

THREE CREEKS RESERVOIR



Introduction

Three Creeks Reservoir is located in the upper reaches of the Beaver River drainage in the Tushar Mountains. It is a small artificial impoundment in a high meadow at the confluence of the north and south forks of Three Creeks and Lake Stream.

The Tushar Mountains on the Beaver Ranger District

of the Fishlake National Forest offers a unique experience. It is one of the most beautiful and scenic areas of our State. Evidence still remains of the Tushar Caldera that exploded thousands of years ago throwing rocks and boulders hundreds of miles. In exploring the area one can

Characteristics and Morphometry

Lake elevation (meters / feet)	2,625 / 8,613
Surface area (hectares / acres)	23.1 / 57
Watershed area (hectares / acres)	4,845 / 11,972
Volume (m ³ / acre-feet)	
capacity	2,502,200 / 2,029
conservation pool	0
Annual inflow (m ³ / acre-feet)	
Retention time (years)	
Drawdown (m ³ / acre-feet)	
Depth (meters / feet)	
maximum	25.7 / 84.3
mean	10.8 / 35.4
Length (meters / feet)	900 / 2,953
Width (meters / feet)	450 / 1,476
Shoreline (meters / feet)	3,500 / 11,483

Location

County	Beaver
Longitude / Latitude	112 25 15 / 38 17 45
USGS Map	Shelly Baldy Peak, Utah, 1981
Cataloging Unit	Beaver River (16030007)

find igneous, sedimentary, and metamorphic rocks. The volcanic activity of the Tushar's is responsible for the highly mineralized rocks which can be found in the area. Minerals which occur are gold, silver, pyrite and uranium.

The reservoir shoreline is 70% owned and administered by the Fish Lake National Forest with unrestricted public access. The south lobe of the lake falls on a school section which was sold into private ownership. Defined beneficial uses include: water recreation excluding swimming,

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propagation of cold water species of game fish and aquatic life, and agricultural needs.

Recreation

Three Creeks Reservoir is accessible via U-153, 17 miles east of Beaver or 18 miles west of Junction. The highway from Beaver is paved, while the highway from Junction is gravel, but a fairly good road.

Fishing, boating, hiking, skiing, packing and camping are possible in the area. Usage is moderate and it is usually possible to launch a boat in the reservoir.

The nearest USFS campground, Mahogany Cove, is 7 miles west on U-153, and offers camping at a nominal charge. It has 7 campsites, drinking water and vault toilets. There are also several private campgrounds in Beaver. There are also some private lodge areas associated with Elk Meadows Ski Resort or Puffer Lake that provide lodging and recreational activities. Other points of interest in the area are the old mining areas of Frisco and Kimberly besides several other lakes and reservoirs for fishing and camping.

Watershed Description

The reservoir is in a small meadow at the top of the Beaver River gorge some distance below the tall peaks of the Tushars. The watershed high point, Delano Peak, is 3,708 m (12,169 ft) above sea level, thereby developing a complex slope of 11.7% to the reservoir. The inflows are North Fork Three Creeks, South Fork Three Creeks and Lake Stream and the outflow is Three Creeks (only one stream). The average stream gradient above the reservoir is 6.2% (327 feet per mile).

The soil is largely of volcanic origin with moderate permeability and moderately slow erosion and runoff. A complete listing of soils compositions that compose the watershed are listed in Appendix III.

The vegetation communities are comprised of pine, aspen, spruce-fir, oak, maple and alpine. The watershed receives 64 - 102 cm (25 - 40 inches) of precipitation annually with a frost-free season of 40 - 60 days at the reservoir.

Limnological Assessment

The water quality of Three Creeks Reservoir is good. It is considered to be soft with a hardness concentration value of approximately 45 mg/L (CaCO₃). The parameter that has exceeded State water quality standards for defined beneficial uses is total phosphorus. The average concentrations of total phosphorus in the water column for 1992 was 49 ug/L which exceeds the recommended pollution indicator for phosphorus of 25 ug/L. The phosphorus concentration in the hypolimnion in August, 1992 was 72 ug/L. The amount of data available at this time is insufficient to determine impairments conclusively.

Additional data will need to be obtained for proper evaluation.

Data suggest that the reservoir is currently a phosphorus limited system. A more accurate descriptions would indicate that the reservoir was phosphorus limited during early summer and in late summer with limited water in the reservoir, it was nitrogen limited. This conclusion is based on the fact that the inorganic nitrogen concentration was below detectable limits in June (< 0.02 mg/L) while in August it rose to 1.9 mg/L. TSI values indicate the reservoir is eutrophic, primarily due to elevated levels of total phosphorus in the water column. The reservoir was weakly stratified during June, 1992 with a thermocline at mid-level in the water column. Early withdrawal probably does not allow for the stratification to become fairly strong,

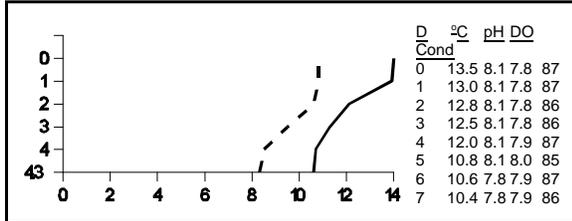
Limnological Data	
Data sampled from STORET site: 594110	
Surface Data	<u>1992</u>
Trophic Status	E
Chlorophyll TSI	47.23
Secchi Depth TSI	46.23
Phosphorous TSI	59.04
Average TSI	50.83
Chlorophyll <i>a</i> (ug/L)	5.5
Transparency (m)	2.6
Total Phosphorous (ug/L)	45
pH	8.3
Total Susp. Solids (mg/L)	<3
Total Volatile Solids (mg/L)	0
Total Residual Solids (mg/L)	3
Temperature (°C / °f)	15/59
Conductivity (umhos.cm)	103
Water Column Data	
Ammonia (mg/L)	0.03
Nitrate/Nitrite (mg/L)	0.96
Hardness (mg/L)	45
Alkalinity (mg/L)	50
Silica (mg/L)	18.6
Total Phosphorous (ug/L)	49
Miscellaneous Data	
Limiting Nutrient	P
DO (Mg/l) at 75% depth	7.8
Stratification (m)	4-5
Depth at Deepest Site (m)	11

but if water was stored for a significant period of time , it probably would occur.

According to DWR no fish kills have been reported in

LAKE REPORTS

recent years, but it was noted that the reservoir could be drained for irrigation requirements if needed. The reservoir is stocked with approximately 2,000 catchable rainbow trout (*Oncorhynchus mykiss*) but because the lake has not been treated for rough fish competition populations of native fishes may still be present in the lake.



Phytoplankton in the euphotic zone include the following taxa (in order of dominance)

Species	Cell Volume (mm ³ /liter)	% Density By Volume
Pennate diatoms	0.973	66.51
<i>Pandorina morum</i>	0.222	15.20
Centric diatoms	0.127	8.67
Anabaena sp.	0.111	7.60
<i>Haematococcus lacustris</i>	0.0	1.3
0.91		
<i>Asterionella formosa</i>	0.009	0.65
<i>Chlamydomonas sp.</i>	0.007	0.46
Total	1.46	
Shannon-Weaver [H']	1.07	
Species Evenness	0.55	
Species Richness	0.30	

The phytoplankton community is dominated by the presence of diatoms, flagellates and some blue-green algae.

Pollution Assessment

Nonpoint pollution sources are: sedimentation and nutrient loading from grazing and recreational development; and wastes and litter from recreation. Cattle graze around the USFS portion of the reservoir and throughout the watershed.

Beneficial Use Classification

The state beneficial use classifications include: boating and similar recreation (excluding swimming) (2B), cold water game fish and organisms in their food chain (3A) and agricultural uses (4).

Information	
Management Agencies	
Fishlake National Forest	896-4491
Beaver Ranger District	438-2436
Five County Association of Governments	673-3548
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146
Recreation	
Beaver County Travel Council	438-2975
Beaver KOA	438-2924
United Beaver Camperland	438-2808
Beaver Chamber of Commerce	438-2975
Elk Meadows Ski and Summer Resort	438-5433
Puffer Lake Resort	864-2751
Reservoir Administrator	
Kents Lake Irrigation Company	438-2275