

Priority Invasive Species and Best Practices NOVEMBER 30,2023

Presented By: Diane Watson and Lara Phillips Invasive Species Council of BC



The Invasive Species Council of BC gratefully acknowledges the territories of the Indigenous Peoples of BC where we live and work to maintain healthy ecosystems for all.



Invasive Species Council of BC

- Largest provincial invasive species charity in Canada
- Focus: education, outreach, training, cross-border collaboration across
 Canada and internationally
- Founding member, co-chair of the Canadian Council on Invasive Species





ISCBC's Mission

Take action to build healthy landscapes, habitats and communities through education and responsible practices to prevent the spread of invasive species.



Board of Directors

Board of Directors represent one of three Chambers

- Governments federal, Indigenous, local, provincial
- Community education, academia, conservation
- Business and industry natural resources, utilities, mining





Partners

- Provincial Government
- Federal
- Indigenous
- Industry
 - Forestry
 - Mining
 - Agriculture
 - Tourism
- Local government
- Regional Committees

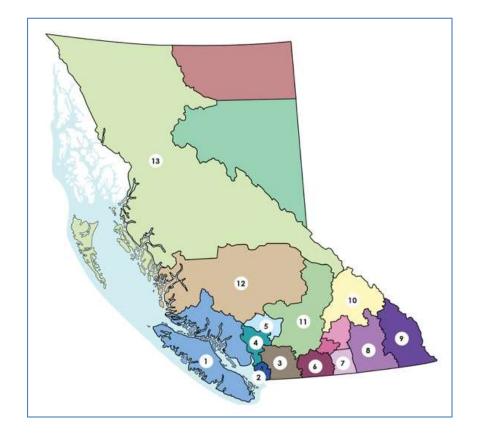




Regional Connections

Regional Partnerships

- Work in partnership with 13 regional invasive species organizations
- Special projects with the Regional Councils has included:
 - Plant Wise, Clean Drain Dry, Don't Let Loose
 - Local Workshops on local concerns
 - Training and more!





What We Do



- 1. Increase awareness on the negative impacts of invasive species
- 2. Develop, deliver training programs for business and industry
- 3. Work to build 'responsible practices' in individuals and organizations
- 4. Increase research on priority issues
- 5. Build collaboration across all parties

"Invasive Species Know No Boundaries"



What Are Invasive Species?

- Alien, non-native
- Invasive
 - Take-over habitat
- Displace native species
- 64 plant species listed as noxious in BC Weed Control Act Regulations
- Over 175 species regulated in all federal, provincial and local gov't statutes





More Than Weeds

Invasive Species are more than "weeds"



Feral Pigs

Japanese beetle

Japanese knotweed Eastern grey squirrel

Smallmouth bass



Pathways and Vectors

How do they spread?





Trails, boating/fishing, movement/sale of plants and pets, ecosystem disturbances, wind/currents

Vectors



Humans, transportation, wildlife, plants, insects, soil, equipment



Pathways and Vectors

How do they spread?

Pathways



Trails, boating/fishing, movement/sale of plants and pets, ecosystem disturbances, wind/currents **Vectors**



Humans, transportation, wildlife, plants, insects, soil, equipment



Which of these IPBES Inter-governmental Panel on Biodiversity and Ecosystem Service drivers are drivers for biodiversity loss?

- a) Changing Use of Sea and Land
- b) Direct Exploitation of Organisms
- c) Climate Change
- d) Pollution
- e) Invasive Non-Native Species



Which of these IPBES Inter-governmental Panel on Biodiversity and Ecosystem Service drivers are drivers for biodiversity loss?

- Changing Use of Sea and Land
- **Direct Exploitation of Organisms**
 - Climate Change
- V Pollution
- Virtual Invasive Non-Native Species



Which of these is the estimated economic impact of invasives?

- a) BC agriculture industry loses >\$50 M/year in crop productivity
- b) Est. annual BC crop damage if Japanese beetle establishes \$14.5 M
- c) Est. cost Zebra Quagga Mussel invasion in BC \$64-\$129 M/year
- d) Invasive plants (Canada) crops & pastures cost est. \$2.2 B/year



Which of these is the estimated economic impact of invasives?

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Est. cost Zebra Quagga Mussel invasion in BC **\$64-\$129 M/year**

Invasive plants (Canada) crops & pastures cost est. **\$2.2 B/year**



Climate Change

What is the linkage to Climate Change?

- Expanded range increases risk of introduction and establishment
- Increased rate of species movement
- Lack of, or shorter cold winters



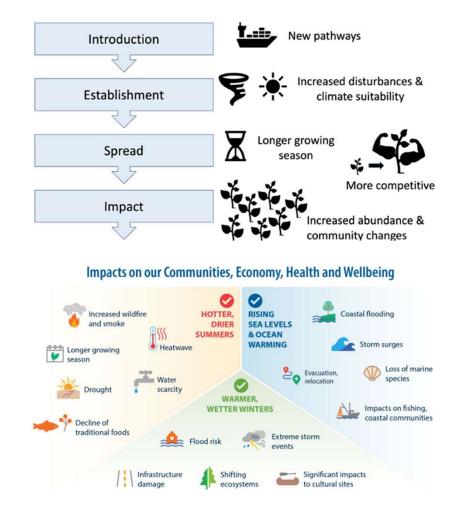
Yellow starthistle



Zebra mussels



Spotted lanternfly





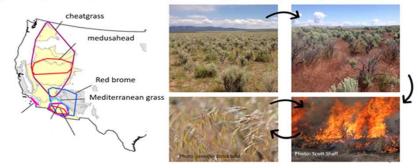
Climate Change

What is the linkage to Climate Change?

- Increase of fuels
- Increase risk of fire
- Contributed to Maui fires

Invasive grasses increase fire occurrence and frequency across US ecoregions

Emily J. Fusco^{a,1}, John T. Finn^b, Jennifer K. Balch^{c,d}, R. Chelsea Nagy^c, and Bethany A. Bradley^{a,b}



> Grass-fire cycle: Invasion increases fuels



Fire removes native species, introduced species thrive



Yellow starthistle range expands with temperature increases

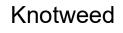


Climate Change

What is the linkage to Climate Change?

- Increased impact for floods
- Invasives reoccupy first having poor water retention





Himalayan balsam









Invasive Species Regulations



Federal

Federal legislation regulates:

- Ballast water management
- Fisheries management
- Movement of wildlife, pathogens, and pests







Federal

Plant Protection Act (CFIA)

Regulates import, sale, movement of plants:

- Movement of imports and within
- Monitors imports by land and sea
- Conducts <u>surveillance</u>
 - Determine if an invasive plant is here or not
- Insects, plant diseases, nematodes, snails, and other species









Seeds Act

- Determine seed grades
- Samples randomly to ensure compliance

Pest Control Products Act

- Regulates pesticides
- Determines all claims are science based
- Reviews all submitted data for accuracy







Provincial

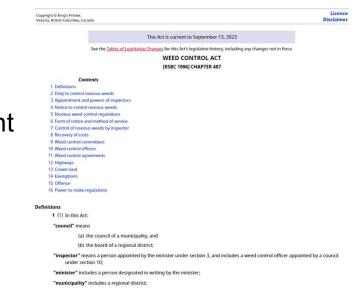
Plant Protection Act – BC Ministry

Agriculture & Food

- Primarily insect related
- Does not apply to regulated species in federal Plant Protection Act

BC Weed Control Act and Regulations

- Invasive plant species listed noxious on all jurisdictions, except federal
- 39 provincially listed, 25 listed with regional districts





Provincial

Forest and Range Act (FRPA)

 Implement measures that prevent the introduction or spread of 42 plant species in their stewardship plans

Wildlife Act

Aquatic Invasive Species Regulation

- Any part of a body of water located in BC
- Includes aquarium species
- Over 65 species listed for BC





Provincial

Integrated Pest Management Act and Regulations Act

- Establishes pesticide classes
- Licenses, certificates, permits, Pesticide Use Notice (PUN), confirmations requirements
- Requirements for storage and transport
- Regulation
- Pesticide use, handling, release, transport, storage, disposal of or sale of a pesticide.

Integrated Pest Management Act and Regulation

Summary

his is a summary prepared to provide general guidance on the use of posicides in tish Columbia. This is not a legal document and the contents should not be relied one for legal purposes. In all cases the integrated Pard Management Act and Regulans will prevail. Ceptes of the Act and Regulations may be obtained through the cent's Printer.



February 28, 2005



Local Government

Community Charter

Spheres Concurrent Jurisdiction

Local governments through Municipal Act

Local Governments

By-laws

- May be species specific or general
- i.e., Nuisance vegetation



Some of these enforcement statutes may allow local government (regional districts, municipalities, etc.) to utilize powers for local purposes.



Key Invasive Plants and Other Species



Knotweed (Reynoutria spp., Persicaria spp.)

- Can grow through concrete and asphalt
 - Damages infrastructure
- Aggressive and very hard to kill
- Significant control, management, and repair costs





Knotweed (Reynoutria spp., Persicaria spp.)

Method of Spread

• Rhizomes, some seed set

Management

- Do not cut
- Herbicide
- Removal by excavator





Giant hogweed (Heracleum mantegazzianum)

- Produces a highly toxic sap
 - Can cause burns, blisters and scarring
- Dominates ravines and stream banks
- Poses serious risks to human health and ecology
- Look alike species Cow parsnip
- <u>https://ssisc.ca/giant-hogweed-lookalike</u>





Giant hogweed (Heracleum mantegazzianum)

Method of Spread

• Seed

Management

- Cut before seed set
- Dig out seedlings
- Herbicide





Spartina (Spartina spp.)

- Decreases habitat for shorebirds, waterfowl, fish and shellfish
- Disrupts tidal drainage patterns and estuary hydrology
- Impacts coastal based industries





Spartina (Spartina spp.)

Method of Spread

• Rhizomes and seeds

Management

- Digging and burying with excavator
- Systematic herbicide treatment





English ivy (Hedera helix)

- Suppress native vegetation by smothering
- Leave plants vulnerable to blowdown and disease
- Unsuitable to wildlife as habitat and forage





English ivy (Hedera helix)

Method of Spread

 Cuttings or juvenile stems in contact with the ground

Management

- Hand pulling and cutting
- Herbicide





Spurge laurel (Daphne laureola)

Poisonous!

Contains toxic sap that can cause skin rashes, nausea, swelling of the tongue and coma

- Shade tolerant can take over forest understories
- Commonly grown in gardens





Spurge laurel (Daphne laureola)

Method of Spread

Rhizomes and seed

Management

- Cutting
- Pulling and digging (young plants)





Yellow flag iris (Iris pseudacorus)

- Perennial aquatic plant
- Thick mats damage wildlife habitat, reduce waterflow, crowd out native vegetation
- Commonly sold for ponds and water gardens





Yellow flag iris (Iris psuedacorus)

Method of Spread

Seed, rhizomes, fragmentation

Management

- Deadheading before seed set
- Pulling and digging caution!
- Benthic barriers
- Deep water cutting





Post-Treatment Activities

- Multi-year approach
- Consider site variables, seed viability and species biology
- Treatments typically result in soil disturbance
- Passive or active restoration
- Monitoring





BC Priority Invasive Plants

Province of BC

- 'Top 25' updated annually
- Priority for management
- Containment lines for some species
- <u>https://iscmv.ca/docs/2023_Provi</u> <u>ncial_Top_25_list_EXTERNAL.pdf</u>

Invasive Plant Species (Species with containment lines in red)	NEW RANK 2023
Bohemian knotweed	1
Giant knotweed	1
Japanese knotweed	1
Giant hogweed	2
Poison Hemlock	3
Wild Parsnip	4
Marsh Plume Thistle	5
(NEW) Japanese Butterbur	6
Shiny geranium	7
Wild chervil	8
North Africa grass	9
Garlic mustard	10
Rush skeletonweed	11

Common tansy	12
Yellow flag iris (5m ² or less sites only)	13
Common bugloss	14
Blueweed	15
Teasel	16
Himalayan Knotweed	17
Field scabious	18
Scotch broom	19
(NEW) White flowered broom (use	
Scotch Broom Containment line)	19
Spotted Knapweed	20
Hoary alyssum	21
Himalayan Blackberry	22
Yellow Archangel	23
Puncturevine	24
Hoary cress	25



EDRR

'Early Detection Rapid Response' Species

- New species or limited extent in BC
- 6 step process
- Report!
- Full list BC Gov webpage

Provincial Priority Invasive Species List



Eggleaf spurge (Euphorbia oblongata)

- Yellow flower clusters
- Egg-shaped leaves, finely toothed
- 0.5 m tall branching stems







Water hyacinth (Eichhornia crassipes)

- Kidney-shaped leaves
- Thick and glossy
- Inflated leafstalk
- 4-15 flowers on spikes
- Purple with yellow spot
- Horticulture plant







Water lettuce (Pistia stratiotes)

- Floating rosettes appear
 'lettuce-like' no stem
- Soft, light green leaves with wavy margins
- Feathery roots
- Dense mats
- Horticulture plant

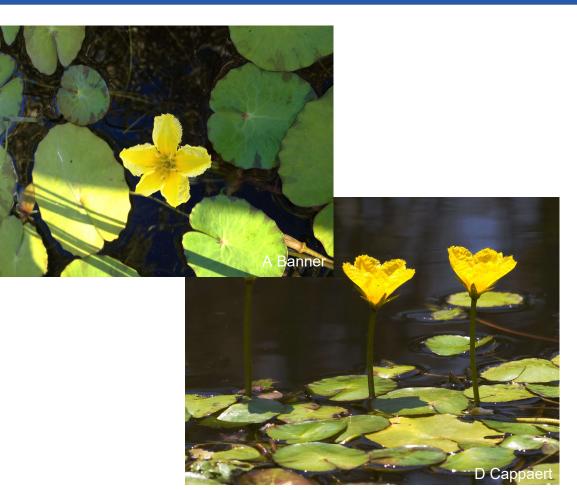






Yellow floating heart (Nymphoides peltata)

- Resembles a water lily
- Single yellow flower grows on a single stalk
- Dense mats
- Planted intentionally ponds near housing
- Provincial alert coming soon





Invasive Plant Disposal

- Landfills deep burial
- Incineration or high-heat composting not often available
- Varies by municipality
- NO regular composting!
- Secure during transport

Metro Vancouver Disposal Options:

https://metrovancouver.org/services/regionalplanning/Documents/invasive-species-toxic-plant-disposaloptions.pdf



Background

There are many different invasive plant species present in British Columbia. Many of these species cannot be fully destroyed through compositing, so they need to be disposed of in other ways. This factsheet will provide you with the information you need to safely and effectively dispose of invasive plants and stop their spread.

What is an invasive species?

The term "invasive species" is any non-native organism that cause environmental, economic er social harm and can spread quickly to new areas. Invasive species, including vegetation altering ecosystems and impacting biodiversity. The economic impacts of invasive plants are a combination of the loss in resource productivity and increased management octs to control further introduction and spread. Invasive plants can also increase fire risks, pose health hazards and impact the values of recreational areas.





What can you do? Prevention is escrittal in controlling further introduction and spread of invasive plants throughout the province. Improper disposal is a major pathway of introduction, as invasive plants are often disposed of Invays that allow their seeds or plant parts to be dispersed. Dumping green waste, which includes plant waste from york, parks and dhere recreational areas, in areas such as parks and forests, is one of the leading ways adpatible and easily move into to new areas by seed or wegetative fragment dispersal. It is actemedy important that responsible invasive plant disposal is common practice. In order to practices alle and responsible disposal methods, residents should context their local municipalities to find ut what disposal options and programs are available to

BCINVASIVES.CA / INFO@BCINVASIVES.CA / 1-888-933-3722

Slide 47	
DW0	https://metrovancouver.org/services/regional-planning/Documents/invasive-species-toxic-plant-disposal-options.pdf

Tasha recommends including this PDF for the Metro Vancouver area if possible because it is always updated with new information Diane Watson, 2023-11-29T16:54:13.528



Japanese beetle (Popillia japonica)

- Feeds on over 300 plants species
- Damages plants by feeding on roots and skeletonizing leaves
- Would impact agriculture and horticulture industries in BC





Japanese beetle (Popillia japonica)

Method of Spread

Movement of plants, soil

Management

- Trapping
- Movement controls
- Larvicide





Brown marmorated stink bug

(Halyomorpha halys)

- Broad diet of fruits, seeds, plants and tree bark
- Serious pest in many fruit, vegetable and hazeInut crops
- Nuisance to homeowners





Brown marmorated stink bug

(Halyomorpha halys)

Method of Spread

 Shipping containers, wood, packing material, cargo and vehicles

Management

- Natural and introduced biocontrol
- Insecticide



LP0	Could mention preferred host tree - TOF
	Lara Phillips, 2023-11-23T21:29:57.066



Tree of Heaven (Ailanthus altissima)

- Prolific reproducer; allelopathic
- Preferred host tree of <u>Spotted lantern fly</u>
- Not listed noxious but an important invasive to watch out for – report!

Spotted lanternfly (Lycorma delicatula)

- Not yet present in BC!
- Huge implications for fruit orchards and vineyards – feeds on 100+ species, including Garry oak





Tree of Heaven (Ailanthus altissima)

Method of Spread

Seed, vegetative sprouts/suckers

Management

- Pulling and digging saplings
- Herbicide

Known host tree of the invasive Brown marmorated stink bug





LP0	Added BMSB fact here and removed from other BMSB slides - confirmed host but perhaps not 'preferred host'
	Lara Phillips, 2023-11-28T06:21:51.529



Zebra and Quagga mussels

- Reproduce rapidly
- Severe impact to economy, environment and society



NOT YET IN BC!





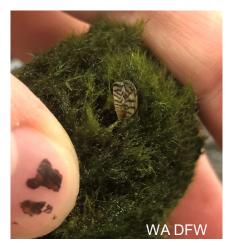
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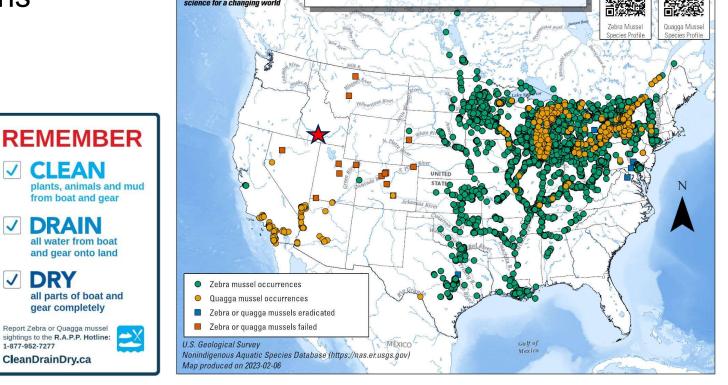
Zebra and Quagga mussels

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V

- **Inspection stations**
- Idaho detection
- Moss balls •





Zebra and Quagga Mussel Sightings Distribution

Dreissena polymorpha and Dreissena bugensis

回射線回

Slide 55

LPO Updated map? Lara Phillips, 2023-11-28T06:00:34.501



American Bullfrog

(Lithobates catesbeianus)

- Largest frog in BC
- Predator with a broad diet
- Serious threat to species at risk
 - Red-legged frog
 - Western painted turtle





American Bullfrog (Lithobates catesbeianus) Method of Spread

- Catch and release
- Land migration
- Require permanent waterbodies

Management

- Manual removal of all life stages
- Habitat manipulation





Reporting

- Report Invasives BC app
- ISCBC online form, phone or email: <u>info@bcinvasives.ca</u>
- iNaturalist app
- Local invasive species organizations
- Local CFIA plant pests





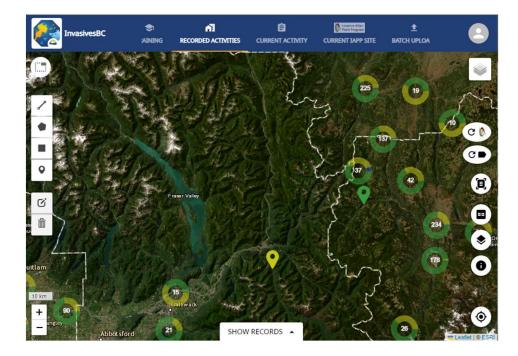






InvasivesBC

- Launched June 2023 replaced 'IAPP' software
- Mapping and information database for invasive plants in BC
- Species distributions and treatment records (mechanical, chemical, biological)
- In progress new phases coming





Resources

- Mobile app management tool
- Agriculture focused plants only
- Identification, management advice from experts, and more
- Available offline
- Excellent resource for land managers





Resources



Identification

BCINVASIVES.CA

Tree of heaven Ailanthus altissima

About

There of heaven (Allorithus ditissima) is a significant invarive species is many gravits of the world. Relieve to Asia, it was introduced to British Columbia as an urban tree known for its large growth and boltening a world energy of growing conditions. There of heaven has multiple modes of reproduction, allowing it to gravit gravitable. There of heaven its known to be the preferred hout of the invasive agricultural and forest pest, Spotted latentimp(), groom deficiation).



Legal Status

Currently, A. ollissime in not listed as a novieux weed in the BC Weed Control Act. However, it is listed as an invasive plant according to the Canadian Food Impection Agency (CPIA) and a species for regional containment and control by the BC Inter-Ministry Invasive Species Working Group.

Tree of heaven's native

and central China and Taiwan. It is now found throughout North America, including British Columbia, Ontario, and Quibber. It has also spread throughout Western Europe, So Miria, Australia, and Hum Tanland.



About English Ivy English ivy is a widely planted to be white, ar yrllow fanglish vig hindist ster growth and Jane. wildfowers, shrots and treest are an an article and treest and anticipation and anticipation and anticipation anticipation and anticipation anticipation and anticipation anticipation anticipation and anticipation anticipat

> Legal Status Community Charter, Spheres of Concurn ronment and Wildlife Regulation.

> > Distribution English ivy is currently found in southwestern BC, and coast, island, and Haida Gwaii. There have been isola

Identification

the base of each leafler.

ts, such as abandoned lots, alleys, parking lots, it can effectively colonize sites with rocky and g conditions.

> Is through climbing. Views through through shiny bark, with instany as. through park, with foort through through the second shift foort three to five point and will climbing. The second shift from 5-30 cm lor from 5-30 cm lor

Fruits: Are dark blue: cal drupes each 6-9 m Similar Native Speci

does not climb, it can also be di the presence of toothed leaf ma as nodding flowers and fruits.



Ecological Characteristics:

table that adaptable to a range of ooll and moisture conditions. Yoo of native postering dense set and of plants are due to became on additing growth under existing othering dense stands of plants and trees. Reproductions: English ivy flowers from late summers to fail. Vegetable reproduction can occur from outlings or for the set of the se

> Dispersal: The plant remains vegetative when growth is horizontal, but turns reproductive when allowed to climb. Fruit and seeds can be eaten and spread by birds.

western BC, along the Impact

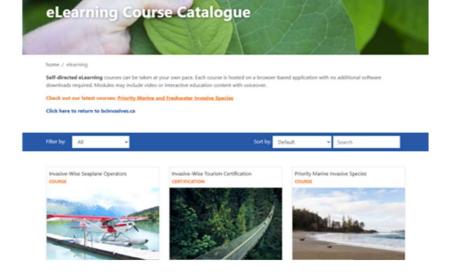
Ecological: English in y can form driver monoultures that spread on the ground and on other planta indivers. It can suppress and exclude native vegetation by unobhring them advorgancy to glo light. The sensative versite of English's veblewdown and disease. English's can also create unsubable wildle hubbat and forge availability. It can also create unsubable wildle hubbat and disease. English's can also create unsubable wildle hubbat and disease. English's can also create unsubable wildle hubbat and disease. English bradinasa, a plant pathogen that is humrit to makes, dask, elliss, and diser native gains. Economic his the ability to damage infrastructure it groos on. Habbat hubbat habbat the been found toxic to human when and the

Integrated Pest Managemen

IPM is a decision-moking process that includes identification and inventory of invasive plant populations, assessment of the risks that they pose, development of well-informed contro options that may include a number of methods, who treatment, and monitoring.

A. Prevention

 Monitor for English key in community gardens, along built-up walls and trees, and in understory vegetation
 Destroy single plants or new infestations early, before seeds are produced.



Numerous publications available for download or print Extensive course catalogue for virtual training – most free!



Who to contact

- Regional invasive species organizations
- ISCBC email, phone, website
- View 'Our Networks' <u>https://bcinvasives.ca/about/our-networks/</u>
- We like to hear from you!





Thank you!

For more information contact: Diane – dwatson@bcinvasives.ca Lara – lphillips@bcinvasives.ca