

HOOP LAKE



Introduction

Hoop Lake is a natural lake on the north slope of the High Uintas. The lake level has been augmented by construction of a dam, and the watershed has been enlarged by a diversion from Thompson Creek. The lake receives heavy use by anglers.

Hoop Lake is a result of glacial moraine impounding the natural drainage of the area. The original lake was 11 feet deep. In 1939, an earth-fill dam was built at the outlet, and in 1948 it was enlarged, raising water level a total of 25 feet. The reservoir shoreline is owned by the Wasatch-Cache National Forest, and public access is unrestricted. Reservoir water is used for irrigation in the McKinnon area of Wyoming (northwest of Manila, UT). The impounded water is drained off before mid-summer for agricultural purposes, but the 11 foot deep original lake remains. Water use is not expected to change in the foreseeable future.

Characteristics and Morphometry

Lake elevation (meters / feet)	2,802 / 9,194
Surface area (hectares / acres)	74.9 / 185.0
Watershed area (hectares / acres)	2,364 / 5842
Volume (m ³ / acre-feet)	
capacity	6,584,220 / 5,340
conservation pool (original lake)	665,820 / 540
Annual inflow (m ³ / acre-feet)	
Retention time (years)	<1
Drawdown (m ³ / acre-feet)	7.6 / 25
Depth (meters / feet)	
maximum	11 / 36
mean	9 / 29
Length (meters / feet)	1,200 / 4,000
Width (meters / feet)	1,100 / 3,600
Shoreline (meters / feet)	3,700 / 12,000

Location

County	Summit
Longitude / Latitude	110 07 02 / 40 55 20
USGS Map	Hoop Lake, UT/WY 1967
DeLorme's Utah Atlas & Gazetteer™	Page 56, A-1
Cataloging Unit	Green River/Flaming Gorge (14040106)

Recreation

Hoop Lake is accessible from Lonetree, Wyoming.

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Approximately 1.5 miles east of Lonetree, turn south on the Cedar Basin Road to the national forest. A point of interest along the way is "Hole in the Rock". Travel approximately 7 miles to the intersection of FS-058. Continue southward approximately 3-4 miles past "Hole in the Rock", to the reservoir.

Recreational facilities at Hoop Lake Campground, a USFS facility, include toilet facilities, picnic areas, a swimming area and 44 campsites. Fishing, boating, swimming, camping, picnicking, and hiking are all possible. While there are no launching facilities, it is generally possible to launch a small boat. Angler use is heavy. User fees are charged.



Watershed Description

Hoop Lake is located on the north slope of the High Uintas. The watershed consists primarily of alpine meadows, coniferous forests and alpine tundra.

Slopes vary from 15% to 58%, and average 17%. Thompson Creek is a tributary of Burnt Fork. Numerous small lakes are in the headwaters of Thompson Creek and on top of Burnt Ridge.

The watershed high point, North Burro Peak, is 3,867 m (12,686 ft) above sea level, thereby developing a complex slope of 11.4% to the reservoir. The average stream gradient of Thompson Creek is 7.3% (375 feet per mile). The inflows are the diversion from Thompson Creek, the diversion of the unnamed stream to the west, and an ephemeral stream from Burnt Ridge. Water is transported via a canal from Thompson Creek. The canal has only minimal slope for much of its length, but races down the hillside as it is released into the lake. This has caused substantial erosion over the years, but the hillside has now stabilized itself. The outflow is East Fork Beaver Creek.

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

The vegetation communities consist of alpine, spruce-fir, oak, maple, pine, aspen, and grassy meadows. The watershed receives 51 - 102 cm (20 - 40 inches) of precipitation annually. The frost-free season around the reservoir is 20 - 40 days per year.

Land use in the watershed is 100% multiple use, with grazing, logging, and human recreation being the primary uses. Much of the watershed has been harvested for trees, and there are still active timber sales in the area.

Limnological Assessment

The water quality of Hoop Lake is good. It is considered to be very soft with a hardness concentration range of 12-16 mg/L (CaCO₃). The parameters monitored that have exceeded State water quality standards for defined beneficial uses are phosphorus, iron, dissolved oxygen and pH. The reported exceedences for pH and dissolved oxygen occur during periods of high algal production or near the bottom of the lake respectively. This is not atypical and overall do not impact the defined beneficial uses severely. The average concentration of total phosphorus in the water column is usually within defined limits, however in June, 1989 it averaged 42 ug/L.

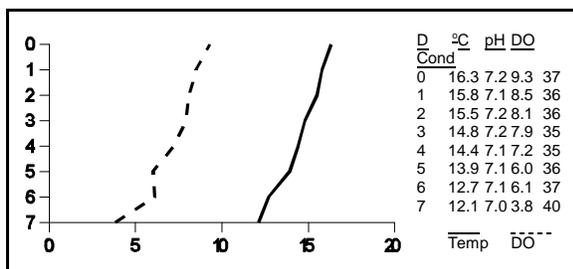
Limnological Data

Data sampled from STORET site: 593837

Surface Data	1981	1989	1991
Trophic Status	E	E	M
Chlorophyll TSI	-	61.69	48.96
Secchi Depth TSI	60	57.08	56.78
Phosphorous TSI	53.2	53.54	43.66
Average TSI	56.6	57.44	49.80
Chlorophyll <i>a</i> (ug/L)	-	23.8	6.5
Transparency (m)	-	1.2	1.3
Total Phosphorous (ug/L)	30	31	16
pH	6.8	8.0	7.3
Total Susp. Solids (mg/L)	<5	-	<3
Total Volatile Solids (mg/L)	-	-	7
Total Residual Solids (mg/L)	-	-	2
Temperature (°C / °f)	16/61	14/57	15/58
Conductivity (umhos.cm)	32	43	34
Water Column Data			
Ammonia (mg/L)	0.05	0.02	0.04
Nitrate/Nitrite (mg/L)	.21	-	0.05
Hardness (mg/L)	16	-	12
Alkalinity (mg/L)	11	-	19
Silica (mg/L)	-	-	6.4
Total Phosphorus (ug/L)	35	22	31
Miscellaneous Data			
Limiting Nutrient	N	N	N
DO (Mg/l) at 75% depth	6.5	8.8	6.0
Stratification (m)	3-4	NO	5-6
Depth at Deepest Site (m)	5	4.1	7

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This is well above the State's pollution indicator of 25 ug/L. Although only half of the samples exceeded the standard, the mean value reported for iron was 1.095 mg/L which is above the established standard for iron of 1.0 mg/L. Metal samples were taken near the bottom of the lake where it is expected to reach a maximum concentration. Concentration may be affected by the concentration of dissolved oxygen, resuspension of materials and turbidity that may be present in the samples. Even though there are reported exceedences it appears that they is no impairment to the defined beneficial uses. A review of the September 4, 1991 profiles indicates there is a weak stratification of the lake with a thermocline developing at the 5-6 meters depth. Although this may present some problems with a decline in the dissolved oxygen concentration near the bottom it is probably short lived due to the shallow nature of the lake and the potential for mixing due to wind and wave action. There have been no reported fish kills at Hoop Lake. No winter sampling has been conducted to evaluate the extent of anoxic conditions that may exist during ice coverage. The lake is a nitrogen limited system with TSI values indicating the lake is a eutrophic lake. According to DWR principle macrophytes present in the lake include: *Sparganium*, *Carex*, *Scirpus*, *Polygonium*, *Isoetes* (submergent), and *Polygonium* (submergent). The present fishery includes brook trout (*Salvelinus fontinalis*), cutthroat trout (*Oncorhynchus clarki*), rainbow trout (*Oncorhynchus mykiss*) and suckers (Catastomidae). DWR annually stocks catchable and fingerling rainbow trout. Some years the reservoir does not fill up and an indeterminate amount of water is diverted from Thompson Creek until midsummer.



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>	3.6	9.7
Spherical green alga	0.111	2.83
<i>Trachelomonas sp.</i>	0.055	1.42
<i>Oocystis sp.</i>	0.033	0.85
<i>Dinobryon divergens</i>	0.010	0.27

Pennate diatoms	0.007	0.17
Centric diatoms	0.006	0.16
<i>Ankistrodesmus falcatus</i>	0.004	0.11

Total 3.923

Shannon-Weaver [H']	0.30
Species Evenness	0.15
Species Richness [d]	0.32

The phytoplankton community is dominated by the presence of blue-green algae. This is indicative of water that is eutrophic and nitrogen limited.

Information	
Management Agencies	
Mountainlands Association of Governments	377-2262
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146
Wasatch-Cache National Forest	524-5030
Mountain Home Ranger District	307-782-6555
Recreation	
Mountainlands Travel Region (Provo)	377-2262
Reservoir Administrators	
Hoop Lake Reservoir and Irrigation Company	801-874-6197

Pollution Assessment

Nonpoint pollution sources include logging, recreation and grazing.

Grazing takes place throughout the watershed and in the vicinity of the reservoir.

Much of the watershed has been harvested for trees in recent history, exposing the soil and creating conditions for increased erosion. A timber sale is currently proposed for Kabell Ridge, some of which is probably in the Hoop Lake Watershed.

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).

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