WILLAMETTE NATIONAL FOREST, LAMPREY PRESENCE/ABSENCE AND DISTRIBUTION SURVEY RESULTS, 2015-2018

Pacific Lamprey *Entosphenus tridentatus* are an anadromous fish native to the Willamette Basin with a historical range extending into coastal and inland watersheds. Construction of multiple hydroelectric dams, beginning in the 1950's that function as upstream migratory barriers are thought to have contributed to the decline or extirpation of Pacific Lamprey populations from suitable habitat upstream. Information about lamprey species distribution, life history, abundance, and habitat requirements is limited or non-existent for many watersheds. The conservation status of the Pacific Lamprey has become a concern to Native American tribes, management agencies, conservation groups and other stakeholders because many populations are in decline or already extinct. Years of research have been applied towards understanding distribution and life histories of other anadromous species in the western United States, yet little is known about the historic and current distribution of lamprey species. Our presence/absence protocol outlines a method to gain a better understanding of lamprey distribution on the Willamette National Forest and may be applied to other areas in the future.

In 2015 and 2016, the U.S. Forest Service, received $25,000 in Interagency Special Status/ Sensitive Species (ISSSSP) funds to complete presence/absence field surveys to determine the distribution and phylogeny of lamprey species across the Willamette National Forest. Additional surveys were completed in subsequent years that include mainstem and tributary streams outside of the Forest boundary, but relevant to the connectivity of the Sub-basin lamprey populations as a whole. The priority was to collect distribution and range data for Pacific Lamprey populations. However, data for all lamprey species collected was used in the overall distribution mapping exercise and genetic variation studies. Presence/absence surveys continued through 2018 and were in part related to prior reports of Pacific Lamprey occupancy in the Middle Fork Willamette River, upstream of Lookout Point Dam.

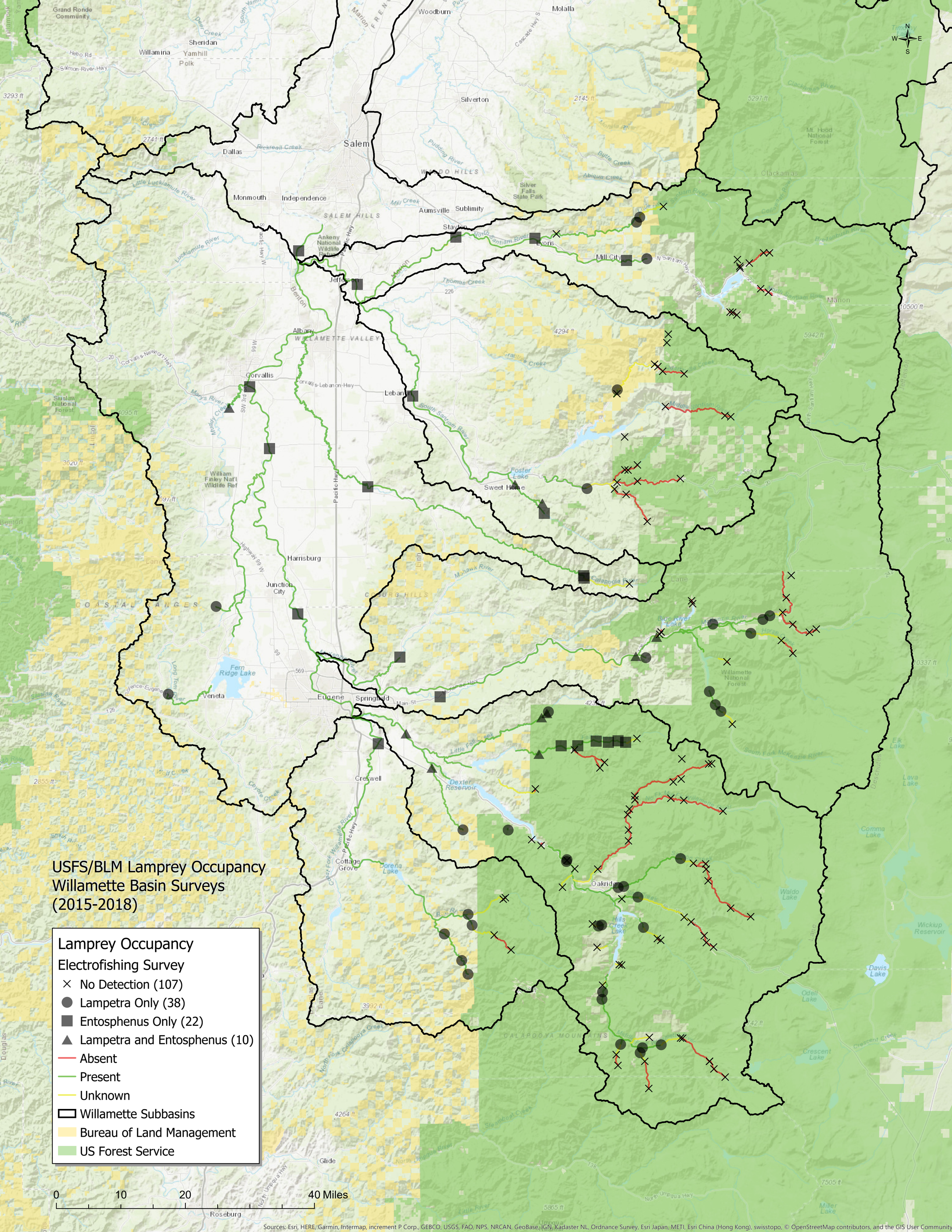
Using lamprey specific electrofishing settings (Dunham et al. 2013; Reid and Goodman 2015), at least three perennial stream reaches, with an average slope less than 2.5%, were assessed for lamprey occupancy in each sub-watershed. Whole specimens and tissue samples were collected at each occupied site. To date, 82 complete surveys and more than 30 additional spot check surveys (biased targeting to suitable larval habitat) have been completed in the Middle Fork Willamette Sub-basin. In addition, 20 sites above Lookout Point Reservoir were evaluated for the presence of Pacific Lamprey using environmental DNA (eDNA). All tissue and eDNA samples were sent to the National Genomics Center for Wildlife and Fish Conservation (NGC; a part of the U.S. Forest Service Rocky Mountain Research Station in Missoula, MT) for genetic variation analysis (mDNA).

Presence and distribution results are depicted in the attached map. Some of the more relevant observations from across the Willamette National Forest with results discussed within each of the four Districts, Middle Fork, McKenzie, Sweet Home and Detroit are highlighted here. Lamprey were detected in every watershed of the Middle Fork Willamette Sub-basin except for the North Fork of the Middle Fork Willamette River. Pacific Lamprey were only detected in two streams, Little Fall Creek (unobstructed stream) and Fall Creek (a result of tribal reintroduction) watersheds. Only brook lamprey (*Lampetra* sp.) were detected above Lookout Point Reservoir.

On the McKenzie District, both brook and Pacific Lamprey were collected in the mainstem McKenzie River as far upstream as Blue River. Upstream of Blue River, only brook lamprey were observed at surveyed sites. The South Santiam River on the Sweet Home District, included Pacific Lamprey in the mainstem and transitioned to both species present in Wiley Creek. Only Pacific Lamprey were present in the Calapooia River and persisted well into the sub-watershed. On the Detroit District, no lamprey were recorded on Forest Service lands but both species were collected in the North Santiam River and brook lamprey only were observed in Little North Santiam River, all downstream of Detroit Dam.

The survey results add a large amount of information to our existing database for lamprey species on the Willamette National Forest. The Willamette lamprey distribution map should serve as a foundation for lamprey occupancy across the Forest and will provide uses with baseline information on populations and areas to focus further surveys.

For additional information regarding lamprey populations and distribution on the Willamette National Forest please contact Doug Larson, District Fish Biologist, Middle Fork R.D. at dlarson@fs.fed.us or Matt Helstab at mhelstab@fs.fed.us


USFS/BLM Lamprey Occupancy
Willamette Basin Surveys
(2015-2018)
Lamprey Occupancy
Electrofishing Survey
No Detection (107)
Lampetra Only (38)
Entosphenus Only (22)
Lampetra and Entosphenus (10)
Absent
Present
Unknown
Willamette Subbasins
Bureau of Land Management
US Forest Service
0
10
20
40 Miles
Salem
Eugene
Springfield
Corvallis
Albany
Oakridge
Sweet Home
Lebanon
Harrisburg
Junction City
Creswell
Cottage Grove
Veneta
Dallas
Monmouth
Independence
Silverton
Woodburn
Molalla
Mill City
Lyons
Stayton
Sublimity
Aumsville
Marion
Willamina
Sheridan
Yamhill
Polk
Grand Ronde Community
Glide
Roseburg
Clackamas
Mt. Hood National Forest
Willamette National Forest
Siuslaw National Forest
William Finley Nat'l Wildlife Ref
Ankeny National Wildlife Refuge
Silver Falls State Park
Fern Ridge Lake
Dexter Reservoir
Hills Creek Lake
Blue River Lake
Foster Lake
Dorena Lake
Waldo Lake
Davis Lake
Odell Lake
Crescent Lake
Wickiup Reservoir
Lava Lake
Elk Lake
Comma Lake
Miller Lake
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