



MEEKS LAKE 2022 TREND NETTING

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BACKGROUND

Meeks Lake is a 7-acre enhanced, on-stream lake -sitting at an elevation of 8,336 feet on the north-slope of Thousand Lake Mountain, in Sevier County. The lake holds approximately 137 acre-feet of water, has a maximum depth of about 14 feet, and receives water from a small, spring-fed pond upstream.

The dam at Meeks Lake was acquired from the Baker Ranch, which is owned by Castle Valley Ranches, LLC (CVR), by the Utah Division of Wildlife Resources (UDWR) in July 2007 in order to maintain and improve fish habitat and recreation opportunities. The dams were in disrepair and could not pass current state inspection standards. CVR desired to construct new ponds on private property downstream and relocate the water rights to these new ponds. It was determined that UDWR would be gifted a one-time fill of the lakes, given responsibility for the maintenance of the dams at Meeks Lake, Round Lake, and Morrell Pond, and pay a lump sum of \$10,000 every 20 years to CVR for compensation of evaporative losses in exchange for the relocation of CVR water rights. The UDWR is under a special-use agreement with Fish Lake National Forest for the maintenance of the dams.

Meeks Lake was treated with liquid rotenone in 1997 to remove illegally introduced Utah chubs (UTC) and redbreast shiners (RSS). UTC and RSS were illegally introduced into the drainage sometime in the early 1990's. These two species became abundant in the lake by 1995 causing the sport fishery to decline dramatically. The survival of stocked trout was poor and angler success was low. Netting in 2003 was the first sampling following the 1997 treatment and it was found that no nongame fish were collected, indicating the apparent success of the 1997 fish eradication project.

Stocking quotas have been reduced in recent years. When the 2012 survey was completed the stocking quotas consisted of 1500 rainbow trout (RBT) and 500 brook trout (BRK) on alternating years, and 5000 Bonneville cutthroat trout (CTT) annually. Those numbers have been changed throughout the years, and the current 2022 stocking quota consists of 750 RBT, 250 BRK, and 4,000 Colorado River cutthroat trout (Table 1). Though Colorado River cutthroat trout (CRCT) is the preferred subspecies of cutthroat in Meeks Lake, sufficient numbers to sustain sport fish stocking were not produced from brood operations regularly until 2014. Therefore, Bonneville cutthroat were stocked up until 2014. From 2015 to present time, Colorado cutthroat trout have been used to sustain the sportfish stocking quota.

METHODS

Two experimental gill nets (one floating and one diving) were set in Meeks Lake on June 20, 2022, 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 since the 1980's (Figure 1). Fish caught were removed from nets on the morning of June 21st, 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 KTL (generated from total length [TL]):

$$KTL = (Weight/Length^3) \times 100,000$$

Results were compared with those from historic trend net surveys.

RESULTS

A total of 47 trout were collected in the two trend nets at Meeks Lake on June 21, 2022. The total catch was made up of 18 BRK, 16 RBT, and 13 CRCT, for a catch rate of 23.5 fish per-net-night (Figure 3, Table 2). Brook trout made up 54% of the total biomass, followed by RBT (26%), and CRCT (19%). The total length (TL) for BRK ranged from 210-422 mm (8.26-16.61 in.) and the mean weight ranged from 123-775 g (0.27-1.7 lbs.) (Figure 2, 4 5). Condition factor (K_{TL}) for BRK ranged from 0.99-1.42. Total length (TL) for RBT ranged from 229-348 mm (9.01-13.70 in.), while the mean weight ranged from 129-440 g (0.28-0.97 lbs.), with a condition factor ranging from 0.85-1.15 (K_{TL}) (Figure 2, 7, Table 2). Total length (TL) for CRCT ranged from 255-339 mm (10.03-13.34 in.), with a weight range from 174-366 g (0.38-0.80 lbs.), and a condition factor ranging from 0.83-1.08 (K_{TL}) (Figure 2, 6, Table 2). Brook Trout had the greatest mean condition factor, at 1.17 (K_{TL}) (Table 2).

DISCUSSION

The 2022 trend netting survey results found an increasing number of fish in Meeks Lake. Catch rates improved from 18.5 fish/net-night in 2012, to 23.5 fish/net-night in 2022 (Figure 3, Table 3). Overall size of each trout species was found to be above or near the long-term mean (Figure 4, Table 3). The condition factor (K_{TL}) in 2022 was slightly lower for CRCT and RBT than the long-term means –while BRK was nearly the same as the long term mean (Figure 4, Table 3). Overall, fish are showing improvement in growth and quantity. It is recommended that netting surveys be conducted on a more consistent rotation, being every 3-5 years, so that more accurate monitoring and stocking adjustments can be made.

RECOMMENDATIONS

1. Conduct trend net surveys more consistently every 3-5 years, with the next netting survey taking place between the years 2025-2027.
2. Continue to monitor and assess the annual stocking quota and angler harvest.



Figure 1. Locations of gill nets set at Meeks Lake during the 2022 trend net survey.

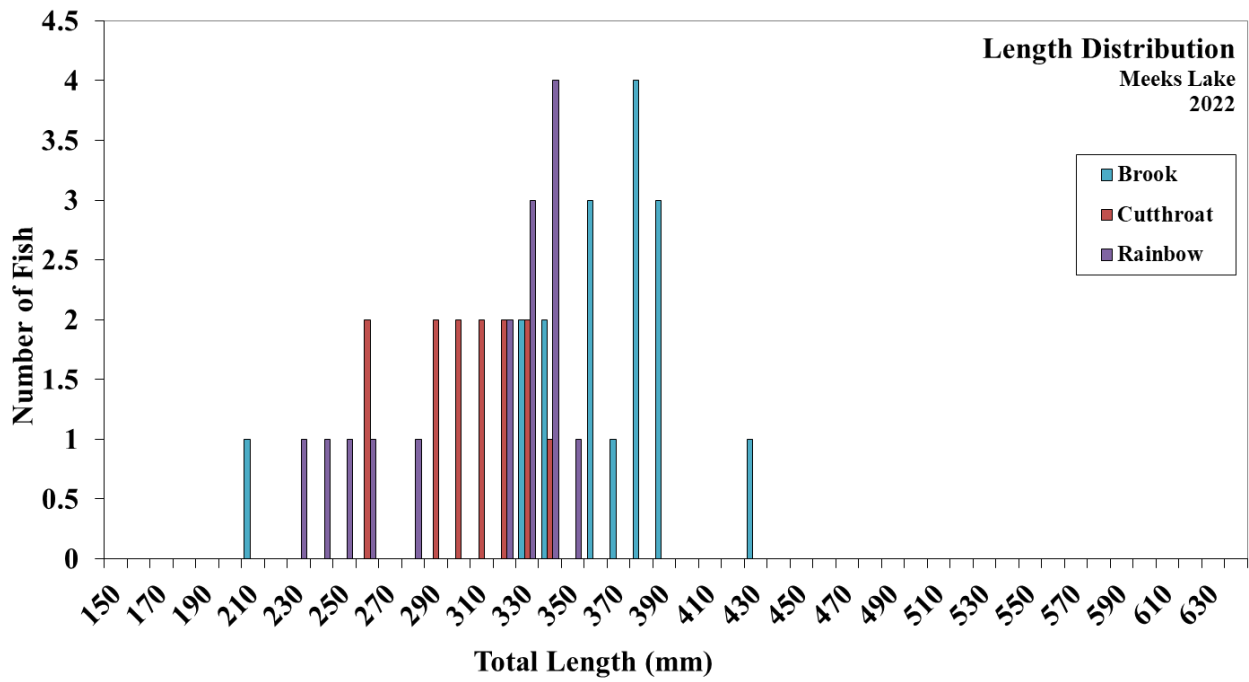


Figure 2. Length distribution of all trout collected in a trend net survey at Meeks Lake on June 21, 2022.

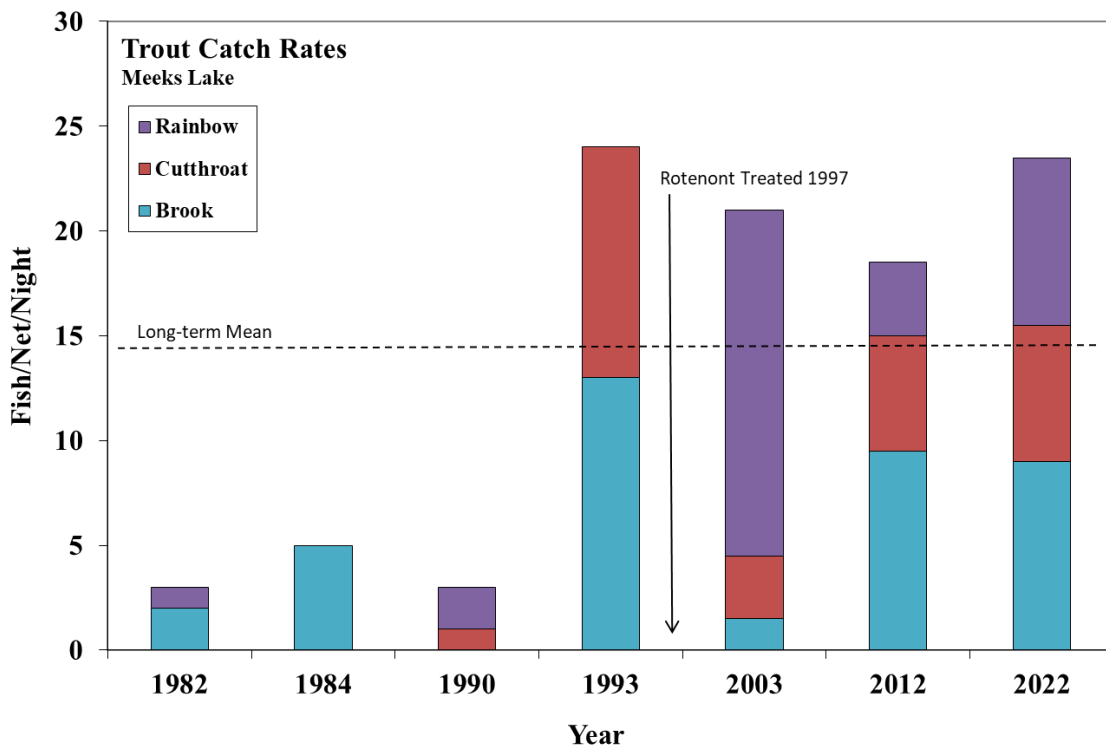


Figure 3. Trout catch rates during trend nest surveys at Meeks Lake from 1982-2022.

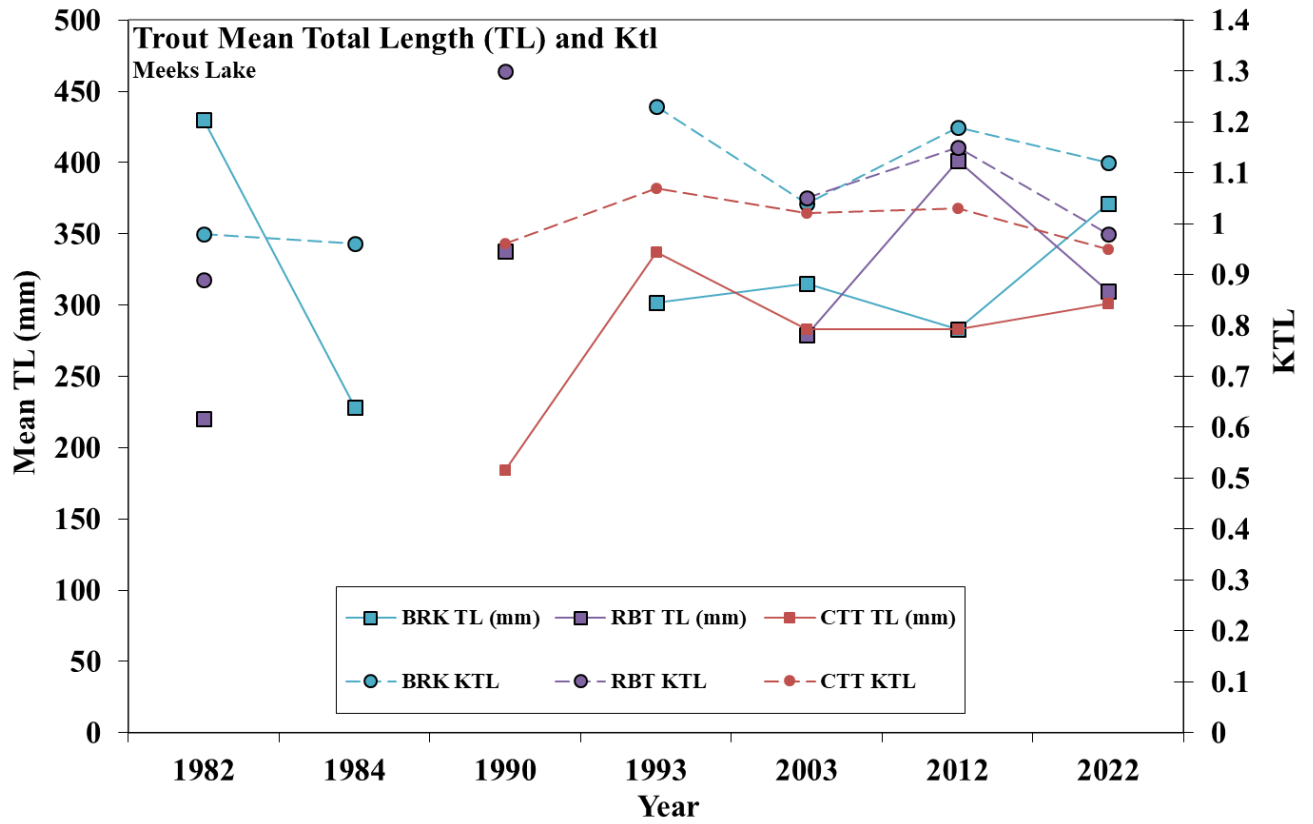


Figure 4. Mean total length (TL) mm and condition (K_{TL}) of trout collected during trend netting surveys at Meeks Lake from 1982-2022.



Figure 5. Brook trout captured in trend net survey at Meeks Lake on June 21, 2022.



Figure 6. Cutthroat trout captured in trend net survey at Meeks Lake on June 21, 2022.



Figure 7. Rainbow trout captured in trend net survey at Meeks Lake on June 21, 2022.

Table 1. Record of trout stocking in Meeks Lake from 2015 to 2022.

Year	<u>Rainbow Trout</u>		<u>Brook Trout</u>		<u>Cutthroat Trout</u>	
	Number	Size (in)	Number	Size (in)	Number	Size (in)
2015	788	3.83	271	2.55	--	--
2016	779	4.11	268	3.34	5,000	1.79
2017	811	3.32	269	3.16	5,048	1.60
2018	778	5.34	255	3.45	5,000	2.43
2019	872	3.33	252	3.03	5,083	1.75
2020	960	3.14	256	2.69	--	--
2021	900	2.54	261	3.03	4,026	1.98
<i>2022 Quota</i>	750	3	250	3	4,000	2

Table 2. Summary of the 2022 trend net survey results at Meeks Lake.

Water:	Meeks Lake	Catalog #:	I 511											
Date Set:	6/20/22	Weather:	Sunny, calm											
Date Pulled:	6/21/22	Water Temp:												
# Nets:	1 diver/ 1 floater	Collectors:	M. Roundy, D. Brown, T. Whitesell, M. Thorley											
Summary for Sport Fish														
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		
Brook Trout	18	9.73	9	356	10.8	210-422	547	36.41	123-755	1.17	0.02	0.99-1.42	38.30	54.14
Rainbow Trout	16	4.81	8	302	11.1	229-348	296	28.7	129-440	1.01	0.01	0.85-1.15	34.04	26.79
Cutthroat Trout	13	3.43	6.5	301	7.04	255-339	264	16.45	174-366	0.95	0.02	0.83-1.08	27.66	19.08
Total Trout	47	17.96	23.5	323	7.0	210-422	382	260.0	123-755	1.05	0.01	0.83-1.42	100.00	100.00
Summary for Non-Sport Fish														
Species	N	Total Weight (kg)	fish per net/night	% total catch	% total biomass	Length range (mm)								
None														

Table 3. Historic trend netting results at Meeks Lake from 1982-2022.

Date	Net Sets		Total Trout	Trout Per Net-Night	Brook Trout All ages				Cutthroat Trout All ages				Rainbow Trout All ages				Non Game per Net-Night	Comments
	Flo	Div			Mean TL (mm)	Mean W (g)	Mean Ktl	Per Net	Mean TL (mm)	Mean W (g)	Mean Ktl	Per Net	Mean TL (mm)	Mean W (g)	Mean Ktl	Per Net		
	24-Jun-82	1			1	3	3	430	930	0.98	2					220		
12-May-84		1	5	5	228	114	0.96	5										
1-Jun-90		1	3	3					184	60	0.96	1	338	505	1.30	2		
27-Jul-93		1	24	24	302	381	1.23	13	337	410	1.07	11					6	6 UTC sampled
9-Jul-03	1	1	42	21	315	327	1.04	1.5	283	240	1.02	3	279	233	1.05	16.5		
21-Aug-12	1	1	37	18.5	283	272	1.19	9.5	283	280	1.03	5.5	401	749	1.15	3.5		
21-Jun-22	1	1	47	23.5	356	547	1.17	9.0	301	264	0.95	6.5	302	296	1.01	8.0		
	Long-term mean			14	311	390	1.16	7	300	298	1.01	5	301	318	1.06	6	6	