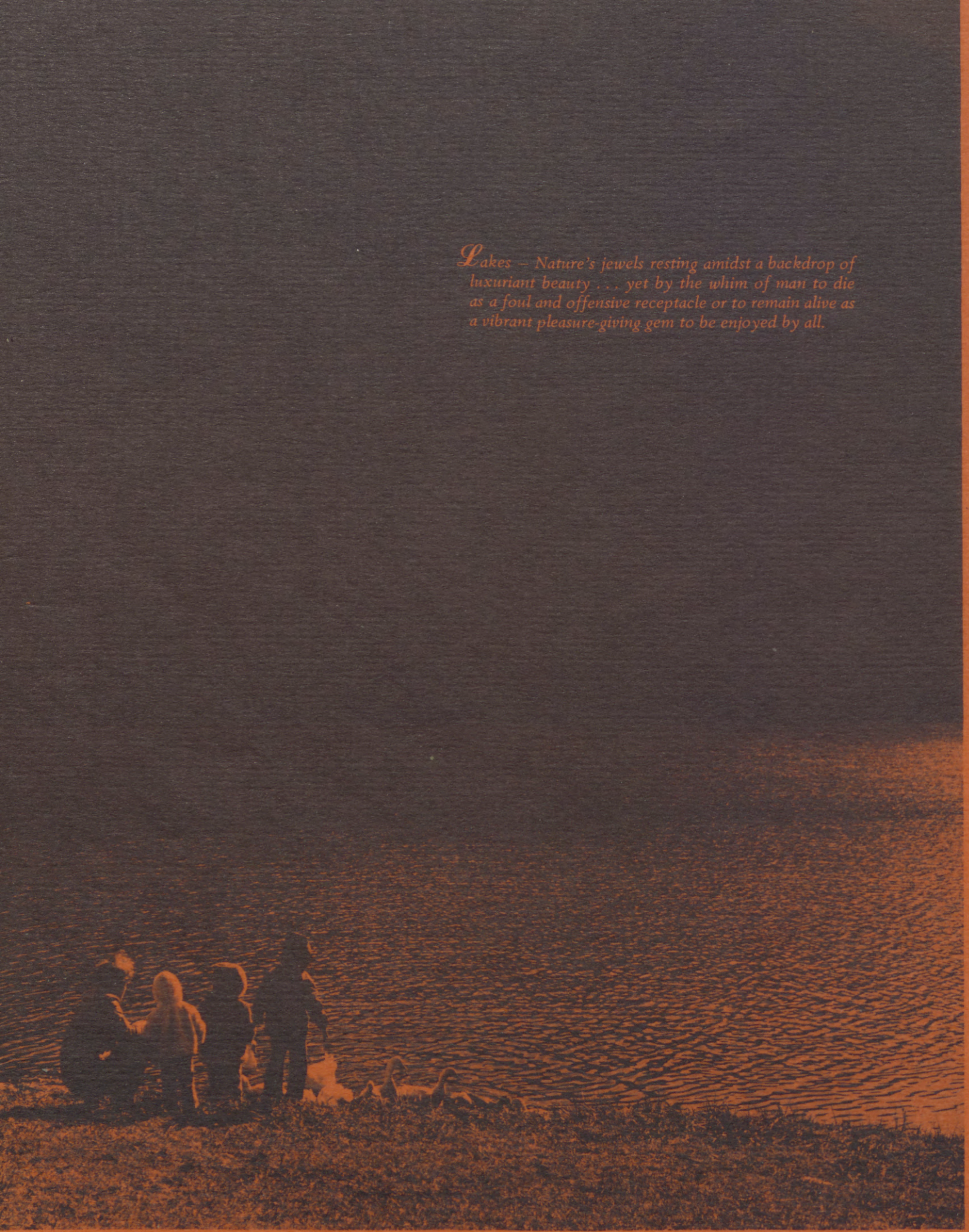
Lakes of Oregon

VOLUME ONE

Clatsop, Columbia, and Tillamook Counties

Lakes – Nature's jewels resting amidst a backdrop of luxuriant beauty . . . yet by the whim of man to die as a foul and offensive receptacle or to remain alive as a vibrant pleasure-giving gem to be enjoyed by all.



OPEN-FILE REPORT ... 1973

LAKES OF OREGON

VOLUME ONE

Clatsop, Columbia, and Tillamook Counties

By

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Prepared by
UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY. Water Resources Division.

in cooperation with the
OREGON STATE ENGINEER

UNITED STATES DEPARTMENT OF THE INTERIOR
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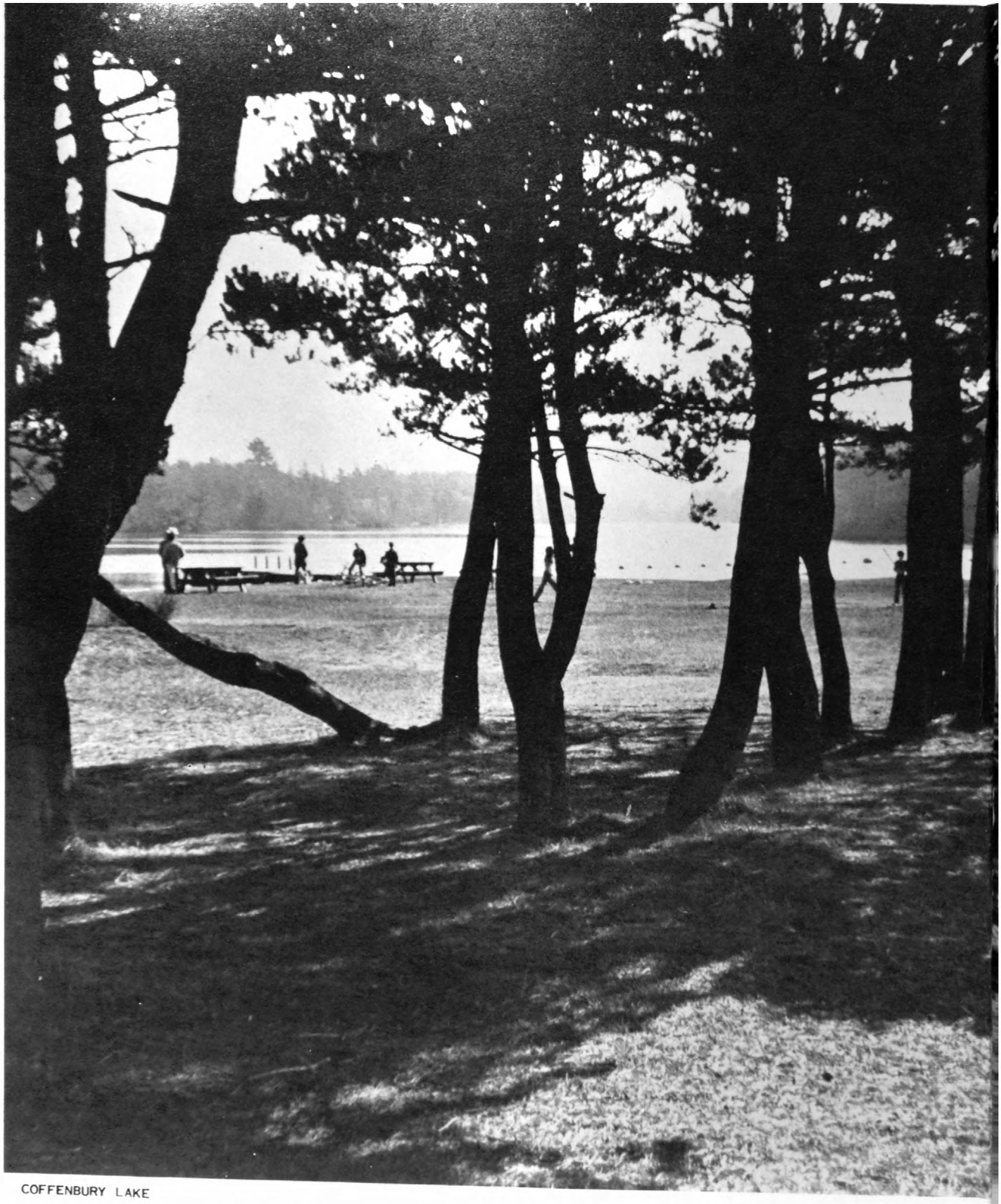
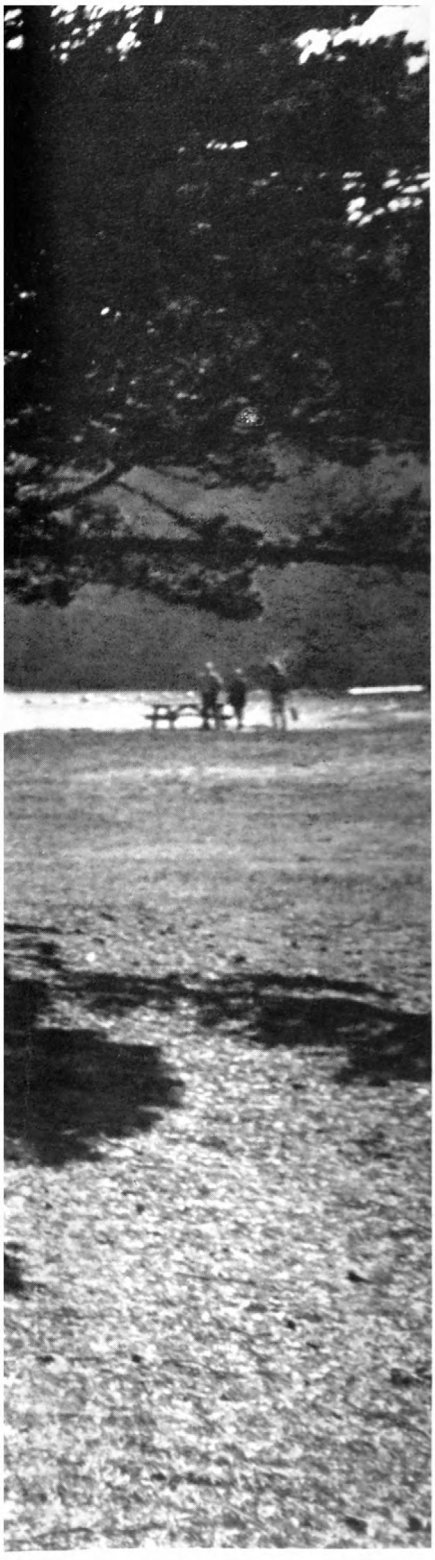


COFFENBURY LAKE



Introduction

An inventory of lakes and reservoirs in Oregon has been needed for many years. Records have long been collected throughout the State to assess the quantity and quality of water from streams, but few data have been collected on water stored in Oregon's lakes and reservoirs. Such data are essential for a complete evaluation of the total surface-water supply of the State and to provide a basis for answering questions about Oregon's lakes. Much of the information on lakes and reservoirs previously collected by Federal and State agencies has never been published. These data were compiled and used as a basis for collecting additional information. This report provides information for use by city, county, and State planning groups as well as for sportsmen, tourists, and others interested in preserving the recreational value of Oregon's lakes.

Because of the large number of lakes and reservoirs in Oregon, a single report covering the State would be bulky. Therefore, the best approach seemed to be to publish several volumes on a county or multicounty basis, and Clatsop, Columbia, and Tillamook Counties were selected for the first report. (See fig. 1.)

In addition to office compilation of existing data, most lakes were visited at least once. Visits were made in late summer or early fall when lakes were most accessible and when water temperature and biological activity are at a maximum. Some lakes previously studied by other Federal or State agencies and included in this report were not visited during the study.

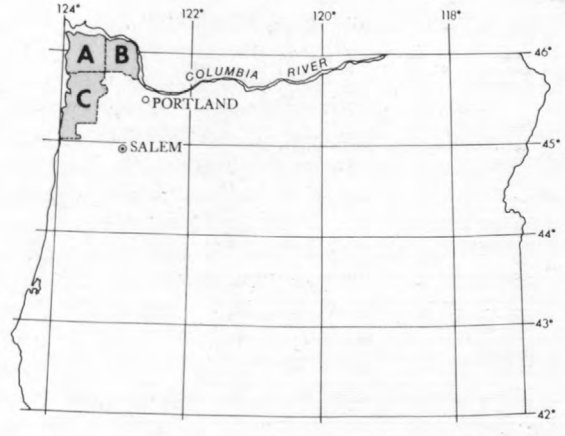


FIGURE 1. — Index map of Oregon showing locations of (A) Clatsop, (B) Columbia, and (C) Tillamook Counties.

CRITERIA USED FOR DESIGNATING LAKES

There are no commonly accepted criteria for distinguishing between lakes, ponds, pools, sloughs, and other water bodies. In general, any lake with a surface area greater than 5 acres was included in this inventory. Ponds and lakes smaller than 5 acres generally were not included, although some lakes only an acre or two in size were included if they have high recreational value or were used for municipal supply. Natural ephemeral lakes are not included nor are ponds several acres in size that are used solely for stock water. Therefore, lakes were selected for inclusion in this report based primarily on size and on the authors' judgment of their actual or potential use.

Natural lakes, as well as manmade ponds and reservoirs, all form and disappear with surprising frequency. Maps may not show all the lakes in a given area nor do they indicate recent changes. Some large lakes shrink into several small ones during the dry season, and the process is reversed when the rains come. Named lakes in Clatsop, Columbia, and Tillamook Counties that did not meet the established criteria are listed on page 6.

RESERVOIRS

In general, any body of water that is either manmade or modified by a manmade structure is classed as a reservoir. This classification includes several ponds that were of sufficient size and significance to be listed in this report.

A steadily increasing number of reservoirs and ponds are being constructed in Oregon. Because many of these are not shown on the latest maps, their existence had to be determined from other sources and some that qualify for inclusion in this report may have been missed.

ACKNOWLEDGMENTS

This report was prepared by the Geological Survey, Water Resources Division, in cooperation with the Oregon State Engineer. The work was done under the general supervision of Stanley F. Kapustka, district chief in charge of water-resources investigations in Oregon.

Several agencies contributed much time and effort in searching their files and reports for data that could be included in this report. The Oregon State Game Commission furnished bathymetric maps, information on lake use, and other valuable data. The office of the State Engineer provided reservoir charts and information on water rights and ownership. Physical data and other information were obtained from reports by the Fish Commission of Oregon, the Oregon State Water Resources Board, and the Oregon State Department of Environmental Quality.

Many individuals, including S. F. Kapustka, D. J. Lystrom, John Friday, and Jack Bjork, did yeoman service in taking aerial photographs and in obtaining other field data. Special thanks are due Parley Merrill for making the initial assembly of reference material and other data; Alexander Gonsalves for cover design and art suggestions; Nyra Johnson, Blanche Crombie, and Thelma Parks for typing; and L. L. Hubbard for general assistance.

Explanation of Terms

Information pertaining to each lake published in this report has been classified under several general terms. An explanation of these terms with comments on the significance and accuracy of the data follows:

Identification number—The identification number, in parentheses following the lake name, is used only for identifying the lake on the county maps. (See figs. 3-5). Within each county, lakes are listed in alphabetical order and numbered serially.

Survey date—The survey date, in the upper right-hand corner of the lake sheet, gives the date the lake was visited by the Geological Survey field party. Most of the field data, including water-quality data, depth soundings, and observations of inflow and outflow, were obtained during this visit. Separate dates are shown where specific data were collected at a time other than the survey date.

Location—From U.S. Geological Survey topographic maps, the township, range, and section location were determined for each lake. Direction and distance, rounded to the nearest half mile, from prominent landmarks, such as towns, roads, rivers, or the ocean, are included to aid in rapid, easy location. The largest scale topographic map available for the lake area also is given. In some instances, a lake is not shown on the topographic map and is so indicated under REMARKS.

Description—Information pertaining to the shape of a lake, aquatic growth, type of surrounding vegetation, and other significant facts are included. Manmade and natural recreational facilities are also mentioned.

Drainage basin—If a lake is part of the drainage system of a specific basin, that basin in cited here. In the Clatsop sand dunes, where several lakes have no surface outflow, the dune area is considered to be the drainage basin.

Drainage area–The surface-drainage area is the area that contributes water to the lake. These areas were delineated on U.S. Geological Survey topographic maps, measured by planimeter, and are reported to the nearest 0.1 square mile. Drainage areas for some lakes were classified as indeterminate because either the surface-drainage area cannot be accurately delineated or the inflow consists primarily of precipitation and ground water.

Surface area–The sizes of the surface areas of lakes were obtained from many sources. Published reports were an important source of information. Occasionally, different publications showed different surface areas for the same lakes. Where there were differences or if a published value was questionable, the surface area was measured by planimeter on Geological Survey quadrangle maps or on aerial photographs. Because the surface area of many lakes varies widely, depending on the surface elevation and time of year, areas shown in this report are intended only to describe the general size of the lake.

Surface elevation–A single elevation, estimated from the best available topographic maps or other source, is shown for most lakes. For the few lakes where lake levels had been monitored, a seasonal range in elevations is shown.

Volume–Lake volumes vary widely between seasons and from year to year. Volume figures reported are intended only to illustrate the relative size of the lakes and should be considered approximate. Some volumes were obtained from published reports and others were determined by multiplying the surface area by the average depth determined from soundings. Where data were not adequate to estimate volume, it is reported as "not determined."

Inflow–On the lake information sheets, sources of inflow are identified by stream name or the direction of inflow is given. Although many lakes receive inflow from several streams, inflow generally could not be measured because the lakes were visited during the low-flow season. For some lakes, estimated inflow was determined by computing cross-sectional area of the channel and by timing drift. Where inflow was measured or estimated, the rate of inflow is reported in cubic feet per second (cfs). Inflow from direct precipitation on the lake or from ground-water inflow was neither measured nor estimated.

Outflow–Generally, surface outflow is confined to one channel, and all available information pertaining to it, including the name of the stream and general direction of outflow, is given. Some lakes have no visible outflow, and the water loss other than that from evaporation and transpiration is by underground flow. Where possible, surface outflows were estimated, but no attempt was made to determine ground-water outflow.

COFFENBURY LAKE *Oregon State Hwy. Dept. Photo*

Use–Information on use of the lakes and their surrounding areas, whether private or public, was obtained from other publications, by observation, and from local residents.

Remarks–Useful information that is not easily classified under the above headings is listed under REMARKS. Topics that might be included in this section are:

1. Ownership.
2. Directions or access.
3. References to additional information.
4. Unusual characteristics.
5. Qualifying statements for other headings (INFLOW, OUTFLOW, etc.).
6. Water rights.

Depth chart–Unless otherwise stated, the depth chart shows soundings made on the SURVEY DATE. Agencies that supplied depth data and the date obtained are cited under REMARKS. These data were checked and revised as necessary by the Geological Survey field party.

Wherever possible, depths are shown by contour lines, in feet, but for some lakes only spot depths are presented. A depth chart may not be included for a lake for one or more of the following reasons:

1. Inaccessibility.
2. No map nor aerial photographs available on which to plot depths.
3. Too shallow (less than 1 foot maximum depth).

If a depth chart is not available, the average depth can be approximated by dividing the VOLUME by the SURFACE AREA.

Depth charts also show the sampling site (symbol ▼), which is reported to the nearest five seconds of latitude and longitude. Aerial photographs were used to estimate the horizontal scale shown on the depth chart which is meant to represent relative size only. Inflow and outflow streams are shown graphically by direction and location. Logs floating in some lakes are shown diagrammatically on the depth charts.

Water-Quality Data

The water-quality data reported in this volume were collected during a visit to the lake on the SURVEY DATE. Most of the quality data are from samples collected 1 foot below the water surface at the sampling point shown on the DEPTH CHART. Dissolved oxygen, temperature, pH, and conductivity were measured at various depths.

Sampling sites were generally near the deepest part of each lake and are considered to be reasonably representative of the physical and chemical characteristics of the entire lake.

Data on alkalinity, hardness, dissolved solids, and dissolved oxygen are reported in milligrams per liter (mg/1). One milligram per liter is a weight of 1 milligram of the particular constituent dissolved in 1 liter of water. At the low concentrations given in this report, 1 mg/1 is equivalent to 1 ppm (part per million) used in some water-quality reports.

To help those unfamiliar with the technical terms and the measurements made in this study, the methods used and the significance of the variables measured are reviewed briefly for each quality parameter.

pH—The pH of a solution is a measure of the effective hydrogen-ion activity. The range of pH values is from 0 to 14; solutions in the range of 0 to 7 are considered to be acidic, and those in the range of 7 to 14 are considered to be alkaline. At a pH of 7, water is neither acidic nor alkaline, but is a neutral solution.

The pH values of lakes may be altered through photosynthesis and respiration by waterborne plants, as well as by other activities. The uptake of carbon dioxide during photosynthesis increases the pH of the water, whereas the release of carbon dioxide during respiration decreases the pH value.

During the early part of this study, pH values were measured with a portable pH meter from samples taken 1 foot below water surface. Later in the study, profiles of pH were taken along with temperature, dissolved oxygen, and conductivity, but only the surface (1 foot below lake surface) and bottom (1 foot above lake bottom) values were reported.

Conductivity—Specific conductance, or conductivity, is a measure of the ability of water to conduct an electrical current and is expressed as micromhos per centimeter at 25°C (Celsius). The specific conductance of pure water is low, but increases as water becomes more mineralized. Hence, specific conductance is related to the concentration of dissolved minerals in the water. In this report, specific conductance was measured for samples taken at various depths, but only the values for samples collected 1 foot below the surface and 1 foot above the bottom of the lakes are reported.

Alkalinity—Alkalinity is the capacity of water to neutralize an acid by means of chemical buffering. In all natural waters, alkalinity is caused by the presence of bicarbonate, carbonate, or hydroxide ions. For this study, alkalinity is reported in mg/1 of calcium carbonate. It includes bicarbonate and carbonate and was determined by titrating the samples with 0.01639 N sulfuric acid to a pH of 4.5.

Total hardness—Historically, water has been classified as "hard" or "soft" depending on how readily the water produces a lather when mixed with soap. For this study, hardness values are reported in milligrams per liter as $CaCO_3$ (calcium carbonate). Generally, any water with hardness of less than 60 mg/1 as $CaCO_3$ is considered to be soft. Waters from the lakes in this report were mostly in the soft category.

Total dissolved solids—Total dissolved solids was determined by evaporating a known quantity of water, drying it at 180°C, and weighing the residue. The dissolved-solids content of several lakes was noticeably higher than implied by conductivity measurements. This significantly higher value is probably due to the abundance of organic material derived from decomposing vegetation.

Dissolved-oxygen profile—The concentration of dissolved oxygen in water is a function of the temperature and salinity of the water and of the atmospheric pressure and can vary daily or even hourly. Oxygen solubility is inversely related to the water temperature and salinity. The warmer the water the less oxygen it will contain. Oxygen in water is continually being altered by life processes such as photosynthesis and respiration and by complex chemical reactions. In lakes at low altitude, such as along the Oregon coast where atmospheric pressure is high, more oxygen goes into solution than it does in lakes at higher altitudes.

Although dissolved-oxygen values in this report represent only one group of observations, the values will provide a guide for evaluating the suitability of a lake for fish life and for other clean-water biota. A generalization based on thousands of field determinations on inland waters (Welch, 1952) states that "dissolved oxygen at levels of 3 ppm [mg/1] or lower should be regarded as hazardous to lethal [for fish] under average stream and lake conditions; and that 5 ppm [mg/1] or more of dissolved oxygen should be present in waters, if conditions are to be favorable for freshwater fishes." This statement, which applies mainly to warm-water fish, assumes that other vital requirements are held within their proper limits. The

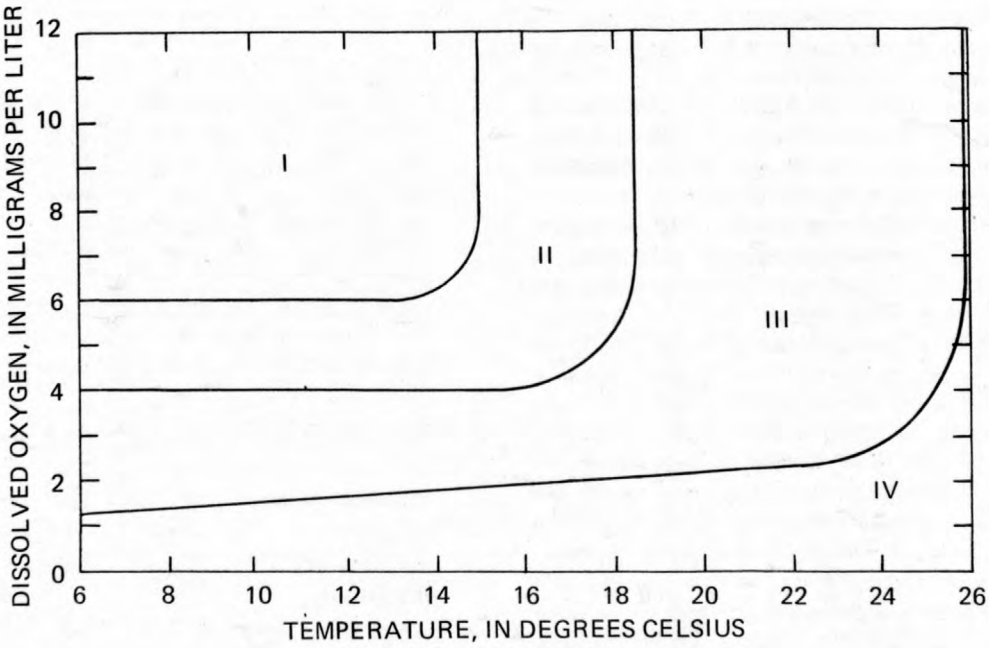


Figure 2. — Favorable to lethal combinations of dissolved oxygen and temperature for rainbow trout. Zone I represents most favorable combinations, whereas zone IV represents lethal combinations.

combined influence of dissolved oxygen and temperature on rainbow trout is illustrated in figure 2, which is patterned after figure 11 in a report by Smith and Bella (1973).

Temperature profile—Temperature, which varies in lakes with depth and time of year, is the most important controlling factor in the aquatic environment. Life processes, chemical-reaction rates, and many physical events occur only within definite temperature ranges. Temperature variations in lakes are important in determining the suitability of a lake for recreation, fish production (see fig. 2), and industrial and agricultural uses.

For most lakes, temperatures listed are probably close to the maximum for the year of sampling. However, temperatures during other years may vary considerably from these, depending on weather conditions, inflow, outflow, lake depth, etc. For most lakes, the temperature was plotted against depth, and a solid line was drawn between the plotted points. In a few instances, where there was little change in temperature, only the surface and bottom temperatures are listed.

Temperatures are reported in degrees Celsius (°C), which can be converted to degrees Fahrenheit (°F) using the following table:

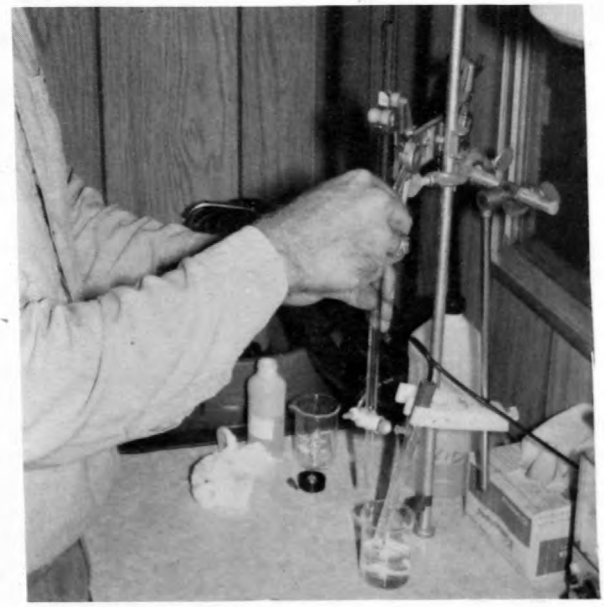
°C	°F	°C	°F	°C	°F
0	32	10	50	20	68
1	34	11	52	21	70
2	36	12	54	22	72
3	37	13	55	23	73
4	39	14	57	24	74
5	41	15	59	25	77
6	43	16	61	26	79
7	45	17	63	27	81
8	46	18	64	28	82
9	48	19	66	29	84

Transparency—Transparency, or penetration of light, refers to the depth to which light can penetrate through water. Because photosynthesis can occur only to depths where sufficient light is available, transparency is one of the most important parameters that govern the biological activity of a lake.

Transparency was measured with a Secchi disk having a diameter of 25 centimeters. The measurements consisted of recording the depth, in feet, at which the disk just disappeared from view. Secchi disk measurements have limitations; however, they do provide comparative information on the transparency of water in the various lakes measured.

Color—Color value is determined by a comparison of the water with standardized colored-glass disks and is reported in platinum-cobalt units. High color values in many of the lakes result from the decomposition of vegetation, which gives the water a brown, tea-like color. Because color determinations were not made in the early part of the study, these data are not included for some of the lakes.

Coliform bacteria—For this report, the coliform bacteria group is defined as any colony that exhibits a characteristic golden metallic sheen when grown on M-Endo medium at 35°C for 18 to 24 hours. The reporting unit is the number of colonies per 100-milliliter sample. For contact water sports, the Oregon Department of Environmental Quality (oral commun., August 9, 1973) has established a conditional upper limit of 1,000 colonies per 100-milliliter sample of water. Although human feces are a common source of coliform bacteria, other natural sources are soil, water, and vegetation. Therefore, a coliform count greater than 1,000 colonies per 100-milliliter sample does not necessarily imply that a pollution problem exists, but the water is generally considered to have disease-producing potential. If any coliform bacteria are indicated, the water should not be used for drinking unless it is first treated.



CHEMICAL QUALITY ANALYSIS

Other Named Lakes

Some of the named lakes on U. S. Geological Survey topographic maps were not studied because at the time of year they were visited they did not meet the established criteria. However, because at other times of the year these lakes might be of some importance and would therefore meet the criteria, they are listed below by county. All the lakes listed for Columbia County are within the Columbia River flood plain, and many of them dry up completely during late summer because the river is at its lowest level.

Lake	Township	Range	Section
Clatsop County			
Burke Lake	T.8 N.	R.10 W.	21
Grassy Lake	T.4 N.	R.10 W.	13
Kyle Lake	T.8 N.	R.10 W.	29
Leineweber Lake	T.8 N.	R.10 W.	20
Spruce Run Lake	T.4 N.	R. 7 W.	17
Columbia County			
Adams Lake	T.5 N.	R. 1 W.	8
Box Lake	T.6 N.	R. 1 W.	32
Cottonwood Lake	T.6 N.	R. 1 W.	32
Crane Lake	T.3 N.	R. 1 W.	4
Gay Lake	T.3 N.	R. 1 W.	14, 23
Grassy Lake	T.3 N.	R. 1 W.	9, 16
Henrici Lake	T.4 N.	R. 1 W.	22
Malarky Lake	T.3 N.	R. 1 W.	9, 16
Martin Lake	T.3 N.	R. 1 W.	16
Muckle Lake	T.5 N.	R. 1 W.	8
Oakridge Lake	T.5 N.	R. 1 W.	5
Rest Lake	T.3 N.	R. 1 W.	5
Round Lake	T.3 N.	R. 1 W.	17
Seal Lake	T.3 N.	R. 1 W.	9, 16
Swan Lake	T.6 N.	R. 1 W.	32
Thorn Lake	T.5 N.	R. 1 W.	5
Whittier Lake	T.4 N.	R. 1 W.	21
Tillamook County			
None			

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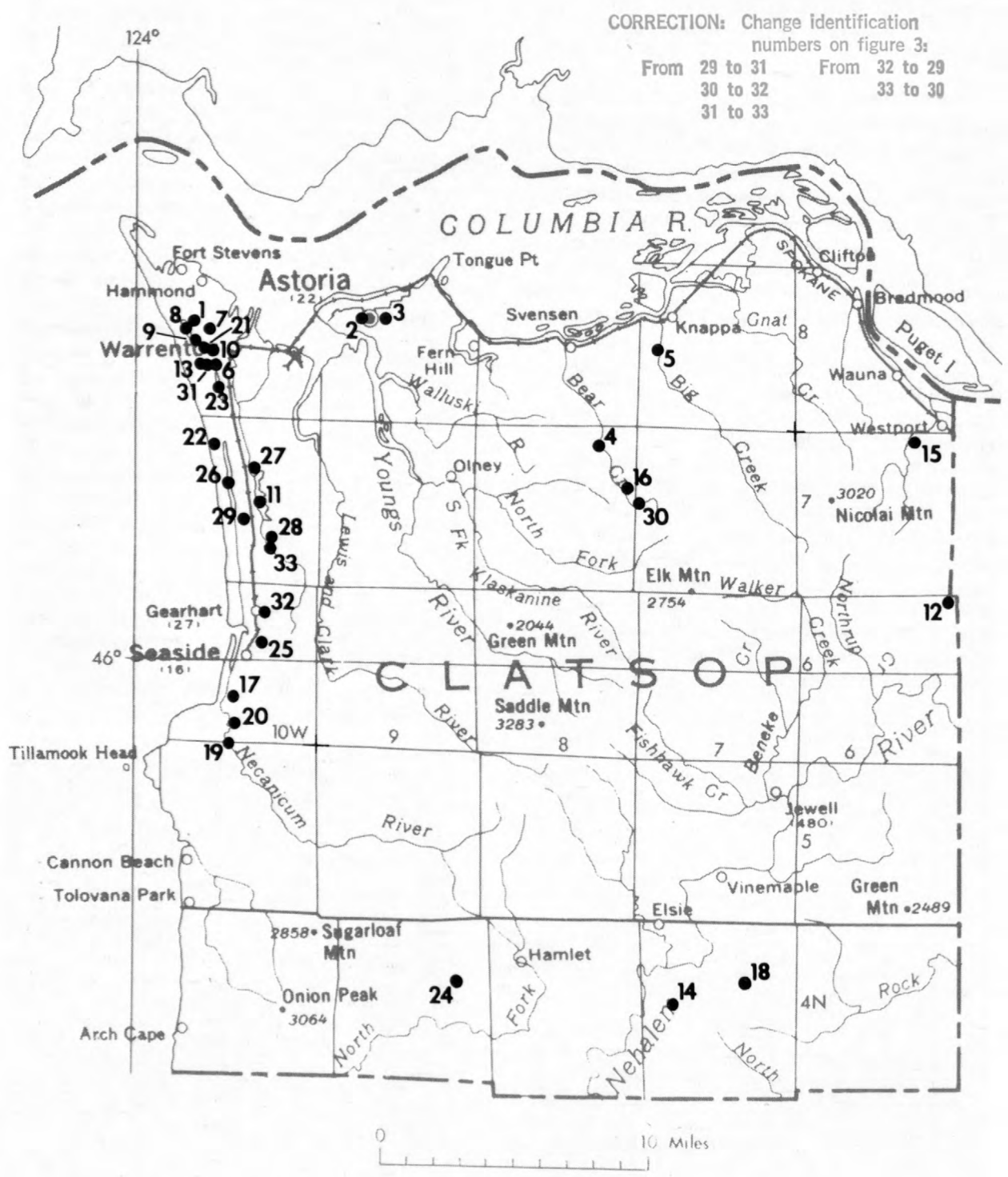


FIGURE 3. — Locations and identification numbers of lakes in Clatsop County.

Lakes of Clatsop County

CLATSOP COUNTY | ABBOT LAKE (1) | SURVEY DATE: August 22, 1972

LOCATION: T.8 N., R.10 W., sec.17, 1.5 miles northwest of Warrenton, Oreg., and 1.5 miles south of Hammond, Oreg. U.S. Geological Survey 7.5-minute topographic map, Warrenton quadrangle.

DESCRIPTION: A shallow lake in the Clatsop Plains sand dunes. Relatively inaccessible because of thick growth and the bog surrounding the lake.

DRAINAGE BASIN: Clatsop sand dunes.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 4 acres.

SURFACE ELEVATION: 20 feet above mean sea level, from topographic map.

VOLUME: Not determined.

INFLOW: None observed and none indicated on topographic map.

OUTFLOW: None observed and none indicated on topographic map.

USE: None.

REMARKS: Survey party was not able to get boat to the lake; therefore, there are no chemical profiles nor bottom readings. A water sample was taken from the southeast end of lake at lat 46°10'40", long 123°57'20".

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.7	210
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 41

TOTAL HARDNESS (Mg/l as $CaCO_3$): 42

TOTAL DISSOLVED SOLIDS (Mg/l): 188

TRANSPARENCY (Feet): --

COLOR (Units): 40

COLIFORM (Colonies/100 ml): 3500

LOCATION: T.8 N., R.9 W., sec.17, in Astoria, Oreg. U.S. Geological Survey 7.5-minute topographic map, Astoria quadrangle.

DESCRIPTION: Concrete reservoir enclosed by chain-link fence.

DRAINAGE BASIN: Bear Creek basin (Lower Columbia).

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 2 acres.

SURFACE ELEVATION: 281 feet above mean sea level.

VOLUME: 17 acre-feet.

INFLOW: Piped from Astoria Reservoir No. 3.

OUTFLOW: Piped to Astoria.

USE: Astoria, Oreg., water-delivery system reservoir.

REMARKS: Average depth is calculated to be about 8.5 feet. Water sampled at lat 46°10'50", long 123°49'25". Physical data furnished by city of Astoria. See Bear Creek Reservoir (4), Middle Lake (17), and Wickiup Lake (31) for water rights.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.1	68
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 25

TOTAL HARDNESS (Mg/l as $CaCO_3$): 24

TOTAL DISSOLVED SOLIDS (Mg/l): 81

TRANSPARENCY (Feet): --

COLOR (Units): 5

COLIFORM (Colonies/100 ml): 40

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	13.5	8.3
BOTTOM:	--	--

LOCATION: T.8 N., R.9 W., sec.16, about 1 mile southeast of Astoria, Oreg. U.S. Geological Survey 7.5-minute topographic map, Astoria quadrangle.

DESCRIPTION: Concrete reservoir enclosed by chain-link fence.

DRAINAGE BASIN: Bear Creek basin (Lower Columbia).

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 3 acres.

SURFACE ELEVATION: 426 feet above mean sea level.

VOLUME: 61 acre-feet.

INFLOW: Piped from Bear Creek Reservoir.

OUTFLOW: Piped to Astoria Reservoir No. 2.

USE: Astoria, Oreg., water-delivery system reservoir.

REMARKS: Average depth is calculated to be about 20 feet. Water sampled at lat 46°10'45", long 123°48'10". Physical data furnished by city of Astoria. See Bear Creek Reservoir (4), Middle Lake (17), and Wickiup Lake (31) in this report.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.1	66
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 31

TOTAL HARDNESS (Mg/l as $CaCO_3$): 46

TOTAL DISSOLVED SOLIDS (Mg/l): 84

TRANSPARENCY (Feet): --

COLOR (Units): 10

COLIFORM (Colonies/100 ml): 0

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	12.5	8.5
BOTTOM:	--	--

LOCATION: T.7 N., R.8 W., sec.2, about 4 miles south of Svenson, Oreg. U.S. Geological Survey 15-minute topographic map, Svenson quadrangle.

DESCRIPTION: Large reservoir with a dam and spillway. It has little aquatic growth and no vegetation on the shoreline. Land surrounding the lake is covered with second-growth timber.

DRAINAGE BASIN: Bear Creek basin (Lower Columbia).

DRAINAGE AREA: 4.2 square miles.

SURFACE AREA: 28 acres at maximum pool.

SURFACE ELEVATION: 640.0 feet above mean sea level on Sept. 6, 1972. Datum of reservoir staff gage (top of spillway) is 654.5 feet above mean sea level. This gage reads from the top down.

VOLUME: 614 acre-feet.

INFLOW: Average is 17.2 cfs for 6 years record, August 1965 to September 1971, at U.S. Geological Survey gaging station on Bear Creek above reservoir. Maximum, 211 cfs on January 25, 1971; minimum, 1.2 cfs on Sept. 8, 1967. Regulated by upstream storage in Wickiup and Middle Lakes.

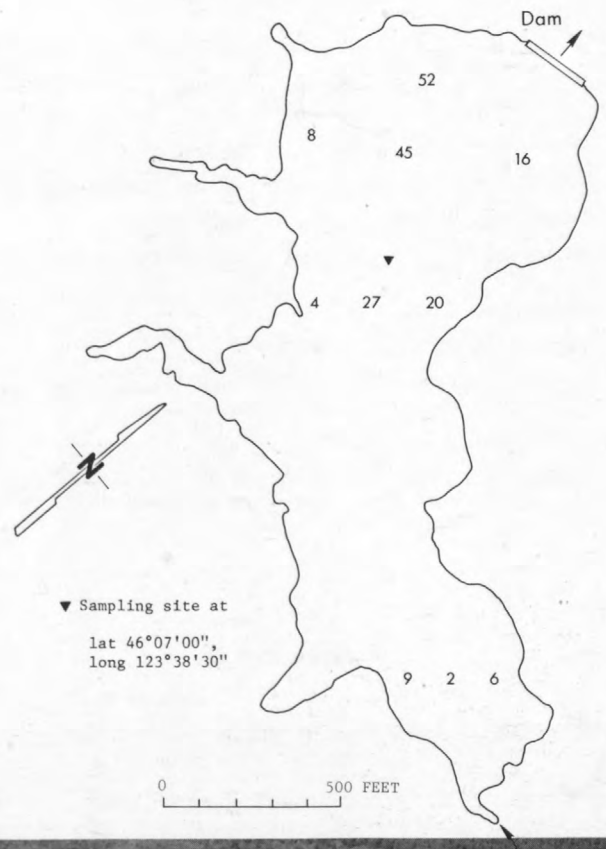
OUTFLOW: Bear Creek and water-system pipeline.

WATER RIGHTS: 12.0 cfs for municipal water supply.

USE: Astoria, Oreg., water-delivery system reservoir.

REMARKS: Not open to the public. Named Astoria Reservoir on topographic map. City of Astoria has rights to 12.0 cfs for municipal water supply.

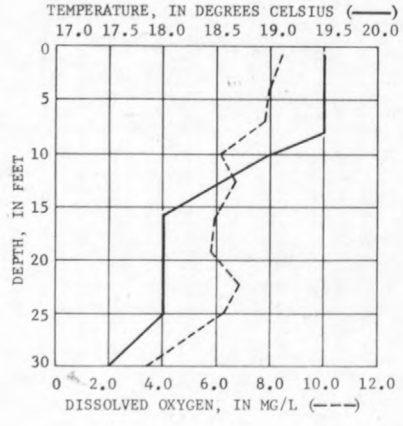
DEPTH CHART

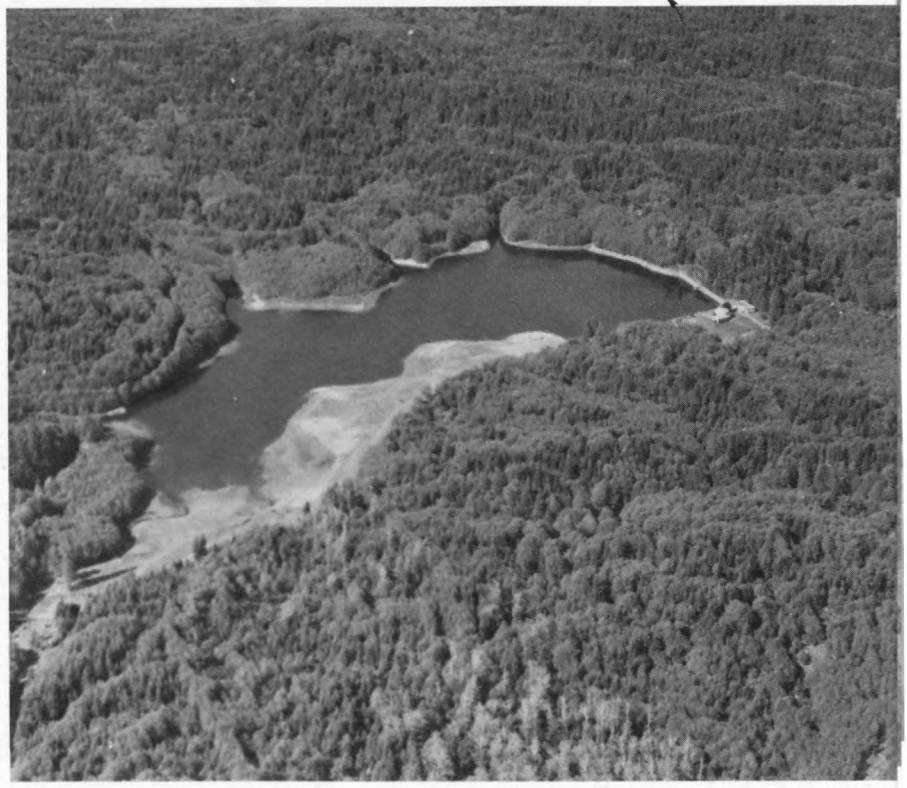


WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.1	68
BOTTOM:	--	68

ALKALINITY (Mg/l as $CaCO_3$):	44
TOTAL HARDNESS (Mg/l as $CaCO_3$):	23
TOTAL DISSOLVED SOLIDS (Mg/l):	92
TRANSPARENCY (Feet):	9
COLOR (Units):	10
COLIFORM (Colonies/100 ml):	--





LOCATION: T.8 N., R.7 W., sec.19, on Big Creek, about 0.5 mile west of Knappa Junction and 1,400 feet south of Highway 30. U.S. Geological Survey 15-minute topographic map, Svenson quadrangle.

DESCRIPTION: Apparently an abandoned gravel pit that has filled with water from Big Creek. Water looks very clean. Pond is surrounded by gravel and short grass. A small park is on the north side.

DRAINAGE BASIN: Big Creek basin (Lower Columbia).

DRAINAGE AREA: 32 square miles.

SURFACE AREA: 7 acres.

SURFACE ELEVATION: 50 feet above mean sea level, from topographic map.

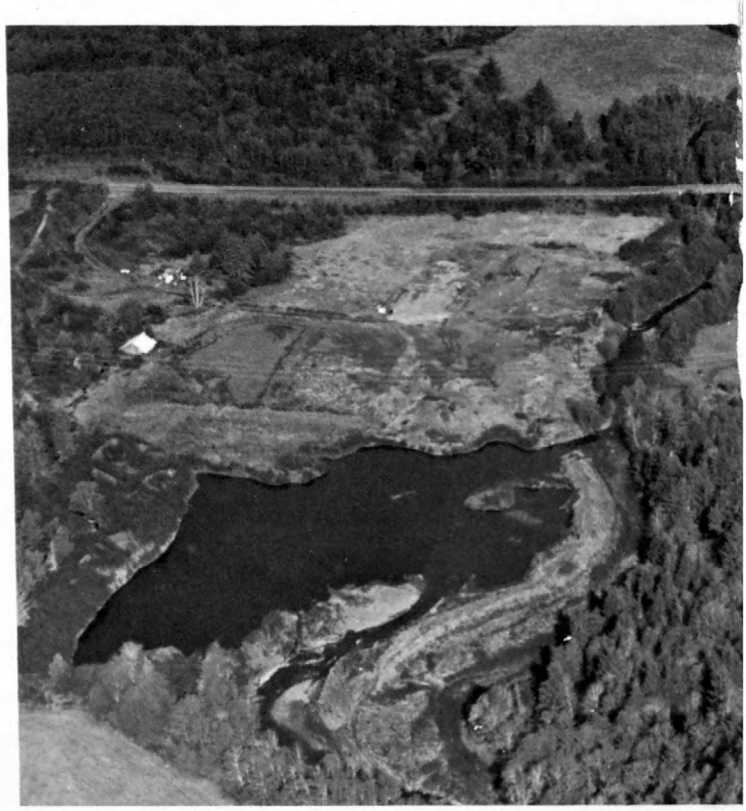
VOLUME: 30 acre-feet.

INFLOW: From Big Creek on south end of pond.

OUTFLOW: Measured 46 cfs on Nov. 14, 1972. Outflow is continuation of Big Creek.

USE: Picnicking and fishing.

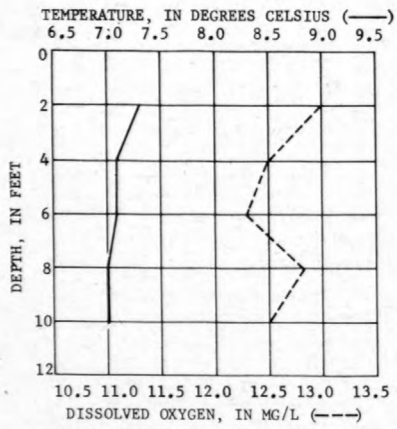
REMARKS: Tables and barbecues are available in the picnic area, and there are chemical toilets on the premises. Not shown on 1955 quadrangle map.

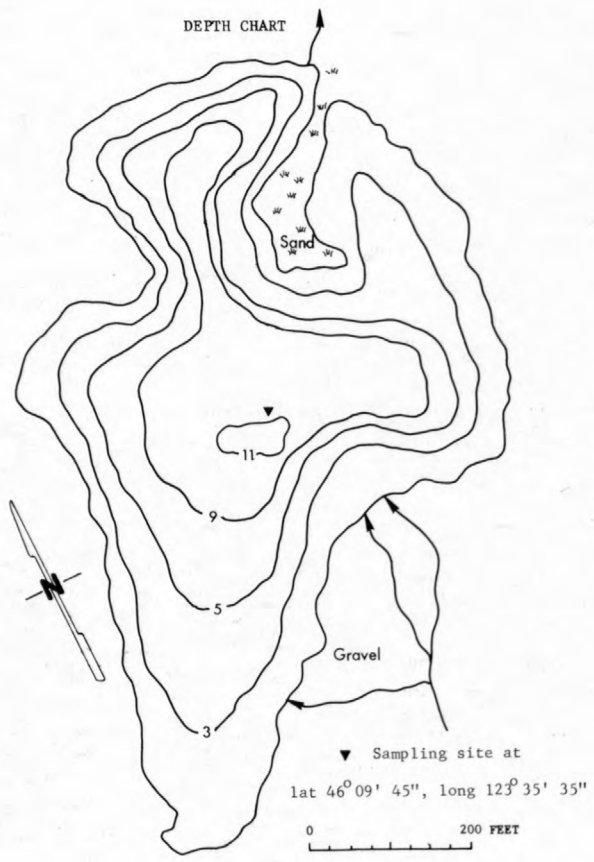


WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.8	52
BOTTOM:	6.8	51

ALKALINITY (Mg/l as $CaCO_3$):	24
TOTAL HARDNESS (Mg/l as $CaCO_3$):	24
TOTAL DISSOLVED SOLIDS (Mg/l):	88
TRANSPARENCY (Feet):	5
COLOR (Units):	5
COLIFORM (Colonies/100 ml):	134





LOCATION: T.8 N., R.10 W., sec.28, about 1 mile southwest of Warrenton, Oreg., and 1 mile east of the Pacific Ocean. U.S. Geological Survey 7.5-minute topographic map, Warrenton quadrangle.

DESCRIPTION: Oblong-shaped lake with moderate aquatic growth. The north end of the lake extends into a bog. Ocean View Cemetery is east of the lake.

DRAINAGE BASIN: Clatsop sand dunes.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 10 acres.

SURFACE ELEVATION: 15 feet above mean sea level, from topographic map.

VOLUME: 40 acre-feet.

INFLOW: No measurable flow through culvert between Cemetery Lake and Smith Lake on Aug. 3, 1972. Water could conceivably flow in either direction through culvert.

OUTFLOW: No measurable flow through culvert between Cemetery Lake and Wild Ace Lake on Aug. 3, 1972. Water could conceivably flow in either direction through culvert.

USE: Fishing by local people.

REMARKS: Lake does not have the dense aquatic growth that Smith Lake has, although it appears to be developing. For information concerning coastal-lake formation, see Baldwin (1964), Chapman (1964), Cooper (1958), Hansen (1947), and Weidemann, Dennis, and Smith (1969).

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.9	118
BOTTOM:	6.7	118

ALKALINITY (Mg/l as $CaCO_3$): 30

TOTAL HARDNESS (Mg/l as $CaCO_3$): 53

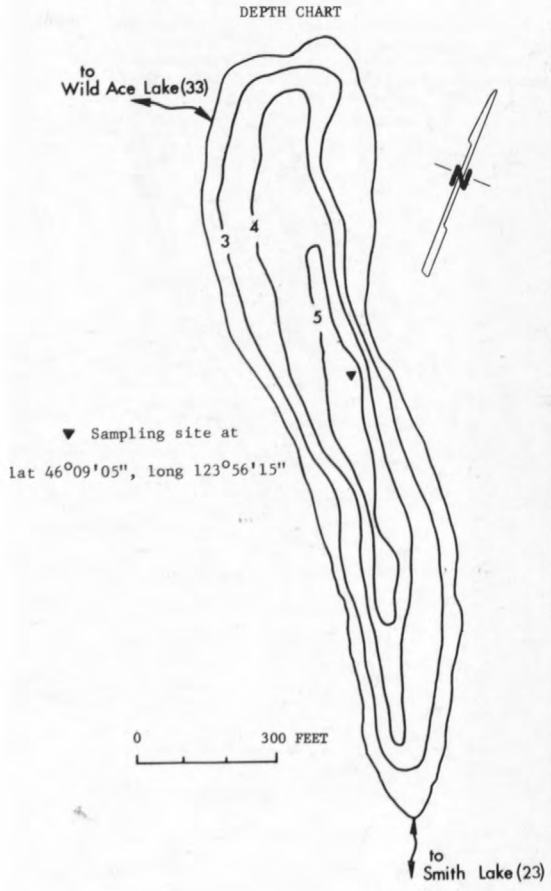
TOTAL DISSOLVED SOLIDS (Mg/l): 138

TRANSPARENCY (Feet): 3

COLOR (Units): 80

COLIFORM (Colonies/100 ml): 3400

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	19.0	5.3
BOTTOM:	18.8	4.9



LOCATION: T.8 N., R.10 W., sec.17, about 1 mile northwest of Warrenton, Oreg., and 2 miles southeast of Hammond, Oreg. U.S. Geological Survey 7.5-minute topographic map, Warrenton quadrangle.

DESCRIPTION: Triangular-shaped lake surrounded by evergreens, with boggy area on south end. The lake has a muddy bottom, but the water is clear and has little aquatic growth.

DRAINAGE BASIN: Clatsop sand dunes.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 8 acres.

SURFACE ELEVATION: 20 feet above mean sea level, from topographic map.

VOLUME: 40 acre-feet.

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: None observed and no channel indicated on topographic map.

USE: Fishing by local people.

REMARKS: Access is on road leading to several homes on southeast side of lake.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	5.4	59
BOTTOM:	5.9	60

ALKALINITY (Mg/l as $CaCO_3$): 12

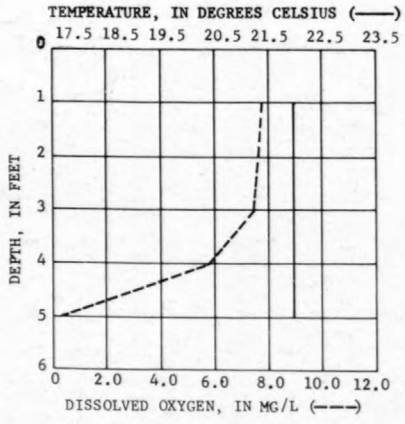
TOTAL HARDNESS (Mg/l as $CaCO_3$): 6

TOTAL DISSOLVED SOLIDS (Mg/l): 96

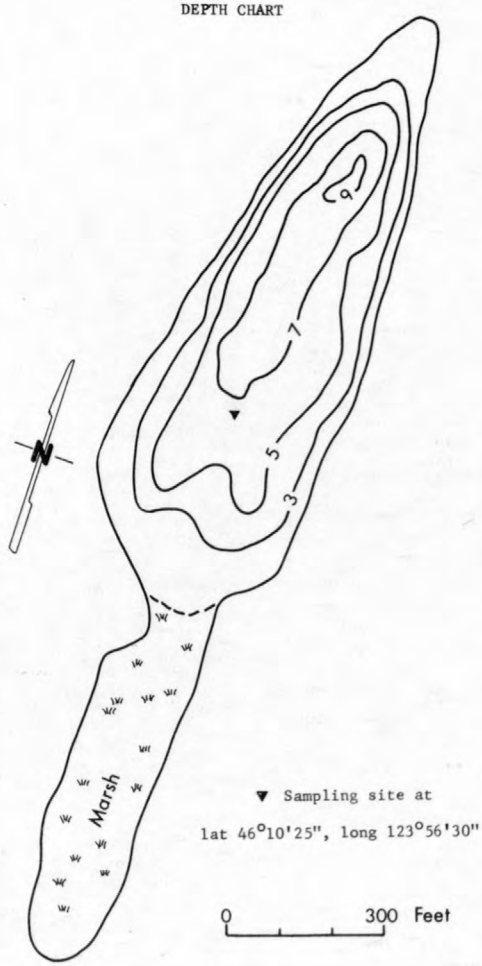
TRANSPARENCY (Feet):

COLOR (Units): 40

COLIFORM (Colonies/100 ml): 1340



DEPTH CHART



LOCATION: T.8 N., R.10 W., sec.17. In Fort Stevens State Park, about 2 miles west of Warrenton, Oreg., and 0.5 mile east of the Pacific Ocean. U.S. Geological Survey 7.5-minute topographic map, Warrenton quadrangle.

DESCRIPTION: A very long, narrow lake in a deep depression between sand dunes and surrounded by willow, crabapple, and alder forests.

DRAINAGE BASIN: Clatsop sand dunes.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 50 acres.

SURFACE ELEVATION: 19.5 feet above mean sea level on Aug. 4, 1972. Varies seasonally from about 16 feet above mean sea level in the fall to about 22 feet above mean sea level in the early spring. Datum of U.S. Geological Survey staff gage on north end of lake is 16.09 feet above mean sea level.

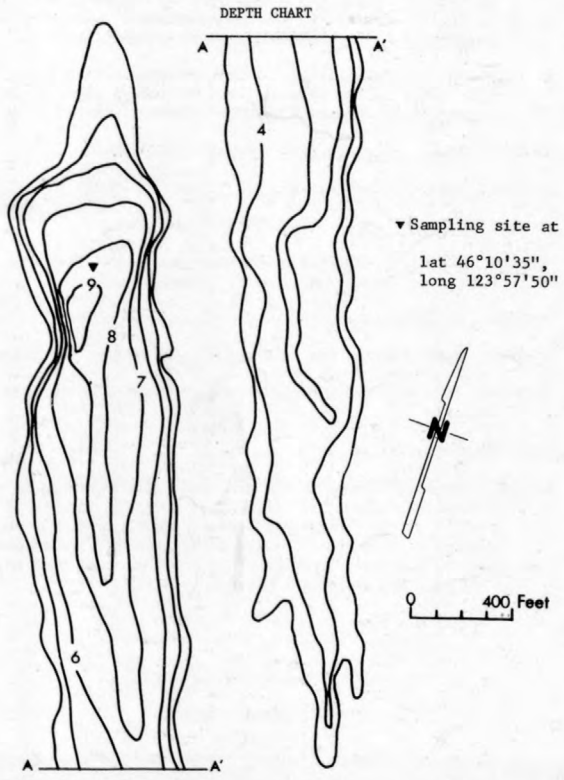
VOLUME: 300 acre-feet.

INFLOW: None observed and no channel indicated on topographic map. Weather records indicate that direct precipitation on the lake surface is about 80 inches per year.

OUTFLOW: None observed and no channel indicated on topographic map. Evaporation discharge accounts for about 20 inches of the 80 inches of precipitation on the lake; therefore, much of the water is probably discharged from the lake by vertical or lateral seepage (Frank, 1970).

USE: General recreational use, including swimming and fishing. The lake is stocked with cutthroat and rainbow trout, with best action in the early season. A boat launch is on the north end of the lake and a marked swimming area on the east side.

REMARKS: Camping spaces are available in the Fort Stevens State Park. For additional information regarding surface-water and ground-water interrelationships and water-quality data, see Frank (1970). For information concerning coastal-lake formation, see Baldwin (1964), Chapman (1964), Cooper (1958), Hansen (1947), and Weidemann, Dennis, and Smith (1969).



WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.6	110
BOTTOM:	7.4	110

ALKALINITY (Mg/l as $CaCO_3$): 15

TOTAL HARDNESS (Mg/l as $CaCO_3$): 19

TOTAL DISSOLVED SOLIDS (Mg/l): 84

TRANSPARENCY (Feet): 6

COLOR (Units): 35

COLIFORM (Colonies/100 ml): 1200

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	19.2	7.8
BOTTOM:	19.0	7.7

LOCATION: T.8 N., R.10 W., sec.20, about 1.5 miles west of Warrenton, Oreg., and 1 mile east of the Pacific Ocean. U.S. Geological Survey 7.5-minute topographic map, Warrenton quadrangle. (See REMARKS.)

DESCRIPTION: Shallow, irregular-shaped lake in sand dunes area. Many water lilies grow on the lake and an algae bloom was beginning as of Aug. 23, 1972. Water is very clear.

DRAINAGE BASIN: Clatsop sand dunes.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 10 acres.

SURFACE ELEVATION: 20 feet above mean sea level, from topographic map.

VOLUME: 25 acre-feet.

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: None observed and no channel indicated on topographic map.

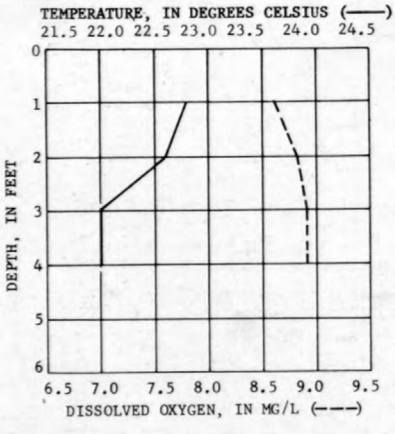
USE: None apparent.

REMARKS: Crabapple Lake is the name used for this lake by the Oregon State Game Commission, and it is so identified in reports of the Oregon State Water Resources Board. On U.S. Geological Survey quadrangle maps, this lake is unnamed, whereas the name "Crabapple" is shown for the lake identified as Creep and Crawl Lake in this report.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	5.7	97
BOTTOM:	5.6	94

ALKALINITY (Mg/l as $CaCO_3$):	11
TOTAL HARDNESS (Mg/l as $CaCO_3$):	11
TOTAL DISSOLVED SOLIDS (Mg/l):	90
TRANSPARENCY (Feet):	4
COLOR (Units):	50
COLIFORM (Colonies/100 ml):	1600



DEPTH CHART

LOCATION: T.8 N., R.10 W., sec.20, about 1.5 miles west of Warrenton, Oreg., and 1 mile east of the Pacific Ocean. U.S. Geological Survey 7.5-minute topographic map, Warrenton quadrangle.

DESCRIPTION: Long, narrow lake with many snags and a heavy aquatic growth at south end. Many water lilies grow along the shoreline.

DRAINAGE BASIN: Clatsop sand dunes.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 5 acres.

SURFACE ELEVATION: 20 feet above mean sea level, from topographic map.

VOLUME: 25 acre-feet.

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: None observed and no channel indicated on topographic map.

USE: None apparent.

REMARKS: Creep and Crawl Lake is the name used for this lake by the Oregon State Game Commission, and it is so identified in reports of the Oregon State Water Resources Board. On U.S. Geological Survey quadrangle maps, this lake is named "Crabapple," whereas the unnamed lake directly west of Creep and Crawl is identified as Crabapple Lake in this report.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.2	150
BOTTOM:	7.0	188

ALKALINITY (Mg/l as $CaCO_3$): 21

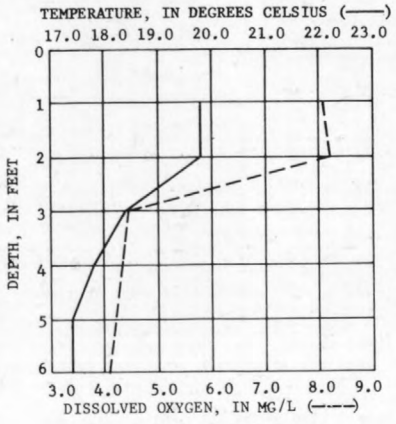
TOTAL HARDNESS (Mg/l as $CaCO_3$): 23

TOTAL DISSOLVED SOLIDS (Mg/l): 168

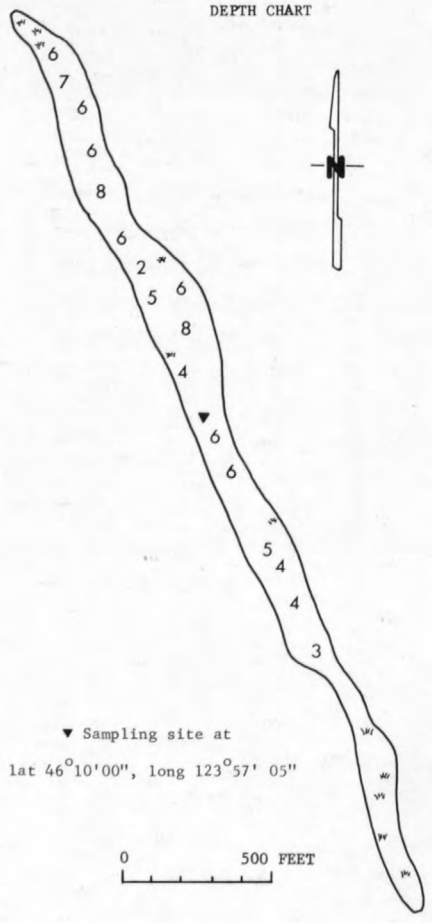
TRANSPARENCY (Feet): 3

COLOR (Units): 80

COLIFORM (Colonies/100 ml): 2400



DEPTH CHART



LOCATION: T.7 N., R.10 W., sec.22, 0.5 mile east of Highway 101, about 4 miles north of Gearhart, Oreg. U.S. Geological Survey 7.5-minute topographic map, Gearhart quadrangle.

DESCRIPTION: Large lake bordered on the southwest by a swamp and some alder, willow, crabapple, and salmonberry trees. A spruce-hemlock forest surrounds the rest of the lake.

DRAINAGE BASIN: Skipanon River basin.

DRAINAGE AREA: 6.3 square miles.

SURFACE AREA: 220 acres.

SURFACE ELEVATION: 7.9 feet above mean sea level on Aug. 1, 1972. Varies seasonally from about 7.5 to 9.5 feet above mean sea level. Low water levels occur in the fall and high water levels occur in early spring. Datum of U.S. Geological Survey staff gage on north end of lake is 6.24 feet above mean sea level.

VOLUME: 1,400 acre-feet.

INFLOW: Discharge measurements made on Cullaby Creek about 1 mile south of the inlet to Cullaby Lake near Delmoor station showed a flow of 12.8 cfs on Feb. 7, 1967, and no flow on Sept. 21, 1967 (Frank, 1970).

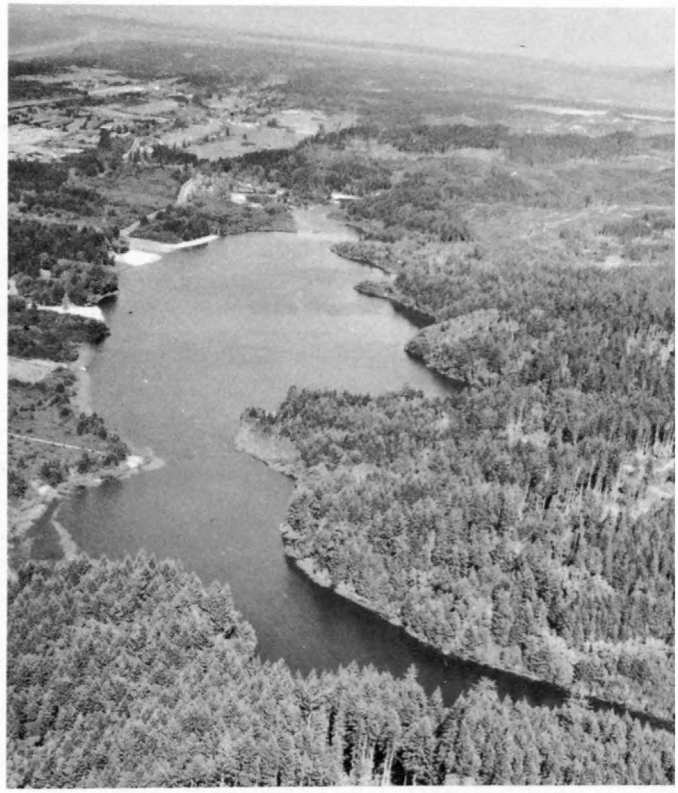
OUTFLOW: Discharge measurements made at the outlet of the lake showed a flow of 28.1 cfs on Feb. 7, 1967, and 0.44 cfs on Sept. 21, 1967 (Frank, 1970).

USE: Primary recreational use is for fishing, although there is some water skiing. The lake contains crappie, bluegill, perch, catfish, largemouth bass, and cutthroat and rainbow trout. A boat launch is on the west side of the lake.

REMARKS: A heavy blue-green algae bloom develops during the summer and is apparently maintained by nutrients leaching from adjacent bogs and swamps (McHugh, 1972).

Boat rentals, groceries, and camping supplies are available at the north end of the lake, and there is a county park on the west shore. Water rights of 16 cfs from Cullaby Lake and Creek for irrigation.

For additional information on surface-water and ground-water interrelationships, and water-quality data, see Frank (1970). For information concerning coastal-lake formation, see Baldwin (1964), Chapman (1964), Cooper (1958), Hansen (1947), and Weidemann, Dennis, and Smith (1969).



WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.5	91
BOTTOM:	7.2	91

ALKALINITY (Mg/l as $CaCO_3$): 25

TOTAL HARDNESS (Mg/l as $CaCO_3$): 19

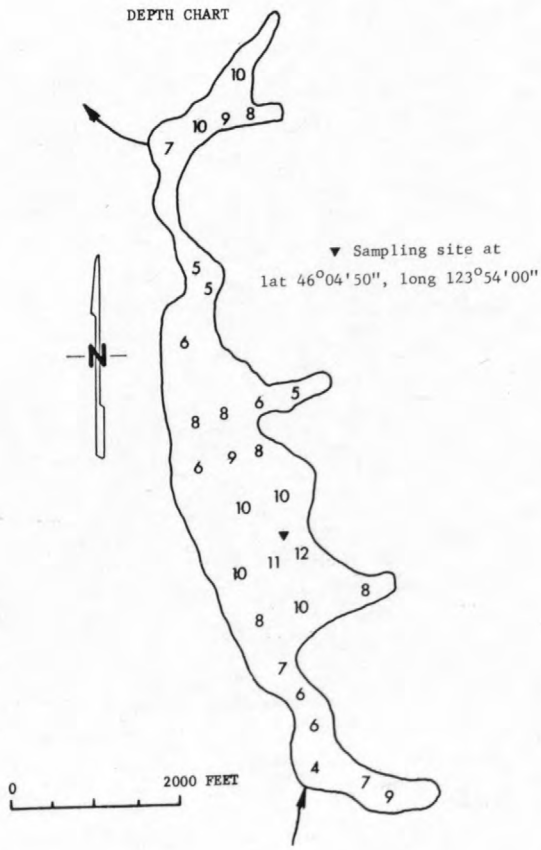
TOTAL DISSOLVED SOLIDS (Mg/l): --

TRANSPARENCY (Feet): 2

COLOR (Units): --

COLIFORM (Colonies/100 ml): 3850

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	21.8	8.1
BOTTOM:	21.2	6.8



LOCATION: T.6 N., R.6 W., sec.1, about 2.5 miles south of Westport, Oreg., and just west of Columbia-Clatsop County line. U.S. Geological Survey 15-minute topographic map, Cathlamet quadrangle (not shown on map).

DESCRIPTION: Large, crescent-shaped reservoir with little aquatic growth. Residential housing is being developed around the lake. A dam and spillway (Glory Hole) are at the south end. Surrounding hills are covered with second-growth timber.

DRAINAGE BASIN: Nehalem River basin.

DRAINAGE AREA: 18 square miles.

SURFACE AREA: 55 acres.

SURFACE ELEVATION: 555 feet above mean sea level at top of spillway.

VOLUME: 340 acre-feet.

INFLOW: From Fishhawk Creek on east end of lake. No measurable flow on September 1, 1972.

OUTFLOW: Continuation of Fishhawk Creek. Estimated 3 cfs on Sept. 1, 1972, downstream from dam.

USE: Recreation for property owners only.

REMARKS: Privately owned; not open to the public. Dam constructed on Fishhawk Creek in 1967 for real-estate development. Water rights of 0.166 cfs to maintain lake.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.8	55
BOTTOM:	6.9	105

ALKALINITY (Mg/l as $CaCO_3$): 40

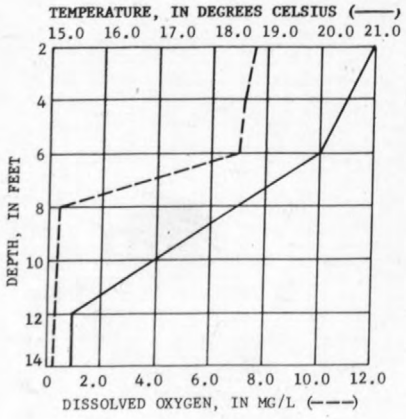
TOTAL HARDNESS (Mg/l as $CaCO_3$): 15

TOTAL DISSOLVED SOLIDS (Mg/l): 94

TRANSPARENCY (Feet): 4

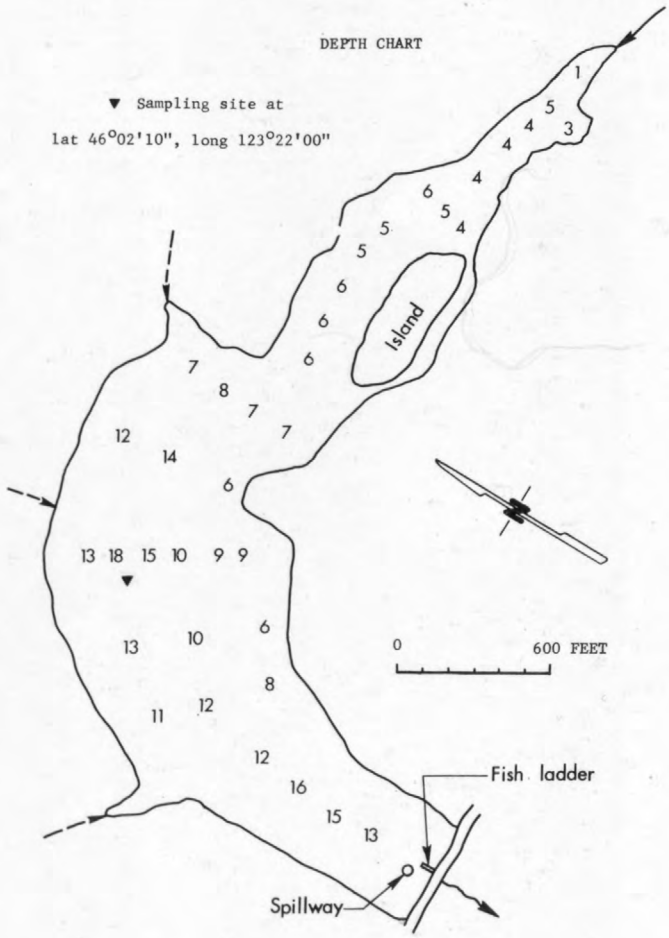
COLOR (Units): 35

COLIFORM (Colonies/100 ml): 1400



DEPTH CHART

▼ Sampling site at lat 46°02'10", long 123°22'00"



LOCATION: T.8 N., R.10 W., secs.20, 29, about 1 mile southwest of Warrenton, Oreg., and 1 mile east of the Pacific Ocean. U.S. Geological Survey 7.5-minute topographic map, Warrenton quadrangle.

DESCRIPTION: Long, narrow lake relatively free of aquatic growth, with dense vegetation on east bank. A Girl Scout camp is west of lake.

DRAINAGE BASIN: Clatsop sand dunes.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 12 acres.

SURFACE ELEVATION: 20 feet above mean sea level, from topographic map.

VOLUME: 50 acre-feet.

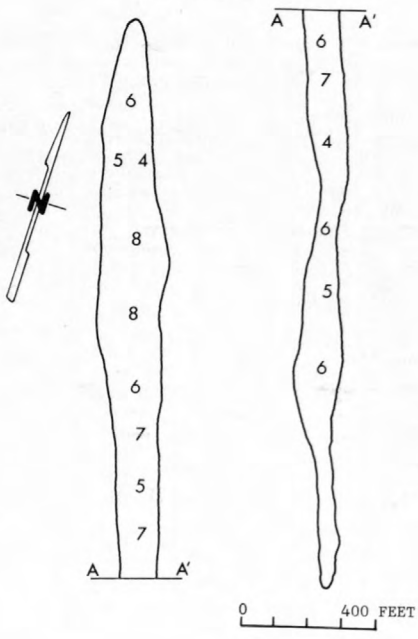
INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: None observed and no channel indicated on topographic map.

USE: Heavy use by Girl Scouts during summer for swimming, boating, and fishing.

REMARKS: Not open to the general public. In recent years, lake has been treated with copper sulfate to control algae. No water-quality data are available.

DEPTH CHART



LOCATION: T.4 N., R.7 W., sec.17, east of Nehalem River Road, about 3 miles south of Elsie, Oreg. U.S. Geological Survey 15-minute topographic map, Saddle Mountain quadrangle.

DESCRIPTION: An irregular-shaped lake, with very little aquatic growth, surrounded by second-growth timber. Many logs float on the lake; largest accumulation is on its perimeter.

DRAINAGE BASIN: Nehalem River basin.

DRAINAGE AREA: 0.1 square mile.

SURFACE AREA: 15 acres.

SURFACE ELEVATION: 1,500 feet above mean sea level, from topographic map.

VOLUME: 150 acre-feet.

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: None observed. Topographic map indicates Lost Lake Creek north of the lake.

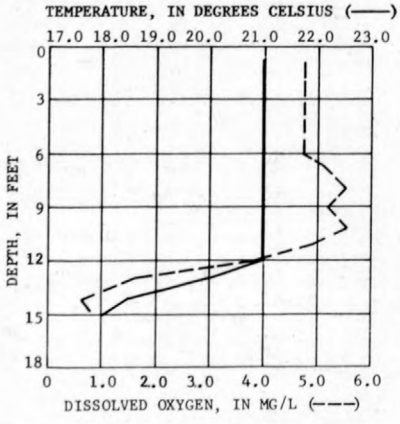
USE: A fairly popular fishing lake, particularly in early spring. It is difficult to get a boat to the lake, but considerable trolling is done. Cutthroat and rainbow trout have been stocked in recent years.

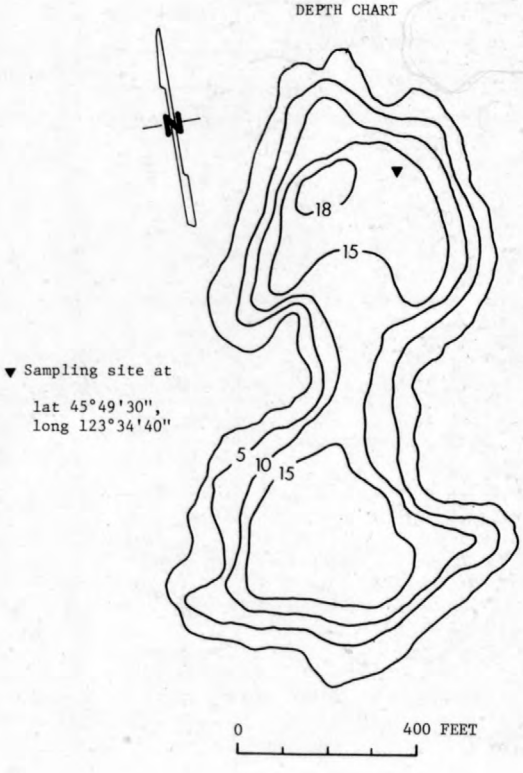
REMARKS: A logging road comes into the lake from the Nehalem River Road north of Spruce Run Creek, and another logging road cuts south off the Sunset Highway a short distance east of Jewell Junction. Depth chart from soundings by the Oregon State Game Commission (date unknown).

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.0	30
BOTTOM:	6.1	40

ALKALINITY (Mg/l as $CaCO_3$):	32
TOTAL HARDNESS (Mg/l as $CaCO_3$):	25
TOTAL DISSOLVED SOLIDS (Mg/l):	36
TRANSPARENCY (Feet):	8
COLOR (Units):	5
COLIFORM (Colonies/100 ml):	420





LOCATION: T.7 N., R.6 W., sec.2, about 1 mile southwest of Westport, Oreg. U.S. Geological Survey 15-minute topographic map, Cathlamet quadrangle.

DESCRIPTION: Circular-shaped lake surrounded by dead trees and grass. There are many snags and fallen logs on its perimeter.

DRAINAGE BASIN: Lower Columbia River basin.

DRAINAGE AREA: 0.2 square mile.

SURFACE AREA: 3 acres.

SURFACE ELEVATION: 550 feet above mean sea level, from topographic map.

VOLUME: 50 acre-feet.

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: None observed and no channel indicated on topographic map. Overflow from lake probably flows into Plympton Creek.

USE: Fishing, mostly by local residents. The lake contains some native cutthroat trout and has been stocked with rainbow trout.

REMARKS: The lake is reached by driving south from Westport on gravel road. Check with local residents for specific directions.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.8	47
BOTTOM:	5.8	65

ALKALINITY (Mg/l as $CaCO_3$): 32

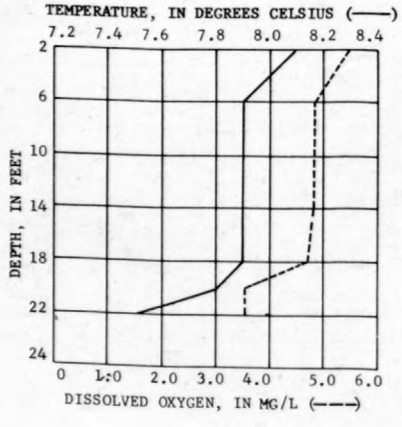
TOTAL HARDNESS (Mg/l as $CaCO_3$): 22

TOTAL DISSOLVED SOLIDS (Mg/l): 92

TRANSPARENCY (Feet): 6

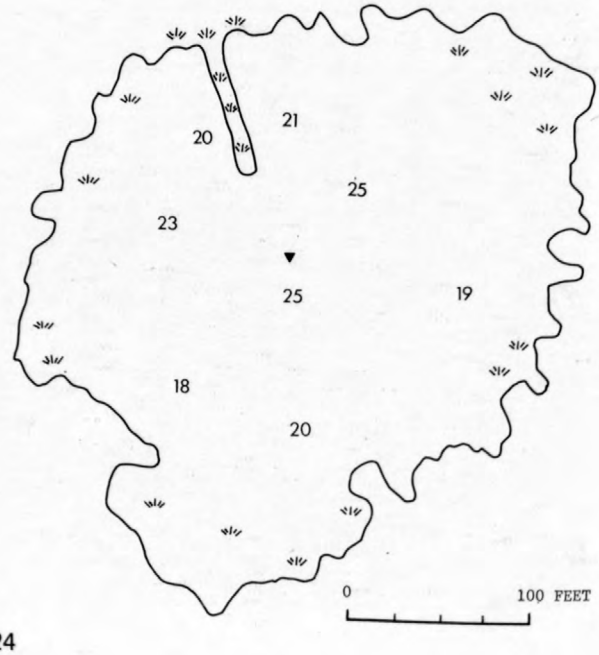
COLOR (Units): 35

COLIFORM (Colonies/100 ml): 140



DEPTH CHART

▼ Sampling site at lat 46°07'20", long 123°23'40"



LOCATION: T.7 N., R.8 W., sec.13, about 6.5 miles southwest of Knappa, Oreg. U.S. Geological Survey 15-minute topographic map, Svenson quadrangle.

DESCRIPTION: A deep lake with a muddy bottom and very little aquatic growth. Dense vegetation surrounds the lake.

DRAINAGE BASIN: Bear Creek basin (Lower Columbia).

DRAINAGE AREA: Less than 0.1 square mile.

SURFACE AREA: 10 acres at maximum pool.

SURFACE ELEVATION: 1,300 feet above mean sea level at top of spillway.

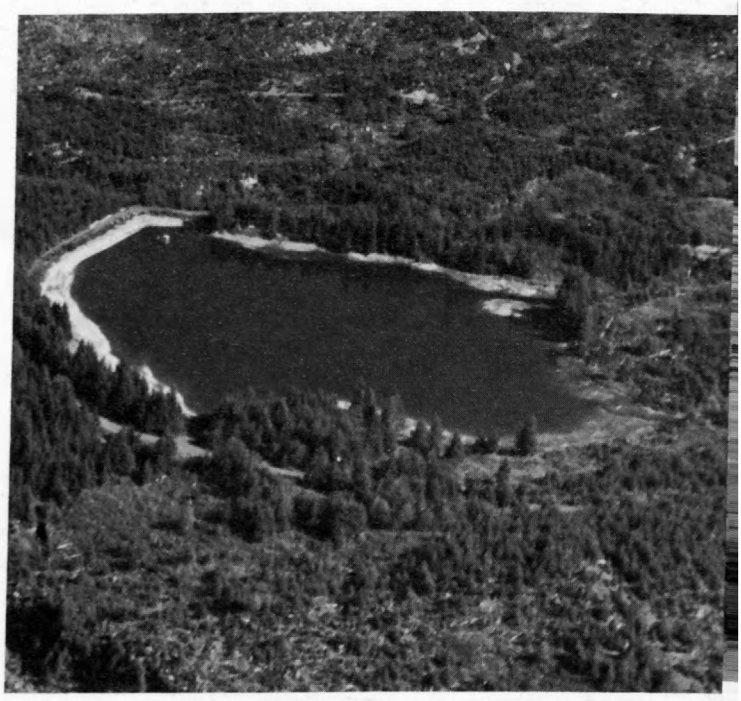
VOLUME: 160 acre-feet at maximum pool.

INFLOW: Estimated 1 cfs through small wooden culvert east of the lake.

OUTFLOW: Regulated to Bear Creek.

USE: Astoria, Oreg., water-delivery system reservoir.

REMARKS: Not open to the public. Water rights of 3.0 cfs from Middle Lake (16) and Wickiup Lake (32) for municipal water supply. Depth chart furnished by office of Oregon State Engineer.



WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	8.4	66
BOTTOM:	6.7	66

ALKALINITY (Mg/l as $CaCO_3$): 42

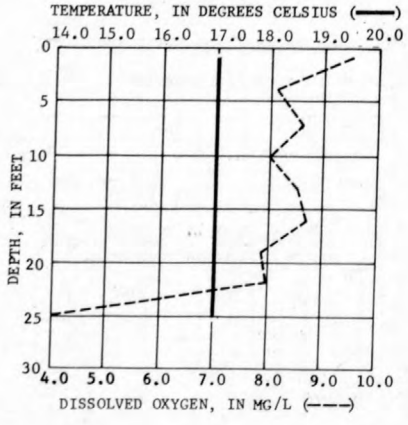
TOTAL HARDNESS (Mg/l as $CaCO_3$): 34

TOTAL DISSOLVED SOLIDS (Mg/l): 118

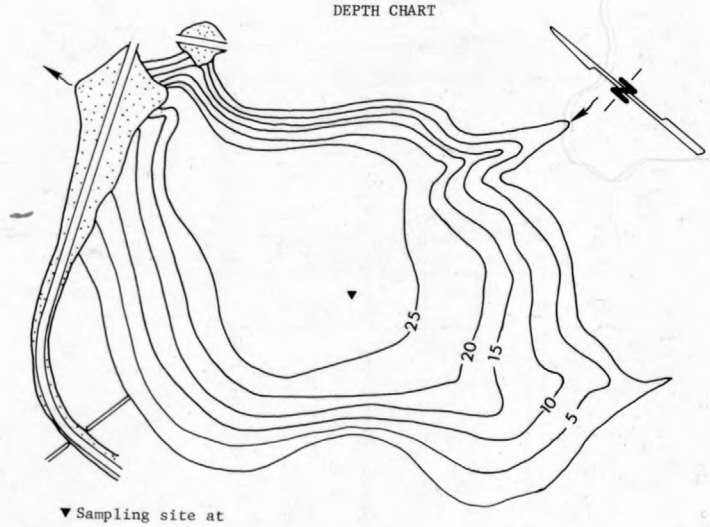
TRANSPARENCY (Feet): 9

COLOR (Units): 5

COLIFORM (Colonies/100 ml): --



DEPTH CHART



▼ Sampling site at

lat 46°05'40", long 123°37'00"

0 250 FEET

LOCATION: T.6 N., R.10 W., sec.28, just east of Highway 26 near Seaside, Oreg., city limits. U.S. Geological Survey 15-minute topographic map, Cannon Beach quadrangle.

DESCRIPTION: Circular-shaped main pond with other ponds nearby. All the ponds contain logs. A lumber mill is north of the main pond and residential and office buildings are to the west.

DRAINAGE BASIN: Clatsop sand dunes.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 7 acres.

SURFACE ELEVATION: 10 feet above mean sea level, from topographic map.

VOLUME: 40 acre-feet.

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: None observed and no channel indicated on topographic map.

USE: Log ponds for local lumber mill.

REMARKS: Ponds are privately owned and not open to the public. Water-quality data and depth chart apply to the main pond only.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.4	420
BOTTOM:	7.1	421

ALKALINITY (Mg/l as $CaCO_3$): 50

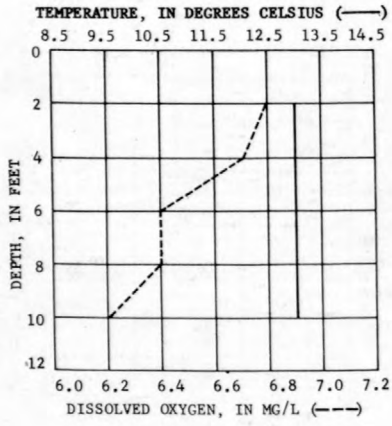
TOTAL HARDNESS (Mg/l as $CaCO_3$): 92

TOTAL DISSOLVED SOLIDS (Mg/l): 326

TRANSPARENCY (Feet): 2

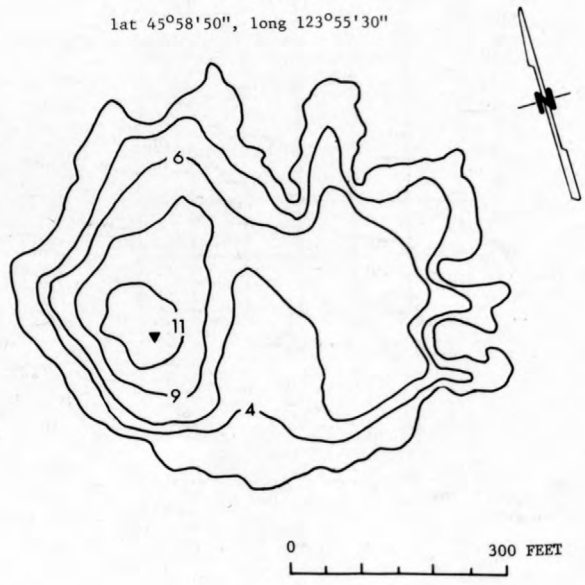
COLOR (Units): 5

COLIFORM (Colonies/100 ml): 220



DEPTH CHART OF MAIN POND

▼ Sampling site at lat 45°58'50", long 123°55'30"



LOCATION: T.4 N., R.7 W., secs.10, 15, about 4 miles southeast of Elsie, Oreg., and about 1 mile southwest of Sunset Highway State Park. U.S. Geological Survey 15-minute topographic map, Saddle Mountain quadrangle.

DESCRIPTION: Small lake about 200 feet off road down steep hillside. Its muddy banks are covered with lush vegetation and there are many stumps and snags in the water.

DRAINAGE BASIN: Nehalem River basin.

DRAINAGE AREA: 0.1 square mile.

SURFACE AREA: 4 acres.

SURFACE ELEVATION: 1,500 feet above mean sea level, from topographic map.

VOLUME: 50 acre-feet.

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: None observed, and no channel indicated on topographic map. Overflow drains to Quartz Creek.

USE: Public fishing.

REMARKS: Lake is not named on U.S. Geological Survey quadrangle maps.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.0	370
BOTTOM:	--	370

ALKALINITY (Mg/l as $CaCO_3$): 64

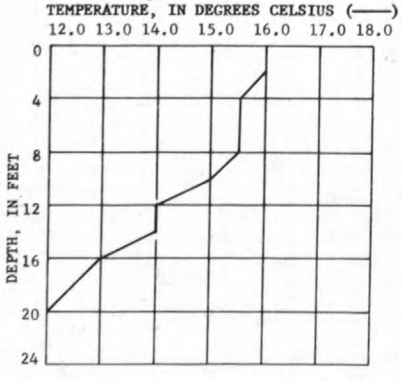
TOTAL HARDNESS (Mg/l as $CaCO_3$): 46

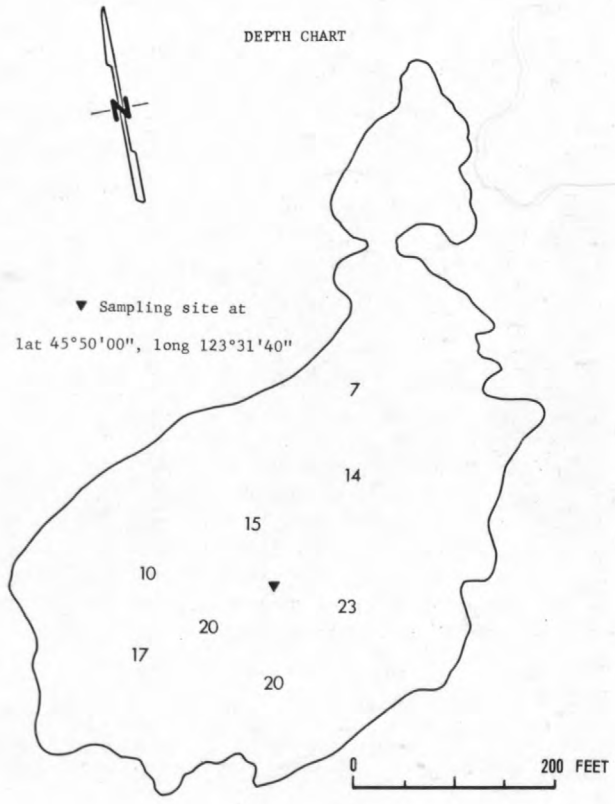
TOTAL DISSOLVED SOLIDS (Mg/l): 132

TRANSPARENCY (Feet): 7

COLOR (Units): 25

COLIFORM (Colonies/100 ml): 2450





LOCATION: T.5 N., R.10 W., sec.4, about 2 miles south of Seaside, Oreg., just east of Highway 101. U.S. Geological Survey 7.5-minute topographic map, Tillamook Head quadrangle.

DESCRIPTION: Small private manmade lake, surrounded by trees and brush, in a small mobile-home park.

DRAINAGE BASIN: Necanicum River basin.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 3 acres.

SURFACE ELEVATION: 40 feet above mean sea level, from topographic map.

VOLUME: 15 acre-feet.

INFLOW: None observed. Residents indicate there is flow through a culvert from Seaside Reservoir (20).

OUTFLOW: On north end of lake to the Necanicum River.

USE: Private fishing.

REMARKS: The two sections of Riverside Lake are divided by the road fill and connected by a culvert, but are treated as one lake. Water rights of 0.3 cfs for fish culture.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.6	38
BOTTOM:	7.5	37

ALKALINITY (Mg/l as $CaCO_3$): 16

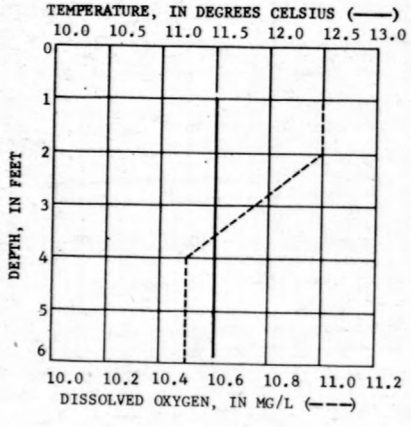
TOTAL HARDNESS (Mg/l as $CaCO_3$): 16

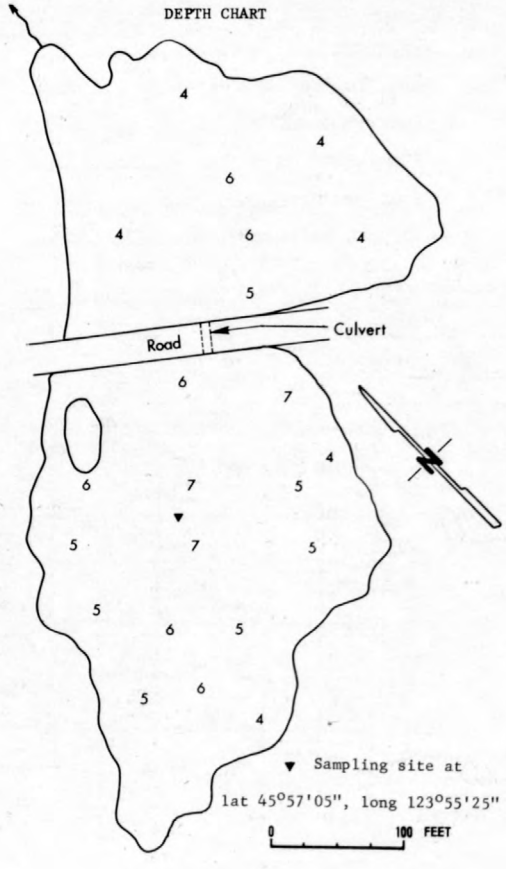
TOTAL DISSOLVED SOLIDS (Mg/l): 44

TRANSPARENCY (Feet): 2

COLOR (Units): 15

COLIFORM (Colonies/100 ml): 73





LOCATION: T.6 N., R.10 W., sec.33, about 2 miles south of Seaside, Oreg., and 0.3 mile east of Highway 26. U.S. Geological Survey 7.5-minute topographic map, Tillamook Head quadrangle.

DESCRIPTION: Reservoir surrounded by small timber. Water is clear and has no noticeable aquatic growth.

DRAINAGE BASIN: Necanicum River basin.

DRAINAGE AREA: 0.1 square mile direct surface runoff. Primary supply of water to the reservoir is diverted from the Necanicum River.

SURFACE AREA: 4 acres.

SURFACE ELEVATION: 175 feet above mean sea level, from topographic map.

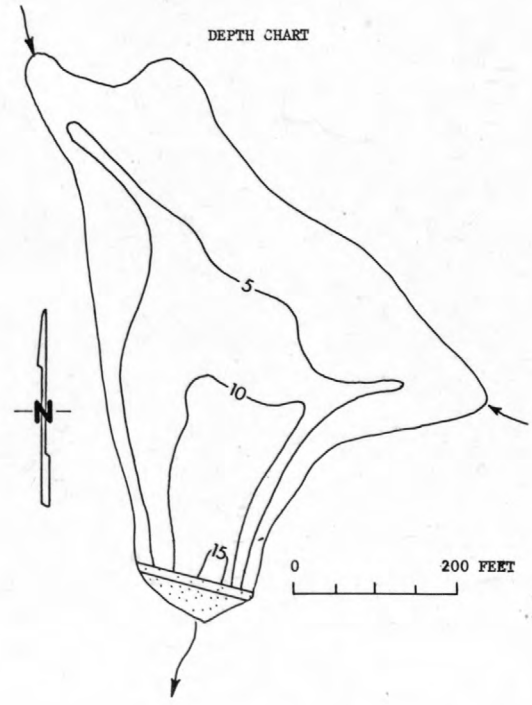
VOLUME: 30 acre-feet.

INFLOW: Diverted from Necanicum River.

OUTFLOW: Part of the outflow provides Seaside, Oreg., with water; the surplus flows back into the Necanicum River.

USE: Municipal water supply for Seaside, Oreg.

REMARKS: Reservoir, which is not open to the public, was drained prior to arrival of field party; therefore, water-quality data are not available. City of Seaside has rights to 7.0 cfs for municipal water supply.



LOCATION: T.8 N., R.10 W., sec.20, about 1 mile west of Warrenton, Oreg., and 2.5 miles south of Hammond, Oreg., U.S. Geological Survey 7.5-minute topographic map, Warrenton quadrangle.

DESCRIPTION: A small lake with moderate aquatic growth. An abundance of water lilies grow on the perimeter, and some algae bloom is present. Lake is in a boggy area and contains many snags.

DRAINAGE BASIN: Clatsop sand dunes.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 5 acres.

SURFACE ELEVATION: 20 feet above mean sea level, from topographic map.

VOLUME: 20 acre-feet.

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: None observed and no channel indicated on topographic map.

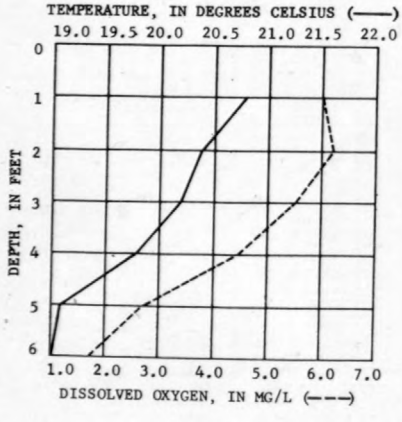
USE: Fishing for stocked cutthroat.

REMARKS: Access to the lake is through county dump. Referred to as Snag Lake in "The Oregon Sportsman's Guide" (1960-61).

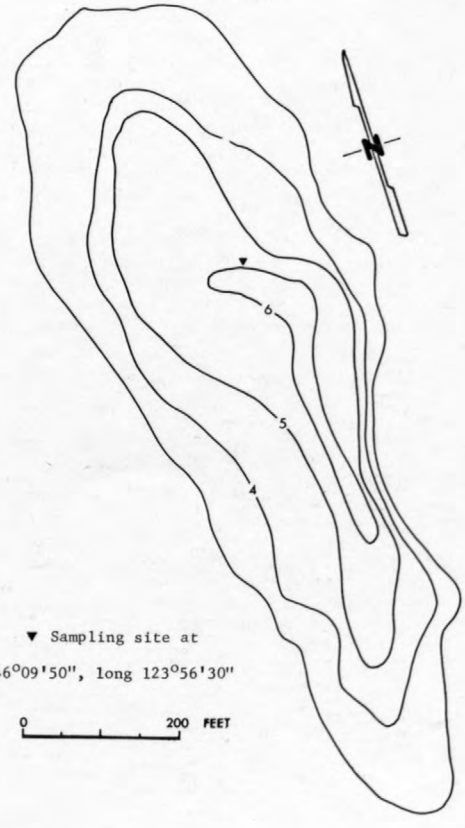
WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.1	133
BOTTOM:	6.6	128

ALKALINITY (Mg/l as $CaCO_3$):	22
TOTAL HARDNESS (Mg/l as $CaCO_3$):	27
TOTAL DISSOLVED SOLIDS (Mg/l):	96
TRANSPARENCY (Feet):	4
COLOR (Units):	70
COLIFORM (Colonies/100 ml):	8400



DEPTH CHART



LOCATION: T.7 N., R.10 W., secs.4, 9, in Camp Clatsop (Rilea) Military Reservation, about 3.5 miles southwest of Warrenton, Oreg. U.S. Geological Survey 7.5-minute topographic map, Gearhart quadrangle.

DESCRIPTION: Triangular-shaped lake surrounded by small pine trees and sand dunes. Water is clear and has an abundance of aquatic growth. Lake bottom is very silty.

DRAINAGE BASIN: Clatsop sand dunes.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 20 acres.

SURFACE ELEVATION: 19.8 feet above mean sea level on Aug. 9, 1972. Varies seasonally from about 17.5 feet above mean sea level in the fall to about 21.5 feet above mean sea level in early spring. Datum of U.S. Geological Survey staff gage is 14.2 feet above mean sea level.

VOLUME: 80 acre-feet.

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: None observed and no channel indicated on topographic map.

USE: Fishing and duck hunting.

REMARKS: See grounds keeper for access through Camp Clatsop (Rilea) Military Reservation. Sounded by the Oregon State Game Commission, June 1955.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	10.1	205
BOTTOM:	9.6	205

ALKALINITY (Mg/l as $CaCO_3$): 48

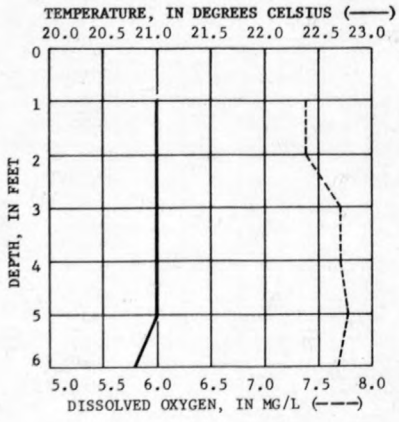
TOTAL HARDNESS (Mg/l as $CaCO_3$): 35

TOTAL DISSOLVED SOLIDS (Mg/l): 180

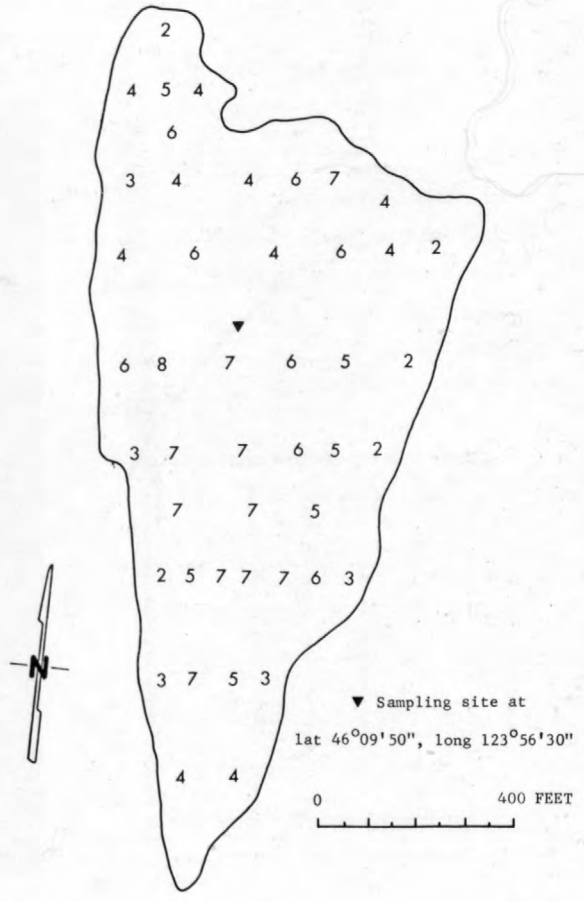
TRANSPARENCY (Feet): 6

COLOR (Units): 15

COLIFORM (Colonies/100 ml): 40



DEPTH CHART



LOCATION: T.8 N., R.10 W., sec. 28, about 1.5 miles southwest of Warrenton, Oreg., and 1 mile east of the Pacific Ocean. U.S. Geological Survey 7.5-minute topographic map, Warrenton quadrangle.

DESCRIPTION: Very dense aquatic growth throughout lake. Surrounding area is mostly boggy, but some filling for home construction has been done. Water has a brownish tint.

DRAINAGE BASIN: Clatsop sand dunes.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 50 acres.

SURFACE ELEVATION: Varies seasonally from about 15.0 feet above mean sea level to about 17.5 feet above mean sea level. Low-water levels occur in the fall and high-water levels occur in early spring.

VOLUME: 150 acre-feet.

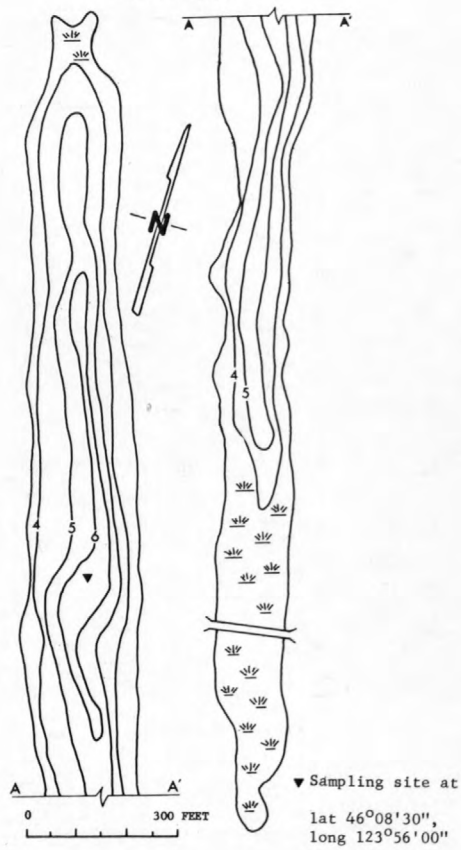
INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: No measurable flow through culvert between Smith Lake and Cemetery Lake on Aug. 3, 1972. Water could conceivably flow in either direction through culvert.

USE: Mostly fishing for white and black crappie, brown bullhead, yellow perch, bluegill, sunfish, warmouth, and largemouth bass (McHugh, 1972).

REMARKS: Smith Lake has been altered physically several times over the years. The overall length of the lake has been shortened by road fills. Water rights of 0.392 cfs for irrigation. City of Astoria has rights to 11,000,000 gallons of stored water for supplemental irrigation of 24.3 acres.

DEPTH CHART



WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.8	92
BOTTOM:	6.7	92

ALKALINITY (Mg/l as $CaCO_3$): 21

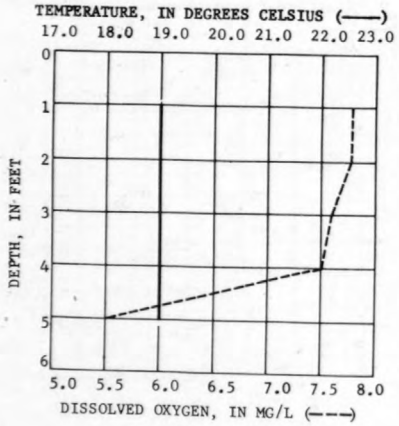
TOTAL HARDNESS (Mg/l as $CaCO_3$): 25

TOTAL DISSOLVED SOLIDS (Mg/l): 180

TRANSPARENCY (Feet): --

COLOR (Units): 30

COLIFORM (Colonies/100 ml): 2800



LOCATION: T.4 N., R.9 W., sec.14, about 4.5 miles south of the Necanicum junction on Highway 26, and about 0.9 mile east of the Necanicum Highway. U.S. Geological Survey 15-minute topographic map, Cannon Beach quadrangle.

DESCRIPTION: Remote lake surrounded by dense foliage. Many logs are adrift in the lake. A small beaver dam is near the outlet on the north end.

DRAINAGE BASIN: Nehalem River basin.

DRAINAGE AREA: 0.4 square mile.

SURFACE AREA: 10 acres.

SURFACE ELEVATION: 550 feet above mean sea level, from topographic map.

VOLUME: 150 acre-feet.

INFLOW: Through marsh on south end of lake.

OUTFLOW: Seepage through dam to Soapstone Creek.

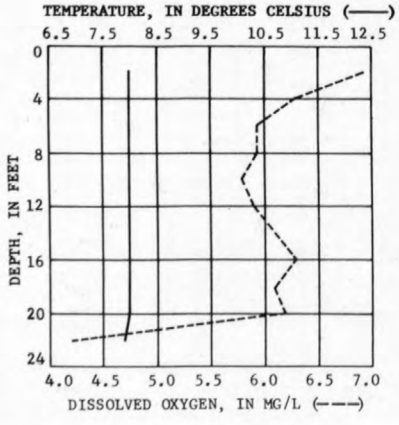
USE: Fishing for cutthroat and rainbow trout. Lake has been stocked in recent years.

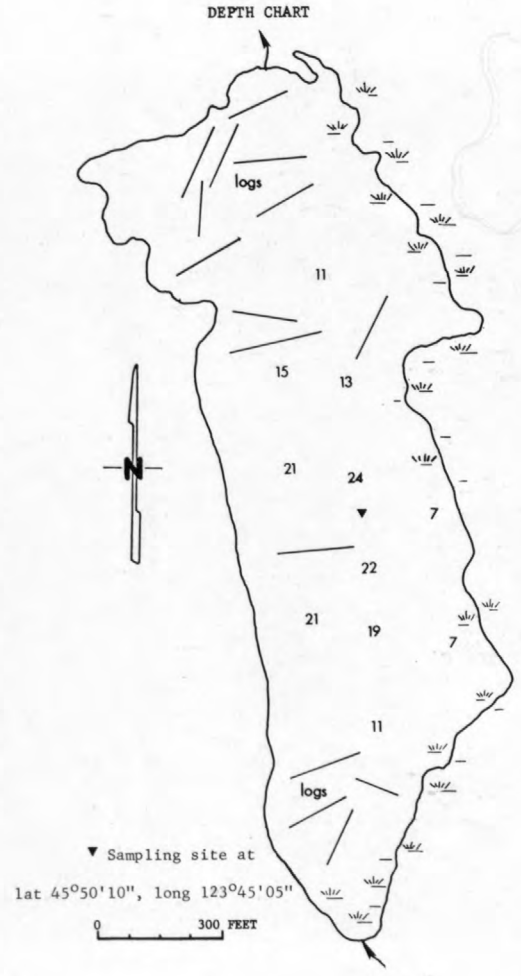
REMARKS: Access roads to the lake are not passable during wet weather. The lake can be reached from either the north or south and involves about a quarter-mile hike from end of road.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.5	35
BOTTOM:	6.1	35

ALKALINITY (Mg/l as $CaCO_3$):	20
TOTAL HARDNESS (Mg/l as $CaCO_3$):	16
TOTAL DISSOLVED SOLIDS (Mg/l):	--
TRANSPARENCY (Feet):	6
COLOR (Units):	40
COLIFORM (Colonies/100 ml):	274





LOCATION: T.6 N., R.10 W., sec.15, about 1 mile southeast of Gearhart, Oreg., and 0.5 mile northeast of Seaside, Oreg. U.S. Geological Survey 7.5-minute topographic map, Gearhart quadrangle.

DESCRIPTION: Very marshy lake surrounded by pasture. The lake bottom is extremely silty. Very little of the water surface is visible because of an abundance of bulrushes.

DRAINAGE BASIN: Neacoxie Creek basin.

DRAINAGE AREA: 2.3 square miles.

SURFACE AREA: 4 acres.

SURFACE ELEVATION: 10 feet above mean sea level, from topographic map.

VOLUME: 4 acre-feet.

INFLOW: Unnamed creek from the south. (See REMARKS.)

OUTFLOW: North end of lake to Neawanna Creek.

USE: None apparent.

REMARKS: Thompson Creek, shown on the 1959 Gearhart quadrangle map, no longer contributes inflow to the lake. The lake, located on private property, has a uniform depth of about 1 foot. Access is difficult because of marshy conditions and brush along the shoreline. Water sampled at lat 46°00'30", long 123°54'30".

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.7	170
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 43

TOTAL HARDNESS (Mg/l as $CaCO_3$): 68

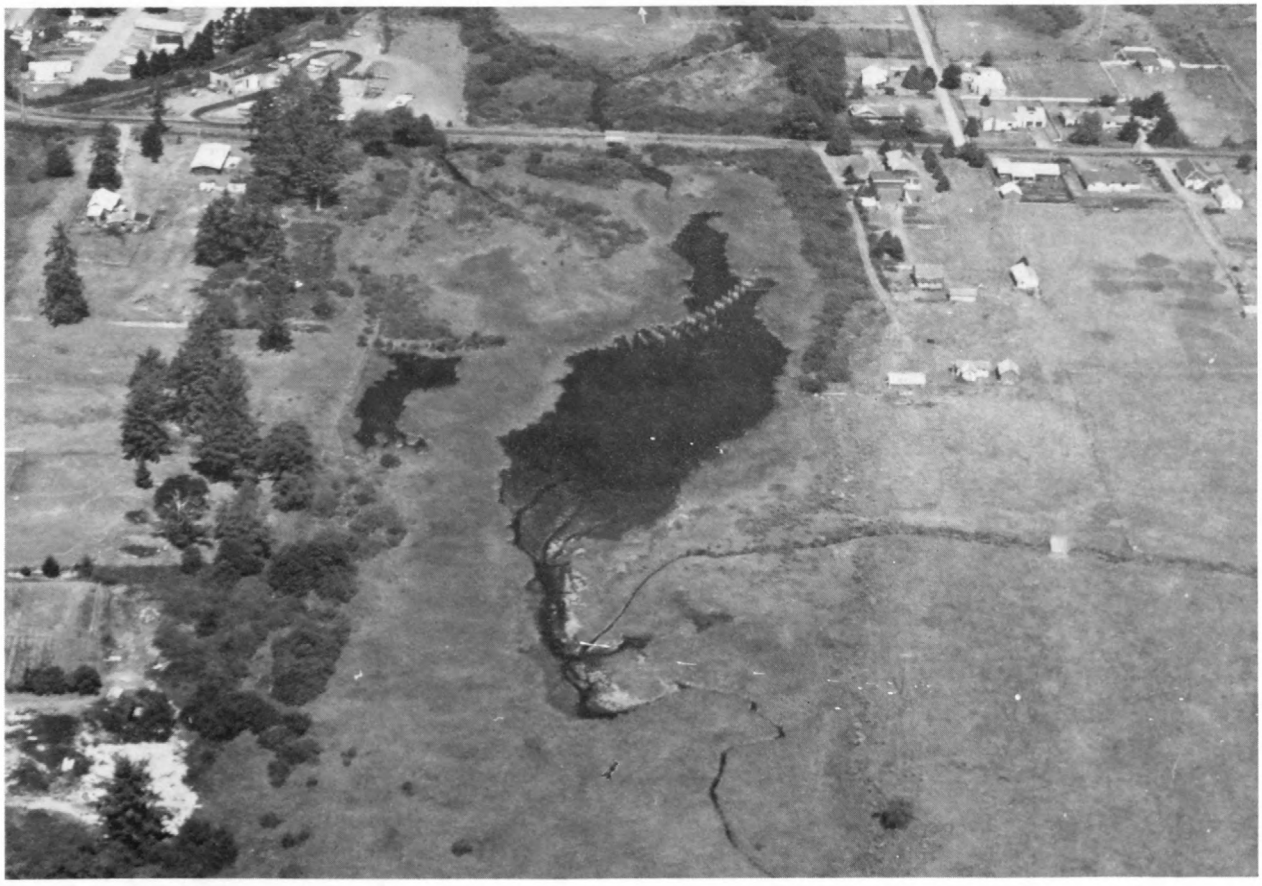
TOTAL DISSOLVED SOLIDS (Mg/l): 156

TRANSPARENCY (Feet): 0

COLOR (Units): 100

COLIFORM (Colonies/100 ml): 660

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	7.0	9.1
BOTTOM:	--	--



LOCATION: T.7 N., R.10 W., sec.21, about 4 miles north of Gearhart, Oreg., 0.5 mile west of Oregon Coast Highway. U.S. Geological Survey 7.5-minute topographic map, Gearhart quadrangle.

DESCRIPTION: Very long, narrow lake in sand-dunes area, with a public park on the west shore and homes and farms surrounding the rest of the lake. Some blue-green algae grows in the lake during summer (McHugh, 1972).

DRAINAGE BASIN: Clatsop sand dunes.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 110 acres.

SURFACE ELEVATION: 20.9 feet above mean sea level on Aug. 8, 1972. Varies seasonally from about 20 to 22 feet above mean sea level. Low-water levels occur in the fall and high-water levels occur in the early spring.

VOLUME: 1,000 acre-feet.

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: Estimated 4.5 cfs at outlet to Neacoxie Creek on Aug. 8, 1972.

USE: Fishing for perch, bullhead, largemouth bass, crappie, and rainbow trout.

REMARKS: Because of the unusual length of this lake (more than 3 miles), water samples were taken at the north, middle, and south ends.

Depth chart is from a July 20, 1952, survey by the Oregon State Game Commission and was field checked by the U.S. Geological Survey. Water rights of 0.56 cfs for golf course irrigation.

For additional information on surface-water and ground-water interrelationships and water-quality data, see Frank (1970). For information concerning coastal-lake formation, see Baldwin (1964), Chapman (1964), Cooper (1958), Hansen (1947), and Weidemann, Dennis, and Smith (1969).

Sampling site B
WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	8.2	172
BOTTOM:	7.3	172

ALKALINITY (Mg/l as $CaCO_3$): 56

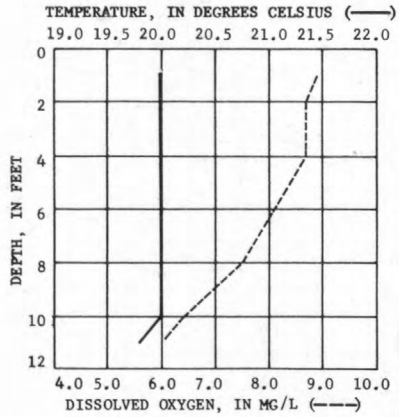
TOTAL HARDNESS (Mg/l as $CaCO_3$): 48

TOTAL DISSOLVED SOLIDS (Mg/l): 180

TRANSPARENCY (Feet): 3

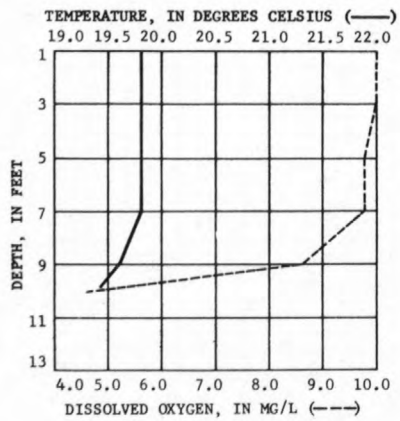
COLOR (Units): --

COLIFORM (Colonies/100 ml): 2900



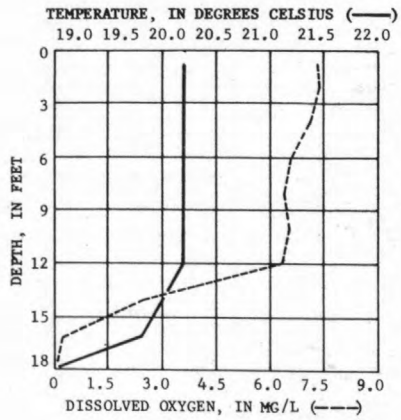
Sampling site A
WATER-QUALITY DATA

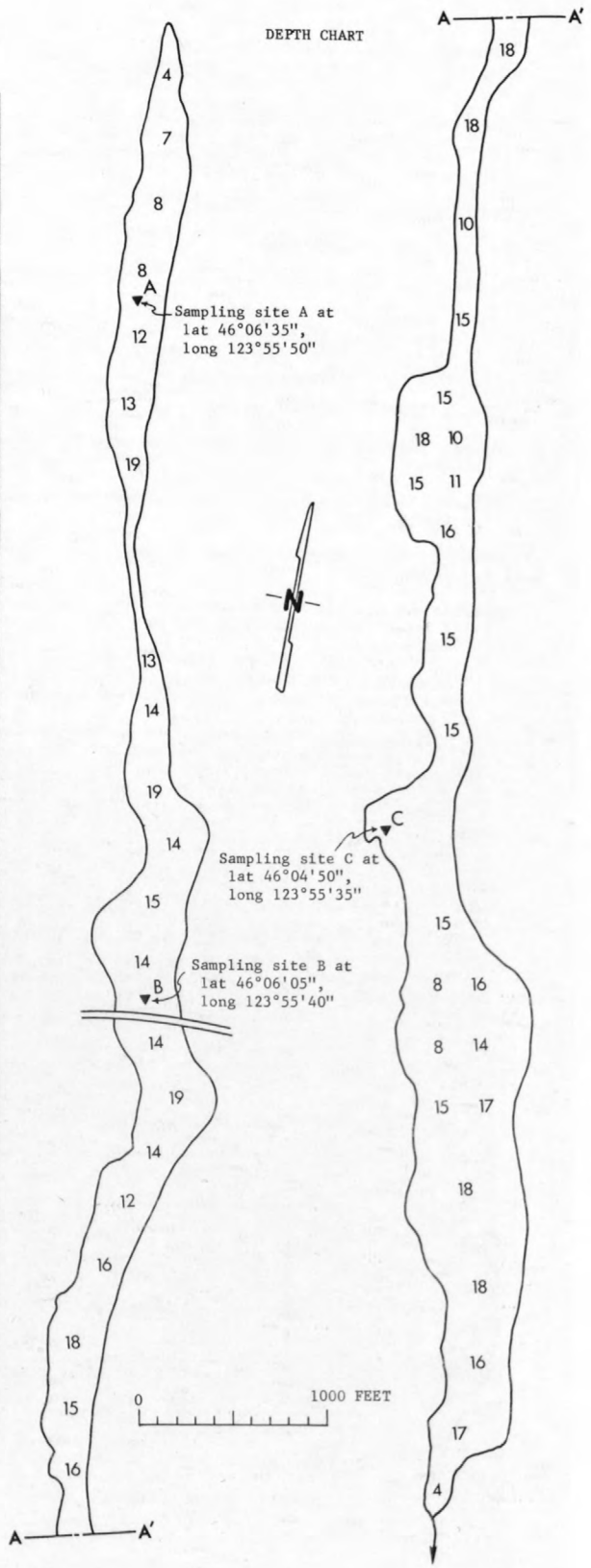
	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	8.1	170
BOTTOM:	7.0	173



Sampling site C
WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.9	165
BOTTOM:	7.3	180




DEPTH CHART
A
A'
Sampling site A at lat 46°06'35", long 123°55'50"
Sampling site B at lat 46°06'05", long 123°55'40"
Sampling site C at lat 46°04'50", long 123°55'35"
N
0
1000 FEET

LOCATION: T.7 N., R.10 W., sec.10, about 5.5 miles north of Gearhart, Oreg., and 0.5 mile east of Oregon Coast Highway, U.S. Geological Survey 7.5-minute topographic map, Gearhart quadrangle.

DESCRIPTION: An isolated lake surrounded by second-growth timber in the foothills of the Coast Range. The water is clear and has some aquatic growth.

DRAINAGE BASIN: Skipanon River basin.

DRAINAGE AREA: 0.4 square mile.

SURFACE AREA: 9 acres.

SURFACE ELEVATION: 20 feet above mean sea level, from topographic map.

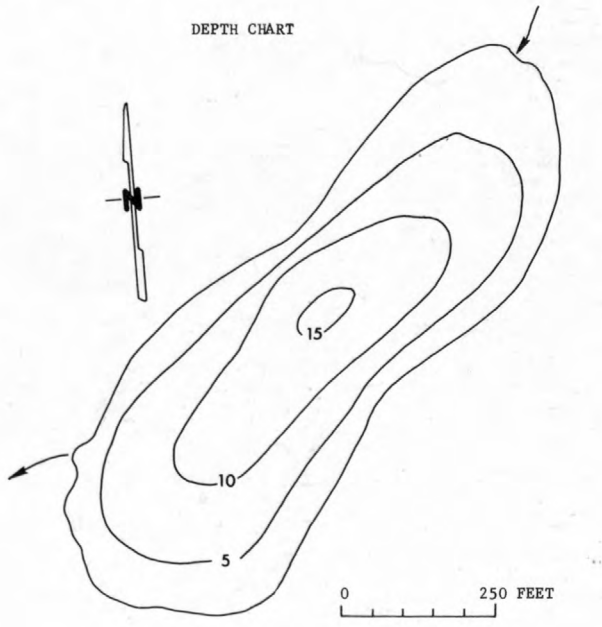
VOLUME: 60 acre-feet.

INFLOW: None observed. Topographic map indicates an intermittent inflow from the northeast.

OUTFLOW: None observed and none indicated on topographic map.

USE: Private fishing.

REMARKS: Not open to the public. No water-quality data available. Depth chart from September 1954 soundings by the Oregon State Game Commission.



LOCATION: T.7 N., R.10 W., sec.26, about 3 miles northeast of Gearhart, Oreg., and 1 mile east of Oregon Coast Highway. U.S. Geological Survey 7.5-minute topographic map, Gearhart quadrangle.

DESCRIPTION: Small lake surrounded by dense brush and trees. The lake has little aquatic growth.

DRAINAGE BASIN: Skipanon River basin.

DRAINAGE AREA: 0.5 square mile.

SURFACE AREA: 3 acres.

SURFACE ELEVATION: 8.2 feet above mean sea level on Aug. 23, 1972 at U.S. Geological Survey staff gage on Cullaby Creek at Delmoor Road southwest of Triangle Lake. Varies seasonally from about 7.0 to 10.5 feet above mean sea level. Datum of gage is 13.6 feet below mean sea level.

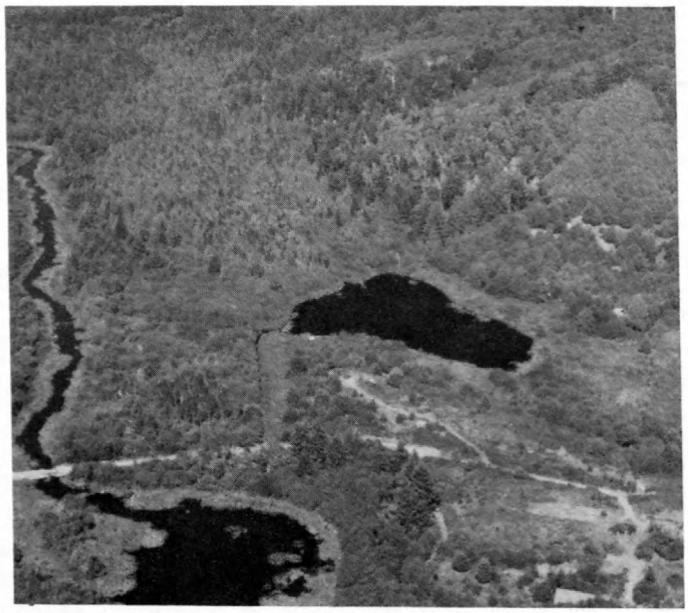
VOLUME: 20 acre-feet.

INFLOW: None observed. Topographic map indicates an intermittent inflow from the east.

OUTFLOW: West side of lake into Cullaby Creek.

USE: Private fishing.

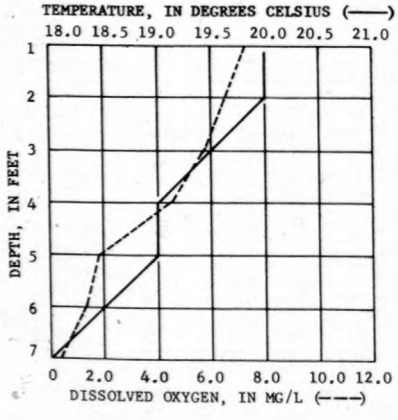
REMARKS: Not open to the public. Small shed and boat dock built on south shore by owner. Depths provided by the Oregon State Game Commission.



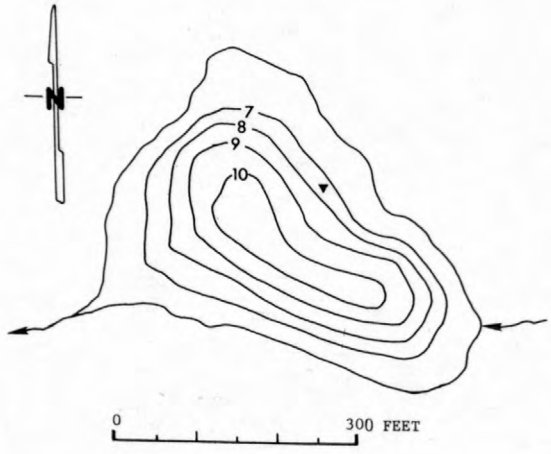
WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.0	105
BOTTOM:	6.3	120

ALKALINITY (Mg/l as $CaCO_3$):	18
TOTAL HARDNESS (Mg/l as $CaCO_3$):	19
TOTAL DISSOLVED SOLIDS (Mg/l):	116
TRANSPARENCY (Feet):	1
COLOR (Units):	100
COLIFORM (Colonies/100 ml):	4800



DEPTH CHART



▼ Sampling site at

lat 46°03'50", long 123°53'50"

LOCATION: T.6 N., R.10 W., sec.3, about 0.5 mile east of Gearhart, Oreg., and 0.5 mile north of the Seaside Airfield. U.S. Geological Survey 7.5-minute topographic map, Gearhart quadrangle. (See REMARKS.)

DESCRIPTION: An abandoned rock quarry surrounded by small trees and brush. Water has a brownish tint. A rock and gravel company is north of the lake.

DRAINAGE BASIN: Clatsop sand dunes.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 4 acres.

SURFACE ELEVATION: 20 feet above mean sea level, from topographic map.

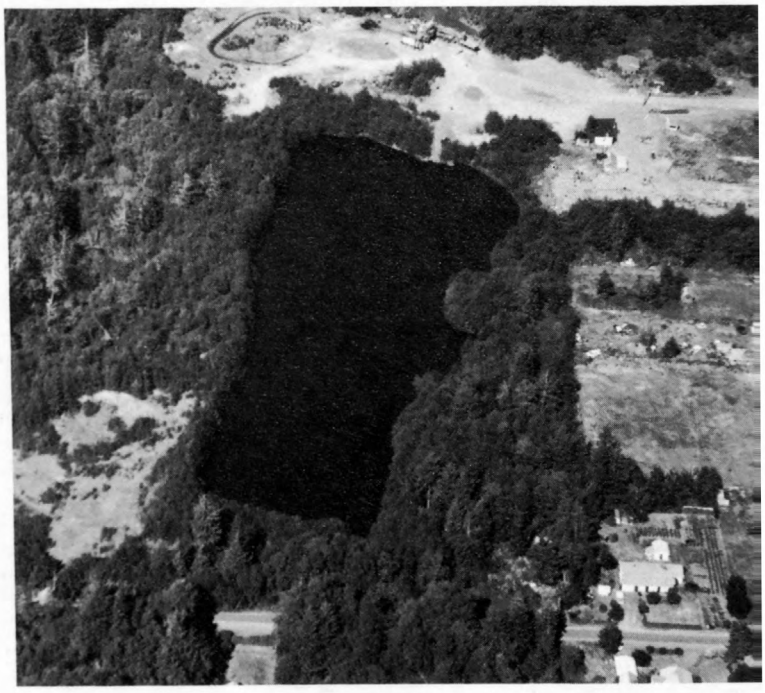
VOLUME: 40 acre-feet.

INFLOW: None observed and no channel indicated on topographic map.

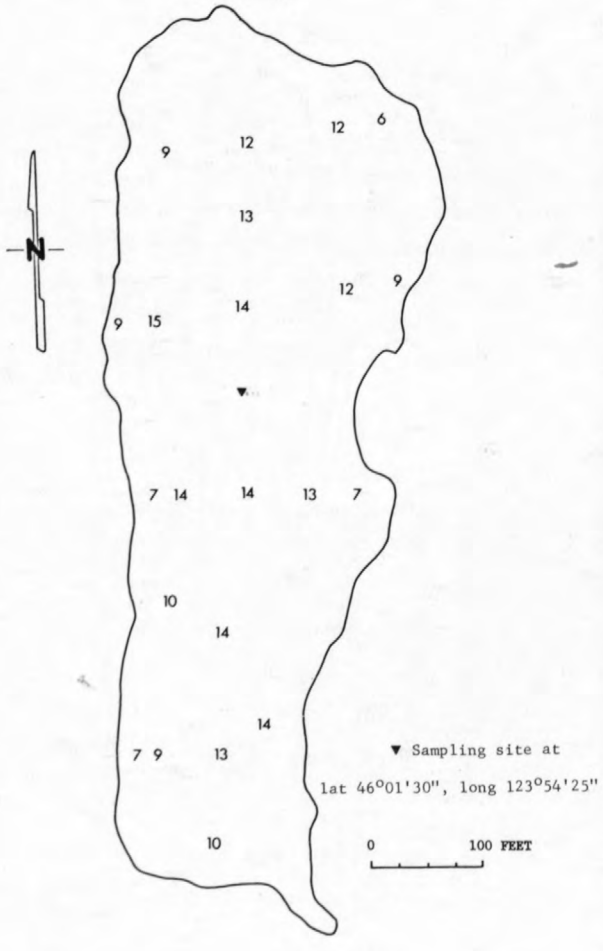
OUTFLOW: None observed and no channel indicated on topographic map.

USE: Fishing by local people. Water is used by local rock and gravel company.

REMARKS: Not shown on 1949 topographic map.



DEPTH CHART



WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.1	122
BOTTOM:	7.2	250

ALKALINITY (Mg/l as $CaCO_3$): 48

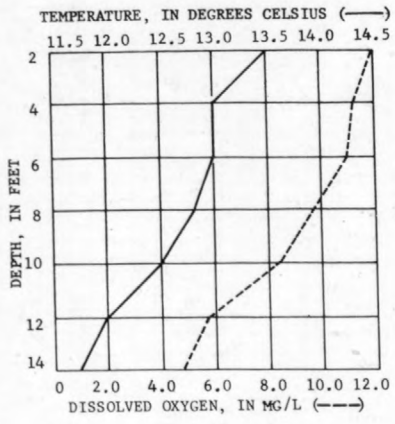
TOTAL HARDNESS (Mg/l as $CaCO_3$): 60

TOTAL DISSOLVED SOLIDS (Mg/l): 168

TRANSPARENCY (Feet): 1

COLOR (Units): 150

COLIFORM (Colonies/100 ml): 150



LOCATION: T.7 N., R.10 W., sec.26, about 3 miles northeast of Gearhart, Oreg., and 1 mile east of the Oregon Coast Highway. U.S. Geological Survey 7.5-minute topographic map, Gearhart quadrangle.

DESCRIPTION: Small lake, surrounded by dense brush, with water lilies covering much of the surface. A small beaver dam is on the northwest side of lake near Delmoor Road.

DRAINAGE BASIN: Skipanon River basin.

DRAINAGE AREA: 3.5 square miles.

SURFACE AREA: 2 acres.

SURFACE ELEVATION: 8.2 feet above mean sea level on Aug. 23, 1972, at U.S. Geological Survey staff gage on Cullaby Creek at Delmoor Road northwest of the lake. Varies seasonally from about 7.0 to 10.5 feet above mean sea level.

VOLUME: 10 acre-feet.

INFLOW: Cullaby Creek south of the lake.

OUTFLOW: Continuation of Cullaby Creek.

USE: Fishing by local people.

REMARKS: Privately owned. Depths provided by Oregon State Game Commission.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.7	62
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 50

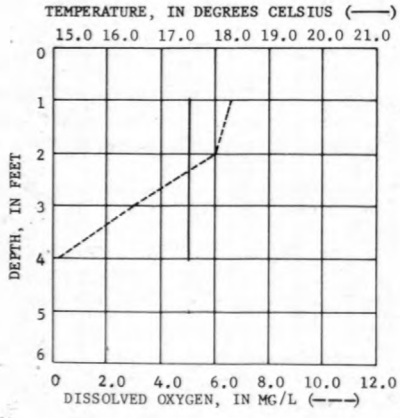
TOTAL HARDNESS (Mg/l as $CaCO_3$): 15

TOTAL DISSOLVED SOLIDS (Mg/l): 98

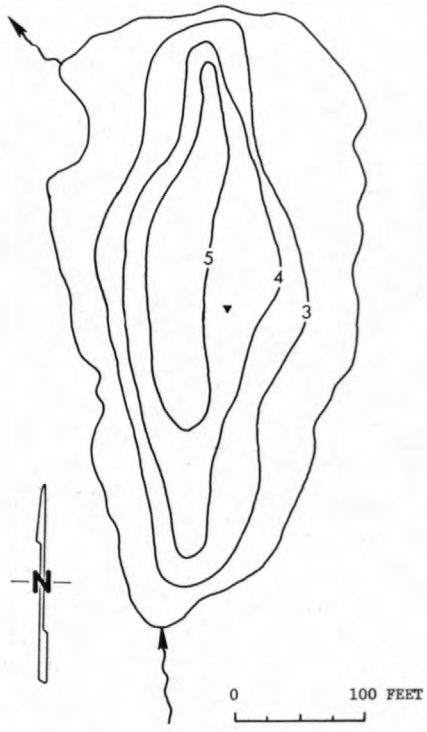
TRANSPARENCY (Feet): 2

COLOR (Units): 60

COLIFORM (Colonies/100 ml): 5100



DEPTH CHART



▼ Sampling site at

lat 46°03'40", long 123°53'50"

LOCATION: T.7 N., R.10 W., secs.15, 22, 27. Oregon Coast Highway divides West Lake about 4 miles north of Gearhart, Oreg. U.S. Geological Survey 7.5-minute topographic map, Gearhart quadrangle.

DESCRIPTION: Long, narrow lake with extremely heavy aquatic growth. Water lilies cover most of the water surface, and the lake is divided twice by roads.

DRAINAGE BASIN: Clatsop sand dunes.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 35 acres.

SURFACE ELEVATION: 18 feet above mean sea level, from topographic map. Varies seasonally from about 18 to 20 feet above mean sea level. Low-water levels occur in the fall and high-water levels occur in the early spring.

VOLUME: 180 acre-feet.

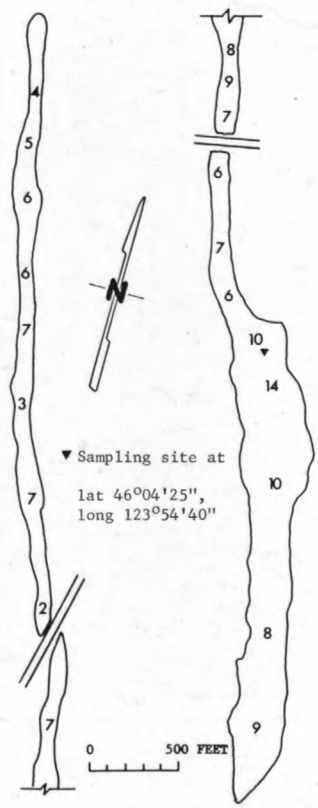
INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: None observed and no channel indicated on topographic map.

USE: Fishing for perch, crappie, bluegill, catfish, and large-mouth bass.

REMARKS: For information concerning coastal-lake formation, see Baldwin (1964), Chapman (1964), Cooper (1958), Hansen (1947), and Weidemann, Dennis, and Smith (1969). Depths provided by the Oregon State Game Commission.

DEPTH CHART



WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.7	110
BOTTOM:	- -	- -

ALKALINITY (Mg/l as $CaCO_3$): 28

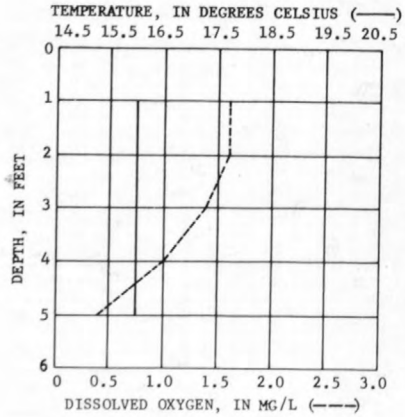
TOTAL HARDNESS (Mg/l as $CaCO_3$): 32

TOTAL DISSOLVED SOLIDS (Mg/l): 122

TRANSPARENCY (Feet): 1

COLOR (Units): 25

COLIFORM (Colonies/100 ml): 4000



LOCATION: T.7 N., R.7 W., sec.18, about 6.5 miles southwest of Knappa, Oreg. U.S. Geological Survey 15-minute topographic map, Svensen quadrangle.

DESCRIPTION: Very clean lake with almost no aquatic growth. Bottom of the lake is rock and mud. Most of the land surrounding the lake has been clear cut and second growth is sparse.

DRAINAGE BASIN: Bear Creek basin (Lower Columbia).

DRAINAGE AREA: 1.0 square mile.

SURFACE AREA: 28 acres at maximum pool.

SURFACE ELEVATION: 1,560.7 feet above mean sea level on Sept. 6, 1972. Datum of reservoir staff gage is 1,552.0 feet above mean sea level. Top of spillway is 1,575.0 feet above mean sea level.

VOLUME: 181 acre-feet at maximum pool.

INFLOW: None observed. Topographic map indicates an inflow from the northeast.

OUTFLOW: Regulated to Bear Creek on west side of lake.

USE: Astoria, Oreg., water-delivery system reservoir.

REMARKS: Not open to the public. Physical data provided by city of Astoria. Water rights of 3.0 cfs from Wickiup Lake (32) and Middle Lake (16) for municipal water supply.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.6	66
BOTTOM:	7.1	66

ALKALINITY (Mg/l as $CaCO_3$): 52

TOTAL HARDNESS (Mg/l as $CaCO_3$): 30

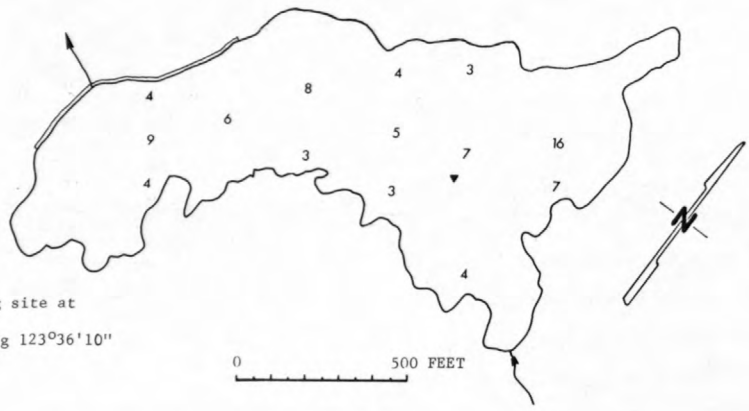
TOTAL DISSOLVED SOLIDS (Mg/l): 94

TRANSPARENCY (Feet): 7

COLOR (Units): 20

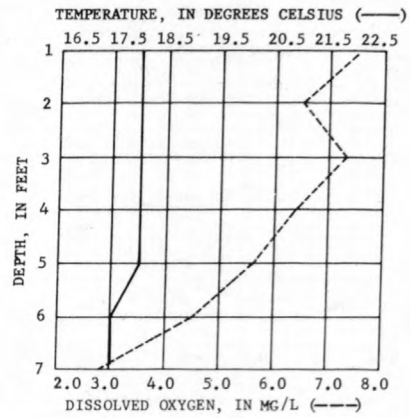
COLIFORM (Colonies/100 ml): - -

DEPTH CHART



▼ Sampling site at

lat 46°05'15", long 123°36'10"



LOCATION: T.8 N., R.10 W., sec.29, about 1 mile southwest of Warrenton, Oreg., and 3 miles south of Hammond, Oreg. U.S. Geological Survey 7.5-minute topographic map, Warrenton quadrangle.

DESCRIPTION: A shallow lake with clear water and little aquatic growth. Many water lilies grow on the perimeter of the lake.

DRAINAGE BASIN: Clatsop sand dunes.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 11 acres.

SURFACE ELEVATION: 15 feet above mean sea level, from topographic map.

VOLUME: 45 acre-feet.

INFLOW: No measurable flow through culvert between Cemetery Lake and Smith Lake on Aug. 3, 1972. Water could conceivably flow in either direction through culvert.

OUTFLOW: See INFLOW.

USE: None apparent.

REMARKS: Heavy brown algae bloom developing as of Aug. 3, 1972. Depth chart is from July 20, 1952, survey by the Oregon State Game Commission and was field checked by the U.S. Geological Survey.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.6	126
BOTTOM:	6.8	124

ALKALINITY (Mg/l as $CaCO_3$): 31

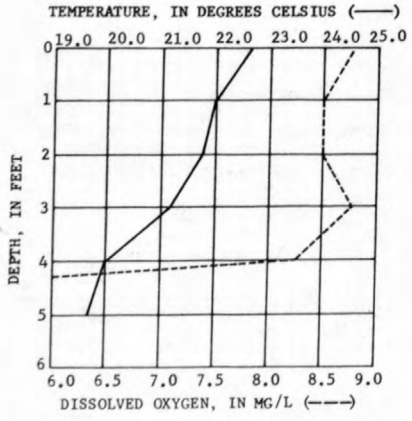
TOTAL HARDNESS (Mg/l as $CaCO_3$): 36

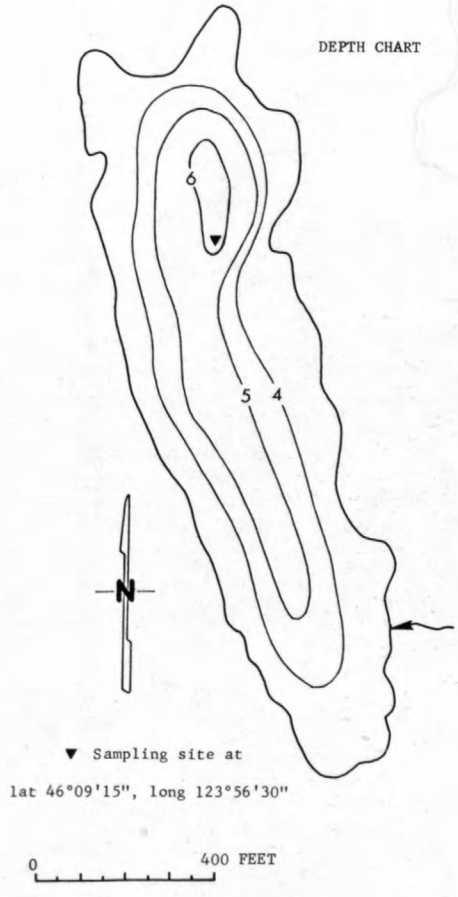
TOTAL DISSOLVED SOLIDS (Mg/l): 128

TRANSPARENCY (Feet): 5

COLOR (Units): 25

COLIFORM (Colonies/100 ml): 2100





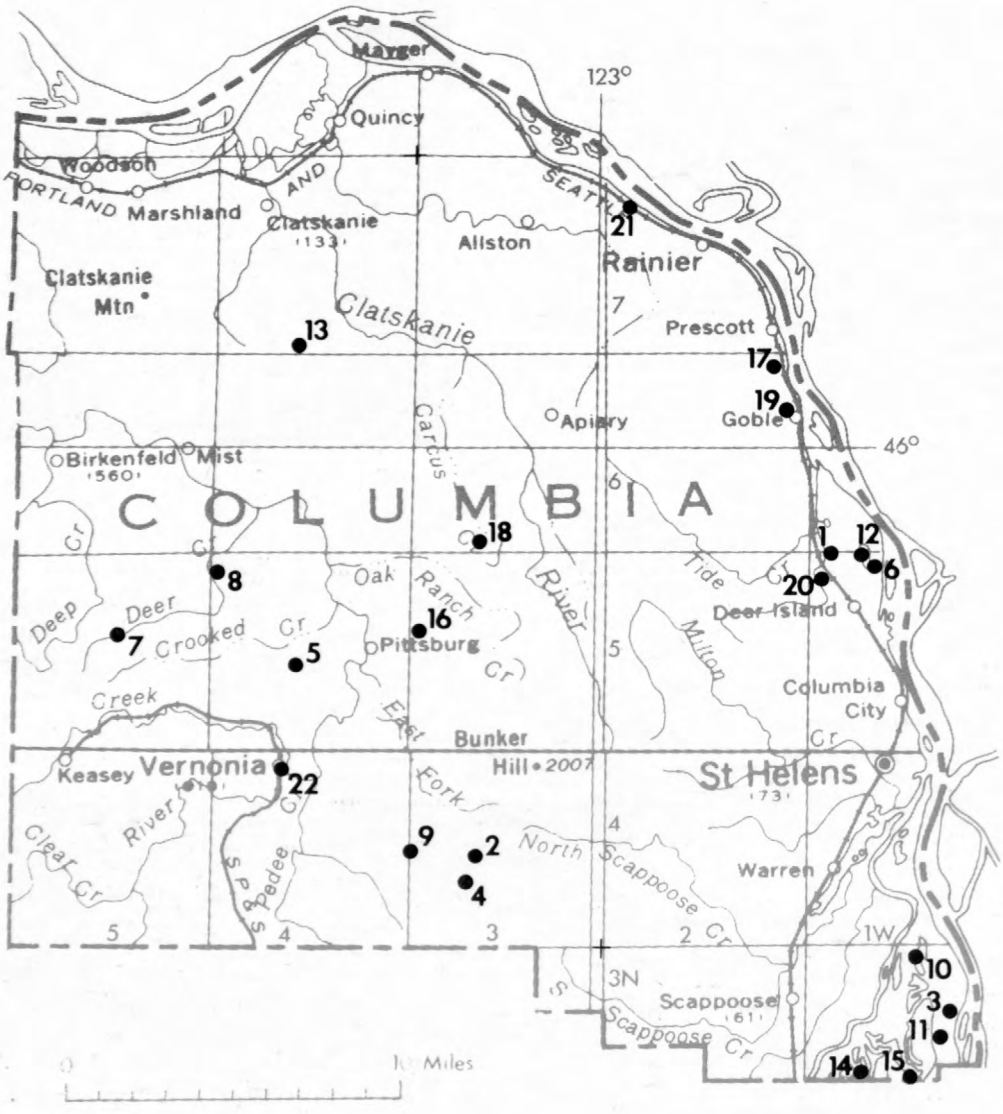


FIGURE 4. — Locations and identification numbers of lakes in Columbia County

Lakes of Columbia County

COLUMBIA COUNTY | ADAMS (BORLIN) LAKE (1) | SURVEY DATE: October 11, 1972

LOCATION: T.6 N., R.1 W., sec.31, about 6 miles northwest of St. Helens, Oreg., 0.5 mile east of Highway 30. U.S. Geological Survey 7.5-minute topographic map, St. Helens quadrangle.

DESCRIPTION: Long, shallow lake surrounded by pasture and lined with small trees and shrubs. The lake bottom is very silty.

DRAINAGE BASIN: Lower Columbia River basin.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 29 acres.

SURFACE ELEVATION: About 10 feet above mean sea level (depending on the Columbia River stage).

VOLUME: 30 acre-feet.

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: None observed and no channel indicated on topographic map.

USE: Duck hunting by permission.

REMARKS: Private property. Water sampled at lat 45°57'15", long 122°51'20".

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.9	56
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 26

TOTAL HARDNESS (Mg/l as $CaCO_3$): 22

TOTAL DISSOLVED SOLIDS (Mg/l): 59

TRANSPARENCY (Feet): --

COLOR (Units): 50

COLIFORM (Colonies/100 ml): 10,500

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	11.9	5.6
BOTTOM:	--	--

LOCATION: T.4 N., R.3 W., sec.21, about 5 miles southeast of Vernonia, Oreg., and 3 miles north of Columbia County line. U.S. Geological Survey 15-minute topographic map, Vernonia quadrangle. (See REMARKS.)

DESCRIPTION: A relatively isolated lake surrounded by dense second-growth Douglas-fir. The lake is dominated by snags and fallen logs, and a beaver dam is near the outlet. The water has a definite brownish tint.

DRAINAGE BASIN: Nehalem River basin.

DRAINAGE AREA: 1.1 square miles.

SURFACE AREA: 3 acres.

SURFACE ELEVATION: 1,100 feet above mean sea level, from topographic map.

VOLUME: Not determined.

INFLOW: Intermittent creek on south end of lake.

OUTFLOW: Estimated 1 cfs on Nov. 17, 1972, to Nehalem River.

USE: Fishing for cutthroat trout.

REMARKS: Not shown on 1955 topographic map. One of several lakes on Crown-Zellerbach property. About 1.5 miles by trail from Vernonia-Scappoose highway. Water sampled at lat 45°49'25", long 123°04'05". Water rights of 0.5 cfs for pond. For additional information and directions, see Knispel (1969).

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.7	32
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 25

TOTAL HARDNESS (Mg/l as $CaCO_3$): 18

TOTAL DISSOLVED SOLIDS (Mg/l): 70

TRANSPARENCY (Feet): 2

COLOR (Units): --

COLIFORM (Colonies/100 ml): 300

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	5.5	13.5
BOTTOM:	--	--

LOCATION: T.3 N., R.1 W., sec.11, on Sauvie Island about 5 miles east of Scappoose, Oreg. U.S. Geological Survey 7.5-minute topographic map, St. Helens quadrangle.

DESCRIPTION: Shallow, elongate lake with considerable aquatic growth, and surrounded by farmland. There are trees north and south of the lake.

DRAINAGE BASIN: Lower Columbia River basin.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 21 acres.

SURFACE ELEVATION: 15 feet above mean sea level (depending on the Columbia River stage).

VOLUME: 60 acre-feet.

INFLOW: None observed and no channel indicated on topographic map. (See REMARKS.)

OUTFLOW: None observed and no channel indicated on topographic map. (See REMARKS.)

USE: Oregon State Game Refuge and irrigation.

REMARKS: The sloughs north and south of the lake contribute neither inflow nor outflow.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.5	210
BOTTOM:	7.2	350

ALKALINITY (Mg/l as $CaCO_3$): 100

TOTAL HARDNESS (Mg/l as $CaCO_3$): 61

TOTAL DISSOLVED SOLIDS (Mg/l): 186

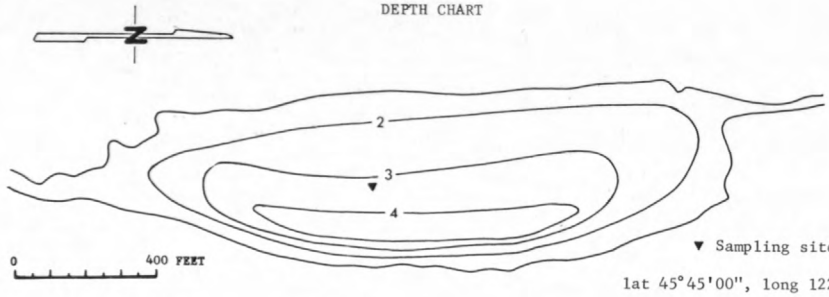
TRANSPARENCY (Feet): 0.5

COLOR (Units): 90

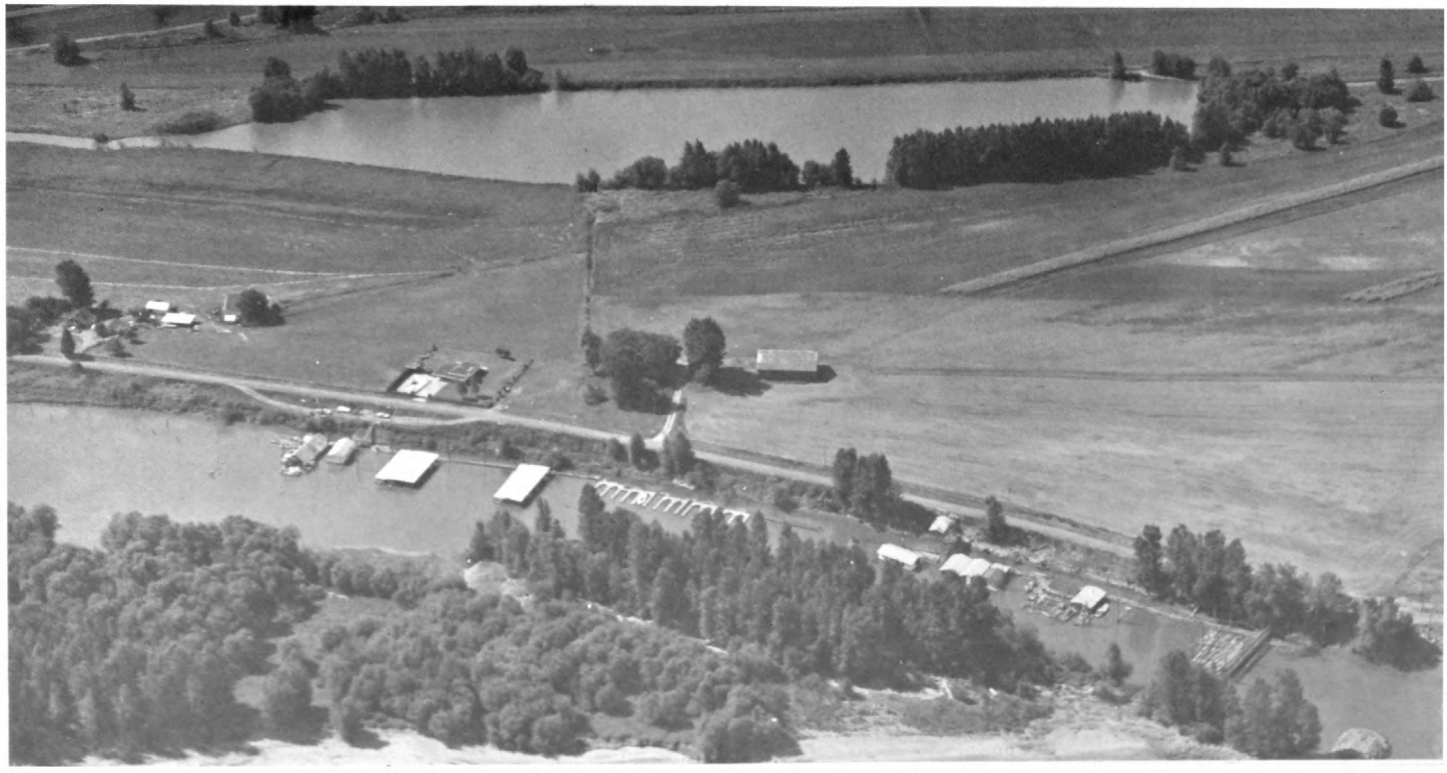
COLIFORM (Colonies/100 ml): >10,000

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	16.5	--
BOTTOM:	---	--

DEPTH CHART



▼ Sampling site at lat 45°45'00", long 122°46'30"



LOCATION: T.4 N., R.3 W., secs.20, 21, 28, 29, about 6 miles southeast of Vernonia, Oreg. U.S. Geological Survey 15-minute topographic map, Vernonia quadrangle. (See REMARKS.)

DESCRIPTION: Water has a rusty color and contains many snags. The lake is surrounded by second-growth timber, and its shape has been altered by a road fill on the west end. Several picnic tables and chemical toilets are on the north side.

DRAINAGE BASIN: Nehalem River basin.

DRAINAGE AREA: 1.1 square miles.

SURFACE AREA: 8 acres.

SURFACE ELEVATION: 1,500 feet above mean sea level, from topographic map.

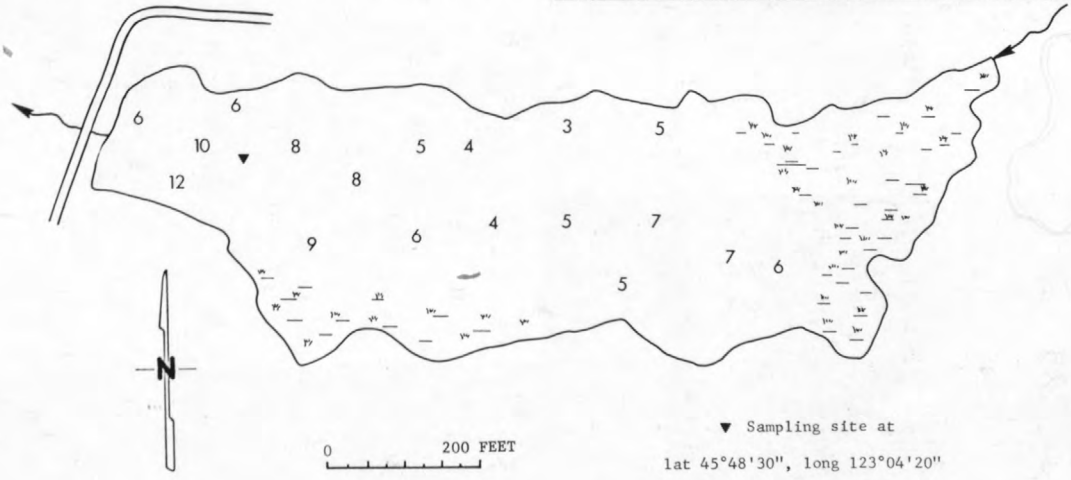
VOLUME: 45 acre-feet.

INFLOW: None observed. Topographic map indicates flow from an unnamed creek east of the lake.

OUTFLOW: No flow through culvert on west end of lake on Oct. 25, 1972.

USE: Fishing for cutthroat trout.

REMARKS: Middle and lower Gunners Lakes are much smaller than the upper Gunners Lake, yet they are similar in appearance. All these lakes are located on Crown Zellerbach land. Gunners Lakes are not shown on 1955 topographic map. For additional information and directions, see Knispel (1969).



▼ Sampling site at
lat 45°48'30", long 123°04'20"

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.5	28
BOTTOM:	6.9	27

ALKALINITY (Mg/l as $CaCO_3$): 24

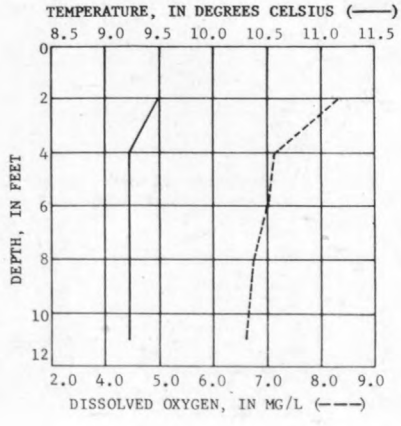
TOTAL HARDNESS (Mg/l as $CaCO_3$): 12

TOTAL DISSOLVED SOLIDS (Mg/l): 29

TRANSPARENCY (Feet): 1

COLOR (Units): 80

COLIFORM (Colonies/100 ml): --



LOCATION: T.5 N., R.4 W., sec.21, about 3.5 miles north of Vernonia, Oreg. U.S. Geological Survey 15-minute topographic map, Vernonia quadrangle. (See REMARKS.)

DESCRIPTION: A small, shallow lake with considerable aquatic growth. An abundance of tall reeds grow on its perimeter, and second-growth fir surrounds the lake.

DRAINAGE BASIN: Nehalem River basin (noncontributing).

DRAINAGE AREA: 0.1 square mile.

SURFACE AREA: 2 acres.

SURFACE ELEVATION: 830 feet above mean sea level, from topographic map.

VOLUME: 6 acre-feet.

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: None observed and no channel indicated on topographic map.

USE: Bullhead fishing.

REMARKS: Not shown on 1955 topographic map. This Crown Zellerbach lake is overpopulated with brown bullheads and has been treated with rotenone by the Oregon State Game Commission. For physical data, additional information, and directions, see Knispel (1969). Soundings for depth chart from Knispel (1969).

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.2	21
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 11

TOTAL HARDNESS (Mg/l as $CaCO_3$): 16

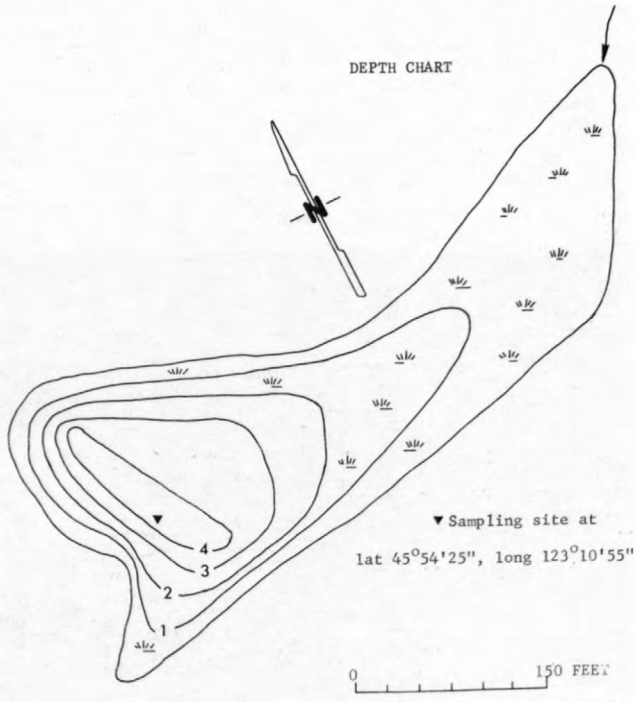
TOTAL DISSOLVED SOLIDS (Mg/l): 55

TRANSPARENCY (Feet): 3.5

COLOR (Units): 35

COLIFORM (Colonies/100 ml): 160

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	6.1	6.6
BOTTOM:	--	--



LOCATION: T.5 N., R.1 W., sec.5, on Deer Island about 6 miles north of St. Helens, Oreg. U.S. Geological Survey 7.5-minute topographic map, St. Helens quadrangle.

DESCRIPTION: A long, narrow lake surrounded by pasture and farmland. Some large lily pads dot the surface, and a bridge divides the lake near its midpoint.

DRAINAGE BASIN: Lower Columbia River basin.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 13 acres.

SURFACE ELEVATION: 10 feet above mean sea level (depending on the Columbia River stage).

VOLUME: 20 acre-feet.

INFLOW: None observed and no channel indicated on topographic map. (See REMARKS.)

OUTFLOW: North end of lake to the Columbia River.

USE: None apparent.

REMARKS: Private property. Connected to Resting Lake (12) during high water.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.2	38
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 12

TOTAL HARDNESS (Mg/l as $CaCO_3$): 9

TOTAL DISSOLVED SOLIDS (Mg/l): 58

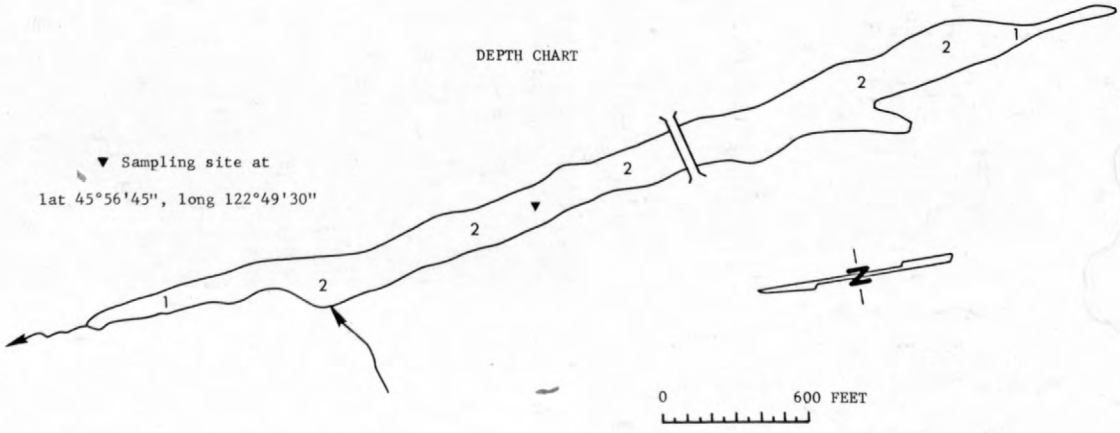
TRANSPARENCY (Feet): 0.5

COLOR (Units): 50

COLIFORM (Colonies/100 ml): 825

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	10.8	8.1
BOTTOM:	--	--

DEPTH CHART



LOCATION: T.5 N., R.5 W., sec.15, about 5.5 miles southeast of Birkenfeld, Oreg. U.S. Geological Survey 15-minute topographic map, Birkenfeld quadrangle. (See REMARKS.)

DESCRIPTION: The lake is being overgrown by aquatic weeks, and about 75 percent of the water surface is covered at present. Logs and snags are in abundance throughout the lake.

DRAINAGE BASIN: Nehalem River basin.

DRAINAGE AREA: 1.0 square mile.

SURFACE AREA: 5 acre-feet.

SURFACE ELEVATION: 800 feet above mean sea level, from topographic map.

VOLUME: 25 acre-feet.

INFLOW: Deer Creek.

OUTFLOW: Continuation of Deer Creek.

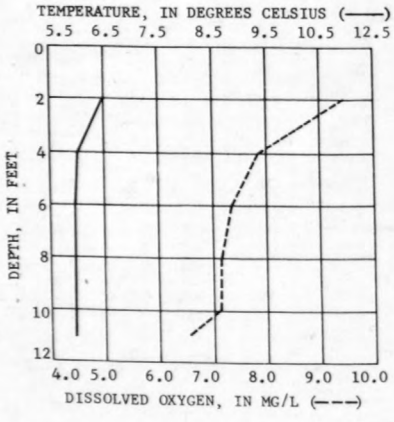
USE: Fishing for cutthroat trout.

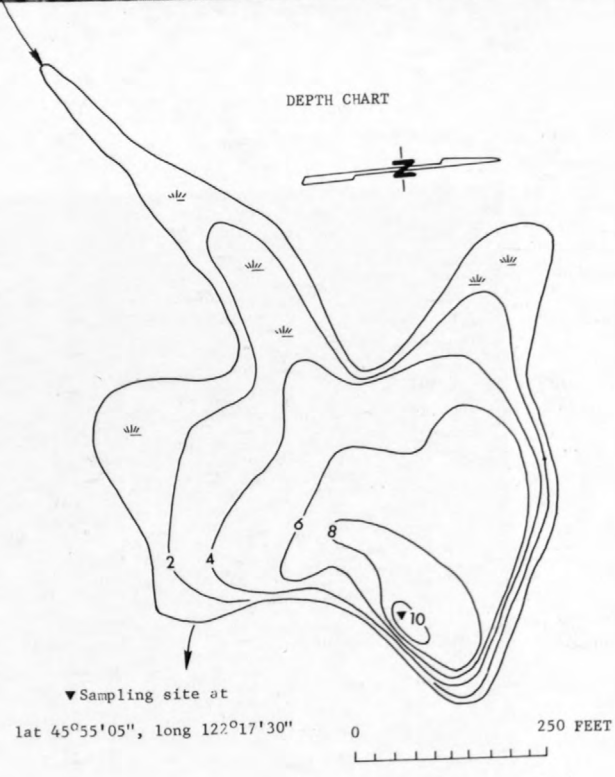
REMARKS: Not shown on 1955 topographic map. Crown Zellerbach is developing a park east of the lake for day use. Tables, barbecues, and chemical toilets are provided. For physical data, additional information, and directions, see Knispel (1969). Soundings for depth chart from Knispel (1969).

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.5	38
BOTTOM:	6.3	38

ALKALINITY (Mg/l as $CaCO_3$):	25
TOTAL HARDNESS (Mg/l as $CaCO_3$):	22
TOTAL DISSOLVED SOLIDS (Mg/l):	70
TRANSPARENCY (Feet):	2
COLOR (Units):	50
COLIFORM (Colonies/100 ml):	116





LOCATION: T.5 N., R.4 W., sec.6, about 5.5 miles northwest of Vernonia, Oreg. U.S. Geological Survey 15-minute topographic map, Vernonia quadrangle. (See REMARKS.)

DESCRIPTION: An abandoned hilltop rock quarry that has developed into a small, deep lake with clear water, free of aquatic growth. Second- and third-growth Douglas-fir grow in the surrounding area.

DRAINAGE BASIN: Nehalem River basin (noncontributing).

DRAINAGE AREA: Less than 0.1 square mile.

SURFACE AREA: 0.5 acre.

SURFACE ELEVATION: 1,040 feet above mean sea level, from topographic map.

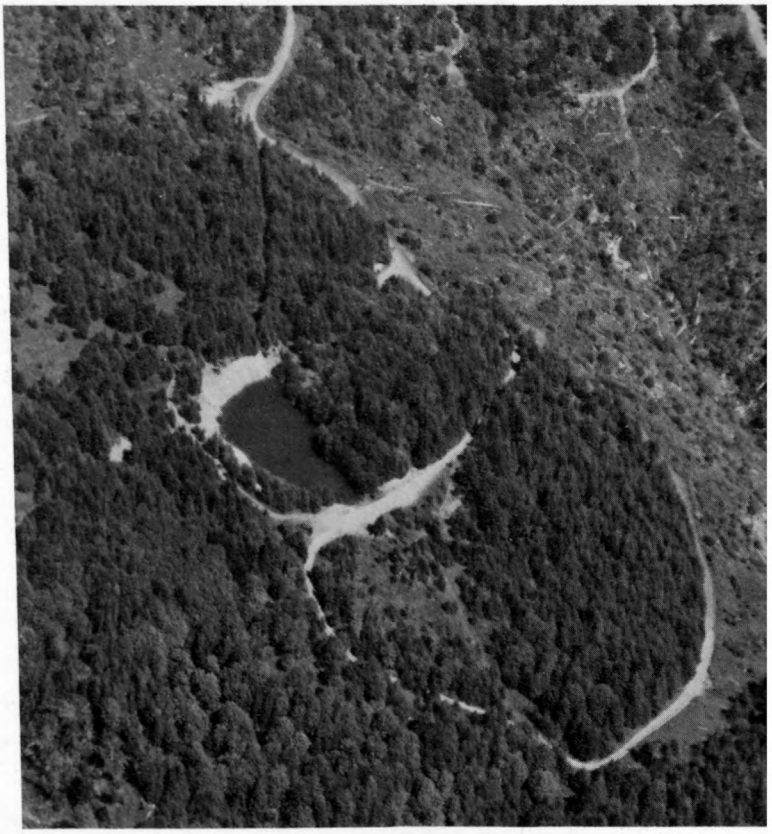
VOLUME: 6 acre-feet.

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: None observed and no channel indicated on topographic map.

USE: Some fishing for cutthroat trout. Stocked in December 1966.

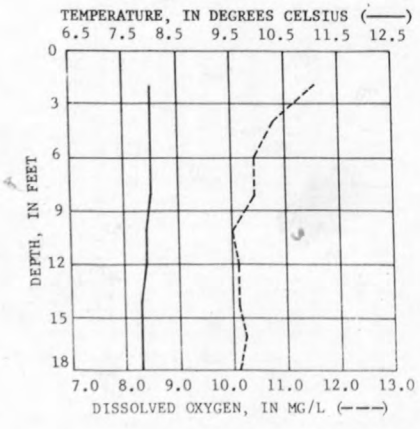
REMARKS: Not shown on 1955 topographic map. For physical data, additional information, and directions, see Knispel (1969). Soundings for depth chart from Knispel (1969).

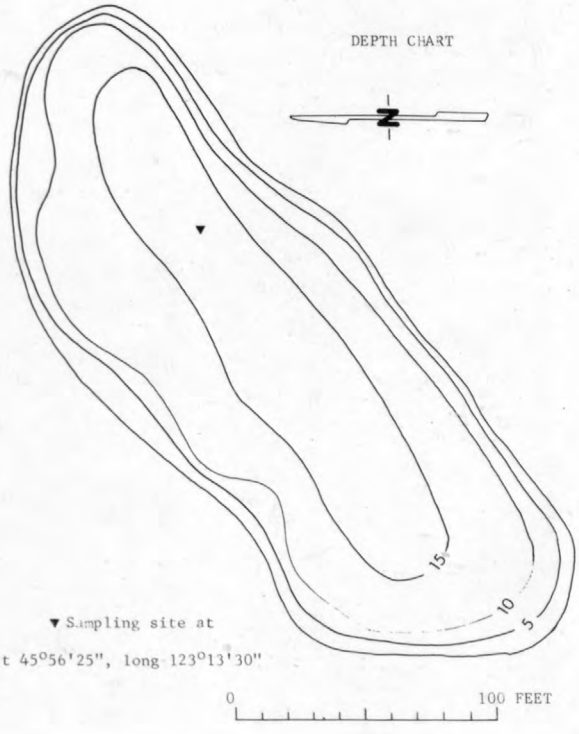


WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.4	34
BOTTOM:	7.0	32

ALKALINITY (Mg/l as $CaCO_3$):	15
TOTAL HARDNESS (Mg/l as $CaCO_3$):	16
TOTAL DISSOLVED SOLIDS (Mg/l):	49
TRANSPARENCY (Feet):	11
COLOR (Units):	5
COLIFORM (Colonies/100 ml):	66





LOCATION: T.4 N., R.3 W., sec.19, about 4.5 miles southeast of Vernonia, Oreg., and 2.5 miles north of Columbia County line. U.S. Geological Survey 15-minute topographic map, Vernonia quadrangle. (See REMARKS.)

DESCRIPTION: Marshy areas and logs are predominant in this small lake. Second- and third-growth Douglas-fir grow in the surrounding area.

DRAINAGE BASIN: Nehalem River basin (noncontributing).

DRAINAGE AREA: 0.1 square mile.

SURFACE AREA: 4 acres.

SURFACE ELEVATION: 1,100 feet above mean sea level, from topographic map.

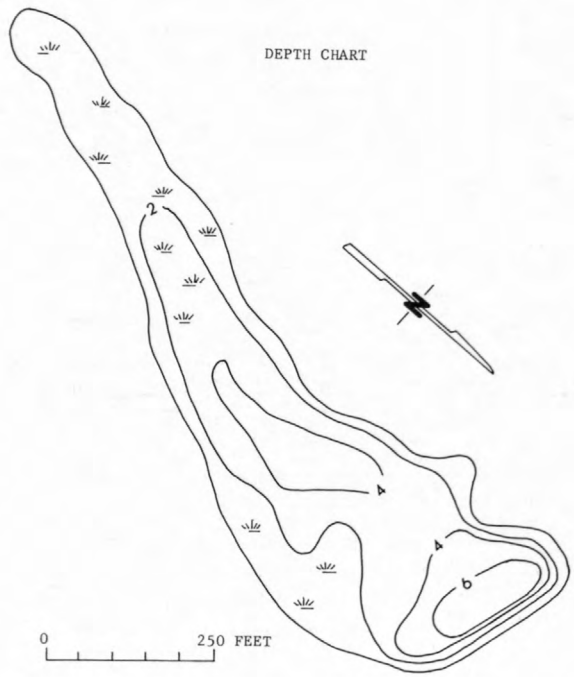
VOLUME: 14 acre-feet.

INFLOW: No channel indicated on topographic map.

OUTFLOW: No channel indicated on topographic map.

USE: Fishing.

REMARKS: Not visited by U.S. Geological Survey field party. Not shown on 1955 topographic map. For physical data, additional information, and directions, see Knispel (1969). Soundings for depth chart from Knispel (1969).



LOCATION: T.3 N., R.1 W., sec.3 on Sauvie Island about 4 miles east of Scappoose, Oreg. U.S. Geological Survey 7.5-minute topographic map, St. Helens quadrangle.

DESCRIPTION: Although little more than a mudflat at the time of this survey, McNary Lake is second only to Sturgeon Lake in total surface area in Columbia County. It actually consists of two water bodies connected by a channel. The lake is surrounded by pasture, farmland, and trees.

DRAINAGE BASIN: Lower Columbia River basin.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 210 acres.

SURFACE ELEVATION: 5 feet above mean sea level (depending on the Columbia River stage).

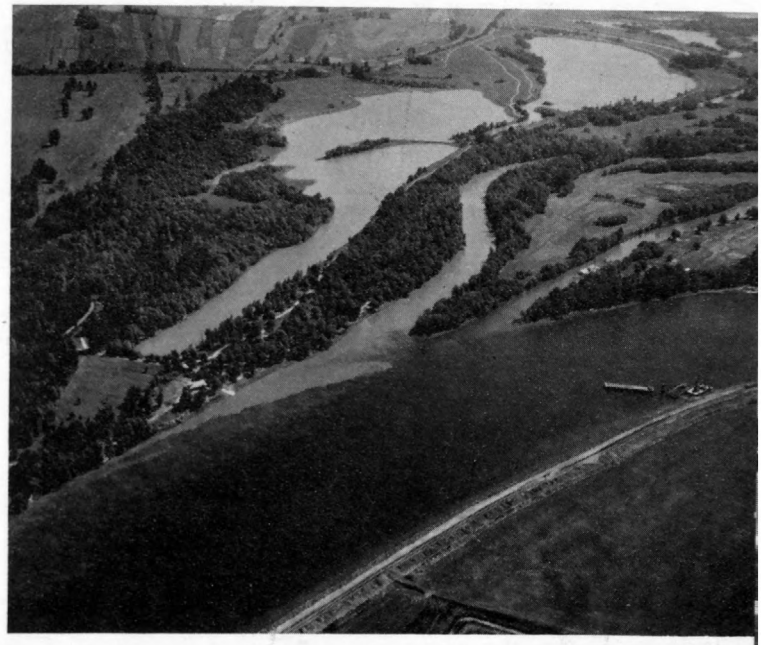
VOLUME: 200 acre-feet.

INFLOW: No measurable flow through channel between McNary and Sturgeon Lakes on Sept. 13, 1972.

OUTFLOW: (See INFLOW.)

USE: Oregon State Game Refuge.

REMARKS: Connected to the north arm of Sturgeon Lake by a slough. Water rights of 15 cfs for fishing and development of a waterfowl habitat by Oregon State Game Commission.



WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.4	81
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 84

TOTAL HARDNESS (Mg/l as $CaCO_3$): 50

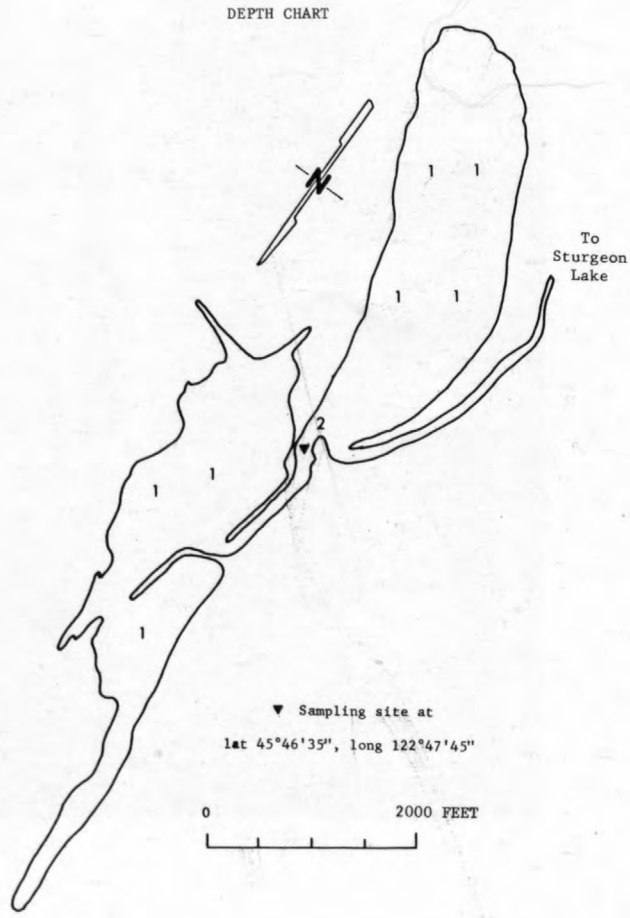
TOTAL DISSOLVED SOLIDS (Mg/l): 144

TRANSPARENCY (Feet): 0.2

COLOR (Units): 220

COLIFORM (Colonies/100 ml): >10,000

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	18.0	--
BOTTOM:	--	--



LOCATION: T.3 N., R.1 W., sec.14, on Sauvie Island about 4.5 miles east of South Scappoose, Oreg. U.S. Geological Survey 7.5-minute topographic map, Sauvie Island quadrangle.

DESCRIPTION: Very shallow lake with dense aquatic growth. The surrounding flood plain is dotted with farms and pastures.

DRAINAGE BASIN: Lower Columbia River basin.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 25 acres.

SURFACE ELEVATION: 5 feet above mean sea level (depending on the Columbia River stage).

VOLUME: 25 acre-feet.

INFLOW: None observed. (See REMARKS.)

OUTFLOW: None observed. (See REMARKS.)

USE: Oregon State Game Refuge.

REMARKS: During high water, Racetrack Lake is connected to Sturgeon Lake, as shown on topographic map. Water sampled at lat 45°44'40", long 122°47'00".

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	8.1	68
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 74

TOTAL HARDNESS (Mg/l as $CaCO_3$): 57

TOTAL DISSOLVED SOLIDS (Mg/l): 182

TRANSPARENCY (Feet): 0.5

COLOR (Units): 360

COLIFORM (Colonies/100 ml): >10,000

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	20.5	14.0
BOTTOM:	--	--

LOCATION: T.5 N., R.1 W., sec.5, on Deer Island about 6 miles north of St. Helens, Oreg. U.S. Geological Survey 7.5-minute topographic map, Deer Island quadrangle.

DESCRIPTION: Although extremely shallow, Resting Lake has the third largest surface area in Columbia County. The water has a muddy appearance, and large lily pads dot the surface of the lake. The surrounding flood-plain area is used for cattle grazing.

DRAINAGE BASIN: Lower Columbia River basin.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 120 acres.

SURFACE ELEVATION: 10 feet above mean sea level (depending on the Columbia River stage).

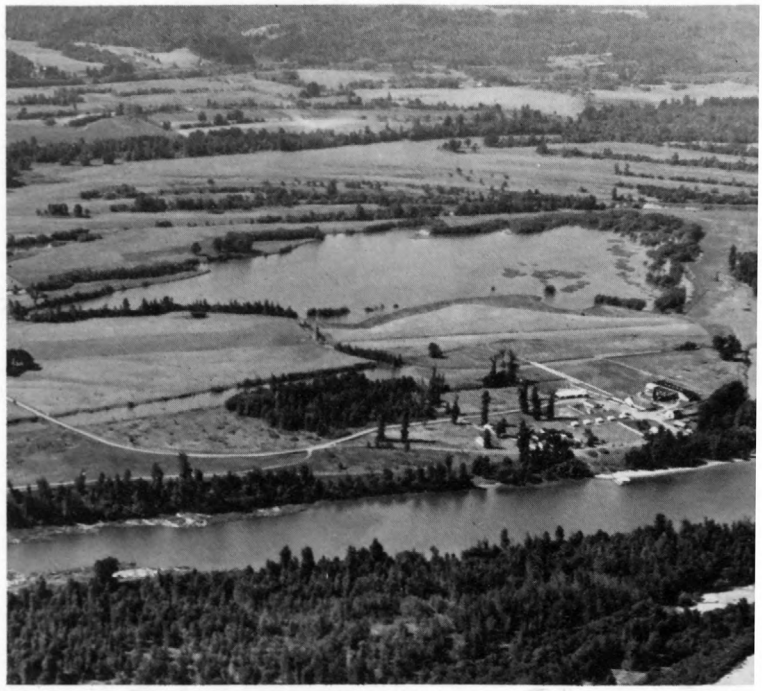
VOLUME: 150 acre-feet.

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: To the Columbia River through Horsepasture Lake during high water.

USE: Private duck hunting.

REMARKS: Private property leased by Deer Island Duck Club.



WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.4	35
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 12

TOTAL HARDNESS (Mg/l as $CaCO_3$): 8

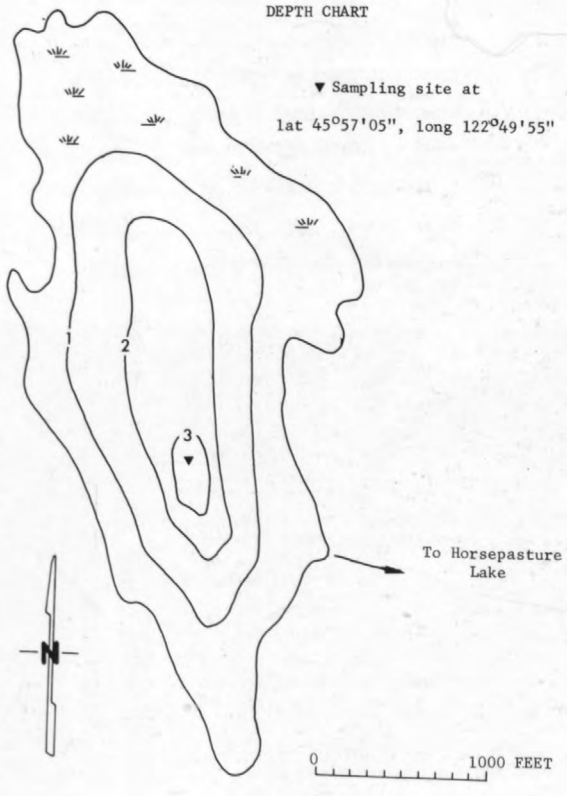
TOTAL DISSOLVED SOLIDS (Mg/l): 64

TRANSPARENCY (Feet): 0.5

COLOR (Units): 200

COLIFORM (Colonies/100 ml): 100

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	11.0	15.2
BOTTOM:	--	--



LOCATION: T.7 N., R.4 W., sec.33, about 4 miles southeast of Clatskanie, Oreg. U.S. Geological Survey 15-minute topographic map, Clatskanie quadrangle.

DESCRIPTION: A small, angular-shaped lake surrounded by dense second-growth Douglas-fir. The water is very clear and has a considerable number of logs and snags in the northwest end.

DRAINAGE BASIN: Clatskanie River basin.

DRAINAGE AREA: 0.15 square mile.

SURFACE AREA: 4 acres.

SURFACE ELEVATION: 780 feet above mean sea level, from topographic map.

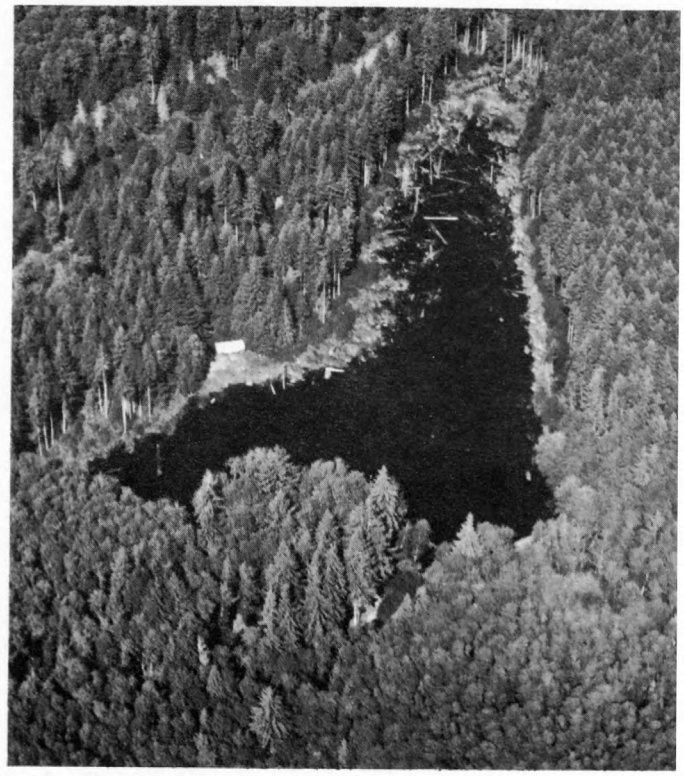
VOLUME: 30 acre-feet.

INFLOW: Estimated 1 cfs from creek south of lake on Sept. 14, 1972. Not indicated on topographic map.

OUTFLOW: To unnamed creek through culvert in dam on east side of lake.

USE: Fishing for cutthroat trout. The lake has been stocked in recent years.

REMARKS: Referred to as Scout Camp Lake in "The Oregon Sportsman's Guide" (1960-61).



WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.5	61
BOTTOM:	6.6	54

ALKALINITY (Mg/l as $CaCO_3$): 50

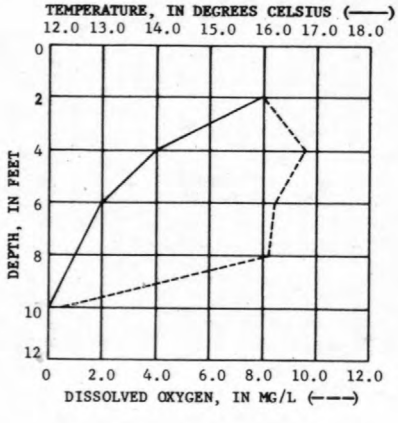
TOTAL HARDNESS (Mg/l as $CaCO_3$): 66

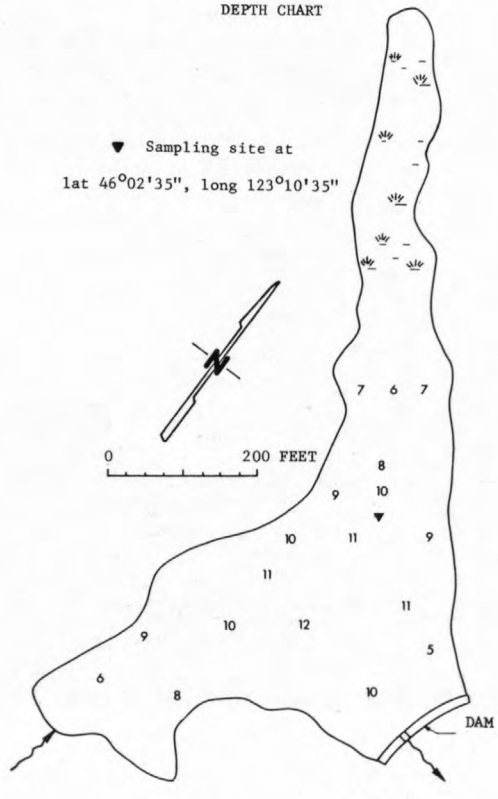
TOTAL DISSOLVED SOLIDS (Mg/l): --

TRANSPARENCY (Feet): 8.0

COLOR (Units): 5

COLIFORM (Colonies/100 ml): 3700





LOCATION: T.3 N., R.1 W., sec.20, on Sauvie Island about 2.5 miles southeast of Scappoose, Oreg., and 2 miles east of Johnson Crossing. U.S. Geological Survey 7.5-minute topographic map, Sauvie Island quadrangle.

DESCRIPTION: Little more than a mudflat at the time of this survey. Water is muddy and has dense aquatic growth. Bounded by Sturgeon Lake (15) on the east and farmland on the west.

DRAINAGE BASIN: Lower Columbia River basin.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 350 acres.

SURFACE ELEVATION: 5 feet above mean sea level (depending on the Columbia River stage).

VOLUME: 300 acre-feet.

INFLOW: No measurable flow between Steelman and Sturgeon Lakes on Sept. 13, 1972. (See REMARKS.)

OUTFLOW: (See INFLOW.)

USE: Oregon State Game Refuge.

REMARKS: A channel named "The Narrows" allows water to flow between Steelman Lake and Sturgeon Lake (15).

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.4	81
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 78

TOTAL HARDNESS (Mg/l as $CaCO_3$): 52

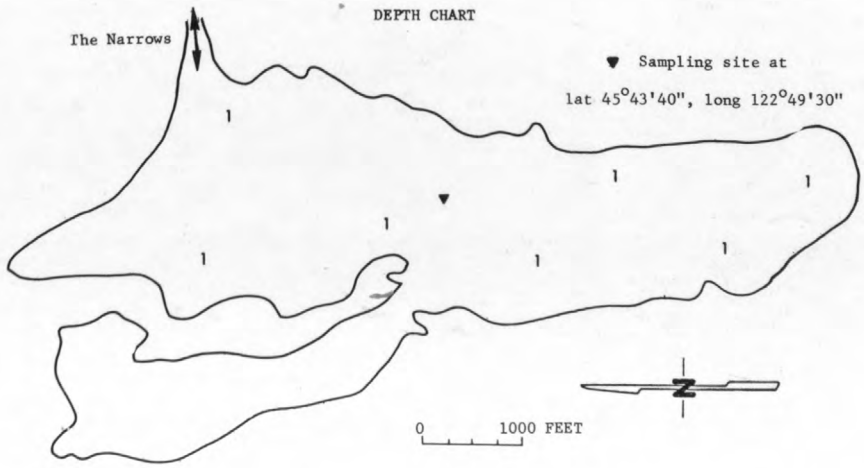
TOTAL DISSOLVED SOLIDS (Mg/l): 168

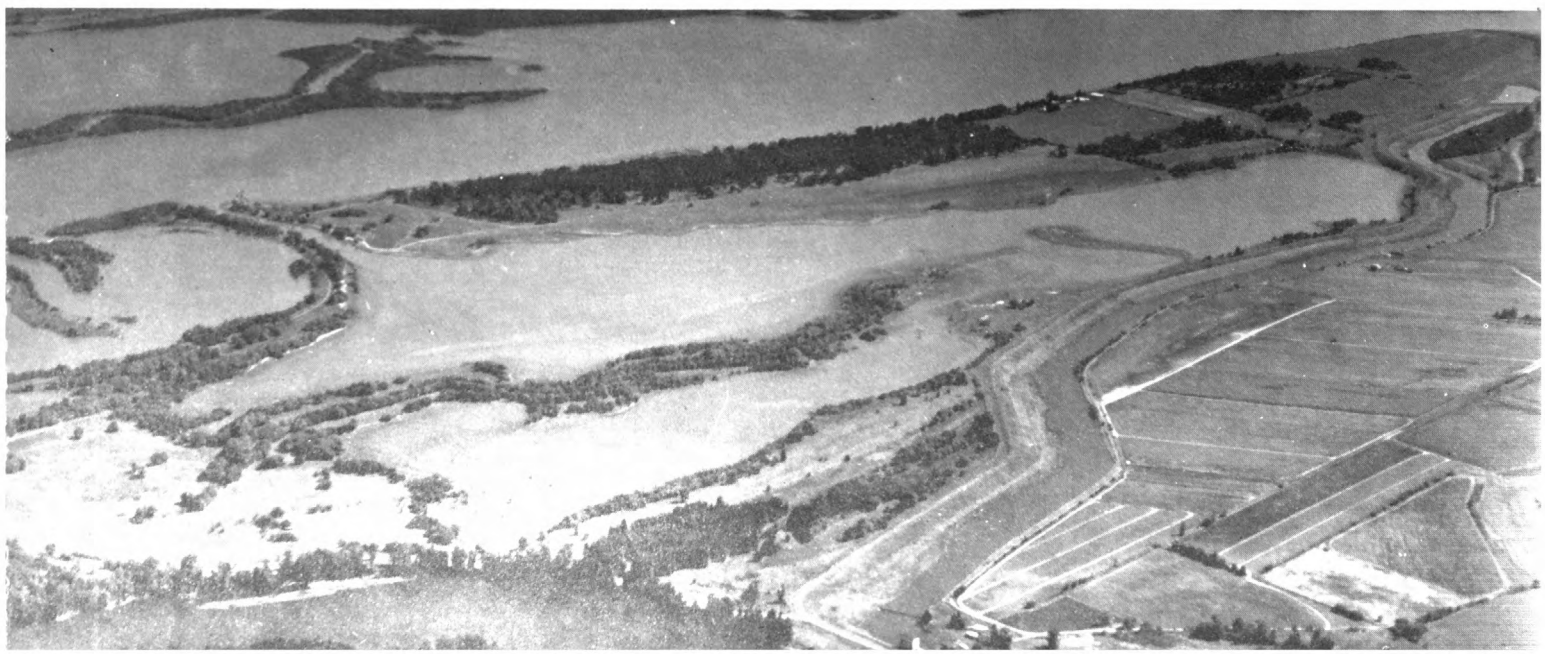
TRANSPARENCY (Feet): 0.3

COLOR (Units): 240

COLIFORM (Colonies/100 ml): >10,000

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	18.0	--
BOTTOM:	--	--





LOCATION: T.3 N., R.1 W., sec.22, on Sauvie Island about 4 miles southeast of Scappoose, Oreg. U.S. Geological Survey 7.5-minute topographic map, Sauvie Island quadrangle.

DESCRIPTION: This lake has the largest surface area and volume of any lake in Columbia County, and like other Columbia River flood-plain lakes, it is very shallow. The lake is surrounded by farms and pastureland.

DRAINAGE BASIN: Lower Columbia River basin.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 3,200 acres.

SURFACE ELEVATION: 5 feet above mean sea level (depending on the Columbia River stage).

VOLUME: 5,400 acre-feet.

INFLOW: None observed. (See REMARKS.)

OUTFLOW: Gilbert River. (See depth chart.)

USE: Fishing for bass, perch, bluegill, and crappie (Oregon State Game Refuge).

REMARKS: A channel named "The Narrows" allows water to flow between Sturgeon Lake and Steelman Lake (14). Angling is not permitted during duck-hunting season.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.4	80
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 72

TOTAL HARDNESS (Mg/l as $CaCO_3$): 52

TOTAL DISSOLVED SOLIDS (Mg/l): 102

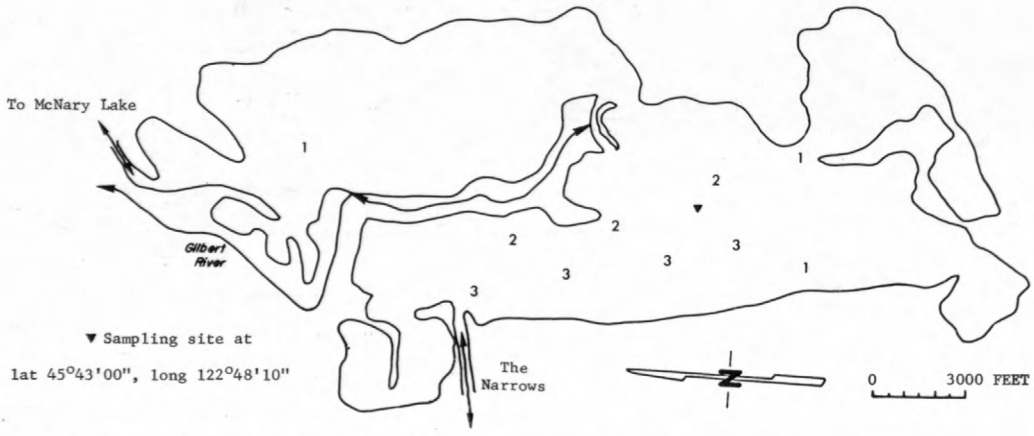
TRANSPARENCY (Feet): 0.3

COLOR (Units): 210

COLIFORM (Colonies/100 ml): 10,000

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	19.0	14.0
BOTTOM:	--	--

DEPTH CHART



LOCATION: T.5 N., R.3 W., sec.18, about 5 miles northeast of Vernonia, Oreg., and 1 mile north of Baker Point Lookout. U.S. Geological Survey 15-minute topographic map, Vernonia quadrangle.

DESCRIPTION: Very small, angular-shaped lake surrounded by second-growth Douglas-fir.

DRAINAGE BASIN: Nehalem River basin.

DRAINAGE AREA: 0.5 square mile.

SURFACE AREA: 0.5 acre.

SURFACE ELEVATION: 1,420 feet above mean sea level, from topographic map.

VOLUME: 1.5 acre-feet.

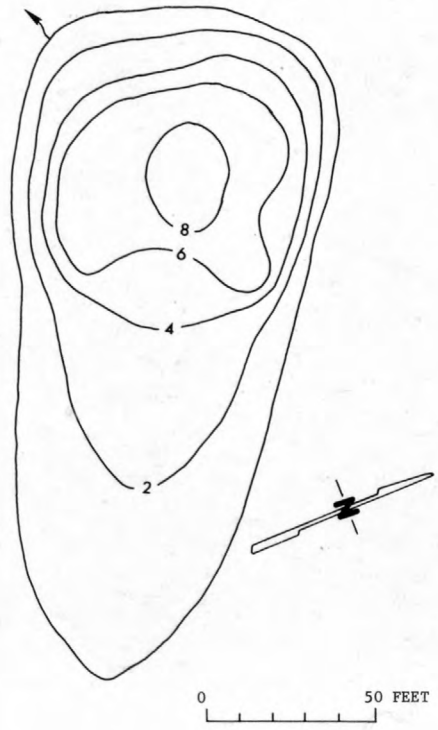
INFLOW: No channel indicated on topographic map.

OUTFLOW: Cook Creek.

USE: Fishing.

REMARKS: Not visited by U.S. Geological Survey field party. For physical data, additional information, and directions, see Knispel (1969). Soundings for depth chart from Knispel (1969).

DEPTH CHART



LOCATION: T.6 N., R.2 W., sec. 35, about 4.5 miles southeast of Rainier, Oreg., and 1.5 miles northwest of Goble, Oreg. U.S. Geological Survey 7.5-minute topographic map, Rainier quadrangle.

DESCRIPTION: Large manmade lake in a parklike setting. The area surrounding the lake has been landscaped for public use. The water was muddy because of construction of nuclear powerplant nearby.

DRAINAGE BASIN: Lower Columbia River basin.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 20 acres.

SURFACE ELEVATION: 10 feet above mean sea level, from topographic map.

VOLUME: 190 acre-feet.

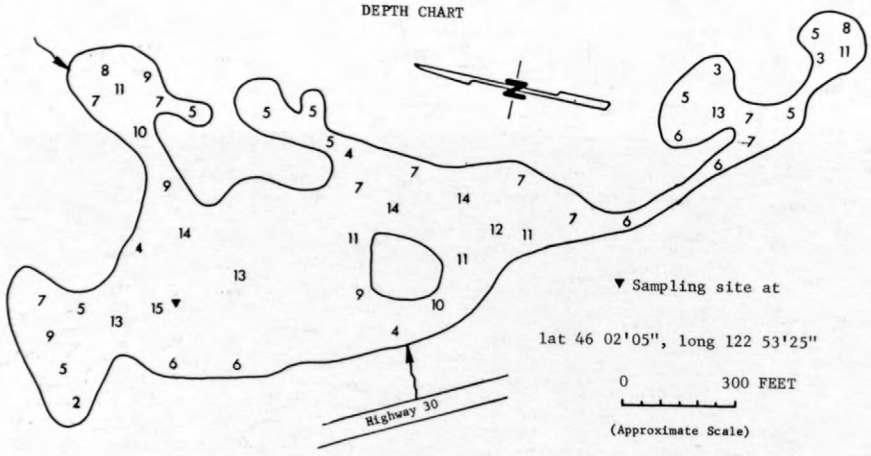
INFLOW: Through culvert under Highway 30 from Neer Creek. There is also some inflow through culvert from construction site northeast of the lake.

OUTFLOW: None observed and no channel indicated on topographic map.

USE: Public recreation.

REMARKS: Part of the Portland General Electric Co. Trojan nuclear power complex. The 1953 (revised 1970) topographic map shows the lake prior to modification. Water rights of 1 cfs from Neer Creek to replace evaporation loss from lake.

DEPTH CHART



▼ Sampling site at

lat 46 02'05", long 122 53'25"

0 300 FEET

(Approximate Scale)

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.6	85
BOTTOM:	7.3	86

ALKALINITY (Mg/l as $CaCO_3$): 55

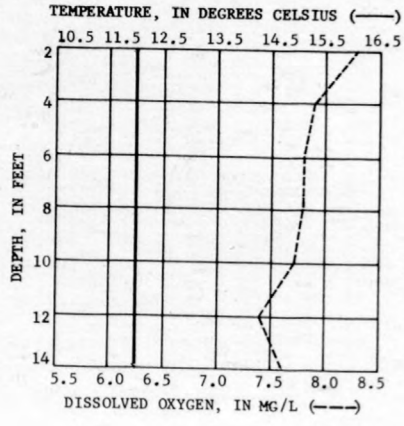
TOTAL HARDNESS (Mg/l as $CaCO_3$): 42

TOTAL DISSOLVED SOLIDS (Mg/l): 110

TRANSPARENCY (Feet): 0.5

COLOR (Units): 80

COLIFORM (Colonies/100 ml): 10



LOCATION: T.6 N., R.3 W., sec.33, about 9 miles northeast of Vernonia, Oreg. U.S. Geological Survey 15-minute topographic map, Vernonia quadrangle.

DESCRIPTION: A group of five ponds surrounded by second-growth Douglas-fir. The largest pond is very marshy on its perimeter, and all the ponds have many snags and logs. The pond studied in this report is shown as No. 3 on the depth chart.

DRAINAGE BASIN: Clatskanie River basin.

DRAINAGE AREA: 3.0 square miles (total for all ponds).

SURFACE AREA: 6 acres (pond 3).

SURFACE ELEVATION: 1,070 feet above mean sea level, from topographic map (pond 3).

VOLUME: 30 acre-feet (pond 3).

INFLOW: None observed. Topographic map indicates intermittent flow from streams south of ponds 2 and 5.

OUTFLOW: None observed and no channel indicated on topographic map. Probably drains to the Clatskanie River during high water.

USE: Private fishing and camping.

REMARKS: The ponds are leased to a camping club on a yearly basis and are not open to the public.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.8	22
BOTTOM:	7.1	21

ALKALINITY (Mg/l as $CaCO_3$): 15

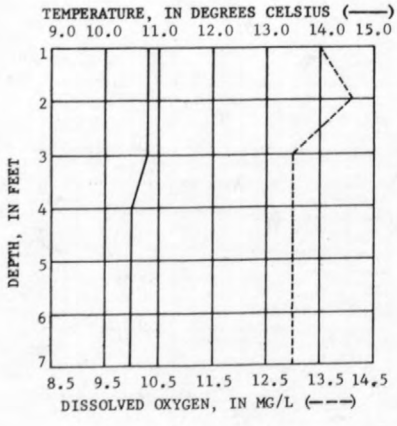
TOTAL HARDNESS (Mg/l as $CaCO_3$): 6

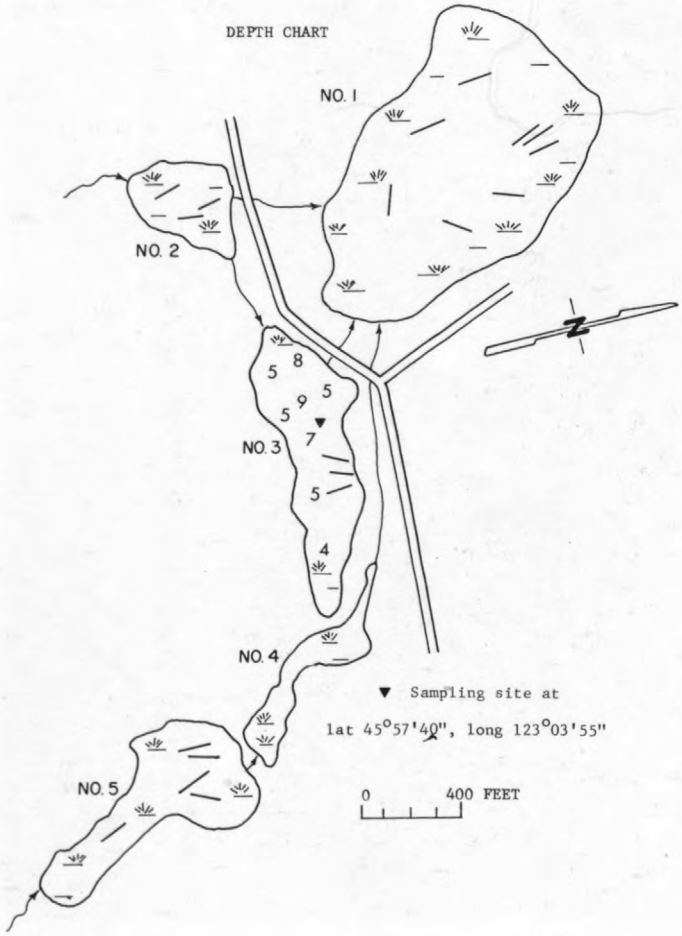
TOTAL DISSOLVED SOLIDS (Mg/l): 41

TRANSPARENCY (Feet): 3.5

COLOR (Units): 10

COLIFORM (Colonies/100 ml): 10





LOCATION: T.6 N., R.2 W., sec.11, about 0.5 mile southwest of Goble, Oreg., and 2.5 miles south of Prescott, Oreg. U.S. Geological Survey 7.5-minute topographic map, Rainier quadrangle.

DESCRIPTION: A group of five lakes clustered together and surrounded by second-growth Douglas-fir. Rusty-colored water with many snags and logs characterizes the lakes. The lake studied in this report is indicated as No. 1 on the depth chart.

DRAINAGE BASIN: Lower Columbia River basin.

DRAINAGE AREA: 0.1 square mile (total for all lakes).

SURFACE AREA: 2.4 acres (No. 1).

SURFACE ELEVATION: 130 feet above mean sea level, from topographic map.

VOLUME: 2 acre-feet (No. 1).

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: None observed and no channel indicated on topographic map. Overflow probably flows into the Columbia River by way of Goble Creek.

USE: Fishing by local residents.

REMARKS: The litter around the lakes would indicate that they are heavily used.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.4	85
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 41

TOTAL HARDNESS (Mg/l as $CaCO_3$): 40

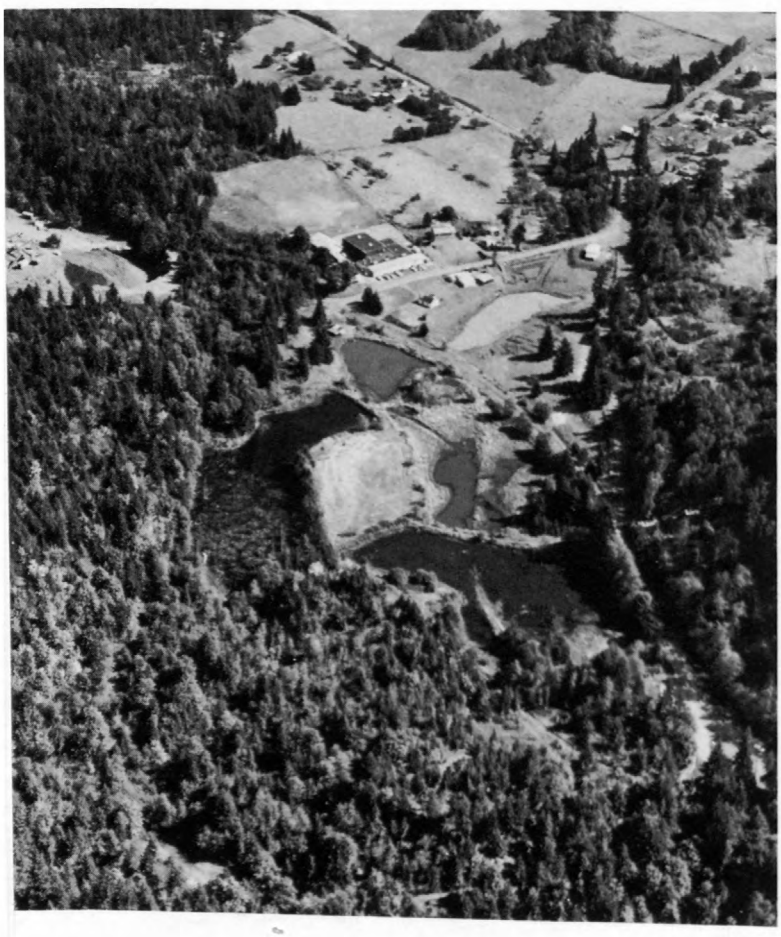
TOTAL DISSOLVED SOLIDS (Mg/l): 64

TRANSPARENCY (Feet): --

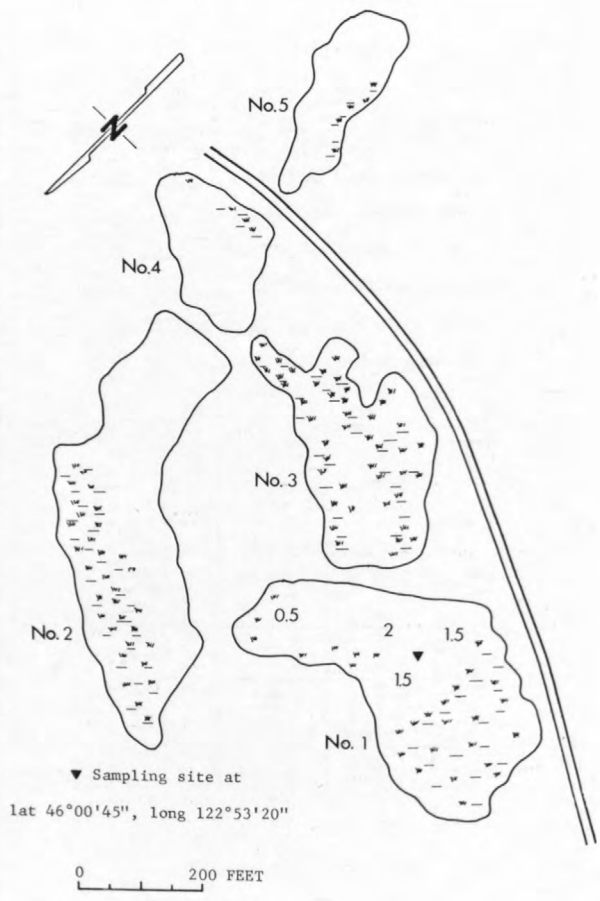
COLOR (Units): 40

COLIFORM (Colonies/100 ml): 2500

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	13.0	0.3
BOTTOM:	--	--



DEPTH CHART



LOCATION: T.5 N., R.1 W., sec.6, about 5.5 miles northwest of St. Helens, Oreg., just west of Highway 30. U.S. Geological Survey 7.5-minute topographic map, Deer Island quadrangle.

DESCRIPTION: A clear lake with considerable aquatic growth. It is bordered on the east by Highway 30 and on the west by pastureland. The surface of the lake is dotted with lily pads, and the south end extends into a bog.

DRAINAGE BASIN: Lower Columbia River basin.

DRAINAGE AREA: 2.1 square miles.

SURFACE AREA: 20 acres.

SURFACE ELEVATION: 10 feet above mean sea level, from topographic map.

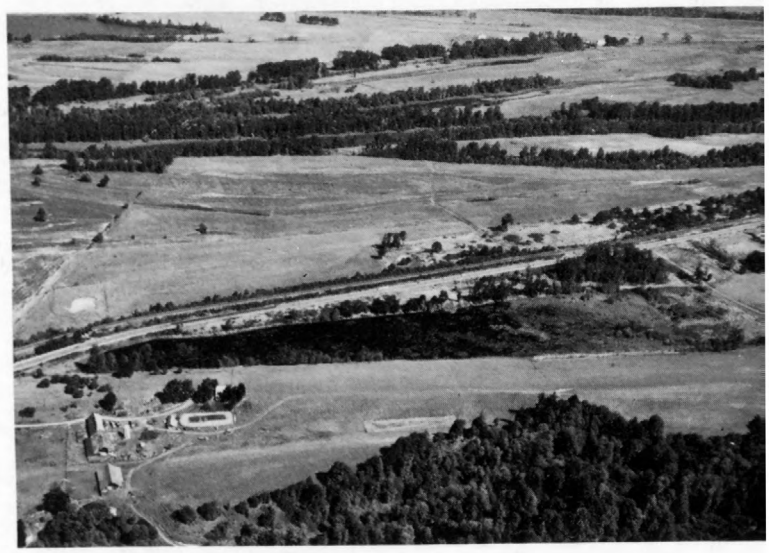
VOLUME: 50 acre-feet.

INFLOW: None observed. Topographic map indicates flow from an unnamed creek south of the lake.

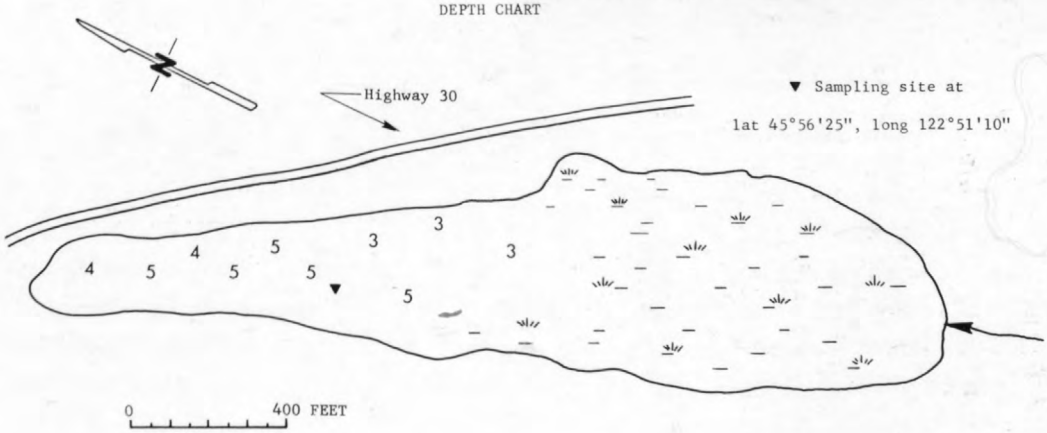
OUTFLOW: None observed and no channel indicated on topographic map.

USE: Private fishing and duck hunting.

REMARKS: Private property.



DEPTH CHART



WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.5	89
BOTTOM:	7.2	92

ALKALINITY (Mg/l as $CaCO_3$): 53

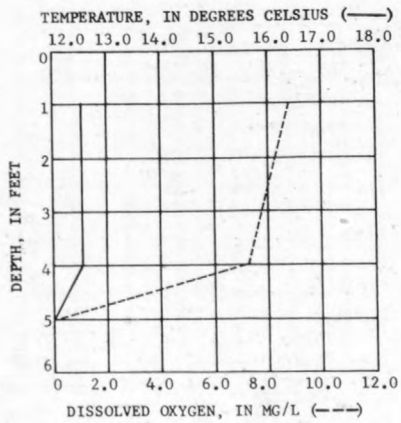
TOTAL HARDNESS (Mg/l as $CaCO_3$): 38

TOTAL DISSOLVED SOLIDS (Mg/l): 76

TRANSPARENCY (Feet): 3.5

COLOR (Units): 25

COLIFORM (Colonies/100 ml): 30



7 N., R.2 W., sec.7, about 0.5 mile northwest of
ate Bridge (Longview, Wash.) and 1.5 miles southwest
gview, Wash. U.S. Geological Survey 7.5-minute topo-
c map, Rainier quadrangle.

A small and relatively deep lake surrounded by
trees. The bottom of the lake is mud and silt, and
pearance of the water reflects this characteristic.

IN: Lower Columbia River basin.

A: Indeterminate.

: 2 acres.

ATION: 10 feet above mean sea level (depending on
lumbia River stage).

acre-feet.

e observed and no channel indicated on topographic

ne observed and no channel indicated on topographic

pparent.

e Columbia River causes flooding in this area during
s of high water.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.2	118
BOTTOM:	6.2	115

ALKALINITY (Mg/l as $CaCO_3$): 62

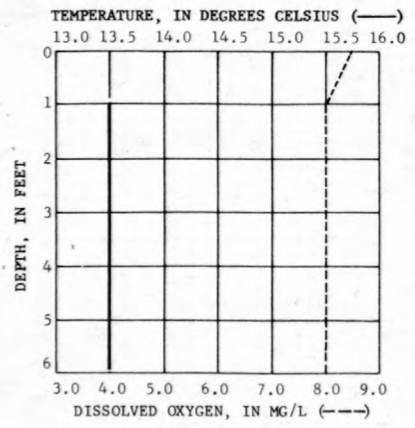
TOTAL HARDNESS (Mg/l as $CaCO_3$): 60

TOTAL DISSOLVED SOLIDS (Mg/l): 86

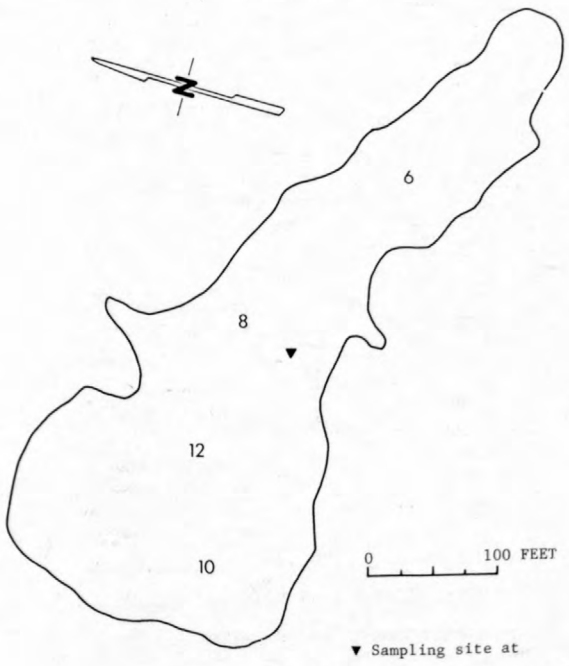
TRANSPARENCY (Feet): 0.3

COLOR (Units): 150

COLIFORM (Colonies/100 ml): 60



DEPTH CHART



▼ Sampling site at
lat 46°06'20", long 122°58'20"

LOCATION: T.4 N., R.4 W., sec.3, in Vernonia, Oreg., just south of Highway 47. U.S. Geological Survey 15-minute topographic map, Vernonia quadrangle.

DESCRIPTION: Large manmade millpond, completely encircled by a gravel road so that all sections are readily accessible. Abandoned mills lie to the west, and trees border the rest of the lake. The pond is extremely brushy.

DRAINAGE BASIN: Nehalem River basin.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 41 acres.

SURFACE ELEVATION: 600 feet above mean sea level, from topographic map.

VOLUME: 100 acre-feet.

INFLOW: Diverted from the Nehalem River.

OUTFLOW: None observed and no channel indicated on topographic map.

USE: Public fishing.

REMARKS: Water level was unusually low on Oct. 13, 1972, and much brush was exposed. Water rights of 4.5 cfs for public fishing.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.7	40
BOTTOM:	6.5	40

ALKALINITY (Mg/l as $CaCO_3$): 22

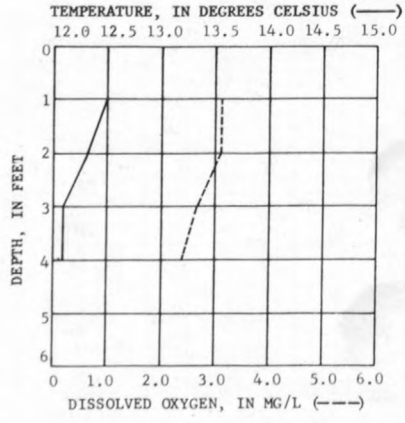
TOTAL HARDNESS (Mg/l as $CaCO_3$): 25

TOTAL DISSOLVED SOLIDS (Mg/l): 66

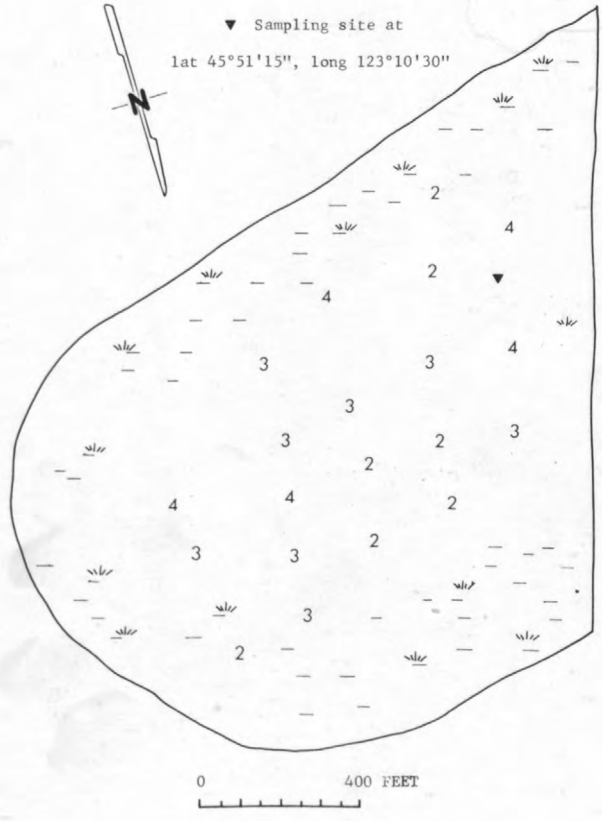
TRANSPARENCY (Feet): 1

COLOR (Units): 100

COLIFORM (Colonies/100 ml): 297



DEPTH CHART



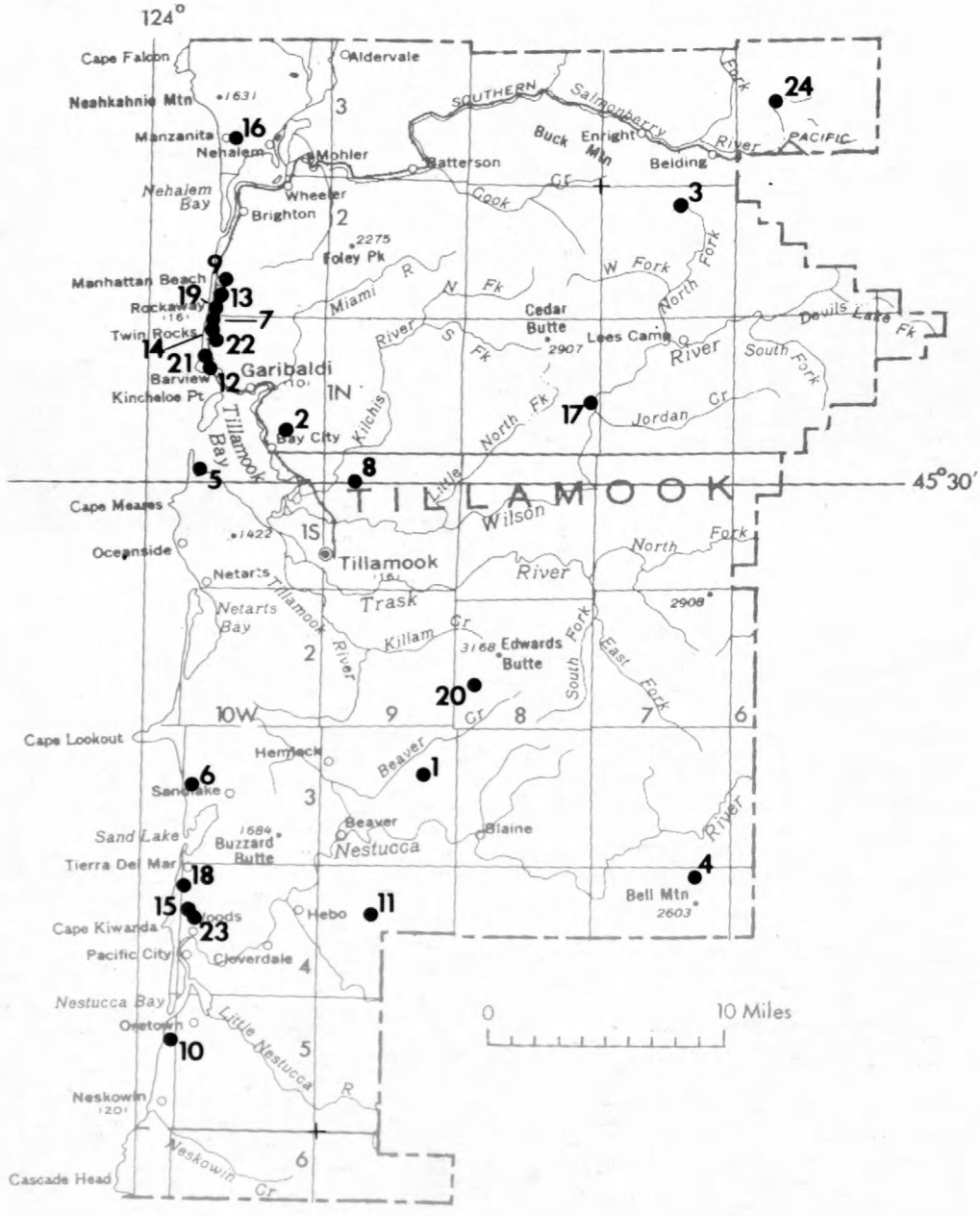


FIGURE 5. – Locations and identification numbers of lakes in Tillamook County.

Lakes of Tillamook County

LOCATION: T.3 S., R.9 W., sec.14, about 4.5 miles northeast of Beaver, Oreg., and 1 mile southeast of Beaver Creek Forest Camp. U.S. Geological Survey 15-minute topographic map, Tillamook quadrangle.

DESCRIPTION: A semi-isolated lake surrounded by steep hills largely covered with alder and second-growth fir. There are a few logs on the lake, but most of the water surface is free of debris.

DRAINAGE BASIN: Nestucca River basin.

DRAINAGE AREA: Less than 0.1 square mile.

SURFACE AREA: 2 acres.

SURFACE ELEVATION: About 1,150 feet above mean sea level, from topographic map.

VOLUME: Not determined.

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: None observed and no channel indicated on topographic map. Overflow probably flows into the Nestucca River by way of Bays Creek.

USE: Fishing for rainbow and cutthroat trout.

REMARKS: One of the few hike-in lakes in this area. The lake can be reached from East Beaver Creek Road north of the lake, but there is no trail and the brush is very dense. The "jeep trail" south of the lake (see topographic map) is longer, but relatively free of dense growth; it is difficult to find because of recent road cut. Water sampled at lat 45°18'50", long 123°45'00".

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.1	68
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 48

TOTAL HARDNESS (Mg/l as $CaCO_3$): 32

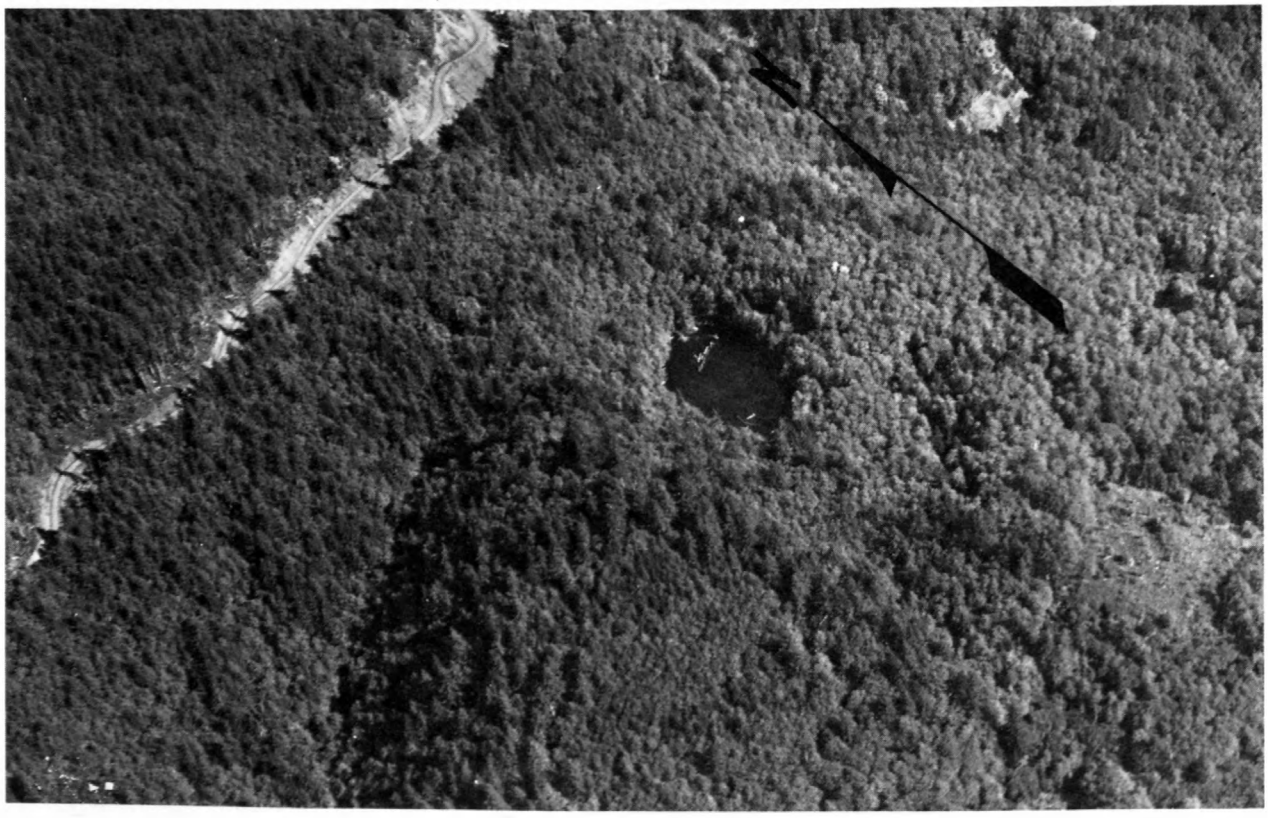
TOTAL DISSOLVED SOLIDS (Mg/l): 67

TRANSPARENCY (Feet): 3

COLOR (Units): 15

COLIFORM (Colonies/100 ml): 12

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	9.5	10.0
BOTTOM:	--	--



LOCATION: T.1 N., R.10 W., sec.35, just north of Bay City, Oreg. U.S. Geological Survey 15-minute topographic map, Nehalem quadrangle.

DESCRIPTION: A symmetrical reservoir of uniform depth, surrounded by dense second-growth fir.

DRAINAGE BASIN: Patterson Creek basin.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 0.5 acre.

SURFACE ELEVATION: 125 feet above mean sea level, from topographic map.

VOLUME: 4 acre-feet.

INFLOW: Diverted from Patterson Creek.

OUTFLOW: Controlled to Bay City water system.

USE: Bay City, Oreg., water-supply system reservoir.

REMARKS: A smaller reservoir in the hills to the northeast was inaccessible because of a bad road.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.3	52
BOTTOM:	7.1	51

ALKALINITY (Mg/l as $CaCO_3$): 25

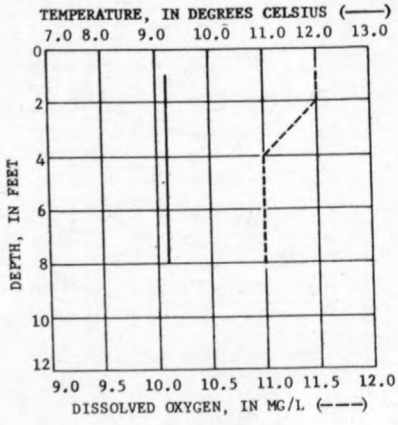
TOTAL HARDNESS (Mg/l as $CaCO_3$): 20

TOTAL DISSOLVED SOLIDS (Mg/l): 66

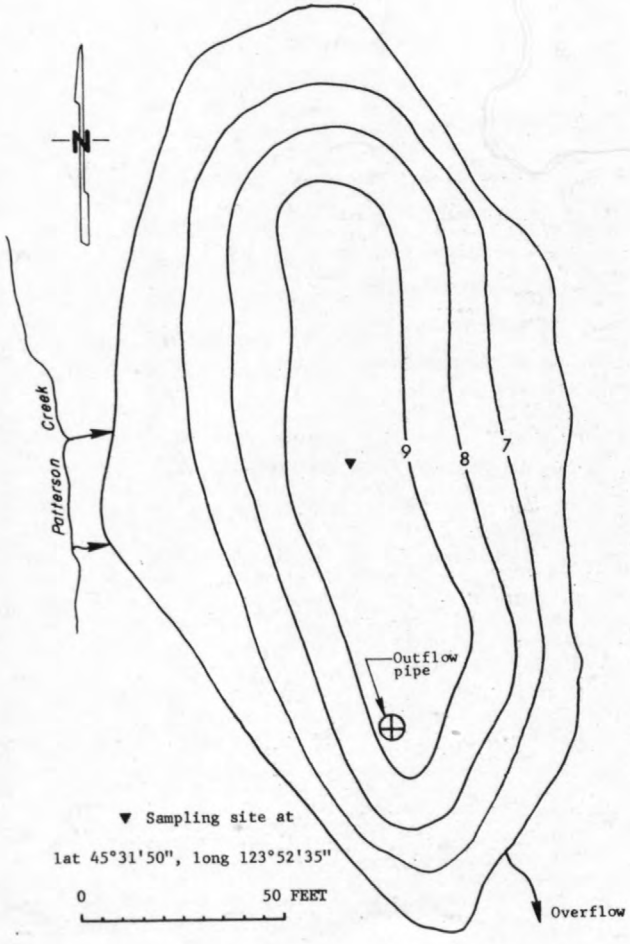
TRANSPARENCY (Feet): 9

COLOR (Units): 20

COLIFORM (Colonies/100 ml): 112



DEPTH CHART



LOCATION: T.2 N., R.7 W., sec.3, about 6 miles north of Lees Camp. U.S. Geological Survey 15-minute topographic map, Enright quadrangle.

DESCRIPTION: A small, deep lake in the Tillamook burn area. Vegetation on the hills around the lake is quite sparse. Many logs have collected on the surface of the lake, with the largest accumulations on its perimeter.

DRAINAGE BASIN: Wilson River basin.

DRAINAGE AREA: 0.5 square mile.

SURFACE AREA: 3 acres.

SURFACE ELEVATION: 2,400 feet above mean sea level, from topographic map.

VOLUME: 50 acre-feet.

INFLOW: No measurable flow from unnamed creek west of lake.

OUTFLOW: Seepage through natural log dam into North Fork Wilson River.

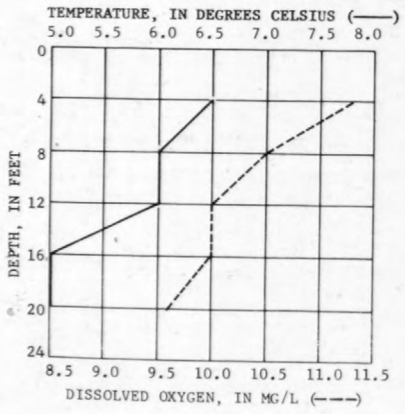
USE: Fishing for rainbow and cutthroat trout.

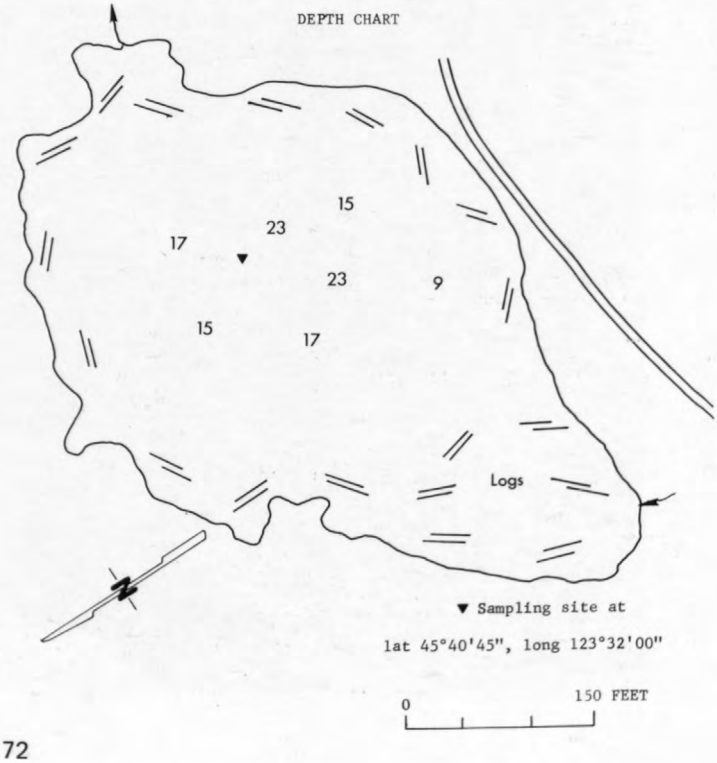
REMARKS: The gravel road leading to the lake from Lees Camp is very narrow in some places and should be avoided during bad weather.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.0	27
BOTTOM:	6.6	26

ALKALINITY (Mg/l as $CaCO_3$):	22
TOTAL HARDNESS (Mg/l as $CaCO_3$):	16
TOTAL DISSOLVED SOLIDS (Mg/l):	44
TRANSPARENCY (Feet):	8
COLOR (Units):	5
COLIFORM (Colonies/100 ml):	16





LOCATION: T.4 S., R.7 W., sec.2, about 14 miles northeast of Grand Ronde, Oreg. U.S. Geological Survey 15-minute topographic map, Grand Ronde quadrangle. (See REMARKS.)

DESCRIPTION: Small reservoir with very clear water. A Boy Scout Camp is to the north, and dense growth surrounds the entire lake. An outlet valve and spillway on the south side of the lake control the water level.

DRAINAGE BASIN: Nestucca River basin.

DRAINAGE AREA: 1.1 square miles.

SURFACE AREA: 2 acres.

SURFACE ELEVATION: 1,900 feet above mean sea level, from topographic map.

VOLUME: 5 acre-feet.

INFLOW: No measurable flow in unnamed creeks from the west and northeast.

OUTFLOW: Estimated 3 cfs through spillway to Testament Creek on Nov. 15, 1972.

USE: Boy Scout recreational pond.

REMARKS: Not open to the public. Not shown on 1955 topographic map. Water rights of 0.1 cfs from Testament Creek to maintain reservoir not to exceed 5.3 acre-feet. Depth chart from office of Oregon State Engineer.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.1	34
BOTTOM:	7.0	33

ALKALINITY (Mg/l as $CaCO_3$): 25

TOTAL HARDNESS (Mg/l as $CaCO_3$): 20

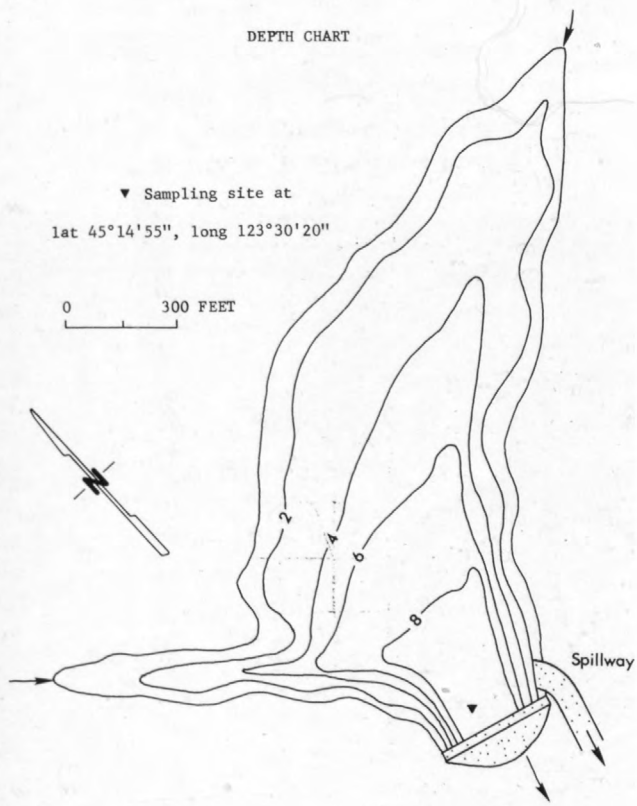
TOTAL DISSOLVED SOLIDS (Mg/l): 54

TRANSPARENCY (Feet): 5

COLOR (Units): 5

COLIFORM (Colonies/100 ml): 28

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	6.0	13.6
BOTTOM:	6.0	13.0



LOCATION: T.1 S., R.10 W., sec.7, about 3 miles southwest of Bay City, Oreg., and just north of Cape Meares. U.S. Geological Survey 15-minute topographic map, Nehalem quadrangle. (See REMARKS.)

DESCRIPTION: A shallow lake with dense aquatic vegetation and situated in the coastal sand dunes. The southwest end extends into a large bog. The lake is separated from Tillamook Bay by a dike on the east side.

DRAINAGE BASIN: Pacific Ocean.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 65 acres.

SURFACE ELEVATION: About mean sea level.

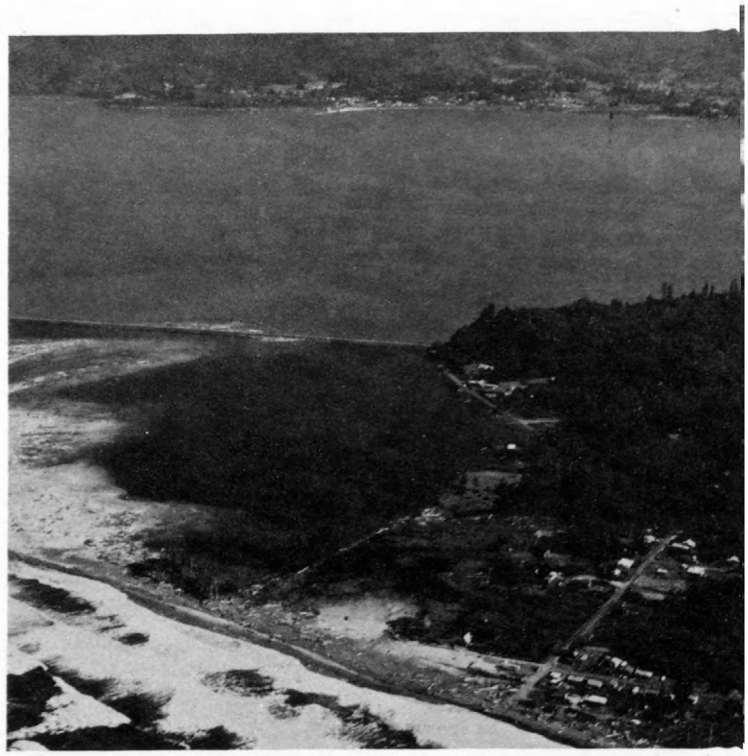
VOLUME: 320 acre-feet.

INFLOW: Through a bog area on the southwest end.

OUTFLOW: Controlled through dike to Tillamook Bay.

USE: Fishing for cutthroat trout.

REMARKS: Shown on 1955 topographic map as Biggs Cove. In the past, the lake has been used for salmon rearing.



WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.4	664
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 89

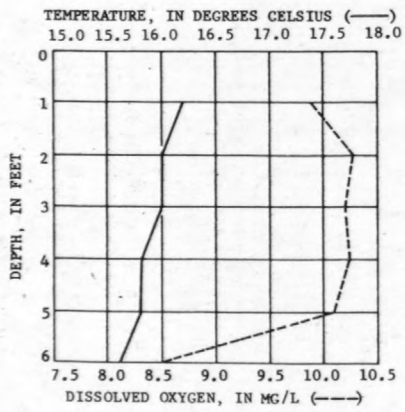
TOTAL HARDNESS (Mg/l as $CaCO_3$): 92

TOTAL DISSOLVED SOLIDS (Mg/l): --

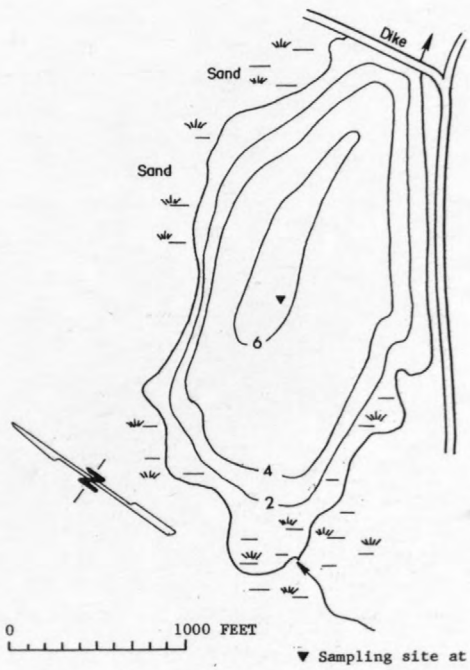
TRANSPARENCY (Feet): 4

COLOR (Units): --

COLIFORM (Colonies/100 ml): 6000



DEPTH CHART



▼ Sampling site at lat 45°30'25", long 123°56'55"

LOCATION: T.3 S., R.10 W., sec.18, about 6 miles west of Hemlock, Oreg., and 3 miles southeast of Cape Lookout. U.S. Geological Survey 15-minute topographic map, Tillamook quadrangle.

DESCRIPTION: A small lake, with relatively little aquatic growth, on a bluff above the Pacific Ocean. Fir trees form a dense cover around the lake. A Boy Scout Camp is west of the lake.

DRAINAGE BASIN: Pacific Ocean.

DRAINAGE AREA: Less than 0.1 square mile.

SURFACE AREA: 8 acres.

SURFACE ELEVATION: 85 feet above mean sea level, from topographic map.

VOLUME: 70 acre-feet.

INFLOW: Through marsh northeast of lake.

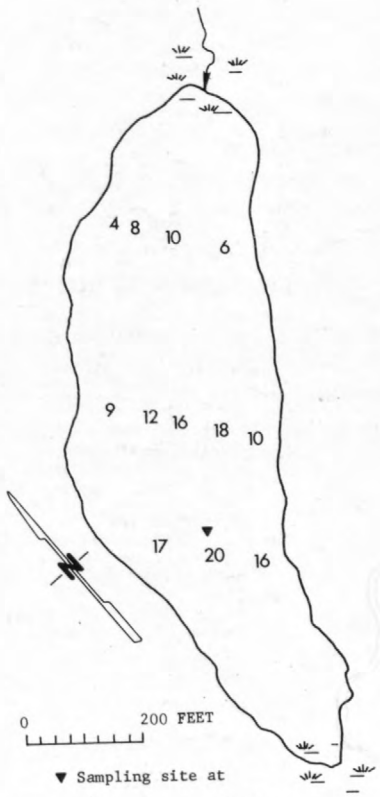
OUTFLOW: Seepage to the Pacific Ocean.

WATER RIGHTS: None.

USE: Boy Scout recreational lake.

REMARKS: Not open to the public.

DEPTH CHART



▼ Sampling site at

lat 45°18'45", long 123°57'35"

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	8.0	147
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 32

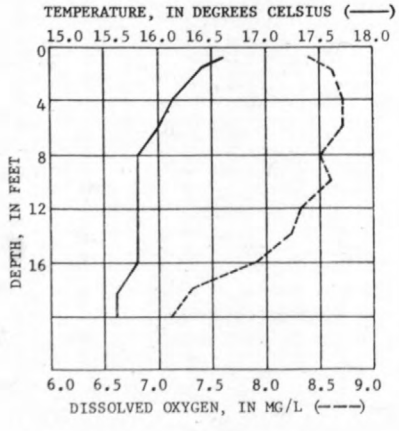
TOTAL HARDNESS (Mg/l as $CaCO_3$): 26

TOTAL DISSOLVED SOLIDS (Mg/l): --

TRANSPARENCY (Feet): 15

COLOR (Units): --

COLIFORM (Colonies/100 ml): --



LOCATION: T.1 N., R.10 W., sec.5, about 0.5 mile south of Rockaway, Oreg., and just east of Highway 101. U.S. Geological Survey 15-minute topographic map, Nehalem quadrangle.

DESCRIPTION: Small lake, near residential area, surrounded by marsh and rushes. Lily pads dot its surface.

DRAINAGE BASIN: Pacific Ocean.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 3 acres.

SURFACE ELEVATION: 10 feet above mean sea level, from topographic map.

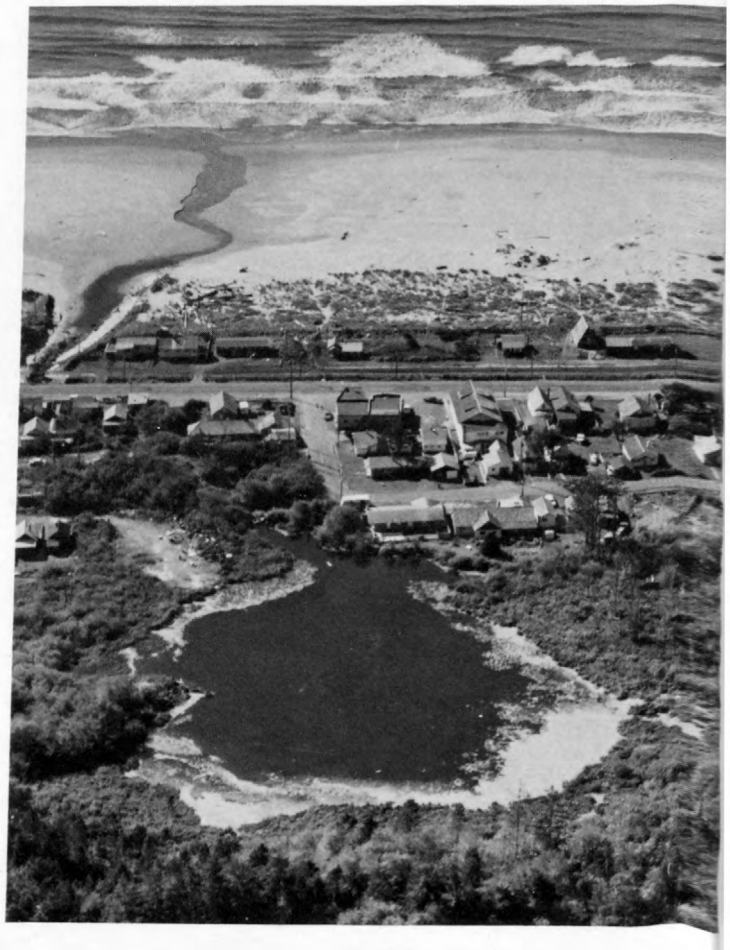
VOLUME: 8 acre-feet.

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: No measurable flow through channel under Highway 101 to the Pacific Ocean.

USE: Fishing.

REMARKS: The small size of the lake and pollution problems have discouraged development in the past.



WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.1	87
BOTTOM:	6.7	84

ALKALINITY (Mg/l as $CaCO_3$): 22

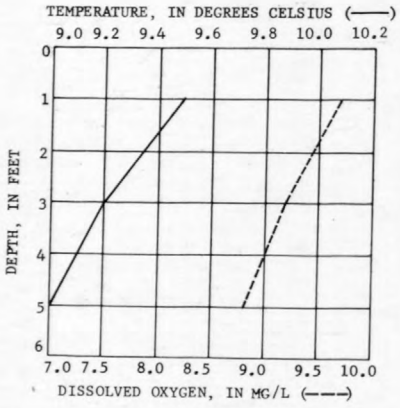
TOTAL HARDNESS (Mg/l as $CaCO_3$): 24

TOTAL DISSOLVED SOLIDS (Mg/l): 116

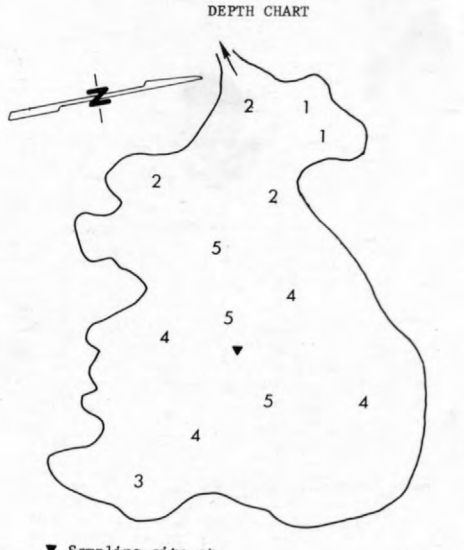
TRANSPARENCY (Feet): 4

COLOR (Units): 35

COLIFORM (Colonies/100 ml): 680



DEPTH CHART



▼ Sampling site at lat 45°36'20", long 123°56'30"

0 100 FEET

LOCATION: T.1 S., R.9 W., sec.8, about 2.5 miles southeast of Idaville, Oreg., and 3.5 miles northeast of Tillamook, Oreg. U.S. Geological Survey 15-minute topographic map, Nehalem quadrangle.

DESCRIPTION: Small reservoir maintained by a concrete dam. The water is very clear. Surrounding area is covered with small brush and fir trees.

DRAINAGE BASIN: Kilchis River basin.

DRAINAGE AREA: 0.8 square mile.

SURFACE AREA: 1 acre.

SURFACE ELEVATION: 200 feet above mean sea level, from topographic map.

VOLUME: 7.67 acre-feet maximum storage (State water-storage rights).

INFLOW: Coal Creek on east side of reservoir.

OUTFLOW: Continuation of Coal Creek on west side of reservoir.

USE: Private water-supply reservoir.

REMARKS: Not open to the public. Water level was down considerably on Nov. 10, 1972. Water rights of 0.05 cfs from Coal Creek and reservoir. Depth chart from office of Oregon State Engineer.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.3	55
BOTTOM:	7.0	54

ALKALINITY (Mg/l as $CaCO_3$): 25

TOTAL HARDNESS (Mg/l as $CaCO_3$): 26

TOTAL DISSOLVED SOLIDS (Mg/l): 77

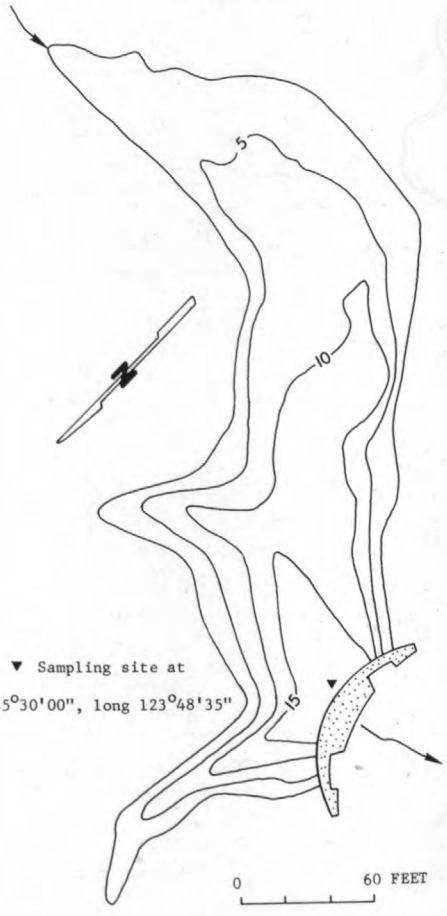
TRANSPARENCY (Feet): 10

COLOR (Units): 10

COLIFORM (Colonies/100 ml): 162

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	9.0	11.3
BOTTOM:	9.0	10.9

DEPTH CHART



LOCATION: T.2 N., R.10 W., sec.29, about 1 mile north of Rockaway, Oreg., and just east of Highway 101. U.S. Geological Survey 15-minute topographic map, Nehalem quadrangle.

DESCRIPTION: A crescent-shaped lake in the coastal and dunes, with much aquatic growth and surrounded by dense brush. The south end of the lake extends into a bog near the inlet.

DRAINAGE BASIN: Pacific Ocean.

DRAINAGE AREA: 2.4 square miles.

SURFACE AREA: 11 acres.

SURFACE ELEVATION: About 10 feet above mean sea level, from topographic map.

VOLUME: 50 acre-feet.

INFLOW: From Lytle Lake (13) on the south by way of Maroney Canal.

OUTFLOW: Measured 20 cfs on Sept. 28, 1971, at the outlet.

USE: Fishing for trout and largemouth bass.

REMARKS: Owned by Tillamook County.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.0	305
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 22

TOTAL HARDNESS (Mg/l as $CaCO_3$): 60

TOTAL DISSOLVED SOLIDS (Mg/l): --

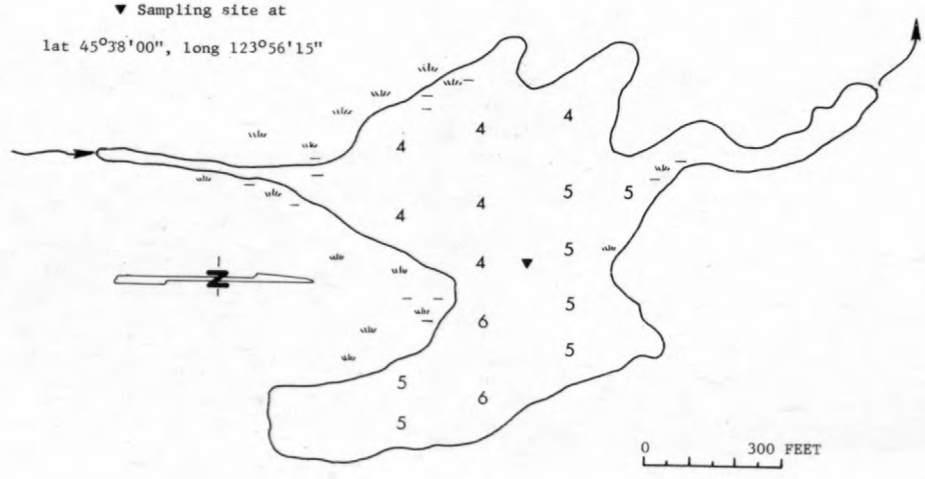
TRANSPARENCY (Feet): --

COLOR (Units): --

COLIFORM (Colonies/100 ml): 6400

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	12.7	--
BOTTOM:	13.1	--

DEPTH CHART



LOCATION: T.5 S., R.11 W., sec.13, about 2.5 miles north of Neskowin, Oreg., between Highway 101 and the Pacific Ocean. U.S. Geological Survey 15-minute topographic map, Hebo quadrangle.

DESCRIPTION: A relatively shallow, elongate lake in a depression between the beach on the west and bluffs on the east. The hills east of the lake have been logged and are used for sheep and cattle grazing. A large marsh extends south from the lake. Wi-Ne-Ma Christian Camp is west of the lake.

DRAINAGE BASIN: Pacific Ocean.

DRAINAGE AREA: 1.8 square miles.

SURFACE AREA: 17 acres.

SURFACE ELEVATION: About mean sea level and varies 1 to 2 feet annually (Fish Commission of Oregon, 1962). Normally the lake is separated from the ocean by a sandspit barrier. On rare occasions during extreme high tide, the ocean water has washed into the lake.

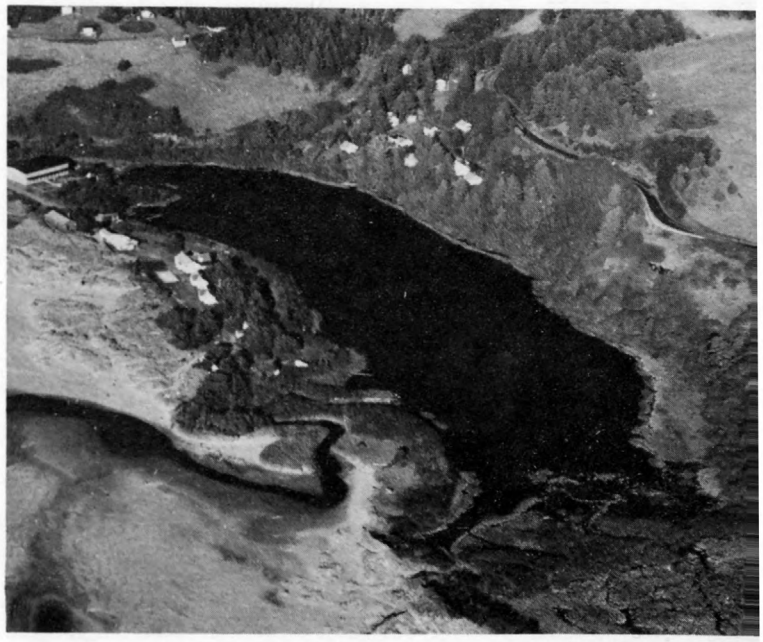
VOLUME: 120 acre-feet.

INFLOW: Three unnamed creeks from hills east of the lake.

OUTFLOW: Channel through sandspit to the Pacific Ocean. Shifting sand periodically closes the outlet and must be removed.

USE: Private fishing and swimming.

REMARKS: Land surrounding the lake is owned by the Wi-Ne-Ma Christian Camp. For additional information, see Fish Commission of Oregon (1962). The depth chart is from a Sept. 9, 1959, survey by the Fish Commission of Oregon and was field checked by the U.S. Geological Survey.



WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.4	132
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 34

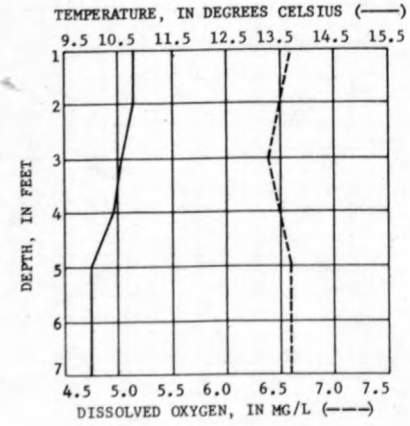
TOTAL HARDNESS (Mg/l as $CaCO_3$): 30

TOTAL DISSOLVED SOLIDS (Mg/l): --

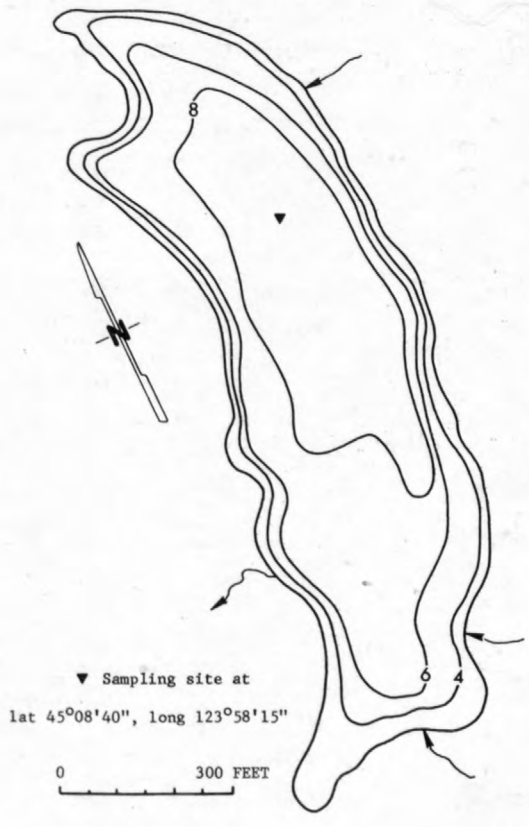
TRANSPARENCY (Feet): 6

COLOR (Units): --

COLIFORM (Colonies/100 ml): 2000



DEPTH CHART



TILLAMOOK COUNTY | HEBO LAKE (11) | SURVEY DATE: November 3, 1971

LOCATION: T.4 S., R.9 W., sec.9, about 3 miles east of Hebo, Oreg., in the Siuslaw National Forest. U.S. Geological Survey 15-minute topographic map, Hebo quadrangle.

DESCRIPTION: A small lake encircled by a gravel road and surrounded by steep hills and second-growth Douglas-fir.

DRAINAGE BASIN: Nestucca River basin.

DRAINAGE AREA: 0.1 square mile.

SURFACE AREA: 2.2 acres.

SURFACE ELEVATION: 1,650 feet above mean sea level, from topographic map.

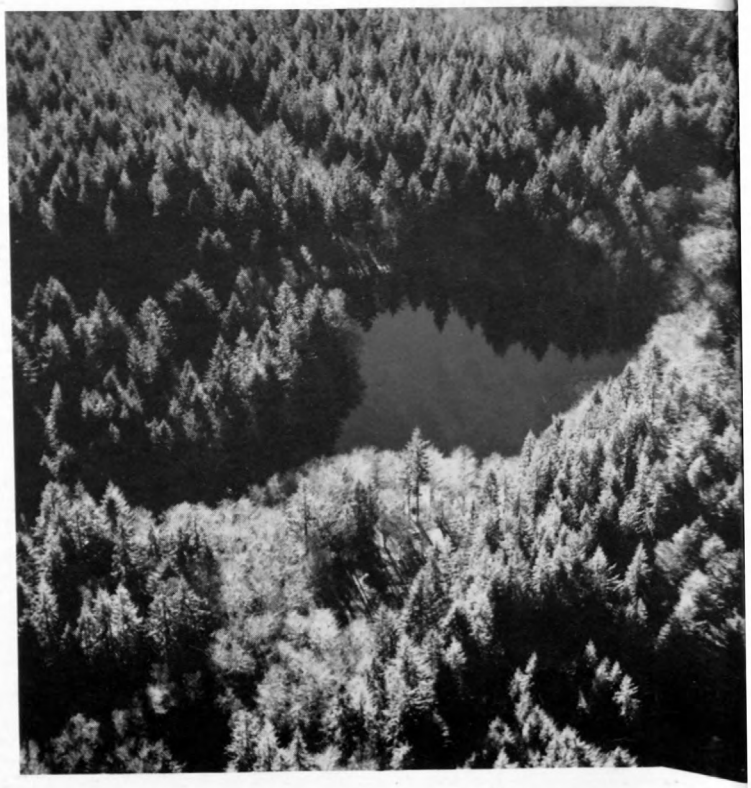
VOLUME: 10 acre-feet.

INFLOW: No flow on Nov. 3, 1971, through small channel east of the lake.

OUTFLOW: Estimated 1 cfs on Nov. 3, 1971, through two controlled outlets on west side of lake.

USE: Boat and bank fishing for stocked cutthroat trout, with best results during spring and summer. There is also swimming during summer. A U.S. Forest Service campground is near the lake.

REMARKS: For additional information, see Oregon State Game Commission (1969).



WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.8	37
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 12

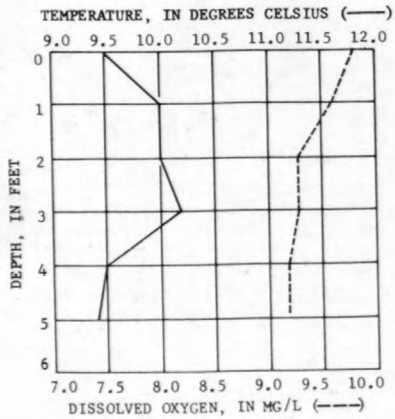
TOTAL HARDNESS (Mg/l as $CaCO_3$): 18

TOTAL DISSOLVED SOLIDS (Mg/l): --

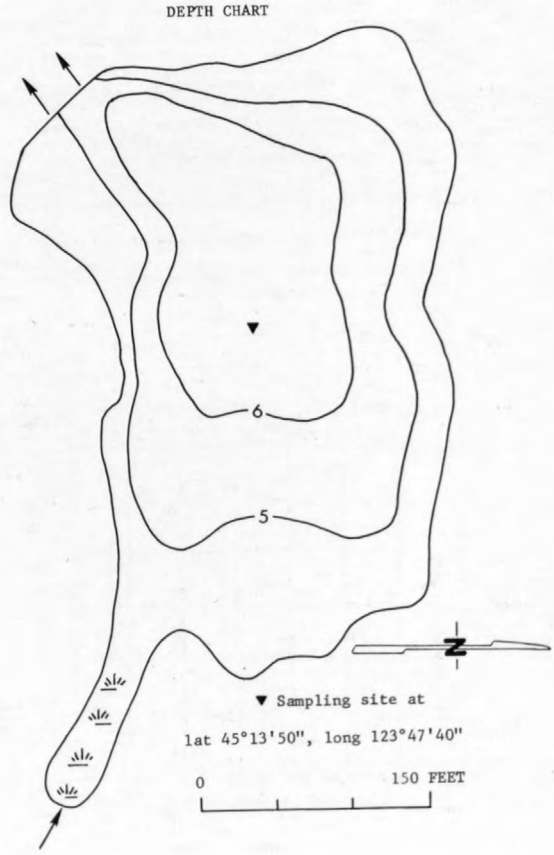
TRANSPARENCY (Feet): 6

COLOR (Units): --

COLIFORM (Colonies/100 ml): 710



DEPTH CHART



LOCATION: T.1 N., R.10 W., sec.17, about 3 miles south of Rockaway, Oreg., near Barview. U.S. Geological Survey 15-minute topographic map, Nehalem quadrangle.

DESCRIPTION: A small lake, of very uniform depth, in the coastal sand dunes and surrounded by dense brush.

DRAINAGE BASIN: Pacific Ocean.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 1 acre.

SURFACE ELEVATION: About 10 feet above mean sea level, from topographic map.

VOLUME: 4 acre-feet.

INFLOW: None observed and no channel indicated on topographic map. See REMARKS.)

OUTFLOW: None observed and no channel indicated on topographic map. (See REMARKS.)

USE: None apparent.

REMARKS: Probably connected to Smith Lake (21) during high water.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.4	115
BOTTOM:	6.6	116

ALKALINITY (Mg/l as $CaCO_3$): 10

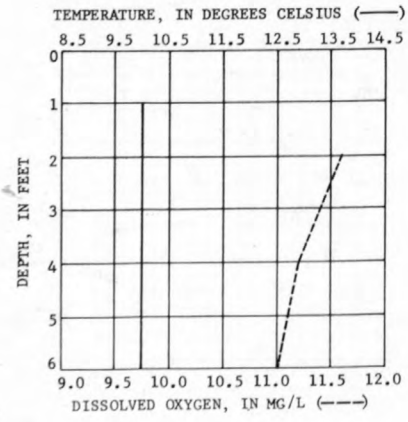
TOTAL HARDNESS (Mg/l as $CaCO_3$): 22

TOTAL DISSOLVED SOLIDS (Mg/l): 178

TRANSPARENCY (Feet): 3

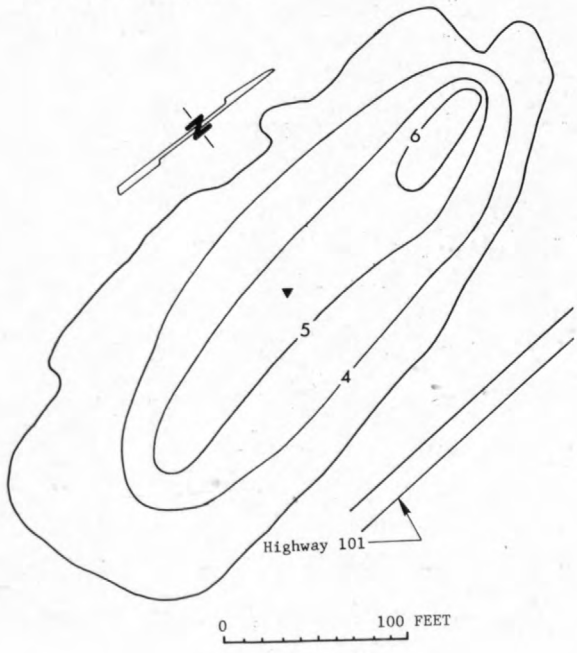
COLOR (Units): 15

COLIFORM (Colonies/100 ml): 112



DEPTH CHART

▼ Sampling site at lat 45°34'20", long 123°56'40"



LOCATION: T.2 N., R.10 W., secs.29, 32, just north of Rockaway, Oreg., and east of Highway 101. U.S. Geological Survey 15-minute topographic map, Nehalem quadrangle.

DESCRIPTION: A shallow lake with dense aquatic growth on the south end, but with considerably less on the north. The bottom is a firm mixture of muck and sand. Highway 101 forms the west boundary, and North Drive Road crosses the lake at the outlet. Dense brush and second-growth timber grow on the hills to the east. Most of the perimeter is marshy.

DRAINAGE BASIN: Pacific Ocean.

DRAINAGE AREA: 2.2 square miles.

SURFACE AREA: 65 acres.

SURFACE ELEVATION: About 10 feet above mean sea level. Seasonal variation of 1 to 3 feet (Fish Commission of Oregon).

VOLUME: 300 acre-feet.

INFLOW: Steinhilber Creek, Spring Creek, and an unnamed creek flow into the lake from the hills to the east. No flow observed on Sept. 28, 1971.

OUTFLOW: To the Pacific Ocean via Moroney Canal and Crescent Lake (9).

USE: Fishing for rainbow and cutthroat trout and largemouth bass. Trout fishing seems to be best in spring and early summer, whereas bass fishing is best in summer and fall. Stocked annually with trout by the Oregon State Game Commission.

REMARKS: Tillamook County owns the lake and operates a boat launch on the northeast end. Toilet and food facilities are nearby. For additional information, see Fish Commission of Oregon (1962). The depth chart is from an Aug. 1, 1960, survey by the Fish Commission of Oregon and was field checked by the U.S. Geological Survey.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.7	120
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 26

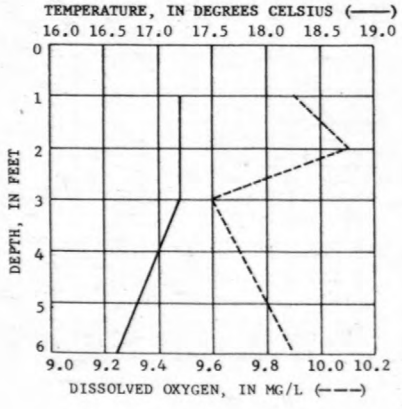
TOTAL HARDNESS (Mg/l as $CaCO_3$): 41

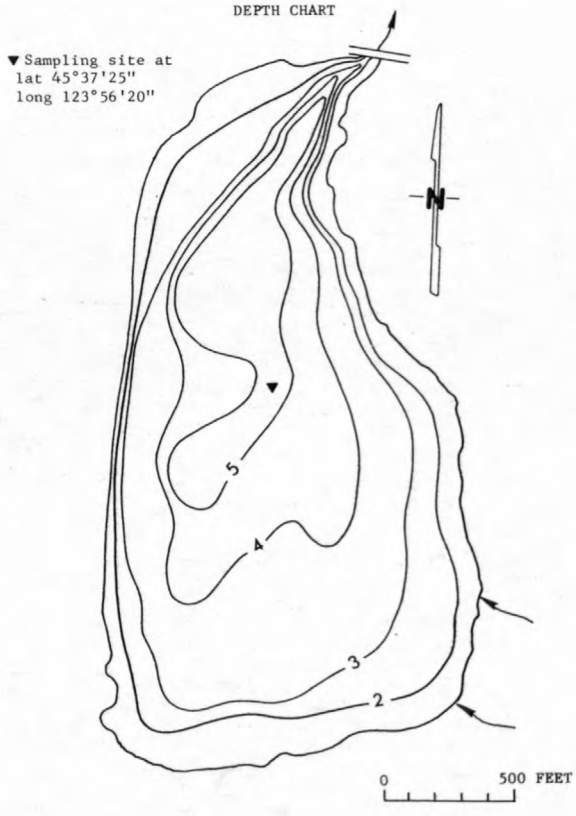
TOTAL DISSOLVED SOLIDS (Mg/l): --

TRANSPARENCY (Feet): --

COLOR (Units): --

COLIFORM (Colonies/100 ml): 2700





LOCATION: T.1 N., R.10 W., sec.5, in residential area about 1 mile south of Rockaway, Oreg. U.S. Geological Survey 15-minute topographic map, Nehalem quadrangle.

DESCRIPTION: Small, symmetrical lake with considerable aquatic growth. Private residences are on three sides of the lake, and Highway 101 forms its western boundary.

DRAINAGE BASIN: Pacific Ocean.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: Less than 1 acre.

SURFACE ELEVATION: About 10 feet above mean sea level, from topographic map.

VOLUME: Not determined.

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: None observed and no channel indicated on topographic map.

USE: Fishing for warm-water fish.

REMARKS: There is an aerator in the middle of the lake, and there appear to be some pollution problems because of the location of the lake. Water sampled at lat 45°36'00", long 123°56'40".

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.6	114
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 27

TOTAL HARDNESS (Mg/l as $CaCO_3$): 61

TOTAL DISSOLVED SOLIDS (Mg/l): --

TRANSPARENCY (Feet): --

COLOR (Units): --

COLIFORM (Colonies/100 ml): 7200

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	14.0	--
BOTTOM:	--	--

LOCATION: T.4 S., R.10 W., sec.7, about 5 miles west of Hebo, Oreg., and 1.3 miles north of Woods, Oreg. U.S. Geological Survey 15-minute topographic map, Hebo quadrangle.

DESCRIPTION: An irregular-shaped lake, relatively free of aquatic growth but with some lily pads. The hills surrounding the lake have a dense brush cover with some mixed trees.

DRAINAGE BASIN: Pacific Ocean.

DRAINAGE AREA: 0.6 square mile.

SURFACE AREA: 15 acres.

SURFACE ELEVATION: 120 feet above mean sea level, from topographic map.

VOLUME: 240 acre-feet.

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: None observed. Topographic map indicates an outflow at the north end of the lake to the Pacific Ocean.

USE: Private fishing.

REMARKS: Not open to the public. The depth chart is from a Sept. 11, 1959, survey by the Fish Commission of Oregon and was field checked by the U.S. Geological Survey.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.8	97
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 14

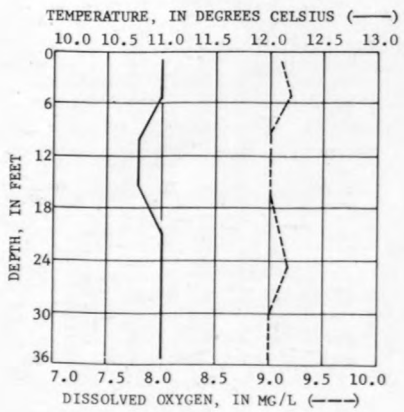
TOTAL HARDNESS (Mg/l as $CaCO_3$): 21

TOTAL DISSOLVED SOLIDS (Mg/l): --

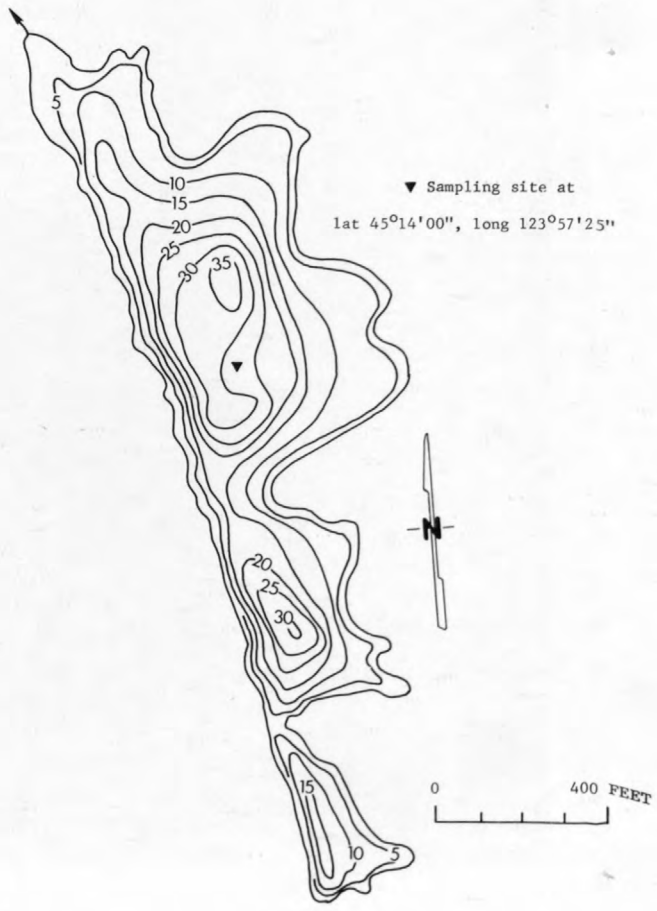
TRANSPARENCY (Feet): 12

COLOR (Units): --

COLIFORM (Colonies/100 ml): 330



DEPTH CHART



LOCATION: T.3 N., R.10 W., sec.29, about 1.5 miles west of Nehalem, Oreg., near Manzanita. U.S. Geological Survey 15-minute topographic map, Nehalem quadrangle.

DESCRIPTION: A small lake separated from residential and business areas by Highway 101; it is bordered on the east and west by dense tree growth, primarily fir.

DRAINAGE BASIN: Pacific Ocean.

DRAINAGE AREA: 1.1 square miles.

SURFACE AREA: 4 acres.

SURFACE ELEVATION: 50 feet above mean sea level, from topographic map.

VOLUME: 20 acre-feet.

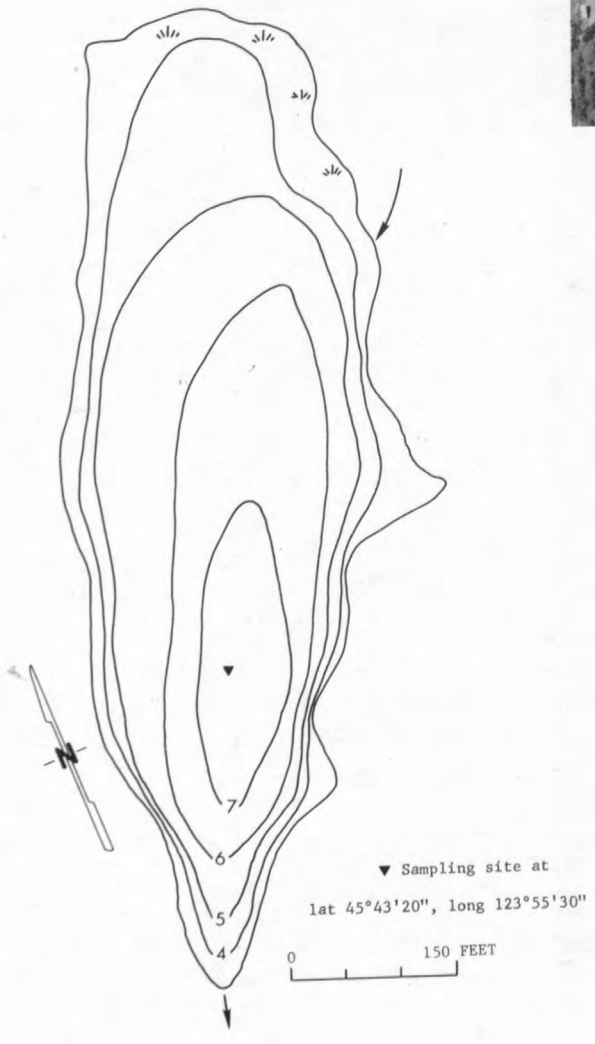
INFLOW: Neahkahnie Creek on north end of the lake.

OUTFLOW: Estimated 6 cfs on Nov. 2, 1971, at the outlet. Flow reflects recent storms.

USE: Private fishing.

REMARKS: For additional information on recreational potential, see Oregon State Game Commission (1969).

DEPTH CHART



WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.8	103
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 23

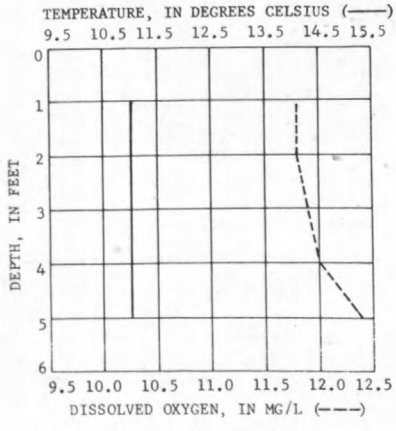
TOTAL HARDNESS (Mg/l as $CaCO_3$): 36

TOTAL DISSOLVED SOLIDS (Mg/l): 103

TRANSPARENCY (Feet): 4

COLOR (Units): --

COLIFORM (Colonies/100 ml): 9250



LOCATION: T.1 N., R.8 W., sec.24, about 4 miles southwest of Lees Camp near Jordan Creek. U.S. Geological Survey 15-minute topographic map, Enright quadrangle.

DESCRIPTION: Small reservoir adjacent to Ryan Creek. The water is clear with almost no aquatic growth. A pumphouse, formerly used for irrigation purposes, is on the southeast corner.

DRAINAGE BASIN: Wilson River basin.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: Less than 1 acre.

SURFACE ELEVATION: 470 feet above mean sea level, from topographic map.

VOLUME: Maximum storage is 1 acre-foot (State water-storage right).

INFLOW: Diverted from Ryan Creek north of the lake. Estimated 1 cfs on Nov. 3, 1972.

OUTFLOW: Regulated to the Wilson River.

USE: Private recreation.

REMARKS: Known locally as Smith Hole. At one time this reservoir was used to irrigate a local golf course. Water rights of 0.26 cfs for irrigation.

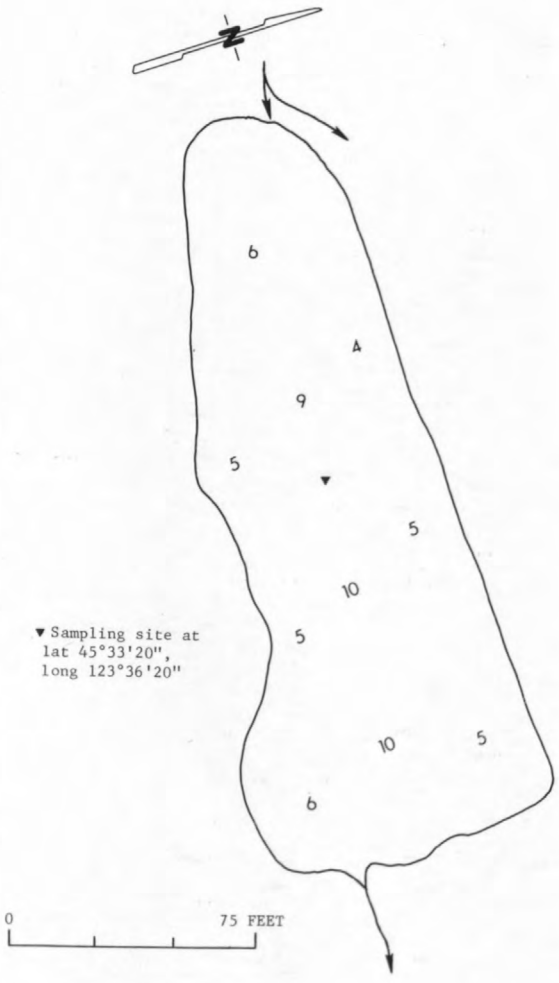
WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.2	57
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$):	34
TOTAL HARDNESS (Mg/l as $CaCO_3$):	26
TOTAL DISSOLVED SOLIDS (Mg/l):	66
TRANSPARENCY (Feet):	6
COLOR (Units):	10
COLIFORM (Colonies/100 ml):	50

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	9.6	12.0
BOTTOM:	--	--

DEPTH CHART



LOCATION: T.4 S., R.10 W., sec.7, about 5 miles west of Hebo, Oreg., and 2 miles north of Cape Kiwanda. U.S. Geological Survey 15-minute topographic map, Hebo quadrangle.

DESCRIPTION: Irregular-shaped lake bordered by hills on the east and a sand barrier on the west. Ground cover is primarily small brush with some mixed trees.

DRAINAGE BASIN: Pacific Ocean.

DRAINAGE AREA: 0.4 square mile.

SURFACE AREA: 15 acres.

SURFACE ELEVATION: About 20 feet above mean sea level.

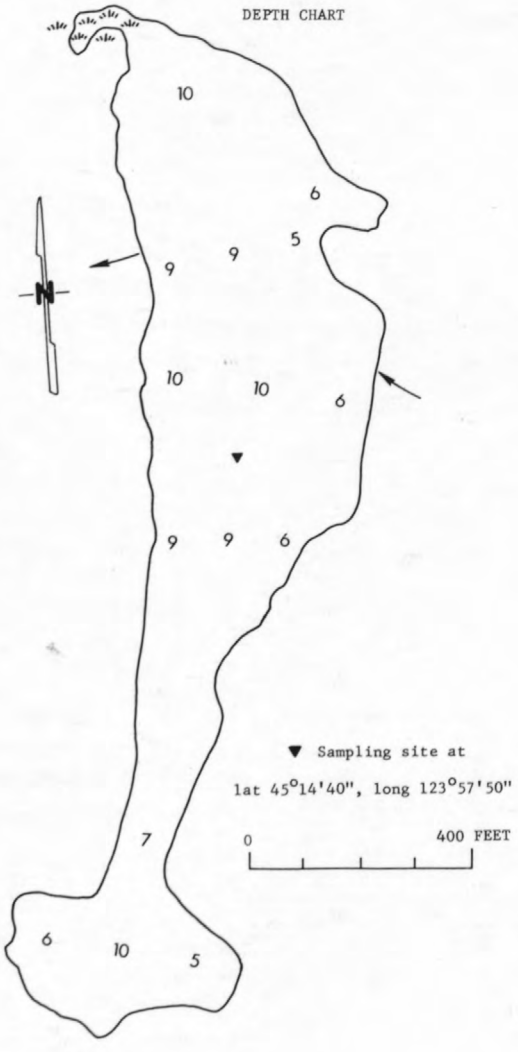
VOLUME: 100 acre-feet.

INFLOW: Estimated 0.3 cfs on Nov. 1, 1971, at the inlet on northeast corner of lake.

OUTFLOW: Estimated 0.8 cfs on Nov. 1, 1971, at the outlet on west side of lake.

USE: Private fishing.

REMARKS: Not open to the public. Located on proposed site for Portland General Electric Co. nuclear powerplant.



WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.6	168
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 23

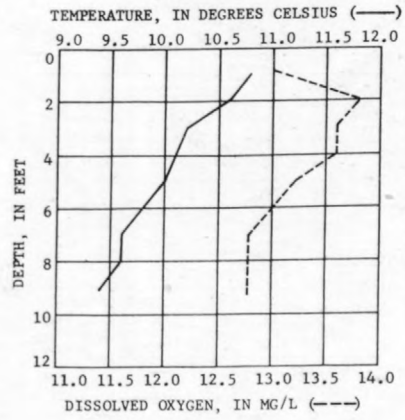
TOTAL HARDNESS (Mg/l as $CaCO_3$): 34

TOTAL DISSOLVED SOLIDS (Mg/l): --

TRANSPARENCY (Feet): 5

COLOR (Units): --

COLIFORM (Colonies/100 ml): 500



LOCATION: T.2 N., R.10 W., sec.32, in Rockaway, Oreg. U.S. Geological Survey 15-minute topographic map, Nehalem quadrangle.

DESCRIPTION: Very small lake in residential area of Rockaway. Water is brownish, and there is little growth around the lake. A park is north of the lake.

DRAINAGE BASIN: Pacific Ocean.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: Less than 1.5 acres.

SURFACE ELEVATION: About 10 feet above mean sea level, from topographic map.

VOLUME: 4.5 acre-feet.

USE: Park is used for picnics, and there is a playground for children.

INFLOW: Primarily spring fed; city water also used to maintain the lake during low water.

OUTFLOW: Through culvert on east side of lake. Culvert closed on Nov. 10, 1972.

REMARKS: Privately owned. Not shown on 1955 topographic map.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.7	100
BOTTOM:	6.7	100

ALKALINITY (Mg/l as $CaCO_3$): 22

TOTAL HARDNESS (Mg/l as $CaCO_3$): 44

TOTAL DISSOLVED SOLIDS (Mg/l): 130

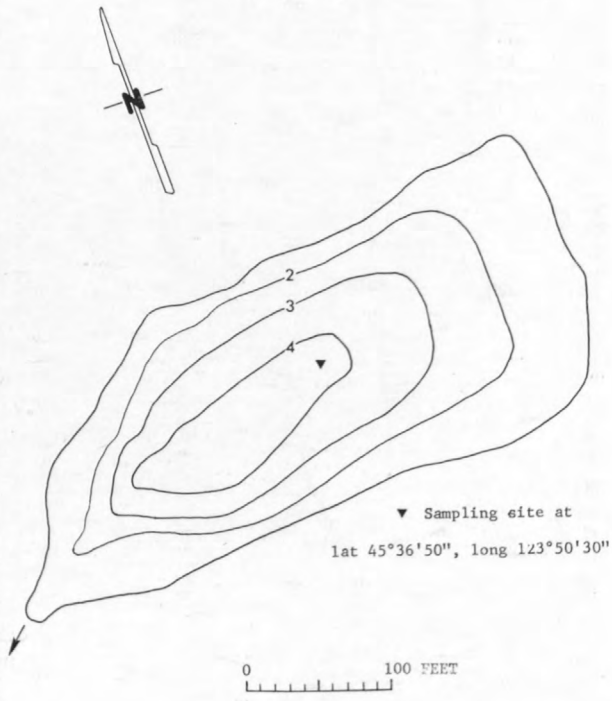
TRANSPARENCY (Feet): 0.5

COLOR (Units): 50

COLIFORM (Colonies/100 ml): 1700

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	9.6	8.5
BOTTOM:	9.6	7.0

DEPTH CHART



LOCATION: T.2 S., R.8 W., sec.30, about 6.5 miles north of Blaine, Oreg. U.S. Geological Survey 15-minute topographic map, Blaine quadrangle.

DESCRIPTION: A large manmade reservoir with a dike and spillway on the west end. The hills around the lake are covered primarily with small second-growth fir trees.

DRAINAGE BASIN: Tillamook River basin.

DRAINAGE AREA: 2.2 square miles.

SURFACE AREA: 40 acres at normal water surface.

SURFACE ELEVATION: 1,193 feet above mean sea level at normal water surface.

VOLUME: 700 acre-feet at normal water surface.

INFLOW: No measurable flow. Receives runoff from several draws around the lake.

OUTFLOW: Regulated through dike to Fawcett Creek.

USE: Tillamook, Oreg., water-supply system reservoir.

REMARKS: Not open to the public. Physical data from Cornell, Howland, Hayes and Merryfield, Engineers and Planners. 1955 topographic map shows lake prior to dam construction. Water rights of 700 acre-feet maximum storage.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.2	46
BOTTOM:	6.8	45

ALKALINITY (Mg/l as $CaCO_3$): 35

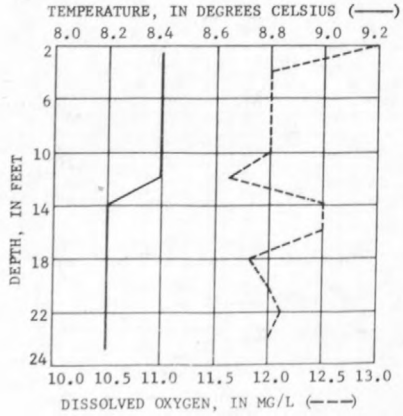
TOTAL HARDNESS (Mg/l as $CaCO_3$): 24

TOTAL DISSOLVED SOLIDS (Mg/l): 64

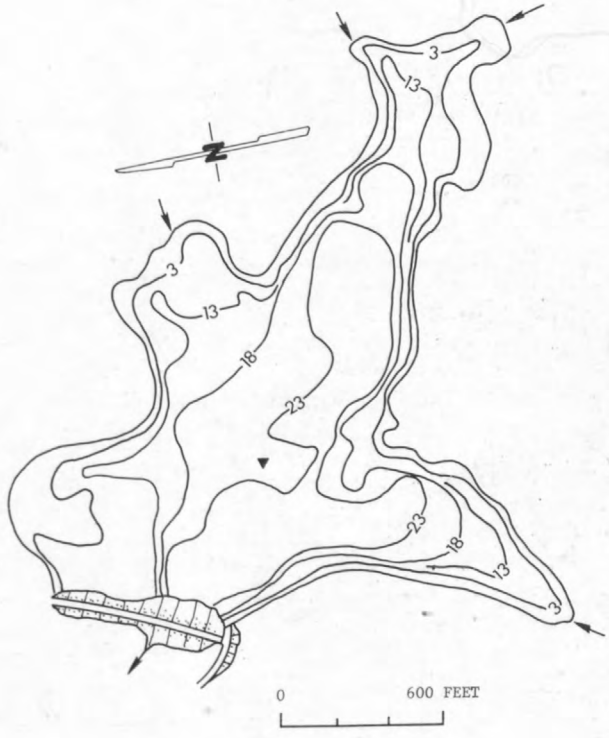
TRANSPARENCY (Feet): 9

COLOR (Units): 10

COLIFORM (Colonies/100 ml): 82



DEPTH CHART



▼ Sampling site at

lat 45°22'20", long 123°42'05"

LOCATION: T.1 N., R.10 W., sec.18, about 2 miles south of Rockaway, Oreg., just west of Highway 101. U.S. Geological Survey 15-minute topographic map, Nehalem quadrangle.

DESCRIPTION: A long lake, relatively free of aquatic growth except on its perimeter. Highway 101 parallels the east shore of the lake, and the west bank is covered with beach grass and scattered trees.

DRAINAGE BASIN: Tillamook sand dunes.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 35 acres.

SURFACE ELEVATION: About 10 feet above mean sea level, from topographic map.

VOLUME: 250 acre-feet.

INFLOW: None observed and no channel indicated on topographic map.

OUTFLOW: None observed and no channel indicated on topographic map.

USE: Fishing (trout, bass, and catfish) and boating. The lake has been stocked with trout and catfish.

REMARKS: A church-sponsored camp is west of the lake. The lake is mostly inaccessible except through the camp.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.6	196
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 24

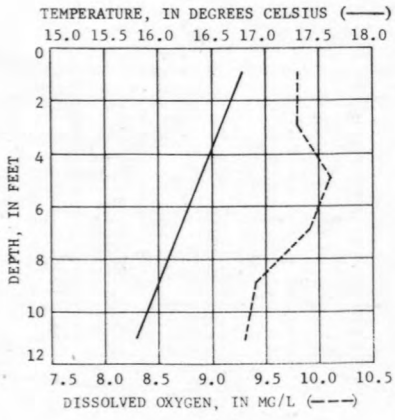
TOTAL HARDNESS (Mg/l as $CaCO_3$): 26

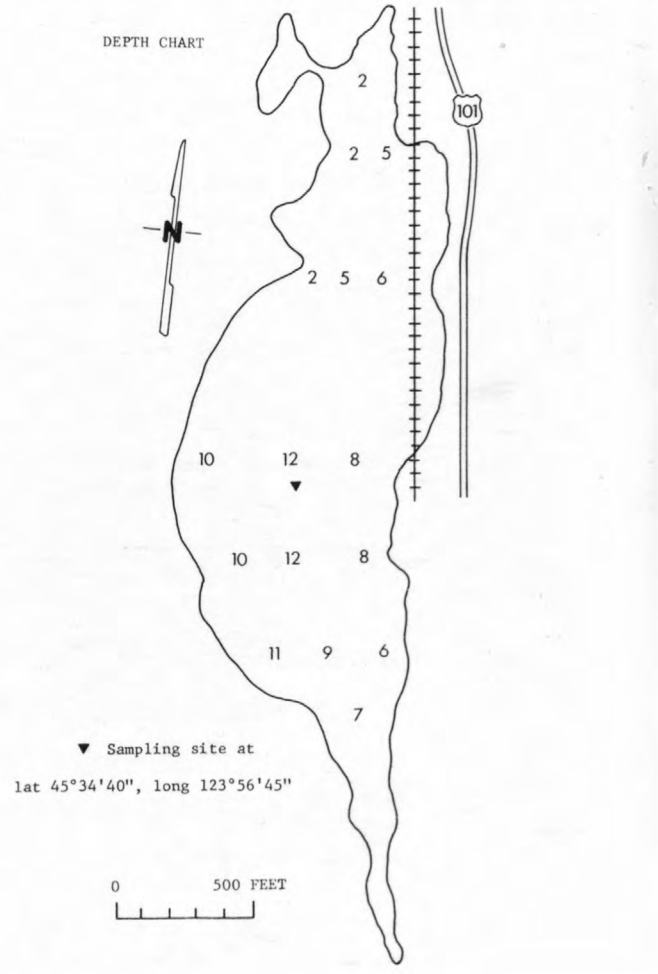
TOTAL DISSOLVED SOLIDS (Mg/l): --

TRANSPARENCY (Feet): 11

COLOR (Units): --

COLIFORM (Colonies/100 ml): 1300





LOCATION: T.1 N., R.10 W., sec.8, about 1 mile south of Rockaway, Oreg., just east of Highway 101. U.S. Geological Survey 15-minute topographic map, Nehalem quadrangle.

DESCRIPTION: A nearly round lake with moderate aquatic growth. The undeveloped land east of the lake is covered with small brush and mixed trees. Highway 101 parallels the lake on the west.

DRAINAGE BASIN: Pacific Ocean.

DRAINAGE AREA: Indeterminate.

SURFACE AREA: 13 acres.

SURFACE ELEVATION: About 20 feet above mean sea level, from topographic map.

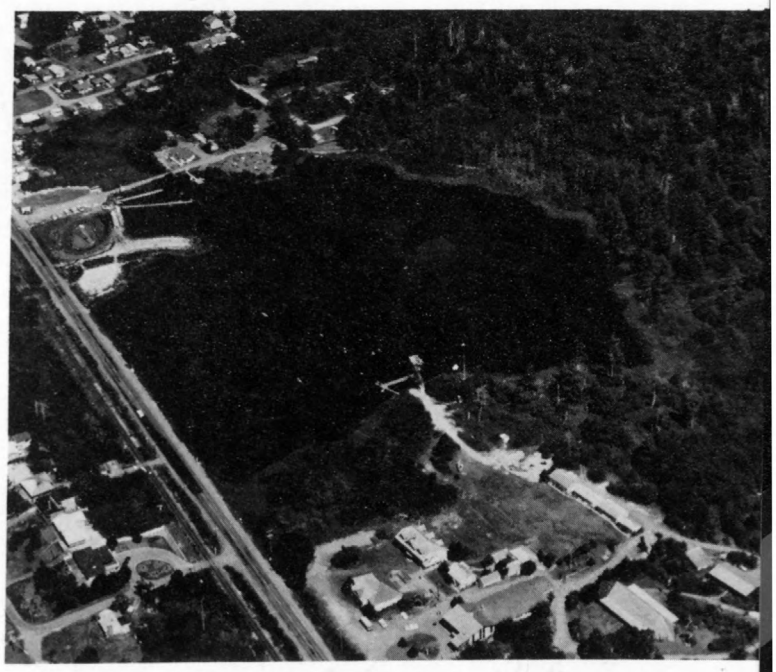
VOLUME: 130 acre-feet.

INFLOW: None observed. Unnamed creek north of lake indicated on aerial photograph.

OUTFLOW: Estimated 2 to 4 cfs on Oct. 6, 1971, under Highway 101 to the Pacific Ocean.

USE: Fishing for trout, bass, and crappie. The lake is used extensively for boating and related activities.

REMARKS: A park is north of the lake and a church organization is to the south. Tillamook County owns some land on the south shore.



WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.1	127
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 21

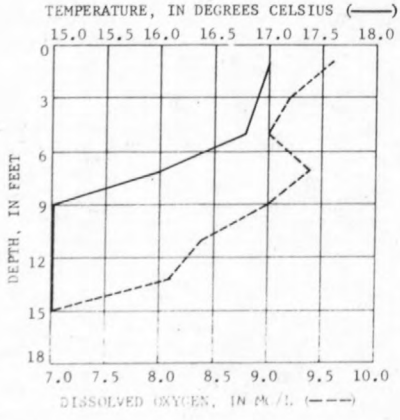
TOTAL HARDNESS (Mg/l as $CaCO_3$): 22

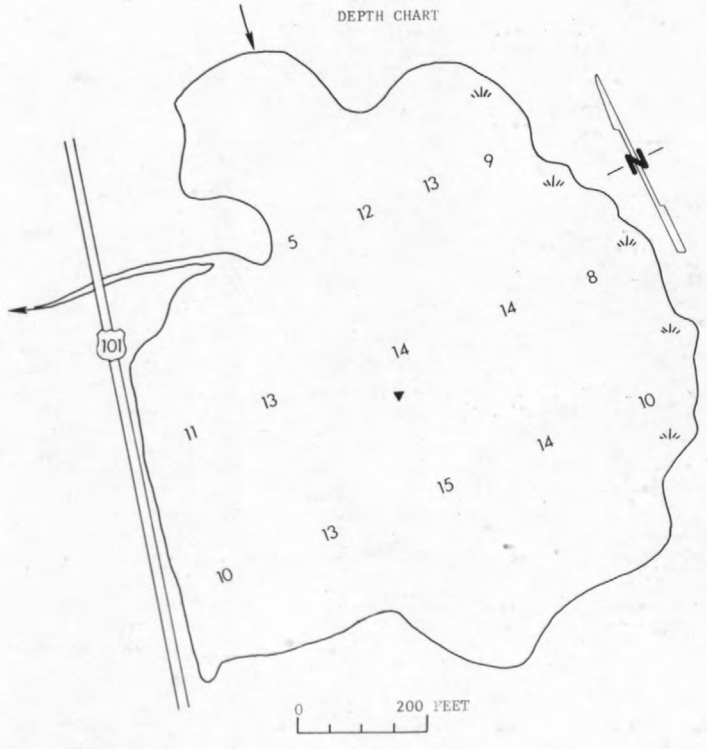
TOTAL DISSOLVED SOLIDS (Mg/l): --

TRANSPARENCY (Feet): 9

COLOR (Units): --

COLIFORM (Colonies/100 ml): >10,000





▼ Sampling site at

lat 45°35'40", long 123°56'40"

LOCATION: T.4 S., R.10 W., sec.18, about 1 mile north of Woods, Oreg., and 4.5 miles west of Hebo, Oreg. U.S. Geological Survey 15-minute topographic map, Hebo quadrangle.

DESCRIPTION: The lake lies in a depression, with sand dunes to the west and foothills to the east. Because of dead trees and brush, the east end of the lake is impassable. A concrete dam was constructed near the outlet by the Oregon State Game Commission. The lake is surrounded primarily by alder, with some second-growth fir, spruce, and hemlock, interlaced with dense underbrush.

DRAINAGE BASIN: Nestucca River basin.

DRAINAGE AREA: 0.4 square mile.

SURFACE AREA: 9 acres.

SURFACE ELEVATION: 50 feet above mean sea level, from topographic map. Varies seasonally about 1 foot (Fish Commission of Oregon, 1962).

VOLUME: 80 acre-feet.

INFLOW: Two small unnamed creeks from foothills east of the lake.

OUTFLOW: Estimated 1.7 cfs over dam on south end of lake on Nov. 2, 1971. Flows south to the Nestucca River.

USE: Fishing for cutthroat trout. Not all the lake is open to the public.

REMARKS: Land around the lake, except near the outlet, is privately owned. For additional information, see Fish Commission of Oregon (1962). The depth chart is from a Sept. 11, 1959, survey by the Fish Commission of Oregon and was field checked by the U.S. Geological Survey.

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	7.0	104
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 15

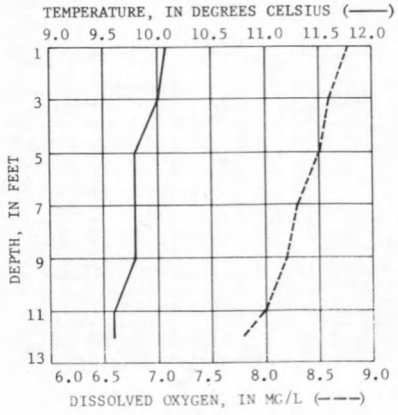
TOTAL HARDNESS (Mg/l as $CaCO_3$): 20

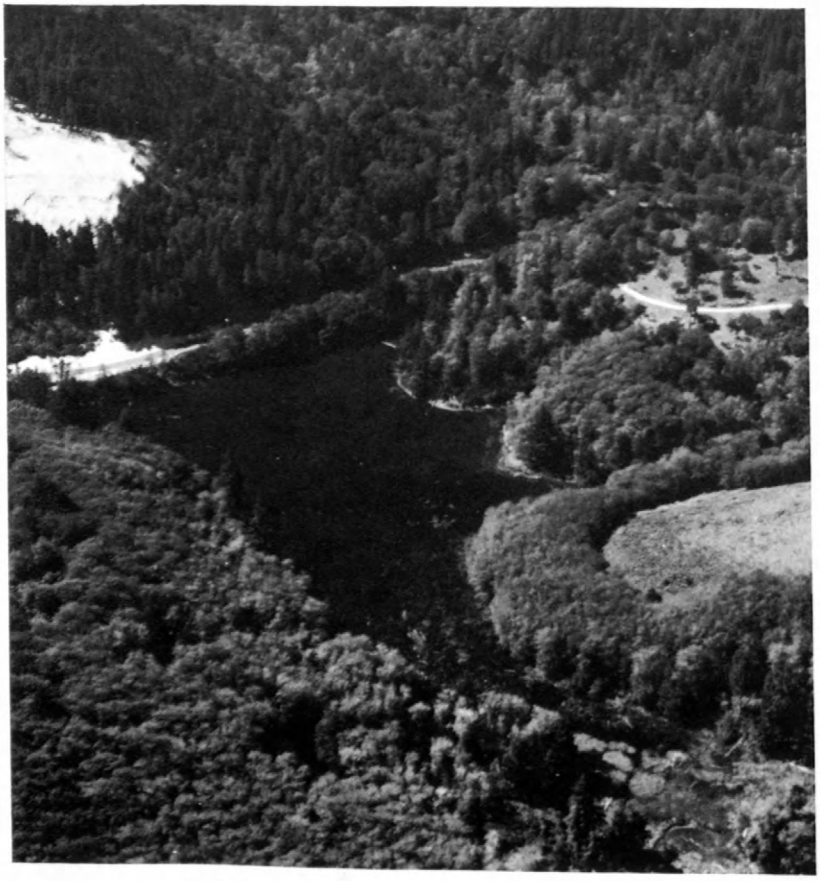
TOTAL DISSOLVED SOLIDS (Mg/l): --

TRANSPARENCY (Feet): 10

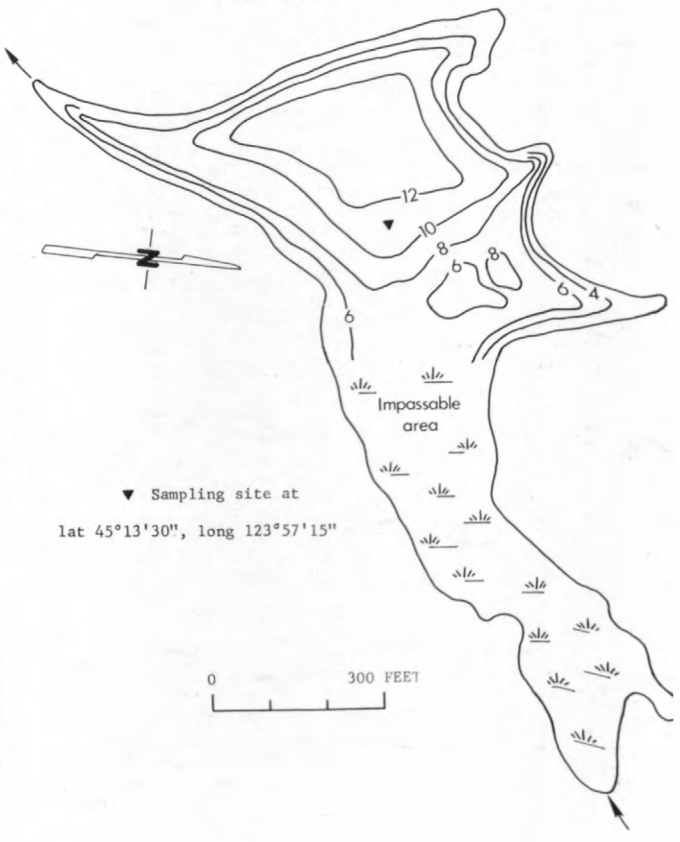
COLOR (Units): --

COLIFORM (Colonies/100 ml): 1030





DEPTH CHART



LOCATION: T.3 N., R.6 W., sec.17, about 7.5 miles west of Timber, Oreg. U.S. Geological Survey 15-minute topographic map, Timber quadrangle.

DESCRIPTION: Small pond created by damming the Salmonberry River with branches and small logs. The hills around the pond are covered with second-growth fir and dense brush.

DRAINAGE BASIN: Nehalem River basin.

DRAINAGE AREA: 2.8 square miles.

SURFACE AREA: Less than 1 acre on Nov. 1, 1972.

SURFACE ELEVATION: 1,800 feet above mean sea level, from topographic map.

VOLUME: Not determined.

INFLOW: Salmonberry River, east side of pond.

OUTFLOW: Continuation of Salmonberry River on south side of pond.

USE: None apparent.

REMARKS: For additional information regarding recreational potential, see Oregon State Game Commission (1969). Water sampled at lat 45°44'35", long 123°26'50".

WATER-QUALITY DATA

	pH (Units)	CONDUCTIVITY (Micromhos at 25°C)
SURFACE:	6.9	33
BOTTOM:	--	--

ALKALINITY (Mg/l as $CaCO_3$): 26

TOTAL HARDNESS (Mg/l as $CaCO_3$): 20

TOTAL DISSOLVED SOLIDS (Mg/l): 66

TRANSPARENCY (Feet): 3

COLOR (Units): 20

COLIFORM (Colonies/100 ml): 53

	TEMPERATURE (°C)	DISSOLVED OXYGEN (Mg/l)
SURFACE:	5.5	10.2
BOTTOM:	--	--

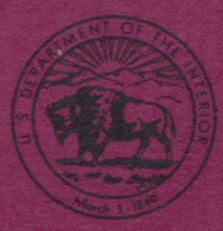
Index

Note: Identification numbers are shown for some lakes.

As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities for water, fish, wildlife, mineral, land, park, and recreational resources. Indian and Territorial affairs are other major concerns of America's "Department of Natural Resources."

The Department works to assure the wisest choice in managing all our resources so each will make its full contribution to a better United States—now and in the future.

CULLABY LAKE



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