

LOWER BOX CREEK RESERVOIR



Introduction

Lower Box Creek Reservoir is west of Greenwich on the Sevier Plateau. It is a small, shallow impoundment of a stream valley. It lies just downstream of Upper Box Creek Reservoir, 1/2 mile upstream, and they are often labeled as "Box Creek Reservoirs" on maps. An alternate name is "Box Creek Reservoir (Lower)".

The reservoir shoreline is publicly owned and administered by the Fish Lake National Forest with

unrestricted public access. Defined beneficial uses include: water recreation excluding swimming, propagation of cold water game fish and aquatic life, and agricultural needs.

Recreation

Characteristics and Morphometry

Lake elevation (meters / feet)	2,581 / 8,466
Surface area (hectares / acres)	20.2 / 50
Watershed area (hectares / acres)	190 / 469
Volume (m ³ / acre-feet)	
capacity	
conservation pool	0
Annual inflow (m ³ / acre-feet)	
Retention time (years)	
Drawdown (m ³ / acre-feet)	
Depth (meters / feet)	
maximum	7.02 / 23
mean	
Length (meters / feet)	610 / 2,000
Width (meters / feet)	183 / 600
Shoreline (meters / feet)	1,402 / 4,600

Location

County	Piute
Longitude / Latitude	111 59 10 / 38 28 42
USGS Map	Greenwich, Utah 1969
Cataloging Unit	Otter Creek (16030002)

Lower Box Creek Reservoir is most easily accessed from Greenwich. If you are coming from the north or west, however, it is also accessible from Monroe.

Take the gravel road 1/2 mile north of the Greenwich church (on U-62, 6 miles south of Koosharem) to the west. This road climbs up onto the Sevier Plateau and becomes FS-069. After about 9 miles a primitive road leads south to

File Contains Data for
PostScript Printers Only

Lower Box Creek Reservoir.

Access is from Monroe via FS-078. From downtown Monroe, go south, then southeast out of town, following signs to Monrovia Park. At Monrovia Park, continue on FS-078 as it turns to gravel and climbs to the top of the plateau. About 16 miles past Monrovia Park and .5 miles beyond the 23rd FS-068 junction, the road to Lower Box Creek Reservoir branches to the right.

Fishing, backpacking and camping are possible in the area. Usage is light. There are no recreational facilities at the reservoir, although there are pleasant groves of aspen for primitive camping. There are no Forest Service Campgrounds in the area, and the nearest private campgrounds are in Koosharem and Monroe.

Watershed Description

The reservoir is in an area of high, rolling ridges and valleys characteristic of the Sevier Plateau. The watershed high point, Monkey Flat Ridge, is 2,695 m (8,844 ft) above sea level, thereby developing a complex slope of 9.0% to the reservoir. Box Creek is the inflow and outlet for the reservoir. Upper Box Creek Reservoir, an upstream impoundment, is 0.5 miles up Box Creek from Lower Box Creek Reservoir. Above the reservoirs the average stream gradient is 8.4% (447 feet per mile).

The soil is largely of volcanic origin with moderate permeability and moderately slow erosion and runoff.

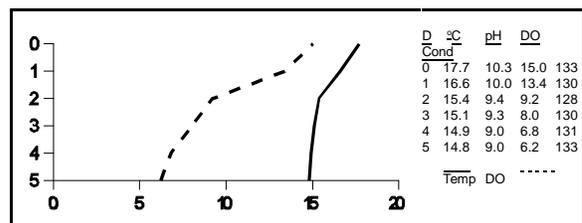
The vegetation communities are comprised of aspen, spruce-fir and sage-grass. The watershed receives 51 - 76 cm (20 - 30 inches) of precipitation annually with a frost-free season of 60 - 80 days at the reservoir.

Limnological Assessment

The water quality of Lower Box Reservoir is fair. It is considered to be soft with a hardness concentration value of approximately 65 mg/L (CaCO₃). The parameters that have exceeded State water quality standards for defined beneficial uses are phosphorus and pH. The average concentration of total phosphorus in the water column in 1992 was 128 ug/L which exceeds the recommended pollution indicator for phosphorus of 25 ug/L. The phosphorus concentration in the water column on August 5, 1992 reached a level of 191 ug/L. With these high concentrations of nutrients the reservoir develops extensive blue-green algal blooms indicative of poorer water quality. As indicated in the August 5 profile the pH concentration throughout the water column either is equal to or exceeds the criteria of 9.0. These high values are indicative of conditions that result from the high production of algae. During photosynthetic activity during the daytime pH values become elevated. The lakes shallow nature usually does not allow for stratification. This condition is also a result of late summer drawdown of the reservoir to meet downstream irrigation needs. Current data suggest

Limnological Data	
Data sampled from STORET site: 594562	
Surface Data	<u>1992</u>
Trophic Status	H
Chlorophyll TSI	85.76
Secchi Depth TSI	67.36
Phosphorous TSI	78.08
Average TSI	77.07
Chlorophyll <u>a</u> (ug/L)	276.7
Transparency (m)	0.6
Total Phosphorous (ug/L)	169
pH	10
Total Susp. Solids (mg/L)	14
Total Volatile Solids (mg/L)	13
Total Residual Solids (mg/L)	<3
Temperature (°C / °f)	17/63
Conductivity (umhos.cm)	141
Water Column Data	
Ammonia (mg/L)	0.05
Nitrate/Nitrite (mg/L)	0.10
Hardness (mg/L)	65.4
Alkalinity (mg/L)	75
Silica (mg/L)	22.2
Total Phosphorous (ug/L)	128
Miscellaneous Data	
Limiting Nutrient	N
DO (Mg/l) at 75% depth	7.1
Stratification (m)	0-2
Depth at Deepest Site (m)	5.0

that the reservoir is currently a nitrogen limited system. TSI values indicate the reservoir is highly eutrophic. It is one of the most eutrophic reservoirs in the State. The phosphorus concentrations are relatively high and are due in part to the grazing that occurs in the vicinity of the reservoir itself during summer and late fall. The waste products deposited on the shoreline when it is drawn down are readily incorporated into the water column through spring runoff and other episodic events. These nutrients are readily available for primary production. In addition dissolved oxygen concentrations may reach critical levels during the winter as the high amount of organic matter deposited on the bottom of the reservoir from high



LAKE REPORTS

production of algae during the summer. Macrophytes are typically not a problem, but they do develop in the western end of the lake in the inlet area later in the summer. According to DWR no fish kills have been reported in recent years. It should be noted that the reservoir can be drained late in the fall. The lake has not been treated for rough fish competition, so populations of native fishes may still be present in the lake. The DWR typically stocks Lower Box Creek Reservoir with 2,000 catchable rainbow trout (*Oncorhynchus mykiss*) and 1,500 fingerling brook trout (*Salvelinus fontinalis*).

boating and similar recreation (excluding swimming) (2B), cold water game fish and aquatic life (3A) and agriculture (4).

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

Species	Cell Volume (mm ³ /liter)	% Density By Volume
<i>Aphanizomenon flos-aquae</i>	116.2	99.79
<i>Microcystis aeruginosa</i>	.244	0.21
Total	116.448	
Shannon-Weaver [H']	0.02	
Species Evenness	0.02	
Species Richness	0.04	

The phytoplankton community is dominated by the presence of blue-green algae, indicative of highly euphotic conditions and poorer water quality.

Information	
Fish Lake National Forest (owners)	896-4491
Richfield Ranger District	896-4491
Koosharem Campground, Cafe	638-7310
Monroe Hot Springs Resort	527-4014
Six County Commissioners Association	896-9222
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146

Pollution Assessment

The only nonpoint source of pollution in Lower Box Creek Reservoir is sedimentation and nutrient loading from grazing in the watershed and in the vicinity of the reservoir. High numbers of cattle graze in the vicinity of the reservoir for part of the summer and fall.

There are no point pollution sources in the watershed.

Beneficial Use Classification

The state beneficial use classifications include:

LOWER BOX CREEK RESERVOIR