

**City of Bend Bridge Creek Water System  
2016 Fish Monitoring Results**

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In accordance with the monitoring requirements for the Operation of the City of Bend Bridge Creek Water System (start-up 4/2016), under Special Use Permit with the Deschutes National Forest, fish populations in Tumalo Creek are to be monitored to assess effects from operation of the new system. Monitoring is to occur annually during 2016-2018, then every other year through 2024.

**Pipeline Operations and Management Plan:** Monitoring will be conducted by Deschutes National Forest Fisheries personnel after the new system is in operation. A total of 5 sites will be surveyed annually in late summer for 3 years, then biennially over the next 6 years. This schedule is subject to change based on an annual evaluation of the monitoring program by staff from the City of Bend, Deschutes National Forest, and other stakeholders. One monitoring site will be above the City of Bend project area (between the junction with Bridge Creek and Tumalo Falls) and 4 sites will be within the affected area of Tumalo Creek within Sub-reach A1. Further, the 4 sites within Sub-reach A1 will include two sites within Sub-reach A1RR (upper and lower) and two sites within Sub-reach A1B. The 4 sites within the affected area will be those previously surveyed in the 2011 fisheries survey of Tumalo Creek. The one site above the project area will be a new site, the Control Reach. Each site will be 200 meters in length. The survey crew generally consists of two snorkelers and one data collector/safety person. One site per night will be surveyed per crew.

**2016 Results:** During 2016, three of the five planned monitoring reaches were surveyed by night snorkeling. The lack of available qualified personnel, equipment failures, inclement early fall weather, and injury to personnel all contributed to preventing the completion of the monitoring prior to extremely cold water temperatures ended the monitoring season. A 200 meter Control reach (Site 32) was added in 2016 to the fish monitoring plan to improve analysis of effects. The reach is located on Tumalo Creek between the confluence with Bridge Creek and Tumalo Falls. This reach was surveyed on 11/01/2016.

Reaches surveyed in addition to the control reach were within Sub-reach A1RR Upper (Site 22, including a side channel of 160 meters length), and sub-reach A1-B (Site 29). Planned, but not surveyed in 2016, included one within Sub-reach A1-RR (lower) and another site in Sub-reach A1-B.

The table below displays the data collected in 2016, which is considered baseline data as operations just began in April, 2016, therefore no inferences on population trends can be made at this time. Nevertheless, data collected within the same reaches in 2011 is also displayed. A control reach was not established in 2011, as the main objective for that survey was to determine the presence or absence of bull trout.

Tumalo Creek 2016 Fish Monitoring

Site	Sub-Reach	Date Sampled	Lat/Long	River Mile	Grad. %	Water Temp °C	Method	Length Surveyed (m)	ONMY	SAFO	SAFO	SAFO	SAFO	Total	SAFO	SAFO	SAFO	SAFO	Total	SATR	SATR	SATR	SATR	SATR	Total	Total
									YOY	<100 mm	100-199 mm	200-299 mm	>300 mm	ONMY	YOY	<100 mm	100-199 mm	200-299 mm	>300 mm	SAFO	YOY	<100 mm	100-199 mm	200-299 mm	>300 mm	>500 mm
32	Control	11/1/16	N44.03180 W121.56523	16.1	2.74	3.1	NS	200	0	7	8	2	0	17	0	0	11	0	0	0	0	0	0	0	0	28
22	A1-RR (upper)	9/2/11	N44.0298 W121.555739	15.5	1.67	6.7	NS	200	0	2	36	9	1	48	0	2	64	6	0	72	0	0	0	0	0	120
22	A1-RR (upper)	9/19/16	N44.0298 W121.555739	15.5	1.67	6.7	NS	200	0	11	42	6	0	59	0	8	18	0	0	26	0	0	0	0	0	85
22 SC	A1-RR (upper)	9/2/11	N44.0298 W121.555739	15.5	1.14	9.4	NS	160	0	9	18	0	0	27	0	87	39	9	0	135	0	0	0	0	0	162
22 SC	A1-RR (upper)	10/5/16	N44.0298 W121.555739	15.5	1.14	5	NS	160	0	0	1	0	0	1	0	52	33	2	0	87	0	0	0	0	0	88
29	A1-B	8/30/11	N44.052291 W121.41028	6.5	1.16	13.5	NS	200	0	22	83	14	0	119	0	1	19	2	0	22	0	0	0	0	0	141
29	A1-B	10/12/16	N44.052291 W121.41028	6.5	1.16	6.1	NS	200	19	37	56	6	0	118	0	3	10	1	0	14	0	0	2	0	0	134

NS = night snorkel

YOY = young of year

ONMY = redband trout

SAFO = eastern brook trout

SATR = brown trout

**Discussion:** Although a control area comparison is not available this early in the monitoring that would help evaluate changes in fish populations due to environmental variability between years, a few observations can be made between 2011 and 2016. These observations are not intended to evaluate the new project operations on fish populations. Brown trout, in low abundance, were observed in Site 29 at river mile 6.5, which is upstream of the distribution noted in the 2011 survey (upstream distribution at river mile 5.8). A slight increase in redband trout and a decrease in brook trout were observed at Site 22. Less redband and brook trout were observed in 2016 within the side channel associated with Site 22. The vegetation along the side channel, an area vegetated in the 2004 restoration project, is becoming very dense, restricting the ability to snorkel effectively. In addition, the side channel site was snorkeled later in the year than in 2011 when leaf fall within the water was significant, restricting visibility. Results were similar for both years in Site 29, with a shift in smaller redband trout observed on average.