

Olive Lake
Grant County
John Day Basin

Location	
Area	153 acres (61.9 hect)
Type	natural lake with dam
Location	20 miles w est of Sumpter in Umatilla National Forest
Access	29 miles east on Forest Service Road from US Hwy 395 at Dale
USGS Quad	Olive Lake (24K), Bates (100K)
Coordinates	44° 47' 09" N, 118° 35' 52" W
USPLSS	tow nship 09S, range 34E, section 15

Olive Lake, originally a small natural lake in the headwaters of the North Fork of the John Day River, was enlarged early in this century by the construction of a 35-foot high dam on the Lake Creek outlet. The primary reason for increasing storage was to provide water for power generation. A pipeline diverts outflow to the Fremont Powerhouse, an old power plant which was built during the gold mining days in the Blue Mountains. Upper Reservoir, above Olive Lake, was constructed simultaneously with the dam at Olive Lake. Although these reservoirs were built to store water for power plant use, there have since been demands placed on the water for irrigation purposes.

The drainage basin for Olive Lake is 4.2 square miles of forest land within the Umatilla National Forest. A nice forest campground is at the north end of the lake near the outlet, and boats can be launched. Because of irrigation withdrawals, the water level fluctuates and sometimes restricts recreational use. A variety of fish species are found in the lake; rainbow trout and brook trout make up most of the catch and there are also lots of kokanee, or land-locked salmon. Unfortunately, there has been a minor problem with rough fish in the lake in past years.

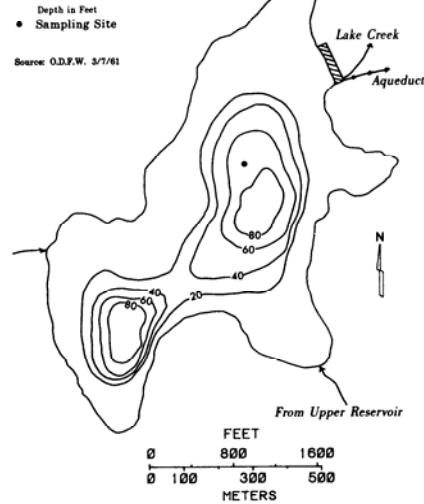
Water in Olive Lake is low in mineral constituents; major ions, alkalinity, and conductivity are well below average for reservoirs in this part of the state. The concentration of phosphorus is low and water transparency is excellent, both suggesting oligotrophic to mesotrophic conditions. However, other characteristics of Olive Lake indicate that it is mesotrophic. There is some evidence of oxygen depletion below the thermocline, and an oxygen surplus within the relatively shallow thermocline. Surplus oxygen in the thermocline, known technically as a "positive heterograph oxygen curve," generally results from active primary production. The concentration of chlorophyll also suggests mesotrophic conditions, as does the excellent growth of kokanee, rainbow trout, and brook trout.



Source: US Forest Service, 1980. Vertical photograph.

Drainage Basin Characteristics			
Area	4.2 sq mi (10.9 sq km)	Relief	moderate
		Precip	35 in (89 cm)
Land Use %		Agriculture	
Forest	93.0	Irrig	-
Range	-	Non Irrig	-
Water	7.0	Urban	-
Use %	-	Other	-
Notes -			
Lake Morphometry		Maximum	
Area	153.0 acres (61.9 hect)	Depth	90 ft (27.4 m)
Ave/Max Depth Ratio	0.280	Volume	3,893 acre ft (4.81 cu hm)
Shoal area	31%	Volume factor	.85
Length of Shoreline	2.8 mi (4.5 km)	Shape factor	1.59
		Retention time	10 mo.
Notes -			
Water Quality			
Trophic status	mesotrophic		
Sample date	07/27/82	Temp	64.8F (18.2C)
Transparency	24. ft (7.3 m)	Phosp (mg/l)	0.008
Alkalinity	13	Conductivity (umhos/cm)	38
Major Ions	Na 1.2, K 0.3, Ca 3.4, Mg 2.0, Cl 0.6, SO4 0.4	Diss. Oxygen (mg/l)	7.7
		Cholorophyll a (mg/l)	4.3
		pH	7.6
Notes -			

BATHYMETRY



TEMPERATURE AND OXYGEN

