



**UPPER ENTERPRISE RESERVOIR  
2019 TREND NET SURVEY**

**Report prepared by:  
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**BACKGROUND:** Upper Enterprise Reservoir has historically been managed as a put-grow-and-take rainbow trout (RBT) fishery maintained by stocking 25,000 5-inch fish in the spring (Table 1). Golden shiners and green sunfish were present in the reservoir during the 1980s and 1990s but were eradicated during a rotenone treatment in 2002. The reservoir became a two-tier fishery with the introduction of smallmouth bass (SMB) in the 1990s. SMB produced a valuable sport fishery, so they were reestablished after the 2002 treatment and again in 2010 after draining and dam repairs. An annual quota of 5,000 two-inch Bonneville cutthroat trout was added in 2013 to utilize excess production from the Manning Meadow brood (Table 1). UDWR owns a conservation pool in Upper Enterprise Reservoir that helps maintain trout survival and growth during most years, though the reservoir can be affected by extreme and extended droughts. 2018 was such a year, with a historically low snowpack following several years of drought. Heavy algae growth also accompanied low water level in 2018.

The fishery at Upper Enterprise Reservoir is monitored annually through trend net surveys. Since 2011 a new gill net design recommended by the American Fisheries Society (AFS) has been utilized. The random placement of differing mesh sizes is intended to avoid “leading” fish into the net and, thus, reduce bias in the net catch – as opposed to nets previously used for decades (“DWR” nets), which comprised of graduating mesh sizes. In other waters these nets have shown variable comparability to DWR nets: in some instances the shorter AFS nets yield similar catch rates, while in others they catch fewer fish. Surveys conducted in Upper Enterprise Reservoir through 2017 showed that the new trend nets caught, on average, 68% of the RBT that the old style sampled.

**METHODS:** Four experimental gill nets (three floating and one diving) were set in Upper Enterprise Reservoir on March 25, 2019, and were allowed to fish overnight. Nets measured 6 ft x 80 ft, with eight panels of randomly-arranged mesh size (1.5”, 2.25”, 1”, 0.75”, 2.5”, 1.25”, 2”). Net locations have been consistent for 20+ years of sampling (Figure 1). Fish caught were removed from nets on the morning of March 26 and all fish were measured to the nearest mm (total length) and weighed to the nearest gram. Trout body condition was measured by the calculation of Fulton’s  $K_{TL}$  (generated from total length [TL]) :

$$K_{TL} = (Weight/Length^3) \times 100,000$$

Results of the 2019 survey were compared with those from historic trend net surveys.

**RESULTS:** A total of just 30 RBT was collected in three nets at Upper Enterprise Reservoir on March 26 for a catch rate of 8 trout per net-night (Table 2). The southeast floating net (Fig. 1) caught no fish but also did not show any evidence of fouling, so that result was included in the calculation of catch rate. The catch rate was the lowest observed in the last 20 years of monitoring (Fig. 2) and less than half of the mean observed with AFS nets since 2011 (Table 3). RBT made up 100% of the total net catch and biomass sampled. Twenty-seven of the RBT sampled (90% of total) were stocked in spring 2018 (Fig. 3) and averaged 308 mm (12.1 in) in total length (TL), 270 g (0.6 lb) in weight, with a mean condition ( $K_{TL}$ ) of 0.93 (Table 2). Length and weight were among the highest ever observed for RBT stocked the previous year, while condition was among the lowest (Table 3, Fig. 4). Year-1 RBT grew at a mean rate of 0.49 mm/day since stocking in 2018, which was higher than the long-term mean (Table 3). Only three RBT stocked prior to 2018 were observed and averaged 448 mm (17.6 in), 735 g (1.6 lb), with a mean  $K_{TL}$  of 0.80 (Fig. 5). Similar to younger RBT, mean size was higher than that observed in most historic surveys, while condition was the lowest ever observed for older fish (Table 3). The

largest RBT observed measured 495 mm (19.5 inches) and weighed 980 g (2.2 lbs.). No SMB or BCT were observed in the survey.

**DISCUSSION:** Results of the 2019 trend net survey indicate that poor water condition in 2018 led to significant losses of RBT, especially older fish. Yearling RBT apparently grew well during the year since stocking, though all fish exhibited poor condition at the time of the survey. The 2018-19 snowpack was historically high and the reservoir filled rapidly in February and March, flooding soil that had been dry for several years. The resulting murky water likely made foraging difficult in late March. Elevated reservoir volume improved conditions for RBT over the subsequent year, however, and it is anticipated that fish stocked 2018 and 2019 should have experienced improved survival and growth over previous years. BCT have not been observed in trend net catch since stocking began in 2013 and the quota was terminated in 2019. In another attempt to increase diversity in angling opportunity, an annual quota of 10,000 Kokanee salmon has been requested and will be stocked as soon as hatchery production is sufficient to fill it. SMB show variable vulnerability to gill nets and are particularly difficult to catch when water temperature is cold, as is typically the case during trend surveys in late March. Electrofishing surveys are more effective in monitoring bass populations. Angler reports indicate that SMB are abundant in Upper Enterprise Reservoir.

#### **RECOMMENDATIONS**

1. Maintain an annual stocking quota of 25,000 advanced fingerling RBT. Stock 10,000 Kokanee salmon annually as soon as available.
2. Conduct trend net surveys every two years in the spring to monitor trout. Conduct electrofishing every two to three years in order to more effectively monitor smallmouth bass.

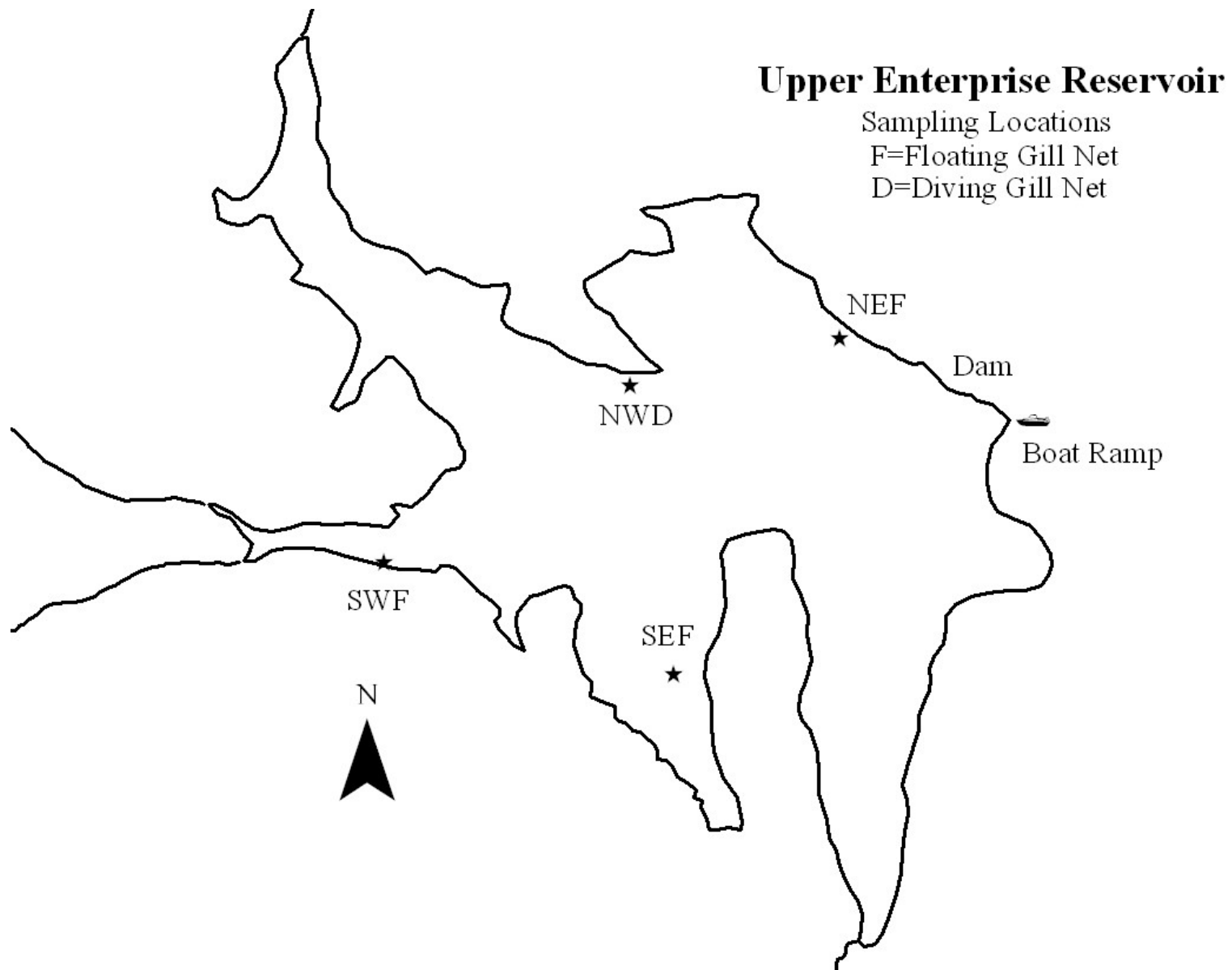


Figure 1. Locations of gill nets set at Upper Enterprise Reservoir during the 2019 trend net survey.

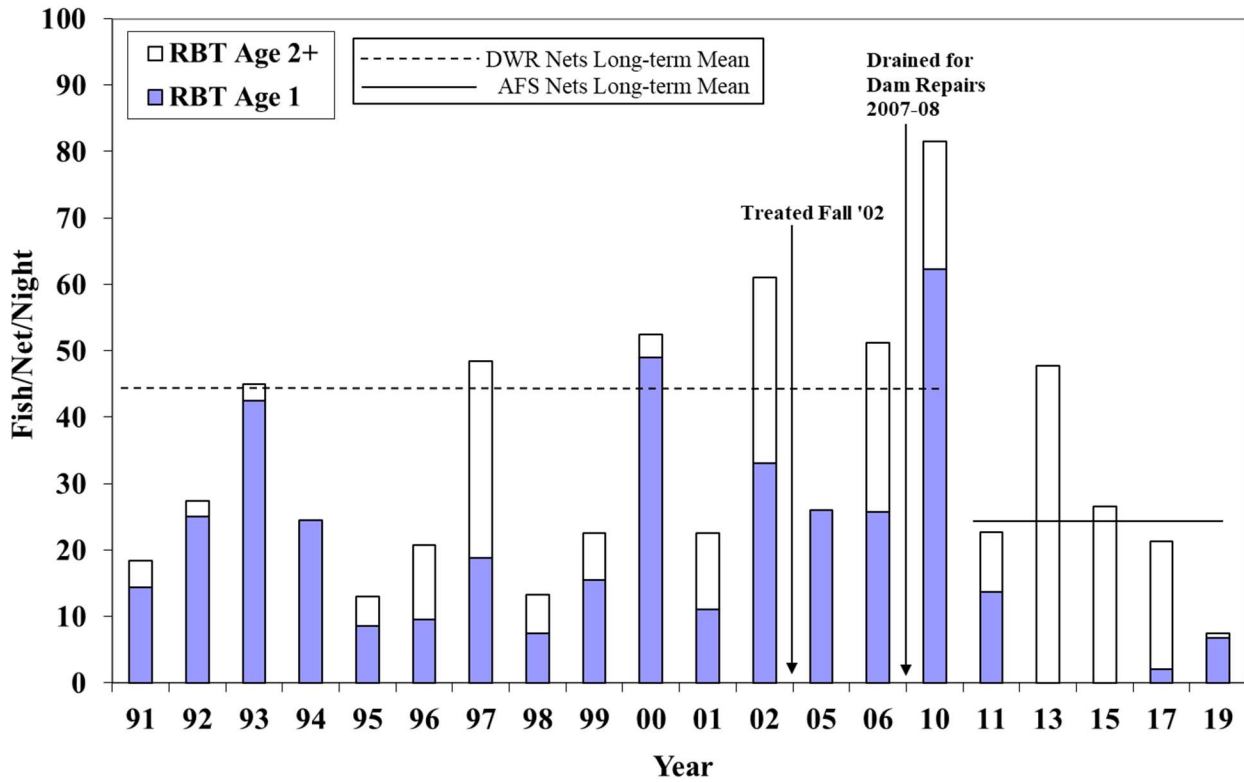


Figure 2. Trout catch rate during spring trend net surveys at Upper Enterprise Reservoir, 1991-2019. Cohorts were indistinguishable in 2013.

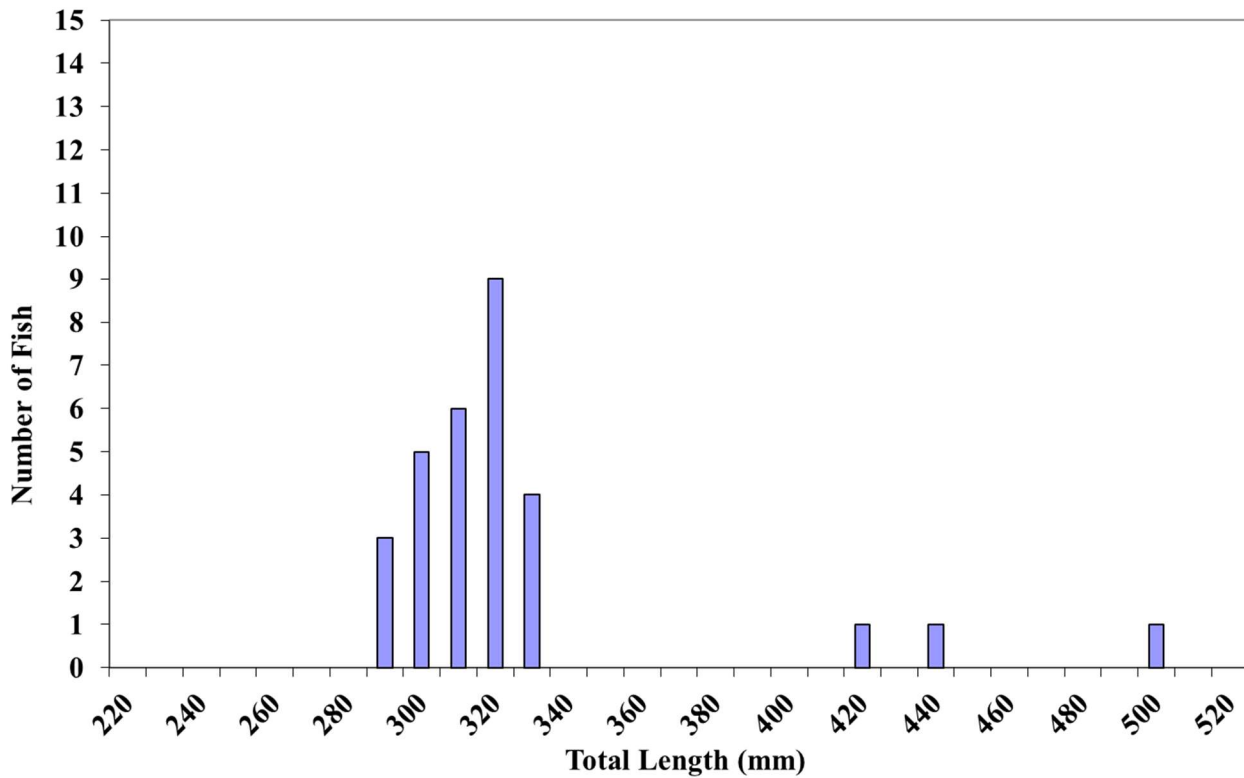


Figure 3. Length distribution of rainbow trout collected at Upper Enterprise Reservoir on March 26, 2019.

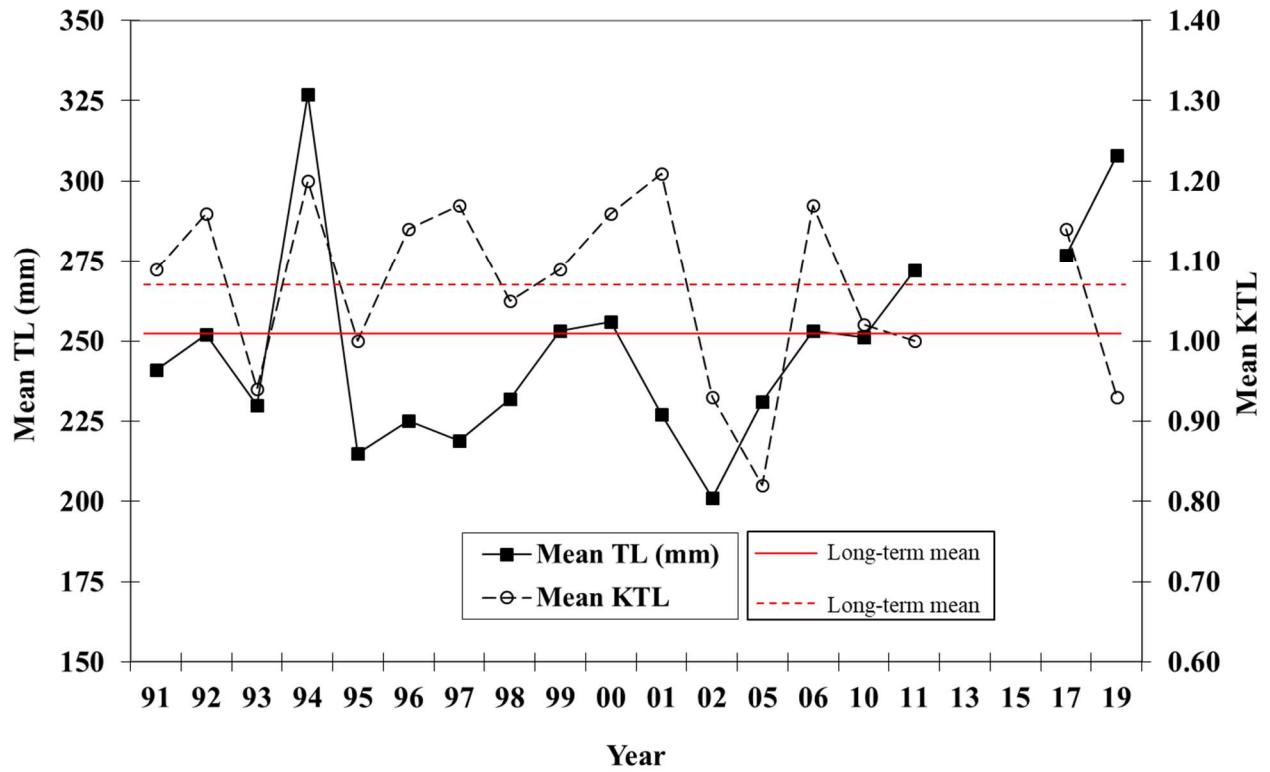


Figure 4. Mean total length (mm) and condition ( $K_{TL}$ ) of rainbow trout stocked the previous year and collected during trend net surveys in Upper Enterprise Reservoir, 1991-2019.



Figure 5. Rainbow trout collected at Upper Enterprise Reservoir on March 26, 2019.

Table 1. Record of trout stocking in Upper Enterprise Reservoir for the five years prior to the 2019 trend net survey.

<b>Year</b>	<b>Rainbow Trout</b>		<b>Cutthroat Trout</b>	
	<b>Number</b>	<b>Size (in)</b>	<b>Number</b>	<b>Size (in)</b>
2014	10,002	6.7	5,084	2.1
2015	26,147	5.5	5,253	2.1
2016	24,367	6.5	5,137	1.8
2017	24,236	6.6	5,076	2.1
2018	25,009	5.0	5,343	2.1
<i>2019 Quota</i>	<i>25,000</i>	<i>5.0</i>	<i>---</i>	<i>---</i>

Table 2. Summary of the results from the 2019 trend net survey at Upper Enterprise Reservoir.

<b>Water:</b>	Upper Enterprise Reservoir			<b>Catalog #:</b>	VI 786B									
<b>Date Set:</b>	3/25/2019			<b>Weather:</b>	Sunny, breezy									
<b>Date Pulled:</b>	3/26/2019			<b>Water Temp:</b>	45 F									
<b># Nets:</b>	3 Floaters, 1 Diver			<b>Collectors:</b>	M. Hadley, R. Hepworth, J. Gleave, K. Tyler									
<b>Summary for Sport Fish</b>														
<b>Species</b>	<b>N</b>	<b>Total Weight (kg)</b>	<b>fish per net/night</b>	<b>Total Length (mm)</b>			<b>Weight (g)</b>			<b>Condition (Ktl)</b>			<b>% total catch</b>	<b>% total biomass</b>
				<b>Mean</b>	<b>SE</b>	<b>Range</b>	<b>Mean</b>	<b>SE</b>	<b>Range</b>	<b>Mean</b>	<b>SE</b>	<b>Range</b>		
Rainbow Trout	30	9.49	7.50	322	8.32	286-495	316	28.3	222-980	0.91	0.01	0.80-1.12	100.00	100.00
RBT 2018	27	7.29	6.75	308	2.20	286-325	270	4.41	222-303	0.93	0.01	0.83-1.12	90.00	76.87
RBT 2017 & prev	3	2.21	0.75	448	24.6	412-495	735	126	560-980	0.80	<0.01	0.80-0.81	10.00	23.24

