



## Davis Lake

### Klamath County

### Deschutes Basin

Location	
<b>Area</b>	3,906 acres (1,580.8 hect)
<b>Elevation</b>	4,386 ft (1,336.9 m)
<b>Type</b>	natural lake
<b>Use</b>	recreation, w aterfowl habitat
<b>Location</b>	30 mi southeast of Oak Ridge in Deschutes National Forest
<b>Access</b>	Forest Service Road from U.S. 97, Ore Hwy y 58, or from Wickiup Res
<b>USGS Quad</b>	Davis Mountain (24K), La Pine (100K)
<b>Coordinates</b>	43° 38' 04" N, 121° 49' 41" W
<b>USPLSS</b>	township 22S, range 07E, section 27

Davis Lake is one of the largest of the many mountain lakes on the east slope of the Central Oregon Cascades. It straddles the Klamath/Deschutes county line and lies at an elevation of 4386 feet

above sea level. The name Davis is taken from "Button" Davis, a nineteenth century stockman from the Prineville area who ran cattle in the vicinity of the lake. Davis Mountain, rising above the lake on the east side, was presumably named for the same man. In 1878 the name was already in use when Lt. T.W. Symons visited the area. His survey report included the first known description of Davis Lake and its valley and pointed out several essential features: the large surrounding meadow, backed by a forest of ponderosa pine; evidence of large fluctuations in water level and surface area; and the lava dam that impounded the waters of Odell Creek to form the shallow lake.

As noted by Symons, Davis Lake is a dramatic product of the recent geologic history of the Central Oregon Cascades, an area of widespread volcanic activity. Odell Creek incised a channel into the surface of a high lava plateau and was later filled by a lava flow several hundred feet thick that impounded the creek, forming Davis Lake. Although the date of this flow has not been determined precisely, it is certainly one of the youngest in the Cascades and may be as recent as 1000 years old. Certainly it is less than 6600 years old, because the flow is not covered by the regional blanket of pumice from Mt. Mazama.

The hydrology of Davis Lake and the physical geography of its drainage basin was well documented by Phillips and Van Denburgh (1968). The drainage basin covers an area of about 111 square miles and reaches a maximum elevation of 8744 feet at the summit of Diamond Peak. The lava plateau slopes gently toward the northeast and is dotted with many cinder cones. A surface deposit of highly permeable pumice overlies all but the most recent deposits and supports an almost continuous forest of ponderosa pine. Infiltration rates into the permeable volcanic material are very high and little surface drainage has developed. Thus, the hydrologic boundary of the basin may not be completely coincident with the topographic basin.

Odell Creek and Ranger Creek, two perennial streams, feed the lake and there is direct surface runoff from snowmelt. Subsurface springs must also contribute inflow. There is no surface outlet, but considerable seepage through the blocky lava dam. During the summer season this output exceeds flow into the lake and the surface area covered by water gradually decreases. High water level usually occurs in June with a two to three foot drop by autumn and considerable reduction in surface area. There is also fluctuation from year-to-year in response to the amount of precipitation in the preceding winter, and to some extent in the two or three previous years. It is not unusual for surface area to vary from 1000 acres to 4000 acres in successive years. Davis Lake is more meadow and marsh than it is lake in drier years. The normal range of water surface elevation in historic times appears to be from about 4376 feet to a high of 4392 feet. Klamath and Deschutes counties and the Oregon Department of Fish and Wildlife combined efforts to seal several sumps along the east side of the lake to reduce water loss (McHugh 1972). Other sumps are known to exist in the bottom of the lake, and water loss through these is the reason that no attempt has been made to raise the lake level for storage, as has been done with many other lakes in the area. Four miles downstream from the lake at the far end of the lava flow is Davis Creek, fed by a number of large springs whose openings range in elevation from 4310 feet to 4360 feet. Since the construction of Wickiup Dam in 1949, located 10 miles northeast of Davis Lake, these springs are usually submerged except when water level in the reservoir is low. However, this does not appear to influence the flow of these springs. Although the source of this spring flow has not been directly traced, it appears that they are in large part supplied by seepage from Davis Lake. There is a well defined relationship between the flow of the springs and the stage of the lake.

Davis Lake is rich biologically; the bottom material has a high organic content and the production of insects, crustaceans, and other fish food is high. It is well enriched from natural sources (McHugh 1972). As the waters in the lake recede, exposing more wetland, a variety of emergent macrophytes grow in the shallow areas. Grasses surround the lake, and small birds nest in the grasses and willows. Waterfowl habitat is excellent and supports a variety of ducks, geese, swans and sandhill cranes. Davis Lake is an important link in the chain of waterways and feeding grounds that form a major migration route.



Source: Oregon National Guard, 1981-82.

Drainage Basin Characteristics								
<b>Area</b>	111.0 sq mi (287.5 sq km)		<b>Relief</b>	moderate		<b>Precip</b>	36-60 in (91-152 cm)	
<b>Land Use %</b>	<b>Forest</b>	<b>Range</b>	<b>Water</b>	<b>Agriculture</b>		<b>Urban</b>	<b>Other</b>	
	88.5	-	10.5	<b>Irrig</b>	<b>Non Irrig</b>	-	-	1.0
<b>Notes</b> Other - Lava fields								
Lake Morphometry				Maximum		Average		
<b>Area</b>	3,906.0 acres (1,580.8 hect)		<b>Depth</b>	20 ft (6.1 m)		9ft (2.8 M)		
<b>Ave/Max Depth Ratio</b>	0.460		<b>Volume</b>	35,942 acre ft (44.40 cu hm)				
<b>Shoal area</b>	50%		<b>Volume factor</b>	1.38		<b>Shape factor</b> 1.59		
<b>Length of Shoreline</b>	13.5 mi (21.7 km)		<b>Retention time</b>		4 mo			
<b>Notes</b> Area determined from current air photo								
Water Quality								
<b>Trophic status</b>	mesotrophic, growth of algae stimulated by recycled bottom sediments							
<b>Sample date</b>	07/16/82		<b>Temp</b>	67.3F (19.6C)		<b>Diss. Oxygen (mg/l)</b>	9.1	
<b>Transparency</b>	10.5 ft (>3.2 m)		<b>Phosp (mg/l)</b>	0.016		<b>Chlorophyll a (mg/l)</b>	2.9	
<b>Alkalinity</b>	15		<b>Conductivity (umhos/cm)</b>	38				
<b>pH</b>	8.7							
<b>Major Ions</b>	<b>Na</b>	<b>K</b>	<b>Ca</b>	<b>Mg</b>	<b>Cl</b>	<b>SO4</b>		
	2.7	0.9	3.1	1.1	0.4	0.1		
<b>Notes</b> -								
<b>Sample date</b>	05/20/82		<b>Temp</b>	57.6F (14.2C)		<b>Diss. Oxygen (mg/l)</b>	10.2	
<b>Transparency</b>	-		<b>Phosp (mg/l)</b>	0.017		<b>Chlorophyll a (mg/l)</b>	1.2	
<b>Alkalinity</b>	16		<b>Conductivity (umhos/cm)</b>	37				
<b>pH</b>	7.6							
<b>Major Ions</b>	<b>Na</b>	<b>K</b>	<b>Ca</b>	<b>Mg</b>	<b>Cl</b>	<b>SO4</b>		
	2.7	1.0	3.4	1.3	0.6	0.2		
<b>Notes</b> -								

Fishing in Davis Lake is excellent. Only fly-fishing is now permitted, thereby reducing pressure on the lake and providing for a quality experience. Baits and lures can be used on Odell Creek. The creek is closed to fishing until the end of May because of spawning rainbow trout. Rainbow trout, some quite large, are taken most commonly in the lake, kokanee also run large, but appear to have declined in numbers in recent years. Landlocked coho salmon are generally self-sustaining, although they have been restocked periodically. The lake was treated in 1961 to kill trash fish. Toxaphene was used and because of the persistence of the toxicant nearly a year passed before restocking was possible. No trace of toxaphene was ever detected in the springs entering Wickiup Reservoir (McHugh 1972). Restocking was with Atlantic salmon, kokanee, and silver salmon. Oregon whitefish also are found.

Much of the ecological character of Davis Lake is determined by its shallow morphology and fluctuating water level. It is constantly mixed from top to bottom and does not develop any stable thermal stratification. Dissolved oxygen is always plentiful throughout the water column. Major ion concentrations are slightly above average for natural mountain lakes in the Cascades, but are characteristic of lakes in the Cascades surrounded by pumice soils. The concentrations of chlorophyll and phosphorus and the water transparency suggest mesotrophic conditions. Nutrients are readily recycled from the rich organic sediments and stimulate the growth of planktonic algae, also a consequence of the continual mixing of the water column. Additional nutrients are added by migrating waterfowl. The phytoplankton densities reflect mesotrophy, however the species present indicate varying ecological conditions. Anabaena is more common in eutrophic lakes, while Chromulina is most often found in oligotrophic lakes. The phytoplankton also contains many periphytic diatoms (diatoms growing attached to macrophytes on the lake bottom), which are characteristic of shallow lakes.

Phytoplankton Surveys:

8/20/81

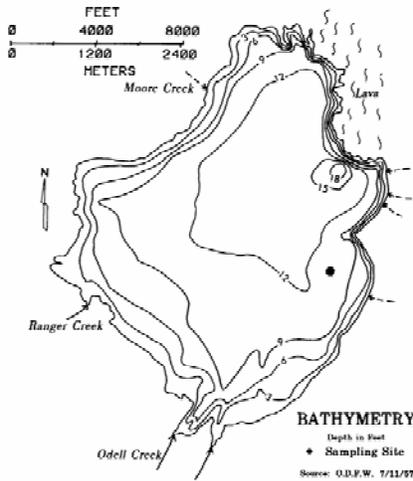
Alga	#/ml	%
Anabaena sp.	41	24.1
Comphonema angustatum	20	11.8
Cryptomonas erosa	18	10.6
Fragilaria construens	18	10.6
Sphaerocystis Schroeteri	16	9.4
others (19)	57	33.5
Total	170	100.0

5/20/82

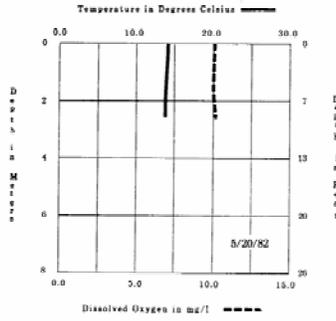
Alga	#/ml	%
Ankistrodesmus falcatus	114	37.3
Fragilaria construens	44	14.4
Nitzschia acicularis	44	14.4
Asterionella formosa	25	8.2
others (11)	79	25.7
Total	306	100.0

7/16/82

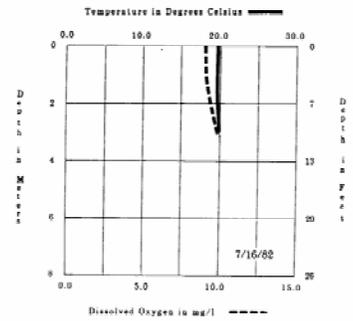
Alga	#/ml	%
Chromulina sp.	231	75.0
Rhodomonas minuta	31	10.1
Ankistrodesmus falcatus	19	6.2
Anabaena sp.	15	4.9
others (2)	12	3.8
Total	308	100.0



TEMPERATURE AND OXYGEN



TEMPERATURE AND OXYGEN



DRAINAGE BASIN

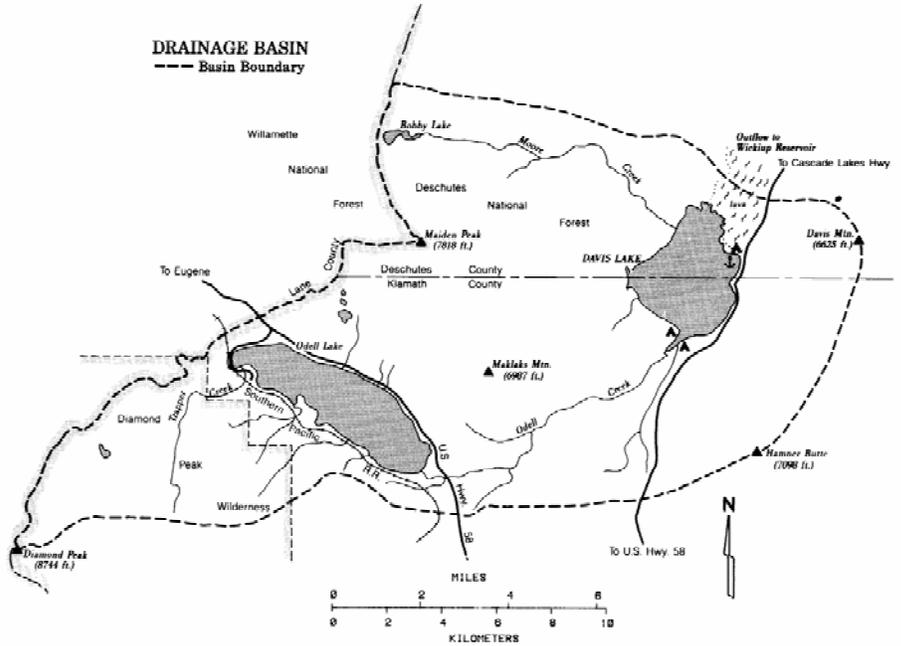


Photo Captions

1. Davis Lake
2. Lava flow
3. Exposed lake bottom

Source: NASA, 1978. Vertical photograph.