
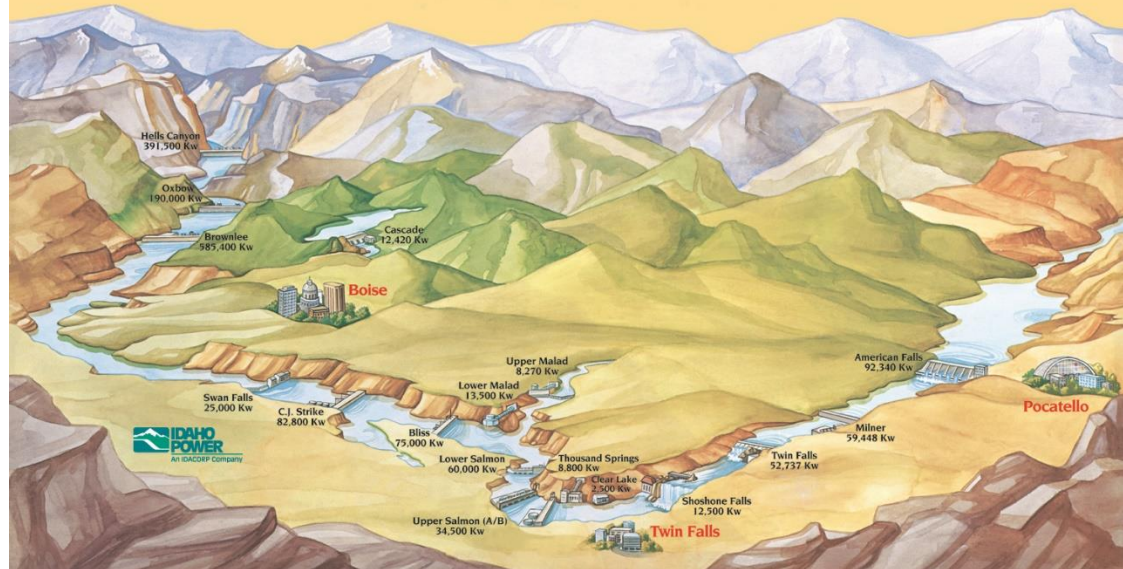


# Idaho Power Vulnerability Assessment Update



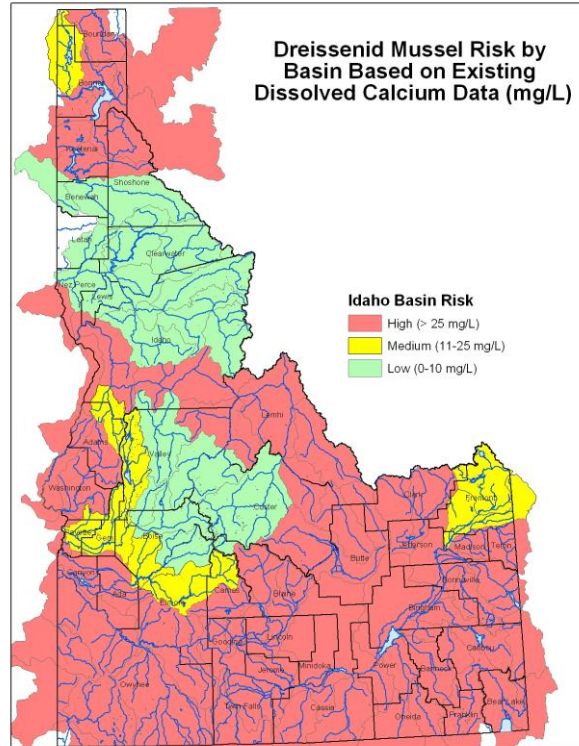
Michael Stephenson  
Resource Professional Leader

# THE SNAKE RIVER & IDAHO POWER'S HYDROELECTRIC SYSTEM





# Is the Snake River vulnerable to Dreissenid Mussels?



# Is Idaho Power Company concerned about the risks?



# Main Stem Snake River Hydroelectric Projects

## Vulnerability Assessments Complete

- American Falls
- Milner
- CJ Strike
- Swan Falls
- Oxbow
- Hells Canyon

## To Do

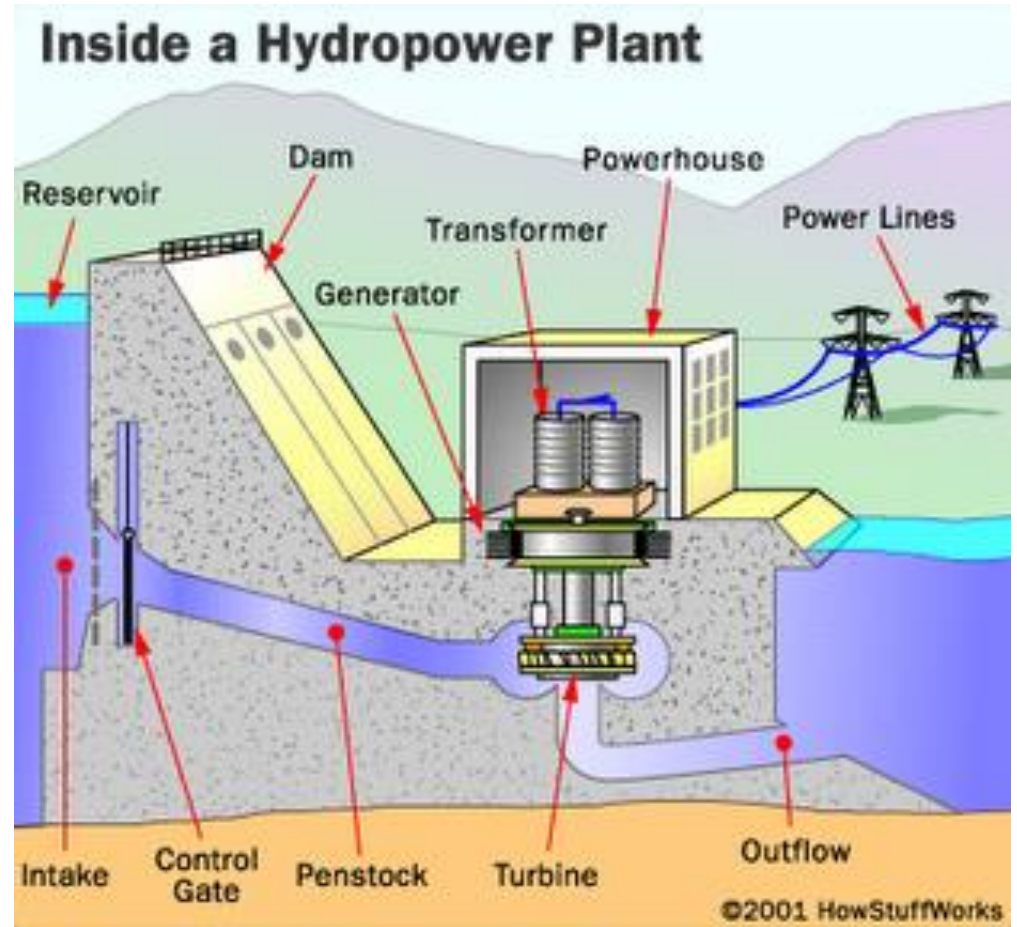
- Twin Falls
- Shoshone Falls
- Upper Salmon Falls
- Lower Salmon Falls
- Bliss
- Brownlee

# Vulnerability Assessment

- Inventory of a hydroelectric plant's infrastructure from intake to tailwater that will be impacted by a dreissenid mussel infestation.
- Anything that touches raw water is subject to driessenid mussel fouling.
- Also look at other project related facilities – recreation facilities, hatcheries and mitigation properties.

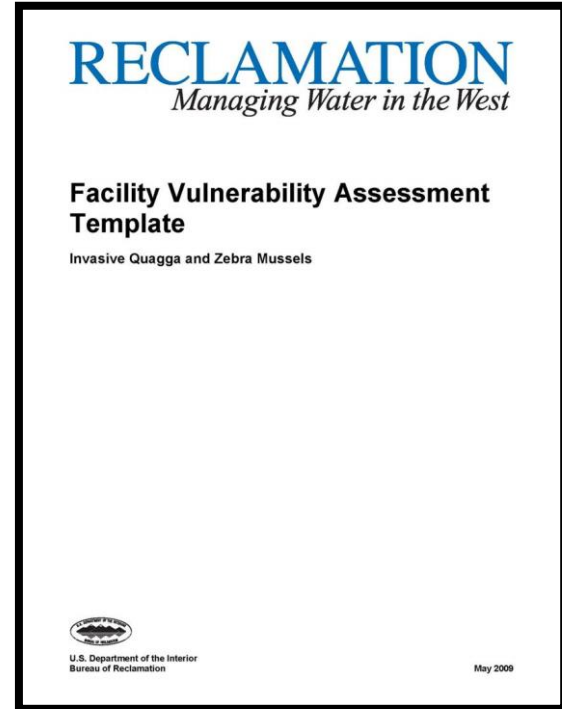
# How does hydroelectric work?

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# How do we to get there ?

- Establish a power plant contact and provide them with a checklist to complete.
- Follow up with a site visit and plant walkthrough.



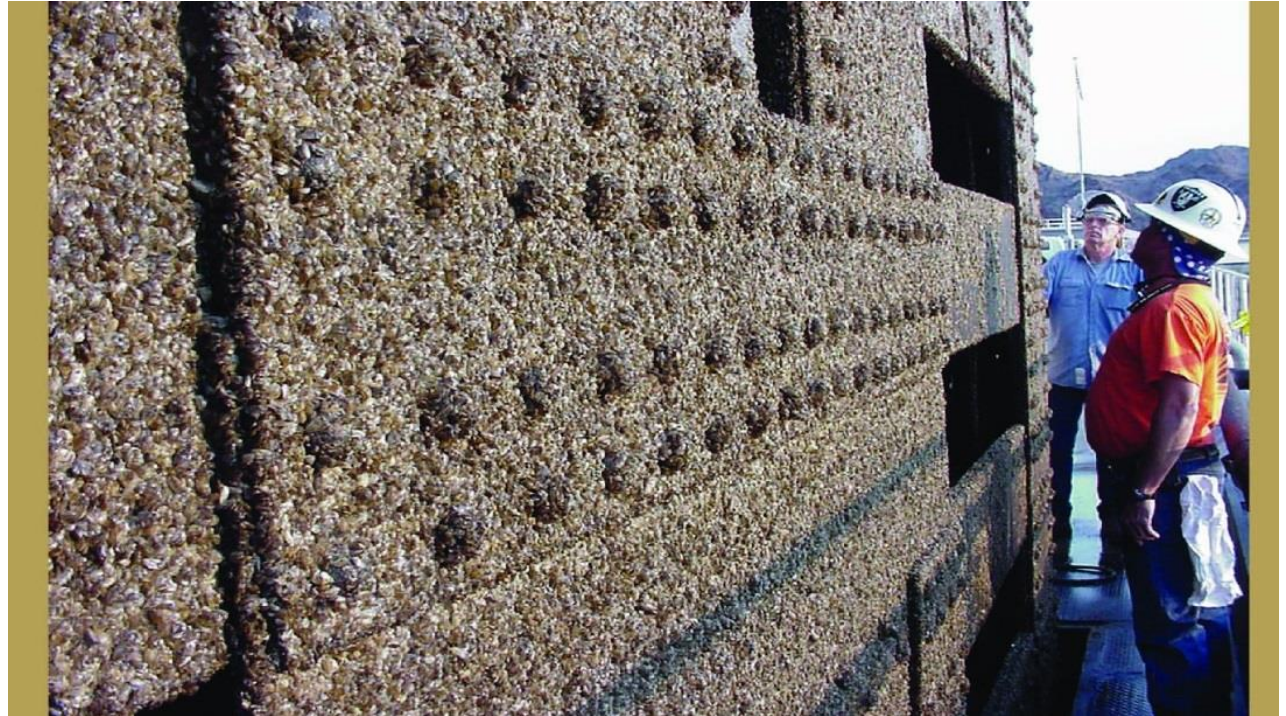


# Vulnerability Assessment Checklist

Component	Size / Diameter	Risk (H, M, L)	Specific Note for Component
Intakes			Number / Depth
Trash Rack			Number of Racks / Spacing in inches
grate			
screen			
Trash Rake			
Trash Rack removal system			Is Rack Removable /Frequency
Gates			
Stop Logs			
Penstock			Diameter / Velocity in f/s/ Construction Materials
Air coolers			
Air vents			
Thrust bearing coolers			
Heat Exchangers			Piping material ie copper
Fire Suppression System			
HVAC			
Drain Gallery			
Sump			
Sump Float			
Pump wells			Temperature
Spill Gates			Number / type
Spill gate opener			
Oil / Water Detection			
Forebay / Tailwater Sensors			
Gland Water Cooling / Lubrication			
Discharge			
Instrumentation e.g			
sight glass			
level guages			
flow meters			
pressure transducer			
pressure transmitter			
pressure tap			

# Site Visit

Background presentation on dreissenid mussel biology, distribution in the western U.S. and photos from the Lower Colorado River plants.



# Shock and Awe

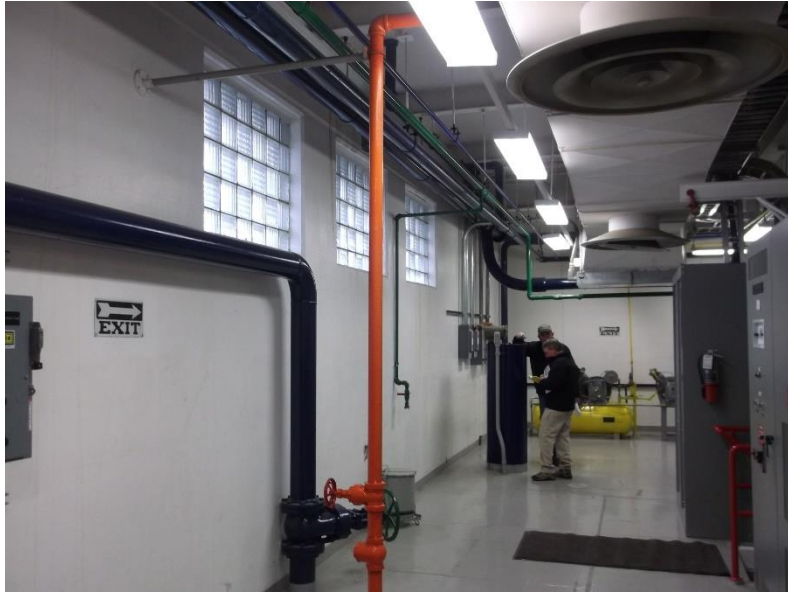


# Site Visit





# Site Visit





# Plant Walkthrough



# Site Visit



# What did we find?

- High risks to cooling system water lines. Including turbine cooling and HVAC cooling systems.
- Instrumentation is also at risk. This includes headwater and tailwater elevation gages, piezometers, oil sensors and sump pumps sensors.



# Long-term Solutions

- Solutions at the hydro plants will come from the operators and maintenance staff. One size does not fit all and these folks know their plants well.
- Filtration and UV treatment systems are currently still the best options for in-line treatment.



# Challenges and Successes

- Scheduling has been difficult. Plant maintenance is constant.
- Plant staff have been very engaged and have been very helpful for the assessment checklists.
- Upper management has been very support of the efforts.



# Questions?



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