HUNTINGTON LAKE NORTH

Introduction

Huntington Lake North is in Castle Valley, one mile north of Huntington City. It is an intermediate-sized impoundment in arid terrain. It was built by the Bureau of Reclamation as part of the Emery Project, using federal funds to subsidize the cost of storing agricultural water in Emery County. Huntington Lake North should not be confused with Huntington Reservoir, 30 miles up Huntington Canyon. Huntington Lake North is also known as Huntington Lake, Huntington North Reservoir, Huntington Reservoir North, and Huntington Reservoir. The reservoir was created in 1966 by the construction of an earth-fill dam. The shoreline is owned by the Emery County Water Conservation District and the State of Utah. Public access is unrestricted, though fees are charged in the State Park. Water is consumed for agricultural uses, but also used for recreation and warmwater aquatic habitat. No changes in use are anticipated.

Characteristics and Morphometry

Lake elevation (meters / feet)	1,780 / 5,839
Surface area (hectares / acres)	91.1 / 225
Watershed area (hectares / acres)	64,751 / 160,000
Volume (m^3 / acre-feet)	
capacity	7,018,626 / 5,690
conservation pool	
Annual inflow (m^3 / acre-feet)	9,004,550 / 7,300
Retention time (years)	.8
Drawdown (m^3 / acre-feet)	not measured
Depth (meters / feet)	
maximum	17 / 55.8
mean	7.7 / 25.3
Length (meters / feet)	1,400 / 4,600
Width (meters / feet)	823 / 2,700
Shoreline (km / miles)	4.11 / 2.56

Location

County	Sanpete
Longitude / Latitude	110 56 48 / 39 20 50
USGS Map	Huntington Reservoir 1978
DeLorme's Atlas and Gazetteer™	Page 46 D-2
Cataloging Unit	San Rafael (14060009)

Recreation

Huntington Lake North is accessible via Huntington State Park, one mile north of Huntington City on U-10.

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The area receives heavy recreational usage throughout considered very good. It is considered to be very hard with a hardness concentration range of 291-304 mg/L (CaCO3) the summer months. Fishing, boating, camping, swimming, and picnicking are all available at the State Park. Access to the lake is restricted to the park area.

The park charges a $3 fee for day use and $8 for camping (1991). Facilities include a boat launch, picnic pavilions, handicapped-accessible flush toilets, showers, and 30 campsites.

Watershed Description

The lake is in an area of desert badlands characteristic of Castle Valley. Water is from Huntington Creek via a short diversion canal. Old Department of Water Quality records list the inflow as a diversion from Cottonwood Creek near Orangeville. While water can be fed to the lake by this canal, present management practices use only Huntington Creek. ***Most and possibly all the water comes from Cottonwood Creek via the Cottonwood Creek Canal, which flows from Cottonwood Canyon above Castle Dale north to Huntington Lake North. The watershed high point is m (ft) above sea level, thereby developing a complex slope of % to the point of diversion in Cottonwood Canyon. Average stream gradient above the diversion is % (feet per mile). The canal is km (miles) long.

The soil is of limestone origin and has good permeability and moderately slow erosion and runoff. Soil Associations are listed in Appendix III.

The vegetation communities are comprised of shadscale, pinion-juniper, saltbrush, sagebrush-grass, mahogany, mountain mahogany, grass-forbs, greasewood, barren areas, pine, aspen, spruce-fir, oak and maple. The watershed receives 20 - 76 cm (8 - 30 inches) of precipitation annually with a frost-free season of 100 - 120 days each year at the reservoir. The reservoir is in an area of rolling ridges and valleys characteristic of the Wasatch Plateau. It collects water directly from the North Fork of Lake Canyon (the canyon the reservoir is located in), and from the South Fork of Lake Canyon via a short diversion canal. The canyons were likely glaciated during the last ice age.

The watershed high point (the top of the South Fork of Lake Canyon) is 3,152 m (10,340 ft) above sea level, thereby developing a complex slope of 10.3% to the reservoir. The average stream gradient above the reservoir is 4.2% (225 feet per mile).

The soil is of limestone origin and has good permeability and moderately slow erosion and runoff. Soil groupings are found in Appendix III.

The vegetation communities are comprised of pine, aspen, spruce-fir, oak and maple. The watershed receives 64 - 76 cm (25 - 30 inches) of precipitation annually with a frost-free season of 20 - 60 days at the reservoir.

Land use in the reservoir is 100% multiple use forest lands, used by humans for hunting, recreation and livestock grazing.

Limnological Assessment

The water quality of Huntington Lake North is considered very good. It is considered to be very hard with an average hardness concentration of 302 mg/L (CaCO3). Those parameters that have exceeded State water quality standards for defined beneficial uses are phosphorus, temperature and dissolved oxygen. Although the average concentration of total phosphorus in the water column has never exceeded the State's pollution indicator (25 ug/L) in 1991 concentrations of 31 and 51 ug/L were reported at various depths in the water column. The only documented dissolved oxygen exceedences were reported by DEQ (1982). A review of the profile obtained on June 13, 1979 showed concentrations near 5.7 mg/L above the thermocline (6 meters) with a declining trend to 1.5 mg/L at the bottom (12 meters). Recent profiles show a higher concentration throughout the water column, but maximum depths during these monitoring events has not approached the point where stratification could develop. With increased storage or during winter ice coverage anoxic conditions may be present in the lake. The low water levels have caused an increase in the overall temperature throughout the water column. The lake is classified as a cold water fishery which has a maximum temperature of 20 degrees C. The August 28, 1991 profile shows temperature values of greater than 21 degrees C throughout the water column. Currently, these exceedences are not critically impairing the reservoirs defined beneficial uses. The lake is defined as a nitrogen limited system with TSI values indicating the reservoir is mesotrophic except for 1989 when it was ranked as an

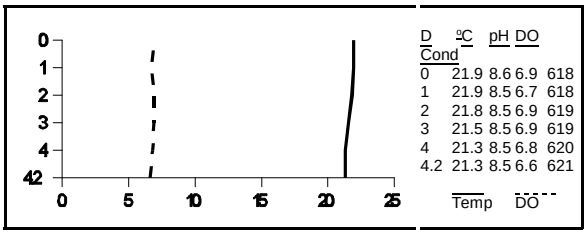
Limnological Data

Data sampled from STORET site: 593197

Surface Data	1979	1989	1991
Trophic Status	M	O	M
Chlorophyll TSI	-	41.38	39.97
Secchi Depth TSI	44.17	44.17*	8.64
Phosphorous TSI	43.20	26.61	45.82
Average TSI	43.69	37.39	44.81
Chlorophyll a (ug/L)	-	3.0	2.6
Transparency (m)	3.0	3.0*	2.2
Total Phosphorous (ug/L)	15	5	18
pH	8.1	8.5*	8.6
Total Susp. Solids (mg/L)	12	-	<3
Total Volatile Solids (mg/L)	-	-	2
Total Residual Solids (mg/L)	-	-	13
Temperature (°C / °f)	19/66	16/61	19/66
Conductivity (umhos.cm)	797	402	640
Water Column Data			
Ammonia (mg/L)	0.06	0.01	0.03
Nitrate/Nitrite (mg/L)	.05	0.05	<0.01
Hardness (mg/L)	306	-	297
Alkalinity (mg/L)	180	-	171
Silica (mg/L)	-	-	3.15
Total Phosphorus (ug/L)	17	9	20
Miscellaneous Data			
Limiting Nutrient	N	N	N
DO (Mg/l) at 75% depth	2.8	7.1	6.8
Stratification (m)	3-8	NO	NO
Depth at Deepest Site (m)	12	6.5	4.2

* Period 2 Data Only

oligotrophic reservoir. The phosphorus concentrations in 1989 appear to be abnormally low (4.8 ug/L) and have shifted the overall TSI index to the oligotrophic range. It does not appear that there has been a significant change in the concentrations of nutrients in the lake since it was originally surveyed in 1981. As indicated earlier the reservoir has stratified during the summer (1979) due to an allowable depth. The profile of June, 1979 indicates that a thermocline developed at the depth of 6-8 meters. Consistent with the stratification there was a noticeable decline in the concentration of dissolved oxygen in the water column below the thermocline. Below 6 meters the concentration declines to a low of 1.5 mg/L at the bottom. These types of conditions are deleterious to the fishery. Dissolved oxygen concentrations have not been surveyed during the winter and could reach a critical state during the winter period for fish. In 1975 this reservoir was included as part of a national eutrophication survey conducted by



the USEPA. Their findings substantiated the data presented so far and they reported the presence of submerged macrophytes at that time.. Fish present in the lake include largemouth bass (*Micropterus salmoides*) and Utah chub (*Gila atraria*). The high abundance of chubs brought about the introduction of largemouth bass. Although the lake was once classified as a cold water fishery it is currently managed and classified as a warm water fishery.

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

Species	Cell Volume (mm^3/liter)	% Density By Volume
Peridinium sp.	.727	81.82
Closteriopsis long. v. tropica	.059	6.66
Centric diatoms	.038	4.28
Pennate diatoms	.033	3.75
Chlamydomonas sp.	.013	1.50
Chlamydomonas sp.	.009	1.00
Wislouchiella planktonica		. 0 0 4
0.50		
Ankistrodesmus falcatus	.004	0.49
Total	.887	
Shannon-Weaver Index [H']	0.76	
Species Evenness	0.37	
Species Richness [d]	0.34	

The phytoplankton community is dominated by flagellates and diatoms indicative of good water with low productivity. In 1975 as reported in the NES the phytoplankton community was dominated by the following groups: May 13, 1975; *Ankistrodesmus sp., Chroomonas sp., Cryptomonas sp.*, and *Synedra sp.*; August 12, 1975 *Cyclotella sp., Aphanocapsa sp., Achnanthes sp.*, *Crucigenia sp.*; September 24, 1975 *Cryptomonas sp., Chroomonas sp.*,*Mallomonas sp.*.

Pollution Assessment

Nonpoint pollution sources include nutrient loading and sedimentation from grazing and litter and human wastes from recreation. About 1,000 sheep graze in the

immediate vicinity of the reservoir for two weeks each year. Cattle also graze the area. No mining or logging takes place in the region.

There are no point pollution sources in the watershed.

Beneficial Use Classification

The state beneficial use classification for the waters of Cleveland Reservoir include: recreational bathing (swimming) (2A), boating and similar recreation (excluding swimming) (2B), cold water game fish and organisms in their food chain (3B) and agricultural uses (4).

Information

Management Agencies	
Manti-La Sal National Forest	637-2817
Six County Commissioners Organization	896-9222
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146
Reservoir Administrators	
Huntington-Cleveland Irrigation Company	687-2505