

## MIRROR LAKE



### Introduction

Mirror Lake is an intermediate-sized natural lake in the western High Uintas. Biologically and geologically it is comparable to numerous other glacial lakes in the High Uintas. It is unique in the fact that a paved road has been built to it, therefore it receives extensive recreational use. Consequently, Utahns are more familiar with Mirror Lake

than perhaps any other natural mountain lake in the state. Due to the accessibility, the Forest Service has extensively developed the area for recreational uses. The shoreline is owned by the Wasatch-Cache National Forest, and public access is unrestricted. The lake drainage is the extreme headwaters of the Duchesne River and is not regulated by man.

#### Characteristics and Morphometry

Lake elevation (meters / feet)	3,045 / 10,020
Surface area (hectares / acres)	20 / 50
Watershed area (hectares / acres)	203 / 502
Volume (m <sup>3</sup> / acre-feet)	
capacity	863,451 / 700
conservation pool	0
Annual inflow (m <sup>3</sup> / acre-feet)	
Retention time (years)	
Drawdown (m <sup>3</sup> / acre-feet)	
Depth (meters / feet)	
maximum	12.5 / 41
mean	4.3 / 14
Length (meters / feet)	777 / 2,550
Width (meters / feet)	389 / 1,275
Shoreline (km / miles)	2.12 / 1.32

#### Location

County	Duchesne
Longitude / Latitude	110 53 13 / 40 42 18
USGS Map	Mirror Lake, UT 1972
DeLorme's Utah Atlas & Gazetteer™	Page 54, B-3
Cataloging Unit	Duchesne (16060003)

### Recreation

Mirror Lake is easily accessible from U-150 about 31 miles east of Kamas. The highway passes very near the lake, and is often referred to as "The Mirror Lake Highway". There is a USFS campground directly on the lake, and many

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others in the vicinity. Large signs on U-150 direct travelers to the lake.

Fishing, boating, swimming, camping, picnicking, scenic beauty and hiking are all popular. Motorized boats are prohibited. Except for a few warm days in the late summer, air and water are too cold for swimming. The backdrop of high, barren peaks are reflected in the still water of the lake, hence its name.

The area receives heavy recreational use throughout the summer, so please tread lightly to ensure that the area remains relatively pristine. U-150 is closed during the winter and much of the spring, but groomed for use by cross country skiers, snowmobilers and hikers.

Recreational facilities at the lake include Mirror Lake Campground, with latrines, day-use areas and 94 campsites.



### Watershed Description

Mirror Lake is located in the western end of the High Uintas. The watershed is quite small, and consists of dense forest, smaller lakes, boggy meadows, and barren, rugged mountain peaks. U-150 passes through the watershed, but water chemistry does not seem to be

significantly effected by transportation activity.

The watershed high point, Bald Mountain, 3,640 m (11,943 ft) above sea level is directly to the west of the lake, thereby developing a complex slope of 49.1% to the reservoir. There are no perennial streams flowing into the lake, but because of the high elevation, snowmelt runoff flows for most of the summer. The water that enters the lake is overflow from Pass Lake located just above Mirror Lake. The outflow is the headwaters of the Duchesne River.

The watershed is made up of high mountains and mountains meadows. The soil associations that compose the watershed are listed in Appendix III.

The vegetation communities consist of Pine, oak, maple, spruce-fir and aspen. The watershed receives 76 - 102 cm (30 - 40 inches) of precipitation annually. The frost-free season around the reservoir is 0 - 20 days per year.

Land use in the watershed is 100% multiple use, with grazing, and recreation being the primary uses. No commercial timber harvesting takes place, but the intensity of summer recreation has some impact on the water quality. This may become a significant problem as usage increases.

### Limnological Assessment

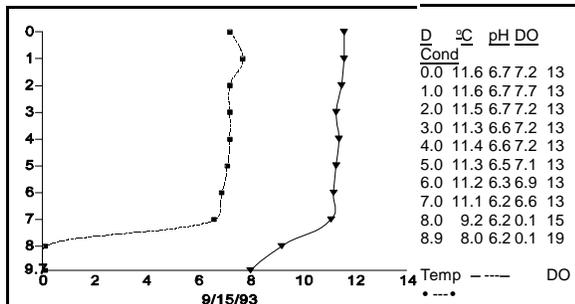
The water quality of Mirror Lake is very good. It is considered to be very soft with a hardness concentration value of approximately 7 mg/L (CaCO<sub>3</sub>). Although there are no overall water column concentrations that exceed State water quality standards there are reported violations of parameters near the bottom of the lake or sporadically through the water column on occasion. These parameters include phosphorus, dissolved oxygen and pH. At various times of the year the hypolimnion of the lake the oxygen deficiencies develop. These occurrences as indicated during the September 15, 1993 profile show anoxic conditions near the bottom of the lake later in the year. Total phosphorus values reported on a rare occasion exceed the pollution indicator of 25 ug/L. However, as a general rule the overall concentration of phosphorus is rather low in the lake. The pH values have dipped to a low of 5.8 on occasion which is only a little under the limit of 6.5 established for a cold water fishery. Although these exceedences have occurred, it does not appear that the water quality is significantly impaired. It does indicate that some winter monitoring should be conducted to determine if impairments are present during extended ice coverage conditions during the winter. The potential for stratification in the lake does occur when there is sufficient depth in the lake. Although the profile shown of September 15, 1993 does show some limited stratification near the bottom of the lake, thermoclines higher in the water column have been documented earlier in the year at other times. As stratified conditions develop they will contribute to the

LAKE REPORTS

Limnological Data			
Data sampled from STORET site: 593605			
Surface Data	1981	1989	1991
Trophic Status	M	O	O
Chlorophyll TSI	-	37.64	38.33
Secchi Depth TSI	41.8	38.01	44.91
Phosphorous TSI	47.3	39.04	36.60
Average TSI	44.5	38.23	39.95
Chlorophyll <i>a</i> (ug/L)	-	2.1	2.2
Transparency (m)	2.5	4.6	2.9
Total Phosphorous (ug/L)	20	11	10
pH	6.2	6.3	7.8
Total Susp. Solids (mg/L)	<5	-	<3
Total Volatile Solids (mg/L)	-	-	4
Total Residual Solids (mg/L)	-	-	1
Temperature (°C / °f)	15/59	12/53	14/56
Conductivity (umhos.cm)	11	21	11
Water Column Data			
Ammonia (mg/L)	0.05	<0.05	0.03
Nitrate/Nitrite (mg/L)	0.07	-	0.01
Hardness (mg/L)	7	-	7.5
Alkalinity (mg/L)	2	-	5
Silica (mg/L)	-	-	1.0
Total Phosphorous (ug/L)	20	12	14
Miscellaneous Data			
Limiting Nutrient	N	N	N
DO (Mg/l) at 75% depth	7.2	4.7	4.4
Stratification (m)	2	7-9	NO
Depth at Deepest Site (m)	9	10.1	8.6

process of oxygen loss as previously discussed. Current data suggest that the reservoir is currently a nitrogen limited system. TSI values indicate the reservoir is oligotrophic in a state of low productivity.

According to DWR no fish kills have been reported in recent years. The reservoir supports a population of brook trout (*Salvelinus fontinalis*), rainbow and albino rainbow trout (*Oncorhynchus mykiss*). The lake has not been treated for rough fish competition, so populations of native fishes may still be present in the lake. The DWR stocks the lake annually with 7,000 catchable rainbow trout,



4,200 albino rainbow trout and 7,500 fingerling brook trout. Phytoplankton in the euphotic zone include the following taxa (in order of dominance)

Species	Cell Volume (mm <sup>3</sup> /liter)	% Density By Volume
<i>Peridinium sp.</i>	0.727	43.61
Pennate diatoms	0.683	41.01
Dinobryon sp.	0.085	5.14
Centric diatoms	0.063	3.80
<i>Oocystis sp.</i>	0.058	3.50
<i>Merismopedia sp.</i>	0.044	2.67
<i>Chlamydomonas sp.</i>	0.004	0.27
<b>Total</b>	<b>1.664</b>	
Shannon-Weaver [H']	1.23	
Species Evenness	0.63	
Species Richness	0.29	

The phytoplankton community is dominated by the presence of flagellates and diatoms indicative of good water quality and fairly low productivity.

**Pollution Assessment**

Nonpoint pollution sources include sedimentation and nutrient loading from grazing, and litter or waste from recreation.

There are no point sources of pollution 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).

Information	
<b>Management Agencies</b>	
Uinta Basin Association of Governments	722-4518
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146
Wasatch-Cache National Forest	524-5030
Kamas Ranger District	783-4338
<b>Recreation</b>	
Dinosaurland Travel Region (Vernal)	789-6932

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