

DONKEY RESERVOIR



Introduction

Donkey Reservoir is one of about a dozen lakes and reservoirs on the north slope of Boulder Mountain in south-central Utah. These lake basins are the result of uneven glacial scouring. Donkey Reservoir, like many

others, is a small natural lake that has been further impounded to

Characteristics and Morphometry

Lake elevation (meters / feet)	3,096 / 10,157
Surface area (hectares / acres)	16 / 40
Watershed area (hectares / acres)	518 / 1,280
Volume (m ³ / acre-feet)	
capacity	4.0 x 10 ⁵ / 324
conservation pool	0
Annual inflow (m ³ / acre-feet)	not measured
Retention time (years)	<1
Drawdown (m ³ / acre-feet)	up to 23'
Depth (meters / feet)	
maximum	8 / 26.2
mean	2.4 / 8.1
Length (meters / feet)	770 / 2,520
Width (meters / feet)	190 / 630
Shoreline (meters / miles)	1,680 / 5,510

Location

County	Wayne
Longitude / Latitude	111 29 32 / 38 12 10
USGS Map	Blind Lake 1985
DeLorme's Utah Atlas and Gazetteer™	Page 28, B-1
Cataloging Unit	Fremont River (14070003)

increase its capacity, creating an intermediate-sized reservoir. These lakes are at the base of the 500 foot cliffs at the edge of the top of the plateau. The reservoir was created in 1923 by the construction of an earth-fill dam where the stream flows out from the lake. Depth was doubled from 13 feet to 26 feet. The shoreline is owned and administered by the Dixie National Forest with unrestricted public access. Water is consumed for irrigation, but also used for recreation and coldwater aquatic habitat. No changes in water use are anticipated

LAKE REPORTS

in the foreseeable **future**.

File Contains Data for
PostScript Printers Only

Recreation

Donkey Reservoir is at the top of the slope from the Fremont River to Boulder Mountain, necessitating a long climb on primitive roads. Just recently the roads have been improved, but the last mile to the reservoir remains primitive and requires a vehicle with high clearance. From downtown Teasdale, go south and east for approximately 1.5 miles. Turn right on a gravel road marked with a sign for Donkey Reservoir and other lakes. Within 2 miles the road begins the ascent on Boulder Mountain. It is a seven mile, fairly continuous climb, to gain 3,000 feet in elevation. Take the left fork at the junction to Coleman Lake. You will pass Bob's Hole, a small lake, on the way and Round Lake near the top. A few hundred yards past Round Lake, an excellent lake for brook trout in the spring, take the right fork which will lead you past a series of impoundments and culminate at Donkey Reservoir at the top. The upper reaches of the road are primitive, suitable only for hikers, horses, mountain bikes, and high clearance vehicles. Good maps, particularly the Teasdale and Blind Lake 7.5' quads, are extremely helpful. The road during inclement weather can become very slick and impassable.

Fishing and primitive camping are the major activities available at the reservoir itself, but the surrounding region is replete with back country hiking areas and additional lakes that are accessible by trail. The water may be considered to cold for most swimmers and the reservoir is noted for the Brook Trout fishery. Although there is no boat ramp small boats can be launched on the reservoir. Access roads are not maintained in the winter. Usage is light to moderate during the spring and summer.

There are no improved USFS campgrounds in the vicinity, although primitive camping is possible throughout the area. There is an RV park in Torrey (see info box).

Watershed Description

Donkey Reservoir at the top of a long, forested slope that begins at the crest of Boulder Mountain. From the plateau top at 3,500 meters, the land drops off down to the Fremont River at 2,100 meters. At the top of the slope, an impressive 200 meter cliff completes the gradient to the top of Boulder Mountain. Donkey Reservoir is in a basin enclosed by the cliff on two sides. Aspens and firs line the lake. Vegetation increases in density near the base of the cliff, and is interspersed with talus slopes.

The surface watershed is very small, extending only a short distance onto the top of the plateau. There are many closed drainages on top of the plateau that have subsurface drainage, appearing as springs on the mountain sides. Such springs are a major source of water for the reservoir, giving it a large subsurface watershed of an unknown location and surface size.

The watershed high point is the top of the plateau above the reservoir at 3,354 m (11,005 ft) above sea level, thereby developing a complex slope of 30.6% to the lake. Inflow is from springs and the outlet is Donkey Creek.

Landforms composing the watershed include a glaciated valley, an escarpment, and a small portion of a high plateau. The soil is of volcanic origin. Soil association types are found in Appendix III.

The vegetation communities are comprised of pine, aspen, spruce-fir and oak, sage-grass, and mountain mahogany. The watershed receives 64 - 76 cm (25 - 30 inches) of precipitation annually with a frost-free season of 0 - 20 days at the reservoir.

Land use is multiple use. The Dixie National Forest encompasses the entire drainage area.

Limnological Assessment

The water quality of Donkey Reservoir is very good. It is considered to be soft with a hardness concentration value of approximately 40 mg/L (CaCO₃). The only parameter that has exceeded State water quality

Limnological Data			
Data sampled from STORET site: 495462			
Surface Data	<u>1979</u>	<u>1989</u>	<u>1991*</u>
Trophic Status	M	M	M
Chlorophyll TSI	-	41.21	43.70
Secchi Depth TSI	38.33	35.05	40.02
Phosphorous TSI	55.4	69.65	49.97
Average TSI	46.8	48.64	44.56
Chlorophyll <u>a</u> (ug/L)	-	2.95	3.8
Transparency (m)	4.5	5.65	4.0
Total Phosphorous (ug/L)	40	94	24
pH	-	9.55	9.6
Total Susp. Solids (mg/L)	5	-	<3
Total Volatile Solids (mg/L)	-	-	2
Total Residual Solids (mg/L)	-	-	<2
Temperature (°C / °f)	-	13/56	15/59
Conductivity (umhos.cm)	-	91	83
Water Column Data			
Ammonia (mg/L)	0.05	<0.01	0.03
Nitrate/Nitrite (mg/L)	0.03	0.03	<0.01
Hardness (mg/L)	41	-	37
Alkalinity (mg/L)	44	-	42
Silica (mg/L)	25	-	20.6
Total Phosphorus (ug/L)	45	91.3	28.0
Miscellaneous Data			
DO (Mg/l) at 75% depth	8.1	-	8.5
Stratification (m)	NO	NO	NO
Limiting Nutrient	N	N	N
Depth at Deepest Site (m)	7	5.8	4.0
* Summer data only			

LAKE REPORTS

standards for defined beneficial uses is phosphorus. The average concentration of total phosphorus in the water column in 1979, 1989, and 1991 was 45, 91.3, and 28 ug/L which exceeds the recommended pollution indicator for phosphorus of 25 ug/L. These high concentrations are indicative of eutrophic conditions. Although in late summer the water level is significantly reduced due to heavy drawdown there appears to be no problem with dissolved oxygen concentrations throughout the water column as indicated by the August 21, 1991 profile. The 1989-91 data suggest that the reservoir is currently a nitrogen limited system. Despite the relatively high phosphorus concentrations, TSI values indicate the reservoir is a fairly stable mesotrophic waterbody. With the wide range of phosphorus concentrations, additional monitoring should be conducted to ascertain the probable causes of this kind of variation. In addition investigations of dissolved oxygen concentration during the winter should be conducted to evaluate the effect of lake productivity and the presence of a fairly heavy macrophyte population that develops in the arm above the dam as drawdown during late summer occurs. The reservoir was not stratified during a late summer monitoring trip was in 1989. Concentrations of dissolved oxygen and the temperature regime at that time indicate no apparent problems in the water column. According to DWR no fish kills have been reported in recent years, however, in the early 1960's there were frequent fish kills. One of the problems at that time was a fairly heavy infection rate of trematodes. The reservoir supports populations of brook trout (*Salvelinus fontinalis*) and cutthroat trout (*Oncorhynchus clarki*).

Shannon-Weaver [H'] 0.35
 Species Evenness 0.32
 Species Richness [d] 0.10

The flora is fairly typical, but not particularly diverse. The dominance of green algae and diatoms indicates that the lake is reasonably healthy.

Information	
Management Agencies	
Dixie National Forest	586-2421
Teasdale Ranger District	425-3435
Division of Water Quality	538-6146
Division of Wildlife Resources	538-4700
Six County Commissioners Organization	637-5444
Recreation	
Red Cliff Oasis (Torrey RV Park)	425-3431
Reservoir Administrators	
Teasdale Irrigation Company	425-3546
Division of Water Rights, Richfield Office	896-4429

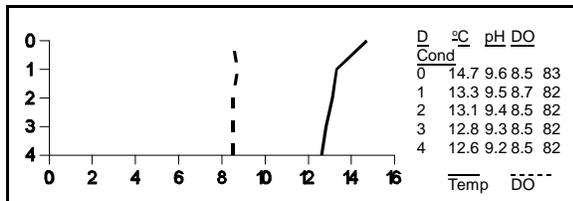
Pollution Assessment

Nonpoint pollution sources are grazing and recreation. Cattle graze in the watershed and probably around the reservoir.

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).



According to existing records, the DWR did not stock Donkey Reservoir in 1991.

Macrophytes can cover about 85% of the surface in late summer if conditions are appropriate.

Phytoplankton in the euphotic zone include the following taxa:

Species	Cell Volume% (mm ³ /liter)	Density By Volume
<i>Sphaerocystis schroeteri</i>	2.641	90.70
<i>Fragilaria crotonensis</i>	0.229	7.87
<i>Oocystis sp.</i>	0.042	1.43
Total	2.912	

DONKEY RESERVOIR