BC Invasive Mussel Defence Program

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- BC-Program co-funded by Ministry of Forests, Lands and Natural Resources (FLRN), Ministry of Environment (MOE), Ministry of Agriculture (MOA), BC Hydro, Columbia Basin Trust (CBT), Columbia Power Corporation and Fortis BC.

- Highway signage (MOTI) for Clean, Drain and Dry at 24 locations near BC/US and BC/Alberta border crossings.

- Six trained inspection crews (2 seasonal staff/crew) with mobile decontamination units for boating season (May to October 2015) based out of Nelson, Penticton, Cranbrook, Invermere and Valemount.
Zebra and Quagga Mussels

- These freshwater mussels settle on any solid surface and grow in big clusters attached to each other.
- They overgrow and clog water intake pipes of power stations, municipal water supplies and agricultural raw-water intakes.
- Invasive mussels are a major threat contributing to the listing of Rocky Mountain ridged mussel in BC.
- Can survive in slightly brackish water (6-8psu – practical salinity units).
Source USGS – Nonindigenous Aquatic Species
Distinguishing Features Zebra and Quagga Mussels

1. **Small** only up to 3cm / 1 inch
2. Form **dense clumps attached to hard surfaces**
3. **Propeller blade shaped**
4. Zebra stripes often but not always present
5. Tolerate **high water flows** <2m/s
Native Mussels vs. Zebra and Quagga Mussels
BC’s Inspection Crews Priorities 2015

- **Roadside Inspections** – target location and times with highest number of boaters, preferably out of Province, identify suitable inspection locations for permanent stations.

- **Education/Outreach** of the boating community to follow **Clean Drain and Dry** their boats to prevent AIS spread.

- **Collaboration**— other government agencies, Conservation Officers, Commercial Vehicle Safety and Enforcement (CVSE), Canada Border Services Agency (CBSA), Fisheries Officers, Park Rangers, Natural Resource Officers.
How to identify High Risk boats?

WHERE WAS THE BOAT IN THE WATER IN THE LAST 30 DAYS?

- Within British Columbia
  - Inform about Clean Drain and Dry -> Release
- In a non-contaminated province/state, see map
  - Inform about Clean Drain and Dry -> Release
- In a contaminated province/state, see map

HOW LONG HAS THE BOAT BEEN OUT OF WATER?

- More than 30 days
  - Inspect - mussels present, wet areas?
    - YES -> Inform about Clean Drain and Dry -> Release
    - NO
      - 30 days or less
        - Inspect - mussels present, wet areas?
          - YES
            - Order decontamination -> Release
          - NO
            - Order decontamination -> Release
        - Order decontamination -> quarantine for 30 days -> Re-Inspect, mussels found?
          - YES
            - Order decontamination -> Release
          - NO
            - Release

Release

Decontamination -> Release
Watercraft Inspection

See the 100th Meridian Initiative website inspection and decontamination video
http://www.youtube.com/watch?v=JX8TmwTx-tU

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<td>For use on High Risk Trailered Watercraft</td>
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- **Location/Time:** ______________________  ______________________  ________________
- **Vessel Registration # (CL#: **____________________
- **Vehicle Tag #: **____________________  **Trailer Tag #: **____________________

**Reason for High Risk Inspection:**
- [ ] Out of state registered or used out of state within last 30 days
- [ ] Been in infected waters within last 30 days: ______________________ (Name/State of water). Days since is infected: __________
- [ ] Leaving infected waters after more than 24 hours at an infested reservoir
- [ ] Big/Complex boat  [ ] Standing water present  [ ] Vol Request  [ ] Dirty/Crusty/Slimy below waterline
- [ ] Entering/Leaving marina  [ ] Other: ______________________

**Vessel Inspection:**

- **Overall look and feel of the hull (check box):**
  - [ ] Clean/Smooth  [ ] Burnt/Sandpaper feel  [ ] Other: ______________________
  - *(If burnt/sandpaper feel, then look at bumps with magnifying glass to see if masses)*

- **Vessel Exterior Checked:**
  - [ ] Entire hull  [ ] Trim tabs (top and bot.)  [ ] Through hull fittings  [ ] Sailboats:
    - [ ] Centerboard box  [ ] Rudders and transom
  - [ ] Transom
  - [ ] Anchors and ropes
  - [ ] Depth sounders
  - [ ] Water intake/outlets
  - [ ] Water holding pockets
  - [ ] Recessed bolts
  - [ ] Motor well
  - [ ] Cavitation plate(s)
  - [ ] Lights
  - [ ] Fittings

- **Motor Checked:**
  - [ ] Exterior housing
  - [ ] Propeller and assembly
  - [ ] Propeller shaft
  - [ ] Prop. shaft supports
  - [ ] Propeller guards
  - [ ] Rudders
  - [ ] Propulsion system
  - [ ] Lower unit
  - [ ] Gearbox area
  - [ ] Boat name
  - [ ] License plate
  - [ ] Trailer lights
  - [ ] Trailer wiring
  - [ ] Trailer axles
  - [ ] Trailer springs
  - [ ] Fenders
  - [ ] Pockets and hollows
  - [ ] Wheels and tires
  - [ ] Ranges

- **Interior/Equipment Checked:**
  - [ ] Bilge and live wells
  - [ ] Internal ballast tanks
  - [ ] PFDs
  - [ ] Float cushions/belts
  - [ ] Rope and equipment lockers
  - [ ] Anchors
  - [ ] Waterfowl decoys
  - [ ] Nets
  - [ ] Water skis and ropes
  - [ ] Other equipment

- **Vessel Thoroughly Drained:**
  - [ ] Bilge plug or pump
  - [ ] Bilge and live wells
  - [ ] Drain lower unit on outboard
  - [ ] Drain water cooled generators, swamp coolers with plugs
  - [ ] Large boats, ask driver to activate bilge pump.
  - [ ] If entering a reservoir with any standing water and from infected or out-of-state waters in last 30 days, send to decontamination
  - [ ] If leaving a reservoir with standing water, require draining. If vessel cannot be drained and has more than 5 gallons, send to decontamination. For lesser volumes of water, assess risk to determine whether to decontaminate.
  - [ ] If leaving, drain and educate about Clean/Drain/Dry.
  - [ ] Closeout (if nothing is found)
    - [ ] Ask owner to replace bilge or other plugs  [ ] Yell "stand clear"  [ ] Thank them for cleaning/draining/drying

- **Vessel Inspection Findings:**
  - [ ] Did not find any identified or suspected ANS species
  - [ ] Found: [ ] Large volume of water  [ ] Suspected ANS in water  [ ] Mussels  [ ] Vegetation
  - [ ] Other: ______________________  [ ] Location(s): ______________________

**Inspection Completed in Accordance with State Procedures:**
- Inspected by (print & name): ______________________
- Inspected by (signature): ______________________
Inspection Crew Data

- As of September 20th over 3,800 watercraft inspected across all 6 inspection crews.
- 64 were high risk watercraft (coming from an infested province or state).
- Inspection crews will be operational until October 31st 2015.
2015 Mussel Veliger Monitoring

- Expanded monitoring this year with plankton tow samples being collected by regional committees and ministry staff in lakes across the Lower Mainland, Vancouver Island, Okanagan, East and West Kootenays, Columbia-Shushwap and Cariboo regions.
Intentional illegal introductions – Yellow perch and Smallmouth bass
Eradication of Yellow Perch in Central BC

- Introductions into small lakes in the Thompson drainage
- Spread into major salmon rearing systems like the Shuswap and Adams Lake are a major concern
- Eradication conducted using plant based fish poison (Rotenone)
- Project cost over one million $ over 4 years
- All nine lakes completed, ongoing monitoring in collaboration with DFO
Illegal Stocking Time Line

1996 - Gardom Lake (Yellow Perch, Smallmouth)
      Little Skmanana Lake (Yellow Perch)
      Skmana Lake (Yellow Perch)

1998 - Phillips Lake (Yellow Perch, Sunfish, Largemouth, Smallmouth)

1999 - Nellies Lake (Yellow Perch)

2005 - Forest Lake (Yellow Perch)
      Miller Lake (Yellow Perch)
      Skimikin Lake (Yellow Perch, Sunfish)
      Fleming Lake (Yellow Perch, Sunfish)
Intentional illegal introduction - Smallmouth bass Beaver Creek

- Upstream barrier work is completed, closing 60% of watershed to upstream dispersal
- Bass population still at a high level
- Downstream barrier is currently being assessed
- Treatment is estimated to cost $5 Million
Northern pike

- Northern pike was removed from Haha Lake in 2006 through intensive gill netting, follow up in 2011
- Northern pike is getting closer through the Pend d’Oreille system
- Proposal to test spring gill netting in the Waneta and Seven Mile Reservoir to determine the spread
- Exploring eDNA as a detection method
Summary

- Provincial Invasive Mussel Defence Program has had a busy year.
- Inspection crews will remain operational until the end of October.
- Veliger sample analysis is underway and will continue into the fall/winter as samples continue to be collected.
- Northern pike research being conducted in the Columbia River system.
Questions?

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