

## JOHNSON VALLEY RESERVOIR



### Introduction

Johnson Valley Reservoir is northeast of Fish Lake on the Fish Lake Plateau. It is a shallow, intermediate-sized impoundment of a mountain meadow.

The reservoir shoreline is publicly owned and administered by the Fish Lake National Forest with

unrestricted public access. Defined beneficial uses include:

water recreation excluding swimming, propagation of cold water species of game fish and aquatic life, and

#### Characteristics and Morphometry

Lake elevation (meters / feet)	2,688 / 8,819
Surface area (hectares / acres)	285 / 704
Watershed area (hectares / acres)	14,017 / 34,634
Volume (m <sup>3</sup> / acre-feet)	
capacity	12,331,318 / 9,997
conservation pool	
Annual inflow (m <sup>3</sup> / acre-feet)	
Retention time (years)	
Drawdown (m <sup>3</sup> / acre-feet)	
Depth (meters / feet)	
maximum	6.4 / 21
mean	4.3 / 14.2
Length (meters / feet)	2.7 / 1.7
Width (km / miles)	1.9 / 1.2
Shoreline (km / miles)	7.9 / 4.9

#### Location

County	Sevier
Longitude / Latitude	111 38 00 / 38 36 05
USGS Map	Fish Lake, Utah, 1968
Cataloging Unit	Fremont River (14070003)

agricultural needs.

### Recreation

Johnson Valley Reservoir is most easily accessed from U-25 at Fish Lake. Continue past Fish Lake on FS-640, which raps around the north shore. An alternate access is on FS-036, a paved road beginning 2 miles north of Fremont on U-72.

Fishing, boating, waterskiing and swimming are possible in the area. Usage is heavy.

Recreational facilities at the reservoir consist of an

File Contains Data for  
PostScript Printers Only

improved public boat ramp and picnic facilities at Johnson Reservoir Park, on FS-036 1 mile east of the junction with FS-640. The Forest Service maintains a free campground at the junction of FS-036 and FS-640 (Piute Parking Area-48 tent sites but no drinking water), and an improved campground between Fish Lake and Johnson Valley on FS-640 (Frying Pan Flat-11 campsites, fee charged). Housekeeping cabins are available nearby at Fish Lake.

### Watershed Description

The reservoir is in an area of high, rolling ridges and wide valleys characteristic of the top of the Fish Lake Plateau. The watershed high point (the Fish Lake Hightop Plateau), is 3,545 m (11,633 ft) above sea level, thereby developing a complex slope of 12.5% to the reservoir. The average stream gradient above the reservoir is 7.3% (386 feet per mile). The soil is largely of volcanic origin with moderate permeability and moderately slow erosion and runoff.

The vegetation communities are comprised of pine, aspen, spruce-fir, oak and maple. The watershed receives 41 - 76 cm (16 - 30 inches) of precipitation annually with a frost-free season of 60 - 80 days at the reservoir.

### Limnological Assessment

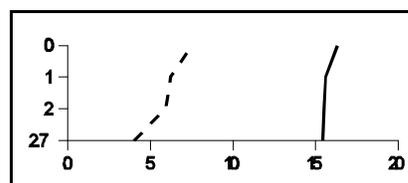
The water quality of Johnson Valley Reservoir is fair, even though it is usually fairly turbid due to the shallow nature of the reservoir. It is considered to be soft with a hardness concentration of 64 mg/L (CaCO<sub>3</sub>). The only parameters that have exceeded State water quality standards for defined beneficial uses are phosphorus and dissolved oxygen. The average concentration of total phosphorus in the water column in 1989 and 1991 was 123 and 97 ug/L which is significantly over the recommended pollution indicator for phosphorus of 25 ug/L. Dissolved oxygen concentrations in late summer as indicated by the August 22, 1991 profile substantiate the fact that water quality impairments do exist. Even with the shallowness of the reservoir dissolved oxygen concentration decline through the water column. Due to the high productivity of the reservoir, it is evident that during the night through the process of respiration carried out by the algal population that severe depletions in the concentration of dissolved oxygen could occur especially with the shallow nature of the reservoir. Although there have not been a recent reports of fish kills in the reservoir, it appears that the possibility of one certainly exists. There are several factors, turbidity, mixing and climatic conditions that could be inhibiting the occurrence of a fish kill. In 1981, 1989 and 1991 the reservoir was characterized as a nitrogen limited system. TSI values indicate the reservoir is hypereutrophic. The DWR currently stocks the reservoir

with fingerling rainbow (*Oncorhynchus mykiss*) and cutthroat (*Oncorhynchus clarki*) trout.

Johnson Valley Reservoir was treated in 1979 for

Limnological Data			
Data averaged from STORET sites: 595610, 595611			
Surface Data	1981	1989	1991
Trophic Status	E	H	H
Chlorophyll TSI	-	58.22	68.58
Secchi Depth TSI	44.17	61.52	65.44
Phosphorous TSI	57.34	71.54	70.09
Average TSI	50.76	63.77	68.04
Chlorophyll <i>a</i> (ug/L)	-	16.87	50.75
Transparency (m)	3	0.9	0.6
Total Phosphorous (ug/L)	40	107	97
pH	7.6	7.9	8.8
Total Susp. Solids (mg/L)	<5	-	20
Total Volatile Solids (mg/L)	-	-	6
Total Residual Solids (mg/L)	-	-	9
Temperature (°C / °f)	10/50	15/59	14/57
Conductivity (umhos.cm)	121	149	129
Water Column Data			
Ammonia (mg/L)	0.05	0.01	0.04
Nitrate/Nitrite (mg/L)	0.13	-	0.01
Hardness (mg/L)	64	-	63
Alkalinity (mg/L)	66	-	65
Silica (mg/L)	-	-	19.3
Total Phosphorous (ug/L)	37.5	123	97
Miscellaneous Data			
Limiting Nutrient	N	N	N
DO (Mg/l) at 75% depth	7.2	5.2	5.9
Stratification (m)	NO	1-2	NO
Depth at Deepest Site (m)	6	4.2	2.7

rough fish control and later restocked with rainbow trout (*Oncorhynchus mykiss*), cutthroat trout (*Oncorhynchus clarki*), and brook trout (*S. fontinalis*). In 1979 DWR reported: an abundant invertebrates population including snails, Chironomids midges, and mayfly larvae; plankton was evident but not abundant; only submergent macrophytes were found and these were abundant. The two most common types were *Scirpus* and *Potamogeton*. DWR recorded the stocking of catchable rainbow trout for 1980.



LAKE REPORTS

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

D	°C	pH	DO
0	16.3	9.0	7.5
1	15.6	5.6	6.2
2	15.5	5.4	5.9
2.7	15.4	5.2	4.0

Species	Cell Volume	%
Density	(mm <sup>3</sup> /liter)	By

Volume		
<i>Anabaena spiroides</i>		
<i>var Crassa</i>	323.814	99.00
<i>Stephanodiscus niagarae</i>	2.991	0.91
<i>Pandorina morum</i>	0.222	0.07
Centric diatoms	0.025	0.01
<i>Oocystis sp.</i>	0.016	0.01
<i>Asterionella formosa</i>	0.009	0.00
Pennate diatoms	0.003	0.00
<b>Total</b>	<b>327.080</b>	
Shannon-Weaver [H']	0.06	
Species Evenness	0.03	
Species Richness	0.23	

While there is a fairly high number of taxa found, it is typical of eutrophic reservoirs in that one taxon is extremely dominant. The system is dominated by blue-

**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).

Water quality is sufficient to sustain current water use.

Information	
<b>Management Agencies</b>	
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146
Fish Lake National Forest	896-4491
Loa Ranger District	836-2811,2800
<b>Recreation</b>	
Bowery Haven Resort	836-2788
Fish Lake Resort	836-2700
Panoramaland Travel Region	896-8965
<b>Reservoir Administrators</b>	
<b>Fremont Irrigation Company</b>	

green algae.

**Pollution Assessment**

Nonpoint pollution sources grazing and recreation. About 1144 cattle graze in the immediate vicinity of the reservoir part of each year.

There are no point pollution sources in the watershed.

