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redds were found, the numbers were considerably below average. Further, we were getting to completing the survey quite late, meaning the redds would be less visible. Steelhead spawning surveys typically are done in April and May.

Spawning surveys are one of the ways that fishery biologists monitor the abundance of adult steelhead returning to their natal streams to spawn. Biologists conduct spawning surveys by walking predetermined stream reaches where spawning is known or suspected to occur. While walking the stream, biologists look for signs of spawning activity called redds.

Steelhead spawn by depositing eggs in redds on the stream bottom that are dug into gravels by the female, the male fertilizing the eggs, and then the female covering the eggs with sediment-free gravels. The female digs by turning on her side and fanning the stream bottom with her tail, or what biologists call the caudal fin. The process of digging, egg deposition, fertilization, and covering of the eggs occurs numerous times until the female has deposited all of her eggs, averaging about 4,000 in number. What is left is a pit on the stream bottom between six and 12 inches deep, with a pillow of sorted gravels immediately downstream. Redds can be between 1.5 and five feet in diameter. Immediately after construction, the excavated gravels of the redd can starkly contrast with



A spawning female steelhead (courtesy of Winston Morton).

surrounding gravels because they have been cleaned of algae and sediment through the digging process. Over the course of a few weeks as the algae recolonizes the moved gravels and streamflows flatten the redds' topography, they become harder to see. The redds typically are found at the tailout of pools, where gravels of appropriate size (between the size of a grape and a baseball) are present and water can readily flow through the redd pillow to keep the developing eggs oxygenated

and free of sediment and waste products.

We counted four redds that day on a 1.5-mile section of Beaver Creek just upstream of the City of La Grande's Beaver Reservoir. The long-term average in the upper Grande Ronde River Basin is approximately two redds per mile, so 2.7 redds per mile is pretty good, considering the factors described above. Nevertheless, given the significance of the survey, we took extra care to carefully examine and discuss what we saw, wanting to make sure that we were seeing steelhead redds and not some anomaly in the stream gravels created by the streamflow. Four times, we observed and discussed the identifying characteristics of the prospective steelhead redd and agreed based on our more than 50 years of combined experience that steelhead had spawned at these locations.

What we witnessed that day – evidence of steelhead spawning in upper Beaver Creek – was the result of a long journey not only for the steelhead, which left their natal stream as juveniles to forage in the Pacific Ocean and returned as adults to spawn, but also for those of us involved in the planning, design, and construction of the Beaver Reservoir fishway.

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Looking upstream at spawning and rearing habitat that is now available to Beaver Creek steelhead (courtesy of Winston Morton).