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October 6, 2015

MEMORANDUM

TO: Fish and Wildlife Committee Members

FROM: Jim Ruff – Manager, Mainstem Passage and River Operations

SUBJECT: Briefing on the framework for a regional defense against quagga and zebra mussels in the Pacific Northwest

BACKGROUND:

Presenters: This briefing will be presented by Stephen Phillips of the Pacific States Marine Fisheries Commission (PSMFC) and Lisa DeBruyckere of Creative Resource Strategies LLC. Ms. DeBruyckere was retained by the Pacific Northwest Economic Region (PNWER) to assist in developing a report concerning a perimeter defense strategy related to quagga and zebra mussel prevention for the Pacific Northwest region.

Summary: Over the last decade, numerous federal, state, and local governments, tribal sovereign nations, industry, non-profit organizations, and others have worked collaboratively to prevent the introduction of invasive quagga and zebra mussels (dreissenids) to Pacific Northwest waters to avoid the deleterious direct and indirect economic, environmental and social effects from such an introduction. This presentation will summarize a recent report entitled “Advancing a Regional Defense Against Dreissenids in the Pacific Northwest.” The briefing will describe: a) a regional framework to prevent the introduction of dreissenid mussels in the Pacific Northwest; and b) the key priorities and recommendations contained in the report.

Relevance: Preventing the establishment of aquatic invasive species, such as quagga and zebra mussels, is a key measure identified in the non-native and

invasive species sub-strategy in the Council's amended 2014 Fish and Wildlife Program. For example, the Program states "the Council encourages federal and other regional entities to prevent non-native and invasive species introductions by monitoring and managing the various pathways that could introduce additional aquatic nuisance species into the Columbia River Basin and developing strategies and public outreach tools to educate the public about regional prevention and management of invasive species." The Program also says that "BPA and other federal agencies should assist the Northwest states' efforts to prevent the establishment of quagga and zebra mussels."

Workplan: Invasive species prevention is identified as a high priority in the Fish and Wildlife Division's work plan. Preventing invasive species introductions in the Columbia Basin, and in particular an infestation of quagga and zebra mussels, will help protect past Program investments.

Background: The following information is from the Executive Summary of the report.

The Pacific Northwest is the only region of the United States and Canada that does not have established populations of quagga or zebra mussels (*Dreissenid* spp.). The Pacific Northwest (PNW) region, for the purposes of this defense strategy, includes the four U.S. states of Washington, Oregon, Idaho, and Montana as well as the western Canadian provinces of British Columbia, Alberta, and Saskatchewan.

The estimated costs associated with failing to prevent an invasion of dreissenids in the Pacific Northwest states and western Canadian provinces exceeds \$500 million annually. Pacific Northwest states and western provinces, as well as a few key states that are source states for dreissenids, are spending more than \$13.2 million annually on prevention efforts. The region can be most effective in preventing an introduction by cooperating on a defense strategy that includes interdiction of contaminated boats entering the region at its perimeter.

An effective and implementable regional defense strategy includes prevention; surveillance and monitoring; rapid response and management capabilities; an aware, informed, an educated public; enhanced detection and response tools and technologies; and improved communication and information about key vectors and pathways. Prerequisites for an effective perimeter defense include awareness and support at the policy level and cooperation at the community level, regional and bilateral coordination to harmonize methods and procedures for preventing further spread, and capacity and allocation of adequate resources that provide for rapid response, and research that informs understanding of dreissenid biology and effective methods for control.

To successfully implement an aquatic invasive species regional defense effort for the Pacific Northwest would require an additional \$20 million in funding to achieve the following five key priorities, as well as implement an additional set of recommendations:

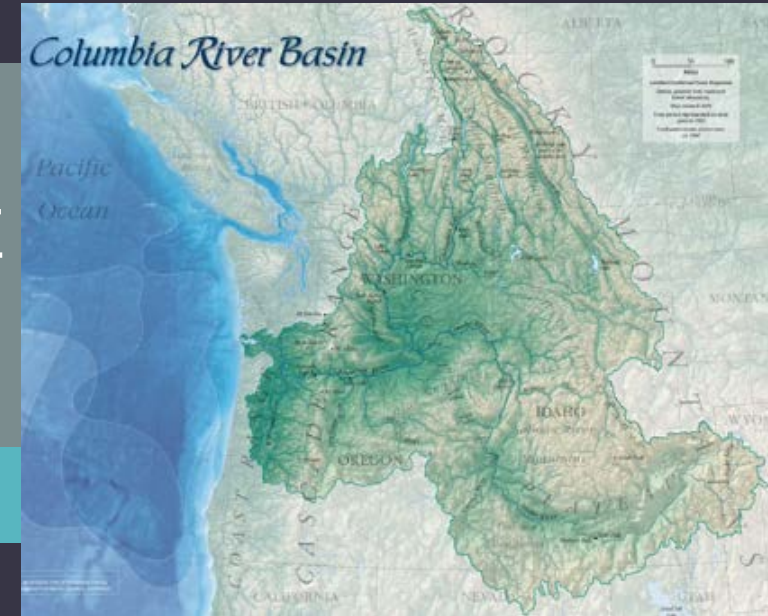
1. Contain dreissenids at the source.
2. Develop and foster long-term, sustainable funding solutions for dreissenid and other aquatic invasive species prevention efforts, including industry participation. Engage the greatest beneficiaries of dreissenid prevention efforts in funding those efforts.
3. Build and fund the institutional capacity and decision-making structures for collaboration in the region to monitor, assess, and renew regional AIS strategies, including enhancing the effectiveness of a regional perimeter defense and achieving consistency in public education and awareness.
4. Establish and implement a real-time rapid response notification database that incorporates commercial haulers into the system.
5. Annually coordinate watercraft inspection and decontamination stations in the Pacific Northwest and with neighboring states and provinces using an online database.

More Info: Below is a hyperlink to this report:

<http://www.westernais.org/media/articlesissuepapers/advancing-a-regional-defense-against-dreissenids-in-the-pacific-northwestfinal.pdf>



VULNERABILITY ASSESSMENT/RAPID RESPONSE/ADVANCING A REGIONAL DEFENSE AGAINST DREISSENIDS IN THE PACIFIC NORTHWEST



October 13, 2015

Northwest Power and Conservation Council

Lisa A. DeBruyckere, Stephen Phillips



VULNERABILITY ASSESSMENT TEAM

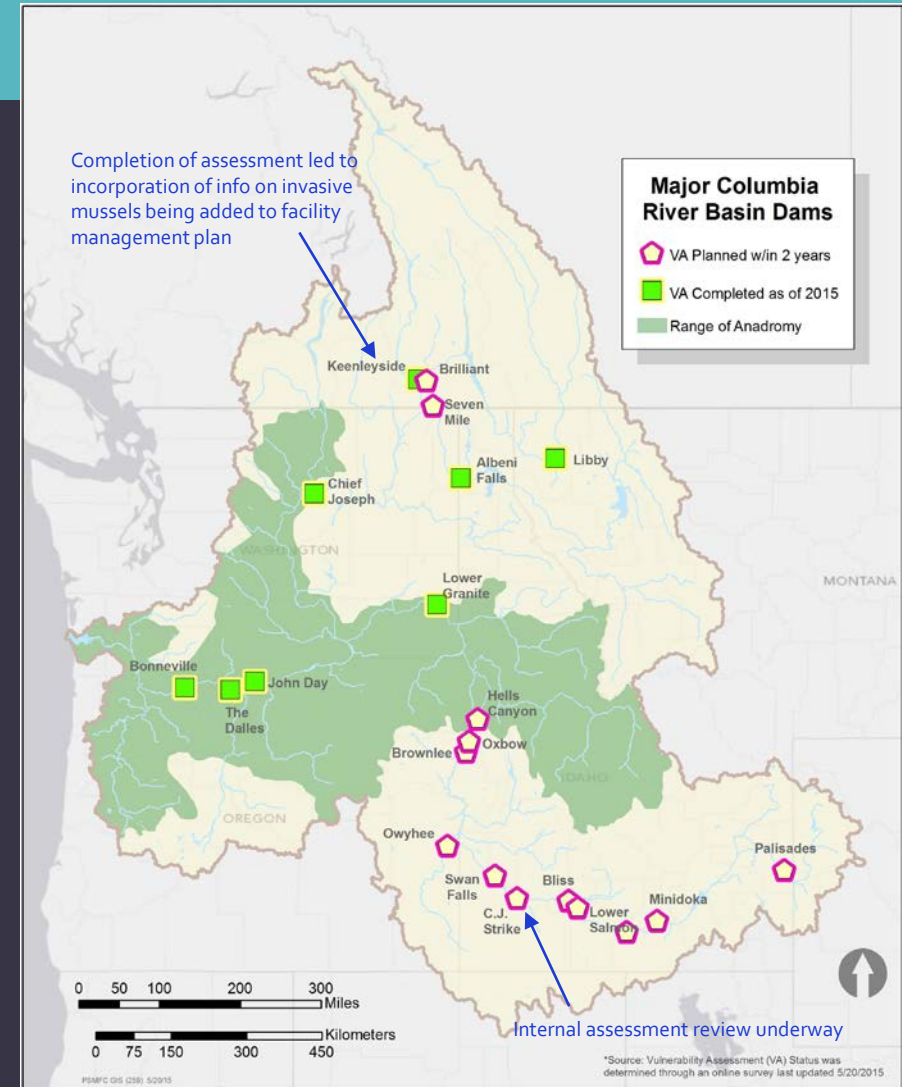
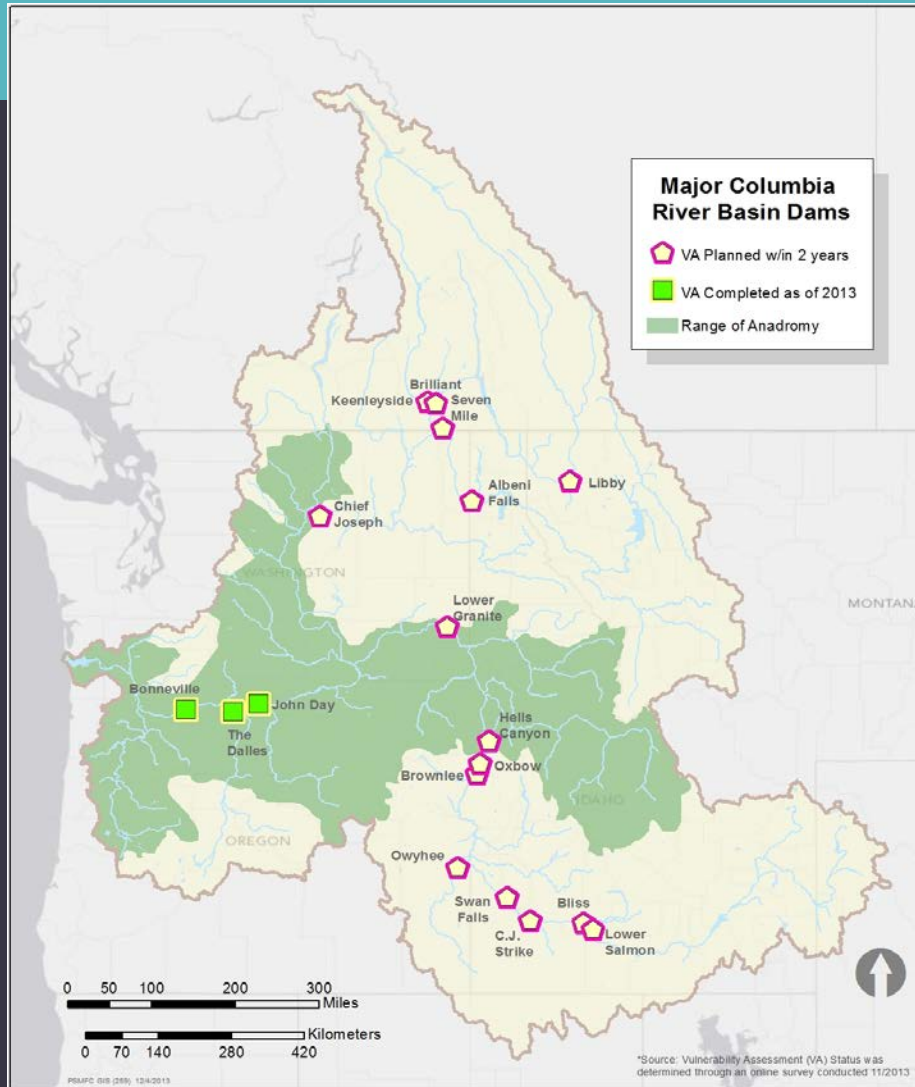
- Vulnerability Assessments
 - Itemize and inspect all hydropower facility structures and components that come into contact with raw water
 - Judge the degree to which debris will impair performance
- Risks and problems facilities face depend on:
 - The extent of the introduction
 - How raw water gets into facility
 - Processes to treat or transform the water
 - Routing of piping and location of equipment
 - Maximum and minimum flow rates, temperature ranges, frequency of operation



The Chief Joseph Dam on the Columbia River is the largest hydropower producing dam operated by the USACE.

Photo credit: USACE

VULNERABILITY ASSESSMENT TEAM UPDATE



RAPID RESPONSE WORKING GROUP

- **Task:** Update control options/permitting requirements needed for eradicating dreissenids in CRB states.
- Host state workshops to simulate eradication scenarios.
- **UPDATES:**
 - Oregon and Washington dreissenid exercise (December 2013)
 - Responding to an introduction of dreissenids in Oregon and Washington – BMPs, effects analysis (54-page document) (2015)
 - Rapid Response Plans – Oregon (2013), Washington (2014), Idaho (2015 DRAFT)
 - CRB regulatory requirements (updated 2014) and updated pesticide use matrices for OR, WA, and ID (2013) and appendix on control (2013)
 - Discussions with federal agencies underway – PSMFC playing lead convening role – USFWS is lead federal point of contact on any dreissenid action effort (2015)
 - Pending meeting with Governor’s Natural Resources cabinet in Oregon (2015)
 - Wyoming Rapid Response Exercise at Jackson Lake (Spring of 2016)
 - Exploring chemical control options on ongoing basis

DREISSENID MUSSEL RESEARCH PRIORITIES WORKSHOP

- Portland State University Lead
- November 4-5, 2015
- 30 experts
- Goal: Review and discuss dreissenid research priorities and develop one list that identifies the highest priority research needs among:
 - Biology
 - Detection
 - Prevention
 - Monitoring
 - Control



Great Northern
LANDSCAPE CONSERVATION COOPERATIVE

REGIONAL DREISSENID FRAMEWORK

- Goals:
 - Define and describe an effective, efficient, and practical perimeter strategy (framework)—structure, cost, and policy needs.
 - Work with stakeholders to assess possible sources of long-term sustainable funding for perimeter defense.
 - Provide a high-level estimate of the avoided costs saved by focusing on prevention.
 - Produce and distribute the framework to member states/provinces, Congressional delegation, stakeholders, and others.



WESTERN INVASIVE MUSSEL EFFORTS

Regional Defense Using resources in a cost-effective, interjurisdictional, coordinated, and **collaborative** response to prevent mussels from entering uninfested areas and to contain AIS at their source.



GOALS OF A REGIONAL FRAMEWORK

- Prevent the introduction of dreissenids (and other AIS) to the PNW
- Prevent the spread of dreissenids in North America
- Improve surveillance and monitoring of dreissenids
- Improve rapid response and management capabilities
- Create an aware, informed, and educated public
- Develop and enhance detection and response tools and technologies
- Improve communication and information about key vectors and pathways
- Help to ensure states and provinces collaborate and cooperate on a regular basis throughout the year

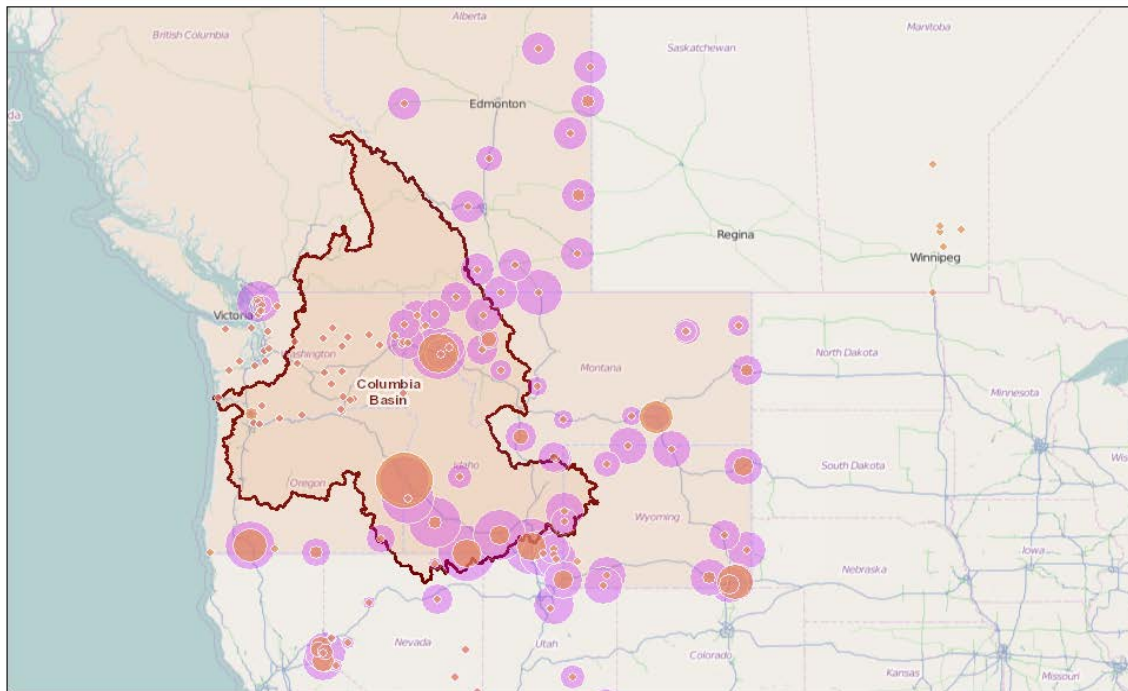


ONLINE WATERCRAFT INSPECTION STATION TOOL

REGIONWIDE Viewer

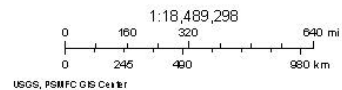


2015 Regional Watercraft Inspection & Decontamination Planning



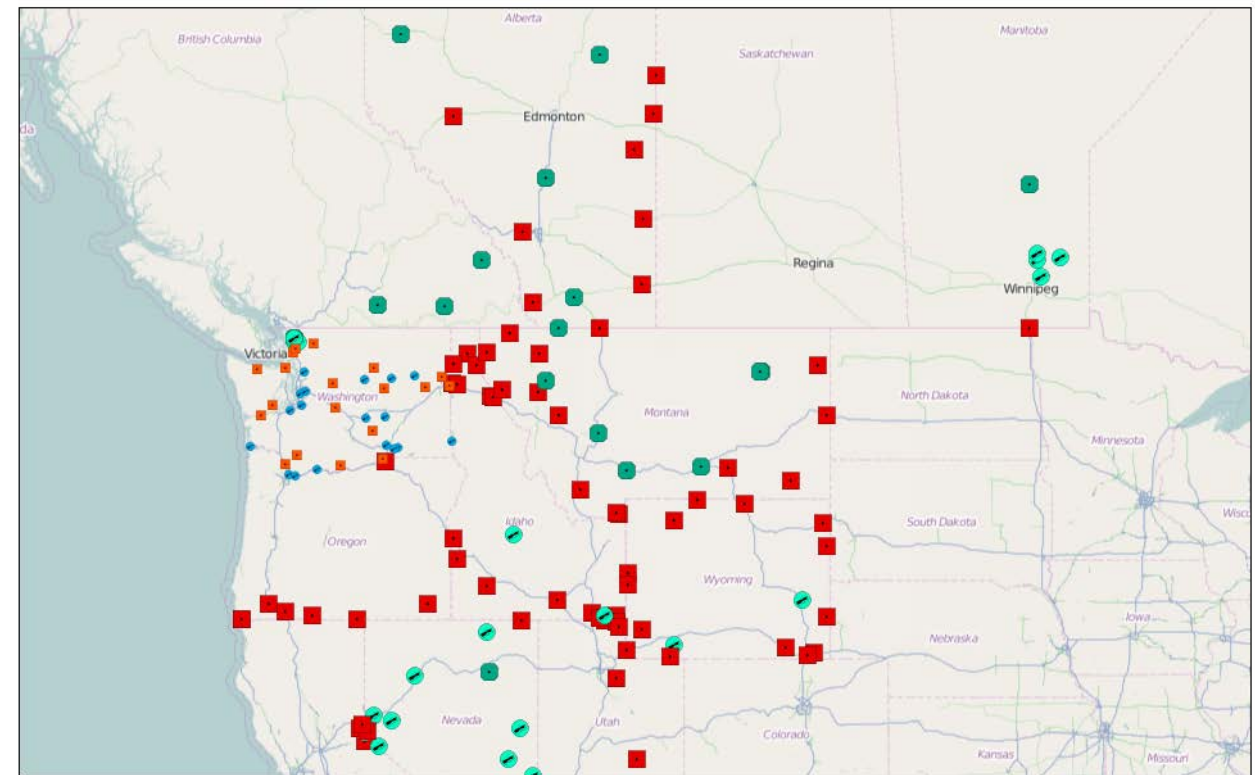
May 25, 2015

- PNW Region States & Provinces
- Columbia Basin Boundary



2015 Regional Watercraft Inspection & Decontamination Planning Team
Aquatic Invasive Species Program, Pacific States Marine Fisheries Commission

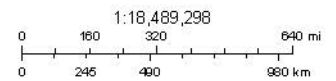
2015 Regional Watercraft Inspection & Decontamination Planning



May 25, 2015

Watercraft Inspection Stations (Proposed and Current 2015)

- Roving
- Highway Inspection Station
- Rampside Inspection Station
- Temporary Rampside
- Temporary Roadside



2015 Regional Watercraft Inspection & Decontamination Planning Team
Aquatic Invasive Species Program, Pacific States Marine Fisheries Commission

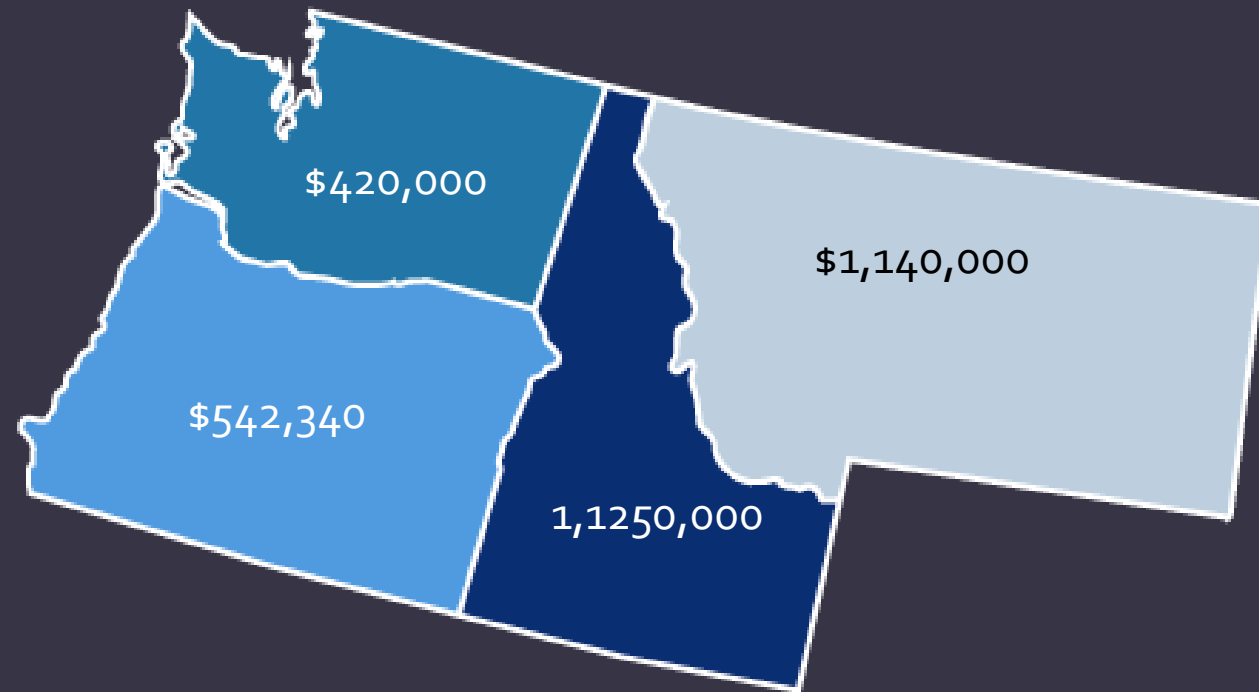
PACIFIC NORTHWEST STATES/PROVINCES	AMOUNT	SOURCE
ALBERTA	\$1,500,000	K. WILSON
BRITISH COLUMBIA	*\$814,834	M. HERBORG
SASKATCHEWAN	**\$274,149	C. DOHERTY
IDAHO	\$1,250,000	T. WOOLF
MONTANA	\$1,140,000	T. BOOS
OREGON	\$542,340	R. BOATNER
WASHINGTON	\$420,000	A. PLEUS
STATES/PROVINCES ADJACENT TO PNW		
WYOMING	\$800,000	B. BEAR
CALIFORNIA/NEVADA – LAKE TAHOE	\$1,500,000	D. ZABAGLO
CALIFORNIA	***\$2,931,207	D. NORTON
NEVADA	\$700,000	K. VARGAS
UTAH	\$1,350,000	J. NIELSON
GRAND TOTAL	\$13,222,530	

*Expressed in US dollars.

**This is an estimate of the amount that will be expended in 2015-16 for equipment and salaries. It does not include that portion of the program carried out by the Communications Branch and Compliance and Field Services Branch. These funds are expressed in US dollars.

***In California, watercraft inspection programs at individual waterbodies are implemented and conducted by the local water manager. These programs and fees vary by waterbody and are not tracked by the state. For information on boating restrictions and inspections please contact the waterbody manager directly. Note: Colorado invests \$4,000,000 annually in watercraft inspection programs. They do not implement roadside inspections.

PNW STATE DREISSENID PREVENTION COSTS



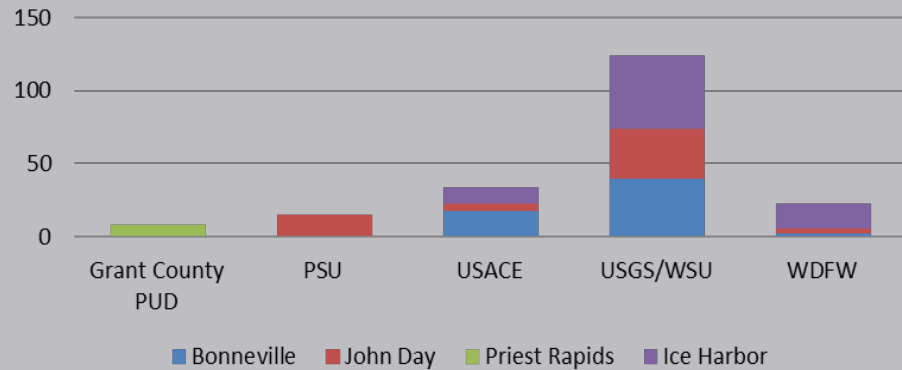
**Total for the PNW
States**

\$3,352,340

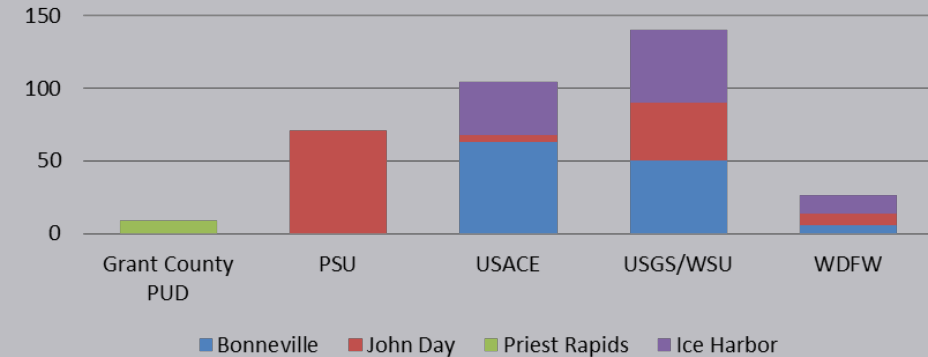
POTENTIAL COSTS OF A DREISSENIID INTRODUCTION	ALBERTA	BRITISH COLUMBIA	NORTHWEST TERRITORIES	SASKATCHEWAN	YUKON TERRITORIES
Power Generation	\$5,938,487	\$6,524,532			
Drinking Water Systems	\$20,839,921	\$9,251,608			
Boat Maintenance	\$390,060				
Recreational Fishing	\$21,830,892	\$12,385,962			
Water Management Structures	\$8,841,373			\$193,713,742	
Water Diversion Intakes	\$3,910,000				
Property Value	\$13,789,500	\$10,867			
Golf Courses					
TOTAL ANNUAL COST ESTIMATED	\$75,540,773	\$28,172,969	EST. \$30M	EST. \$30M	EST. \$30M
	ALASKA	IDAHO	OREGON	MONTANA	WASHINGTON
Hydropower		\$47,242,000			
Other Dams		\$148,700			
Drinking Water Intakes		\$4,287,000			
Boating Facilities		\$285,000			
Fish Hatcheries and Aquaculture		\$1,136,800			
Boater Costs/Maintenance		\$23,850,000			
Fishing Use		\$17,507,500			
Golf Courses		\$17,100			
Irrigation					
TOTAL ANNUAL COST ESTIMATED	EST. \$5M	\$94,474,000	EST. \$100M	EST. \$80M	EST. \$100M

TOTAL ESTIMATED COST TO THE PNW = MORE THAN \$500 MILLION ANNUALLY

**2013 Dreissenid Veliger Monitoring
by Agency**



**2014 Dreissenid Veliger Monitoring
by Agency**



* Current early detection efforts for quagga and zebra mussels in the main stem Columbia River reservoirs are insufficient and need to be expanded to protect both the FCRPS and the CRB ecosystem.

* The joint WSU-USGS project, funded by BPA Technology Innovation Program from FY13-15, represents the largest early detection effort in the main stem reservoirs.

* As of October 1, 2015 BPA Technology Innovation Program is no longer funding this project, severely hampering early detection efforts, and thus managers' ability to respond to an invasion and to reduce its spread and mitigate its impacts.

FUNDING NEEDED - \$20 MILLION

- **Watercraft inspection and decontamination station expansion (\$1,977,969)**
 - Oregon-\$410,000; Montana-\$83,000; Washington-\$694,000; Wyoming-\$718,000
- **Build and fund the institutional capacity for regional collaboration - \$647,030**
- **Produce *Clean, Drain, Dry* pamphlets and support training for United States/Canada border patrol) - \$25,000**
- **Produce highway signs at the borders of the United States and Canada - \$100,000**
- **Increase monitoring to ensure early detection of dreissenids in the region - \$200,000**
- **Conduct research - boater movement models to likely locations for an introduction of dreissenids in the PNW- \$50,000**
- **Contain at the source (outside of the PNW and CRB) - sources that pose the greatest risk to the PNW - \$1,000,000**
- **Fund ANS Management Plans - \$16,000,000**

HIGHEST PRIORITY LEGISLATION

- Support appropriation of Water Resources Reform and Development Act funds to Columbia River Basin dreissenid activities.
- Support mandatory decontamination of fouled watercraft at federally managed waterbodies.
- Support reauthorization of the National Invasive Species Act.
- Support adding quagga mussels as “Injurious species” under the Lacey Act.
- Support the implementation of federal aquatic invasive species legislation in Canada.
- Support the Western Governors Association (WGA) resolution on dreissenid prevention efforts.

PRIORITIZED RECOMMENDATIONS

1. Contain dreissenids at the source.
2. Develop and foster long-term sustainable funding solutions for dreissenid and other aquatic invasive species prevention efforts, including industry participation.
3. Build and fund the institutional capacity for collaboration in the region to monitor, assess, and renew regional AIS strategies, including enhancing the effectiveness of perimeter defense, on an annual basis.
4. Establish and implement a real-time rapid response notification database.
5. Coordinate annual watercraft inspection and decontamination stations in the Pacific Northwest and with neighboring states and provinces annually using an online database.