

WOODRUFF CREEK RESERVOIR



Introduction

Woodruff Creek Reservoir is an intermediate size reservoir on the east slope of the Monte Cristo Range. It provides some summer recreational opportunities. It should not be confused with Woodruff Narrows Reservoir, an impoundment of the Bear River in Wyoming, just over the state line from the town of Woodruff. Woodruff

Creek Reservoir was created in 1970 by the construction of an earth-fill dam on Woodruff Creek. The reservoir shoreline is

Characteristics and Morphometry

Lake elevation (meters / feet)	2,088 / 6,852
Surface area (hectares / acres)	36.42 / 90
Watershed area (hectares / acres)	11,655 / 28,800
Volume (m ³ / acre-feet)	
capacity	4,195,140 / 3,401
conservation pool	555,075 / 450
Annual inflow (m ³ / acre-feet)	
Retention time (years)	
Drawdown (m ³ / acre-feet)	
Depth (meters / feet)	
maximum	28.4 / 93
mean	10.1 / 33
Length (meters / feet)	2,450 / 8,038
Width (meters / feet)	238 / 781
Shoreline (km / miles)	7.24 / 4.5

Location

County	Rich
Longitude / Latitude	111 19 54 / 41 27 50
USGS Map	Meachum Ridge, UT 1968
DeLorme's Utah Atlas & Gazetteer™	Page 61, B-5
Cataloging Unit	Upper Bear (16010101)

owned by the BLM with a few small parcels of private land. Public access is unrestricted. Reservoir water is used entirely for irrigation, and most of the water is drained for irrigational use, with the conservation pool being about 15% of total capacity. There are no foreseeable changes in water usage at this time.

Recreation

Woodruff Creek Reservoir is easily accessible from U-39. The turnoff is about 38 miles east of Huntsville, exactly two miles east of the Birch Creek Reservoirs

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turnoff, and 6 miles west of Woodruff. Turn south and
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road to the southwest up Woodruff Creek for about four miles to the reservoir. The turnoff is poorly marked, but the road is not hard to find.

Fishing is the primary recreational use of the reservoir and there are no developed recreational facilities. It is possible to launch a boat in the reservoir but access points are limited. By midsummer the reservoir is drained down to the conservation pool (about 25 feet deep) leaving 25 vertical feet of muddy banks exposed.

Monte Cristo Campground, a USFS facility, is about 15 miles west of the Woodruff Creek Reservoir turnoff on U-39. It is open from June through September, and has 53 tent sites, picnic areas, and primitive toilets. Fees are charged for use.

Watershed Description

The Little Bear River is eroding the west slopes of the Monte Cristo Range at a rate relatively faster than Woodruff Creek erodes the east slopes. Both sides of the ridge are dissected by deep canyons, but the canyons to the west are much deeper, indicating that their headwaters are slowly capturing drainage from the east side of the ridge. Woodruff Creek drains the east slopes, and the reservoir is built about halfway from the headwaters to where the creek joins the Bear River in the town of Woodruff. Slopes surrounding the reservoir are quite steep (60%). The reservoir is an impoundment of the narrow, "V" shaped canyon.

The watershed high point, Monte Cristo Peak, is 2,788 m (9,148 ft) above sea level, thereby developing a complex slope of 4.7% to the reservoir. The average stream gradient of Little Brush Creek is 2.5% (131 feet per mile). The inflow and outflow is Woodruff Creek. There is also an unnamed tributary flowing from the south into the reservoir.

The watershed is made up of mountains. The soil is derived from the Wasatch Formation, the limestone bedrock that underlies much of the watershed. The soil associations that compose the watershed are listed in Appendix III.

The vegetation communities consist of spruce-fir and aspen. The watershed receives 41 - 102 cm (16 - 40 inches) of precipitation annually. The frost-free season around the reservoir is 80 - 120 days per year.

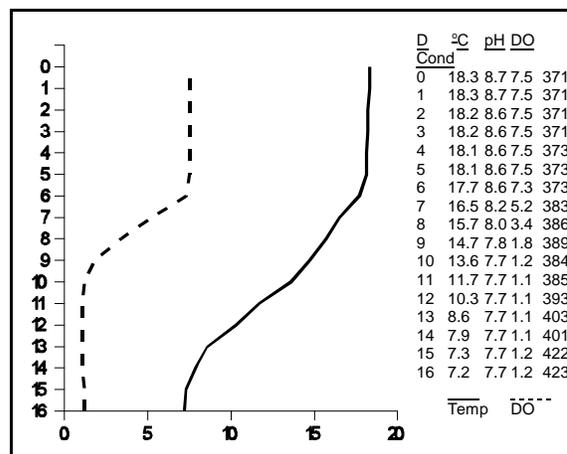
Land use in the watershed is 100% multiple use and native grazing. Minor recreational use takes place.

Limnological Assessment

The water quality of Woodruff Creek Reservoir is good. It is considered to be hard with a hardness concentration value of approximately 174 mg/L (CaCO3). Those parameters that have exceeded State water quality standards for defined beneficial uses are total phosphorus and dissolved oxygen. The average concentration of total

Limnological Data			
Data averaged from STORET sites: 590686, 590687			
Surface Data	1981*	1989	1991
Trophic Status	E	M	M
Chlorophyll TSI	-	44.97	53.35
Secchi Depth TSI	45.16	44.38	52.52
Phosphorous TSI	63.2	33.43	39.93
Average TSI	54.18	40.92	48.60
Chlorophyll <u>a</u> (ug/L)	-	4.4	9.3
Transparency (m)	2.8	2.5	1.7
Total Phosphorous (ug/L)	100	23	12
pH	8.4	8.5	8.5
Total Susp. Solids (mg/L)	<5	-	5
Total Volatile Solids (mg/L)	-	-	4
Total Residual Solids (mg/L)	-	-	3
Temperature (°C / °f)	17/63	17/63	15/60
Conductivity (umhos.cm)	260	343	336
Water Column Data			
Ammonia (mg/L)	0.13	0.01	0.08
Nitrate/Nitrite (mg/L)	0.27	0.59	0.55
Hardness (mg/L)	174	-	173
Alkalinity (mg/L)	171	-	158
Silica (mg/L)	-	-	4.8
Total Phosphorous (ug/L)	55	11.5	19
Miscellaneous Data			
Limiting Nutrient	N	P	P
DO (Mg/l) at 75% depth	3.35	2.5	1.1
Stratification (m)	14-16	NO	6-13
Depth at Deepest Site (m)	21	23.0	16.0
* One site only (590686)			

phosphorus in the water column for the three study periods only exceeded the recommended pollution indicator for phosphorus of 25 ug/L in 1981 with an overall concentration of 55 ug/L. In recent years concentration have averaged below the indicator, but elevated values have been reported later in the year with shallow



conditions present. However, dissolved oxygen concentrations in late summer substantiate the fact that water quality impairments do exist. Concentrations dropped dramatically below the thermocline to approximately 1.0 mg/L. The demand exerted in the lower portion of the water column may be due in fact to larger productions of organic matter during the early history of the reservoir when it was more productive. Winter monitoring will need to be conducted to determine the extent of impairment to the fishery. The data does indicate an impairment later in the summer as oxygen levels fall below those necessary to maintain a viable fishery.

Data suggest that the reservoir is currently a phosphorus limited system. TSI values indicate the reservoir is mesotrophic. The reservoir does stratify as indicated in the August 27, 1991 profile.

According to DWR no fish kills have been reported in recent years. The reservoir supports populations of rainbow trout (*Oncorhynchus mykiss*), cutthroat trout (*Oncorhynchus clarki*), whitefish (*Prosopium williamsoni*), and mountain sucker (*Pantosteus platyrhynchus*). The lake has not been treated for rough fish competition, so populations of native fishes may still be present in the lake.

The DWR has typically stocked the reservoir annually with 100,000 yellowstone cutthroat fry. In 1992, however, the reservoir was not stocked, and the DWR's future plans are unknown.

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

Species	Cell Volume (mm ³ /liter)	% Density By Volume
<i>Sphaerocystis schroeteri</i>	15.846	98.60
<i>Asterionella formosa</i>	0.094	0.59
<i>Euglena sp.</i>	0.081	0.51
Pennate diatoms	0.020	0.12
<i>Wislouchiella planktonica</i>		0. 0 1 5
0.10		
<i>Oocystis sp.</i>	0.008	0.05
<i>Ankistrodesmus falcatus</i>	0.004	0.03
Total	16.068	
Shannon-Weaver [H']	0.09	
Species Evenness	0.05	
Species Richness	0.26	

The phytoplankton community is dominated by the presence of green algae and diatoms.

Pollution Assessment

Nonpoint pollution sources include the following:

sedimentation and nutrient loading from grazing, and litter or wastes from recreation.

Grazing takes place throughout the watershed and along the reservoir shoreline.

There are no point sources of pollution in the watershed.

Beneficial Use Classification

The state beneficial use classifications include:

Information	
Management Agencies	
Bear River Association of Governments	752-7242
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146
Bureau of Land Management	539-4001
Bear River Resource Area	977-4300
Recreation	
Bridgerland Travel Region (Logan)	657-5353
Garden City Chamber of Commerce	946-2901
Reservoir Administrators	
Woodruff Reservoir and Irrigation Company	
PO Box 520, Woodruff, UT 84086	

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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