Introduction

Bridger Lake sits in a glacial valley on the north slope of the Uinta Mountains. It is a small, natural impoundment, formed by a dam of lateral moraine in the Smith's Fork valley. It is in a cluster of four lakes and reservoirs just south of the Wyoming state line (Bridger Lake, Marsh Lake, and China Lake.)

The reservoir shoreline is 100% publicly owned by the Wasatch-Cache National Forest. Public access is unrestricted. Water is used for recreation and cold water aquatic life. The passage of water through the lake is unregulated by man, but water that flows through it is later stored in Stateline Reservoir and used for agricultural purpose in Wyoming.

Characteristics and Morphometry

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevation (meters / feet)</td>
<td>2,854 / 9,364</td>
</tr>
<tr>
<td>Surface area (hectares / acres)</td>
<td>8.5 / 21</td>
</tr>
<tr>
<td>Watershed area (hectares / acres)</td>
<td></td>
</tr>
<tr>
<td>Volume (m$^3$ / acre-feet)</td>
<td>337,000/273</td>
</tr>
<tr>
<td>Capacity</td>
<td></td>
</tr>
<tr>
<td>Conservation pool</td>
<td>not measured</td>
</tr>
<tr>
<td>Annual inflow (m$^3$ / acre-feet)</td>
<td></td>
</tr>
<tr>
<td>Retention time (years)</td>
<td></td>
</tr>
<tr>
<td>Depth (meters / feet)</td>
<td></td>
</tr>
<tr>
<td>maximum</td>
<td>5 / 15</td>
</tr>
<tr>
<td>mean</td>
<td>4 / 13</td>
</tr>
<tr>
<td>Length (meters / feet)</td>
<td>671 / 2,200</td>
</tr>
<tr>
<td>Width (meters / feet)</td>
<td>213 / 700</td>
</tr>
<tr>
<td>Shoreline (meters / feet)</td>
<td>1,280 / 4,200</td>
</tr>
</tbody>
</table>

Location

<table>
<thead>
<tr>
<th>County</th>
<th>Summit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longitude / Latitude</td>
<td>110 23 09 / 40 57 46</td>
</tr>
<tr>
<td>USGS Map</td>
<td>Bridger Lake, UT / WY 1967</td>
</tr>
<tr>
<td>DeLorme’s Utah Atlas and Gazetteer™</td>
<td>Page 55, A-5</td>
</tr>
<tr>
<td>Cataloging Unit</td>
<td>Black's Fork (1404017)</td>
</tr>
</tbody>
</table>

Recreation

Bridger Lake is in the Smith’s Fork drainage, 30 miles east of U-150 on the North Slope Road (FS-058). It is a...
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accessible from Mountain View, Wyoming. Go south from
Mountain View on the paved road towards Robertson (not
towards Lonetree). At the second 90° bend to the west
(about 5 miles from Mountain View), leave the highway,
continuing south on a gravel road that becomes FS-072.

Bridger Lake is 2 miles south of the Wyoming State
Line. The lake is 1/2 mile south of the turnoff to Stateline
Reservoir. Located at the lake are the Bridger Lake Guard
Station and the Bridger Lake Campground on the west
shore. The route to the lake is well marked.

The lake offers fishing, boating and some degree of
solitude. The area is noted for good moose habitat with
frequent observations noted. The water is too cold for
most swimmers. Fishing is popular, and there is a
concrete boat ramp for launching small boats. It should
be noted that there is a 5 hp restriction on motors used on
this small lake.

Bridger Lake Campground, administered by the
Forest Service, has recently been refurbished (1993). It
has 30 campsites, each with a fire pit, barbeque grills, and
drinking water. There are two vault toilets, and two of the
campsites have been developed with cement pads with a
concrete pathway to the restroom facilities for those
individuals with special needs. Reservations can be made
through Biospherics, the new national reservation system
for camping in National Forest camp areas. User fees are
charged. There are several other USFS campgrounds in
the vicinity, including Stateline, Trail Head, Marsh Lake,
China Meadows, and Smiths Fork Trail Head. This area
provides access to the popular High Uinta Wilderness, so
campgrounds are heavily used in the summer.

Watershed Description

Bridger Lake is on the east side of the valley floor.
The valley is about two miles wide and 800' deep. The
lake's watershed is a portion of the glacial valley floor,
about one mile wide and four miles long, stretching due
south from the lake. There is a perennial stream flowing
down the watershed, and several smaller glacial lakes
near the top. The entire watershed consists of glacial
valley floor that has been separated from the river by a
long lateral moraine. (The China Lake report has a
complete description of the process of glaciation.)

The watershed high point, a point two miles
southwest of the lake on the valley wall, is 3,118 m
(10,230 feet) above sea level, thereby developing a
complex slope of 7.0% to the reservoir. The inflow
consists of an unnamed stream that flows north into the
lake. The stream gradient is 3.5% (186 feet per mile).
The outflow is the continuation of this stream, which flows
into Stateline Reservoir (an impoundment of Smiths Fork)
about two miles downstream from Bridger Lake.

The soil in the watershed is derived from glacial till,
alluvium, and the sedimentary rocks of the east wall of the
valley. It is comprised primarily of debris from the
scouring of upstream valleys, so the soil is similar to the Precambrian rocks of the High Uintas. See
Appendix III for a complete soil description.

The vegetation community is comprised of lodgepole
pine and marshlands. The watershed receives 51 - 64 cm
(20 - 25 inches) of precipitation annually with a frost-free
season of 20 - 40 days.

Land use is about 75% multiple use and 25%
intensive agriculture. The major use of the watershed is
sheep grazing, which has increased soil erosion. The
campground and ranger station lie within the watershed.

Limnological Assessment

The water quality of Bridger Lake is very good. It is
considered to be moderately soft with a hardness
concentration near 40 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
August, 1992 was 0.045 mg/L which is significantly higher
than the recommended pollution indicator for phosphorus
of 0.025 mg/L. The phosphorus concentrations on an
annual basis was only slightly higher with an average
value of 0.033 mg/L. No other constituents analyzed
indicate any water quality impairments. In 1981 the system
was not characterized for a limiting factor due to nutrient
concentrations below detection limits. In 1992 with nutrient
concentrations well above detection limits the lake has
been classified as a nitrogen limited system. TSI values
indicate the lake is mesotrophic. It does appear that there
has been a significant rise in the concentrations of
nutrients in the lake since it was originally surveyed in
1981. It is very important that these constituents continue
to be monitored to see if this is an actual trend or a more
consistent evaluation of conditions in the lake. Although
the lake has a mean depth of only 4 meters it appears
from the profile of August 11, 1992 that a mild stratification was present. Consistent with the stratification there is a noticeable decline in the concentration of dissolved oxygen in the water column. Below 2 meters the concentration declines to a low of 2.0 mg/L at the bottom. Due to the shallow nature of the lake the stratification is probable weak and may be broken down by wind and wave action. These conditions are probably critical to the overwintering of fish in the lake and is consistent with the reporting of some fishkills. There are extensive coverage of emergent macrophytes (lily pads) in close proximity to the shoreline.

The DWR stocks the lake annually with 4,000 catchable rainbow trout (*Oncorhynchus mykiss*). In 1992, 2,100 fingerling brook trout (*Salvelinus fontinalis*) were also stocked.

The lake was chemically treated by the DWR to control rough fish competition in 1973, so native fish populations may not be present.

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

<table>
<thead>
<tr>
<th>Species</th>
<th>Cell Volume</th>
<th>Density By Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Botryococcus braunii</em></td>
<td>11.120</td>
<td>46.02</td>
</tr>
<tr>
<td><em>Sphaerocystis schroeteri</em></td>
<td>5.64</td>
<td>43.72</td>
</tr>
<tr>
<td><em>Dinobryon divergens</em></td>
<td>1.773</td>
<td>7.34</td>
</tr>
<tr>
<td><em>Peridinium sp.</em></td>
<td>0.361</td>
<td>1.50</td>
</tr>
<tr>
<td><em>Staurastrum sp.</em></td>
<td>0.166</td>
<td>0.69</td>
</tr>
<tr>
<td><em>Anabaena sp.</em></td>
<td>0.111</td>
<td>0.46</td>
</tr>
<tr>
<td><em>Oocystis sp.</em></td>
<td>0.033</td>
<td>0.14</td>
</tr>
<tr>
<td><em>Ankistrodesmus falcatus</em></td>
<td>0.013</td>
<td>0.05</td>
</tr>
<tr>
<td><em>Chroococcus sp.</em></td>
<td>0.011</td>
<td>0.05</td>
</tr>
<tr>
<td><em>Crucigenia sp.</em></td>
<td>0.006</td>
<td>0.02</td>
</tr>
<tr>
<td>Pennate diatoms</td>
<td>0.004</td>
<td>0.02</td>
</tr>
</tbody>
</table>

As observed the algal community is dominated by two species of green algae indicative of good water usually oligotrophic to mesotrophic conditions.

**Pollution Assessment**

Nonpoint pollution sources include grazing and recreation. In addition to sheep grazing in the area cattle graze in the watershed and around the reservoir. The campground and guard station are on the west shore, where heavy recreational use can degrade the riparian vegetation. 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).