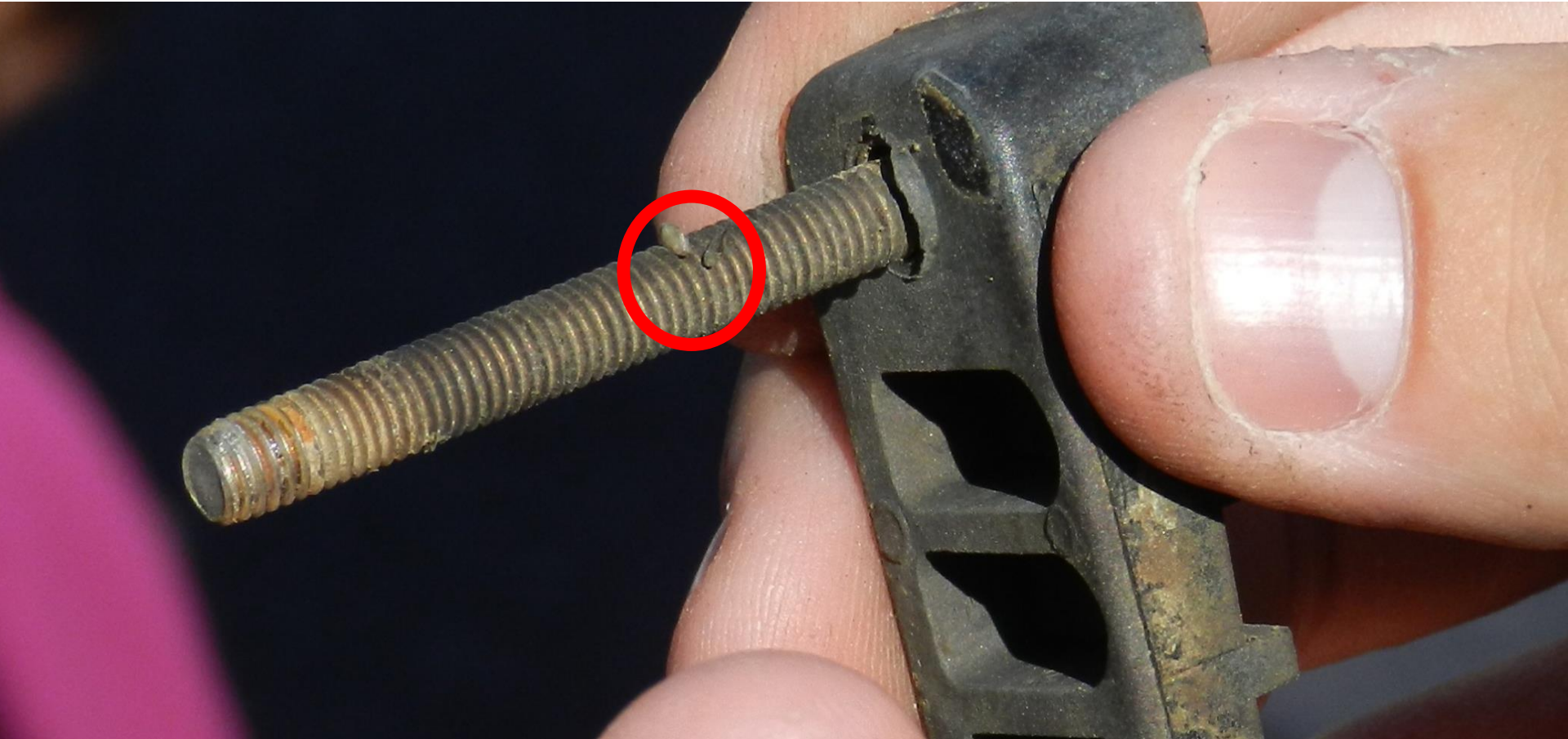




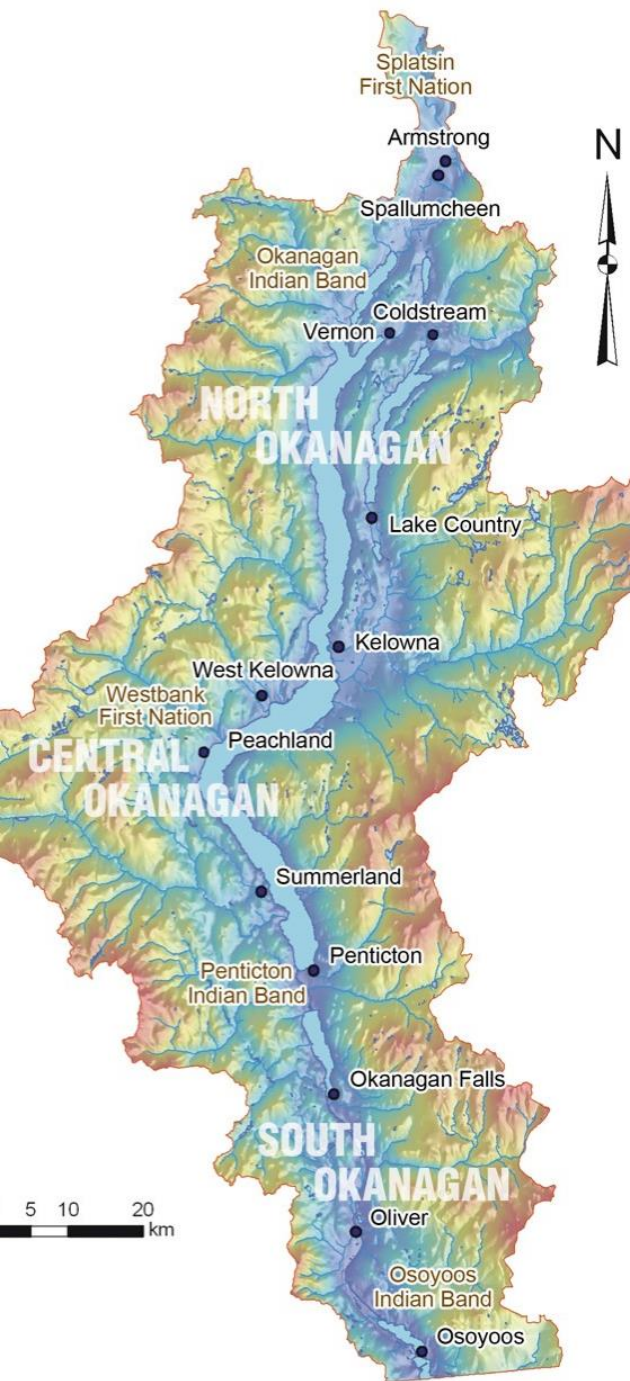
**DON'T MOVE A  
MUSSEL**  
DONTMOVEAMUSSEL.CA



**James Littley**  
**Okanagan Basin Water Board**



*Okanagan Basin*  
WATER BOARD



# Actions to Prevent Invasive Mussels

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- The Okanagan Basin Water Board's mission is to provide leadership to protect and enhance quality of life in the Okanagan Basin through sustainable water management.
- Define water problems and priorities, economic feasibility of solutions, responsibility, necessary legislation and required action.



**DON'T MOVE A MUSSEL**  
DONTMOVEAMUSSEL.CA

## ZEBRA MUSSELS ALTER THEIR HABITAT BY REMOVING ALGAE

SUNLIGHT  
PENETRATES  
DEEPER

WATER CLARITY  
DRAMATICALLY  
INCREASES

AQUATIC  
PLANTS MOVE  
TO DEEPER  
WATER

THE WARMER  
TOP LAYER OF  
WATER GROWS  
DEEPER

THE COLDER  
BOTTOM LAYER  
OF WATER DROPS

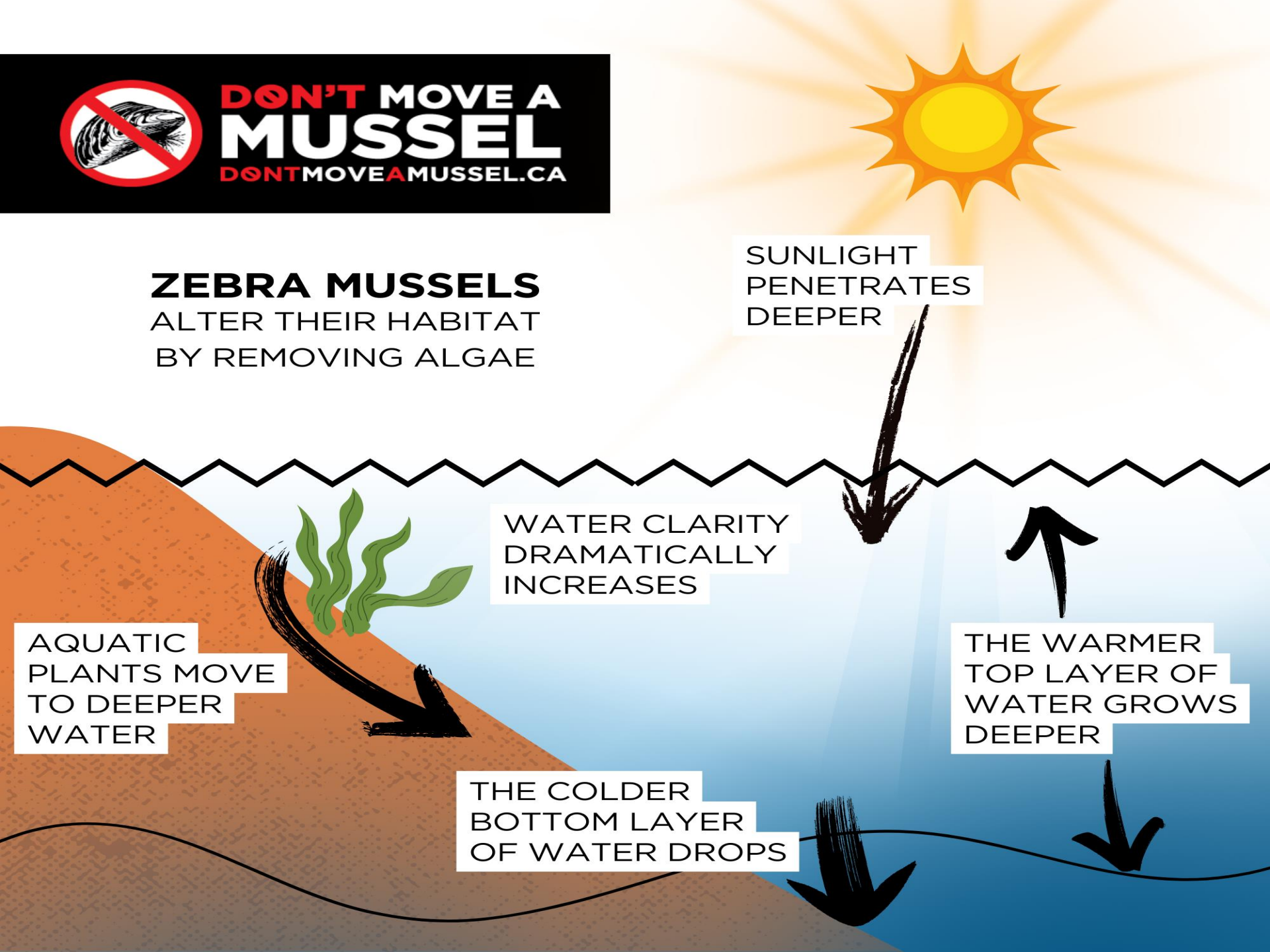




Photo credit: Timm Bruch, Global News, May 23, 2018  
<https://globalnews.ca/news/4223683/growing-invasion-of-lake-winnipeg-evident-as-countless-shells-wash-ashore/>



Photo Credit my2fish: a blog about sunfish sailing:  
<https://my2fish.wordpress.com/tag/power/>



- **Photo Credit Chris Roxburgh. Car in 20 feet of water in Great Lakes, covered in quagga mussels**

Water pump for public utility in Texas









New

2 Months

4 Months

6 Months

Quagga Mussels on ABS Pipe from Lake Mead, NV



[https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.usbr.gov%2Fmussels%2F&psig=AOvVaw25j3aJrCsbMGuPoU3aD5gr&ust=1706467267785000&source=images&cd=vfe&opi=89978449&ved=0CBMQjRxqGAoTClighI2c\\_oMDFQAAAAAdAAAAABCgAQ](https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.usbr.gov%2Fmussels%2F&psig=AOvVaw25j3aJrCsbMGuPoU3aD5gr&ust=1706467267785000&source=images&cd=vfe&opi=89978449&ved=0CBMQjRxqGAoTClighI2c_oMDFQAAAAAdAAAAABCgAQ)



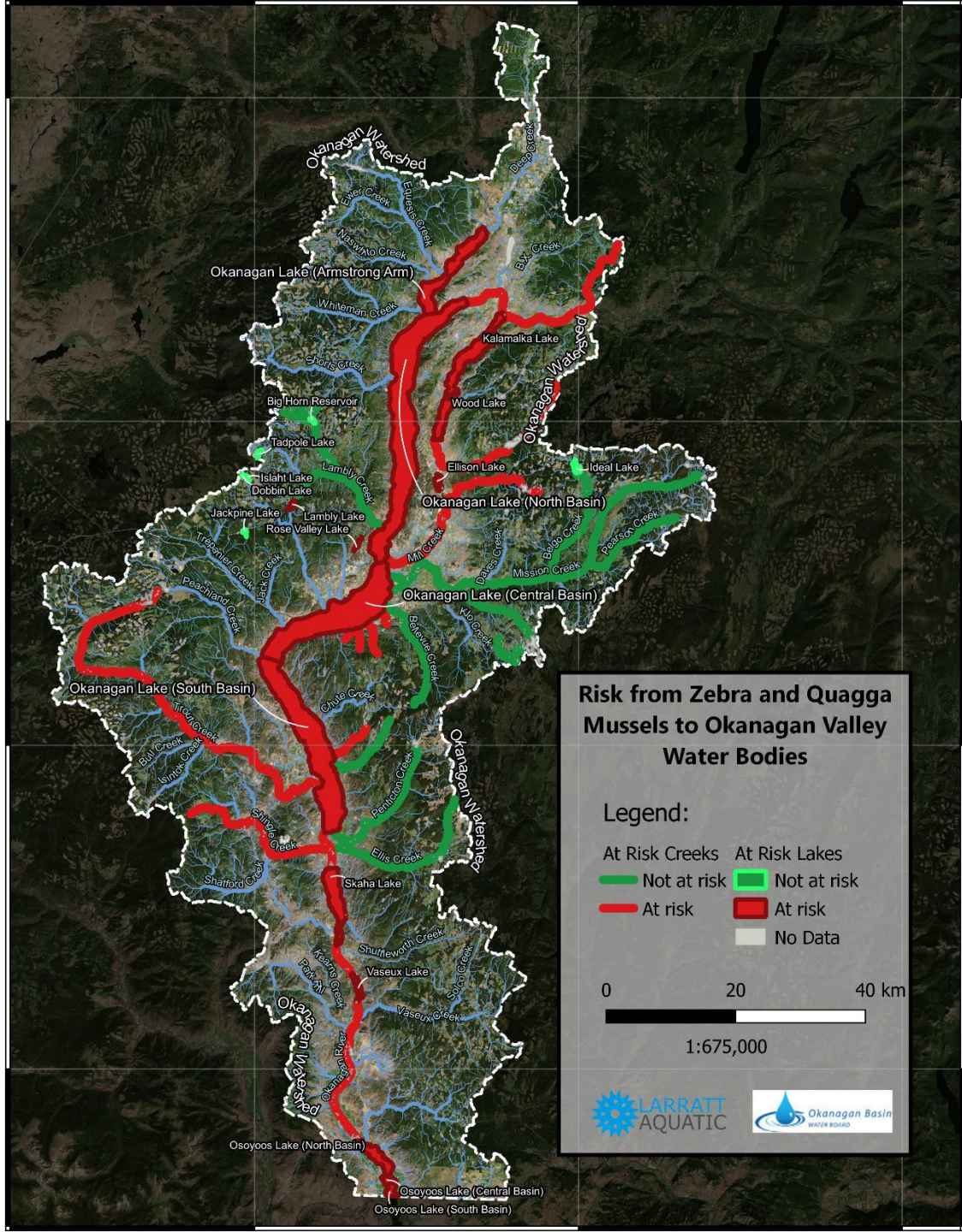
Photo credit Damon McCormick, Common Coast Research and Conservation  
<https://www.mprnews.org/story/2013/03/11/invasive-species-may-be-key-to-understanding-death-of-hundreds-of-loons>



# Economic Losses

- \$64 million to \$129 Million per year
  - Up to \$92.5 million for infrastructure
  - Up to \$8.1 million for extra maintenance on boats and marinas
  - Up to \$12.6 million in lost profits and revenue from tourism
  - \$30.2 million annualized loss in property value and lost property taxes.
- **Does not include the ecosystem effects or loss of fish**





Okanagan Watershed

Okanagan Lake (Armstrong Arm)

Okanagan Watershed

Okanagan Lake (North Basin)

Okanagan Lake (Central Basin)

Okanagan Lake (South Basin)

Okanagan Watershed

Okanagan Watershed

Osoyoos Lake (North Basin)

Osoyoos Lake (Central Basin)

Osoyoos Lake (South Basin)

Evans Creek

Lester Creek

Nasipato Creek

Whiteman Creek

Chorle Creek

Big Horn Reservoir

Tadpole Lake

Islahit Lake

Dobbin Lake

Jackpine Lake

Rose Valley Lake

Tribonian Creek

Peachland Creek

Jack Creek

Tring Creek

Bull Creek

Isimor Creek

Shapiro Creek

Shattford Creek

Skaha Lake

Shurtlewath Creek

Vaseux Lake

Vaseux Creek

Keenon Creek

Parx M

Okanagan River

Okanagan River

Okanagan River

Okanagan River

Okanagan River

Brady Creek

BY Creek

Kalamalka Lake

Wood Lake

Ellison Lake

Ellison Lake

Ellison Lake

Mn Creek

Diara Creek

Kla Creek

Bathurst Creek

Chula Creek

Penitence Creek

Elle Creek

Skaha Lake

Shurtlewath Creek

Vaseux Lake

Vaseux Creek

Keenon Creek

Parx M

Okanagan River

Okanagan River

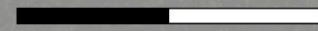
Okanagan River

**Risk from Zebra and Quagga Mussels to Okanagan Valley Water Bodies**

**Legend:**

- At Risk Creeks
- At Risk Lakes
- Not at risk
- Not at risk
- At risk
- At risk
- No Data

0 20 40 km

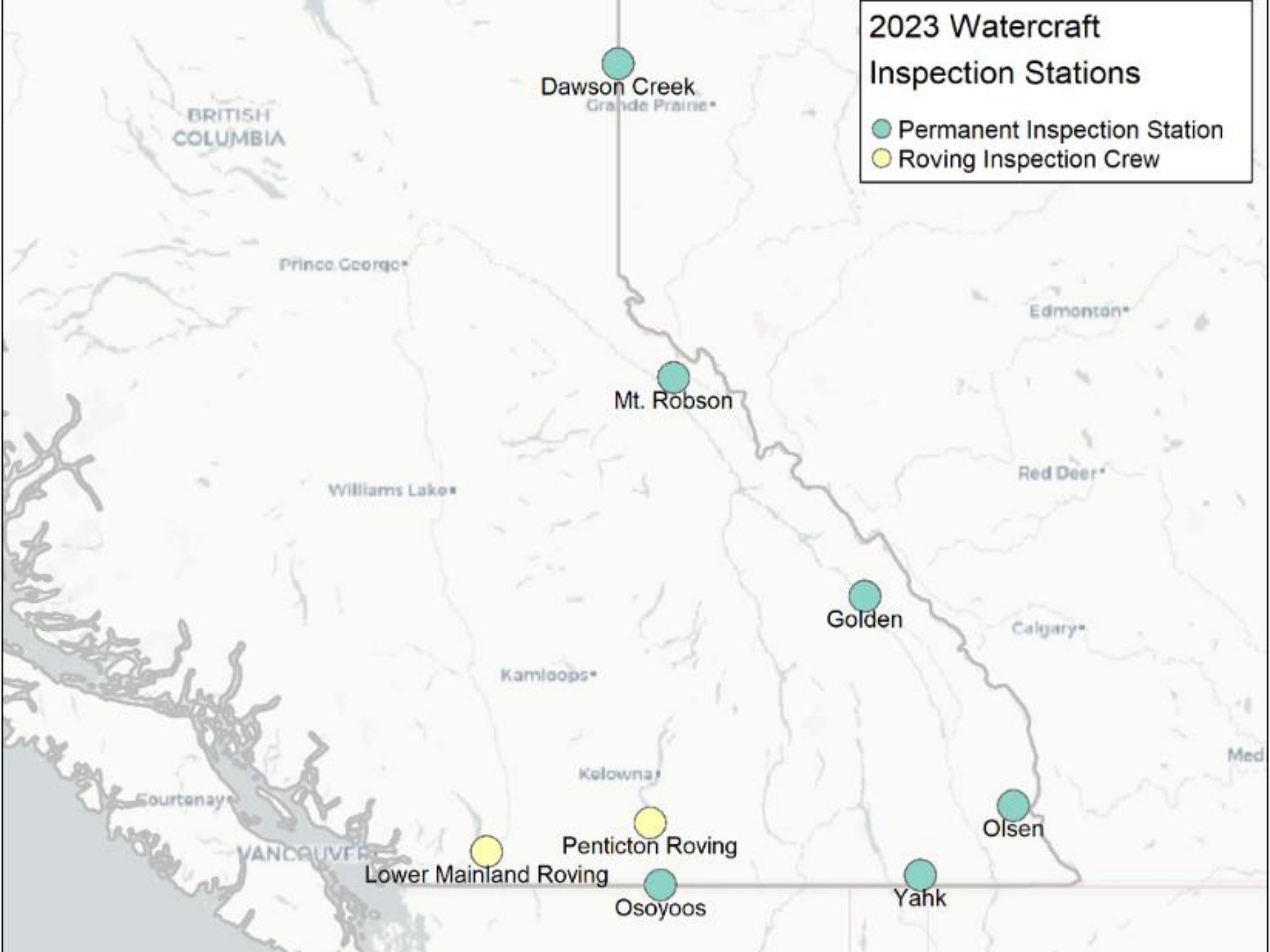


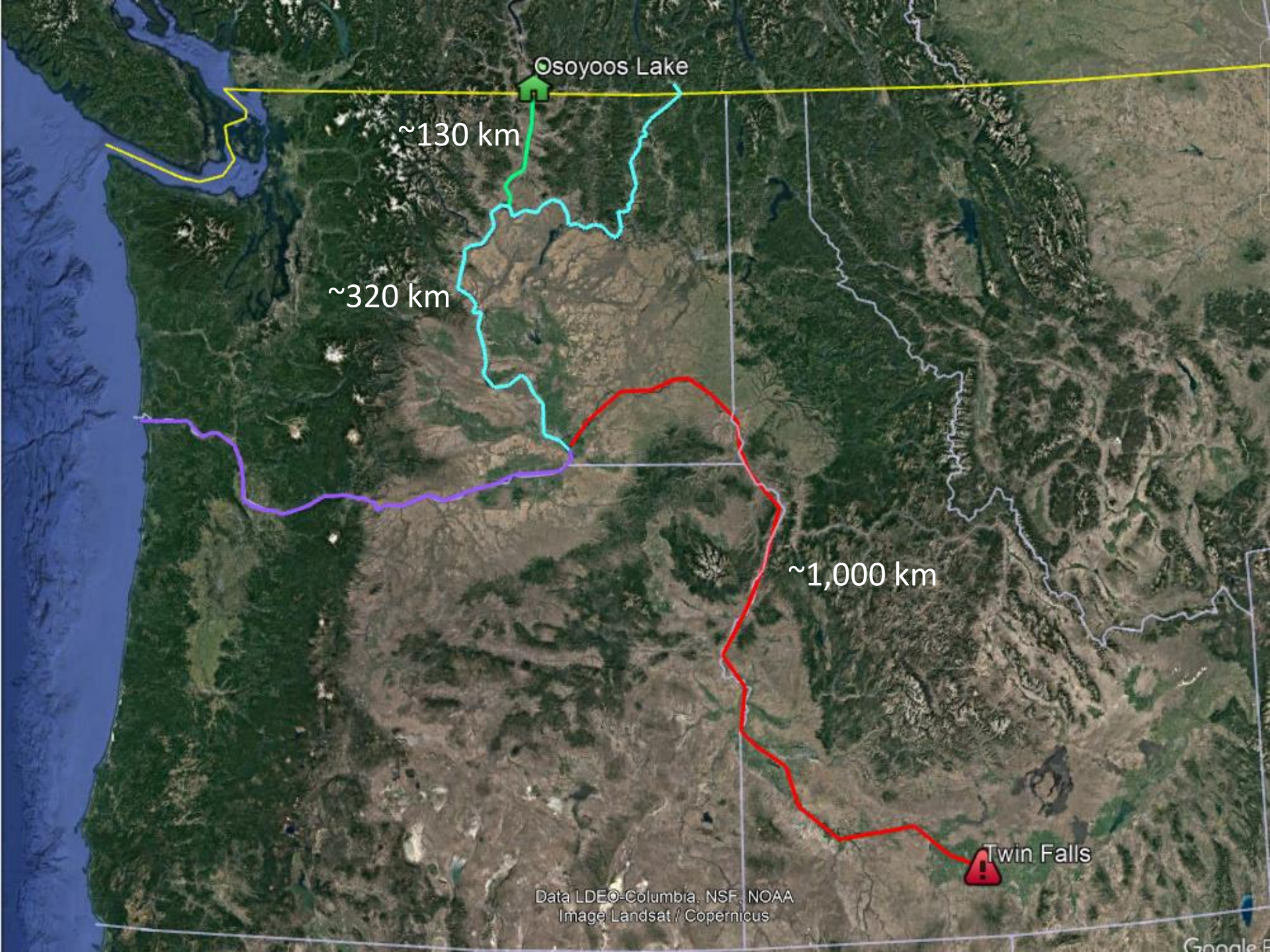
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### 2023 Watercraft Inspection Stations

- Permanent Inspection Station
- Roving Inspection Crew





Osoyoos Lake

~130 km

~320 km

~1,000 km

Twin Falls

Data LDEO-Columbia, NSF, NOAA  
Image Landsat / Copernicus

Google Earth





# Quagga Mussel Veliger presence September 27, 2023

Centennial Park

Pillar Falls

Shoshone Falls

## Legend

Number of Veligers



## Idaho Rapid Response

### Chelated Copper

- killed mussels (including native mussels)
- killed other invertebrates
- killed fish
- killed plants
- killed algae
- killed amphibians



116,351 L or 3.86 times the volume of this tanker trailer



CUSTOM WELD

# Gaps in prevention B.C.

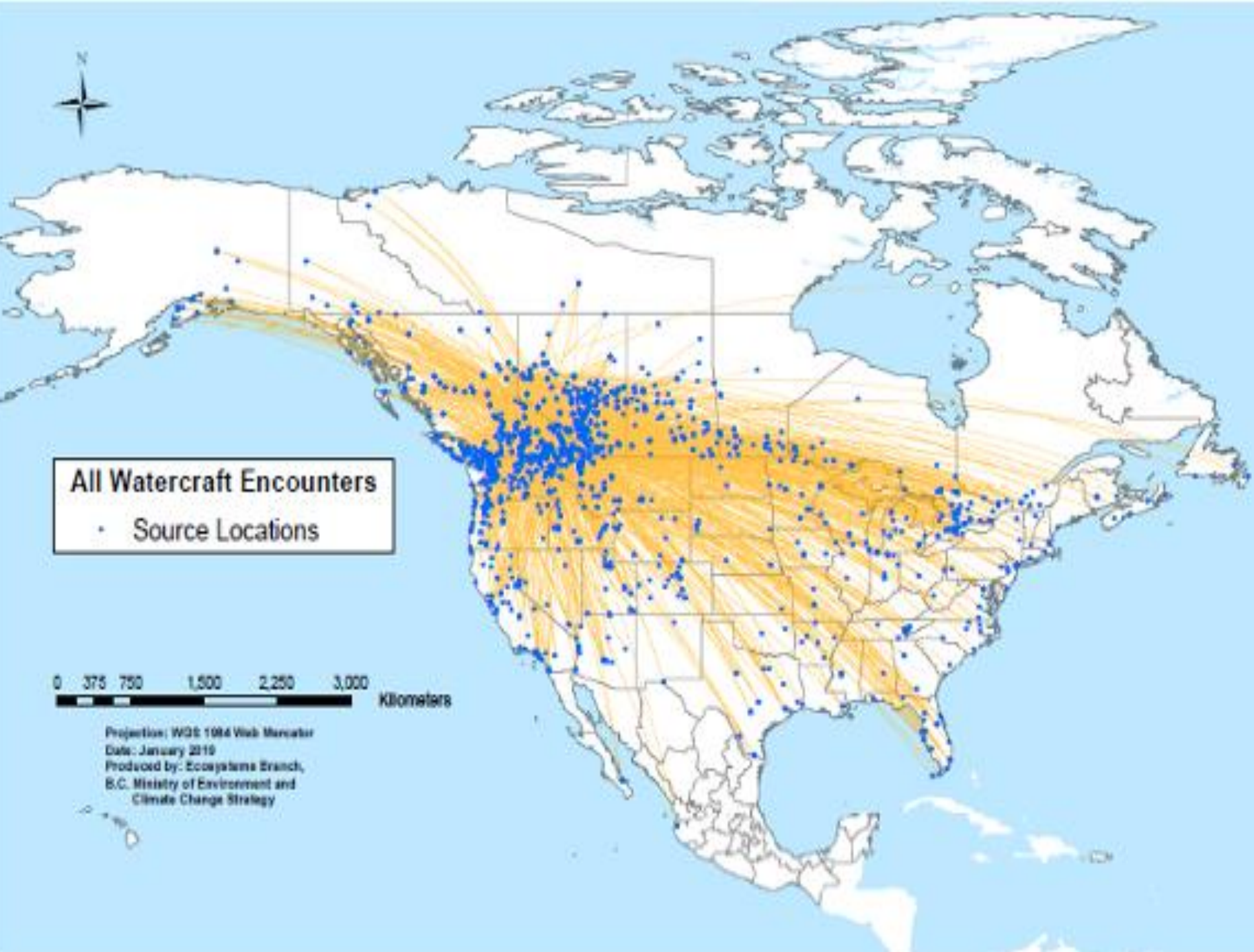
- Inspection required ONLY if driving past an open inspection station
- No requirement to remove drain plug from boat when out of water
- B.C. inspection budget, staffing shortage (\$3.3 million in 2023)
- B.C. relies on a “perimeter defence” – no longer reliable
- No regional plans in place for when a detection occurs
- CBSA inspections not consistent at all crossings





## Immediate Action

OBWB is calling for a temporary moratorium on out-of-province boats until the full status of the infestation of the Columbia Basin is assessed or until every boat coming into B.C. is required to be inspected.



### All Watercraft Encounters

- Source Locations

0 375 750 1,500 2,250 3,000 Kilometers

Projection: WGS 1984 Web Mercator  
Date: January 2019  
Produced by: Ecosystems Branch,  
B.C. Ministry of Environment and  
Climate Change Strategy

# Calls to Action - Province

Temporary out of province boat ban

Introduce pull-the-plug legislation

Commit **\$4 million**/year indexed to inflation for 10 years

Enhance funding and recruiting for inspections

Update Early Detection, Rapid Response Plan

Create and lead regional planning process

Promote vulnerability assessments



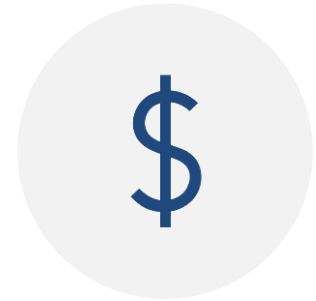
# Calls to Action - Federal



IMMEDIATE DIRECTION TO  
BORDER AGENTS FROM  
SASKATCHEWAN WEST TO  
INSPECT ALL WATERCRAFT



SUPPORT TEMPORARY  
BOAT BAN FROM THE  
PROVINCE



COMMIT TO MATCHING  
PROVINCIAL FUNDING FOR  
INVASIVE MUSSEL  
INSPECTION PROGRAMS  
THROUGHOUT THE WEST.

## Current Actions

Calls for Action from senior  
government

Don't Move a Mussel

Infrastructure Vulnerability  
Assessment Guide

Working Group



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WATER BOARD