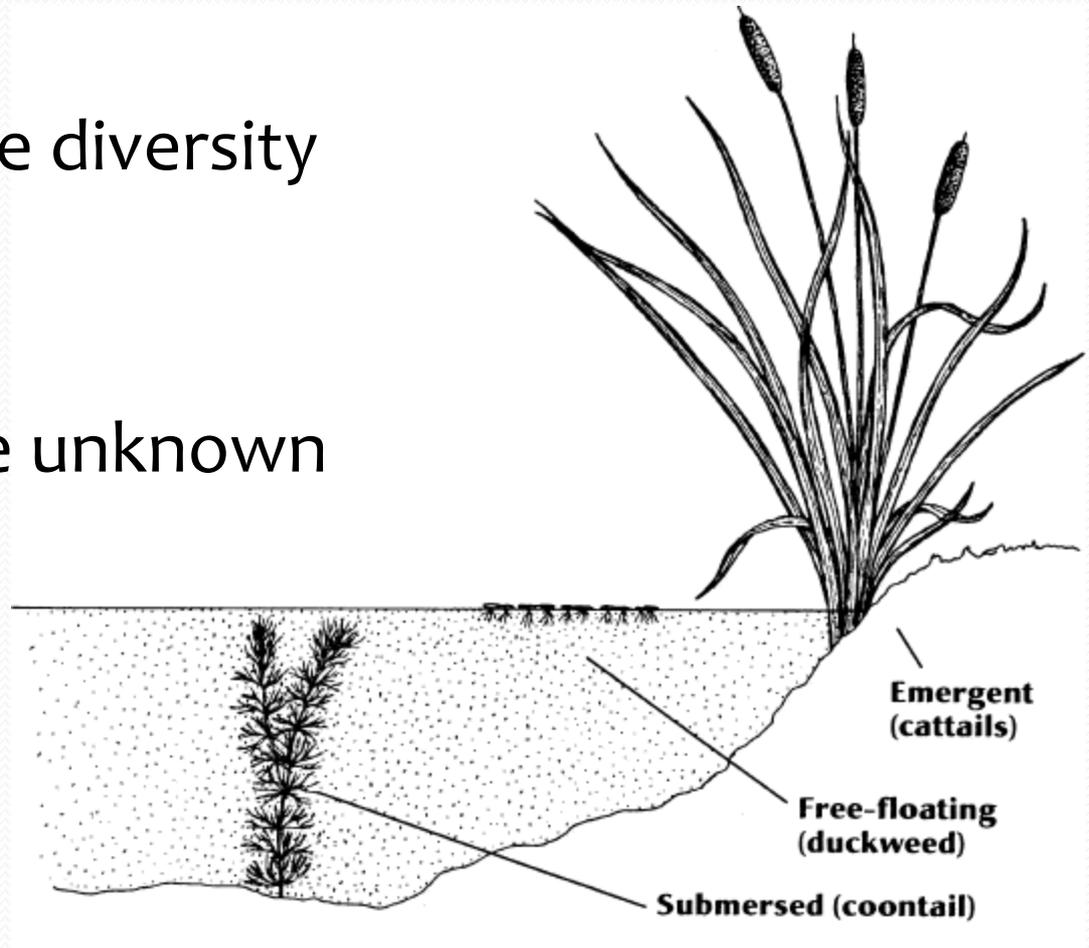


Biological Assessment

Assessing life in the stream

Aquatic Plants

- More plants = more diversity
- Hard to identify
- Pollution tolerance unknown
- Record in “Other”



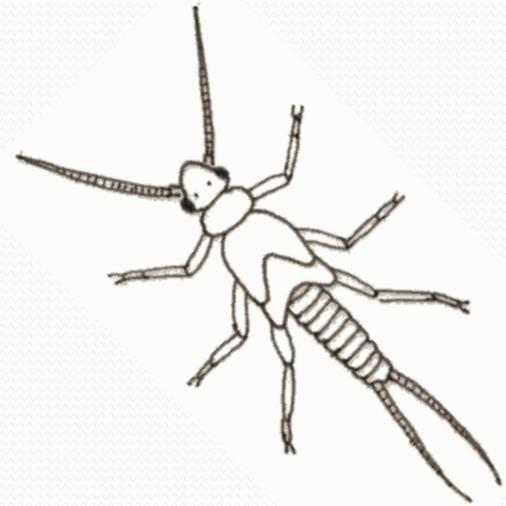
Benthic Aquatic Macroinvertebrates

- Benthic - bottom dwellers
- Aquatic – live in water
- Macro - large
- Invertebrates - without backbone



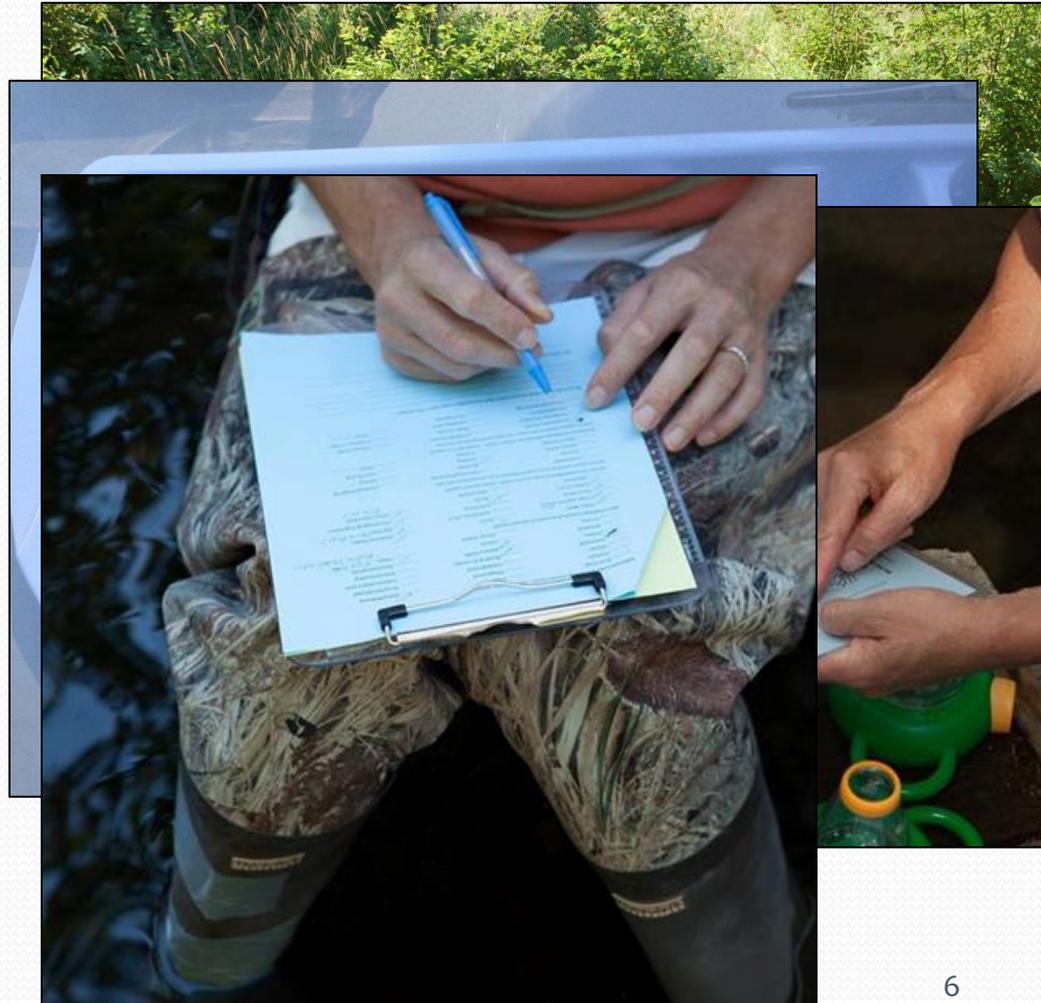
Macroinvertebrates

- Do not migrate far
- Easy to collect and identify
- Known tolerance levels-
“Environmental thermometers”



Critter Collection

- Frequency
 - No more than 3 times/year
 - Spring, Summer and Fall
- Methods:
 - Collect
 - Sort
 - Identify
 - Record



Critter Collection

- Survey as many micro-habitats as possible!

Microhabitats (check all present in stream reach, check if sampled)

Algae Mats	Present <input checked="" type="checkbox"/>	Sampled <input type="checkbox"/>	Leaf Packs	Present <input checked="" type="checkbox"/>	Sampled <input type="checkbox"/>
Logjams	Present <input type="checkbox"/>	Sampled <input type="checkbox"/>	Rocks	Present <input checked="" type="checkbox"/>	Sampled <input checked="" type="checkbox"/>
Root Wads	Present <input type="checkbox"/>	Sampled <input type="checkbox"/>	Weed Beds	Present <input type="checkbox"/>	Sampled <input type="checkbox"/>
Fallen Trees	Present <input type="checkbox"/>	Sampled <input type="checkbox"/>	Undercut Banks	Present <input type="checkbox"/>	Sampled <input type="checkbox"/>
Silt/Muck	Present <input checked="" type="checkbox"/>	Sampled <input checked="" type="checkbox"/>	Rip Rap	Present <input checked="" type="checkbox"/>	Sampled <input type="checkbox"/>
Sand	Present <input checked="" type="checkbox"/>	Sampled <input type="checkbox"/>	Overhanging Vegetation		
Junk (tires, garbage, etc.)				Present <input type="checkbox"/>	Sampled <input type="checkbox"/>
	Present <input type="checkbox"/>	Sampled <input type="checkbox"/>	Other (describe)	Present <input type="checkbox"/>	Sampled <input type="checkbox"/>

University of Idaho
Extension

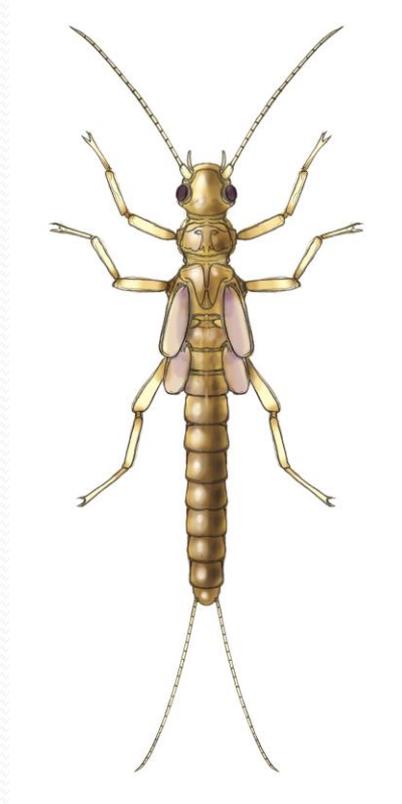


Indicator Groups

- Group 1 Taxa:
 - **LOW** pollution tolerance = **Only high quality H₂O**
- Group 2 Taxa:
 - **MEDIUM** pollution tolerance = **Mid – high quality H₂O**
- Group 3 Taxa:
 - **HIGH** pollution tolerance = **Low - high quality H₂O**

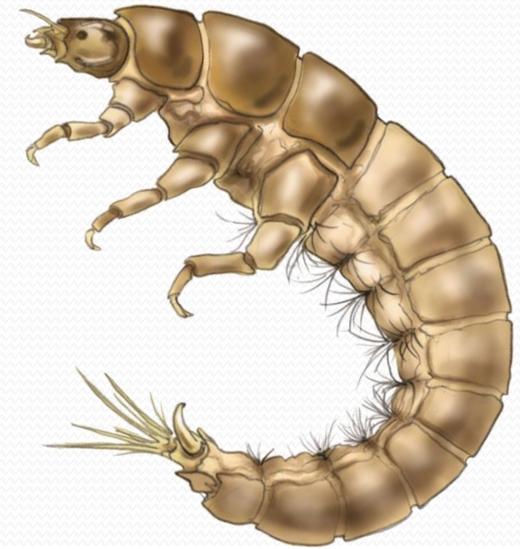
LOW pollution tolerance

- Stonefly – shredder



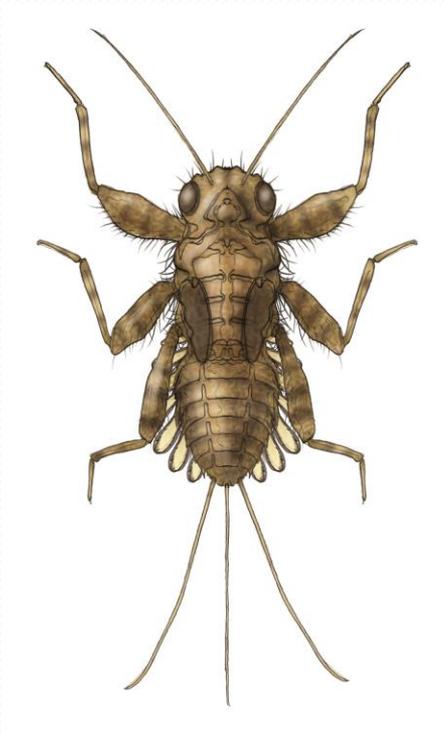
LOW pollution tolerance

- Caddisfly – shredder



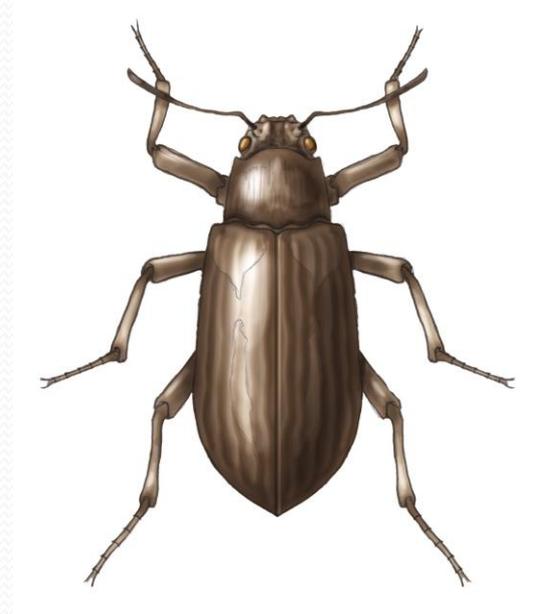
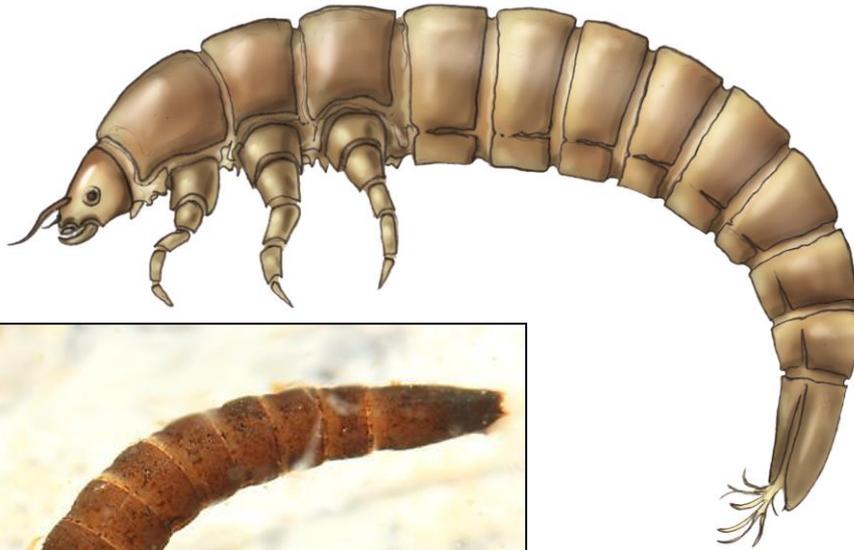
LOW pollution tolerance

- Mayfly – grazer



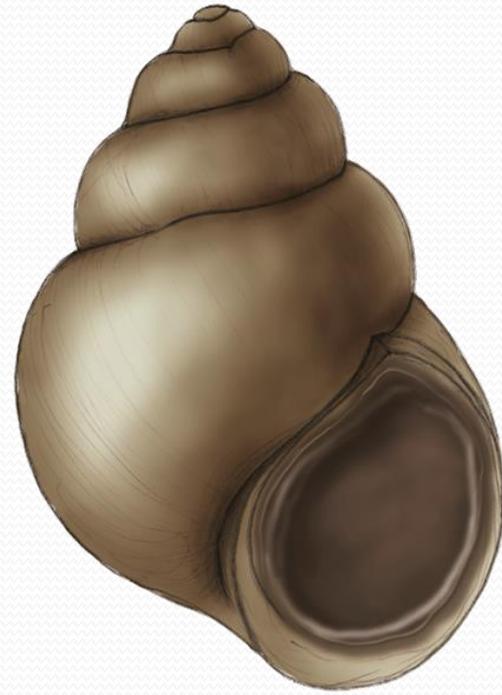
LOW pollution tolerance

- Riffle beetle



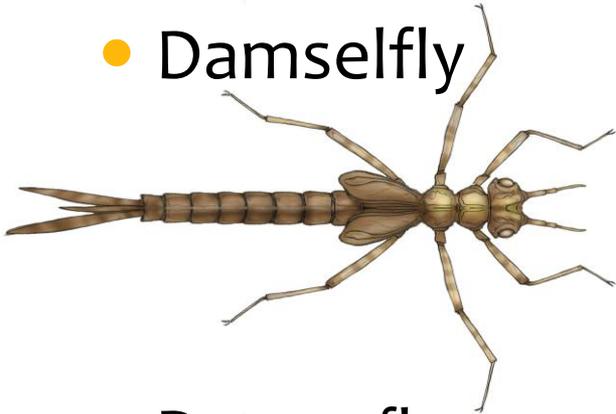
LOW pollution tolerance

- Water penny beetle
- Snail (not pouch)



MEDIUM pollution tolerance

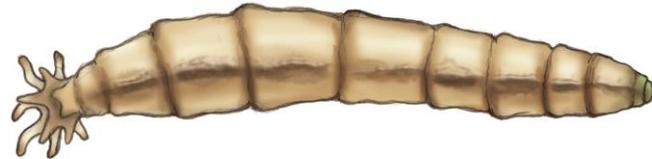
- Damselfly



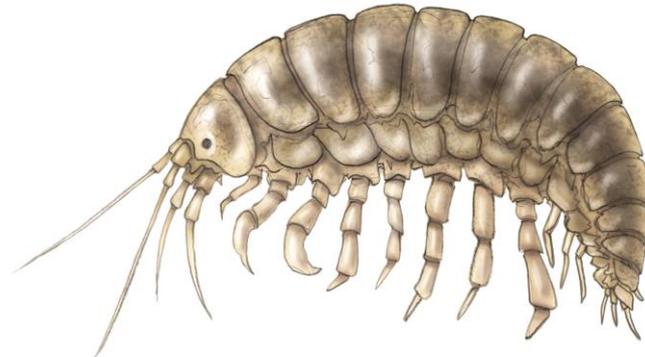
- Dragonfly



- Crane fly

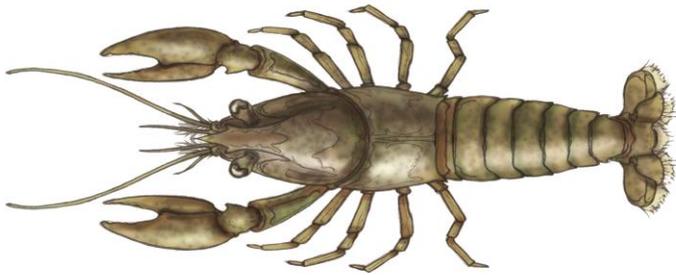


- Scud



MEDIUM pollution tolerance

- Crawdad



- Alderfly



- Mussels/Clams



- Sowbug



HIGH pollution tolerance

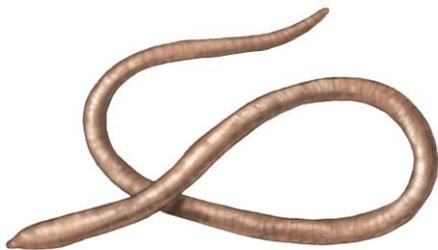
- Midge fly



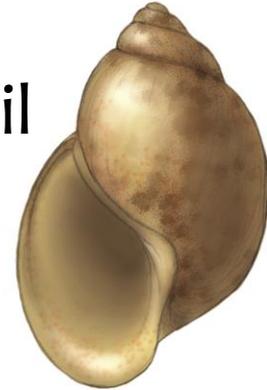
- Flatworm



- Aquatic worm



- Pouch snail



- Black fly



- Leech



Fish

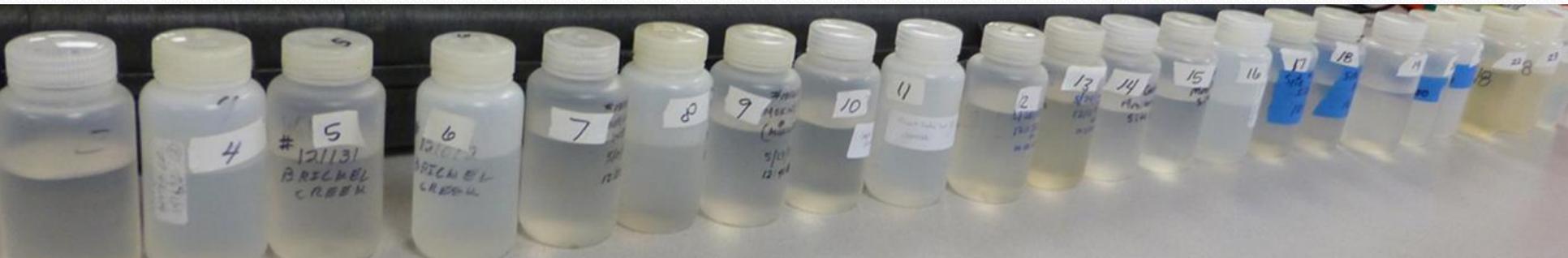


Snapshot Parameters

Special event sampling

Snapshot Sampling

- Occurs twice a year
 - Spring
 - Fall
- \$10/sample for Nitrate, total Phosphorus, total coliform and *E. coli*

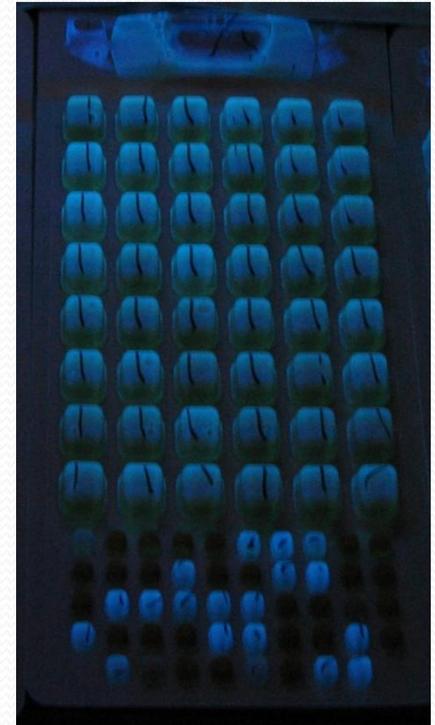
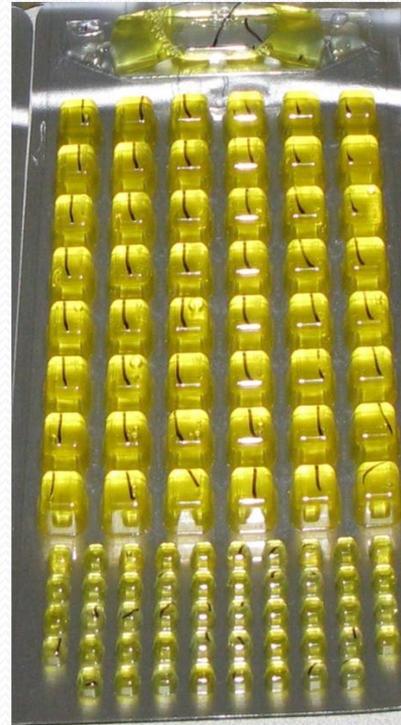


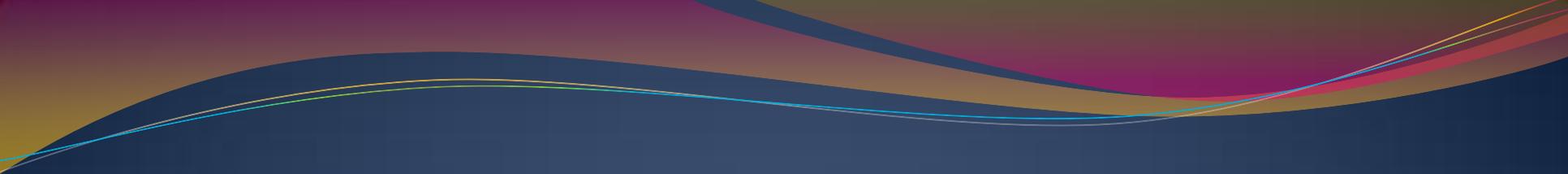
Snapshot Procedure

- Register for Snapshot online
- Sample bottles will be sent out
- Samples must be:
 - Collected on day of Snapshot
 - Kept cool during transport
 - Returned by time indicated
- All samples will be analyzed at UI Coeur d'Alene water lab
- Assistance in lab welcome

Bacteria

- Test for
 - Total coliform bacteria
 - *E. coli*
- Results in Most Probable Number per 100 mL of sample water (MPN/100mL)





Invasive Species

Identification and Prevention

Transport by Boats and Gear

- Invasive plants and animals are one of the most significant threats to our lakes and rivers
 - Choke out waterways
 - Disrupt water transfer, and increase power generation costs
 - Outcompete native species
 - Disrupt aquatic ecosystems

Invasive Species Prevention

- To prevent the transport of invasive species:
 - **Clean:** all mud and plant material from sampling equipment
 - **Drain:** all standing water from boats and sampling equipment
 - **Dry:** all surfaces and compartments to prevent the movement of invasive species

Eurasian Watermilfoil



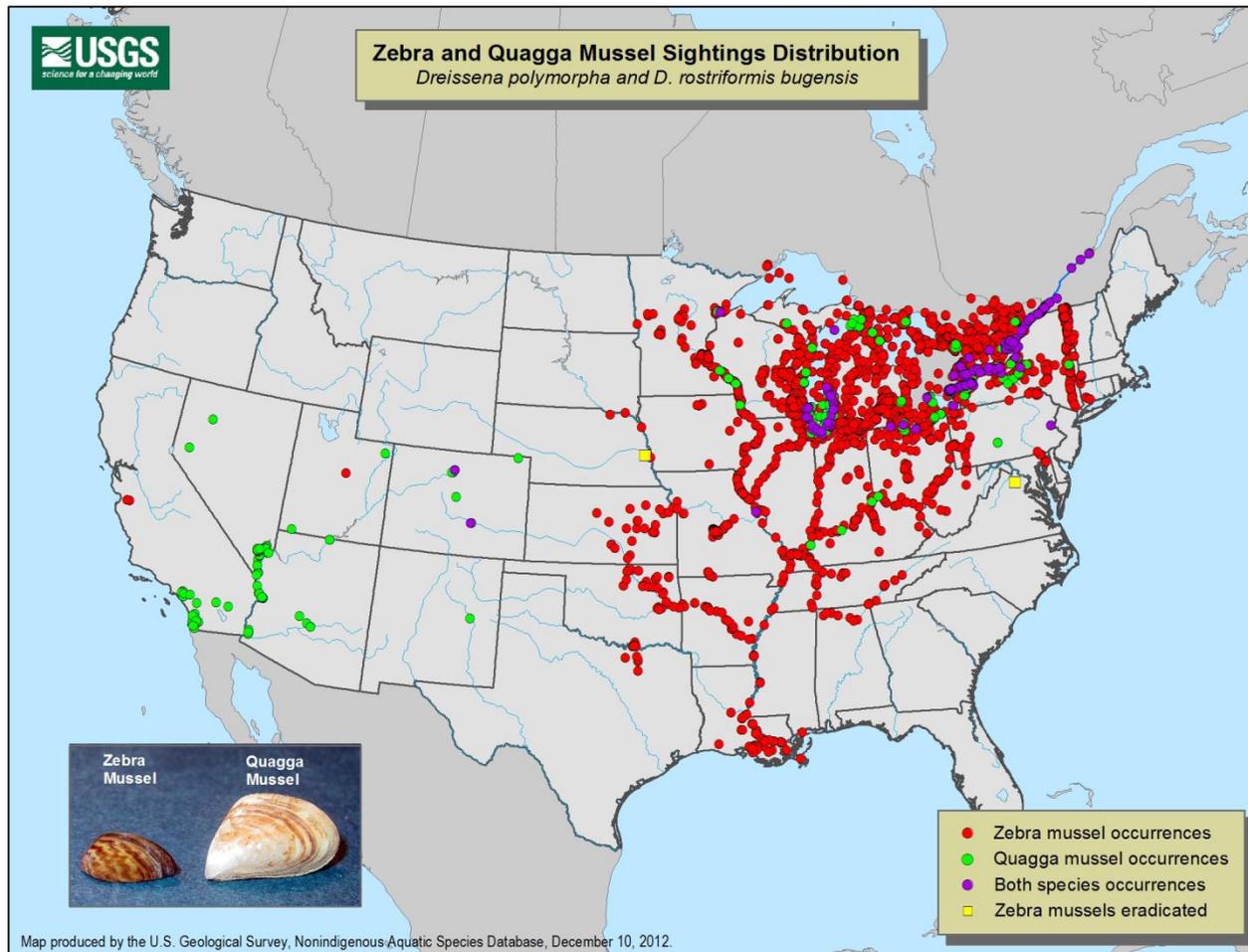


New Zealand Mudsnails

Zebra & Quagga Mussels



Zebra and Quagga Mussels



For more information on invasive species:

- Idaho Department of Agriculture: www.agri.idaho.gov
- Mussel Information: www.100thmeridian.org
- USGS Invasive Species Program:
www.usgs.gov/ecosystems/invasive_species/

Questions?

