



## POTENTIAL FRESHWATER AQUATIC INVASIVE SPECIES

There are several AIS that are imported live into Canada and have the potential to cause enormous damage to fisheries if released into the wild.

**Snakehead** – this species which is indigenous to Asia, Malaysia, Indonesia, and Africa has not yet been discovered in Canada’s natural freshwater ecosystems. However, should they find a way into natural freshwater ecosystems, they have the potential to cause enormous damage to recreational and commercial fisheries. Snakeheads can eat practically any small animal or fish they encounter. They can travel across land, live out of water for at least three days and reproduce quickly.

**Swamp eel** – this freshwater species is also imported live into Canada and can have similar destructive effects as snakeheads. Swamp eel is a voracious piscivore (carnivorous animal which lives primarily by eating on fish), but also consumes crayfish, turtles, frogs and wading birds. This AIS may alter the habitat beneath ponds and marshy regions, where they burrow in nests. Swamp eel is capable of living out of water for a considerable length of time. Established populations in the United States have shown a surprising degree of cold water tolerance, as evidenced by them surviving air temperatures below freezing and ice cover over their pond habitat.

**Zebra/Quagga mussels** - these mussels are small bivalve molluscs native to freshwater lakes of the Ponto-Caspian region. It is believed that they were accidentally brought into the Laurentian Great Lakes of North America in the ballast water of vessels arriving from Europe. Zebra/quagga mussels continue to cause ecological and economic damage, proving to be a huge pest, with increasing impacts as this species continues to invade westward in North America.

**Chinese mitten crab** - is the only freshwater crab found in North America and poses a serious threat to freshwater and tidal water ecosystems. Native to Korea and China, the Chinese mitten crab was first discovered on the west coast of California in 1992, indicating that they could possibly migrate into B.C. waters.

While the mitten crab lives in freshwater, it migrates to tidal water to reproduce. They can eat salmon, trout and sturgeon eggs and may threaten successful spawning of these species. They have also been known to damage fish habitat by causing the erosion of river banks.

Chinese mitten crabs could be introduced into Canada accidentally through ballast water or intentionally through the live food fish industry, as mitten crab is considered a delicacy in Asian cuisine. It is important to note that the importation of the Chinese mitten crab is **illegal** as the mitten crab is an intermediate host for the oriental lung fluke and may pose a health risk to humans who consume raw or undercooked mitten crabs.



Snakehead



Zebra mussel

Quagga mussel



Chinese mitten crab

Swamp eel

### PHOTO CREDITS:

Violet tunicate - Heidi Gartner  
Styela clava "clubbed" tunicate - AVC/UPEI Shellfish Health  
Northern pike - Michigan Sea Grant  
Zebra/Quagga mussel - Ron Dermott

**For more information:**  
<http://www.dfo-mpo.gc.ca/>

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# STOP

## THE SPREAD OF AQUATIC INVASIVE SPECIES

How you  
can help stop  
these harmful  
invaders



## WHAT ARE AQUATIC INVASIVE SPECIES?

Aquatic invasive species (AIS) are fish, animal and plant species that have been introduced into an aquatic ecosystem (ocean, lake, river or stream) where they have not been found historically.

Aquatic invasive species have been entering Canadian waters for centuries but never as rapidly as today. Every decade, some 15 AIS establish themselves in our coastal or inland waters where, in the absence of their natural predators, the most aggressive of them spread rapidly. This can, and often does, result in harmful consequences for the native species found in the natural aquatic ecosystem, by radically altering habitat and rendering it inhospitable for native species. AIS have been implicated in vast reductions or the outright extinction of indigenous fish populations across Canada and the resulting devastation of local fisheries.<sup>1</sup>

## WHERE DO AQUATIC INVASIVE SPECIES COME FROM?

Aquatic invasive species enter our ecosystems through many different pathways. A significant pathway is increased global trade and travel which has led to the introduction of many AIS. They enter marine and freshwater by hitchhiking on the bottom of vessels, both commercial and recreational, and are frequently transferred through the discharge of ballast water. They may also hitchhike on infrastructure and equipment such as drilling platforms, dry docks, navigational aids, sea planes, jet skis, fishing gear, snorkelling and scuba gear.

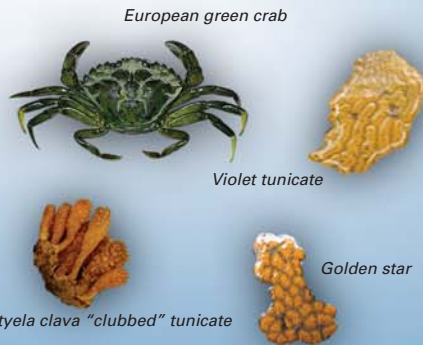
**IF YOU FIND ANY OF THESE MARINE INVASIVE SPECIES, or if you see any activities associated with the intentional or accidental movement of live fish or other aquatic organisms, PLEASE REPORT THEM TO FISHERIES AND OCEANS CANADA by e-mail [AISPACIFIC@dfo-mpo.gc.ca](mailto:AISPACIFIC@dfo-mpo.gc.ca), or by phone at 1-888-356-7525.**

Photos of the species may also be sent to the above e-mail address. Please include the date and exact location (GPS if available). If possible, obtain individual specimens or a small sample and put them in a sealed container with alcohol or freeze in a sealed plastic bag.

AIS are also transferred through the release of live bait or fish from public and private aquariums into natural aquatic ecosystems, or by being accidentally transported with live food fish and shellfish. **Aquatic invasive species have also been introduced illegally by fishers hoping to create new fishing opportunities. This illegal activity often results in widespread ecological damage to native species and habitat.**

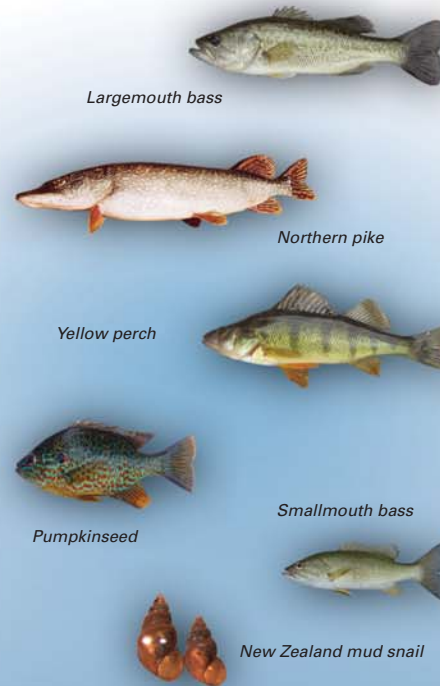
## WHAT HARM CAN AQUATIC INVASIVE SPECIES CAUSE?

- AIS can reduce natural biodiversity and native species, **including species at risk**
- Reduce or destroy ecosystem functions and fish habitat
- Make lakes and rivers unusable for recreational and commercial activities
- Damage commercial and recreational equipment, as well as infrastructure
- Dramatically increase the operating costs of water purification plants, water waste treatment plants, power plants, and dams
- Affect human and native animal health
- Lead to significant economic impacts
- Reduce property values
- Cost millions of dollars to destroy or control, as well as in lost fisheries revenue



**IF YOU FIND ANY OF THESE FRESHWATER INVASIVE SPECIES, or if you see any activities associated with the intentional or accidental movement of live fish and other aquatic organisms, PLEASE REPORT THESE ACTIVITIES TO THE B.C. Ministry of the Environment using the Report All Poachers and Polluters (RAPP) line at 1-877-952-RAPP (7277) or visit <http://www.env.gov.bc.ca/cos/rapp/rapp.html>**

Please include the date and exact location (GPS if available). If possible, take a photograph.



## HOW YOU CAN HELP

Efforts to control or destroy AIS once they become established are often unsuccessful and very costly. **Prevention is the most effective method of dealing with this problem.**

### Ways to prevent the introduction and spread of Aquatic Invasive Species:

- **THOROUGHLY WASH** your boat and all gear, including waders, after use
- **REMOVE ALL** aquatic plants and animals from boats and gear
- **DRAIN WATER** from your boat, trailer, tackle and gear before leaving an area
- **DO NOT RELEASE** aquarium pets, plants or live bait into aquatic ecosystems
- **DO NOT MOVE** live fish and other aquatic organisms from one body of water to another. **IT IS ILLEGAL**



<sup>1</sup> A Canadian Action Plan to Address the Threat of Aquatic Invasive Species – September, 2004