Aquatic and Riparian Effectiveness Monitoring Program

Interagency Monitoring Program - Northwest Forest Plan Area

Garlic mustard photo by Glen Miller

Aquatic Invasive Species Survey Report 2008 Field Season

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USDA Forest Service Pacific Northwest Regional Office
Bureau of Land Management Oregaon State Office

February 2009

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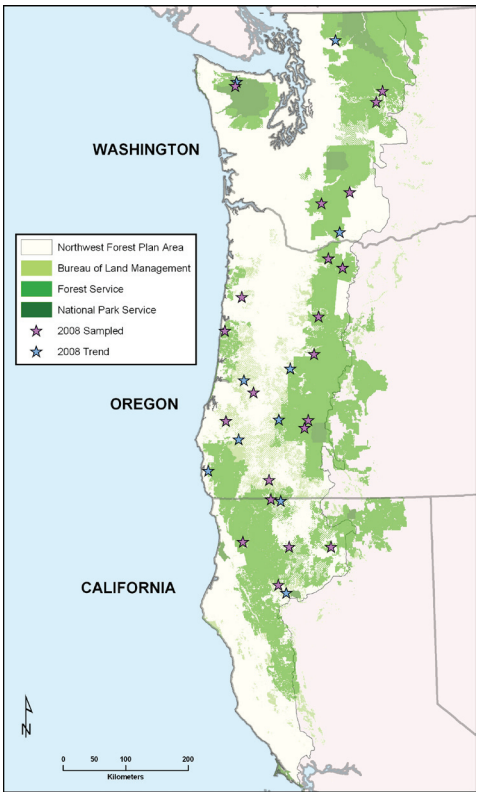


Figure 1. Map of the watersheds surveyed during the 2008 field season.

Background

Invasive species have been identified as one of the four critical threats to the Nation's ecosystems by the Chief of the USDA Forest Service (FS). The broad geographic area sampled by the Aquatic and Riparian Effectiveness Monitoring Program (AREMP) provides an excellent opportunity to detect aquatic invasive plants and animals on federal lands while working in randomly-selected watersheds in the Northwest Forest Plan area (NWFP; "west of the Cascades" from Point Reyes, California north to the Canadian Border). In 2008, AREMP included surveys for aquatic and riparian invasive species at sampled watersheds (Figure 1). Several recommendations made subsequent to the 2007 pilot season were implemented for the 2008 field season.

Protocol development

Personnel from AREMP, Oregon State University (OSU), Portland State University (PSU), and the FS met in 2007 to develop an Aquatic Invasive Species Early Detection Rapid Response protocol that outlined how field personnel would collect data on thirteen species of plants and animals considered of primary concern to Northwest waterways as well as fifteen species of secondary concern. The species of concern were chosen based on three criteria:

- The species is on the Oregon Department of Agriculture's A list (http://www.oregon.gov/ODA/PLANT/WEEDS/statelist2.shtml) or the Oregon Invasive Species Councils 100 most dangerous list (http://oregon.gov/OISC/most_dangerous.shtml); or
- The species has a large management program which could benefit from additional spatial distribution knowledge; and
- The species invades stream or riparian habitats.

The 2007 pilot season incorporated opportunistic surveys for invasive species into AREMP's existing watershed monitoring protocol. The 2007 pilot season report is available at: http://www.reo.gov/monitoring/reports/watershed/InvasiveSpeciesAREMP2007.pdf

Program changes from last year

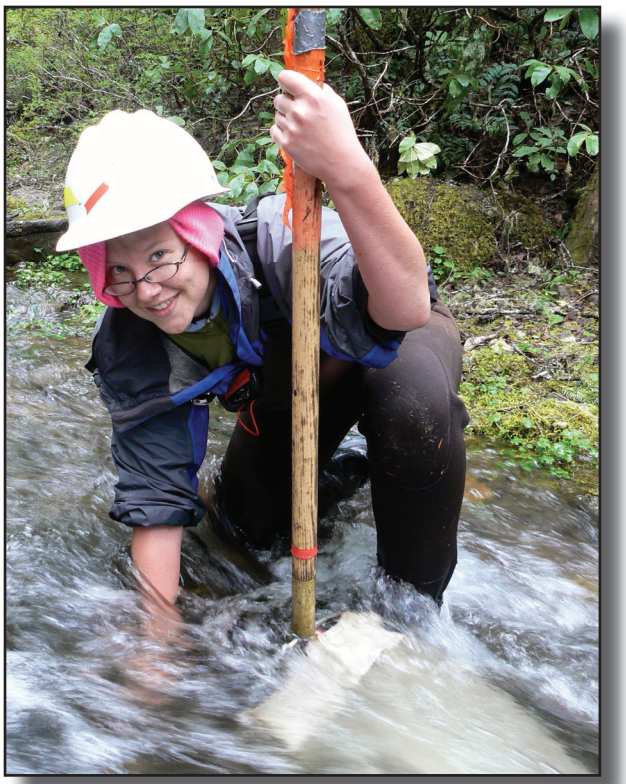
Personnel from AREMP, OSU, and PSU met during the spring of 2008 to discuss the success of the 2007 pilot season, and provide recommendations for improving future invasive species surveys. The following recommendations were implemented for the 2008 field season:

Simplify Species of Concern List - In 2007, the list of species of concern contained twenty-eight species broken into two groups. Originally, species of primary concern had been designated because of the probability of them occurring in AREMP survey sites and their ability to

Field crews performed six, five minute bank searches at each sampled reach to detect the presence of invasive terrestrial plants. Photo by Peter Gruendike

rapidly colonize new waterways. Species of secondary concern, were thought to be less likely to occur, unlikely to spread quickly, or were already considered to be widespread, meaning rapid containment or eradication would be improbable. For the 2008 field season, the list of concern was condensed by dropping five species that were highly unlikely to occur (e.g., Chinese Mitten Crab), or would be nearly impossible to detect in the field (e.g., Whirling disease). Also, the designations of primary and secondary were dropped to ensure that each species received consistent effort and documentation. Instead, the twenty-three species were grouped by type of organism and by type of environment (Table 1).

Develop and implement standardized surveys for invasive species - Opportunistic surveys during the 2007 field season were occasionally shortened or dropped due to time and field crew workload and logistical constraints. Therefore, some sites were not examined as thoroughly as others, resulting in inconsistent efforts among crews between sites. In 2008, AREMP staff developed and implemented a standardized invasive species survey protocol as part of the existing watershed monitoring protocol. Six time-constrained bank searches (five minutes for each of the six searches at each surveyed stream reach) were added to examine each stream bank for invasive riparian and terrestrial plants. Macroinvertebrate kick net samples were examined in the field to check for the presence of non-native crayfish, snails, and mussels. Macroinvertebrate samples were also checked for the presence of non-native snails and mussels a second time during processing at the Bug Lab at Utah State University, in Logan, Utah (http://www1.usu.edu/buglab). During reach layout, survey crews walk upstream in the center of the stream channel and examined the site for the presence of any non-native aquatic plants. Sample reaches were also examined for the presence of feral swine (tracks, feces and dig outs) during large wood surveys. The non-opportunistic, standardized protocol ensures that each site is examined in an equal manner and provides managers with more consistent data across the NWFP area.



New Zealand mudsnails, zebra mussels and quagga mussels are sometimes too small to be readily seen in the field. However, their presence can be detected when the macroinvertebrate samples are processed. Photo by Steve Lanigan

Table 1. Species surveyed for during the 2008 field season.

Type	Common name	Genus species
Aquatic invertebrates	New Zealand mudsnails	*Potamopyrgus antipodarum*
	Zebra mussels	*Dreissena polymorpha*
	Quagga mussels	*Dreissena rostriformis bugensis*
	Rusty Crayfish	*Orconectes rusticus*
	Red Swamp Crayfish	*Procambarus clarkia*
	Ringed Crayfish	*Orconectes neglectus*
	Northern Crayfish	*Oronectes virilis*
Aquatic plants	Yellow Flag Iris	*Iris pseudacorus*
	Hydrilla	*Hydrilla verticillata*
	Parrot Feather Watermilfoil	*Myriophyllum aquaticum*
	Eurasian Watermilfoil	*Myriophyllum spicatum*
	Giant Reed	*Arundo donax*
	Brazilian Elodea	*Ergeria densa*
	Didymo	*Didymosphenia geminata*
Terrestrial vertebrates	Feral Swine	*Sus Scrofa*
Terrestrial plants	Japanese Knotweed	*Fallopia japonica*
	Cultivated Knotweed	*Polygonum polystachyum*
	Giant Knotweed	*Polygonum sachalinese*
	Old Man's beard	*Clematis vitalba*
	Garlic Mustard	*Alliaria petiolata*
	Giant Hogweed	*Heracleum mantegazzianum*
	Himalayan blackberry	*Rubus discolor*
	English Ivy	*Hedera helix*

Improve training techniques and materials - During the 2007 pilot season, several native species were misidentified as invasive species, indicating a need for better and more intensive training at the beginning of the field season. In 2008, two separate trainings were held for AREMP field staff. The first training session was directed at the crew leaders and field coordinators who are directly responsible for the quality of field data. The second training included all field going personnel (field coordinators, crew leaders, and crew members, Both of these trainings were led by professional experts including Sam Chan and Tania Siemens of OSU's Sea Grant Extension Services as well as Robyn Draheim from PSU's Center for Lakes and Reservoirs. This was a drastic improvement over the "train the trainer" format used during the 2007 pilot season in which crew leaders were trained by experts, and in turn, were responsible for training field crew members. The trainers were able to procure live and preserved specimens of the targeted invasive species providing an opportunity for hands-on experience. Also included in the training were new field identification books which included many of the invasive species that were to be targeted during the 2008 field season. The field identification book titled; On the Lookout for Aquatic Invaders: Identification Guide for the Pacific Northwest can be previewed and purchased on the web at: http://seagrant.oregonstate.edu/themes/invasives/index.html.

Results

During the 2008 field season (June through September), AREMP field crews surveyed 167 sites in 31 unique watersheds for invasive species in addition to performing their standard watershed monitoring protocol. Himalayan blackberry was documented at fifteen different sites in seven watersheds. Reed Canary Grass, although not on the list of species of concern, was documented at two sites in one watershed No other invasive species were found (Figure 2).

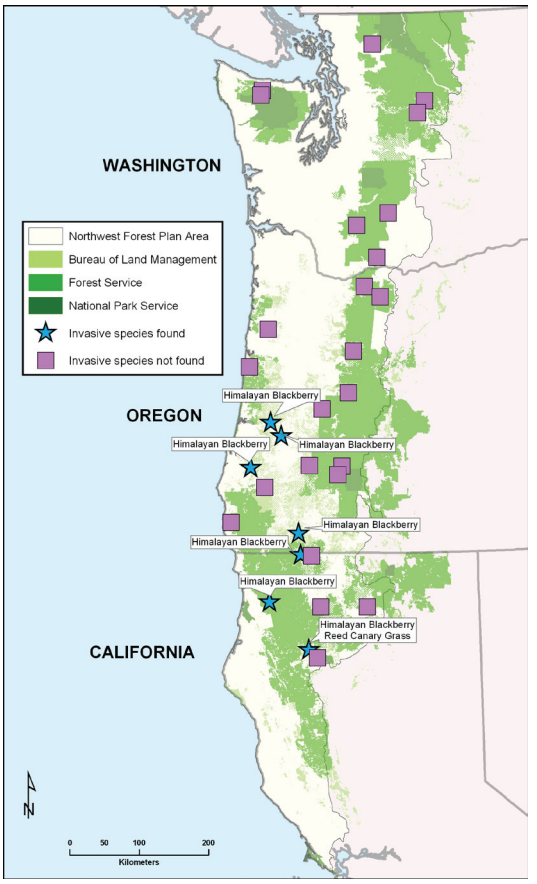


Figure 2. Map of watersheds sampled in 2008, with detected invasive species highlighted.

Recommendations

Invasive species surveys need to be funded - AREMP staff members want to continue supporting the agencies' emphasis on detecting invasive species. However, implementing a yearly rigorous survey protocol requires resources for training, surveys, and data entry. Funding opportunities are being investigated.

Standardized data forms and reporting pathways within the US Forest Service need to be improved - AREMP needs an easy, non-resource intensive way to share the data they collect with the FS. AREMP staff recommend that the Natural Resource Information System (NRIS) staff provide a data form with required data fields to all groups collecting aquatic invasive species data that will be entered into NRIS Terra.

Develop a coordinated approach with other entities for sharing data - Efforts to clarify how to share aquatic invasive species data with state, federal, tribal, and citizen groups (e.g., Nature Conservancy, watershed councils) are underway. A coordinated approach is needed to get an accurate aquatic and riparian invasive species assessment, so strategies for reducing or eliminating invasive species can be developed.

Continue to improve training sessions and identification materials - During the 2008 field season, several native species were misidentified as invasive species. The most commonly misidentified species were Garlic Mustard, and Giant Hogweed. Photo documentation allowed experts to examine AREMP data and eliminate misidentified species from the dataset. Field crews will be provided with more reference material and live specimens during training to reduce misidentifications in future field seasons.

Acknowlegments

Tania Siemens and Sam Chan (Oregon State University Sea Grant College Program and Extension), Robyn Draheim (Portland State University's Center for Lakes and Reservoirs), and Jeff Uebel (US Forest Service) provided valuable guidance.