



**FORSYTH RESERVOIR  
2020 TREND NET SURVEY**

**Report prepared by:  
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**BACKGROUND:** Since the mid-1990s, the Forsyth Reservoir fishery has been managed with sterile hybrid tiger (TG) and splake (SPL) trout in order to help protect Colorado River cutthroat trout (CRCT) in UM Creek from the threat of hybridization with rainbow trout (RBT). Current annual stocking quotas consist of 8,000 TG and 4,000 SPL (Table 1). A quota of 5,000 CRCT is also requested annually, though actual stocking is dependent on excess production at the Dougherty Basin brood, which has been inconsistent. Excess TG have been stocked periodically in recent years, while the 2019 SPL quota was not stocked due to hatchery production shortages.

Water level fluctuation has consistently affected trout populations in Forsyth Reservoir – the reservoir can be drawn down almost completely during drought years. While trout are often lost from the reservoir during these periods, it appears that at least a significant portion survive by traveling downstream to UM Creek and Mill Meadow Reservoir. TG and SPL also regularly migrate upstream into upper UM Creek. Forsyth Reservoir was treated with rotenone in 2012 in conjunction with low water to remove illegally introduced yellow perch. The most recent draw down occurred in 2018, a historically dry year.

The fishery at Forsyth Reservoir is monitored through trend net surveys conducted on even years. Since 2012 a new gill net design recommended by the American Fisheries Society (AFS) has been utilized in these surveys. 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. As in most waters, catch rate trends observed since 2012 indicate that the AFS nets catch about 50% fewer trout at Forsyth Reservoir than did the DWR nets, though the reduced catches are still sufficient to provide measures of population dynamics.

**METHODS:** Four experimental gill nets (two floating and two diving) were set in Forsyth Reservoir on April 27, 2020, 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 many years, though EMLD was moved in 2020 from the south shore of the Short Creek cove to the north shore of the same (Figure 1). Fish caught were removed from nets on the morning of April 28, measured to the nearest millimeter (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 2020 survey were compared with those from historic trend net surveys.

**RESULTS:** A total of 89 trout was collected in four nets at Forsyth Reservoir on April 28, for a catch rate of 22 trout per net-night (Table 2). This was the second highest rate observed in the last ten years (Table 3, Fig. 2). TG made up 94% of the catch (Table 3) and spanned at least three size classes (Fig. 3, 4). The TG catch was dominated by the 2018 and 2019 cohorts, which were bolstered by excess stocking (Table 1). TG averaged 353 mm (13.9 in) in total length (TL), 521 g (1.1 lbs) in weight, with a mean condition ( $K_{TL}$ ) of 0.98. Mean length was similar to the long-term mean, while weight and condition were slightly higher (Table 3). TG ranged in length up to 616 mm (24.3 in) and in weight up to 2,320 (5.1 lbs). Only five SPL were observed in the four nets (Fig. 5) and averaged 426 mm (16.8 in) in TL, 930 g (2.0 lbs) in weight, with a mean  $K_{TL}$  of 1.12. No other species were observed.

**DISCUSSION:** Despite low water level documented in late summer 2018, the 2020 trend net survey found multiple cohorts of TG in Forsyth Reservoir, indicating that these fish persisted through the draw down. SPL catch was low, however, resulting from exiting the reservoir in 2018 and no stocking in 2019. (2020 netting results from Mill Meadow Reservoir confirmed that many SPL went downstream.) The total trout catch remained high due to excess stocking of TG in recent years (Table 1, Fig. 3). TG survival and growth also benefited from improved water conditions following the high snowpack in 2019.

Multiple anglers (including DWR and Fishlake NF personnel) documented catching yellow perch at Forsyth Reservoir later in 2020 (Fig. 6). It has been hypothesized that fish may be able to pass upstream through the Forsyth dam outlet during low water (two RBT were observed in the 2016 netting survey) so a fish passage barrier will be built in UM Creek upstream of Mill Meadow Reservoir in 2021. Perch, however, typically do not show the same propensity for upstream movement and the population in Mill Meadow Reservoir is maintaining at a low density, so it is also possible that they were illegally reintroduced to Forsyth. Biennial trend net surveys will monitor response of stocked trout to yellow perch in the coming years. If trout survival or growth decline due to perch competition, another rotenone treatment may be necessary.

Water level fluctuation continues to present the greatest challenge to the Forsyth Reservoir sport fishery. Stocked hybrid trout exhibit favorable survival and growth when water levels remain high enough to sustain suitable conditions. The fishery has been required to “reset” multiple times in the last decade, however, due to repeated draw downs (coupled with a treatment to remove yellow perch). The inconsistent nature of the fishery has also led to limited use by anglers, even when conditions are good. At this point, the best course for sustaining a fishery at Forsyth Reservoir is to cultivate relations with local water users.

#### **RECOMMENDATIONS:**

1. Ensure that only triploid RBT are stocked in Mill Meadow Reservoir.
2. Construct a fish passage barrier in UM Creek upstream of Mill Meadow Reservoir to prevent upstream movement to Forsyth Reservoir.
3. Maintain annual quotas of TG and SPL. Continue to stock CRCT as they are available.
4. Conduct trend nets surveys every two years to evaluate trout stocking and monitor yellow perch population dynamics.

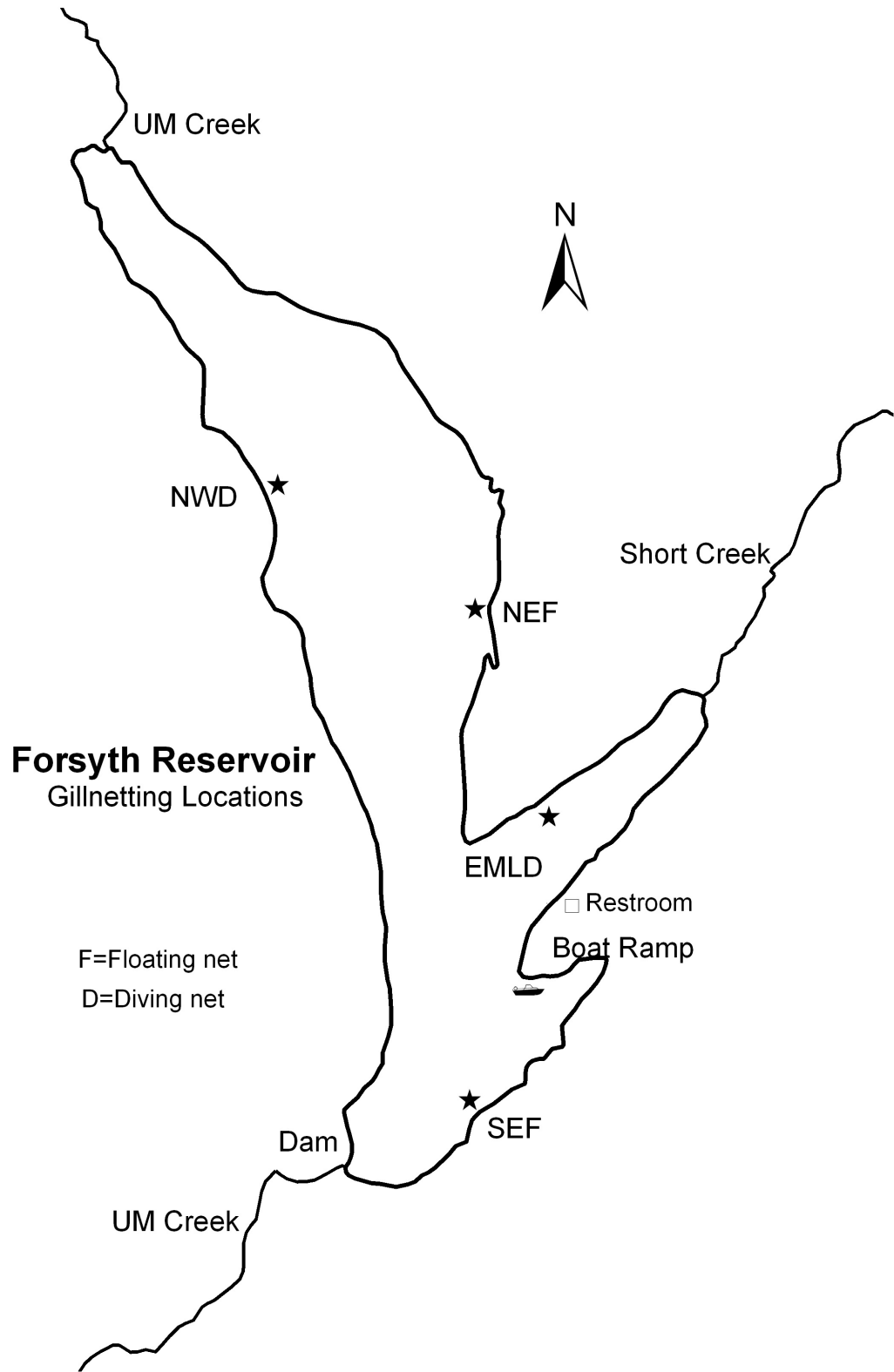


Figure 1. Locations of gill nets set at Forsyth Reservoir during the 2020 trend net survey.

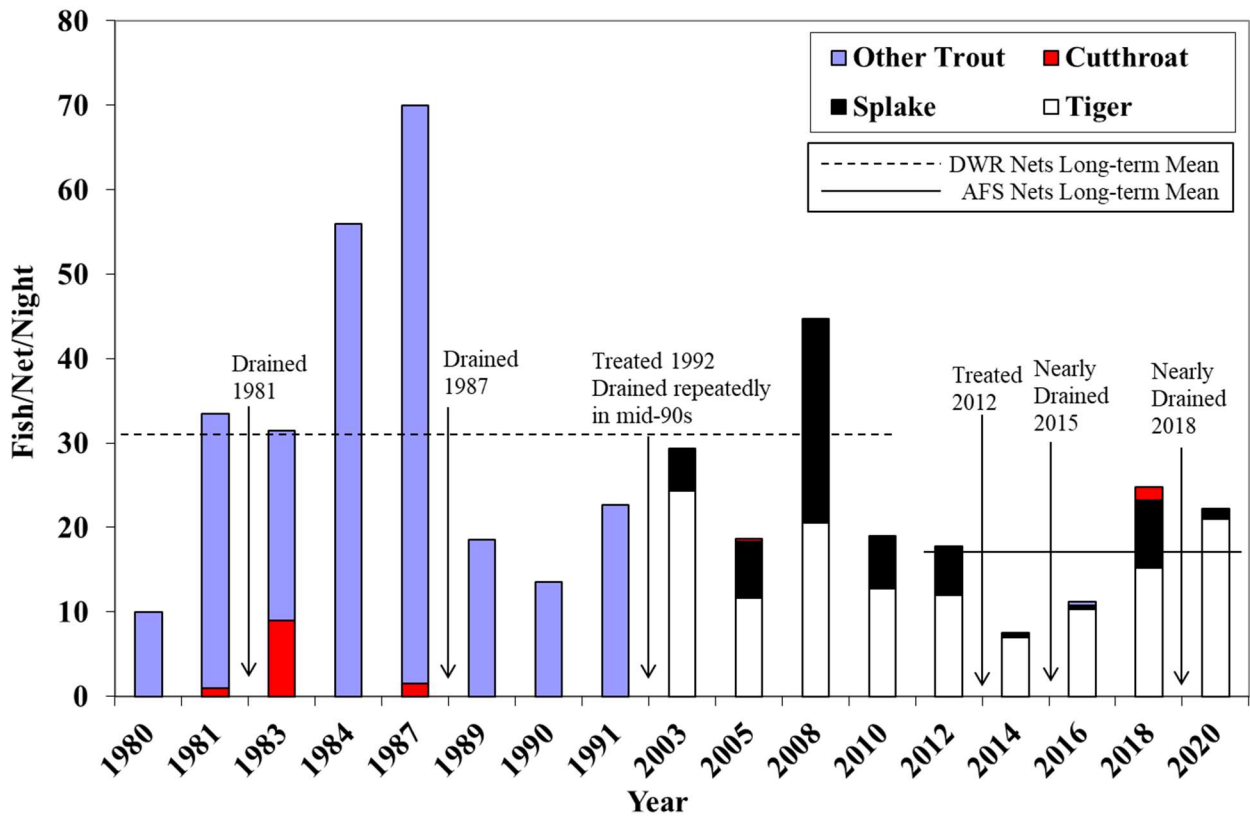


Figure 2. Trout catch rate during trend net surveys at Forsyth Reservoir, 1980-2020.

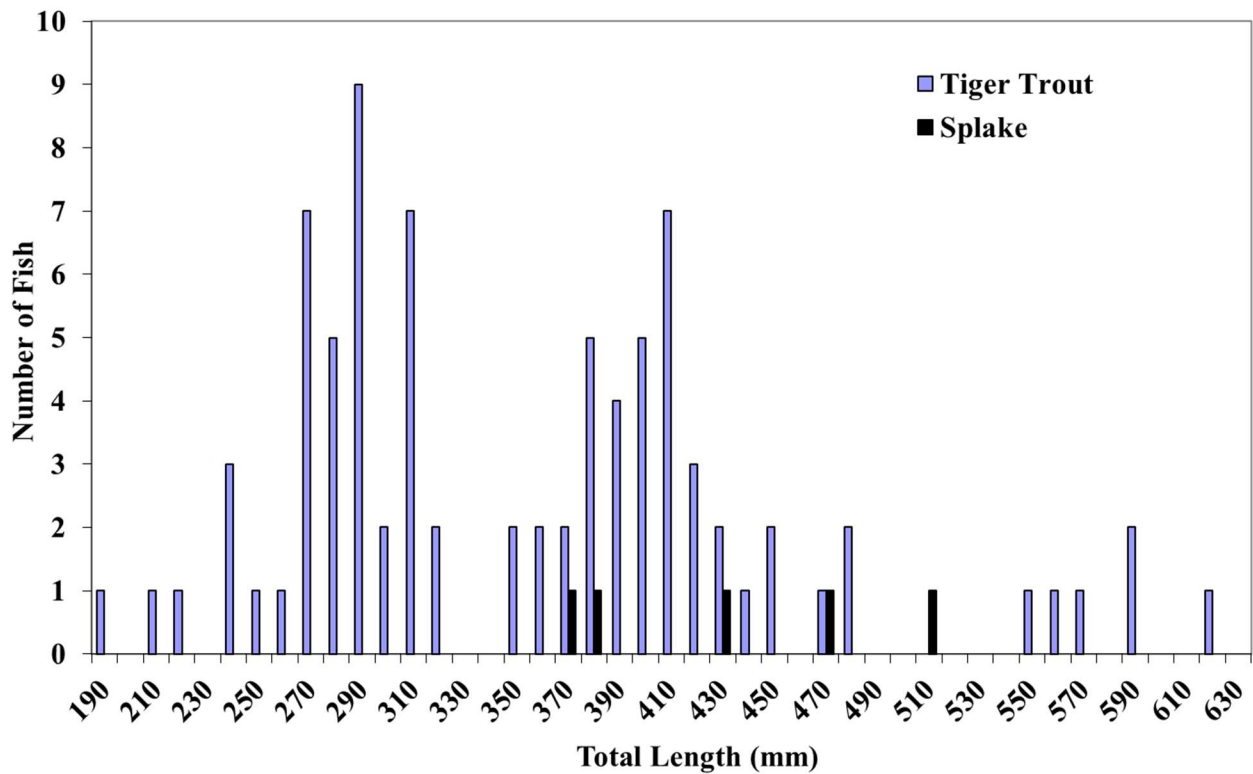


Figure 3. Length distribution of trout collected at Forsyth Reservoir on April 28, 2020.



Figure 4. Tiger trout collected at Forsyth Reservoir on April 28, 2020.



Figure 5. Splake trout collected at Forsyth Reservoir on April 28, 2020.



Figure 6. Yellow perch caught at Forsyth Reservoir in July 2020.

Table 1. Record of trout stocking in Forsyth Reservoir for the five years prior to the 2020 trend netting.

<u>Year</u>	<u>Tiger Trout</u>		<u>Splake Trout</u>		<u>Cutthroat Trout</u>	
	<u>Number</u>	<u>Size (in)</u>	<u>Number</u>	<u>Size (in)</u>	<u>Number</u>	<u>Size (in)</u>
2015	10,650 <sup>a</sup>	2.4	3,509	3.5	2,040	7.5
	6,808 <sup>b</sup>	9.5			6,336	2.5
2016	8,008 <sup>a</sup>	3.2	4,013	3.6	5,040	2.0
	10,080 <sup>b</sup>	3.2				
2017	8,021 <sup>a</sup>	3.6	4,511	3.4		
2018	8,012 <sup>a</sup>	2.7	4,045	2.9		
	4,000 <sup>b</sup>	2.1				
2019	10,008 <sup>a</sup>	2.6				
	5,040 <sup>b</sup>	5.4				
<i>2020 Quota</i>	<i>8,000</i>	<i>3.0</i>	<i>4,000</i>	<i>5.0</i>	<i>5,000</i>	<i>7.0</i>

<sup>a</sup> – Requested quota.

<sup>b</sup> – Excess stocking.



Table 2. Summary of the results from the 2020 trend net survey at Forsyth Reservoir.

<b>Water:</b>	Forsyth Reservoir			<b>Catalog #:</b>	I 503									
<b>Date Set:</b>	4/27/2020		<b>Time Set:</b>	14:00		<b>Weather:</b>	Calm, sunny							
<b>Date Pulled:</b>	4/28/2020		<b>Time Pulled:</b>	9:00		<b>Water Temp:</b>	47 F							
<b># Nets:</b>	2 floaters, 2 divers; AFS design			<b>Collectors:</b>	M. Hadley, M. Jensen, M. Roundy, T. Utley, J. Hall									
<b>Summary for Sport Fish</b>														
Species	N	Total Weight (kg)	fish per net/night	Total Length (mm)			Weight (g)			Condition (Ktl)			% total catch	% total biomass
				Mean	SE	Range	Mean	SE	Range	Mean	SE	Range		
Tiger Trout	84	43.76	21.00	353	10.1	182-616	521	47.2	42-2320	0.98	0.01	0.60-1.21	94.38	90.40
Splake Trout	5	4.65	1.25	426	26.6	361-501	930	193	482-1459	1.12	0.06	0.96-1.29	5.62	9.60
Trout	89	48.41	22.25	357	9.79	182-616	544	46.7	42-2320	0.99	0.01	0.60-1.29	100.00	100.00

Table 3. Trend net survey results at Forsyth Reservoir, 1980-2020.

Date	Net Sets		Total Trout	All Trout Per Net-Night	Splake All ages			Tiger Trout All ages			Comments
	Flo	Div			Mean TL (mm)	Mean W (g)	Mean Ktl	Mean TL (mm)	Mean W (g)	Mean Ktl	
22-May-80	0	2	22	11							
19-May-81	0	2	67	34							Drained '81
10-May-83	2	0	63	32							
10-May-84	2	0	112	56							
19-May-87	2	0	140	70							Drained '87
18-May-89	2	0	37	19							
26-Apr-90	2	0	27	14							
24-Apr-91	2	1	66	22							Treated '92
7-May-03	2	1	88	29	400	584	0.89	358	431	0.89	
3-May-05	2	1	56	19	290	281	0.90	320	339	0.88	1 CRCT
30-Apr-08	2	2	179	45	359	416	0.88	376	490	0.81	
4-May-10	2	2	76	19	430	795	0.91	419	693	0.86	3 Yellow Perch
2-May-12	2	2	71	18	329	419	0.94	376	552	0.90	87 Yellow Perch
29-Apr-14	2	2	30	8	412	717	1.03	304	317	0.99	Treated '12
26-Apr-16	2	2	45	11				304	253	0.87	Nearly drained 2015
23-Apr-18	2	2	99	25	373	534	1.00	380	549	0.99	Nearly drained 2018
28-Apr-20	2	2	89	22	426	930	1.12	353	521	0.98	
Long-term mean				27	365	496	0.92	361	481	0.91	
DWR Nets (1980-2010)				31							
AFS Nets (2012-present)				17							