Occupancy, detection, and habitat use of larval Pacific lamprey *Entosphenus tridentatus* and *Lampetra* spp. in large river habitats

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Pacific lamprey *Entosphenus tridentatus* are declining in the Pacific Northwest. How larval lamprey use large, mainstem river habitats is unknown. We used a deepwater electrofisher to explore occupancy, detection, and habitat use of larval Pacific lamprey and *Lampetra* spp. in the Willamette and Columbia rivers in Washington and Oregon. We used a generalized randomized tessellation stratified (GRTS) approach to select sampling quadrats in a random, spatially-balanced order. Pacific lamprey, *Lampetra* spp., and unidentified lamprey occupied the Willamette and Columbia Rivers. Larvae occupied all reaches except the Multnomah Channel (Willamette River). We calculated reach- and quadrat-specific detection probabilities and, in turn, the amount of sampling effort required to be 80% confident those larval lampreys were absent when they were not detected. In the Willamette River, lampreys were widespread and detected up to 16 m deep. Detection probabilities were 0.07 (reach) and 0.23 (quadrat). The sampling required for 80% confidence of lamprey absence when they were not detected was 20 quadrats (in the reach) and 6 subquadrats (in a quadrat). Differences in lamprey detection by depth were not detected. A wide range of sizes was collected (20-144 mm TL) indicating the likely occurrence of multiple ages of larvae. These results were used to design an evaluation in the Columbia River above and below Bonneville Dam. Lamprey occupied Bonneville Reservoir and initial results suggest they may be lower in detectability (d = 0.02) than in the Willamette River. Preliminary results also indicate that larval lamprey are either absent or are not detectable in the reach below Bonneville Dam. Our study documents the first quantitative information on larval Pacific lamprey and *Lampetra* spp. occupancy in mainstem river habitats. The role of these habitats in life history and the effect of channel management activities on larval lamprey must be considered when conserving these important species.