

"Waldo Lake"

Waldo Lake, located at an elevation of 5414 feet near the crest of the Cascade Range, is one of the largest natural lakes in Oregon. Its surface area of 6298 acres is second only to Upper Klamath Lake (and Agency Lake) among natural non-alkali lakes in the state. It is also the second deepest lake in the state after Crater Lake; maximum depth is 420 feet and the mean depth is 128 feet. The total volume of water in Waldo Lake is nearly 800,000 acre-feet, and it has an extremely long retention time. However, the most outstanding feature of this lake is its ultraoligotrophic character; it is indeed one of the most oligotrophic water bodies in the world. The water is a beautiful cobalt blue color and remarkably clear. Certainly this feature has changed little since the lake was first visited by surveyors in the nineteenth century. Waldo Lake and others nearby were shown as the Virgin Lakes on an 1863 survey map, and it was also at one time known as Pengra Lake. Eventually, the lake was named for Judge John B. Waldo who sought his recreation in the Cascades.

The lake basin, estimated to be 10,000 to 12,000 years old, is a glaciated depression enclosed by end and lateral moraines. This entire section of the Cascades is dotted with lakes in depressions left by the melting of ice sheets at the end of the Pleistocene Epoch. Little surface drainage has developed in the relatively flat, youthful topography. No permanent surface streams enter Waldo Lake, although there is snowmelt runoff through countless temporary streams during spring and early summer. There is also some seepage in from springs on the lake bottom. Almost one-third of the drainage basin consists of the lake itself, and direct precipitation is a major source of water. The lake is the source of the North Fork of the Willamette River, which discharges from the northwest end, and there is another outlet to the southwest. At one time there were plans to install hydroelectric generating equipment at this second outlet, but to date it has not been done. The surrounding landscape is blanketed by a coniferous forest, predominantly Douglas fir, hemlock, and pine. Huckleberry is the principal species of understory vegetation. The thin, porous soil mantle overlies basaltic bedrock and consists of moderately weathered volcanic ash and boulders from glacial outwash. Generally, the shoreline of the lake is rocky and irregular shaped with numerous indentations. Small sandy beaches are numerous along the eastern shoreline, while the western shore has fewer beaches and is generally steeper.

Prior to 1969 Waldo Lake was accessible only by trail or four-wheel drive vehicle and the majority of users lived within a 100-mile radius. In June of that year a paved road was opened, thus linking the lake with a major highway. Campgrounds were constructed by the Forest Service on the east shoreline and plans made for an all-year recreation site. As a result of the improved access, visitor use has risen dramatically, although it is for the most part confined to the period July 15 to September 15. The Waldo Lake Recreation Area of 32,000 acres is a management unit of the Willamette National Forest, designed to protect the beautiful alpine characteristics of the lake and its surroundings. A network of trails lace the area and vehicle access is restricted. Sail boaters and canoeists find the lake appealing during the short season. Anglers commonly pack into some of the many small, high lakes nearby. Waldo Lake has a lot of kokanee, eastern brook trout and rainbow trout, although populations are small; the most productive areas are in the littoral zone where the fish feed in shallow water near shore.

Waldo Lake is thermally stratified in the summer. The surface water remains cool, 59 to 64 degrees Fahrenheit (15 to 18 degrees Celsius) and the thermocline begins at a depth of about 33 feet (10 meters). Because of the lake's considerable depth, heating extends to only about this depth; bottom water is near the temperature of maximum density, 39 degrees Fahrenheit (4 degrees Celsius) year round. The chemistry and biology of the water in Waldo Lake are exceptional and clearly classify the lake as ultraoligotrophic. It is the most oligotrophic lake in the state and, as noted by Carter et al (1966), among the purest lakes in the world. Concentrations of ions, conductivity, and alkalinity are exceptionally low, closely similar to the composition of rain water in a pristine environment. The pH of the lake is slightly acid, also characteristic of uncontaminated rain water which acquires its mild acidity from atmospheric carbon dioxide.

Source: Oregon National Guard, 1981-82. View looking north.

DRAINAGE BASIN CHARACTERISTICS

Area 31 sq mi (76 sq km) Relief moderate Precep. 72 in (183 cm)
 Land use by Forest Range Water Irr. Ag. Non-irrig. Urban Other
 type (%) 69.2 30.8

LAKE MORPHOMETRY

Area 6298 acres (2548.8 hect) Maximum Depth 420 ft (128 m) Average
 Ave./Max Depth Ratio 0.31 Volume 787,400 acre ft (970.86 cu km)
 Shore Area 4% Length of Shoreline 21.7 mi (34.9 km) Shape Factor 2
 Notes Area determined from current air photo. Retention Time 32 yr

WATER QUALITY DATA

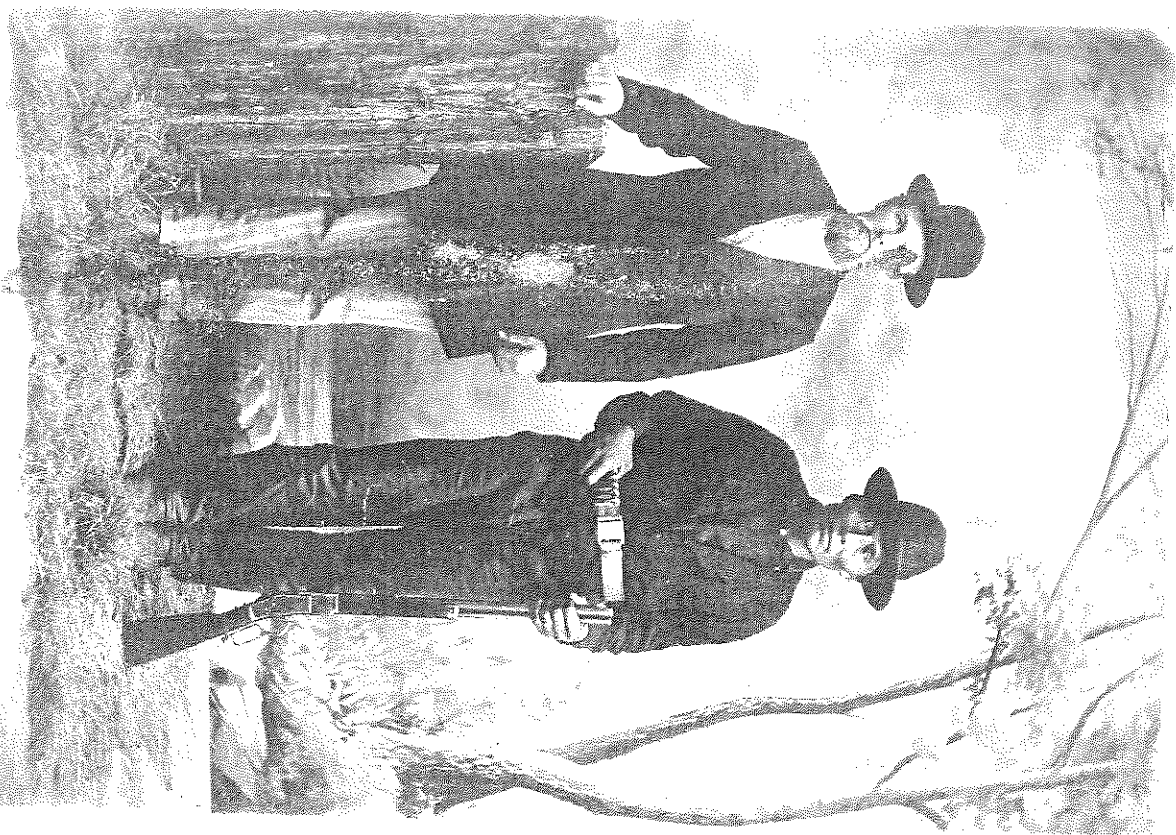
Sample Date 8/18/81 Temp. 65.7 F (18.7 C) pH 6.7
 Transparency 52.5 ft (16 m) Phosp. (mg/l) 0.001 Chlorophyll a (µg/l) 0.1
 Alkalinity (mg/l) <0.1 Conductivity (µmhos/cm) 4 Dism. Oxygen (mg/l) 8.8
 Major ions Na⁺ K Ca Mg Cl SO₄
 (mg/l) 0.2 0.2 0.7 0.1 0.6 <0.1
 Sample Date 8/23/82 Temp. 63.5 F (17.5 C) pH 6.28
 Transparency 65.6 ft (20 m) Phosp. (mg/l) 0.009 Chlorophyll a (µg/l) 0.1
 Alkalinity (mg/l) <0.1 Conductivity (µmhos/cm) 3.0 Dism. Oxygen (mg/l) -
 Major ions Na⁺ K Ca Mg Cl SO₄
 (mg/l) 0.2 0.0 0.4 0.1 0.6 0.3

Trophic Status ultraoligotrophic - dramatically so

Notes

Nutrient concentrations are exceptionally low as well. Bioassay experiments conducted by Powers et al (1975) and Maloney et al (1975) indicate that phosphorus concentrations limit the growth of algae. The population densities of planktonic algae are perennially low, seldom exceeding 50 cells/ml. A few planktonic species of diatoms (*Asterionella formosa*, *Melosira* sp, *Synedra* sp) have been reported, but the commonest species observed all belong to the diatom genus *Eunotia*, a characteristically benthic or epiphytic species, and the dinoflagellate genus *Glenodinium*. Patches of aquatic moss (*Hygrohypnum*) appear at all depths. Much of the very limited primary production in the lake results from the growth of the moss and attached diatoms. Larson (1970a) measured the primary production of the plankton by the sensitive carbon-14 method, and observed some of the lowest productivities anywhere in the world (average of 29 mg C/m² during summer months); for example, this productivity is less than half the productivity observed in Crater Lake (Larson 1972a). The very pure water and lack of plankton are responsible for the exceptional transparency of the water. Larson (1970a) measured transparency at over 115 feet (35 meters) using a one-meter Secchi disk; other observers consistently report Secchi disk readings of 66 to 100 feet (20 to 30 meters) or more. At noted, natural fish growth in the lake is undoubtedly limited because of the very unproductive planktonic food chain; zooplankton are sparse. In some areas, there are noticeable populations of benthic invertebrates, primarily insect larvae, and this benthic productivity may be vitally important to the maintenance of fish populations.

79F



Ident. #.....GN5320
 Subject.....People - ~~S to~~ W
 Date.....unknown
 Description.....Frank Warner and his foster brother, Charley
 Tufti. Warner was the son of Fred and Elizabeth
 Young Stewart Warner, who came to Oregon with the
 "Lost Wagon Train of 1853" and settled in the Fall
 Creek area. Frank was born in 1859. Tufti was a
 Molalla tribe orphan, given to the Warners by his
 aunt when he was 6 years old in exchange for "a
 pan of flour and 12 pumpkins." The Warners raised
 Tufti and he became "Uncle Charley" to the
 children of Fall Creek.

Print.....copy
 Negative.....copy
 Photographer.....unknown



Oregon

John A. Kitzhaber, MD, Governor

Parks and Recreation Department

725 Summer St NE, Ste C

Salem, OR 97301-1266

(503) 986-0707

Fax (503) 986-0794

www.oregonstateparks.org

January 24, 2013

Mr. Mark Gardiner, Chair
Oregon Aviation Board
3040 25th St SE
Salem, OR 97302-1125



Re: Waldo Lake Rulemaking

Dear Mr. Gardiner,

As the state's agency responsible for administering Oregon's Scenic Waterways system, I would encourage you and your board to act in concert with the recent rulemaking of the Oregon Marine Board in banning internal combustion engines from use on Waldo Lake. With certain exceptions for emergencies, banning float planes will preserve the values the state legislature acknowledged when it adopted Waldo Lake into the scenic waterway system.

Waldo Lake is the only lake designated as a scenic waterway. There is reason for that distinction. It possesses a natural, pristine condition that is largely unfettered by development and provides an outdoor recreation experience unparalleled on other water bodies of the state. The noise and distraction introduced by internal combustion engines infringes upon the quiet, contemplative atmosphere and enjoyment of those seeking the peace and solitude that brings a respite to people's lives.

Without reservation, the greater public interest, both present and future, will be served by retaining Waldo Lake free of the noise and distraction caused by float plane operations on the lake and thus protecting the outstanding scenic, fish, wildlife, geological, botanical, historic, archaeological, and outdoor recreation values it possesses.

Thank you for your consideration.

Sincerely,

Tim Wood
Director

Cc: Mr. Richard M. Whitman, Governor's Office
Mr. Scott Brewen, Director, Oregon Marine Board
Mr. Mitch Swecker, Director, Oregon Aviation Board





Two seaplanes landed on Waldo Lake on Sept. 23, 2013. The plane in this picture is a "RV7amphib", home built kit model.

A full video of the landing was uploaded to YouTube by Cliff Gerber, Treasurer of the Columbia Seaplane Association and can be seen here:

<http://www.youtube.com/watch?v=30d4CbmcRYg>

Waldo Lake float plane landing



Cliff Gerber · 4 videos



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<http://www.c-spa.org/v2/contact.html>

Treasurer: [Cliff Gerber](#), cliff@c-spa.org



...flying from his dock on the Willamette River through Arizona, California, Washington, Idaho, British Columbia, to Oshkosh, the Bahamas and back...

Our concerns:

1. *This seaplane can easily reach waters affected by invasive species. We also are concerned about seaplanes from those locations easily reaching Waldo Lake.*

Mention noise and safety here also? Put concerns here and

SAFETY



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<http://www.seaplanes.org/forum/showthread.php?501-Waldo-lake-now-officially-open>

Posted by Bill Wainwright, Columbia Seaplane Association and Seaplane Association Field Director for Oregon
In the Seaplane Association SPA Forum 5/21/12

"Bear in mind that Waldo lake is over 5000 feet in elevation and on a hot summer day even a high performance plane is going to have its work cut out for it."

Our concerns:

1. Safety. Would underpowered seaplanes be regulated in any different way than seaplanes larger than 200 hp. Is the RV7amphib considered high power?
2. What about the small model

NOISE POLLUTION



One comment following this article "Oregon lawmakers consider banning motors, seaplanes from Waldo Lake"

"I was @ Waldo for three nights in September 2012 and I observed two seaplanes landing on the lake - one after the other. After about ten minutes, both seaplanes taxied down the lake and took off again. The planes were LOUD - they could be heard from anywhere on the pristine lake. There seemed no purpose for the landing and take off other than giving the pilots a thrill.

Note: It is interesting to note that in the video posted on youtube that the plane coming into Waldo is passing over or near the east side of the lake, this is where all of the public campgrounds are located.

In the paper, "SEAPLANE NOISE", written by Aron Faegre, current President of the Columbia Seaplane Association (December 15, 1995 & Revised September 10, 2002)

<http://www.seaplanes.org/mambo/UserFiles/File/SeaplaneNoise.pdf>

Mr. Faegre states (page 6, Section 4.0 How Much Noise is Too Much / Section 4.1 Neighborhood Compatibility)

To determine the compatibility of a seaplane noise level with a surrounding community, the following factors should be considered:

- Is the maximum sound level similar to that of other background sound levels in the neighborhood?
- How does it compare to train, motorcycle, truck, automobile, chain saw, motorboat, and lawnmower sounds in the vicinity?
- What are the community norms of activity?

We feel that the estimated noise level for a 215 hp seaplane (similar size to the RV7amphib seaplane) of 81 decibels (page 3 of "Seaplane Noise" is inconsistent with the intent of Oregon Scenic Waterways designation for Waldo Lake