

# The Costs of Invasive Intruders!

## Who are they?

Zebra mussels (*Dreissena polymorpha*) and quagga mussels (*Dreissena rostriformis bugensis*) are freshwater mussels that are invasive in the United States.

## Where do they come from?

Zebra mussels are native to the Black, Caspian and Aral Seas in Eastern Europe and Western Asia and quagga mussels are indigenous to Ukraine. Zebra and quagga mussels were discovered in the United States in the 1980s in the Great Lakes. They were likely introduced from the discharge of ballast water from oceanic cargo ships. Since their introduction, the mussels have spread rapidly across the U.S. by connected water systems and recreational boating.

## What can they do?

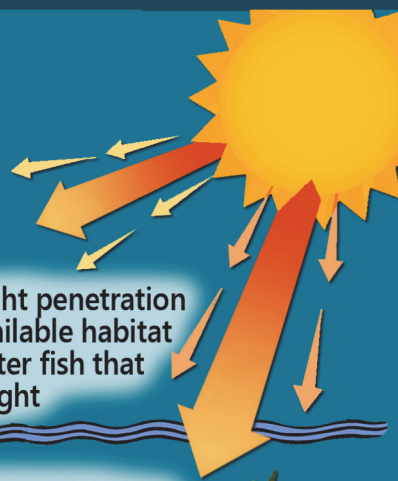
Zebra and quagga mussels have significant economic and ecological impacts in the United States. Due to their ability to attach to hard surfaces, mussels are able to clog water supply pipes of hydro and nuclear power plants becoming a threat to functionality and safety of power facilities.



## Ecological Impacts:



Invasive intruders move in & alter aquatic systems & threaten the diversity & abundance of native species



Increased light penetration reducing available habitat for deep-water fish that prefer low-light



Harmful algal blooms which can cause significant economic costs to human health, commercial fisheries, tourism, & resource management programs



"Bye-Bye!"



Significant reductions (up to 87%) in planktonic biomass negatively impacts a primary source of food for higher-order organisms



Physically alter the substrate & reallocate resources & greater potential for cyanobacteria

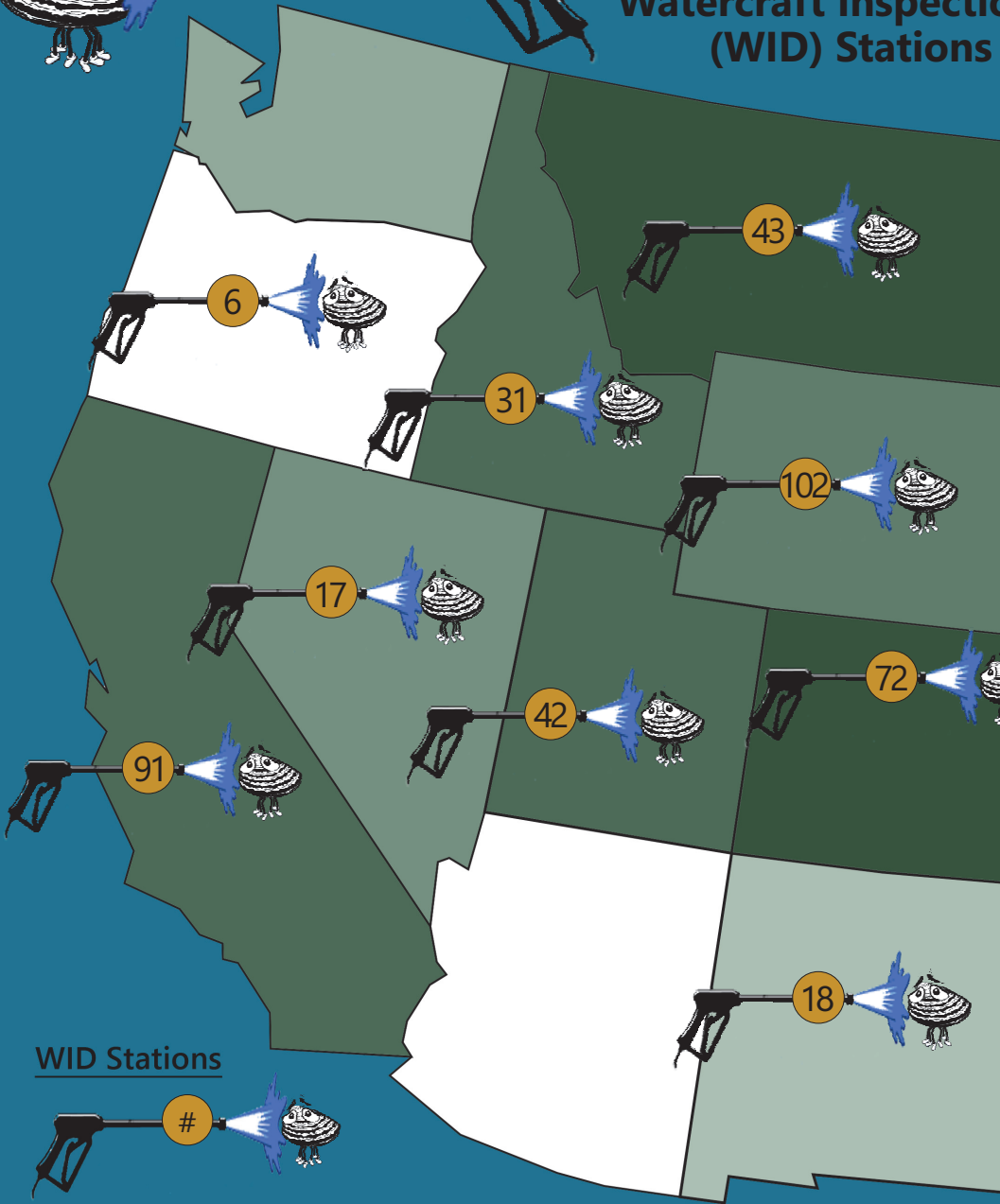


Damage industrial, agricultural, & recreational activities dependent on surface waters.

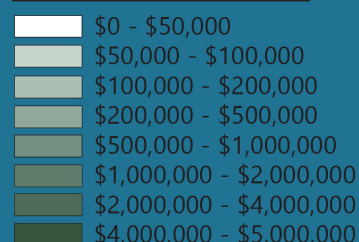
## Prevention and Control Costs:

### Watercraft Inspection & Decontamination (WID) Stations

Annual WID budgets ranged from \$18,000-\$4,500,000 per year. The average 2019 WID Budget for western member states is approximately \$1,605,900. Montana and Colorado had the largest 2019 WID budgets at \$4,500,000 and \$4,100,000, respectively.



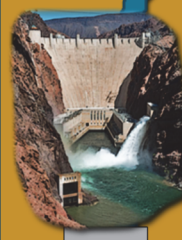
### WID Program Costs



## Hydropower Facilities

### Glen Canyon Dam:

\$1.9 million (planned) total;  
\$4,000 per year  
\$59,820 per year



### Hoover Dam:

\$2.6 million total  
\$122,630 (recurring)  
Unplanned outages:  
\$44,000- \$80,000 (recurring)



### Davis Dam:

\$26,000 per year



### Parker Dam:

\$1 million total;  
\$18,000 per year

\$\$ Preventative control costs  
\$\$ Increased maintenance costs



BUREAU OF RECLAMATION

For more information go to:

[www.usbr.gov/research/projects/detail.cfm?id=8142](http://www.usbr.gov/research/projects/detail.cfm?id=8142)