Northwest **Power** and **Conservation** Council

December 31, 2014

MEMORANDUM

TO: Council members

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

SUBJECT: Briefing on coordinated efforts to develop 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 has been retained by the Pacific Northwest Economic Region (PNWER) to assist in the effort to develop a perimeter defense strategy for quagga and zebra mussels for the Pacific Northwest region.

Summary: Over the last decade, numerous federal, state, and local governments, tribal sovereign nations, industry, nonprofit 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. The combined economic impacts of such a dreissenid introduction are estimated to be about $0.5 billion for states and provinces within the Pacific Northwest Economic Region. This presentation will summarize the work of these consortiums and entities, and describe the collaborative strategies moving forward leading to the development of a regional framework to prevent the introduction of dreissenid mussels in the Pacific Northwest.

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." In particular, the Program says that "BPA and other federal agencies should assist the Northwest states' efforts to prevent the establishment of quagga and zebra mussels."

Workplan: The invasive species prevention is identified as a high priority in the Fish and Wildlife Division's work plan and this effort will help protect past Program investments.

Background: The Council and staff have been actively involved in aquatic invasive species prevention efforts for a number of years. For example, on May 13, 2013, the Council co-sponsored, along with PSMFC, PNWER and Portland State University, a regional workshop in Vancouver, WA entitled "Preventing an Invasion: Building a Regional Defense against Quagga and Zebra Mussels."

More recently, Council member Rockefeller and staff attended a PNWER workshop on November 21, 2014, entitled "Developing a Regional Defense Against Zebra and Quagga Mussels." The objective of this meeting was to continue regional efforts toward building a shared regional defense strategy for the Pacific Northwest to prevent the introduction of and establishment of dreissenid mussels. A total of 46 representatives from Canada and the U.S. participated in this workshop in Seattle, WA.

Attendees summarized success in a year to include shared inter-jurisdictional processes and priorities, fewer infested boats being intercepted in the Pacific Northwest, expanded public outreach and education, consistent regional messaging, an effective regional prevention program and informed political leaders.

Regional success in five years would include fully developed contingency plans, inspected and decontaminated boats leaving infested waters elsewhere, effective messaging and state notification programs, performance metrics, a well-funded regional prevention program and enhanced coordination.

More Info: A conference call with participants from both the U.S. and Canada will be held on January 21, 2015, to continue efforts in developing a regional framework for preventing an introduction of dreissenids to the Pacific Northwest. This call is a follow-up to the November 2014 PNWER zebra and quagga mussel workshop. Staff has a summary of this workshop if Council members are interested.

BRIEFING ON COORDINATED EFFORTS TO DEVELOP A REGIONAL DEFENSE AGAINST DREISSENIDS IN THE PACIFIC NORTHWEST

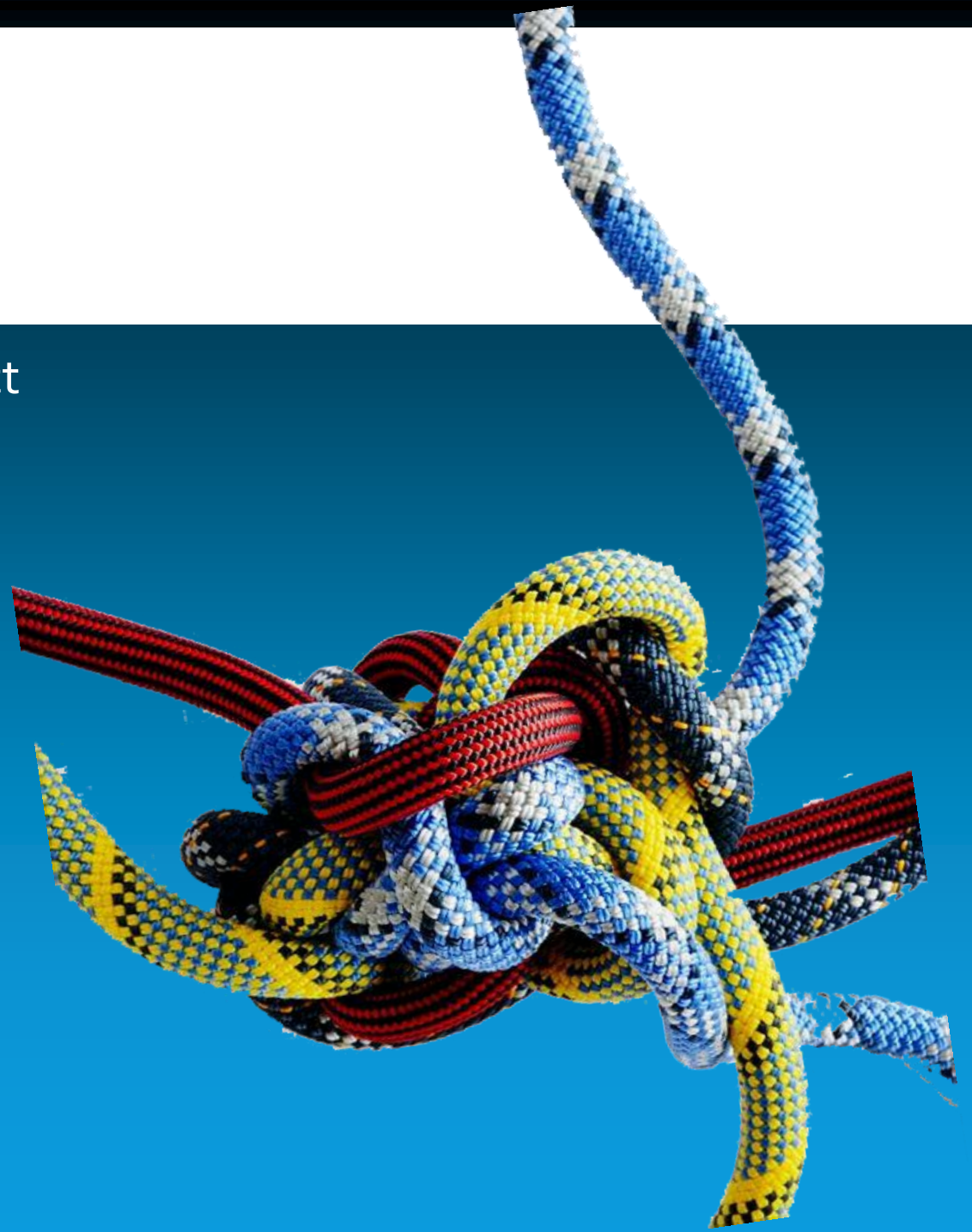
January 13, 2015

NWPCC

"Unity is strength . . . When there is teamwork and collaboration, wonderful things can be achieved."
– Mattie Stepanek

THE PROBLEM

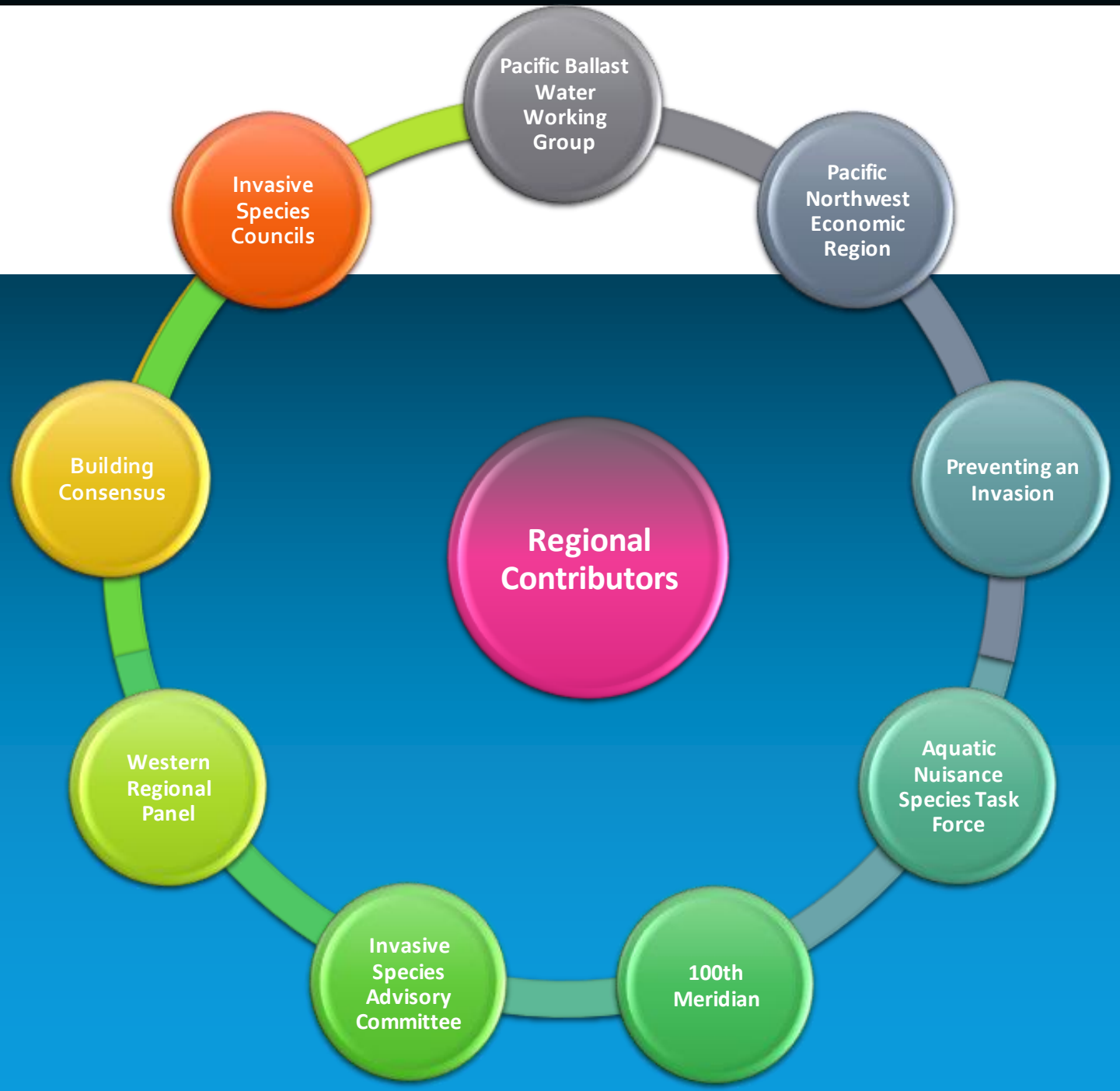
- Dreissenids pose significant direct and indirect costs to the Pacific Northwest
  - Economic
  - Environmental
  - Social
- Prevention, Early Detection, Control and Management are complicated
  - Vectors and pathways
  - Multi-jurisdictional
  - Coordination
  - Resources
  - Data sharing
  - Messaging
  - Cost to manage, control and eradicate



WESTERN INVASIVE MUSSEL EFFORTS

Regional Defense

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



BUILDING CONSENSUS

- 2012: Phoenix, Arizona – Legal and Regulatory Efforts
  - US Fish and Wildlife Service, National Association of Attorneys General, Oregon Sea Grant, National Sea Grant Law Center, Western Regional Panel
    - Establish clear legal and regulatory approaches and opportunities for AIS abatement and reform
    - Outcome: Action Plan
- 2013 and 2014: Denver, Colorado – Multi-state vision for WID programs in 19 states
  - Reach consensus:
    - Training and certification minimum standards
    - Guidelines for AIS QA/QC program
    - A model law
    - WID definitions and protocols
    - Materials for trained inspectors
    - Minimum standards for seals and common components of receipts
    - Data sharing for WIDS

CRB 100TH MERIDIAN INITIATIVE

Local, state, provincial, regional and federal agencies prevent the westward spread of zebra/quagga mussels and other aquatic nuisance species in North America – Administered by PSMFC

Watershed "Teams": Columbia River Basin

I. Coordination forum for Quagga/Zebra/AIS response

II. Q/Z Rapid Response Planning
- Columbia River Basin Interagency Invasive Species Response Plan: Zebra Mussels and Other Dreissenid Species (2008, updated 2011, 2013)
- Six table top and two mini-exercises exercises held (2007-2014)

III. Information Sharing (AIS News)

IV. Q/Z Monitoring Website (since 2010) (w/USGS; Cook, WA, Gainesville, FL)

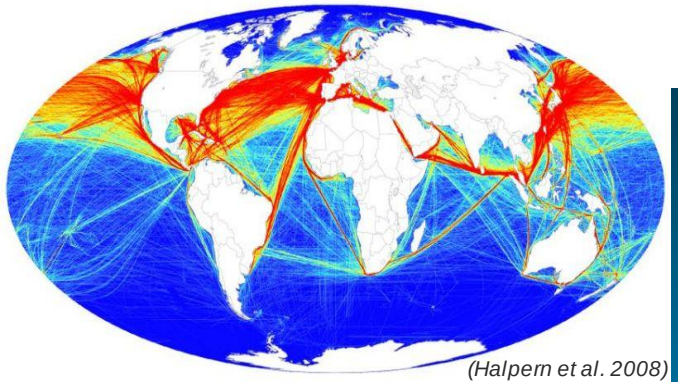
QUAGGA MUSSEL

WESTERN REGIONAL PANEL

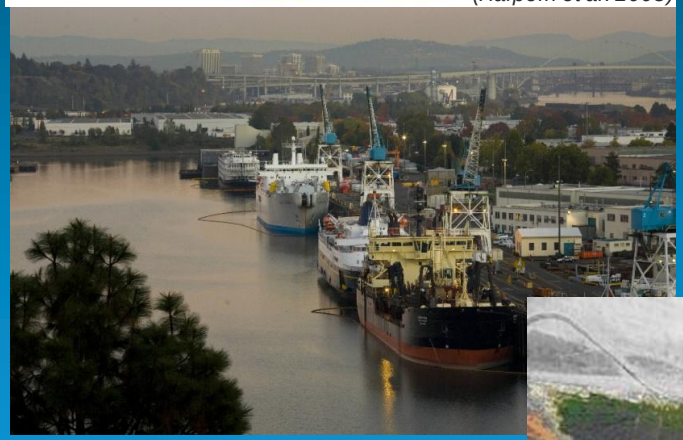
The Western Regional Panel
On Aquatic Nuisance Species

- Limits the introduction, spread and impacts of aquatic nuisance species into western North America – all states and provinces west of the 100th meridian
  - Identify regional priorities for response
  - Make recommendations to prevent the spread of dreissenids west of the 100th Meridian
  - Coordinate other aquatic nuisance species program activities in the West
  - Develop an emergency response strategy to stem new regional AIS invasions
  - Guide others on prevention and control
- Developed "*Quagga-zebra Mussel Action Plan for Western U.S. Waters*" – prioritized actions needed to prevent the spread (~$75 million)
  - Prevention, EDRR, Containment and Control, Outreach and Education, Research

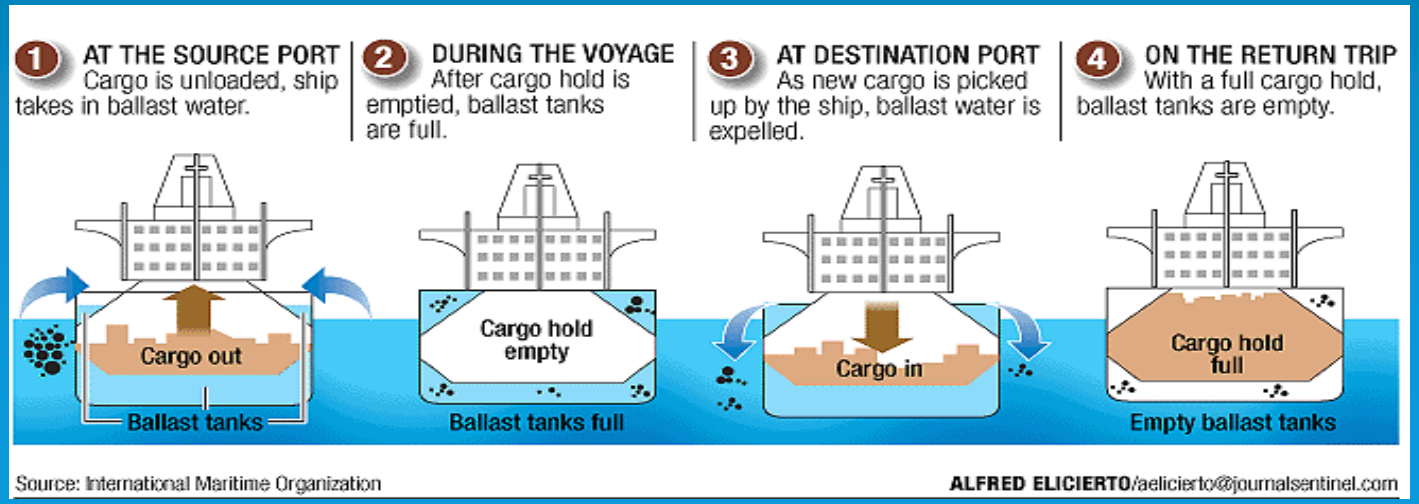
PACIFIC BALLAST WORK GROUP



(Halpern et al. 2008)



Foster coordination and formulate consensus solutions for safe, economical, and environmentally protective management strategies of common concern to regulators, managers, scientists and the **commercial shipping industry** on the West Coast – state, federal, research institutions, maritime industry



PACIFIC NORTHWEST ECONOMIC REGION

Pacific NorthWest Economic Region

Public/private non-profit - Alaska, Idaho, Oregon, Montana, Washington, and Canadian provinces and territories of British Columbia, Alberta, Saskatchewan, Northwest Territories, and the Yukon

Legislators work across borders

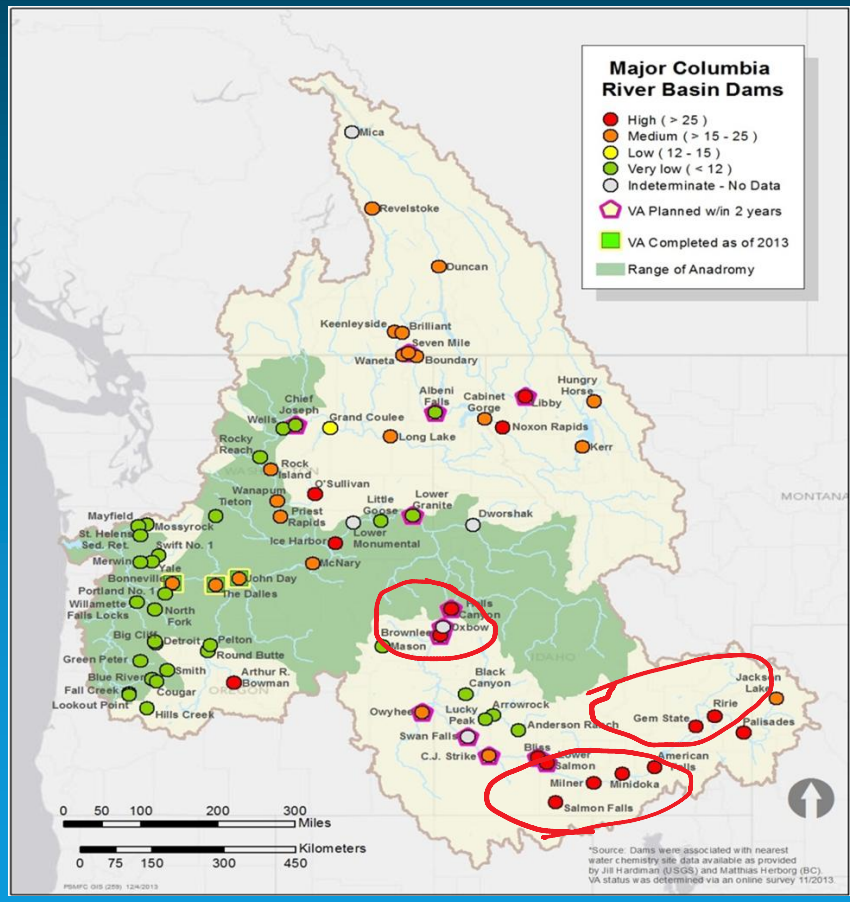
- Opportunity for one-on-one interaction on issues outside the formal legislative process
- Capitol visits can advance regional efforts at the state and federal levels

- Invasive Species Working Group – coordinates across borders

PREVENTING AN INVASION

PNWER, NWPCC, PSU, PSMFC – May 2013

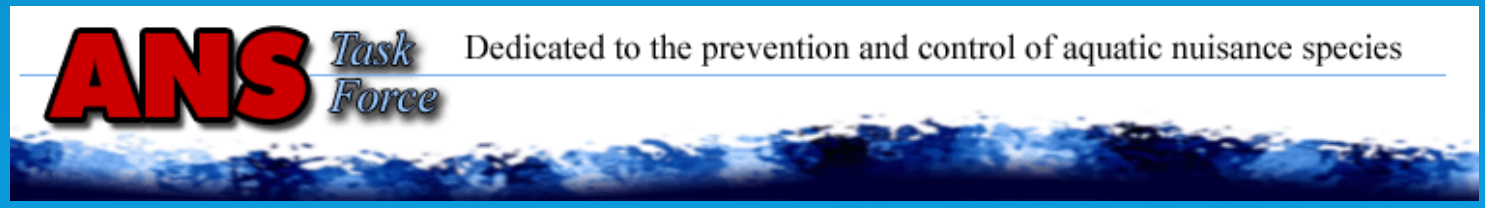
- 25 signatories to Declaration of Cooperation (action plan)
- Communication: New website, www.westernais.org
- Rapid Response Working Group: (21 individuals)
  - Updated control options and permitting requirements
  - Held 2 simulation scenarios to test notification, permitting, and control options
  - Informal consultation with USFWS and NOAA
  - Updated Rapid Response Notification List
  - Best Management Practices document and Action document
- Legislation
  - Washington passed legislation in 2014 that provides authorization to WDFW to expedite actions to control, contain and eradicate AIS (quarantine authority, etc.)
- Rapid Response Plans/Efforts
  - Washington and Oregon completed plans
- Vulnerability Assessment Team (26 individuals)



AQUATIC NUISANCE SPECIES TASK FORCE

- Intergovernmental – prevent and control ANS
  - 13 federal agency members
  - Chaired by USFWS and NOAA – regional panels (Western Regional Panel)
  - Coordinates government efforts dealing with AIS in the U.S. with the private sector
    - Increase public understanding
    - Facilitate research
    - Prevent introductions of ANS
    - Reduce risks of introduced ANS

  - Received the QZAP Mussel Action Plan from the Western Regional Panel



NORTHWEST POWER AND CONSERVATION COUNCIL

Northwest **Power** and **Conservation** Council

Interstate Compact among 4 NW states (ID, MT, OR, WA)

- Develop a fish and wildlife program for CRB
  - Reduce threats from invasive species (2014)
  - Prevent the establishment of AIS such as Q/Z mussels
  - Monitoring & managing various introduction pathways into CRB
  - Developing strategies & public outreach tools to educate the public
- Prepare a Power Plan for the PNW
- Engage the public
- Regional decision making
- Independent scientific review
- Regional power planning

Columbia River Basin Fish and Wildlife Program 2014

INVASIVE SPECIES COUNCILS

- State and Provincial – Montana new in 2015
- Consortiums that collaborate to prevent new introductions and control the spread of existing introductions
- Coordinate through council members, coordinators, and existing venues, such as PNWER
- Emphasis on outreach and education

PROGRESS TO DATE – ACTION PLAN COMPILATION

- Regional accomplishments
  - Preventing an Invasion Action Plan
  - Building Consensus in the West Action Plan
  - Rapid Response Working Group Actions
  - Vulnerability Assessment Team Actions

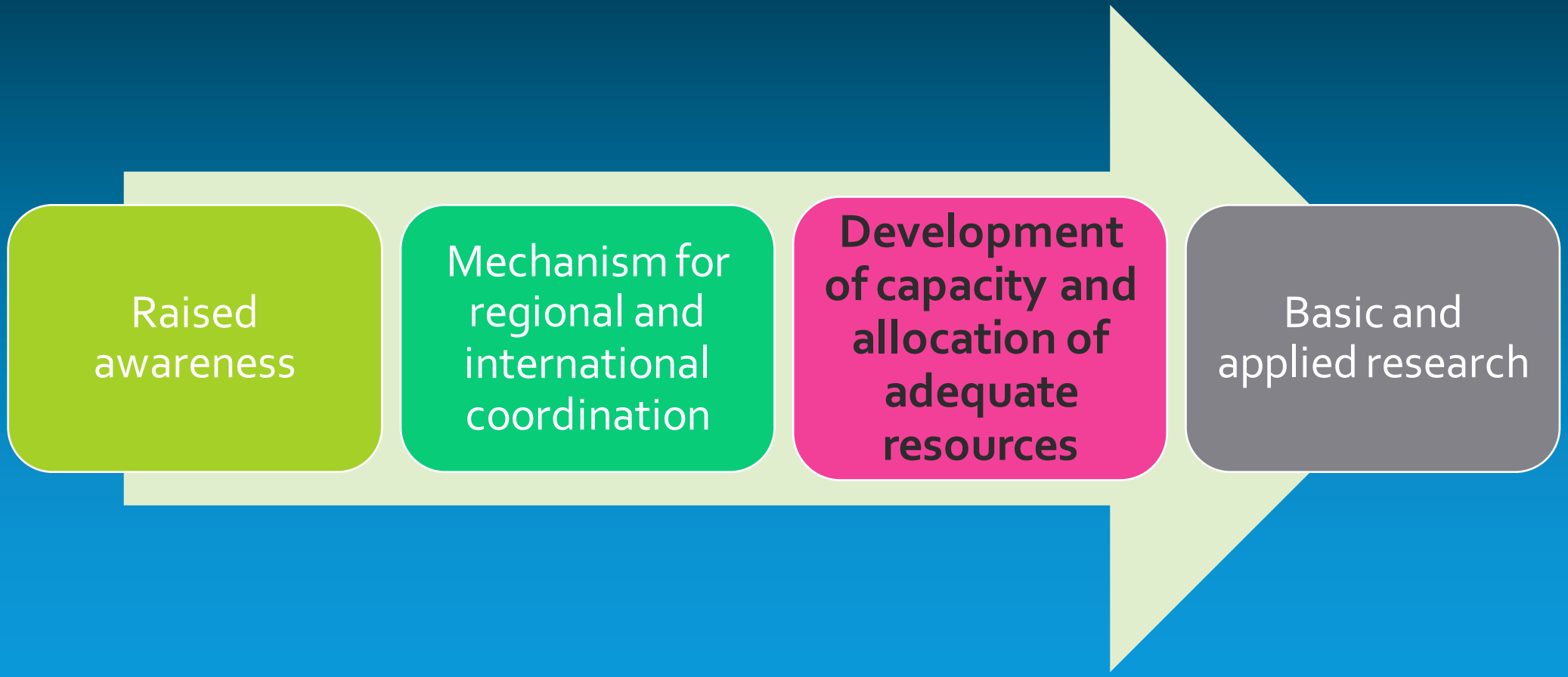
→ Prevention
EDRR
Control and Management

- Regional Framework Addresses Gaps

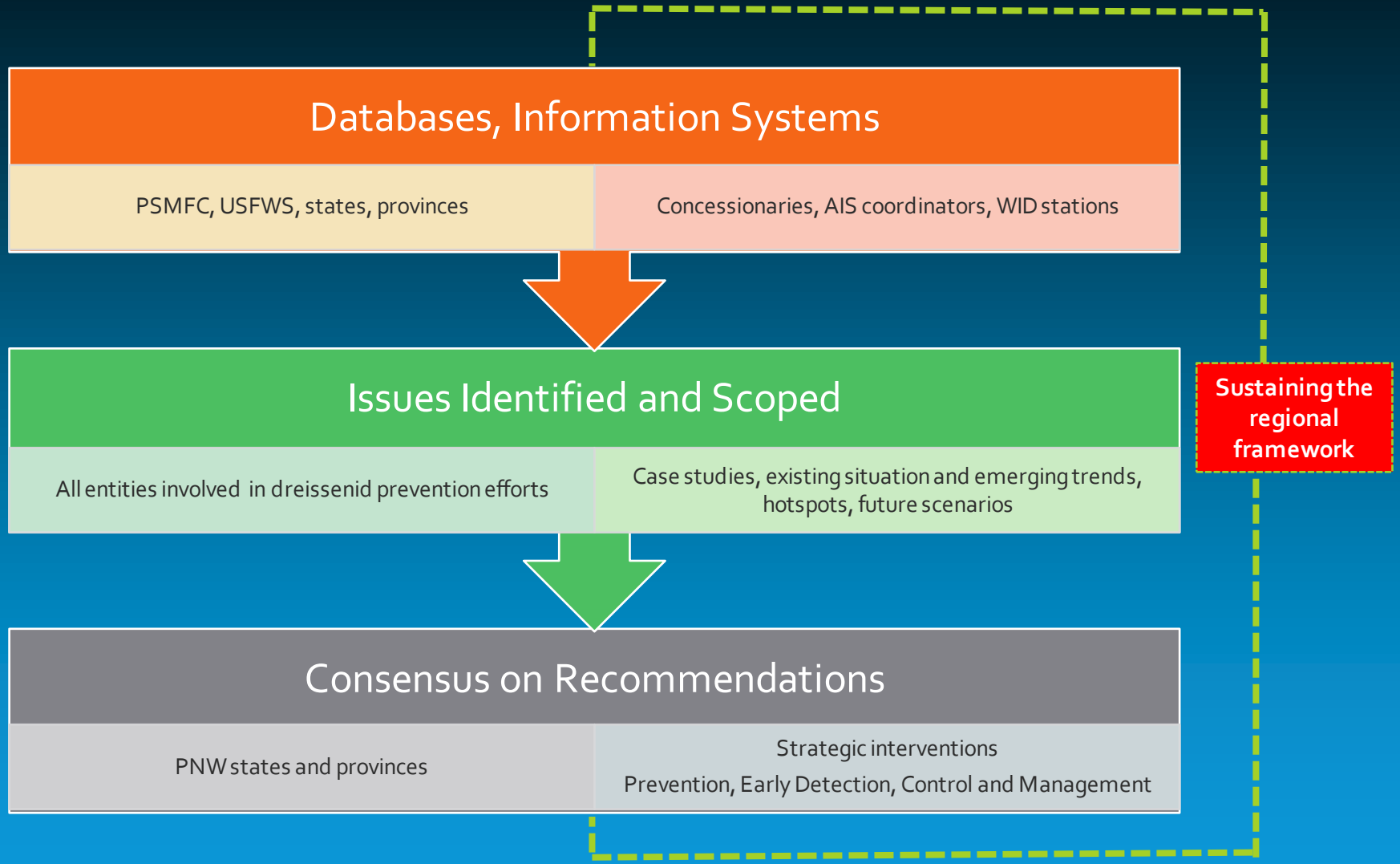
GOALS OF A REGIONAL FRAMEWORK

- 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

REGIONAL FRAMEWORK PREREQUISITES



Pacific Northwest Regional Dreissenid Framework



Consensus on Recommendations

Requires resources and capacity

PREVENTION

- Identify, forecast and prioritize threat
- Identify high-risk pathways for movement and introduction
- Identify vulnerable ecosystems
- Collaborative efforts
- **Implement actions** to prevent introduction and establishment

EARLY DETECTION

- Survey to detect new introductions and monitor priority species
- Evaluate the extent of infestations and their existing and potential impacts
- Report detection findings in standardized databases
- Develop tools and techniques to detect and monitor invasives

CONTROL AND MANAGEMENT

- Coordinate with partners
  - NOAA, USFWS
- Prioritize and implement treatments
- Implement rapid response for new infestations
- Monitor and report accomplishments in standardized databases
- Develop the tools, technologies, methods, and budgetary processes to prioritize, manage, and eradicate invasives

TARGET AUDIENCES

- Policy and decision makers
- Governor's offices/agencies/commissions (AIS oversight entities)
- AIS coordinators
- Federal natural resource managers
- Recreation and boating public
- Commercial vessel haulers
- Boat manufacturers
- General public

COSTS – ANNUALLY WID

- Idaho - $1,250,000 (2015 – T. Woolf)
- Montana - $640,000 (T. Boos – Montana)
- Oregon - $542,340 (R. Boatner – ODFW)
- Washington - $175,000 (A. Pleus – WDFW)
- California – Lake Tahoe - $1.5 million (D. Zabaglo – TRPA)
- Wyoming - $600,000
- Utah - $1,000,000
- Lake Tahoe - $1.5 million/year (D. Zabaglo, TRPA) – in addition to CA or NV
- Nevada – $600,000 (K. Vargas, NDOW)
- Lake Mead – inspect boats leaving Mead and decontaminate - $381,000 (USFWS grant)

$8,188,340

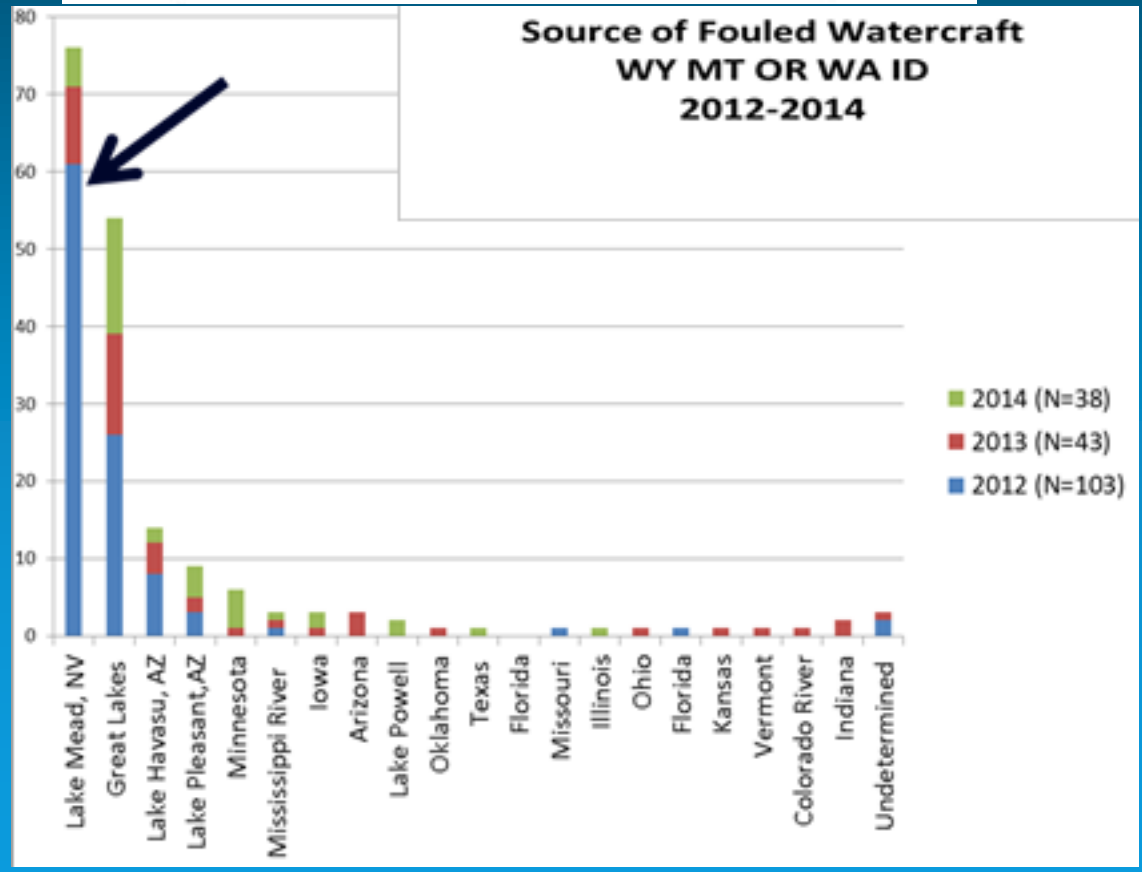
POTENTIAL COSTS OF A DREISSENID INTRODUCTION	ALBERTA	BRITISH COLUMBIA	NORTHWEST TERRITORIES	SASKATCHEWAN	YUKON TERRITORIES
Power Generation	$5,938,487	$6,524,532			
Drinking Water Systems	$20,839,921	$9,251,608			
Boat Maintenance	$390,060				
Recreational Fishing	$21,830,892	$12,385,962		$193,713,469	
Water Management Structures	$8,841,373				
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		$41,791,000	
Other Dams		$148,700		$328,700	
Drinking Water Intakes		$4,287,000		$4,287,000	
Boating Facilities		$285,000	$359,719,356	$240,000	
Fish Hatcheries and Aquaculture		$1,136,800		$146,500	
Boater Costs/Maintenance		$23,850,000		$13,250,000	
Fishing Use		$17,507,500		$20,157,166	
Golf Courses		$17,100			
Irrigation					
TOTAL ANNUAL COST ESTIMATED	**EST. $5M**	**$94,474,000**	**EST. $100M**	**$80,245,356**	**EST. $100M**

TOTAL ESTIMATED COST TO THE PNW = $573 MILLION ANNUALLY

SOURCE OF INFESTED BOATS

IDAHO: Of the 48 vessels from the Great Lakes and eastern waters, ~ 2-3 were out of the water for <30 days, compared to >40 that were "fresh" from Mead, Havasu, Pleasant and Powell (Source: TW/SC, ISDA)

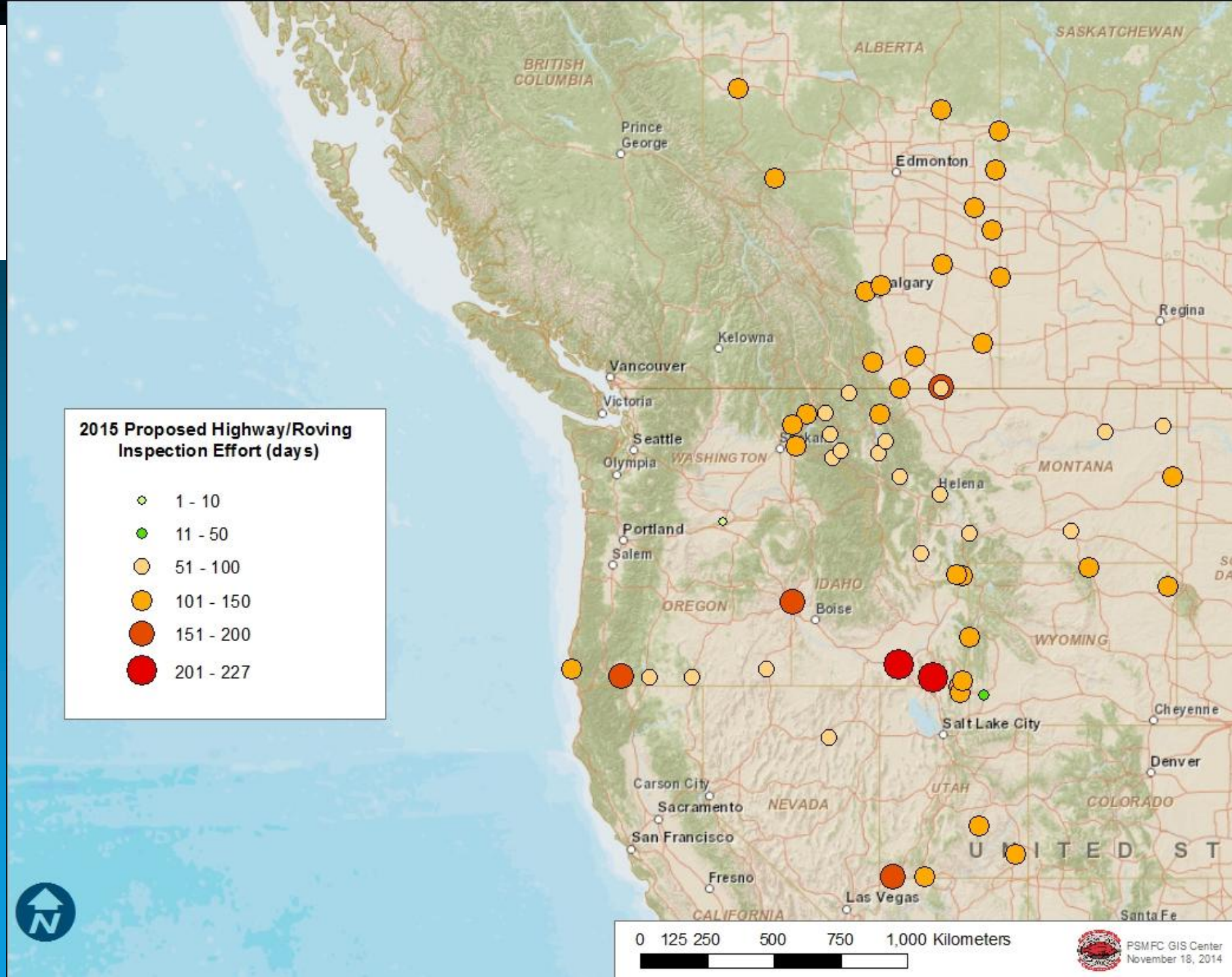
The source of the majority of fouled watercraft in the Pacific Northwest is the Great Lakes and Lake Mead. But the Lower Colorado region (Lake Powell to Mexican Border) is a leader in high-risk "fresh" boats, and likely a greater threat than the Great Lakes.



2014 WATERCRAFT INSPECTION/INTERCEPTION PROGRAM DATA BY STATE

STATE	# BOATS INSPECTED	CONTAMINATED DREISSENID BOATS INSPECTED	ORIGIN	DESTINATION
MONTANA	34,000	3	ON, OH, IN	WA, MT (2)
OREGON	11,245	11	WI (3), MN, NV, IL GREAT LAKES, OH, MI, LAKE POWELL, TX	WA (6), OR (3), COLUMBIA R., WILLAMETTE R.
WASHINGTON STATE WID LAKE WHATCOM	 14,215 7,859	 0 1	 LAKE HAVASU, AZ	 LAKE WHATCOM, WA
IDAHO	49,380	15	MN (2), OH (2), MI, IA, LAKE PLEASANT, LAKE POWELL (2), GREAL LAKES, NEVADA (5)	ID (5), WA (4), BC (2), AB (1), MT (3)
WYOMING	40,587	10	IL, IA (2), MN (2), GREAT LAKES, AZ (3), TX, WI	ID, WA (2), OR (2), CO, CA, WY (2), ND
UTAH	106,000	5	LAKE MEAD (5)	UT (5)
COLORADO	428,457	11	UNKNOWN (4), WI (2), LAKE MEAD, LAKE POWELL, LAKE PLEASANT (AZ), LAKE HAVASU (AZ)	
CALIFORNIA	110,053	112	LOWER COLORADO RIVER (MEAD, HAVASU) (99), GREAT LAKES (10), MI (2), TN (1)	CA (105), NV (2), OR (1), AZ (2), AK
LAKE TAHOE	8000	11	LAKE MICHIGAN, UNKNOWN (3), LAKE MEAD (3), LAKE HAVASU (2), MISSISSIPPI RIVER (1), LAKE MOHAVE	LAKE TAHOE
NEVADA Performed 246 decons at Lake Mead in 2014	1,331	0		
PROVINCE OF ALBERTA	3,747	4	NY, ON, MI, AZ	AB (3), AK
PROVINCE OF BRITISH COLUMBIA	132	1	LAKE PLEASANT, AZ	UNKNOWN

2015 ROADSIDE/ ROVING INSPECTION STATIONS



RESEARCH PRIORITIES (2010 QZAP)

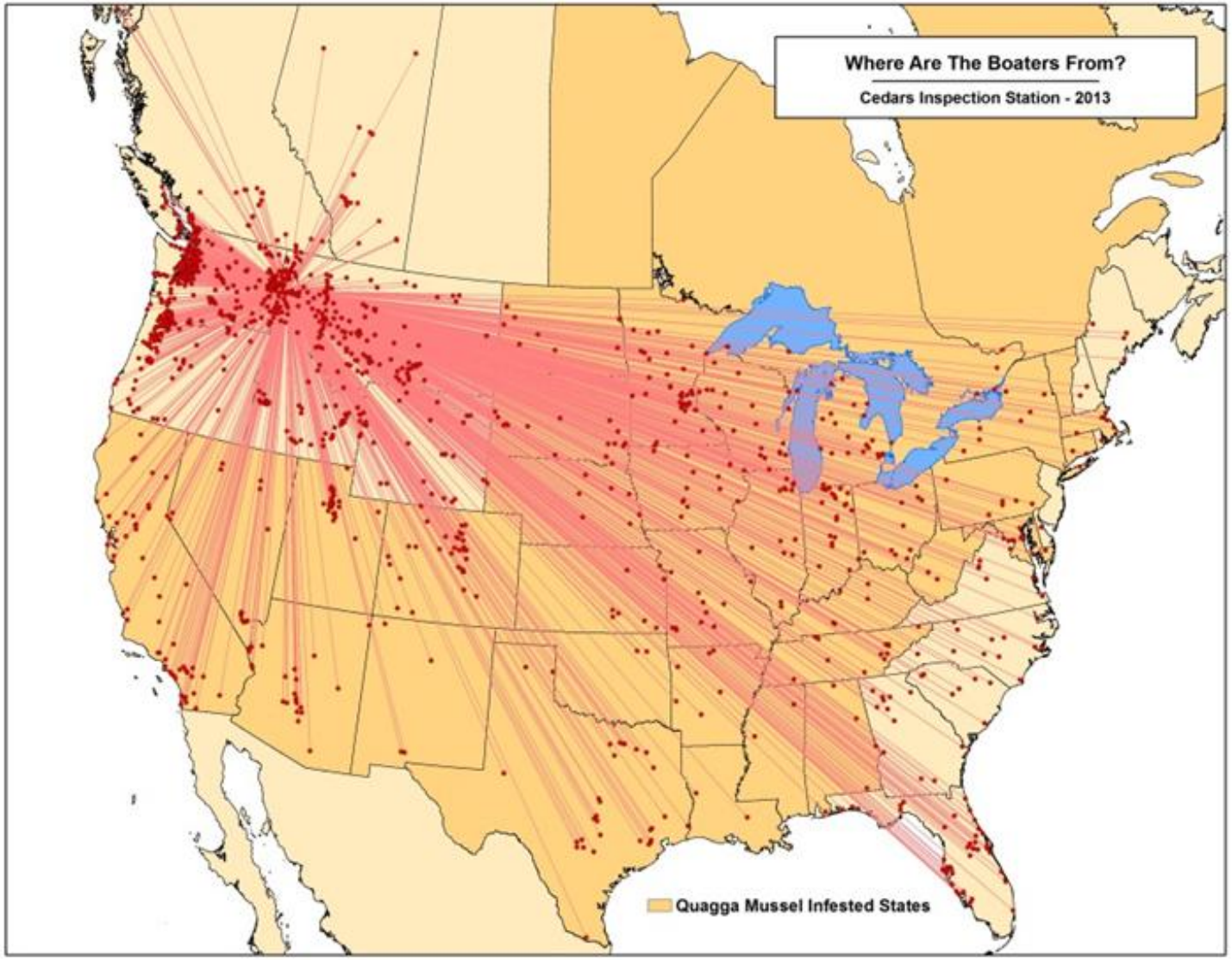
- Determine physiological tolerances to estimate potential range
- Develop a method to track dispersal via genetic fingerprints
- Develop alternative decontamination methods
- Develop biological control methods
- Develop eco-friendly chemical control methods

ISSUES IDENTIFIED AND SCOPED
COMPARISON TO MODEL LAW

	IDAHO	OREGON	MONTANA	WASHINGTON	WYOMING
% of core authorities suggested in Model Law	70	75	55	75	90
LEGISLATIVE FINDINGS	√	X	√	√	X
DEFINITIONS	No definitions for decontamination or inspection	No explicit definition for inspection	No definitions for inspection, decontamination, and waters	Does not define inspection	√
POWERS AND DUTIES	√	√	√	√	√
PROHIBITIONS	√	√	No launching prohibitions	No prohibition on launching out-of compliance conveyances	√
OWNER RESPONSIBILITIES	No general obligation to Clean, Drain, Dry	X	No cleaning and drying obligations	√	Does not impose Clean, Drain, Dry obligations
INSPECTION	√	√	No provisions to authorize law enforcement stops	No express authority for law enforcement stops	√
DECONTAMINATION	√	No express authority to impound conveyances or impose costs	No express authority to impound conveyances or impose costs	√	√
CERTIFICATION	Authorizes issuance of receipts/seals only for decontamination	√	X	No provisions for seals or reciprocity	√
PENALTIES	√	√	√	√	√

ISSUES IDENTIFIED AND SCOPED

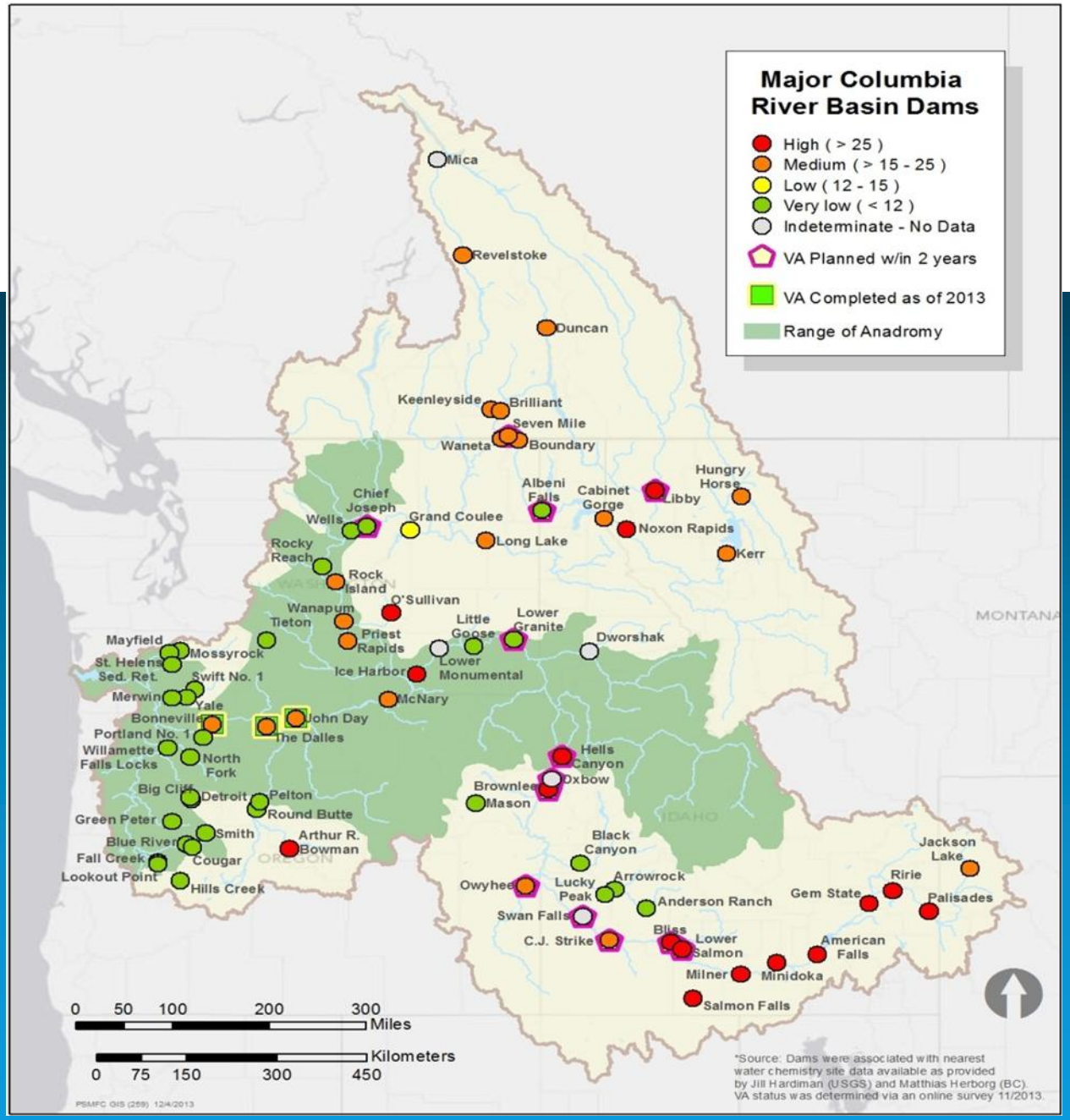
- High-risk pathways of movement and introduction
  - Recreational boaters from infested waters
  - Commercial haulers hauling conveyances from infested waters



Source: Idaho Dept. Ag/S.Cox

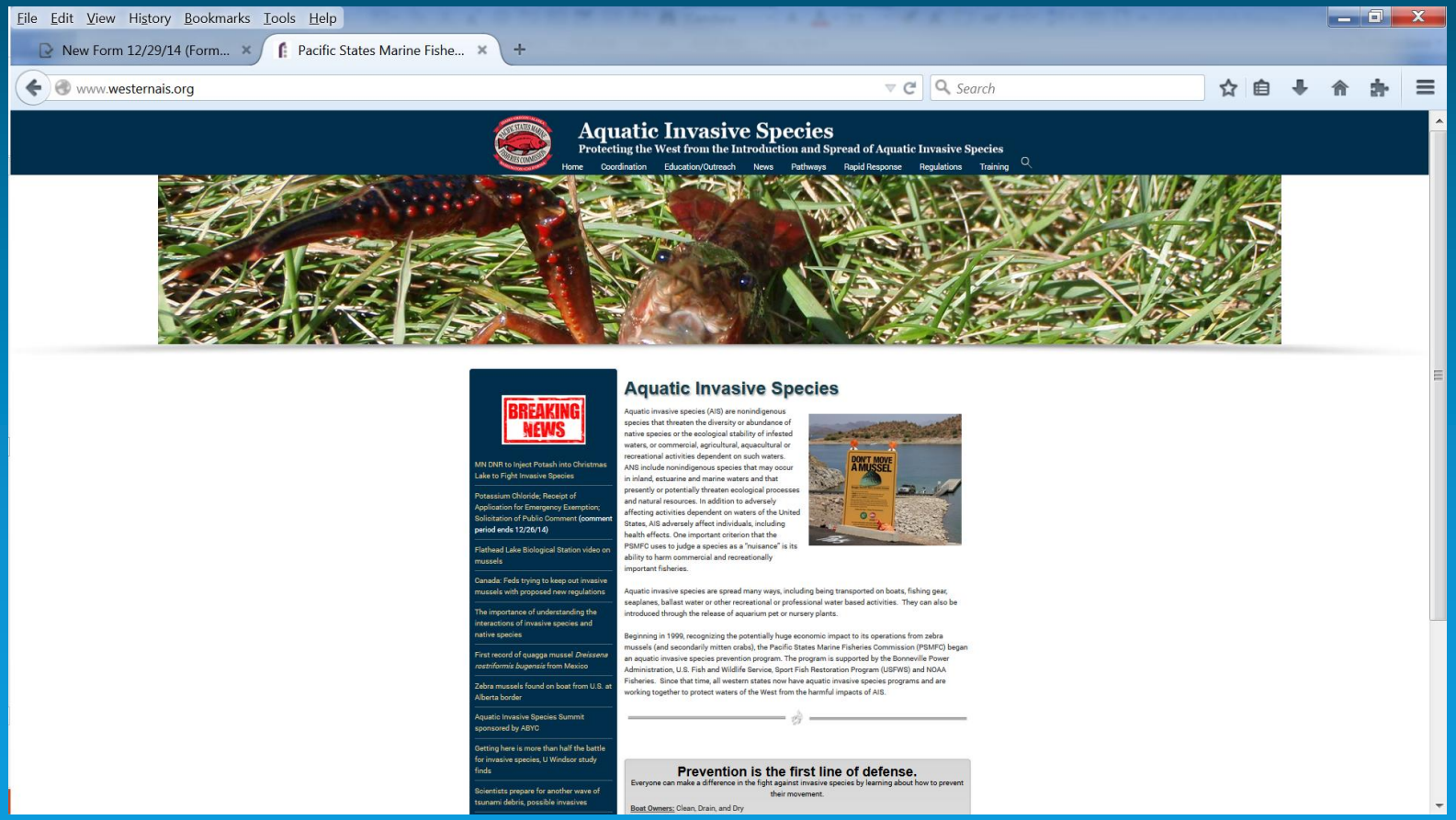
ISSUES IDENTIFIED AND SCOPED

- Vulnerable systems and ecosystems
  - Columbia River Basin
    - Water bodies with high calcium levels in the CRB
    - Hydropower facilities without vulnerability assessments
    - Water bodies with significant recreational boater traffic



ISSUES IDENTIFIED AND SCOPED

Collaborative efforts – westernais.org



ISSUES IDENTIFIED AND SCOPED

- Collaborative Efforts
  - Cross-border information sharing (database)
    - REAL-TIME SHARED DATABASE: Details on boats
    - Outreach and education (distribute pamphlets) – *Clean, Drain, Dry*

PREVENTION RECOMMENDATIONS

Policy

- Lead a PNW-coordinated 2015 legislative outreach "SURGE" through regional entities to mandate containment at the source from federally infested waters
- Ensure WRDA language/process provides for transfer of adequate funds ($20 million) to the CRB states for PNW perimeter defense
- Introduce boat launch surcharge on federal waters infested with dreissenids to fund mandatory decontamination efforts at source water bodies
- List quagga mussels as injurious under the Lacey Act
- Encourage states to consider enacting recent Wyoming law
- Involve the Federal Highway System in dreissenid prevention efforts
- Review state deficiencies with the Model Law and take steps to rectify
- Support reauthorization of NISA in 2015

PREVENTION RECOMMENDATIONS

Pathways

- Identify high-risk water bodies and direct WRDA funding to those locations to ensure boats are *Clean, Drain, Dry*
- Advocate for and engage the boat manufacturing industry in design and development that can lessen the potential movement and introduction of aquatic invasive species via watercraft
- Develop a shared database for high-risk boats crossing the Canada-US border

Planning

- Advance discussions with NOAA and the USFWS for ESA consultation and Section 10 permitting
- Ensure all states and Canadian provinces develop rapid response plans
- Complete vulnerability assessments for all major hydropower facilities in the CRB
- Update WID training, field procedures and technical guides
- Continue efforts to advance *BUILDING CONSENSUS* efforts to develop shared and accepted water body monitoring classifications, definitions, and standard protocols

PREVENTION RECOMMENDATIONS

Outreach and Education

- Develop informational materials for boat vendors/industry to share with customers upon purchase of watercraft
- Develop a packet of information and contacts to state AIS coordinators for all fishing tournament coordinators in the United States
- Use consistent language (*Clean*, *Drain*, *Dry* and *Don't Move a Mussel*) versus developing new campaigns and new messaging
- Create and erect perimeter signage at every border entry point – explain PNW is mussel-free
- Explore opportunities to expand the Passport concept to states and provinces in the PNW – with an emphasis on outreach and education

EARLY DETECTION RECOMMENDATIONS

High risk boats

- Obtain refined boat hauling/movement routes and destination data for all recreationally and commercially hauled conveyances
- Work with the Departments of Transportation in each of the states to share permit information on commercially hauled watercraft/conveyances.
- Work with the border patrol in the United States and Canada to capture the information contained on the Montana Motor Carrier form and provide outreach and education (pamphlet)
- Ensure that any watercraft leaving an infested water is entered into a shared database and that the information about the boat includes its destination
- Support the development of a shared interjurisdictional database for real-time temporal and spatial information on high-risk boats
- Host an annual meeting to coordinate timing/location of regional inspection stations and key messages

Research

- Prioritize research needs for the PNW through GNLCC-sponsored workshop in Spring of 2015 – build off 2010 QZAP research priorities

CONTROL AND MANAGEMENT RECOMMENDATIONS

Infrastructure

- Install permanent decontamination stations at key locations along the perimeter
- Create a shared rapid response equipment pool (e.g., curtains, barriers) for the PNW
- Define the perimeter for the PNW and fund adequate prevention infrastructure on these borders

THE PATH FORWARD

- January 21 webinar – 90 people registered
  - Develop a shared understanding
  - Merge all existing dreissenid action plans, update and share
  - Obtain consensus on prevention, early detection, and control and management recommendations for the region
  - Define the sticking points
    - Willingness/ability
    - Political will – Enact needed legislation
    - Administrative will – Enact needed federal policies
    - Adequate Funding
    - Best combination of perimeter defense and monitoring
    - Containment at the source
- Provide PNWER leaders with the needed materials and information to conduct state capitol visits and garner political support for PNW efforts
- FUNDING