



Article Extract for Newsletter (See Images and Full Article on Following pages):

Protect Our Waters from Invaders:

Clean, Drain and Dry Your Boat and Equipment

By Robyn Hooper, CSISS Program Manager

The Shuswap's beautiful lakes, rivers, and wetlands are threatened by an aquatic invader: invasive zebra and quagga mussels!

Aquatic invasive species are a major concern for British Columbia, and the Shuswap is no exception. Aquatic invasive species take many forms and include not only aquatic invasive plants like Eurasian Watermilfoil and Yellow Flag Iris, but invasive animals as well, such as American Bullfrog. Currently the largest threat to BC's freshwater is the Zebra and Quagga Mussel, which has been estimated to cost the province \$43 million dollars annually, if an infestation were to occur.

Zebra and quagga mussels are not currently found in British Columbia, but are found in nearby areas which include the Great Lakes and many U.S. states. Zebra and Quagga mussels are less than 2cm in size, which is much smaller than our native mussels. Zebra and quagga mussels can even live out of water for up to 30 days! Once introduced to a water body they spread rapidly and are impossible to remove.

What are the impacts of Zebra and Quagga Mussels (ZQM)?

In Shuswap, access to clean water makes our communities thrive. Invasive species can negatively affect our community through environmental, economic, and social impacts. An invasive population of mussels can clog or damage any water intake systems and infrastructure (e.g. piping, boats, dams, and irrigation systems), greatly increasing maintenance costs.

Invasive mussels cause severe ecological problems that threaten native biodiversity, including wildlife and fish populations. They produce harmful wastes and deplete important nutrients causing a bottom-up reaction in the food chain, ultimately degrading water quality.

The tourism industry and recreational values in Shuswap are important, and we cannot put the quality of our beaches at risk. A mussel infestation can seriously degrade recreational areas. As the mussel die, they wash up on shore, leaving the sand full of sharp and foul-smelling dead mussels.

What can you do to help?

As a boat or watercraft owner, be sure to “Clean, Drain, and Dry” your boat and equipment before and after launching into a new water body to prevent the spread of any aquatic invasive species. You can also **report** invasive mussels by calling the Report All Poachers and Polluters (RAPP) hotline at 1-877-952-7277.

As **Shuswap waterfront owners**, you can educate yourself and others about invasive species in the Shuswap. As well, you can take action by organizing a community weed pull or restoration events with support from CSISS to protect our waters. On March 16 at 7pm there will be a presentation by CSISS at the Lakeview Centre, hosted by the North Shuswap Community Association in Anglemont [actually, the Garden Club at the Lakeview Centre], and all are welcome to attend.

Learn more about Invasive Mussels at:

<https://www.for.gov.bc.ca/hra/invasive-species/mussels.htm>

Identify and Report Invasive Species in the Columbia Shuswap Region at:

www.columbiashuswapinvasives.org

What is CSISS?

The Columbia Shuswap Invasive Species Society is a non-profit organization dedicated to the prevention, management and reduction of invasive species in the Columbia Shuswap Regional District. CSISS is thankful for the generous support of the Columbia Basin Trust, the Columbia Shuswap Regional District, the Ministry of Forests, Lands and Natural Resource Operations, and the Ministry of Transportation and Infrastructure.

IMAGES for Newsletter /Website :



Figure 1: Zebra and Quagga Mussels are small (less than 2cm) with stripes



Figure 2: How to Prevent Aquatic Hitchhikers with Clean, Drain, and Dry Activities



Figure 3: CSISS Program Assistant Laura Gaster samples Shuswap Lake, looking for invasive zebra and quagga mussels in summer 2015. They have not been found in BC, but have caused devastating impacts on the Eastern provinces and Southern states.

Full Article for Website:

Protect Our Waters from Invaders:

Clean, Drain and Dry Your Boat and Equipment

By Robyn Hooper, CSISS Program Manager

There are a myriad of invasive species that threaten our precious local watersheds: From Eurasian milfoil in the Shuswap; to Northern Pike in the Columbia River; to Knotweed and Yellow Flag Iris in our waterways and gardens; and, most dangerous of all, invasive Zebra and Quagga Mussels.

Aquatic invasive species are a major concern for British Columbia, and the Shuswap is no exception. Aquatic invasive species take many forms and include not only aquatic invasive plants like Eurasian Watermilfoil, but invasive animals as well, such as American Bullfrog. Currently the largest threat to BC's freshwater is the Zebra and Quagga Mussel, which has been estimated to cost the province \$43 million dollars annually, if an infestation were to occur.

What are Zebra and Quagga Mussels (ZQM)?

Zebra and quagga mussels are small freshwater mussels native to Europe, initially introduced into the Great Lakes in the ballast water of a cargo ship, they have spread throughout eastern Canada and the USA, working their way westward. Zebra and quagga mussels start their life cycle as a microscopic free-swimming larvae, called a veliger. They attach themselves to a hard substrate using byssal threads, a characteristic which most native mussels do not have. A second defining characteristic is their small size, zebra quagga mussels can grow up to 2 cm in length, native freshwater mussels grow much larger. There are native freshwater mussels in the Shuswap Lake region, but they are much larger than the zebra and quagga mussels.

Zebra mussels are prolific reproducers and produce up to 40 000 eggs each reproductive cycle, over 1 million eggs in a year. They can be easily spread by "hitchhiking" on boats, gear, and any items that carry water to a new place. These mussels can even live out of water for up to 30 days! Once introduced to a water body they spread rapidly and are impossible to remove.

What are the impacts of Zebra and Quagga Mussels (ZQM)?

In Shuswap, access to clean water makes our communities thrive. Invasive species can negatively affect our community through environmental, economic, and social impacts. An invasive population of mussels can clog or damage any water intake system or infrastructure, including piping, boats, dams, and irrigation systems. The Shuswap could expect to see higher maintenance costs for various industries including: hydropower, municipal water supply,

fishing, industrial, agricultural, tourism and recreational facilities. Economic losses for the province are an estimated \$43 million annually.

Invasive mussels cause severe ecological problems. They produce harmful wastes and deplete important nutrients causing a bottom-up reaction in the food chain, ultimately degrading water quality. By reducing essential resources, mussel infestations threaten native biodiversity including wildlife and fish populations.

The tourism industry in Shuswap is important, and we cannot put the quality of our beaches at risk. A mussel infestation can seriously degrade recreational areas. As the mussel die, they wash up on shore, leaving the sand full of sharp and foul-smelling dead mussels.

Current status of ZQM

Zebra and quagga mussels are not currently found in British Columbia, but are found in nearby areas which include the Great Lakes and many U.S. states. There have been multiple “close calls” for BC’s freshwater. In summer 2015, a boat from Ontario heading to Vancouver was found carrying mussels and stopped at a watercraft inspection station in Kelowna to be decontaminated by conservation officers. The province of BC has invested \$1.3 million towards the prevention of Zebra/Quagga mussels.

What can you do to help?

As a boat or watercraft owner, be sure to “Clean, Drain, and Dry” your boat and associated water equipment before and after launching into a new water body to prevent the spread of any aquatic invasive species.

You can also **report** invasive mussels by calling the Report All Poachers and Polluters (RAPP) hotline at 1-877-952-7277.

As **Shuswap waterfront owners**, you can educate yourself and others about invasive species in the Shuswap, and promote the “Clean Drain Dry” behaviours. As well, you can take action by organizing a community weed pull or restoration events with



Figure 4: How to Prevent Aquatic Hitchhikers with Clean, Drain, and Dry Activities

support from CSISS to protect our waters. On March 16 at 7pm there will be a presentation by CSISS at the Lakeview Centre, hosted by the North Shuswap Community Association in Anglemont, and all are welcome to attend.

Learn more about Invasive Mussels at:

<https://www.for.gov.bc.ca/hra/invasive-species/mussels.htm>

Identify and Report Invasive Species in the Columbia Shuswap Region at:

www.columbiashuswapinvasives.org

What is CSISS?

CSISS has been hard at work educating boaters and recreationalists about “Clean, Drain, Dry” methods to prevent the spread of invasives. As well, CSISS has been researching high priority lakes throughout the Columbia Shuswap Region for aquatic invasive species surveys and monitoring. The goal of this project is to prevent the spread of invasive species, and increase the probability of early detection and rapid response for the potentially new highly invasive species, such as Zebra and Quagga mussels. Other species on our watch-list include Yellow Flag Iris, Purple Loosestrife, Knotweed species (aka False Bamboo), and American Bullfrog.

The Columbia Shuswap Invasive Species Society is a non-profit organization dedicated to the prevention, management and reduction of invasive species in the Columbia Shuswap Regional District. CSISS is thankful for the generous support of the Columbia Basin Trust, the Columbia Shuswap Regional District, the Ministry of Forests, Lands and Natural Resource Operations, and the Ministry of Transportation and Infrastructure.

Identify and Report Invasive Species in the Columbia Shuswap Region at:

www.columbiashuswapinvasives.org



Figure 5: Zebra and Quagga Mussels are small (less than 2cm) with stripes