Aquatic and Riparian Effectiveness Monitoring Program

Interagency Monitoring Program - Northwest Forest Plan Area

Jared Blake

Ringed crayfish

Aquatic Invasive Species Survey Report 2009 Field Season

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Aquatic and Riparian Effectiveness Monitoring Program
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http://www.reo.gov/monitoring/watershed-overview.shtml

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) (Figure 1) provides an excellent opportunity to detect aquatic invasive plants and animals on federal lands while surveying streams in the Northwest Forest Plan area (NWFP; "west of the Cascades" from Point Reyes, California north to the Canadian Border).

In early 2007, AREMP, Oregon State University (OSU), and FS personnel met to develop an aquatic invasive species early detection rapid response protocol that described how to survey for aquatic invasive plants and animals of primary and secondary concern to Northwest waterways. The species of concern were chosen based on three criteria:.

1. 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
2. The species has a large management program which could benefit from additional spatial distribution knowledge; and
3. The species invades stream or riparian habitats.

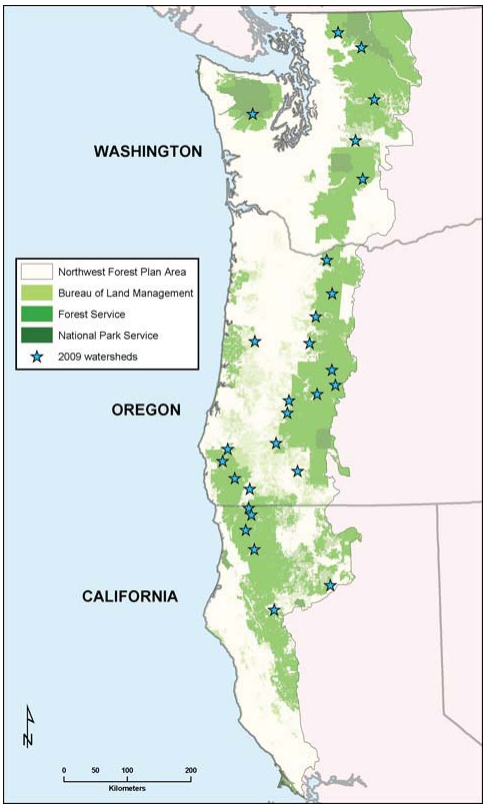


Figure 1. Map of the watersheds surveyed by AREMP crews during the 2009 field season.

Thirteen species of primary concern received this designation because of the probability that they could rapidly colonize new waterways. Fourteen 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 and 2009 field seasons, the list of concern was condensed by dropping four 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).

Table 1. Species surveyed for during the 2009 field season.

Type	Common Name	Genus Species
Aquatic Inverte-brates	New Zealand mud-snails	*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 water-milfoil	*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 mantegaz-zianum*
	Himalayan blackberry	*Rubus discolor*
	English ivy	*Hedera helix*

Initial planning efforts included the design of data forms, data management, and reporting mechanisms. Tania Siemens and Sam Chan of OSU developed a field protocol which incorporated opportunistic searches for aquatic invasive species while field crews performed their standard watershed monitoring protocols. Timed riparian plant searches were added in 2008 to ensure a consistent effort.

Tania Siemens and Robin Draheim (Portland State University) trained AREMP field crews on-site in Corvallis in 2009 (Figure 2) They used custom-made

Peter Gruendike

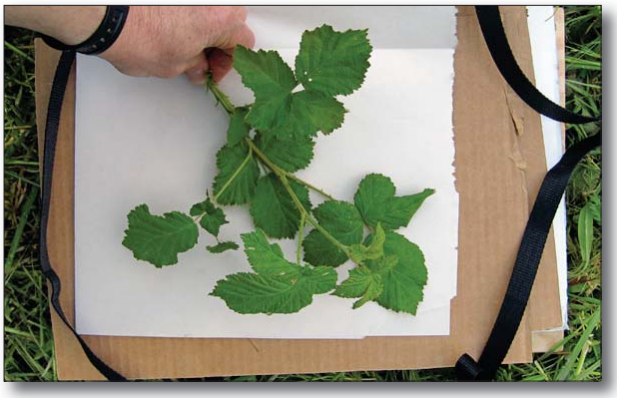
Figure 2. Invasive species identification training included both live and prepared specimens.

photo guides and live specimens for field identification. Their training included the importance of early detection and rapid response to invasive species, as well as documentation and reporting procedures.

In 2009, AREMP added a requirement for crews to collect samples of suspected invasive plant species, using a plant press (Figure 3). We also received funding in 2009 from the FS Region 6 Invasive Species Program to support our aqutaic invasive species surveys.

Results

During the 2009 field season (June through September), AREMP field crews surveyed for aquatic invasive specicies in 189 stream reaches throughout 28 unique watersheds, in addition to performing our standard watershed monitoring protocol. Crews recorded 54 detections of invasive species in 13 watersheds. However, after samples or photographs were examined by AREMP staff and Samuel Chan of OSU for confirmation, a total of 17 detections were verified, 12 detections were identified as false, and 23 detections could not be verified because of a lack of specimens or photographs (Table 2). Crayfish located at two sites in the Little Butte/ Lick Creek watershed were tentativly identified as rusty crayfish. However, a crayfish speciman sent to Samuel Chan and Bill Gerth from OSU was identified as a ringed crayfish, which are native to the Midwest. Locations of the ringed crayfish were entered in the US Geological Servicesn non indigenous aquatic species database (http://nas3.er.usgs.gov/).



Steve Lanigan

Figure 3. Samples of suspected plant invasive species were collected in a plant press for verification

Table 2. Invasive species verified, and falsely identified by AREMP field crews during the 2009 field season.

Species Verified		Species with False ID	
Japanese knotweed	1	Giant hogweed	7
Ringed crayfish	2	Eurasian milfoil	1
Himalayan blackberry	14	Rusty crayfish	3
		Himilayan blackberry	2
		Didymo algae	1

Data Entry

AREMP staff worked with the FS Natural Resource Information System (NRIS) staff to develop a data entry process so that AREMP data can be entered into the NRIS system. We expect to complete the data entry process in 2010. We also discussed how to identify the area sampled and agreed to delineate the aquatic invasive survey area using a polygon (Figure 4).

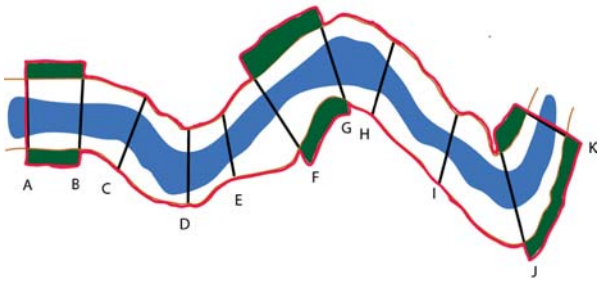


Figure 4. The orange polygon denotes the total area sampled. Green polygons denote areas surveyed for terrestrial plants. The total stream area sampled is from transect A to K.

Presentations

Pete Gruendike gave a presentation about our aquatic invasive species monitoring program at the 2009 Oregon Chapter of the American Fisheries Society. Hank LaVigne presented a poster about our invasive species disinfection protocol at the same meeting. Steve Lanigan was a speaker at the First Symposium of National Investigation on Invasive Plants in Taiwan (Figure 5).

Steve Lanigan

Figure 5. The AREMP team leader, Steve Lanigan, was a featured speaker at the "First Symposium of National Investigation on Invasive Plants in Taiwan," held in Taipei, Taiwan. He described AREMP's success in incorporating invasive species surveys into an ongoing monitoring program, decontamination protocols, and the benefits of the FS and BLM working together on the common goal of identifying aquatic invasive species.

Recommendations for 2010

Develop a coordinated approach with other entities for sharing data. Clarification is needed for how to share aquatic invasive species data with state, federal, tribal, and citizen groups (e.g., Nature Conservancy, watershed councils) to get a comprehensive invasive species assessment. We are expecting FS Region 6 invasive species program managers to lead this effort.

Develop a rapid response system for when aquatic invasives are detected. Directions are needed for whom to contact, and the types of actions managers should take to prevent the spread of aquatic invasives when they are encountered. We are expecting FS Region 6 invasive species program managers to lead this effort.

Continue to improve training sessions and identification materials. During the 2009 field season, several native species were misidentified as invasive species. AREMP will direct field crews to take more pictures and collect samples of all potential invasive species to bring back to the office for verification. Field crews will also be provided with more reference materials and live specimens during training to reduce misidentifications in future field seasons.

Acknowlegments

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