

Member Update Reports for the Western Regional Panel Meeting

September 17-19, 2014, Houston, TX

U.S. FEDERAL AGENCIES

U.S. Army Corp of Engineers

No report.

USDA- APHIS

No report.

USDA - Forest Service

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REGION 2 (Colorado, w Wyoming, SD, NE, KS)

The Region transfers funds through an agreement to Colorado Parks and Wildlife for boat inspections and decontaminations on Forest Service waterbodies. Although some chytrid fungus inventories have been conducted in important amphibian habitats, a 50% decrease in funding has limited FS efforts on other AIS.

REGION 3 (AZ, NM)

- Tonto National Forest participated in three AZ Central Quagga Team meetings
- The forest hosted a Quagga Inspection event at Bartlett Lake June 21 in coordination with Salt River Project and AZ Game and Fish:
 - 70+ watercraft contacted
 - 4 vessels came from Lake Pleasant, 2 from Mojave, 3 from Mead, and one from Havasu. All those waters are infested with quaggas.
 - One boat denied visiting Lake Pleasant but had attached quaggas. The AGFD mobile unit decontaminated the vessel. Boat owner was not cited because the event was educational/informational only. I hope down the road that we (FS, AGFD) do cite such cases.
 - Nearly half the vessels were wake board boats with ballast water. This is problematic since there is no way to purge all the water in the boat.

REGION 4 (UT, NV, s. ID, w. WY)

- The Regional Office funds AIS inspection and outreach seasonals and AIS monitoring on high risk USFS waterbodies, through partnerships with Utah Department of Wildlife Resources, Idaho Department of Agriculture, and Wyoming Department of Game & Fish. Local Forests have contributed to signage, AIS surveys, seasonal AIS Outreach specialists, program management, and training.
- *Fire guidance and protocols:* The RO provides AIS preventative guidance on the Region 4 website, including regional distribution data (as spatial data accessible for download) for ~ 10 aquatic invasive species for the 2014 field season.
(http://www.fs.usda.gov/detail/r4/landmanagement/resourcemanagement/?cid=fsbdev3_016101)
- The National Wildfire Coordinating Group is STILL developing interagency protocols for preventing inadvertent spread of AIS by fire operations. The guidebook will be national, not

regional, in scope and should provide consistency across agencies as well as sound science. ETA is now = Spring 2015.

REGION 5 (California & Hawaii)

- In December 2013, quagga mussels were discovered in Lake Piru, 40 miles NW of Los Angeles on Los Padres National Forest. California Department of Fish and Wildlife, United Water Conservation District and Lake Piru Recreation Area staff are working to contain the infestation. All boaters are required to clean, drain and dry their watercraft upon exit from the lake. This discovery marks the first time quagga or zebra mussels have been found in a Southern California water body that does not receive water from the Colorado River.
- The invasive freshwater red alga, *Compsopogon coeruleus*, was discovered in the Santa Ana River in February 2014. It has a cosmopolitan distribution in tropical and subtropical climates and may completely cover rocky substrates with dark brown filaments up to ½ meter in length. The aggressive alga has compromised nearly 7 miles of suitable habitat for the *Santa Ana sucker*, leaving less than ¼ mi currently unencumbered for the threatened fish.
- Re-licensed hydroelectric projects (FERC) have mandated inclusions of AIS prevention and monitoring protocols for the 30-year life of the permits. Licensees will use the protocols to survey surface waters for dreissenid veligers, and artificial substrates for adult mussels.
- Angeles National Forest removed invasive weeds from the Los Angeles River (Big Tujunga Canyon) in a partnership with Coca-Cola. By removing the invasive plants, increased water flow in the channel should occur, thus allowing native aquatic species more area to survive.

REGION 6 (Oregon & Washington)

- A Regional AIS Management Plan and National direction is implemented for the management of AIS.
- Three stream survey programs incorporated a standardized AIS survey into their protocols, feeding a regional AIS monitoring effort. A Focal Species List is established annually for the survey crews by an interagency team of experts.
- The Regional Dive Team has recently been established as a Regional AIS Swat Team to be used in rapid responses to small populations of AIS. They have been successfully deployed to eradicate a population of Yellow floating heart from a lake in SW Oregon and are currently being used to assess a population of Eurasian milfoil in a lake system in SW Washington.

U.S. Environmental Protection Agency

No report.

USDOC – NOAA

No report.

USDOHS – U.S. Coast Guard

No report.

Organization: Bureau of Land Management

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1. John Moore and David Hu were hired as the new permanent National and Assistant Fisheries Program Leads for BLM this winter/spring. They are in the process of developing a new BLM fisheries strategy to focus on aquatic invasive species management, among other program priorities.

2. Oregon BLM formed a partnership with Portland State University's Center for Lakes and Reservoirs to sample for AIS in multiple waterbodies throughout Eastern Oregon in 2014. Portland State's survey protocol is primarily focused on detection of invasive plant species, but it also includes sample collection for crayfish and mollusks as well. The final report will help guide BLM in determination of the need for and design of any treatment strategies to remove aquatic nuisance species.
3. Nationally, the BLM has been working with Wildlife Forever to develop and place aquatic invasive species information in outdoor magazines and fishing regulations in western states, with estimates that the images reached over 5 million sportsmen in 2014. Magazines include Alaska Sportsman, Fish Alaska, Hunt Alaska, Northwest Sportsman and California Sportsman . State regulations include Utah Upland & Spring Turkey, Arizona Spring Hunt, Oregon Gamebird, Idaho Waterfowl, Washington Waterfowl, Oregon Fishing, Oregon Hunting, Arizona Fishing and Wyoming Fishing.
4. In Montana, BLM continued their partnership with USGS and Montana Fish Wildlife and Parks on bullfrog eradication in the Yellowstone River drainage. One publication has been accepted in Aquatic Invasions Journal, with more in the works that are a direct result of BLM funding. Bullfrog survey research from the previous summers was analyzed and it was determined that bullfrogs are spreading up and downstream, but the direction of spread is downstream biased. It was also found that bullfrogs have a greater probability of being present at sites with public-access and at sites with deeper waters. Only 2 strains of bullfrog exist in the Yellowstone River region, suggesting that there have been relatively few introductions or that there have been many introductions, but very few sources. Additional work in summer 2014 addressed how bullfrogs spread and bullfrog impacts on native northern leopard frogs.

U.S. Department of Interior – Bureau of Reclamation

No report.

U.S. Department of Interior – National Park Service

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1. Obtained \$2 million in base funding for Dreissenid mussel prevention / management at 9 NPS units (Amistad National Recreation Area, Bighorn Canyon National Recreation Area, Curecanti National Recreation Area / Black Canyon of the Gunnison National Park, Glacier National Park, Glen Canyon National Recreation Area, Grand Teton National Park, Lake Mead National Recreation Area, Lake Roosevelt National Recreation Area).
2. Initiated an AIS planning committee for NPS units in the Colorado River Basin (Curecanti National Recreation Area / Black Canyon National Park, Dinosaur National Monument, Glen Canyon National Recreation Area, Grand Canyon National Park, Lake Mead National Recreation Area).
3. Initiated a National Park Service working group to explore the need for servicewide regulations for invasive species.

Organization: U.S. Fish & Wildlife Service

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FWS HQ - Craig Martin

1. ANSTF Executive Secretary: The Fish and Aquatic Conservation (FAC) co-chairs and administers the Aquatic Nuisance Species Task Force (ANSTF). The Executive Secretary position has been vacant since the March 2014 retirement of Ms. Susan. FAC has a planned series of rotations for the position until such time as it is filled. Laura Norcutt has been the acting Executive Secretary for the past several months and Don MacLean will fill the role from October through January.
2. Stop Aquatic Hitchhikers!: Operational control of the SAH! campaign was handed over to Wildlife Forever (WF) via MOU signed by Director Ashe on September 12, 2012. FAC provided WF with a \$50K grant for national operational funding in FY13. WF has since competed for funding through the 100th Meridian and QZAP dollars in FY14 but was unsuccessful. Although the AIS Program is not in a financial position to provide Headquarters funding to WF this year, to help offset workload for national coordination, FAC will modernize and update the SAH! campaign website, ProtectYourWaters.net.
3. Summit on Invasive Species: The American Boat and Yacht Council (ABYC) is working with ANSTF to hold a summit to discuss boat design and construction in consideration of AIS. The summit will include representatives from industry, including boat manufactures, boat engineers, marina owners and other boating related associations, and AIS management experts. We expect that design standards will be developed with summit input that will reduce the risk of spread of AIS through the boating pathway. The current planned date for the summit is the week of January 26th, 2015. FAC, through Region 6's 100th Meridian Initiative, has committed \$20K toward this \$40K+ project. Additional support is being sought for this important industry-agency collaboration from state, industry, and other Federal partners.
4. Federal Lands Workgroup (FLW) was established as an ANSTF Ad-hoc Committee in November 2012. NISC agreed to participate in the Committee shortly thereafter. The group's charge was to examine federal laws, policies and regulations governing the movement of invasive species (including but not limited to AIS) onto and off of federal lands and waters and to explore federal policy options on how to improve federal coordination and capacity to address this issue. Most ANSTF/NISC agencies participated in the FLW drafting the Federal Policy Options paper and provided supporting documentation. The draft approved for review by agency general council seems to have passed muster with most agency's legal review (e.g., NOAA, EPA, DOT, ACOE). We received the DOI's Solicitor review on April 30th, 2014, with significant input that will need to be addressed before releasing the documents. We hope to be able to turn around a finalized draft by the November 2014 ANSTF meeting, though progress continues to be contingent on availability of NISC and FWS/ANSTF staff.
5. Injurious wildlife update (in brief) - Large Constrictor Snake final rule: BAIS reopened the public comment period on the 2010 proposed rule to list the five remaining constrictor snakes (four were listed in 2012). The comment period closed on July 24 with more than 28,000 comments. We are sorting through the comments now and will prepare the final rule in the next few months. Categorical Exclusion (CatEx) under NEPA for the injurious wildlife listing under the Lacey Act: The CatEx would allow the Service to list species more efficiently by precluding the need to conduct redundant NEPA analyses. BAIS published the proposed CatEx in the Federal Register in July 2013, reviewed and addressed the more than 5,000 comments, and composed a draft final notice. That draft is under review by the Service and Department of Interior before going on surname and for coordination with the Council on Environmental Quality. "Invasive Fish and Wildlife Prevention Act" (S. 1153 and H.R. 996): These bills would significantly amend the injurious wildlife listing process if enacted. The bills establish tiered listings that would allow for some import of listed species by qualified institutions, attempt to restrict importation of novel

species, and include language aimed at improving wildlife disease management. The Service supports the bills' intent but has concerns about implementation. Protecting Lakes Against Quaggas Act of 2014" (S. 2530): This bill would add all species of the genus Dreissena, including quagga mussels, to the injurious wildlife list. The bill also provides a broad exemption from title 18 of the Lacey Act, which would no longer apply to the operation of a public water system or a related water conveyance, storage, or distribution facility. The Service opposes any weakening of the Lacey Act and is exploring options that meet the apparent intent of the bill, while addressing water conveyer's concerns that listing quaggas could restrict water operations in the West.

FWS Region 1 – Robyn Draheim

1. Education and Outreach: Invasives Quarterly <http://www.fws.gov/pacific/IQ/> By the time the WRP meeting comes around we will have three issues under our belt in the first year of this innovative new multi-media publication on invasive species.
2. Regional Coordination on Zebra/Quagga Mussel Issues: We are actively working with NOAA, PSMFC and other federal agencies in the Columbia River Basin on informal consultation and coordination guidance should Dreissenid mussels be discovered in the basin states.
3. Coastal AIS Issues: With assistance from our AIS intern we are in the process of developing a coastal management plan to address management responses to invasive fouling organisms. This project was bolstered by input from the WRPs Coastal Committee's Tunicate Management Workshop in Seattle.

FWS Region 2 – David Britton

1. Prioritized and allocated FY14 QZAP funding to address threat of invasive mussels in Lower Colorado River. Hosted meeting of QZAP partners in Phoenix to discuss progress of previously funded work and to gather input on strategy priorities.

FWS Region 6 – Joanne Grady

1. Chair WRP Building Consensus committee which includes planning team calls, meetings in Denver for state AIS coordinators & legal committee, pre-WRP meeting in Houston, contributing to Federal Lands Management committee and working with FWS HQ and ABYC on January 2015 boat design summit.
2. Prioritization and allocation of 100th Meridian Initiative grant funding. Annual grant competition largely focused on supporting efforts to collectively protect the Western U.S. from invasive species spread.
3. Serve on Wildlife Forever's SAH! Advisory Task Force as representative for WRP and FWS. Goal of group is to focus on critical development of outreach to recreational users including consistent campaign marketing, branding, and increased use of SAH! throughout the outdoor community.
4. Providing HACCP courses throughout FWS R6 states. Classes are open to all of our partners. Upcoming classes include October 7th & 8th in Bozeman, MT and December 9th & 10th in Cheyenne, WY.

FWS Region 7 – Cecil Rich

1. Elodea early detection and response: Supported surveys to monitor efficacy and nontarget impacts of whole-lake herbicide treatments for eradication of the invasive submersed aquatic plant Elodea in Southcentral Alaska. This included providing funding and technical support to a Cooperative Weed Management Area and a FWS field office.
2. Conducted a literature review and pathway assessment for the invasive aquatic plant Elodea. This will result in a peer reviewed publication assessing risks to Alaska's fisheries and an assessment of the extent to which floatplanes may play a role in the spread of this species.
3. Continued to help fund implementation of the Alaska Aquatic Nuisance Species Management Plan. The ADFG Sport Fish Division uses these funds primarily for invasive northern pike management

in southcentral Alaska and education activities. This included development of eDNA methods for early detection of northern pike as well as support through our Conservation Genetics Lab. The Service worked with ADFG to conduct planning for a multi-year project starting in October 2014 to eradicate northern pike from a tributary of Alaska's most famous salmon-producing watershed, the Kenai River.

4. The Service supported a project by the Kodiak Soil and Water Conservation District to assess the status and develop a response plan for rusty crayfish in Buskin Lake, an important salmon producing system.
5. Through our Regional AIS Coordinator and staff in our Field Offices, we continued collaboration with a wide range of partners via forums like Western Regional Panel, Alaska Invasive Species Working Group, and Alaska Committee for Noxious and Invasive Plants Management (CNIPM) and directly with our leading partners (Alaska Department of Fish and Game and Department of Natural Resources). Activities and topics included prevention planning, aquatic plant survey methods, outreach to a range of water users, assisting with regional and national foci (e.g., development of invasive species deliverables for the National Strategy for the Arctic Implementation Plan potential Lacey Act improvements), and support to other Service programs.

U.S. Department of Interior – U.S. Geological Survey

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1. Coordinating with Federal, State, and Tribal entities to prevent the introduction and establishment of quagga and zebra mussels into the Columbia River Basin.
2. Compiled, analyzed and presented regional quagga and zebra mussel early detection monitoring activities for 2013.
3. Worked with stakeholders to compile and present early detection monitoring activities for 2014 prior to the field season.
4. Published paper in Aquatic Invasions describing the distribution and seasonal dynamics of *Pseudodiaptomus forbesi*, an invasive Asian copepod, into the mainstem Columbia and Snake Rivers.
5. Initiated efforts with Washington State University to better understand the deterministic environmental factors affecting *Corbicula fluminea* distributions in the Columbia River Basin

CANADIAN FEDERAL MEMBER

No report.

MEXICAN FEDERAL MEMBER

No report.

U.S. STATE GOVERNMENT AGENCIES

Organization: Alaska Department of Fish and Game

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1. Smithsonian Environmental Research Center (SERC) has been contracted to work with ADF&G to prepare for field trials to investigate *in situ* control options for the invasive tunicate *D.vexillum*. Initial investigations will include evaluation of rock salt, chlorine, and cement dust to kill invasive tunicates on the seabed by introducing compounds into containment enclosures. Based on results of field trials, SERC will evaluate feasibility of a bay-scale treatment to eliminate the invasive tunicate from Whiting Harbor. We are presently working through permitting process/challenges in order to use compounds that have not been registered for species/environments we propose to use them.
2. Partner with other state agencies to offer invasive species training to state, federal, and local agencies and interested natural resource field staff regarding species of concern; including identification, BMPs when working in infested areas, and opportunistic sampling protocols. Aquatic and terrestrial invasive species covered.
3. Northern pike population control and eradication in southcentral AK continued in 2013-2014. Stormy Lake on the Kenai Peninsula was treated with rotenone in September 2013, in order to keep pike out of the Swanson River watershed which contains 240 square miles of lakes, supporting important salmon habitat. The Swanson River runs through Kenai National Wildlife Refuge into Cook Inlet. Stormy Lake has rainbow trout and a genetically distinct population of Arctic char, both of which were reintroduced after waters were free of rotenone. This was the largest lake treatment thus far, following treatment of five smaller, closed systems in the region. In October 2014, ADF&G will begin what is projected to be a four-year rotenone treatment of the Soldotna Creek drainage on the Kenai Peninsula. Soldotna Creek is a tributary of the Kenai River, one of Alaska's prime salmon fishing rivers. The Soldotna drainage has been divided into two segments with two phases. Phase I, treatment of four connected lakes, will occur in 2014. These four lakes contain northern pike exclusively. Potassium permanganate will be used to neutralize the rotenone at the mainstem of Soldotna Creek.
4. ADF&G teamed up with USGS and USFWS to begin testing the viability of eDNA as a means to assess effectiveness of rotenone treatments, and as a tool to monitor absence/presence of northern pike. Genetic markers were developed for northern pike and then tested under various lab and field conditions, assay protocols for processing samples using qPCR have been refined, and pike eDNA samples have been collected from various locations and populations. The study is looking to describe the quantity of water or eDNA required for positive detection, how distance effects sample detection probability, how long pike eDNA persists in the environment post-mortem, and how well eDNA detection results align with known northern pike distribution in Alexander Creek (Susitna drainage) and Kenai Peninsula drainages.
5. On-going work with stakeholders to post signs about invasive species infestations and best management practices to prevent the spread of invasive species.

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1. Continued our "Don't Move a Mussel-Now It's the Law" outreach campaign by finishing the replacement of existing boat ramp signage with a new and improved design to help boaters understand the clean, drain and dry message. We also continued mass media advertising on the

radio/billboards concerning our DMAM message along the lower Colorado River (Havasu/Mohave/Mead), the N. Phoenix metro area along interstate 17 (Pleasant), and commenced this type of outreach in Page, Arizona (Powell). Furthermore, the Department will be installing a 3-Burner Decontamination Station (thru USFWS Grant monies) at Lake Havasu State Park by the end of September.

2. Increased our “Pull the Plug” law outreach efforts by printing metal signs which reminds boaters to pull their boats plug when leaving the vicinity of an infested water body. In addition to the signs, our Law Enforcement Branch and Regions (along with our AIS program) has held a total of 8 AIS patrols (6 at Lake Pleasant, 1 at Bartlett Lake, 1 at Roosevelt Lake, and 3 at Lake Havasu) since March, enforcing the current AIS Interdiction laws (A.R.S. 17-255) and the “pull your boat plug” rule (R12-4-1102). A total of over 70 citations have been written for failure to pull the boat plug and one citation for failure to remove vegetation.
3. On March 5, 2014 we held our first AIS Training Workshop in Parker, AZ. The announcement for the workshop went out to all marinas, boat dealerships, boat repair/detail shops and other businesses who dealt with the boating public. Along with Parker’s Chamber of Commerce Director, fifteen (15) boating enthusiasts attended the workshop. The AIS Program supported and assisted with six (6) Watercraft Inspection Training-Level II (WIT II) classes (1-Lake Havasu, 1-Lake Pleasant, 4-Lake Mead), training more than a 100 individuals from various government, public, and private entities.
4. On June 21, 2014, along with the Cave Creek Forest Service office (Tonto Forest) at Bartlett Lake (not a quagga mussel infested lake), we held the second Decontamination/Inspection Day. We talked with 78 boaters entering the lake and found one boat to be contaminated with dead mussels. We will coordinate with the USFS-Tonto NF in scheduling more Decon/ Inspection Day events in the future.
5. In February, we began performing our Boating & Angling surveys and Pull-the-Plug Surveys for the 2014 boating season at Bartlett, Pleasant, Havasu, and Powell. We have completed over 1,100 AIS Program Boating and Angling Surveys and over 2,300 boats have been observed for our Pull the Plug Surveys. The Plug Survey gives us data on the actual percentage of boaters who abide by the “Pull the Plug” law and is performed by observing boaters (with binoculars) leaving the vicinity of infested water bodies, such as Havasu and Powell. In addition, the survey allows the AIS program to compare these results with the AIS Boating & Angling survey, in which we personally ask boaters if they drain/pull the plug to help prevent the spread of AIS. Data results for the 2014 AIS Boating & Angling survey shows that 81% of boaters have verbally said they drain/pull the boats plug. The 2014 Pull-the-Plug survey data results shows that only 56% of boaters observed leaving had actually pulled the boats plug. The personnel to do these surveys has revolved around the addition of Technicians and Summer Interns to the current staff of 2 FTE’s – 1 AIS Program Coordinator and 1 AIS Specialist.

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1. Maintained Quagga Mussel Program (Lead Agency - Department of Fish and Wildlife)
The statewide program continues to work toward prevention through interdiction of watercraft and outreach and education, and by providing support to responsible parties implementing containment efforts at infested waters and prevention efforts at uninfested waters. December

2013 was the first definitive case of mussel spread via overland transport (Lake Piru, with no hydrological connection to infested water). In February and March of 2014 quagga mussel were discovered in two residential lakes receiving water from an infested source.

2. Invasive Species Action Week (Lead Agency - Department of Fish and Wildlife)
The inaugural Action Week was held August 2-10, 2014 with the goal of promoting public awareness of invasive species issues and to encourage public participation in the fight against California's invasive species and their impacts on our natural resources. The Department of Fish and Wildlife partnered with other departments, agencies, organizations and volunteer programs across the state to host more than 40 educational and "action" events including invasive species removals, habitat restoration projects, quagga mussel surveys, field outings, public presentations, youth activities, a film festival, and a poster contest. The week also launched the first "citizen science" effort. This was a no-budget effort, and drew upon the Invasive Species Program's existing resources and the creation of partnerships.
3. Implementation of AB 2443: Quagga and Zebra Mussel Infestation Prevention Program (Lead Agency - State Parks, Division of Boating and Waterways)
http://www.leginfo.ca.gov/pub/11-12/bill/asm/ab_2401-2450/ab_2443_bill_20120923_chaptered.pdf
Late 2013/early 2014 a legislated "mussel infestation prevention program" fee of \$16 (per two-year cycle) began to be collected on registered watercraft. The majority of the approximately \$9.9M in funds will be disbursed by the Division of Boating and Waterways to agencies subject to Fish and Game Code (Section 2302; <http://www.leginfo.ca.gov/cgi-bin/displaycode?section=fgc&group=02001-03000&file=2300-2302>), to fund implementation of prevention programs. The Division of Boating and Waterways is working on regulations, and opened the grant application period August 20, 2014
<http://www.dbw.parks.ca.gov/Funding/QZGrant.aspx>.
4. Implementation of AB 763: Aquatic invasive plants: control and eradication (Lead Agency - State Parks, Division of Boating and Waterways)
http://www.leginfo.ca.gov/pub/13-14/bill/asm/ab_0751-0800/ab_763_bill_20130923_chaptered.pdf
The Division of Boating and Waterways is responsible for managing invasive aquatic plants in the Sacramento-San Joaquin Delta, its tributaries, and the Suisun Marsh. Historically they have only been authorized to treat individual species of plants through the legislative process. This new legislation creates a process that allows the Division of Boating and Waterways to treat species it has identified as invasive. That process consists of requesting the Department of Fish and Wildlife, in consultation with other experts, to develop a risk assessment to determine if the species presents a threat to the environment, economy, or human health, and thus meets the definition of an "invasive aquatic plant."
5. Marine Invasive Species Program: (Lead Agency – California State Lands Commission)
Monitored compliance with the Marine Invasive Species Act, submitted annual reports to the California Legislature, supported several ballast research projects, and continued development of regulations to manage biofouling and enforcement and fines for violations of the Marine Invasive Species Act. Please see below for full details.

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All reports, forms, and rulemaking documents can be found on the following website:

http://www.slc.ca.gov/Spec_Pub/MFD/Ballast_Water/Ballast_Water_Default.html

1. Between July 1, 2013 and June 30, 2014 – 9400 qualifying vessel (>300 gross registered tons) arrivals to California ports. 97% of all ballast water carried into the state was reported as legally managed in accordance with Marine Invasive Species Act. 2493 vessels (=27% of all arrivals) were inspected for compliance with the Marine Invasive Species Act. Statutory mandate is “at least 25%.” 55 violations detected during inspections – 33 administrative (recordkeeping/reporting) and 22 operational (illegal exchange or no exchange).
2. Completed report, “2014 Assessment of the Efficacy, Availability, and Environmental Impacts of Ballast Water Treatment Technologies in California Waters.” Legislatively mandated report to the California Legislature on the availability of shipboard and shore-based ballast water treatment technologies to meet California’s performance standards for the discharge of ballast water. The report concluded that no technologies are currently available. Additional time is necessary to complete a shore-based treatment feasibility study and conduct additional research on shipboard treatment system performance.
3. Contracted with the California Maritime Academy for the testing of a portable ballast water treatment unit that could be used in emergency or contingency situations.
4. Continued development of draft regulations regulating the management of biofouling on vessels operating in California waters. The proposed rule would set requirements for a biofouling management plan, record keeping and reporting, and establish inspection or cleaning requirements for very high risk vessels remaining in a port, place, or shared waters for extended periods of time. Rulemaking to commence late-2014.
5. Development of draft regulations to establish procedures for enforcement and fines associated with non-compliance with Marine Invasive Species Act and associated regulations.
6. Completed the legislatively mandated report: “California’s Marine Invasive Species Program and the United States federal programs that manage vessels as vectors of nonindigenous species: A comparison of the relative effectiveness at reducing the risk of nonindigenous species introduction from maritime shipping activities.”
7. Organized three sessions for Prevention First 2014: An Onshore and Offshore Pollution Prevention Symposium and Technology Exhibition, to be held in Long Beach, CA, on October 7-8, 2014. Presentations including ballast water compliance assessment methods, vessel in-water cleaning, and an update of Marine Invasive Species Program activities.
8. Provided assistance to researchers from Michigan State University, San Jose State University, and the Smithsonian Environmental Research Center to conduct ballast water and/or biofouling research studies.
9. Received final report on funded research with the Aquatic Bioinvasions Policy and Research Institute, “Evaluating ship biofouling and emerging management tools for reducing biofouling-mediated species incursions.”
10. Received final report on funded research with The Glisten Associates, “Prototype Compliance Monitoring and Sampling System. Biology Testing Report.”

Organization: Colorado Parks and Wildlife

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1. Watercraft Inspection and Decontamination (WID)

There are currently 72 authorized watercraft inspection and decontamination stations operating in Colorado. CPW coordinates the vast network of inspection and decontamination stations that are operated by CPW, the National Park Service, Larimer County, various municipalities and private industry locations including businesses, concessioners, marinas, clubs and private lakes. In total the state has collectively performed over 2.5 million inspections and 35,000 decontaminations since 2008. In 2014, Colorado piloted reciprocity with New Mexico and Wyoming through per Building Consensus guidelines and acceptance of each other's the seal and receipt program.

2. New Mobile App and Website for ANS Inspection and Decontamination Stations

Colorado began collecting boat inspection and decontamination records electronically in 2010 as a pilot program that was eventually expanded to 45 unique locations at 28 reservoirs across the state in 2012. In 2013, the system collected 337,329 inspection records successfully (83% of total inspections). In order to maintain the high volume over time and provide for maximum efficiency of the software in rural locations and on high use ramps, the software was rebuilt over the winter and a new and improved application was launched in April 2014. Alongside the mobile application, which works on any Android or iOS tablet or smart phone, the system rebuild included a new website which allows managers to run a variety of custom reports. For those without tablets or smart phones, the website allows the user to choose two options to enter the inspections directly online. The mobile and web software are being supported through an IT contract which includes a help desk hotline available 7 days a week for inspectors experiencing difficulties in the field. The mobile and web applications are currently being adapted for broader use in the Western USA.

3. New Trainings for ANS Inspection and Decontamination Station Staff

In January and March 2014, CPW held the first Train the Trainer courses for supervisors with experience operating boat inspection stations with a need to host their own trainings on site. The course provided hands on experience presenting PowerPoint and facilitating outdoor sessions with students/trainers. The goal was to ensure all persons providing certification training in CPW were training to the same standards, and to provide resources to assist trainers which included a trainers manual, PowerPoint presentations on CD, mussel adult and settler props, and a variety of other tools to facilitate classroom and field settings.

In March 2014, Pueblo Lake State Park hosted the first advanced decontamination course. This course was specialized towards those supervisors and lead decontamination staff that wanted additional practice and guidance on very complex watercraft. The State Park arranged for a cabin cruiser, ballast sailboat, and PWCs for students to decontaminate.

CPW launched an online training for experienced inspectors needing to recertify in 2014. This is the first year that returning inspectors did not need to come to a 2-day class, but could recertify online. The two hour online course covered program updates, new species of concern, advanced zebra and quagga mussel biology, and inspection and decontamination procedure updates.

Students take an online exam and receive their certification card in the mail within 10 days.

Filming is underway currently to provide professional instructional videos in the courses in 2015. All newly developed training materials have been given to the WRP's new training committee for regional implementation in the future per Building Consensus guidelines.

4. Water Body De-Listing per Building Consensus Guidelines

In 2014, Colorado adopted the Western Regional Panel's *Building Consensus* classifications to identify water bodies based on early detection sampling. The definitions for detected waters are listed below. The regional *Building Consensus* standards also set timelines for de-listing detected waters. In adopting the regional standard Colorado has de-listed Granby, Grand Lake, Shadow

Mountain, Willow Creek, Tarryall, Jumbo and Blue Mesa in 2014. Therefore, the only positive water for quagga mussel veligers in Colorado is Pueblo Reservoir. There are no positive waters for zebra mussels in Colorado as of 2014. While the new classification has been in effect since January 2014, regulation changes are currently underway to reflect this.

History of Zebra and Quagga Mussel Detections in Colorado:

There were no detections for zebra or quagga mussels in Colorado in 2014.

There has never been an adult zebra or quagga mussels found in Colorado waters.

- Pueblo Reservoir State Park tested positive for zebra or quagga mussel larvae (veligers) in 2007, 2008, 2009 and 2011.
- Granby Reservoir, Grand Lake, Shadow Mountain Reservoir, Willow Creek Reservoir, Tarryall Reservoir and Jumbo Reservoir all tested positive for one zebra or quagga mussel veliger in 2008. There have been no verified detections at any of these waters since.
- Blue Mesa Reservoir tested positive for quagga mussel eDNA in 2009, 2011 and 2012 by the U.S. Bureau of Reclamation.

5. New Risk Assessment for Zebra and Quagga Mussels

Priorities for sampling/monitoring and watercraft inspection and decontamination stations, are based upon a risk assessment from 2008. At that time, little boater and water quality data were available. Updating the original risk assessment includes a two-part analysis consisting of the risk of an invasive mussel introduction from watercraft (the likelihood mussels will be introduced to a specific reservoir or lake) and risk of establishment (could invasive mussels survive and reproduce at a specific reservoir or lake).

Over time, the state has collected data through both the watercraft inspection and decontamination program, and from sampling and monitoring, which provides more information for analysis than was previously available at the program's inception. Following the CPW merger, we now have a complete set of statewide watercraft inspection data for 2012 and 2013. Another example is that the mussel habitat suitability score was based on calcium alone because other parameters were not available. Through a new partnership, water quality experts at the Colorado Division of Public Health and the Environment processed samples collected by CPW ANS staff and providing analytical expertise for the risk of establishment.

The need for an updated risk assessment is clear in order to prioritize resource allocations based on the best available science as a fully merged statewide program. The data also has value that reaches beyond the invasive species program. The boater demographic and water quality data could prove useful for other CPW efforts, and could illuminate avenues to service the agency's mission at a broader level in the future.

The analysis was completed in December 2013. The sampling program was altered with this new information for the 2014 season. The watercraft inspection and decontamination program is being re-prioritized for the 2015 boating season to maximum efficiencies utilizing the new risk assessment.

6. *Economic Impact Analysis of Invasive Species in Colorado*

Published by Colorado State University, CPW and the Colorado Weed Management Association in December 2013, the initial study focused on 9 terrestrial and 1 aquatic noxious weeds. Economic loss values statewide included utilizing the Western Governors Association Crucial Habitat Assessment Tool for wildlife values, in addition to other tools used for recreation and agriculture values. The final result was a mere \$13.8M in direct economic loss from only ten noxious weeds on three land uses. This broad analysis illuminated the need for greatly improved noxious weed inventory data, and the importance of being able to communicate the economic losses of invasive species to policy and decision makers. Phase 2 is underway and has taken a shift to determine the current cost of managing weeds within the given land uses, as well as documenting what the current weed management practices are, who is involved, perceptions among final users and examine the infrastructure and resources in place for weed management.

Organization: Hawaii Department of Land and Natural Resources

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1. Increase capacity – An Aquatic Invasive Species Biologist was hired on August 25, 2014 to develop and implement statewide AIS management activities. This is the only civil service FTE dedicated to AIS management in Hawaii. Brian Neilson will also become the WRP voting member for Hawaii, replacing Sonia Gorgula who will remain Coastal Subcommittee Chair. The next priority is to hire field and technical staff, and institutionalize an AIS program in the state of Hawaii.
2. Minimize further introductions – Vessel biofouling remains the vector responsible for the majority of Hawaii's marine & estuarine bioinvasions. Substantial progress has been made in the collection of biofouling management data and vessel voyage patterns to establish the status quo. >90 commercial vessel and >60 small boat forms have been collected, together with biofouling samples from two dry docking events. Data analysis and policy recommendations will be completed by the Smithsonian Environmental Research Center in late 2014.
3. Targeted control efforts - SNAP assessment of invasive macro algae in Kaneohe Bay, Oahu. Control efforts of invasive macro algae in Kaneohe Bay have been ongoing for seven years yet the proliferation of algae throughout the bay has continued. Invasive macro algae pose a major threat to coral reef ecosystems. A bay-wide snap-assessment survey was carried out to prioritize control efforts and invest resources to areas that have the greatest ecological gain for a bay-wide management approach. Forty-one patch reefs were surveyed from February to April 2014 and a Kaneohe Bay coral and invasive algae distribution dataset was established. Results showed that invasive algae were distributed throughout the bay at variable densities. Coral distribution was also variable, with high coral densities found on patch reefs throughout the bay. Mitigation reefs were selected by use of a prioritization ranking structure that weighted reefs with a high co-occurrence of live coral and invasive algae (*Eucheuma* spp. and *Kappaphycus* spp.). These reefs were believed to have the highest potential for invasive algae restoration. The survey methodology was found to provide accurate and repeatable coral and invasive algal cover estimates and will provide a valuable data set for tracking changes in coral and algal distribution over time.
4. Communication & coordination - A new aquatic invasive species webpage was created. Additional updates are planned for 2015. <http://dlnr.hawaii.gov/ais/> Another big priority has been to strengthen & build partnerships and work more closely with regional states. Hawaii chaired the Coastal Subcommittee during 2014 and is leading the development of a regional management plan for marine invasive species issues.
5. Improve existing AIS rules – the state of Hawaii's ballast water rules are under review. The proposed amendments will bring the state's rule in line with the federal and international standard for ballast water management. In 2015, Hawaii will begin the proposed rule change process.

Organization: Idaho State Department of Agriculture

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1. Watercraft Inspection: Over 46,000 watercraft were inspected at 15 stations in 2014. ISDA also worked with several lake associations to support boat ramp watercraft inspection at 6 locations around the state. Over 500 high risk vessels were identified and hot washed. 13 Dreissenid mussel fouled vessels were intercepted in 2014 (118 intercepted since 2009).
2. Data Collection and Evaluation: Watercraft inspection data is collected for each vessel that is inspected. This data is collected electronically and uploaded daily. This allows for rapid identification of data issues and allows for quick evaluation of boater movement trends. Idaho compiled five years of watercraft inspection data and published a 5 Year Data Review in early 2014. The evaluation of data collected at the watercraft inspection stations highlights areas that pose the highest risk for producing boats with zebra / quagga mussels travelling into the region. <http://www.agri.idaho.gov/>
3. Survey and Early Detection: Over 60 waterbodies were surveyed for AIS in 2014. Waterbodies are surveyed for invasive mussels, clams, snails, fish, crayfish and plants. New detections of flowering rush and Eurasian watermilfoil were observed in 2014. Over 520 plankton tow samples were collected and analyzed for Dreissenid mussel veliger early detection. Increased involvement with survey and sampling by regional partners has helped to improve the sampling coverage around the state. To date, no evidence of Dreissenid adults or veligers has been found in Idaho.
4. Outreach and Education: ISDA worked in conjunction with Idaho Parks and Recreation to distribute educational fliers to all Idaho registered boaters and to boaters that purchase an Idaho Invasive Species Sticker. The fliers reinforce the "Clean Drain Dry" message and alert boaters to the new Dreissenid mussel infestation in Lake Powell. The Invasive Species Passport program continued to expedite watercraft inspections as well as help educate boaters on the risk of Dreissenid mussels. Over 7,200 Passport inspections were conducted in 2014.
5. Legislative: Language to address the invasive species threat posed by "Energy Crops" and "Trap Crops" was added to Idaho's Invasive Species Rules during the 2014 Legislative Session (*IDAPA 02.03.09.105 and 106*). This language puts in place a formal process to regulate the introduction of potentially invasive species into the state for biofuel production, combustible fuel production and trap crops utilized to control plant pests.

Organization: Kansas Department of Wildlife, Parks, and Tourism

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1. Commercial bait program
We continue to monitor Kansas all bait shops for prohibited species, unsecure water sources, and diseases. Regulations require that all purchased bait must be accompanied by a detailed receipt.
2. On-going zebra mussel detection and monitoring
We continue to monitor (Portland samplers and/or plankton tows) all department waters for the presence of zebra mussels.
3. Support research

We are supporting multiple research projects on aquatic nuisance species. One project focuses on the effectiveness of current treatments for killing zebra mussel veligers that may be present during fish transportation. Another project is assessing which early detection method (eDNA, plankton tows, Portland samplers, etc.) is most effective in a suspected zebra mussel water. Our third project is trying to determine food habits of white perch and large predatory fish in reservoirs with white perch. There is also research focusing on refining eDNA as an early detection method for Asian carp.

4. Expanded ANS outreach campaign

We implemented a new outreach campaign last year. It included a zebra mussel watch card, an informational brochure about ANS that explains “Clean, Drain, Dry,” and several items to hand out with either a “Don’t Dump Bait” logo or the Stop Aquatic Hitchhikers logo. A media kit was produced to inform the public and press and includes two radio ads, a video PSA, a bait fish regulation article, and a logo. The media kit was distributed to media outlets and is available for download on our website at www.protectKSwaters.org. This year we expanded this effort to produce Spanish versions of several of the items developed last year, including radio ads, a press release, and our brochure. These were all distributed, and we purchased air time for the Spanish radio ads. We are also in the process of developing school curriculum for the elementary, middle school, and high school levels using the same branding and messaging from last year’s campaign.

5. ANS kiosk pilot program

We designed and created ANS kiosks to expand ANS signage at high-use areas. The kiosks are approximately 7 feet tall and include an attention-getting sign, an informational sign (varying by infested or non-infested), literature holders, and a sign specific to bait disposal. The literature is printed, park managers have selected sites, the kiosks are in, and the pilot program is set to begin early next spring, with installation of the kiosks this fall. The pilot program will begin with four Kansas waters that incorporate large and small waters and waters that are and are not considered an ANS Designated Water (contains any combination of zebra mussels, white perch, or Asian carp; special regulations apply). An outreach component next year will evaluate the pilot program for determination on full implementation throughout Kansas.

Organization: Montana Fish, Wildlife & Parks

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1. WATERCRAFT INSPECTIONS: FWP operated 19 watercraft inspection crews for the 2014 field season: 8 highway stations on the border, 6 internal highway inspection stations, and 5 crews that operate at boat ramps on popular waterbodies. Crews were trained the week of May 19, and deployed on a staggered basis the following week. One crew along highway 2 was trained earlier and that station opened on May 1. MFWP issued seal receipts with boat seals in 2014. Final numbers are not in yet but the total number of inspected boats should be approximately 30,000. PROHIBITED SPECIES PERMIT: MFWP issued a prohibited species permit to Working Dogs for Conservation to allow possession of dead quagga and zebra mussels. The mussels will be used in training mussel-detection dogs in the Flathead Basin (as well as Alberta). The dogs were trialed at voluntary inspection stations in the region. Please contact Caryn Miske cmiske@mt.gov for more information on the success of the project.
2. FWP EARLY DETECTION AND MONITORING: Waterbodies surveyed in Montana are prioritized based on: previous years’ work, angler/boater pressure, water quality data, risk of introduction, etc. AIS early detection and monitoring includes: invertebrate and macrophyte sampling, and plankton

sampling for veligers (samples processed at the FWP lab in Helena). Priority locations for sampling include the 10 state, 3 federal, and 12 private hatcheries in Montana. We also had one dedicated monitoring crew sampling for and surveying aquatic weeds on state waters.

SCIENTIFIC COLLECTING PERMIT: For the first time, MFWP issued scientific collecting permits to researchers using plankton tow nets in Montana. The purpose was to increase the communication and knowledge on the extent of surveys in the state, as well as to tie MFWP into the potential for Rapid Response.

DREISSENID VELIGER LAB: Montana's lab is processing the majority of plankton samples for the Missouri River Basin. The lab processed more than 1100 samples in 2013, and has already processed 642 this year.

3. EXOTIC SPECIES CLASSIFICATION: Montana recently reviewed proposed classifications for several species of quail, sheep, wallaroo and red-eared sliders. Red-eared sliders have been listed as prohibited in the state, and a "turn-in program" for pet turtles will be initiated this fall. Prohibited status does make it illegal to sell or possess these species in Montana. Notice of amendments to Exotic Species Classification:
http://fwp.mt.gov/news/publicNotices/armRules/pn_0181.html
4. FISH IMPORTATION AND BAIT: Montana FWP is currently reviewing fish importation, bait practices and regulations. There is a concern that current bait practices may increase the risk of importation of invasive species and/or pathogens into the State or increase the spread within the state, in addition to potentially impacting native minnow populations.
http://fwp.mt.gov/news/newsReleases/fishing/nr_0848.html
http://fwp.mt.gov/news/publicNotices/armRules/pn_0182.html
5. PERSONNEL CHANGES: FWP is currently in the process of hiring a statewide AIS Coordinator.

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1. Conducting electronic tablet boater surveys to gain public knowledge of AIS species and whether or not they would support increased boat registration for ANS prevention in Nebraska.
2. Development of Bait fish guide for bait dealers in Nebraska & new regulation this fall requiring bait dealers to give a sample to Game and Parks employees for inspection purposes without compensation.
3. Boat inspections were conducted in tandem with the boater surveys. Staff were at Harlan, Lake McConaughy, Branched Oak and various Omaha area lakes.
4. All veliger samples were negative except for Offutt AFB lake. The lake is heavily infested. It has been since 2009 when cooper sulfate was treated and they have come back. The lake doesn't allow people to put water crafts in except canoes and kayaks. No treatment will occur to kill the infestation. Freezing the mussels isn't an option due to the outfall not being at an elevation to drain the lake which is 115 acres in size and 30 feet. They will be stocking red eared sunfish and blue catfish this spring in the lake to help control numbers of mussels
5. Focusing now on summary of the survey results of boaters from 2012-2014. Will be presenting at a few conferences this fall in the mid-west. Will be meeting with the legislature to show results that people are in favor of funding invasive species prevention activities.

Organization: New Mexico Dept. Game and Fish

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1. AIS Program contacted multiple watercraft transport companies (mainly those transporting from Lake Mead) and explained Zebra/Quagga mussel issues and NM requirements regarding AIS. The companies agreed to work with NMDGF by providing advanced notice of transport and also provide transportation permits whenever delivering or traveling through NM with a watercraft. Unannounced houseboat arrivals dropped dramatically in 2014. NMDGF will continue to contact additional companies.
2. Updated public outreach materials: reservoir signage, website, highway billboards and materials for outdoor expos. The new Stop Aquatic Aliens logo received positive responses from attendees at the NMDGF outdoor expo and highway travelers. NMDGF will continue to use the Alien logo for future AIS outreach.
3. Public outreach using radio and television was increased. Radio ads were placed in the Four corners region encouraging boaters to Clean, Drain and Dry their watercraft. Radio ads also informed the public of the positive status at Lake Powell and NMDGF's ability to provide FREE decontaminations. Several Albuquerque and Santa Fe public radio and TV channels invited the AIS program coordinator for a half hour question/answer prior to Memorial Day and Fourth of July holidays. Albuquerque Channel KOB4 conducted 3 news stories on zebra and quagga mussels and Albuquerque KASA FOX2 conducted a live interview with the AIS Program coordinator during their morning program.
4. Four seasonal AIS inspectors continued watercraft outreach/inspections at Navajo Reservoir and Ute Lake. Inspections totals are preliminary, but NMDGF is expected to provide outreach and inspections to approximately 9,000 watercraft owners. Approximately 50 standing water decontaminations were conducted-many as a result of boaters calling NMDGF after returning from Lake Powell. Two full decontaminations were conducted on fireboats that were being delivered to Navajo Reservoir and Fallen Leaf Lake, CA. Adult mussels were not found on either boat, but significant standing water was found in multiple locations on each boat. Prior to arriving in New Mexico, each fireboat had been in Lake Superior for testing.
5. The States of Wyoming, Colorado and New Mexico agreed to honor wire seals attached by each states AIS program.
6. Changed the way NMDGF was collecting and storing outreach/inspection data by reducing the use of paper logs and using tablet/ipads to collect data. Colorado Parks and Wildlife allowed NMDGF to access their ANS database in order to test the mobile application. This change will reduce a tremendous amount of time NMDGF spent during the fall/winter entering data. Paper logs have not been completely eliminated as they were needed during peak boater entry.

Organization: Nevada

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Please provide a description of your top five ANS activities/accomplishments/priorities for the past year:

1. Four mandatory watercraft inspection and decontamination stations were operated during the 2014 summer season at Lahontan, Rye Patch and Wildhorse Reservoirs in cooperation with Nevada State Parks. The stations have been operational for 3 summer seasons and have inspected over 3500 watercraft. In 2014, due to drought conditions at all the above mentioned reservoirs; watercraft usage was down compared to previous years. Watercraft user information is routinely collected at all stations and free of charge inspection and decontaminations are performed. NDOW continues to monitor the above mentioned reservoirs for quagga and zebra mussels utilizing tactile monitoring, PCR and veliger analysis. All NDOW results have remained negative since 2011.
 2. NDOW initiated two seasonal statewide watercraft inspection and decontamination rovers during the 2014 summer season. The rovers were responsible for performing public outreach and watercraft inspections and decontaminations at various lakes and river throughout the state. The rovers were located in both the southern and northern regions of the state. The southern rover's primary focus was on the lower Colorado River system near Laughlin, NV and the northern rover was focused at several reservoirs in the northern portion of the state. Watercraft user information is collected at all visited recreational areas and free of charge inspection and decontaminations are performed.
 3. In late December 2013, NDOW in coordination with the National Park Service opened 3 year around watercraft inspection and decontamination stations located near marinas at Lake Mead with funding provided by U.S. F&WS and state match. NDOW conducts public AIS outreach and provide free of charge AIS removals on watercraft exiting or entering Lake Mead National Recreation Area. Over 100 decontaminations have been performed as of August 2014 and thousands of watercraft users have been educated on the AIS removal stations and the Clean, Drain & Dry methodology. AIS staff also collects boater information at the stations and at the Lake Mead boat docks and marinas. NDOW continues to notify western states of Lake Mead watercraft destined for their respective state.
 4. In August 2014, South Fork Reservoir in northeastern Nevada tested positive for quagga DNA utilizing PCR analysis. No adult or larval stages have been collected or observed. In response to the positive testing, NDOW established a mandatory inspection and decontamination station at the reservoir for watercraft both entering and exiting the waterbody. The station is expected to remain open until late October or when the reservoir freezes over and reopen in spring 2015. NDOW is continuing to monitor the reservoir and a scuba survey at the dam has been completed with negative results.
 5. AIS outreach efforts have continued statewide with 5 AIS billboards implemented during the summer of 2014. The billboards focused on the clean, drain and dry message and Nevada's AIS watercraft decal. In addition, AIS radio advertising was implemented with a focus in southern Nevada and a Facebook media campaign was also established. AIS informational brochures are routinely printed and distributed to watercraft user at all AIS stations, natural resource agencies and watercraft vendors.
- Also in 2014, NDOW focused on limiting the spread of New Zealand mud snails in the northern section of the state. In 2013 NZMS were discovered in Reno in the Truckee River - which flows from Lake Tahoe through Reno and into Pyramid Lake. In a coordinated effort and the award of a competitive grant, NDOW along with the Cities of Reno & Sparks, Washoe County, Pyramid Lake Paiute Tribe, the Nature Conservancy, and the Truckee Meadows Water Authority are in the process of installing Clean, Drain & Dry signage along the Truckee River and developing regional public service announcements to prevent further spread of the snails and other AIS.

Organization: North Dakota Game & Fish Department

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1. A statewide crayfish survey was completed in 2013 via a cooperative effort involving Valley City State University and NDG&F district fisheries staff. This study's main focus was to determine whether rusty crayfish were present in ND. Only two species of crayfish (calico and virile) were identified amongst several hundred specimens collected from 228 NDG&F sampled waters and 58 sites (mostly rivers and streams in eastern ND). The results of this study, combined with the crayfish sampling and identification component of a recent study focusing on streams and rivers in central and western ND (in which no rusty crayfish were collected), indicate that it is highly unlikely that rusty crayfish currently exist in ND.
2. Two sites in ND that were identified by an EPA EMAP project as being positive for *Didymosphenia geminata* several years ago were reexamined to determine whether these sites were infested with didymo. These sites (one on the Souris River east of Minot and one on the Red River east of Grafton) are both on very turbid, warm water streams that are highly unlikely to have been infested or to sustain didymo. These EPA findings are the only reported instances of didymo in ND; it is extremely unlikely that these records are valid.
3. Curly leaf pondweed was found at one additional site in ND in 2013 (Grass Lake in Richland County) and to date at one additional site in 2014 (Raleigh Reservoir in Grant County). CLP is now found in a dozen waters in ND; at none of these waters is it considered a serious problem in terms of biological or other resource impacts.
4. Despite the annual fairly intensive search for zebra mussel adults or veligers in ND (and especially in the Red River along the state's eastern border), to date no adult zebra mussels have been found. The only instance in which zebra mussels were collected in ND was in 2011, when a plankton tow from the Red River at Wahpeton was positive for zebra mussel veligers. Although similar veliger sampling in 2012 and 2013 failed to document their presence, zebra mussels are established in the Ottertail River in MN within 20 river miles of the mouth of the Ottertail (which flows into the Red River at Wahpeton). Zebra mussels will likely continue to move downstream in the Ottertail and into the Red River; the biggest unknown is whether habitat conditions in the Red River are suitable to wide spread establishment of this species.
5. The presence of silver carp in ND was first documented in 2011, when immature silver carp were documented as being present in the James River at LaMoure Dam. This invasion occurred during the extremely high flows experienced on this river in that year. Sampling later that year confirmed that silver carp were present in the James as far upstream as Jamestown. Sampling in subsequent years has confirmed that although silver carp continue to be present in this river, to date no reproduction or recruitment has occurred. There are no known populations of grass, bighead, or black carp in ND.

Organization: Oklahoma

No report.

Organization: Oregon Dept. of Fish & Wildlife

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1. 2014 Watercraft Inspection Program. So far this season, the program has conducted 9,442 watercraft inspections. Which includes the interception of: 10 - watercrafts for Zebra/Quagga mussels, 4 - watercraft for standing water, 1 - watercraft for Conrad False mussel, and 169 - watercraft for other types of AIS. The final numbers for the 2013 season was: 7,441 watercrafts inspected, which includes 17 watercraft for mussels and 279 for other types of AIS.
2. In 2014, the Department worked on an small awareness campaign for Prohibited turtles. The effort result in a significant increase in the numbers of pet turtle and feral turtles turn over to the Department.

Organization: South Dakota

No report submitted.

Organization: Texas Parks and Wildlife Department

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1. Treated approximately 2,500 acres of giant salvinia with herbicide.
2. Completed construction of a giant salvinia weevil rearing facility in Brookeland, Texas.
3. Hired two invasive species biologists.
4. Partnered with University of Texas at Arlington to monitor for zebra mussels in over 30 water bodies.
5. Issued approximately 1,000 triploid grass carp permits for vegetation control.

Organization: Utah Division of Wildlife Resources

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1. Increased effort at the I-15 Port of Entry.
In 2012, a small amount of effort was made to interdict boat traffic arriving at the southern border of Utah at the I-15 Port of Entry. Four months of effort were made between the months of June and September in 2013 at 40 hours per week. In 2014, additional one-time money was received for the operation of the POE and it was opened in April and will run later into the fall, hopefully through November. In 2014 two mussel encrusted boats were stopped and only one has been stopped in 2014.
2. Changes in Utah Code and Rule to emulate model law drafted through the Oregon Sea Grant Law Center and WRP.
Throughout 2013 and into 2014 several changes were made to Utah Code and rule that allowed us to drop Sand Hollow Reservoir, Red Fleet Reservoir, and Electric Lake as waters affected by quagga mussels. Additionally, we received authority from the Utah legislature to conduct

mandatory, non-law enforcement, roadside boat inspection stations and have worked on them at Bear Lake and Flaming Gorge. We will continue to work on placing them around Lake Powell to interdict boats leaving the only infested water body in Utah.

3. Shifted focus to Lake Powell

We initially placed UDWR law enforcement personnel on the boat ramps at Lake Powell and have now shifted to place AIS technicians at the boat ramps to inspect and tag boats leaving Lake Powell. Coordination and negotiation with NPS continues. We currently do not have access to decontamination equipment at Lake Powell.

4. Roadside inspection stations at Bear Lake and Flaming Gorge Reservoir

Although the authority to conduct roadside inspection stations does not require law enforcement, UDWR officers have participated heavily in roadside inspection stations and have increased compliance to over 80% of passing watercraft. Inspection stations are proving to be easier to manage than technicians intercepting boats on ramps and are more efficient at ensuring that we are providing adequate protection to our water bodies.

5. Renewed outreach effort

UDWR contracted a private media firm to renew AIS program outreach efforts. We have rebranded mussels as a “skiff-transmitted disease” and have a current live website (STDotheSea.com), new outreach materials, and a online social media presence.

Organization: Washington Department of Fish and Wildlife (WDFW)

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1. Passage of Engrossed Substitute Senate Bill 6040. The bill accomplished five primary objectives: a) consolidates aquatic invasive species (AIS) into a single Title 77.135 RCW chapter; b) enhances invasive species classification system to increase flexibility of response and risk management capacity; c) enhances existing authorities for mandatory AIS check stations to improve control of inadvertently transported AIS on state roadways; d) provides explicit authority to request state Emergency Declaration and implement emergency measures when AIS pose substantial, imminent risk; and e) requires the posting of the scientific name of nonnative species (aquarium, live food market, pet, and similar species) when sold or distributed in public venues. Unfortunately, all funding was pulled from the bill. WDFW is moving forward internally with a funding proposal for the 2015 legislative session. So far, we’ve compiled a list of over 35 funding ideas from which we hope to find 4-6 viable options for the next step of stakeholder outreach.
2. A coordinated effort by the WDFW, Washington Invasive Species Council, University of Washington SeaGrant, Pacific States Marine Fisheries Commission, and Puget Sound Partnership was successful in proposing an Environmental Protection Act Puget Sound Marine and Nearshore Protection and Restoration grant of \$100,000 to establish a European green crab program. The program will develop and implement an early detection and monitoring for European green crab in Washington’s inland waters.
3. WDFW successfully obtained the National Pollutant Discharge Elimination System AIS Management General Permit. The permit will allow the use of chemicals (e.g. algacides, herbicides, insecticides, molluscicides, piscicides, and other chemicals or appropriate products) to manage nonnative AIS. Chemical discharges of aquatic pesticides have been permitted to manage aquatic plants and algae, burrowing shrimp, fish, invasive moths, and mosquitoes, but

this is the first permit in Washington State that allows the management of AIS such as zebra and quagga mussels.

4. WDFW successfully obtained \$120,000 for Japan Tsunami Marine Debris (JTMD) through Emergency Management Division of the Washington State Department of Military. The funding will create a dedicated position within WDFW as the lead State Marine Debris Response Plan responder. Objectives of the position will be to conduct rapid response to reports of marine debris, shoreline surveys, assist in organized beach clean-up events, and provide education and outreach on JTMD risks and reporting.
5. The WDFW Enforcement Program continues to work in preventing the introduction of invasive species into Washington State from all possible pathways. Several years ago it was determined that invasive crayfish were being imported into the state for various live-food markets and restaurants. After initial education and outreach campaigns were conducted to prevent any additional import Officers were advised of one location that decided to continue their trade in invasive crayfish. An additional investigation ensued which eventually resulted in the violator receiving a felony conviction that included \$3,000 in restitution.

Organization: Wyoming Game and Fish Department

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1. Outreach

Outreach in 2014 has continued to focus on increasing boater awareness of mandatory inspection requirements. Billboard advertisements were used in neighboring states at major entrances into Wyoming with the message "Boating in Wyoming? Your boat MUST be inspected before launching". A boater appreciation raffle was initiated in order to increase compliance of boats stopping at mandatory AIS check stations for inspections. After each inspection, a boater is given a raffle card and then must complete a short survey online and enter a unique code to be entered in the raffle. Prizes include an inflatable fishing pontoon, a guided fishing trip, weekend stay at a Nature Conservancy preserve, and spotting scope.

2. Watercraft Inspections

Through August 2014, 30,067 inspections have been conducted at border locations, major waters, Department offices, and private inspection locations. Of these, 1,376 were A high risk inspections and 642 resulted in decontamination. Ten of the watercraft contained dead invasive mussels.

3. Monitoring

65 waters were surveyed for aquatic invasive species during 2013. A similar number of waters have been sampled in 2014. All samples to date have been negative for larval zebra/quagga mussels. Curly pondweed continues to be found at new locations throughout Wyoming. A new population of New Zealand mudsnails has been confirmed at a lake in western Wyoming. This is the first new introduction of mudsnails in Wyoming in over a decade.

4. More information can be found at wgfd.wyo.gov/AIS.

U.S. TERRITORIAL GOVERNMENT MEMBER

No report.

CANADIAN PROVINCIAL GOVERNMENTS

Organization: Alberta Environment and Sustainable Resource Development

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Following the 2013 AIS pilot to kick start the province into action, Alberta fully expanded its program province-wide in 2014 to include the following highlights:

1. Inspections: Voluntary inspections stations opened on June 9th and will remain open until the end of September, targeting the 4 major highways entering Alberta. Due to the positive mussels detected in Lake Winnipeg, Manitoba, in October 2013, Alberta chose to focus the majority of inspections on the eastern border with Saskatchewan. Highways from the south and west are also targeted. Commercial Vehicle Weigh Stations are being used as inspections sites, and 2 additional roving crews are at provincial park boat launches. As of August 30, 2 mussel fouled boats were intercepted at the Alberta – Saskatchewan border. Protocols from WIT II are used for inspections and decontamination in Alberta.
The Alberta Government and Irrigation Projects Association in cooperation with Montana Department of Natural Resources co-led a canine mussel detection pilot this summer. Through the organization Working Dogs for Conservation, 4 dogs were trained in zebra and quagga scent detection with the California Fish and Wildlife canine unit. The pilot was held for 10 days on each side of the border to test the dog's efficacy and speed in doing inspections. Due to the success of this pilot, Alberta will explore the possibility of expanding canines into their inspections program for 2015.
2. Monitoring: 73 waterbodies are being monitored for *Dreissenid* mussels & spiny waterflea this season. In addition, an aquatic plant monitoring pilot project was initiated this summer. It has a limited scope but hopes to expand by next year to multi-taxa monitoring.
3. Response: Water managers (from both government and industry) are in the process of drafting a response plan for Alberta. The plan will focus on verification and treatment/containment options per waterbody type. Waterbodies will be ranked by priority on calcium levels, number of launches, number of boats inspected destined for the waterbody, endangered species present, waterbody type, etc.
4. Education and Awareness: Alberta's CLEAN DRAIN DRY campaign included radio and TV spots, billboards, boat launch signs, ads in boating/angling magazines, and articles.
5. Legislation: Amendments to Fisheries (Alberta) Act will move forward for the spring 2015 session. Highlights of amendments include:
 - Provide for mandatory inspections of AIS vectors (boat, shipments of live fish, aquarium plants, etc.) – this will be done through a specific Ministerial Order
 - Create a schedule (addendum to the Act) of prohibited species that can be modified at the ESRD Minister level
 - Create categories of prohibited species (e.g. 1 = must initiate rapid response!, 2 = control/maintenance, 3 = nuisance)
 - Enhance authority provided to Fishery Officers (and potentially Fishery Guardians). This would be a way to expand some authorities for enforcement to municipal officers, compliance officers, etc.

Finally, there is an Alberta AIS program summit planned for November 18-20 in Calgary, Alberta. This will include a first year review of the provincial program and an evaluation by the Aquatic

Ecosystem Restoration Foundation. AERF is compiling a panel of experts to assist with program evaluation and recommendations for the future of the Alberta program.

Organization: British Columbia

No report.

Organization: Manitoba

No report.

Organization: Saskatchewan

No report.

MEXICO STATE OR AT LARGE MEMBER

No report.

TRIBAL/FIRST NATIONS REGIONS

Organization: Alaskan Natives

No report.

Organization: Coastal Tribes

No report.

Organization: Inland Tribes

No report.

Organization: Native American Fish and Wildlife Society

No report.

OTHER INTERESTS – APPOINTING ORGANIZATIONS

Organization: Pacific States Marine Fisheries Commission

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1. Watercraft Inspection Training (WIT): PSMFC contractor D Davis continued to lead Level Two watercraft inspection trainings in Fall 2013 and Spring 2014. Level Two training, delivered over two days at Lake Mead, is intensive and designed for professionals in all fields that expect to be actively involved in the inspection and decontamination of trailered watercraft and those who wish to become trainers within their state or work group. This project is funded by USFWS and BPA. <http://www.aquaticnuisance.org/wit>. Besides training at Lake Mead, additional remote trainings by D were also carried out in Arizona (Lake Pleasant and Lake Havasu, with Kami Silverwood/Tom McMahon, AZDGF), Utah (Utah Lake, with Jordan Neilson, UTDWR), California (Castaic Lake, with CADFW) and New York (With Lake George Park Commission). Quagga D and Stephen also worked with the WRP's WI committee on developing new trainers and student manuals for WIT courses. UMPS III is also being developed.
2. Columbia River Basin (CRB) Dreissenid Rapid Response Planning:
 - In February an updated version of the CRB RR Plan was completed and can be found at http://www.100thmeridian.org/Columbia_RBT.asp.

- A Rapid Response Work Group scenario exercise for Oregon and Washington was held December 11, 2014 in Vancouver, Washington. Presentations and the report from that meeting can be found @ <http://preventinganinvasion.psmfc.org/rapid-response-workgroup/>
 - PSMFC and lead contractor Lisa DeBruyckere have been holding meetings with Federal Agencies (e.g. NOAA and the USFWS) to discuss key next steps in developing a proposed action toward Section 7 consultations relative to an introduction of dreissenids in the Columbia River Basin. A decision matrix and best management practices were developed and shared at this meeting. The matrix and BMP document can be found @ <http://preventinganinvasion.psmfc.org/rapid-response-workgroup/>
 - The CRB Vulnerability Assessment (VA) Team led by Lisa DeBruyckere and Stephen Phillips released the latest version of the VA report (April). It can be found @ <http://preventinganinvasion.psmfc.org/vat/>
3. Coordination/Other: We hosted meetings of the Pacific Ballast Water Group (<http://www.psmfc.org/ballast/>) in April in Portland, Oregon, and Columbia River Basin Team of the 100th Meridian Initiative in October and May (<http://www.100thmeridian.org>); Continued to produce ~bi-weekly "AIS News" <http://www.aquaticnuisance.org/>; PSMFC continues to host a website on current dreissenid monitoring sites in the CRB that can be found at <http://crbans.psmfc.org/monitoring.html> in cooperation with USGS (Cook Washington).

Organization: Puget Sound Partnership

No report.

Organization: San Francisco Estuary Partnership

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SFEP has been active on the ANS Task force, helping integrate results of recently completed vector assessments, and working on Technical Advisory Committees for California State Lands Commission's Marine Invasive Species Program. The key work and documents is summarized below.

Marine/Estuarine Vector Assessments:

Six Vector Assessments were completed by 3 different research teams in the state of California (<http://calost.org/science-initiatives/?page=aquatic-invasive-species>). Although the vector assessments were completed in California for marine and estuarine waters, many of the results should be applicable to other areas.

1. "Live Saltwater Bait and the Introduction of Non-native Species into California," Andrew Cohen, CRAB.
2. "Live Marine Seafood and the Introduction of Non-native Species into California," Andrew Cohen, CRAB.
3. "An Analysis of Aquaculture as a Vector for Introduced Marine and Estuarine Species in California," University of California at Davis, Bodega Marine Laboratory & Department of Environmental Science and Policy, Edwin Grosholz*, R. Eliot Crafton, Rachel E. Fontana, Jae Pasari, Susan Williams & Chela Zabin.
4. "A Vector Analysis of the Aquarium and Aquascape ('Ornamental Species') Trades in California," University of California at Davis, Bodega Marine Laboratory, Susan L. Williams*, R. Eliot Crafton, Rachel E. Fontana, Edwin D. Grosholz, Jae Pasari & Chela Zabin.
5. "Recreational Vessels as Vectors for Non-native Marine Species in California," The Aquatic Bioinvasion Research & Policy Institute, A Partnership between Portland State University &

the Smithsonian Environmental Research Center, Gail Ashton, Chela Zabin, Ian Davidson & Greg Ruiz

6. The Role of Fishing Vessels as Vectors for Marine and Estuarine Species in California,” The Aquatic Bioinvasion Research & Policy Institute, A Partnership between Portland State University & the Smithsonian Environmental Research Center, Ian Davidson, Gail Ashton, Chela Zabin & Greg Ruiz.

SFEP participated in a meeting with researchers to attempt to integrate the 6 vectors and determine the relative risk associated with each vector. In addition, SFEP participated in a meeting with managers to determine next steps for managing the vectors studied in the reports.

Ballast Water Management and Vessel Biofouling

SFEP has been an active participant in working on Technical Advisory Committee Meeting for California’s Marine Invasive Species program, which manages invasive species on commercial vessels.

1. Ballast Water Treatment Standards – The latest report determined that shipboard technologies cannot current meet the California Standard (which is more stringent than the Federal and International standards). SFEP is working with the California State Lands Commission to help move forward the process of finalizing compliance protocols, which will help clarify the results on the testing and help determine how close technologies are to meeting the standard. In addition, a shore-side treatment feasibility study is being conducted to determine if shore-side treatment is a viable option for ballast water treatment.
2. Vessel Biofouling – SFEP is also working with the California State Lands Commission to develop vessel biofouling regulations for commercial vessels. This will be a key step in dealing with the biofouling issue on the west coast, which is one of the key mechanisms for spreading species along the west coast of the US.

Organization: Sea Grant

No report.

Organization: Tahoe Regional Planning Agency

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1. Approval of the Lake Tahoe Region AIS Management Plan revisions by the ANS Task Force. US Fish & Wildlife Service officials made several complimentary statements regarding the Plan and that it should be used as a model for all plans moving forward.
2. Obtained stop-gap funding for the Prevention Program for 2015. Currently, half of the Prevention Program is funded by boater inspections fees, with the other half funded by federal dollars through the Southern Nevada Public Lands Management Act (SNPLMA). SNPLMA dollars are sun setting, so additional funds are necessary. Other SNPLMA funded projects that have returned unused dollars were awarded to the Lake Tahoe Program for 2015. TRPA is actively seeking funds from other sources for the future- 2016 and beyond.
3. Funding for Control work in Lake Tahoe has been awarded for work through 2015. \$300,000 was made available through California Senate Bill 630 which directs funds received by CA State Lands Commission recreational leases (piers and buoys) in Lake Tahoe to fund AIS control projects on the California side of the Lake. While on the Nevada side, funds through the Nevada-Lake Tahoe

License Plate fund in the amount of \$65,000 was awarded for control work in Nevada. Priority projects include aquatic weed removal projects and warm water fish removal projects.

4. The Prevention program continues to operate, only allowing inspected (and possibly decontaminated) boats to launch in Lake Tahoe. Approximately 38,000 vessels each year are certified as either being inspected, or last launched in Lake Tahoe prior to launching.
5. TRPA continues to work with WakeWorx LLC and others to help introduce and promote the use of AIS prevention technology. Specifically, WakeWorx has developed a ballast filter (Mussel Mast'r) that is designed to filter out AIS, including veligers, with the notion that the ballast tanks could then possibly avoid the need for decontamination. Agreements are being sought with manufactures to offer it as an option on all new vessels, as well as working with authorized dealers to offer retrofit installs. Research has suggested that these filters can prevent over 99% of AIS from passing through the filter media (< 20 microns). A local authorized installer has installed a retrofit system on a boat. Tahoe officials are scheduling an opportunity to inspect the installation. An update at the WRP meeting will be available.

Organization: Western Association of Fish and Wildlife Agencies

No report.

Organization: Western Aquatic Plant Management Society

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1. 33rd Annual meeting was successfully held March 31 to April 2, 2014 in Reno, NV. Presentation topics included: NPDES permitting for the application of aquatic herbicides to control invasive aquatic plants, fish toxicity risks from herbicide applications, and numerous talks on controlling weeds in irrigation canals, including a panel discussion that included managers from five large irrigation systems in Washington, Idaho, and Oregon.
2. Continued work on emerging and expanding plant problems, including flowering rush (*Butomus umbellatus*), South American spongeplant (*Limnobium laevigatum*), water primrose (*Ludwigia grandiflora* ssp. *hexapetala*), common reed (*Phragmites australis*), hydrilla (*Hydrilla verticillata*), hybrid milfoils (e.g., *Myriophyllum spicatum* x *M. sibiricum*), and yellow floating-heart (*Nymphoides peltata*).
3. WAPMS is now active on social media. Members and other interested parties can "Like" WAPMS on Facebook to stay plugged into aquatic plant and as well as other invasive species issues in the West.
4. In 2017, WAPMS is planning a joint meeting with the Western Society of Weed Science (WSWS) to be held in the Coeur d'Alene, ID area in March or April.
5. The 2015 annual WAPMS meeting will be held in Portland, OR at the Crowne Plaza (NE of downtown) March 30 to April 1.
6. More information on WAPMS may be found at www.wapms.org

OTHER INTERESTS – INDIVIDUAL

Academia Coastal

Organization: Portland State University

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1. Surveys for AIS throughout Oregon and in the Columbia River basin.
No mussels found to-date, however, we did find flowering rush in Lake Wallula (behind McNary Dam), the furthest downstream population yet discovered. We also discovered reynolds grass at the McNary Wildlife Nature Area just downstream for McNary Dam. Reynolds grass is being considered for listing as a class A noxious weed in Washington. It is not listed in Oregon, but the process for listing will begin soon. Oregon Dept of Agriculture is implementing a rapid response (diver dredging for flowering rush, yet to be determined for Reynolds grass)
2. Yellow floating heart (*Nymphoides peltata*) has turned up in several small waterbodies in central Oregon, probably from plant nursery sales. These are in addition to other populations in southwest Oregon, near Eugene and in Portland. This is a difficult plant to control, although hand pulling, covering, and herbicides are all being tried at various locations.
3. We are entering the third, and final year, of a study of the longevity of 3 foul release coatings for mitigation of mussel fouling in the Columbia River. Results will be forthcoming.
4. In collaboration with Uri Shanas, University of Haifa, we have begun a study of nutria management and microevolution. We will be examining the use of the Halderian gland as a lure to increase trapping efficiency and are doing a comparative morphological study of nutria in Oregon and Israel. Preliminary data suggests that tail: body length is greater in Israeli populations, even though they were introduced into Israel and the US about the same time. The tail is a thermoregulatory organ, and we hypothesize that we are seeing rapid evolution of morphology as a result of the differing selective pressures in Oregon and Israel (it's colder in Oregon than in Israel).
5. I chair the Oregon Invasive Species Council this year. We were asked by the Governor's office for a proposal for funding invasive species prevention in Oregon. We submitted a \$10 million proposal. We are waiting to see if it is in the Governor's budget. We have legislative support for invasive species management, and the budget situation in the state appears to be easing somewhat; however, there are many demands on the state budget and our probability of getting full funding is small. Although any additional funding for prevention efforts would be useful.

Academia - Inland

Organization: The University of Texas at Arlington

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1. My laboratory completed an invasion risk assessment and monitoring for the presence of zebra mussels in 23 Texas water bodies both during early summer and again in fall 2013. This zebra mussel risk assessment and invasion monitoring program has been under development since 2011 and was initially supported by QZAP (Quagga Zebra Mussel Action Plan) funding. It has now been adopted by the Texas Parks and Wildlife Department (TPWD) and was expanded to 35 water bodies in Eastern Texas in 2014. The 2014 sampling did not detect zebra mussel veliger larvae at any of the 35 sampled water bodies with only one water body having a weak qPCR signal for larval presence. At present, reproducing zebra adult mussel populations are known to occur in four Texas water bodies: Lake Texoma (Red River Drainage), Lakes Ray Roberts and

Bridgeport (Trinity River Drainage), and Lake Belton (Brazos River Drainage). Since 2011 veliger larvae and mussel DNA have been detected periodically in a number of other Texas Water bodies but these have yet to develop sustainably reproducing adult populations.

2. My laboratory continues to study zebra mussel population and reproductive dynamics in Texas water bodies. These studies have been ongoing in Lake Texoma since 2011, in Lake Ray Roberts since 2013 and in Lake Belton since 2014. Texas mussel populations survive and reproduce at higher ambient temperature (30-32°C) than mussel populations in the Northern US and Europe (28-30°C) suggesting that they have evolved an increased thermal tolerance in warm southwestern water bodies. Our results indicate that Texas zebra mussels undergo massive population expansions in the first several years after introduction followed by relatively rapid major declines in juvenile settlement rates and adult density over a period of 2-3 years. It also appears that settlement-ready pediveligers appear in the plankton for relatively short periods relative to the entire length of the spawning season so that juvenile settlement periods are relatively attenuated. In Lake Texoma, mussels reach full adult sizes (2-2.5 cm in length) within a life span of 12-15 months. They display a higher growth rate and shorter life span compared to mussel populations in North America or their European home range (i.e., typical life spans are 3-5 years with slower growth rates). My laboratory is studying the bases for these major differences in Texas zebra mussel population dynamics compared to those more typical of mussel population in other areas of North America and in Europe.
3. Recent publications on dreissenids from my laboratory include:
 - Choi, W.J., Gerstenberger, S., McMahon, R.F., Wong, W.H. 2013. Estimating survival rates of quagga mussel (*Dreissena rostriformis bugensis*) veliger larvae under summer and autumn temperature regimes in residual water of trailered watercraft at Lake Mead, USA. *Management of Biological Invasions* 4(1) 61-69.
 - Kappel, M., Gerstenberger, S., McMahon, R.F., Wong, W.H. 2015. Thermal tolerance of invasive quagga mussels in Lake Mead National Recreation Area. Pages ???-??? in Wong, D. W-H. and Gerstenberger, S.L. (eds.) *Biology and Management of Invasive Quagga/Zebra Mussels in the Western United States*. CRC Press, Boca Raton, Florida. In press.
 - Chilton, E.W. III, McMahon, R.F., Zan Zee, B. 2015. Zebra mussels in Texas 2009-2013: A case history. Pages ???-??? in Wong, D. W-H. and Gerstenberger, S.L. (eds.) *Biology and Management of Invasive Quagga/Zebra Mussels in the Western United States*. CRC Press, Boca Raton, Florida. In press.
 - McMahon, R.F. 2015. Implementation of a cost-effective monitoring and early detection program for zebra mussel invasion of Texas water bodies. Pages ???-??? in Wong, D. W-H. and Gerstenberger, S.L. (eds.) *Biology and Management of Invasive Quagga/Zebra Mussels in the Western United States*. CRC Press, Boca Raton, Florida. In press.

Aquaculture – Coastal

Organization: Pacific Coast Shellfish Growers Association

No report.

Aquaculture – Inland

Organization: TBD

No report.

Conservation NGO – Coastal

Organization: TBD

No report.

Conservation NGO – Inland

Organization: Invasive Species Action Network

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1. Development of a Greater Yellowstone Area (GYA) AIS collaborative management effort -The partners in the GYA effort include three states, two national parks, 6 National Forests and 2 National Wildlife Refuges. Collectively they recognize the need for coordinated management and ISAN is facilitating in the development of this effort. We have completed a recreational boating management assessment for Yellowstone Park and are currently expanding the scope of the report to include the entire GYA. In early 2014 we conducted a facilitated workshop to begin the development of a rapid response plan for the GYA. We are currently addressing the needs identified during the workshop and have a goal of conducting a rapid response exercise in 2016.
2. Promoting fishing boot cleaning – Anglers’ boots have been identified as a high risk vector for transporting certain types of AIS. Through a multi-year effort, we have identified several barriers to boot cleaning that must be addressed to achieve greater compliance. One of the biggest barriers identified was the difficulty in cleaning boots conveniently. This led us to develop two different styles of boot cleaning stations that have been installed in fly shops and other locations frequented by anglers. The stations are constructed of powder-coated steel and are effective tools to encourage boot cleaning. We currently have about 80 stations installed and expect to have well over 100 stations installed prior to the beginning of the 2015 fishing season. A map of all locations can be found at <http://stopans.org/bootcleaninglocations.html>
3. Youth Education – Youth education is an important activity for ISAN. We provide a wide variety of youth education experiences both in and outside of the classroom. We have a host of AIS presentations that are tailored for any audience from K – 12. During the 2013 – 2014 school year we conducted more than 350 youth programs that reached more than 9,000 students. The “Invader Inspector” youth activity we developed has been used in many different situations and provides a great teaching tool for anyone who needs an AIS youth activity.
4. Forest Pest Outreach – Although not an AIS problem, ISAN’s expertise at developing programs that reach target audiences to change behavior has been utilized to develop a unique outreach program that uses fly tying to teach people to identify forest pest insects. This project uses fly tiers who tie flies at public venues which attracts public attention and engages the public in discussion about the forest pest issue. The activity of the fly tiers really attracts attention and engages the audience in conversation and learning. The program has been growing rapidly as forest pest programs across the country seek to incorporate public outreach.
5. Other Targeted Outreach Projects – ISAN specializes in developing targeted outreach that seeks to achieve behavior change in a specified user group. We are currently working on several of these efforts related to AIS. We have a special outreach program for permitted river users on Montana’s Smith River that is designed to encourage all floaters to arrive with a clean boat. We are implementing a pet store outreach project that is designed to involve independent pet stores in the education effort to reduce the release of unwanted pets. We are beginning a targeted outreach project designed to encourage cleaning among boaters on the Lee’s Ferry and Grand Canyon stretches of the Colorado River.



Regional Power Council**Organization: TBD**

No report.

Regional Water Council**Organization: TBD**

No report.

Aquatic Pet Industry**Organization: TBD**

No report.

Aquatic Plant Industry**Organization: Crop Production Services**

No report.

Recreational Boating**Organization: Recreational Boaters Association of Washington**

No report.

Legal/Law Enforcement**Organization: National Sea Grant Law Center**

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1. Served as lead, with Priya Nanjappa of Association of Fish and Wildlife Agencies, of Building Consensus Model Law Working Group.
2. Maintained an up-to-date electronic compilation of laws and regulations of western states related to watercraft inspection and decontamination.
3. Oversaw development and drafting of model legislative provisions for WID programs. Final document was released in March 2014 and entitled “Preventing the Spread of Aquatic Invasive Species by Recreational Boats: Model Legislative Provisions & Guidance to Promote Reciprocity among State Watercraft Inspection and Decontamination Programs.”
4. Conducted nationwide comparative analysis to identify how existing state law compares to the model legislative provisions.
5. Conducted an analysis of statutory and regulatory authorities of the five federal land management agencies (NPS, USFS, FWS, BLM, BOR) to restrict the movement of watercraft on and off public lands.

At Large – Coastal**Organization: TBD**

No report.

At Large – Inland**Organization: TBD**No report.
