T.I.P.S.

Targeted Invasive Plant Solutions

J Water-based Recreation

Invasive Plants in Our Waters

Invasive species are threatening BC's aquatic and riparian ecosystems, such as streams, lakes, and wetlands, and the species that rely on them. Water-based recreation activities, like angling, boating, diving, and hunting, can spread aquatic invasive species to new locations. Plants, animals, and microscopic creatures can cling to clothing, equipment, and boats. If not cleaned, these species can be introduced into new bodies of water.

This document provides a summary of best management practices designed to assist boaters, anglers, and hunters in preventing the introduction and spread of invasive plants. Anyone who enjoys the recreational opportunities of the waters of BC, or who appreciates the value of these unique ecosystems, is encouraged to use this document.

The term invasive plant, as used hereafter, includes provincially listed invasive plants and noxious weeds, as well as other alien plant species that have the potential to pose undesirable impacts on people, the economy, or the environment.

Impacts of Invasive Plants

Aquatic invasive plants are those plants that have been introduced into an aquatic ecosystem (ocean, lake, river, or wetland) where they do not naturally occur. Lacking natural pathogens or predators that keep them under control in their native ecosystems, invasive plants can spread rapidly and negatively impact fish and wildlife habitat, biodiversity, species at risk, fisheries productivity, water quality, and power generation.

Many aquatic invasive plant species, such as didymo *(Didymosphenia geminata)*, Eurasian watermilfoil *(Myriophyllum spicatum)* and Japanese wireweed *(Sargassum muticum)*, form thick mats (up to 20 cm for didymo) on the surface of the water, which can impede light penetration to underwater plants and animals, hinder boat traffic, clog intake pipes of boats, foul fishing lines and nets, and cause a danger to swimmers. Once established, aquatic invasive plants are extremely difficult, if not impossible, to eradicate.

Economically, the impacts of aquatic invasive plants can be devastating. Many of these species can cause increased boat repair and maintenance costs when they become tangled in motors. Real estate values can become depressed on waterbodies with aquatic plant infestations like Eurasian watermilfoil. Water intake structures on dams can be damaged from mats of invasive plant materials. Management strategies to address infestations are extremely costly.

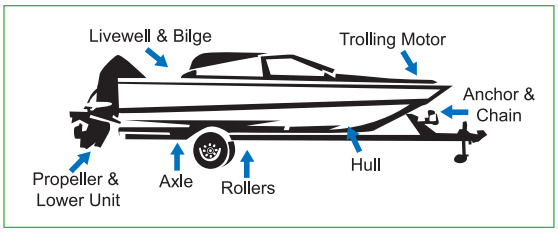
Every decade, 15 aquatic invasive species establish themselves in the coastal or inland waters of BC. (These species) have been implicated in vast reductions or the outright extinction of indigenous fish populations across Canada and the resulting devastation of local fisheries.

— Fisheries and Oceans Canada

The objectives of this publication are to:

1. Prevent the establishment of new aquatic invasive plants in BC.
2. Provide practical strategies for preventing the spread of aquatic invasive plant species within and between waterways.
3. Increase awareness of the negative ecological, social, and economic impacts of aquatic invasive plants.
4. Encourage responsible practices for boaters, anglers, hunters, and other water-based recreationists.

Water-based Recreation



Parts of a boat to check for fragments or seeds.

Environment Waikato Regional Council, Hamilton, NZ

Didymo, a devastating algae that forms a blanket across river beds, only needs a single cell to be transported in order to spread.

Pathways of Spread

Recreational gear, equipment, and boats

Many invasive plant species have the ability to cling to or become collected in gear, equipment, and vessels. Pieces of vegetation or seeds can be trapped throughout boats, trailers, and watercraft. Seeds and vegetation can be collected in the water of boat hulls, motors, transom wells, and bilges, and then transported to another waterbody. For most species, only a small fragment of the plant is needed in order to take root and grow a new colony. For example, root and stem fragments as small as a few centimetres can form new Japanese knotweed *(Fallopia japonica)* plants, an extremely aggressive bamboo-like plant that forms dense thickets along riverbanks.

Fishing equipment, diving gear, hunting dogs, decoys, and other recreational items that are transported among waterbodies can also spread invasive plant problems to new waters. For example, didymo, a devastating algae that forms a blanket on riverbeds, can be spread by cells absorbed in the felt soles of fishing waders. Even out of the water, these aquatic species can survive for many days on gear.

Other Pathways of Spread

Aquatic invasive plant species may also be introduced or spread by other means. The release of aquarium water into natural waterbodies, when pet owners dispose of fish or other aquatic animals, can introduce invasive plant species such as parrotfeather *(Myriophyllum aquaticum)* and Eurasian watermilfoil. Ballast water, collected in the hull of a boat to increase stability, can contain fish, microbes, and seeds, which are released into new waterbodies. Riparian invasive species used for horticulture, including purple loosestrife, yellow flag iris *(Iris pseudacorus)*, knotweed (*Polygonum* or *Fallopia* spp.) and policeman's helmet *(Impatiens glandulifera)*, can escape into adjacent lands. Invasive plants may also be introduced by planting for roadside beautification, ecosystem and rights-of-way restoration, and other projects requiring re-vegetation.

For more information, see the Aquariums and Water Gardens T.I.P.S. and Garden Smart T.I.P.S. at: http://www.invasiveplantcouncilbc.ca/resources/targeted-invasive-plant-solutions-tips.

What Can You Do?

Prevention is the most important and cost-effective invasive plant management strategy, but often the least used. It is critical to prevent invasive plants from spreading and becoming established in new waterbodies and riparian areas. Seed and plant part attachment on boats and personal gear is a key pathway of invasion of new invasive plants into BC and Canada; therefore, T.I.P.S. provided for aquatic invaders are focused on PREVENTION.

Integrated Pest Management

Since the goal of this document is to prevent the entry and movement of invasive plants between waterbodies, other invasive plant management options are not described. In the event that invasive plants are introduced, Integrated Pest Management (IPM) principles should be implemented. IPM is a decision-making process that includes identification and inventory of invasive plant populations, assessment of the risks that they pose, development of well-informed control options that may include a number of methods, site treatment, and monitoring.

Control methods and management strategies vary by invasive plant species, severity of the plant invasion, and site characteristics. Site-specific mechanical, chemical, or biological control methods may be applied. Additional information on control methods is available in species-specific T.I.P.S. (www.invasiveplantcouncilbc.ca), from a regional invasive plant committee coordinator, or online at www.weedsbc.ca. Contacting your regional invasive plant committee is an excellent way to receive information specific to your area and to get involved locally. To find a committee near you, please visit www.invasiveplantcouncilbc.ca/committees.

Parrotfeather
(Myriophyllum aquaticum)

Yellow Flag Iris
(Iris pseudacorus)

Eurasian Watermilfoil
(Myriophyllum spicatum)

Japanese Wireweed
(Sargassum muticum)

Policeman's Helmet
(Impatiens glandulifera)

Knotweed
(Polygonum or *Fallopia* spp.)

Think ahead when planning an outing on the water. Ask yourself:

1. When entering and departing the water, is my boat/trailer/equipment clean of aquatic debris?
2. What are the local aquatic invasive plants I should be aware of?
3. If I spot an aquatic invasive plant, do I know who to alert?

Cordgrass (*Spartina* spp.) infestations in the intertidal zones of the Pacific Northwest out-compete native species typically found in the intertidal region, such as eelgrasses, Dungeness crab, clams, juvenile salmonids and fish species, and migratory waterfowl. Cordgrass also traps sediment (up to 15 cm of new material annually), which changes the intertidal zone to salt marsh above Mean Ordinary High Water.

— Salmon Habitat Limiting Factors Final report, Washington State Conservation Commission

T.I.P.S. for Boaters, Anglers, and Hunters

ACTIVITY	TARGETED INVASIVE PLANT SOLUTIONS
General	These T.I.P.S. are always applicable: • **Educate** yourself, find out what invasive plants are in your area, and inform others. • **Learn** how to identify aquatic invasive plants. • **Never transport** plants, sediment, or live bait among bodies of water. • **Do not release** aquarium plants or live bait into aquatic ecosystems. • After leaving a water body that is known to have didymo, thoroughly **disinfect** gear and equipment. • If you find debris after leaving the affected area, do not wash it down the drain. Treat it chemically (for didymo), or dry for at least two more days after the gear is no longer damp. • **Dispose** of submerged aquatic invasive plant material far from water and spread it out so that it can completely dry. For all other plant material, bag and dispose of it at a landfill. • **Report** invasive plants to your regional invasive plant committee by calling 1-888-WEEDSBC (1-888-933-3722), or the through the Invasive Alien Plant Program (www.for.gov.bc.ca/hra/plants/application.htm). • **Help educate** other boaters, anglers, and hunters.
Boaters	• **Drain** water from boat (including motor, live well, bilge, and transom wells), trailers, tackle, and gear (including waders) before leaving an area. • **Inspect** your boat, motor, trailer, and equipment and remove all aquatic plants and visible debris before leaving the area. **Dispose** of plant material responsibly.
Anglers	• **Empty** your bait bucket on land before leaving any waterbody. • **Inspect** your equipment and remove all aquatic plants and visible debris before leaving the area. **Dispose** of plant material responsibly.
Hunters	• **Use bulb-shaped or strap anchors** on decoys because they won't collect submersed or floating plants as easily. • **Inspect** your equipment and dogs, and remove all aquatic plants, plant parts, and visible debris before leaving the area. **Dispose** of plant material responsibly.

Water-based Recreation

Legislation and Regulations

There is a growing network of partnerships and collaborations among all levels of government, industry, regional invasive plant committees, and concerned individuals to address unwanted aquatic invasive plants. In addition, there are legislation and regulations that pertain to aquatic invasive plants.

Federal

The ***Fisheries Act*** specifies that it is an offence to harmfully alter, disrupt, or destroy fish habitat, including streamside vegetation. It is also an offence to move or introduce aquatic organisms (including plants) to new habitats: http://laws.justice.gc.ca/en/F-14/

Provincial

In BC, invasive plant management on all lands (Crown and non-Crown) is regulated by the ***BC Weed Control Act***, and the management of specific Crown lands is regulated by the ***Forest and Range Practices Act***, the ***Community Charter***, and the ***Integrated Pest Management Act***. For more information, see the IPCBC's *Legislative Guidebook for Invasive Plant Management in BC*. www.invasiveplantcouncilbc.ca/resources/reports

References and Links

Provincial and Regional Coordination

Invasive Plant Strategy for British Columbia: www.invasiveplantcouncilbc.ca/publications/invasive-plant-strategy.pdf

Species Identification and Management

BC Ministry of Forests and Range Invasive Alien Plants: www.for.gov.bc.ca/hra/plants/index.htm

BC Ministry of Agriculture and Lands: www.agf.gov.bc.ca/cropprot/weedguid/weedguid.htm

E-Flora BC, Electronic Atlas of the Plants of BC: www.eflora.bc.ca

Community Mapping Network: http://cmnbc.ca/

Global Invasive Species Database: www.issg.org/database/welcome/

Invasive Plant Council of BC. Targeted Invasive Plant Solutions publication series and Garden Smart brochure: www.invasiveplantcouncilbc.ca

Weeds BC (BC Ministry of Agriculture and Lands): www.weedsbc.ca

Provincial Inventory and Mapping Database

Invasive Alien Plant Program (IAPP) Application, Reference Guide and Field Forms: www.for.gov.bc.ca/hra/plants/application.htm

Community Mapping Network: http://cmnbc.ca/

Integrated Pest Management

BC Ministry of Environment Integrated Pest Management Program: www.env.gov.bc.ca/epd/epdpa/ipmp/index.html

Wetlands lose 50-100% of their native biomass due to purple loosestrife *(Lythrum salicaria)* invasion. The displacement of food supply and loss of nesting habitat results in the matching displacement of many animals, including birds.

— Thompson et al, 1987, cited in *Invasive Plant Strategy for British Columbia*

Reference

Washington State Conservation Commission, 1995. *Salmon Habitat Limiting Factors Final Report: Water Resource Inventory Area 5 Stillaguamish Watershed.* http://www.scc.wa.gov/index2.php?option=com_docman&task=doc_view&gid=1011&Itemid=26

Partners

Canada

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Thank you to the IPCBC Aquatic Advisory Committee, which guided the development of these T.I.P.S.

PLACE YOUR STAMP HERE

REPORT A WEED:
1-888-WEEDSBC

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INVASIVE PLANT COUNCIL OF BC