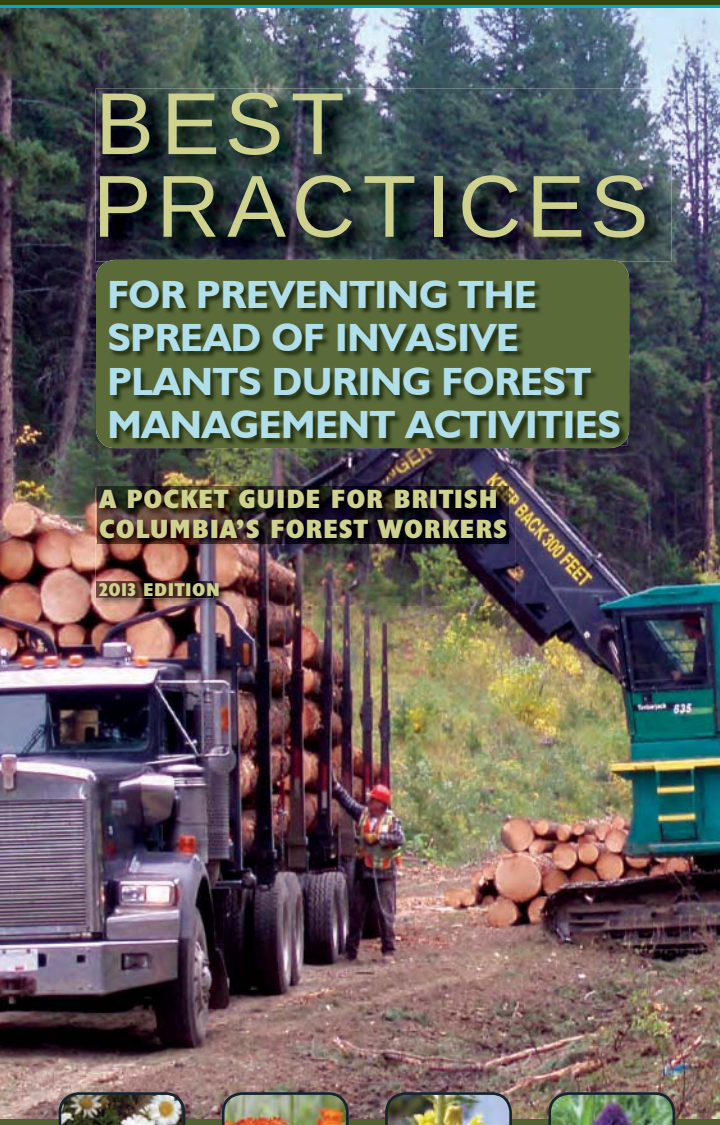
BEST PRACTICES

FOR PREVENTING THE SPREAD OF INVASIVE PLANTS DURING FOREST MANAGEMENT ACTIVITIES

A POCKET GUIDE FOR BRITISH COLUMBIA'S FOREST WORKERS

2013 EDITION



isc
Invasive Species Council of British Columbia

BRITISH COLUMBIA

Acknowledgements

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For more information, please visit the ministry Invasive Plant Program website (http://www.for.gov.bc.ca/hra/plants/), and/or contact the ISCBC:

Invasive Species Council of BC
www.bcinvasives.ca
info@bcinvasives.ca
1.888.933.3722

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Field scabious in pine plantation.

Invasive Plants and Why You Should Care

An ***invasive plant*** is any non-native plant species that has the potential to pose undesirable or detrimental impacts on humans, animals or ecosystems. Invasive plants have the capacity to establish quickly and easily, especially on disturbed sites, and can cause widespread negative economic, social, and environmental impacts.

The term ***noxious weed*** is also encountered in British Columbia (B.C.), but refers solely to those invasive plant species listed under the ***B.C. Weed Control Act Regulation*** (see p. 4).

DID YOU KNOW?

If plants appear to be growing out-of-control on sites that have had soil disturbance, chances are they are invasive species. Use a field guide or send a photo or specimen to a provincial invasive plant specialist or your regional invasive plant/species committee for identification.

Giant knotweed in equipment storage yard.

THE PROBLEM

Invasive plants negatively impact lands across B.C. Several forestry activities can lead to introduction and spread of invasive plant species to forests, sensitive areas, and along resource roads and work sites.

DID YOU KNOW?

Moving muddy equipment to new work sites can introduce invasive plants to pristine areas. Remove mud and plant parts BEFORE leaving an infested site.

INVASIVE PLANTS AND FOREST MANAGEMENT

Invasive plant infestations may compete with natural forest vegetation and tree seedlings for resources, lead to erosion and water siltation, increase fire hazards, and reduce landscape aesthetics. They can also severely degrade riparian zones, forage production, and habitat quality for wildlife and species at risk. Reduced sight-lines along resource roads and exposure to certain plant species can endanger worker safety.

Once established, invasive plant infestations displace native vegetation, resulting in areas that are less biologically diverse, and more costly to treat.

Forest managers and field workers can help limit the introduction and spread of invasive plants by applying best practices (p. 8 - 18).

Legislation and Commitments

LEGISLATION*

B.C. ***Forest and Range Practices Act*** (FRPA)

FRPA (Section 47) requires managers of Crown forests to specify measures in their Stewardship Plans that they will implement to prevent the introduction or spread of invasive plants listed in the Invasive Plants Regulation.

B.C. ***Weed Control Act*** (WCA)

The WCA requires all land owners or occupiers of non-federal lands to control designated noxious weeds. The *Act* states, "Every occupier shall control, in accordance with the regulations, noxious weeds growing or located on land and premises, and on any other property located on land and premises, occupied by him." In terms of forest management, this legislation relates to private forest lands, and other private land used for activities such as log sorting and equipment storage. Within the Crown forest and range land base the Province is recognized as the occupier.

Remove mud and plant parts before moving to a new site.

Other Related Legislation

Integrated Pest Management Act (provincial)
Seeds Act (federal)
Local Government Act (regional districts) and ***Community Charter Act*** (municipalities) enact local invasive plant by-laws

COMMITMENTS

Professional Codes of Ethics

In B.C., forest, applied biology, and agrology professionals are bound to practise good stewardship of publicly-owned natural resources.

***Please refer to original documentation for more details. This section is meant only as a tool to raise awareness.**

DID YOU KNOW?

WorkSafeBC released a Toxic Plant Warning about Giant Hogweed. Forest workers exposed to the sap of this plant risk getting burn-like blisters. Training in plant recognition is an important safety precaution.

Giant hogweed is a safety hazard to workers.

Forestry Activities That Affect Invasive Plant Establishment and Spread

Forestry activities affect invasive plant establishment in two major ways:

- (V) As a **vector** - Seeds and plant parts hitchhike in caked-on mud or get carried in to new places on boots and clothing, equipment, vehicles, and road-building materials.

- (D) As a source of **soil disturbance** – Exposed soil is an invitation to the establishment of invasive plants.

DID YOU KNOW?

Marsh Plume Thistle can compete with planted seedlings for resources, lead to snow-press, and is painful to walk through. This wind-borne and shade-tolerant invader has unwelcome implications to forest management.

Marsh plume thistle infestation.

V

Forestry Field Work (e.g. timber cruising, engineering layout, silviculture surveys), via pick-up truck, all-terrain vehicle, boat, bike, and boot

V D

Road Infrastructure Development, Maintenance, and Deactivation including stream crossings, ditching, and road construction

V D

Cut Block Infrastructure Development including landings, bladed skid trails, and back-spar trails

V D

Harvesting including falling, skidding, forwarding, yarding, processing, loading, and trucking

V

Storage of equipment and supplies when not in use, plus log sort sites

V

Transport of Equipment and Supplies

D

Burning including prescribed fire, wildfire, waste piles, and fuel reduction

V D

Tree Planting and Site Preparation (creating seed beds for tree planting)

Invasive Plant (IP) Best Practices

KEY ACTIVITY	BEST PRACTICES		
	Report IP Sites	Avoid Infested Sites	Work first in uninfested areas
FIELD WORK	✓	✓	
ROAD WORK	✓	✓	✓
CUT BLOCK DEVELOPMENT	✓	✓	✓
HARVESTING	✓	✓	✓
STORAGE	✓	✓	✓
TRANSPORT OF EQUIPMENT AND SUPPLIES		✓	✓
BURNING	✓	✓	
TREE PLANTING AND SITE PREPARATION	✓	✓	✓

BEST PRACTICES				
Clean Equipment BEFORE Moving	Materials are IP Free	Minimize disturb-ance	Revege-tate Disturbed Sites	Control infesta-tions
✓				✓
✓	✓	✓	✓	✓
✓	✓	✓	✓	✓
✓		✓		✓
✓				
✓	✓			
✓		✓	✓	✓
✓			✓	✓

BEST PRACTICES FOR FOREST MANAGEMENT ACTIVITIES

1 Incorporate known invasive plant sites into development plans and report new sites as they are discovered.

Early in the development planning process, consult the map display module of the Invasive Alien Plant Program (IAPP) online database for known invasive plant sites (www.for.gov.bc.ca/hra/plants/application.htm). Inspect work sites and report the size and location of new infestations. Plan activities so they won't create new or spread existing infestations (see other Best Practices).

Related Forestry Activities

Orange hawkweed infestation.

2 Avoid infested sites for staging, parking, and log sorting, both in the bush and storage yards.

Roadsides, landings and storage yards are frequently already infested with invasive plants. Vehicles, equipment, and logs can pick up plant parts and seeds, especially in muddy conditions, and carry them to new locations.

Related Forestry Activities

Culverts infested with Scotch Broom.

DID YOU KNOW?

Early identification and reporting of infestations is key to limiting the spread of invasive plants in B.C. See p. 19 for reporting protocol.

3 Work in uninfested sites before moving to infested sites.

Work sites can be widely infested by invasive plants, partially infested, or invasive plant-free. As vehicles, equipment, and clothing are vectors for seeds and plant parts, schedule work activities to begin in the most pristine sites first and end in the most infested sites last.

Related Forestry Activities

Harvesting next to Scotch broom infestation.

DID YOU KNOW?

Invasive hawkweeds, knotweeds, Giant hogweed, and Marsh plume thistle are shade-tolerant and can become established under forest canopies.

4 Clean equipment before moving to a new work site or region.

Remove seeds and plant parts **within existing infestations** or **designated wash sites** to prevent spread to new sites. **Avoid moving unclean equipment to a new work location.** Carefully bag and dispose of seeds or plant parts picked from your clothes, boots, or equipment.

Cleaning With Water: Pressure washing all mud from vehicles and equipment is best. Prevent run-off from contaminating waterways and riparian areas. Wash within existing infestations or use designated wash sites to concentrate run-off. Alternatively, temporary sumps can be used and then buried when decommissioned.

Cleaning Without Water: Before departing infested sites, visually inspect vehicles and equipment and remove any lodged plant parts found. Knock off mud with a shovel, broom or use your boots (then knock out the boot treads).

Equipment relocated from other regions may be importing new problem plants to your area. Request that such equipment be cleaned before transport.

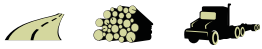
Related Forestry Activities

5 Inspect and ensure fill and erosion-control materials are free of invasive plants before transport and use.

Use only clean fill material from an "invasive plant free" source. Regularly inspect material sources (e.g. gravel pits) for invasive plants and record and report any infestations.

Use "Certified Weed Free" straw or hay for erosion-control. Such bales will be labeled and/or have colour-coded twine.

Related Forestry Activities



Spotted knapweed infestation in active gravel pit.

6 Minimize soil disturbance and maintain native vegetation.

Minimize unnecessary soil disturbance. Every cut made by bladed equipment into previously undisturbed soil and vegetation increases the likelihood of infestation by invasive plants. A cover of native vegetation is the best defense against problem plants.

Related Forestry Activities

Harvesting with minimum disturbance.

DID YOU KNOW?

Scotch broom, which contains flammable compounds and grows tall, can both present a fire hazard and compete with tree seedlings.

7 Revegetate disturbed sites as soon as possible.

Road and bridge construction/deactivation sites, landings, and bladed trails are most likely to host new or expanding infestations if not revegetated quickly. Increase the shade levels or fill in growing space with non-invasive ground-cover and/or overstory plants.

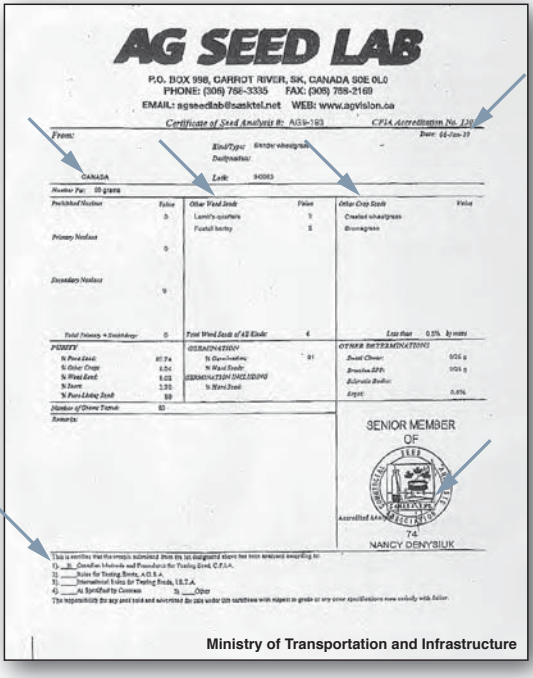
To quickly achieve planned closed canopy tree cover on cut blocks: minimize planting delay, plant trees in high density, use large or fast-growing stock, or fertilize at time of planting.

Establish ground-cover promptly by seeding with mixtures that are free of weeds, locally adapted, non-invasive, and quick to establish (e.g. native species or non-native but non-invasive grass mixtures such as Common No.1 Forage Mixture or better).

Request a "Certificate of Seed Analysis" and reject seed lots containing invasive species listed under the WCA Regulation or FRPA Invasive Plants Regulation (see "For More Information" on p. 65). Sow seed in the early spring or late fall for best germination results. Monitor to ensure successful establishment and re-seed as necessary.

Related Forestry Activities

Undesirable plants can be introduced through contaminants in seed mixtures!



AG SEED LAB

P.O. BOX 998, CARROT RIVER, SK, CANADA S0E 0L0
PHONE: (306) 768-3335 FAX: (306) 768-2169
EMAIL: agseedlab@saskte1.net WEB: www.agvision.ca

Certificate of Seed Analysis #: AG9-193 CFIA Accreditation No. 120

From: Date: 04-Jan-19

Kind/Type: Sunder wheatgrass
Designation:
Lot#: 94083

CANADA

Number Per: 50 grams

Prohibited Noxious	Value	Other Weed Seeds	Value	Other Crop Seeds	Value
	0	Lamb's-quarters	7	Crested wheatgrass	
		Foxtail barley	5	Bromegrass	
Primary Noxious	0				
Secondary Noxious	0				
Total Primary + Secondary:	0	Total Weed Seeds of All Kinds:	4	Less than 0.5% by mass	

PURITY		GERMINATION		OTHER DETERMINATIONS	
% Pure Seed:	87.74	% Germination:	91	Dwarf Ginger:	0.05 g
% Other Crops:	0.04	% Weed Seeds:		Brassica SPP:	0.01 g
% Weed Seed:	0.02	SERMINATION INCLUDING		Bulrusia Bodies:	
% Inert:	1.20	% Hard Seed:		Ergot:	0.0%
% Pure Living Seed:	89				

Number of Grams Tested: 50

Remarks:

SENIOR MEMBER OF

Accredited Analyst

74

NANCY DENYSIUK

This is certifies that the sample submitted from the lot designated above has been analyzed according to:
1) ___ Canadian Methods and Procedures for Testing Seed, C.F.I.A.
2) ___ Rules for Testing Seeds, A.O.S.A.
3) ___ International Rules for Testing Seeds, I.S.T.A.
4) ___ As Specified by Contract 5) ___ Other
The responsibility for any seed sold and advertised for sale under this certificate with respect to grade or any other specifications now entirely with Seller.

Ministry of Transportation and Infrastructure

A Certificate of Seed Analysis will list "other" seeds present and be dated, signed and sealed by an accredited laboratory. Check all species listed against provincially regulated noxious and invasive plants. Reject all seed lots that are contaminated.

8 Promptly control infestations resulting from forestry activities.

Remove invasive plants prior to seed set to prevent build-up of seed banks that will take years to control. Prioritize treatment of roadsides and landings to reduce inadvertent movement of seeds and plant parts by vehicles and equipment. Monitor to ensure control efforts are successful and re-treat if necessary. Contact the provincial Invasive Plant Specialist in your area (see p. 62) to determine the best treatment approach.

Related Forestry Activities

Herbicide crew preparing to treat a Scotch broom infestation in a plantation.

Reporting Invasive Plants

It is critical to report new infestations! Fast treatment of new infestations is key to stopping the spread of invasive plants.

Unusual plants that appear to be taking over or growing out of control should be reported in one of these four ways:

- Online through 'Report-A-Weed,' (www.for.gov.bc.ca/hra/plants/application.htm) which connects to the provincial Invasive Alien Plant Program (IAPP) application
- 'Report-A-Weed' Mobile App, for iPhone and Android smart phones (find download links at www.reportaweedbc.ca)
- Directly to your regional invasive plant/ species committee (www.bcinvasives.ca/partners/committees); or by
- Phone 1-888-933-3722 (ISCBC)

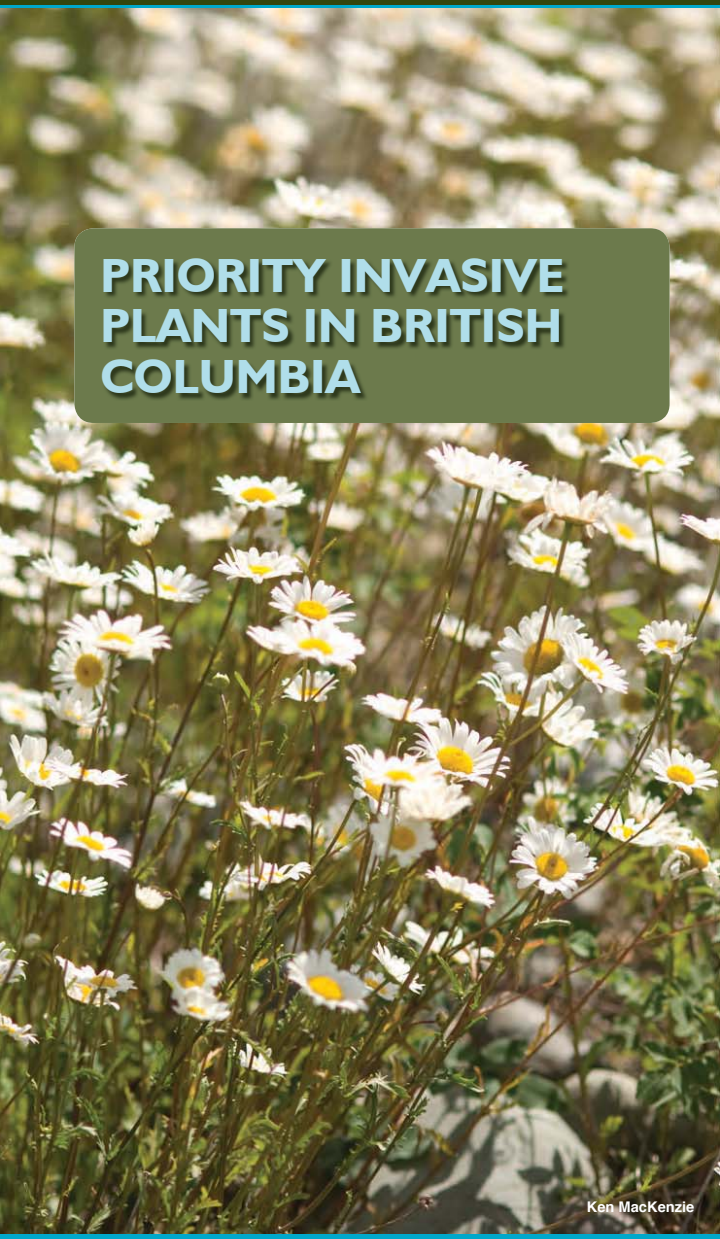
Please report the following information:

1. Species (include a photo whenever possible)
2. Size and density of infestation
3. UTM coordinates or directions to site
4. Reporter's contact information

DID YOU KNOW?

Early identification and reporting of infestations is key to limiting the spread of invasive plants in B.C..

PRIORITY INVASIVE PLANTS IN BRITISH COLUMBIA



Ken MacKenzie

Oxeye Daisy

Priority Invasive Plants Affecting Forest Management in B.C.

The plants included in this guide are those listed under the Invasive Plants Regulation of the ***Forest and Range Practices Act*** (FRPA)*. Forest Stewardship Plans for Crown forests must specify measures that prevent the introduction or spread of these species and managers have an obligation to implement those measures. Managers of private forest land should reference the B.C. ***Weed Control Act*** (WCA) Regulation for a listing of provincial noxious weeds.

Many additional non-listed species are also problematic—consider applying best practices to all suspect plants.

Note:** ***Giant hogweed is also included due to its status as a safety hazard and it is also listed under the WCA.

Invasive Plant Treatment Recommendations

Treatment recommendations in this guide generally apply to small infestations, and only cover manual control. When addressing large infestations or highly invasive plants, consider integrated pest management: mechanical, chemical, or biological treatments. Consult a provincial invasive plant specialist or your regional committee for species and site-specific treatment recommendations, including biocontrol.

Note:** ***Look for a blue box on each species page

Symbols

Invasive plants may be spread by many or all of the methods represented below. For the purpose of this booklet, only the most significant methods have been indicated.

Seed or plant pieces spread in farm produce such as hay or commercial seed

Seed or plant pieces carried on machinery, equipment and vehicles

Seed or plant pieces spread by brushing or mowing

Seed or plant pieces spread by "hitchhiking" on clothing, fur, etc.

Seed or plant pieces spread in soil

Seed eaten or carried by birds and mammals

Seed or plant pieces carried in water

Seed blown by wind

Seed or plant pieces spread by cultivation

P

Indicates perennial weeds (plants that grow for more than two seasons)

B

Indicates biennial weeds (plants that grow for two seasons)

A

Indicates annual weeds (plants with a growth cycle lasting one year)

Plant Flowering and Seed Production Calendars

All plants should be controlled before they flower and set seed. Calendars of flowering and seed production are included for each plant in this guide to help with forestry activity planning.

The shaded months in these calendars indicate the time of year when each species is producing one of the following:

- ***Flowers (pink squares)***
- ***Seed (orange circles)***

For example, in the calendar below, the plant produces flowers from June-September and seed from July – October.

J	F	M	A	M	J	J	A	S	O	N	D

Note: Plants may flower and produce seed at times other than indicated in this guide. Contact your Regional Invasive Plant/Species Committee for local information.

Nodding thistle infestation.

Distribution map

Legend

Invasive Plant Site

Natural Resource Operations Regions

- Cariboo Region
- Kootenay / Boundary Region
- Northeast Region
- Omineca Region
- Skeena Region
- South Coast Region
- Thompson / Okanagan Region
- West Coast Region

***Note:** *Distribution maps in this guide are from the provincial Invasive Alien Plant Program (IAPP) database as of March 2013. As inventory and reporting is a continual process, maps may not entirely represent plant distribution.*

ANCHUSA *Anchusa officinalis*

To kill this plant, dig out or sever taproot at least 5cm below soil surface. Infestations can be prevented by maintaining a strong population of native perennials. Report all sightings.

Description: Upright plant up to 60cm in height.

Flowers: Found in coiled clusters at the ends of stalks. Tubular and initially reddish flowers eventually turn purplish-blue with white centers.

Leaves: Lance-shaped lower and basal leaves. Stem leaves decrease in size toward the top of the plant, and lack stalks. Leaves are covered in stiff hairs.

Stems: Angular and covered with hairs.

Other ID Tips: Forms a rosette in year one. Plant has a long taproot.

J	F	M	A	M	J	J	A	S	O	N	D

B **P**

BABY'S BREATH *Gypsophila paniculata*

R. Mueller

J. Leekie

J. DiTomasco

Hand-pull small plants or dig out large woody specimens. Seeds can mature after cutting or pulling – bag to dispose of. Report all sightings.

Description: Upright, bushy plant up to 1.0m in height. Found in disturbed areas, fields and roadsides, and often used in floral arrangements.

Flowers: Sweet-scented, five-petalled, white flowers in clusters at the end of each stem.

Leaves: Bluish appearance, linear, opposite and covered with a white film.

Stems: Highly branched, and swollen at the nodes.

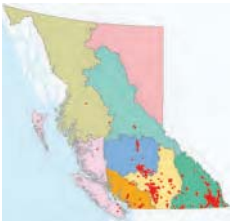
Other ID Tips: Woody taproot.

J	F	M	A	M	J	J	A	S	O	N	D

P

BLUEWEED *Echium vulgare*

To kill the plant, dig out or sever taproot at least 5cm below soil surface. Limit or stop seed production. Report all sightings.



Description: Upright, tap-rooted plant up to 1.0m in height. Adapted to rocky, gravelly habitats like roadsides, gravel pits.

Flowers: Short, arched branches covered on upper side with purplish-blue, funnel-shaped flowers.

Leaves: Stem leaves are lance-shaped and alternately arranged.

Stems: Stiff hairs with swollen reddish bases are found along the stem. Stem hairs are prickly and can irritate skin.

Other ID Tips: Forms a rosette in year one.

J	F	M	A	M	J	J	A	S	O	N	D

B P

BULL THISTLE *Cirsium vulgare*

Competing vegetation limits bull thistle introduction and spread. Re-vegetating disturbed areas is the best defense.

Description: This weed can grow to 3.0m tall, with branches spreading up from erect stems.

Flowers: Flowers are found clustered at the end of the branches. They are 4–5cm wide, pinkish to dark purple, and covered with spines.

Seed/Fruit: The brown, shiny seeds have a top of white, soft hairs.

Leaves: The leaves are alternate and deeply lobed, with spines at the lobes and tips. The base of each leaf surrounds the stem with spiny wings.

Stems: The stems are erect and branched.

Other ID Tips: This weed has a short, fleshy taproot. Skeletons have nodding heads. In the first year, these plants form a rosette.

J	F	M	A	M	J	J	A	S	O	N	D

B

CANADA THISTLE *Cirsium arvense*

Incomplete pulling or cutting can stimulate remaining roots to re-sprout and worsen infestations. Continual, repeated cutting or pulling will deplete root reserves.

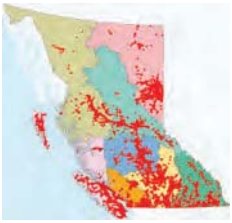
Description: A prickly upright plant up to 1.2m tall, often forming dense stands. Common on road rights-of-way and in riparian areas.

Flowers: Purplish-pink, less than 2.5cm across, without sharp spines.

Leaves: Stalkless, alternate, dark green leaves, with spiny lobes.

Stems: Prickly, hollow.

Other ID Tips: Forms a rosette in its first year.

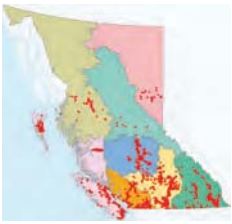


J	F	M	A	M	J	J	A	S	O	N	D

P

COMMON BURDOCK *Arctium minus*

First year rosettes are easily hand-pulled. Deep roots of mature plants require digging to remove as much root as possible. Preventing dispersal of burs is particularly important.



Description: Upright, tap-rooted plant up to 3m high. Found on roadsides, ditches, riparian areas, grasslands and forests.

Flowers: Globe-shaped purple flowers, to 2.5cm in diameter, on short stalks. Covered in hooked green bristles.

Leaves: Basal leaves are rhubarb-like. Upper leaves are alternate, with wavy or toothed edges. Leaves have woolly undersides.

Stems: Upright, grooved, and highly branched.

Other ID Tips: Forms a rosette in year one. Mature flower heads form a bur, which allows seeds to be spread throughout the year.

J	F	M	A	M	J	J	A	S	O	N	D

B

COMMON TANSY *Tanacetum vulgare*

Small plants can be easily hand-pulled. Use shovel to loosen soil for more complete root removal. Plants can regrow from severed roots and cut stems may still produce viable seed.

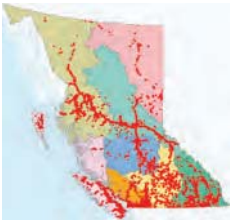
Description: Bushy perennial growing up to 1.8m tall. Common on disturbed areas, streambanks, and roadsides.

Flowers: Flat-topped clusters of 'button-like' yellow flowers, at the top of stems.

Leaves: Alternate, dark green, fern-like leaves.

Stems: Mature plants have several branched stems that can be reddish, and somewhat woody near the base.

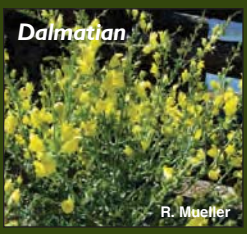
Other ID Tips: Forms a rosette in year one. Leaves and flowers aromatic when crushed.



J	F	M	A	M	J	J	A	S	O	N	D

P

DALMATIAN TOADFLAX *Linaria dalmatica*
YELLOW TOADFLAX *Linaria vulgaris*



Incomplete root removal/cutting can stimulate remaining roots to re-sprout and worsen infestations. A commitment to regular, repeated cutting/pulling is required for this control method.

Description: Pretty, waxy-leaved, yellow-flowered plants up to 1.2m tall. Commonly found on dry sites like gravel pits, road shoulders, and cut banks.

Flowers: Bright yellow snapdragon-like flowers with a long spur.

Leaves: Pale-green, waxy leaves are stalkless and have a pointed tip.

Stems: Branched or unbranched.

Other ID Tips: Yellow toadflax has leaves pointed at both ends, and is shorter – up to 60cm in height.

Dalmatian

Yellow

J	F	M	A	M	J	J	A	S	O	N	D

P

FIELD SCABIOUS *Knautia arvensis*

Can be challenging to hand-pull. To kill plant, dig out or sever root at least 5cm below soil surface. Report all sightings.

Description: Upright plant up to 1.3m in height. Found on dry roadsides and in pastures.

Flowers: Clover-like violet-purple flowers up to 4cm in diameter, on long leafless stalks.

Leaves: Stem leaves are deeply lobed, stalkless, and opposite.

Stems: Hairy, upright stems. Can form above-ground runners.

Other ID Tips: Forms a rosette in its first year. Woody taproot.

J	F	M	A	M	J	J	A	S	O	N	D

P

GIANT HOGWEED

Heracleum mantegazzianum

Leaves and stems contain a highly toxic sap that can burn skin. Refer to WorkSafe BC guidelines and consult with regional invasive plant/species committee. Mature plants should be cut below ground. Report all sightings.

Description: Large upright plant up to 5m in height, preferring damp, rich soils. Found along roadsides, ditches, riparian areas and disturbed sites.

Flowers: Clustered white flowers in large umbrella-shaped heads up to 0.8m in diameter.

Leaves: Dark green, toothed and deeply cut into three large segments. Stiff hairs on undersides.

Stems: Hollow, ridged, green; some with reddish-purple spots.

Other ID Tips: Similar to smaller native cow parsnip (2.5m).

J	F	M	A	M	J	J	A	S	O	N	D

P

GORSE *Ulex europaeus*

Bergman

B. Brown

J. Hallworth

Young plants in very loose, sandy soil can be removed by carefully digging to remove entire root mass. Incomplete pulling or cutting can stimulate root fragments to re-sprout and worsen infestations. Be sure to re-inspect. Report all sightings.

Description: A spiny evergreen shrub which can grow upwards of 2m in height. Can be found on roadside cutbanks.

Flowers: Bright yellow flowers develop into black seed pods with dark hairs.

Leaves: Slightly waxy, narrow leaves end in sharp, rigid spines.

Stems: Heavily branched stems; bushy.

Other ID Tips: Sharp spines can puncture tires and skin.

J	F	M	A	M	J	J	A	S	O	N	D
■	■	■	■	■	■						

P

HOARY ALYSSUM *Berteroa incana*

B. Stewart

B. Stewart

R. Mueller

Taproot may be hand-pulled from moist soil. Remove as much of the root system as possible. Report all sightings.

Description: Slender plant from the mustard family, growing up to 1.0m in height. Found on disturbed sites, especially roadsides, pastures and embankments.

Flowers: Small white almost spherical flowers found at the end of stems.

Leaves: Greyish, hairy leaves clasp the stem near the top of the plant.

Stems: Stems are covered with star-shaped hairs.

Other ID Tips: Seed pods have a distinct oval shape, and a pointy tip.

J	F	M	A	M	J	J	A	S	O	N	D

A B P

HOARY CRESS *Cardaria draba*

L. Scott

B. Stewart

S. Dewey

Highly invasive plants. Mowing before seed set will limit seed production, but may encourage spread by runners. Prevent spread and consult your Regional Invasive Plant/Species Committee. Report all sites.

Description: Upright perennial up to 60cm in height, with flat-topped appearance. Found in pastures, rangelands, ditches and roadsides.

Flowers: Clusters of white, four-petalled flowers give plant 'flat top'.

Leaves: Alternate, blue-green leaves up to 10cm in length with toothed edges. Lower leaves are stalked; upper leaves clasp the stem.

Stems: Single stem, often branched at the top, supports one flower cluster.

Other ID Tips: Heart-shaped, stalked seed pods.

J	F	M	A	M	J	J	A	S	O	N	D

P

HOUND'S-TONGUE *Cynoglossum officinale*

R. Mueller

L. Scott

L. Scott

First year rosettes can be easily hand-pulled. Deep roots of mature plants require digging to remove as much root as possible. In southern B.C., control of sites can be achieved through a root-attacking biological control weevil.

Description: A taprooted leafy plant, up to 1.2m in height, found along roads, trails and in meadows.

Flowers: Small, reddish-purple flowers with five petals.

Leaves: Rough, hairy leaves from 10-30cm in length.

Stems: Hairy; usually branched near the top.

Other ID Tips: Forms a rosette in its first year. Seeds are small hooked 'burs' which cling to clothing and animals.

J	F	M	A	M	J	J	A	S	O	N	D

B

KNAPWEED

Diffuse *Centaurea diffusa*
Spotted *Centaurea stoebe*

Taproot may be hand-pulled from moist soil. Remove as much of the root system as possible. Report all sightings north of Clinton and on Vancouver Island.

Description: Heavily branched plants 1.0m to 1.5m in height. Found on dry roadsides, gravel pits, disturbed sites, and in fields.

Flowers: Small white, pink or purple flowers atop spiny bracts.

Leaves: Deeply lobed, hairy, grayish-green leaves. Form rosettes in their first year.

Stems: Single main-stem that divides into bushy, spreading branches on a mature plant.

Other ID Tips: Spotted knapweed flowers are usually pink to purple, and have black tipped bracts.

Diffuse

Spotted

J	F	M	A	M	J	J	A	S	O	N	D

B **P**

KNAPWEED

Meadow ***Centaurea debeauxii;***
Black ***Centaurea nigra;*** Brown ***Centaurea jacea***

Taproot may be hand-pulled from moist soil. Remove as much of the root system as possible. Dispose of bagged flowering plants into garbage.

Description: Species similar, upright, branched, up to 1 m in height. Found on dry roadsides, disturbed sites and in fields.

Flowers: Large pink to purple-red flowers supported atop comb-like bracts ranging from light to dark brown.

Leaves: Lower leaves long-stalked and shallowly lobed, covered with long to cobwebby hairs. Form rosettes in their first year.

Stems: Single main-stem that divides into branches and is somewhat hairy.

Other ID Tips: Leaves are undivided, unlike other knapweeds.

J	F	M	A	M	J	J	A	S	O	N	D

P

KNOTWEED

Japanese, Giant, Bohemian *Fallopia* spp.
Himalayan *Polygonum polystachyum*

A single plant can have roots extending 20m in all directions; as little as 0.6g of rhizome can produce a new plant in six days. Do not disturb patches and redistribute material during road or skid trail construction. Report all sightings.

Description: Large, woody, bamboo-like shrubs grow 1-5m in height. Found in moist to wet areas like roadside ditches and riparian areas.

Flowers: Small, white/green flowers grow in plume-like, branched clusters along the stem and leaf joints.

Leaves: Variable. Japanese: spade-shaped; Giant: larger, heart-shaped; and Himalayan: lance-shaped, pointy.

Stems: Reddish-brown, hollow stems form dense thickets.

Other ID Tips: Japanese leaves zig-zagged along stems. Bohemian is a hybrid of giant and Japanese knotweeds.

J	F	M	A	M	J	J	A	S	O	N	D

P

LEAFY SPURGE *Euphorbia esula*

B. Stewart

L. Scott

R. Mueller

Highly invasive plant. Pulling or cutting may worsen infestations. Very young plants and small patches may be removed manually with deep digging. Wear gloves as the milky sap is toxic. Report all sightings.

Description: Upright plant up to 1.0m tall, with creeping roots. Thrives in a variety of habitats.

Flowers: Greenish-yellow flower clusters on long stalks. Floral leaves are heart-shaped.

Leaves: Narrow bluish-green leaves are spirally arranged on the stem.

Stems: Smooth, hairless stems are branched near the top.

Other ID Tips: Exudes a milky juice when cut or broken. This juice is toxic to people and some animals.

J	F	M	A	M	J	J	A	S	O	N	D

P

MARSH PLUME THISTLE *Cirsium palustre*

Ministry of Agriculture and Lands

J. Leekie

Ministry of Agriculture and Lands

To kill plant, dig out or sever taproot at least 5cm below soil surface. Limited distribution – important to report all sightings.

Description: Slender upright plant up to 3.0m in height. Prefers moist-wet soils, and grows on roadsides, in ditches, cutblocks and riparian areas.

Flowers: Purple flowers found at the tips of stems. Bracts at flowers bases are sticky, and tipped with a prickle.

Leaves: Spiny leaves are hairy on undersides and have winged bases.

Stems: Usually unbranched, with spiny wings at leaf bases. Branching may occur at the cluster of flowers.

Other ID Tips: Forms a rosette in first year. Fibrous roots.

J	F	M	A	M	J	J	A	S	O	N	D

B

NODDING THISTLE *Carduus nutans*

C. Koot

C. Koot

B.C. Ministry of Agriculture

Repeated hand-pulling or cutting prior to flowering will help reduce seed production. Expansion of nodding thistle populations in southern B.C. has been reduced through biological control agents. Report all infestations north of Quesnel.

Description: Solitary stem or several branched stems from a single base, up to 2.4m in height, with nodding flower heads. Found on dry roadsides and disturbed sites.

Flowers: Large (5cm), reddish purple flowers above spiny-tipped bracts, nodding when mature.

Leaves: Deeply lobed with spiny, edges, winged at stem. Overwinter as rosettes.

Stems: Smooth with no spines.

Other ID Tips: Similar to plumeless thistle but has no spines on stem.

J	F	M	A	M	J	J	A	S	O	N	D

B

ORANGE HAWKWEED *Hieracium aurantiacum*
YELLOW HAWKWEED *Hieracium* spp.

Highly invasive plants. Mowing before seed set will limit seed production, but may encourage spread by runners. Prevent spread and consult your Regional Invasive Plant/Species Committee.

Description: Fast-spreading, generally hairy plants, growing up to 60cm in height. Found on grasslands, lawns, roadsides and other disturbed sites.

Flowers: Bright orange or yellow clusters, atop slender unbranched stems.

Leaves: Hairy leaves are arranged in a rosette. Few to no leaves found on stem.

Stems: Stems are covered with bristly hairs, which are black on orange hawkweed.

Other ID Tips: Above ground runners root and grow new plants. Plants produce a milky juice when broken.

J	F	M	A	M	J	J	A	S	O	N	D

P

OXEYE DAISY

Chrysanthemum leucanthemum

L. Scott

L. Scott

S. Atherton

Pull or cut prior to seed set. Pulling or cutting during or after flowering will disperse seeds. Plants will continue to flower and grow if soil is not shaken from roots.

Description: Upright plant growing up to 1.0m in height in dense clumps. Common along roadsides, in fields and in disturbed areas.

Flowers: Daisy-like flowers on the end of each stem branch.

Leaves: Alternate, and decreasing in size up the stem. Upper leaves are stalkless with wavy to toothed edges.

Stems: Smooth to sparsely hairy, and branched.

Other ID Tips: Similar to the ornamental shasta daisy and invasive scentless chamomile.

J	F	M	A	M	J	J	A	S	O	N	D

P

PERENNIAL PEPPERWEED

Lepidium latifolium

Highly competitive plant that is extremely limited in distribution in B.C.. Report all sightings through Report-A-Weed or to an Invasive Plant Specialist. Incomplete pulling or cutting can stimulate remaining roots to re-sprout and worsen infestations.

Description: Creeping root system results in dense colonies of plants up to 1.0m in height (taller in wet areas). Occasionally found on roadsides and in ditches; thrives in moist habitats.

Flowers: Fragrant white flowers in rounded clusters on branch tips.

Leaves: Waxy, alternate leaves, with a white midvein. Lower leaves are stalked; upper leaves are virtually stalkless.

Stems: Stems are branched.

Other ID Tips: Seed pods are attached by long stalks.

J	F	M	A	M	J	J	A	S	O	N	D

P

PLUMELESS THISTLE *Carduus acanthoides*

Hand-pull rosettes. Once stalk grows, hand-pulling prior to flowering or removal of flower heads will help reduce seed production. Has an enormous seed banking potential. Limited distribution in B.C.; report all sightings.

Description: Very spiny, many branched on upper portion, up to 1.5m in height. Found on dry fields, roadsides and disturbed sites.

Flowers: Purplish-pink flowers up to 2.5cm wide, singly or in clusters at ends of branches.

Leaves: Long, narrow, very spiny. Rosette leaves are saw-toothed to the midrib.

Stems: Very spiny.

Other ID Tips: More spiny than nodding thistle and flowers upright.

J	F	M	A	M	J	J	A	S	O	N	D

B

PUNCTURE VINE *Tribulus terrestris*

After loosening soil, use thick gloves to grab plant at base of vines and pull out. Bag all plant parts and dropped seeds and dispose of in landfill. Report all sightings.

Description: Densely-matted, prostrate, trailing plant. Restricted to dry roadsides, fields and disturbed habitats in the Okanagan and Similkameen areas.

Flowers: Yellow, five-petalled single flowers on short stalks. Open only in the morning.

Leaves: Opposite, hairy leaves with four to eight oval leaflet pairs.

Stems: Trailing and up to 1.5m long, often branching along the ground.

Other ID Tips: Spines on seed pods can cause injury to the feet of people and animals, and can puncture bicycle tires.

J	F	M	A	M	J	J	A	S	O	N	D

A

PURPLE LOOSESTRIFE *Lythrum salicaria*

Highly competitive. Purple loosestrife may be pulled from base of plant but it can re-grow from root fragments. Report all sightings.

Description: Competitive perennial plant, with showy purple flowers. Thrives in moist habitats, such as ditches, ponds, and wetlands.

Flowers: Spike of purple flowers found at the upper end of stems.

Leaves: Leaves are lance-shaped and can vary in arrangement from opposite to whorled.

Stems: Stiff smooth stems are square in cross-section.

Other ID Tips: Purple loosestrife is sometimes confused with native fireweed, but purple loosestrife does not produce windborne seeds and is generally found growing adjacent to water or in moist soil areas.

J	F	M	A	M	J	J	A	S	O	N	D

P

RUSH SKELETONWEED *Chondrilla juncea*

L. Scott

J. Friesen

R. Mueller

Highly invasive plant with extensive deep root system. Incomplete pulling or cutting can stimulate remaining roots to re-sprout and worsen infestations. Continual, repeated cutting or pulling will eventually deplete root reserves. Report all sightings.

Description: Long-lived perennial up to 1.2m tall with skeleton-like appearance. Found on disturbed, dry sites.

Flowers: Small yellow flowers randomly scattered along branches.

Leaves: Inconspicuous, narrow stem leaves.

Stems: Wiry, highly branched stems with downward pointing hairs near the base.

Other ID Tips: Forms a dandelion-like rosette in the first year. Leaves exude a milky juice when cut or broken.

J	F	M	A	M	J	J	A	S	O	N	D

P

RUSSIAN KNAPWEED *Acroptilon repens*

L. Scott

R. Mueller

L. Berry

Highly competitive plant. Incomplete pulling or cutting can stimulate remaining roots to re-sprout and worsen infestations. Continual, repeated cutting or pulling will deplete root reserves. Report all sightings.

Description: Upright plant up to 1.0m in height, often forming dense colonies.

Flowers: Single, pink to purple flowers are urn-shaped. Bracts are green at the base with a white, slightly hairy tip.

Leaves: Lower stem leaves are alternate, longer and deeply lobed. Upper leaves are toothed and decrease in size toward the top of the plant.

Stems: Upright, stiff, branched, and covered in soft grey hairs.

Other ID Tips: Roots are black, scaly and creeping.

J	F	M	A	M	J	J	A	S	O	N	D

P

SCENTLESS CHAMOMILE

Tripleurospermum inodorum

Single plant can produce 1,000,000 seeds. To hand-pull, loosen the soil using a shovel, then pull from plant base.

Description: Small, bushy plant up to 1.0m in height.

Flowers: Daisy-like and scentless, up to 3cm in diameter.

Leaves: Feathery, and alternate.

Stems: Smooth, often reddish- purple, and highly branched near the top.

Other ID Tips: Fibrous taproot. Often found in wildflower seed mixes.

J	F	M	A	M	J	J	A	S	O	N	D

A P

SCOTCH BROOM *Cytisus scoparius*

Small plants should be gently pulled from moist soil. Ensure all roots are removed. Large plants may be cut off as close to the soil surface as possible, without causing soil disturbance.

Description: Taprooted evergreen shrub up to 3.0m in height. Common on roadsides, cutblocks and disturbed areas throughout southern and coastal B.C..

Flowers: Bright yellow pea-like flowers, sometimes with red markings.

Leaves: Lower leaves are stalked and have three leaflets; upper leaves are simple and un-stalked.

Stems: Five-angled and ridged, woody, and brown to green.

Other ID Tips: Flat seed pods have fine hairs on edges.

J	F	M	A	M	J	J	A	S	O	N	D

P

SCOTCH THISTLE *Onopordum acanthium*

An extremely large and distinctly grey coloured thistle. Deep roots of mature plants require digging to remove as much root as possible. Limited distribution outside the North Okanagan area. Report all sightings.

Description: Spiny thistle up to 3.0m in height. Found in disturbed areas, ditches and rangelands.

Flowers: Many single violet flowers on up to 5cm long branches. Bracts are spiny.

Leaves: Very hairy, large, lobed leaves with sharp yellow spikes.

Stems: Numerous branched stems with spiny, hairy wings running down the length.

Other ID Tips: Forms a rosette in the first year, and has a fleshy taproot.

J	F	M	A	M	J	J	A	S	O	N	D

B **P**

ST. JOHN'S-WORT *Hypericum perforatum*

Repeated hand-pulling or cutting prior to flowering will help reduce seed production and deplete root reserves. Biological control has been the primary treatment method for this species across southern B.C. for over twenty-five years.

Description: Branched, up to 1m in height, with sticky seeds. Found on dry and acidic rangeland, roadsides and disturbed sites.

Flowers: Bright yellow, 5-petalled, numerous.

Leaves: Opposite, oval, small, covered with transparent dots.

Stems: Smooth, upright, and branched.

Other ID Tips: A deep root system finds water when scarce and spreads underground to produce new shoots.

J	F	M	A	M	J	J	A	S	O	N	D

P

SULPHUR CINQUEFOIL *Potentilla recta*

Small patches may be manually removed using a shovel. First loosen soil, then carefully remove stolons, plants, and roots. Be sure to re-inspect. Report all sightings outside the Thompson-Okanagan area.

Description: Long-lived perennial, up to 80cm in height. Found in open forests, pastures, disturbed areas, and along roadsides.

Flowers: Stalked flowers are pale yellow with five petals, and found at the top of the stem.

Leaves: Long hairs cover the leaves, which are made up of five to seven toothed leaflets. Leaves appear yellowish-green, not grey, and are hairy on the underside.

Stems: Stems are hairy and have numerous leaves.

Other ID Tips: Can be confused with native graceful cinquefoil, whose leaves have a woolly, grey underside.

J	F	M	A	M	J	J	A	S	O	N	D

P

TANSY RAGWORT *Senecio jacobaea*

Seeds are viable for up to 20 years. Small plants can be easily hand-pulled. Use shovel to loosen soil for more complete root removal. Plants can regrow from severed roots and cut stems may still produce viable seed. Report all sightings outside the Lower Mainland and south coast areas.

Description: Ragged looking plant up to 1.0m in height. Found on roadsides, fields, disturbed and riparian areas.

Flowers: Yellow, daisy-like flowers are borne in clusters at the top of stems.

Leaves: Alternate leaves are deeply cut and almost ragged, and covered with web-like hairs.

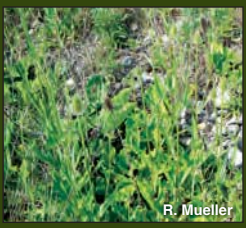
Stems: Mature plants have branched stems (often purple).

Other ID Tips: In the first year it forms a rosette with 10-20 leaves. Crushed leaves have an unpleasant odour.

J	F	M	A	M	J	J	A	S	O	N	D

B **P**

TEASEL *Dipsacus fullonum*



Species is a significant threat in moist areas where it can form impenetrable stands. Dig out or sever taproot at least 5cm below soil surface or cut stalks before flowering occurs. Report all sightings.

Description: Upright taprooted plant up to 1.8m in height. Found in moist areas like ditches and pastures, but also found on drier sites like roadsides.

Flowers: Oval-shaped flower heads over two inches in length consisting of numerous tiny purple flowers. Long, spiny, upward pointing bracts enclose the flower.

Leaves: Stem-leaves opposite, lance-shaped, veiny, with prickles on the lower part of the central vein.

Stems: Large stems have vertical ribs with rows of downward pointing prickles.

Other ID Tips: Forms a rosette in its first year.

J	F	M	A	M	J	J	A	S	O	N	D

B

YELLOW FLAG IRIS *Iris pseudacorus*

R. Mueller

C. Hougen

C. Hougen

Dig and pull as much of the rhizome system as possible and dispose of away from water bodies, preferably a landfill site. Re-visit site at least once per year for several years and repeat treatment. If digging is not possible, flowers, leaves and seed heads may be cut off and disposed of to reduce plant vigour and limit seed spread. Repeat cutting regularly. Report all sightings.

Description: Showy, upright plant up to 1.5m in height. Grows in wet areas like ditches and irrigation canals. Widely sold in nurseries.

Flower: Iris-like yellow flowers.

Leaves Long, sword-like leaves with bases that fold and clasp the stem in a fan-like fashion.

Other ID Tips: Forms green pods with hard, dark brown, smooth seeds, which can float.

J	F	M	A	M	J	J	A	S	O	N	D

P

YELLOW STARTHISTLE

Centaurea solstitialis

Not present in B.C.

REPORT ALL SIGHTINGS IMMEDIATELY! Contact an Invasive Plant Specialist, use Report-A-Weed, or phone the ISC hotline.

Description: Upright plant growing up to 1.5m in height. Can form dense stands. Found in rangelands, pastures, and disturbed areas.

Flowers: Yellow, single flowers with sharp spines radiating from bracts in a star-like formation.

Leaves: Upper leaves are sharply pointed.

Stems: Winged and covered with fine hairs.

Other ID Tips: Hairy cotton-ball seed head visible throughout winter. Deep taproot.

J	F	M	A	M	J	J	A	S	O	N	D

A

Assistance with Invasive Plants

Provincial Invasive Plant Program
Invasive Plant Specialists and program staff manage high risk invasive plant species on Crown land through analyzing the results of surveys, inventories, and monitoring activities to determine priority areas and sites for containment and control actions. Invasive plant priorities are identified through legislation, risk analysis, and collaborative planning with regional district weed programs and regional invasive plant/species committees. See **www.for.gov.bc.ca/hra/plants/contact.htm** for contact information.

Regional Invasive Plant/Species Organizations in B.C.
Regional invasive plant organizations consist of representatives from all levels of government, First Nations, forest and range agreement holders, utilities, special interest groups, and the public. Contact your regional organization to find out more about problem plants in your area, for assistance with plant identification, and to coordinate invasive plant management activities.

www.bcinvasives.ca/partners/committees

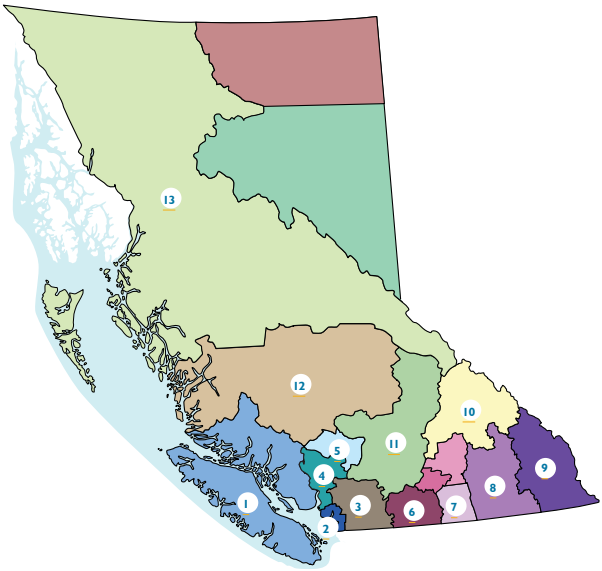
DID YOU KNOW?

The Invasive Alien Plant Program (IAPP) application is at: www.for.gov.bc.ca/hra/plants/application.htm. This map display module is cross-referenced with a database for all known invasive plant sites in B.C. and updated every 24 hours.

Regional Invasive Plant/Species Committees

Regional invasive plant/species committees are key partners in managing invasive plants in B.C..

Please contact your Regional Committee to find out more about problem plants in your area, for assistance with plant identification, or to coordinate weed management activities. The most current contact information can be found here: **www.bcinvasives.ca/partners/committees**



1. **COASTAL INVASIVE PLANT COMMITTEE**
   www.coastalisc.com

2. **INVASIVE SPECIES COUNCIL OF METRO VANCOUVER**
   www.iscmv.ca

3. **FRASER VALLEY INVASIVE PLANT COUNCIL**
   www.fraservalleyweeds.com

4. **SEA TO SKY INVASIVE SPECIES COUNCIL**
   www.ssisc.info

5. **LILLOOET REGIONAL INVASIVE SPECIES SOCIETY**
   Email: lrinvasives@gmail.com

6. **OKANAGAN AND SIMILKAMEEN INVASIVE SPECIES SOCIETY**
   www.oasiss.ca

7. **BOUNDARY INVASIVE SPECIES SOCIETY**
   www.rdkb.com

8. **CENTRAL KOOTENAY INVASIVE PLANT COMMITTEE**
   www.ckipc.ca

9. **EAST KOOTENAY INVASIVE PLANT COUNCIL**
   www.ekipc.com

10. **COLUMBIA-SHUSWAP INVASIVE SPECIES SOCIETY**
    www.columbiashuswapinvasives.org

11. **SOUTHERN INTERIOR WEED MANAGEMENT COMMITTEE**
    www.siwmc.ca

12. **CARIBOO CHILCOTIN COAST INVASIVE PLANT COMMITTEE**
    www.cccipc.ca

13. **NORTHWEST INVASIVE PLANT COUNCIL**
    www.nwipc.org

For More Information

Provincial Invasive Plant Program
www.for.gov.bc.ca/hra/plants/

Invasive Species Council of British Columbia
www.bcinvasives.ca

Invasive Alien Plant Program (IAPP)
www.for.gov.bc.ca/hra/plants/application.htm

Report-A-Weed B.C.
www.reportaweedbc.ca

Weeds BC
www.weedsbc.ca

Forest and Range Practices Act Invasive Plants Regulation
www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/18_2004

Noxious Weeds under the Weed Control Act Regulation
www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/10_66_85

BACKGROUND SOURCES

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Centre for Invasive Species and Ecosystem Health. ND. Best Management Practices to Prevent the Introduction and Spread of Invasive Species. www.forestasyst.org/invasive_species.html (Accessed February, 2013).

Miller, V. and J. Kekula. 2008. *Forest and Range Practices Act:* Invasive Plant Species Considerations. B.C. Ministry of Forests and Range, unpublished report.

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Deactivated Road Seeded with Native Groundcover Mix.

Glossary

ALTERNATE: arranged singly, one at a time; usually referring to leaves or branches.
ANNUAL: a plant that completes its lifecycle in one growing season.
BASAL LEAVES: leaves growing at the base of the stem.
BIENNIAL: a plant that lives for two years, usually flowering and producing seed in year two.
BRACT: a modified leaf, usually associated with a flower.
BUR: a rough, prickly husk around the seeds or fruit of some plants.
CLASPING LEAF: the base of the leaf surrounds the stem.
COMPOUND LEAF: a leaf that is divided into many smaller parts.
FIBROUS ROOT: root system with many fine parts.
FLORAL LEAF: a modified leaf that is part of a flower.
LANCE-SHAPED: much longer than wide; tapering towards the tip.
LEAF JOINT: a place where a leaf is attached (a node).
LEAFLET: a single segment of a compound leaf.
LINEAR LEAVES: long and narrow, with almost parallel sides.
MIDVEIN: the main vein of a leaf.
NODE: a place where a leaf or branch is attached (a joint).
OPPOSITE: arranged in pairs, like leaves on opposite sides of a branch.
PERENNIAL: a plant that lives for more than two years.
PROSTRATE: growing flat along the ground.
RHIZOME: an underground stem that can develop nodes or buds at the joints.
ROSETTE: a circular cluster of leaves found at the base of a stem.
RUNNER: a stem that spreads horizontally, often rooting at its joints.
SEED POD: the protective shell or case surrounding a seed.
SPIKE: a flower cluster in which each flower is not stalked.
TAPROOT: a main root, usually tapering and pointing down, and larger than the branching roots.
TRAILING: lying flat on the ground, but not rooting.
VEGETATIVE REPRODUCTION: reproduction without seeds or spores.
WHORLED: leaves, flowers or branches arranged around an axis in groups of three or more.

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