A Survey of Lake Crescent for Endemic Salmonid Spawning Sites Using eDNA

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Located in Olympic National Park, Lake Crescent is a glacially carved lake isolated ~7,000 years ago by a massive landslide. It is home to two endemic salmonids; the Beardslee trout (Oncorhynchus mykiss irideus beardsleei) and Crescenti cutthroat trout (Oncorhynchus clarki crescenti). Traditional methods for locating fish spawning areas include walking surveys along waterways. Environmental DNA (eDNA) is a technique used to sample target species DNA from the environment. A species-specific DNA amplification is then done through qPCR. Project goals were to identify known salmonid spawning sites using eDNA and determine the efficacy of this technique as a monitoring tool for potential spawning sites. Water was sampled from 15 locations around Lake Crescent during the spawning season. Sites included known spawning locations and potential spawning sites. Samples of water were collected and processed using a filtration system to collect any DNA present. Salmonid eDNA extraction was done using a modified protocol with a commercial DNA extraction kit. A fluorescent probe system was used for qPCR. Sampling for Lyre River Crescenti cutthroats yielded positive results at 6 of 9 sites. Testing for Barnes Creek Crescenti cutthroats yielded results at 2/6 sites and sampling for Beardslee trout yielded results at 2/4 sites. One Barnes Creek cutthroat site and both Beardslee trout sites were not listed as known spawning sites. Location and protection of all spawning sites is important to the survival of these endemic salmonids, making efficient monitoring of sites and populations within the lake crucial.

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