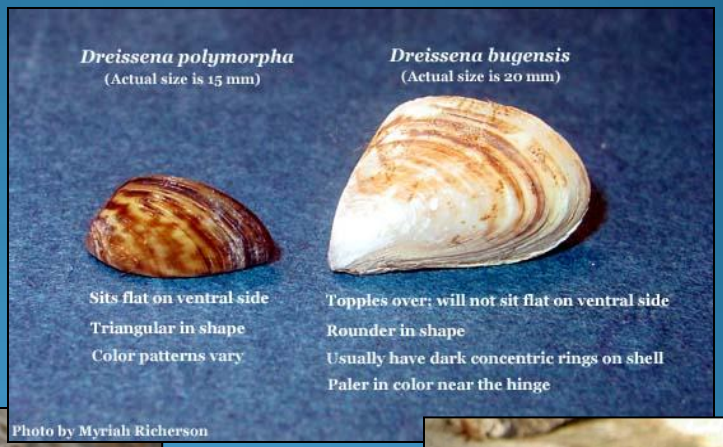
Aquatic Nuisance Species

(plants and animals that create problems in our lakes and rivers)



Topics Covered Today

- What are Aquatic Nuisance Species (ANS)?
- Why are we concerned? (Or -What are the impacts?)
- How are they transported and by whom?
- Which ones are of greatest concern to SPU?
- What can we do to help prevent invasion in SPU's watersheds?
- What are the next steps for SPU's ANS program?

What is an Aquatic Nuisance Specie?

A species that threatens native species' abundance or diversity, stability of aquatic systems and commercial or water recreational use.

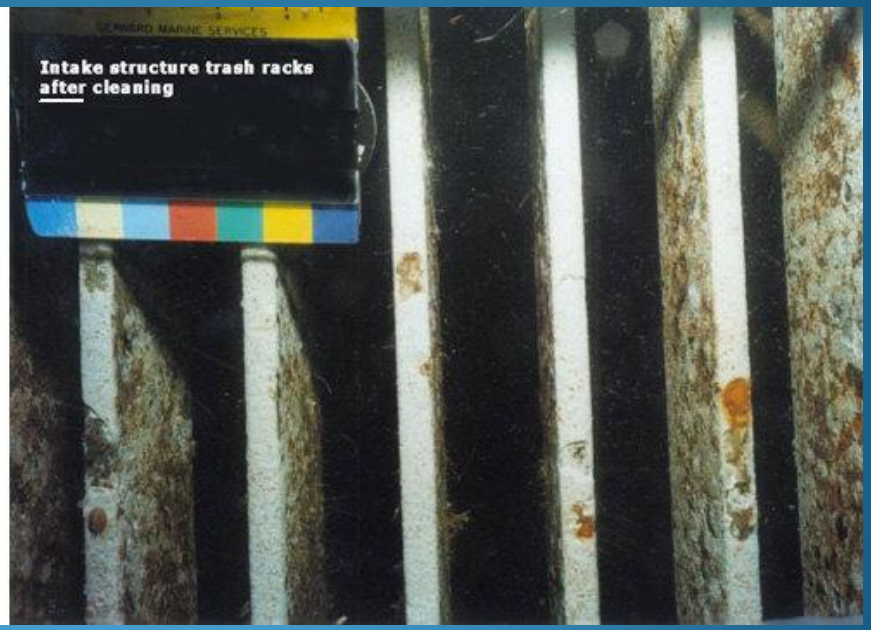
Why are we concerned about ANS?

- There can be significant operational, water quality, and financial impacts.
- Some ANS we already have or we have spent considerable budget eliminating.
  1. Lake Youngs milfoil
  2. Walsh Lake milfoil
  3. Cedar River didymo
- Many ANS are already in Washington State and King County.

Operational Impacts

- Clogged pipes, screens, intake structures, valves
- Reduced hydraulic capacity
- Impact to water treatment such as filter clogging
- Plug cooling water lines resulting in loss of equipment use such as generators, compressors, transformers
- Increase cleaning requirements
- Lose the ability to remain unfiltered on the Cedar

Operational Impacts - Mussels



Try Delivering Water With This

Pipe clogged with mussels

Or Taking Measurements With These

Or Supplying Cooling Water With This

Water Quality Impacts

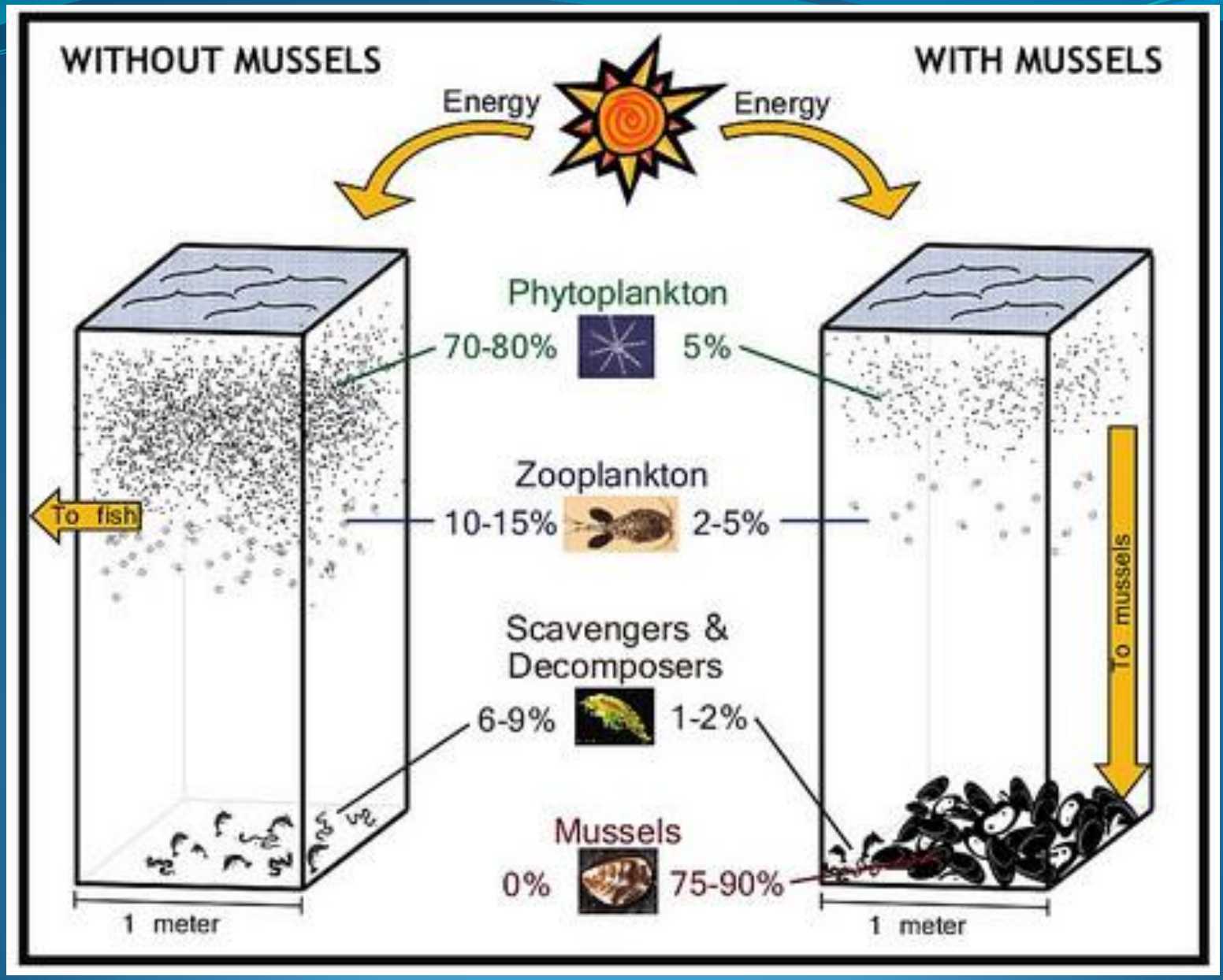
- Increased organic content, resulting in increased chemical usage and increased disinfection by-product formation
- Could increase the bacterial counts
- Can result in depletion of oxygen, resulting in the killing of aquatic species including fish
- Could cause taste and odor issues
- Can replace the native species, resulting in changes to the food chain, and potential loss of other native species elsewhere in the food chain
- Increase or decrease in water clarity

Water Quality Impacts - This Could Happen to Our Water Sources

Before ANS

After ANS

Plant and Algae Die-Offs Deplete Oxygen - Leading to Fish Kills


WITHOUT MUSSELS
WITH MUSSELS
Energy
Energy
Phytoplankton
70-80%
5%
Zooplankton
10-15%
2-5%
To fish
Scavengers &
Decomposers
6-9%
1-2%
Mussels
0%
75-90%
To mussels
1 meter
1 meter

Financial Impacts

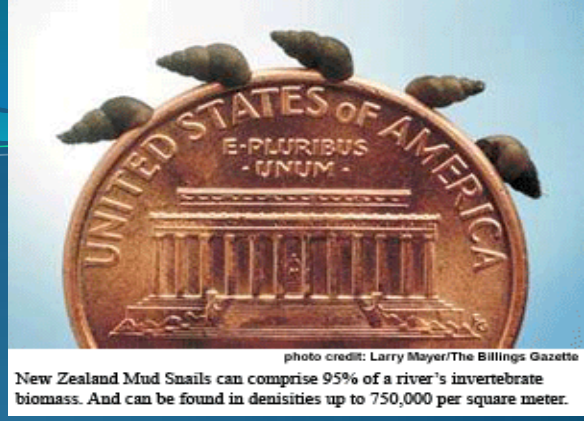


photo credit: Larry Mayer/The Billings Gazette

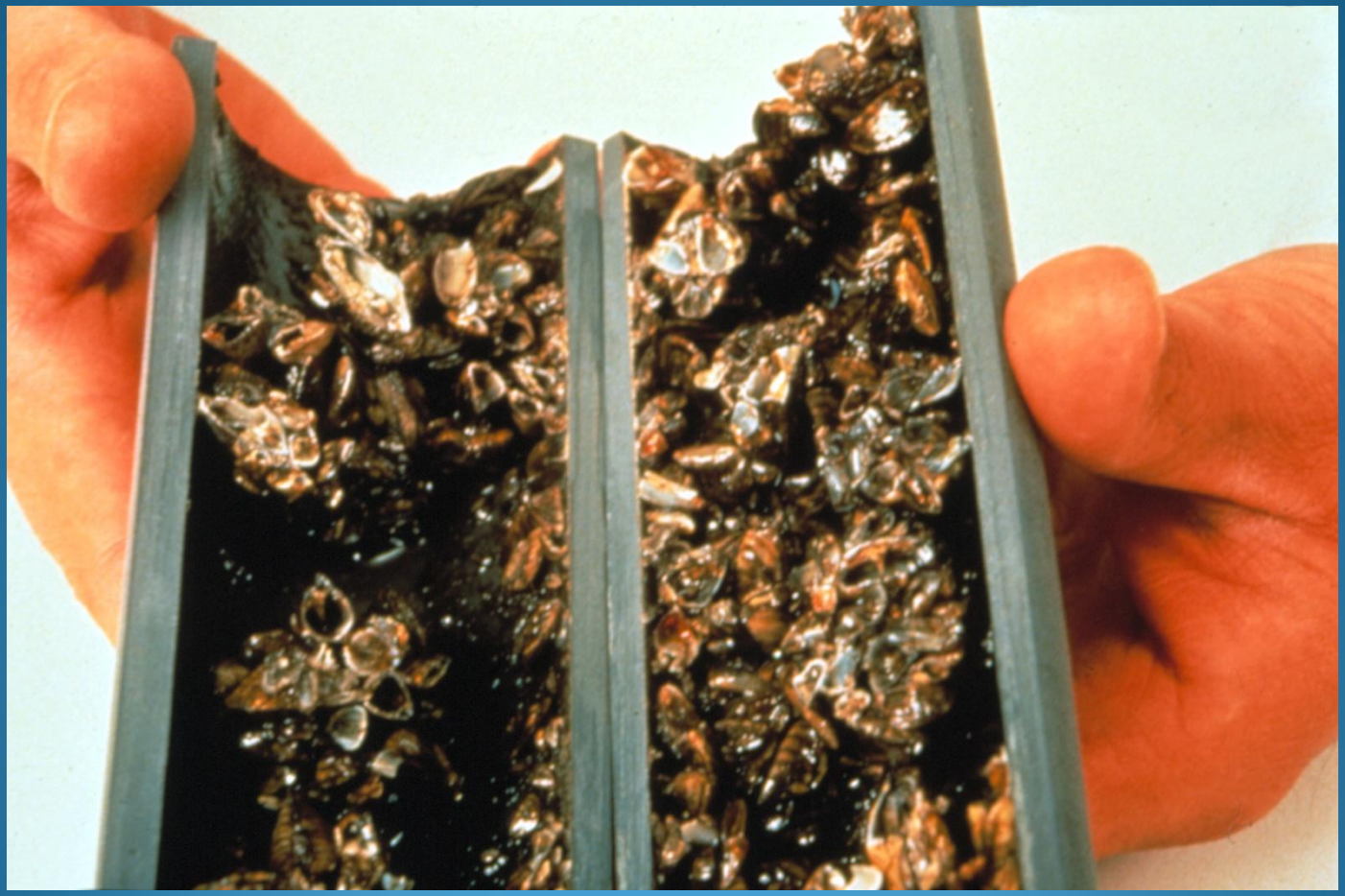
New Zealand Mud Snails can comprise 95% of a river's invertebrate biomass. And can be found in denisities up to 750,000 per square meter.

- Costs associated with increased cleaning
- Loss of hydro power generation (loss of revenue)
- Increased chemical costs (mainly disinfectants)
- Costs for installing additional treatment
- Costs to replace damaged equipment
- Loss of public confidence with a taste and odor event
- Cost of doing public notification (if necessary)

Cleaning could be fun!

Detroit Edison water intake cleaning

Pipe replacement is not cheap

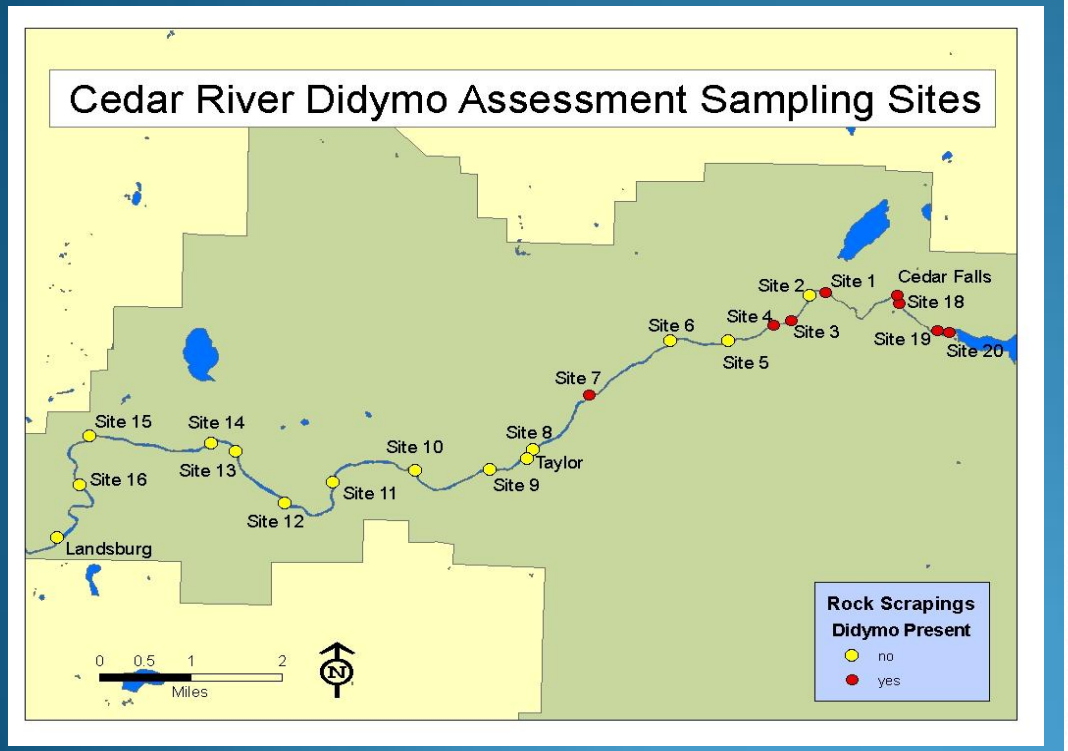


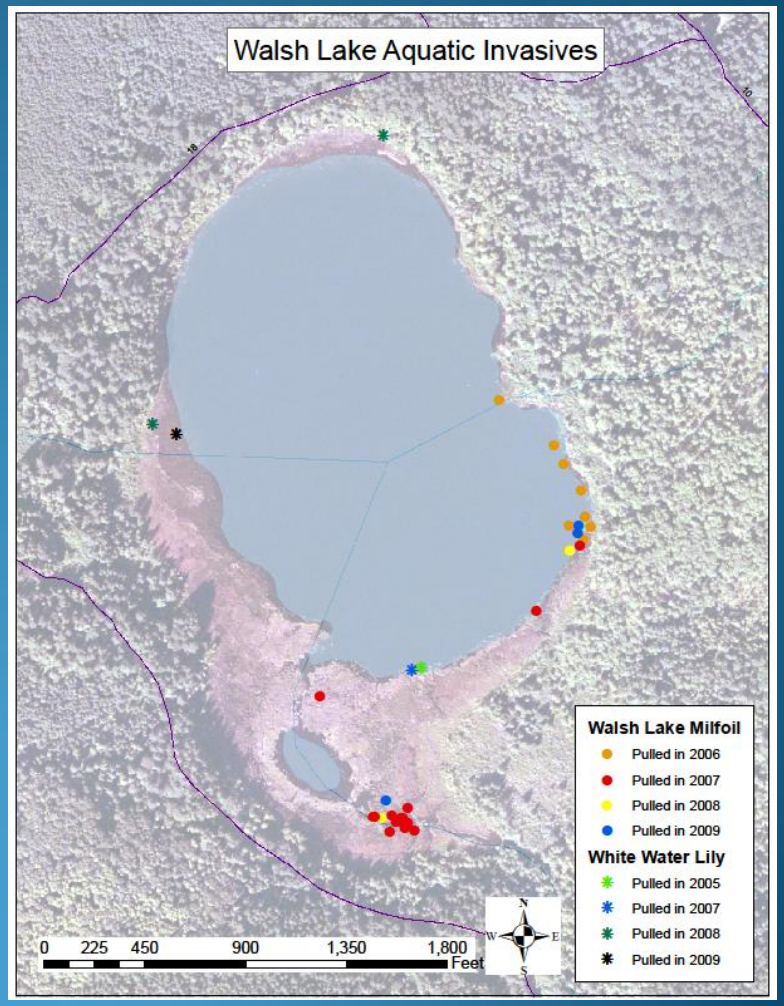
Purchase of new equipment

Some Number$ to Ponder

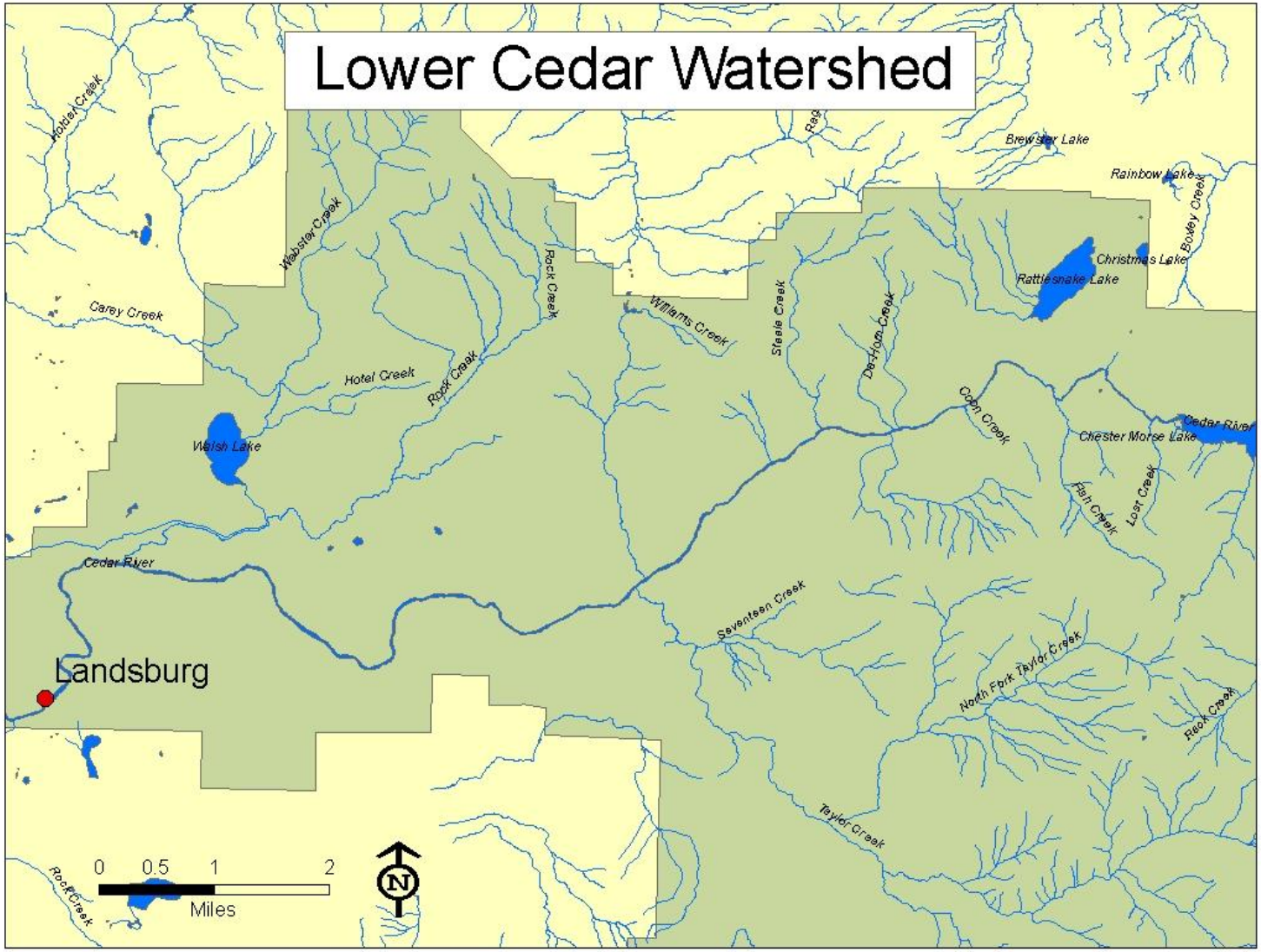
- MWD's Quagga Mussel Control Program has a $15 million dollar budget total. Almost $8 million has been spent since quaggas were found in 2007.
- Seattle spent $500,000 to eradicate milfoil from Lake Youngs (only found on 8 acres)
- Hoover Dam estimates they will spend $1 to $4 million annually to control quagga mussels
- The total cost for all utilities dealing with zebra and quagga mussels in the US from 1989 to 2004 was estimated to be between $276 and $467 million
- A new filtration plant for the Cedar system could easily cost $100 million

ANS Currently Found in Our Watersheds





The Walsh Lake Dilemma



How do ANS Invade Water bodies?

- Human transportation is most common.
- ANS flow downstream.
- Birds and other wildlife can transport.
- Some ANS can move upstream.

Human Transportation

- Boats – most significant invasions came by boat.
- Fishing gear, boots, scientific equipment, and dive gear.
- Aquarium dumping.
- Fish stocking.

Possible ANS Transport Modes Into Our Watersheds

Work Type	Who	Potential Risk for ANS
Water Quality Sampling	WDOE, consultants, SPU	High
Pump Station Maint.	Contractor	High
Stream Gage Work	USGS	High
Wildlife and Plant Surveys	MIT, USFWS, UW, Contractors, NOAA, WDFW, WA Trout	Low to High
GIS Surveys	SPU, SCL	Low to High
Road and Bridge Work	Contractors, SPU, WDNR	Low to High
Masonry Dam Maint.	SCL and Contractors	Low to High
Plant Restoration	Contractors, Friends of CRW	Low to Medium
Drilling	Contractors	High
Public Tours	SPU, Friends of CRW	Low
50+ Other Activities	130+ other groups	Low to High

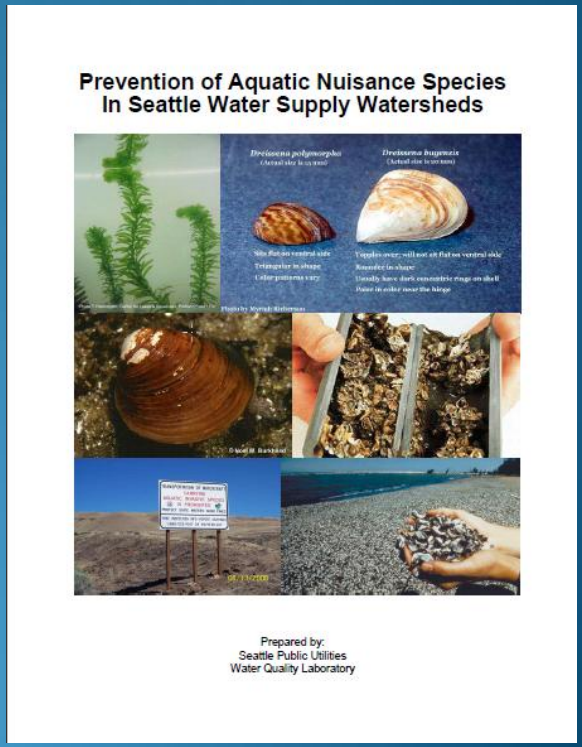
What Are the Species of Main Concern to SPU?

Species	Type of Organism	Nearest Occurrence
Didymosphenia geminata (didymo)	Algae	Cedar River
Myriophyllum spicatum or Milfoil	Aquatic Plant	Walsh Lake
Hydrilla verticillata or just Hydrilla	Aquatic Plant	Lucerne Lake
Nymphaea odorata or white water lily	Aquatic Plant	Walsh Lake
Myxobolus cerebralis or Whirling Disease	Microscopic Parasite	King County
Corbicula fluminea or Asian Clam	Animal	Lake Washington
Zebra mussel and Quagga mussel	Animal	California
New Zealand Mudsnail	Animal	Capitol Lake
Argulus japonicus or Parasitic copepod	Parasite	WA State
Eriocheir sinensis or Chinese Mitten Crab	Animal	California
Pectinatella magnifica or bryozoan	Moss Animal	WA State
Myocastor coypus or nutria	Animal	King County

What Does SPU Need to Prevent the Invasion of ANS? A Plan!

Aquatic Nuisance Species Plan has four elements:

1. Prevention
2. Early detection and monitoring
3. Rapid response
4. Control and/or eradication



SPU Actions

- Current:
  - Revised/updated ANS Plan (Prevention, Monitoring, Rapid Response, Control and Eradication)
  - Conducted ANS early detection and monitoring training for Watersheds staff (includes decon. overview)
  - Assembled ANS ID Field Kits and distribute at training
- Next Steps:
  - Refine decontamination procedures
  - Conduct interviews and training with outside agencies
  - Train additional SPU staff on decon. procedures
  - Purchase additional equipment (duplicate gear, decontamination equipment, polarizing stereoscope, field kits)
  - Coordinate with regional partners

Questions?