



# Crescent Lake

Klamath County  
Deschutes Basin

Location	
Area	4,547 acres (1,840.2 hect)
Elevation	4,839 ft (1,474.9 m)
Type	natural lake with dam
Use	irrigation, recreation
Location	29 mi southeast of Oakridge in Deschutes National Forest
Access	2 mi on paved road SW from Ore Hw y 58
USGS Quad	Odell Lake (24K), La Pine (100K)
Coordinates	43° 30' 05" N, 121° 58' 10" W
USPLSS	township 23S, range 06E, section 11

Crescent Lake is a large natural lake lying high on the east slope of the Cascades at an elevation of 4839 feet. In 1909 its waters were reserved for irrigation purposes and the subsequent construction of a control dam at the lake's outlet by private interests raised the water level several feet. The lake now serves as the key component of the Bureau of Reclamation's Crescent Lake Dam Project which provides for irrigation of 8000 acres of land on the west side of the Deschutes River near Bend. When the Bureau of Reclamation took over the project, the original dam was removed and a new 40-foot high dam was constructed. Usable storage is 86,860 acre-feet, which is about 15 percent of the total lake volume (Bureau of Reclamation 1982). This reconstruction was begun in 1955 and completed in 1956. Rehabilitation of the associated canal and lateral system began in 1974 and was completed in 1977. The Tumalo Irrigation District operates and maintains the project.

Crescent Lake is one of several large, deep lakes in Oregon formed by the erosive and depositional activity of glaciers during the Pleistocene Epoch. It lies in a broad, glacially scoured valley behind a moraine dam left behind during the glacial retreat. Odell Lake nearby and Wallowa Lake in northeast Oregon are other lakes formed in the same manner. Each consists of a single deep basin, aligned with the valley, with an uncomplicated bottom topography. Crescent Lake is five miles long, four miles wide, and has a maximum depth of 265 feet. The water surface drops several feet in late summer because of irrigation withdrawals. However, because of its depth the surface lowering has very little impact on the ecology of the lake. The primary surface inflow is from Summit Lake via Summit Creek. Several small, intermittent streams contribute during the snowmelt season. Crescent Creek, a tributary of the Deschutes River, is the outlet stream. The lake and its drainage basin are entirely within the Deschutes National Forest. It is a landscape blanketed with a thick coniferous forest of both fir and pine species, except for areas of rock outcrops at higher elevations.

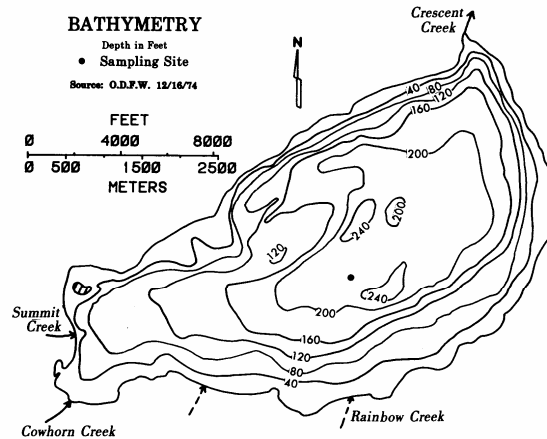
Located near a major highway, Crescent Lake receives heavy recreational use throughout the summer; the entire shoreline is accessible by road. However, only the portion paralleling the north and west shore is paved, while the east shore road is narrow and unsurfaced. Trails leading into nearby Diamond Peak Wilderness and to several small lakes to the south provide an opportunity for hiking. Picnic grounds and four Forest Service Campgrounds are available, with Crescent Lake Campground near the outlet being the largest. In addition there are over 70 recreation cabins on the northwest shore, a private resort near the outlet, and a Boy Scout Camp on the south shore. In spite of all the facilities and recreational opportunities at Crescent Lake, much of the lake's shoreline is undeveloped and the forest unaltered in keeping with Forest Service management objectives. It has become quite a good fishing lake with kokanee, lake trout, mackinaw, and whitefish. A few brown trout are also caught each year.

Water quality in Crescent Lake is excellent and it is distinctly oligotrophic. The lake is sometimes exposed to strong winds, which help produce a relatively deep (50 to 60 feet, 15 to 18 meters) thermocline during summer stratification. The presence of a deep, cold, well oxygenated hypolimnion provides an excellent habitat for the mackinaw trout which thrive in Crescent Lake. The mineral content of the water is low; water transparency is excellent; and the concentrations of chlorophyll and phosphorus are generally low. There is very little growth of macrophytes because of the lack of a suitable substrate. The population density of phytoplankton is low, but zooplankton populations are reported to be modest (Chapman and Fortune 1963). Phytoplankton densities (except for the sample collected from the dock in November, 1982) indicate a trophic state between ultraoligotrophic to oligotrophic. The species present, however, are indicators of different trophic states. Certain algae (Kephyrion, Dinobryon, Tabellaria, and Chromulina) are most commonly found in oligotrophic lakes, but may also be found in mesotrophic lakes. Other algae are most commonly found in mesotrophic to eutrophic lakes (Asterionella formosa, Fragilaria crottenensis, and Anabaena). Although not conclusive, the presence of these eutrophic algae do indicate the possibility of impacts from cultural activities on and around the lake. The soils around Crescent Lake are very porous and have little capacity to absorb and retain nutrients. For this reason, special care has been taken in the development of recreation facilities to prevent any accidental cultural eutrophication of the lake. The water quality in Crescent Lake should be monitored in the future to detect any changes that may occur. However, to date the lake shows little evidence of eutrophication, despite considerable use (McHugh 1972).



Source: US Bureau of Reclamation, 1970. View looking southwest.

Drainage Basin Characteristics								
Area	56.8 sq mi (147.1 sq km)		Relief	moderate		Precip	40-60 in (102-152 cm)	
Agriculture								
Land Use %	Forest	Range	Water	Irrig	Non Irrig	Urban	Other	
	86.4	-	11.8	-	-	-	1.8	
Notes Other - Lava fields								
Lake Morphometry				Maximum		Average		
Area	4,547.0 acres (1,840.2 hect)		Depth	265 ft (80.8 m)		124ft (37.8 M)		
Ave/Max Depth Ratio	0.470		Volume	566,556 acre ft (699.86 cu hm)				
Shoal area	5%	Volume factor	1.41		Shape factor			1.38
Length of Shoreline	12.4 mi (20.0 km)			Retention time				13 yr
Notes -								
Water Quality								
Trophic status	oligotrophic, possibility of adverse cultural influences on water quality							
Sample date	08/23/82		Temp	63.5F (17.5C)		Diss. Oxygen (mg/l)	9.1	
Transparency	52.5 ft (16.0 m)		Phosp (mg/l)	0.062		Cholorophyll a (mg/l)	0.1	
Alkalinity	11		Conductivity (umhos/cm)	26		pH 7.6		
Major Ions	Na	K	Ca	Mg	Cl	SO4		
	1.7	0.9	2.4	0.9	-	0.8		
Notes -								
Sample date	08/19/81		Temp	68.4F (20.2C)		Diss. Oxygen (mg/l)	6.8	
Transparency	43 ft (13.0 m)		Phosp (mg/l)	0.001		Cholorophyll a (mg/l)	0.2	
Alkalinity	10		Conductivity (umhos/cm)	28		pH 8.0		
Major Ions	Na	K	Ca	Mg	Cl	SO4		
	1.9	1.1	2.8	1.0	0.6	0.1		
Notes -								
Sample date	05/19/82		Temp	50.9F (10.5C)		Diss. Oxygen (mg/l)	-	
Transparency	-		Phosp (mg/l)	0.014		Cholorophyll a (mg/l)	0.8	
Alkalinity	8		Conductivity (umhos/cm)	28		pH 7.00		
Major Ions	Na	K	Ca	Mg	Cl	SO4		
	2.0	1.0	2.3	0.8	0.6	-0.1		
Notes -								



Phytoplankton Surveys:

8/19/81

Alga	#/ml	%
<i>Kephyrion</i> sp.	4.9	36.0
<i>Dinobryon</i> sp.	1.1	8.1
<i>Tabellaria fenestrata</i>	0.8	5.9
<i>Asterionella formosa</i>	0.6	4.4
<i>Melosira</i> sp.	0.6	4.4
others (20)	5.6	41.2
Total	13.6	100.0

8/23/82

Alga	#/ml	%
<i>Chromulina</i> sp.	21	87.4
<i>Synedra cyclopum</i>	1	4.2
<i>Cryptomonas erosa</i>	1	4.2
<i>Fragilaria crotonensis</i>	1	4.2
Total	24	100.0

11/6/82 (collected from dock)

Alga	#/ml	%
<i>Melosira granulata</i>	162	69.8
<i>Asterionella formosa</i>	30	12.9
<i>Tabellaria fenestrata</i>	7	3.0
<i>Anabaena</i> sp.	27	11.7
Total	232	100.0

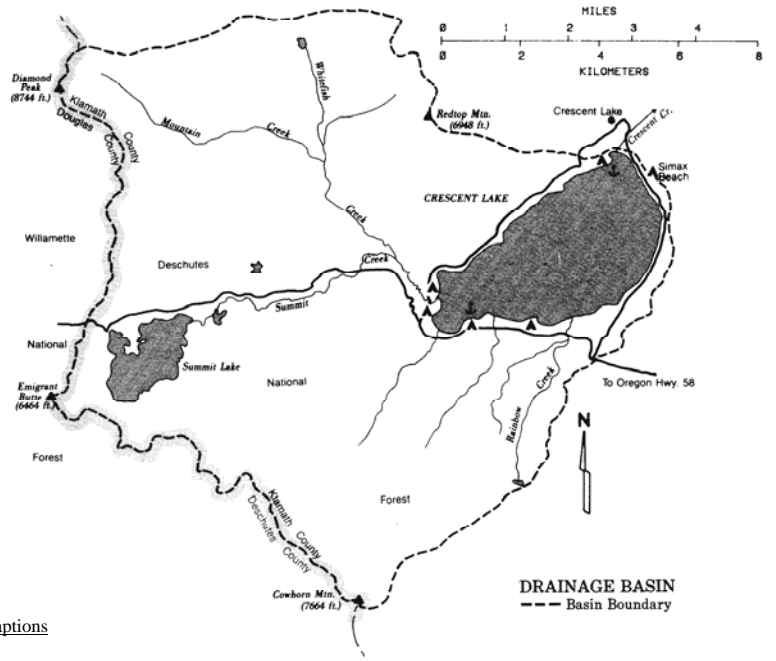
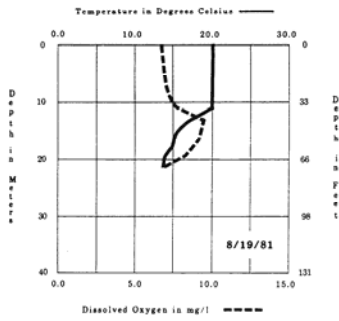


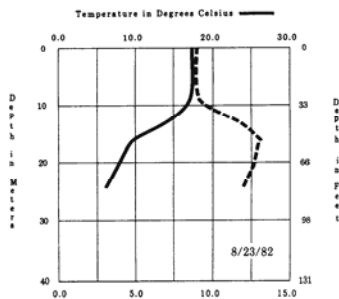
Photo Captions

1. Crescent Lake
2. Simax Beach
3. Big Marsh
4. Tandy Bay
5. Fawn Lake
6. Lakeview Mtn.

TEMPERATURE AND OXYGEN



TEMPERATURE AND OXYGEN



Source: US Forest Service, 1974. Vertical photograph.