



**BARNEY LAKE  
2020 TREND NET SURVEY**

**Report prepared by:  
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**BACKGROUND:** Barney Lake is a 15-acre impoundment located on Monroe Mountain in Piute County (Figure 1). The reservoir was built after the purchase of the Elbow Ranch and the corresponding water rights in Manning Creek by the Utah Division of Wildlife Resources (UDWR) in the late 1980s. The dam is owned and operated by UDWR and the water level is maintained at full pool to support a sport fishery. Four-wheel recreation is popular in the area, which previously led to extensive resource damage and reduced water quality at Barney Lake. In 2010, the Fishlake National Forest (FNF) installed fencing and a parking area at Barney Lake to limit impacts to the fishery as well as the nearby Barney Kettle, which once supported the area's largest and most robust population of boreal toads.

A conservation population of Bonneville cutthroat trout (BCT) is maintained in the Manning Creek drainage, so Barney Lake has historically been stocked with BCT and sterile, hybrid tiger trout (TG). Stocking quotas have been adjusted multiple times in attempts to produce a balance between BCT and TG performance, though such balance has been difficult to achieve in Barney Lake. Each adjustment to stocking that has been made to promote one species has resulted in a decline in the other. This dynamic between TG and native cutthroat trout has been unique to Barney Lake and not observed among other Southern Region waters. Anglers have made it clear that a quality TG fishery is more valued at Barney Lake, especially due to its proximity to the BCT brood at Manning Meadow Reservoir. Gaining angler support for the native cutthroat trout program in the Manning Creek drainage is vital to its continued success and, as such, management in recent years has focused on improving angler satisfaction, including liberalizing the BCT harvest limit at Manning Meadow Reservoir and adjusting stocking in Barney Lake to favor TG. Current requested quotas for Barney Lake include 1,000 fingerling TG and 5,000 fingerling BCT (Table 1). While it is assumed that trophy TG prey upon some BCT shortly after stocking, previous attempts to stock holdover BCT negatively impacted TG growth.

The fishery in Barney Lake is regularly monitored through trend net surveys and the Southern Region Sampling Strategy has prescribed netting surveys every five years. In 2011, a new net design recommended by the American Fisheries Society (AFS) was introduced in trend net surveys at most Southern Region waters, including Barney Lake. This design was intended to reduce catch bias generated by graduated mesh nets, which "lead" fish into the net. In most waters where they have been employed, the AFS-style nets have yielded about 50% of the trout catch rates of the older style nets that were used by UDWR for many years. The new net design has been employed just twice at Barney Lake, so new trends in catch are still being evaluated. This report summarizes results of the 2020 spring trend net survey at Barney Lake, with comparisons to results of previous surveys.

**METHODS:** One diving experimental gill net was set in Barney Lake on June 16, 2020 (Figure 1) and was allowed to fish overnight. The net 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"). Fish caught were removed from the net on the morning of June 17, measured to the nearest mm (total length), and weighed to the nearest gram. 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:** A total of 10 BCT and 16 TG were collected at Barney Lake on June 17, 2020, for a catch rate of 26 trout per net-night. This rate was equal to the long-term mean (Table 3). Catch rates of both BCT and TG increased in comparison to the last survey in 2015 (Fig. 2), though TG continued to be more abundant. TG spanned at least four size classes (Fig. 3, 4) and averaged 427 mm (16.8 in) in total length (TL), 960 g (2.1 lbs) in weight, with a mean condition ( $K_{TL}$ ) of

1.08. Mean TL and weight were higher than long-term means (Table 3, Fig. 5), while condition was similar. TG ranged in size up to 573 mm (22.6 in) and 1,864 g (4.1 lbs). BCT spanned at least three size classes (Fig. 3, 6) and averaged 314 mm (12.4 in), 384 g (0.8 lbs), with a mean  $K_{TL}$  of 1.15 (Table 2). All values were slightly higher than long-term means (Table 3). Mean TL has varied little since 1997 (Fig. 5), despite various changes in stocking size and variability in abundance (Fig. 2). BCT ranged in size up to 402 mm (15.8 in) and 697 g (1.5 lbs).

**DISCUSSION:** Mean trout catch rate has differed little at Barney Lake between DWR and AFS net designs (Table 3), indicating that other factors (stocking rates, recruitment to the fishery) have affected catch more during the last three surveys. Current stocking quotas appear to be stabilizing the fishery and satisfying angler demand for abundant, quality-size TG. Netting trends indicate that BCT growth potential is fairly static, regardless of size at stocking or abundance. However, though that growth potential may be limited, it is still acceptable for a secondary fishery. Both species are achieving favorable growth and condition.

**RECOMMENDATIONS:**

1. Maintain current annual stocking quotas of 1,000 fingerling TG and 5,000 fingerling BCT at Barney Lake.
2. Conduct gill net surveys every five years to monitor trout performance.

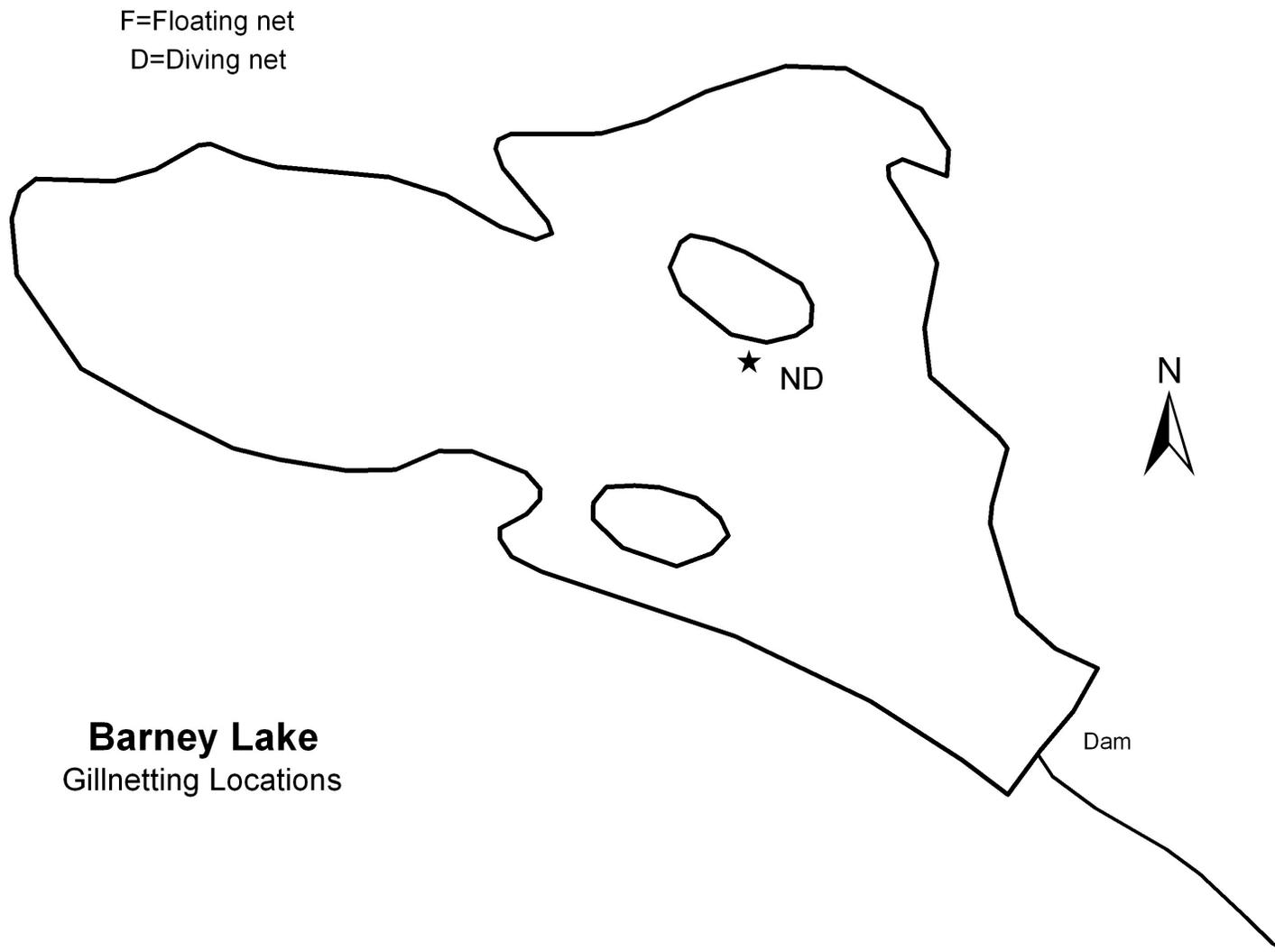


Figure 1. Location of gill net set in Barney Lake.

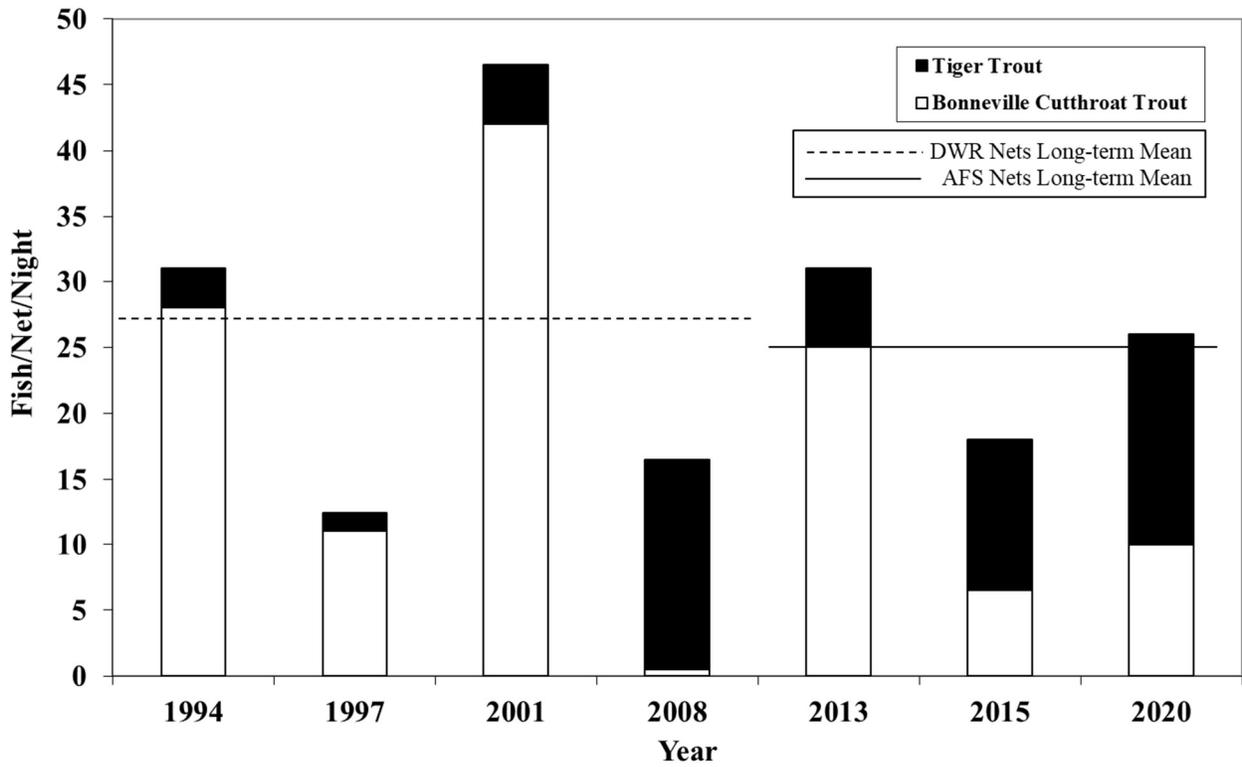


Figure 2. Trout catch rate during trend net surveys at Barney Lake, 1994-2020.

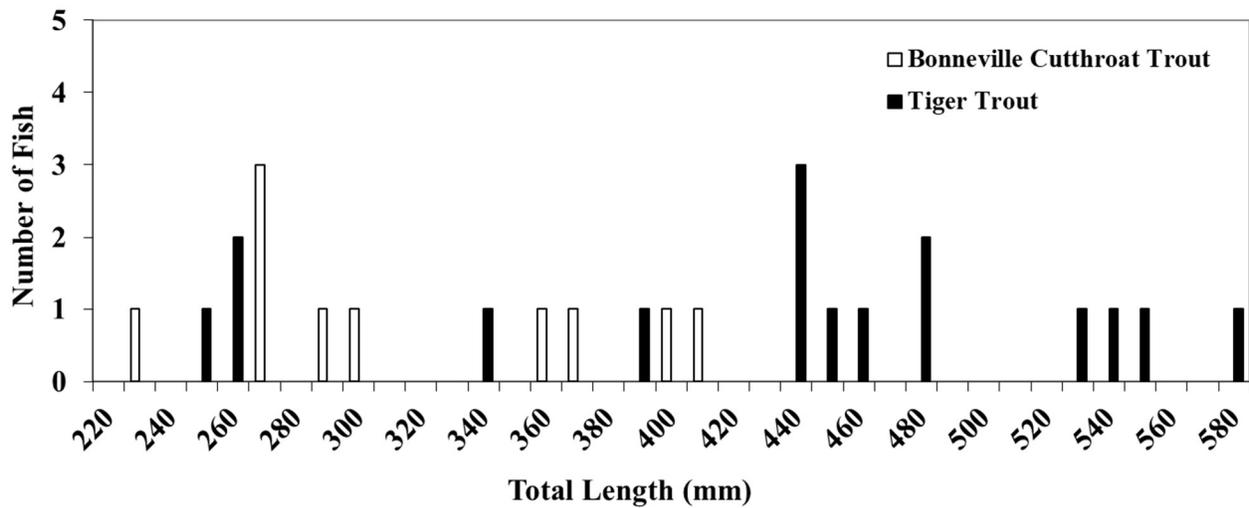


Figure 3. Length distribution of trout collected at Barney Lake on June 17, 2020.



Figure 4. Tiger trout collected at Barney Lake on June 17, 2020.

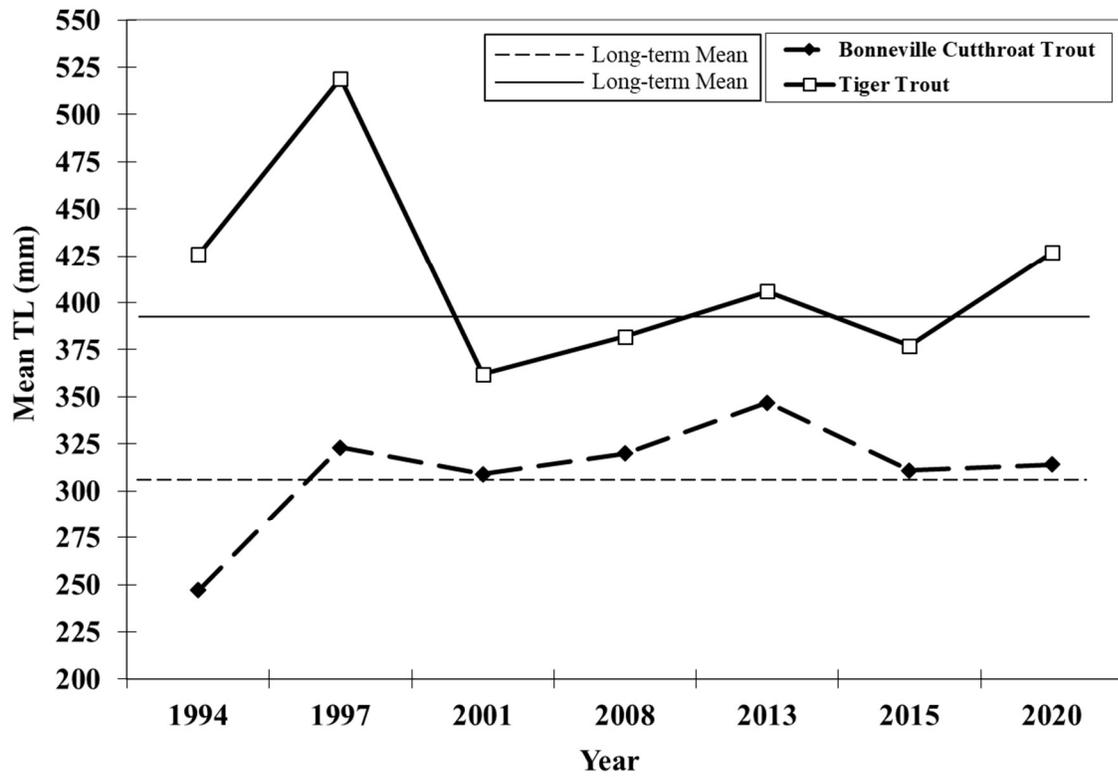


Figure 5. Mean total length (TL) of trout collected during trend nets surveys at Barney Lake, 1994-2020.



Figure 6. Bonneville cutthroat trout collected at Barney Lake on June 17, 2020.

Table 1. Record of trout stocking in Barney Lake for the five years prior to the 2020 trend net survey.

<u>Year</u>	<u>Bonneville Cutthroat Trout</u>		<u>Tiger Trout</u>	
	<u>Number</u>	<u>Length (in)</u>	<u>Number</u>	<u>Length (in)</u>
2015	2,002	7.0	840	5.0
2016	2,007	7.0	810	3.9
	5,137	1.8		
2017	5,335	1.8	748	6.0
2018	5,343	2.1	1,000	2.9
2019	6,450	1.5	1,000	3.0
<i>2020 Quotas</i>	<i>5,000</i>	<i>2.0</i>	<i>1,000</i>	<i>3.0</i>

Table 2. Summary of the results from the 2020 trend net survey at Barney Lake.

<b>Water:</b>	Barney Lake					<b>Catalog #:</b>	VI 493AC							
<b>Date Set:</b>	6/16/2020	<b>Time:</b>	14:00			<b>Weather:</b>	Cold, fog							
<b>Date Pulled:</b>	6/17/2020	<b>Time:</b>	8:00			<b>Water Temp:</b>								
<b># Nets:</b>	1 diver, 1 floater					<b>Collectors:</b>	M. Hadley, M. Roundy, T. Utley, G. Bezzant, T. Shamo							
<b>Summary for Sport Fish</b>														
<b>Species</b>	<b>N</b>	<b>Total Wt (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>		
Bonneville Cutthroat Trout	10	3.84	10.00	314	19.6	225-402	384	64.1	108-697	1.15	0.05	0.88-1.32	38.46	20.01
Tiger Trout	16	15.37	16.00	427	26.0	250-573	960	133	153-1864	1.08	0.02	0.92-1.28	61.54	79.99
Trout	26	19.21	26.00	383	20.6	225-573	739	101	108-1864	1.11	0.02	0.88-1.32	100.00	100.00

Table 3. Results of trend net surveys at Barney Lake, 1994-2020.

Date	Net Sets		Trout per net-night	Bonneville Cutthroat Trout all ages				Tiger Trout all ages				Comments
	Flo	Div		Mean TL (mm)	Mean W (g)	Mean Ktl	Per net-night	Mean TL (mm)	Mean W (g)	Mean Ktl	Per net-night	
1-Jul-94	0	1	32	247	212	1.22	28	426	899	1.16	3	1 triploid brook trout
26-Jun-97	1	1	13	323	467	1.21	11	519	1593	1.13	1.5	
20-Jun-01	1	1	47	309	332	1.07	42	362	545	1.15	4.5	
2-Jul-08	1	1	17				0.5	382	622	1.03	16	
18-Jun-13	0	1	31	347	475	1.11	25	406	746	1.09	6	Holdover BCT
17-Jun-15	1	1	18	311	374	1.17	6.5	377	765	1.14	11.5	Holdover BCT
17-Jun-20	0	1	26	314	384	1.15	10	427	960	1.08	16	
Long-term mean			26	307	355	1.13	18	394	758	1.09	8	
DWR Nets (94-08)			27				20				6	
AFS Nets (13-present)			25				14				11	