

Aquatic and Riparian Effectiveness Monitoring Program Invasive Species Report 2014 Field Season



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Introduction

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. The broad geographic area sampled by the Aquatic and Riparian Effectiveness Monitoring Program (AREMP) provides an excellent opportunity to detect the presence or absence of "high concern" aquatic invasive plants and animals (Table 1) on federal lands while surveying stream reaches in randomly-selected watersheds in the Northwest Forest Plan area (NWFP; "west of the Cascades" from Point Reyes, California north to the Canadian Border).

Methods

Searches for invasive terrestrial plants were performed at all sites within each watershed between longitudes A-B, F-G, J-K (Figure 1). AREMP field crews began searches at the bankfull indicator of the upper transect (B, G, K) with one crew member on each bank. For 5 minutes crew members thoroughly searched

downstream in a zigzag pattern no more than 5 meters from the wetted edge. When an invasive plant was encountered, the search time was paused and the longitude segment, species code, bank the plant was found on (left or right), and the photo numbers of the pictures were recorded. Additionally, a GPS location was recorded. If a suspected invasive plant species was encountered but couldn't be clearly identified in the field, a specimen was collected and placed in a plant press so that it could be later identified. To determine the presence of any invasive snails, mussels, or crayfish listed in Table 1, AREMP crews collected eight benthic macroinvertebrate subsamples in the first four fast-water riffles at each site using a kick net. After the field season those samples were sent to the Utah State National Aquatic Monitoring Center

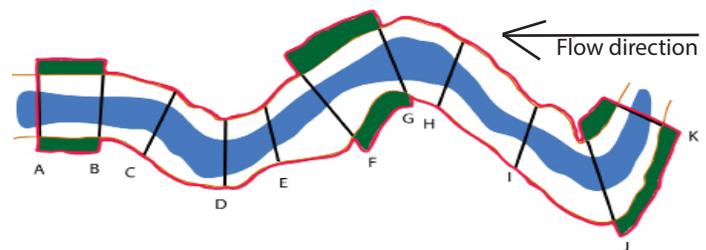


Figure 1. Schematic of search areas for Aquatic and Riparian Effectiveness Monitoring Program terrestrial invasive species surveys, letters represent transect locations. Areas in green represent the area searched by crew members.

and processed under a microscope to ensure invasive species that may have been too small for field crews to identify were not present (results from the laboratory are still pending and any invasive species found will result in immediate notification of local managers). After the original eight subsamples were preserved, and if an invasive snail, mussel or crayfish was suspected to be present in the field, photographs were taken and the specimen was preserved in 95% ethanol. Then more macroinvertebrate samples were opportunistically collected throughout the site. For invasive aquatic plants, AREMP crews searched the wetted portion of the channel and any off channel wetted areas during site layout. When a suspected invasive plant was encountered the longitudinal segment was recorded, photographs were taken and a specimen was collected and placed in a plant press to later verify identification.

Verified invasive species

AREMP crews surveyed 157 sites in 27 watersheds for aquatic invasive species throughout the 2014 field season (June through September). AREMP crews recorded 10 verified invasive detections. Nine of the 10 detections were of Himalayan [Armenian] blackberry (*Rubus armeniacus*). The other invasive species detected was Herb Robert (*Geranium robertianum*). Six of the detections occurred in Oregon (fig. 2a). Four occurred in California (fig. 2b) and none in Washington (fig. 2c).

Table 1. Aquatic Invasive species surveyed for during the 2014 field season.

Type	Common Name	Genus Species
Aquatic animals	New Zealand mudsnails	<i>Potamopyrgus antipodarum</i>
	Zebra mussels	<i>Dreissena polymorpha</i>
	Quagga mussels	<i>Dreissena rostriformis bugensis</i>
	Rusty crayfish	<i>Orconectes rusticus</i>
	Red swamp crayfish	<i>Procambarus clarkia</i>
	Ringed crayfish	<i>Orconectes neglectus</i>
	Northern crayfish	<i>Oronectes virilis</i>
	Bullfrog	<i>Rana cotesbeiana</i>
Aquatic plants	Nutria	<i>Myocaster coypus</i>
	Yellow flag iris	<i>Iris pseudacorus</i>
	Hydrilla	<i>Hydrilla verticillata</i>
	Parrot feather watermilfoil	<i>Myriophyllum aquaticum</i>
	Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
	Giant reed	<i>Arundo donax</i>
	Brazilian elodea	<i>Ergeria densa</i>
	Didymo	<i>Didymosphenia geminata</i>
	Variable-leaf milfoil	<i>Myriophyllum heterophyllum</i>
	Yellow floating heart	<i>Nymphoides peltata</i>
	Giant salvinia	<i>Salvinia molesta</i>
	Flowering rush	<i>Butomus umbellatus</i>
	Kudzu	<i>Pueraria lobata</i>
	Common reed	<i>Phragmites australis</i>
Curly-leaf pondweed	<i>Potamogeton crispus</i>	
Water primrose	<i>Ludwigia spp.</i>	
Terrestrial animals	Feral swine	<i>Sus scrofa</i>
Terrestrial plants	Japanese knotweed	<i>Fallopia japonica</i>
	Himalayan knotweed	<i>Polygonum polystachyum</i>
	Giant knotweed	<i>Polygonum sachalinense</i>
	Old man's beard	<i>Clematis vitalba</i>
	Garlic mustard	<i>Alliaria petiolata</i>
	Giant hogweed	<i>Heracleum mantegazzianum</i>
	Himalayan blackberry	<i>Rubus armeniacus</i>
	English ivy	<i>Hedera helix</i>
	Salt cedar	<i>Tamarisk ramosissima</i>
	Herb Robert	<i>Geranium robertianum</i>
	Shiny Geranium	<i>Geranium lucidum</i>

Oregon

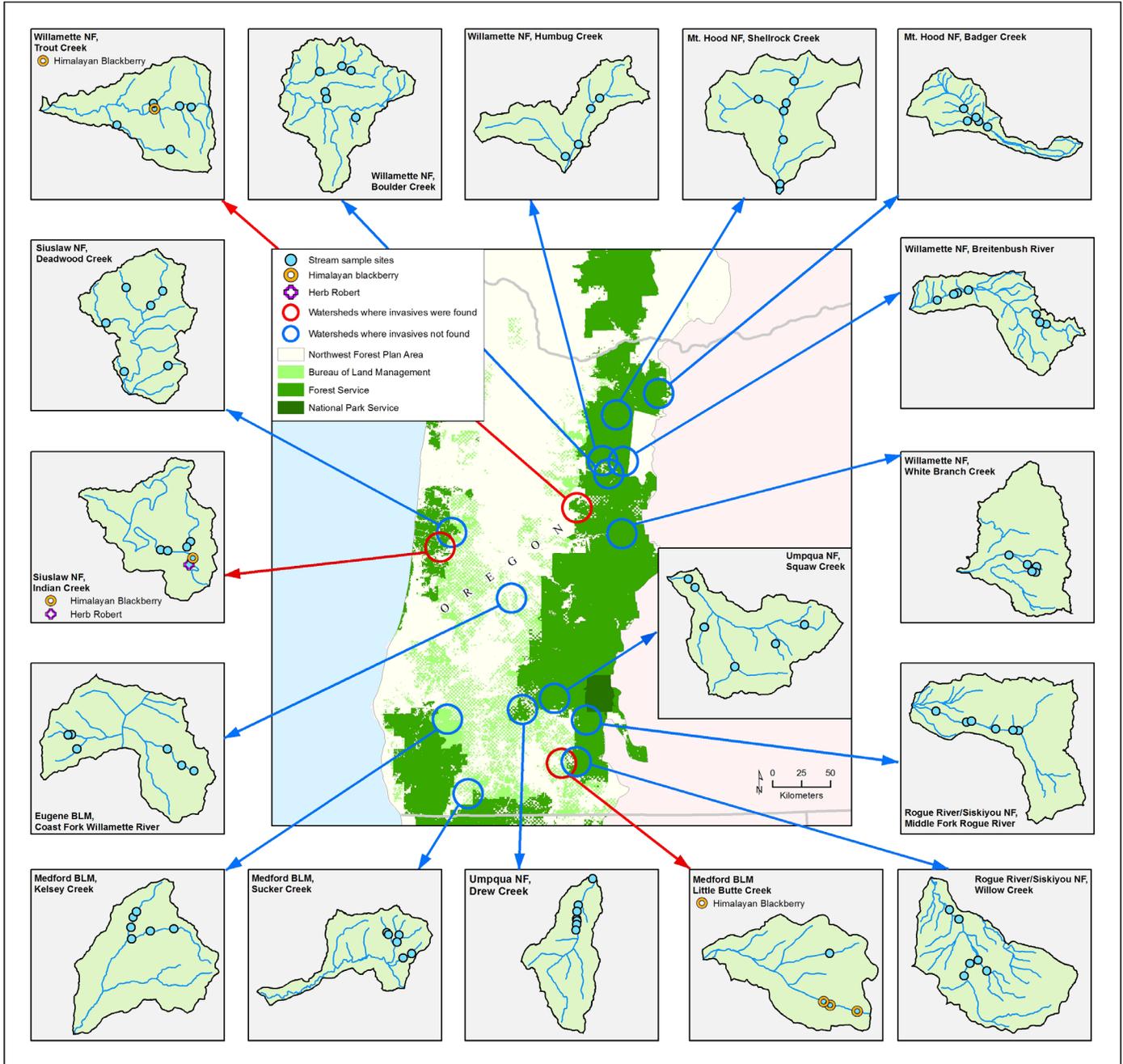


Figure 2a-Map of Oregon watersheds surveyed by Aquatic and Riparian Effectiveness Monitoring Program crews during the 2014 field season. Blue lines represent watersheds where invasive species were not found; red lines depict watersheds where invasive species were detected. NF = National Forest. BLM = Bureau of Land Management.

Northern California

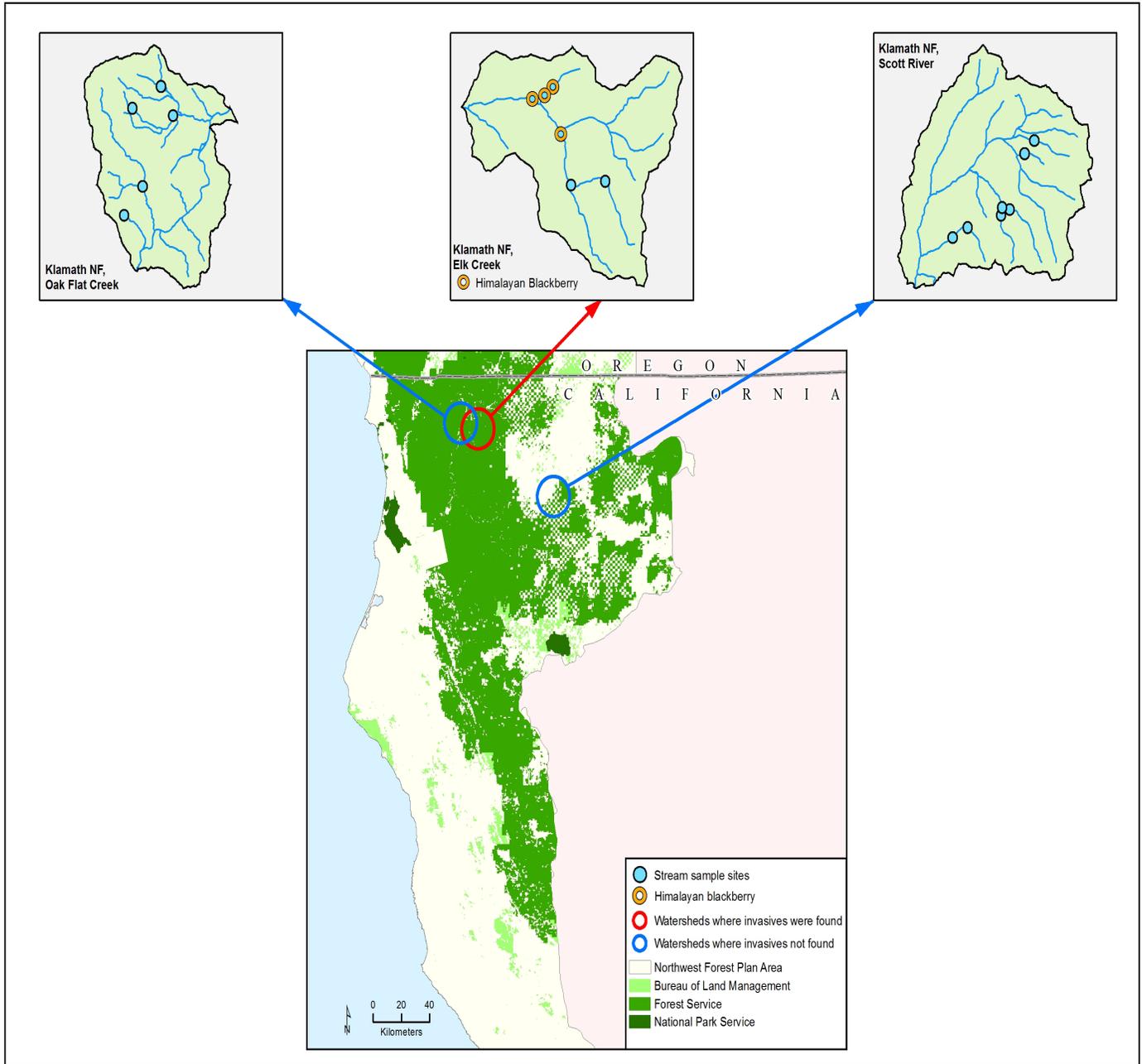


Figure 2b-Map of California watersheds surveyed by Aquatic and Riparian Effectiveness Monitoring Program crews during the 2014 field season. Blue lines represent watersheds where invasive species were not found; red lines depict watersheds where invasive species were detected. NF = National Forest.

Washington

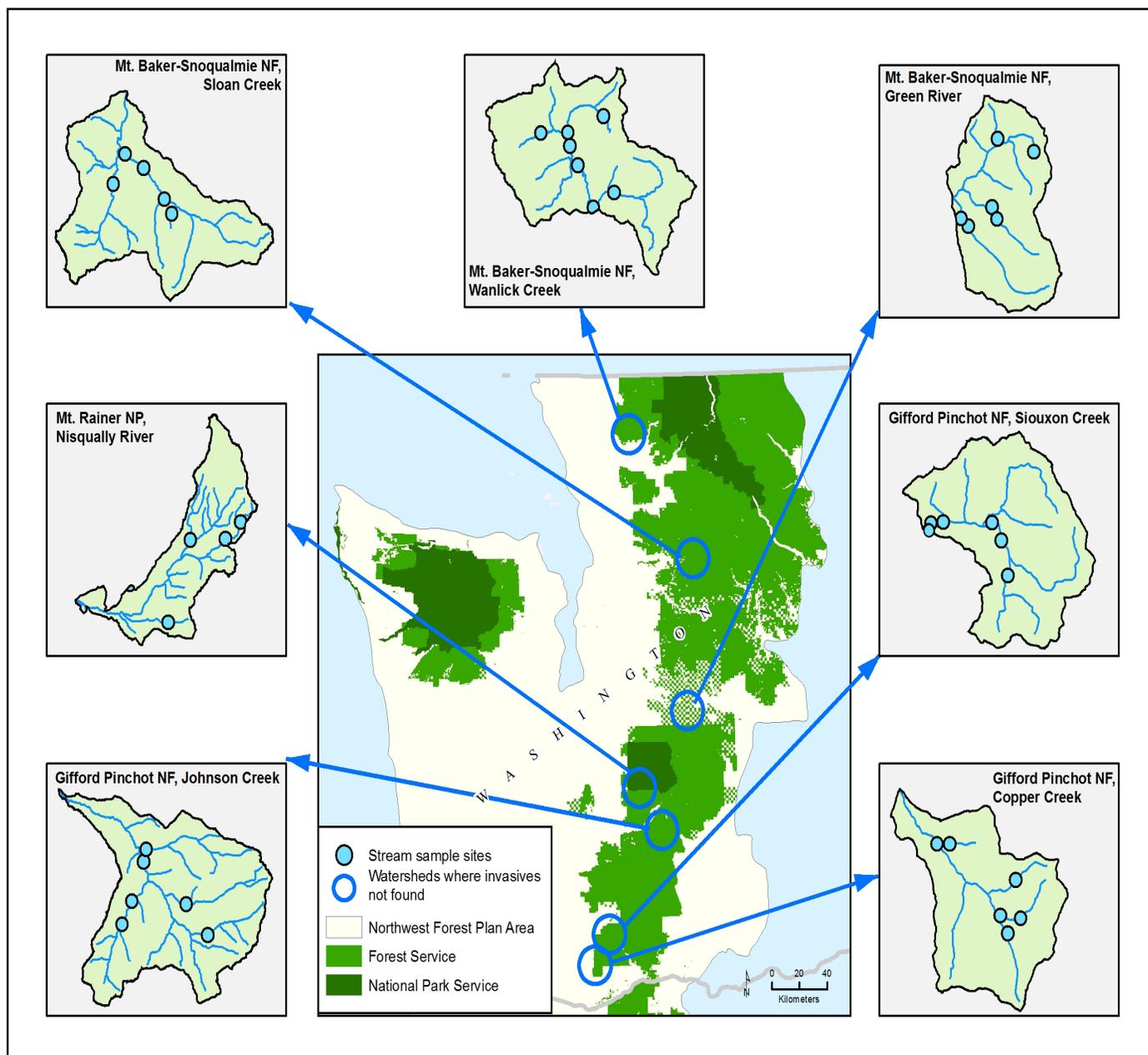


Figure 2c-Map of Washington watersheds surveyed by Aquatic and Riparian Effectiveness Monitoring Program crews during the 2014 field season. Blue lines represent watersheds where invasive species were not found. NF = National Forest. NP = National Park.

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