

SEVIER BRIDGE RESERVOIR (YUBA LAKE)



Introduction

Measured by surface area, the Sevier Bridge Reservoir is the fourth largest artificial body of water in the state. It is located in a long, narrow valley between the Valley Mountains and the San Pitch Mountains, between Gunnison and I-15. It is also known as Yuba Lake. The

Sevier Bridge Reservoir was created in 1914 by the construction of an earth-fill dam. The reservoir shoreline is about 50% privately owned, with BLM comprising the remaining 50%. Public access is unrestricted. Current water use is for irrigation, cooling water for the Intermountain Power Project (IPP) coal burning power plants and recreation. The potential exists for the construction of two additional plants, which would double

Characteristics and Morphometry

Lake elevation (meters / feet)	1,517 / 4,978
Surface area (hectares / acres)	4,413 / 10,905
Watershed area (hectares / acres)	511,000 / 1,260,000
Volume (m ³ / acre-feet)	
capacity	201,302,930 / 236,145
conservation pool	0
Annual inflow (m ³ / acre-feet)	
Retention time (years)	1.6
Drawdown (m ³ / acre-feet)	125,364,900 / 101,633
Depth (meters / feet)	
maximum	22.6 / 74
mean	6.5 / 21.3
Length (km / miles)	5.8 / 19
Width (km / miles)	4.99 / 3.1
Shoreline (km / miles)	56.32 / 34.8

Location

County	Juab / Sanpete
Longitude / Latitude	111 58 10 / 39 21 39
USGS Maps	Mills, UT 1985, Skinner Peaks, UT 1966, Hell's Kitchen Canyon, UT 1965, Hayes Canyon, UT 1966, Gunnison, UT 1966.
DeLorme's Utah Atlas & Gazetteer™	Page 37, A-4, A-5
Cataloging Unit	Middle Sevier (16030003)

their water needs.

The Sevier River is an exotic stream, meaning it carries water originating in a moist climate (in this case the mountains) across the deserts. Before the river was

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dammed, it emptied into Sevier Lake (about 60 miles west of the Sevier Bridge Reservoir) where all the water

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evaporated. Because of the high evaporative potential of the river flowing across the desert, all chemicals in the water become increasingly concentrated. The Sevier Bridge Reservoir loses much water to evaporation.

Recreation

Sevier Bridge Reservoir is accessible from many points on U-28 north of Gunnison, as well as from old US-91 north of Scipio. Northern accesses are favored because the south end of the reservoir is often shallow or dry.

Old US-91 passes by Yuba Lake State Park, near the dam. Exit I-15 at exit #202 and go south, or exit at #188 (Scipio), and take the frontage road on the west side of the freeway which intersects old US-91 via an underpass a few miles north of Scipio.

There are numerous accesses along U-28 from about 15 miles south of Levan (Painted Rocks access) to near Fayette. Access is also possible from a network of unpaved roads on the west side of the reservoir.

The lake is used for fishing, swimming, boating, waterskiing and picnicking. Usage is fairly heavy throughout the year with excessively large crowds around Memorial Day weekend.

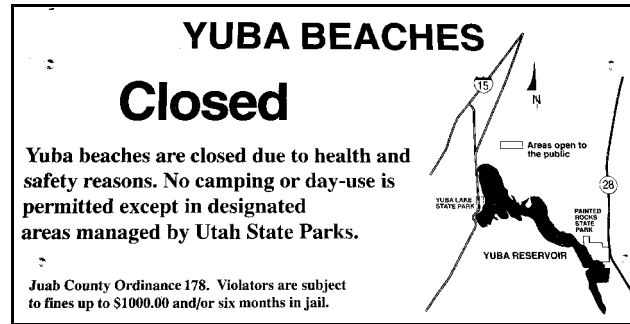
Yuba Lake State Park has a sanded beach, a boat



ramp, a 27 unit campground, flush toilets, hot showers, and picnic areas. Painted Rocks State Access (midway between Gunnison and Levan on U-28) has a primitive campground and a boat ramp. Primitive camping has been allowed north of the state park, but recent abuse of the area is forcing the evaluation of current policies. In addition there is a private campground in Gunnison (see info box).

Watershed Description

Sevier Bridge Reservoir is an impoundment of the Sevier River. The reservoir occupies a long, narrow valley



between the San Pitch Mountains and the Valley Mountains. The valley is filled with alluvial deposits from the mountains. The valley is so flat that a change of several vertical feet of reservoir water level will expose large areas of mud.

The watershed covers the upper Sevier River Drainage, from The Paunsaugunt and Markagunt Plateaus in the south, the west face of the Escalante Mountains, the Awapa Plateau, the Sevier Plateau, the east slopes of the Tushars and Pavant Ranges, the San Pitch Mountains, and the east face of the Wasatch Plateau. Everything from Panguitch to Manti drains into the Sevier Bridge Reservoir.

The watershed high point, Delano Peak in the Tushar Mountains, is 3,709 m (12,167 ft) above sea level, thereby developing a complex slope of 2.1% to the reservoir. The inflow and outlet is the Sevier River. The average stream gradient above the reservoir is 0.32% (16.9 feet per mile). There are several upstream reservoirs in the Sevier River and its tributaries. Gunnison Reservoir dams the Sanpete River not far above its confluence with the Sevier, which is not far from the upstream end of Sevier Bridge Reservoir. On the Sevier River itself, the nearest upstream reservoir is Piute, more than 60 highway miles upstream and probably double that in river miles. Hence, there are few buffers to protect the reservoir water from upstream mismanagement.

The watershed contains substantial amounts of all the major soil types found in the state. See Appendix III for soil composition data.

The vegetation communities consist of pine, spruce-fir, aspen, oak-maple, sagebrush-grass, bitterbrush, pinyon-juniper, shadscale, and greasewood. The watershed receives 20 - 102 cm (8 - 40 inches) of precipitation annually. The frost-free season around the reservoir is 80 - 120 days per year.

According to the 1982 Clean Lakes Inventory, land use is as follows. The largest use is multiple use land (39%). These lands are administered by the BLM, USFS, and the State of Utah. Grazing, recreation, and limited logging occur on many areas of these lands. Pasture, hay, and croplands make up 35%, native grazing (mostly

cattle and sheep) comprise 17% of the watershed. Irrigated cropland (6%), wildlife (3%), urban (0.7%), and recreation (0.05%) make up the remainder of the watershed.

Limnological Assessment

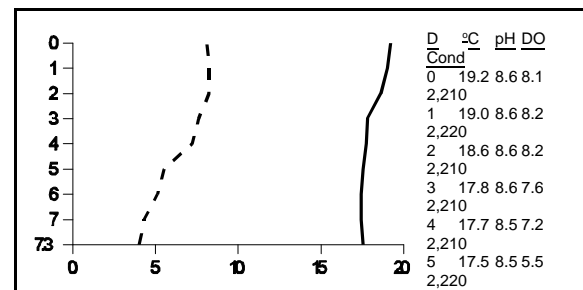
The water quality of Sevier Bridge Reservoir is fairly good. It is considered to be very hard with a hardness concentration value of approximately 425 mg/L (CaCO₃). Those parameters that have exceeded State water quality standards for defined beneficial uses are total phosphorus and dissolved oxygen. Although data hasn't been collect for total dissolved solids conductivity values as depicted in the September 8, 1992 profile, indicate that exceedences could be occurring later in the summer season. The average concentrations of total phosphorus in the water column for the three study periods were 40, 44 and 110 ug/L which all exceed the recommended pollution indicator for phosphorus of 25 ug/L. The phosphorus concentration in the hypolimnion near the dam reached a level of 190 ug/L. This increased concentration occurred when the reservoir was also exhibiting a decline in dissolved oxygen

concentrations in the lower levels of the reservoir as indicated in the profile. This substantiates the fact that water quality impairments do exist. Concentrations drop to a low of 4.0 mg/L. The loss of dissolved oxygen could be more extensive during ice coverage and result in a greater impairment to the existing fishery. Although the profile does not indicate that the reservoir was stratified in September there is data that shows that the reservoir does stratify earlier in the year when conditions are appropriate. The reservoir was stratified during May, 1980 with a thermocline present at 10-11 meters.

Current data suggest that the reservoir is currently a phosphorus limited system. This conclusion is substantiated by the 1975 NES survey. TSI values indicate the reservoir is eutrophic with hypereutrophic conditions present in 1992. It appears that there was a significant increase in the overall concentrations of phosphorus in the lake in 1992 compared to the other survey years.

According to DWR no fish kills have been reported in recent years. However, it should be noted that DWR staff reported that the perch fishery crashed with an increasing walleye population and low water conditions. With the loss of the perch as a stable fishery the walleye populations have diminished significantly too. The reservoir supports populations of channel catfish (*Ictalurus punctatus*) stocked in 1978 and 1983-84, yellow perch (*Perca flavescens*), walleye (*Stizostedion vitreum*) stocked in 1978, northern pike (*Esox lucius*), carp (*Cyprinus carpio*) and Utah sucker (*Catostomus ardens*). The lake has not been treated for rough fish competition, so populations of native fishes may still be present in the lake. DWR has not stocked the reservoir in recent years with fish.

Limnological Data			
Data averaged from STORET sites: 494230, 494231, 494232			
Surface Data	<u>1980</u>	<u>1990</u>	<u>1992</u>
Trophic Status	E	E	H
Chlorophyll TSI	-	46.14	48.76
Secchi Depth TSI	46.85	63.54	80.27
Phosphorous TSI	59.67	53.51	62.81
Average TSI	53.26	54.40	63.95
Chlorophyll <i>a</i> (ug/L)	-	5.0	6.9
Transparency (m)	-	0.9	0.6
Total Phosphorous (ug/L)	41.4	32	90
pH	8.2	8.4	8.5
Total Susp. Solids (mg/L)	14.8	13	6
Total Volatile Solids (mg/L)	-	-	2
Total Residual Solids (mg/L)	-	-	3
Temperature (°C / °f)	18/65	20/67	18/64
Conductivity (umhos.cm)	1564	2007	2140
Water Column Data			
Ammonia (mg/L)	0.17	0.06	0.09
Nitrate/Nitrite (mg/L)	0.70	0.40	0.31
Hardness (mg/L)	405	441	428
Alkalinity (mg/L)	279	259	250
Silica (mg/L)	14	-	21.6
Total Phosphorous (ug/L)	40	44	110
Miscellaneous Data			
Limiting Nutrient	P	P	P
DO (Mg/l) at 75% depth	8.1	5.9	5.3
Stratification (m)	9-10	NO	NO
Depth at Deepest Site (m)	20	14.0	7.3



The DWR would like to chemically treat the lake if funds become available and water storage conditions are favorable, then restock with Smallmouth Bass and Yellow Perch, but no Walleye.

According to the 1975 NES survey, there were thirteen genera of phytoplankton found in the reservoir. Of those found, five of the genera were diatoms (*Synedra*, *Diatoma*, *Fragilaria*, *Cyclotella*, and *Nitzschia*), and

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one species of blue-green algae, *Aphanizomenon*.

Phytoplankton in the euphotic zone for the last study period include the following taxa (in order of dominance)

Species	Cell Volume (mm ³ /liter)	% Density By Volume
<i>Anabaena spiroides</i>		
<i>var. crassa</i>	89.623	94.13
<i>Sphaerocystis Schroeteri</i>	2.641	2.77
<i>Ceratium hirundinella</i>	0.936	0.98
<i>Coelastrum</i> sp.	0.556	0.58
<i>Ankistrodesmus falcatus</i>	0.432	0.45
<i>Staurastrum</i> sp.	0.334	0.35
Pennate diatoms	0.267	0.28
<i>Asterionella formosa</i>	0.189	0.20
Centric diatoms	0.062	0.07
Unknown spherical green alga	0.038	0.04
<i>Closteriopsis longissima</i>		
<i>var. tropica</i>	0.033	0.04
<i>Crucigenia</i> sp.	0.033	0.04
<i>Scenedesmus bijuga</i>	0.022	0.02
<i>Microcystis incerta</i>	0.022	0.02
<i>Scenedesmus</i> sp.	0.008	0.01
<i>Euglena</i> sp.	0.008	0.01
<i>Oocystis</i> sp.	0.004	0.00
<i>Chlamydomonas</i> sp.	0.003	0.00
Total	95.208	
Shannon-Weaver [H']	0.32	
Species Evenness	0.11	
Species Richness	0.67	

The phytoplankton community is currently dominated by the presence of blue-green algae indicative of the eutrophic state of the reservoir.

Pollution Assessment

Nonpoint pollution sources include the following: sedimentation and nutrient loading from logging, grazing, feedlots and croplands; wastes and litter from recreation; household wastes and nutrient loading from urban areas; and sedimentation and heavy metal production from active and inactive mines. The major use of the watershed is livestock grazing, which may contribute to heavy runoff and substantial soil erosion. There are several industrial mineral (sand, gravel, clay) mines in the watershed, further information is available from the Utah Geologic Survey. There are many active timber sales, none of which are near enough to be of any significance. Further information on logging is available from the Fishlake, Dixie, and Manti-La Sal National Forests.

Essentially, all types of non-point pollution sources

occur in the watershed, but the impacts are somewhat mitigated by the long river distances and upstream reservoirs.

The area around the reservoir is rangeland and cropland. These land uses have impact on the reservoir, including sediment and nutrient production associated with grazing and land use practices.

There are a number of point sources throughout the watershed area of various types. These would include fish hatcheries, municipal and industrial discharges.

Beneficial Use Classification

The state beneficial use classifications include: boating and similar recreation (excluding swimming) (2B), warm water game fish and organisms in their food chain (3B) and agricultural uses (4).

Information	
Management Agencies	
Bureau of Land Management	539-4001
House Range Resource Area (Fillmore)	743-6811
Sevier River Resource Area (Richfield)	896-8228
Six County Commissioners Association	896-9222
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146
Recreation	
Panoramaland Travel Region (Richfield)	896-9222
Delta Chamber of Commerce	864-4316
Nephi Chamber of Commerce	623-2411
Lund's Campground (Gunnison)	528-3366
Reservoir Administrators	
Consolidated Sevier Bridge Company	864-2494

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