Northwest Power and Conservation Council



September 4, 2013

# MEMORANDUM

**TO:** Council Members

**FROM:** Tony Grover – Director, Fish and Wildlife Division
Jim Ruff – Manager, Mainstem Passage and River Operations

**SUBJECT:** Briefing on the Updated IEAB Invasive Mussel Report

At the September 11, 2013, meeting in Coeur d'Alene, Dr. Roger Mann, Chair of the Council's Independent Economic Analysis Board (IEAB), will present the findings of the IEAB's invasive mussels update entitled, "Economic Risk of Zebra and Quagga Mussels in the Columbia River Basin." For your information and review, here is a link to the report on the Council's web site: www.nwcouncil.org/fw/ieab/ieab2013-2

This report is an update to IEAB report 2010-1 titled "Economic Risk Associated with the Potential Establishment of Zebra and Quagga Mussels in the Columbia River Basin." Overall, the information provided in the updated report suggests that recent state actions to augment ongoing regional prevention efforts are justified economically and should be continued, if not expanded.

In addition to providing updated information about the environmental conditions required for zebra or quagga mussel survival and establishment, the report's major findings are:

- Since 2010, a number of events have led to increasing concern about the probability of zebra or quagga mussels becoming established in the basin.
- The potential economic and ecological impacts of invasive mussels in the Columbia Basin are becoming more widely recognized.
- The outlook for prevention to be successful has improved, and some studies suggest that prevention may be underfunded.
- Prevention efforts at the State level might be improved by better enforcement, expanded inspections, and applied research.
- Changes to the federal Lacey Act and its implementation could help improve prevention.



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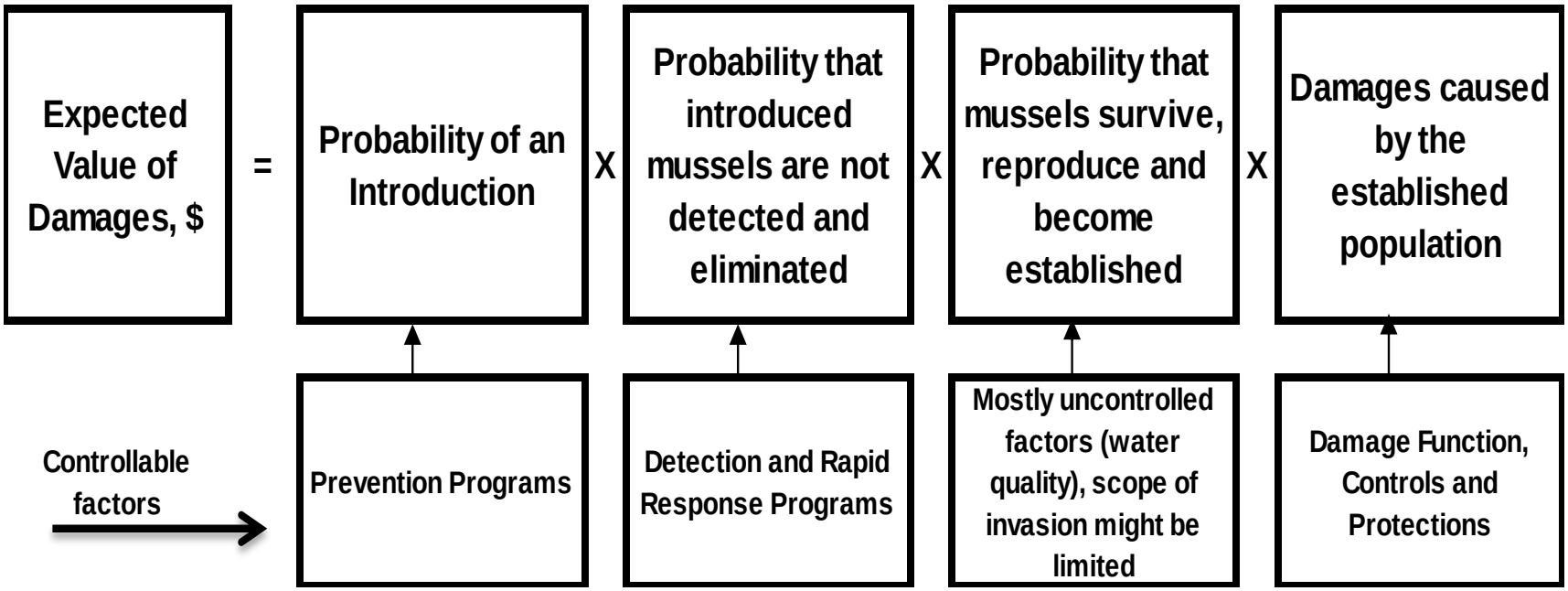
# Invasive Mussels Update
# Economic Risk of
# Zebra and Quagga Mussels in the
# Columbia River Basin

# Approach

- Update to 2010 IEAB Report
- Focus on new information regarding potential for establishment, potential damages, prevention economics, and control technology
- As with 2010 report, compiled non-economic information and worked with non-economist experts
- Identified some data gaps from the 2010 report and found information to fill them.
- No major new information regarding economic damage potential
- Reviewed State inspection programs to look for potential improvements
- Reviewed federal Lacey Act and its implementation

**Figure 3. Flow Diagram for Expected Value of Damages from an Invasive Mussels**



# Findings

**Finding 1. Since 2010, a number of events have led to increasing concern about the probability of zebra or quagga mussels becoming established in the basin.**

- More boats fouled with mussels are being detected at state-operated watercraft inspection stations.
- PSU studies suggest adult quagga mussels can live in mainstem Columbia River water.
- Water quality data from selected sites in western Montana suggest calcium very favorable for mussels
- Mussels could become established in large densities in favorable upstream locations. Then, veligers floating downstream could be a nuisance even though they might not be able to reproduce at their full potential in the downstream locations.

State Inspections and Boats with Mussels Intercepted in 2012

| State | # Boats Inspected | # Boats Intercepted | Origin |
|---|---|---|---|
| MT | 39,441 | 4 | 2-Great Lakes<br>1-Lake Mead<br>1-Florida |
| OR | 4,617 | 18 | 12-Lake Mead<br>1-Lake Pleasant<br>1-Lake Havasu<br>2-Great Lakes<br>2-other sources |
| WA | 14,690 | 30 | 27-Lake Mead<br>3-Lake Michigan |
| ID | 47,320 | 57 | 29-Lake Mead<br>18-Great Lakes<br>2-Lake Pleasant<br>6-Lake Havasu<br>2-Undetermined |
| Total | 106,068 | 109 | |

**Finding 2. The potential economic and ecological impacts of invasive mussels in the Columbia Basin are becoming more widely recognized**

- The important influence of invasive species in the Columbia Basin is becoming more appreciated.
- Ecosystem damages being documented in mussel-infested regions suggest possible damages in our region.
- The potential ecological impacts of invasive mussels may include hosting of pathogens and parasites, fish injuries, bioaccumulation of toxins, and hypoxia caused by the breakdown of waste products.
- Once established in open water, mussels may be very difficult or impossible to eradicate.

**Finding 3. The outlook for prevention to be successful has improved, and studies suggest that prevention may be underfunded**

- Some of the Pacific Northwest states and British Columbia have passed new legislation aimed at preventing the introduction of aquatic invasive species
- State inspection and decontamination programs are improving
- New federal funding for prevention efforts at Lake Mead should help
- Population genetics data suggest that "introduction of large numbers of zebra or quagga mussels are required to establish sustainable infestations“

**Finding 4. Prevention efforts at the State level might be improved by better enforcement, expanded inspections, and applied research**

- Some boaters do not purchase AIS permits
- Some trailers do not stop at AIS inspection stations
- Many inspection stations do not operate on some days of the week and some time of day
- Inspections cease off-season, but data suggest that veligers survive better in trailered water in the cooler months
- New federal funding for expanded state prevention efforts would help the NW states
- More information is becoming available that could improve targeting (Wells et al)
- The potential for long-term survival of mussels in many parts of the Basin is still not clear.

**Finding 5. Changes to the federal Lacey Act and its implementation could help improve prevention**

- Quagga mussels are not listed as an injurious species
- To date, there has not been a single case to date in the Northwest states where an attempt to knowingly transport mussels against State and federal laws has been successfully prosecuted.
- State of WA felony case from fall 2012 is proceeding

# Other new information to consider

- If "introduction of large numbers of zebra or quagga mussels are required to establish sustainable infestations“ it’s the big vectors that matter most.
- New control technologies are being tested and improved, but they can not be expected to provide eradication in open water.
- There are 2 phenotypes of quagga mussels in North America with different habitat preferences, and zebra mussels have different habitat preferences. How should management and prevention change if one becomes established?