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BC AGRICULTURE & FOOD

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CANADIAN AGRICULTURAL PARTNERSHIP

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Strategic Integrated Management of some Priority Invasive Plants in the Cariboo Region

Dave Ralph

Extension and Operations Manager

Integrated Pest Management

IPM

What is involved in IPM

- Decision making process
- Preventing invasive plants from becoming problems
- Suggests actions to take if invasive plants do become problems
- Does not to eliminate all invasive plants
- Goal is to reduce damage caused by invasive plants
- Reduces adverse impact to industry and protects the environment

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Components of IPM

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.

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Prevention

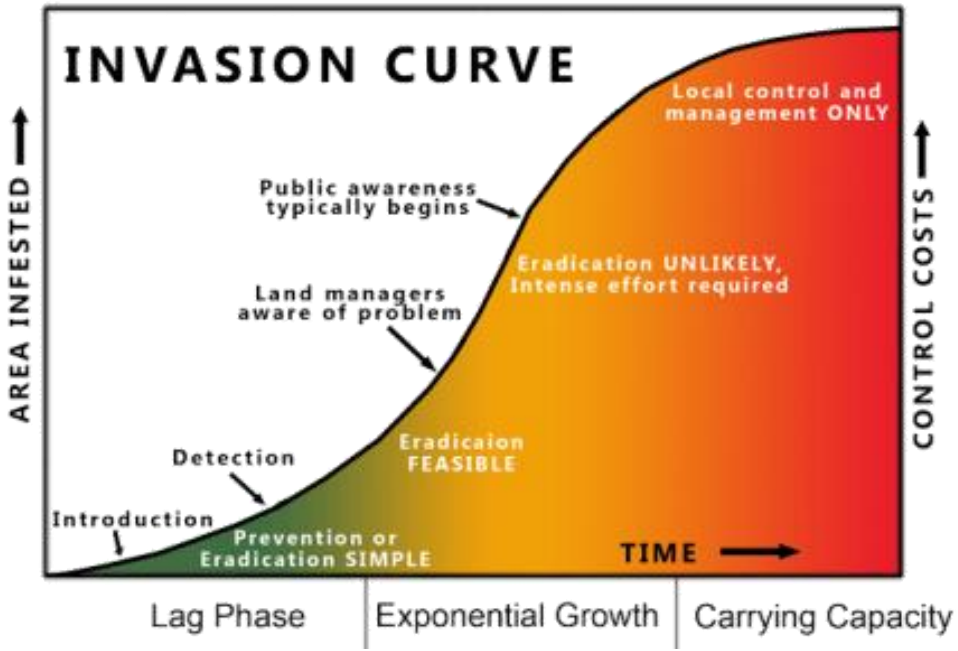

Photo Credit: California Department of Fish And Wildlife

Preventative Actions

Seeding

Eliminate Introduction

Eliminate pathways and vectors

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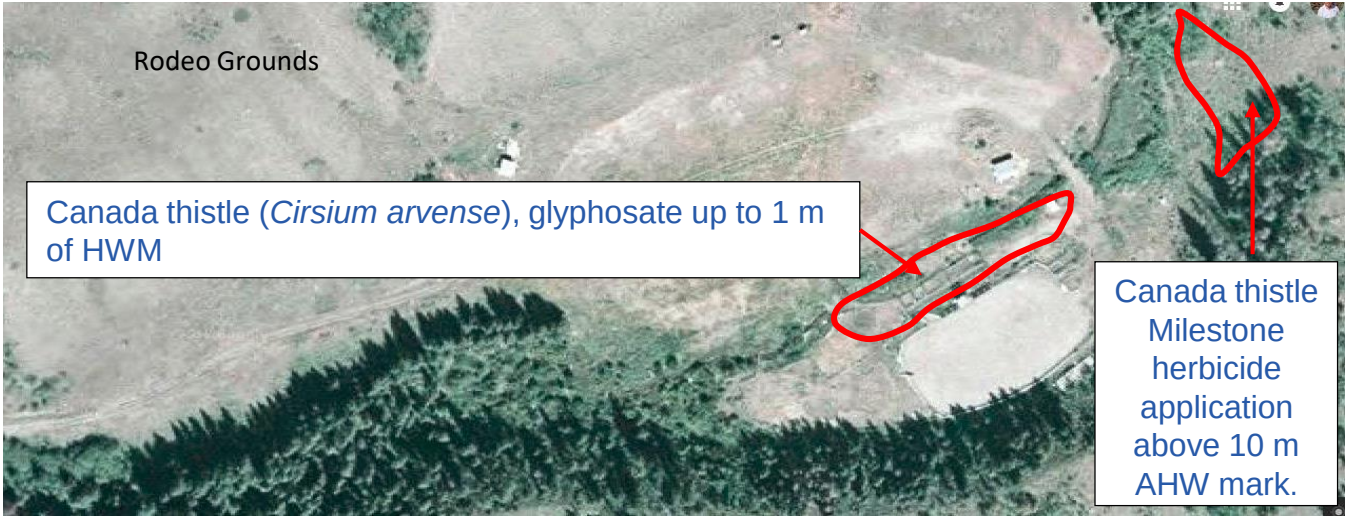
Identification x 2

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

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

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.



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Treatment/Control Choices

Cultural

Mechanical

Chemical

Biological

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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?

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Monitoring

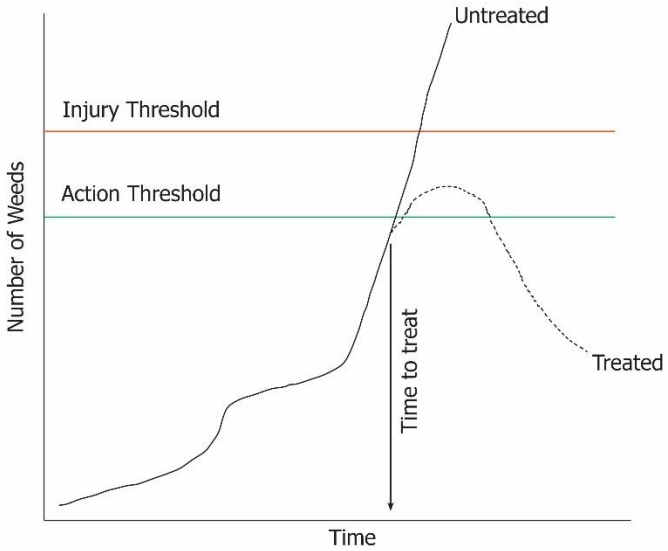
University of Idaho Archive, University of Idaho, bugwood.org

Injury Threshold- Definitions

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



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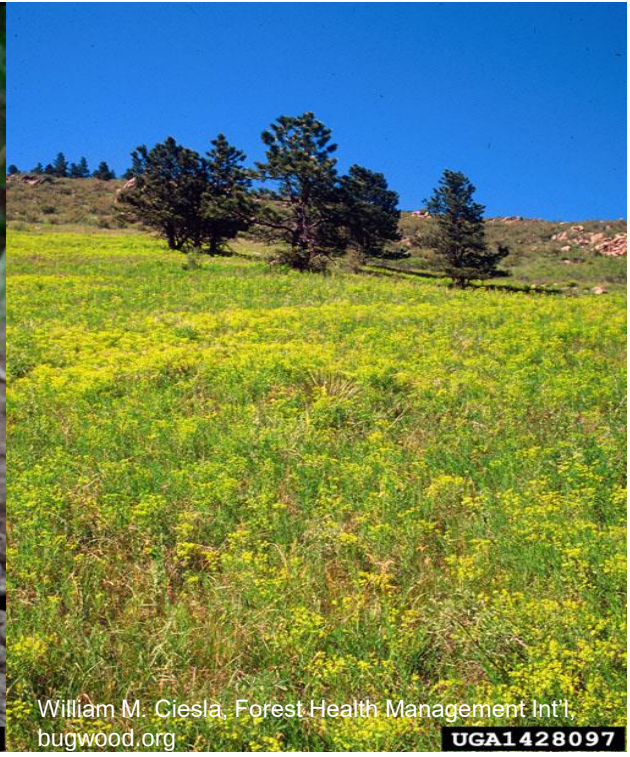
Injury Threshold



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Invasive Species of Cariboo Region

Common Name	Latin Name
Hoary Alyssum	*(Berteroa incana)*
Marsh Plume Thistle	*(Cirsium palustre)*
Orange Hawkweed	(Hieracium aurantiacum)
Hoary cress	*(Cardaria spp.)*
Perennial Pepperweed	(Lepidium latifolium)
Field Scabious	(Knautia arvense)
Blueweed	*(Echium vulgare)*
Black Henbane	(Hyoscyamus niger)

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Common Herbicides for Noxious Weed Species

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

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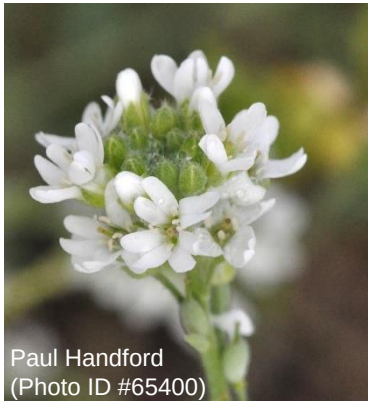
Hoary Alyssum (*Berteroa incana*)


Paul Handford (Photo ID #65400)


Gordon Neish (Photo ID #23661)


Paul Handford (Photo ID #65399)

- 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.

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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

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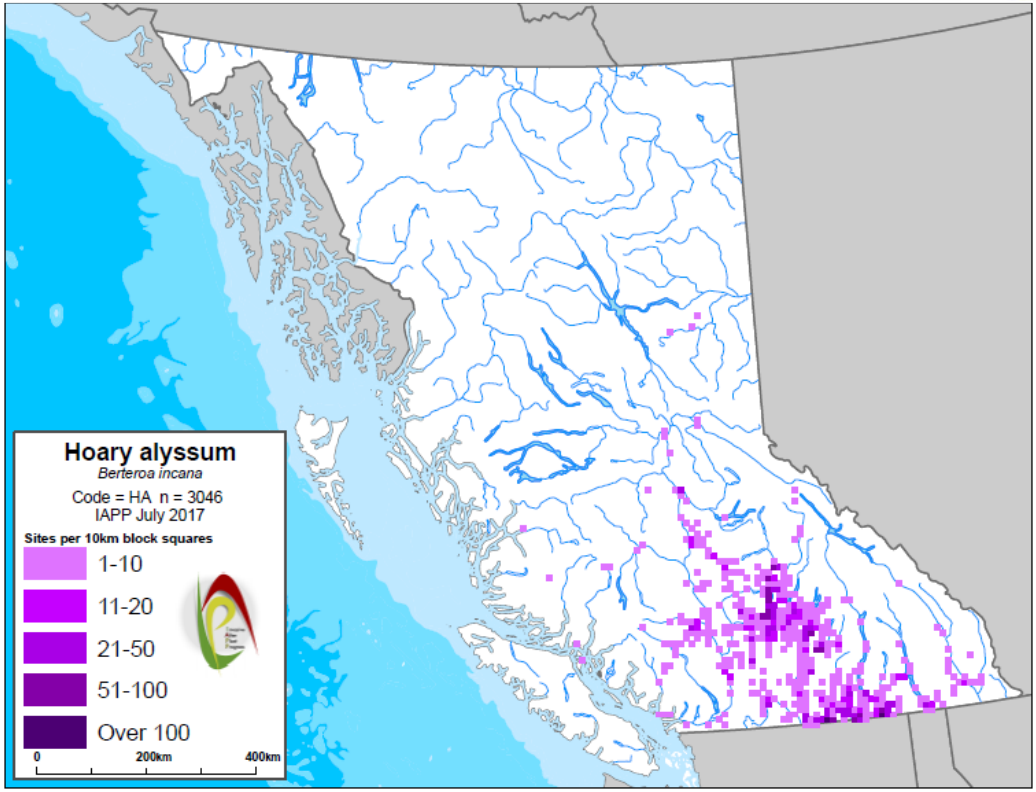
Hoary Alyssum



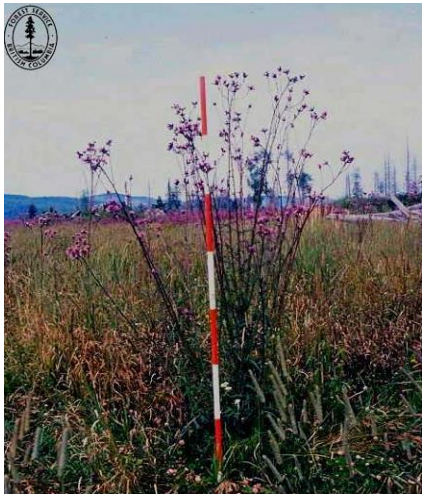
Marsh Plume Thistle
(*Cirsium palustre*)

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



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Marsh Plume Thistle Management

Mechanical

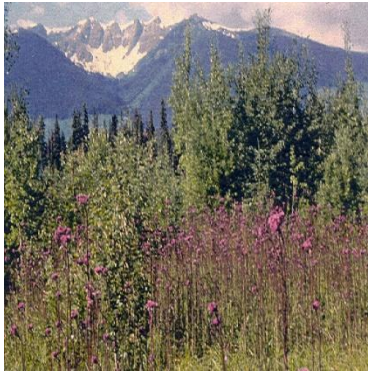
Cutting/Mowing - cut low before flowering

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

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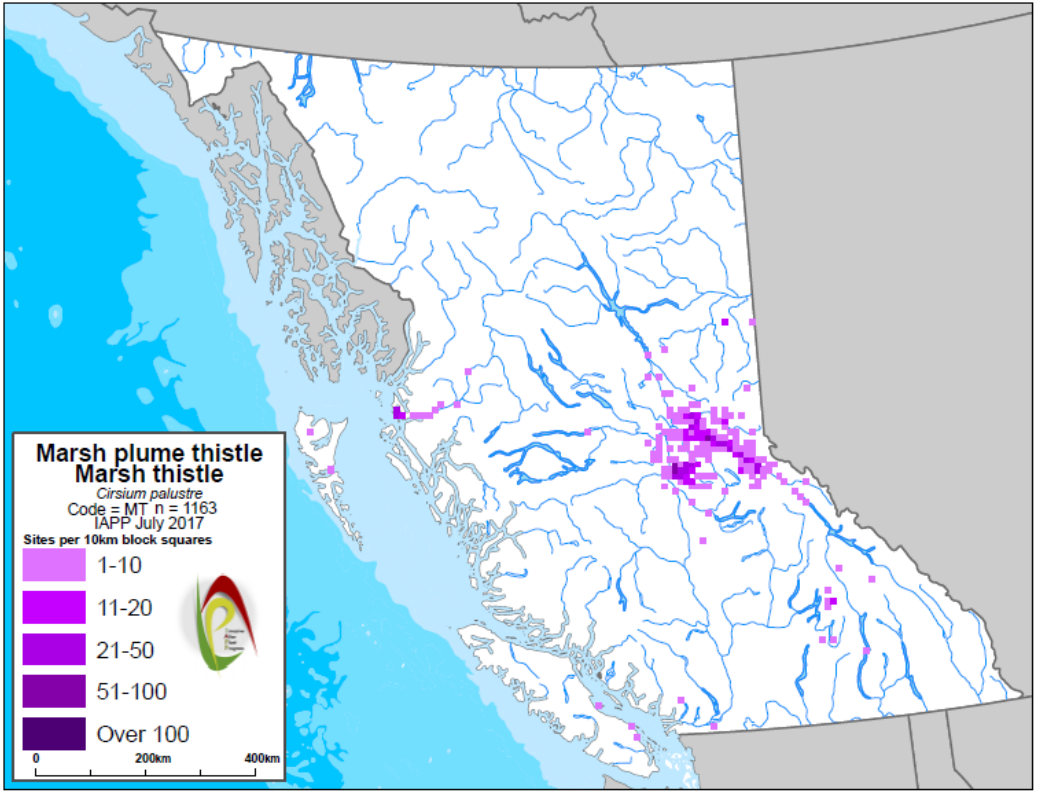
Marsh Plume Thistle



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Orange Hawkweed
(*Hieracium aurantiacum*)


Adolf Ceska (Photo ID #5791)


Neil Harris (Photo ID #19793)


Natasha Gellatly (Photo ID #14352)

- 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

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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

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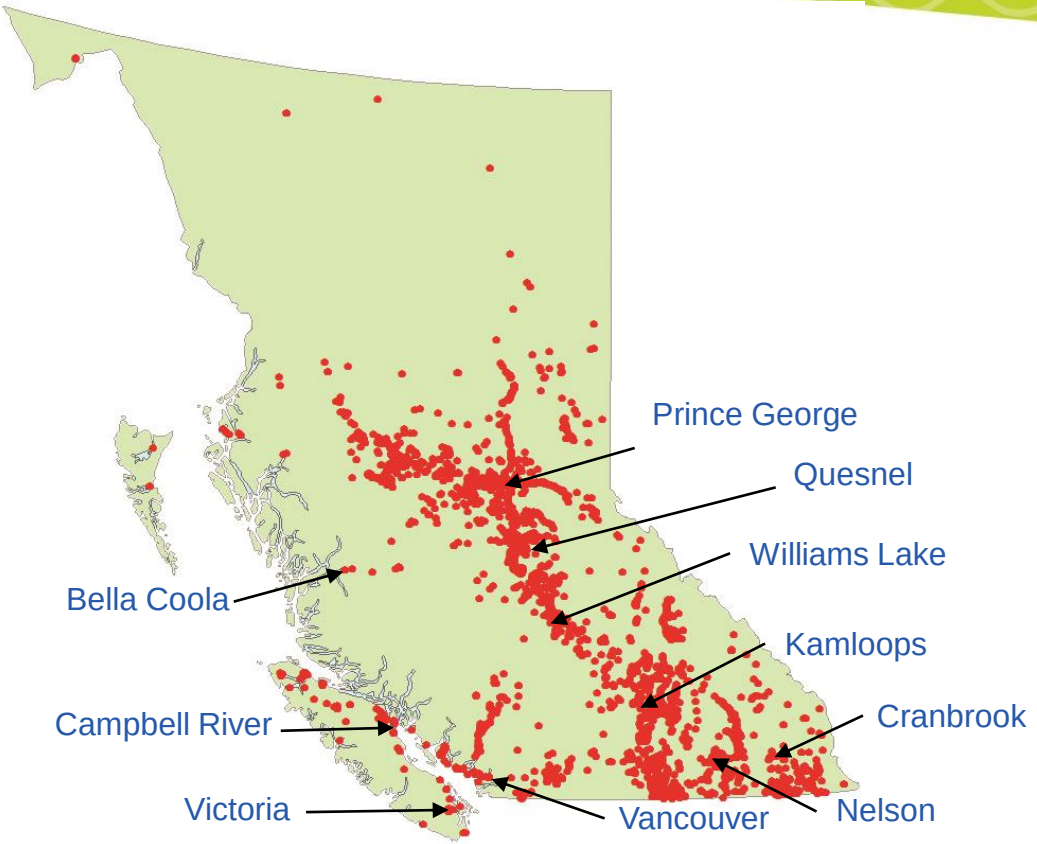
Orange Hawkweed



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Hoary Cress

globe, lens-podded, heart-podded

(Cardaria spp.)

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

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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

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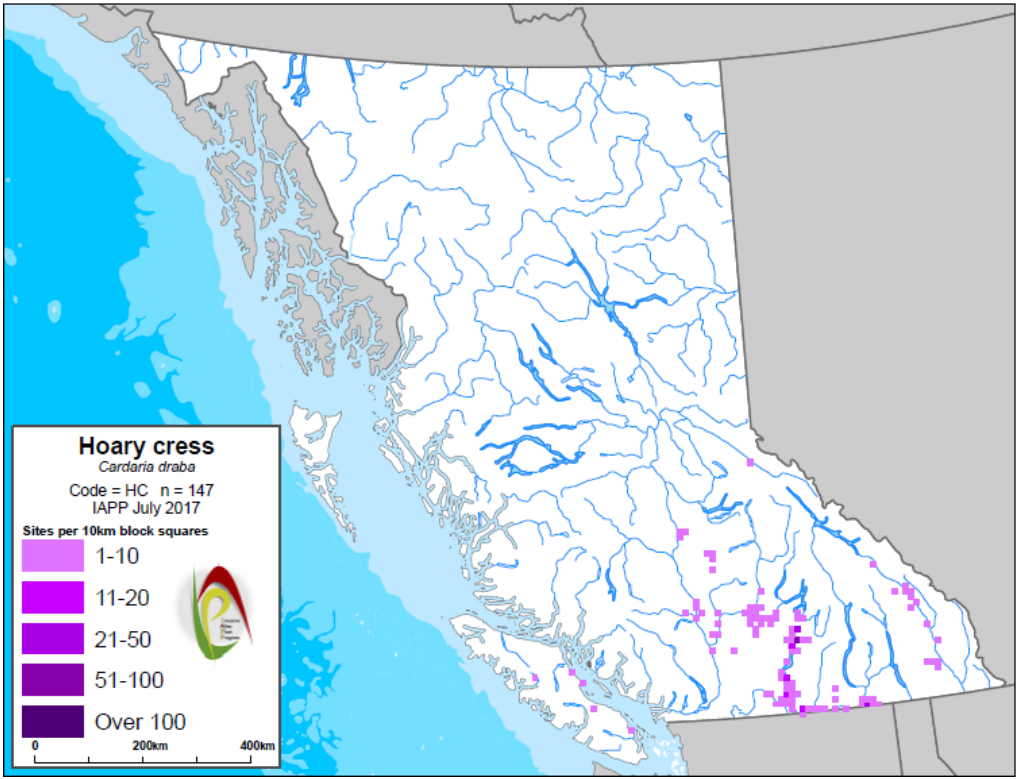
Hoary Cress



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Perennial Pepperweed
(*Lepidium latifolium*)

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

Perennial Pepperweed Management

Mechanical

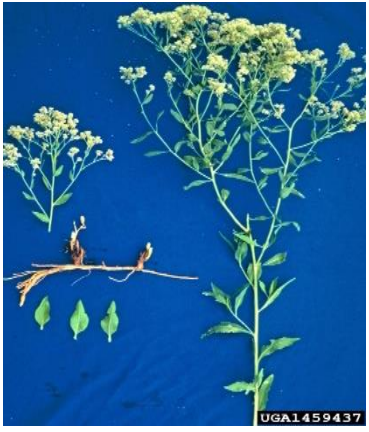
Periodic mowing and spring burning have reduced perennial pepperweed density in Utah

Cultural

Cutting and pulling can manage this weeds 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

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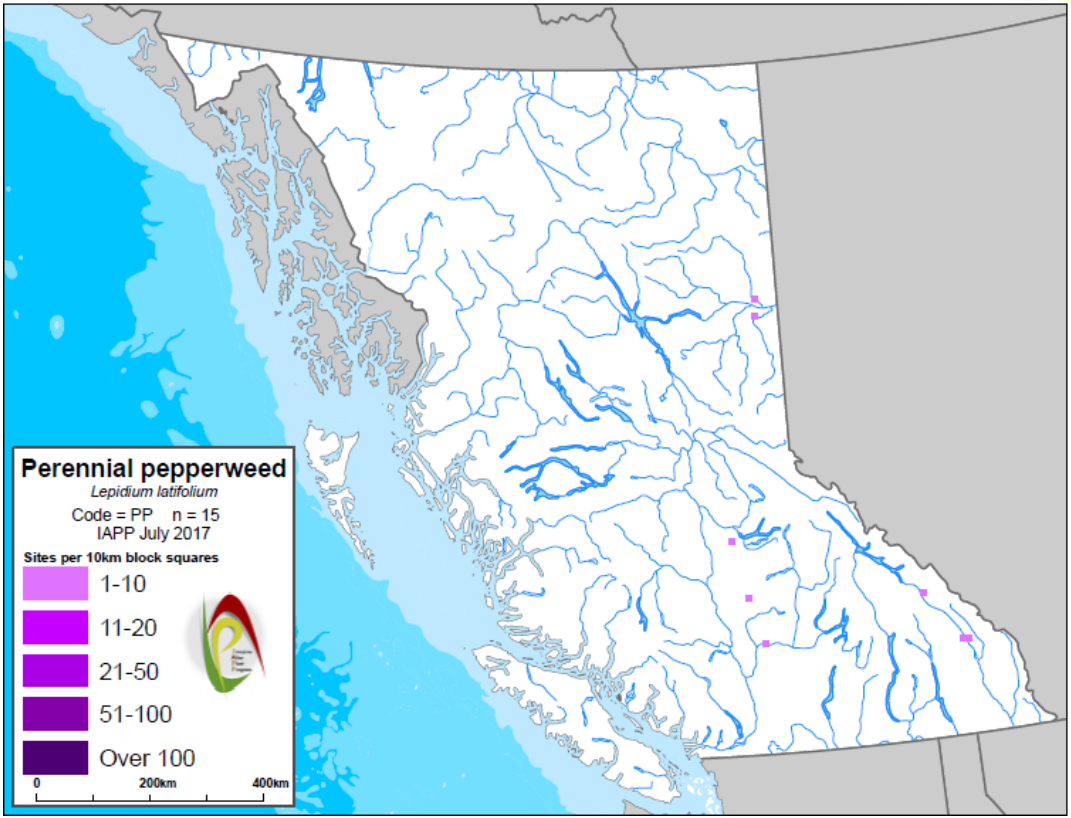
Perennial Pepperweed



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Field Scabious
(*Knautia arvense*)

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 Management

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

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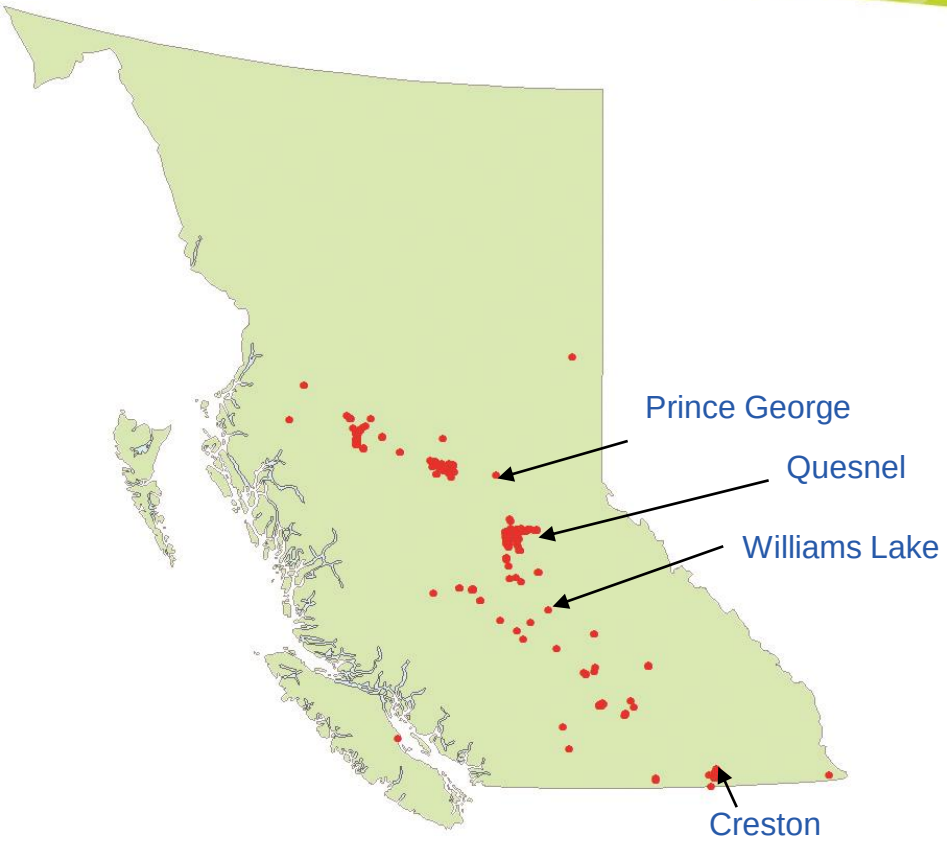
Field Scabious



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Blueweed
(*Echium vulgare*)

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.

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Blueweed Management

Mechanical

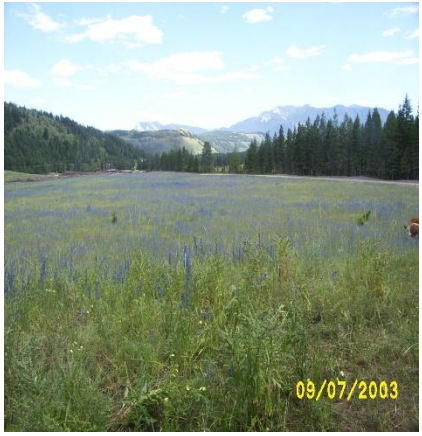
Cutting established blueweed can reduce seed production, repeat treatments to prevent shoots from re-sprouting and producing seed. Repeated defoliation to deplete root reserves and reduce flowering

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

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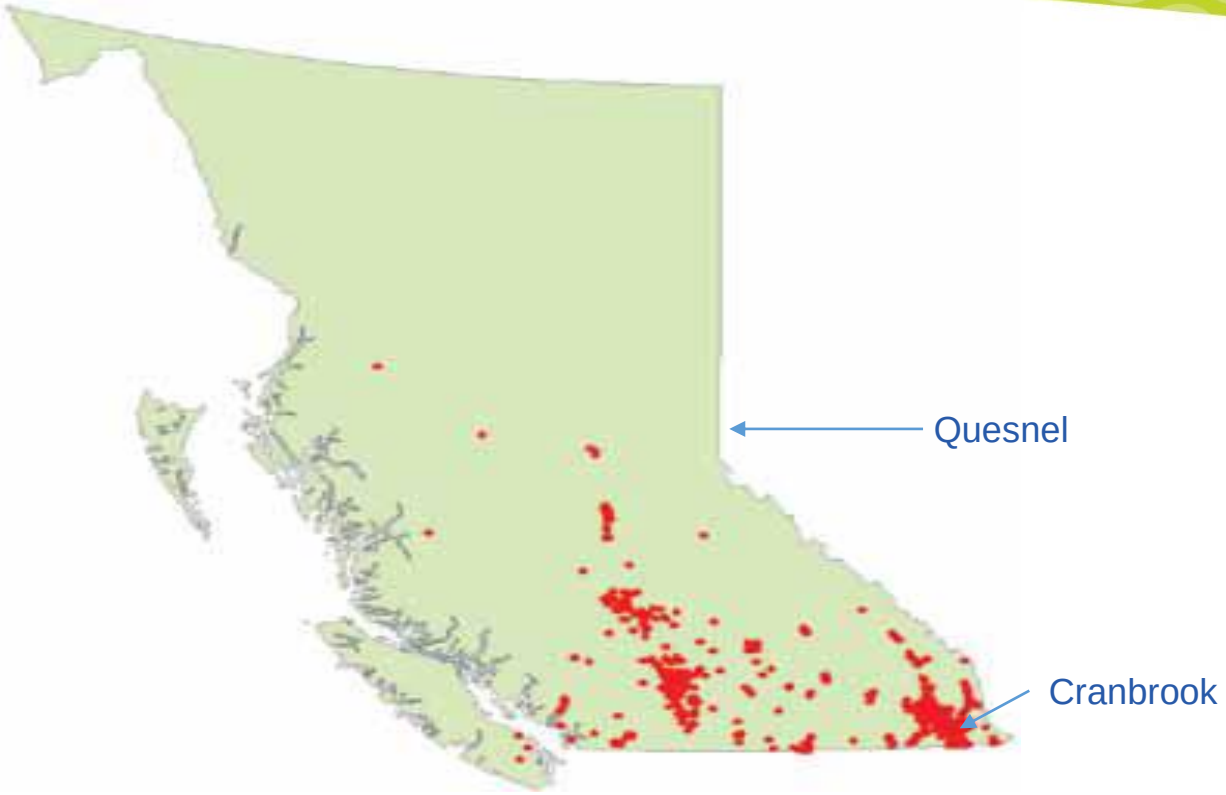
Blueweed



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Black Henbane
(*Hyoscyamus niger*)

- Perennial
- Large deep taproot reproduces by seed
- Has a fowl scent at all growth stages.
- Poisonous

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Black Henbane
(*Hyoscyamus niger*)

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

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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.

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Black Henbane
(*Hyoscyamus niger*)

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

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Black Henbane

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Up next

Mobile apps for invasive species management and reporting

Ksenia Kolodka, Outreach Coordinator

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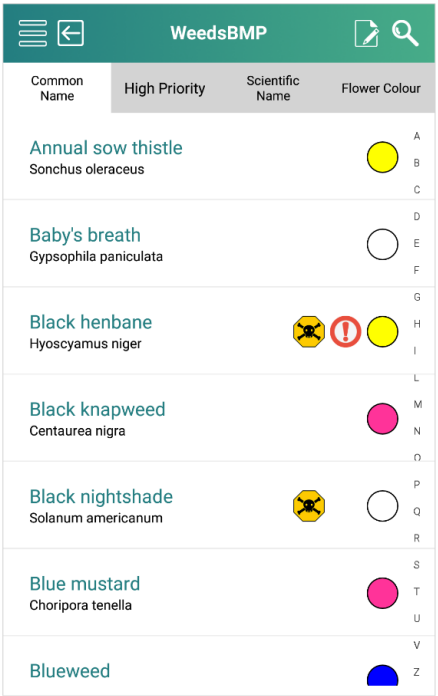
Weeds BMP

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.



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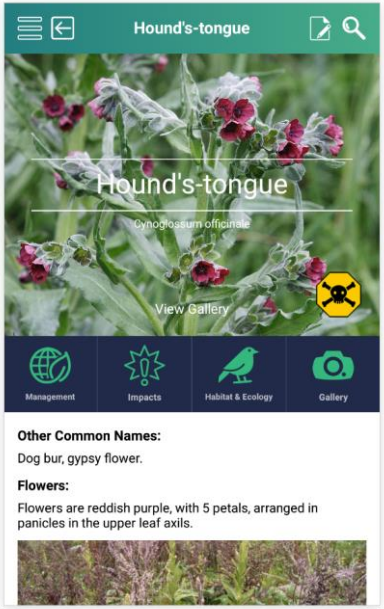
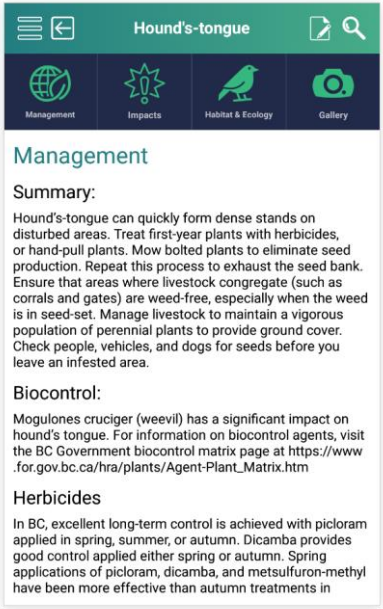
WeedsBMP





Hound's tongue

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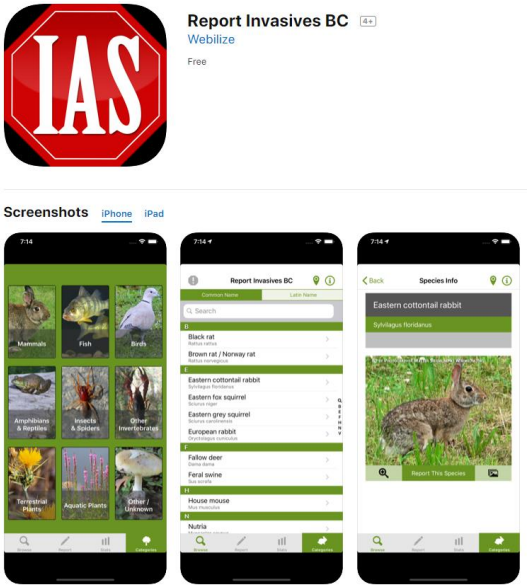
Report Invasives

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.



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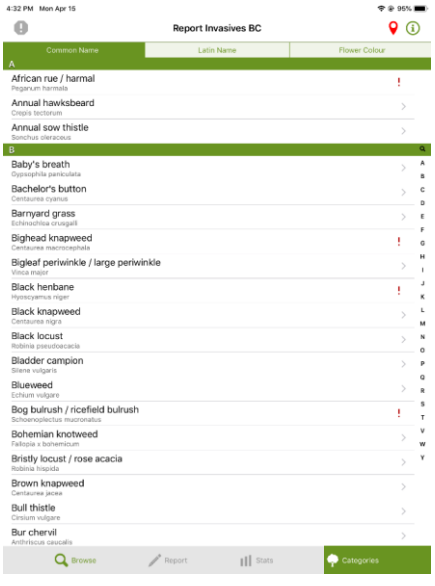
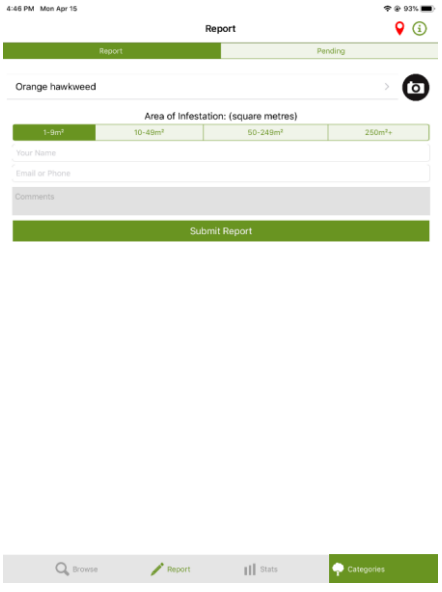
Report Invasives





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Thank you for your attendance!

Questions?

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