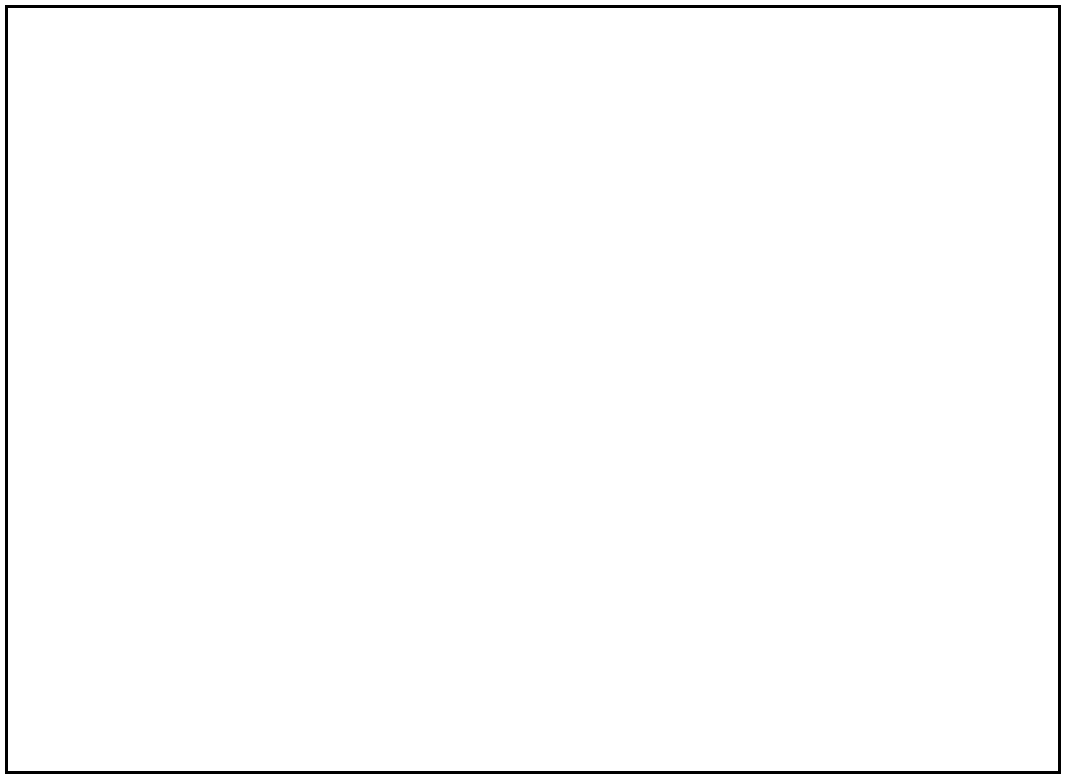
BIG LAKE



Introduction

Big Lake is southeast of Richfield on the Sevier Plateau. It is located in a remote, high elevation forest in a little-known part of the state. The area is popular for camping, hunting hiking and fishing. There are several other small lakes in the area.

Big Lake is a small, shallow natural lake in a high meadow. An earth-fill dam was built in 1979 to control water levels. 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 species of game fish and aquatic life, and agricultural needs.

Characteristics and Morphometry

Lake elevation (meters / feet)	2,845 / 9,331
Surface area (hectares / acres)	45 / 123
Watershed area (hectares / acres)	1,334 / 3,296
Volume (m^3 / acre-feet)	
capacity	1.2×10^6 / 950 + cons. pool
conservation pool	65 surface acres
Annual inflow (m^3 / acre-feet)	unknown
Retention time (years)	unknown
Drawdown (m^3 / acre-feet)	3 / 10
Depth (meters / feet)	unknown (10 feet + cons. pool)
Length (meters / feet)	1,650 / 5,400
Width (meters / feet)	470 / 1,530
Shoreline (km / miles)	4.1 / 2.6

Recreation

There are several other lakes of this name found in Utah, including one on the Aquarius Plateau one on Thousand Lake Mountain, and at least one in the Uintas, as well as Big East Lake in Payson Canyon. Big Lake is accessible from FS-068, the road between Annabella and Glenwood. From Annabella, head due east out of town (the

Location

County	Sevier
Longitude / Latitude	111 58 00 / 38 39 30
USGS Map	Water Creek Canyon, Utah, 1968
DeLormes Utah Atlas and Gazetteer	Page 37, D-4 - D-5
Cataloging Unit	Sevier River (16030002)

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road is unpaved) for 5 miles to a road on the right, which becomes FS-068 and goes to Big Lake. From Glenwood, go east out of downtown on the paved road, which bends south, turns to gravel, and reaches the junction with FS-068 after about 4 miles. Travel on FS-068 for about 9 miles to Big Lake, which is on the north side of the road. Good maps are recommended.

Fishing, boating, and camping are possible in the area. Usage is light.

There are no recreational facilities at the reservoir, although the area offers itself to primitive camping. If you camp, remember to haul out all of your garbage. There are no Forest Service Campgrounds in the area, and the nearest private campground is in Richfield.

Watershed Description

The reservoir is in an area of high, rolling ridges and valleys characteristic of the top of the Sevier Plateau. The area is not densely forested, but has good timber growing on north-facing slopes. The area immediately around the reservoir has sage-grass vegetation with some dense forest nearby. The lake is drawn down in the summer, but a large, shallow pool remains intact.

The watershed high point, Glenwood Mountain, is 3,338 m (10,954 ft) above sea level, thereby developing a complex slope of 11.4% to the reservoir. The inflow and outflow is Water Canyon Creek, and the average stream gradient above the reservoir is 5.5% (290 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 sage-grass, pine, aspen, spruce-fir, oak and maple. The watershed receives 51 - 76 cm (20 - 30 inches) of precipitation annually with a frost-free season of 60 - 80 days at the reservoir.

Land use in the watershed is almost 100% multiple use on national forest land, with Section 17 north of Red Pine Ridge being privately owned rangeland.

Limnological Assessment

The water quality of Big Lake is good. The water is considered soft with a total hardness concentration of 23 mg/L. The only parameter that exceeds State standards is phosphorus. Total inorganic nitrogen concentration are below the minimum detectable limits giving nitrogen/phosphorus ratios indicative of a nitrogen limited system. The reservoir is classified as hypereutrophic with an average TSI value of 64.03. The TSI evaluation for transparency is misleading since the index is not representative of a true secchi depth, but represents the maximum depth of the reservoir during the sampling period. The reservoir was monitored for the first time in 1992 during drought conditions. Under these circumstances very little water was in the reservoir during the year. For a complete understanding of the reservoir limnology and the water quality conditions of the reservoir addition monitoring will need to be conducted before a proper evaluation can be determined. No profile data is included due to the lack of depth during sampling. According to DWR the reservoir has critical anoxic conditions during the winter due to oxygen demand, low water and an extended winter period.

Limnological Data

Data sampled from STORET site: 594461

Surface Data	1992
Trophic Status	H
Chlorophyll TSI	55.30
Secchi Depth TSI	65.14
Phosphorous TSI	66.97
Average TSI	62.47
Chlorophyll a (ug/L)	12.4
Transparency (m)	0.7
Total Phosphorous (ug/L)	78
pH	8.6
Total Susp. Solids (mg/L)	3.5
Total Volatile Solids (mg/L)	2
Total Residual Solids (mg/L)	2
Temperature (°C / °f)	17/63
Conductivity (umhos.cm)	34
Water Column Data	
Ammonia (mg/L)	0.03
Nitrate/Nitrite (mg/L)	0.01
Hardness (mg/L)	22.6
Alkalinity (mg/L)	25
Silica (mg/L)	0.5
Total Phosphorous (ug/L)	78
Miscellaneous Data	
DO (Mg/l) at 75% depth	8.4
Stratification (m)	NO
Limiting Nutrient	N
Depth at Deepest Site (m)	0.6

It appears that the DWR stock Big Lake with 5000 catchable rainbow trout (*Oncorhynchus mykiss*) annually. The lake has not been treated by the DWR for rough fish control, so native fish populations may still be present.

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

Species	Cell Volume (mm^3/liter)	% Density By Volume
Aphanocapsa pulchra	500.400	40.25

Anabaena spiroides var. *crassa*	442.353	35.58
Gloeotrichia echinulata	278.000	22.36
Aphanizomenon flos-aquae		12. 9 9 4 1.05
Sphaerocystis schroeteri	5.282	0.42
Botryococcus braunii	2.224	0.18
Anabaena sp.	0.556	0.04
Coelastrum sp.	0.556	0.04
Staurastrum sp.	0.500	0.04
Cosmarium sp.	0.156	0.01
Euglena sp.	0.041	0.00
Pennate diatoms	0.031	0.00
Ankistrodesmus falcatus	0.013	0.00
Scenedesmus bijuga	0.011	0.00
Oocystis sp.	0.008	0.00
Centric diatoms	0.007	0.00
Oscillatoria sp.	0.006	0.00
Merismopedia tenuissima		0. 0 0 5 0.00
Ankyra judayi	0.003	0.00
Total	1,242.587	
Shannon-Weaver [H']	1.16	
Species Evenness	0.40	
Species Richness	.65	

It appears that the lake is dominated by blue-green algal species. The four leading species are all blue-greens and comprise 99.2% of the density by volume.

Pollution Assessment

The only nonpoint source of pollution in Big Lake is sedimentation and nutrient loading and potential pathogens from grazing in the watershed and the immediate vicinity of the reservoir.

There are no point pollution sources in 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).

Water quality is sufficient to sustain current water use.

Information

Management Agencies	
Fish Lake National Forest	896-4491
Richfield Ranger District	896-4491
Six County AOG	896-9222
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146
Recreation	
Richfield KOA	896-6674
Reservoir Administrators	
Big Lake Irrigation Company	896-6596