

## YANKEE MEADOW RESERVOIR



### Introduction

Yankee Meadow Reservoir is north of Brian Head on the face of the Markagunt Plateau as it drops into Parowan. It is a small impoundment in a high meadow surrounded by coniferous and aspen forests.

The reservoir shoreline is owned and administered by the Utah Division of Wildlife Resources while the water

ownership and management is controlled by the Parowan Reservoir Company. Public access to the reservoir is unrestricted, but camping and grazing is restricted in direct

### Characteristics and Morphometry

Lake elevation (meters / feet)	2,639 / 8,656
Surface area (hectares / acres)	21.4 / 53
Watershed area (hectares / acres)	658 / 1,625
Volume (m <sup>3</sup> / acre-feet)	
capacity	1,270,000 / 1,028
conservation pool	1,603,550 / 1,300
Annual inflow (m <sup>3</sup> / acre-feet)	
Retention time (years)	
Drawdown (m <sup>3</sup> / acre-feet)	
Depth (meters / feet)	
maximum	7.9 / 26
mean	4.8 / 15.7
Length (meters / feet)	640 / 2,100
Width (meters / feet)	343 / 1,125
Shoreline (meters / feet)	1,460 / 4,790

### Location

County	Iron
Longitude / Latitude	112 46 01 / 37 45 03
USGS Map	Yankee Meadows, Utah, 1971
Cataloging Unit	Cedar City (16030006)

proximity to the reservoir by fencing. Defined beneficial uses include: water recreation excluding swimming, propagation of cold water species of game fish and aquatic life, and agricultural needs.

### Recreation

Yankee Meadow Reservoir is accessible from FS-049, a gravel road leading up the face of the Markagunt Plateau. Access is easiest from Parowan on U-143. Approximately 3.5 miles south of Parowan, turn left on a paved road up First Left Hand Canyon to Vermillion Castle  
C a m p g r o u n d

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and Yankee Meadow Reservoir. At the campground, the road turns to gravel. Yankee Meadow is about 8 miles from U-143. Access is also possible from FS-048, up Second Left Hand Canyon (1/4 mile further south on U-143) and FS-048 from the top of the Markagunt Plateau, from 5 miles east of Cedar Breaks and 11 miles west of Panguitch Lake. The latter route may be snow covered until early summer in years of heavy snow accumulation. FS-047 is better maintained than FS-048. It should be noted that one of the most scenic drives in Utah is from U-143 north on FS-048, the Sidney Valley Road. Just before the road begins its decent off the Markagunt Plateau at an elevation of just over 11,000 feet above sea level, the road passes adjacent to an area that looks over the Escalante Desert. The first few hundred yards down the dugway, from the plateau top, may appear challenging but is passable.

Fishing, boating, and camping are possible in the area. Usage is fairly heavy.

There are no improved recreational facilities at the reservoir. The nearest USFS campground, Vermillion Castle, is 6 miles down canyon. It has 10 campsites, lacks drinking water and has vault toilets. There are no private campgrounds in the area, but primitive camping is allowed in the area.

**Watershed Description**

The reservoir is on the steep northwest face of the Markagunt Plateau uplifted by repeated movements of the Hurricane Fault below. Yankee Meadow is on a bench area, above the Pink Cliff formation (of which the remarkable formations of Noah's Ark and the Vermillion Castle are carved from) but below the steep upper face of volcanic rock that caps the plateau.

The watershed high point, the crest of the Markagunt Plateau, is 3,207 (10,520 ft) above sea level, thereby developing a complex slope of 21.9% to the reservoir. The inflow and outflow is Bowery Creek, and the average stream gradient above the reservoir is 15.6% (825 feet per mile).

The soil is entirely of volcanic origin with moderate permeability and moderately slow erosion and runoff.

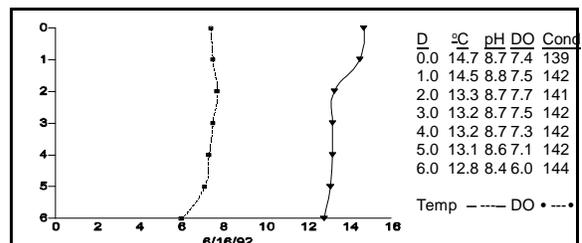
The vegetation communities are comprised of pine, aspen, spruce-fir, oak, maple and alpine. The watershed receives 41 - 51 cm (16 - 20 inches) of precipitation annually with a frost-free season of 40 - 60 days at the reservoir.

**Limnological Assessment**

The water quality of Yankee Meadow Reservoir is fairly good. It is considered to be soft with a hardness concentration value of approximately 67 mg/L (CaCO3). Those parameters that have exceeded State water quality standards for defined beneficial uses are total phosphorus

Limnological Data	
Data sampled from STORET site: 594190	
<b>Surface Data</b>	<u>1992</u>
Trophic Status	E
Chlorophyll TSI	43.95
Secchi Depth TSI	50.01
Phosphorous TSI	56.60
Average TSI	50.19
Chlorophyll <u>a</u> (ug/L)	3.9
Transparency (m)	2.0
Total Phosphorous (ug/L)	38
pH	9.0
Total Susp. Solids (mg/L)	<3
Total Volatile Solids (mg/L)	-
Total Residual Solids (mg/L)	3
Temperature (°C / °f)	16/61
Conductivity (umhos.cm)	143
<b>Water Column Data</b>	
Ammonia (mg/L)	0.03
Nitrate/Nitrite (mg/L)	0.06
Hardness (mg/L)	67
Alkalinity (mg/L)	76
Silica (mg/L)	19.7
Total Phosphorous (ug/L)	41
<b>Miscellaneous Data</b>	
Limiting Nutrient	N
DO (Mg/l) at 75% depth	7.5
Stratification (m)	1-2
Depth at Deepest Site (m)	3.8

and dissolved oxygen. The average concentration of total phosphorus in the water column for 1992 was 41 ug/L which exceeds the recommended pollution indicator for phosphorus of 25 ug/L. Dissolved oxygen concentrations in early summer begin to decline below a weak thermocline. It appears the thermocline breaks down later in the summer as drawdown of the reservoir creates shallow conditions. This is only slightly indicated in the June 16, 1992 profile, but it is evident in data collected in subsequent years. Winter monitoring needs to be conducted to determine the extent of dissolved oxygen depletion and its effect on the fishery. There are large



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accumulations of macrophytes and algae later in the season which could exhibit a substantial demand on dissolved oxygen during the winter as this organic material decomposes under ice coverage.

Data suggest that the reservoir is currently a nitrogen limited system. TSI values indicate the reservoir is eutrophic. The reservoir does stratify, but it is weak and not for an extended period of time due to early withdrawal of water for downstream irrigation needs.

According to DWR a fish kill has been reported in recent years, and they have concerns about potential winter mortality. The reservoir supports populations of brook trout (*Salvelinus fontinalis*), and rainbow trout (*Oncorhynchus mykiss*). It appears that DWR stocks Yankee Meadow Reservoir with 2,500 catchable and 2,500 fingerling rainbow trout and 2,000 fingerling brook trout annually.

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

Species	Cell Volume (mm <sup>3</sup> /liter)	% Density By Volume
<i>Sphaerocystis schroeterii</i>	150.537	96.53
<i>Ceratium hirundinella</i>	4.726	3.03
Planktospheria gelatinosa	0.612	0.39
Pennate diatoms	0.051	0.03
Centric diatoms	0.010	0.01
<i>Oocystis sp.</i>	0.008	0.01
<i>Mallomonas sp.</i>	0.007	0.00
Total	155.948	
Shannon-Weaver [H']	0.17	
Species Evenness	0.09	
Species Richness	0.27	

The phytoplankton community is dominated by the presence of green algae and diatoms with a fairly high rate of productivity.

**Pollution Assessment**

Nonpoint pollution sources are: sedimentation and nutrient loading from grazing and wastes or litter from recreation. Cattle graze in the watershed and until recent construction of fence in direct proximity to the reservoir. They are allowed in the area adjacent to the reservoir, but not direct access to 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

Information	
<b>Management Agencies</b>	
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146
Dixie National Forest	865-3700
<b>Recreation</b>	
<b>Reservoir Administrators</b>	
Parowan Reservoir Company	477-3422

(3A) and agricultural uses (4).

