

Highway Operations

What Can You Do?

Invasive plants are negatively impacting lands across British Columbia (BC), and highway rights-of-way can be a major pathway for their spread. BC Ministry of Transportation and Infrastructure (MOTI) staff and maintenance contractors, land managers, and others have the ability to mitigate weed distribution by implementing a program of prevention and effective controls.

This document provides an overview of roadside maintenance best practices for invasive plants, that maintenance contractors, land managers, and others are encouraged to use when developing annual work plans for roadside operational activities. These best practices are part of a broad approach to invasive plant management that includes MOTI collaboration with other agencies who provide coordination at provincial, regional and district levels, technical expertise, and educational outreach programs. They also complement specific activities carried out on highway rights-of-way by other parties, e.g. – regional programs for herbicide treatment of designated noxious weeds.

The term invasive plant, as used hereafter, includes provincially listed invasive plants and noxious weeds, as well as other alien plant species that have the potential to cause undesirable impacts on humans, animals or ecosystems.

Impacts of Invasive Plants on Roadside Maintenance Operations

Invasive plants are highly competitive and, lacking natural pathogens or predators, they can spread rapidly through aggressive root systems and/or production of vast numbers of long-lived seeds. Once established, invasive plant infestations can displace desirable roadside vegetation, resulting in rights-of-way areas that are less ecologically diverse, more costly to maintain, and aesthetically less attractive.



Invasive plants can severely degrade riparian zones, increase fire hazards, and in some cases have the potential to cause damage to the highway infrastructure, itself. For example, Japanese knotweed (*Fallopia japonica*) can grow through highway shoulders and pavement.



Certain species can be a concern from a health and safety perspective as well. Puncturevine (*Tribulus terrestris*) produces hard, spiny burrs that can penetrate human skin and puncture bicycle tires. Giant Hogweed (*Heracleum mantegazzianum*) can cause severe skin irritations and burns. Invasive plants can also invade and contaminate gravel pits and other material sources. This allows for plant parts and seeds to be spread during material transport and application, thus aggravating control efforts.

Management Strategies

Management strategies will vary by invasive plant species and by region of the province. Refer to the accompanying species-specific factsheets or visit the province's invasive plants website for detailed information on management of specific invasive plant species.

Three elements common to all management strategies include:

- » Prevention measures that encompass annual roadside maintenance program planning and operations.
- » Establishment of coordinated early detection and reporting systems.
- » Application of Integrated Pest Management (IPM) principles

Objectives of this Document:

- » Manage and mitigate the impacts of invasive plants by providing roadside maintenance contractors, land managers, and others with information and resources to prevent, detect, and report invasive plants.
- » Develop a coordinated approach to invasive plant management for all maintenance contractors, land managers, and others.
- » Assist in compliance with the Weed Control Act. http://www.bclaws.ca/civix/document/id/complete/statreg/96487_01

Prevention

The most cost-effective management option for invasive plants depends on the current distribution of the species, this includes preventing the initial introduction to an area, and subsequent introductions (spread). Prevention requires that, at a minimum:

- » A coordinated detection and reporting system is used; and
- » Specific practices, such as those outlined in this document, are in place across all roadside maintenance operations to prevent introduction or spread of invasive plants.

Early Detection and Rapid Response (EDRR) is a strategy that incorporates education, coordinated detection, and focused response efforts. A common approach to prevent invasive plant introduction or spread through EDRR includes the following steps.

1. Determine the priority invasive plant species within your operating area and maintain an awareness of species new to your area using, at minimum, the following sources of information.
 - » Province-wide web-based databases such as the Invasive Alien Plant Program (IAPP) Application and E-Flora BC (see References for web links).
 - » Regional invasive plant committee coordinator(s) serve to coordinate invasive plant management within each regional district or group of districts across most of BC. For current contact information visit:
<https://bcinvasives.ca/about/partners/bc-stakeholders/>
2. Ensure staff, contractors, and others learn to identify species of concern that are present at and near their operating areas and, at a minimum, to follow the prevention measures specified in this document. This may include, but is not limited to:
 - » Collaborating with the regional invasive plant committee coordinator(s) or regional staff to ensure training is available on species identification.
 - » Making resources available to staff and contractors to facilitate identification of species and implementation of recommendations.
 - » Facilitating networking among staff and contractors, who are likely to encounter invasive plants, with MOTI regional staff and regional invasive plant committee coordinators.



3. Establish a protocol for action when an invasive plant is encountered that includes the following:
 - » Identifying the species. Determining the plant's legal status and regional priority. Flagging and locating Universal Transverse Mercator (UTM) the new site.
 - » Selecting a species-specific factsheet to determine appropriate control measures.
 - » Reporting the species name, date of observation, location (UTM coordinates), and estimated area (ha or m²) of infestation to the regional invasive plant committee coordinator or MOTI contact. Preferably, complete a Site and Inventory Invasive Plant Record form and submit it to the regional invasive plant committee coordinator for entry into IAPP.

Integrated Pest Management (IPM)

- » IPM is a decision-making process that includes identification and inventory of invasive plant populations, assessment of the risks that they pose, development of well-informed control options that may include a number of methods, site treatment, and monitoring.
- » Control methods vary with species, severity of the plant invasion, and site considerations. Site-specific mechanical, chemical, or biological control methods may be applied.
- » Additional information on control methods is available in the accompanying species-specific factsheet, from a regional coordinator, online at the provincial invasive plant website, or online at the IAPP Application Reference Guide.



Recommendations: Roadside Maintenance Operations »

OPERATION TARGETED INVASIVE PLANT SOLUTIONS

General

These practices are always applicable, regardless of the operation, and are not limited to specific operations listed here. In addition to these recommendations please see the ISCBC Best Management Practices for Soil Movement and Disposal. https://bcinvasives.ca/documents/ISCBC-Soil-BMP-180926_Final_web.pdf

1. Contact your regional invasive plant committee coordinator and consult the appropriate resources (species- and activity-specific factsheets) prior to conducting maintenance activities; include appropriate recommendations in your annual planning program; and participate in annual invasive plant identification and management training.
2. Inspect and clean (wash if water truck is available) vehicles and equipment, including tires and undercarriage, before entering an un-infested area or leaving an infested area.
3. Remove and bag invasive plant seeds and plant parts from equipment and dispose of waste at a landfill or other designated disposal site.
4. Wash equipment after returning it to the maintenance yard.
5. Use only clean (invasive plant free) fill material, including soil and gravel, from un-infested sources.
6. Where surface soils contaminated with invasive plants are excavated, this material should not be re-used in topical applications prior to appropriate treatment with herbicide and/or a suitable quarantine period. Where treatment is not practical, this material should be properly disposed of.
7. Avoid parking, turning around, or staging equipment in invasive plant infestations or mow prior to use. Keep equipment yards and storage areas free of invasive plants.
8. Identify and control invasive plants PRIOR TO their flowering stage and seed-set.
9. Selectively remove invasive plants and promptly revegetate disturbed areas with grass seed and/or plantings of native shrubs that are appropriate for the application, non-invasive, and quick to establish. Preserve existing desirable native vegetation.



Shoulder, Ditch and Watercourse Maintenance

1. Provide timely road shoulder grading to avoid significant disturbance to aggregate when removing established invasives.
2. Do not dump ditch waste above or below the ditch where desirable vegetation is established. Instead, dispose of waste materials at a designated disposal site. Record and report the source location of the disposed waste or spill materials.
3. Minimize the removal of desirable vegetation and the exposure of bare soils.

Roadside Vegetation, Rest Area and Facilities Maintenance

1. Establish an annual mowing/brushing schedule in collaboration with the regional invasive plant committee coordinator and, whenever possible, schedule the route so that activities start in un-infested areas and move toward infested areas.
2. Do not brush or mow within 7-days of an herbicide treatment.
3. Implement effective, targeted mowing of invasives around riparian areas, wells, and other areas where herbicides cannot be applied.
4. Avoid mowing grasses and vegetation lower than 15cm above ground level – this is particularly important for steep slopes where erosion potential is high.
5. Shut-off and raise mower equipment when selectively mowing areas – this is critical when traveling through un-infested areas.
6. Retain desirable native vegetation ground cover when possible and encourage its spread.

Gravel Pits

1. Regularly inspect gravel pits and other material sources to ensure they are free of invasive plants prior to use.
2. Record and report invasive plant infestations to MOTI gravel managers so that appropriate controls can be implemented.

Legal Status

Invasive plant management on highway rights-of-way is regulated by the BC Weed Control Act (WCA) and the Integrated Pest Management Act (IPMA).

The WCA requires all land occupiers to control the spread of sixty-four provincial and/or regional noxious weeds on their land and premises, and specifies provisions for transportation, movement, and cleaning of machinery.

http://www.bclaws.ca/civix/document/id/complete/statreg/96487_01

The IPMA regulates herbicide applications that may be used to control invasive plant infestations.

http://www.bclaws.ca/civix/document/id/complete/statreg/03058_01

References/Links

Provincial and Regional Coordination:

- » Invasive Species Strategy for British Columbia. 2018-2022: https://bcinvasives.ca/documents/Invasive_Species_Strategy_for_BC-2018-180117-WEB.pdf
- » Ministry of Transport and Infrastructure, 2010. <http://www.bv.transports.gouv.qc.ca/mono/1011767.pdf>
- » BC Ministry of Transport and Infrastructure. 2018-2019. Highway Maintenance Specifications: https://www2.gov.bc.ca/assets/gov/driving-and-transportation/transportation-infrastructure/highway-bridge-maintenance/highway-maintenance/maintenance-agreements/maintenance-specifications/schedule_1a_specifications_-_final_-_2018-19.pdf

Species Identification and Management:

- » BC Ministry of Agriculture. 2014. Field Guide to Noxious Weeds and Other Selected Invasive Plants of British Columbia, 8th ed. https://bcinvasives.ca/documents/Field_Guide_to_Noxious_Weeds_Final_WEB_09-25-2014.pdf
- » E-Flora BC, Electronic Atlas of the Plants of BC: www.eflora.bc.ca
- » Global Invasive Species Database: <http://www.iucngisd.org/gisd/>



Provincial Inventory and Mapping Database

- » Invasive Alien Plant Program (IAPP) Application, Reference Guide and Field Forms: <https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/invasive-species/reporting-invasive-species>

Integrated Pest Management

- » BC Ministry of Environment and Climate Change Integrated Pest Management: <https://www2.gov.bc.ca/gov/content/environment/pesticides-pest-management>

Contact Us:

bcinvasives.ca



**Invasive Species
Council of BC**

Go to "Contact Us" link or, call, write us at:

Phone: 250-305-1003
or 1-888-933-3722

info@bcinvasives.ca

#104 - 197 North 2nd Avenue
Williams Lake, BC V2G 1Z5



Thank you to the BC Ministry of Environment and the BC Ministry of Transportation and Infrastructure for providing project funding, and to those who advised the development of these management recommendations