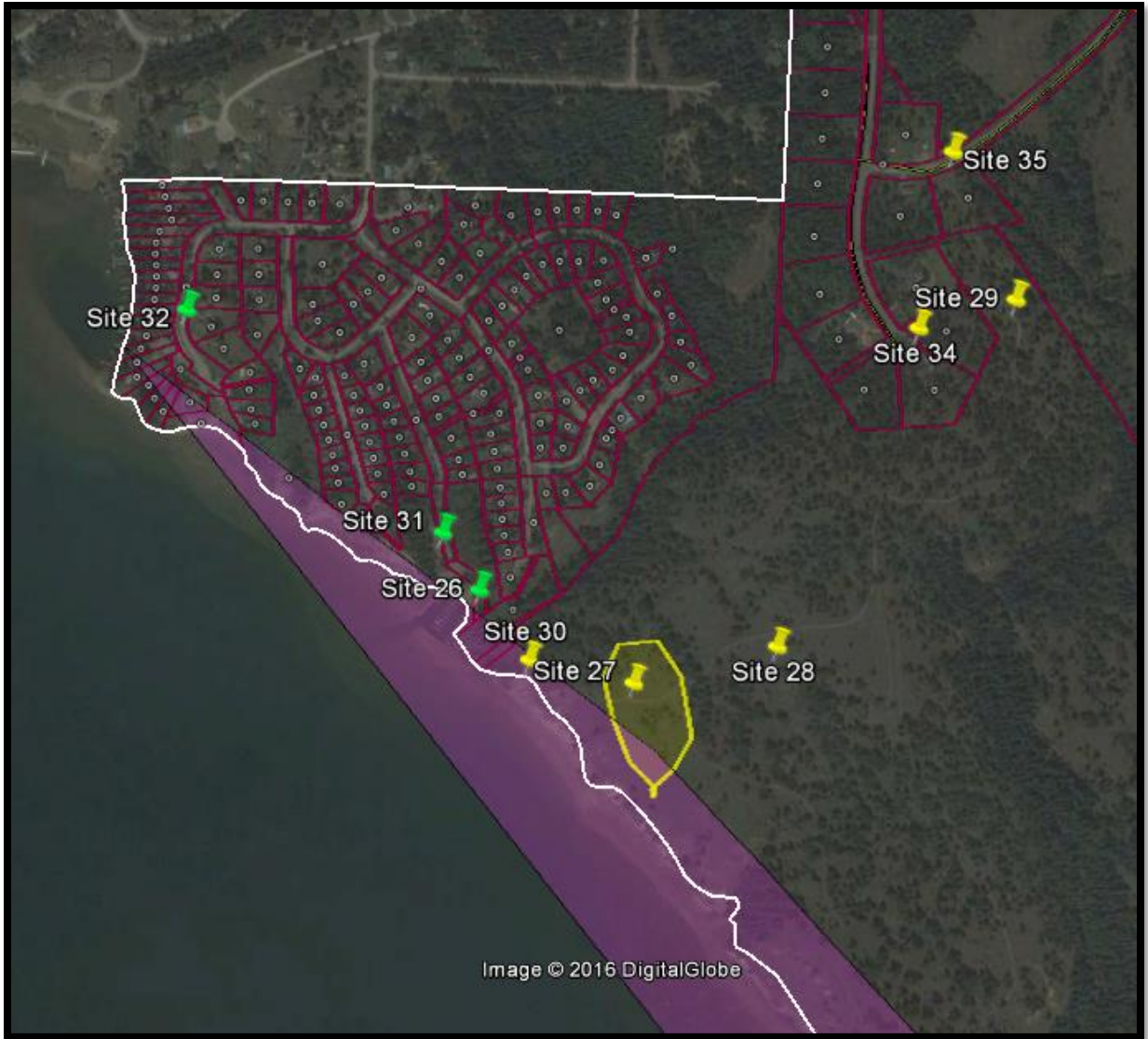
BB – Bluebur  
 BD - Burdock  
 BT – Bull Thistle  
 BW - Blueweed  
 BY – Baby’s Breath  
 CT – Canada Thistle  
 CY – Chicory  
 DK – Diffuse Knapweed  
 LS – Leafy Spurge  
 PS – Perennial Sow Thistle  
 RT – Russian Thistle  
 SK – Spotted Knapweed

## Appendix II Invasive Plant Site Overview Maps







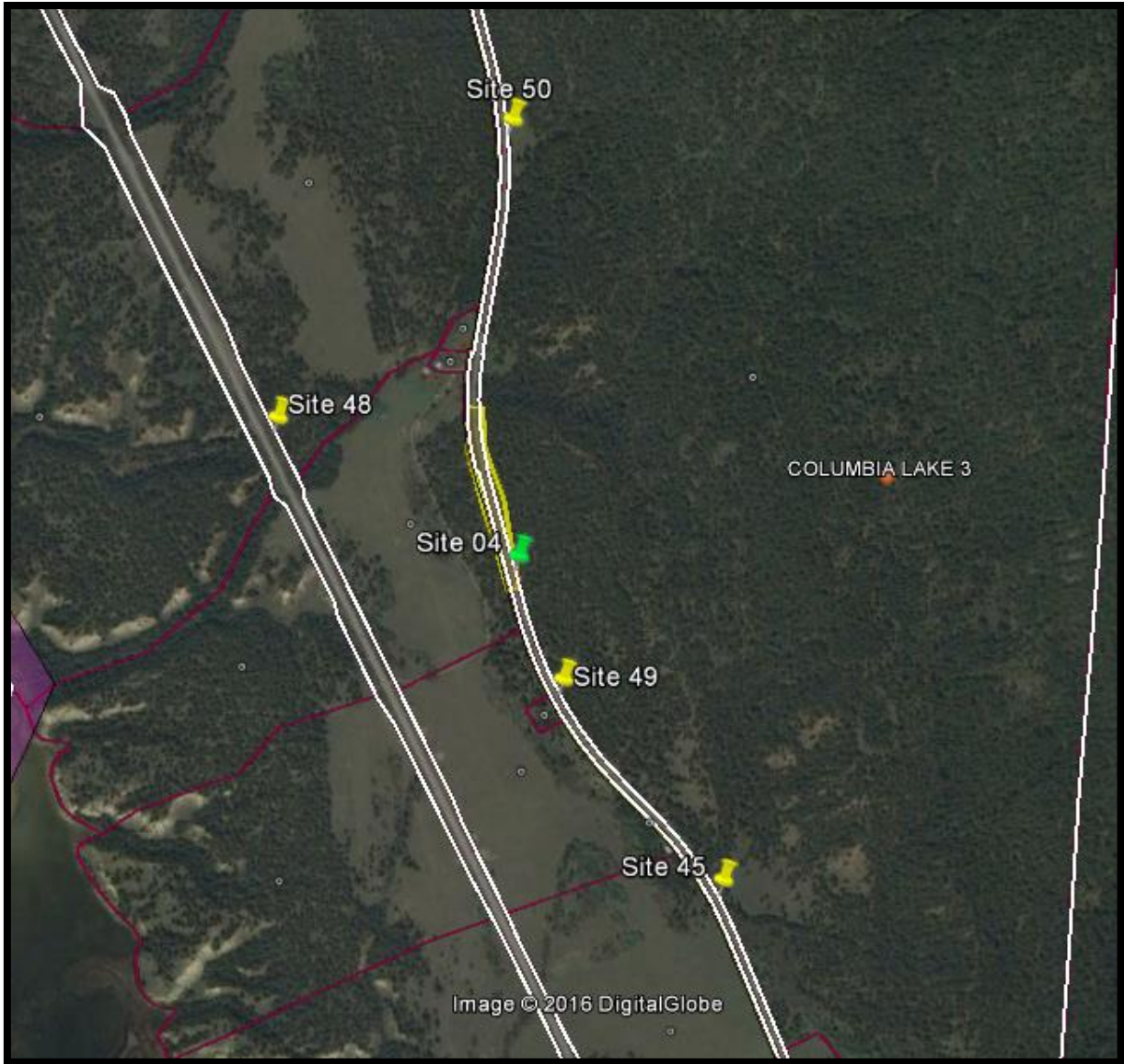




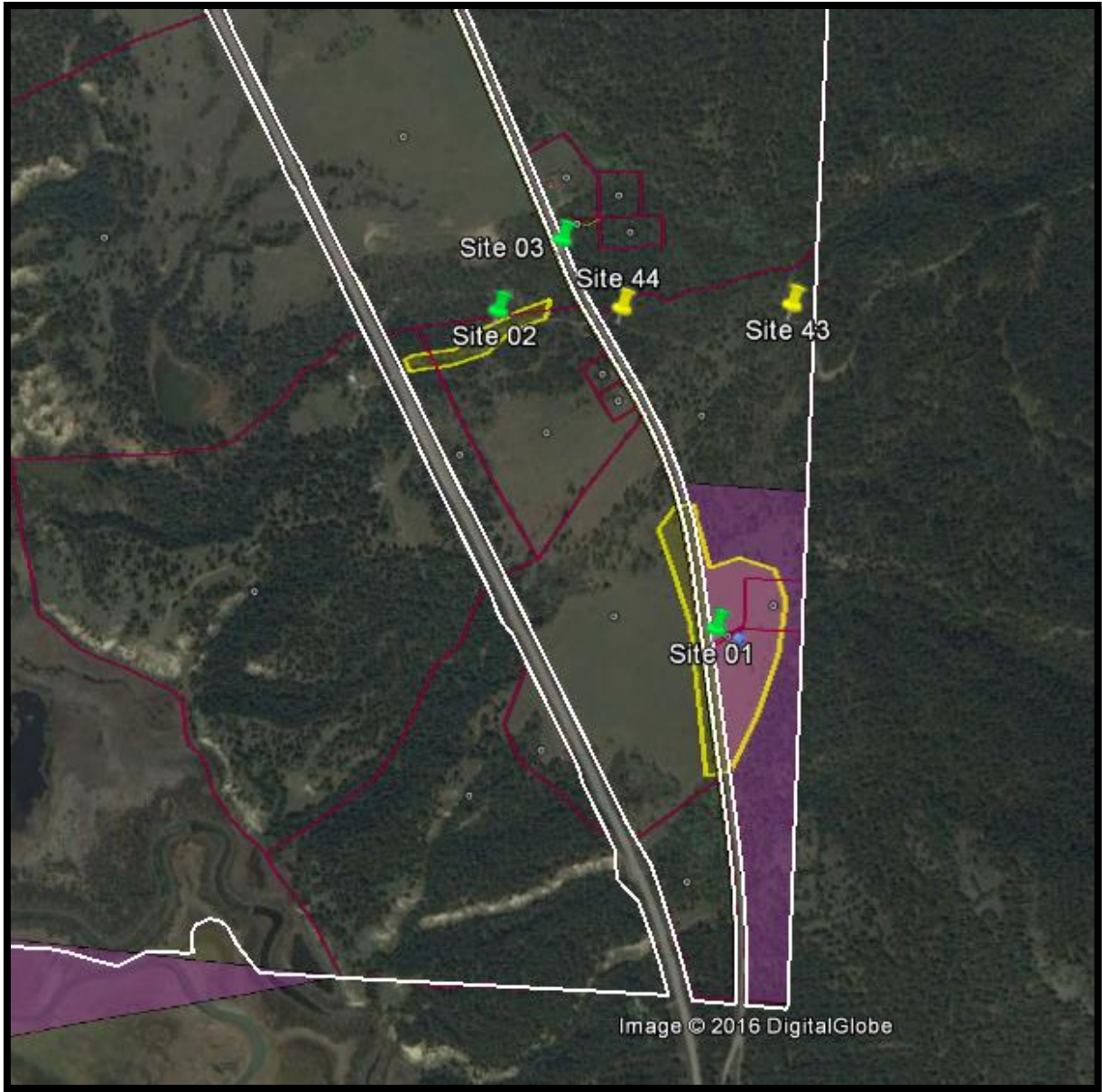
















## Appendix III      Herbicide Product Information

Herbicide Trade Name	Active Ingredient	PCP #	Application Rate/Ha	Weeds Treated	Treatment Information
<b>Milestone</b>	Aminopyralid	28137	0.25 - 0.5 L	Canada Thistle Common Tansy Spotted Knapweed Scentless Chamomile Wormwood Absinthe Hawkweeds	Post emergence, selective, broadleaf herbicide, provides short term residual control for 2 years.
<b>Clearview</b>	Aminopyralid & Metsulfuron-methyl	29752	125 – 230 grams	Canada Thistle Ox-eye Daisy Scentless Camomile Spotted Knapweed Blueweed	Selective broadleaf weed control in right-of-way, industrial and other non-crop areas.
<b>Tordon 22K</b>	Picloram	9005	2.25 – 4.5L	Scentless Chamomile Common Tansy Spotted Knapweed Perennial Sowthistle Canada Thistle Blueweed Leafy Spurge Dalmatian Toadflax Yellow Toadflax	Selective broadleaf weed control on medium to fine soils. Avoid trees and coarse textured soils due to residual factor of 3-7 years. Not for commercial and residential-zoned use.
<b>Lontrel 360</b>	Clopyralid	23545	0.42 - 0.83L	Canada Thistle Scentless Chamomile Perennial Sowthistle Ox-eye Daisy Spotted Knapweed Diffuse Knapweed	Post emergence, selective, broadleaf herbicide for use on medium to fine textured soils. Little to no residual. No impact on woody vegetation.
<b>Round-Up, Vantage</b>	Glyphosate	13644	1.5 – 2.5% Solution	Annual grasses and all perennial weeds and brush	Post emergence, non-selective control, used for spot applications




Invasive Species	Description	Management
<p style="text-align: center;"><b>Spotted Knapweed</b> (<i>Centaurea maculosa</i>)</p>  <p style="text-align: center;">Figure 3 Spotted Knapweed <i>H.M.Price 2011, some rights reserved</i></p>	<p>Provincial Noxious Weed</p> <p>Biennial to short-lived tap rooted perennial with branched stems growing to 1.5 meters in height; deeply cut hairy leaves; very bitter to taste; purple, occasionally white flowers; flower head bracts with black-tipped fringe giving head a "spotted" appearance.</p>	<p><u>Grazing:</u> Goat grazing is shown to be quite successful on knapweeds</p> <p><u>Mechanical:</u> Cutting, mowing or pulling before the plant sets seed can be effective on small infestations. The entire root system should be removed so that the plant will not re-sprout from the crown or remaining roots.</p> <p><u>Chemical:</u> Aminopyralid, Picloram, a mixture of Picloram and 2,4-D, 2,4-D alone, clopyralid and glyphosate are effective in controlling spotted knapweed. Herbicides should be applied before the mature plants set seed for maximum effectiveness.</p> <p><u>Biological:</u> There are many biological control agents for managing knapweed.</p>
<p style="text-align: center;"><b>Diffuse Knapweed</b> (<i>Centaurea diffusa</i>)</p>  <p style="text-align: center;">Figure 4 Diffuse Knapweed <i>M.Lavin 2015 Some rights reserved</i></p>	<p>Biennial to short-lived perennial that reproduces by seed. Seeds germinate in the fall or spring and develop low lying rosettes in the first year of growth. It is a highly competitive plant that establishes quickly on disturbed sites and can also invade undisturbed plant communities. A single plant can produce 18,000 seeds. Diffuse knapweed is an extremely tough plant that can tolerate drought, trampling, and very rocky soils. Its roots exude a chemical that inhibits the root growth of other plants</p>	<p><u>Mechanical:</u> Mowing prevents seed production but the remaining root will re-sprout. Digging before flowering can be effective on small infestations but will require several years' effort to eradicate and should be accompanied by sowing desirable plants. Remove as much of the root system as possible to prevent re-sprouting. Diffuse knapweed is very abrasive and bare skin contact can cause irritation, so wear gloves and a long-sleeved shirt.</p> <p><u>Chemical:</u> Clopyralid, Dicamba, and Aminopyralid herbicides are registered for use on diffuse knapweed.</p> <p><u>Biological:</u> There are many biological agents available for managing knapweeds.</p>

<p style="text-align: center;"><b>Leafy Spurge</b> (<i>Euphorbia esula</i>)</p>  <p style="text-align: center;">Figure 5 Leafy Spurge <i>M.Lavin 2010 Some rights reserved</i></p>	<p>Long-lived perennial that was introduced as either an ornamental or crop seed contaminant in the early 1800's. It reproduces primarily by re-sprouting from its extensive, persistent, creeping root system, but also by seed. Leafy spurge roots can extend 4.5 m laterally and about 9 m deep. Leafy spurge forms dense stands over times and a large plant can produce up to 130,000 seeds. All parts of the plant contain a milky colored latex that can poison livestock and cause skin irritation on humans.</p>	<p>Leafy spurge is extremely resilient and a combination of control methods will be necessary to achieve significant control. <u>Grazing:</u> Sheep and goats will readily graze leafy spurge and are not affected by the toxic juices in the stems. The subsequent resprouting will weaken the plants by diminishing root reserves. However, there is the risk of seed being carried by the animals to uninfested locations.</p> <p><u>Mechanical:</u> Hand-pulling and mowing is in-effective other than on small, young infestations. Wear gloves and wash after handling leafy spurge to avoid skin rashes.</p> <p><u>Chemical:</u> 2,4-D, Amitrole, Dicamba, Glyphosate, Imazapyr, MCPA and Picloram are registered for use on leafy spurge.</p> <p><u>Biological:</u> There are currently biocontrol agents available</p>
<p style="text-align: center;"><b>Baby's Breath</b> (<i>Gypsophila paniculata</i>)</p>  <p style="text-align: center;">Figure 6 Baby's Breath <i>T.Tuason 2013 Some rights reserved</i></p>	<p>Much branched perennial herb with a thick, deep, woody rooting system; smooth stems grow to 1 m; opposite, hairless, linear leaves with a prominent mid-vein grow 2 cm to 10 cm long; small white flowers are produced in diffusely branched clusters. An escaped ornamental originating from Eurasia and now used extensively in flower arrangements. Can produce over 13,000 seeds per plant, they can travel long distances when a complete stalk rolls free like a tumbleweed. When it mixes with hay, it reduces the protein value of the crop, making it less valuable for livestock and wildlife forage.</p>	<p><u>Mechanical:</u> Mowing can prevent seed production but is not an effective control method as plants will re-sprout. Baby's breath is very difficult to hand pull because of its deep tap root – sever the root below the root crown (several cm below ground level) otherwise will re-sprouting will occur.</p> <p><u>Chemical:</u> can be controlled with herbicides that contain metsulfuron (e.g. Clearview, Escort or Ally), or glyphosate, applied during the bolt to pre-flower growth stage.</p> <p><u>Biological:</u> Currently none</p>




<p style="text-align: center;"><b>Russian Thistle</b> (<i>Salsola tragus</i>)</p>  <p style="text-align: center;">Figure 7 Russian Thistle <i>M.Lavin 2009 Some rights reserved</i></p>	<p>Annual herb from a fibrous root; stems ascending, solitary, freely branched, glabrous to hairy, purplish, 0.1-1.0 m tall, becoming hardened, ridged and rounded in late summer, then breaking at ground level to form "tumbleweeds". They grow best on loose, sandy soils, and can tolerate alkaline soil. Accumulation of dry skeleton plants can create a fire hazard.</p>	<p><u>Mechanical:</u> Repeated hand pulling, cutting or mowing prior to seed set can be effective to manage young plants and small infestations. Pulling of large plants may cause significant soil disturbance.</p> <p><u>Chemical:</u> 2,4-D, Dicamba, Picloram, Metsulfuron-methyl (Clearview), or Triclopyr can be applied post emergence when plants are small. Aminopyralid is only effective pre-emergence. Chemical control is not effective in late season when plants are spiny.</p> <p><u>Biological:</u> There is no reliable biological option.</p>
<p style="text-align: center;"><b>Burdock</b> (<i>Arctium</i> species)</p>  <p style="text-align: center;">Figure 8 Burdock <i>T.Kaisner</i></p>	<p>Regional Noxious Weed Biennial weeds common in farmyards, fence lines, roadsides, stream banks and idle areas well known for their rounded flower heads with hooked spines that easily attach to clothing and animals.</p> <p>Burdock grows 1 to 3 meters in height; lower leaf stalks are hollow; flower heads are less than 2.5 cm across and scattered along the stems.</p>	<p><u>Mechanical:</u> Mowing or cutting after the plant has bolted but before it has flowered can be used to eliminate seed production.</p> <p><u>Chemical:</u> Aminopyralid, 2,4-D, Picloram and glyphosate are effective when applied to first-year rosettes.</p> <p><u>Biological:</u> There are currently no biological control agents available for common burdock control.</p>




<p style="text-align: center;"><b>Chicory</b> (<i>Cichorium intybus</i>)</p>  <p style="text-align: center;">Figure 9 Chicory <i>P.Paw 2009 Some rights reserved</i></p>	<p>Is listed as an unregulated species of concern in BC. Tap rooted perennial with milky juice growing to 1.5 m in height; low growing rosette leaves resemble dandelion but are hairy; blue flowers (occasionally pink or white) usually close by midday.</p> <p>Leaves are used as a salad and roots when dried are used as a coffee substitute.</p>	<p><u>Mechanical:</u> Repeated mowing can be effective at reducing seed production. Small infestations can be removed by hand pulling.</p> <p><u>Chemical:</u> Spring applications of selective herbicide prior to flowering. Chemical application can follow mowing to reduce regrowth.</p> <p><u>Biological:</u> none</p>
<p style="text-align: center;"><b>Canada Thistle</b> (<i>Cirsium arvense</i>)</p>  <p style="text-align: center;">Figure 10 Canada Thistle <i>A.Erickson 2012 Some rights reserved</i></p>	<p>Provincial Noxious Weed</p> <p>Creeping rooted perennial growing erect to 1.2 meters; stalk-less dark green leaves with irregular spiny lobes; flower heads spineless and small compared to other thistles; flowers variable in colour from rose-purple to pink to white.</p>	<p><u>Grazing:</u> Sheep and goats will readily graze thistle, but not so much in the spiny stage.</p> <p><u>Mechanical:</u> Repeated mowing can be effective in reducing seed set. Intensive cultivation aimed at depleting food reserves in the roots, followed by competitive cropping, is effective in the long term.</p> <p><u>Chemical:</u> Spring and autumn applications of clopyralid, aminopyralid, or a dicamba/2,4-D tank mix have been effective when the roots are actively growing or in the pre-bud to early bud growth stages.</p> <p><u>Biocontrol:</u> Six biological control agents are available.</p>
<p style="text-align: center;"><b>Sun Spurge</b> (<i>Euphorbia helioscopia</i>)</p>  <p style="text-align: center;">Figure 11 Sun Spurge <i>T.Kaisner</i></p>	<p>Rare in SW BC and SE BC, introduced from Eurasia. Annual herb from a fibrous root; stems somewhat fleshy, branched in an umbrella-shape, 20-50 cm tall, only reproduces by seed. Milky latex in the stem may be toxic to livestock and can cause dermatitis or even temporary blindness in humans. Prefers mesic to dry roadsides, fields and waste places in the lowland and montane zones.</p>	<p><u>Mechanical:</u> Plants should be hand-pulled or mechanically controlled before flowering. They must be either uprooted or buried, as simply breaking the stem will result in resprouting at the soil surface.</p> <p><u>Chemical:</u> no specific herbicides listed.</p> <p><u>Biocontrol:</u> none identified</p>

# Appendix V Invasive Plant Survey Record



## IAPP Site & Invasive Plant Survey Record



Entered into IAPP  
(YYYY-MM-DD): \*

By: \_\_\_\_\_

Assigned Site IDs  
recorded on this form:


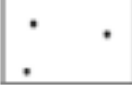
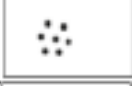
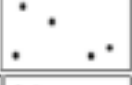
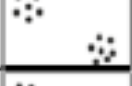
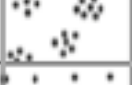
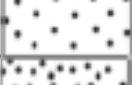


<b>Site Created Date</b> (YYYY-MM-DD): *		<b>Invasive Plant Survey Date</b> (YYYY-MM-DD): * <small>(only if different from Site Created Date)</small>		<b>Site ID:</b> (assigned at IAPP data entry)	
<b>Site Details</b>					
<b>Jurisdiction:</b> * (see reverse for choices/codes)		<b>District Lot Nr:</b>		<b>Range Unit:</b>	<b>Site Paper File ID:</b>
<b>UTM Zone:</b> *	<b>UTM Easting:</b> * (no initial zero)		<b>UTM Northing:</b> * (7 digits)		<b>Site Soil Texture:</b>
				coarse <input type="checkbox"/>	fine <input type="checkbox"/> organic <input type="checkbox"/>
<b>Slope:</b>		<b>Aspect:</b>		<b>Elevation (m):</b>	
<b>Site Location</b> (and directions how to get there):				<b>Site Comments</b> (anything else important /useful):	
<b>Invasive Plant Survey Details</b>					
<b>Survey Agency:</b> *		<b>Employer:</b>		<b>Surveyor(s):</b>	
<b>Invasive Plants</b> *	<b>Area</b> *	<b>Distr. Code</b>	<b>Density Code</b>	<b>Survey Type</b> *	<b>Proposed Activity</b>
<small>Species name or code</small>	<small>Dimension or Ha</small>	<small>(see reverse for codes)</small>	<small>(see reverse for codes)</small>	<small>Cumory /Operational /Precede</small>	<small>Man Chem Bio</small>
				C <input type="checkbox"/> O <input type="checkbox"/> P <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
				C <input type="checkbox"/> O <input type="checkbox"/> P <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
				C <input type="checkbox"/> O <input type="checkbox"/> P <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>Site Image Details</b>					
<b>Date taken</b> (YYYY-MM-DD):		<b>Reference No.:</b> *	<b>Perspective:</b> *		<b>Image Comments:</b>
			<small>(see reverse for codes)</small>		

<b>Site Created Date</b> (YYYY-MM-DD): *		<b>Invasive Plant Survey Date</b> (YYYY-MM-DD): * <small>(only if different from Site Created Date)</small>		<b>Site ID:</b> (assigned at IAPP data entry)	
<b>Site Details</b>					
<b>Jurisdiction:</b> * (see reverse for choices/codes)		<b>District Lot Nr:</b>		<b>Range Unit:</b>	<b>Site Paper File ID:</b>
<b>UTM Zone:</b> *	<b>UTM Easting:</b> * (no initial zero)		<b>UTM Northing:</b> * (7 digits)		<b>Site Soil Texture:</b>
				coarse <input type="checkbox"/>	fine <input type="checkbox"/> organic <input type="checkbox"/>
<b>Slope:</b>		<b>Aspect:</b>		<b>Elevation (m):</b>	
<b>Site Location</b> (and directions how to get there):				<b>Site Comments</b> (anything else important /useful):	
<b>Invasive Plant Survey Details</b>					
<b>Survey Agency:</b> *		<b>Employer:</b>		<b>Surveyor(s):</b>	
<b>Invasive Plants</b> *	<b>Area</b> *	<b>Distr. Code</b>	<b>Density Code</b>	<b>Survey Type</b> *	<b>Proposed Activity</b>
<small>Species name or code</small>	<small>Dimension or Ha</small>	<small>(see reverse for codes)</small>	<small>(see reverse for codes)</small>	<small>Cumory /Operational /Precede</small>	<small>Man Chem Bio</small>
				C <input type="checkbox"/> O <input type="checkbox"/> P <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
				C <input type="checkbox"/> O <input type="checkbox"/> P <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
				C <input type="checkbox"/> O <input type="checkbox"/> P <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>Site Image Details</b>					
<b>Date taken</b> (YYYY-MM-DD):		<b>Reference No.:</b> *	<b>Perspective:</b> *		<b>Image Comments:</b>
			<small>(see reverse for codes)</small>		

\* Indicates mandatory field - this form may be used for 2 sites, with their invasive plant surveys, and site images (if taken).

Some commonly used codes in IAPP:

Distribution Code		
Code	Reference	Description
1		Rare individual, a single occurrence
2		Few sporadically occurring individuals
3		Single patch or clump of a species
4		Several sporadically occurring individuals
5		A few patches or clumps of a species
6		Several well-spaced patches or clumps of a species
7		Continuous uniform occurrence of well-spaced individuals
8		Continuous occurrence of a species with a few gaps in the distribution
9		Continuous dense occurrence of a species

Density Code		
Code	Reference	Description
1	Low	≤ 1 plant/m <sup>2</sup>
2	Medium	2-5 plants/m <sup>2</sup>
3	High	6-10 plants/m <sup>2</sup>
4	Dense	> 10 plants/m <sup>2</sup>

Jurisdiction Codes	
MFR	Ministry of Forests and Range
AH	Alaska Highway
HYDR	BC Hydro
BCR	BC Rail
BCTC	British Columbia Transmission Corp.
BNSF	Burlington Northern Santa Fe
CNR	CN Rail
CPR	CP Rail
DND	Department of National Defense
GL	Grazing Lease
FN	First Nations Reserves
MN	Mining Companies
MOT	Ministry of Transportation and Infrastructure
MOE	Ministry of Environment - <i>except Provincial Parks</i>
MOP	Municipality owned land
PIPE	Oil and Gas Companies
PNG	Pacific Northern Gas
PCAN	Parks Canada
P	Private Land
PP	Provincial Parks
MRD	Regional District owned land
TEL	Telus
TER	Terasen Gas Inc.
TRP	TransCanada Pipelines
WE	Westcoast Energy Inc.

\* Indicates mandatory field - this form may be used for 2 sites, with their invasive plant surveys, and site images (if taken).

# Appendix VI Invasive Plant Treatment Record



## INVASIVE PLANT CHEMICAL & MECHANICAL TREATMENT RECORD



<input type="checkbox"/> DATA ENTERED INTO APP TREATMENT DATE: YYYMMDD ENTERED BY: _____ AGENCY: _____ EMPLOYER: _____		PCP #s: 2,4-D 14726; Bamvel 18037; Escort 23006; Milestone 28137 Restore 28137/28271; Vantage 26960; Grazon 26849 Roundup 13844; Tordon 22K 9005; Transline 24084 OTHER HERBICIDE: _____ REGISTRATION # _____ OTHER APPLICATORS: _____		CERTIFIED APPLICATORS: _____ CERT. NUMBER: _____ SUPERVISOR SIGNATURE: _____ CERT. NUMBER: _____	
RANGE UNIT	PASTURE	PAPER FILE ID	PMP NUMBER	CERT. NUMBER	
New Site OR Paper File ID LTM Zone Easement Working	New Site OR Paper File ID LTM Zone Easement Working	Location or Road Name/Km Location or Road Name/Km Location or Road Name/Km Location or Road Name/Km Location or Road Name/Km Location or Road Name/Km Location or Road Name/Km Location or Road Name/Km	Invasive Plant Not Found Invasive Plant Not Found Invasive Plant Not Found Invasive Plant Not Found Invasive Plant Not Found Invasive Plant Not Found Invasive Plant Not Found Invasive Plant Not Found	Species 1 % Distribution Code Species 2 % Distribution Code Species 3 % Distribution Code Area Treated (ha) Distribution Code COMMENTS	Name of Herbicide Application Rate Wind Direction Wind Speed (km/h) Temperature (C) COMMENTS
ACTIVITY <input type="checkbox"/> CHEMICAL <input type="checkbox"/> MECHANICAL <input type="checkbox"/> SURVEY ONLY	JURISDICTION JURISDICTION JURISDICTION JURISDICTION JURISDICTION JURISDICTION JURISDICTION	JURISDICTION JURISDICTION JURISDICTION JURISDICTION JURISDICTION JURISDICTION JURISDICTION	JURISDICTION JURISDICTION JURISDICTION JURISDICTION JURISDICTION JURISDICTION JURISDICTION	COMMENTS COMMENTS COMMENTS COMMENTS COMMENTS COMMENTS COMMENTS	Name of Herbicide Application Rate Amount of Mix Used (L) Amount of Mix Used (L) Amount of Mix Used (L) Amount of Mix Used (L) Amount of Mix Used (L) Amount of Mix Used (L) Amount of Mix Used (L)

Mechanical Treatments Mandatory Fields: Date of Treatment, Agency, Jurisdiction, Sta ID OR LTM Zone, Easement & Number, Species 1, Treatment Method, Area Treated, Wind Speed  
 Chemical Treatments Mandatory Fields: All fields indicated in Mech. Treatments, PLUS: Certified Applicator and Number, Application Time, Temperature, Name of Herbicide, Application Rate, Amount of Mix Used

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Ministry of  
Forests and Range



# INVASIVE PLANT CHEMICAL & MECHANICAL TREATMENT RECORD

IMAP  
SKETCH/MAP (INDICATE NORTH)

IMAGE DETAILS		PERSPECTIVE		REFERENCE NO.
ID	DATE YYMMDD			
COMMENTS				