Aquatic Invasive Species in Douglas County Waterways

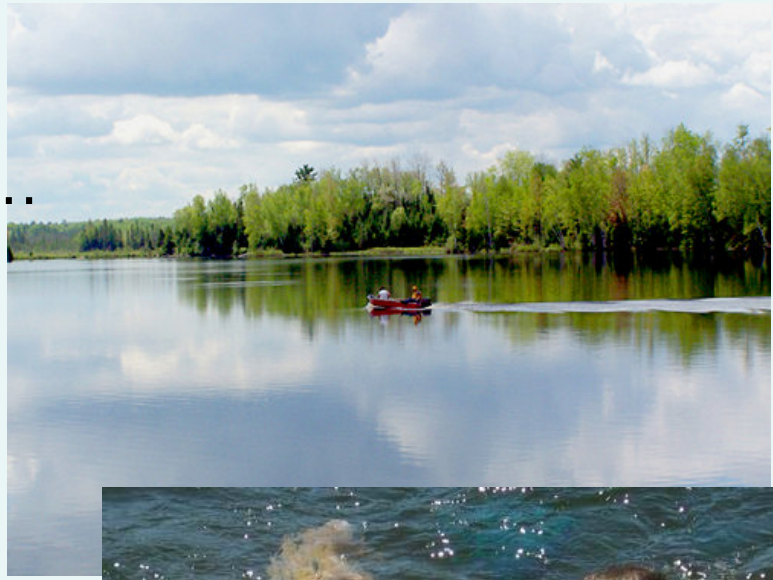
Saturday, March 28, 2009
Douglas County Fish & Game League Sport Show
Wessman Arena, Superior, WI

The Public Trust

Wisconsin lakes and rivers are public resources, owned in common by all Wisconsin citizens under the state's **Public Trust Doctrine**. Based on the state constitution, it declares that all navigable waters are "common highways and forever free", and held in trust by the Department of Natural Resources.

What does this really mean?

- The public has the right to access waterways to fish, swim or just motor around…



•Riparian landowners have special rights to place piers to access public waters

Our Lakes and Streams

Our Responsibility

The Douglas County
Land & Water Conservation Department

Work with landowners on best management practices on their farms and shorelands

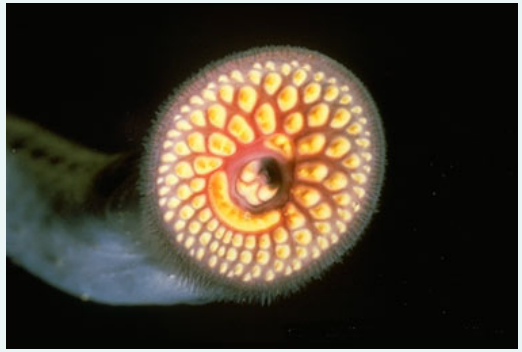
Work on projects to restore fish habitat

Received a 2008-2009 Wisconsin DNR Aquatic Invasive Species Grant

The Douglas County Aquatic Invasive Species Grant Goals

- **Work with citizens to create a strategic plan for preventing the spread of AIS in the County**
- **Conduct an inventory of inland lakes**
- **Create a GIS database and county web page**
- **Provide education to the community**
- **Recruit volunteers and provide training for boat landing surveys**
- **Develop easy to understand rapid response templates**
- **Seek more grant funding to provide to support an AIS coordinator**

So, what are aquatic invasive species?



White Perch, John Lyons, WI DNR

Aquatic species that never existed here naturally

Native Species In Wisconsin

- Native species traits:
  - Have narrow food preferences
  - Require certain spawning habitat
  - Intolerant of poor water quality

Source: Aquatic Exotics in Wisconsin, Wisconsin Sea Grant Advisory Services, March 2004

Aquatic Exotics In Wisconsin

- Invasive species traits:
  - High reproductive rate
  - Mature quickly
  - Eat various types of food
  - Tolerate poor water quality
  - Easily adapt to new habitats
  - Few natural predators

Source: Aquatic Exotics in Wisconsin, Wisconsin Sea Grant Advisory Services, March 2004

Where Did They Come From?

Eurasia	77
Atlantic	18
Asia	12
Mississippi	7
Pacific/Southern U.S.	7
Unknown	18
Total:	139

(data taken from Mills et al. 1993)

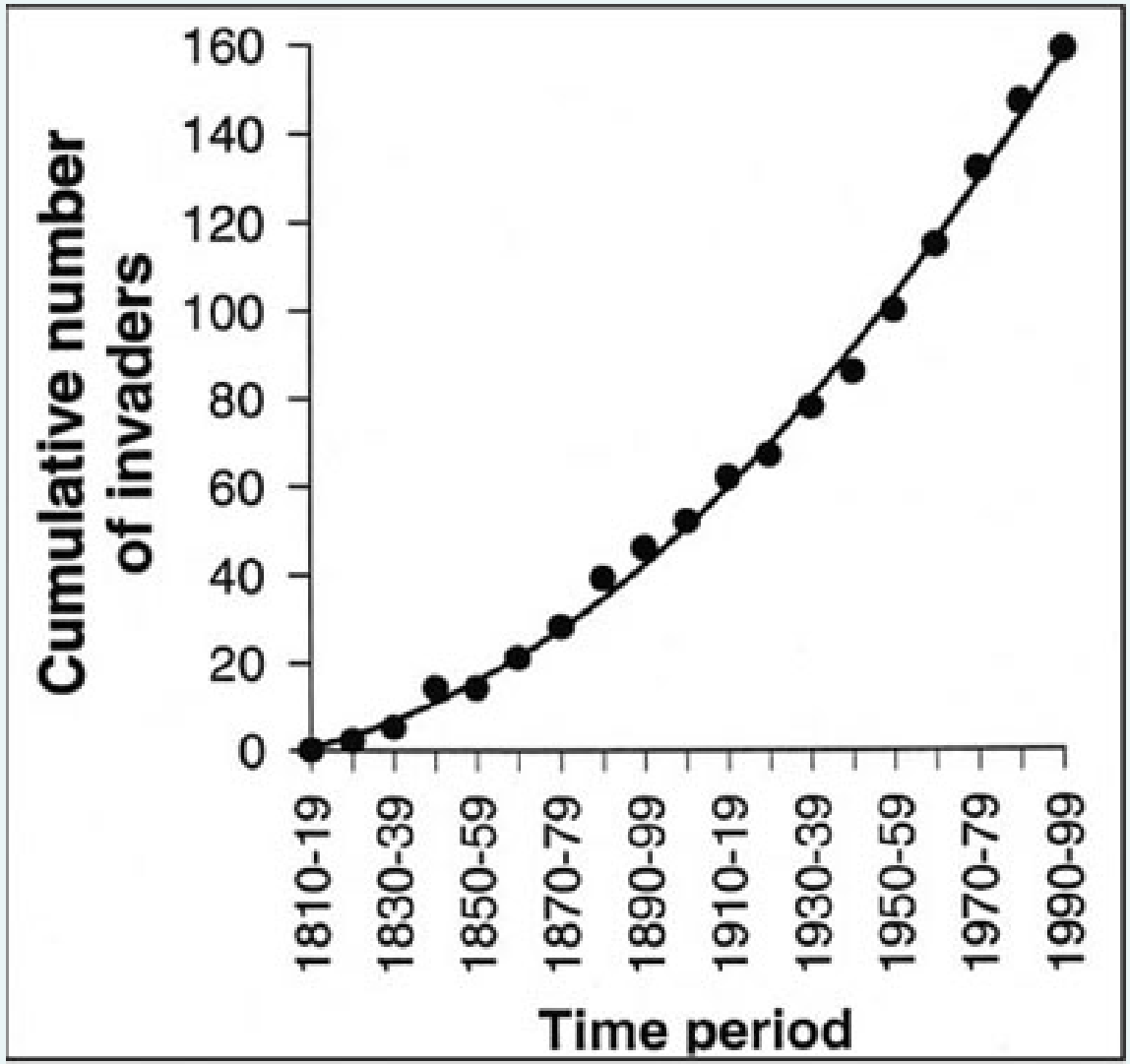
How did they Get here?

Mechanism	Number of Species	Percent[1]
Ballast Water Discharge	30	35
Cultivation	19	22
Stocked Fish	12	13
Unknown	9	10
Diseases and Parasites with Fish	9	10
Canals and Diversions	6	7
Aquarium Releases	4	5
Live Bait Releases by Anglers	3	3
Recreational Boaters	2	2
Railroads and Highways	1	1
Packaging Hitchhiker	1	1
Other Release	1	1

[1]exceeds 100% since six species arrived via multiple pathways

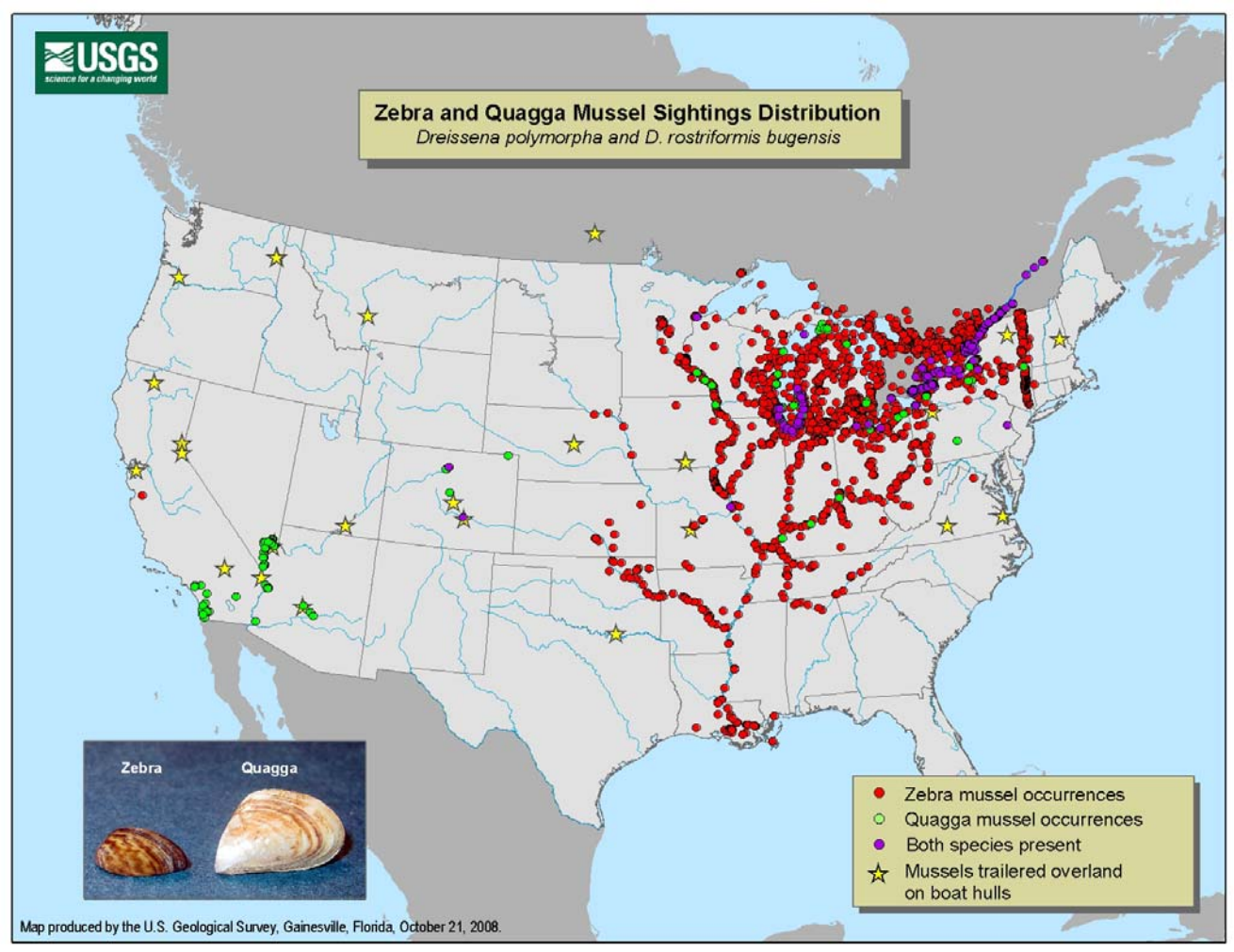
Natural and not so natural modes of transport

Aquatic Non-native Species in the Great Lakes

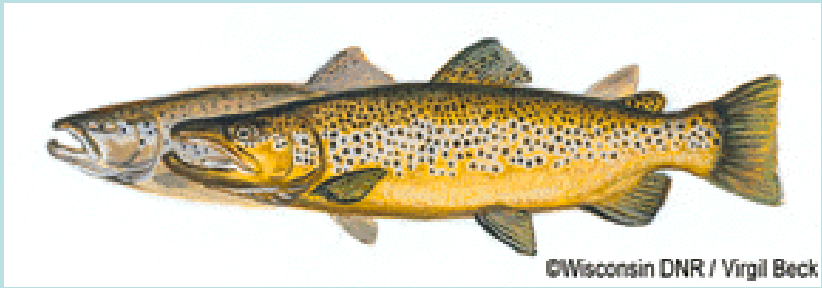


87 Non-native Species found in Lake Superior since 1883

Many routes to Douglas County



So, are all non-native species are invasive?



Brown trout

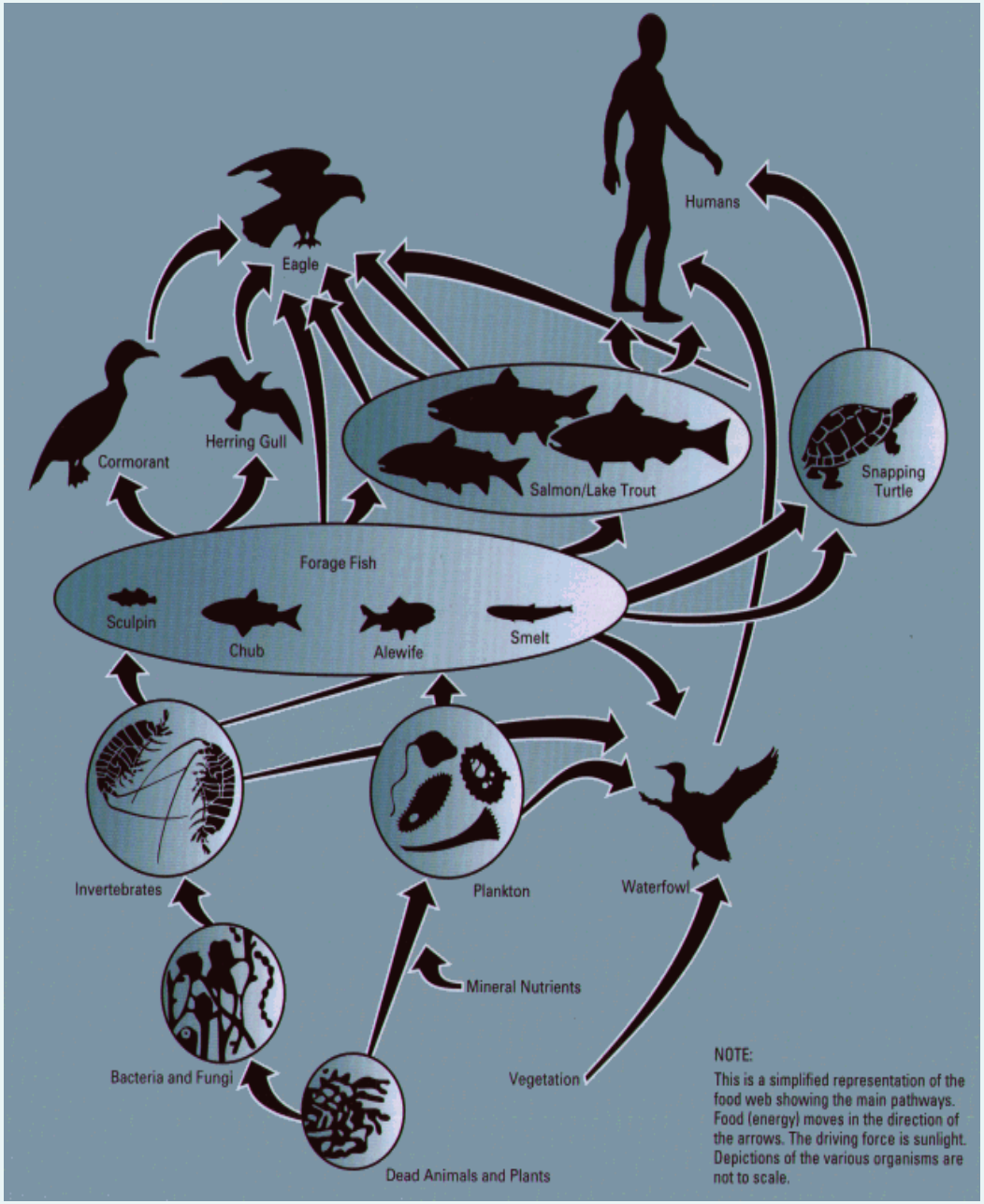
Rainbow trout

85 % are not a problem

The Problem with Non-native Species

- **Can disrupt complex communities of plants and animals that have evolved over thousands of years.**
- **Expensive and difficult to control; nearly impossible to eradicate**
- **Harm recreation**
- **Can alter food web**

Girl swimming in milfoil

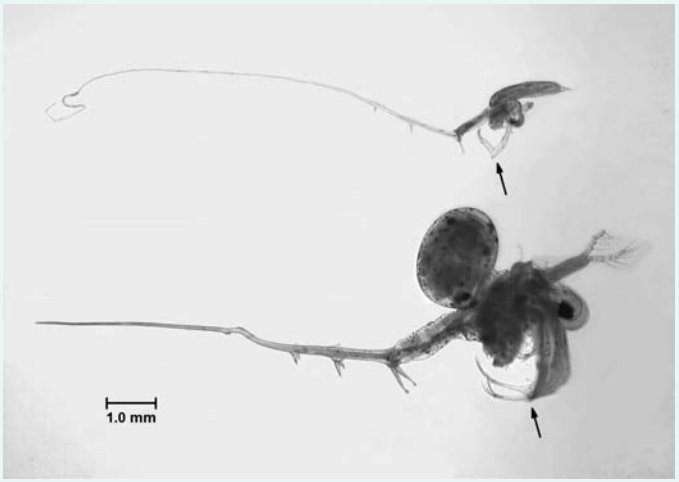


Basic Food Web

- The sun gives energy.
- Green plants convert solar energy.
- Plants are eaten by animals, which in turn become food.
- Humans are part of the food web.

Spiny Water Flea - ‘BC’ & ‘CP’

Bythotrephes cederstroemi
& *Cercopagis pengoi*



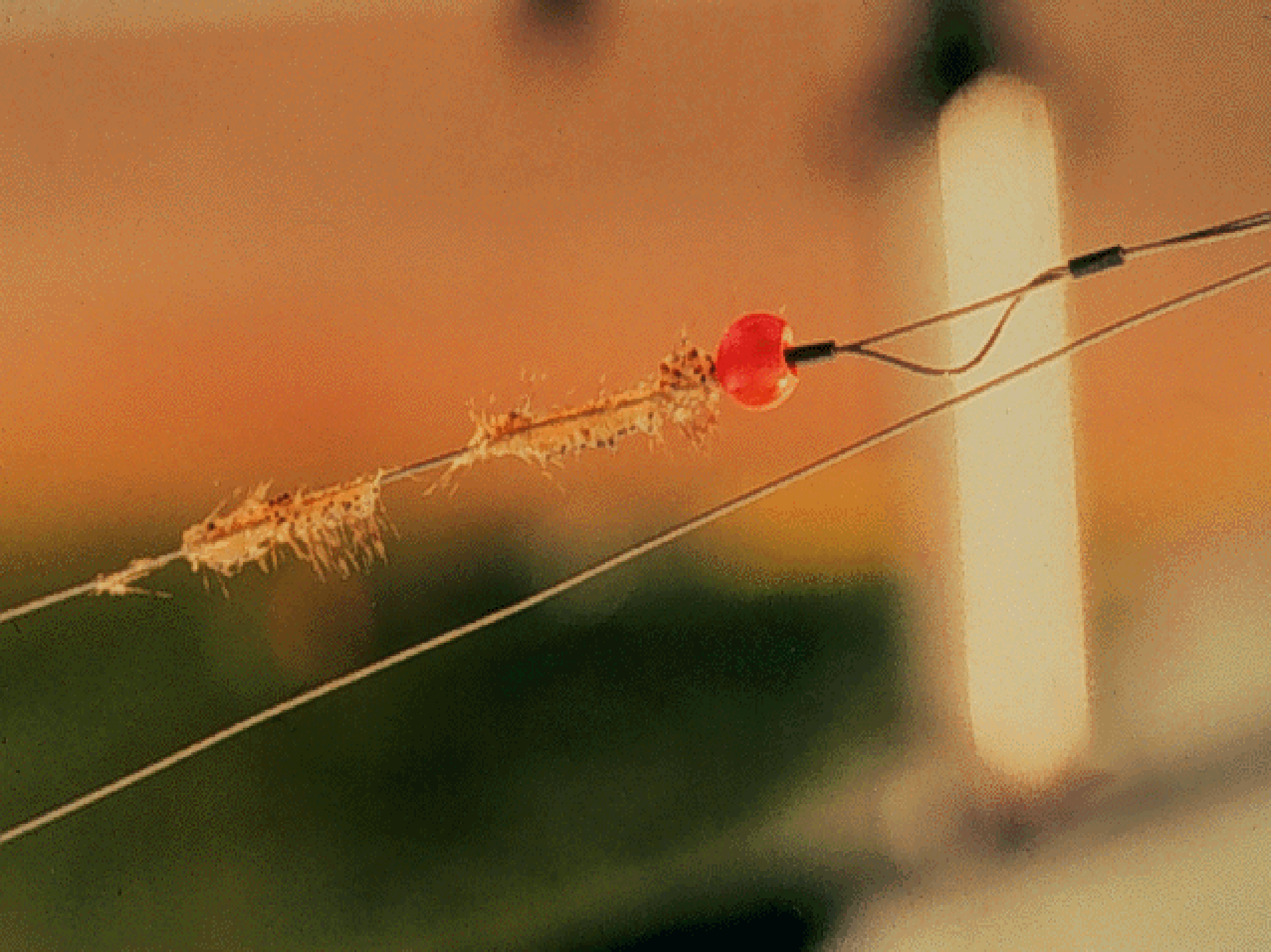
5mm Long
Max. 1/3’’

Long spines make them hard for fish to eat

Foul fishing lines and nets (look fuzzy or gooey)

Introduced via ballast water from Europe

Present in all the Great Lakes



Spiny Waterflea

- Predaceous zooplankton
- Causes declines in native zooplankton
  - May impact fisheries

Source: MN Sea Grant, Aquatic Exotics, Jensen, Doug and Gunderson, Jeff, et al., 2001.

SPREAD OF BC INTO THE GREAT LAKES

Source: MN Sea Grant, Aquatic Exotics, Jensen, Doug and Gunderson, Jeff, et al., 2001.

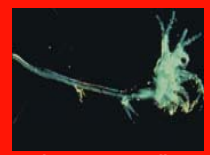
LAKE SUPERIOR BASIC FOOD WEB

SUNLIGHT

TOP PREDATORS
(ADULTS AND JUVENILES > 10”)

Brook Trout to 24 “

INVASIVE ZOOPLANKTON



Spiny water flea
(Bythotrephes)
12 mm

Fishhook water flea
(Cercopagis)
10 mm

?

FORAGE FISH

Lake herring 11-15”

Bloater 9”

Sculpin 2-3”

Larval fish 1.5”

BENTHOS

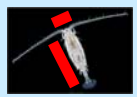
Mayflies larval stage 2-32 mm

Amphipod/Diporeia (scud)
5-20 mm

Oligochaetes (aquatic worms)
1-30 mm

ZOOPLANKTON

Cladoceran (water flea)
0.2 – 3.0 mm



Calanoid Copepod (oarsmen) 0.3-3.2 mm

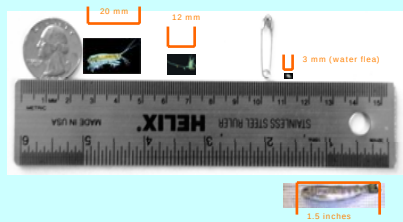
Cyclopoid Copepod (oarsmen)
0.3-3.2 mm

Copepod nauplii
0.1-0.4 mm

Rotifers
0.089-0.32 mm

The Importance of Zooplankton to Larval Fish

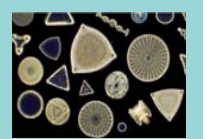
- Are “gape limited”
- Must have the right food available to survive
- Must reach a minimum size to eat larger plankton
- Must reach a critical size prior to winter to survive



DETRITUS

PHYTOPLANKTON

Algae



Diatoms

WATERSHED INPUTS
NUTRIENTS
SILICA

Source: A. Eliot,
UWS-Lake Superior
Research Institute

Aquatic Exotics In Wisconsin

- A Quick look at six recent invaders:
  - Zebra mussels
  - Round goby
  - Ruffe
  - Purple loosestrife
  - Eurasian milfoil
  - Spiny water fleas

Zebra Mussel

Max. size ~ 2’’

Introduced via ballast water from Europe

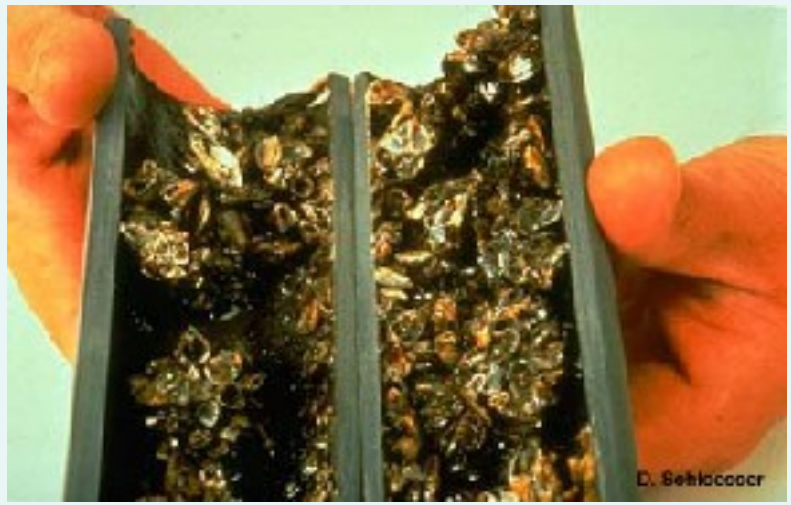
First found in Lake St. Claire (MI) in 1988

Eats plankton, filters up to 1 liter of water per day

Produce 40,000 eggs/year

Densities up to 700,000 per sq. meter =
43,000 on a piece of notebook paper

Zebra Mussels Colonize Lots of Things



Zebra mussels get moved to new lakes by water in and weeds on boats.

Ruffe

3-4’’ Long

Max. 10’’

First found in 1986 in Lake Superior

Introduced via ballast water from Southern Europe

Affects perch, whitefish and minnows

Eats fish eggs, bottom-dwelling insects and worms

Now Present in Lakes Superior, Huron and Michigan

Round Goby

3-4’’ Long

Max. 10’’

Introduced via ballast water from Europe

Affects sculpins and other bottom-dwelling species

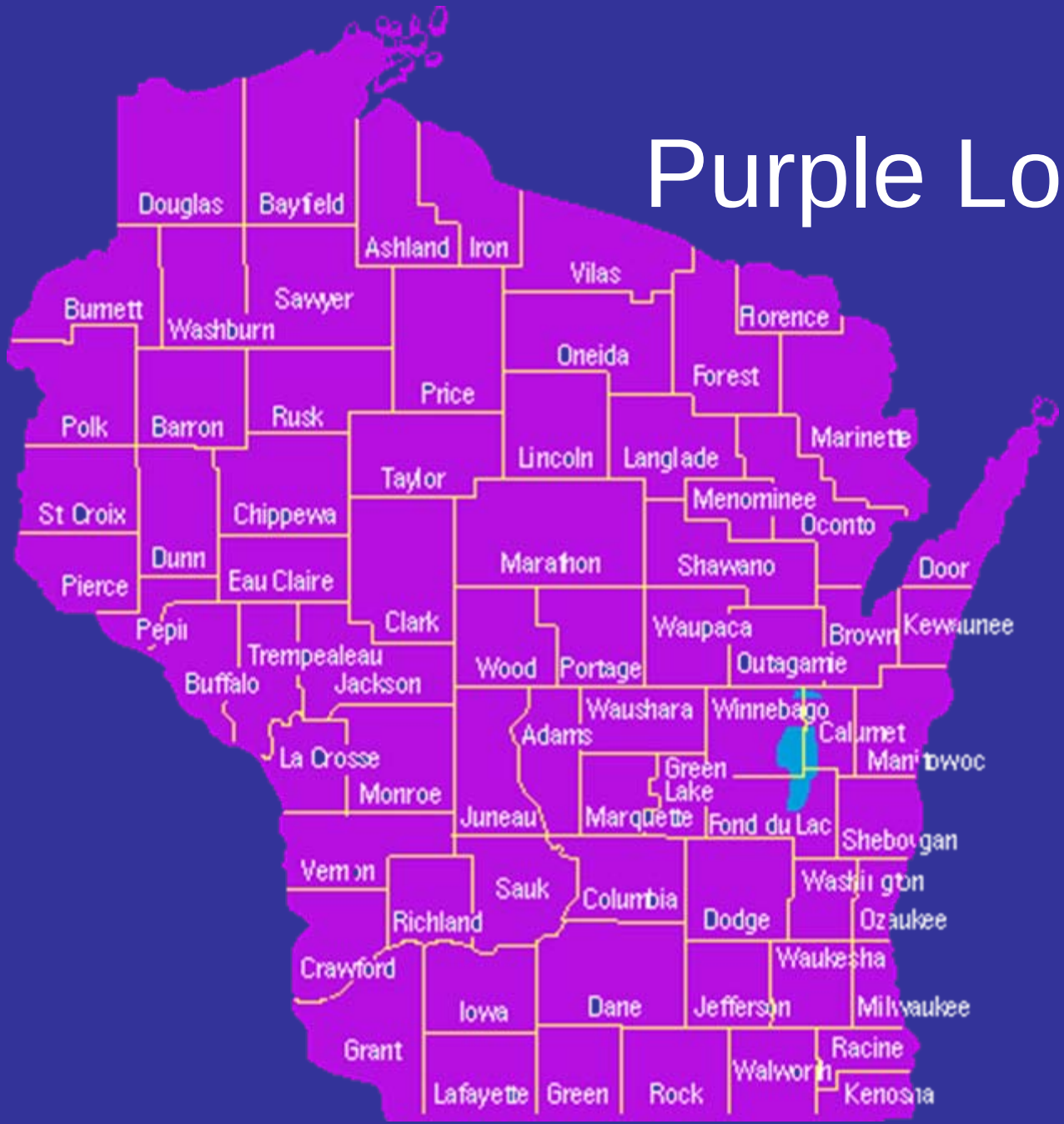
Eats fish eggs, bottom-dwelling insects and worms

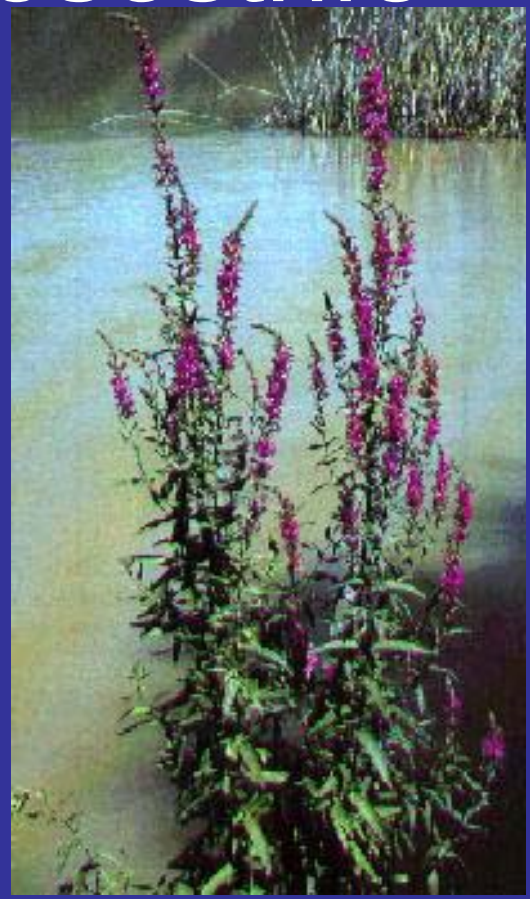
Present in all the Great Lakes, Chicago River

- **Purple Loosestrife**
  - **4-Sided Stem**
  - **2 Million Seeds per Year**
  - **Displaces Native Vegetation**
  - **Destroys Habitat**
- **Controlled by:**
  - **Physical Removal**
  - **Beetles**

Galerucella beetles: biocontrol for purple loosestrife

Purple Loosestrife



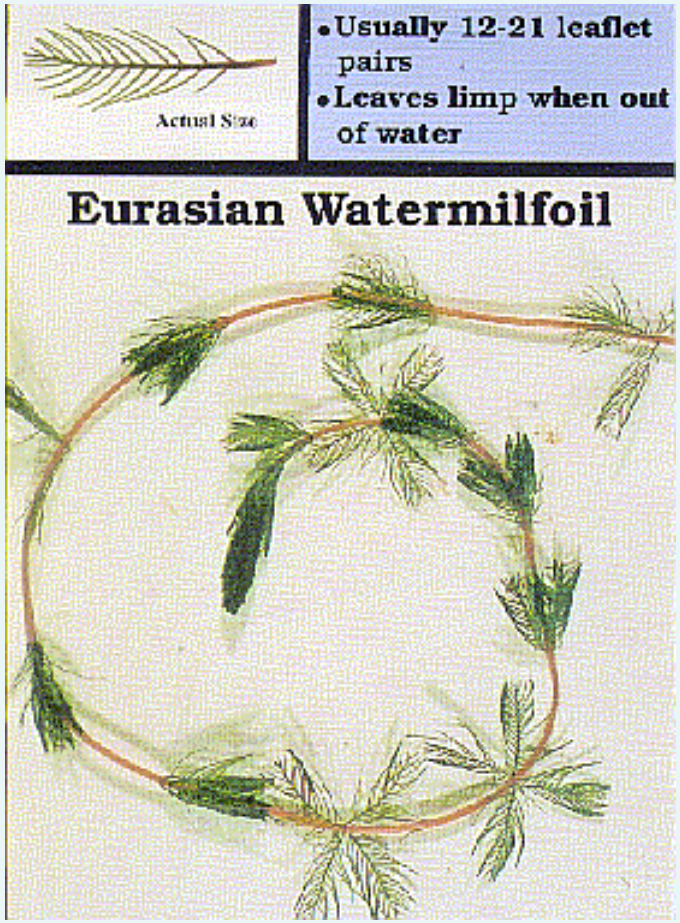


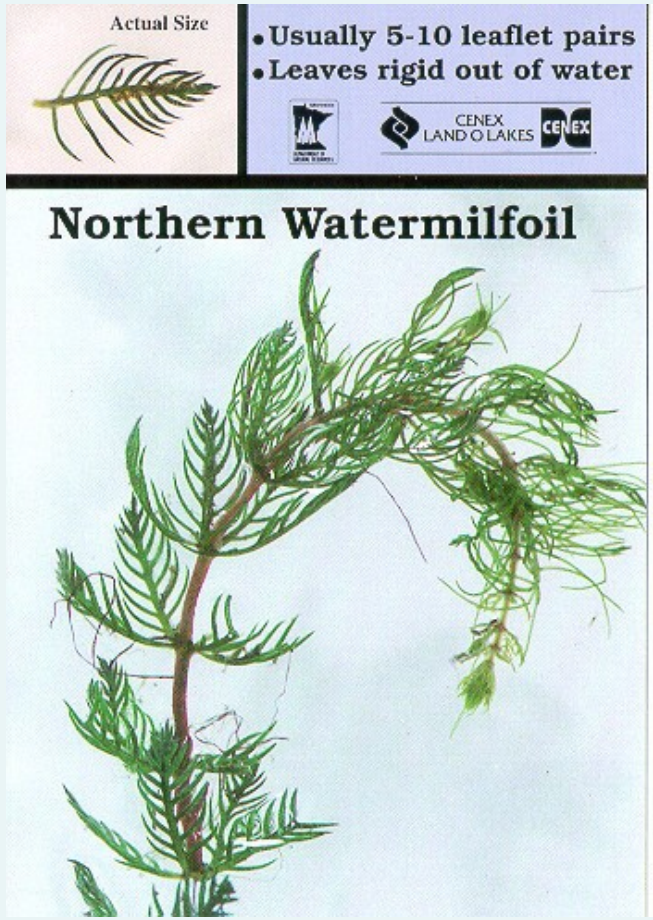
❖Eurasian Watermilfoil

- Displaces native vegetation
- Clogs boating and swimming areas
- Spread by boaters through fragmentation

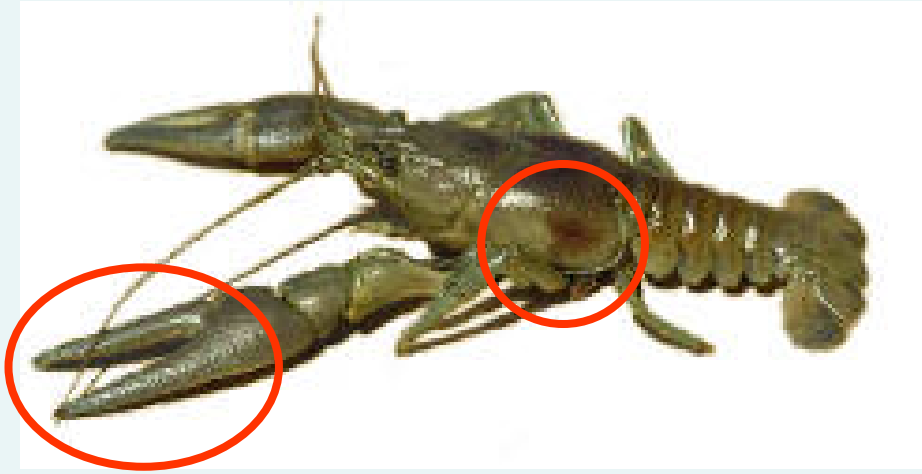
❖ Control:
Northern milfoil beetle
Chemical

Eurasian milfoil compared to Northern milfoil



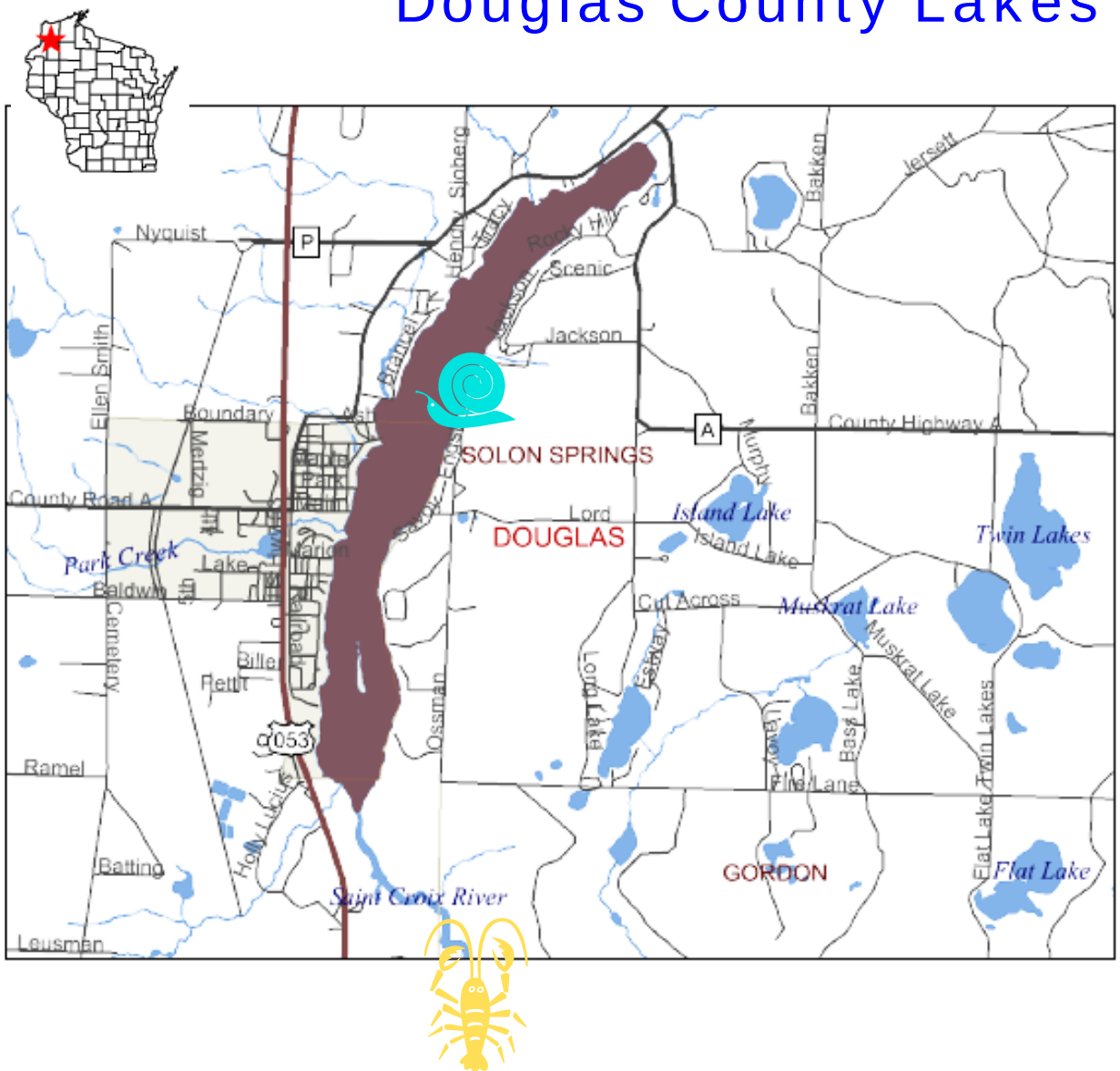


Rusty Crayfish



- Native to southern U.S.
- Introduced with bait
- Aggressive
- Destroys vegetation as they feed
- Displaces native crayfish
- Present in many Wisconsin lakes
- Often spread as bait

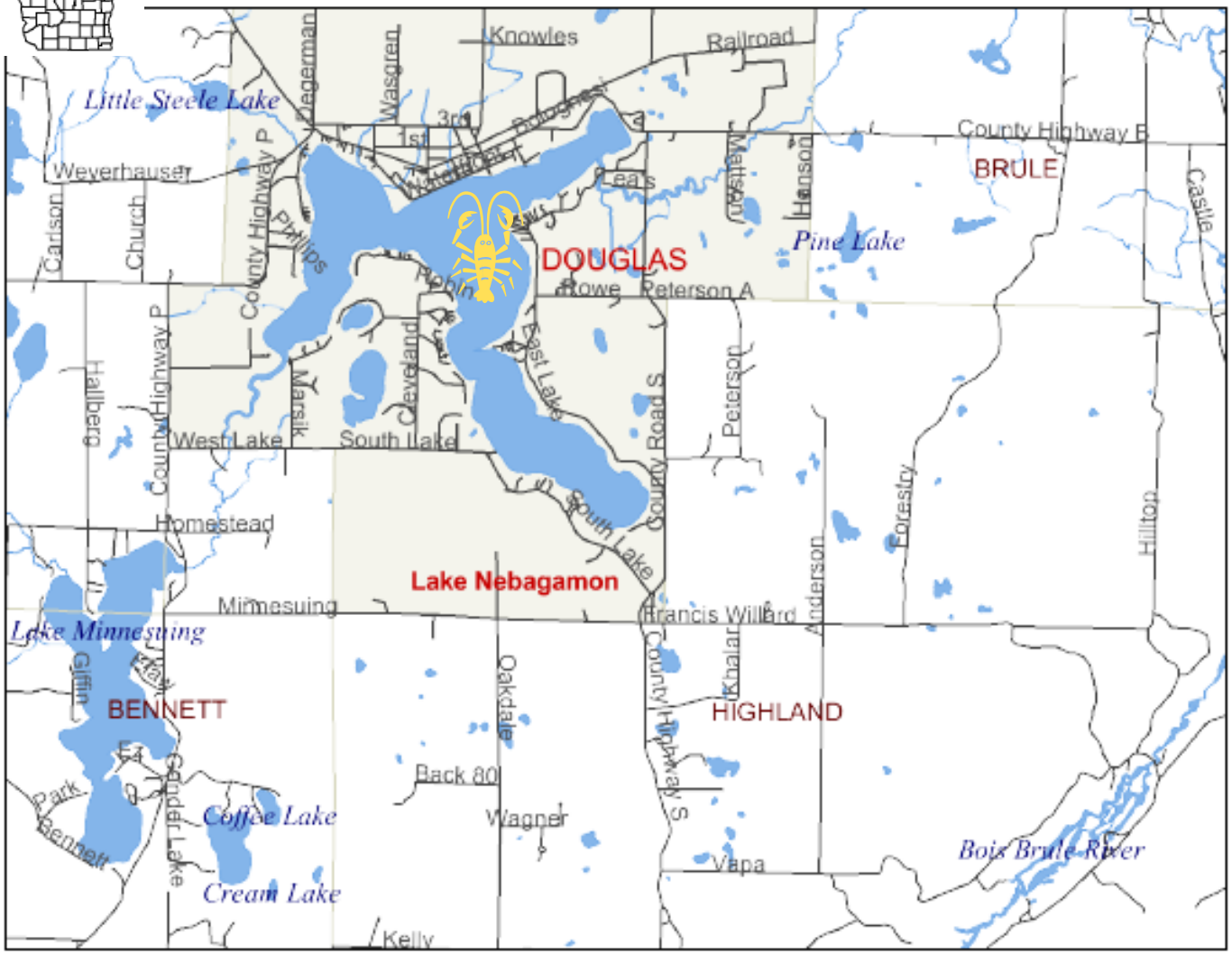
WDNR Database: Known AIS in Douglas County Lakes



Banded Mystery Snail

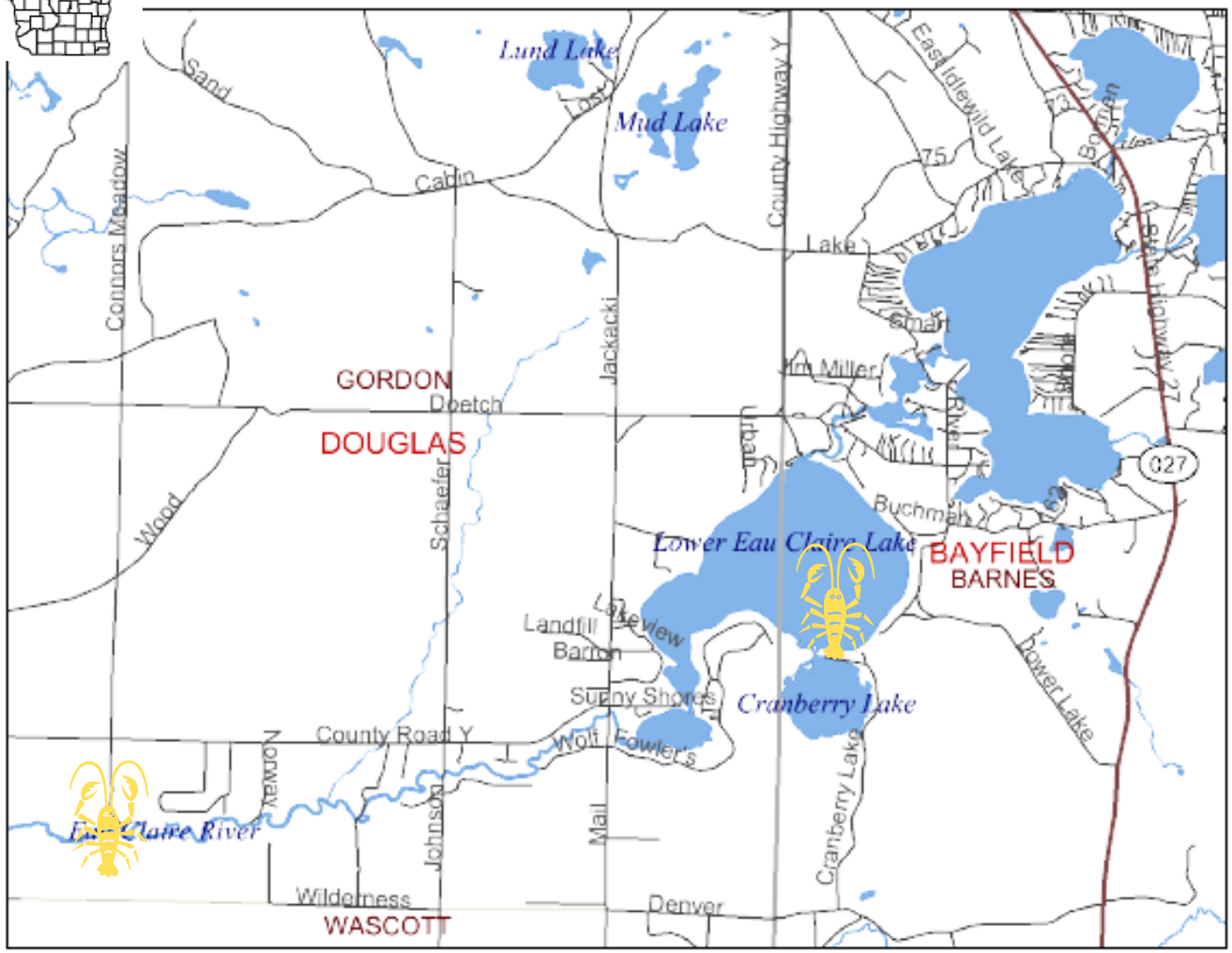
Rusty Crayfish

WDNR Database: Known AIS in Douglas County Lakes



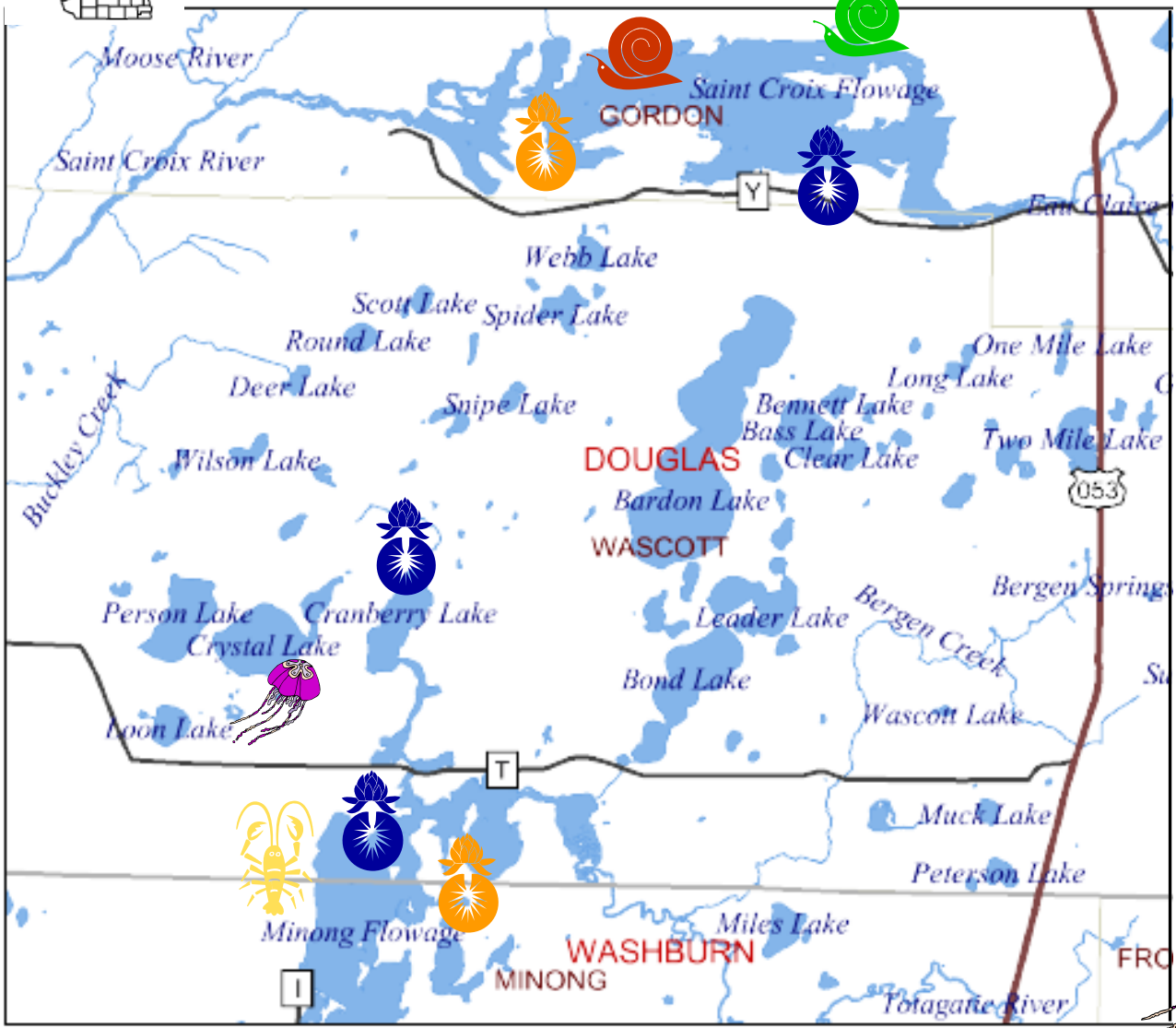
Rusty Crayfish

WDNR Database: Known AIS in Douglas County Lakes



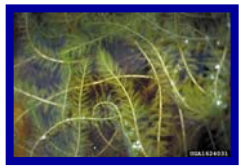
Rusty Crayfish

WDNR Database: Known AIS in Douglas County Lakes



Curly Leaf Pondweed

Eurasion Water Milfoil

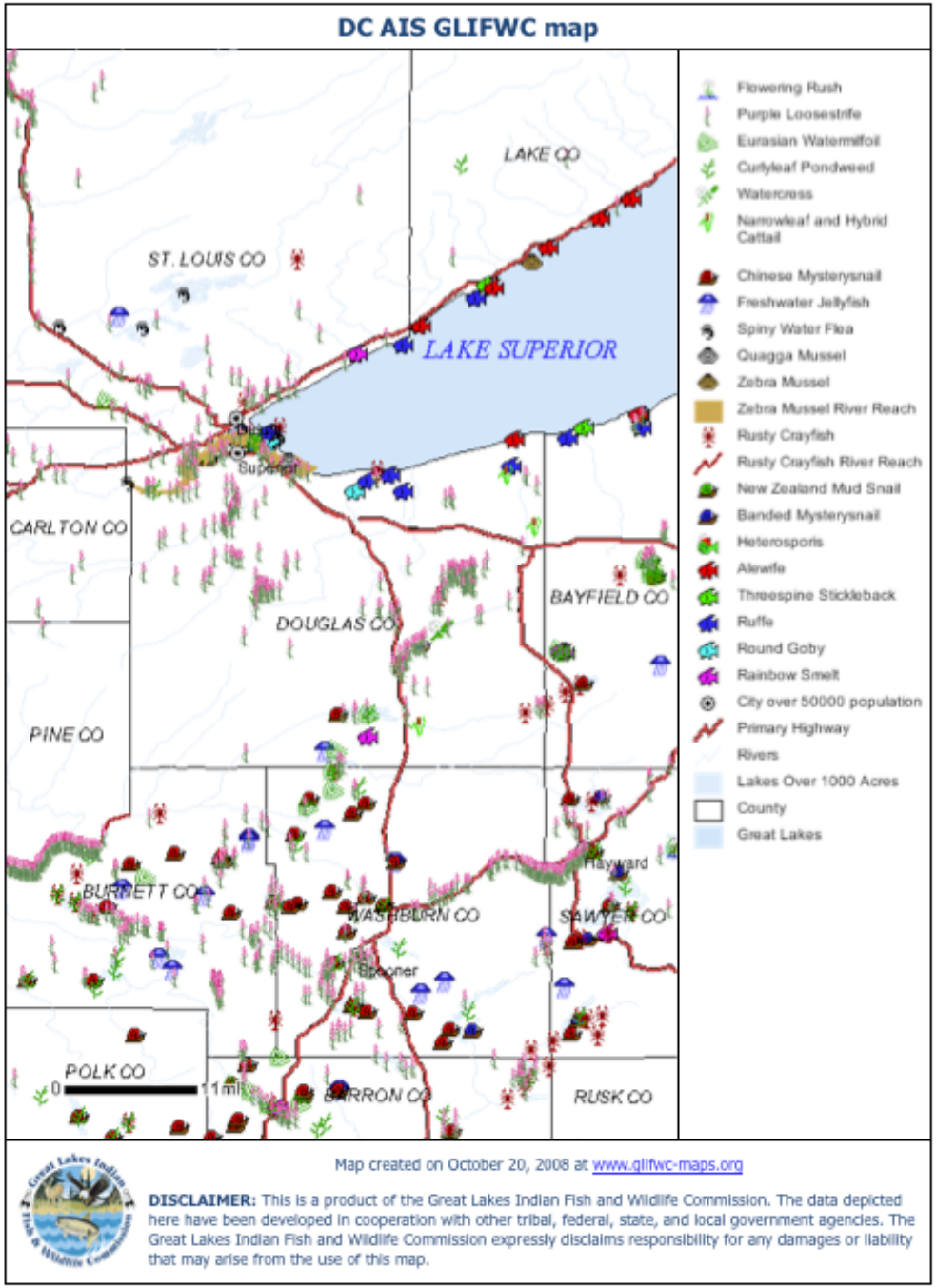


Chinese Mystery Snail

Japanese Mystery Snail

Rusty Crayfish

Fresh-water Jellyfish



Invasive Species Documented by

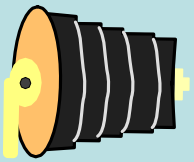
Great Lakes Indian Fish & Wildlife Commission

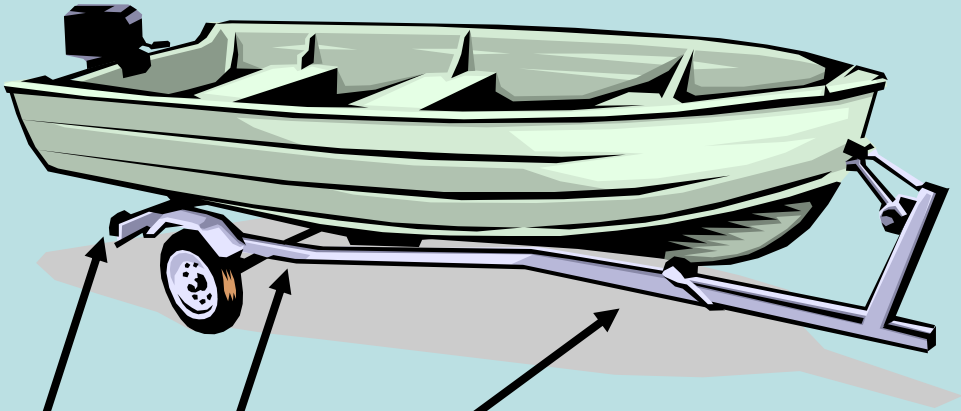
What can you do to help?

Prevent the Spread

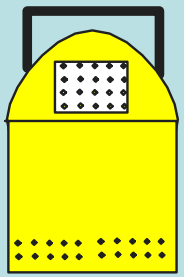
- **BEFORE launching….. BEFORE leaving**

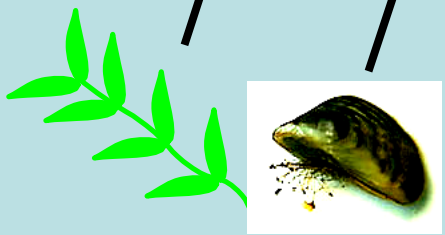
Drain bilge water





Dispose of live bait in the trash

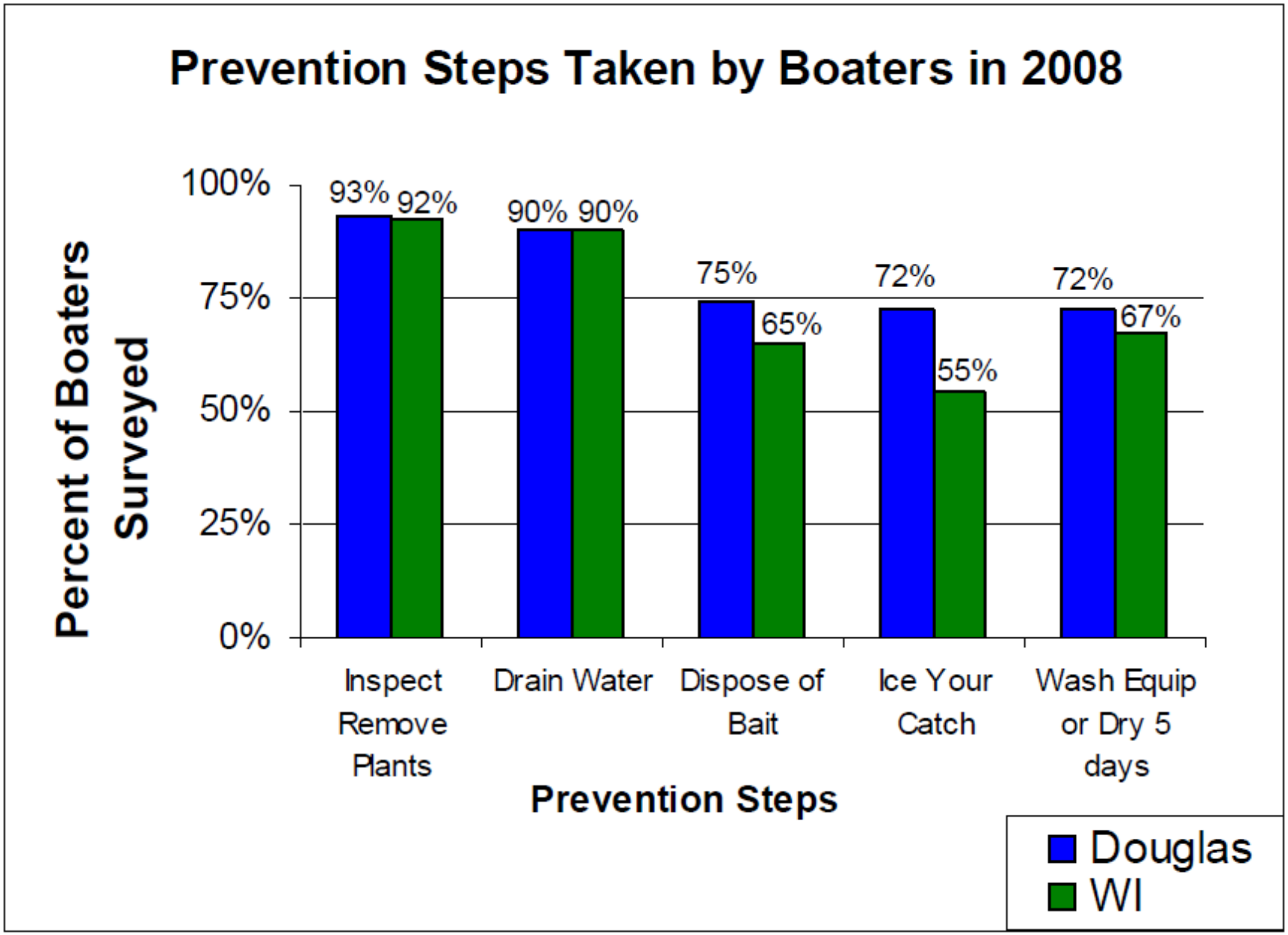




Remove weeds and animals

Rinse equipment with high pressure or 104° F water or Dry everything for at least 5 days

Source: Adapted from Aquatic Exotics in Wisconsin, Wisconsin Sea Grant Advisory Services, March 2004

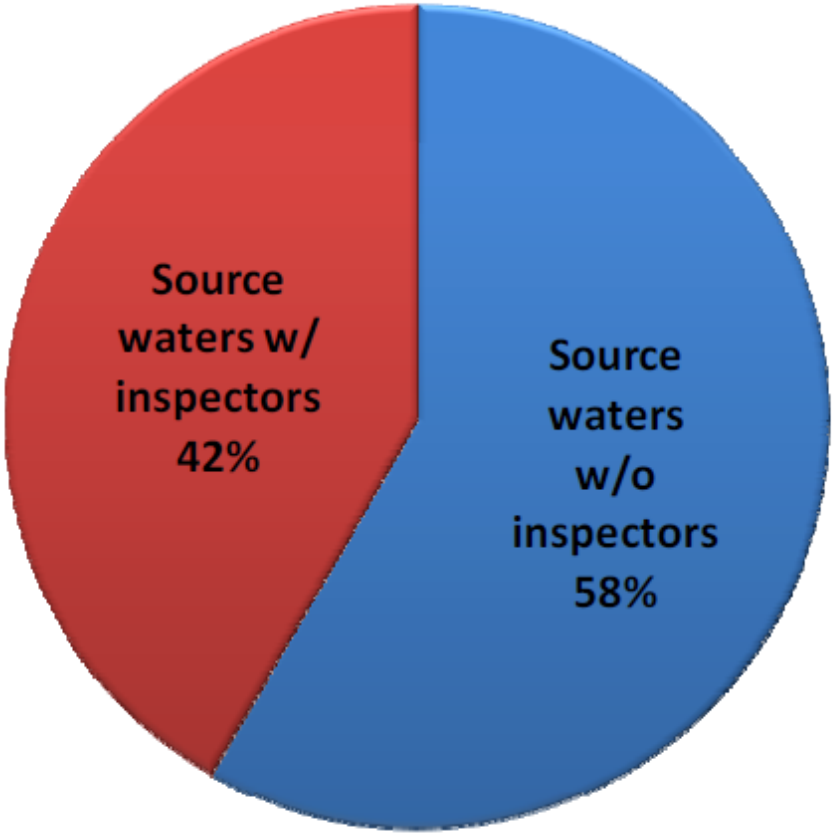

Prevention Steps Taken by Boaters in 2008
Percent of Boaters Surveyed
100%
75%
50%
25%
0%
93%
92%
90%
90%
75%
65%
72%
55%
72%
67%
Inspect Remove Plants
Drain Water
Dispose of Bait
Ice Your Catch
Wash Equip or Dry 5 days
Prevention Steps
Douglas
WI

Volunteer to monitor a boat landing

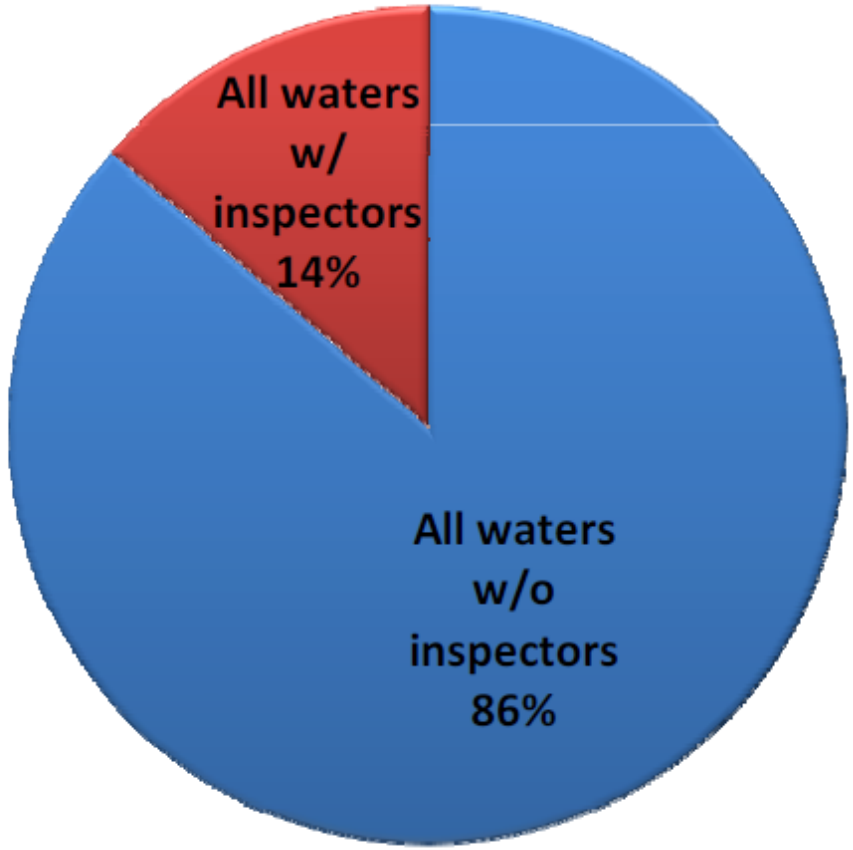
Clean Boats Clean Water Program

Learn how this April and July 2009

2008 Watercraft Inspections on Public Access Waters – DOUGLAS COUNTY



Source Waters Only



All Public Access Waters

***Source waters= waters with ZM, EWM, SWF, VHS, or Rainbow Smelt

88 waters with public access

Source waters- 5 w/ inspectors, 7 w/o inspector

Non-source waters- 7 w/inspectors, 69 w/o inspectors

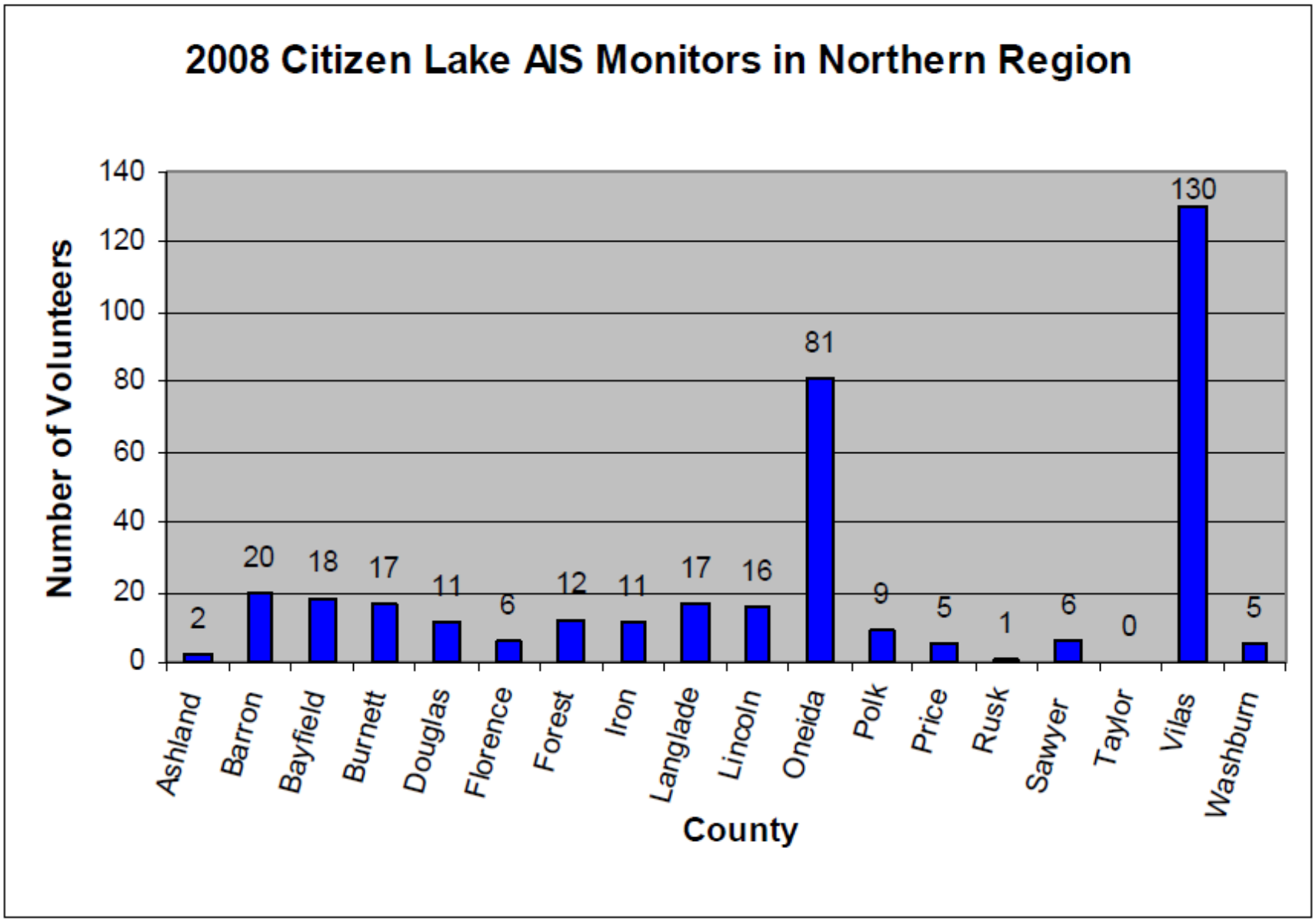
Volunteer to monitor a lake for AIS

Aquatic Invasive Species Monitoring Program

Learn how this July 2009

Photo by Pieter Johnson UW Center for Limnology

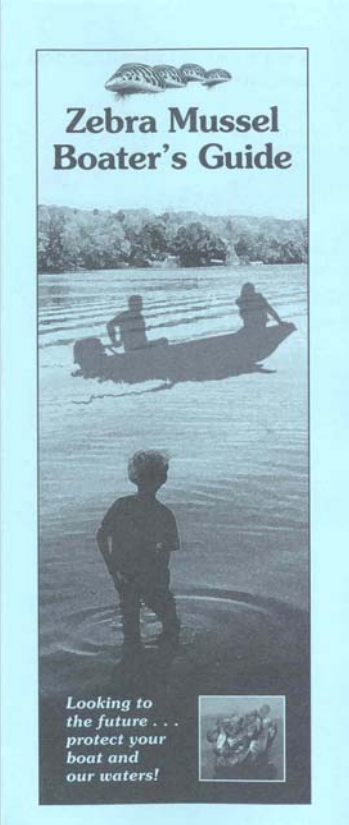
United States Geological Survey Photo. 2008.


2008 Citizen Lake AIS Monitors in Northern Region
Number of Volunteers
140
120
100
80
60
40
20
0
2
20
18
17
11
6
12
11
17
16
81
9
5
1
6
0
130
5
Ashland
Barron
Bayfield
Burnett
Douglas
Florence
Forest
Iron
Langlade
Lincoln
Oneida
Polk
Price
Rusk
Sawyer
Taylor
Vilas
Washburn
County

All of us need to get in involved in preventing the spread of aquatic invasive species.

Remember, its up to us !

Learn what to do if you find AIS



Stop by the Douglas County AIS booth for watch cards and other information

Thank You!