WELCOME TO ISCBC’S WEBINAR SERIES
Strategic Integrated Management of some Priority Invasive Plants in the Cariboo Region

Dave Ralph
Extension and Operations Manager
Integrated Pest Management

IPM
• Decision making process

• Preventing invasive plants from becoming problems

• Suggests actions to take if invasive plants do become problems

• Does not eliminate all invasive plants

• Goal is to reduce damage caused by invasive plants

• Reduces adverse impact to industry and protects the environment
1. Managing the resources to prevent invasive plants from invading.

2. Need to identify invasive plant species and be knowledgeable about them.

3. Requires mapping and inventorying weed populations and recognizing the damage they cause.

4. Making control decisions based on knowledge of the weed, potential damage, cost of control, and the environmental impact of the invasive plants and the control options.

5. Using suitable combinations of control strategies to reduce the weed population to an acceptable level. *Injury Threshold*

6. Must monitor effectiveness and adjust activities and actions as need be.
Preventative Actions

Seeding

Eliminate pathways and vectors

Eliminate Introduction
Identification x 2

Photo: Steve Dewey, Utah State University, bugwood.org

Underlying cause of the invasive plant problem

Photo: Andrew J. Boone, South Carolina Forestry Commission, bugwood.org

Plant Characteristics
Map and Inventory

Know their location, how and where the weeds arrived, where agricultural, natural or sensitive areas are located, etc. Without this and other related information, how do you know where to start and execute your management activities to get the best results.

Canada thistle (Cirsium arvense), glyphosate up to 1 m of HWM

Canada thistle Milestone herbicide application above 10 m AHW mark.
Treatment/Control Choices

Cultural

Chemical

Mechanical

Biological
Considerations for Decision(s)

- Which species or complex of species is present
  - annuals, biennials, perennials, prolific seed producers, intense competitors, toxic to people?
- What life stage is the plant at?
- What is the site used for?
- Is the site: urban or rural; close to water; Close to a rare or endangered habitat or species?
- What are the costs of treatment?
- What are the consequences of not treating at this time?
- Are there safety concerns, like impaired vision on a road or blocked signs or driveways or impaired utility lines?
- Is there anything in the area that will be impacted by the invasive plants, economically or otherwise?
- Is the plant naturalized or under biological control?
Monitoring
**Threshold:**
the level of a weed population; the amount of damage that leads to a decision

**Injury Threshold:**
the point when a weed population reaches numbers that incur unacceptable injury or damage

**Action/Treatment Threshold:**
the point at which a treatment should be started, to prevent weeds from reaching the injury threshold
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Latin Name</th>
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<tr>
<td>Hoary Alyssum</td>
<td><em>(Berteroa incana)</em></td>
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<td>Marsh Plume Thistle</td>
<td><em>(Cirsium palustre)</em></td>
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<tr>
<td>Orange Hawkweed</td>
<td><em>(Hieracium aurantiacum)</em></td>
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<td>Hoary cress</td>
<td><em>(Cardaria spp.)</em></td>
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<td>Perennial Pepperweed</td>
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<td>Blueweed</td>
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<td>Black Henbane</td>
<td><em>(Hyoscyamus niger)</em></td>
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</table>
Selective

- Tordon 22K (picloram) – 4-7 yrs
- Grazon (picloram + 2,4-D) – 3-5 yrs
- Milestone (aminopyralid) - 2-3 yrs
  - Restore (milestone + 2,4-D amine)
- Escort (metsulfuron methyl) - 1-2 years
- Clearview (aminopyralid + metsulfuron methyl) – 2-3 yrs
  - Reclaim (aminopyralid/metsulfuron methyl + 2,4-D ester)
- Banvel, Vanquish (dicamba) - 9 mths-1.5 yrs
- Lontrel (clopyralid) – 1-2 yrs
- 2,4-D amine, ester – 2-3 mths (max 6 mths)

Non-Selective

- Roundup, Vantage (glyphosate) - non-residual
- Arsenal (imazapyr) – 1-3 yrs
Hoary Alyssum
(\textit{Berteroa incana})

- Plant can grow up to 1.1m in height, small white flowers with deeply notched petals.

- Often times this plant has multiple stems branching out near the root collar. Stems are also covered in star shaped hairs.

- Upper leaves clasp stem, are stalkless less and have an elliptical shape.

- These plants grow well in open fields, cutblocks, landings and roadsides, forming large monocultures, preventing native growth.
Hoary Alyssum Management

**Mechanical**
- Cut/Mow low before flowering
- Pulling, Burning - pile and burn

**Cultural**
- Good control by cultivation
- Tillage- late fall/early spring, deep to cut root below crown, bury seed before rosette develop stalk
- seed to perennial crop

**Chemical**
- 2,4-D,
- glyphosate,
- aminopyralid/ metsulfuron methyl alone with 2,4-D (Clearview, Reclaim)

**Biological**
None
Biology
- Fibrous rooted biennial,
- Leaves covered with tangled or matted woolly hairs 1st yr
- Rosette, 2nd yr, bolting, erect slender stem, grows to 0.3 – 2.5 m (1-8 ft.)
- Stem is ribbed with spiny wings

Impacts
- Displaces desirable and native vegetation
- Very invasive into even competitive vegetation
- Invades wetland meadows and forested sites
Mechanical
Cutting/Mowing - cut low before flowering

Cultural
Encourage or enhance competitive desirable species

Chemical
- Picloram,
- picloram + 2,4-D,
- aminopyralid,
- aminopyralid + 2,4-D,
- clopyralid,
- dicamba,
- dicamba + 2,4-D

Biological
Pending
Marsh Plume Thistle

Marsh plume thistle
Cirsium palustre
Code = MT  n = 1163
IAPP July 2017
Sites per 10km block squares
1-10
11-20
21-50
51-100
Over 100

0 200km 400km
Orange Hawkweed  
(Hieracium aurantiacum)

- Biennial,  
- 0.3m – 1.2m,  
- Rosette the first year,  
- Oblong leaves, 4-20 cm long covered in long white hairs on both sides.  
- Plant single stem covered in long white hairs  
- Flowers bright orange-red in colour, forming in clusters at the top of the stem  
- Grow in most open areas, outcompeting native species and form large monocultures affecting biodiversity
Orange Hawkweed Management

Mechanical
- Pulling - difficult to get all stolons
- Cut/mow prevents seed production, long term reduces seed production
- Burning – ineffective

Cultural
- Does poor under cultivation or established competition
- Encourage competitive species to resist invasion
- Fertilization nitrogen + Sulphur

Chemical
- picloram,
- picloram + 2,4-D,
- 2,4-D, dicamba, aminopyralid,
- glyphosate,
- Clopyralid
- metsulfuron methyl + aminopyralid

Biological
- gall forming wasp
- root feeding fly
Biology
Perennial, reproduces by seed and sprouting from lateral roots

Impacts
- Reduces hay quality and value
- Produces a large number of seeds
- Unpalatable to grazers
- Can cause dense monocultures that displace native plants

Hoary Cress
globe, lens-podded, heart-podded
(Cardaria spp.)
Hoary Cress Management

**Mechanical**
- Cutting/Mowing - cut low before flowering
- Mowing can exhaust energy in roots
- Cultural
  - Tillage - start in early spring, repeat every ten days, sow and fertilize grasses/legumes

**Chemical**
- Dicamba,
- 2,4-D,
- glyphosate,
- glyphosate + MCPA,
- aminopyralid + 2,4-D (Restore)

**Biological**
None
Biology
Rhizomatous, perennial forb, reproduces vegetatively by roots and seeds.

Impacts
Invades irrigated pastures, cropland, and native meadows, aggressively colonizes riparian habitats and can eliminate competing vegetation.
Mechanical
Periodic mowing and spring burning have reduced perennial pepperweed density in Utah

Cultural
Cutting and pulling can manage this weed if plants are treated before seed-set.

Chemical
- Metsulfuron-methyl,
- dicamba,
- glyphosate,
- chlorsulfuron,
- imazapyr,
- a combination of glyphosate and 2,4-D have also been effective in the US.

Biological
None
Perennial Pepperweed

Perennial pepperweed
*Lepidium latifolium*
Code = PP  n = 15
IAPP July 2017
Sites per 10km block squares

- 1-10
- 11-20
- 21-50
- 51-100
- Over 100

 ISC Invasive Species Council of BC
Biology
Perennial forb, well developed taproot, predominantly lower leaves, hairy stem, reproduces by seed

Impacts
Competes with forage stands and native pastures, causing declines in hay production and pasture carrying capacity, difficult to eradicate.

Field Scabious
(Knautia arvense)
Mechanical
• Cut/mow pastures before seed-set.
• Cultivation can manage this weed.
• Heavily infested pastures and hayfields can be cultivated and rotated to an annual crop

Cultural
Handpull small infestations of young plants. Seed production can be reduced by cattle grazing early, plants become unpalatable as it matures.

Chemical
• glyphosate,
• picloram,
• aminopyralid + 2,4-D,
• metsulfuron methyl + aminopyralid + 2,4-D
Biology
Long, stout, and black taproots, with smaller fibrous lateral roots, spreads by seed

Impacts
Usually not found in cultivated crops but can invade rangelands and pastures. Seeds can contaminate clover and other crop seeds and generally unpalatable and increases in overgrazed pastures.

Blueweed
(Echium vulgare)
Mechanical
Cutting established blueweed can reduce seed production, repeat treatments to prevent shoots from re-sprouting and producing seed. Repeated defoliation to deplete root reserves and reduce flowering.

Cultural
Small infestations can be managed with hand-pulling.

Chemical
- glyphosate,
- aminopyralid + 2,4-D,
- aminopyralid + metsulfuron methyl + 2,4-D,
- picloram,
- picloram + 2,4-D

Biological control
None
Black Henbane
*(Hyoscyamus niger)*

- Perennial
- Large deep taproot reproduces by seed
- Has a fowl scent at all growth stages.
- Poisonous
Black Henbane
(*Hyoscyamus niger*)

- Leaves are alternate, large and broad.
- Leaf edges are shallowly lobed.
- Veins are conspicuous.
Black Henbane

*Hyoscyamus niger*

- Flowers pale yellow with dark purple throats and veins.
- Has 5 – lobed shaped pedals, a funnel shaped flower.
- Plant flowers from June – September, peak flowering in July.

Mary Ellen Harte
Mechanical
- Cutting/Mowing – prevent seed, must cut low
- Pulling - use gloves as it is poisonous
- Burning – destroys seed

Cultural
- frequent, shallow cultivation
- DO NOT graze, poisonous

Chemical
- dicamba,
- picloram,
- glyphosate,
- metsulfuron methyl + aminopyralid,
- 2,4-D

Biological
None
Up next

Mobile apps for invasive species management and reporting

Ksenia Kolodka, Outreach Coordinator
Use the **WeedsBMP** app to identify any invasive plants that you see on your property or natural areas.

**WeedsBMP** includes information on 95 invasive plant species directly relevant to forage and livestock production.
Management

Summary:
Hound’s-tongue can quickly form dense stands on disturbed areas. Treat first-year plants with herbicides, or hand-pull plants. Mow bolted plants to eliminate seed production. Repeat this process to exhaust the seed bank. Ensure that areas where livestock congregate (such as corrals and gates) are weed-free, especially when the weed is in seed set. Manage livestock to maintain a vigorous population of perennial plants to provide ground cover. Check people, vehicles, and dogs for seeds before you leave an infested area.

Biocontrol:
Mepolones cruciger (weevil) has a significant impact on hound’s tongue. For information on biocontrol agents, visit the BC Government biocontrol matrix page at https://www.for.gov.bc.ca/hra/plants/Agent-Plant_Matrix.htm

Herbicides
In BC, excellent long-term control is achieved with picloram applied in spring, summer, or autumn. Dicamba provides good control applied either spring or autumn. Spring applications of picloram, dicamba, and metsulfuron-methyl have been more effective than autumn treatments in
Use the **Report Invasives** app to report any sightings of invasive species – this helps promote Early Detection and Rapid Response in BC.

Early detection is critical in stopping the spread of invasive species.
Thank you for your attendance!

Questions?

Dave Ralph, Extension & Operations Manager
extension@bcinvasives.ca

Ksenia Kolodka, Outreach Coordinator
outreach@bcinvasives.ca