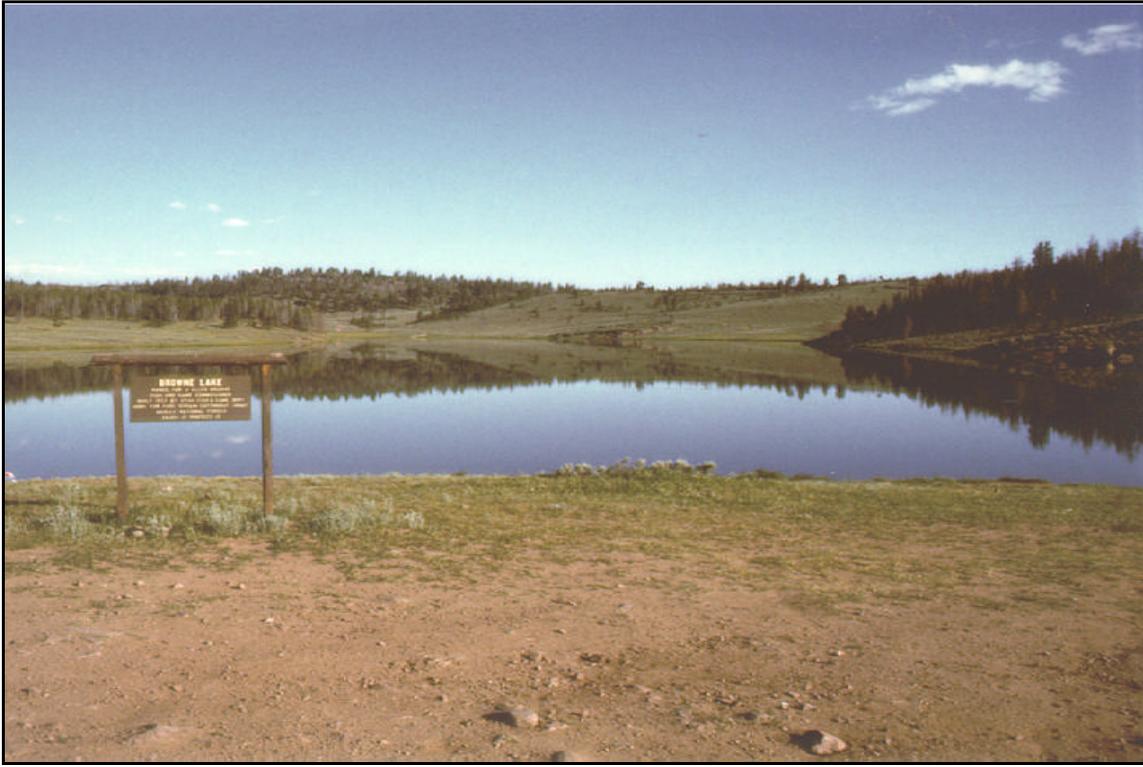


BROWNE LAKE



Introduction

Browne Lake (pronounced "Brownie") is a small stabilized lake on the north slope of the eastern High Uintas.

Characteristics and Morphometry

Lake elevation (meters / feet)	2,526 / 8,289
Surface area (hectares / acres)	21.9 / 54
Watershed area (hectares / acres)	7,555 / 18,668
Volume (m ³ / acre-feet)	
capacity	792,000 / 642
conservation pool	none
Annual inflow (m ³ / acre-feet)	
Retention time (years)	
Drawdown (m ³ / acre-feet)	
Depth (meters / feet)	
maximum	7.6 / 25
mean	3.7 / 12
Length (meters / feet)	914 / 3,000
Width (meters / feet)	244 / 800
Shoreline (km / miles)	2.23 / 1.4

It is owned and maintained by the state of Utah to provide recreational fishing. It is also known as Browne Reservoir or Brownie Lake. It lies at the top of Carter Creek Gorge, one of the tributaries to Flaming Gorge. A Forest Service

Campground, good fishing, and a trail head to Leidy Peak make this a popular summer recreation area.

It is an artificial lake, impounding Beaver Creek in a mid-elevation meadow. The Lake was created as a reservoir for irrigational use, storing spring runoff for agricultural use in the summer. The Utah DWR acquired the lake in 1958 to provide a permanent stabilized body of water for purely recreational use. The shoreline is owned by the Ashley National Forest, and public access is unrestricted. No changes in water use are foreseen.

Location

County	Daggett
Longitude / Latitude	109 / 40
USGS Map	Leidy Peak, 1963
DeLorme's Utah Atlas & Gazetteer™	Page 56, B-2
Cataloging Unit	Flaming Gorge (14040106)

Recreation

Browne Lake is on the north slope road of the Uintas, about 10 miles west of U-44. From near milepost 15 on U-

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44, turn west on the Sheep Creek Geologic Loop. A sign says "Browne Lake 10". Follow the Sheep Creek Road for three miles, then turn west again on a gravel road also signed to Browne Lake. This is the North Slope Road. Follow it for five miles to the turnoff to Browne Lake on the left. The lake is two miles south on this road.

The lake is maintained solely as a fishery. There is no improved boat ramp, but the campground has privies, drinking water, picnic areas and charges user fees. Vehicular access to the lake is possible and smaller boats can be launched from an unimproved dirt boat ramp. It is an excellent trail head for hiking in the eastern Uintas, where glaciers have cut huge cirques out of the ridge line of the Uintas, creating an ice cream scoop effect. Ute Mountain Lookout Tower is off Sheep Creek Road and offers splendid views of the lake and the watershed.



Watershed Description

Browne Lake is an impoundment of a mid-elevation meadow in the north slope of the eastern Uintas. The lake itself lies outside the reach of Pleistocene glaciation, but its watershed includes cirques and dozens of morainal lakes. The area around the lake is a meadow with sage-grass vegetation and a few rock outcroppings, but coniferous forest covers most of the watershed. Much of the forest was burned in 1985, and has been slow to grow back. To the south, barren peaks rise above the forest. The lookout tower offers a good view of the region.

The Sheep Creek Canal diverts much of the runoff out of the Browne Lake watershed into Long Park Reservoir for agricultural use. This canal is at about the 9,100' level and collects much of the runoff from above this elevation.

Beaver Creek, the primary tributary to Browne Lake, enters the Sheep Creek Canal. The same amount of water is released back into the Beaver Creek drainage. Due to mixing, the Browne Lake watershed includes the Sheep Creek Canal watershed upstream from Beaver Creek, with only a small fraction of the water diverted back into the

Beaver Creek drainage.

The watershed headwaters are in the eastern Uintas, clearly visible to the south. The high point, an unnamed peak two miles west of Leidy Peak, is 3,680 m (12,074 ft) above sea level, thereby developing a complex slope of 9.6% to the lake. The average stream gradient of Beaver Creek is 5.1% (270 feet per mile). The inflow and outflow are Beaver Creek and Weyman Creek. Weyman Creek has been diverted by the Sheep Creek Canal, but runoff into the lower reaches drains into the lake. Sheep Creek Lake is an upstream impoundment of Sheep Creek Canal water that flows into Beaver Creek. It is also a stabilized lake that is not drawn down for irrigational use.

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

The vegetation communities consist of spruce-fir, pine, and aspen. The watershed receives 51 - 76 cm (20 - 30 inches) of precipitation annually. The frost-free season around the reservoir is 40 - 60 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 burned in the 1985 Lyman Fire. The area was subsequently logged to salvage the burned timber. Some salvaging operations are still occurring.

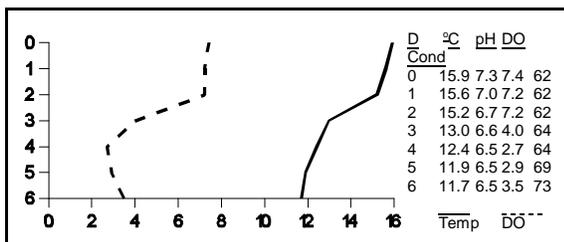
Limnological Assessment

The water quality of Browne Reservoir is very good. It is considered to be soft with a hardness concentration value of approximately 25 mg/L (CaCO₃). The only parameter that has exceeded State water quality standards for defined beneficial uses is phosphorus. The average concentration of total phosphorus in the water column in 1981 and 1991 was 32.5 and 31.4 ug/L which exceeds the recommended pollution indicator for phosphorus of 25 ug/L. The phosphorus concentration in the hypolimnion in September, 1991 reached a level of 113 ug/L. This increased concentration occurred when the reservoir was stratified, however anoxic conditions were not present near the bottom. Dissolved oxygen concentrations in late summer substantiate the fact that water quality impairments do exist. Concentrations dropped dramatically below the thermocline to approximately 3.0 mg/L. Although in 1981 the reservoir was characterized as a phosphorus limited system, the 1989-91 data suggest that the reservoir is currently a nitrogen limited system. TSI values indicate the reservoir is mesotrophic. The phosphorus concentrations in 1989 appear to be abnormally low (5.9 ug/L) and have shifted the overall TSI index to the low mesotrophic range. It does not appear that there has been a significant rise in the concentrations of nutrients in the lake since it was

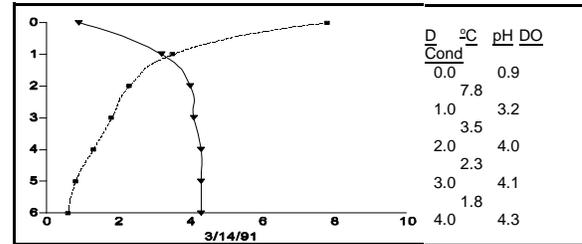
LAKE REPORTS

Limnological Data			
Data sampled from STORET site: 593792			
Surface Data	1981	1989	1991
Trophic Status	M	M	M
Chlorophyll TSI	-	48.50	54.39
Secchi Depth TSI	51.9	45.69	42.16
Phosphorous TSI	46.9	26.61	39.37
Average TSI	49.4	40.27	45.31
Chlorophyll <i>a</i> (ug/L)	-	6.2	11.3
Transparency (m)	2.0	2.7	3.45
Total Phosphorous (ug/L)	30	5	12
pH	7.1	8	7.2
Total Susp. Solids (mg/L)	<5		5
Total Volatile Solids (mg/L)	-		3
Total Residual Solids (mg/L)	-		3
Temperature (°C / °f)	16/61	14/57	15/58
Conductivity (umhos.cm)	61	86	66
Water Column Data			
Ammonia (mg/L)	0.05	0.013	0.03
Nitrate/Nitrite (mg/L)	0.2	-	0.01
Hardness (mg/L)	28	-	25
Alkalinity (mg/L)	27	-	26
Silica (mg/L)	-	-	9.2
Total Phosphorus (ug/L)	30	6	31
Miscellaneous Data			
DO (Mg/l) at 75% depth	6.6	1.8	2.8
Stratification (m)	2-4	NO	2-3
Limiting Nutrient	N	N	N
Depth at Deepest Site (m)	6	8.0	6.0

originally surveyed in 1981. In fact the concentration may have declined specifically the nitrogen species. The reservoir was stratified during a summer monitoring trip was in June, 1981 and September, 1991. Both periods were characterized with a thermocline developed at a depth of 2-3 meters. On the September 5, 1991 profile, consistent with the stratification there was a noticeable decline in the concentration of dissolved oxygen in the water column. These conditions are deleterious to the fishery rendered approximately 1/2 of the water column unsuitable for a fishery. In addition dissolved oxygen concentrations at time have reached a critical state during the winter period for fish. The reservoir was surveyed on



March 13, 1991 and near anoxic conditions were found present in the lower depths of the water column. Concentrations of dissolved oxygen at the surface were 7.8 mg/L but dropped to 3.5 mg/L at 1 meter and reached a low of 0.6 mg/L at the bottom (6 meters). Water temperature at that time was relatively uniform near 4.3 degrees C throughout the water column.



According to DWR no fish kills have been reported in recent years. The reservoir supports populations of brook trout (*Salvelinus fontinalis*), rainbow trout (*Oncorhynchus mykiss*), cutthroat trout (*Oncorhynchus clarki*), and sculpins (*Cottus sp.*). Brook trout up to 5 pounds have been reported from Browne Reservoir.

Since the lake was acquired by the DWR and water levels stabilized, the riparian vegetation has become established along the shore, with a thin band of grass and sedges being the colonizing species. Eventually more riparian vegetation may provide significantly improved habitat for aquatic organisms.

The lake has not been treated for rough fish competition, so 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
<i>Anabaena spiroides v. crassa</i>	2.891	32.32
<i>Sphaerocystis schroeteri</i>	2.641	29.53
<i>Fragilaria crotonensis</i>	1.832	20.49
<i>Trachelomonas sp.</i>	1.334	14.92
<i>Cosmarium sp.</i>	0.078	0.88
<i>Chlamydomonas globosa</i>	0.038	0.38
<i>Oocystis sp.</i>	0.033	0.37
Pennate diatoms	0.030	0.34
<i>Asterionella formosa</i>	0.019	0.21
<i>Melosira granulata angustissima</i>	0.016	0.19
Centric diatoms	0.015	0.18
<i>Microcystis incerta</i>	0.011	0.12

<i>Mallomonas sp.</i>	0.007	0.07
Total	8.939	
Shannon-Weaver [H']	1.49	
Species Evenness	0.58	
Species Richness	0.53	

As observed the algal community is dominated by algae and diatom species that are indicative of more eutrophic conditions as supported by the trophic state index.

Pollution Assessment

Nonpoint pollution sources include grazing, recreation, and logging.

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

The fire may have caused some short-term increases in sediment production, but earlier logging operations probably caused more substantial damage. The damage has been largely healed.

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	
Management Agencies	
Uinta Basin Association of Governments	722-4518
Division of Wildlife Resources	789-3103
Division of Water Quality	538-6146
Ashley National Forest	789-1181
Flaming Gorge Ranger District	784-3445
Recreation	
Dinosaurland Travel Region (Vernal)	789-6932
Manila Chamber of Commerce	784-3395
Reservoir Administrators	
Division of Wildlife Resources, Fisheries Management	538-4812