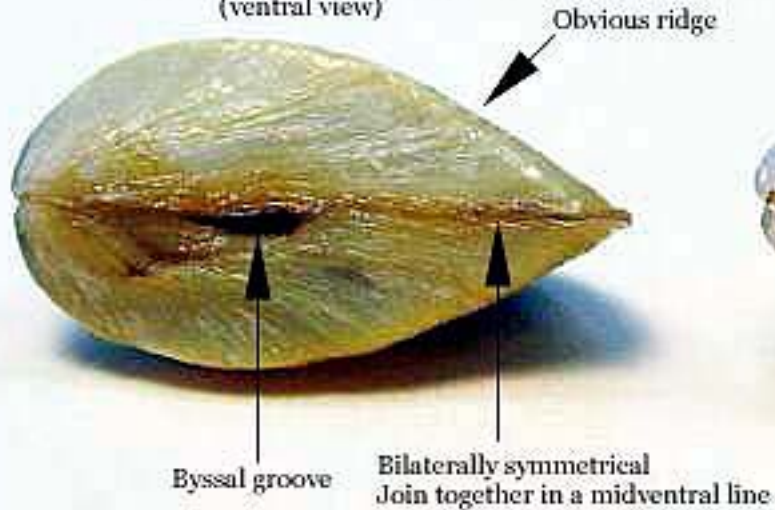


Aquatic Invaders

Zebra & Quagga Mussels

Presented by o6oBIO LLC – Producers of The Dock Disk Mussel Repellent

Dreissena polymorpha
(ventral view)



Dreissena bugensis
(ventral view)



Photo by Myriah Richerson

Dreissena polymorpha

(Actual size is 15 mm)



Sits flat on ventral side

Triangular in shape

Color patterns vary

Dreissena bugensis

(Actual size is 20 mm)



Topples over; will not sit flat on ventral side

Rounded in shape

Usually have dark concentric rings on shell

Paler in color near the hinge

Photo by Myriah Richerson





Crayfish covered with zebra mussels.









Where Did They Come From?

- Originally native to the lakes of southern Russia and Ukraine, Black Sea and Caspian Sea.
- Introduced to the USA in the early 1980's – Hudson River and the Great Lakes

WHY SHOULD YOU CARE

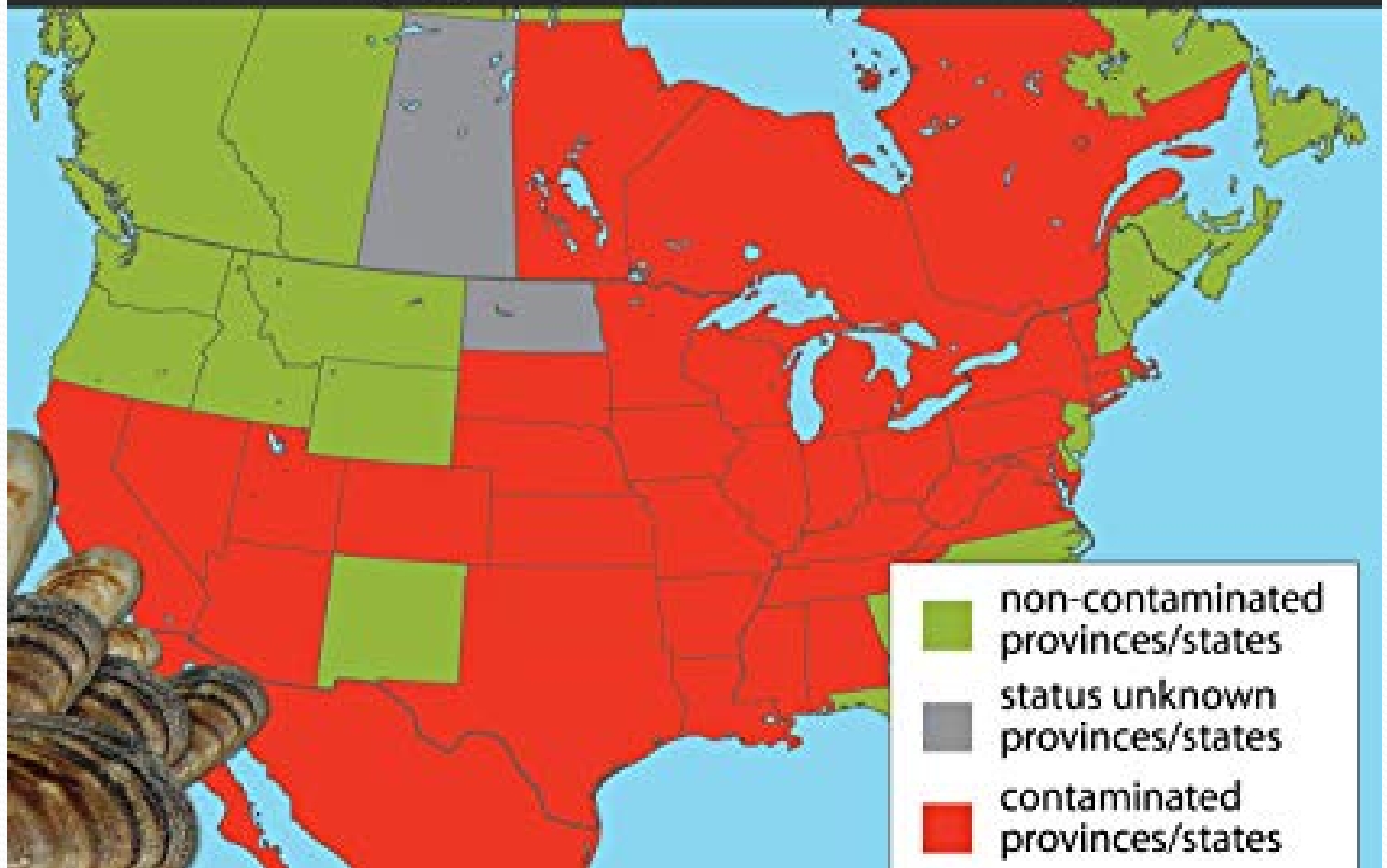
BECAUSE THEY ARE SPREADING FAST AND COSTING ALL OF
US A LOT OF MONEY

\$



Zebra and Quagga Mussel Sightings and Distribution

Dreissena polymorpha and *D. rostriformis bugensis*



What Are They Costing Us?

Sector	Annual Costs
Agriculture – Irrigation	\$14,800,000
Municipal Water Supplies	\$9,251,608
Recreational Boating	\$12,385,962

COST

- In 2018, the Colorado General Assembly approved a bill that requires those who operate motorboats and sailboats on waters of the state to purchase an ANS stamp annually. The cost of the stamp for Colorado residents is \$25. For boaters coming to Colorado from other states or provinces, the stamp will cost \$50.

COST

- Idaho is spending \$3 million annually to attempt to keep the mussels out of the state
- \$350 million spent in Texas on a pipeline to get water to the Dallas metro area - bypassing bodies of water with mussels
- Montana approved an additional \$6 million to fund inspection and education

CANADA

- Managing the impacts of zebra mussels in Ontario is estimated to be about \$75 to \$91 million per year; that includes funding for education, cleaning, maintenance of equipment, around zebra mussels
- Canada, in total, the price tag rises to about \$7 billion
- The annual cost on the Great Lakes to control the zebra mussels in water intake pipes alone is \$250 million and the total cost tops more than \$500 million.

POWER INDUSTRY

- \$60 million per year
- Maintenance of pipes clogged with zebra mussels costs the power industry up to **\$60 million** per year and temporary shutdowns due to insufficient water flow can cost over \$5,000 per hour. The total cost to the United States of the zebra mussel invasion is estimated at **\$3.1 billion** over the next ten years.

[Case Study: Zebra Mussel - State Department \(state.gov\)](#)

<https://2001-2009.state.gov/g/oes/ocns/inv/cs/2304.htm>

Home Owners

In parts of Minnesota
– Home values have
dropped by as much
as $\frac{1}{3}$

WHAT TO DO??

A close-up photograph of a large number of dark blue mussels, likely Littorina saxatilis, covering the entire frame. The mussels are densely packed, showing their characteristic dark blue-black shells with some lighter, yellowish-brown spots. Overlaid on this background is the text "Don't Move A Mussel!" in a large, bold, white sans-serif font, centered horizontally and vertically.

**Don't
Move A
Mussel!**



DON'T MOVE A MUSSEL



Quagga Mussels Have Invaded Arizona

Before leaving any lake, please:

- **BRAIN** the water from the boat, livewell and the lower unit
- **CLEAN** the hull and remove all plant and animal material
- **DRY** the boat and **INSPECT** all exposed surfaces

After you visit a lake or other body of water, the Arizona Game and Fish Department asks you to please wait five days before launching your watercraft someplace else. This five-day waiting period will aid tremendously in killing those hidden hitchhikers on your boat, such as the microscopic quagga larvae.

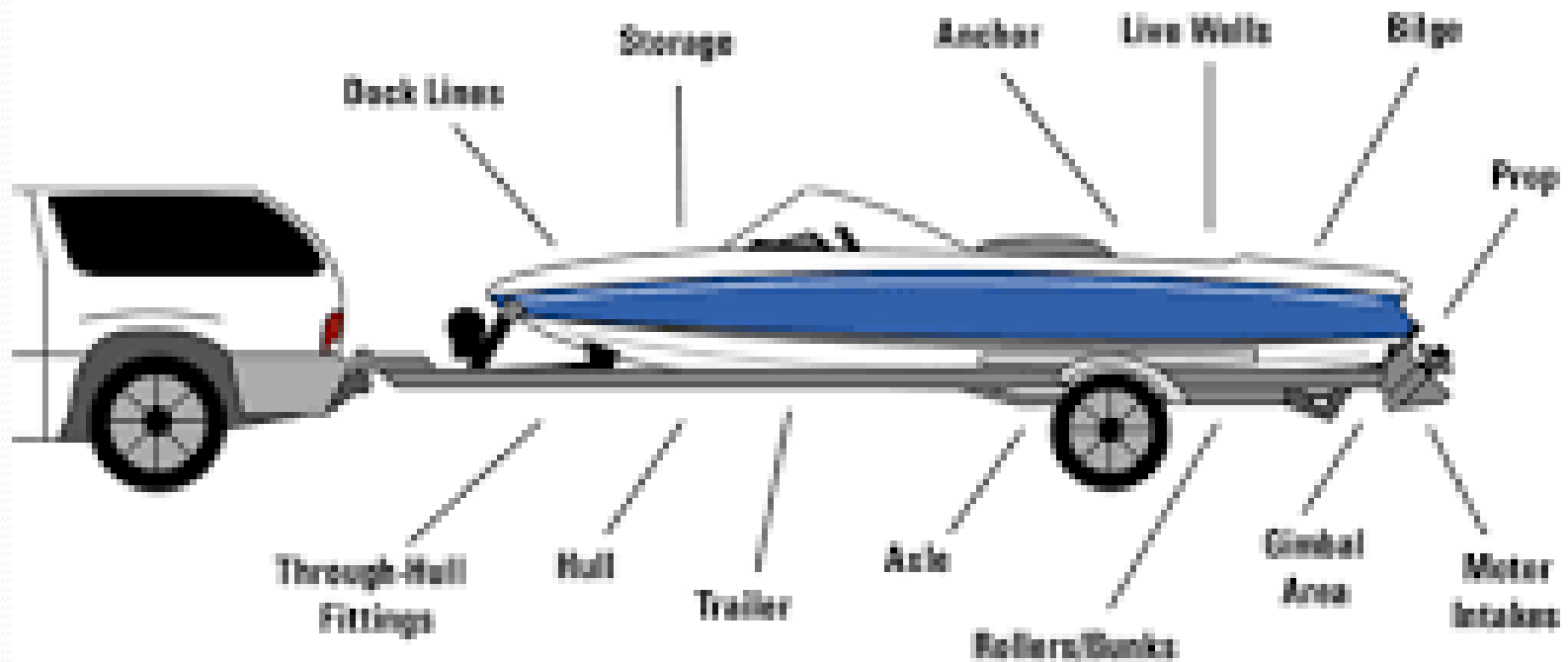
Protect Your Boat | Protect The Environment



STOP AQUATIC
HITCHHIKERS!

For more information visit www.azgfd.gov/mussels
Arizona Game and Fish Department

Before launching and before leaving... **Inspect everything!**





**CLEAN
DRAIN
DRY**

PULL THE PLUG

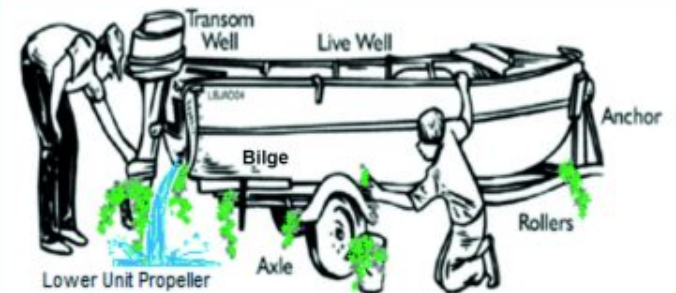
on aquatic hitchhikers!

Before leaving any boat launch area:

CLEAN all mud, plants, animals, and debris off your boat, trailer, and equipment and dispose away from the waterbody where it won't wash back into the water.

DRAIN the boat motor, live wells, bait wells, ballast bags and tanks, and bilge areas away from the waterbody where it won't flow directly back into the water - avoid draining while on the ramp incline.*
(Commercial Enterprises & Emergency Response Vehicles: See special exemptions below.)

DRY anything that came in contact with the water. Rinse and towel-dry all equipment or allow for 5 days drying time.



Canoes, Kayaks and Paddleboards:
Clean, Drain, and Dry these, too!

For more information:
NH LAKES
www.nhlakes.org
info@nhlakes.org 603.226.0299

NEW STATE LAW EFFECTIVE JANUARY 1, 2017

When transporting boats between waterbodies:

- ALL hitchhiking fragments of vegetation and animals must be removed before leaving the launch area.
- ALL drain plugs must be REMOVED or in the OPEN position.

***SPECIAL EXEMPTIONS:** Commercial enterprises transporting boats for off-site storage, maintenance, or repairs, and emergency response vehicles and equipment DO NOT need to be drained before leaving the launch area but DO NEED to be drained BEFORE being launched into another waterbody.

(NH RSA 487:16-d)







Mussel Repellent



The Dock Disk
060Bio.com

Invasive Mussel Defense
Made in the USA US Patent #99271758

The Dock Disk – Invasive Mussel Defense

- **Eco friendly pesticide device which repels Quagga and zebra mussels**
- **Protects your investment by creating a mussel free zone**
- **Reduces maintenance and repair costs**
- **Does not require an energy source**



MUSSEL REPELLENT



The Dock Disk
060Bio.com

Invasive Mussel Defense
Made in the USA US Patent #9827758



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