

Resources and examples of aquatic invasive species management

<p>Alberta Invasive Species Council</p>	<p>Fact Sheets The Alberta Invasive Species Council has created fact sheets for each invasive species present in the province.</p> <p>Click here to see a fact sheet on Eurasian Water Milfoil.</p>
<p>Alberta Water Council</p>	<p>Aquatic Invasive Species Stakeholder and Jurisdictional Review Project Team The Alberta Water Council (AWC) formed the Aquatic Invasive Species Stakeholder and Jurisdictional Review Project Team in 2014 to identify gaps and opportunities for improving awareness, communication and coordination of activities by stakeholders in Alberta that are working to prevent and manage the threats of aquatic invasive species.</p> <p>Click here to learn more about the AWC team's work.</p>
<p>City of Toronto</p>	<p>Pre-Chlorination System The City of Toronto has been dealing with Zebra Mussels in their water supply since the early 1990s. To combat the invaders, they created a system to pre-chlorinate their water pipes, which assists in controlling the spread of the invasive species in their infrastructure.</p> <p>Pre-chlorination entails adding chlorine at the intake source of a water system to prevent mussel spores from entering the infrastructure. While research previously suggested that this was only needed in temperatures above 10 degrees Celsius, new evidence shows that the mussels can survive in colder water, adding the necessity to chlorinate all year.</p> <p>While successful in combating the mussels, this program still has a considerable cost. Toronto Water Department staff estimate that setting up the initial pumping infrastructure cost roughly \$3 million per plant. In addition, the department needs to hire divers to scrape off mussels outside the chlorinated area each year.</p> <p>Click here to learn more about Zebra Mussels in the City of Toronto.</p>
<p>Government of Alberta</p>	<p>Mandatory Inspections In response to AUMA advocacy, the province is undergoing mandatory boat inspections to intercept boats at risk of spreading zebra mussels to our water bodies.</p> <p>Click here to learn more about mandatory inspections.</p>

	<p>Educational Outreach Alberta Environment and Parks (AEP) has created an informational website that gives an overview of aquatic invasive species (AIS) in the province.</p> <p>Click here to see the Aquatic Invasive Species website.</p> <p>In addition, AEP has started an informational campaign, called “Clean, Drain, Dry” to spread the importance of cleaning, draining, and drying gear and boats to prevent the spread of AIS, such as zebra or quagga mussels.</p> <p>Click here to find out more about inspections and the Clean, Drain, Dry your boat campaign.</p> <p>24/7 AIS Hotline number: 1-855-336-BOAT (2628).</p> <p>Aquatic Invasive Species Program Alberta Environment and Parks' <i>Aquatic Invasive Species Program</i> tackles AIS through five sectors: Policy and Implementation; Education and Outreach; Monitoring; Inspections; and Response. The program provides annual reports, detailing information on watercraft inspections, response efforts, monitoring, and more.</p> <p>2015 & 2016 Annual Reports on Alberta Aquatic Invasive Species are found on the AEP website.</p> <p>AEP also features information on how to stop the spread of whirling disease in Alberta.</p>
<p>Lake Huron Centre for Coastal Conservation</p>	<p>Zebra Mussels Information Zebra Mussels were first encountered in North America in the great lakes. The Lake Huron Centre for Coastal Conservation has created an informational website providing information on the history of Zebra Mussels in the region, and the species itself. The site also contains information on other invasive species, such as the phragmites australis, which is found in Alberta.</p> <p>Click here to see the Zebra Mussels site, and here for phragmites australis information.</p>
<p>Ontario's Invasive Species Awareness Program</p>	<p>Fact Sheets Ontario's Invasive Species Awareness program, a joint effort of the Ontario federation of Anglers and Hunters and the Ontario Ministry of natural Resources and Forestry, has developed comprehensive fact sheets on aquatic invasive species that communicates information about invaders, the dangers they present, and control measures.</p> <p>Click here to see the fact sheet on Zebra and Quagga Mussels. Click here to see the fact sheet on Eurasian Water Milfoil.</p>

Regional Municipality of Durham	<p>Pre-Chlorination System</p> <p>The Regional Municipality of Durham services a large geographical area, and has five surface water plants drawing from lakes that have been invaded by zebra mussels. To combat the mussels, they have installed pre-chlorination systems that feed chlorine into the water directly at the intake point, which prevents zebra mussel spores from entering the system.</p> <p>Staff at the Durham Water Department report that this system does not utilize a large amount of resources to operate, but that the cost is in the initial work to set up pumps to deliver the chlorine into intake points.</p>
United States Aquatic Nuisance Species Task Force	<p>Protect Your Waters Site</p> <p>The U.S. Fish and Wildlife Service and the U.S. Coast Guard have partnered to sponsor the creation of a “Protect Your Waters” website through the U.S. national Aquatic Species Task Force.</p> <p>The Protect Your Waters site is running a “stop aquatic hitchhikers” campaign that provides information on various aquatic invasive species and efforts that can be taken to combat them.</p> <p>Click here to see the Protect Your Waters site.</p>

Reports and Studies

The following academic resources may be useful for municipalities looking to learn more about invasive species:

[Rothlisberger, W., Chadderton, L., McNulty, J., and Lodge, D. \(2010\). Aquatic Invasive Species Transport via Trailered Boats: What is being moved, who is moving it, and what can be done. *Fisheries*, 35\(3\).](#)

[Keller, R., Lodge, D., Lewis, M., and Shogren, J. \(2009\). Bioeconomics of Invasive Species: Integrating Ecology, Economics, Policy, and Management. *Oxford University Press*, New York.](#)

[Larson, D., Phillips-Mao, L., Quiram, G., Sharpe, L., Stark, R., Sugita, S., and Weiler, A. \(2011\). A framework for sustainable invasive species management: Environmental, social, and economic objectives. *Journal of Environmental Management*, 92\(1\): 14-22.](#)

[Grigorovich, I., Kelly, J., Darling, J., and West, C. \(2008\). The Quagga Mussel Invades the Lake Superior Basin. *Journal of Great Lakes Research*, 34\(2\): 342-350.](#)