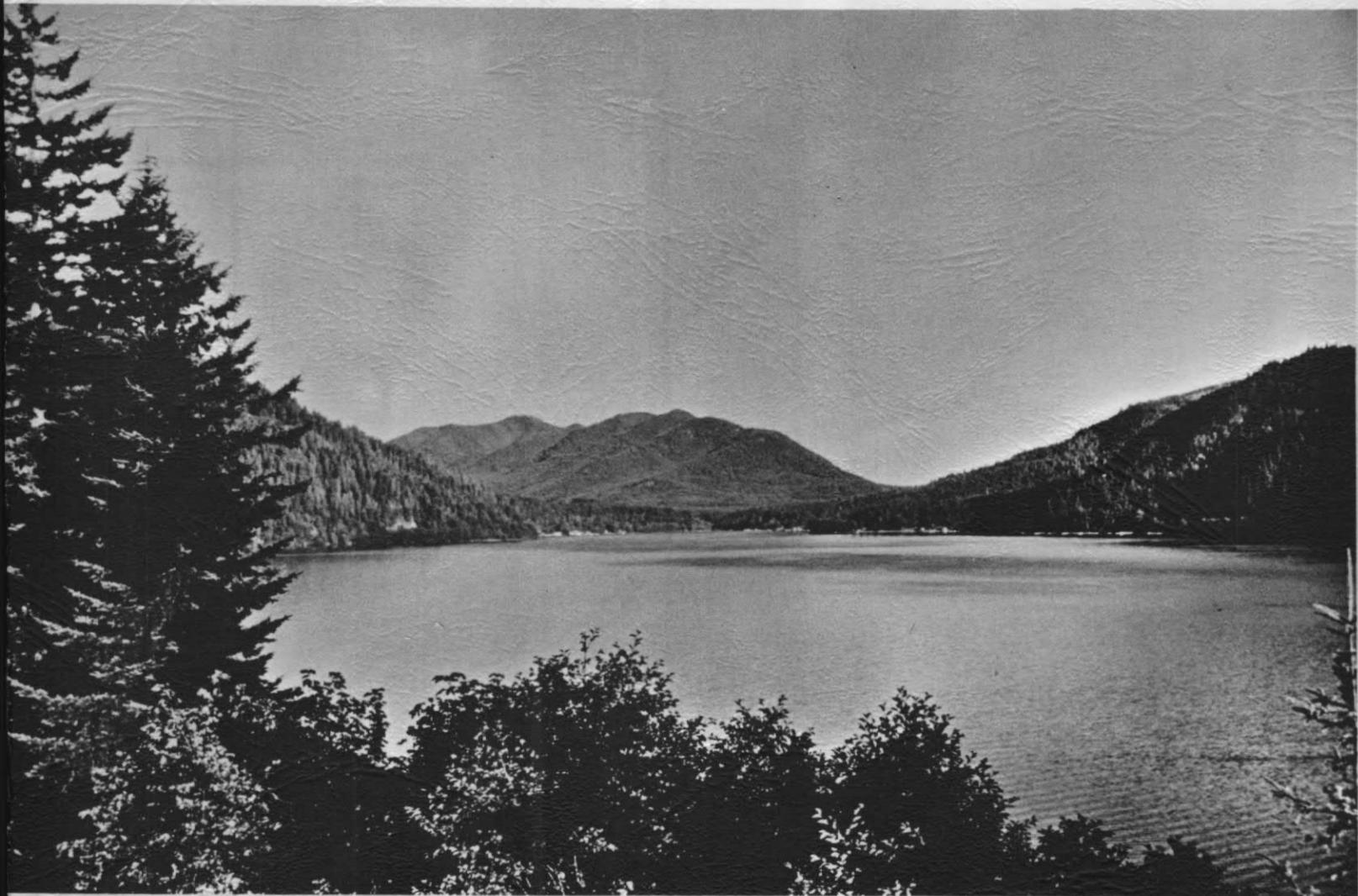


# TROPHIC CLASSIFICATION OF WASHINGTON LAKES USING RECONNAISSANCE DATA



STATE OF WASHINGTON  
BOOTH GARDNER, Governor  
DEPARTMENT OF ECOLOGY  
ANDREA BEATTY, Director

Water-Supply Bulletin 57

Prepared in Cooperation With  
United States Department of the Interior  
Geological Survey • 1985



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By

S. S. Sumioka and N. P. Dion

Prepared in cooperation with the  
UNITED STATES GEOLOGICAL SURVEY

1985



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METRIC (SI) CONVERSION FACTORS

| <u>Multiply</u>                           | <u>By</u> | <u>To obtain</u>                             |
|---|-----------|--|
| acre-----                                 | 4047      | square meter (m <sup>2</sup> )               |
| acre-foot (acre-ft)-----                  | 1233      | cubic meter (m <sup>3</sup> )                |
| foot (ft)-----                            | 0.3048    | meter (m)                                    |
| inch (in.)-----                           | 2.54      | centimeter (cm)                              |
| mile (mi)-----                            | 1.609     | kilometer (km)                               |
| square mile (mi <sup>2</sup> )-----       | 2.59      | square kilometer (km <sup>2</sup> )          |
| micromho per centimeter<br>at 25° Celsius |           | microsiemen per centimeter<br>at 25° Celsius |
| (umhos/cm at 25°C)-----                   | 1.000     | (uS/cm at 25°C)                              |

National Geodetic Vertical Datum of 1929 (NGVD of 1929): A geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called mean sea level; it is referred to as sea level in this report.

TROPHIC CLASSIFICATION OF WASHINGTON LAKES  
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ABSTRACT

A total of 134 Washington lakes were sampled to obtain information on their physical, cultural and water-quality conditions. Each lake was classified by trophic level using two methods: (1) a relative, multivariate technique based on Secchi-disc transparency and concentrations of total phosphorus, total organic nitrogen, and chlorophyll a in the epilimnion; and (2) an absolute, univariate technique based on any one of three water-quality parameters: Secchi-disc transparency, total phosphorus concentration, or chlorophyll a concentration.

The first method yielded a characteristic value (CV) for each lake with a range of 45 to 1,047 and median of 119, for the 134 lakes visited. The second method yielded trophic state index (TSI) values ranging from 30 to 67, 0 to 108, and 0 to 74, with medians of 44, 47, and 44 when based on Secchi disk transparency, total phosphorus, and chlorophyll a, respectively. In both methods, the degree of eutrophication increases as the numeric value increases. The lake rankings produced by the two methods were in general agreement, in that lakes were placed in about the same relative position using either system. Characteristic values and TSI's were also calculated for all lakes in Washington for which adequate data exist.

## INTRODUCTION

Washington has more than 7,800 lakes, ponds, and reservoirs, many of which provide recreational opportunities and supply water for agricultural, industrial, and municipal uses. Many of these lakes are in or near centers of population or are influenced by areas affected by man's activities; thus, the potential for cultural eutrophication and other water-quality problems is high. It is sometimes possible to restore deteriorated lakes or to slow the deterioration process using one or more restoration techniques (Peterson and others, 1974).

In order to select lakes for restoration, however, a knowledge of the general physical features, water quality, and trophic conditions of the lakes is required. In addition, Section 314(a) of the 1972 Amendments to the Federal Water Pollution Control Act (PL 92-500) specifically requires each state to identify and classify all publicly owned fresh waters within the State according to trophic condition. This requirement was partially satisfied by the publication of Washington Department of Ecology Bulletins 42 and 43, which contain a description of water-quality conditions in many Washington lakes; the detailed references are given at the end of this report.

A preliminary water-quality characterization has also been made for more than 600 Washington lakes (Bortleson, 1978). The purpose of the study summarized in this report, initiated in July 1981 by the U.S. Geological Survey in cooperation with the Washington Department of Ecology, was to update the information contained in these earlier bulletins and to provide additional knowledge of water quality conditions in Washington lakes. The study was partially funded by the Washington Department of Ecology and the U.S. Environmental Protection Agency.

### Objectives

This study was designed to (1) provide data pertaining to the physical, cultural, and water-quality characteristics of 43 lakes statewide not included in previous Geological Survey studies; (2) resample 91 lakes previously visited that either have had significant land-use changes in their drainage basins, or have significantly higher nutrient concentrations than expected in relation to the concentrations determined from previous studies; and (3) classify, according to trophic level, the 134 study lakes and all other Washington lakes for which adequate data exist, utilizing the techniques of Carlson (1977) and Bortleson (1978).

### Lake Selection

Lakes not sampled previously were selected from a gazetteer of Washington lakes (Wolcott, 1973a, b) using the criteria of lake surface area, proximity to urban centers, and degree of public use. Priority was given to large lakes, close to urban centers, that were used a great deal, on the assumption that these lakes would be most susceptible to water-quality degradation. Because most lakes larger than 20 acres had already been included in previous studies, lakes of this study were generally between 15 and 20 acres.

The selection of previously studied lakes was completed by personnel of the Washington Department of Ecology, and was based in part on input by regional planners, county agents, and resource managers. These persons identified lakes in their areas of responsibility where land use has changed extensively in the drainage basins, and lakes that have developed water-quality problems since last studied. Another selection technique was to compare predevelopment concentrations of the nutrient phosphorus, as calculated using a method devised by Gilliom (1980), with actual phosphorus concentrations as measured in past studies. Those lakes showing the greatest amount of increase in phosphorus concentration have theoretically been affected the most by development and were given priority for resampling.

### Occurrence of Lakes in Washington

Lakes in Washington occur under various geologic conditions. In the Puget Sound Lowland most lakes occupy depressions in the surface of glacial drift. These depressions are either elongate troughs cut by the passing ice sheet or more circular kettles formed by the melting of stagnant ice blocks. Still others are simply shallow depressions left on an irregular surface of glacial deposits.

In the adjacent foothills of the Cascade Range and Olympic Mountains, most lakes occupy depressions eroded into the bedrock by the passing continental glacier, while lakes in the higher mountains are in basins cut by local alpine glaciers.

In eastern Washington, lakes in the higher northern areas—the Okanogan Highlands and Selkirk Mountains—and on the eastern slope of the Cascade Range generally occur in glacier-cut depressions in bedrock. In the semiarid Columbia Plateau, underlain by basalt, most lakes occupy the more deeply cut parts of coulees of the Channeled Scablands. Most of these coulees were cut by gigantic, catastrophic floods (Bretz, 1959) resulting from the breaking of ice dams and the rapid emptying of large glacial lakes.

Many lakes have been formed, or increased in size, by man's activities. Numerous reservoirs are located in mountain valleys and serve a variety of purposes, including municipal water supply, irrigation, electrical-power generation, flood control, and recreation. In lowland areas, some natural lakes have been enlarged and new lakes have been formed by small dams. In the Columbia Basin Irrigation Project area of eastern Washington, several lakes have been enlarged and reservoirs have been created in conjunction with large-scale irrigation by water diverted from the Columbia River at Grand Coulee Dam. Also, numerous small lakes and ponds have resulted from irrigation in the area.

More detailed discussions of lake formation are provided by Hutchinson (1957) for lakes in general, and by Dion (1978) for Washington lakes.

The physical, cultural, and water-quality parameters used to describe the individual lakes studied in 1981 are explained in this section in the sequence in which it appears on the data sheet in Appendix A. An index to Appendix A begins on page 317, and indicates which of the 1981 study lakes had been studied previously and which had not. The definitions of numerous limnological and hydrological terms used throughout the report are provided in the Glossary (p. 24).

### General

Lake name. The lake name was taken from Geological Survey topographic maps. Duplicate lake names within a single county are followed by location (township, range, and section) designations for uniqueness. The proper name of the lake is given first; in common usage, however, the term "Lake" may either precede or follow the lake name. All adjectives (for example, Big, East, and Lower) follow the lake name. When a lake has two names, both are given, but priority is given to the topographic-map name. The lake names and respective data are listed alphabetically by counties.

Drainage basin. The river drainage basin in which the lake is located is designated by a Water Resources Inventory Area (WRIA) number as established by the Washington Department of Ecology. The WRIA numbers and names are listed in table 1.

Location. The township, range, section, latitude, and longitude were determined from Geological Survey topographic maps. The location point is the lake outlet; for lakes without outlets, the southernmost shoreline point was used. The lakes are presented in the report according to the county in which the location point is found.

Bathymetric map. A bathymetric map is presented for each lake, including the source, the scale of the map, and the date of preparation.

Aerial photographs. Oblique black-and-white aerial photographs, taken at the time of visit, are presented for most lakes. Vertical black-and-white aerial photos, obtained from the Washington Department of Natural Resources, are used only if suitable oblique photos were not available.

## TROPIC CLASSIFICATION OF WASHINGTON LAKES

TABLE 1.--Water-resource inventory areas of Washington

| <u>Number</u> | <u>WRIA</u><br><u>Name</u> | <u>Number</u> | <u>WRIA</u><br><u>Name</u> |
|---------------|----------------------------|---------------|----------------------------|
| 01            | Nooksack                   | 32            | Walla Walla                |
| 02            | San Juan                   | 33            | Lower Snake                |
| 03            | Lower Skagit-Samish        | 34            | Palouse                    |
| 04            | Upper Skagit               | 35            | Middle Snake               |
| 05            | Stillaguamish              | 36            | Esquatzel Coulee           |
| 06            | Island                     | 37            | Lower Yakima               |
| 07            | Snohomish                  | 38            | Naches                     |
| 08            | Cedar-Sammamish            | 39            | Upper Yakima               |
| 09            | Duwamish-Green             | 40            | Alkali-Squillchuck         |
| 10            | Puyallup-White             | 41            | Lower Crab                 |
| 11            | Nisqually                  | 42            | Grand Coulee               |
| 12            | Chambers-Clover            | 43            | Upper Crab-Wilson          |
| 13            | Deschutes                  | 44            | Moses Coulee               |
| 14            | Kennedy-Goldsborough       | 45            | Wenatchee                  |
| 15            | Kitsap                     | 46            | Entiat                     |
| 16            | Skokomish-Dosewallips      | 47            | Chelan                     |
| 17            | Quilcene-Snow              | 48            | Methow                     |
| 18            | Elwha-Dungeness            | 49            | Okanogan                   |
| 19            | Lyre-Hoko                  | 50            | Foster                     |
| 20            | Soleduck-Hoh               | 51            | Nespelem                   |
| 21            | Queets-Quinault            | 52            | Sanpoil                    |
| 22            | Lower Chehalis             | 53            | Lower Lake Roosevelt       |
| 23            | Upper Chehalis             | 54            | Lower Spokane              |
| 24            | Willapa                    | 55            | Little Spokane             |
| 25            | Grays-Elochoman            | 56            | Hangman                    |
| 26            | Cowlitz                    | 57            | Middle Spokane             |
| 27            | Lewis                      | 58            | Middle Lake Roosevelt      |
| 28            | Salmon-Washougal           | 59            | Colville                   |
| 29            | Wind-White Salmon          | 60            | Kettle                     |
| 30            | Klickitat                  | 61            | Upper Lake Roosevelt       |
| 31            | Rock-Glade                 | 62            | Pend Oreille               |

### Physical

Physical data were collected from topographic maps, bathymetric maps, and aerial reconnaissance from a helicopter. Drainage areas and lake altitudes were determined from topographic maps. Bathymetric maps were used to calculate such morphometric parameters as area, volume, mean depth, maximum depth, shoreline length, shoreline configuration, development of volume, and bottom slope.

The physical characteristics of lakes are presented not only because they may influence the trophic status of the lakes, but because they provide values by which lakes may be compared. Further discussions of the determination of morphometric parameters and their significance are presented by Dion (1978) and most textbooks on limnology (for example, Hutchinson, 1957, and Wetzel, 1975).

Drainage area. The drainage area that contributes runoff water to each lake was computed from Geological Survey maps, based on topographic divides. Some lakes are in drainage basins where rainfall is so low that surface-water runoff to the lake may not be a significant factor.

Altitude. The altitude of the lake water surface above sea level was determined from topographic maps.

Lake area (A). The surface area of the lake, in acres, was obtained from the lake outline on the bathymetric map. Because lake area can vary between seasons and from year to year, the area figures reported (as well as other morphometric data) are intended only to describe the general size of the lake.

Lake volume (V). Lake volume, in acre-feet, was obtained by computing and then summing the volumes of each stratum of water between successive contours on the bathymetric map.

Mean depth ( $\bar{Z}$ ). The mean depth for a lake is obtained by dividing the volume of the lake by its area. It represents, in a single quantity, a relationship between depth, volume, and area, and can be used in comparing lakes.

Maximum depth ( $Z_m$ ). The greatest depth of the lake as determined from the bathymetric map.

Shoreline length (L). The distance around, or perimeter of, the water surface touching the shore (zero contour line), as shown on the bathymetric map. The shoreline length is used in calculation of shoreline configuration.

Shoreline configuration ( $D_L$ ) (also called shoreline development). A dimensionless ratio of shoreline length to the circumference of a circle having an area equal to that of the lake, given as

$$D_L = \frac{L}{\sqrt{2\pi A}}$$

This quantity is an index of the potential for littoral, or near-shore, geological and biological processes to affect the lake. Nearly circular lakes have values near unity, oval or irregularly shaped lakes have higher  $D_L$  values, and very elongated lakes have the highest  $D_L$  values. High values for shoreline configuration suggest the presence of inlets and protected bays--areas suitable for plant growth--and also indicate an increase in contact between land and water. Therefore, shoreline configuration is often an indirect indicator of plant growth capacity and enrichment potential from nearshore development and runoff.

Development of volume ( $D_V$ ). The development of volume is defined as the ratio of the mean depth ( $Z$ ) to the maximum depth ( $Z_m$ ), and represents an expression of the form or shape of the lake basin as related to lake volume. Lakes with a low  $D_V$  ratio are usually cone-shaped depressions, and lakes with a high  $D_V$  ratio are steep-sided with flat bottoms. Shallow flat-bottomed lakes, which have high  $D_V$  values, tend to provide a greater opportunity for exposure of nutrient-rich bottom sediments to light and warmer, near-surface water, which in turn could stimulate phytoplankton growth in the overlying water.

Bottom slope ( $Z_r$ ). Bottom slope is a percentage ratio of the maximum depth of a lake to its surface area, expressed as the mean lake diameter. It is calculated from the equation

$$Z_r = \frac{88.6 (Z_m)}{\sqrt{A}}$$

Lakes with high bottom slopes will have a small surface area relative to the maximum depth. Thus, bottom slope is a measure of the extent of shallow water, which is important to the growth of rooted aquatic plants and to the potential for wind mixing of bottom sediments with the overlying water. This quantity is sometimes referred to as relative depth (Hutchinson, 1952).

Surface inflow. The presence or absence of a surface inflow of water, as determined from maps or by aerial reconnaissance, is indicated. However, even though no inflow may be indicated, a surface inflow may in fact be present at other times of the year, or may have been present but not seen from the air because of heavy vegetation. Some lakes have no surface inflow, and water gain is by direct precipitation and (or) ground-water seepage.

Surface outflow. The presence or absence of a surface outflow of water, as determined from maps or by aerial reconnaissance, is indicated. The presence of a dry outflow channel was considered to constitute an outflow for purposes of this report. As with inflows, outflows may be present only during part of the year, or the channel may not have been visible at the time of aerial reconnaissance. Some lakes have no surface outflow, and water loss is by evaporation, transpiration, and (or) ground-water seepage.

### Cultural

Data related to cultural development were obtained from topographic maps, aerial photographs, and aerial reconnaissance of the shoreline. These data give a general indication of the potential for nutrient loading to a lake. For example, a lake with a large number of nearshore homes and a relatively high percentage of residential development in the drainage basin will be more likely to receive nutrient inputs, and at higher concentrations, than a lake with few or no homes along the shore.

Nearshore residential development. The percentage of shoreline occupied by residential development.

Number of nearshore homes. A count of the number of nearshore homes adjoining the lakefront.

Land use in drainage basin. The drainage basins of the lakes were partitioned into various generalized land use categories. Values given reflect the percentages of the basin used primarily for forest or for residential urban, residential suburban, or agricultural development. The lake surface is also given as a percentage of the total drainage basin. A general description of the land-use categories is as follows:

- a. Residential urban.--Predominant use is for single-family residences, although apartment complexes and commercial or industrial activities also may be present.
- b. Residential suburban.--Predominant use is single-family residences.
- c. Agricultural.--Pasture or cropland.
- d. Forest or unproductive.--Public and private forest lands and tree farms. Lands may include cleared or fallow unproductive land, meadows, wetlands, and recreational areas.
- e. Lake surface.--Includes the surface area of the study lake and of upstream tributary lakes.

Public boat access to lake. The presence of a public boat access access is shown on the bathymetric map (symbol, black triangle).

### Water Quality

Water-quality samples were collected from each lake during June and July 1981 using a float-equipped helicopter, except for three lakes which were sampled by boat in September 1981.

Vertical profiles of temperature and dissolved-oxygen concentration were made over the deepest part of the lake as determined from bathymetric maps or by sounding. Discrete samples were taken 3 feet below the water surface and 3 feet above the lake bottom for the determination of specific conductance, pH, and nutrient concentrations. Lakes less than 7 feet deep were sampled only at the 3-foot depth. The transparency of the water was determined by Secchi disc.

The collection of biological data involved sampling from the 3-foot depth for the determination of chlorophyll *a* concentration, and a low-level aerial reconnaissance of the lake surface and shoreline to determine the extent of macrophyte coverage.

All samples were collected and analyzed according to accepted standardized procedures (Greeson and others, 1977; Skougstad and others, 1979; American Public Health Association and others, 1980).

Water temperature. Water temperature, which varies in lakes with depth and time of year, is an important controlling factor for life processes and chemical-reaction rates, as well as many physical events that occur in the aquatic environment. For some lakes, the water temperatures listed for the upper, near-surface water were probably close to the maximum for the year. Temperature profiles in lakes during midsummer generally follow one of two common patterns. In shallow lakes, well exposed to the wind, temperatures are practically constant from top to bottom. This uniformity of temperature indicates that the water is well mixed throughout. The other common pattern occurs in deeper lakes, where three characteristic thermal layers, or zones, are present: (1) an upper zone (epilimnion) of warmer water in which temperature is more or less uniform throughout; (2) an intermediate zone (metalimnion) in which temperature declines rapidly with depth; and (3) a lower zone (hypolimnion) of colder water in which temperature is again more or less uniform throughout. This thermal relationship (warmer water at surface and colder water near bottom) prevents vertical mixing of the lake.

Of special significance is the temperature of the hypolimnion compared to the epilimnion during midsummer, because (1) temperature stratification and the resultant lack of water circulation affect the vertical distribution of nutrients, and (2) water temperatures affect the potential of cold-water fisheries resources.

A more detailed discussion of thermal relationships in lakes is presented by Dion (1978).

Dissolved oxygen. The concentration of DO (dissolved oxygen) in a lake varies with time of year and depth of water, and is a function of many factors, including the water temperature, atmospheric pressure, and salinity of the water. Oxygen concentration in water is continually being altered by life processes, such as photosynthesis and respiration, and by complex chemical reactions. Of special biological significance is the amount of DO in the hypolimnion during midsummer. The organisms in the lighted upper layers of water produce organic matter that eventually settles to the bottom, where bacteria consume oxygen to degrade the organic materials, thereby reducing the DO concentration in the hypolimnion. Thus, the hypolimnetic-oxygen deficit frequently is related to the biomass or plant growth in the upper water (Hutchinson, 1957). For good growth and general health of trout, salmon, and other species of cold-water biota, the DO concentrations should not be less than 6.0 mg/L (milligrams per liter) according to the Federal Water Pollution Control Administration (1968). The U.S. Environmental Protection Agency (1977) has established a criterion of 5 mg/L as the minimum dissolved concentration required to maintain a "good fish population."

Specific conductance. Specific conductance is a measure of the water's ability to conduct an electric current, and is expressed in micromhos per centimeter (umho/cm) at 25°C (25 degrees Celsius). Because the specific conductance is related to the concentration and chemical types of ions in solution, it can be used for approximating the dissolved-solids concentration in the water. The purer the water, the greater its resistance to electrical flow, and the lower the specific conductance value. In general, lakes drained by outflow channels have low conductivities, reflecting the relatively rapid rate of water movement from inflows to outflow. In those lakes lacking significant outflow channels, the ionic composition of the water is, in large part, dependent on concentration effects due to evaporation from the lake surface. The specific conductance of water in western Washington lakes usually ranges from 25 to 100 umho/cm and in eastern Washington lakes from 100 to 400 umho/cm, except in the Columbia Basin, where the values range from 400 to 800 umho/cm.

pH. pH is the negative logarithm of the hydrogen-ion concentration, expressed as a number from 0 to 14. A pH of 7 is neutral, a pH less than 7 is acidic, and a pH greater than 7 is basic.

The Environmental Protection Agency (1977) has established a pH range of 6.5 to 9.0 as being satisfactory for the well-being of freshwater fish and invertebrate fish-food organisms. While the pH of a water may not directly affect all living organisms, the toxicity of some compounds increases when the pH is very low or very high. Additionally, in association with anaerobic conditions (very little or no dissolved oxygen), changes in pH affect the solubility of nutrients and some metallic elements (iron, manganese, and aluminum, for example) found in lake sediments.

Nutrients. A nutrient is any chemical element, ion, or compound that is required by an organism for the continuation of growth, reproduction, and other life processes. Many elements and compounds act as nutrients to supply the food for aquatic plants. Nitrogen and phosphorus, however, usually are considered the limiting nutrients for aquatic plant growth—algae in particular—and as such, were the only nutrients considered in this study. Whatever nutrient is limiting algal growth, the concentrations of nitrogen and phosphorus are useful in evaluating the trophic conditions of a lake (Lee, 1972). The nutrient concentrations that were determined at top and bottom sampling depths included total nitrate, total nitrite, total ammonia, total organic nitrogen, total nitrogen, dissolved orthophosphate, and total phosphorus.

Water transparency. Water transparency is usually expressed in terms of Secchi-disc transparency, which is the depth at which a black-and-white disc (8 inches in diameter) disappears from view when lowered into the water. Because changes in biological production can cause changes in the color and turbidity of a lake, Secchi-disc transparency often is used as a gross measure of the quantity of plankton in the water. Secchi-disc depths preceded by the symbol ">" indicate the disc was resting on the bottom of the lake and was still visible.

Chlorophyll a. Chlorophyll a is a green photosynthetic pigment present in all groups of algae. The concentration of chlorophyll a is frequently used in estimating the productivity level of a lake and in quantifying its trophic state. The chlorophyll a values reported on the data sheets have been adjusted to exclude contributions from phaeophytin, a pigment formed when chlorophyll breaks down.

Aquatic macrophytes. Aquatic macrophytes are plants that have roots, stems, and leaves and can usually be seen with the unaided eye.

Estimates of the percentage of both the littoral (shoreline) and water-surface (entire lake) zones covered by emersed and (or) floating aquatic macrophytes were made by visual inspection during the aerial reconnaissance.

### TROPIC CLASSIFICATION

The very broad nature of the traditional classification categories of oligotrophic, mesotrophic, and eutrophic makes them inadequate for all but the most general of uses. Shapiro (1975) argued that in order to properly identify and manage lakes, to estimate their recreational potential, to estimate their sensitivity to degradation, and to restore them efficiently, the lakes should be classified with quantitative trophic indices. Shapiro further suggested that what limnology needed was a classification system analogous to the Richter scale used to describe earthquakes—an objective, numerical scale whose derivation might not be understood by all, but whose significance has come to be appreciated through use. In recent years, numerous lake-classification schemes have been developed.

As part of this investigation, all Washington lakes for which adequate data exist were classified trophically using two methods. One method utilized principal-component analysis to derive a characteristic value (CV) for each lake. The characteristic value concept was developed by Bortleson (1978) specifically for Washington lakes, using data from 617 lakes. It is both relative and multivariable in nature. In a relative classification scheme, classes are based on analysis of the data base; that is, lakes are classified with respect to one another.

The other method yielded trophic state indices (TSI's) for each lake. The TSI system was developed for Minnesota lakes (Carlson, 1977), but has since proven to have broad geographic applicability. It is both absolute and univariate in nature, although in theory the same TSI number can be calculated using any one of three variables.

An absolute classification scheme is composed of predefined classes that do not depend on the data base. Such a scheme is simpler to use than a relative scheme, and new lakes can be added without changing the structure of the classification.

#### Characteristic Value (CV)

Principal-component analysis examines a set of data so that linear relationships between variables are obtained that account for the variation within the data. The first principal component accounts for the largest percentage of the variance in the data, with each succeeding principal component accounting for smaller and smaller percentages. As many principal components can be determined as there are variables. The results of the analysis yield vectors, the elements of which are the correlations of each variable with the components, and also the amount of the total sample variance represented by each component. A more thorough discussion of the theoretical basis and computational methods for principal-component analysis can be found in Morrison (1967). Applications of principal-component analysis to hydrology (and lake classification in particular) may be found in Shannon and Brezonik (1972), Bortleson (1978), and Ciecka and others (1980).

In this study, four water-quality variables were used in the principal-component analysis: Secchi-disc transparency, and concentrations of total organic nitrogen, total phosphorus, and chlorophyll a in the epilimnion. These variables were selected because they are commonly used to characterize the trophic conditions of lakes (Shannon and Brezonik, 1972; Bortleson, 1978; and Chapra and Dobson, 1981). It should be noted that in the original development of the CV concept, Bortleson did not include the variable chlorophyll a because chlorophyll data were not available for most lakes.

The equation for determining CV, which follows, was derived using the methods described by Bortleson (1978) and Shannon and Brezonik (1972).

$$CV = 73.7 (TON-1.05) + 304 (TP-0.057) + 159 (1/SD-0.47) + 3.35 (Chl-8.38) + 178.4 \quad (1)$$

where

- CV = characteristic value,
- TON = total organic-nitrogen concentration of epilimnion, in mg N/L (milligrams of nitrogen per liter)
- TP = total phosphorus concentration of epilimnion, in mg P/L (milligrams of phosphorus per liter),
- SD = Secchi-disc transparency, in meters, and
- Chl = chlorophyll a concentration of epilimnion, in ug chl a/L (micrograms of chlorophyll a per liter).

Lakes with higher CV's are generally considered to be more "eutrophic" than lakes with lower CV's.

Characteristic values for each of the 134 lakes sampled as part of this study are given on the individual lake data sheets (Appendix A) and are listed in aggregate in Appendix B. Appendix C lists CV's calculated by Bortleson (1978) for 616 lakes and, where appropriate data exists, TSI's for an additional 160 lakes.

### Trophic-State Index

Because a TSI number can be calculated using any one of three variables, Reckhow (1979) believes the method is actually multivariate. Carlson (1979) also stated that his method could be made multivariable by averaging the three TSI's (but if one of the TSI's diverged significantly from the other two, it would be difficult to detect the divergence in the average value). However, the use of a single variable upon which to base a trophic state index greatly simplifies data collection and, according to Wentz (1981), leads to less ambiguity than do indices based on several variables. A disadvantage of the single-variable approach is that as fewer variables are used, the index becomes more unstable. Shannon and Brezonik (1972) present the example that if phytoplankton biomass was the sole criterion, lakes with a dense macrophyte and (or) periphyton population but low phytoplankton population would be misclassified as "oligotrophic."

Carlson's TSI was developed by first assigning a TSI range of 0-100 to the largest range of Secchi-disc depth that could reasonably be expected (0-210 ft), such that a halving or doubling of the Secchi-disc depth corresponded to a change of 10 units in TSI. Regression equations were then used to relate the TSI to concentrations of total phosphorus and chlorophyll a. Because of this regression approach, values of TSI greater than 100 are not uncommon for trophic determinations based on total phosphorus.

TSI values are calculated from Secchi-disc depth and concentrations of total phosphorus and chlorophyll a as follows:

$$TSI(SD) = 10 \left( 6 - \frac{\ln SD}{0.693} \right) \quad (2)$$

$$TSI(TP) = 10 \left( 6 - \frac{\ln \frac{48}{TP}}{0.693} \right) \quad (3)$$

$$TSI(Chl) = 10 \left( 6 - \frac{2.04 - 0.68 \ln Chl}{0.693} \right) \quad (4)$$

where

- SD = Secchi-disc depth, in meters,
- TP = total phosphorus concentration of epilimnion, in ug P/L (micrograms of phosphorus per liter), and
- Chl = chlorophyll a concentration, in ug chl a/L.

Carlson (1977) suggested that for purposes of classification in summer, priority should be given to the chlorophyll index. In spring, autumn, and winter, when algal growth may be limited by factors other than phosphorus, priority should be given to the total phosphorus index. These priorities would result in about the same TSI during any season of the year.

TSI values for the 134 lakes sampled as part of this study are given on the individual lake data sheets (Appendix A) and in Appendix B. As in the Bortleson method, lakes with higher TSI values are normally considered more "eutrophic" than lakes with lower values.

As might be expected, the TSI values determined separately from the three parameters do not always coincide for an individual lake. Shapiro (1975) points out that this does not necessarily mean that some of the index values are wrong, but may indicate instead certain facts about the individual lake's behavior. For example, if the  $TSI_{(TP)}$  is higher than the  $TSI_{(SD)}$  or  $TSI_{(Ch)}$ , it could indicate either that the lake is not phosphorus-limited, or that grazing by herbivorous zooplankton is sufficient to keep algal populations at a low level.

The advantages of Carlson's TSI method are that it is simple, uses easily obtained data, is highly objective, the raw data can be retrieved from the index values, and additional lakes may be indexed at any time.

### Summary of Trophic Values

Ranges and median values of CV and of TSI for both 1981 and pre-1981 lake data are presented in table 2 for purposes of summary. Although 91 lakes were previously visited, only 85 had been included by Bortleson (1978) in the data set used to develop the CV concept. The data in table 2 should be used only to obtain an overview of the CV's and TSI's for each group of lakes, and not as a statistical comparison between lakes through time.

On the basis of comparisons with other methods of classifying lakes, Carlson (1979) has suggested limits of TSI values that correspond to the traditional terms "oligotrophic" and "eutrophic." He found that a mean TSI value of 41 (with a standard deviation of 5.8) was the upper limit of oligotrophy, and a mean TSI value of 51 (s.d. = 7.6) was the lower limit of eutrophy. Although these suggested guidelines are of limited use when applied to the median value of a large number of lakes, they are of considerable use in estimating the likely trophic levels of the individual lakes described in Appendix A and in describing the "trophic range" of the study lakes in aggregate.

TABLE 2.--Ranges and median values of CV (characteristic value)  
and TSI (trophic state index)

| Index           | Pre-1981 <sup>1</sup> |        |         | 1981 <sup>2</sup>  |        |          |
|-----------------|-----------------------|--------|---------|--------------------|--------|----------|
|                 | Number<br>of lakes    | Median | Range   | Number<br>of lakes | Median | Range    |
| CV:             |                       |        |         |                    |        |          |
| Original        | 3617                  | 55     | 1-1,259 | 85                 | 106    | 46-77    |
| Newly visited   | --                    | --     | --      | 49                 | 157    | 45-1,047 |
| Total           | --                    | --     | --      | 134                | 119    | 45-1,047 |
| TSI:            |                       |        |         |                    |        |          |
| SD <sup>4</sup> | 712                   | 46     | 12-93   | 134                | 44     | 30-67    |
| TP <sup>4</sup> | 775                   | 47     | 4-142   | 134                | 47     | 0-106    |
| CH <sup>4</sup> | 99                    | 45     | 27-65   | 134                | 44     | 0-74     |

<sup>1</sup>Pre-1981 CV values are based on Secchi-disc transparency and concentrations of total organic nitrogen and total phosphorus.

<sup>2</sup>1981 CV values are based on Secchi-disc transparency and concentrations of total organic nitrogen, total phosphorus, and chlorophyll a.

<sup>3</sup>Original method data base.

<sup>4</sup>TSI(SD), TSI(TP), and TSI(CH) refer to the trophic state index based on Secchi-disc transparency, total phosphorus, and chlorophyll a concentrations, respectively.

The TSI system appears to be the most meaningful way to classify a lake or group of lakes, because the system is absolute and univariate in nature. However, the choice of variable on which to base the system is very important, and without a knowledge of the chemical and biological processes occurring in a lake, the resulting TSI number may be misleading. A problem of interpretation is also present when two or more TSI's are determined for a lake; that is, how to reconcile differing TSI's. Although an average of the different TSI's for a lake yields a single number, some advantages of a univariate classification are lost.

Because the CV of a lake is a relative value, the assignment of trophic names (oligotrophic, eutrophic, etc.) to a particular range of CV's is not recommended. The method can be used, however, to detect temporal changes of trophic level in individual lakes and to compare trophic levels of two or more lakes.

A comparison of TSI's using pre-1981 data with TSI's calculated from 1981 data can be done for specific lakes using Appendix B. For example, in 27 lakes, TSI(SD) decreased (indicating an improvement in Secchi-disc transparency), while TSI(TP) increased (indicating increased total phosphorus concentration in the epilimnion). One possible explanation for this relationship may be that some nutrient other than phosphorus is limiting the growth of phytoplankton in these 27 lakes.

However, comparisons of only two trophic assessments made several years apart are probably inadequate to detect long-term changes in trophic level. In addition, short-term fluctuations of nutrient concentrations, suspended matter, and biological activity undoubtedly occur because of varying climatic, hydrologic, and chemical conditions, so a trophic designation based on a single sample in time may not reliably represent the long-term trophic status of a lake.

It should also be emphasized that, because the range in CV units for the 1981 study was approximately 10 times that of the TSI range (see table 2), CV and TSI units should not be equated or compared.

To determine the degree of similarity of relative lake rankings as determined by both classification methods, the lakes were listed by order of increasing trophic number calculated from each equation (1981 CV, Bortleson's CV with 1981 data, TSI(SD), TSI(TP), and TSI(Chl)). The calculation of CV's from data not used in the derivation of Bortleson's original equation was based on the assumption that, because the new data were within the range of those used to develop the original equations, any discrepancies would be minor and the overall interpretation would be valid. Spearman's rank-correlation coefficients were then calculated for all possible pairs of rankings. The coefficients provided an indication of the similarity in the ranking of the lakes as determined by each equation. A coefficient ( $r$  value) of 1.0 indicates that the two classification methods have ranked the lakes in exactly the same order, even though the actual trophic numbers (CV or TSI) differ in magnitude. Less perfect correlations would produce coefficients of less than 1.0.

The following matrix present the correlation coefficients calculated for the pairs of rankings.

|                    | 1981<br>CV | Bortleson<br>CV | TSI <sub>TP</sub> | TSI <sub>SD</sub> | TSI <sub>Chl</sub> |
|--------------------|------------|-----------------|-------------------|-------------------|--------------------|
| 1981 CV            | 1.0        | 0.90            | 0.66              | 0.90              | 0.79               |
| Bortleson CV       |            | 1.0             | 0.54              | 0.67              | 0.53               |
| TSI <sub>TP</sub>  |            |                 | 1.0               | 0.60              | 0.52               |
| TSI <sub>SD</sub>  |            |                 |                   | 1.0               | 0.81               |
| TSI <sub>Chl</sub> |            |                 |                   |                   | 1.0                |

As might be expected, the 1981 CV's compare well with the Bortleson CV's using 1981 data ( $r = 0.90$ ). The 1981 CV's also compare well with TSI(SD)'s and TSI(Chl)'s ( $r = 0.90$  and  $r = 0.79$ , respectively); the correlation is not as good with TSI(TP) ( $r = 0.66$ ) but it is still significant ( $\alpha = 0.01$ ; that is, the probability that there is no correlation is 1 percent).

The matrix also indicates that the correlation coefficients between lakes listed by TSI(TP) and the other TSI numbers are relatively low. One possible explanation for the low correlations is that phosphorus may be present in the lakes but not associated with algal biomass (as measured by Secchi-disc transparency and (or) chlorophyll a concentration).

- American Public Health Association, American Water Works Association, and Water Pollution Control Federation, 1980, Standard methods for the examination of water and wastewater, (15th ed.): New York, American Public Health Association, Inc., 1134 p.
- Bortleson, G.C., 1978, Preliminary water-quality characterization of lakes in Washington: U.S. Geological Survey Water-Resources Investigations 77-94, 31 p.
- Bortleson, G. C., Higgins, G. T., and Hill, G. W., 1974, Data on selected lakes in Washington, part II: Washington Department of Ecology Water-Supply Bulletin 42, 145 p.
- Bortleson, G. C., Dion, N. P., McConnell, J. B., and Nelson L. M., 1976a, Reconnaissance data on lakes in Washington, v. 1, Clallam, Island, Jefferson, San Juan, Skagit, and Whatcom counties: Washington Department of Ecology Water-Supply Bulletin 43, v. 1, 248 p.
- 1976b, Reconnaissance data on lakes in Washington, vol. 2, King and Snohomish counties: Washington Department of Ecology Water-Supply Bulletin 43, v. 2, 424 p.
- 1976c, Reconnaissance data on lakes in Washington, vol. 3, Kitsap, Mason, and Pierce counties: Washington Department of Ecology Water-Supply Bulletin 43, v. 3, 259 p.
- 1976d, Reconnaissance data on lakes in Washington, vol. 4, Clark, Cowlitz, Grays Harbor, Lewis, Pacific, Skamania, and Thurston counties: Washington Department of Ecology Water-Supply Bulletin 43, v. 4, 197 p.
- Bortleson, G. C., Higgins, G.T., McConnell, J. B., and Innes, J. K., 1976, Data on selected lakes in Washington, part 3: Washington Department of Ecology Water-Supply Bulletin 42, part 3, 143 p.
- Bretz, J H., 1959, Washington's channeled scabland: Washington Division of Mines and Geology Bulletin 45, 57 p.
- Carlson, R. E., 1977, A trophic state index for lakes: Liminology and Oceanography, v. 22, no. 2, p. 361-369.
- Carlson, R.E., 1979, A review of the philosophy and construction of trophic state indices, in Maloney, T. E., Lake and reservoir classification systems: U.S. Environmental Protection Agency Report No. EPA-600/3-79-074, p. 1-52.

- Chapra, S.C., and Dobson, H.F.H., 1981, Quantification of the lake trophic typologies of Naumann (surface quality) and Thienemann (oxygen) with special reference to the Great Lakes: *Journal of Great Lakes Research*, v. 7, no. 2, p. 182-193.
- Cieka, J.E., Fabian, R.G., and Merilatt, D.S., 1980, Eutrophication measures for small lake water-quality management: *Water Resources Bulletin*, v. 16, no. 4, p. 681-189.
- Collings, M. R., 1973, Data on selected lakes in Washington, part I: U.S. Geological Survey Open-File Report, 179 p.
- Dion, N.P., 1978, Primer on lakes in Washington: Washington Department of Ecology Water-Supply Bulletin 49, 55 p.
- Dion, N.P., Bortleson, G.G., McConnell, J.B., and Innes, J.K., 1976, Data on selected lakes in Washington, part 5: Washington Department of Ecology Water-Supply Bulletin 42, part 5, 125 p.
- Dion, N. P., Bortleson, G. C., McConnell, J. B., and Nelson, L. M., 1976a, Reconnaissance data on lakes in Washington, v. 5, Chelan, Ferry, Kittitas, Klickitat, Okanogan, and Yakima counties: Washington Department of Ecology Water-Supply Bulletin 43, v. 5, 264 p.
- 1976b, Reconnaissance data on lakes in Washington, v. 6, Adams, Benton, Douglas, Franklin, Grant, Lincoln, Walla Walla, and Whitman counties: Washington Department of Ecology Water-Supply Bulletin 43, v. 6, 407 p.
- 1976c, Reconnaissance data on lakes in Washington, v. 7, Pend Oreille, Spokane, and Stevens counties: Washington Department of Ecology Water-Supply Bulletin 43, v. 7, 267 p.
- Dion, N.P., Bortleson, G.C., and Innes, J.K., 1980, Data on selected lakes in Washington, part 6: Washington State Department of Ecology Water-Supply Bulletin 42, part 6, 125 p.
- Federal Water Pollution Control Administration, 1968, Water quality criteria: Report of the National Technical Advisory Committee to the Secretary of the Interior: Federal Water Pollution Control Admin., 234 p.
- Gilliom, R. J., 1980, Estimation of background loadings and concentrations of phosphorus for lakes in the Puget Sound region, Washington: U.S. Geological Survey Open-File Report 80-328, 37 p.
- Greeson, P.E., and others, editors, 1977, Methods for collection and analysis of aquatic biological and microbiological samples: U.S. Geological Survey Techniques of Water-Resources Investigations, Book 5, Chapter A4, 332 p.

- Hutchinson, G. E., 1957, A treatise on limnology; vol. 1--Geography, physics, and chemistry: New York, John Wiley and Sons, Inc., 1015 p.
- Lee, G.F., 1972, Eutrophication: Transactions of Northeast Fish and Wildlife Conference, p. 39-60.
- McConnell, J. B., Bortleson, G. C., and Innes, J. K., 1976, Data on selected lakes in Washington, part 4: Washington Department of Ecology Water-Supply Bulletin 42, part 4, 141 p.
- Morrison, D.F., 1967, Multivariate statistical methods: New York, McGraw-Hill, 338 p.
- Peterson, J. O., Born, S. M., and Dunst, R. C., 1974, Lake rehabilitation techniques and experiences: Water Resources Bulletin, v. 10, no. 6, p. 1228-1245.
- Reckhow, K. H., 1979, Quantitative techniques for the assessment of lake quality: U.S. Environmental Protection Agency Report No. EPA-440/5-79-015, 146 p.
- Shannon, E.E. and Brezonik, P. L., 1972, Eutrophication analysis--a multivariate approach: American Society Civil Engineers Proceedings, Journal Sanitary Engineering Division, v. 98, SA1, Proceedings Paper 8735, p. 37-57.
- Shapiro, Joseph, 1975, The current status of lake trophic indices--a review: University of Minnesota Limnological Research Center, Interim Report No. 15, 39 p.
- Skougstad, M. W., and others, 1979, Methods for determination of inorganic substances in water and fluvial sediments: U.S. Geological Survey Techniques of Water-Resources Investigation, Book 5, Chapter A1, 626 p.
- U.S. Environmental Protection Agency, 1977, Quality criteria for water, 1976: U.S. Government Printing Office, 256 p.
- Wentz, D.A., 1981, Lake classification - is there method to this madness?, in Greeson, P. E., ed., Biota and biological parameters as environmental indicators: U.S. Geological Survey Circular 848-B, p. B15-B24.
- Wetzel, R.G., 1975, Limnology: Philadelphia, W.B. Saunders Company, 743 p.
- Wolcott, E.E., 1973a, Lakes of Washington, v. 1, Western Washington: Washington Department of Ecology Water-Supply Bulletin 14, 619 p.
- 1973b, Lakes of Washington, vol. 2, Eastern Washington: Washington Department of Ecology Water-Supply Bulletin 14, 650 p.

## GLOSSARY

Acre-foot. The volume of water required to cover 1 acre to a depth of 1 foot, and equal to 43,560 cubic feet or 325,900 U.S. gallons.

Bathymetric. Relating to the measurement of water depths, as for a lake.

Biomass. The total amount of living material in a particular habitat or area.

Chlorophyll a. A green pigment that is found in all types of algae and is partly responsible for photosynthesis.

Coulee. A short gulch or water channel.

Drainage area. The area drained by, or contributing to, a stream, lake, or other surface-water body.

Drift. Any rock material transported and deposited directly or indirectly by a glacier.

Epilimnion. The upper, relatively warm, circulating zone of water in a thermally stratified lake.

Eutrophic. Pertaining to waters in which production is high as a consequence of a large supply of available nutrients.

Herbivore. An organism that feeds on plants.

Hypolimnion. The lower, relatively cold, non-circulating water zone in a thermally stratified lake.

Kettle. A basin formed by the melting of a detached mass of glacial ice buried or submerged in glacial drift.

Limnology. The science or study of inland bodies of water, such as lakes.

Littoral. The shoreward region of a body of water, where light penetrates to the bottom.

Macrophyte. A plant that can be seen with the unaided eye.

Mean depth. A morphometric parameter of a lake obtained by dividing the volume by the area.

Mesotrophic. Pertaining to waters in which production is moderate.

Metalimnion. The middle layer of water in a thermally stratified lake, in which temperature decreases rapidly with depth; also called the thermocline.

Morphometric. Pertaining to the measurement of the shape characteristics of lakes and lake basins.

Nutrient. Any chemical element, ion, or compound required by an organism for the continuation of growth, reproduction, and other life processes.

Oligotrophic. Pertaining to waters in which production is low as a consequence of a small supply of available nutrients.

Periphyton. Aquatic microorganisms that are attached to, or live upon, submerged surfaces.

pH. The negative logarithm of the hydrogen-ion concentration; it is used to indicate the relative acidity or alkalinity of a solution.

Photosynthesis. The process by which chlorophyll-bearing plants use energy from the sun to convert water and carbon dioxide into carbohydrates.

Phytoplankton. The plant part of the plankton.

Plankton. Suspended or weakly swimming aquatic organisms.

Productivity. The total amount of living matter produced in an area per unit of time, regardless of the fate of the living matter.

Regression. A statistical method of determining the relationship between one variable and one or more other variables.

Relative depth. A morphometric parameter of a lake defined as the ratio of the maximum depth to the mean lake diameter, in percent.

Scablands. Areas where erosion has removed the soil and the underlying rock is exposed or covered largely with its own coarse debris.

Secchi disc. A disc, usually 8 inches in diameter and painted in alternating white and black quadrants, used to measure light transparency in lakes.

Shoreline configuration. A morphometric characteristic of a lake defined as the dimensionless ratio of the shoreline length to the circumference of a circle having the same area as the lake.

Specific conductance. The measure of a water's ability to conduct an electric current, usually expressed as micromhos per centimeter at 25° Celsius.

Till. A nonsorted, nonstratified glacial deposit usually composed of gravel, sand, silt, and clay.

Transpiration. The process by which water vapor escapes from a living plant and enters the atmosphere.

Trophic. Pertaining to the relative level of production of a water body, such as a lake.

Zooplankton. The animal part of the plankton.

APPENDIX A.--Physical, cultural, and water-quality data  
for lakes visited in 1981

DEAD LAKE

CLARK COUNTY

WRIA 28

T01N-R03E-02

LATITUDE 45° 35' 59" LONGITUDE 122° 24' 33"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.59 mi <sup>2</sup> |
| Altitude                | 175 ft               |
| Lake Area               | 23 acres             |
| Lake Volume             | 310 acre-ft          |
| Mean Depth              | 14 ft                |
| Maximum Depth           | 30 ft                |
| Shoreline Length        | 0.92 mi              |
| Shoreline Configuration | 1.4                  |
| Development of Volume   | 0.46                 |
| Bottom Slope            | 2.7 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 5  | pct |
| Number of Nearshore Homes  | 3  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 13 | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 83 | pct |
| Lake Surface               | 4  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

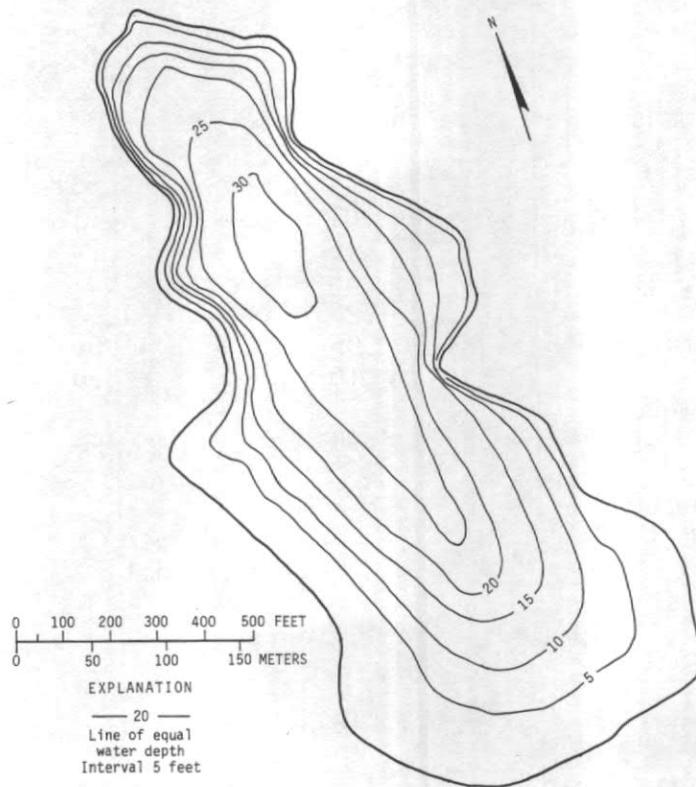
Date

June 16, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 25     |
| Water Temperature (°C)         | 17.7 | 7.1    |
| Dissolved Oxygen               | 10.9 | 0.2    |
| Specific Conductance (umho)    | 67   | 94     |
| pH (units)                     | 7.3  | 6.4    |
| Total Nitrate, as N            | 0.02 | .02    |
| Total Nitrite, as N            | .00  | .01    |
| Total Ammonia, as N            | .15  | .74    |
| Total Organic Nitrogen, as N   | .40  | 1.4    |
| Total Nitrogen, as N           | .57  | 2.1    |
| Dissolved Orthophosphate, as P | .02  | .06    |
| Total Phosphorus, as P         | .05  | .20    |
| Secchi-Disc Visibility (ft)    |      | 6      |
| Chlorophyll <u>a</u> (ug/L)    | 10.1 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 90 pct |
| Water-Surface Zone             |      | 5 pct  |

LAKE TROPHIC CLASSIFICATION

|  |     |
|--|-----|
| Characteristic Value (Bortleson, 1978) | 146 |
| Trophic State Index (Carlson, 1977)    |     |
| TSI <sub>SD</sub>                      | 51  |
| TSI <sub>TP</sub>                      | 61  |
| TSI <sub>Chl</sub>                     | 53  |



Dead Lake, Clark County. Photo taken June 16, 1981, view northerly.  
Bathymetric map from Washington Department of Game, November 23, 1947.

LACKAMAS LAKE

CLARK COUNTY

WRIA 28

T01N-R03E-02

LATITUDE

45° 36' 16"

LONGITUDE

122° 24' 22"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 64.3 mi <sup>2</sup> |
| Altitude                | 179 ft               |
| Lake Area               | 320 acres            |
| Lake Volume             | 7500 acre-ft         |
| Mean Depth              | 24 ft                |
| Maximum Depth           | 65 ft                |
| Shoreline Length        | 5.3 mi               |
| Shoreline Configuration | 2.1                  |
| Development of Volume   | 0.37                 |
| Bottom Slope            | 1.6 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 15 | pct |
| Number of Nearshore Homes  | 56 |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | <1 | pct |
| Agricultural               | 49 | pct |
| Forest or Unproductive     | 50 | pct |
| Lake Surface               | 1  | pct |

Public Boat Access to Lake      Yes

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 16, 1981

|                                |      |     |
|--------------------------------|------|-----|
| Depth (ft)                     | 3    | 59  |
| Water Temperature (°C)         | 15.8 | 9.5 |
| Dissolved Oxygen               | 9.1  | 0.2 |
| Specific Conductance (umho)    | 62   | 68  |
| pH (units)                     | 6.7  | 6.4 |
| Total Nitrate, as N            | 0.44 | .63 |
| Total Nitrite, as N            | .01  | .01 |
| Total Ammonia, as N            | .16  | .24 |
| Total Organic Nitrogen, as N   | .55  | .62 |
| Total Nitrogen, as N           | 1.2  | 1.5 |
| Dissolved Orthophosphate, as P | .05  | .06 |
| Total Phosphorus, as P         | .10  | .20 |
| Secchi-Disc Visibility (ft)    |      | 4   |
| Chlorophyll <u>a</u> (ug/L)    | 4.98 | --  |

Aquatic Macrophyte Coverage

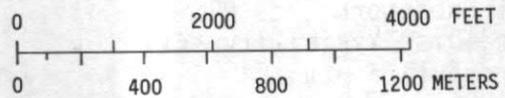
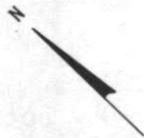
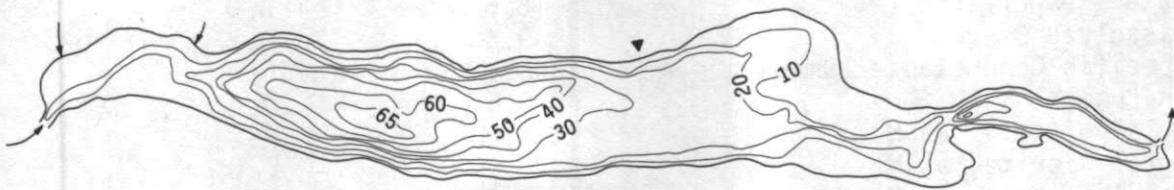
|                    |    |     |
|--------------------|----|-----|
| Littoral Zone      | 60 | pct |
| Water-Surface Zone | <1 | pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value      199

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 57 |
| TSI <sub>TP</sub>  | 71 |
| TSI <sub>chl</sub> | 46 |



EXPLANATION  
 — 20 —  
 Line of equal  
 water depth  
 Interval 10 and 5 feet

Lackamas Lake, Clark County. Photo taken July 1, 1968.  
 Bathymetric map from Washington Department of Game, November 18, 1947.

CURLEW LAKE

FERRY COUNTY

WRIA 60

T38N-R33E-28

LATITUDE 48° 46' 03" LONGITUDE 118° 39' 23"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 64.5 mi <sup>2</sup> |
| Altitude                | 2,333 ft             |
| Lake Area               | 920 acres            |
| Lake Volume             | 40,000 acre-ft       |
| Mean Depth              | 43 ft                |
| Maximum Depth           | 130 ft               |
| Shoreline Length        | 16 mi                |
| Shoreline Configuration | 3.7                  |
| Development of Volume   | 0.33                 |
| Bottom Slope            | 1.8 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 20  | pct |
| Number of Nearshore Homes  | 148 |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | <1  | pct |
| Agricultural               | 13  | pct |
| Forest or Unproductive     | 85  | pct |
| Lake Surface               | 2   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

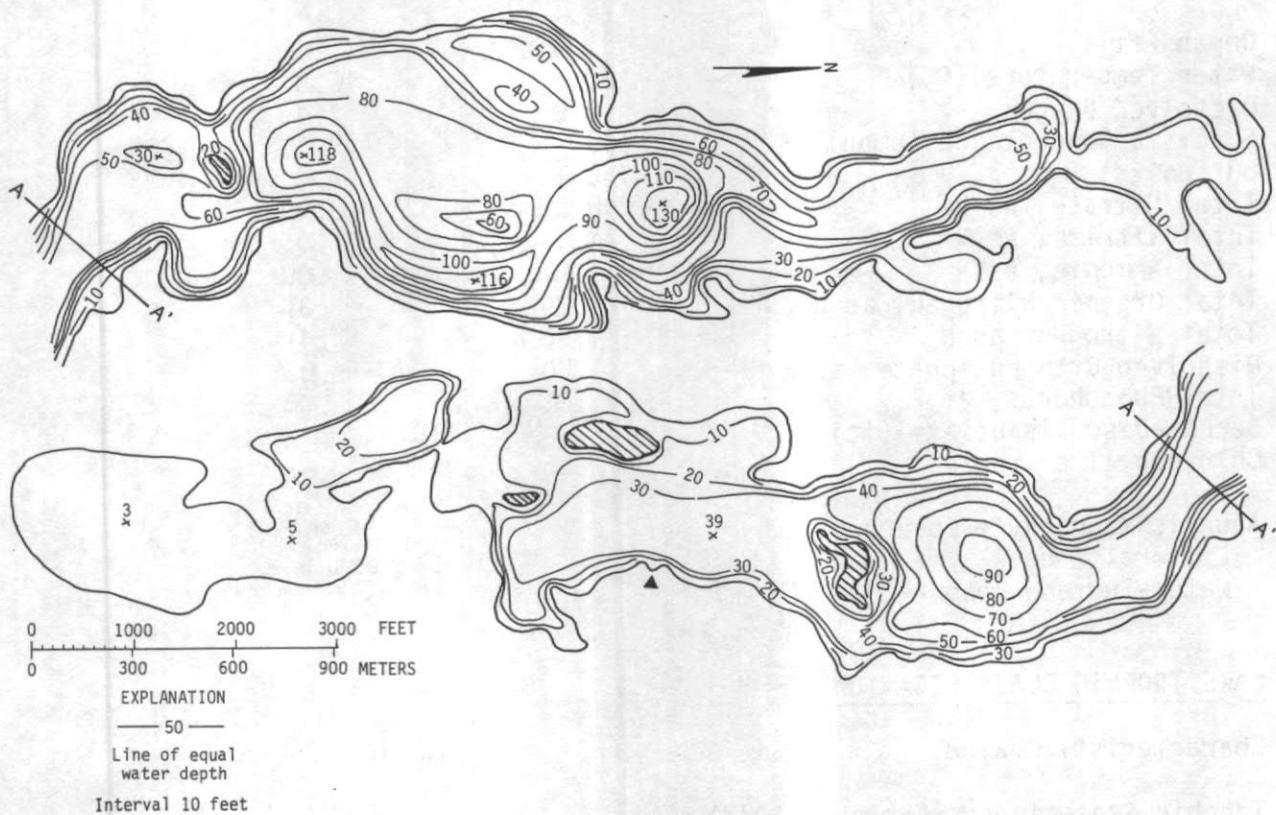
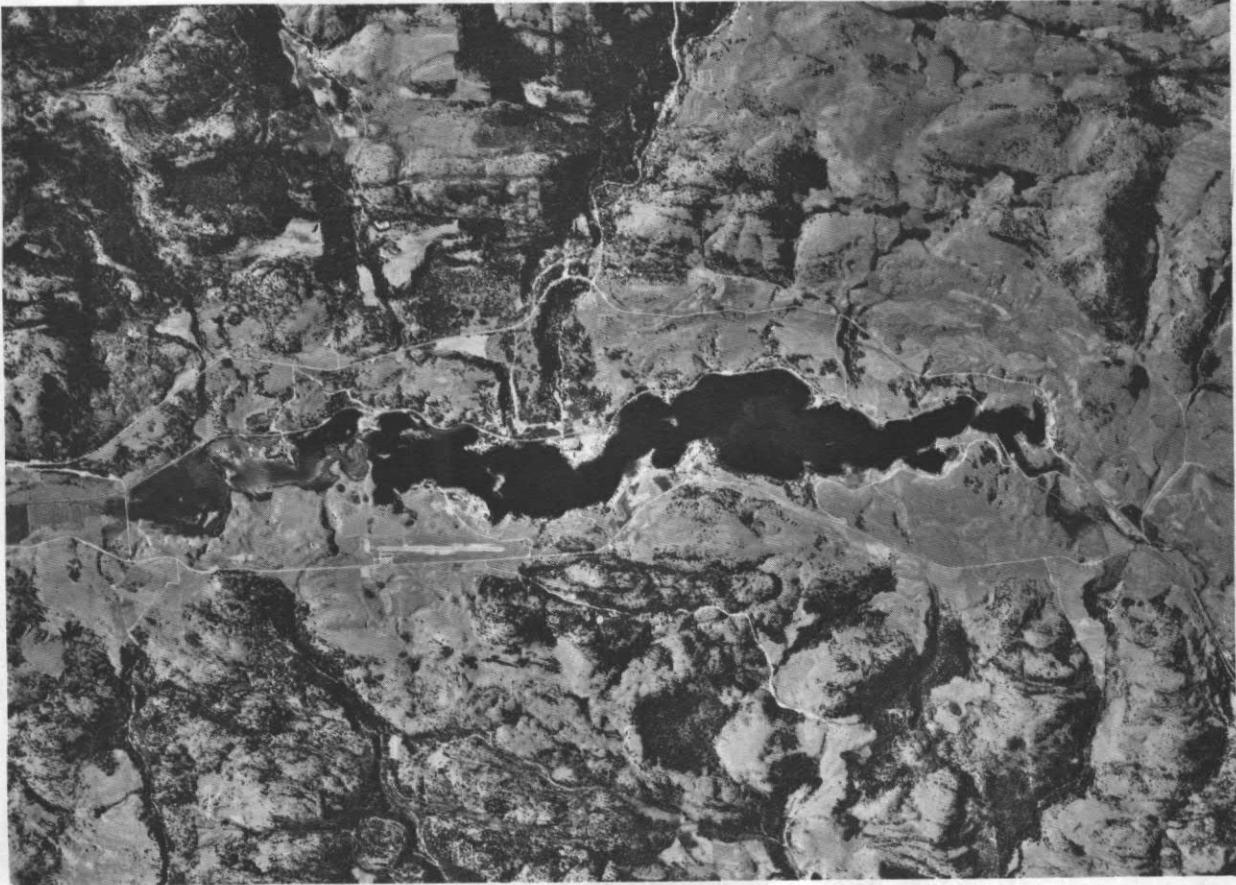
Date

July 15, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 100    |
| Water Temperature (°C)         | 18.6 | 6.0    |
| Dissolved Oxygen               | 9.4  | 0.2    |
| Specific Conductance (umho)    | 223  | 270    |
| pH (units)                     | 8.5  | 7.0    |
| Total Nitrate, as N            | 0.00 | .24    |
| Total Nitrite, as N            | .00  | .01    |
| Total Ammonia, as N            | .08  | .10    |
| Total Organic Nitrogen, as N   | .61  | .45    |
| Total Nitrogen, as N           | .69  | .80    |
| Dissolved Orthophosphate, as P | <.01 | .10    |
| Total Phosphorus, as P         | .02  | .10    |
| Secchi-Disc Visibility (ft)    |      | 9      |
| Chlorophyll <u>a</u> (ug/L)    | 2.42 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 95 pct |
| Water-Surface Zone             |      | 0 pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 98 |
| Trophic State Index (Carlson, 1977) |    |
| TSI <sub>SD</sub>                   | 45 |
| TSI <sub>TP</sub>                   | 47 |
| TSI <sub>Chl</sub>                  | 39 |



Curlew Lake, Ferry County. Photo taken July 22, 1977.  
Bathymetric map from Washington Department of Game, March 1949.

FRENCH JOHNS LAKE

FERRY COUNTY

WRIA 52

T29N-R33E-20

LATITUDE 48° 00' 13" LONGITUDE 118° 41' 18"

PHYSICAL DATA

Drainage area 21.4 mi<sup>2</sup>  
 Altitude 1,320 ft  
 Lake Area 17 acres  
 Lake Volume 262 acre-ft  
 Mean Depth 15 ft  
 Maximum Depth 29 ft  
 Shoreline Length 1.1 mi  
 Shoreline Configuration 1.9  
 Development of Volume 0.53  
 Bottom Slope 3.0 pct  
 Surface Inflow Yes  
 Surface Outflow No

CULTURAL DATA

Residential Development 0 pct  
 Number of Nearshore Homes 0  
 Land Use in Drainage Basin  
 Residential-Urban 0 pct  
 Residential-Suburban 0 pct  
 Agricultural 2 pct  
 Forest or Unproductive 98 pct  
 Lake Surface <1 pct  
 Public Boat Access to Lake No

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

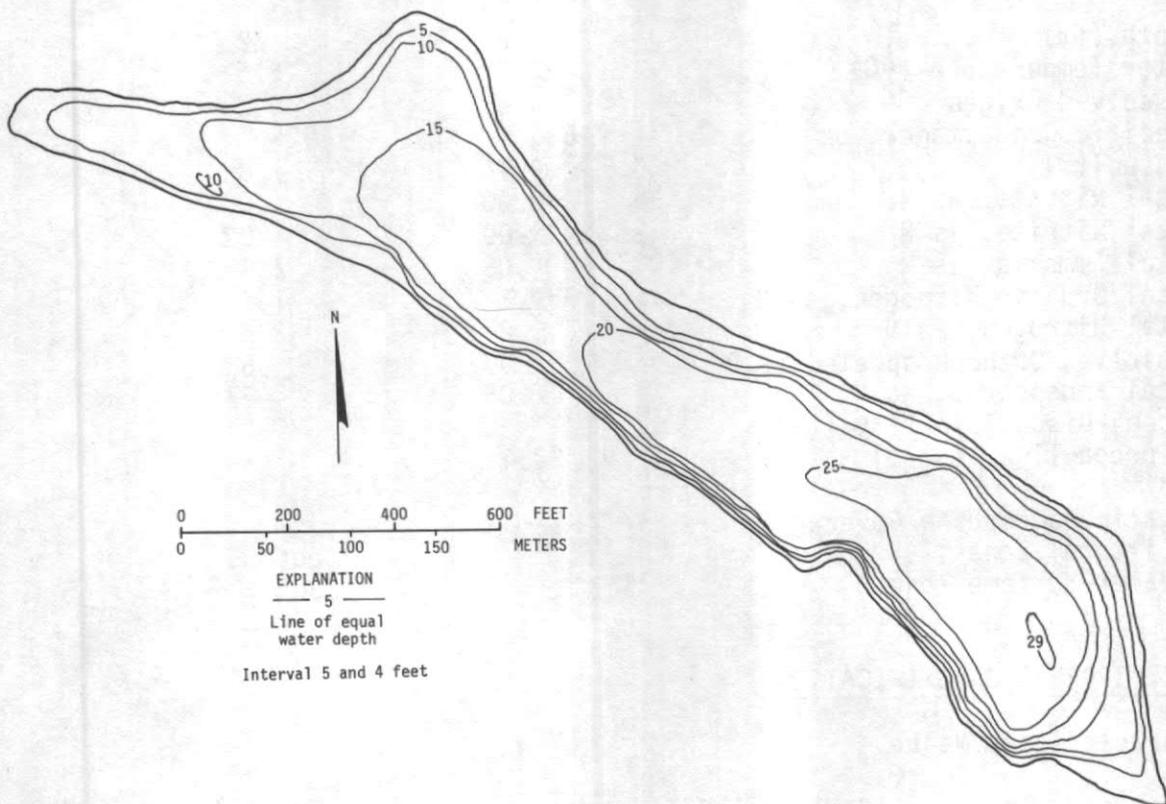
Date

July 16, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 26     |
| Water Temperature (°C)         | 20.9 | 15.8   |
| Dissolved Oxygen               | 8.8  | 7.4    |
| Specific Conductance (umho)    | 162  | 159    |
| pH (units)                     | 8.1  | 7.8    |
| Total Nitrate, as N            | 0.00 | 0.00   |
| Total Nitrite, as N            | .00  | .01    |
| Total Ammonia, as N            | .07  | .09    |
| Total Organic Nitrogen, as N   | .29  | .31    |
| Total Nitrogen, as N           | .36  | .41    |
| Dissolved Orthophosphate, as P | .00  | .03    |
| Total Phosphorus, as P         | .01  | .06    |
| Secchi-Disc Visibility (ft)    |      | 15     |
| Chlorophyll <u>a</u> (ug/L)    | 1.36 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | <1 pct |
| Water-Surface Zone             |      | 0 pct  |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 45  
 Trophic State Index (Carlson, 1977)  
 TSI<sub>SD</sub> 38  
 TSI<sub>TP</sub> 37  
 TSI<sub>Chl</sub> 34



French Johns Lake, Ferry County. Photo taken July 16, 1981, view northwesterly.  
Bathymetric map from U.S. Geological Survey, June 24, 1981.

THOMPSON LAKE

GRANT COUNTY

WRIA 42

T27N-R29E-11

LATITUDE 47° 50' 54" LONGITUDE 119° 08' 17"

PHYSICAL DATA

Drainage area 22 mi<sup>2</sup>  
 Altitude 1,570 ft  
 Lake Area 35 acres  
 Lake Volume 441 acre-ft  
 Mean Depth 13 ft  
 Maximum Depth 25 ft  
 Shoreline Length 0.98 mi  
 Shoreline Configuration 1.2  
 Development of Volume 0.51  
 Bottom Slope 1.8 pct  
 Surface Inflow No  
 Surface Outflow No

CULTURAL DATA

Residential Development 0 pct  
 Number of Nearshore Homes 0  
 Land Use in Drainage Basin  
 Residential-Urban 0 pct  
 Residential-Suburban 0 pct  
 Agricultural 0 pct  
 Forest or Unproductive 80 pct  
 Lake Surface 20 pct  
 Public Boat Access to Lake No

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

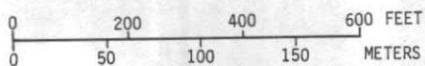
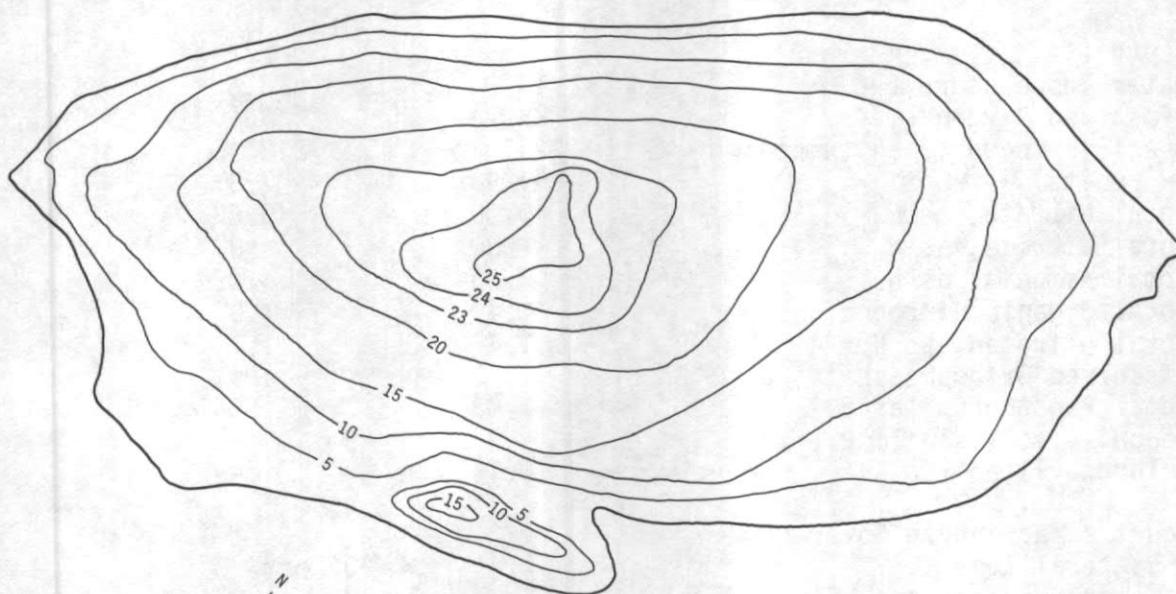
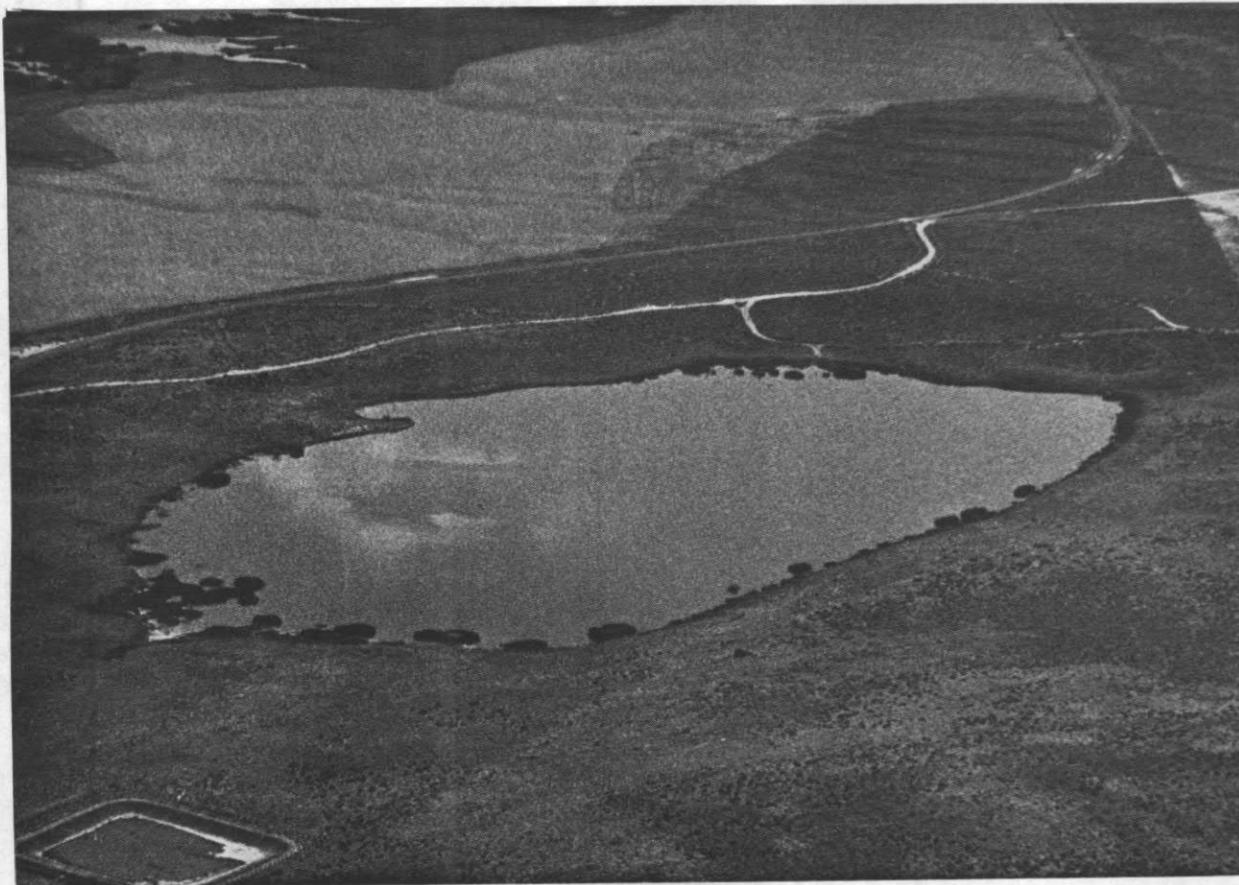
Date

July 16, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 22     |
| Water Temperature (°C)         | 22.2 | 15.5   |
| Dissolved Oxygen               | 15.6 | 0.2    |
| Specific Conductance (umho)    | 885  | 925    |
| pH (units)                     | 9.1  | 7.8    |
| Total Nitrate, as N            | 0.00 | .00    |
| Total Nitrite, as N            | .00  | .02    |
| Total Ammonia, as N            | .08  | 2.4    |
| Total Organic Nitrogen, as N   | 2.1  | 1.2    |
| Total Nitrogen, as N           | 2.2  | 3.6    |
| Dissolved Orthophosphate, as P | .00  | .68    |
| Total Phosphorus, as P         | .05  | .77    |
| Secchi-Disc Visibility (ft)    |      | 7      |
| Chlorophyll <u>a</u> (ug/L)    | 23.4 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 30 pct |
| Water-Surface Zone             |      | 5 pct  |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 304  
 Trophic State Index (Carlson, 1977)  
 TSI<sub>SD</sub> 49  
 TSI<sub>TP</sub> 61  
 TSI<sub>chl</sub> 62



EXPLANATION  
 — 10 —  
 Line of equal  
 water depth  
 Interval, in feet, variable

Thompson Lake, Grant County. Photo taken July 16, 1981, view southerly. Bathymetric map from U.S. Geological Survey, June 24, 1981.

CRANBERRY LAKE

ISLAND COUNTY

WRIA 06

T34N-R01E-35

LATITUDE 48° 23' 22" LONGITUDE 122° 39' 23"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.61 mi <sup>2</sup> |
| Altitude                | 20 ft                |
| Lake Area               | 130 acres            |
| Lake Volume             | 1,600 acre-ft        |
| Mean Depth              | 13 ft                |
| Maximum Depth           | 25 ft                |
| Shoreline Length        | 2.8 mi               |
| Shoreline Configuration | 1.8                  |
| Development of Volume   | 0.50                 |
| Bottom Slope            | 0.95 pct             |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

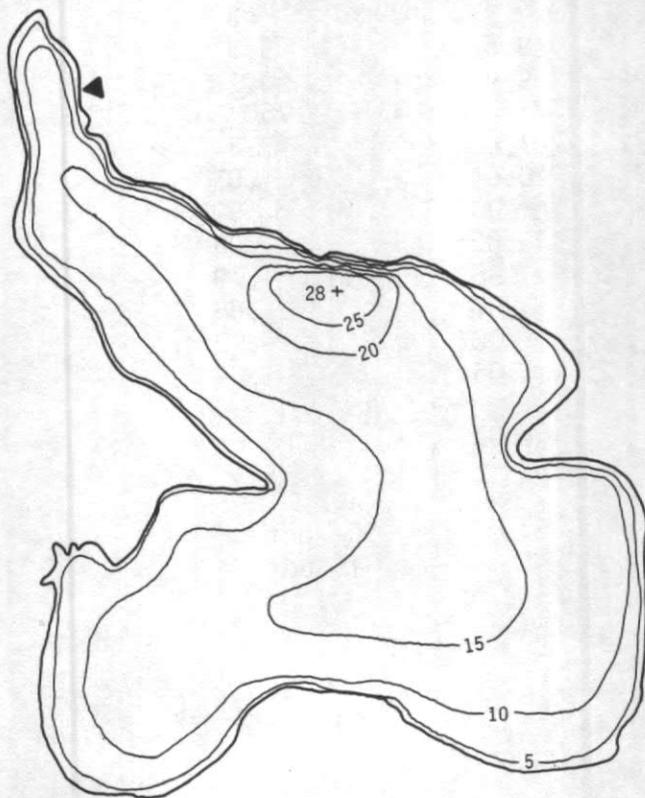
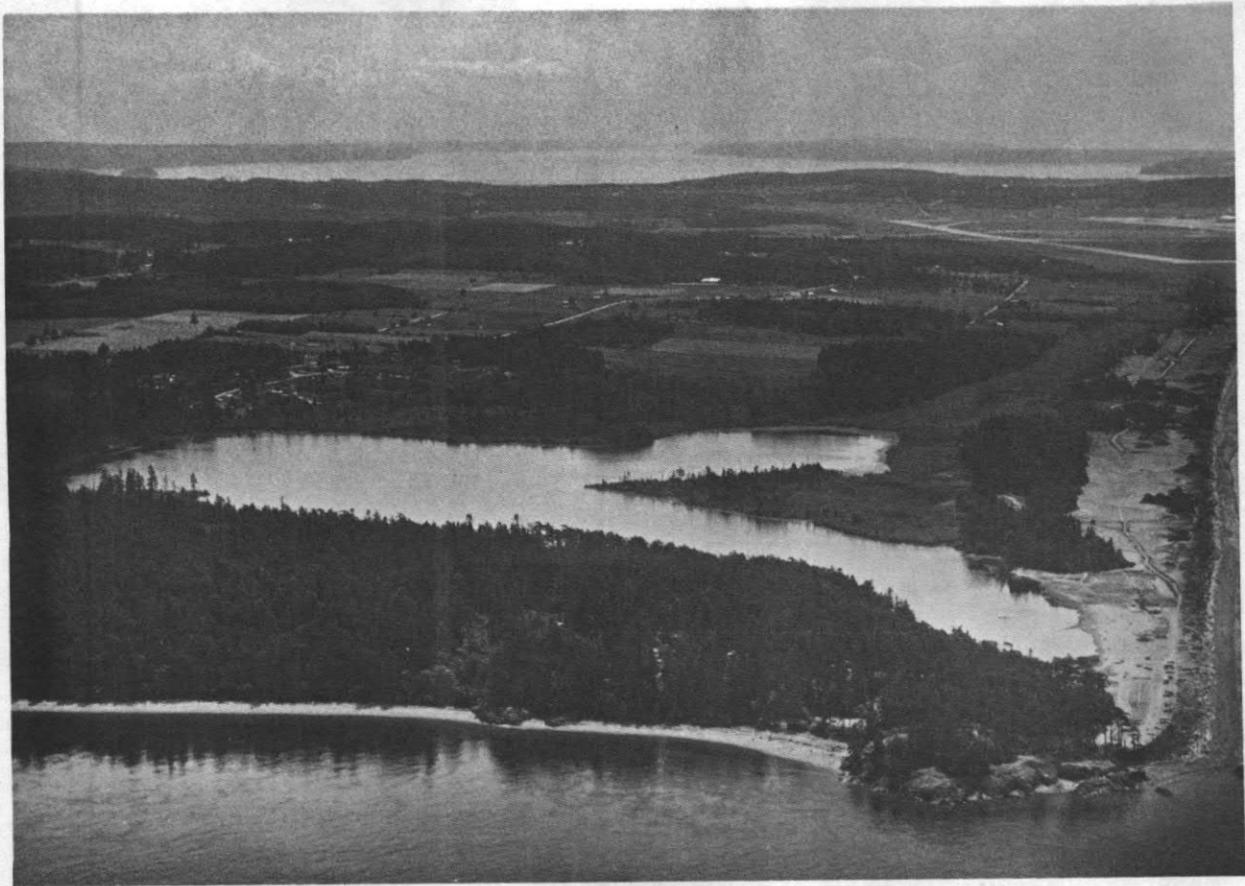
|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 0   | pct |
| Number of Nearshore Homes  | 0   |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 0   | pct |
| Agricultural               | 0   | pct |
| Forest or Unproductive     | 69  | pct |
| Lake Surface               | 31  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

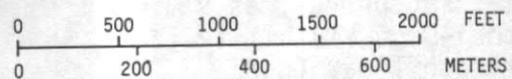
|                                |              |      |
|--------------------------------|--------------|------|
| Date                           | July 9, 1981 |      |
| Depth (ft)                     | 3            | 22   |
| Water Temperature (°C)         | 18.9         | 16.5 |
| Dissolved Oxygen               | 8.7          | 1.1  |
| Specific Conductance (umho)    | 220          | 218  |
| pH (units)                     | 7.9          | 7.3  |
| Total Nitrate, as N            | 0.00         | 0.02 |
| Total Nitrite, as N            | .00          | .00  |
| Total Ammonia, as N            | .05          | .09  |
| Total Organic Nitrogen, as N   | 1.4          | 1.0  |
| Total Nitrogen, as N           | 1.4          | 1.1  |
| Dissolved Orthophosphate, as P | .00          | <.01 |
| Total Phosphorus, as P         | .03          | .05  |
| Secchi-Disc Visibility (ft)    | 9            |      |
| Chlorophyll <u>a</u> (ug/L)    | 8.16         | --   |
| Aquatic Macrophyte Coverage    |              |      |
| Littoral Zone                  | 90           | pct  |
| Water-Surface Zone             | 20           | pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 178 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 45  |
| TSI <sub>TP</sub>                   | 53  |
| TSI <sub>Chl</sub>                  | 51  |



N



EXPLANATION  
 — 5 —  
 Line of equal  
 water depth  
 Interval 5 feet

Cranberry (34N-1E-35) Lake, Island County. Photo taken July 9, 1981, view southerly. Bathymetric map from Washington Department of Game, July 23, 1950.

DEER LAKE

ISLAND COUNTY

WRIA 06

T29N-R03E-26

LATITUDE 47° 58' 28" LONGITUDE 122° 22' 41"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 1.19 mi <sup>2</sup> |
| Altitude                | 352 ft               |
| Lake Area               | 81 acres             |
| Lake Volume             | 1,700 acre-ft        |
| Mean Depth              | 20 ft                |
| Maximum Depth           | 50 ft                |
| Shoreline Length        | 1.7 mi               |
| Shoreline Configuration | 1.3                  |
| Development of Volume   | 0.40                 |
| Bottom Slope            | 2.4 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 70  | pct |
| Number of Nearshore Homes  | 37  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 5   | pct |
| Agricultural               | 15  | pct |
| Forest or Unproductive     | 65  | pct |
| Lake Surface               | 11  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

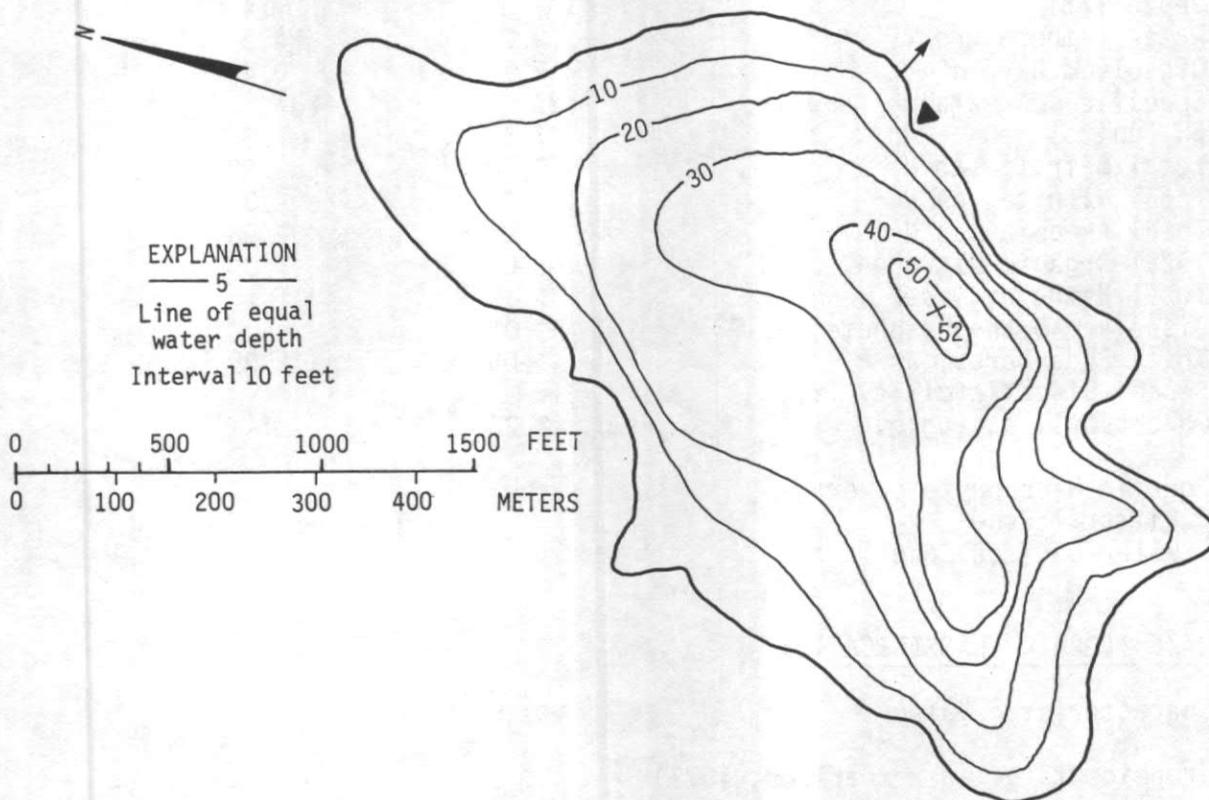
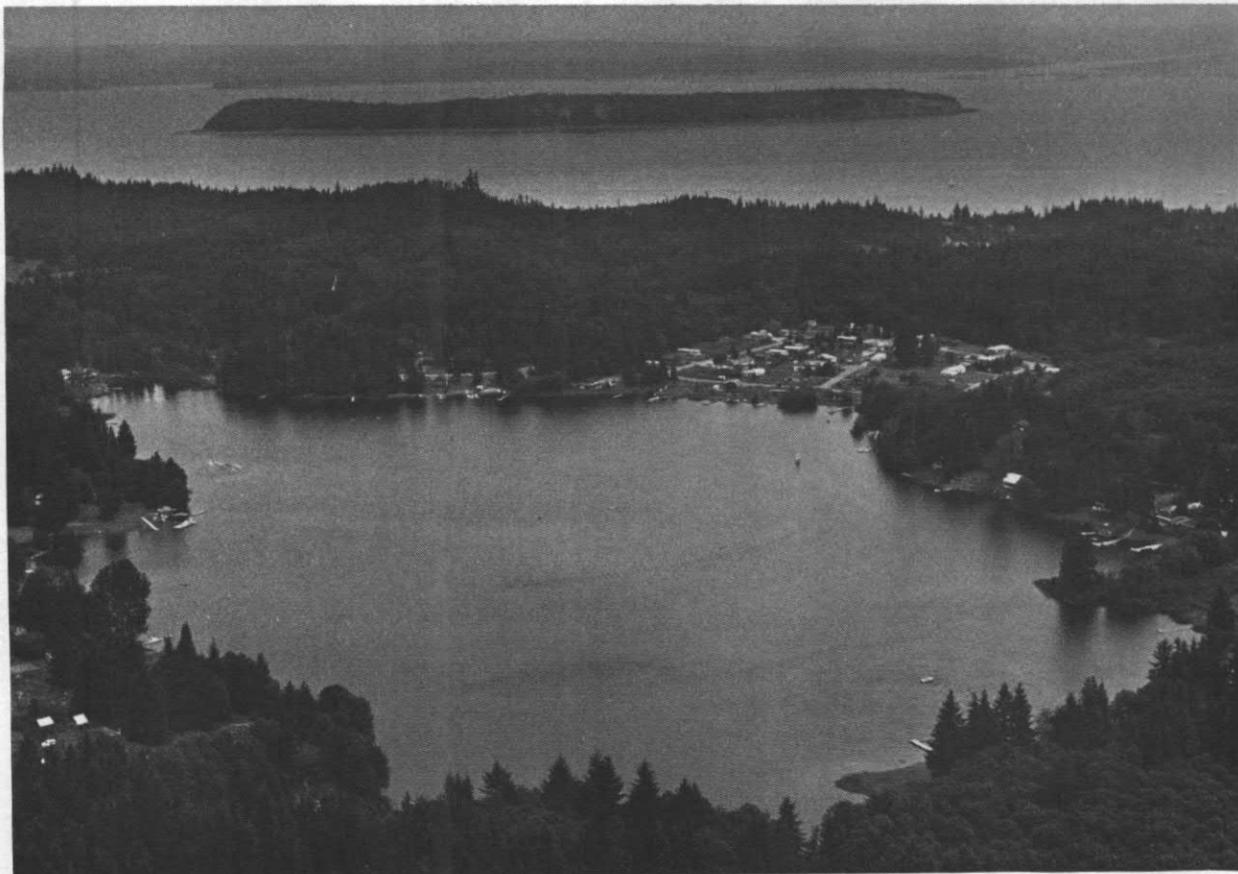
Date

July 2, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 43     |
| Water Temperature (°C)         | 19.6 | 9.5    |
| Dissolved Oxygen               | 9.9  | 0.2    |
| Specific Conductance (umho)    | 77   | 76     |
| pH (units)                     | 7.8  | 7.8    |
| Total Nitrate, as N            | 0.01 | .01    |
| Total Nitrite, as N            | .00  | .00    |
| Total Ammonia, as N            | .05  | .08    |
| Total Organic Nitrogen, as N   | .85  | .79    |
| Total Nitrogen, as N           | .91  | .88    |
| Dissolved Orthophosphate, as P | .02  | .02    |
| Total Phosphorus, as P         | .06  | .04    |
| Secchi-Disc Visibility (ft)    |      | 19     |
| Chlorophyll <u>a</u> (ug/L)    | 1.03 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 90 pct |
| Water-Surface Zone             |      | 1 pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 93 |
| Trophic State Index (Carlson, 1977) |    |
| TSI <sub>SD</sub>                   | 35 |
| TSI <sub>TP</sub>                   | 63 |
| TSI <sub>Chl</sub>                  | 31 |



Deer Lake, Island County. Photo taken July 2, 1981, view northeasterly.  
 Bathymetric map from Washington Department of Game, July 11, 1949.

OLIVER LAKE

ISLAND COUNTY

WRIA 06

T29N-R02E-23

LATITUDE 47° 58' 48" LONGITUDE 122° 31' 13"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.16 mi <sup>2</sup> |
| Altitude                | 243 ft               |
| Lake Area               | 16 acres             |
| Lake Volume             | 166 acre-ft          |
| Mean Depth              | 11 ft                |
| Maximum Depth           | 19 ft                |
| Shoreline Length        | 0.58 mi              |
| Shoreline Configuration | 1.0                  |
| Development of Volume   | 0.56                 |
| Bottom Slope            | 2.0 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 0  | pct |
| Number of Nearshore Homes  | 0  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 8  | pct |
| Forest or Unproductive     | 81 | pct |
| Lake Surface               | 11 | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

July 2, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 14   |
| Water Temperature (°C)         | 19.2 | 14.5 |
| Dissolved Oxygen               | 8.7  | 0.4  |
| Specific Conductance (umho)    | 137  | 137  |
| pH (units)                     | 7.3  | 7.2  |
| Total Nitrate, as N            | 0.00 | .00  |
| Total Nitrite, as N            | .01  | .01  |
| Total Ammonia, as N            | .08  | .08  |
| Total Organic Nitrogen, as N   | 1.0  | 1.0  |
| Total Nitrogen, as N           | 1.1  | 1.1  |
| Dissolved Orthophosphate, as P | .03  | .03  |
| Total Phosphorus, as P         | .05  | .05  |
| Secchi-Disc Visibility (ft)    |      | 11   |
| Chlorophyll <u>a</u> (ug/L)    | 2.23 | --   |

Aquatic Macrophyte Coverage

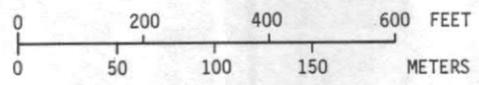
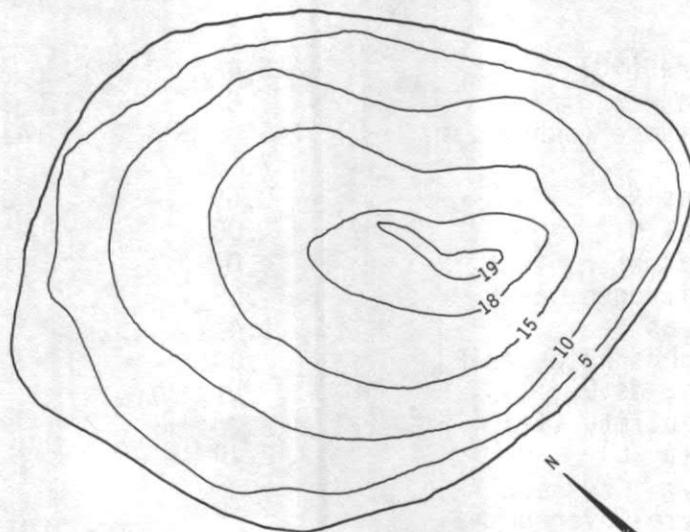
|                    |     |     |
|--------------------|-----|-----|
| Littoral Zone      | 100 | pct |
| Water-Surface Zone | 10  | pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 125

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 43 |
| TSI <sub>TP</sub>  | 61 |
| TSI <sub>Chl</sub> | 38 |



EXPLANATION

10  
Line of equal  
water depth

Interval, in feet, variable

Oliver Lake, Island County. Photo taken July 2, 1981, view northeasterly. Bathymetric map from U.S. Geological Survey, June 17, 1981.

SILVER LAKE

ISLAND COUNTY

WRIA 06

T33N-R02E-34

LATITUDE 48° 18' 12" LONGITUDE 122° 31' 46"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.30 mi <sup>2</sup> |
| Altitude                | 334 ft               |
| Lake Area               | 16 acres             |
| Lake Volume             | 262 acre-ft          |
| Mean Depth              | 16 ft                |
| Maximum Depth           | 30 ft                |
| Shoreline Length        | 0.73 mi              |
| Shoreline Configuration | 1.3                  |
| Development of Volume   | 0.54                 |
| Bottom Slope            | 3.2 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 5  | pct |
| Number of Nearshore Homes  | 2  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 92 | pct |
| Lake Surface               | 8  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

July 9, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 19   |
| Water Temperature (°C)         | 16.4 | 7.2  |
| Dissolved Oxygen               | 6.8  | 2.2  |
| Specific Conductance (umho)    | 145  | 147  |
| pH (units)                     | 7.1  | 7.0  |
| Total Nitrate, as N            | 0.59 | 0.00 |
| Total Nitrite, as N            | .00  | .00  |
| Total Ammonia, as N            | .07  | .05  |
| Total Organic Nitrogen, as N   | .69  | .52  |
| Total Nitrogen, as N           | 1.4  | .57  |
| Dissolved Orthophosphate, as P | .00  | <.01 |
| Total Phosphorus, as P         | .01  | .01  |
| Secchi-Disc Visibility (ft)    |      | 2    |
| Chlorophyll <u>a</u> (ug/L)    | 2.40 | --   |

## Aquatic Macrophyte Coverage

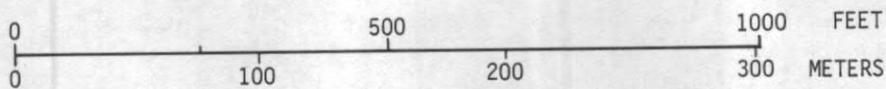
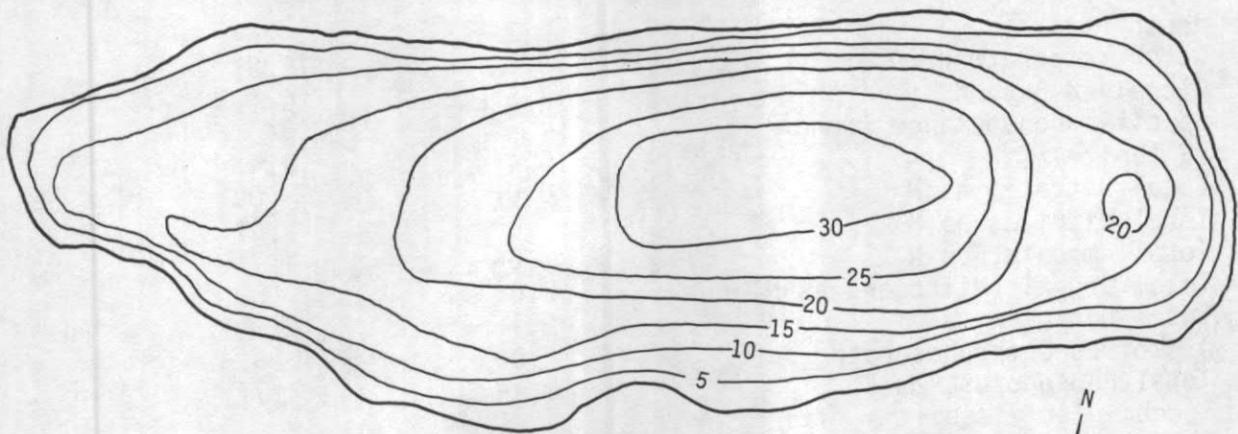
|                    |    |     |
|--------------------|----|-----|
| Littoral Zone      | 75 | pct |
| Water-Surface Zone | <5 | pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 304

## Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 67 |
| TSI <sub>TP</sub>  | 37 |
| TSI <sub>Chl</sub> | 39 |



EXPLANATION  
— 5 —  
Line of equal  
water depth  
Interval 5 feet

Silver Lake, Island County. Photo taken July 9, 1981, view westerly.  
Bathymetric map from U.S. Geological Survey, July 10, 1981.

ANDERSON LAKE

JEFFERSON COUNTY

WRIA 17

T29N-R01W-09

LATITUDE 48° 00' 54" LONGITUDE 122° 48' 04"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 1.40 mi <sup>2</sup> |
| Altitude                | 250 ft               |
| Lake Area               | 66 acres             |
| Lake Volume             | 1,200 acre-ft        |
| Mean Depth              | 19 ft                |
| Maximum Depth           | 29 ft                |
| Shoreline Length        | 1.6 mi               |
| Shoreline Configuration | 1.4                  |
| Development of Volume   | 0.64                 |
| Bottom Slope            | 1.5 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 2  | pct |
| Number of Nearshore Homes  | 1  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 7  | pct |
| Forest or Unproductive     | 86 | pct |
| Lake Surface               | 7  | pct |

Public Boat Access to Lake Yes

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

July 2, 1981

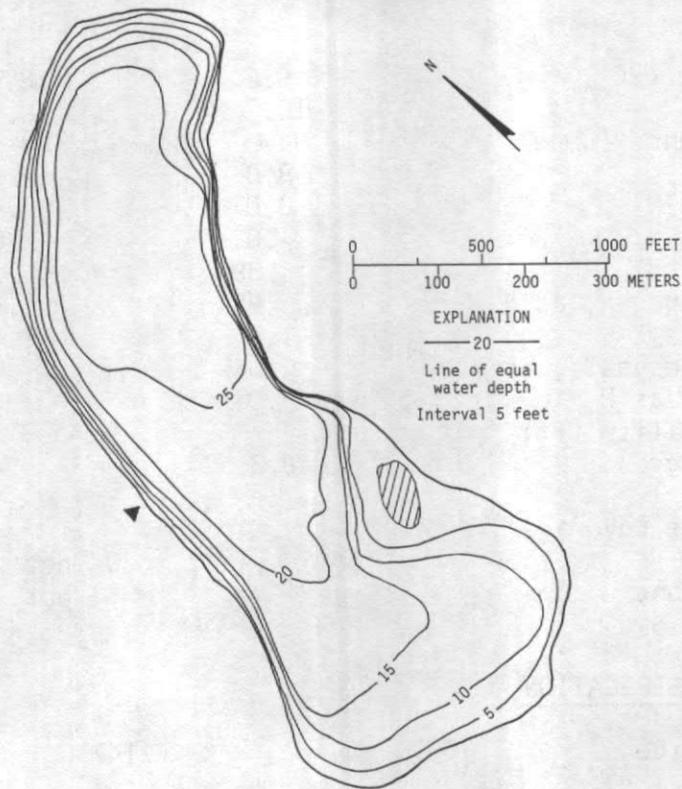
|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 26     |
| Water Temperature (°C)         | 19.0 | 11.8   |
| Dissolved Oxygen               | 17.5 | 0.1    |
| Specific Conductance (umho)    | 217  | 225    |
| pH (units)                     | 10.4 | 7.4    |
| Total Nitrate, as N            | 0.01 | .00    |
| Total Nitrite, as N            | .00  | .01    |
| Total Ammonia, as N            | .06  | 1.7    |
| Total Organic Nitrogen, as N   | 2.0  | .80    |
| Total Nitrogen, as N           | 2.1  | 2.5    |
| Dissolved Orthophosphate, as P | .07  | .69    |
| Total Phosphorus, as P         | .14  | .77    |
| Secchi-Disc Visibility (ft)    |      | 3      |
| Chlorophyll <u>a</u> (ug/L)    | 87.4 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 60 pct |
| Water-Surface Zone             |      | 1 pct  |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 639

Trophic State Index (Carlson, 1977)

|        |    |
|--------|----|
| TSISD  | 61 |
| TSITP  | 75 |
| TSICh1 | 74 |



Anderson Lake Jefferson County. Photo taken July 2, 1981, view northeasterly.  
Bathymetric map from County Engineer, July 1924.

GIBBS LAKE

JEFFERSON COUNTY

WRIA 17

T29N-R01W-28

LATITUDE 47° 58' 38" LONGITUDE 122° 48' 48"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 1.23 mi <sup>2</sup> |
| Altitude                | 340 ft               |
| Lake Area               | 44 acres             |
| Lake Volume             | 1,200 acre-ft        |
| Mean Depth              | 27 ft                |
| Maximum Depth           | 47 ft                |
| Shoreline Length        | 1.4 mi               |
| Shoreline Configuration | 1.5                  |
| Development of Volume   | 0.56                 |
| Bottom Slope            | 3.0 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 8  | pct |
| Number of Nearshore Homes  | 4  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | <1 | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 94 | pct |
| Lake Surface               | 6  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

July 2, 1981

|                                |      |     |
|--------------------------------|------|-----|
| Depth (ft)                     | 3    | 44  |
| Water Temperature (°C)         | 19.2 | 8.8 |
| Dissolved Oxygen               | 10.7 | 0.1 |
| Specific Conductance (umho)    | 84   | 93  |
| pH (units)                     | 8.0  | 7.1 |
| Total Nitrate, as N            | 0.07 | .02 |
| Total Nitrite, as N            | .01  | .00 |
| Total Ammonia, as N            | .38  | .53 |
| Total Organic Nitrogen, as N   | .92  | .87 |
| Total Nitrogen, as N           | 1.4  | 1.4 |
| Dissolved Orthophosphate, as P | .04  | .05 |
| Total Phosphorus, as P         | .04  | .15 |
| Secchi-Disc Visibility (ft)    |      | 9   |
| Chlorophyll <u>a</u> (ug/L)    | 8.3  | --  |

Aquatic Macrophyte Coverage

Littoral Zone

70 pct

Water-Surface Zone

&lt;5 pct

LAKE TROPHIC CLASSIFICATION

Characteristic Value

147

Trophic State Index (Carlson, 1977)

TSISD

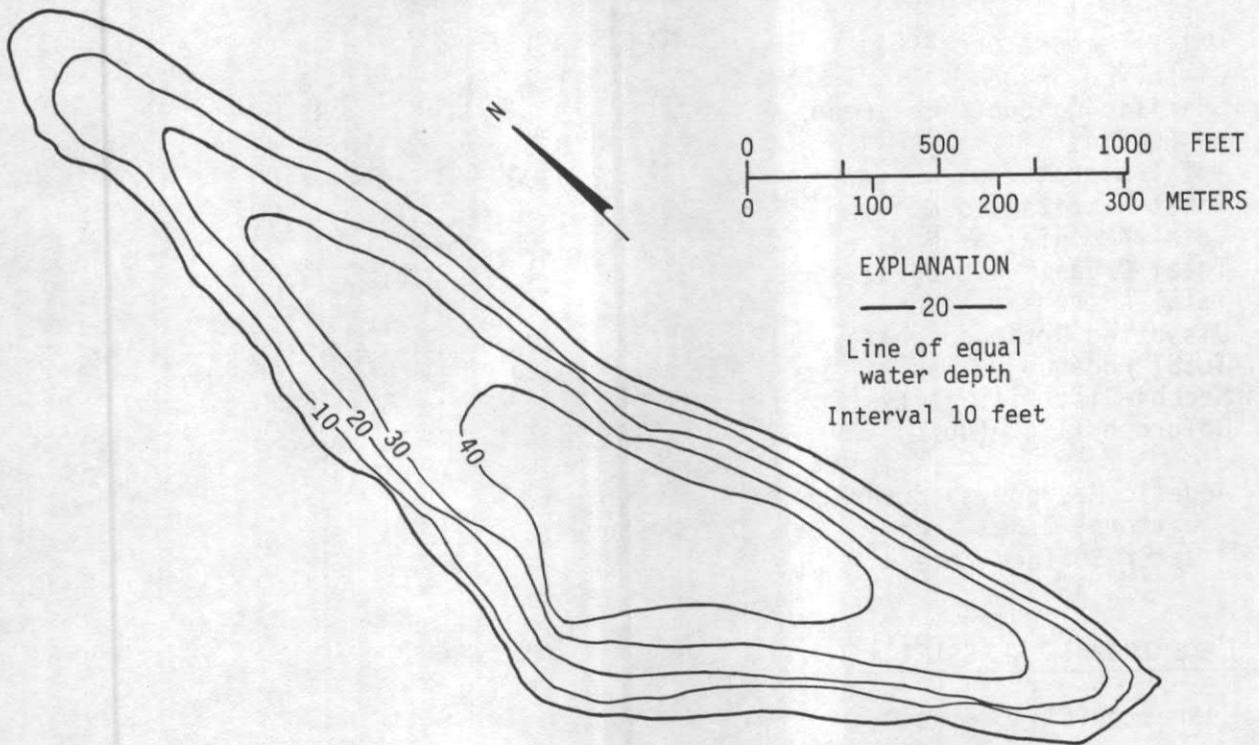
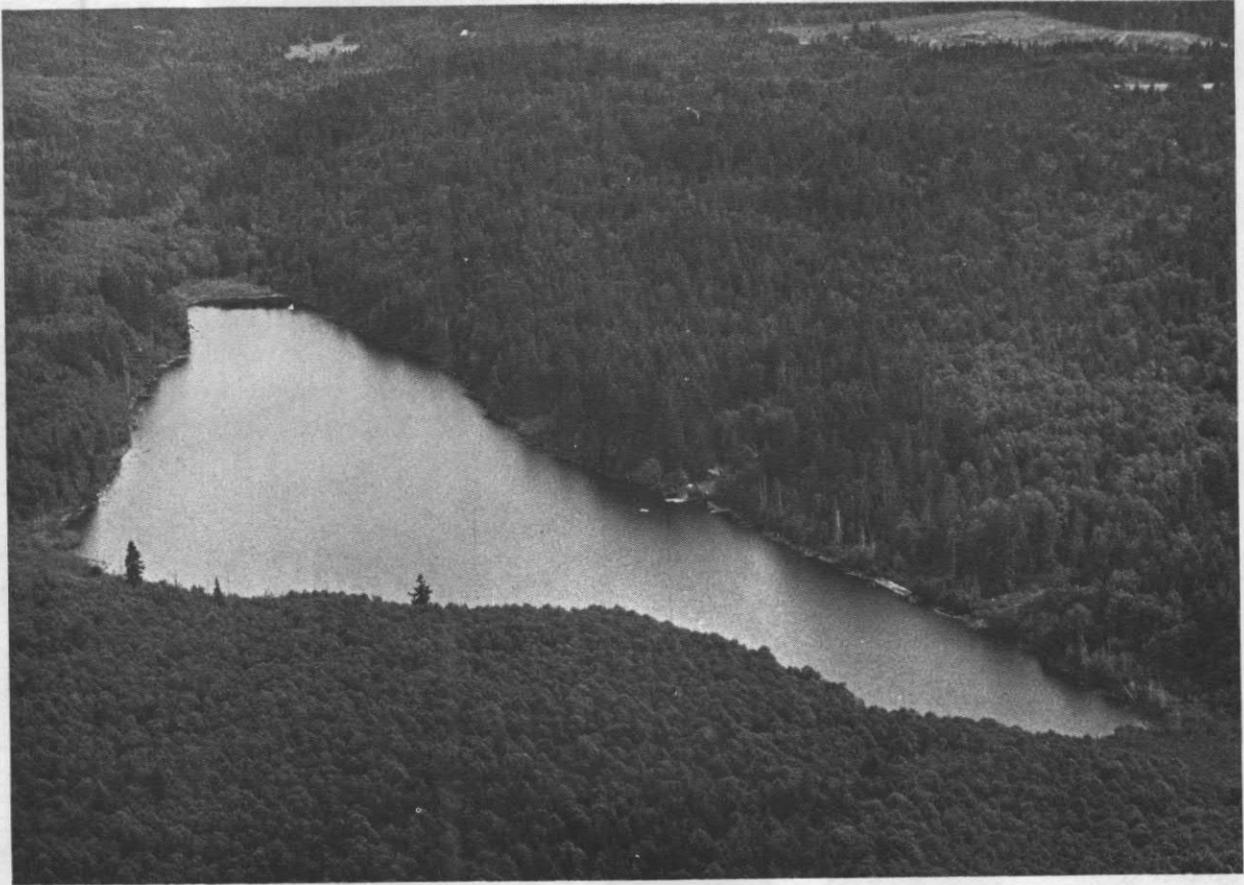
45

TSITP

57

TSICh1

51



Gibbs Lake, Jefferson County. Photo taken July 2, 1981, view northeasterly.  
Bathymetric map from County Engineer, January 1926.

LELAND LAKE

JEFFERSON COUNTY

WRIA 17

T28N-R02W-26

LATITUDE 47° 53' 12" LONGITUDE 122° 53' 05"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 5.71 mi <sup>2</sup> |
| Altitude                | 190 ft               |
| Lake Area               | 110 acres            |
| Lake Volume             | 1,400 acre-ft        |
| Mean Depth              | 13 ft                |
| Maximum Depth           | 20 ft                |
| Shoreline Length        | 2.7 mi               |
| Shoreline Configuration | 1.9                  |
| Development of Volume   | 0.66                 |
| Bottom Slope            | 0.82 pct             |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

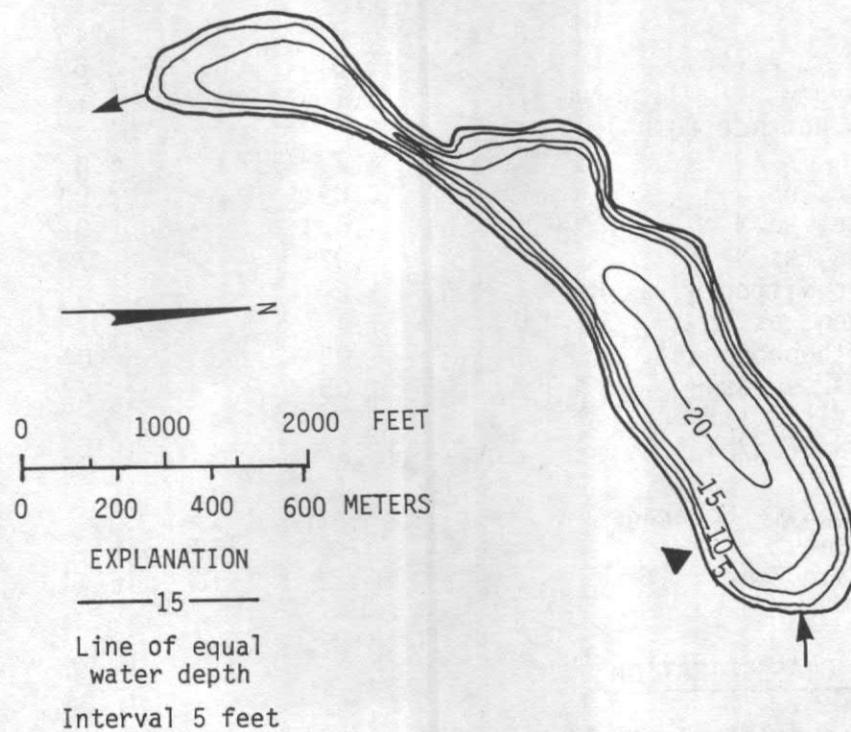
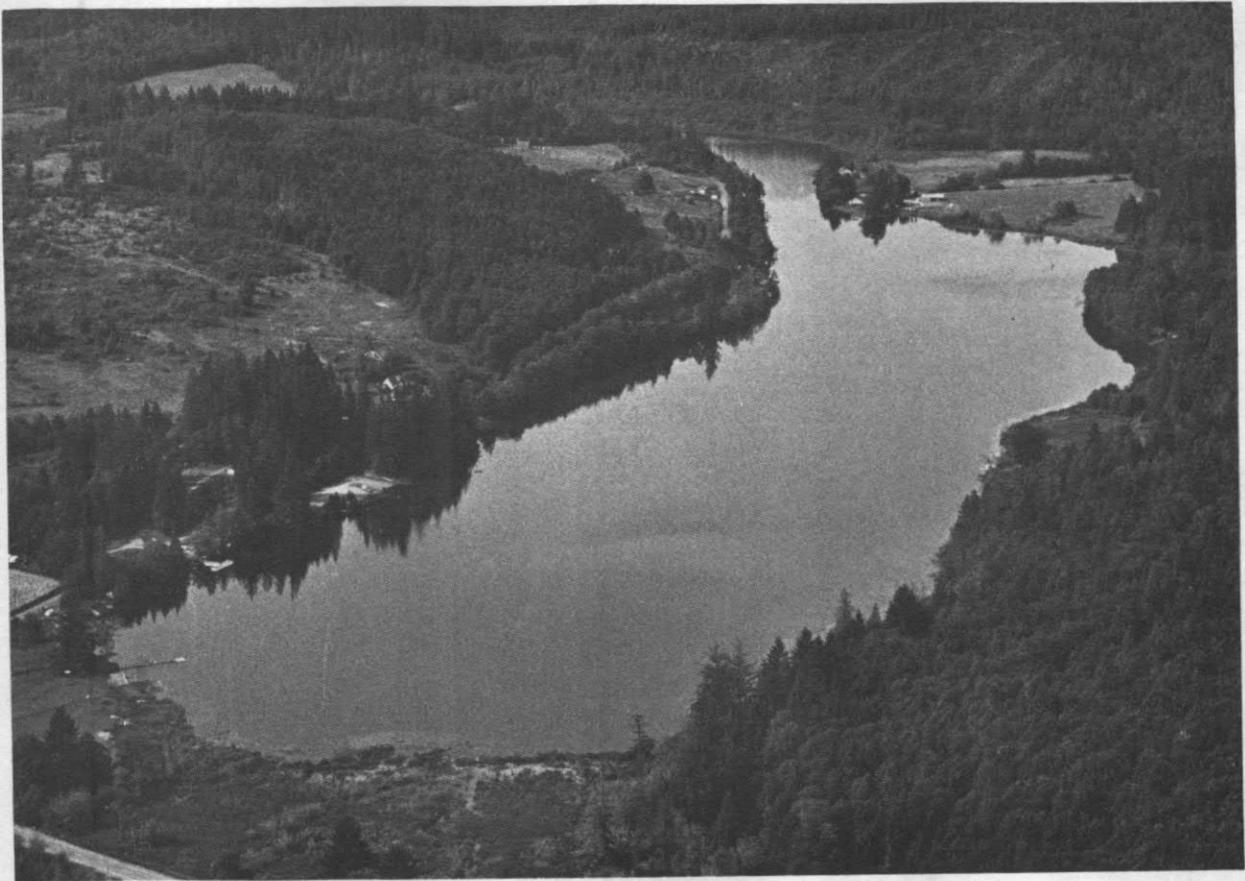
|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 25  | pct |
| Number of Nearshore Homes  | 18  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 0   | pct |
| Agricultural               | 10  | pct |
| Forest or Unproductive     | 87  | pct |
| Lake Surface               | 3   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |              |      |
|--------------------------------|--------------|------|
| Date                           | July 2, 1981 |      |
| Depth (ft)                     | 3            | 19   |
| Water Temperature (°C)         | 19.1         | 14.0 |
| Dissolved Oxygen               | 11.4         | 0.4  |
| Specific Conductance (umho)    | 79           | 83   |
| pH (units)                     | 8.0          | 6.9  |
| Total Nitrate, as N            | 0.00         | .00  |
| Total Nitrite, as N            | .00          | .00  |
| Total Ammonia, as N            | .05          | .04  |
| Total Organic Nitrogen, as N   | 1.4          | .96  |
| Total Nitrogen, as N           | 1.4          | 1.0  |
| Dissolved Orthophosphate, as P | .00          | .03  |
| Total Phosphorus, as P         | .06          | .06  |
| Secchi-Disc Visibility (ft)    | 7            |      |
| Chlorophyll <u>a</u> (ug/L)    | 5.7          | --   |
| Aquatic Macrophyte Coverage    |              |      |
| Littoral Zone                  | 90           | pct  |
| Water-Surface Zone             | 1            | pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 196 |
| Trophic State Index (Carlson, 1977) |     |
| TSISD                               | 49  |
| TSITP                               | 63  |
| TSICh1                              | 48  |



Leland Lake, Jefferson County. Photo taken July 2, 1981, view southerly.  
Bathymetric map from Washington Department of Game, July 19, 1952.

BASS LAKE

KING COUNTY

WRIA 09

T20N-R06E-02

LATITUDE 47° 15' 23" LONGITUDE 121° 59' 49"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 2.42 mi <sup>2</sup> |
| Altitude                | 665 ft               |
| Lake Area               | 23 acres             |
| Lake Volume             | 270 acre-ft          |
| Mean Depth              | 12 ft                |
| Maximum Depth           | 26 ft                |
| Shoreline Length        | 0.89 mi              |
| Shoreline Configuration | 1.3                  |
| Development of Volume   | 0.44                 |
| Bottom Slope            | 2.3 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 5  | pct |
| Number of Nearshore Homes  | 1  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 72 | pct |
| Forest or Unproductive     | 27 | pct |
| Lake Surface               | 1  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 23, 1981

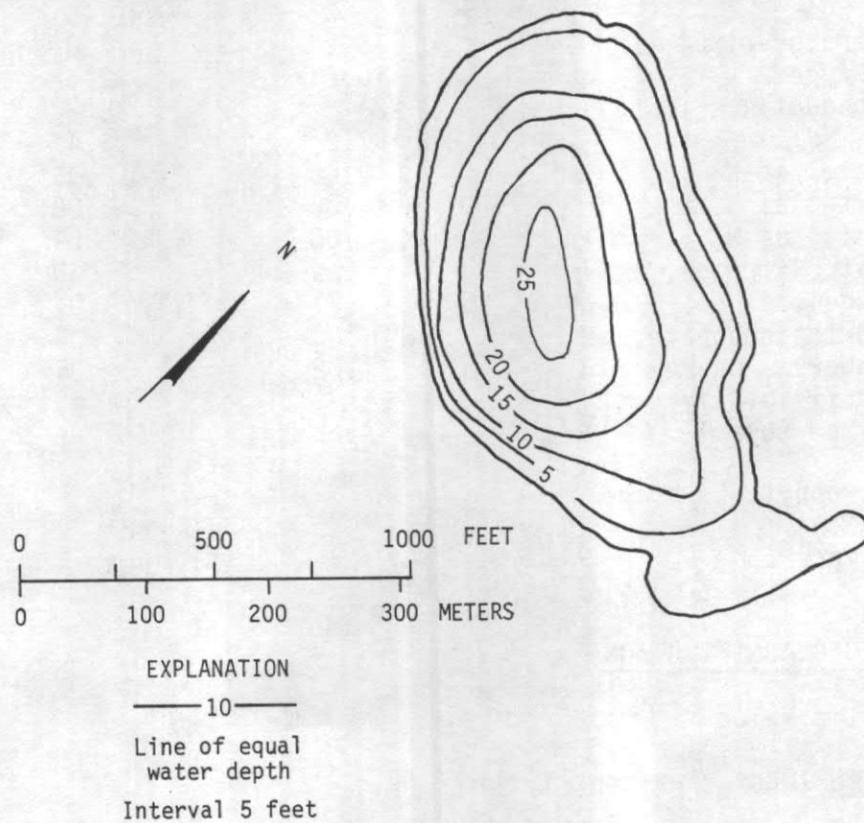
|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 24     |
| Water Temperature (°C)         | 15.0 | 8.8    |
| Dissolved Oxygen               | 11.1 | 0.1    |
| Specific Conductance (umho)    | 92   | 150    |
| pH (units)                     | 6.7  | 6.8    |
| Total Nitrate, as N            | 0.09 | .00    |
| Total Nitrite, as N            | .00  | .01    |
| Total Ammonia, as N            | .07  | .70    |
| Total Organic Nitrogen, as N   | 1.2  | 2.0    |
| Total Nitrogen, as N           | 1.4  | 2.7    |
| Dissolved Orthophosphate, as P | .02  | .04    |
| Total Phosphorus, as P         | .05  | .27    |
| Secchi-Disc Visibility (ft)    |      | 4      |
| Chlorophyll <u>a</u> (ug/L)    | 18.9 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 50 pct |
| Water-Surface Zone             |      | 10 pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value (Bortleson, 1978) 278

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 57 |
| TSI <sub>TP</sub>  | 61 |
| TSI <sub>Chl</sub> | 59 |



Bass Lake, King County. Photo taken June 23, 1981, view northwesterly.  
Bathymetric map from U.S. Geological Survey, July 2, 1973.

BEAVER NO. 2 LAKE

KING COUNTY

WRIA 08

T24N-R06E-11

LATITUDE 47° 35' 10" LONGITUDE 122° 00' 03"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 1.14 mi <sup>2</sup> |
| Altitude                | 406 ft               |
| Lake Area               | 62 acres             |
| Lake Volume             | 1,300 acre-ft        |
| Mean Depth              | 21 ft                |
| Maximum Depth           | 54 ft                |
| Shoreline Length        | 2.0 mi               |
| Shoreline Configuration | 1.8                  |
| Development of Volume   | 0.39                 |
| Bottom Slope            | 2.9 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

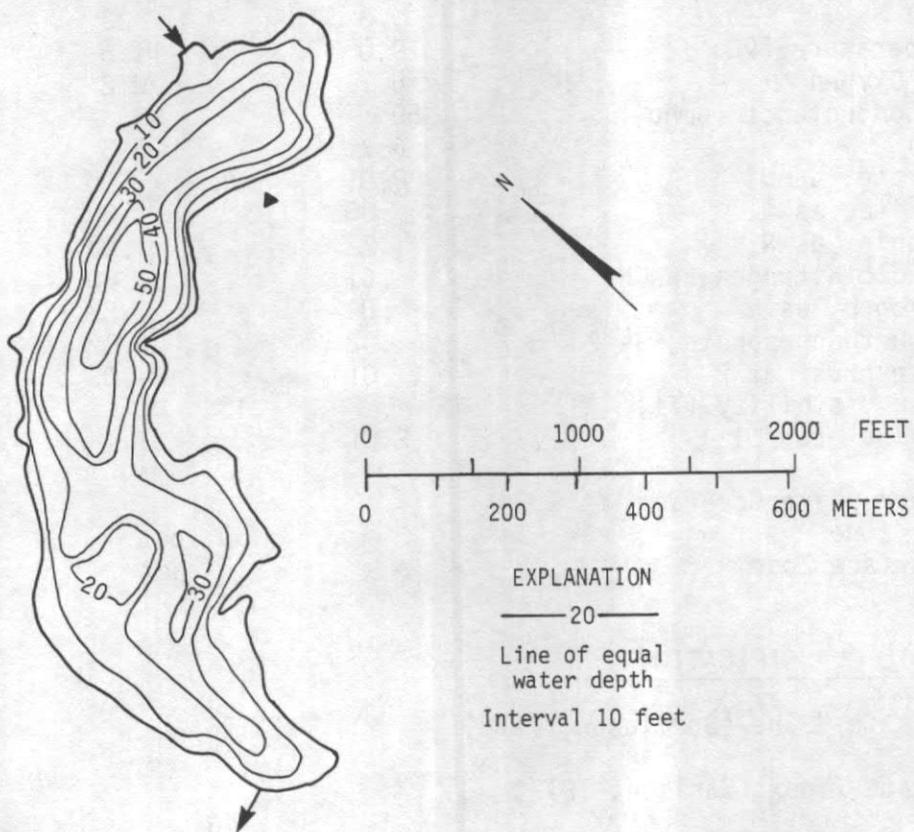
|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 95  | pct |
| Number of Nearshore Homes  | 81  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 7   | pct |
| Agricultural               | 0   | pct |
| Forest or Unproductive     | 83  | pct |
| Lake Surface               | 10  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |               |      |
|--------------------------------|---------------|------|
| Date                           | June 26, 1981 |      |
| Depth (ft)                     | 3             | 46   |
| Water Temperature (°C)         | 19.2          | 7.8  |
| Dissolved Oxygen               | 10.6          | 2.6  |
| Specific Conductance (umho)    | 34            | 38   |
| pH (units)                     | 7.2           | 6.4  |
| Total Nitrate, as N            | 0.00          | 0.33 |
| Total Nitrite, as N            | .00           | .00  |
| Total Ammonia, as N            | .08           | .09  |
| Total Organic Nitrogen, as N   | .69           | .60  |
| Total Nitrogen, as N           | .77           | 1.0  |
| Dissolved Orthophosphate, as P | .00           | .00  |
| Total Phosphorus, as P         | .02           | .04  |
| Secchi-Disc Visibility (ft)    | 8             |      |
| Chlorophyll <u>a</u> (ug/L)    | 4.62          | --   |
| Aquatic Macrophyte Coverage    |               |      |
| Littoral Zone                  | 50            | pct  |
| Water-Surface Zone             | <5            | pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 118 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 47  |
| TSI <sub>TP</sub>                   | 47  |
| TSI <sub>Chl</sub>                  | 46  |



Beaver No. 2 Lake, King County. Photo taken July 26, 1981, view northeasterly.  
Bathymetric map from Washington Department of Game, date unknown.

BITTER LAKE

KING COUNTY

WRIA 08

T26N-R04E-19

LATITUDE 47° 43' 31" LONGITUDE 122° 20' 55"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.51 mi <sup>2</sup> |
| Altitude                | 438 ft               |
| Lake Area               | 19 acres             |
| Lake Volume             | 300 acre-ft          |
| Mean Depth              | 16 ft                |
| Maximum Depth           | 31 ft                |
| Shoreline Length        | 0.86 mi              |
| Shoreline Configuration | 1.4                  |
| Development of Volume   | 0.51                 |
| Bottom Slope            | 3.0 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 80 | pct |
| Number of Nearshore Homes  | 46 |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 52 | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 42 | pct |
| Lake Surface               | 6  | pct |

Public Boat Access to Lake Yes

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

July 1, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 23   |
| Water Temperature (°C)         | 19.0 | 11.8 |
| Dissolved Oxygen               | 8.7  | 0.2  |
| Specific Conductance (umho)    | 50   | 59   |
| pH (units)                     | 6.7  | 6.3  |
| Total Nitrate, as N            | 0.01 | .00  |
| Total Nitrite, as N            | .00  | .00  |
| Total Ammonia, as N            | .22  | .03  |
| Total Organic Nitrogen, as N   | .61  | .80  |
| Total Nitrogen, as N           | .84  | .83  |
| Dissolved Orthophosphate, as P | .02  | .02  |
| Total Phosphorus, as P         | .01  | .03  |
| Secchi-Disc Visibility (ft)    |      | 13   |
| Chlorophyll <u>a</u> (ug/L)    | 2.01 | --   |

Aquatic Macrophyte Coverage

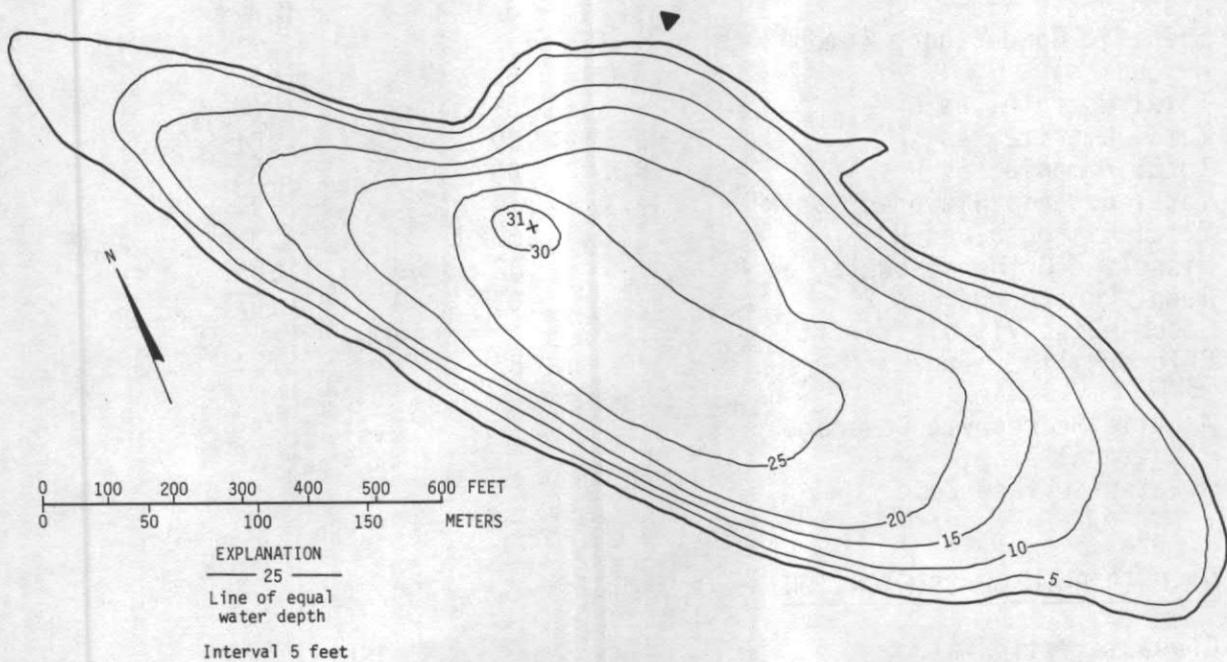
|                    |    |     |
|--------------------|----|-----|
| Littoral Zone      | 80 | pct |
| Water-Surface Zone | 5  | pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value (Bortleson, 1978) 76

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 40 |
| TSI <sub>TP</sub>  | 37 |
| TSI <sub>Chl</sub> | 37 |



Bitter Lake, King County. Photo taken July 1, 1981, view westerly.  
 Bathymetric map from Washington Department of Game, January 29, 1949.

BLACK LAKE

KING COUNTY

WRIA 07

T25N-R08E-13

LATITUDE 47° 38' 39" LONGITUDE 121° 43' 25"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.24 mi <sup>2</sup> |
| Altitude                | 1,270 ft             |
| Lake Area               | 25 acres             |
| Lake Volume             | 550 acre-ft          |
| Mean Depth              | 22 ft                |
| Maximum Depth           | 38 ft                |
| Shoreline Length        | 0.85 mi              |
| Shoreline Configuration | 1.2                  |
| Development of Volume   | 0.58                 |
| Bottom Slope            | 3.2 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 0  | pct |
| Number of Nearshore Homes  | 0  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 84 | pct |
| Lake Surface               | 16 | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 29, 1981

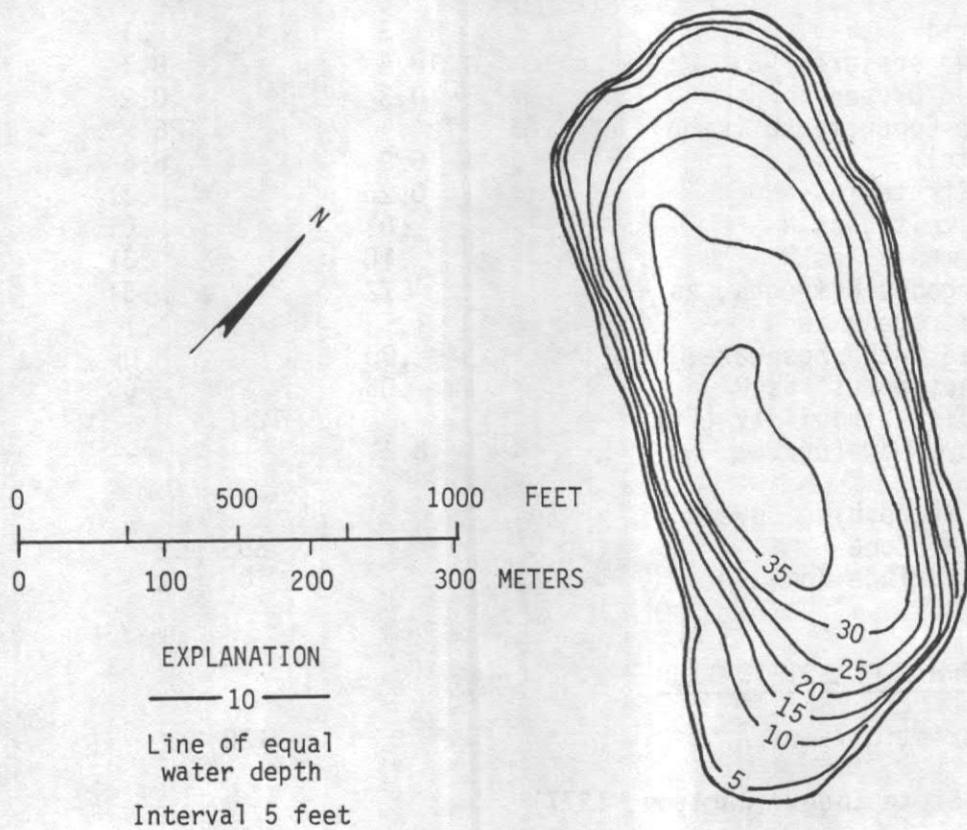
|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 33     |
| Water Temperature (°C)         | 19.5 | 6.3    |
| Dissolved Oxygen               | 9.6  | 0.4    |
| Specific Conductance (umho)    | 26   | 43     |
| pH (units)                     | 6.5  | 6.2    |
| Total Nitrate, as N            | 0.05 | .00    |
| Total Nitrite, as N            | .00  | .01    |
| Total Ammonia, as N            | .05  | .33    |
| Total Organic Nitrogen, as N   | .77  | .97    |
| Total Nitrogen, as N           | .87  | 1.3    |
| Dissolved Orthophosphate, as P | .03  | .06    |
| Total Phosphorus, as P         | .03  | .07    |
| Secchi-Disc Visibility (ft)    |      | 14     |
| Chlorophyll <u>a</u> (ug/L)    | 1.87 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 80 pct |
| Water-Surface Zone             |      | 1 pct  |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 90

Trophic State Index (Carlson, 1977)

|        |    |
|--------|----|
| TSISD  | 39 |
| TSITP  | 53 |
| TSICh1 | 37 |



Black Lake, King County. Photo taken June 29, 1981, view northwesterly.  
Bathymetric map from U.S. Geological Survey, July 9, 1973.

BOREN LAKE

KING COUNTY

WRIA 08

T24N-R05E-28

LATITUDE 47° 31' 52" LONGITUDE 122° 09' 45"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 1.07 mi <sup>2</sup> |
| Altitude                | 1,047 ft             |
| Lake Area               | 18 acres             |
| Lake Volume             | 330 acre-ft          |
| Mean Depth              | 18 ft                |
| Maximum Depth           | 34 ft                |
| Shoreline Length        | 0.70 mi              |
| Shoreline Configuration | 1.2                  |
| Development of Volume   | 0.53                 |
| Bottom Slope            | 3.4 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

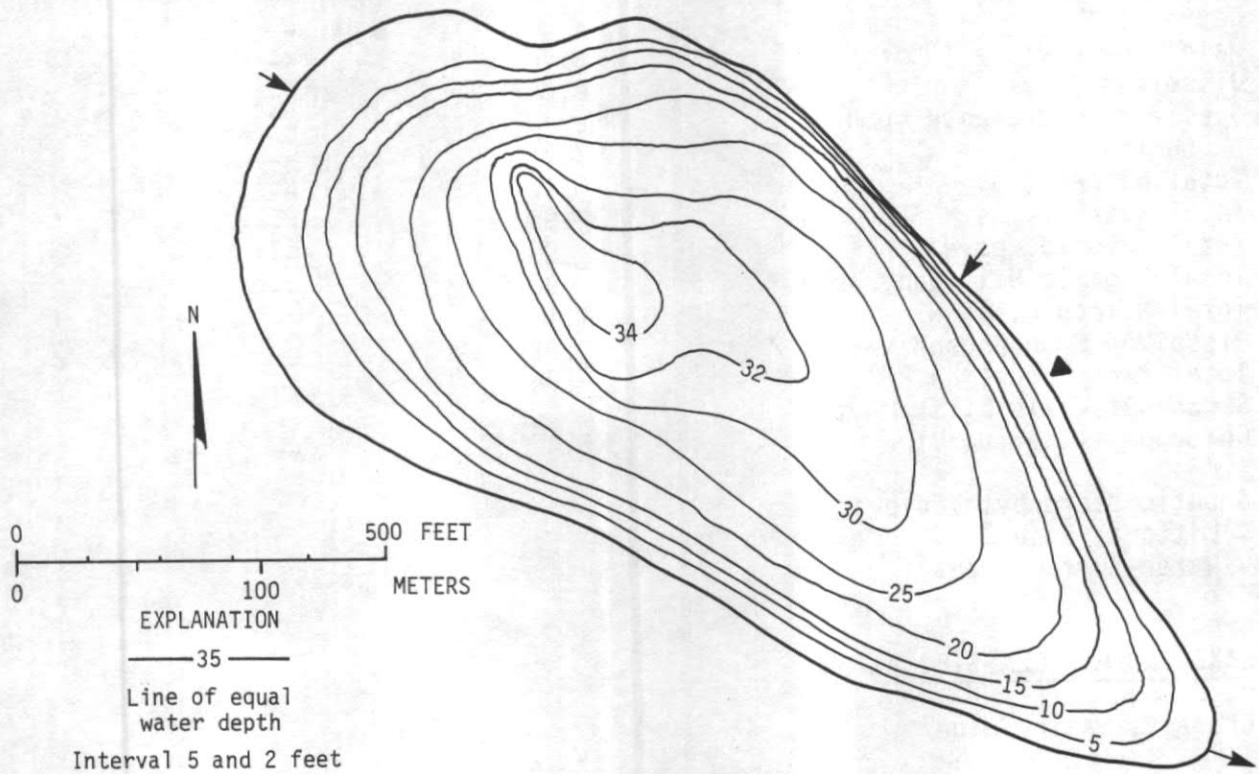
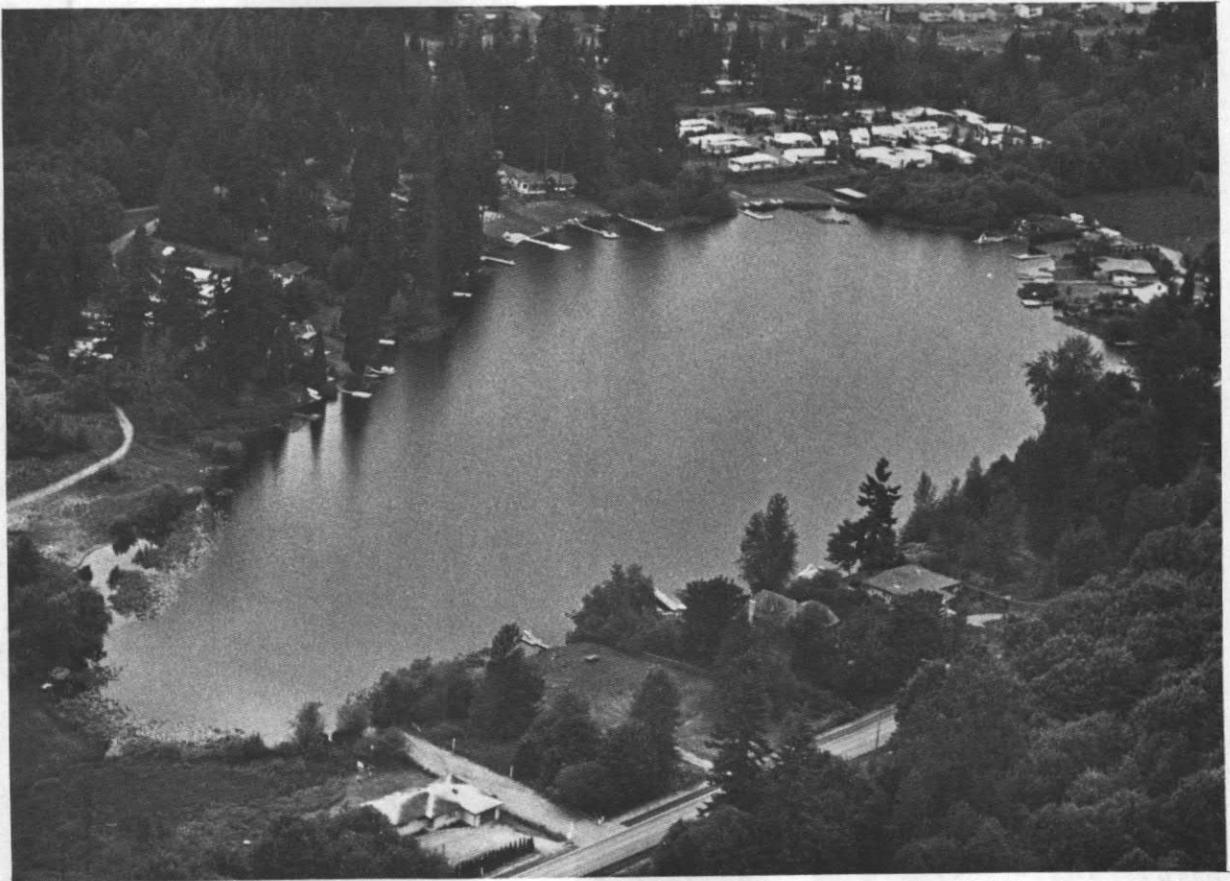
|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 75  | pct |
| Number of Nearshore Homes  | 34  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 24  | pct |
| Agricultural               | 5   | pct |
| Forest or Unproductive     | 68  | pct |
| Lake Surface               | 3   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |               |     |
|--------------------------------|---------------|-----|
| Date                           | June 26, 1981 |     |
| Depth (ft)                     | 3             | 31  |
| Water Temperature (°C)         | 18.4          | 8.1 |
| Dissolved Oxygen               | 10.3          | 0.2 |
| Specific Conductance (umho)    | 124           | 126 |
| pH (units)                     | 6.9           | 6.6 |
| Total Nitrate, as N            | 0.26          | .31 |
| Total Nitrite, as N            | .01           | .01 |
| Total Ammonia, as N            | .10           | .31 |
| Total Organic Nitrogen, as N   | .72           | .51 |
| Total Nitrogen, as N           | 1.1           | 1.1 |
| Dissolved Orthophosphate, as P | .00           | .00 |
| Total Phosphorus, as P         | .05           | .09 |
| Secchi-Disc Visibility (ft)    | 12            |     |
| Chlorophyll <u>a</u> (ug/L)    | 8.31          | --  |
| Aquatic Macrophyte Coverage    |               |     |
| Littoral Zone                  | 80            | pct |
| Water-Surface Zone             | 10            | pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 120 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 41  |
| TSI <sub>TP</sub>                   | 61  |
| TSI <sub>Chl</sub>                  | 51  |



Boren Lake, King County. Photo taken June 26, 1981, view northwesterly.  
Bathymetric map from Washington Department of Game, October 4, 1946.

BOW LAKE

KING COUNTY

WRIA 09

T23N-R04E-33

LATITUDE 47° 26' 13" LONGITUDE 122° 17' 33"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.55 mi <sup>2</sup> |
| Altitude                | 338 ft               |
| Lake Area               | 14 acres             |
| Lake Volume             | 90 acre-ft           |
| Mean Depth              | 6 ft                 |
| Maximum Depth           | 10 ft                |
| Shoreline Length        | 0.68 mi              |
| Shoreline Configuration | 1.3                  |
| Development of Volume   | 0.63                 |
| Bottom Slope            | 1.1 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 40 | pct |
| Number of Nearshore Homes  | 22 |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 86 | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 10 | pct |
| Lake Surface               | 4  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

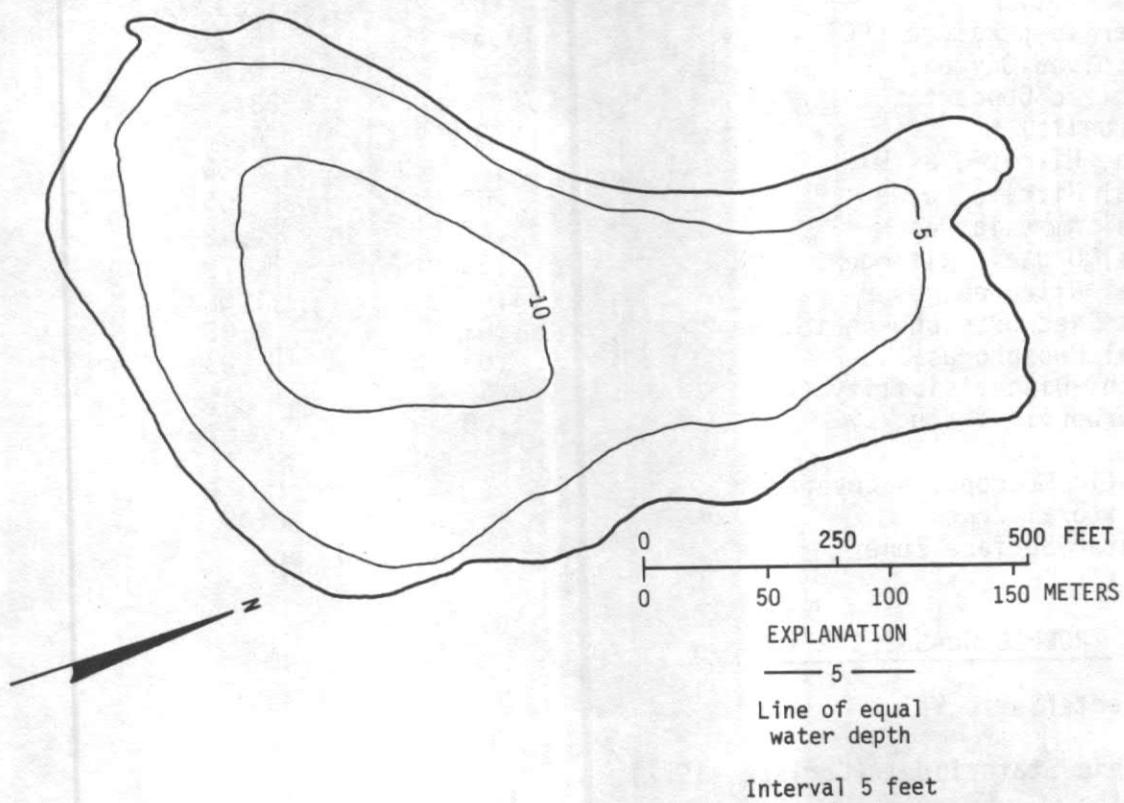
Date

June 24, 1981

|                                |      |     |
|--------------------------------|------|-----|
| Depth (ft)                     | 3    | --  |
| Water Temperature (°C)         | 19.7 | --  |
| Dissolved Oxygen               | 8.8  | --  |
| Specific Conductance (umho)    | 150  | --  |
| pH (units)                     | 7.3  | --  |
| Total Nitrate, as N            | 0.16 | --  |
| Total Nitrite, as N            | .00  | --  |
| Total Ammonia, as N            | .09  | --  |
| Total Organic Nitrogen, as N   | .88  | --  |
| Total Nitrogen, as N           | 1.1  | --  |
| Dissolved Orthophosphate, as P | .02  | --  |
| Total Phosphorus, as P         | .08  | --  |
| Secchi-Disc Visibility (ft)    | 9    | --  |
| Chlorophyll <u>a</u> (ug/L)    | 5.47 | --  |
| Aquatic Macrophyte Coverage    |      |     |
| Littoral Zone                  | 75   | pct |
| Water-Surface Zone             | 0    | pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 146 |
| Trophic State Index (Carlson, 1977) |     |
| TSISD                               | 45  |
| TSITP                               | 67  |
| TSICh1                              | 47  |



Bow Lake, King County. Photo taken June 29, 1979.  
Bathymetric map from U.S. Geological Survey, May 29, 1981.

DEEP LAKE

KING COUNTY

WRIA 09

T21N-R07E-32

LATITUDE 47° 16' 13" LONGITUDE 121° 56' 19"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 3.92 mi <sup>2</sup> |
| Altitude                | 770 ft               |
| Lake Area               | 37 acres             |
| Lake Volume             | 1,200 acre-ft        |
| Mean Depth              | 33 ft                |
| Maximum Depth           | 74 ft                |
| Shoreline Length        | 1.3 mi               |
| Shoreline Configuration | 1.6                  |
| Development of Volume   | 0.45                 |
| Bottom Slope            | 5.2 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 5  | pct |
| Number of Nearshore Homes  | 1  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 1  | pct |
| Agricultural               | 6  | pct |
| Forest or Unproductive     | 91 | pct |
| Lake Surface               | 2  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

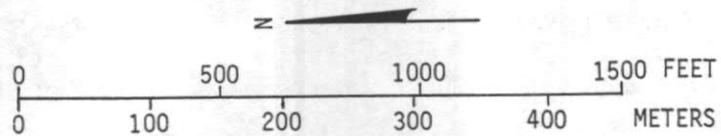
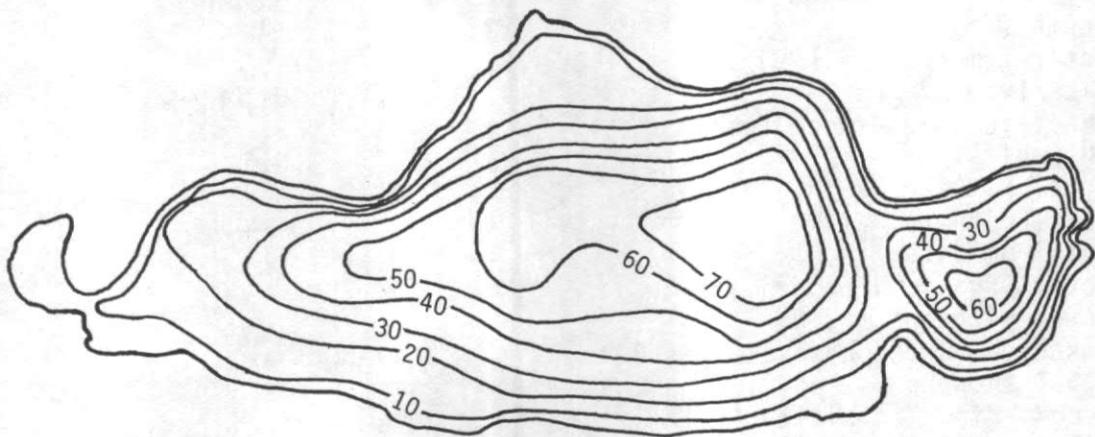
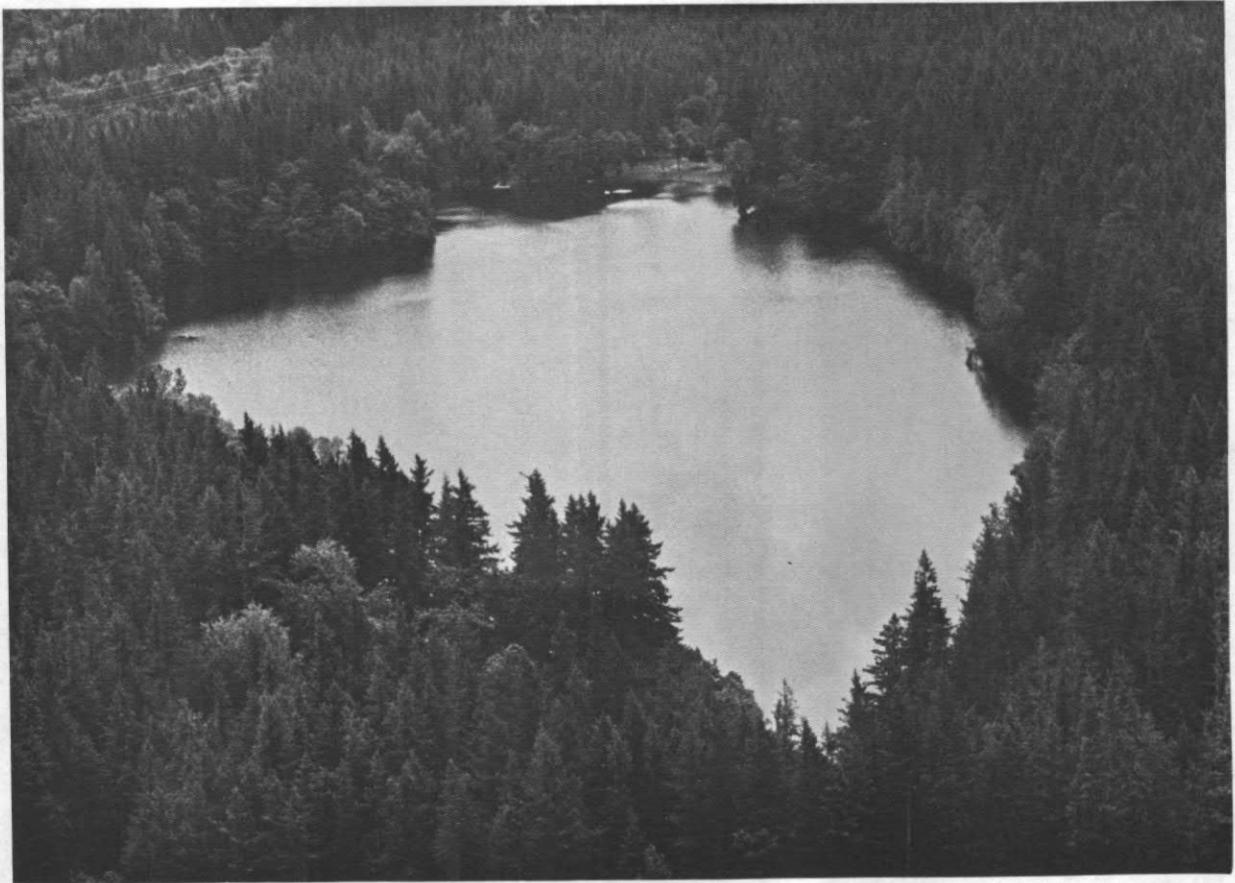
Date

June 23, 1981

|                                |      |       |
|--------------------------------|------|-------|
| Depth (ft)                     | 3    | 69    |
| Water Temperature (°C)         | 13.5 | 5.2   |
| Dissolved Oxygen               | 10.0 | 0.8   |
| Specific Conductance (umho)    | 75   | 83    |
| pH (units)                     | 6.9  | 6.7   |
| Total Nitrate, as N            | 0.74 | .60   |
| Total Nitrite, as N            | .00  | .00   |
| Total Ammonia, as N            | .08  | .12   |
| Total Organic Nitrogen, as N   | .53  | .79   |
| Total Nitrogen, as N           | 1.4  | 1.5   |
| Dissolved Orthophosphate, as P | .02  | .03   |
| Total Phosphorus, as P         | .03  | .03   |
| Secchi-Disc Visibility (ft)    |      | 11    |
| Chlorophyll <u>a</u> (ug/L)    | 1.08 | --    |
| Aquatic Macrophyte Coverage    |      |       |
| Littoral Zone                  |      | 0 pct |
| Water-Surface Zone             |      | 0 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 80 |
| Trophic State Index (Carlson, 1977) |    |
| TSISD                               | 43 |
| TSITP                               | 53 |
| TSICh1                              | 31 |



EXPLANATION  
— 10 —  
Line of equal  
water depth  
Interval 10 feet

Deep Lake, King County. Photo taken June 23, 1981, view southerly.  
Bathymetric map from U.S. Geological Survey, July 2, 1973.

DOLLOFF LAKE

KING COUNTY

WRIA 09

T21N-R04E-10

LATITUDE 47° 19' 25" LONGITUDE 122° 17' 05"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.81 mi <sup>2</sup> |
| Altitude                | 405 ft               |
| Lake Area               | 20 acres             |
| Lake Volume             | 200 acre-ft          |
| Mean Depth              | 10 ft                |
| Maximum Depth           | 19 ft                |
| Shoreline Length        | 1.1 mi               |
| Shoreline Configuration | 1.7                  |
| Development of Volume   | 0.51                 |
| Bottom Slope            | 1.8 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 70 | pct |
| Number of Nearshore Homes  | 38 |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 3  | pct |
| Residential-Suburban       | 10 | pct |
| Agricultural               | 18 | pct |
| Forest or Unproductive     | 65 | pct |
| Lake Surface               | 4  | pct |

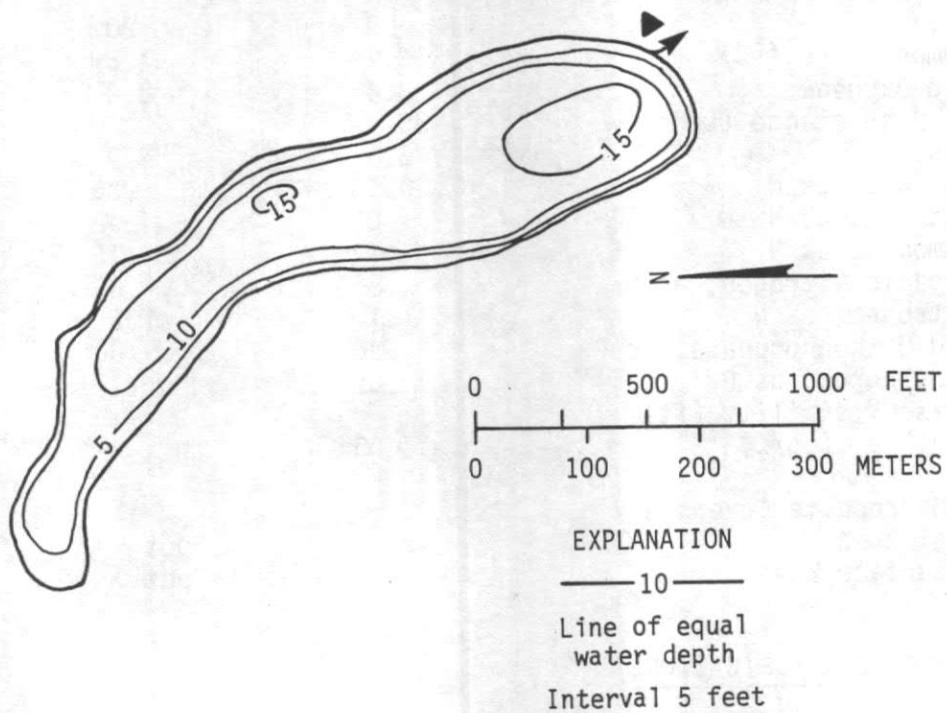
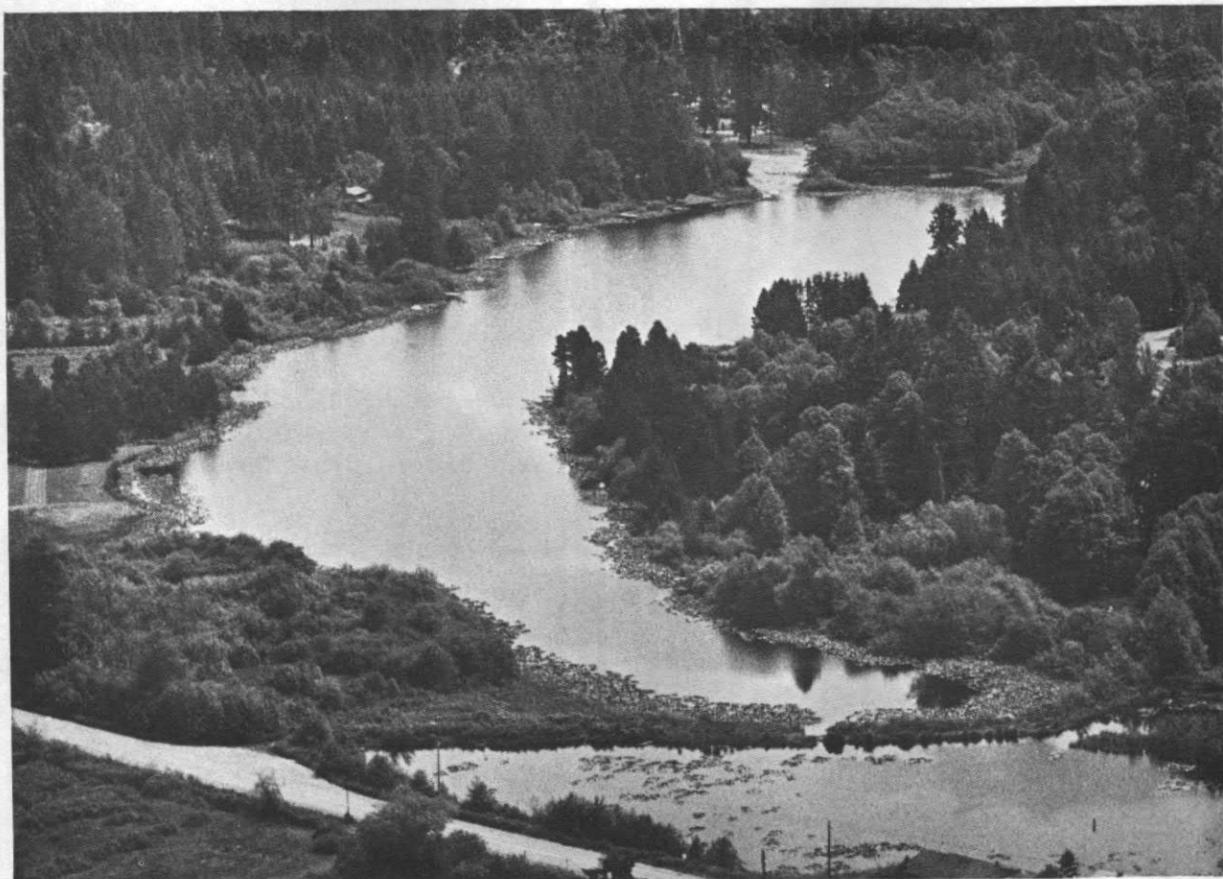
Public Boat Access to Lake Yes

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

| Date                           | June 11, 1981 |        | September 17, 1981 |        |
|--------------------------------|---------------|--------|--------------------|--------|
| Depth (ft)                     | 3             | 14     | 3                  | 14     |
| Water Temperature (°C)         | 16.8          | 11.0   | 16.8               | 16.1   |
| Dissolved Oxygen               | 9.8           | 0.1    | --                 | --     |
| Specific Conductance (umho)    | 80            | 88     | 83                 | 112    |
| pH (units)                     | 7.1           | 6.6    | 6.6                | 6.2    |
| Total Nitrate, as N            | --            | --     | <0.06              | <0.07  |
| Total Nitrite, as N            | --            | --     | .03                | .03    |
| Total Ammonia, as N            | --            | --     | .14                | 1.3    |
| Total Organic Nitrogen, as N   | --            | --     | 1.5                | 1.1    |
| Total Nitrogen, as N           | --            | --     | 1.6                | 2.5    |
| Dissolved Orthophosphate, as P | --            | --     | .05                | .24    |
| Total Phosphorus, as P         | --            | --     | .05                | .26    |
| Secchi-Disc Visibility (ft)    |               | 4      |                    | 3      |
| Chlorophyll <u>a</u> (ug/L)    | 33.9          | --     | --                 | --     |
| Aquatic Macrophyte Coverage    |               |        |                    |        |
| Littoral Zone                  |               | 90 pct |                    | -- pct |
| Water-Surface Zone             |               | 5 pct  |                    | -- pct |

LAKE TROPHIC CLASSIFICATION

|                                     |    |     |
|-------------------------------------|----|-----|
| Characteristic Value                | -- | 395 |
| Trophic State Index (Carlson, 1977) |    |     |
| TSISD                               | 57 | 61  |
| TSITP                               | -- | 61  |
| TSICh1                              | 65 | --  |



Dolloff Lake, King County. Photo taken June 11, 1981, view southeasterly.  
Bathymetric map from Washington Department of Game, February 25, 1953.

DUBOIS LAKE

KING COUNTY

WRIA 07

T26N-R06E-03

LATITUDE 47° 45' 54" LONGITUDE 122° 01' 47"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.72 mi <sup>2</sup> |
| Altitude                | 390 ft               |
| Lake Area               | 12 acres             |
| Lake Volume             | 132 acre-ft          |
| Mean Depth              | 11 ft                |
| Maximum Depth           | 20 ft                |
| Shoreline Length        | 1.1 mi               |
| Shoreline Configuration | 2.4                  |
| Development of Volume   | 0.55                 |
| Bottom Slope            | 2.5 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 25 | pct |
| Number of Nearshore Homes  | 9  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | <1 | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 97 | pct |
| Lake Surface               | 3  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

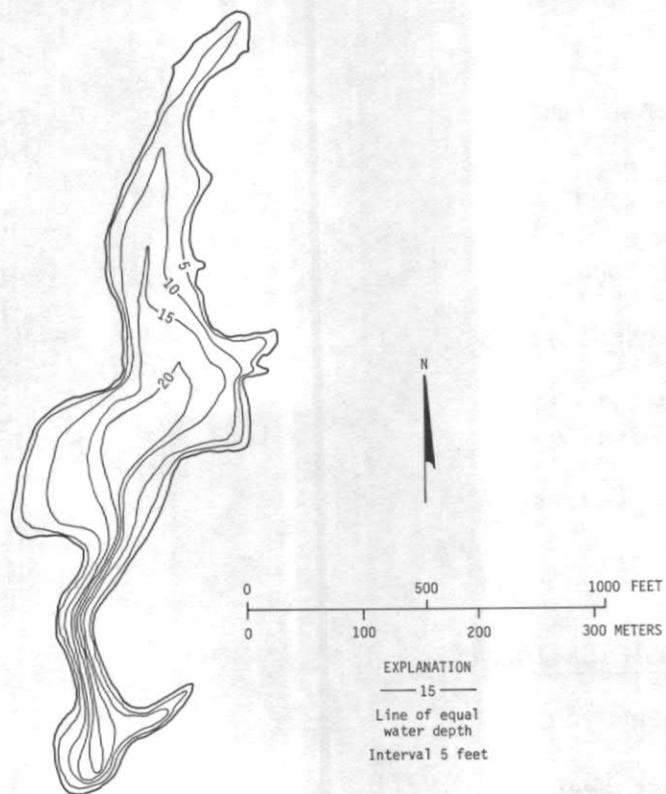
Date

July 6, 1981

|                                |      |       |
|--------------------------------|------|-------|
| Depth (ft)                     | 3    | 20    |
| Water Temperature (°C)         | 19.2 | 7.8   |
| Dissolved Oxygen               | 8.4  | 0.2   |
| Specific Conductance (umho)    | 36   | 40    |
| pH (units)                     | 6.3  | 5.9   |
| Total Nitrate, as N            | 0.10 | .36   |
| Total Nitrite, as N            | .01  | .02   |
| Total Ammonia, as N            | .12  | .16   |
| Total Organic Nitrogen, as N   | .85  | .65   |
| Total Nitrogen, as N           | 1.1  | 1.2   |
| Dissolved Orthophosphate, as P | .00  | .00   |
| Total Phosphorus, as P         | .01  | .11   |
| Secchi-Disc Visibility (ft)    |      | 6     |
| Chlorophyll <u>a</u> (ug/L)    | 4.00 | --    |
| Aquatic Macrophyte Coverage    |      |       |
| Littoral Zone                  |      | 5 pct |
| Water-Surface Zone             |      | 1 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 147 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 51  |
| TSI <sub>TP</sub>                   | 37  |
| TSI <sub>Chl</sub>                  | 44  |



Dubois Lake, King County. Photo taken July 6, 1981, view northerly.  
Bathymetric map from U.S. Geological Survey, June 10, 1981.

ECHO LAKE

KING COUNTY

WRIA 08

T26N-R04E-06

LATITUDE 47° 46' 23" LONGITUDE 122° 20' 25"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.45 mi <sup>2</sup> |
| Altitude                | 393 ft               |
| Lake Area               | 13 acres             |
| Lake Volume             | 220 acre-ft          |
| Mean Depth              | 14 ft                |
| Maximum Depth           | 30 ft                |
| Shoreline Length        | 0.64 mi              |
| Shoreline Configuration | 1.3                  |
| Development of Volume   | 0.46                 |
| Bottom Slope            | 3.6 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 100 | pct |
| Number of Nearshore Homes  | 31  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 96  | pct |
| Residential-Suburban       | 0   | pct |
| Agricultural               | 0   | pct |
| Forest or Unproductive     | 0   | pct |
| Lake Surface               | 4   | pct |
| Public Boat Access to Lake | No  |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

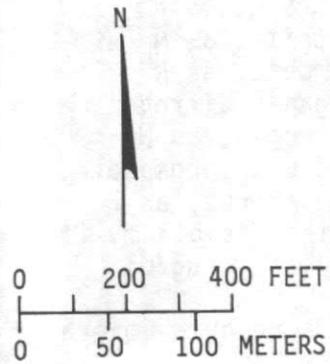
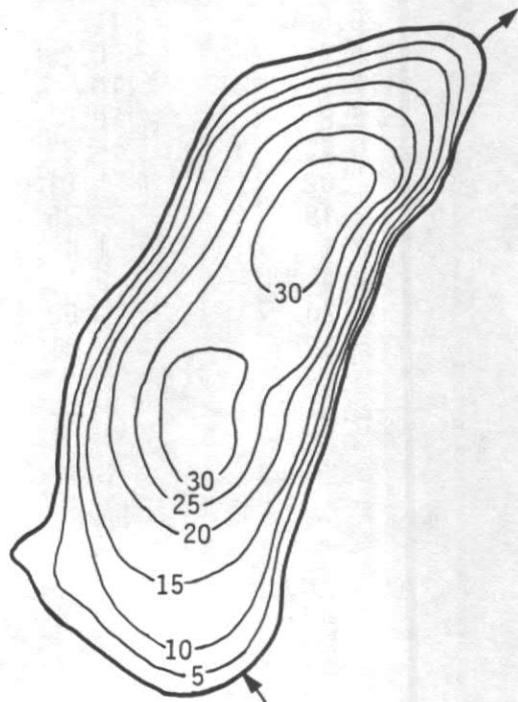
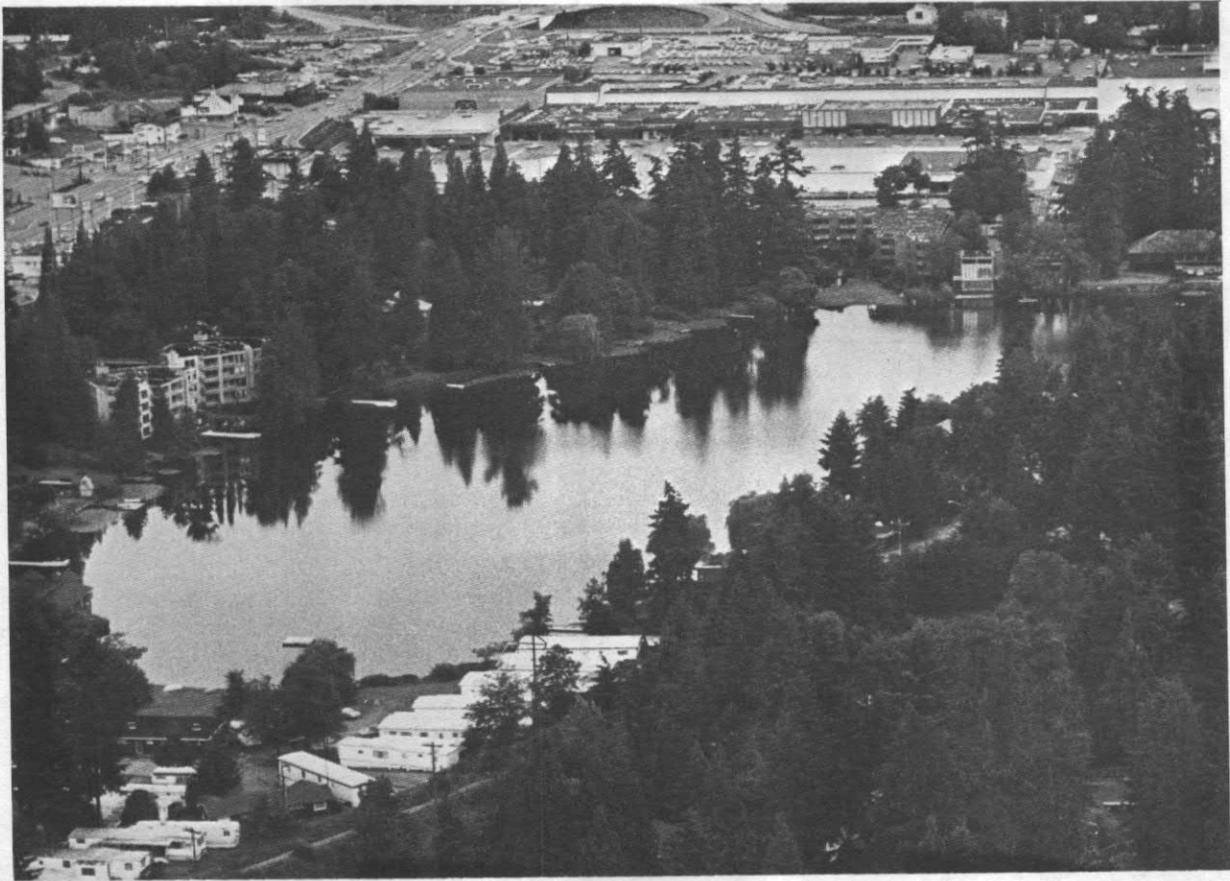
Date

July 1, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 29     |
| Water Temperature (°C)         | 18.5 | 9.2    |
| Dissolved Oxygen               | 8.7  | 0.2    |
| Specific Conductance (umho)    | 53   | 63     |
| pH (units)                     | 6.9  | 6.4    |
| Total Nitrate, as N            | 0.01 | .01    |
| Total Nitrite, as N            | .00  | .00    |
| Total Ammonia, as N            | .04  | .41    |
| Total Organic Nitrogen, as N   | .81  | 1.1    |
| Total Nitrogen, as N           | .86  | 1.5    |
| Dissolved Orthophosphate, as P | .01  | .03    |
| Total Phosphorus, as P         | .02  | .08    |
| Secchi-Disc Visibility (ft)    |      | 10     |
| Chlorophyll <u>a</u> (ug/L)    | 1.68 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 30 pct |
| Water-Surface Zone             |      | <5 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 104 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 44  |
| TSI <sub>TP</sub>                   | 47  |
| TSI <sub>Chl</sub>                  | 36  |



EXPLANATION  
 — 10 —  
 Line of equal  
 water depth

Interval 5 feet

Echo (26N-4E-6) Lake, King County. Photo taken July 1, 1981, view northerly. Bathymetric map from Washington Department of Game, June 6, 1946.

LARSEN LAKE

KING COUNTY

WRIA 08

T25N-R05E-35

LATITUDE 47° 36' 22" LONGITUDE 122° 08' 21"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.31 mi <sup>2</sup> |
| Altitude                | 245 ft               |
| Lake Area               | 10 acres             |
| Lake Volume             | 95 acre-ft           |
| Mean Depth              | 9 ft                 |
| Maximum Depth           | 16 ft                |
| Shoreline Length        | 0.47 mi              |
| Shoreline Configuration | 1.0                  |
| Development of Volume   | 0.57                 |
| Bottom Slope            | 2.1 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 4  | pct |
| Number of Nearshore Homes  | 1  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 61 | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 34 | pct |
| Forest or Unproductive     | 0  | pct |
| Lake Surface               | 5  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter) unless otherwise indicated)

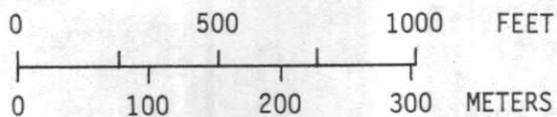
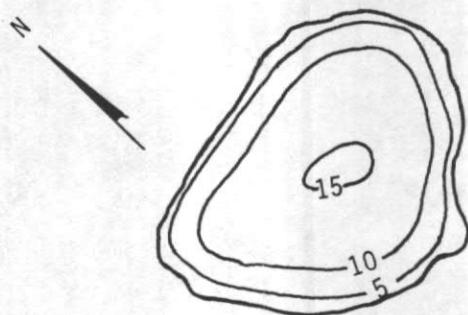
Date

June 29, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 13     |
| Water Temperature (°C)         | 20.6 | 11.3   |
| Dissolved Oxygen               | 6.4  | 0.2    |
| Specific Conductance (umho)    | 112  | 114    |
| pH (units)                     | 6.8  | 6.6    |
| Total Nitrate, as N            | 0.11 | .03    |
| Total Nitrite, as N            | .02  | .01    |
| Total Ammonia, as N            | .18  | .75    |
| Total Organic Nitrogen, as N   | 2.1  | 1.4    |
| Total Nitrogen, as N           | 2.4  | 2.1    |
| Dissolved Orthophosphate, as P | .20  | .53    |
| Total Phosphorus, as P         | .29  | .61    |
| Secchi-Disc Visibility (ft)    |      | 2.5    |
| Chlorophyll <u>a</u> (ug/L)    | 5.84 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 80 pct |
| Water-Surface Zone             |      | 1 pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 453 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 64  |
| TSI <sub>TP</sub>                   | 86  |
| TSI <sub>Chl</sub>                  | 48  |



EXPLANATION

— 10 —

Line of equal  
water depth

Interval 5 feet

Larsen Lake, King County. Photo taken June 29, 1981, view northeasterly.  
Bathymetric map from U.S. Geological Survey, July 11, 1973.

LUCERNE LAKE

KING COUNTY

WRIA 09

T22N-R06E-28

LATITUDE 47° 22' 04" LONGITUDE 122° 02' 53"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.63 mi <sup>2</sup> |
| Altitude                | 530 ft               |
| Lake Area               | 18 acres             |
| Lake Volume             | 310 acre-ft          |
| Mean Depth              | 18 ft                |
| Maximum Depth           | 37 ft                |
| Shoreline Length        | 0.70 mi              |
| Shoreline Configuration | 1.2                  |
| Development of Volume   | 0.47                 |
| Bottom Slope            | 3.7 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

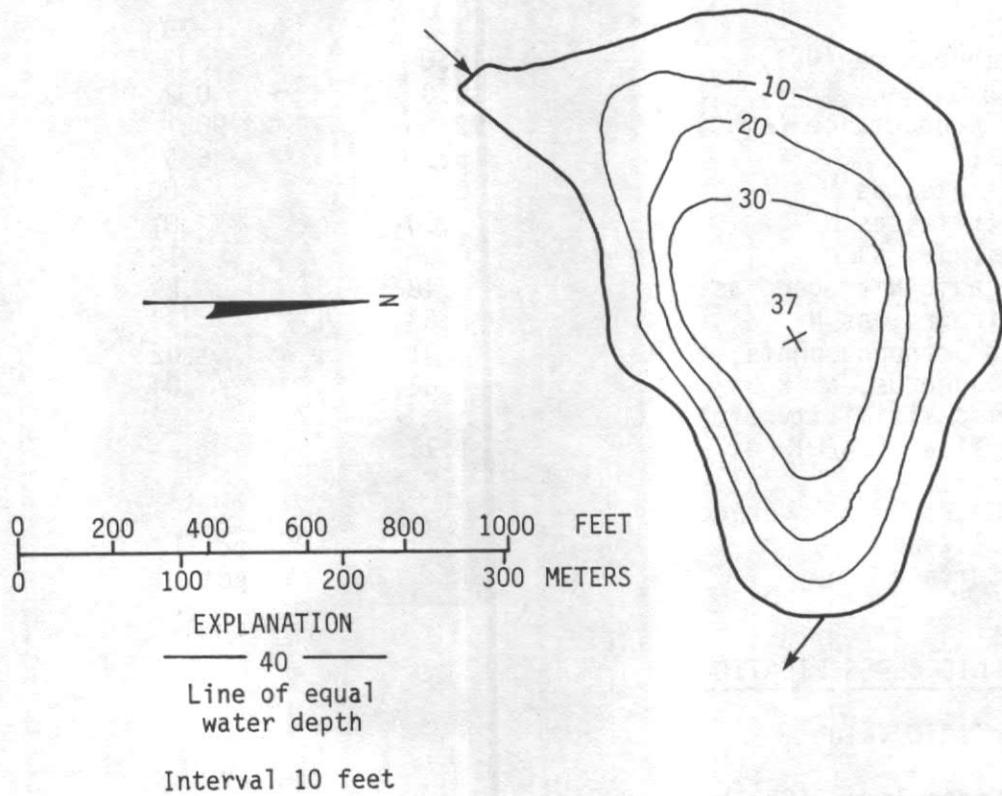
|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 90 | pct |
| Number of Nearshore Homes  | 35 |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 5  | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 77 | pct |
| Lake Surface               | 18 | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |               |        |
|--------------------------------|---------------|--------|
| Date                           | June 26, 1981 |        |
| Depth (ft)                     | 3             | 32     |
| Water Temperature (°C)         | 19.6          | 5.8    |
| Dissolved Oxygen               | 10.4          | 0.1    |
| Specific Conductance (umho)    | 73            | 100    |
| pH (units)                     | 6.6           | 6.3    |
| Total Nitrate, as N            | 0.00          | .00    |
| Total Nitrite, as N            | .00           | .00    |
| Total Ammonia, as N            | .09           | 1.0    |
| Total Organic Nitrogen, as N   | .69           | .90    |
| Total Nitrogen, as N           | .78           | 1.9    |
| Dissolved Orthophosphate, as P | .00           | .00    |
| Total Phosphorus, as P         | .02           | .06    |
| Secchi-Disc Visibility (ft)    |               | 8      |
| Chlorophyll <u>a</u> (ug/L)    | 13.9          | --     |
| Aquatic Macrophyte Coverage    |               |        |
| Littoral Zone                  |               | 80 pct |
| Water-Surface Zone             |               | 20 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 150 |
| Trophic State Index (Carlson, 1977) |     |
| TSISD                               | 47  |
| TSITP                               | 47  |
| TSICh1                              | 56  |



Lucerne Lake, King County. Photo taken June 26, 1981, view westerly.  
Bathymetric map from U.S. Geological Survey, February 3, 1955.

MERIDIAN LAKE

KING COUNTY

WRIA 09

T22N-R05E-27

LATITUDE 47° 21' 30" LONGITUDE 122° 08' 43"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 1.16 mi <sup>2</sup> |
| Altitude                | 370 ft               |
| Lake Area               | 150 acres            |
| Lake Volume             | 6,100 acre-ft        |
| Mean Depth              | 41 ft                |
| Maximum Depth           | 90 ft                |
| Shoreline Length        | 2.5 mi               |
| Shoreline Configuration | 1.4                  |
| Development of Volume   | 0.45                 |
| Bottom Slope            | 3.1 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 95  | pct |
| Number of Nearshore Homes  | 112 |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 25  | pct |
| Agricultural               | 55  | pct |
| Forest or Unproductive     | 0   | pct |
| Lake Surface               | 20  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 15, 1981

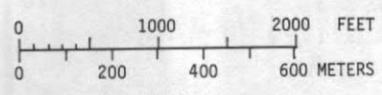
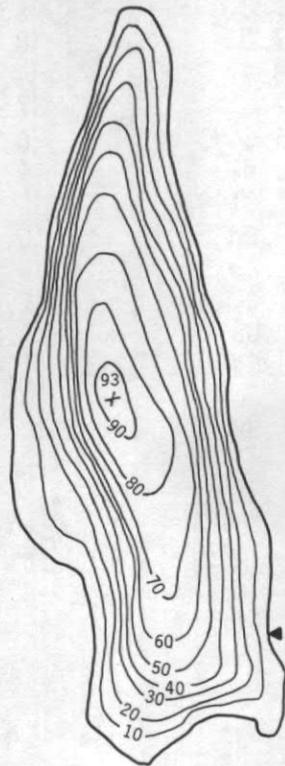
|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 78     |
| Water Temperature (°C)         | 18.0 | 6.3    |
| Dissolved Oxygen               | 10.0 | 0.2    |
| Specific Conductance (umho)    | 99   | 90     |
| pH (units)                     | 6.7  | 6.5    |
| Total Nitrate, as N            | 0.00 | .00    |
| Total Nitrite, as N            | .00  | .01    |
| Total Ammonia, as N            | .05  | .10    |
| Total Organic Nitrogen, as N   | .48  | .29    |
| Total Nitrogen, as N           | .53  | .39    |
| Dissolved Orthophosphate, as P | .01  | .02    |
| Total Phosphorus, as P         | .02  | .04    |
| Secchi-Disc Visibility (ft)    |      | 17     |
| Chlorophyll <u>a</u> (ug/L)    | 1.72 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 95 pct |
| Water-Surface Zone             |      | 1 pct  |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 59

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 36 |
| TSI <sub>TP</sub>  | 47 |
| TSI <sub>Chl</sub> | 36 |



EXPLANATION  
 — 20 —  
 Line of equal  
 water depth  
 Interval 10 feet

Meridian (22N-5E-27) Lake, King County. Photo taken June 15, 1981, view northwesterly. Bathymetric map from Washington Department of Game, June 16, 1950.

MUD LAKE

KING COUNTY

WRIA 07

T25N-R08E-11

LATITUDE 47° 39' 30" LONGITUDE 121° 44' 30"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.69 mi <sup>2</sup> |
| Altitude                | 1,320 ft             |
| Lake Area               | 15 acres             |
| Lake Volume             | 212 acre-ft          |
| Mean Depth              | 14 ft                |
| Maximum Depth           | 37 ft                |
| Shoreline Length        | 0.64 mi              |
| Shoreline Configuration | 1.2                  |
| Development of Volume   | 0.38                 |
| Bottom Slope            | 4.0 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

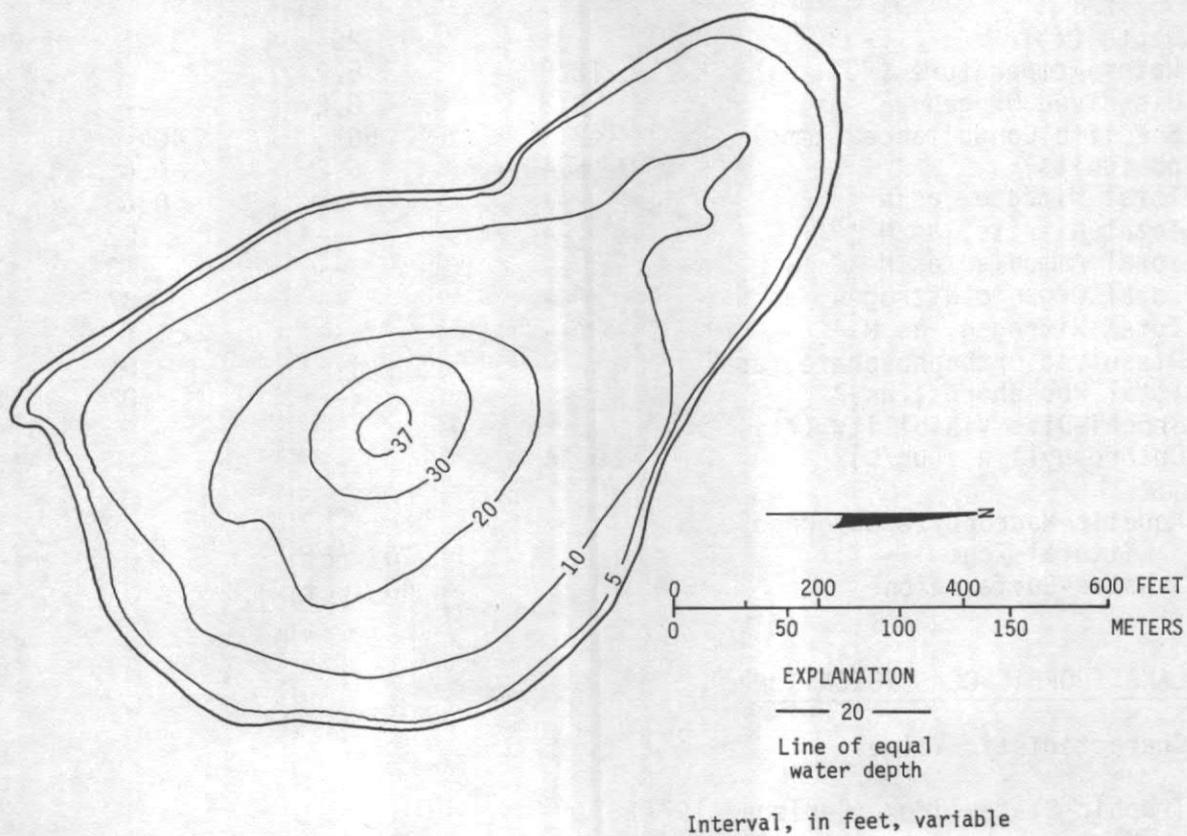
|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 0  | pct |
| Number of Nearshore Homes  | 0  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 97 | pct |
| Lake Surface               | 3  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

| Date                           | June 29, 1981 |      |
|--------------------------------|---------------|------|
| Depth (ft)                     | 3             | 30   |
| Water Temperature (°C)         | 17.8          | 8.0  |
| Dissolved Oxygen               | 8.9           | 4.4  |
| Specific Conductance (umho)    | 37            | 37   |
| pH (units)                     | 6.6           | 6.2  |
| Total Nitrate, as N            | 0.61          | 0.55 |
| Total Nitrite, as N            | .01           | .01  |
| Total Ammonia, as N            | .06           | .07  |
| Total Organic Nitrogen, as N   | .65           | .77  |
| Total Nitrogen, as N           | 1.3           | 1.4  |
| Dissolved Orthophosphate, as P | .03           | .05  |
| Total Phosphorus, as P         | .04           | .07  |
| Secchi-Disc Visibility (ft)    | 18            |      |
| Chlorophyll <u>a</u> (ug/L)    | 1.82          | --   |
| Aquatic Macrophyte Coverage    |               |      |
| Littoral Zone                  | 60            | pct  |
| Water-Surface Zone             | 1             | pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 76 |
| Trophic State Index (Carlson, 1977) |    |
| TSI <sub>SD</sub>                   | 35 |
| TSI <sub>TP</sub>                   | 57 |
| TSI <sub>Chl</sub>                  | 36 |



Mud (25N-8E-11) Lake, King County. Photo taken June 29, 1981, view westerly. Bathymetric map from U.S. Geological Survey, July 7, 1981.

NEILSON (HOLM) LAKE

KING COUNTY

WRIA 09

T21N-R05E-14

LATITUDE 47° 18' 04" LONGITUDE 122° 07' 19"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.29 mi <sup>2</sup> |
| Altitude                | 395 ft               |
| Lake Area               | 19 acres             |
| Lake Volume             | 340 acre-ft          |
| Mean Depth              | 18 ft                |
| Maximum Depth           | 31 ft                |
| Shoreline Length        | 0.86 mi              |
| Shoreline Configuration | 1.4                  |
| Development of Volume   | 0.57                 |
| Bottom Slope            | 3.0 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 40 | pct |
| Number of Nearshore Homes  | 17 |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 5  | pct |
| Agricultural               | 16 | pct |
| Forest or Unproductive     | 69 | pct |
| Lake Surface               | 10 | pct |

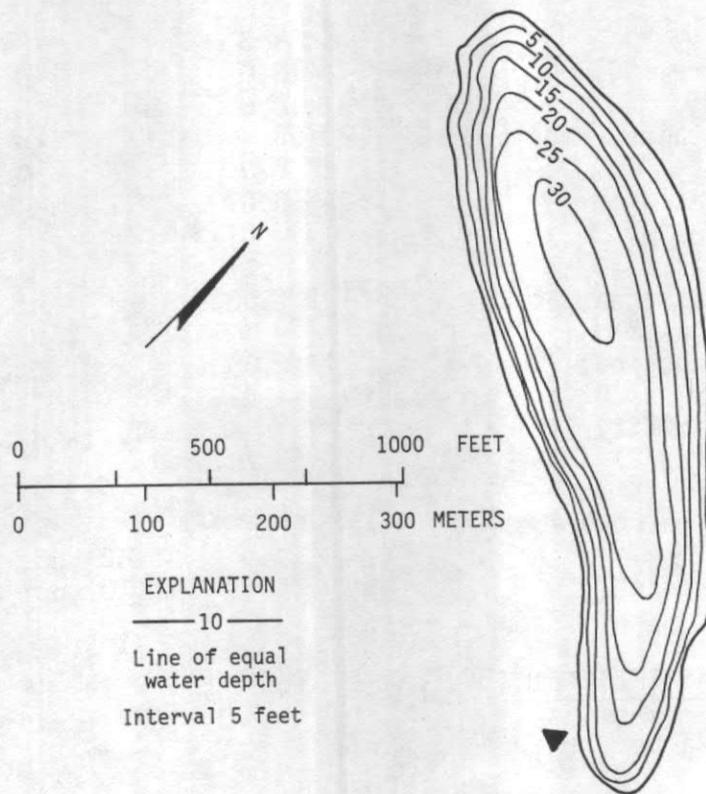
Public Boat Access to Lake Yes

WATER-QUALITY DATA (in mg/L unless otherwise indicated)

| Date                           | June 11, 1981 |        | September 17, 1981 |        |
|--------------------------------|---------------|--------|--------------------|--------|
| Depth (ft)                     | 3             | 29     | 3                  | 28     |
| Water Temperature (°C)         | 18.0          | 5.2    | 23.5               | 7.2    |
| Dissolved Oxygen               | 9.2           | 0.2    | --                 | --     |
| Specific Conductance (umho)    | 42            | 56     | 40                 | 53     |
| pH (units)                     | 6.4           | 6.2    | 6.4                | 6.2    |
| Total Nitrate, as N            | --            | --     | <0.08              | <0.07  |
| Total Nitrite, as N            | --            | --     | .02                | .03    |
| Total Ammonia, as N            | --            | --     | .13                | .67    |
| Total Organic Nitrogen, as N   | --            | --     | .87                | .83    |
| Total Nitrogen, as N           | --            | --     | <1.1               | <1.6   |
| Dissolved Orthophosphate, as P | --            | --     | .01                | .02    |
| Total Phosphorus, as P         | --            | --     | .02                | .02    |
| Secchi-Disc Visibility (ft)    |               | 7      |                    | 6      |
| Chlorophyll <u>a</u> (ug/L)    | 10.34         | --     | --                 | --     |
| Aquatic Macrophyte Coverage    |               |        |                    |        |
| Littoral Zone                  |               | 70 pct |                    | -- pct |
| Water-Surface Zone             |               | 40 pct |                    | -- pct |

LAKE TROPHIC CLASSIFICATION

|                                     |    |     |
|-------------------------------------|----|-----|
| Characteristic Value                | -- | 172 |
| Trophic State Index (Carlson, 1977) |    |     |
| TSI <sub>SD</sub>                   | 49 | 53  |
| TSI <sub>TP</sub>                   | -- | 47  |
| TSI <sub>Chl</sub>                  | 53 | --  |



Neilson (Holm) Lake, King County. Photo taken June 11, 1981, view northwesterly.  
Bathymetric map from Washington Department of Game, September 18, 1951.

OTTER (SPRING) LAKE

KING COUNTY

WRIA 08

T23N-R06E-31

LATITUDE 47° 25' 56" LONGITUDE 122° 05' 07"

PHYSICAL DATA

Drainage area 0.70 mi<sup>2</sup>  
 Altitude 495 ft  
 Lake Area 68 acres  
 Lake Volume 1,300 acre-ft  
 Mean Depth 19 ft  
 Maximum Depth 32 ft  
 Shoreline Length 1.5 mi  
 Shoreline Configuration 1.3  
 Development of Volume 0.59  
 Bottom Slope 1.6 pct  
 Surface Inflow No  
 Surface Outflow Yes

CULTURAL DATA

Residential Development 70 pct  
 Number of Nearshore Homes 44  
 Land Use in Drainage Basin  
 Residential-Urban 0 pct  
 Residential-Suburban 8 pct  
 Agricultural 0 pct  
 Forest or Unproductive 77 pct  
 Lake Surface 15 pct

Public Boat Access to Lake Yes

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 26, 1981

|                                |      |     |
|--------------------------------|------|-----|
| Depth (ft)                     | 3    | 13  |
| Water Temperature (°C)         | 19.0 | 8.8 |
| Dissolved Oxygen               | 10.0 | 0.1 |
| Specific Conductance (umho)    | 63   | 72  |
| pH (units)                     | 7.0  | 6.5 |
| Total Nitrate, as N            | 0.07 | .05 |
| Total Nitrite, as N            | .01  | .02 |
| Total Ammonia, as N            | .11  | .31 |
| Total Organic Nitrogen, as N   | .60  | .57 |
| Total Nitrogen, as N           | .79  | .95 |
| Dissolved Orthophosphate, as P | .00  | .00 |
| Total Phosphorus, as P         | .03  | .05 |
| Secchi-Disc Visibility (ft)    |      | 10  |
| Chlorophyll <u>a</u> (ug/L)    | 5.76 | --  |

Aquatic Macrophyte Coverage

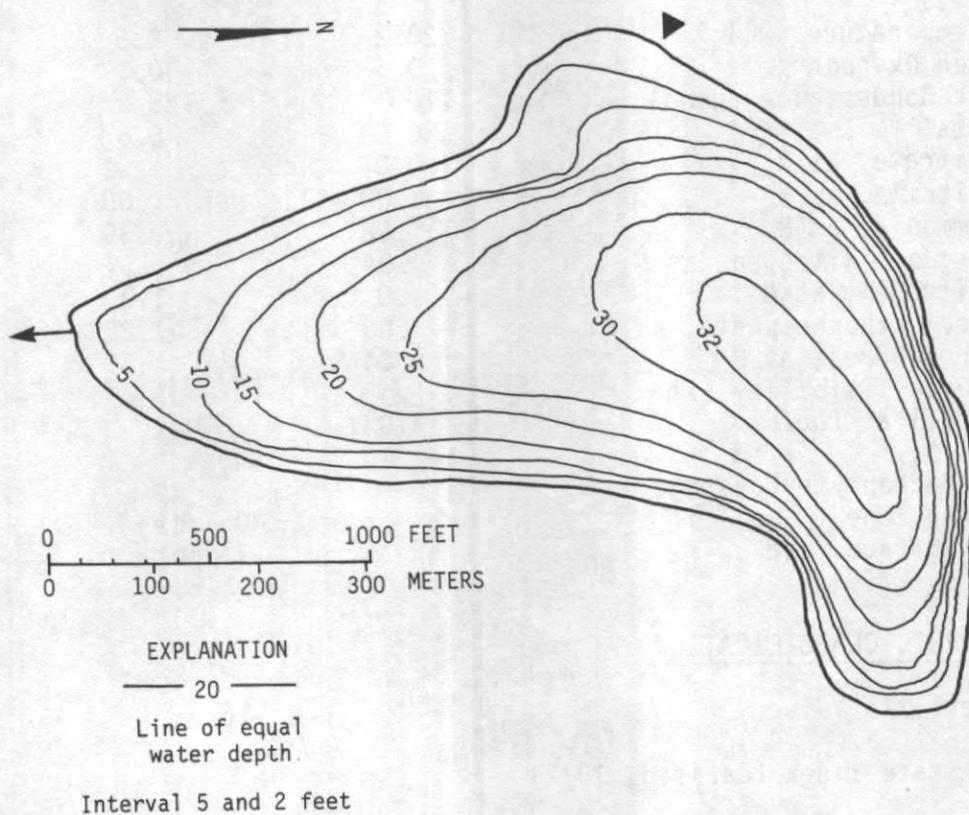
Littoral Zone 40 pct  
 Water-Surface Zone 10 pct

LAKE TROPHIC CLASSIFICATION

Characteristic Value 98

Trophic State Index (Carlson, 1977)

TSI<sub>SD</sub> 44  
 TSI<sub>TP</sub> 53  
 TSI<sub>Chl</sub> 48



Otter (Spring) (23N-6E-31) Lake , King County. Photo taken June 24, 1981, view southwesterly. Bathymetric map from Washington Department of Game, July 27, 1950.

PHANTOM LAKE

KING COUNTY

WRIA 08

T24N-R05E-02

LATITUDE 47° 35' 27" LONGITUDE 122° 07' 31"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 1.94 mi <sup>2</sup> |
| Altitude                | 240 ft               |
| Lake Area               | 67 acres             |
| Lake Volume             | 1,400 acre-ft        |
| Mean Depth              | 21 ft                |
| Maximum Depth           | 45 ft                |
| Shoreline Length        | 1.4 mi               |
| Shoreline Configuration | 1.2                  |
| Development of Volume   | 0.46                 |
| Bottom Slope            | 2.3 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 70 | pct |
| Number of Nearshore Homes  | 49 |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 47 | pct |
| Residential-Suburban       | 16 | pct |
| Agricultural               | 18 | pct |
| Forest or Unproductive     | 14 | pct |
| Lake Surface               | 5  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

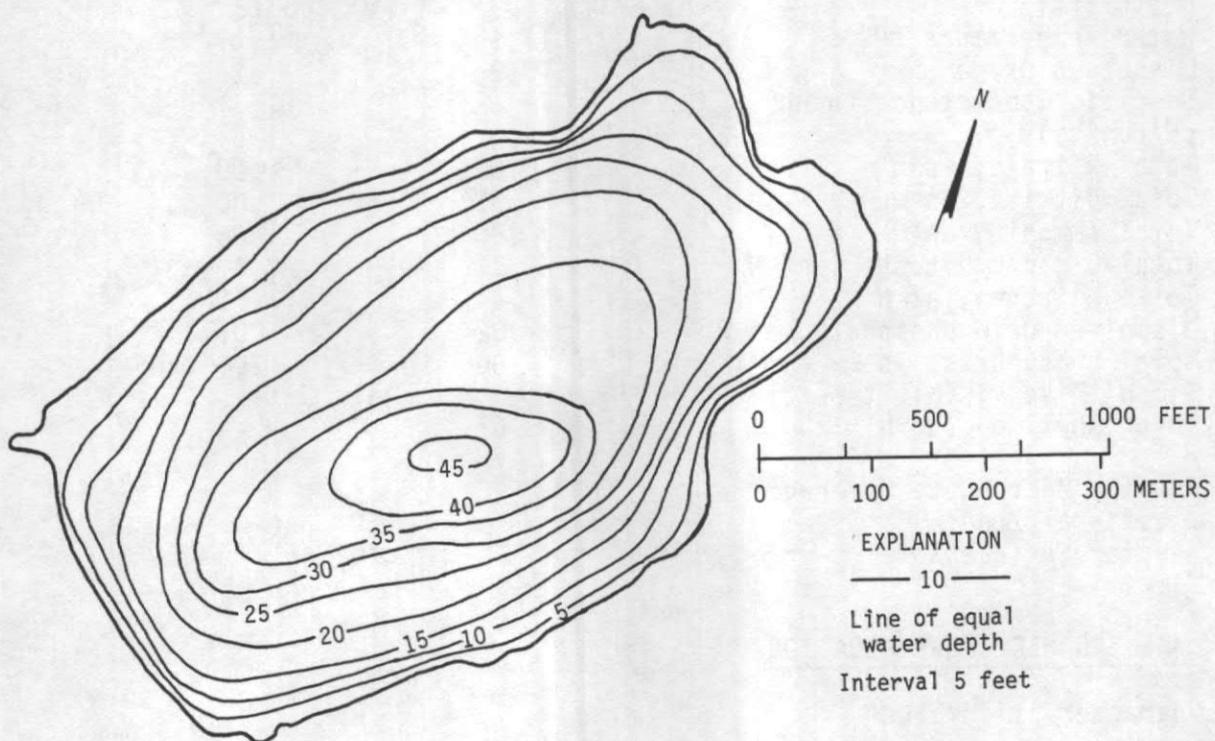
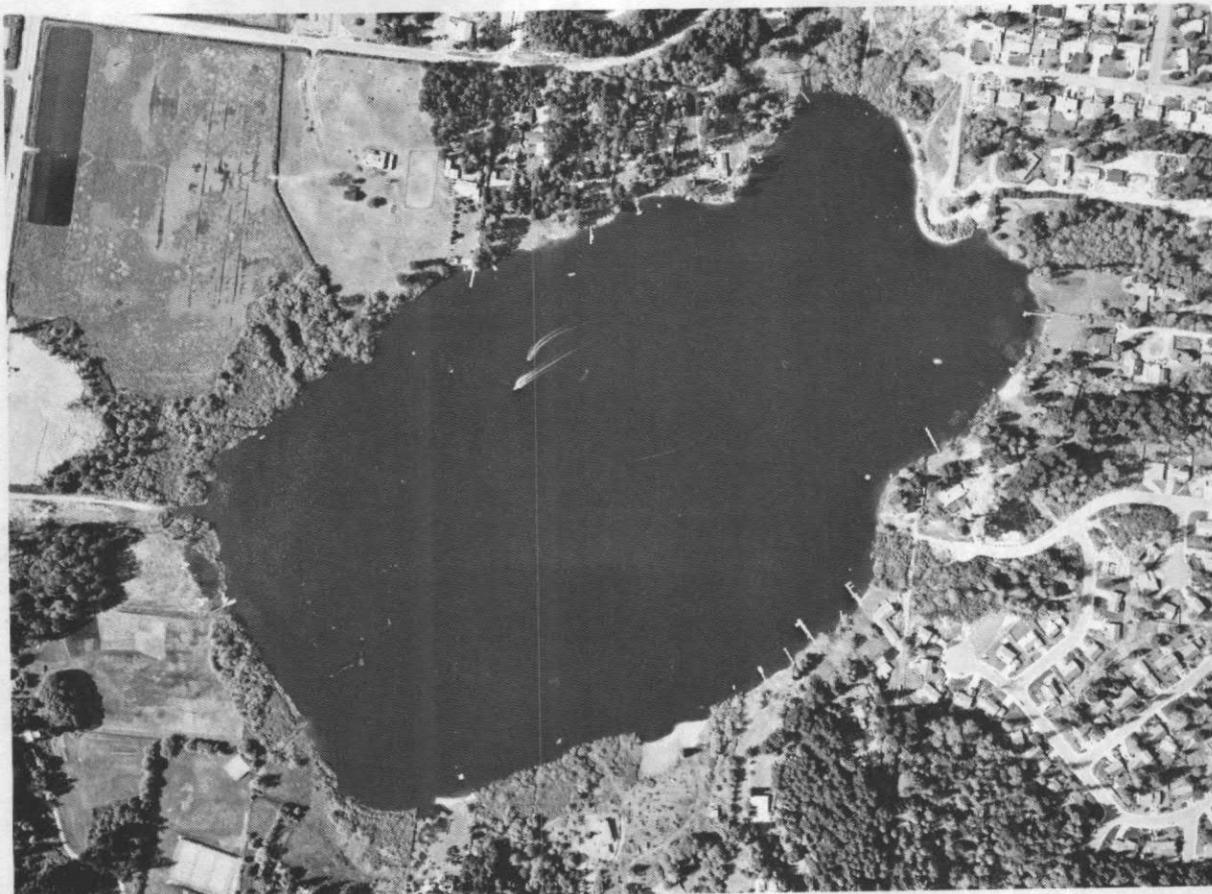
Date

June 29, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 31     |
| Water Temperature (°C)         | 20.2 | 9.5    |
| Dissolved Oxygen               | 9.5  | 0.1    |
| Specific Conductance (umho)    | 110  | 123    |
| pH (units)                     | 6.6  | 6.6    |
| Total Nitrate, as N            | 0.01 | .01    |
| Total Nitrite, as N            | .00  | .00    |
| Total Ammonia, as N            | .06  | .39    |
| Total Organic Nitrogen, as N   | .94  | .91    |
| Total Nitrogen, as N           | 1.0  | 1.3    |
| Dissolved Orthophosphate, as P | .03  | .22    |
| Total Phosphorus, as P         | .04  | .30    |
| Secchi-Disc Visibility (ft)    |      | 13     |
| Chlorophyll <u>a</u> (ug/L)    | 4.03 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 40 pct |
| Water-Surface Zone             |      | 1 pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 116 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 40  |
| TSI <sub>TP</sub>                   | 57  |
| TSI <sub>Chl</sub>                  | 44  |



Phantom Lake, King County. Photo taken May 13, 1977.  
Bathymetric map from U.S. Geological Survey, July 12, 1973.

PIPE LAKE

KING COUNTY

WRIA 09

T22N-R06E-28

LATITUDE 47° 21' 58" LONGITUDE 122° 03' 06"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.49 mi <sup>2</sup> |
| Altitude                | 550 ft               |
| Lake Area               | 55 acres             |
| Lake Volume             | 1,500 acre-ft        |
| Mean Depth              | 27 ft                |
| Maximum Depth           | 65 ft                |
| Shoreline Length        | 1.7 mi               |
| Shoreline Configuration | 1.6                  |
| Development of Volume   | 0.41                 |
| Bottom Slope            | 13 pct               |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 90  | pct |
| Number of Nearshore Homes  | 71  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 14  | pct |
| Agricultural               | 0   | pct |
| Forest or Unproductive     | 68  | pct |
| Lake Surface               | 18  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 15, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 61   |
| Water Temperature (°C)         | 17.9 | 5.6  |
| Dissolved Oxygen               | 10.2 | 0.2  |
| Specific Conductance (umho)    | 73   | 81   |
| pH (units)                     | 7.0  | 6.6  |
| Total Nitrate, as N            | 0.00 | .00  |
| Total Nitrite, as N            | .01  | .00  |
| Total Ammonia, as N            | .06  | .06  |
| Total Organic Nitrogen, as N   | .37  | 1.6  |
| Total Nitrogen, as N           | .44  | 1.71 |
| Dissolved Orthophosphate, as P | .02  | .01  |
| Total Phosphorus, as P         | .06  | .04  |
| Secchi-Disc Visibility (ft)    |      | 11   |
| Chlorophyll <u>a</u> (ug/L)    | 3.67 | --   |

Aquatic Macrophyte Coverage

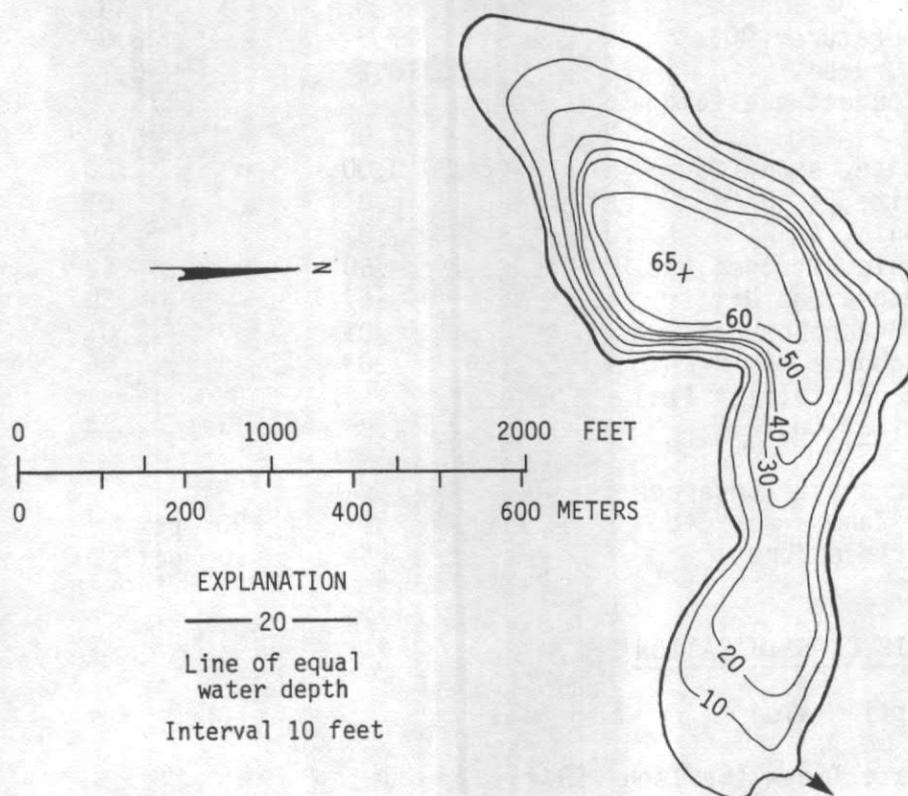
|                    |     |     |
|--------------------|-----|-----|
| Littoral Zone      | 80  | pct |
| Water-Surface Zone | <10 | pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 86

Trophic State Index (Carlson, 1977)

|        |    |
|--------|----|
| TSISD  | 43 |
| TSITP  | 63 |
| TSICh1 | 43 |



Pipe Lake, King County. Photo taken June 15, 1981, view northwesterly.  
 Bathymetric map from Washington Department of Game, February 3, 1955.

SHADOW LAKE

KING COUNTY

WRIA 09

T22N-R06E-07

LATITUDE 47° 24' 08" LONGITUDE 122° 04' 58"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.71 mi <sup>2</sup> |
| Altitude                | 540 ft               |
| Lake Area               | 49 acres             |
| Lake Volume             | 1,100 acre-ft        |
| Mean Depth              | 22 ft                |
| Maximum Depth           | 45 ft                |
| Shoreline Length        | 1.2 mi               |
| Shoreline Configuration | 1.2                  |
| Development of Volume   | 0.49                 |
| Bottom Slope            | 2.7 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 30  | pct |
| Number of Nearshore Homes  | 17  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 8   | pct |
| Agricultural               | 23  | pct |
| Forest or Unproductive     | 58  | pct |
| Lake Surface               | 11  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

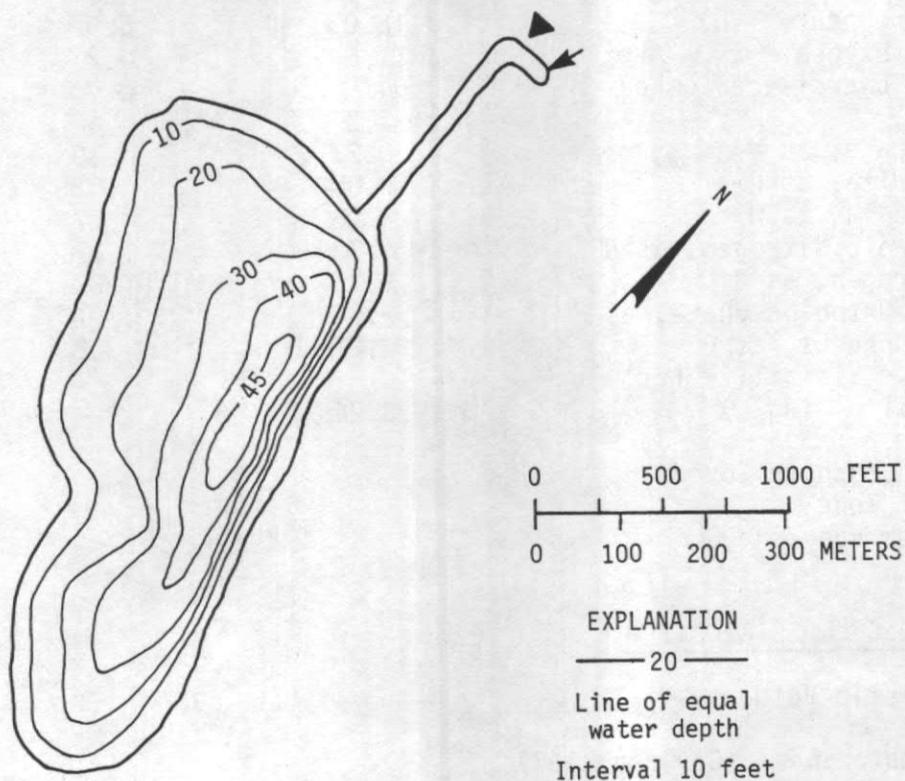
Date

June 15, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 43     |
| Water Temperature (°C)         | 17.6 | 6.3    |
| Dissolved Oxygen               | 10.2 | 0.1    |
| Specific Conductance (umho)    | 70   | 75     |
| pH (units)                     | 7.0  | 6.6    |
| Total Nitrate, as N            | 0.00 | .00    |
| Total Nitrite, as N            | .01  | .01    |
| Total Ammonia, as N            | .07  | .08    |
| Total Organic Nitrogen, as N   | .50  | .42    |
| Total Nitrogen, as N           | .57  | .50    |
| Dissolved Orthophosphate, as P | .01  | .01    |
| Total Phosphorus, as P         | .03  | .06    |
| Secchi-Disc Visibility (ft)    |      | 9      |
| Chlorophyll <u>a</u> (ug/L)    | 4.86 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 90 pct |
| Water-Surface Zone             |      | 10 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 101 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 45  |
| TSI <sub>TP</sub>                   | 53  |
| TSI <sub>Chl</sub>                  | 46  |



Shadow Lake, King County. Photo taken June 15, 1981, view northwesterly.  
Bathymetric map from Washington Department of Game, February 1, 1952.

SHADY LAKE

KING COUNTY

WRIA 09

T22N-R05E-01

LATITUDE 47° 25' 43" LONGITUDE 122° 06' 19"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.34 mi <sup>2</sup> |
| Altitude                | 520 ft               |
| Lake Area               | 21 acres             |
| Lake Volume             | 440 acre-ft          |
| Mean Depth              | 21 ft                |
| Maximum Depth           | 40 ft                |
| Shoreline Length        | 0.78 mi              |
| Shoreline Configuration | 1.2                  |
| Development of Volume   | 0.52                 |
| Bottom Slope            | 3.7 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 95 | pct |
| Number of Nearshore Homes  | 47 |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 8  | pct |
| Agricultural               | 14 | pct |
| Forest or Unproductive     | 68 | pct |
| Lake Surface               | 10 | pct |

Public Boat Access to Lake Yes

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 24, 1981

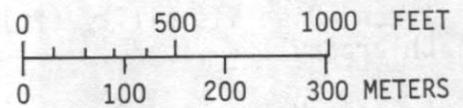
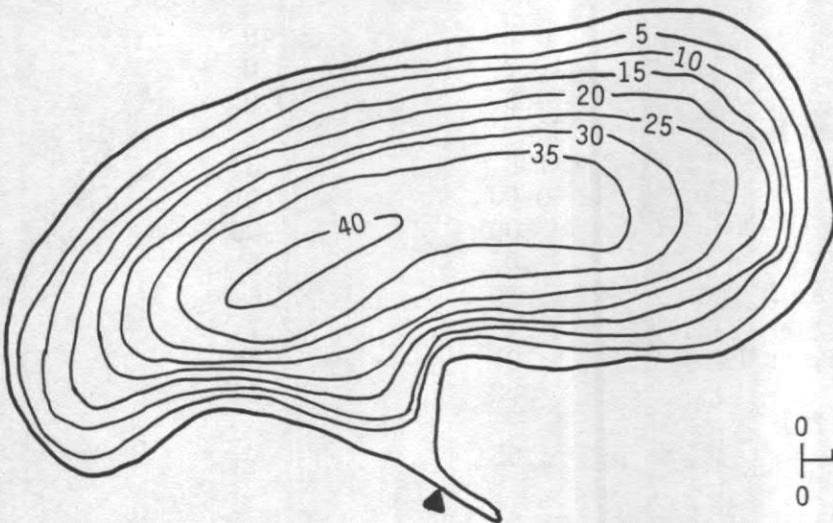
|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 31     |
| Water Temperature (°C)         | 18.0 | 5.9    |
| Dissolved Oxygen               | 11.6 | 0.2    |
| Specific Conductance (umho)    | 64   | 76     |
| pH (units)                     | 7.3  | 6.4    |
| Total Nitrate, as N            | 0.33 | .10    |
| Total Nitrite, as N            | .00  | .03    |
| Total Ammonia, as N            | .08  | .07    |
| Total Organic Nitrogen, as N   | .73  | 1.1    |
| Total Nitrogen, as N           | 1.1  | 1.3    |
| Dissolved Orthophosphate, as P | .01  | .01    |
| Total Phosphorus, as P         | .01  | .02    |
| Secchi-Disc Visibility (ft)    |      | 13     |
| Chlorophyll <u>a</u> (ug/L)    | 3.24 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 40 pct |
| Water-Surface Zone             |      | 5 pct  |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 89

Trophic State Index (Carlson, 1977)

|        |    |
|--------|----|
| TSISD  | 40 |
| TSITP  | 37 |
| TSICh1 | 42 |



EXPLANATION  
 — 30 —  
 Line of equal  
 water depth  
 Interval 5 feet

Shady Lake, King County. Photo taken April 30, 1973.  
 Bathymetric map from Washington Department of Game, August 9, 1947.

STAR LAKE

KING COUNTY

WRIA 09

T22N-R04E-34

LATITUDE 47° 21' 10" LONGITUDE 122° 17' 06"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.59 mi <sup>2</sup> |
| Altitude                | 320 ft               |
| Lake Area               | 35 acres             |
| Lake Volume             | 870 acre-ft          |
| Mean Depth              | 25 ft                |
| Maximum Depth           | 50 ft                |
| Shoreline Length        | 1.1 mi               |
| Shoreline Configuration | 1.3                  |
| Development of Volume   | 0.50                 |
| Bottom Slope            | 3.6 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 100 | pct |
| Number of Nearshore Homes  | 78  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 14  | pct |
| Residential-Suburban       | 27  | pct |
| Agricultural               | 4   | pct |
| Forest or Unproductive     | 46  | pct |
| Lake Surface               | 9   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

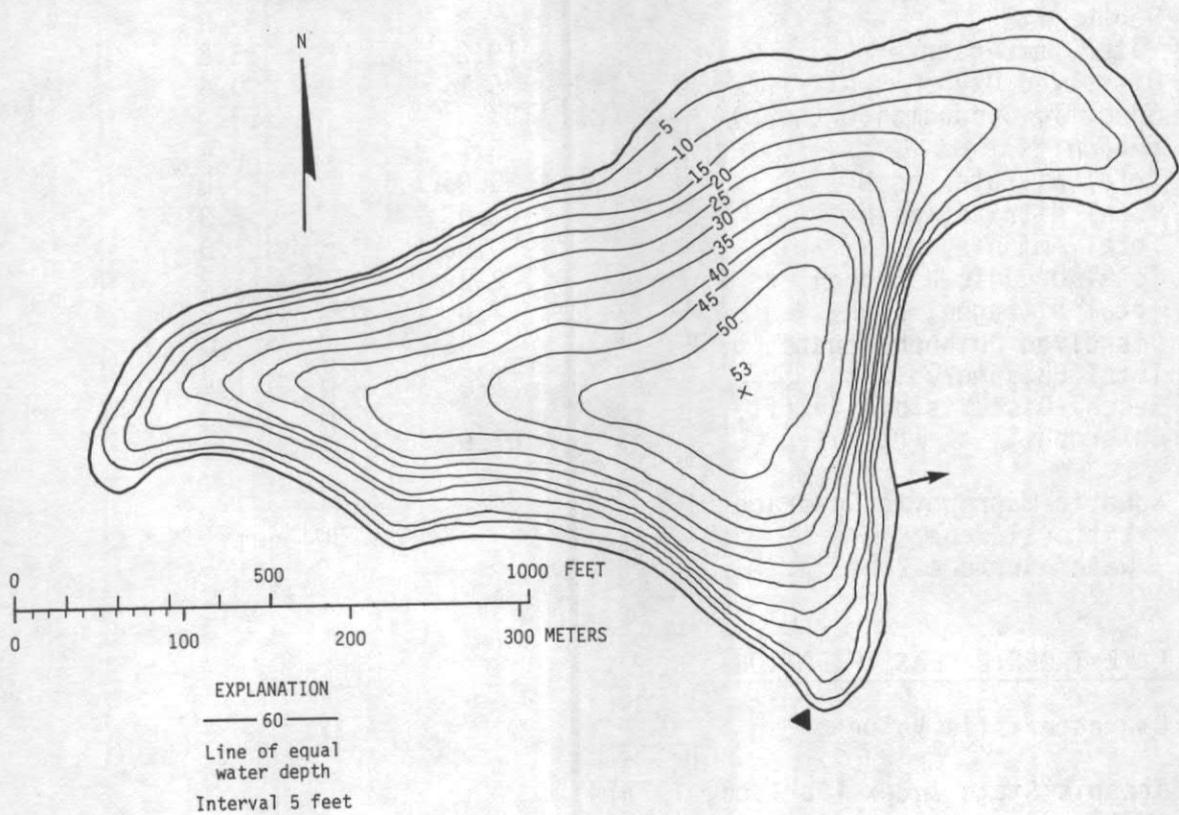
Date

June 15, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 48     |
| Water Temperature (°C)         | 18.2 | 6.0    |
| Dissolved Oxygen               | 10.0 | 0.2    |
| Specific Conductance (umho)    | 96   | 116    |
| pH (units)                     | 7.5  | 6.6    |
| Total Nitrate, as N            | 0.00 | .01    |
| Total Nitrite, as N            | .00  | .00    |
| Total Ammonia, as N            | .07  | 1.5    |
| Total Organic Nitrogen, as N   | .39  | .6     |
| Total Nitrogen, as N           | .46  | 2.1    |
| Dissolved Orthophosphate, as P | .01  | .06    |
| Total Phosphorus, as P         | .02  | .24    |
| Secchi-Disc Visibility (ft)    |      | 11     |
| Chlorophyll <u>a</u> (ug/L)    | 6.65 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 75 pct |
| Water-Surface Zone             |      | 5 pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 85 |
| Trophic State Index (Carlson, 1977) |    |
| TSI <sub>SD</sub>                   | 43 |
| TSI <sub>TP</sub>                   | 49 |
| TSI <sub>Chl</sub>                  | 49 |



Star Lake, King County. Photo taken April 30, 1973.  
Bathymetric map from Washington Department of Game, January 31, 1952.

STURTEVANT LAKE

KING COUNTY

WRIA 08

T25N-R05E-28

LATITUDE 47° 37' 09" LONGITUDE 122° 10' 48"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.66 mi <sup>2</sup> |
| Altitude                | 140 ft               |
| Lake Area               | 10 acres             |
| Lake Volume             | 72 acre-ft           |
| Mean Depth              | 8 ft                 |
| Maximum Depth           | 11 ft                |
| Shoreline Length        | 0.44 mi              |
| Shoreline Configuration | 1.0                  |
| Development of Volume   | 0.69                 |
| Bottom Slope            | 1.5 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 70 | pct |
| Number of Nearshore Homes  | 36 |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 27 | pct |
| Residential-Suburban       | 17 | pct |
| Agricultural               | 13 | pct |
| Forest or Unproductive     | 41 | pct |
| Lake Surface               | 2  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 29, 1981

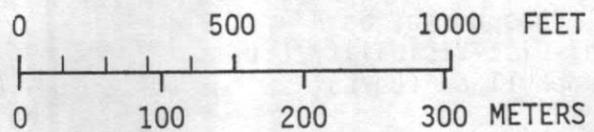
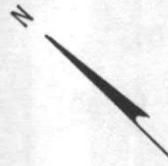
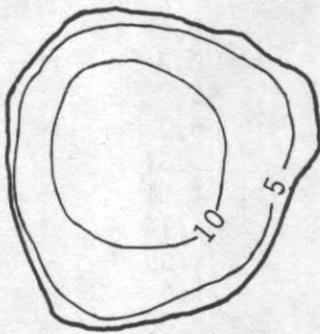
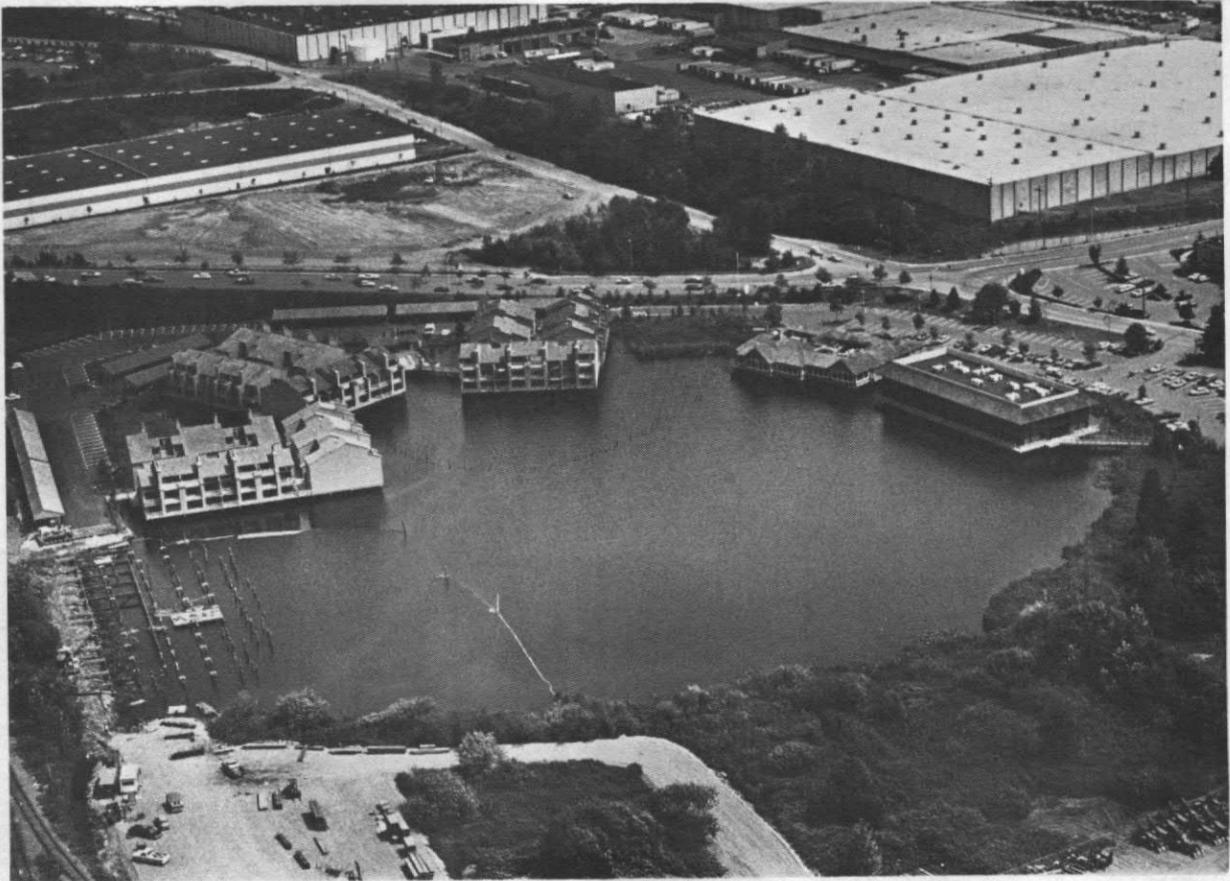
|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 9    |
| Water Temperature (°C)         | 19.2 | 15.8 |
| Dissolved Oxygen               | 5.1  | 0.4  |
| Specific Conductance (umho)    | 137  | 150  |
| pH (units)                     | 6.7  | 6.4  |
| Total Nitrate, as N            | 0.06 | .01  |
| Total Nitrite, as N            | .03  | .01  |
| Total Ammonia, as N            | .32  | 1.0  |
| Total Organic Nitrogen, as N   | 2.2  | 1.2  |
| Total Nitrogen, as N           | 2.6  | 2.2  |
| Dissolved Orthophosphate, as P | .86  | 2.0  |
| Total Phosphorus, as P         | 1.2  | 1.6  |
| Secchi-Disc Visibility (ft)    | 3    |      |
| Chlorophyll <u>a</u> (ug/L)    | 27.9 | --   |
| Aquatic Macrophyte Coverage    |      |      |
| Littoral Zone                  | 30   | pct  |
| Water-Surface Zone             | 0    | pct  |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 777

Trophic State Index (Carlson, 1977)

|        |     |
|--------|-----|
| TSISD  | 61  |
| TSITP  | 106 |
| TSIch1 | 63  |



EXPLANATION

—— 10 ——

Line of equal  
water depth

Interval 5 feet

Sturtevant Lake, King County. Photo taken June 29, 1981, view northeasterly.  
Bathymetric map from U.S. Geological Survey, July 20, 1973.

WELCOME LAKE

KING COUNTY

WRIA 08

T26N-R06E-21

LATITUDE 47° 43' 29" LONGITUDE 122° 02' 48"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.92 mi <sup>2</sup> |
| Altitude                | 360 ft               |
| Lake Area               | 14 acres             |
| Lake Volume             | 132 acre-ft          |
| Mean Depth              | 9 ft                 |
| Maximum Depth           | 15 ft                |
| Shoreline Length        | 1.0 mi               |
| Shoreline Configuration | 1.9                  |
| Development of Volume   | 0.63                 |
| Bottom Slope            | 1.7 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 0   | pct |
| Number of Nearshore Homes  | 0   |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 0   | pct |
| Agricultural               | 0   | pct |
| Forest or Unproductive     | 98  | pct |
| Lake Surface               | 2   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 29, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 12   |
| Water Temperature (°C)         | 19.2 | 10.6 |
| Dissolved Oxygen               | 9.4  | 0.2  |
| Specific Conductance (umho)    | 40   | 46   |
| pH (units)                     | 6.3  | 6.0  |
| Total Nitrate, as N            | 0.37 | .31  |
| Total Nitrite, as N            | .01  | .01  |
| Total Ammonia, as N            | .07  | .14  |
| Total Organic Nitrogen, as N   | 1.0  | .96  |
| Total Nitrogen, as N           | 1.5  | 1.4  |
| Dissolved Orthophosphate, as P | .03  | .06  |
| Total Phosphorus, as P         | .06  | .07  |
| Secchi-Disc Visibility (ft)    |      | 5    |
| Chlorophyll <u>a</u> (ug/L)    | 6.55 | --   |

Aquatic Macrophyte Coverage

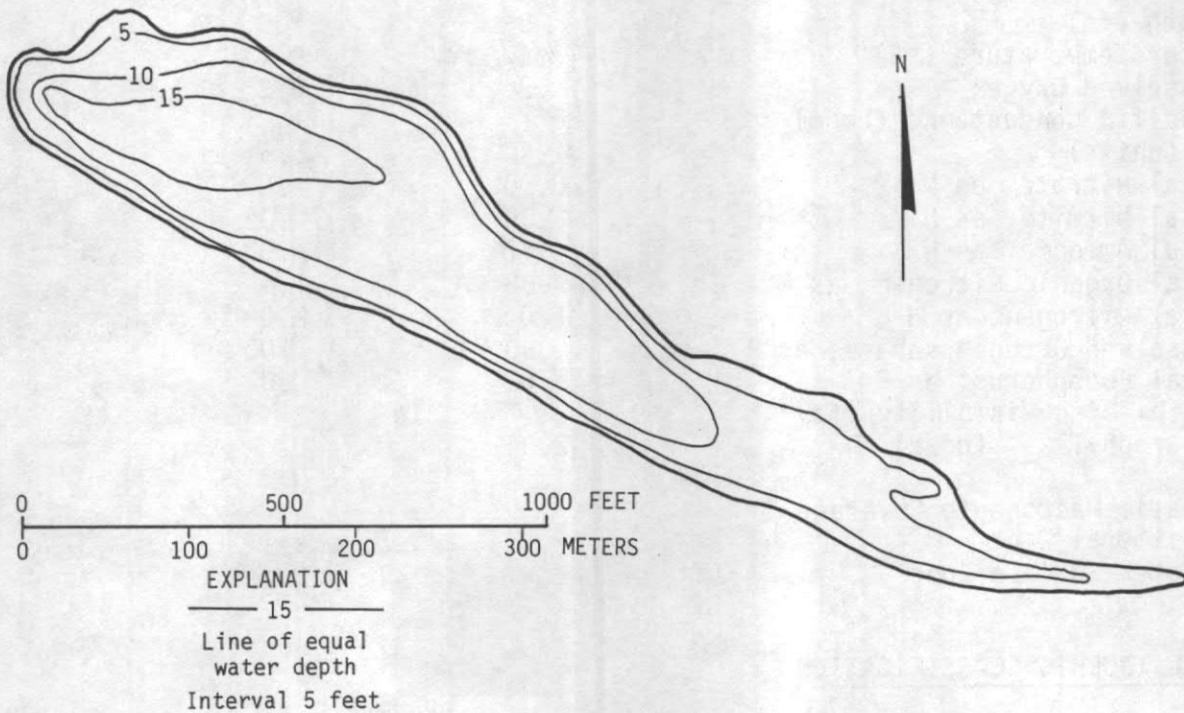
|                    |    |     |
|--------------------|----|-----|
| Littoral Zone      | <1 | pct |
| Water-Surface Zone | 0  | pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 199

Trophic State Index (Carlson, 1977)

|        |    |
|--------|----|
| TSISD  | 54 |
| TSITP  | 63 |
| TSICh1 | 49 |



Welcome Lake, King County. Photo taken June 29, 1981, view westerly.  
Bathymetric map from U.S. Geological Survey, July 7, 1981.

WILDERNESS LAKE

KING COUNTY

WRIA 09

T22N-R06E-27

LATITUDE 47° 22' 12" LONGITUDE 122° 02' 04"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.66 mi <sup>2</sup> |
| Altitude                | 470 ft               |
| Lake Area               | 69 acres             |
| Lake Volume             | 1,400 acre-ft        |
| Mean Depth              | 21 ft                |
| Maximum Depth           | 38 ft                |
| Shoreline Length        | 1.8 mi               |
| Shoreline Configuration | 1.5                  |
| Development of Volume   | 0.54                 |
| Bottom Slope            | 7.7 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 50  | pct |
| Number of Nearshore Homes  | 48  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 2   | pct |
| Agricultural               | 0   | pct |
| Forest or Unproductive     | 82  | pct |
| Lake Surface               | 16  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

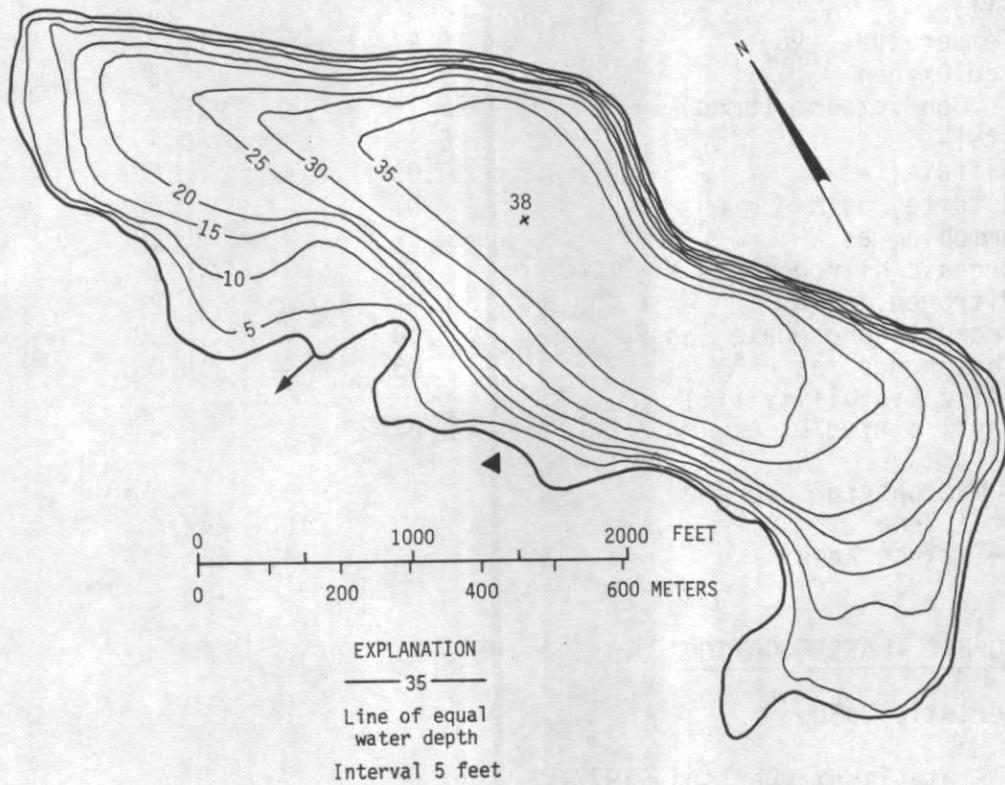
Date

June 26, 1981

|                                |      |     |
|--------------------------------|------|-----|
| Depth (ft)                     | 3    | 29  |
| Water Temperature (°C)         | 18.6 | 9.1 |
| Dissolved Oxygen               | 11.3 | 0.2 |
| Specific Conductance (umho)    | 80   | 111 |
| pH (units)                     | 7.4  | 6.6 |
| Total Nitrate, as N            | 0.00 | .03 |
| Total Nitrite, as N            | .00  | .02 |
| Total Ammonia, as N            | .12  | .53 |
| Total Organic Nitrogen, as N   | .88  | 1.4 |
| Total Nitrogen, as N           | 1.0  | 2.0 |
| Dissolved Orthophosphate, as P | .00  | .00 |
| Total Phosphorus, as P         | .02  | .07 |
| Secchi-Disc Visibility (ft)    |      | 14  |
| Chlorophyll <u>a</u> (ug/L)    | 2.34 | --  |
| Aquatic Macrophyte Coverage    |      |     |
| Littoral Zone                  | < 5  | pct |
| Water-Surface Zone             | < 1  | pct |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 97 |
| Trophic State Index (Carlson, 1977) |    |
| TSISD                               | 39 |
| TSITP                               | 47 |
| TSIcchl                             | 39 |



Wilderness Lake, King County. Photo taken June 26, 1981, view northeasterly.  
Bathymetric map from Washington Department of Game, July 25, 1952.

YELLOW LAKE

KING COUNTY

WRIA 08

T24N-R06E-14

LATITUDE 47° 34' 08" LONGITUDE 122° 00' 29"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.68 mi <sup>2</sup> |
| Altitude                | 388 ft               |
| Lake Area               | 14 acres             |
| Lake Volume             | 66 acre-ft           |
| Mean Depth              | 5 ft                 |
| Maximum Depth           | 16 ft                |
| Shoreline Length        | 0.55 mi              |
| Shoreline Configuration | 1.1                  |
| Development of Volume   | 0.30                 |
| Bottom Slope            | 1.8 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 0  | pct |
| Number of Nearshore Homes  | 0  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 97 | pct |
| Lake Surface               | 3  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 26, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 13   |
| Water Temperature (°C)         | 19.2 | 11.8 |
| Dissolved Oxygen               | 9.2  | 0.3  |
| Specific Conductance (umho)    | 25   | 30   |
| pH (units)                     | 6.9  | 6.4  |
| Total Nitrate, as N            | 0.00 | .00  |
| Total Nitrite, as N            | .01  | .00  |
| Total Ammonia, as N            | .09  | .12  |
| Total Organic Nitrogen, as N   | .91  | 1.1  |
| Total Nitrogen, as N           | 1.0  | 1.2  |
| Dissolved Orthophosphate, as P | .00  | .00  |
| Total Phosphorus, as P         | .03  | .05  |
| Secchi-Disc Visibility (ft)    |      | 7    |
| Chlorophyll <u>a</u> (ug/L)    | 3.84 | --   |

Aquatic Macrophyte Coverage

Littoral Zone

100 pct

Water-Surface Zone

40 pct

LAKE TROPHIC CLASSIFICATION

Characteristic Value

145

Trophic State Index (Carlson, 1977)

TSISD

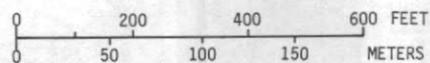
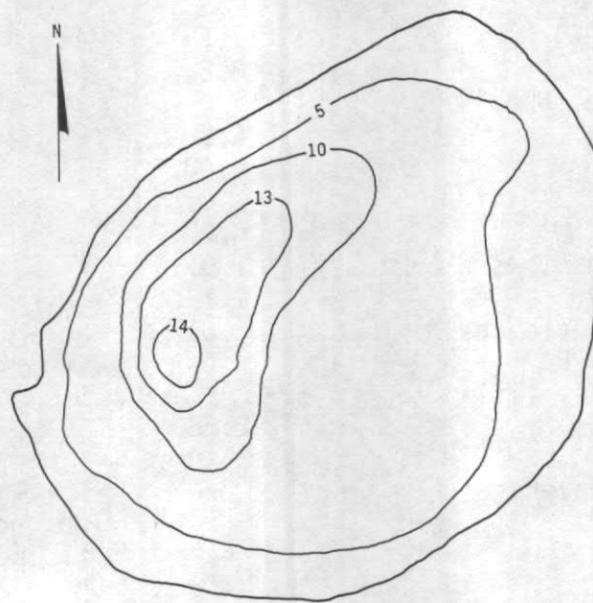
49

TSITP

53

TSICh1

44



EXPLANATION  
— 10 —  
Line of equal  
water depth  
Interval, in feet, variable

Yellow Lake, King County. Photo taken June 26, 1981, view southeasterly.  
Bathymetric map from U.S. Geological Survey, July 6, 1981.

BEAR LAKE

KITSAP COUNTY

WRIA 15

T23N-R01W-36

LATITUDE 47° 26' 36" LONGITUDE 122° 44' 50"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.12 mi <sup>2</sup> |
| Altitude                | 390 ft               |
| Lake Area               | 15 acres             |
| Lake Volume             | 95 acre-ft           |
| Mean Depth              | 6 ft                 |
| Maximum Depth           | 11 ft                |
| Shoreline Length        | 0.89 mi              |
| Shoreline Configuration | 1.7                  |
| Development of Volume   | 0.59                 |
| Bottom Slope            | 1.2 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 70 | pct |
| Number of Nearshore Homes  | 24 |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 15 | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 62 | pct |
| Lake Surface               | 23 | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

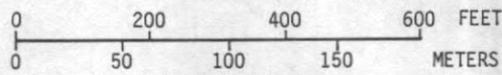
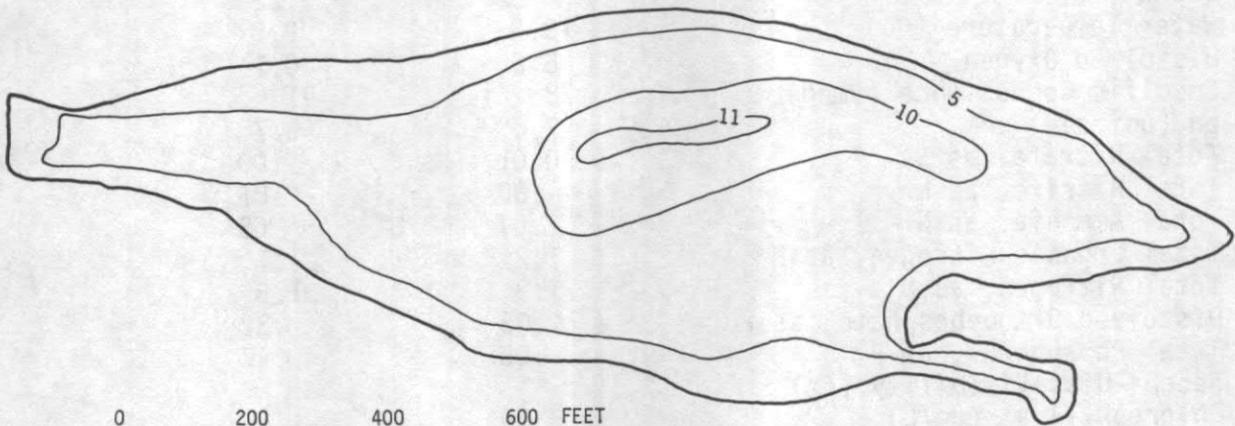
Date

June 12, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 9    |
| Water Temperature (°C)         | 17.6 | 17.6 |
| Dissolved Oxygen               | 8.8  | 8.6  |
| Specific Conductance (umho)    | 17   | 15   |
| pH (units)                     | 6.6  | 6.5  |
| Total Nitrate, as N            | 0.00 | 0.00 |
| Total Nitrite, as N            | .01  | .00  |
| Total Ammonia, as N            | .08  | .07  |
| Total Organic Nitrogen, as N   | 1.0  | 1.1  |
| Total Nitrogen, as N           | 1.1  | 1.2  |
| Dissolved Orthophosphate, as P | .01  | .01  |
| Total Phosphorus, as P         | .04  | .03  |
| Secchi-Disc Visibility (ft)    | 9    |      |
| Chlorophyll <u>a</u> (ug/L)    | 2.58 | --   |
| Aquatic Macrophyte Coverage    |      |      |
| Littoral Zone                  | 100  | pct  |
| Water-Surface Zone             | <1   | pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 133 |
| Trophic State Index (Carlson, 1977) |     |
| TSISD                               | 45  |
| TSITP                               | 57  |
| TSICh1                              | 40  |



EXPLANATION  
— 5 —  
Line of equal  
water depth  
Interval 5 and 1 feet



Bear Lake, Kitsap County. Photo taken May 18, 1978.  
Bathymetric map from U.S. Geological Survey, June 3, 1981.

BUCK LAKE

KITSAP COUNTY

WRIA 15

T28N-R02E-21

LATITUDE 47° 54' 33" LONGITUDE 122° 33' 27"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.27 mi <sup>2</sup> |
| Altitude                | 130 ft               |
| Lake Area               | 22 acres             |
| Lake Volume             | 157 acre-ft          |
| Mean Depth              | 7 ft                 |
| Maximum Depth           | 24 ft                |
| Shoreline Length        | 0.85 mi              |
| Shoreline Configuration | 1.3                  |
| Development of Volume   | 0.30                 |
| Bottom Slope            | 2.2 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 5   | pct |
| Number of Nearshore Homes  | 2   |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 0   | pct |
| Agricultural               | 12  | pct |
| Forest or Unproductive     | 78  | pct |
| Lake Surface               | 10  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

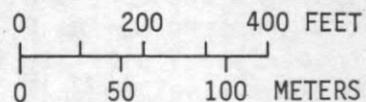
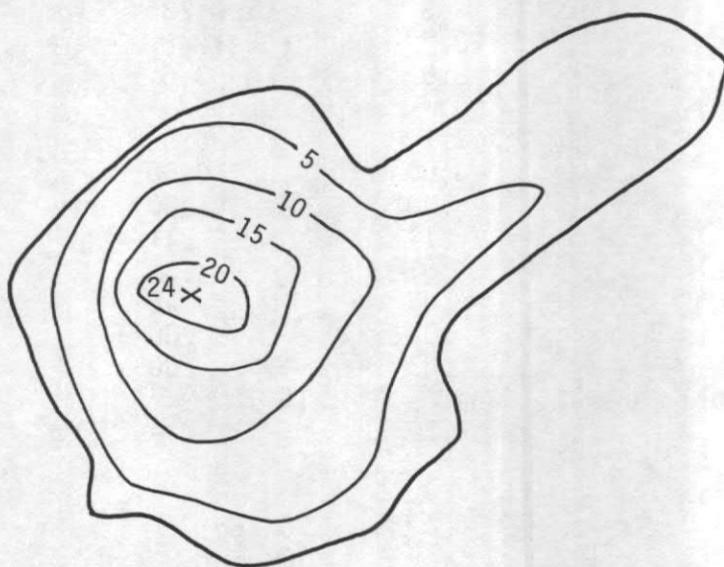
Date

July 2, 1981

|                                |      |     |
|--------------------------------|------|-----|
| Depth (ft)                     | 3    | 22  |
| Water Temperature (°C)         | 19.8 | 9.8 |
| Dissolved Oxygen               | 8.6  | 0.1 |
| Specific Conductance (umho)    | 78   | 91  |
| pH (units)                     | 7.6  | 6.7 |
| Total Nitrate, as N            | 0.01 | .00 |
| Total Nitrite, as N            | .00  | .01 |
| Total Ammonia, as N            | .07  | .68 |
| Total Organic Nitrogen, as N   | 1.2  | 1.1 |
| Total Nitrogen, as N           | 1.3  | 1.8 |
| Dissolved Orthophosphate, as P | .03  | .32 |
| Total Phosphorus, as P         | .05  | .47 |
| Secchi-Disc Visibility (ft)    |      | 7   |
| Chlorophyll <u>a</u> (ug/L)    | 3.39 | --  |
| Aquatic Macrophyte Coverage    |      |     |
| Littoral Zone                  | 100  | pct |
| Water-Surface Zone             | 5    | pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 171 |
| Trophic State Index (Carlson, 1977) |     |
| TSISD                               | 49  |
| TSITP                               | 61  |
| TSICh1                              | 43  |



EXPLANATION  
— 15 —  
Line of equal  
water depth  
Interval 5 feet

Buck Lake, Kitsap County. Photo taken July 2, 1981, view southwesterly.  
Bathymetric map from Washington Department of Game, date unknown.

KITSAP LAKE

KITSAP COUNTY

WRIA 15

T24N-R01E-08

LATITUDE 47° 34' 47" LONGITUDE 122° 42' 34"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 2.73 mi <sup>2</sup> |
| Altitude                | 156 ft               |
| Lake Area               | 250 acres            |
| Lake Volume             | 4,500 acre-ft        |
| Mean Depth              | 18 ft                |
| Maximum Depth           | 29 ft                |
| Shoreline Length        | 2.7 mi               |
| Shoreline Configuration | 1.2                  |
| Development of Volume   | 0.62                 |
| Bottom Slope            | 2.7 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 75  | pct |
| Number of Nearshore Homes  | 109 |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 12  | pct |
| Agricultural               | 3   | pct |
| Forest or Unproductive     | 71  | pct |
| Lake Surface               | 14  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

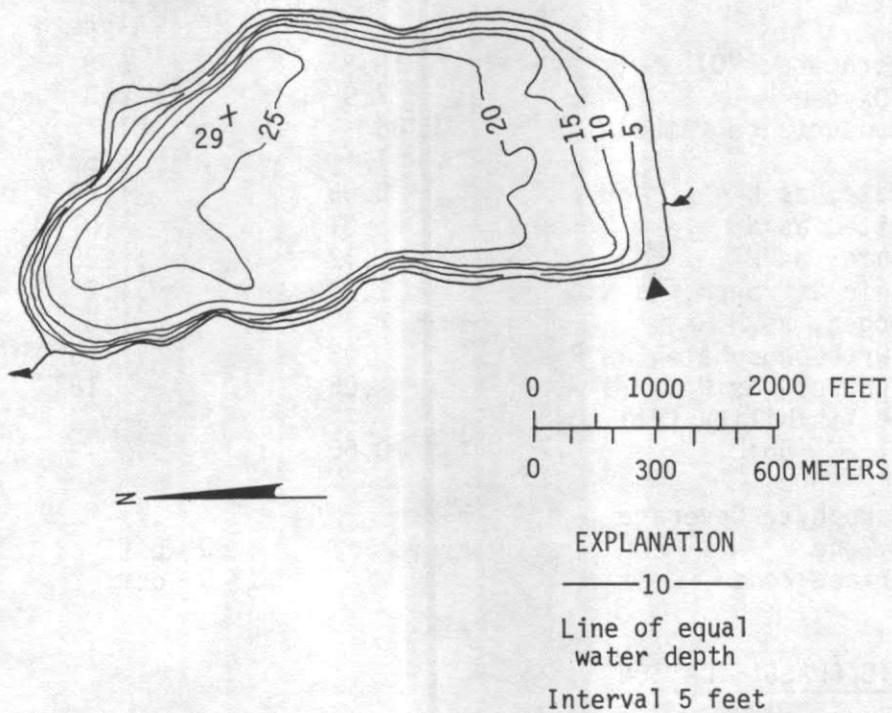
Date

July 21, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 23     |
| Water Temperature (°C)         | 20.2 | 18.8   |
| Dissolved Oxygen               | 8.5  | 3.6    |
| Specific Conductance (umho)    | 96   | 96     |
| pH (units)                     | 7.1  | 6.9    |
| Total Nitrate, as N            | 0.00 | 0.00   |
| Total Nitrite, as N            | .00  | .00    |
| Total Ammonia, as N            | .17  | .11    |
| Total Organic Nitrogen, as N   | .51  | .34    |
| Total Nitrogen, as N           | .68  | .45    |
| Dissolved Orthophosphate, as P | .02  | .00    |
| Total Phosphorus, as P         | .03  | .00    |
| Secchi-Disc Visibility (ft)    |      | 15     |
| Chlorophyll <u>a</u> (ug/L)    | 2.50 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 70 pct |
| Water-Surface Zone             |      | 30 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 71 |
| Trophic State Index (Carlson, 1977) |    |
| TSISD                               | 38 |
| TSITP                               | 53 |
| TSICh1                              | 40 |



Kitsap Lake, Kitsap County. Photo taken September 1974, view southeasterly. Bathymetric map from Washington Department of Game, June 7, 1950.

MILLER LAKE

KITSAP COUNTY

WRIA 15

T27N-R02E-21

LATITUDE 47° 48' 56" LONGITUDE 122° 33' 28"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 1.23 mi <sup>2</sup> |
| Altitude                | 50 ft                |
| Lake Area               | 31 acres             |
| Lake Volume             | 640 acre-ft          |
| Mean Depth              | 20 ft                |
| Maximum Depth           | 30 ft                |
| Shoreline Length        | 0.80 mi              |
| Shoreline Configuration | 1.0                  |
| Development of Volume   | 0.68                 |
| Bottom Slope            | 2.3 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

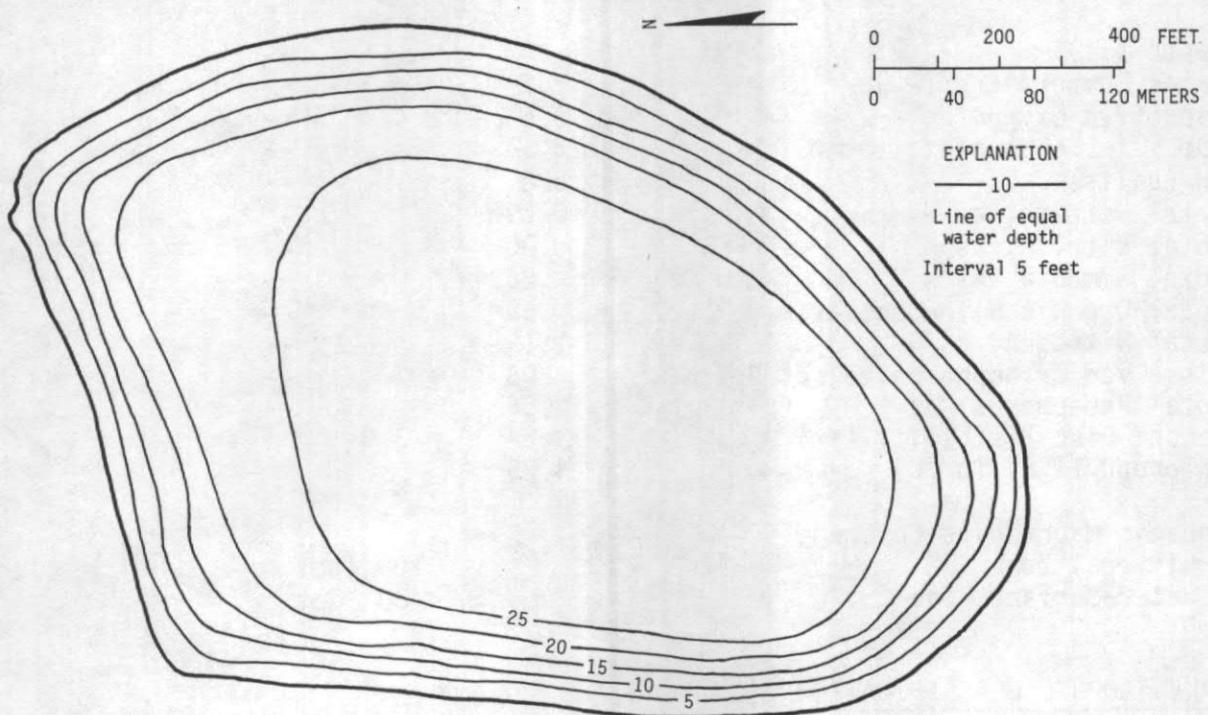
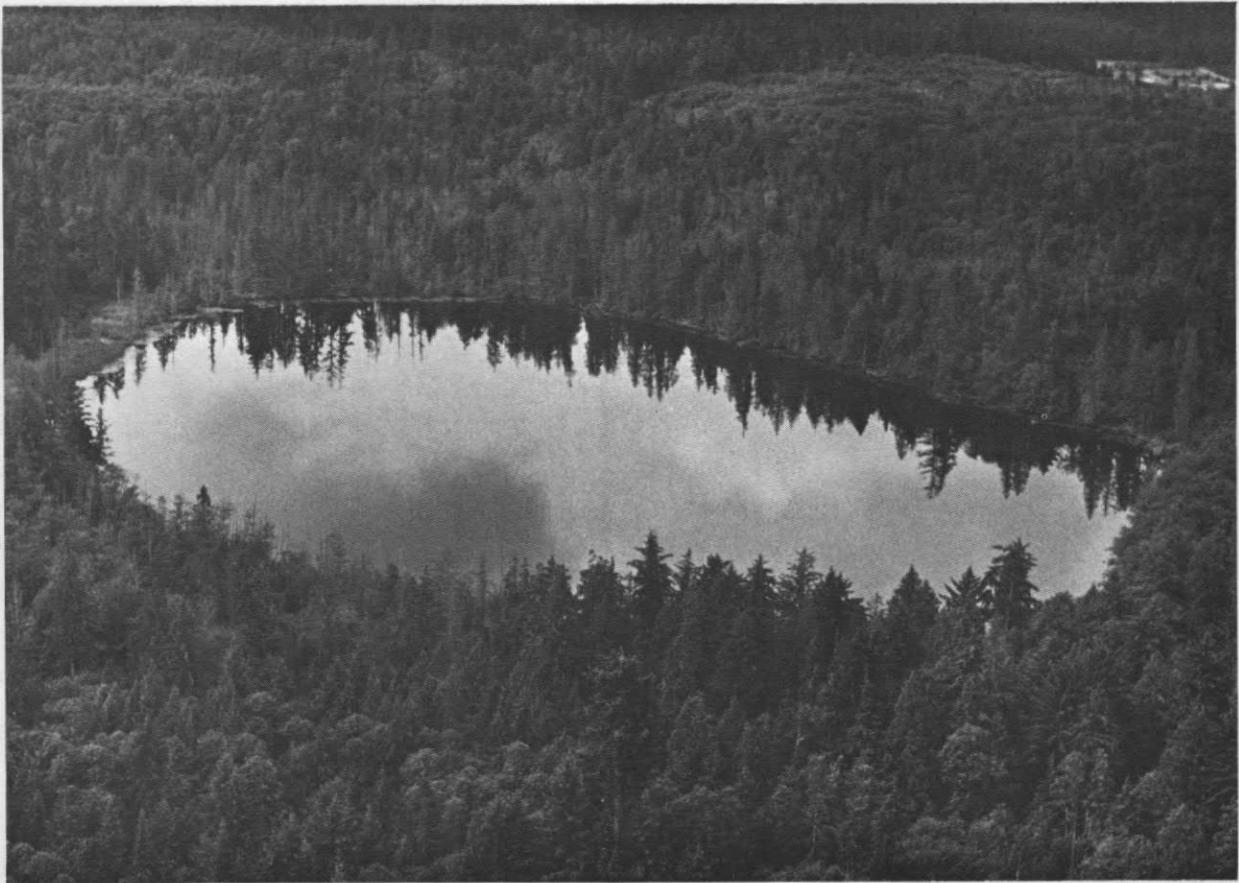
|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 0  | pct |
| Number of Nearshore Homes  | 0  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 11 | pct |
| Forest or Unproductive     | 85 | pct |
| Lake Surface               | 4  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |              |     |
|--------------------------------|--------------|-----|
| Date                           | July 1, 1981 |     |
| Depth (ft)                     | 3            | 26  |
| Water Temperature (°C)         | 18.8         | 6.8 |
| Dissolved Oxygen               | 7.9          | 0.3 |
| Specific Conductance (umho)    | 86           | 87  |
| pH (units)                     | 7.1          | 6.5 |
| Total Nitrate, as N            | 0.06         | .08 |
| Total Nitrite, as N            | .01          | .01 |
| Total Ammonia, as N            | .12          | .20 |
| Total Organic Nitrogen, as N   | 1.2          | 1.2 |
| Total Nitrogen, as N           | 1.4          | 1.5 |
| Dissolved Orthophosphate, as P | .03          | .15 |
| Total Phosphorus, as P         | .06          | .18 |
| Secchi-Disc Visibility (ft)    | 3            |     |
| Chlorophyll <u>a</u> (ug/L)    | 10.66        | --  |
| Aquatic Macrophyte Coverage    |              |     |
| Littoral Zone                  | 90           | pct |
| Water-Surface Zone             | < 5          | pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 298 |
| Trophic State Index (Carlson, 1977) |     |
| TSISD                               | 61  |
| TSITP                               | 63  |
| TSICh1                              | 54  |



Miller Lake, Kitsap County. Photo taken July 1, 1981, view easterly.  
Bathymetric map from U.S. Geological Survey, April 3, 1974.

DAVIS LAKE

LEWIS COUNTY

WRIA 26

T12N-R04E-12

LATITUDE 46° 32' 44" LONGITUDE 122° 15' 10"

PHYSICAL DATA

|                         |                     |
|-------------------------|---------------------|
| Drainage area           | 8.3 mi <sup>2</sup> |
| Altitude                | 920 ft              |
| Lake Area               | 15 acres            |
| Lake Volume             | 80 acre-ft          |
| Mean Depth              | 5 ft                |
| Maximum Depth           | 9 ft                |
| Shoreline Length        | 1.0 mi              |
| Shoreline Configuration | 1.9                 |
| Development of Volume   | 0.60                |
| Bottom Slope            | 1.0 pct             |
| Surface Inflow          | Yes                 |
| Surface Outflow         | Yes                 |

CULTURAL DATA

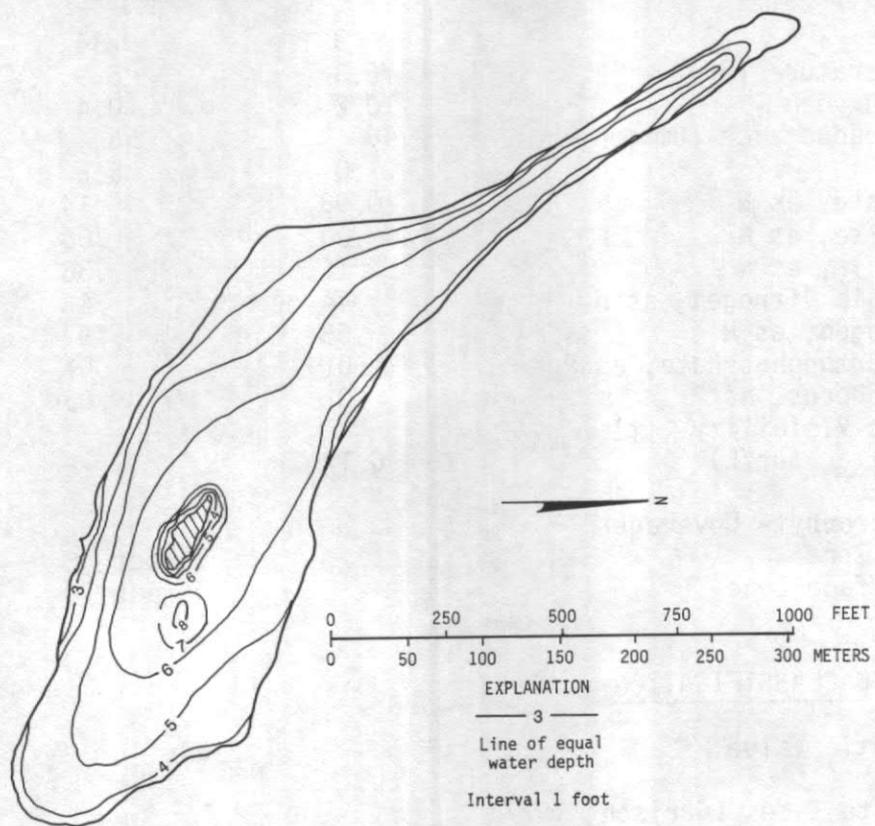
|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 0  | pct |
| Number of Nearshore Homes  | 0  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 8  | pct |
| Agricultural               | 9  | pct |
| Forest or Unproductive     | 83 | pct |
| Lake Surface               | <1 | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |              |     |
|--------------------------------|--------------|-----|
| Date                           | June 4, 1981 |     |
| Depth (ft)                     | 3            | --  |
| Water Temperature (°C)         | 12.2         | --  |
| Dissolved Oxygen               | 5.6          | --  |
| Specific Conductance (umho)    | 123          | --  |
| pH (units)                     | 6.6          | --  |
| Total Nitrate, as N            | 0.29         | --  |
| Total Nitrite, as N            | .00          | --  |
| Total Ammonia, as N            | .26          | --  |
| Total Organic Nitrogen, as N   | .58          | --  |
| Total Nitrogen, as N           | 1.1          | --  |
| Dissolved Orthophosphate, as P | .03          | --  |
| Total Phosphorus, as P         | .06          | --  |
| Secchi-Disc Visibility (ft)    | 3.5          | --  |
| Chlorophyll <u>a</u> (ug/L)    | 4.25         | --  |
| Aquatic Macrophyte Coverage    |              |     |
| Littoral Zone                  | 100          | pct |
| Water-Surface Zone             | 30           | pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 205 |
| Trophic State Index (Carlson, 1977) |     |
| TSISD                               | 59  |
| TSITP                               | 45  |
| TSICh1                              | 63  |



Davis Lake, Lewis County. Photo taken June 4, 1981, view westerly.  
Bathymetric map from U.S. Geological Survey, July 15, 1981.

MINERAL LAKE

LEWIS COUNTY

WRIA 11

T14N-R05E-09

LATITUDE 46° 43' 08" LONGITUDE 122° 10' 36"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 2.19 mi <sup>2</sup> |
| Altitude                | 1,450 ft             |
| Lake Area               | 280 acres            |
| Lake Volume             | 7,600 acre-ft        |
| Mean Depth              | 26 ft                |
| Maximum Depth           | 38 ft                |
| Shoreline Length        | 3.3 mi               |
| Shoreline Configuration | 1.4                  |
| Development of Volume   | 0.69                 |
| Bottom Slope            | 0.95 pct             |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 30  | pct |
| Number of Nearshore Homes  | 20  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 13  | pct |
| Residential-Suburban       | 0   | pct |
| Agricultural               | 0   | pct |
| Forest or Unproductive     | 67  | pct |
| Lake Surface               | 20  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

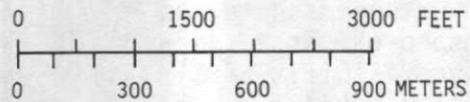
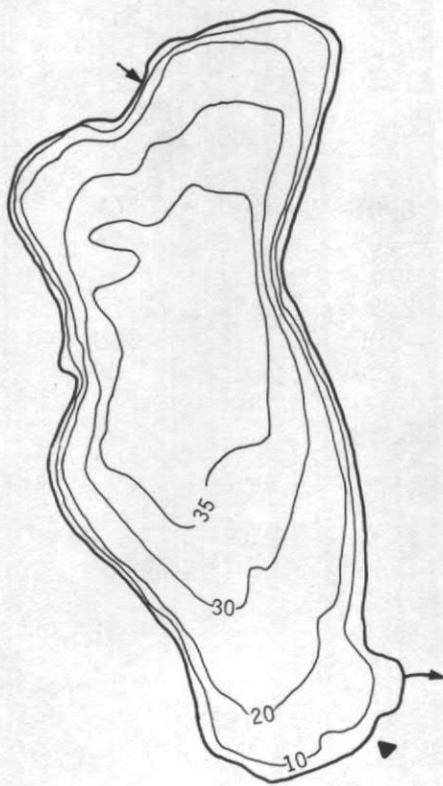
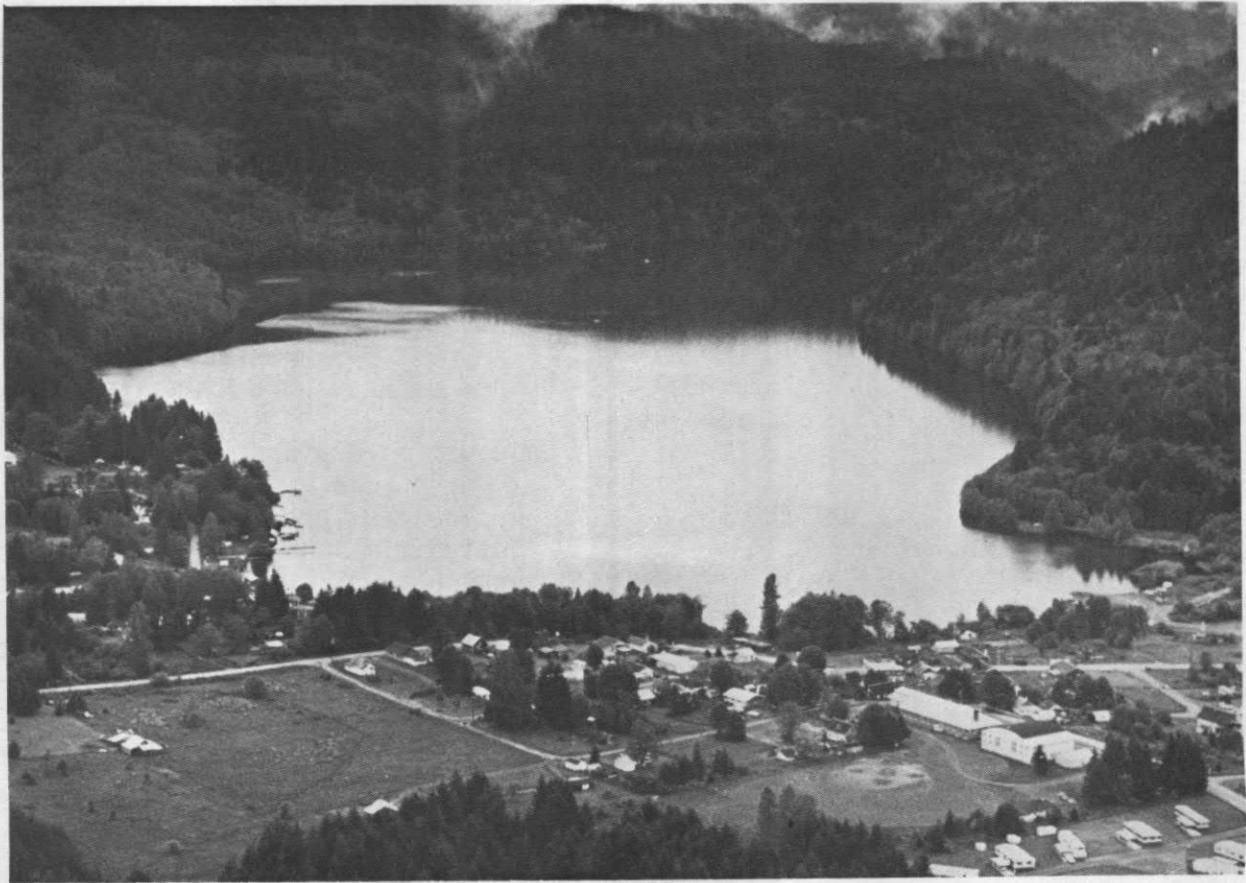
Date

June 4, 1981

|                                |      |       |
|--------------------------------|------|-------|
| Depth (ft)                     | 3    | 34    |
| Water Temperature (°C)         | 16.3 | 8.9   |
| Dissolved Oxygen               | 10.2 | 0.4   |
| Specific Conductance (umho)    | 48   | 55    |
| pH (units)                     | 7.0  | 6.5   |
| Total Nitrate, as N            | 0.08 | .14   |
| Total Nitrite, as N            | .00  | .00   |
| Total Ammonia, as N            | .16  | .38   |
| Total Organic Nitrogen, as N   | .44  | .45   |
| Total Nitrogen, as N           | .68  | .97   |
| Dissolved Orthophosphate, as P | .01  | .01   |
| Total Phosphorus, as P         | .01  | .03   |
| Secchi-Disc Visibility (ft)    |      | 16    |
| Chlorophyll <u>a</u> (ug/L)    | 6.17 | --    |
| Aquatic Macrophyte Coverage    |      |       |
| Littoral Zone                  |      | 0 pct |
| Water-Surface Zone             |      | 0 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 69 |
| Trophic State Index (Carlson, 1977) |    |
| TSI <sub>SD</sub>                   | 37 |
| TSI <sub>TP</sub>                   | 37 |
| TSI <sub>Chl</sub>                  | 49 |



EXPLANATION

— 60 —

Line of equal  
water depth

Interval 5 and 10 feet

Mineral Lake, Lewis County. Photo taken June 4, 1981, view northeasterly.  
Bathymetric map from Washington Department of Game, February 26, 1952.

PLUMMER LAKE

LEWIS COUNTY

WRIA 23

T14N-R02W-07

LATITUDE 46° 42' 50" LONGITUDE 122° 58' 23"

PHYSICAL DATA

Drainage area .13 mi<sup>2</sup>  
 Altitude 140 ft  
 Lake Area 15 acres  
 Lake Volume 252 acre-ft  
 Mean Depth 16 ft  
 Maximum Depth 43 ft  
 Shoreline Length 0.71 mi  
 Shoreline Configuration 1.3  
 Development of Volume 0.38  
 Bottom Slope 4.6 pct  
 Surface Inflow No  
 Surface Outflow Yes

CULTURAL DATA

Residential Development 40 pct  
 Number of Nearshore Homes 6  
 Land Use in Drainage Basin  
 Residential-Urban 0 pct  
 Residential-Suburban 90 pct  
 Agricultural 0 pct  
 Forest or Unproductive 0 pct  
 Lake Surface 10 pct  
 Public Boat Access to Lake Yes

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date June 9, 1981

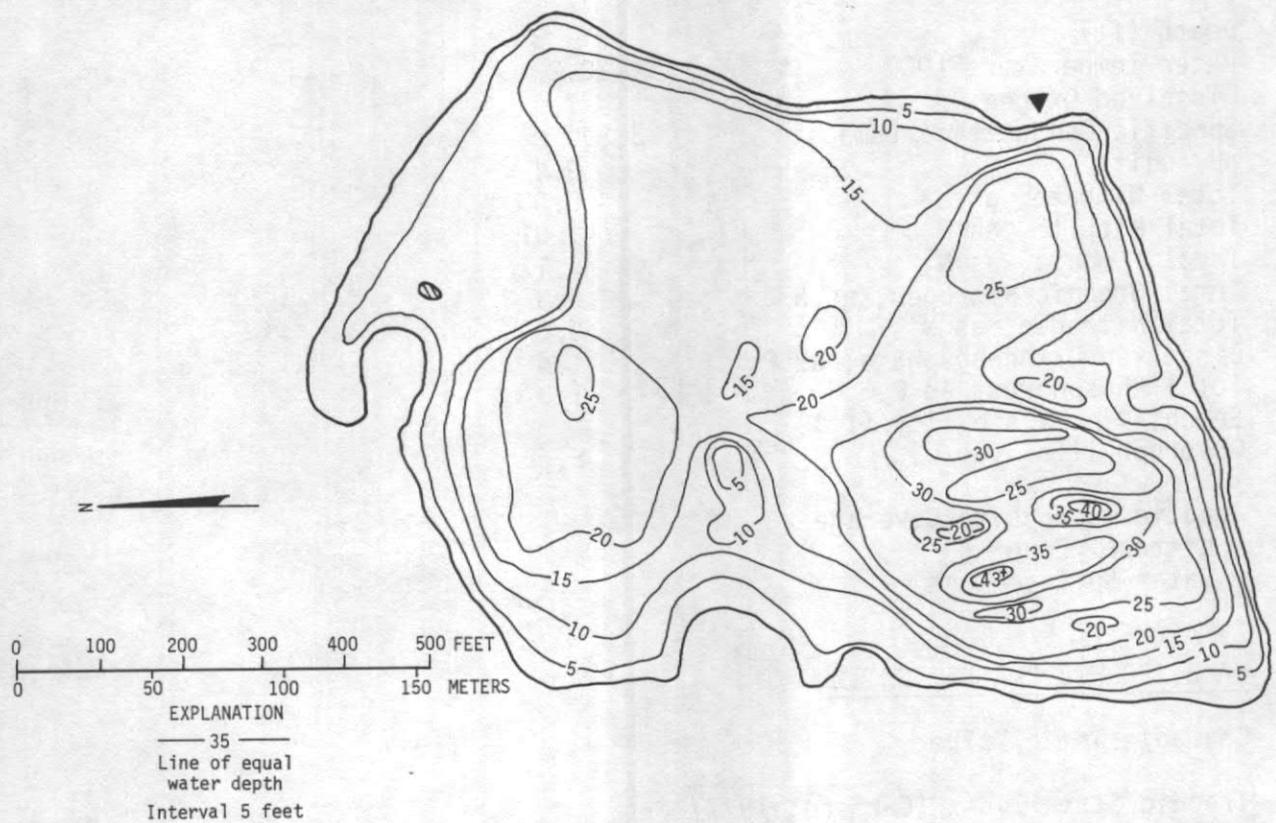
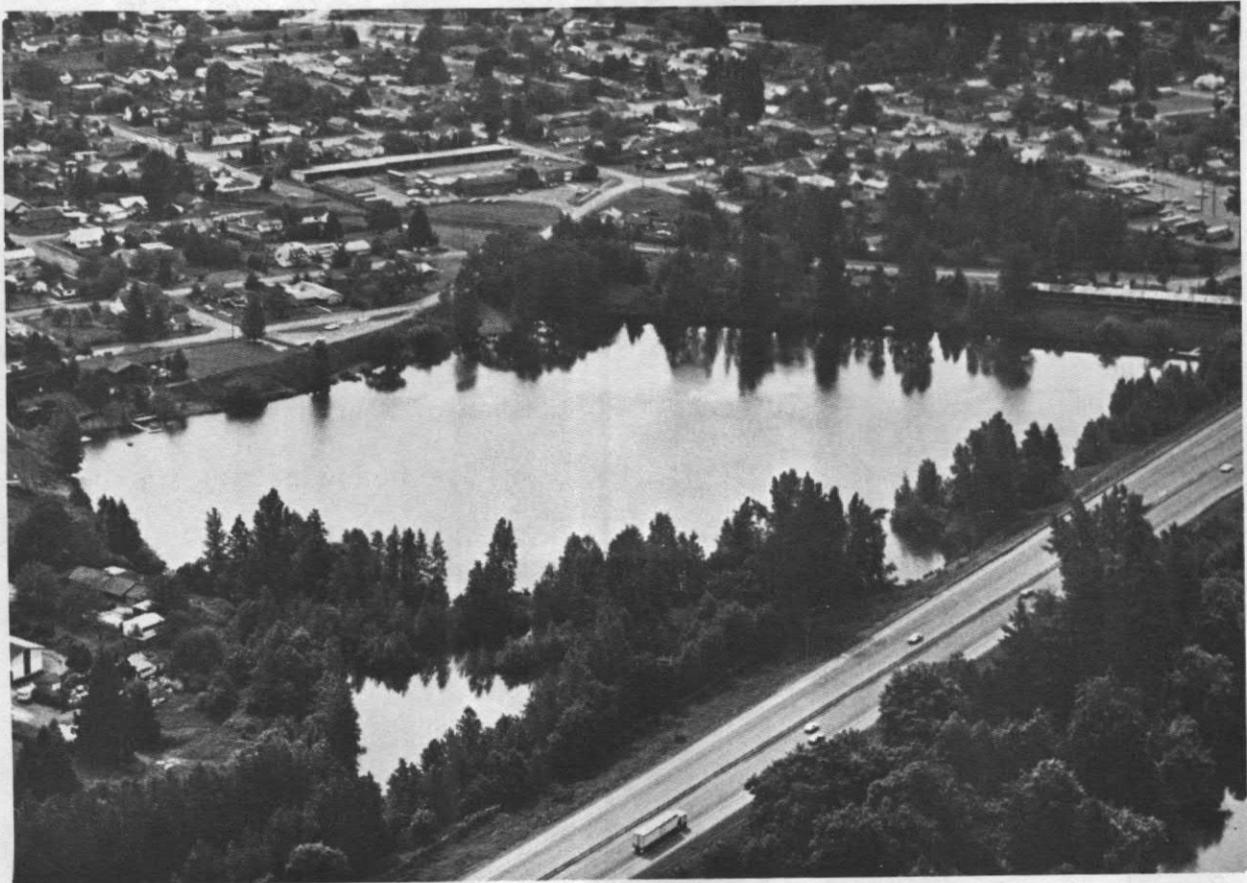
|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 21   |
| Water Temperature (°C)         | 16.2 | 11.1 |
| Dissolved Oxygen               | 11.3 | 0.2  |
| Specific Conductance (umho)    | 155  | 180  |
| pH (units)                     | 7.2  | 6.7  |
| Total Nitrate, as N            | 1.2  | 1.5  |
| Total Nitrite, as N            | 0.01 | .01  |
| Total Ammonia, as N            | .09  | .24  |
| Total Organic Nitrogen, as N   | 1.6  | 1.5  |
| Total Nitrogen, as N           | 2.9  | 3.2  |
| Dissolved Orthophosphate, as P | .00  | .00  |
| Total Phosphorus, as P         | .04  | .06  |
| Secchi-Disc Visibility (ft)    |      | 8    |
| Chlorophyll <u>a</u> (ug/L)    | 6.38 | --   |

Aquatic Macrophyte Coverage  
 Littoral Zone 10 pct  
 Water-Surface Zone <1 pct

LAKE TROPHIC CLASSIFICATION

Characteristic Value 197

Trophic State Index (Carlson, 1977)  
 TSI<sub>SD</sub> 47  
 TSI<sub>TP</sub> 57  
 TSI<sub>Chl</sub> 49



Plummer Lake, Lewis County. Photo taken June 9, 1981, view southeasterly.  
 Bathymetric map from U.S. Geological Survey, Spetember 9, 1981.

FLAT LAKE

LINCOLN COUNTY

WRIA 43

T24N-R33E-01

LATITUDE 47° 36' 32" LONGITUDE 118° 36' 36"

PHYSICAL DATA

Drainage area 1.50 mi<sup>2</sup>  
 Altitude 2,185 ft  
 Lake Area 20 acres  
 Lake Volume 63 acre-ft  
 Mean Depth 3 ft  
 Maximum Depth 4 ft  
 Shoreline Length 1.0 mi  
 Shoreline Configuration 1.6  
 Development of Volume 0.78  
 Bottom Slope 0.38 pct  
 Surface Inflow Yes  
 Surface Outflow No

CULTURAL DATA

Residential Development 0 pct  
 Number of Nearshore Homes 0  
 Land Use in Drainage Basin  
 Residential-Urban 0 pct  
 Residential-Suburban 0 pct  
 Agricultural 97 pct  
 Forest or Unproductive 0 pct  
 Lake Surface 3 pct  
 Public Boat Access to Lake No

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

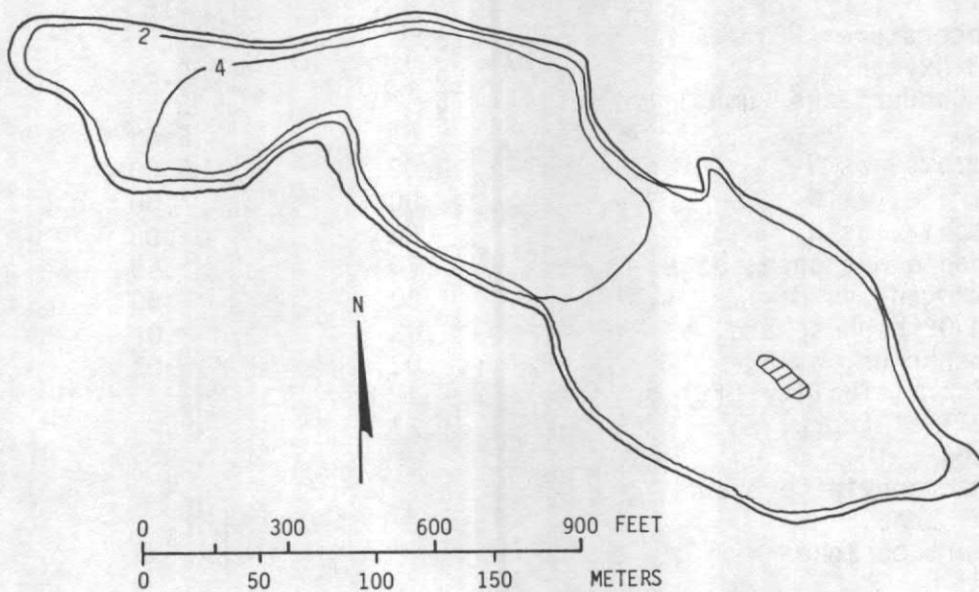
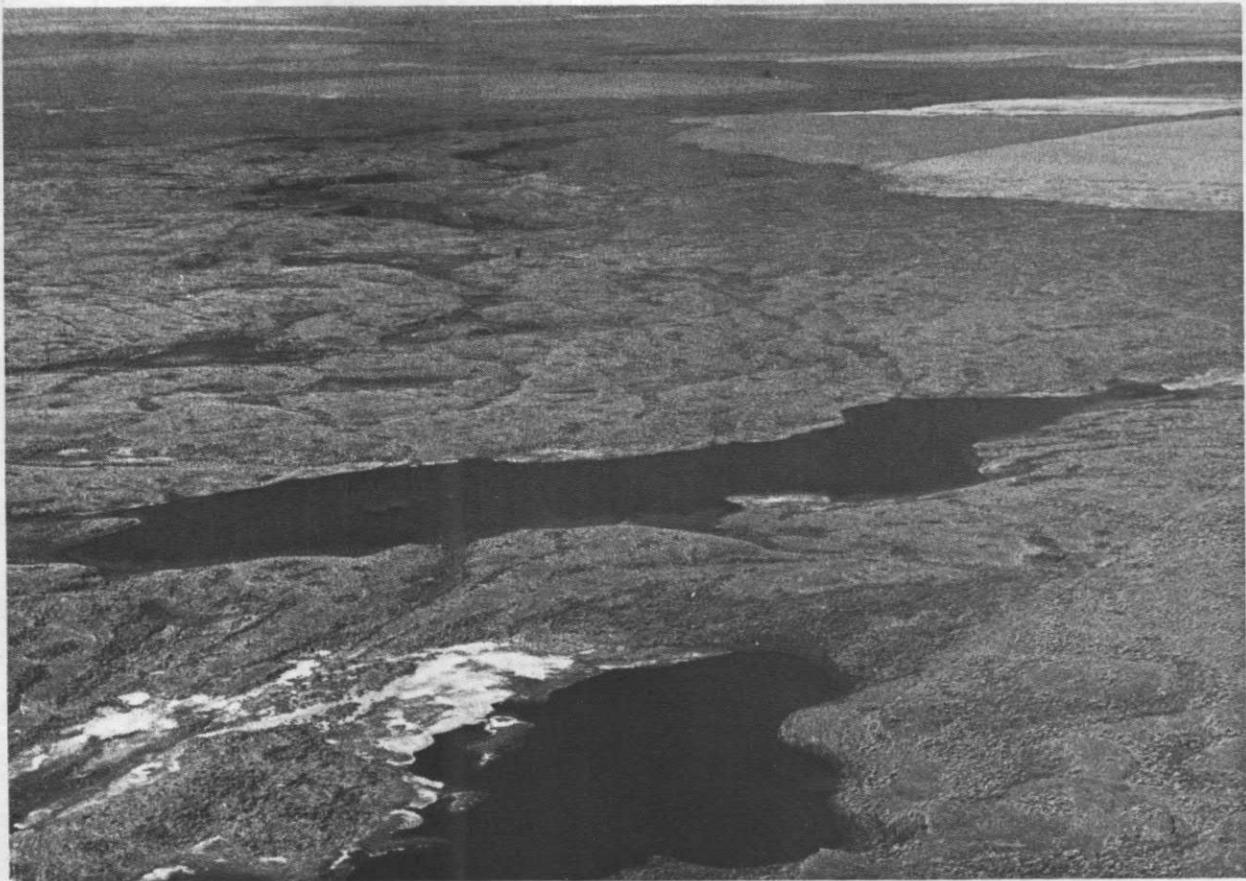
Date

July 17, 1981

Depth (ft) 3 --  
 Water Temperature (°C) 20.2 --  
 Dissolved Oxygen 7.4 --  
 Specific Conductance (umho) 3,800 --  
 pH (units) 9.4 --  
 Total Nitrate, as N 0.00 --  
 Total Nitrite, as N .01 --  
 Total Ammonia, as N .17 --  
 Total Organic Nitrogen, as N 5.3 --  
 Total Nitrogen, as N 5.5 --  
 Dissolved Orthophosphate, as P 1.4 --  
 Total Phosphorus, as P 1.3 --  
 Secchi-Disc Visibility (ft) 2  
 Chlorophyll a (ug/L) 5.56 --  
 Aquatic Macrophyte Coverage  
 Littoral Zone 20 pct  
 Water-Surface Zone 0 pct

LAKE TROPHIC CLASSIFICATION

Characteristic Value 1,047  
 Trophic State Index (Carlson, 1977)  
 TSI<sub>SD</sub> 67  
 TSI<sub>TP</sub> 108  
 TSI<sub>Chl</sub> 47



EXPLANATION  
— 2 —  
Line of equal  
water depth  
Interval 2 feet

Flat Lake, Lincoln County. Photo taken July 17, 1981, view southerly.  
Bathymetric map from U.S. Geological Survey, June 30, 1981.

BLACKSMITH LAKE

MASON COUNTY

WRIA 15

T23N-R02W-10

LATITUDE 47° 30' 20" LONGITUDE 122° 55' 22"

PHYSICAL DATA

Drainage area 0.99 mi<sup>2</sup>  
 Altitude 422 ft  
 Lake Area 25 acres  
 Lake Volume 233 acre-ft  
 Mean Depth 9 ft  
 Maximum Depth 22 ft  
 Shoreline Length 1.4 mi  
 Shoreline Configuration 2.0  
 Development of Volume 0.42  
 Bottom Slope 1.9 pct  
 Surface Inflow Yes  
 Surface Outflow No

CULTURAL DATA

Residential Development 0 pct  
 Number of Nearshore Homes 0  
 Land Use in Drainage Basin  
 Residential-Urban 0 pct  
 Residential-Suburban 0 pct  
 Agricultural 0 pct  
 Forest or Unproductive 96 pct  
 Lake Surface 4 pct  
 Public Boat Access to Lake No

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

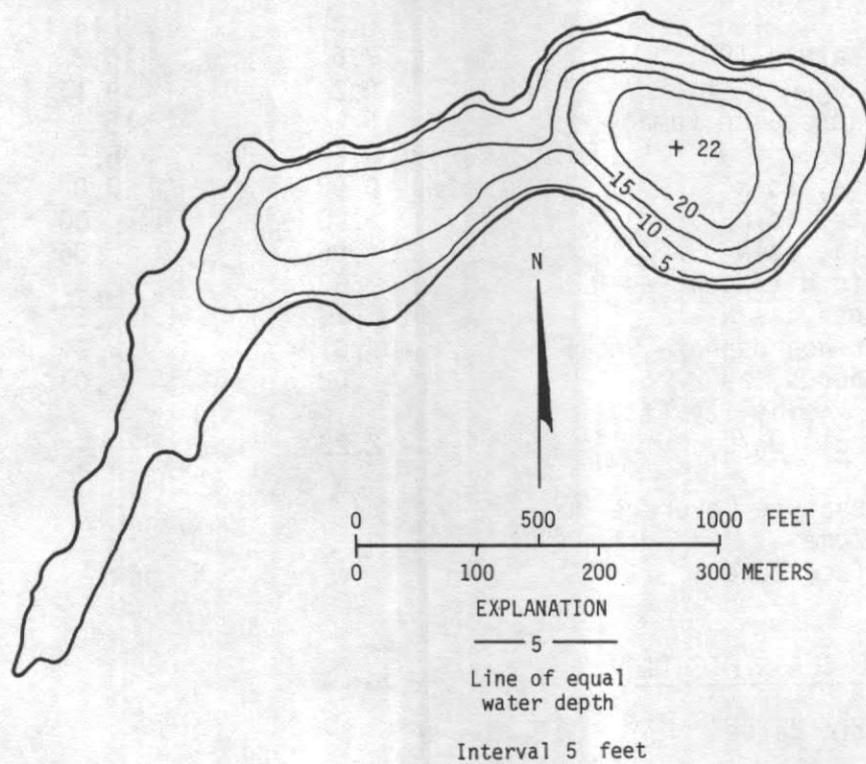
Date

June 12, 1981

|                                |      |         |
|--------------------------------|------|---------|
| Depth (ft)                     | 3    | 16      |
| Water Temperature (°C)         | 18.0 | 15.0    |
| Dissolved Oxygen               | 8.7  | 9.9     |
| Specific Conductance (umho)    | 15   | 18      |
| pH (units)                     | 6.6  | 6.6     |
| Total Nitrate, as N            | 0.00 | 0.00    |
| Total Nitrite, as N            | .00  | .00     |
| Total Ammonia, as N            | .06  | .05     |
| Total Organic Nitrogen, as N   | .74  | .55     |
| Total Nitrogen, as N           | .80  | .60     |
| Dissolved Orthophosphate, as P | .02  | .01     |
| Total Phosphorus, as P         | .02  | .03     |
| Secchi-Disc Visibility (ft)    |      | 13      |
| Chlorophyll <u>a</u> (ug/L)    | 1.27 | --      |
| Aquatic Macrophyte Coverage    |      |         |
| Littoral Zone                  |      | 100 pct |
| Water-Surface Zone             |      | 1 pct   |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 86  
 Trophic State Index (Carlson, 1977)  
 TSI<sub>SD</sub> 40  
 TSI<sub>TP</sub> 47  
 TSI<sub>chl</sub> 33



Blacksmith Lake, Mason County. Photo taken June 12, 1981, view northeasterly. Bathymetric map from U.S. Geological Survey, June 9, 1981.

COON LAKE

MASON COUNTY

WRIA 14

T22N-R02W-24

LATITUDE 47° 22' 53" LONGITUDE 122° 52' 03"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.23 mi <sup>2</sup> |
| Altitude                | 330 ft               |
| Lake Area               | 18 acres             |
| Lake Volume             | 177 acre-ft          |
| Mean Depth              | 10 ft                |
| Maximum Depth           | 17 ft                |
| Shoreline Length        | 0.94 mi              |
| Shoreline Configuration | 1.6                  |
| Development of Volume   | 0.60                 |
| Bottom Slope            | 1.7 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 10 | pct |
| Number of Nearshore Homes  | 3  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 89 | pct |
| Lake Surface               | 11 | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

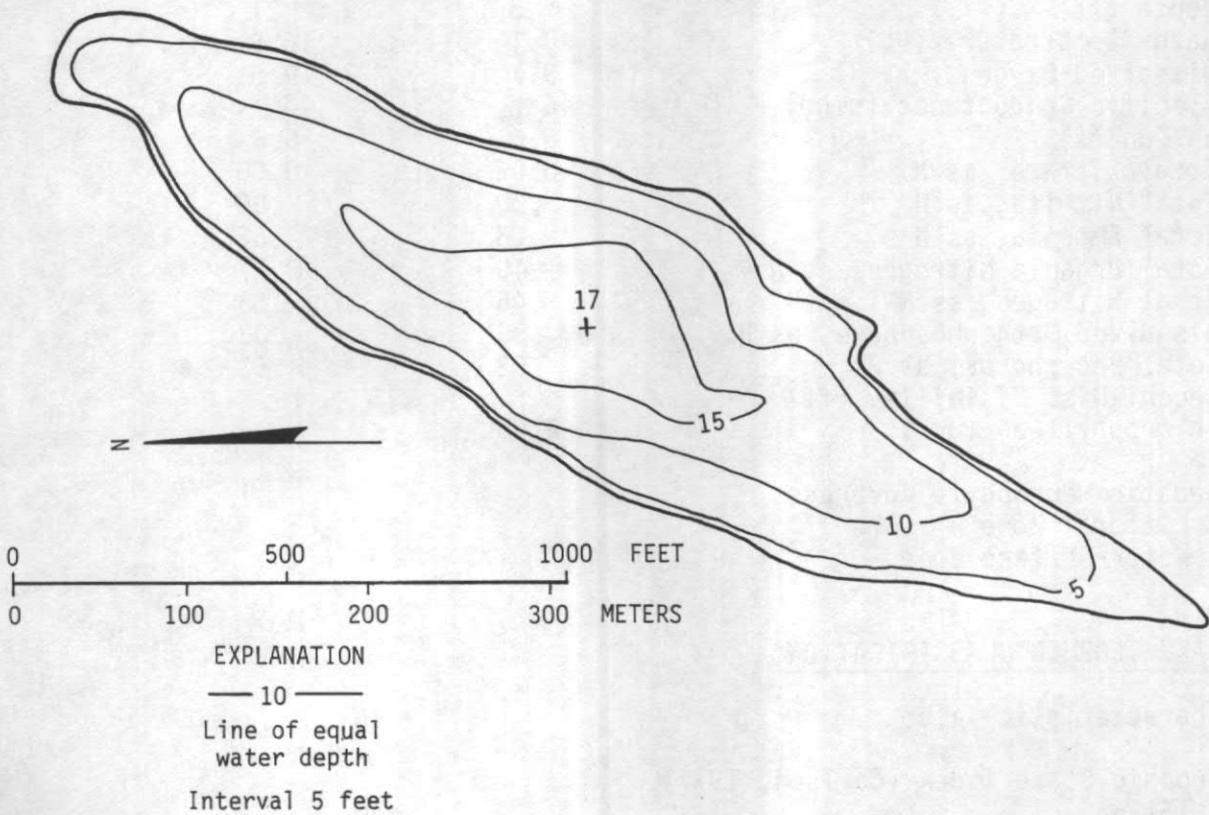
Date

June 12, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 14     |
| Water Temperature (°C)         | 17.6 | 16.8   |
| Dissolved Oxygen               | 9.2  | 9.1    |
| Specific Conductance (umho)    | 15   | 15     |
| pH (units)                     | 6.5  | 6.5    |
| Total Nitrate, as N            | 0.00 | 0.00   |
| Total Nitrite, as N            | .00  | .00    |
| Total Ammonia, as N            | .06  | .06    |
| Total Organic Nitrogen, as N   | .67  | .47    |
| Total Nitrogen, as N           | .73  | .53    |
| Dissolved Orthophosphate, as P | .01  | .01    |
| Total Phosphorus, as P         | .02  | .03    |
| Secchi-Disc Visibility (ft)    |      | 11     |
| Chlorophyll <u>a</u> (ug/L)    | 2.22 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 80 pct |
| Water-Surface Zone             |      | 5 pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 91 |
| Trophic State Index (Carlson, 1977) |    |
| TSISD                               | 43 |
| TSITP                               | 47 |
| TSICh1                              | 38 |



Coon Lake, Mason County. Photo taken June 12, 1981, view northeasterly.  
Bathymetric map from U.S. Geological Survey, May 28, 1981.

ISLAND LAKE

MASON COUNTY

WRIA 14

T20N-R03W-06

LATITUDE 47° 14' 44" LONGITUDE 123° 06' 40"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.26 mi <sup>2</sup> |
| Altitude                | 230 ft               |
| Lake Area               | 110 acres            |
| Lake Volume             | 2,200 acre-ft        |
| Mean Depth              | 21 ft                |
| Maximum Depth           | 31 ft                |
| Shoreline Length        | 1.7 mi               |
| Shoreline Configuration | 1.2                  |
| Development of Volume   | 0.67                 |
| Bottom Slope            | 1.3 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 100 | pct |
| Number of Nearshore Homes  | 88  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 35  | pct |
| Agricultural               | 0   | pct |
| Forest or Unproductive     | 0   | pct |
| Lake Surface               | 65  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 10, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 21   |
| Water Temperature (°C)         | 17.1 | 16.9 |
| Dissolved Oxygen               | 9.7  | 9.5  |
| Specific Conductance (umho)    | 44   | 44   |
| pH (units)                     | 6.6  | 6.8  |
| Total Nitrate, as N            | 0.02 | 0.00 |
| Total Nitrite, as N            | .00  | .00  |
| Total Ammonia, as N            | .03  | .06  |
| Total Organic Nitrogen, as N   | .40  | .77  |
| Total Nitrogen, as N           | .45  | .83  |
| Dissolved Orthophosphate, as P | .03  | .03  |
| Total Phosphorus, as P         | .03  | .03  |
| Secchi-Disc Visibility (ft)    |      | 13   |
| Chlorophyll <u>a</u> (ug/L)    | 2.00 | --   |

## Aquatic Macrophyte Coverage

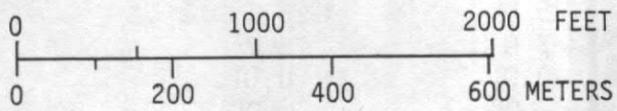
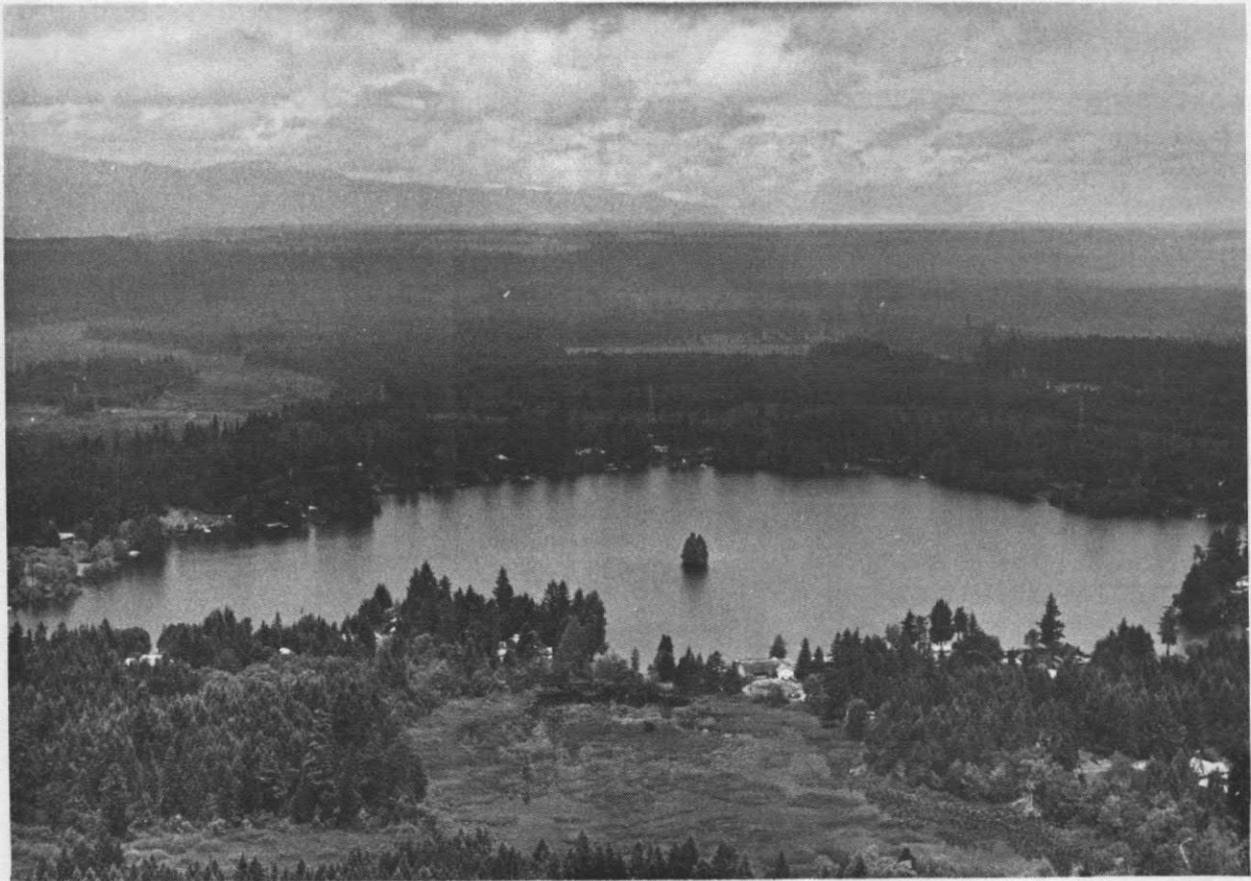
|                    |    |     |
|--------------------|----|-----|
| Littoral Zone      | 10 | pct |
| Water-Surface Zone | <5 | pct |

LAKE TROPHIC CLASSIFICATION

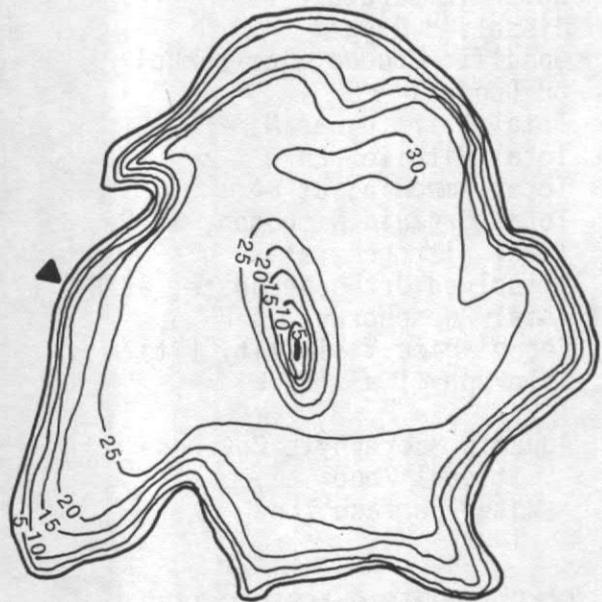
Characteristic Value 66

## Trophic State Index (Carlson, 1977)

|        |    |
|--------|----|
| TSISD  | 40 |
| TSITP  | 53 |
| TSICh1 | 37 |



EXPLANATION  
 — 15 —  
 Line of equal  
 water depth  
 Interval 5 feet



Island Lake, Mason County. Photo taken June 10, 1981.  
 Bathymetric map from Washington Department of Game, February 15, 1952.

LOST LAKE

MASON COUNTY

WRIA 14

T19N-R05W-01

LATITUDE 47° 09' 16" LONGITUDE 123° 14' 51"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 1.08 mi <sup>2</sup> |
| Altitude                | 480 ft               |
| Lake Area               | 120 acres            |
| Lake Volume             | 3,400 acre-ft        |
| Mean Depth              | 28 ft                |
| Maximum Depth           | 65 ft                |
| Shoreline Length        | 3.2 mi               |
| Shoreline Configuration | 2.1                  |
| Development of Volume   | 0.42                 |
| Bottom Slope            | 2.5 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

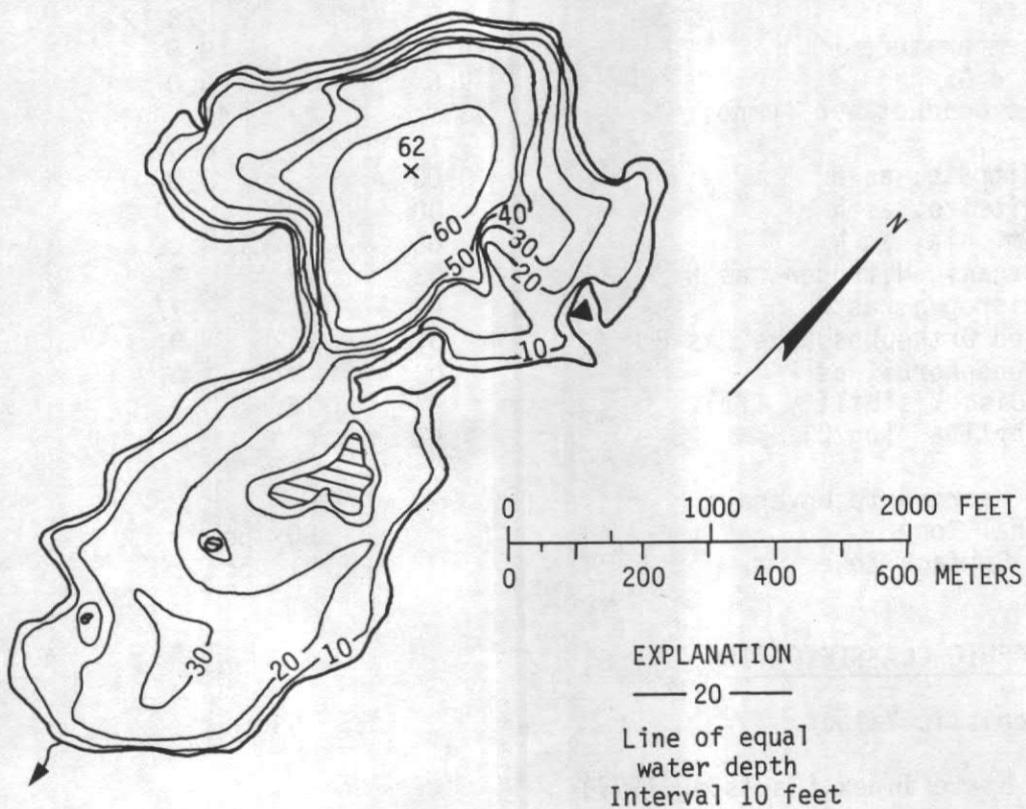
|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 95  | pct |
| Number of Nearshore Homes  | 108 |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 12  | pct |
| Agricultural               | 0   | pct |
| Forest or Unproductive     | 70  | pct |
| Lake Surface               | 18  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |               |      |
|--------------------------------|---------------|------|
| Date                           | June 24, 1981 |      |
| Depth (ft)                     | 3             | 50   |
| Water Temperature (°C)         | 16.9          | 7.0  |
| Dissolved Oxygen               | 10.0          | 4.3  |
| Specific Conductance (umho)    | 25            | 25   |
| pH (units)                     | 7.0           | 6.2  |
| Total Nitrate, as N            | 0.01          | 0.01 |
| Total Nitrite, as N            | .00           | .00  |
| Total Ammonia, as N            | .07           | .07  |
| Total Organic Nitrogen, as N   | .47           | .42  |
| Total Nitrogen, as N           | .55           | .50  |
| Dissolved Orthophosphate, as P | .01           | .01  |
| Total Phosphorus, as P         | .01           | .01  |
| Secchi-Disc Visibility (ft)    | 21            |      |
| Chlorophyll <u>a</u> (ug/L)    | .90           | --   |
| Aquatic Macrophyte Coverage    |               |      |
| Littoral Zone                  | 5             | pct  |
| Water-Surface Zone             | 0             | pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 46 |
| Trophic State Index (Carlson, 1977) |    |
| TSI <sub>SD</sub>                   | 33 |
| TSI <sub>TP</sub>                   | 37 |
| TSI <sub>Chl</sub>                  | 30 |



Lost Lake, Mason County. Photo taken June 24, 1981, view northwesterly.  
Bathymetric map from Washington Department of Game, February 12, 1952.

MASON LAKE

MASON COUNTY

WRIA 14

T22N-R02W-34

LATITUDE 47° 21' 14" LONGITUDE 122° 55' 17"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 20.2 mi <sup>2</sup> |
| Altitude                | 194 ft               |
| Lake Area               | 1,000 acres          |
| Lake Volume             | 49,000 acre-ft       |
| Mean Depth              | 48 ft                |
| Maximum Depth           | 90 ft                |
| Shoreline Length        | 11 mi                |
| Shoreline Configuration | 2.4                  |
| Development of Volume   | 0.53                 |
| Bottom Slope            | 1.2 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 95  | pct |
| Number of Nearshore Homes  | 642 |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 3   | pct |
| Agricultural               | 0   | pct |
| Forest or Unproductive     | 89  | pct |
| Lake Surface               | 8   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

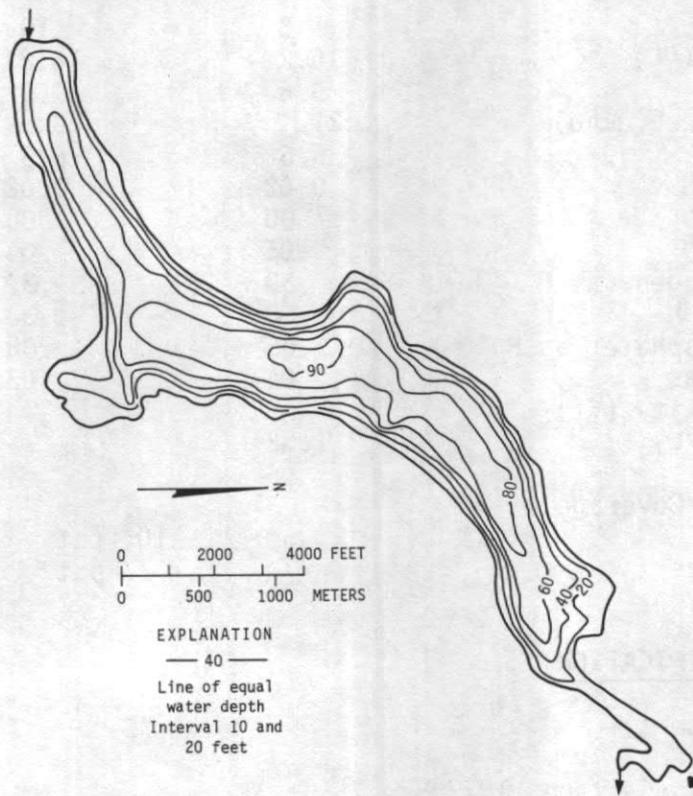
Date

June 12, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 78     |
| Water Temperature (°C)         | 16.2 | 9.8    |
| Dissolved Oxygen               | 9.6  | 6.0    |
| Specific Conductance (umho)    | 43   | 41     |
| pH (units)                     | 7.1  | 6.8    |
| Total Nitrate, as N            | 0.00 | 0.00   |
| Total Nitrite, as N            | .00  | .00    |
| Total Ammonia, as N            | .06  | .06    |
| Total Organic Nitrogen, as N   | .93  | .71    |
| Total Nitrogen, as N           | .99  | .77    |
| Dissolved Orthophosphate, as P | .01  | .01    |
| Total Phosphorus, as P         | .02  | .01    |
| Secchi-Disc Visibility (ft)    |      | 16     |
| Chlorophyll <u>a</u> (ug/L)    | 1.52 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 80 pct |
| Water-Surface Zone             |      | 1 pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 93 |
| Trophic State Index (Carlson, 1977) |    |
| TSISD                               | 37 |
| TSITP                               | 47 |
| TSICh1                              | 35 |



Mason Lake, Mason County. Photo taken June 12, 1981, view westerly.  
Bathymetric map from Washington Department of Game, May 4, 1954.

NAHWATZEL LAKE

MASON COUNTY

WRIA 22

T20N-R05W-08

LATITUDE 47° 14' 08" LONGITUDE 123° 20' 08"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 6.20 mi <sup>2</sup> |
| Altitude                | 440 ft               |
| Lake Area               | 270 acres            |
| Lake Volume             | 4,600 acre-ft        |
| Mean Depth              | 17 ft                |
| Maximum Depth           | 25 ft                |
| Shoreline Length        | 2.9 mi               |
| Shoreline Configuration | 1.3                  |
| Development of Volume   | 0.69                 |
| Bottom Slope            | 0.65 pct             |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 70  | pct |
| Number of Nearshore Homes  | 116 |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 2   | pct |
| Agricultural               | 0   | pct |
| Forest or Unproductive     | 91  | pct |
| Lake Surface               | 7   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

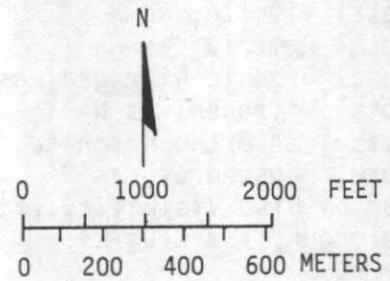
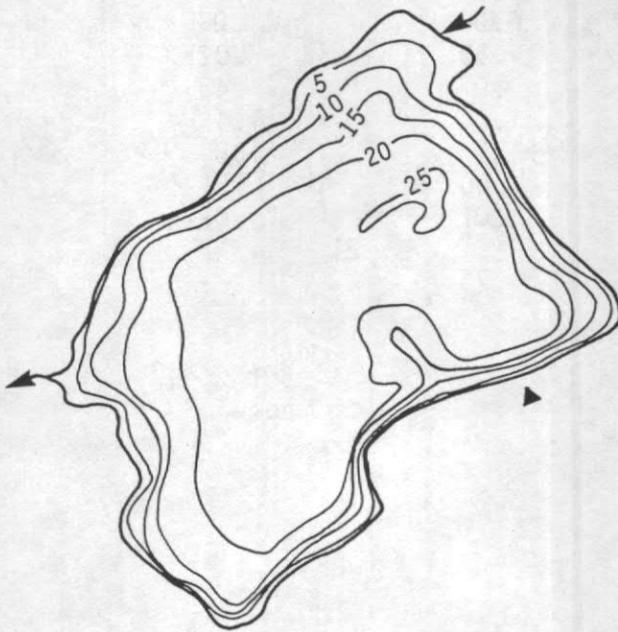
Date

June 10, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 19     |
| Water Temperature (°C)         | 16.2 | 16.2   |
| Dissolved Oxygen               | 9.6  | 9.5    |
| Specific Conductance (umho)    | 21   | 19     |
| pH (units)                     | 6.6  | 6.5    |
| Total Nitrate, as N            | 0.02 | 0.02   |
| Total Nitrite, as N            | .00  | .00    |
| Total Ammonia, as N            | .06  | .04    |
| Total Organic Nitrogen, as N   | .50  | .32    |
| Total Nitrogen, as N           | .58  | .38    |
| Dissolved Orthophosphate, as P | .05  | .03    |
| Total Phosphorus, as P         | .04  | .03    |
| Secchi-Disc Visibility (ft)    |      | 13     |
| Chlorophyll <u>a</u> (ug/L)    | 1.52 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 10 pct |
| Water-Surface Zone             |      | <1 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 75 |
| Trophic State Index (Carlson, 1977) |    |
| TSI <sub>SD</sub>                   | 40 |
| TSI <sub>TP</sub>                   | 57 |
| TSI <sub>Chl</sub>                  | 35 |



EXPLANATION  
 — 10 —  
 Line of equal  
 water depth  
 Interval 5 feet

Nahwatzel Lake, Mason County. Photo taken May 20, 1978.  
 Bathymetric map from Washington Department of Game, June 7, 1949.

BLUE LAKE

OKANOGAN COUNTY

WRIA 49

T35N-R26E-06

LATITUDE 48° 33' 51" LONGITUDE 119° 36' 42"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.28 mi <sup>2</sup> |
| Altitude                | 2,562 ft             |
| Lake Area               | 20 acres             |
| Lake Volume             | 634 acre-ft          |
| Mean Depth              | 31 ft                |
| Maximum Depth           | 50 ft                |
| Shoreline Length        | 0.76 mi              |
| Shoreline Configuration | 1.2                  |
| Development of Volume   | 0.63                 |
| Bottom Slope            | 4.7 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 0  | pct |
| Number of Nearshore Homes  | 0  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 37 | pct |
| Forest or Unproductive     | 54 | pct |
| Lake Surface               | 9  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

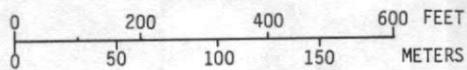
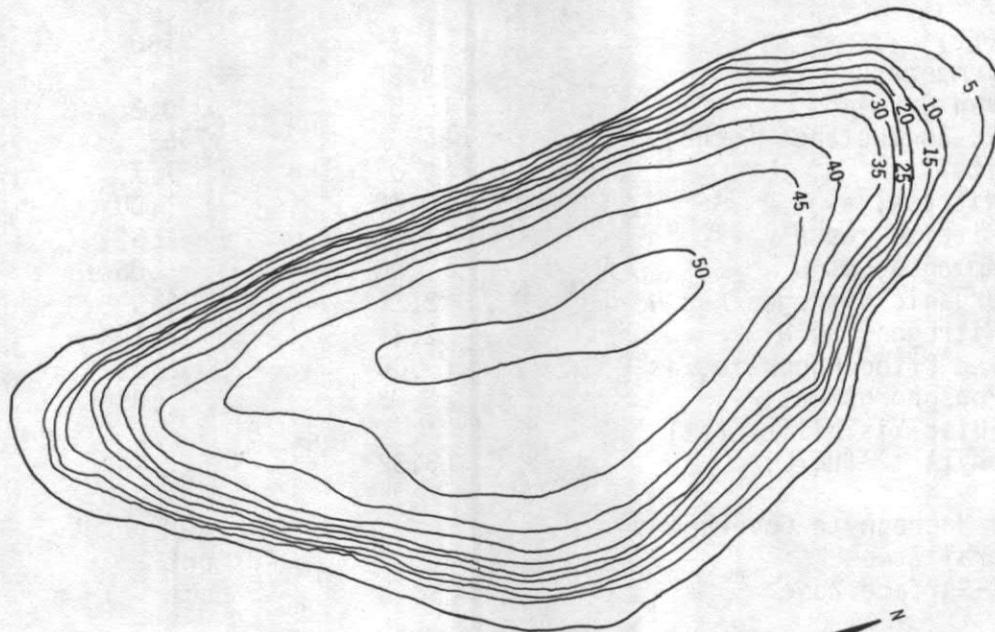
Date

July 16, 1981

|                                |       |        |
|--------------------------------|-------|--------|
| Depth (ft)                     | 3     | 44     |
| Water Temperature (°C)         | 18.8  | 5.1    |
| Dissolved Oxygen               | 9.0   | 0.2    |
| Specific Conductance (umho)    | 2,045 | 2,145  |
| pH (units)                     | 8.6   | 7.7    |
| Total Nitrate, as N            | 0.00  | .00    |
| Total Nitrite, as N            | .00   | .02    |
| Total Ammonia, as N            | .07   | .43    |
| Total Organic Nitrogen, as N   | 1.0   | 1.4    |
| Total Nitrogen, as N           | 1.1   | 1.8    |
| Dissolved Orthophosphate, as P | .00   | .01    |
| Total Phosphorus, as P         | .01   | .01    |
| Secchi-Disc Visibility (ft)    |       | 21     |
| Chlorophyll <u>a</u> (ug/L)    | .75   | --     |
| Aquatic Macrophyte Coverage    |       |        |
| Littoral Zone                  |       | <1 pct |
| Water-Surface Zone             |       | <1 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 85 |
| Trophic State Index (Carlson, 1977) |    |
| TSI <sub>SD</sub>                   | 33 |
| TSI <sub>TP</sub>                   | 37 |
| TSI <sub>Chl</sub>                  | 28 |



EXPLANATION  
 — 25 —  
 Line of equal  
 water depth  
 Interval 5 feet

Blue (35N-26E-6) Lake, Okanogan County. Photo taken July 16, 1981, view northwesterly. Bathymetric map from U.S. Geological Survey, June 23, 1981.

BONNER LAKE

OKANOGAN COUNTY

WRIA 48

T34N-R22E-32

LATITUDE 48° 23' 47" LONGITUDE 120° 05' 59"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.80 mi <sup>2</sup> |
| Altitude                | 2,266 ft             |
| Lake Area               | 15 acres             |
| Lake Volume             | 233 acre-ft          |
| Mean Depth              | 15 ft                |
| Maximum Depth           | 32 ft                |
| Shoreline Length        | 0.60 mi              |
| Shoreline Configuration | 1.1                  |
| Development of Volume   | 0.48                 |
| Bottom Slope            | 3.5 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 0  | pct |
| Number of Nearshore Homes  | 0  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 92 | pct |
| Forest or Unproductive     | 5  | pct |
| Lake Surface               | 3  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

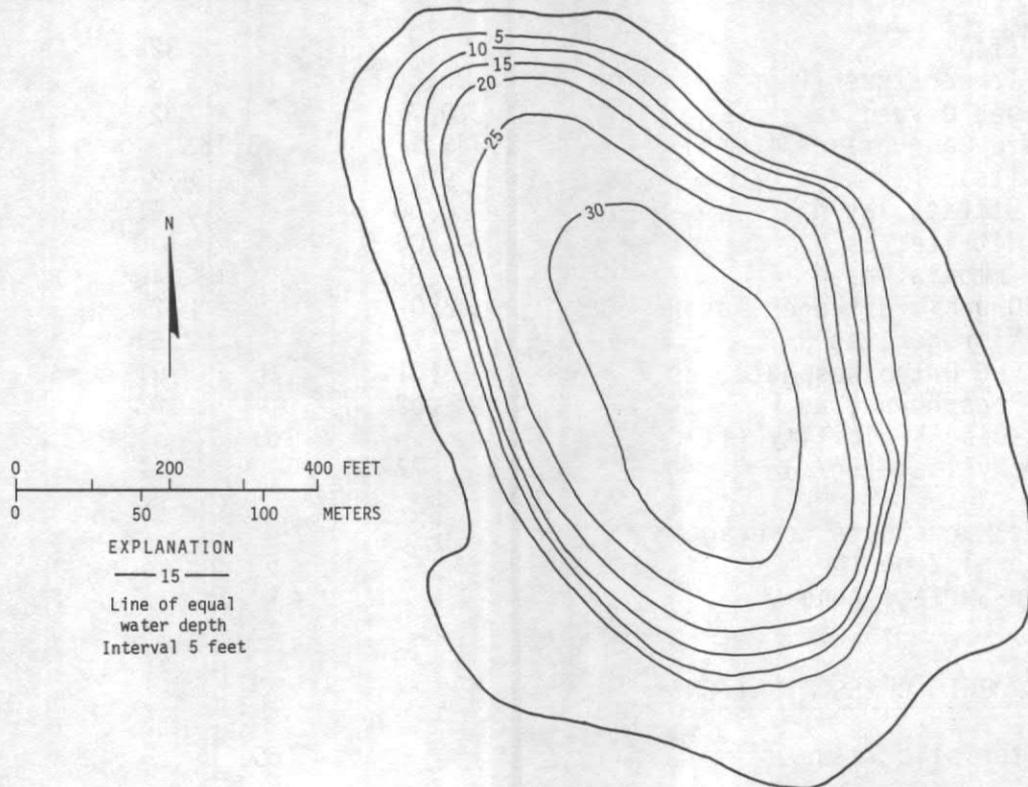
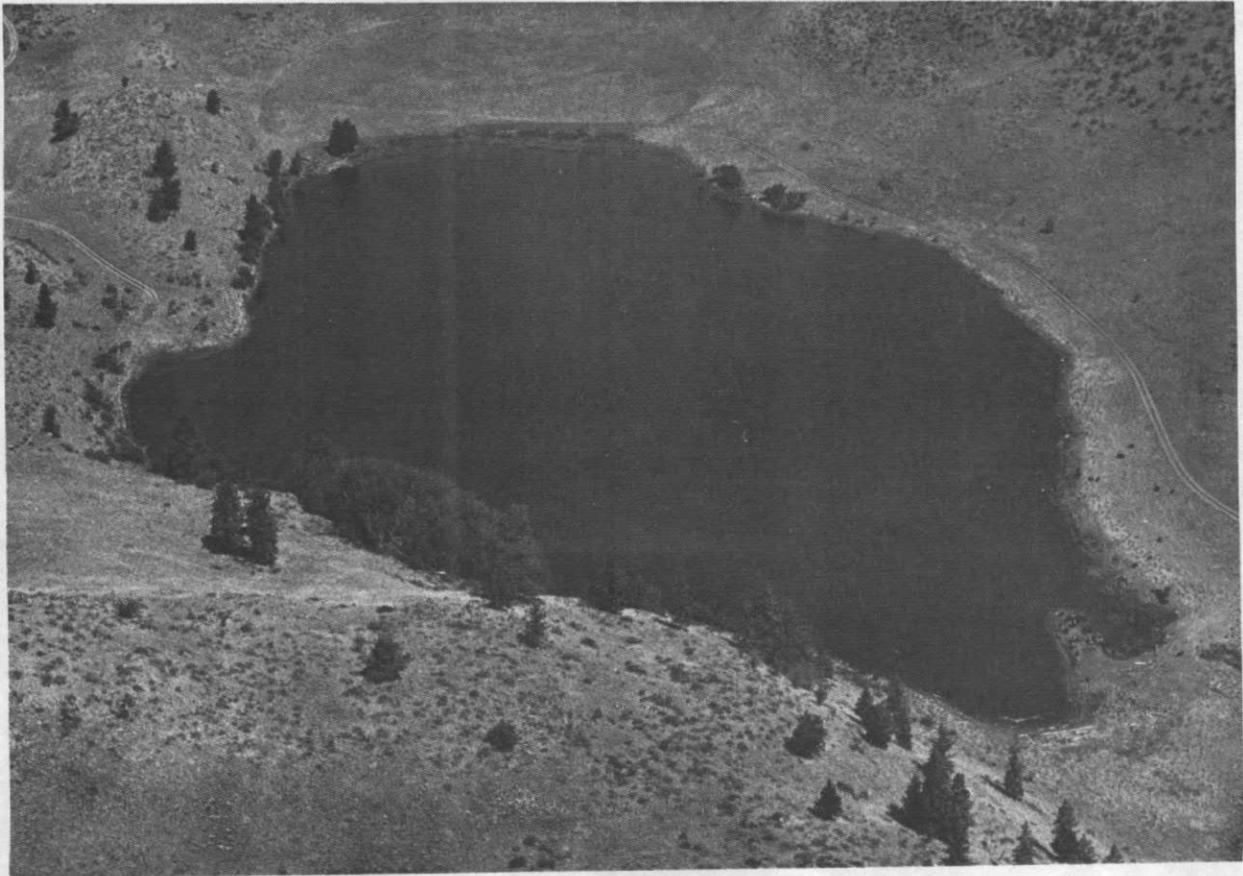
Date

July 16, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 30     |
| Water Temperature (°C)         | 19.8 | 6.7    |
| Dissolved Oxygen               | 10.8 | 0.2    |
| Specific Conductance (umho)    | 695  | 735    |
| pH (units)                     | 9.0  | 7.7    |
| Total Nitrate, as N            | 0.00 | .00    |
| Total Nitrite, as N            | .00  | .02    |
| Total Ammonia, as N            | .08  | .06    |
| Total Organic Nitrogen, as N   | 2.2  | 2.0    |
| Total Nitrogen, as N           | 2.3  | 2.1    |
| Dissolved Orthophosphate, as P | .00  | .09    |
| Total Phosphorus, as P         | .03  | .08    |
| Secchi-Disc Visibility (ft)    |      | 8      |
| Chlorophyll <u>a</u> (ug/L)    | 3.32 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 40 pct |
| Water-Surface Zone             |      | 5 pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 228 |
| Trophic State Index (Carlson, 1977) |     |
| TSISD                               | 47  |
| TSITP                               | 53  |
| TSICh1                              | 42  |



Bonner Lake, Okanogan County. Photo taken July 16, 1981, view northerly. Bathymetric map from Washington Department of Game, January 6, 1948.

CASTOR LAKE

OKANOGAN COUNTY

WRIA 49

T35N-R26E-16

LATITUDE 48° 32' 17" LONGITUDE 119° 33' 40"

PHYSICAL DATA

|                         |                     |
|-------------------------|---------------------|
| Drainage area           | .66 mi <sup>2</sup> |
| Altitude                | 1,950 ft            |
| Lake Area               | 15 acres            |
| Lake Volume             | 268 acre-ft         |
| Mean Depth              | 18 ft               |
| Maximum Depth           | 39 ft               |
| Shoreline Length        | 0.65 mi             |
| Shoreline Configuration | 1.2                 |
| Development of Volume   | 0.47                |
| Bottom Slope            | 4.32 pct            |
| Surface Inflow          | No                  |
| Surface Outflow         | No                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 0  | pct |
| Number of Nearshore Homes  | 0  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 87 | pct |
| Forest or Unproductive     | 7  | pct |
| Lake Surface               | 6  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

July 16, 1981

|                                |       |       |
|--------------------------------|-------|-------|
| Depth (ft)                     | 3     | 32    |
| Water Temperature (°C)         | 20.0  | 7.9   |
| Dissolved Oxygen               | 10.7  | 0.2   |
| Specific Conductance (umho)    | 3,335 | 3,185 |
| pH (units)                     | 9.1   | 8.8   |
| Total Nitrate, as N            | 0.00  | .01   |
| Total Nitrite, as N            | .00   | .00   |
| Total Ammonia, as N            | .09   | .40   |
| Total Organic Nitrogen, as N   | 2.0   | 2.2   |
| Total Nitrogen, as N           | 2.1   | 2.6   |
| Dissolved Orthophosphate, as P | .01   | .01   |
| Total Phosphorus, as P         | .02   | .03   |
| Secchi-Disc Visibility (ft)    |       | 16    |
| Chlorophyll <u>a</u> (ug/L)    | .72   | --    |

Aquatic Macrophyte Coverage

Littoral Zone

&lt; 5 pct

Water-Surface Zone

&lt; 1 pct

LAKE TROPHIC CLASSIFICATION

Characteristic Value

169

Trophic State Index (Carlson, 1977)

TSISD

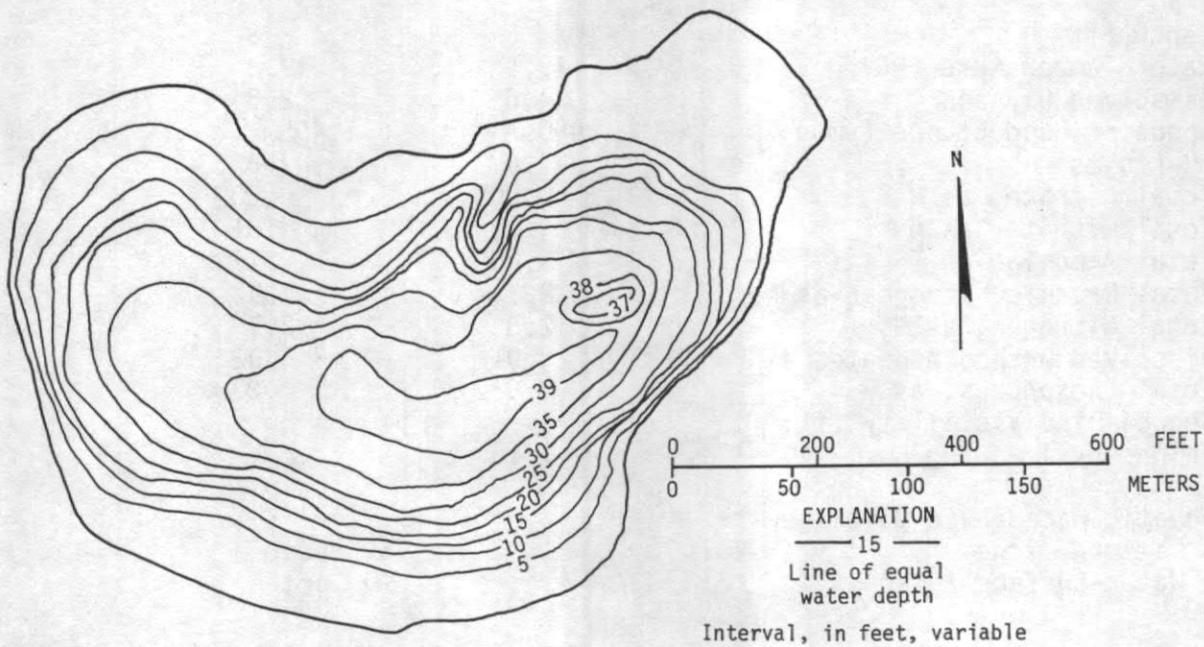
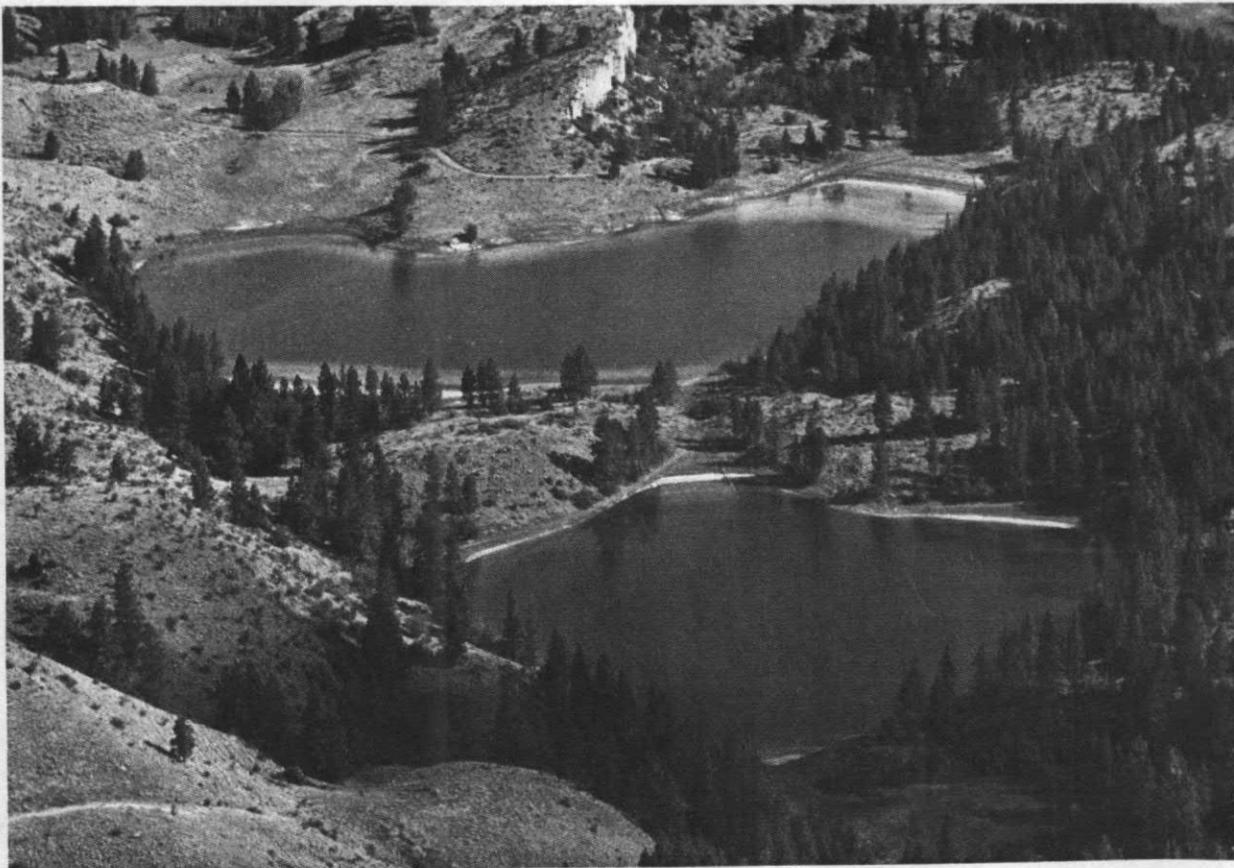
37

TSITP

47

TSICh1

27



Castor Lake, Okanogan County. Photo taken July 16, 1981, view northerly. Castor Lake at top of photo. Bathymetric map from U.S. Geological Survey, June 23, 1981.

MUD LAKE

OKANOGAN COUNTY

WRIA 49

T36N-R25E-25

LATITUDE 48° 35' 44" LONGITUDE 119° 37' 41"

PHYSICAL DATA

|                         |                     |
|-------------------------|---------------------|
| Drainage area           | 4.5 mi <sup>2</sup> |
| Altitude                | 2,120 ft            |
| Lake Area               | 7 acres             |
| Lake Volume             | 43 acre-ft          |
| Mean Depth              | 6 ft                |
| Maximum Depth           | 16 ft               |
| Shoreline Length        | 0.56 mi             |
| Shoreline Configuration | 1.5                 |
| Development of Volume   | 0.38                |
| Bottom Slope            | 2.5 pct             |
| Surface Inflow          | No                  |
| Surface Outflow         | No                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 10 | pct |
| Number of Nearshore Homes  | 1  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 72 | pct |
| Forest or Unproductive     | 27 | pct |
| Lake Surface               | 1  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

July 15, 1981

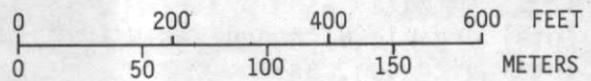
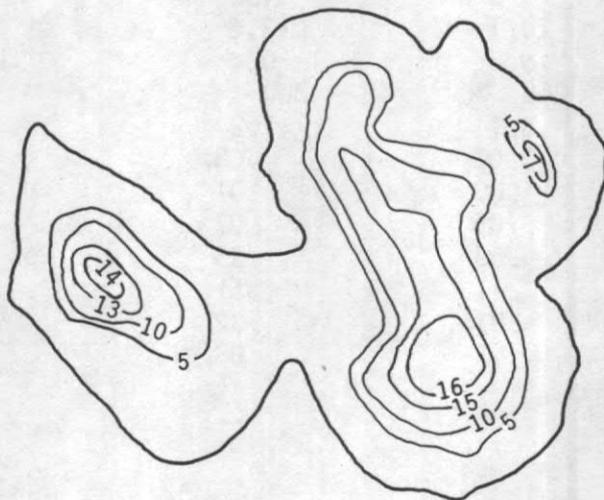
|                                |       |        |
|--------------------------------|-------|--------|
| Depth (ft)                     | 3     | 8      |
| Water Temperature (°C)         | 19.4  | 17.3   |
| Dissolved Oxygen               | 4.6   | 2.6    |
| Specific Conductance (umho)    | 1,490 | 1,495  |
| pH (units)                     | 7.6   | 7.5    |
| Total Nitrate, as N            | 0.00  | .00    |
| Total Nitrite, as N            | .01   | .01    |
| Total Ammonia, as N            | .20   | .17    |
| Total Organic Nitrogen, as N   | 2.1   | 1.9    |
| Total Nitrogen, as N           | 2.3   | 2.1    |
| Dissolved Orthophosphate, as P | .01   | .02    |
| Total Phosphorus, as P         | .03   | .03    |
| Secchi-Disc Visibility (ft)    |       | >10    |
| Chlorophyll <u>a</u> (ug/L)    | 1.15  | --     |
| Aquatic Macrophyte Coverage    |       |        |
| Littoral Zone                  |       | 60 pct |
| Water-Surface Zone             |       | 0 pct  |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 201

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 44 |
| TSI <sub>TP</sub>  | 53 |
| TSI <sub>chl</sub> | 32 |



EXPLANATION

— 10 —  
Line of equal  
water depth

Interval, in feet, variable

Mud (36N-25E-25) Lake, Okanogan County. Photo taken July 15, 1981, view easterly. Mud Lake at lower right of photo. Bathymetric map from U.S. Geological Survey, June 23, 1981.

OSOY00S LAKE

OKANOGAN COUNTY

WRIA 49

T40N-R27E-22

LATITUDE 48° 57' 00" LONGITUDE 119° 25' 42"

PHYSICAL DATA

|                         |         |                 |
|-------------------------|---------|-----------------|
| Drainage area           | --      | mi <sup>2</sup> |
| Altitude                | 911     | ft              |
| Lake Area               | 3,320   | acres           |
| Lake Volume             | 111,000 | acre-ft         |
| Mean Depth              | 34      | ft              |
| Maximum Depth           | 86      | ft              |
| Shoreline Length        | 17      | mi              |
| Shoreline Configuration | 2.1     |                 |
| Development of Volume   | 0.41    |                 |
| Bottom Slope            | 0.63    | pct             |
| Surface Inflow          | Yes     |                 |
| Surface Outflow         | Yes     |                 |

CULTURAL DATA

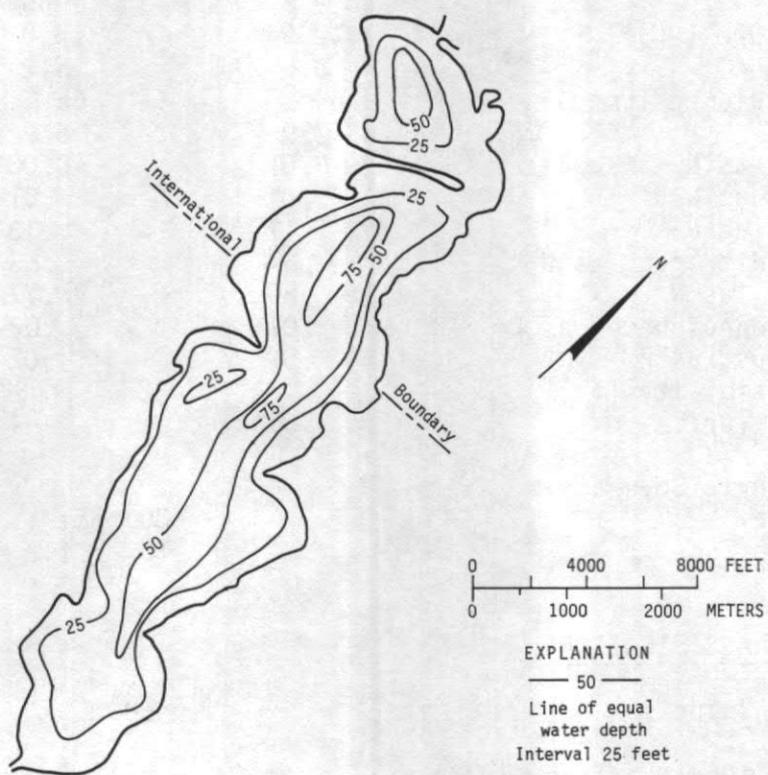
|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | --  | pct |
| Number of Nearshore Homes  | --  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | --  | pct |
| Residential-Suburban       | --  | pct |
| Agricultural               | --  | pct |
| Forest or Unproductive     | --  | pct |
| Lake Surface               | --  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |               |        |
|--------------------------------|---------------|--------|
| Date                           | July 15, 1981 |        |
| Depth (ft)                     | 3             | 50     |
| Water Temperature (°C)         | 20.1          | 13.6   |
| Dissolved Oxygen               | 8.8           | 0.4    |
| Specific Conductance (umho)    | 262           | 300    |
| pH (units)                     | 8.1           | 7.2    |
| Total Nitrate, as N            | 0.00          | .08    |
| Total Nitrite, as N            | .00           | .01    |
| Total Ammonia, as N            | .05           | .07    |
| Total Organic Nitrogen, as N   | .66           | .35    |
| Total Nitrogen, as N           | .71           | .51    |
| Dissolved Orthophosphate, as P | .01           | .02    |
| Total Phosphorus, as P         | .02           | .00    |
| Secchi-Disc Visibility (ft)    |               | 9      |
| Chlorophyll <u>a</u> (ug/L)    | 3.28          | --     |
| Aquatic Macrophyte Coverage    |               |        |
| Littoral Zone                  |               | 40 pct |
| Water-Surface Zone             |               | 0 pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 105 |
| Trophic State Index (Carlson, 1977) |     |
| TSISD                               | 45  |
| TSITP                               | 47  |
| TSICh1                              | 42  |



Osoyoos Lake, Okanogan County. Photo taken August 1974, view northwesterly. Bathymetric map from Washington Department of Game, August 10, 1966.

DIAMOND LAKE

PEND OREILLE COUNTY

WRIA 55

T30N-R44E-03

LATITUDE 48° 07' 08" LONGITUDE 117° 13' 05"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 17.4 mi <sup>2</sup> |
| Altitude                | 2,340 ft             |
| Lake Area               | 800 acres            |
| Lake Volume             | 22,000 acre-ft       |
| Mean Depth              | 27 ft                |
| Maximum Depth           | 58 ft                |
| Shoreline Length        | 7.0 mi               |
| Shoreline Configuration | 1.8                  |
| Development of Volume   | 0.47                 |
| Bottom Slope            | 0.87 pct             |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

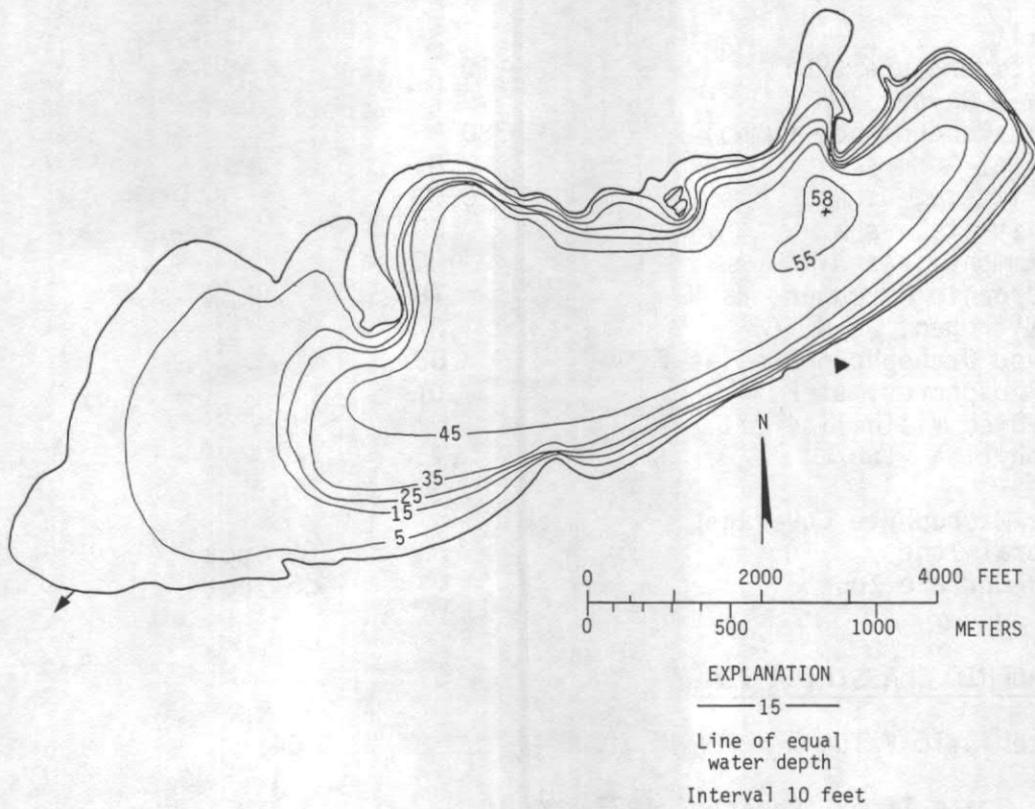
|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 80  | pct |
| Number of Nearshore Homes  | 352 |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 2   | pct |
| Agricultural               | 13  | pct |
| Forest or Unproductive     | 78  | pct |
| Lake Surface               | 7   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |               |      |
|--------------------------------|---------------|------|
| Date                           | July 13, 1981 |      |
| Depth (ft)                     | 3             | 35   |
| Water Temperature (°C)         | 18.9          | 14.0 |
| Dissolved Oxygen               | 8.6           | 5.2  |
| Specific Conductance (umho)    | 64            | 65   |
| pH (units)                     | 7.9           | 6.9  |
| Total Nitrate, as N            | 0.01          | 0.00 |
| Total Nitrite, as N            | .01           | .01  |
| Total Ammonia, as N            | .11           | .13  |
| Total Organic Nitrogen, as N   | .67           | .63  |
| Total Nitrogen, as N           | .80           | .77  |
| Dissolved Orthophosphate, as P | .01           | .03  |
| Total Phosphorus, as P         | .01           | .02  |
| Secchi-Disc Visibility (ft)    | 22            |      |
| Chlorophyll <u>a</u> (ug/L)    | .64           | --   |
| Aquatic Macrophyte Coverage    |               |      |
| Littoral Zone                  | 30            | pct  |
| Water-Surface Zone             | 10            | pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 59 |
| Trophic State Index (Carlson, 1977) |    |
| TSISD                               | 33 |
| TSITP                               | 37 |
| TSICh1                              | 26 |



Diamond Lake, Pend Oreille County. Photo taken August 2, 1977.  
Bathymetric map from Washington Department of Game, January 27, 1955.

LUCERNE (YORKE) LAKE

PEND OREILLE COUNTY

WRIA 62

T40N-R43E-12

LATITUDE 48° 58' 34" LONGITUDE 117° 18' 50"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.40 mi <sup>2</sup> |
| Altitude                | 2,448 ft             |
| Lake Area               | 9 acres              |
| Lake Volume             | 104 acre-ft          |
| Mean Depth              | 12 ft                |
| Maximum Depth           | 20 ft                |
| Shoreline Length        | 0.66 mi              |
| Shoreline Configuration | 1.6                  |
| Development of Volume   | 0.58                 |
| Bottom Slope            | 2.8 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 0  | pct |
| Number of Nearshore Homes  | 0  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 97 | pct |
| Lake Surface               | 3  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date July 15, 1981

|                                |      |    |
|--------------------------------|------|----|
| Depth (ft)                     | 3    | -- |
| Water Temperature (°C)         | 16.7 | -- |
| Dissolved Oxygen               | 9.7  | -- |
| Specific Conductance (umho)    | 380  | -- |
| pH (units)                     | 7.5  | -- |
| Total Nitrate, as N            | 0.01 | -- |
| Total Nitrite, as N            | .00  | -- |
| Total Ammonia, as N            | .08  | -- |
| Total Organic Nitrogen, as N   | .78  | -- |
| Total Nitrogen, as N           | .87  | -- |
| Dissolved Orthophosphate, as P | .00  | -- |
| Total Phosphorus, as P         | .01  | -- |
| Secchi-Disc Visibility (ft)    | >26  | -- |
| Chlorophyll <u>a</u> (ug/L)    | .73  | -- |

## Aquatic Macrophyte Coverage

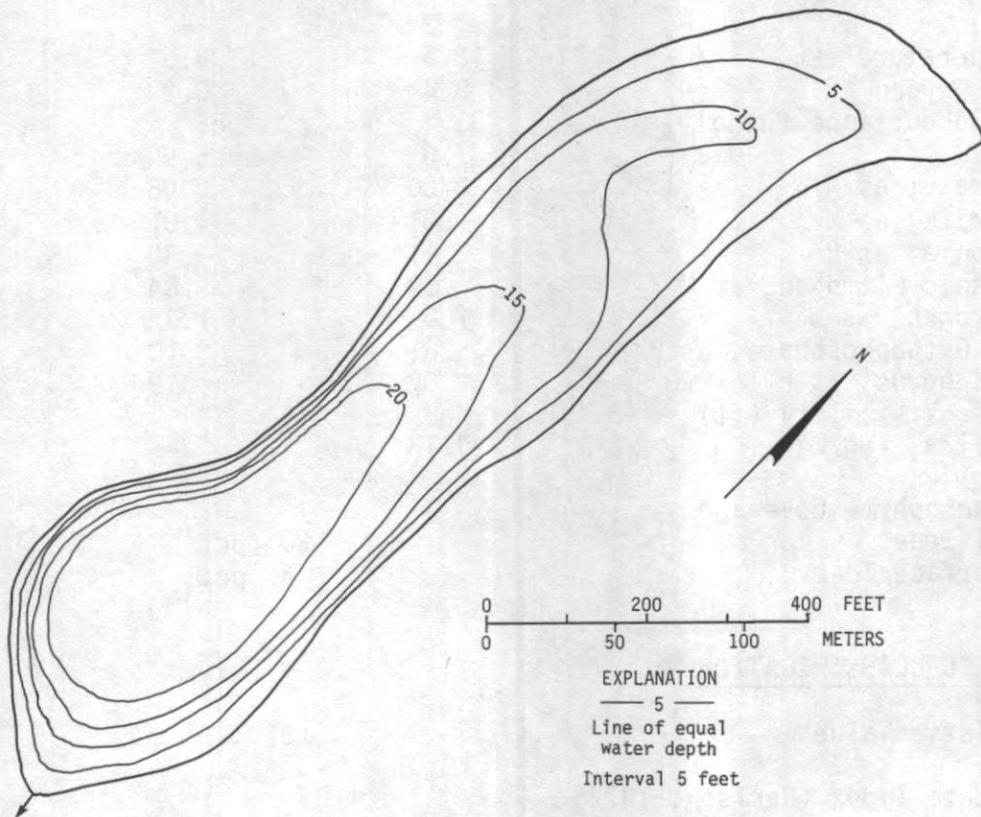
|                    |    |     |
|--------------------|----|-----|
| Littoral Zone      | 85 | pct |
| Water-Surface Zone | <5 | pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 64

## Trophic State Index (Carlson, 1977)

|        |    |
|--------|----|
| TSISD  | 30 |
| TSITP  | 37 |
| TSICh1 | 27 |



Lucerne (Yorke) Lake, Pend Oreille County. Photo taken July 15, 1981, view northwesterly. Bathymetric map from Washington Department of Game, January 3, 1957.

SACHEEN LAKE

PEND OREILLE COUNTY

WRIA 55

T31N-R43E-35

LATITUDE 48° 08' 47" LONGITUDE 117° 20' 05"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 42.8 mi <sup>2</sup> |
| Altitude                | 2,234 ft             |
| Lake Area               | 320 acres            |
| Lake Volume             | 7,600 acre-ft        |
| Mean Depth              | 24 ft                |
| Maximum Depth           | 40 ft                |
| Shoreline Length        | 6.3 mi               |
| Shoreline Configuration | 2.5                  |
| Development of Volume   | 0.60                 |
| Bottom Slope            | 0.95 pct             |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 85  | pct |
| Number of Nearshore Homes  | 232 |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 1   | pct |
| Agricultural               | 13  | pct |
| Forest or Unproductive     | 82  | pct |
| Lake Surface               | 4   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

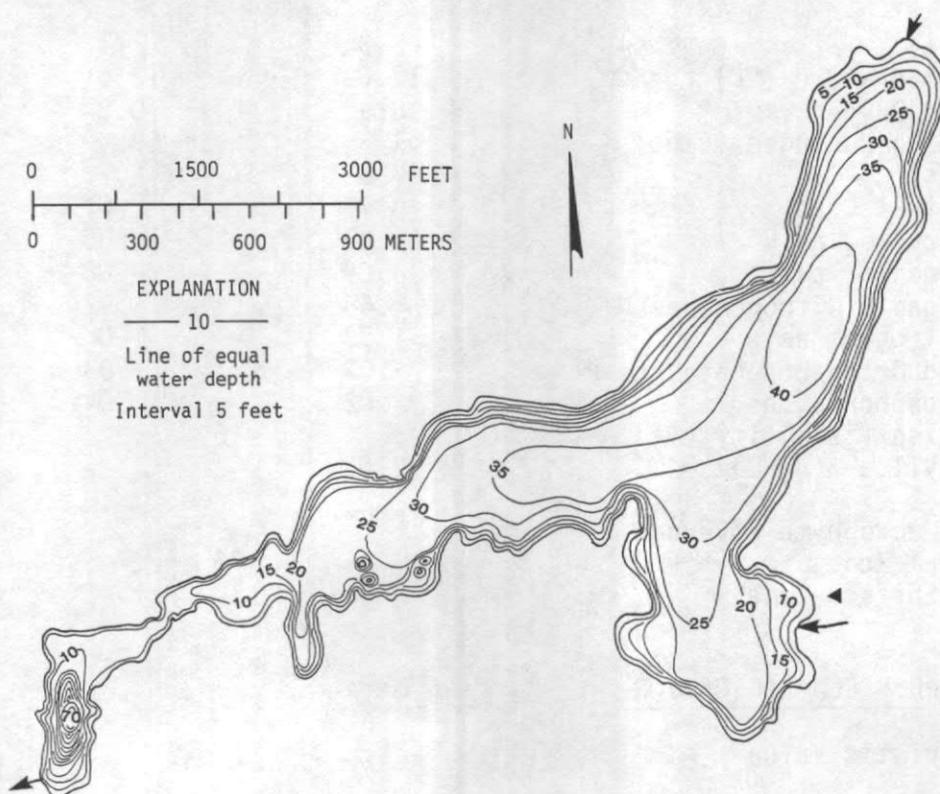
Date

July 14, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 42     |
| Water Temperature (°C)         | 18.5 | 8.9    |
| Dissolved Oxygen               | 8.4  | 0.2    |
| Specific Conductance (umho)    | 83   | 88     |
| pH (units)                     | 7.8  | 6.9    |
| Total Nitrate, as N            | 0.00 | .08    |
| Total Nitrite, as N            | .01  | .01    |
| Total Ammonia, as N            | .11  | .36    |
| Total Organic Nitrogen, as N   | .89  | .84    |
| Total Nitrogen, as N           | 1.0  | 1.3    |
| Dissolved Orthophosphate, as P | .01  | .10    |
| Total Phosphorus, as P         | .02  | .19    |
| Secchi-Disc Visibility (ft)    |      | 11     |
| Chlorophyll <u>a</u> (ug/L)    | 9.13 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 20 pct |
| Water-Surface Zone             |      | 5 pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 131 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 43  |
| TSI <sub>TP</sub>                   | 47  |
| TSI <sub>Chl</sub>                  | 52  |



Sacheen Lake, Pend Oreille County. Photo taken August 1, 1977.  
 Bathymetric map from Washington Department of Game, March 4, 1957.

BONNEY LAKE

PIERCE COUNTY

WRIA 10

T20N-R05E-28

LATITUDE 47° 11' 23" LONGITUDE 122° 10' 57"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.22 mi <sup>2</sup> |
| Altitude                | 605 ft               |
| Lake Area               | 17 acres             |
| Lake Volume             | 160 acre-ft          |
| Mean Depth              | 10 ft                |
| Maximum Depth           | 19 ft                |
| Shoreline Length        | 0.74 mi              |
| Shoreline Configuration | 1.3                  |
| Development of Volume   | 0.52                 |
| Bottom Slope            | 2.0 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

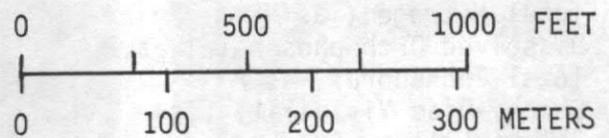
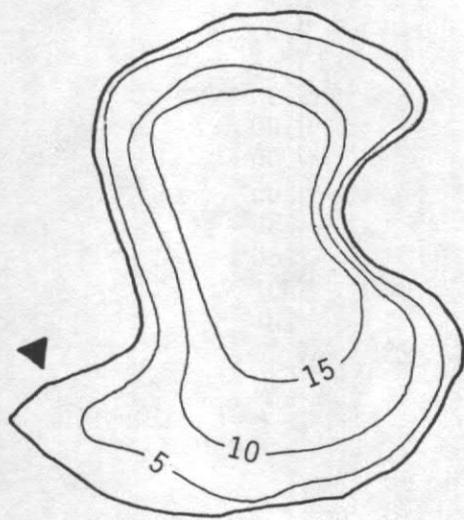
|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 90  | pct |
| Number of Nearshore Homes  | 22  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 8   | pct |
| Agricultural               | 4   | pct |
| Forest or Unproductive     | 76  | pct |
| Lake Surface               | 12  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |               |        |
|--------------------------------|---------------|--------|
| Date                           | June 23, 1981 |        |
| Depth (ft)                     | 3             | 17     |
| Water Temperature (°C)         | 17.0          | 12.6   |
| Dissolved Oxygen               | 8.9           | 0.2    |
| Specific Conductance (umho)    | 64            | 69     |
| pH (units)                     | 7.0           | 6.7    |
| Total Nitrate, as N            | 0.01          | .01    |
| Total Nitrite, as N            | .00           | .00    |
| Total Ammonia, as N            | .09           | .08    |
| Total Organic Nitrogen, as N   | .68           | .92    |
| Total Nitrogen, as N           | .78           | 1.0    |
| Dissolved Orthophosphate, as P | .02           | .03    |
| Total Phosphorus, as P         | .02           | .04    |
| Secchi-Disc Visibility (ft)    |               | 16     |
| Chlorophyll <u>a</u> (ug/L)    | 2.03          | --     |
| Aquatic Macrophyte Coverage    |               |        |
| Littoral Zone                  |               | 75 pct |
| Water-Surface Zone             |               | 30 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 76 |
| Trophic State Index (Carlson, 1977) |    |
| TSISD                               | 37 |
| TSITP                               | 47 |
| TSICh1                              | 38 |



EXPLANATION  
——10——  
Line of equal  
water depth  
Interval 5 feet

Bonney Lake, Pierce County. Photo taken June 23, 1981, view northeasterly.  
Bathymetric map from U.S. Geological Survey, June 18, 1973.

CARNEY LAKE

PIERCE COUNTY

WRIA 15

T22N-R01W-14

LATITUDE 47° 24' 02" LONGITUDE 122° 45' 39"

PHYSICAL DATA

Drainage area 0.46 mi<sup>2</sup>  
 Altitude 350 ft  
 Lake Area 41 acres  
 Lake Volume 500 acre-ft  
 Mean Depth 12 ft  
 Maximum Depth 25 ft  
 Shoreline Length 1.1 mi  
 Shoreline Configuration 1.3  
 Development of Volume 0.49  
 Bottom Slope 1.7 pct  
 Surface Inflow No  
 Surface Outflow No

CULTURAL DATA

Residential Development 95 pct  
 Number of Nearshore Homes 29  
 Land Use in Drainage Basin  
 Residential-Urban 0 pct  
 Residential-Suburban 5 pct  
 Agricultural 0 pct  
 Forest or Unproductive 81 pct  
 Lake Surface 14 pct

Public Boat Access to Lake Yes

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 24, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 21   |
| Water Temperature (°C)         | 18.5 | 18.1 |
| Dissolved Oxygen               | 9.5  | 9.5  |
| Specific Conductance (umho)    | 17   | 16   |
| pH (units)                     | 6.2  | 5.9  |
| Total Nitrate, as N            | 0.00 | 0.00 |
| Total Nitrite, as N            | .00  | .00  |
| Total Ammonia, as N            | .06  | .05  |
| Total Organic Nitrogen, as N   | .89  | .55  |
| Total Nitrogen, as N           | .95  | .60  |
| Dissolved Orthophosphate, as P | .01  | .01  |
| Total Phosphorus, as P         | .01  | .01  |
| Secchi-Disc Visibility (ft)    | > 23 |      |
| Chlorophyll <u>a</u> (ug/L)    | 1.50 | --   |

Aquatic Macrophyte Coverage

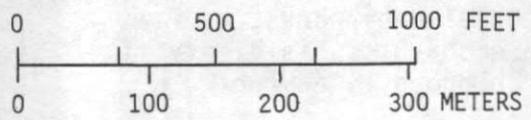
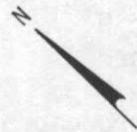
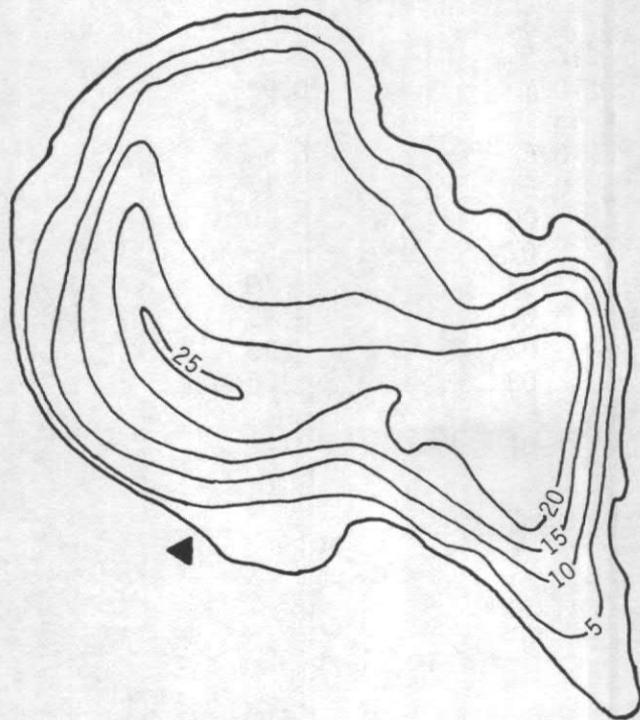
Littoral Zone 60 pct  
 Water-Surface Zone 0 pct

LAKE TROPHIC CLASSIFICATION

Characteristic Value 77

Trophic State Index (Carlson, 1977)

TSI<sub>SD</sub> 32  
 TSI<sub>TP</sub> 37  
 TSI<sub>Chl</sub> 35



EXPLANATION  
 — 10 —  
 Line of equal  
 water depth  
 Interval 5 feet

Carney Lake, Pierce County. Photo taken June 24, 1981, view northeasterly. Bathymetric map from U.S. Geological Survey, June 22, 1973.

CLEAR LAKE

PIERCE COUNTY

WRIA 11

T17N-R04E-27

LATITUDE 46° 55' 33" LONGITUDE 122° 16' 34"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.41 mi <sup>2</sup> |
| Altitude                | 778 ft               |
| Lake Area               | 160 acres            |
| Lake Volume             | 6,100 acre-ft        |
| Mean Depth              | 38 ft                |
| Maximum Depth           | 85 ft                |
| Shoreline Length        | 2.1 mi               |
| Shoreline Configuration | 1.2                  |
| Development of Volume   | 0.45                 |
| Bottom Slope            | 2.8 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

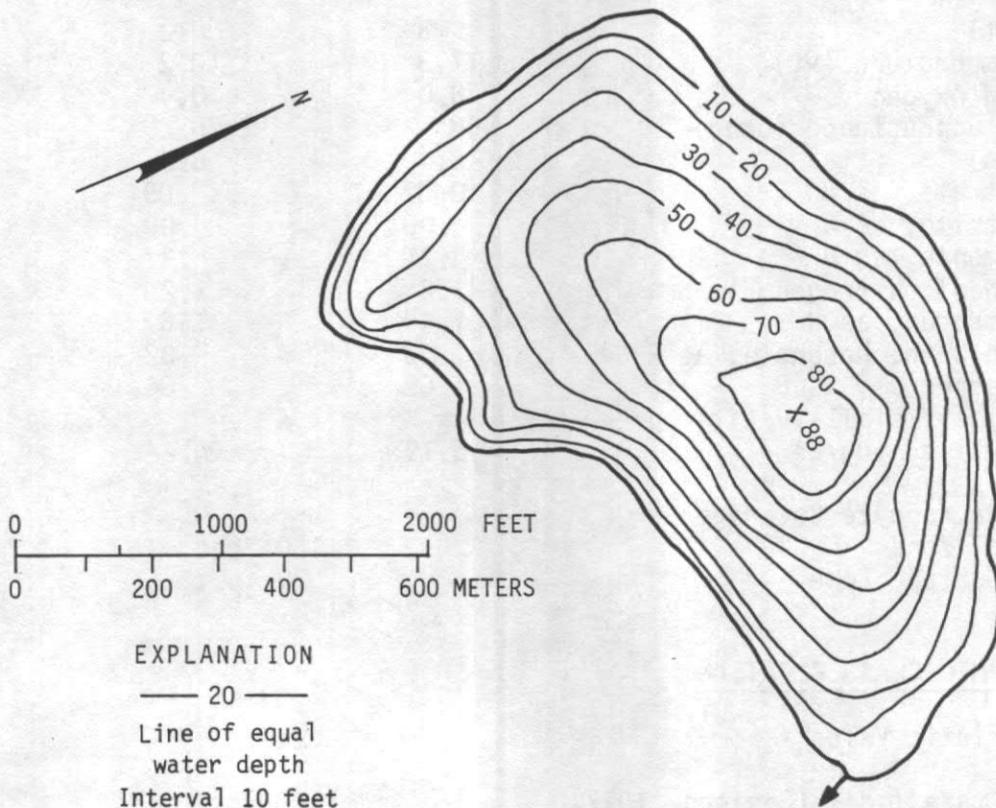
|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 85  | pct |
| Number of Nearshore Homes  | 105 |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 17  | pct |
| Agricultural               | 0   | pct |
| Forest or Unproductive     | 34  | pct |
| Lake Surface               | 49  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |               |        |
|--------------------------------|---------------|--------|
| Date                           | June 23, 1981 |        |
| Depth (ft)                     | 3             | 70     |
| Water Temperature (°C)         | 16.5          | 7.0    |
| Dissolved Oxygen               | 10.1          | 0.9    |
| Specific Conductance (umho)    | 55            | 59     |
| pH (units)                     | 6.6           | 6.5    |
| Total Nitrate, as N            | 0.01          | .17    |
| Total Nitrite, as N            | .00           | .00    |
| Total Ammonia, as N            | .07           | .08    |
| Total Organic Nitrogen, as N   | .53           | .70    |
| Total Nitrogen, as N           | .61           | .95    |
| Dissolved Orthophosphate, as P | .02           | .03    |
| Total Phosphorus, as P         | .02           | .08    |
| Secchi-Disc Visibility (ft)    |               | 25     |
| Chlorophyll <u>a</u> (ug/L)    | 1.01          | --     |
| Aquatic Macrophyte Coverage    |               |        |
| Littoral Zone                  |               | 2 pct  |
| Water-Surface Zone             |               | <1 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 50 |
| Trophic State Index (Carlson, 1977) |    |
| TSI <sub>SD</sub>                   | 31 |
| TSI <sub>TP</sub>                   | 47 |
| TSI <sub>Chl</sub>                  | 31 |



Clear Lake, Pierce County. Photo taken June 23, 1981, view northwesterly.  
Bathymetric map from Washington Department of Game, February 7, 1949.

CRANBERRY LAKE

PIERCE COUNTY

WRIA 11

T16N-R03E-01

LATITUDE 46° 53' 51" LONGITUDE 122° 21' 46"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.55 mi <sup>2</sup> |
| Altitude                | 644 ft               |
| Lake Area               | 37 acres             |
| Lake Volume             | 430 acre-ft          |
| Mean Depth              | 12 ft                |
| Maximum Depth           | 18 ft                |
| Shoreline Length        | 0.86 mi              |
| Shoreline Configuration | 1.0                  |
| Development of Volume   | 0.65                 |
| Bottom Slope            | 1.3 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 6  | pct |
| Number of Nearshore Homes  | 2  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 50 | pct |
| Forest or Unproductive     | 40 | pct |
| Lake Surface               | 10 | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

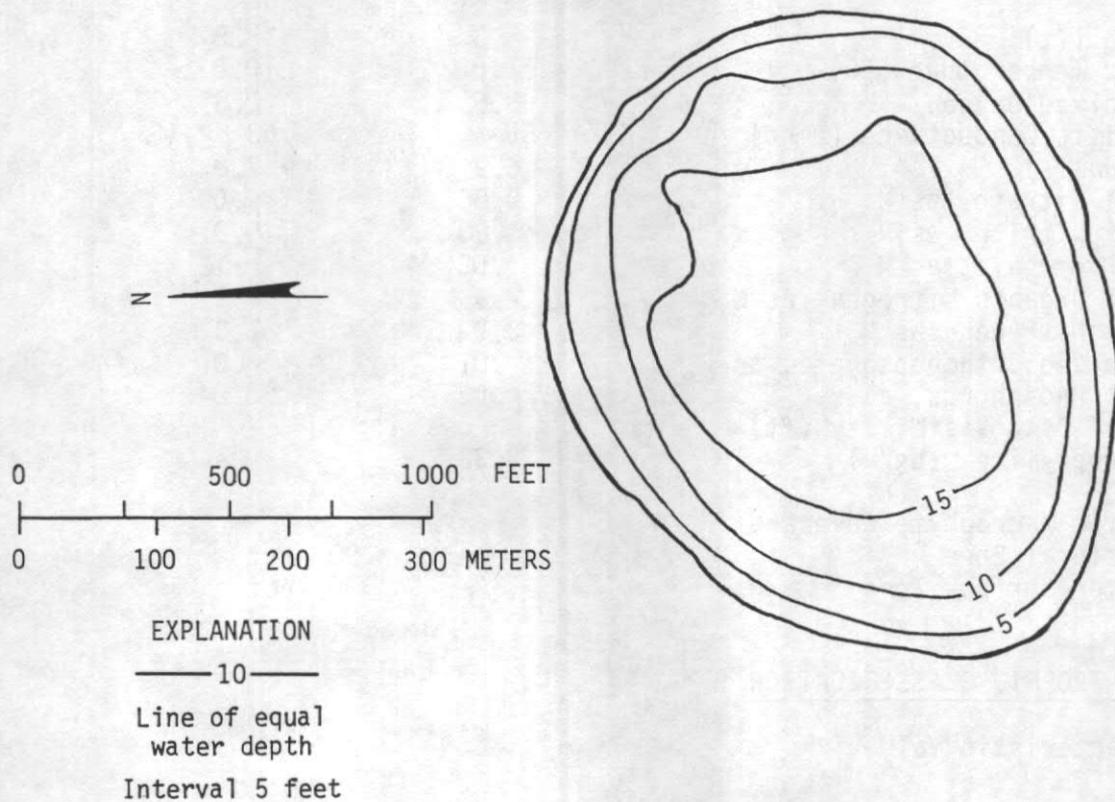
Date

June 4, 1981

|                                |      |         |
|--------------------------------|------|---------|
| Depth (ft)                     | 3    | 13      |
| Water Temperature (°C)         | 17.3 | 10.2    |
| Dissolved Oxygen               | 8.0  | 0.4     |
| Specific Conductance (umho)    | 68   | 75      |
| pH (units)                     | 6.4  | 6.3     |
| Total Nitrate, as N            | 0.02 | .09     |
| Total Nitrite, as N            | .00  | .00     |
| Total Ammonia, as N            | .21  | .27     |
| Total Organic Nitrogen, as N   | 1.2  | 1.2     |
| Total Nitrogen, as N           | 1.4  | 1.6     |
| Dissolved Orthophosphate, as P | .02  | .02     |
| Total Phosphorus, as P         | .02  | .04     |
| Secchi-Disc Visibility (ft)    |      | 4       |
| Chlorophyll <u>a</u> (ug/L)    | 5.19 | --      |
| Aquatic Macrophyte Coverage    |      |         |
| Littoral Zone                  |      | 100 pct |
| Water-Surface Zone             |      | 20 pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 223 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 57  |
| TSI <sub>TP</sub>                   | 47  |
| TSI <sub>Chl</sub>                  | 47  |



Cranberry Lake, Pierce County. Photo taken June 4, 1981, view easterly.  
Bathymetric map from U.S. Geological Survey, June 14, 1973.

CRESCENT LAKE

PIERCE COUNTY

WRIA 15

T22N-R02E-20

LATITUDE 47° 23' 18" LONGITUDE 122° 34' 19"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 1.18 mi <sup>2</sup> |
| Altitude                | 166 ft               |
| Lake Area               | 50 acres             |
| Lake Volume             | 780 acre-ft          |
| Mean Depth              | 16 ft                |
| Maximum Depth           | 29 ft                |
| Shoreline Length        | 1.4 mi               |
| Shoreline Configuration | 1.4                  |
| Development of Volume   | 0.54                 |
| Bottom Slope            | 1.3 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

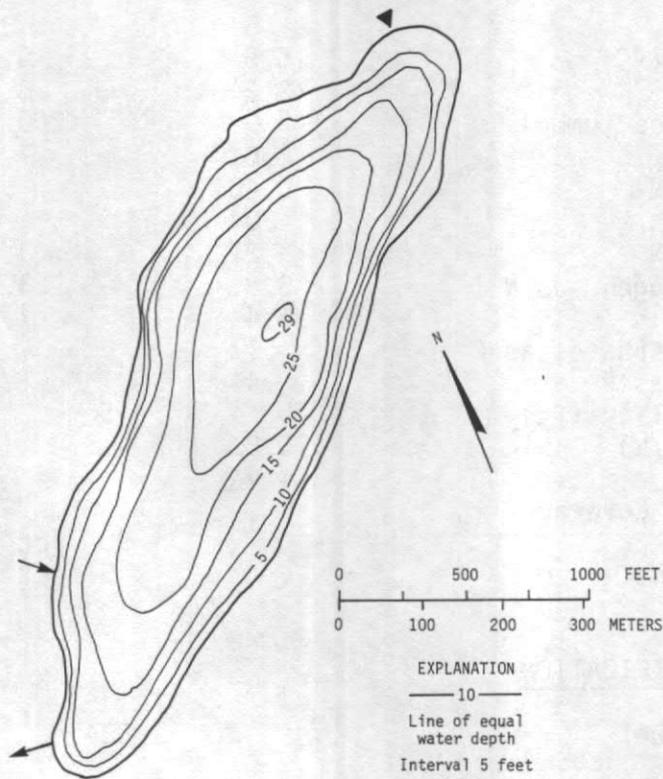
|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 50  | pct |
| Number of Nearshore Homes  | 31  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 1   | pct |
| Agricultural               | 3   | pct |
| Forest or Unproductive     | 89  | pct |
| Lake Surface               | 7   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |               |      |
|--------------------------------|---------------|------|
| Date                           | June 12, 1981 |      |
| Depth (ft)                     | 3             | 28   |
| Water Temperature (°C)         | 17.8          | 10.8 |
| Dissolved Oxygen               | 8.6           | 0.8  |
| Specific Conductance (umho)    | 55            | 63   |
| pH (units)                     | 6.9           | 7.0  |
| Total Nitrate, as N            | 0.00          | .00  |
| Total Nitrite, as N            | .00           | .01  |
| Total Ammonia, as N            | .05           | .12  |
| Total Organic Nitrogen, as N   | 2.9           | 1.2  |
| Total Nitrogen, as N           | 2.9           | 1.3  |
| Dissolved Orthophosphate, as P | .01           | .01  |
| Total Phosphorus, as P         | .02           | .04  |
| Secchi-Disc Visibility (ft)    |               | 10   |
| Chlorophyll <u>a</u> (ug/L)    | 2.38          | --   |
| Aquatic Macrophyte Coverage    |               |      |
| Littoral Zone                  | 90            | pct  |
| Water-Surface Zone             | 5             | pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 261 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 44  |
| TSI <sub>TP</sub>                   | 47  |
| TSI <sub>Chl</sub>                  | 39  |



Crescent (22N-2E-20) Lake, Pierce County. Photo taken June 12, 1981, view northeasterly. Bathymetric map from Washington Department of Game, August 19, 1947.

HARTS LAKE

PIERCE COUNTY

WRIA 11

T16N-R03E-07

LATITUDE 46° 53' 32" LONGITUDE 122° 28' 18"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 3.57 mi <sup>2</sup> |
| Altitude                | 347 ft               |
| Lake Area               | 120 acres            |
| Lake Volume             | 3,100 acre-ft        |
| Mean Depth              | 26 ft                |
| Maximum Depth           | 50 ft                |
| Shoreline Length        | 1.6 mi               |
| Shoreline Configuration | 1.0                  |
| Development of Volume   | 0.52                 |
| Bottom Slope            | 5.5 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 25  | pct |
| Number of Nearshore Homes  | 14  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | <1  | pct |
| Agricultural               | 20  | pct |
| Forest or Unproductive     | 74  | pct |
| Lake Surface               | 6   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

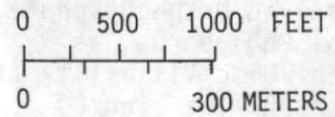
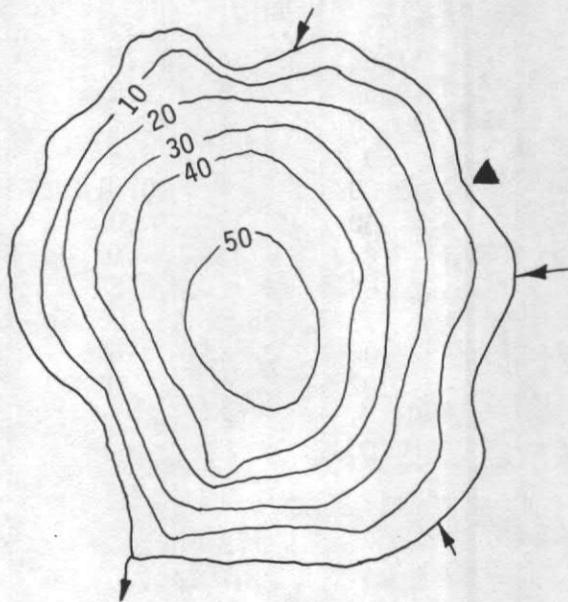
Date

June 9, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 39     |
| Water Temperature (°C)         | 16.5 | 6.9    |
| Dissolved Oxygen               | 12.2 | 0.2    |
| Specific Conductance (umho)    | 148  | 200    |
| pH (units)                     | 8.0  | 7.0    |
| Total Nitrate, as N            | 0.40 | .00    |
| Total Nitrite, as N            | .04  | .00    |
| Total Ammonia, as N            | .21  | 3.9    |
| Total Organic Nitrogen, as N   | 3.8  | 3.6    |
| Total Nitrogen, as N           | 4.4  | 7.5    |
| Dissolved Orthophosphate, as P | .13  | .12    |
| Total Phosphorus, as P         | .44  | 1.9    |
| Secchi-Disc Visibility (ft)    |      | 5      |
| Chlorophyll <u>a</u> (ug/L)    | 10.2 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 90 pct |
| Water-Surface Zone             |      | 5 pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 534 |
| Trophic State Index (Carlson, 1977) |     |
| TSISD                               | 54  |
| TSITP                               | 92  |
| TSICh1                              | 53  |



EXPLANATION

— 20 —

Line of equal  
water depth

Interval 10 feet

Harts Lake, Pierce County. Photo taken June 9, 1981, view northerly.  
Bathymetric map from Washington Department of Game, June 1, 1953.

LOUISE LAKE

PIERCE COUNTY

WRIA 12

T19N-R02E-04

LATITUDE 47° 09' 36" LONGITUDE 122° 34' 00"

PHYSICAL DATA

Drainage area 0.34 mi<sup>2</sup>  
 Altitude 230 ft  
 Lake Area 39 acres  
 Lake Volume 860 acre-ft  
 Mean Depth 22 ft  
 Maximum Depth 35 ft  
 Shoreline Length 0.91 mi  
 Shoreline Configuration 1.0  
 Development of Volume 0.63  
 Bottom Slope 2.4 pct  
 Surface Inflow No  
 Surface Outflow No

CULTURAL DATA

Residential Development 100 pct  
 Number of Nearshore Homes 80  
 Land Use in Drainage Basin  
 Residential-Urban 8 pct  
 Residential-Suburban 41 pct  
 Agricultural 21 pct  
 Forest or Unproductive 12 pct  
 Lake Surface 18 pct  
 Public Boat Access to Lake Yes

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

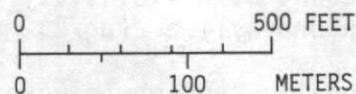
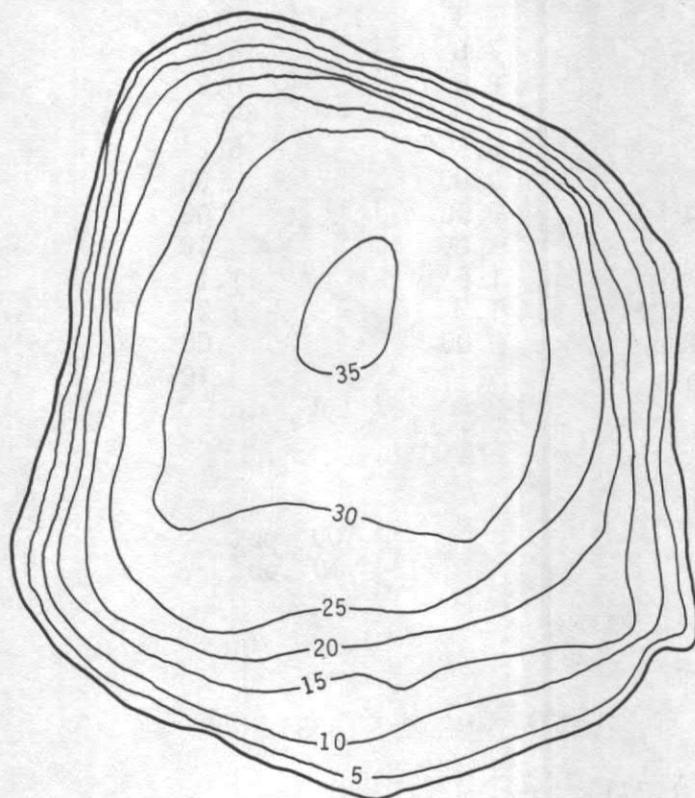
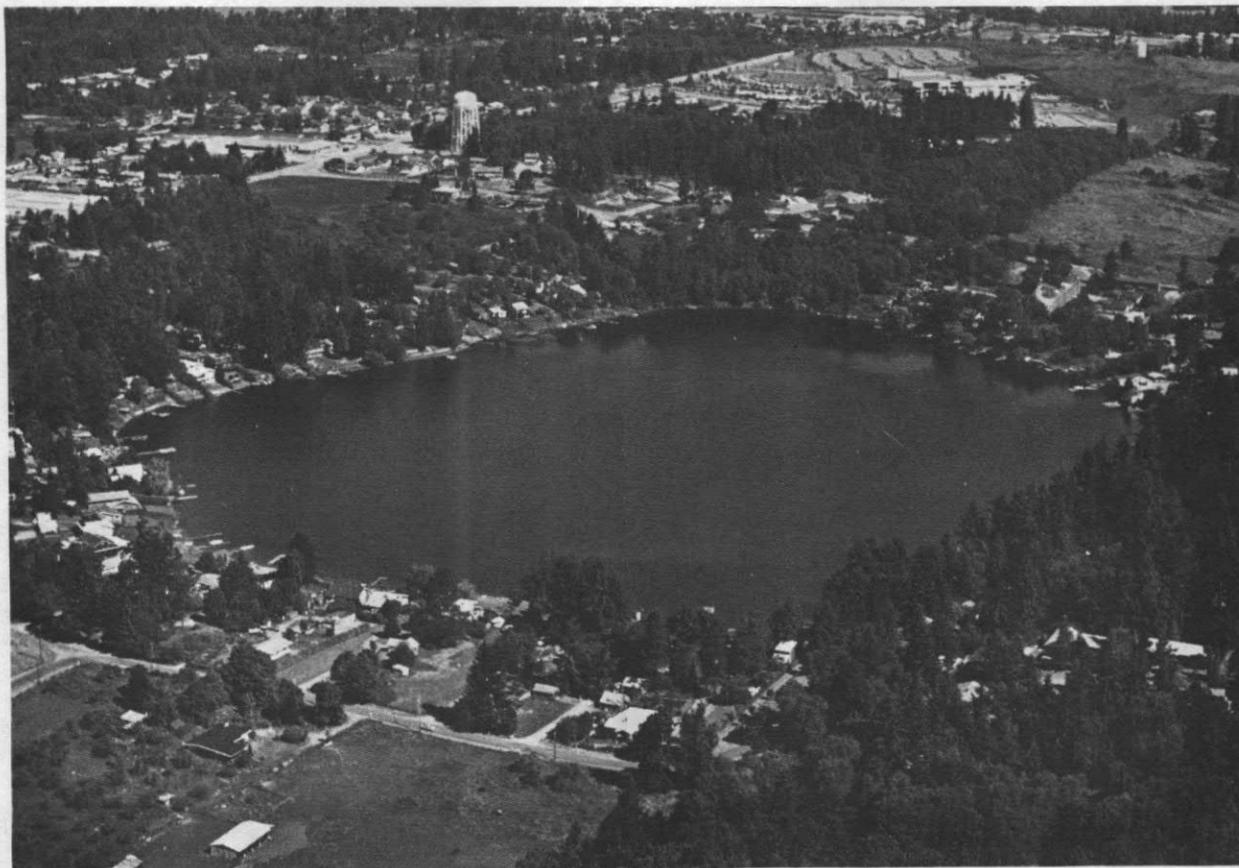
Date

June 24, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 30     |
| Water Temperature (°C)         | 17.6 | 12.6   |
| Dissolved Oxygen               | 10.6 | 4.8    |
| Specific Conductance (umho)    | 80   | 72     |
| pH (units)                     | 6.9  | 6.6    |
| Total Nitrate, as N            | 0.00 | 0.01   |
| Total Nitrite, as N            | .00  | .00    |
| Total Ammonia, as N            | .07  | .07    |
| Total Organic Nitrogen, as N   | .65  | .69    |
| Total Nitrogen, as N           | .72  | .77    |
| Dissolved Orthophosphate, as P | .00  | .01    |
| Total Phosphorus, as P         | .02  | .01    |
| Secchi-Disc Visibility (ft)    |      | 12     |
| Chlorophyll <u>a</u> (ug/L)    | .00  | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 3 pct  |
| Water-Surface Zone             |      | <1 pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 78  
 Trophic State Index (Carlson, 1977)  
 TSI<sub>SD</sub> 41  
 TSI<sub>TP</sub> 47  
 TSI<sub>Chl</sub> 0



EXPLANATION  
 — 25 —  
 Line of equal  
 water depth  
 Interval 5 feet

Louise Lake, Pierce County. Photo taken June 24, 1981, view northwesterly.  
 Bathymetric map from Washington Department of Game, June 5, 1950.

MORGAN LAKE

PIERCE COUNTY

WRIA 10

T18N-R05E-30

LATITUDE 47° 00' 48" LONGITUDE 122° 13' 41"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 1.20 mi <sup>2</sup> |
| Altitude                | 688 ft               |
| Lake Area               | 27 acres             |
| Lake Volume             | 310 acre-ft          |
| Mean Depth              | 12 ft                |
| Maximum Depth           | 23 ft                |
| Shoreline Length        | 0.79 mi              |
| Shoreline Configuration | 1.1                  |
| Development of Volume   | 0.51                 |
| Bottom Slope            | 1.9 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

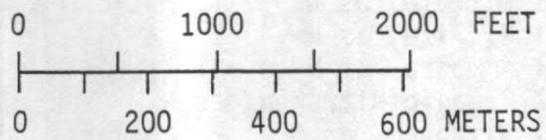
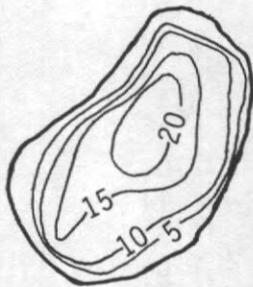
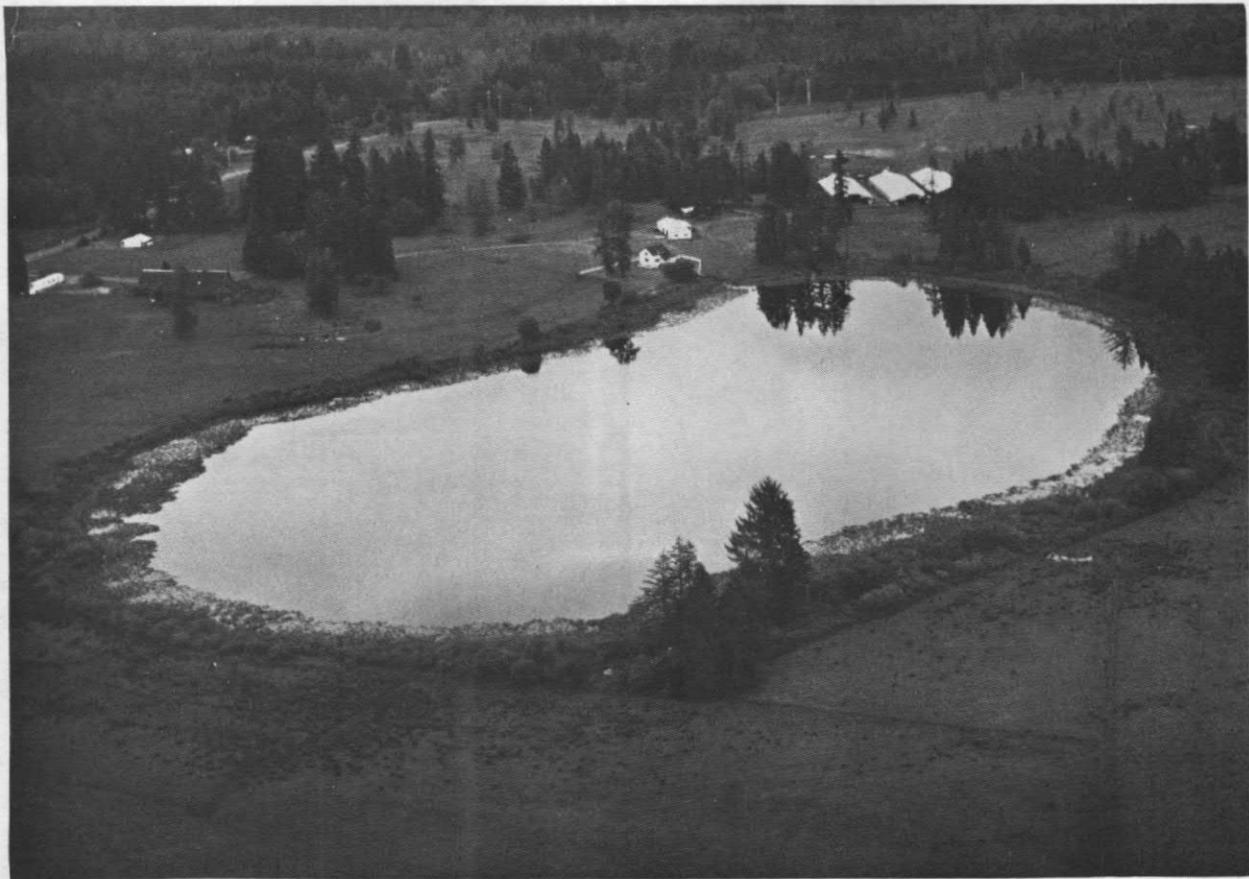
|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 5  | pct |
| Number of Nearshore Homes  | 2  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 26 | pct |
| Forest or Unproductive     | 70 | pct |
| Lake Surface               | 4  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |              |     |
|--------------------------------|--------------|-----|
| Date                           | June 3, 1981 |     |
| Depth (ft)                     | 3            | 16  |
| Water Temperature (°C)         | 17.8         | 8.9 |
| Dissolved Oxygen               | 8.5          | 0.2 |
| Specific Conductance (umho)    | 60           | 69  |
| pH (units)                     | 6.5          | 6.2 |
| Total Nitrate, as N            | 0.00         | .00 |
| Total Nitrite, as N            | .00          | .00 |
| Total Ammonia, as N            | .09          | .10 |
| Total Organic Nitrogen, as N   | 1.6          | 1.1 |
| Total Nitrogen, as N           | 1.7          | 1.2 |
| Dissolved Orthophosphate, as P | .00          | .00 |
| Total Phosphorus, as P         | .11          | .10 |
| Secchi-Disc Visibility (ft)    |              | 4   |
| Chlorophyll <u>a</u> (ug/L)    | 21.1         | --  |
| Aquatic Macrophyte Coverage    |              |     |
| Littoral Zone                  | 100          | pct |
| Water-Surface Zone             | 10           | pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 333 |
| Trophic State Index (Carlson, 1977) |     |
| TSISD                               | 57  |
| TSITP                               | 72  |
| TSICh1                              | 60  |



EXPLANATION  
— 10 —  
Line of equal  
water depth  
Interval 5 feet

Morgan Lake, Pierce County. Photo taken June 3, 1981, view northeasterly.  
Bathymetric map from U.S. Geological Survey, February 7, 1974.

OHOP LAKE

PIERCE COUNTY

WRIA 11

T16N-R04E-10

LATITUDE 46° 53' 06" LONGITUDE 122° 16' 38"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 17.3 mi <sup>2</sup> |
| Altitude                | 524 ft               |
| Lake Area               | 230 acres            |
| Lake Volume             | 3,800 acre-ft        |
| Mean Depth              | 17 ft                |
| Maximum Depth           | 25 ft                |
| Shoreline Length        | 4.6 mi               |
| Shoreline Configuration | 2.1                  |
| Development of Volume   | 0.66                 |
| Bottom Slope            | 4.5 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 60  | pct |
| Number of Nearshore Homes  | 144 |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 1   | pct |
| Agricultural               | 5   | pct |
| Forest or Unproductive     | 92  | pct |
| Lake Surface               | 2   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

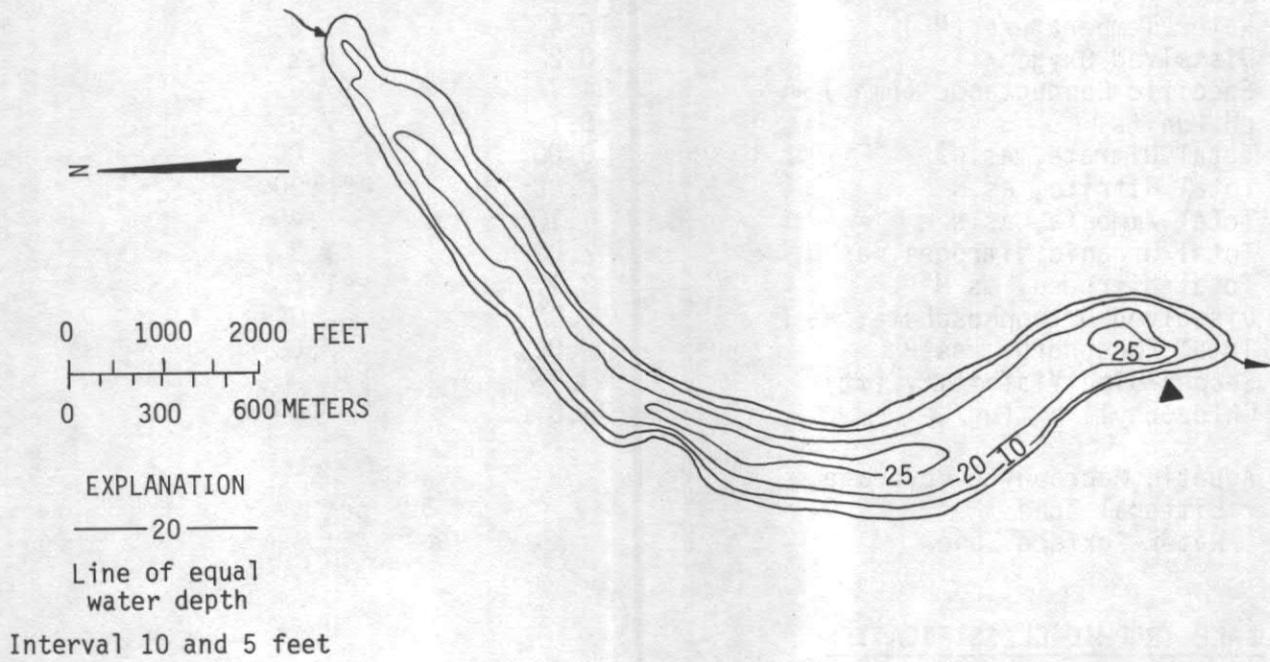
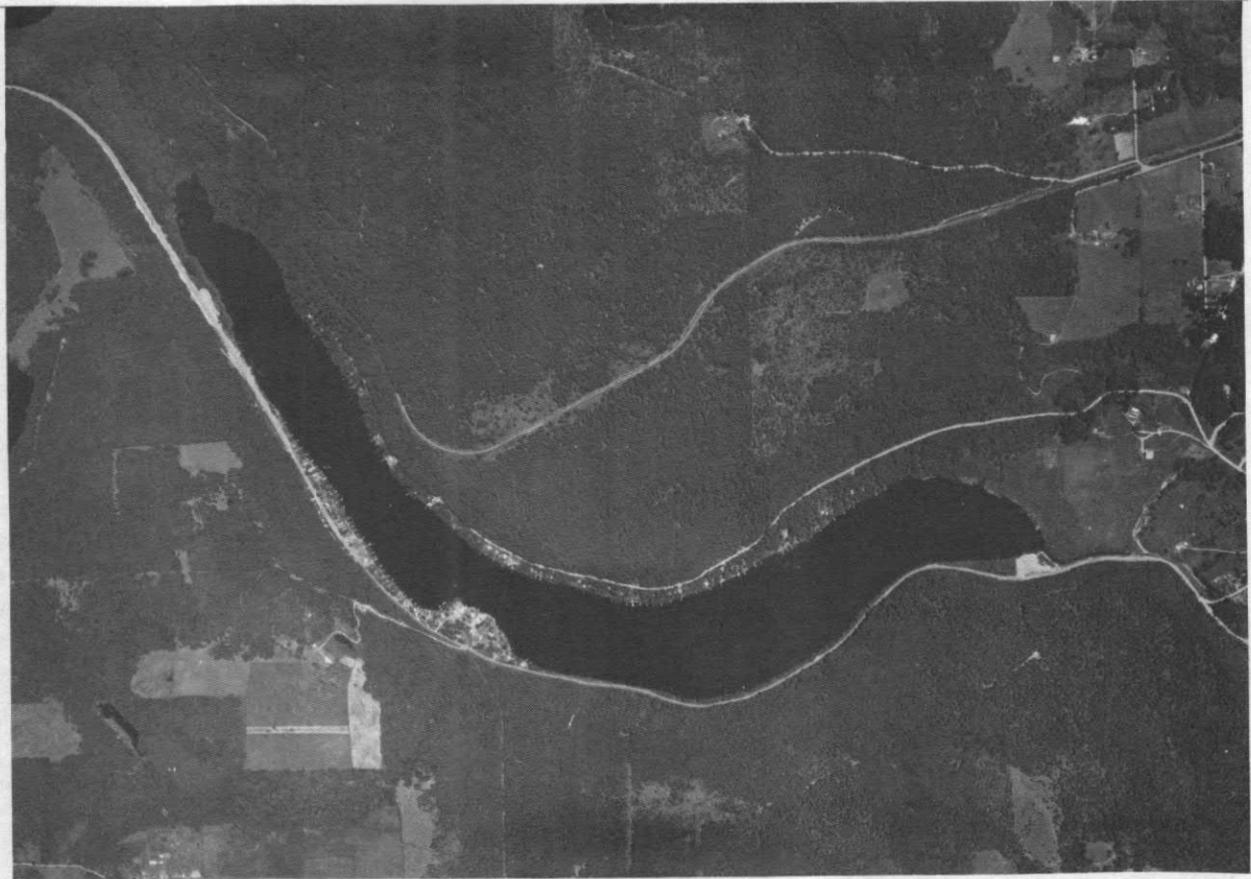
Date

June 3, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 18     |
| Water Temperature (°C)         | 17.5 | 10.6   |
| Dissolved Oxygen               | 10.0 | 1.4    |
| Specific Conductance (umho)    | 65   | 67     |
| pH (units)                     | 6.6  | 6.4    |
| Total Nitrate, as N            | 0.13 | 0.22   |
| Total Nitrite, as N            | .01  | .01    |
| Total Ammonia, as N            | .09  | .14    |
| Total Organic Nitrogen, as N   | 1.3  | 1.3    |
| Total Nitrogen, as N           | 1.5  | 1.6    |
| Dissolved Orthophosphate, as P | .01  | .01    |
| Total Phosphorus, as P         | .06  | .10    |
| Secchi-Disc Visibility (ft)    |      | 5      |
| Chlorophyll <u>a</u> (ug/L)    | 16.8 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 5 pct  |
| Water-Surface Zone             |      | <1 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 256 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 54  |
| TSI <sub>TP</sub>                   | 63  |
| TSI <sub>Chl</sub>                  | 58  |



Ohop Lake, Pierce County. Photo taken June 21, 1971.  
Bathymetric map from Washington Department of Game, June 14, 1954.

SILVER LAKE

PIERCE COUNTY

WRIA 11

T16N-R03E-12

LATITUDE 46° 52' 53" LONGITUDE 122° 21' 55"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 1.83 mi <sup>2</sup> |
| Altitude                | 604 ft               |
| Lake Area               | 150 acres            |
| Lake Volume             | 1,800 acre-ft        |
| Mean Depth              | 12 ft                |
| Maximum Depth           | 25 ft                |
| Shoreline Length        | 1.7 mi               |
| Shoreline Configuration | 1.0                  |
| Development of Volume   | 0.54                 |
| Bottom Slope            | 2.1 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 30  | pct |
| Number of Nearshore Homes  | 26  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 1   | pct |
| Agricultural               | 43  | pct |
| Forest or Unproductive     | 43  | pct |
| Lake Surface               | 13  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 23, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 19   |
| Water Temperature (°C)         | 16.4 | 11.2 |
| Dissolved Oxygen               | 10.2 | 0.2  |
| Specific Conductance (umho)    | 84   | 97   |
| pH (units)                     | 8.1  | 7.0  |
| Total Nitrate, as N            | 0.00 | .00  |
| Total Nitrite, as N            | .00  | .00  |
| Total Ammonia, as N            | .10  | .40  |
| Total Organic Nitrogen, as N   | 2.0  | 1.2  |
| Total Nitrogen, as N           | 2.1  | 1.6  |
| Dissolved Orthophosphate, as P | .03  | .07  |
| Total Phosphorus, as P         | .06  | .08  |
| Secchi-Disc Visibility (ft)    |      | 3    |
| Chlorophyll <u>a</u> (ug/L)    | 74.8 | --   |

Aquatic Macrophyte Coverage

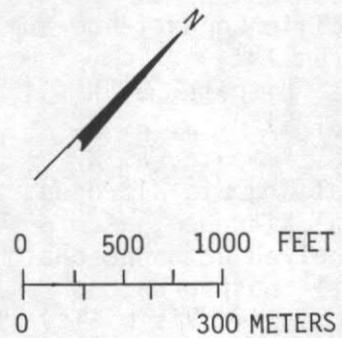
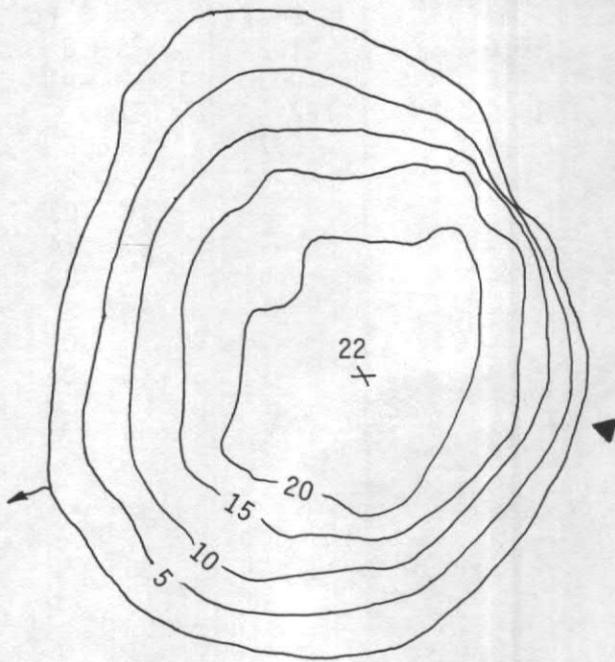
|                    |    |     |
|--------------------|----|-----|
| Littoral Zone      | 50 | pct |
| Water-Surface Zone | <2 | pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 572

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 61 |
| TSI <sub>TP</sub>  | 63 |
| TSI <sub>Chl</sub> | 73 |



EXPLANATION  
— 10 —  
Line of equal  
water depth  
Interval 5 feet

Silver Lake, Pierce County. Photo taken August 2, 1974, view northwesterly.  
Bathymetric map from Washington Department of Game, date unknown.

SPANAWAY LAKE

PIERCE COUNTY

WRIA 12

T19N-R03E-20

LATITUDE 47° 07' 11" LONGITUDE 122° 26' 45"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 17.0 mi <sup>2</sup> |
| Altitude                | 320 ft               |
| Lake Area               | 280 acres            |
| Lake Volume             | 4,600 acre-ft        |
| Mean Depth              | 16 ft                |
| Maximum Depth           | 28 ft                |
| Shoreline Length        | 4.4 mi               |
| Shoreline Configuration | 1.9                  |
| Development of Volume   | 0.57                 |
| Bottom Slope            | 0.71 pct             |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

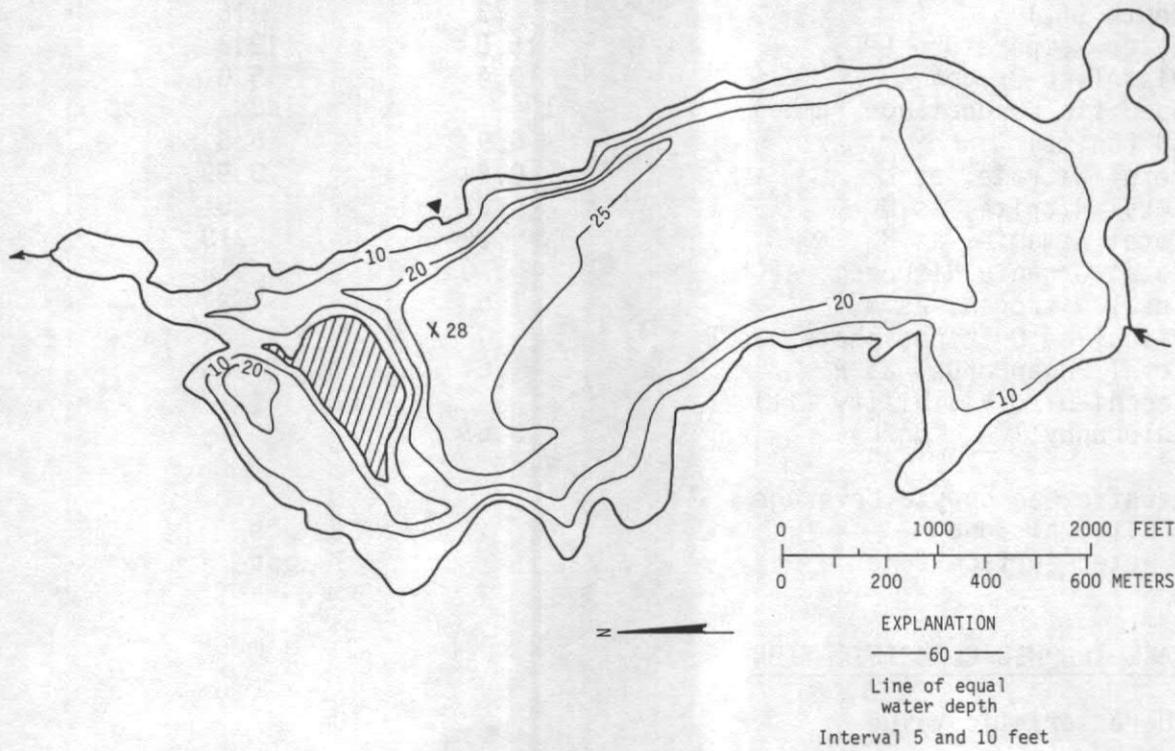
|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 80  | pct |
| Number of Nearshore Homes  | 161 |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 5   | pct |
| Residential-Suburban       | 38  | pct |
| Agricultural               | 0   | pct |
| Forest or Unproductive     | 54  | pct |
| Lake Surface               | 3   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

| Date                           | June 11, 1981 |        | September 17, 1981 |        |
|--------------------------------|---------------|--------|--------------------|--------|
| Depth (ft)                     | 3 ft          | 24 ft  | 3 ft               | 25 ft  |
| Water Temperature (°C)         | 16.6          | 11.2   | 19.8               | 16.4   |
| Dissolved Oxygen               | 9.0           | 0.2    | --                 | --     |
| Specific Conductance (umho)    | 114           | 122    | 184                | 184    |
| pH (units)                     | 7.0           | 6.7    | 6.5                | 6.4    |
| Total Nitrate, as N            | --            | --     | 0.21               | 0.12   |
| Total Nitrite, as N            | --            | --     | .03                | .04    |
| Total Ammonia, as N            | --            | --     | .14                | .92    |
| Total Organic Nitrogen, as N   | --            | --     | .82                | 1.1    |
| Total Nitrogen, as N           | --            | --     | 1.2                | 2.2    |
| Dissolved Orthophosphate, as P | --            | --     | .01                | .20    |
| Total Phosphorus, as P         | --            | --     | .01                | .29    |
| Secchi-Disc Visibility (ft)    |               | 22     |                    | 14     |
| Chlorophyll <u>a</u> (ug/L)    | 1.62          | --     | --                 | --     |
| Aquatic Macrophyte Coverage    |               |        |                    |        |
| Littoral Zone                  |               | 15 pct |                    | -- pct |
| Water-Surface Zone             |               | 1 pct  |                    | -- pct |

LAKE TROPHIC CLASSIFICATION

|                                     |    |    |
|-------------------------------------|----|----|
| Characteristic Value                | -- | 87 |
| Trophic State Index (Carlson, 1977) |    |    |
| TSI <sub>SD</sub>                   | 33 | 39 |
| TSI <sub>TP</sub>                   | -- | 37 |
| TSI <sub>Chl</sub>                  | 35 | -- |



Spanaway Lake, Pierce County. Photo taken May 20, 1978.  
 Bathymetric map from Washington Department of Game, February 2, 1950.

STEILACOOM LAKE

PIERCE COUNTY

WRIA 12

T20N-R02E-34

LATITUDE 47° 10' 40" LONGITUDE 122° 32' 04"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 89.4 mi <sup>2</sup> |
| Altitude                | 210 ft               |
| Lake Area               | 320 acres            |
| Lake Volume             | 3,500 acre-ft        |
| Mean Depth              | 11 ft                |
| Maximum Depth           | 20 ft                |
| Shoreline Length        | 5.7 mi               |
| Shoreline Configuration | 2.3                  |
| Development of Volume   | 0.56                 |
| Bottom Slope            | 2.8 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

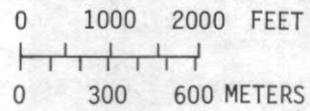
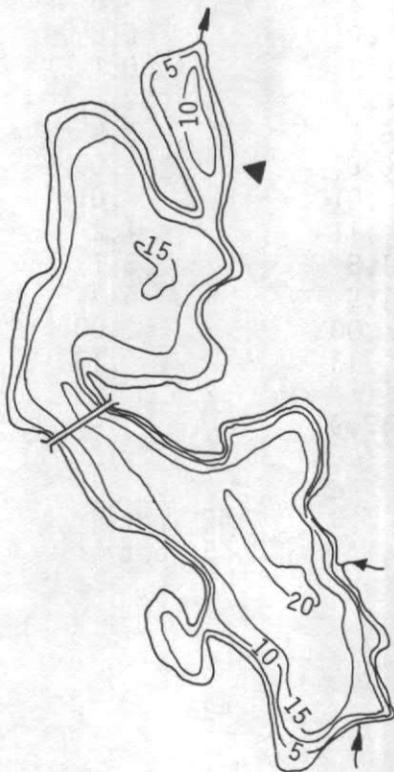
|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 100 | pct |
| Number of Nearshore Homes  | 285 |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 28  | pct |
| Residential-Suburban       | 27  | pct |
| Agricultural               | 2   | pct |
| Forest or Unproductive     | 42  | pct |
| Lake Surface               | 1   | pct |
| Public Boat Access to Lake | No  |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |               |      |
|--------------------------------|---------------|------|
| Date                           | June 10, 1981 |      |
| Depth (ft)                     | 3             | 16   |
| Water Temperature (°C)         | 16.0          | 13.3 |
| Dissolved Oxygen               | 10.4          | 5.0  |
| Specific Conductance (umho)    | 134           | 148  |
| pH (units)                     | 6.9           | 6.8  |
| Total Nitrate, as N            | 0.84          | 0.99 |
| Total Nitrite, as N            | .01           | .01  |
| Total Ammonia, as N            | .04           | .10  |
| Total Organic Nitrogen, as N   | .70           | .70  |
| Total Nitrogen, as N           | 1.6           | 1.8  |
| Dissolved Orthophosphate, as P | .02           | .04  |
| Total Phosphorus, as P         | .04           | .06  |
| Secchi-Disc Visibility (ft)    | 11            | --   |
| Chlorophyll <u>a</u> (ug/L)    | 3.57          | --   |
| Aquatic Macrophyte Coverage    |               |      |
| Littoral Zone                  | <1            | pct  |
| Water-Surface Zone             | <1            | pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 104 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 43  |
| TSI <sub>TP</sub>                   | 57  |
| TSI <sub>Chl</sub>                  | 43  |



EXPLANATION

—10—

Line of equal  
water depth

Interval 5 feet

Steilacoom Lake, Pierce County. Photo taken June 26, 1979.  
Bathymetric map from Washington Department of Game, June 2, 1950.

STIDHAM LAKE

PIERCE COUNTY

WRIA 11

T17N-R04E-22

LATITUDE 46° 57' 08" LONGITUDE 122° 16' 36"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.12 mi <sup>2</sup> |
| Altitude                | 655 ft               |
| Lake Area               | 10 acres             |
| Lake Volume             | 120 acre-ft          |
| Mean Depth              | 12 ft                |
| Maximum Depth           | 22 ft                |
| Shoreline Length        | 0.50 mi              |
| Shoreline Configuration | 1.1                  |
| Development of Volume   | 0.56                 |
| Bottom Slope            | 3.0 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 0  | pct |
| Number of Nearshore Homes  | 0  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 19 | pct |
| Forest or Unproductive     | 68 | pct |
| Lake Surface               | 13 | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 3, 1981

|                                |      |     |
|--------------------------------|------|-----|
| Depth (ft)                     | 3    | 20  |
| Water Temperature (°C)         | 17.0 | 6.0 |
| Dissolved Oxygen               | 5.2  | 0.1 |
| Specific Conductance (umho)    | 36   | 52  |
| pH (units)                     | 6.5  | 5.9 |
| Total Nitrate, as N            | 0.00 | .00 |
| Total Nitrite, as N            | .01  | .01 |
| Total Ammonia, as N            | .11  | 1.2 |
| Total Organic Nitrogen, as N   | 1.8  | 3.1 |
| Total Nitrogen, as N           | 1.9  | 4.3 |
| Dissolved Orthophosphate, as P | .00  | .00 |
| Total Phosphorus, as P         | .13  | .13 |
| Secchi-Disc Visibility (ft)    |      | 2.5 |
| Chlorophyll <u>a</u> (ug/L)    | 17.9 | --  |

Aquatic Macrophyte Coverage

Littoral Zone

40 pct

Water-Surface Zone

&lt;5 pct

LAKE TROPHIC CLASSIFICATION

Characteristic Value

423

Trophic State Index (Carlson, 1977)

  TSI<sub>SD</sub>

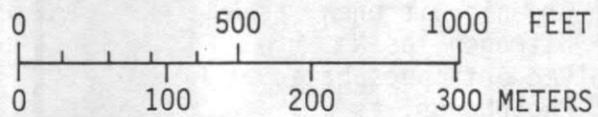
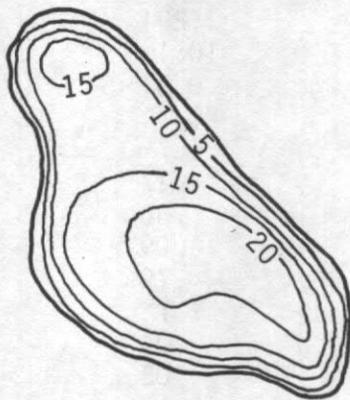
64

  TSI<sub>TP</sub>

74

  TSI<sub>Chl</sub>

59



EXPLANATION

— 10 —

Line of equal  
water depth

Interval 5 feet

Stidham Lake, Pierce County. Photo taken June 3, 1981, view easterly.  
Bathymetric map from U.S. Geological Survey, June 20, 1973.

TANWAX LAKE

PIERCE COUNTY

WRIA 11

T17N-R04E-23

LATITUDE 46° 56' 40" LONGITUDE 122° 16' 26"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 4.08 mi <sup>2</sup> |
| Altitude                | 600 ft               |
| Lake Area               | 170 acres            |
| Lake Volume             | 3,300 acre-ft        |
| Mean Depth              | 20 ft                |
| Maximum Depth           | 30 ft                |
| Shoreline Length        | 2.8 mi               |
| Shoreline Configuration | 1.5                  |
| Development of Volume   | 0.65                 |
| Bottom Slope            | 5.1 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 70  | pct |
| Number of Nearshore Homes  | 69  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 6   | pct |
| Agricultural               | 24  | pct |
| Forest or Unproductive     | 62  | pct |
| Lake Surface               | 8   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 23, 1981

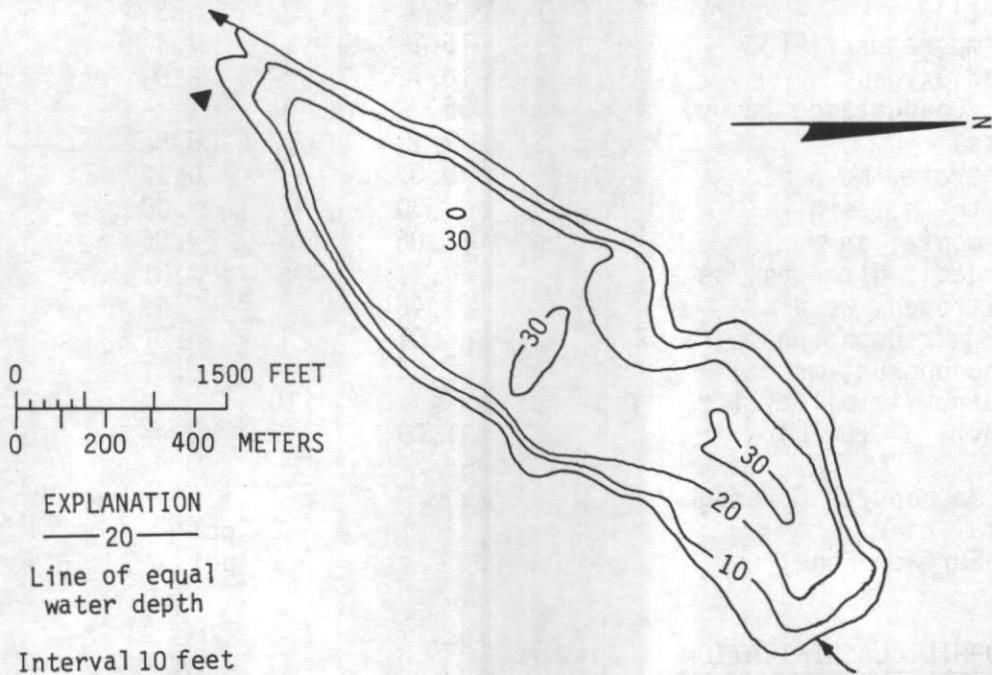
|                                |       |        |
|--------------------------------|-------|--------|
| Depth (ft)                     | 3     | 20     |
| Water Temperature (°C)         | 16.2  | 10.1   |
| Dissolved Oxygen               | 9.0   | 0.3    |
| Specific Conductance (umho)    | 67    | 80     |
| pH (units)                     | 7.2   | 6.7    |
| Total Nitrate, as N            | 0.01  | .17    |
| Total Nitrite, as N            | .00   | .00    |
| Total Ammonia, as N            | .08   | .09    |
| Total Organic Nitrogen, as N   | 1.0   | .79    |
| Total Nitrogen, as N           | 1.1   | 1.1    |
| Dissolved Orthophosphate, as P | .03   | .04    |
| Total Phosphorus, as P         | .03   | .05    |
| Secchi-Disc Visibility (ft)    |       | 4      |
| Chlorophyll <u>a</u> (ug/L)    | 17.58 | --     |
| Aquatic Macrophyte Coverage    |       |        |
| Littoral Zone                  |       | 75 pct |
| Water-Surface Zone             |       | 10 pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 253

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 57 |
| TSI <sub>TP</sub>  | 53 |
| TSI <sub>chl</sub> | 59 |



Tanwax Lake, Pierce County. Photo taken June 23, 1981, view southwesterly.  
Bathymetric map from Washington Department of Game, June 26, 1952.

TAPPS LAKE

PIERCE COUNTY

WRIA 10

T20N-R05E-08

LATITUDE 47° 14' 18" LONGITUDE 122° 12' 11"

PHYSICAL DATA

|                         |                    |
|-------------------------|--------------------|
| Drainage area           | -- mi <sup>2</sup> |
| Altitude                | 543 ft             |
| Lake Area               | 2,700 acres        |
| Lake Volume             | 67,000 acre-ft     |
| Mean Depth              | 25 ft              |
| Maximum Depth           | 90 ft              |
| Shoreline Length        | 42 mi              |
| Shoreline Configuration | 5.7                |
| Development of Volume   | 0.28               |
| Bottom Slope            | 0.73 pct           |
| Surface Inflow          | Yes                |
| Surface Outflow         | Yes                |

CULTURAL DATA

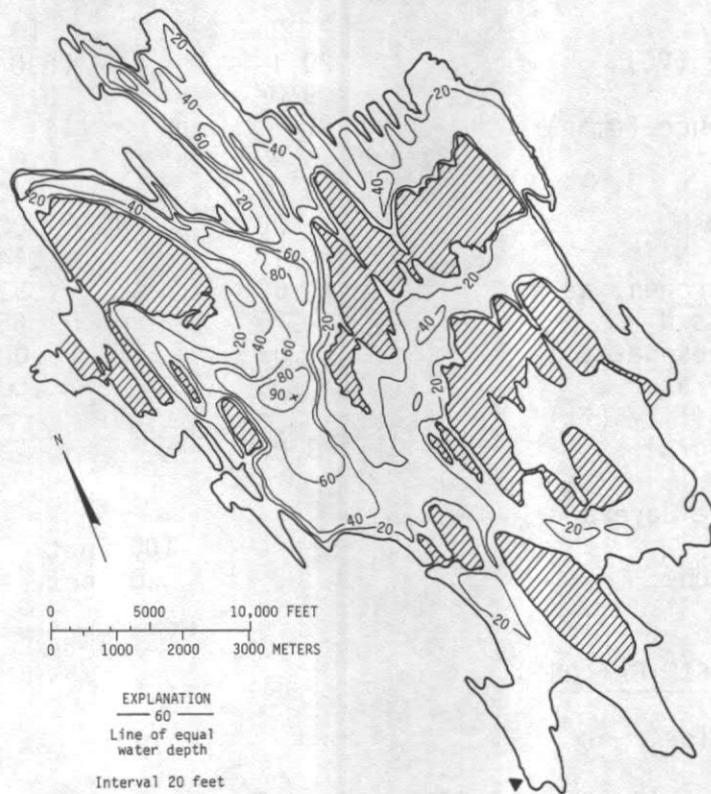
|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 70  | pct |
| Number of Nearshore Homes  | 650 |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | --  | pct |
| Residential-Suburban       | --  | pct |
| Agricultural               | --  | pct |
| Forest or Unproductive     | --  | pct |
| Lake Surface               | --  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |               |      |
|--------------------------------|---------------|------|
| Date                           | June 24, 1981 |      |
| Depth (ft)                     | 3             | 83   |
| Water Temperature (°C)         | 15.1          | 7.4  |
| Dissolved Oxygen               | 10.1          | 8.0  |
| Specific Conductance (umho)    | 55            | 61   |
| pH (units)                     | 7.1           | 6.8  |
| Total Nitrate, as N            | 0.01          | 0.12 |
| Total Nitrite, as N            | .00           | .00  |
| Total Ammonia, as N            | .06           | .06  |
| Total Organic Nitrogen, as N   | .41           | .31  |
| Total Nitrogen, as N           | .48           | .49  |
| Dissolved Orthophosphate, as P | .01           | .01  |
| Total Phosphorus, as P         | .02           | .01  |
| Secchi-Disc Visibility (ft)    |               | 10   |
| Chlorophyll <u>a</u> (ug/L)    | 1.09          | --   |
| Aquatic Macrophyte Coverage    |               |      |
| Littoral Zone                  | < 2           | pct  |
| Water-Surface Zone             | < 2           | pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 73 |
| Trophic State Index (Carlson, 1977) |    |
| TSI <sub>SD</sub>                   | 44 |
| TSI <sub>TP</sub>                   | 47 |
| TSI <sub>Chl</sub>                  | 31 |



Tapps Lake, Pierce County. Photo taken June 23, 1981, view northerly.  
 Bathymetric map from U.S. Geological Survey, May 31, 1974.

TWENTYSEVEN LAKE

PIERCE COUNTY

WRIA 11

T17N-R04E-27

LATITUDE 46° 55' 29" LONGITUDE 122° 17' 00"

PHYSICAL DATA

Drainage area 0.14 mi<sup>2</sup>  
 Altitude 776 ft  
 Lake Area 17 acres  
 Lake Volume 180 acre-ft  
 Mean Depth 10 ft  
 Maximum Depth 18 ft  
 Shoreline Length 0.62 mi  
 Shoreline Configuration 1.1  
 Development of Volume 0.57  
 Bottom Slope 1.8 pct  
 Surface Inflow No  
 Surface Outflow No

CULTURAL DATA

Residential Development 15 pct  
 Number of Nearshore Homes 2  
 Land Use in Drainage Basin  
 Residential-Urban 0 pct  
 Residential-Suburban 0 pct  
 Agricultural 28 pct  
 Forest or Unproductive 53 pct  
 Lake Surface 19 pct  
 Public Boat Access to Lake No

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date July 21, 1981

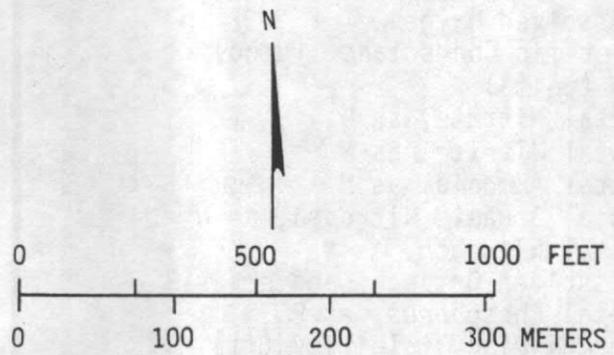
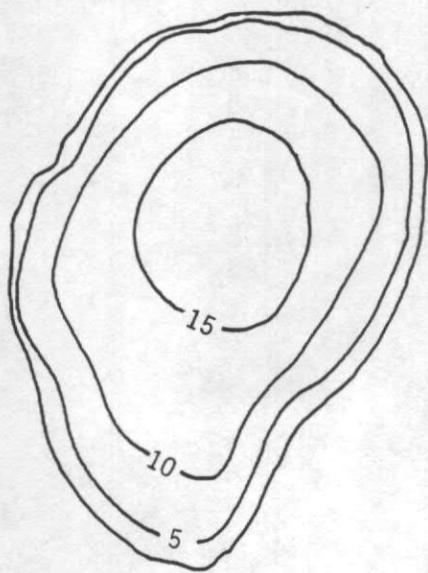
|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 14   |
| Water Temperature (°C)         | 20.1 | 16.0 |
| Dissolved Oxygen               | 9.0  | 0.3  |
| Specific Conductance (umho)    | 41   | 44   |
| pH (units)                     | 6.9  | 6.8  |
| Total Nitrate, as N            | 0.01 | .00  |
| Total Nitrite, as N            | .00  | .00  |
| Total Ammonia, as N            | .12  | .14  |
| Total Organic Nitrogen, as N   | .62  | .52  |
| Total Nitrogen, as N           | .75  | .66  |
| Dissolved Orthophosphate, as P | .03  | .00  |
| Total Phosphorus, as P         | .00  | .00  |
| Secchi-Disc Visibility (ft)    |      | 14   |
| Chlorophyll <u>a</u> (ug/L)    | 3.07 | --   |

Aquatic Macrophyte Coverage  
 Littoral Zone 100 pct  
 Water-Surface Zone 20 pct

LAKE TROPHIC CLASSIFICATION

Characteristic Value 74

Trophic State Index (Carlson, 1977)  
 TSI<sub>SD</sub> 39  
 TSI<sub>TP</sub> 0  
 TSI<sub>chl</sub> 42



EXPLANATION  
—— 10 ——  
Line of equal  
water depth  
Interval 5 feet

Twentyseven Lake, Pierce County. Photo taken April 3, 1973.  
Bathymetric map from U.S. Geological Survey, June 13, 1973.

TWIN LAKE, NORTH

PIERCE COUNTY

WRIA 11

T17N-R04E-12

LATITUDE 46° 58' 01" LONGITUDE 122° 15' 00"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.76 mi <sup>2</sup> |
| Altitude                | 600 ft               |
| Lake Area               | 48 acres             |
| Lake Volume             | 656 acre-ft          |
| Mean Depth              | 14 ft                |
| Maximum Depth           | 20 ft                |
| Shoreline Length        | 1.2 mi               |
| Shoreline Configuration | 1.3                  |
| Development of Volume   | 0.69                 |
| Bottom Slope            | 1.2 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

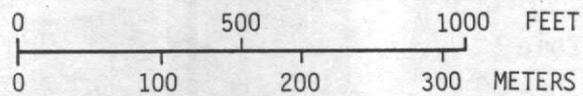
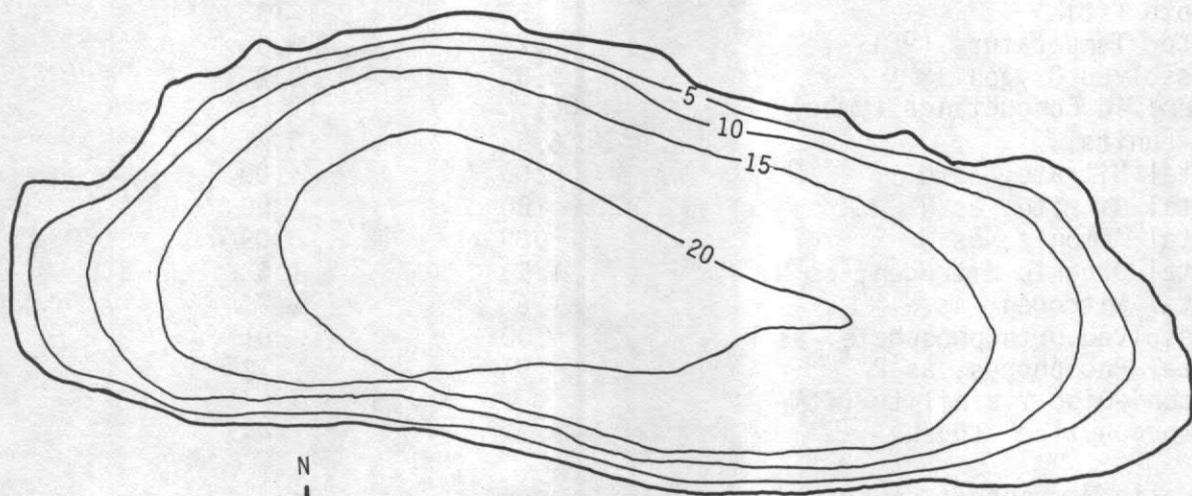
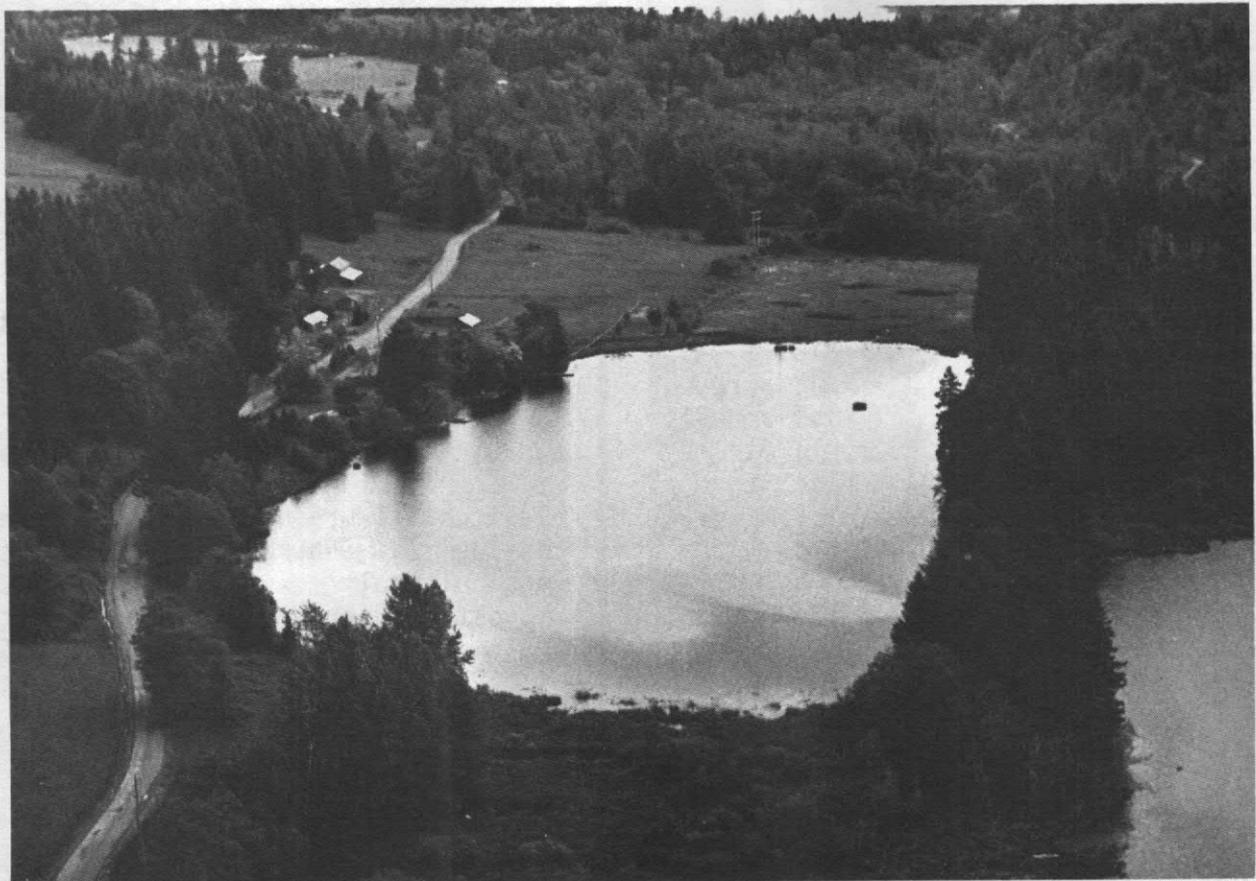
|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 10 | pct |
| Number of Nearshore Homes  | 2  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 14 | pct |
| Agricultural               | 15 | pct |
| Forest or Unproductive     | 69 | pct |
| Lake Surface               | 2  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |              |        |
|--------------------------------|--------------|--------|
| Date                           | June 3, 1981 |        |
| Depth (ft)                     | 3            | 19     |
| Water Temperature (°C)         | 18.3         | 8.0    |
| Dissolved Oxygen               | 8.5          | 0.4    |
| Specific Conductance (umho)    | 68           | 69     |
| pH (units)                     | 6.6          | 6.6    |
| Total Nitrate, as N            | 0.00         | .08    |
| Total Nitrite, as N            | .01          | .00    |
| Total Ammonia, as N            | .11          | .15    |
| Total Organic Nitrogen, as N   | 1.6          | 1.7    |
| Total Nitrogen, as N           | 1.7          | 1.9    |
| Dissolved Orthophosphate, as P | .00          | .02    |
| Total Phosphorus, as P         | .06          | .08    |
| Secchi-Disc Visibility (ft)    |              | 4      |
| Chlorophyll <u>a</u> (ug/L)    | 17.0         | --     |
| Aquatic Macrophyte Coverage    |              |        |
| Littoral Zone                  |              | 50 pct |
| Water-Surface Zone             |              | 5 pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 304 |
| Trophic State Index (Carlson, 1977) |     |
| TSISD                               | 57  |
| TSITP                               | 63  |
| TSICh1                              | 58  |



EXPLANATION  
— 5 —  
Line of equal  
water depth  
Interval 5 feet

Twin, North Lake, Pierce County. Photo taken June 3, 1981, view northeasterly.  
Bathymetric map from U.S. Geological Survey, May 27, 1981.

TWIN LAKE, SOUTH

PIERCE COUNTY

WRIA 11

T17N-R04E-13

LATITUDE 46° 57' 57" LONGITUDE 122° 15' 05"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.83 mi <sup>2</sup> |
| Altitude                | 610 ft               |
| Lake Area               | 43 acres             |
| Lake Volume             | 459 acre-ft          |
| Mean Depth              | 11 ft                |
| Maximum Depth           | 16 ft                |
| Shoreline Length        | 1.2 mi               |
| Shoreline Configuration | 1.4                  |
| Development of Volume   | 0.65                 |
| Bottom Slope            | 1.1 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

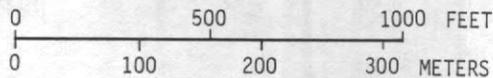
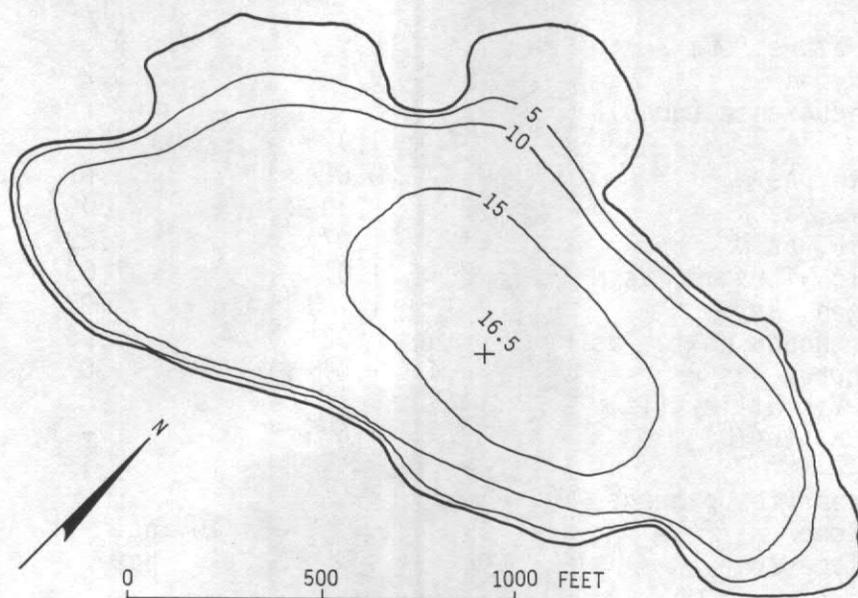
|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 30 | pct |
| Number of Nearshore Homes  | 13 |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 13 | pct |
| Agricultural               | 13 | pct |
| Forest or Unproductive     | 70 | pct |
| Lake Surface               | 4  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |              |        |
|--------------------------------|--------------|--------|
| Date                           | June 3, 1981 |        |
| Depth (ft)                     | 3            | 13     |
| Water Temperature (°C)         | 18.2         | 9.3    |
| Dissolved Oxygen               | 9.0          | 0.2    |
| Specific Conductance (umho)    | 66           | 77     |
| pH (units)                     | 6.6          | 6.4    |
| Total Nitrate, as N            | 0.00         | .00    |
| Total Nitrite, as N            | .00          | .00    |
| Total Ammonia, as N            | .09          | .09    |
| Total Organic Nitrogen, as N   | 1.5          | 1.6    |
| Total Nitrogen, as N           | 1.6          | 1.7    |
| Dissolved Orthophosphate, as P | .00          | .01    |
| Total Phosphorus, as P         | .05          | .12    |
| Secchi-Disc Visibility (ft)    |              | 5      |
| Chlorophyll <u>a</u> (ug/L)    | 15.7         | --     |
| Aquatic Macrophyte Coverage    |              |        |
| Littoral Zone                  |              | 35 pct |
| Water-Surface Zone             |              | 10 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 264 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 54  |
| TSI <sub>TP</sub>                   | 61  |
| TSI <sub>Chl</sub>                  | 58  |



EXPLANATION

— 5 —

Line of equal  
water depth

Interval 5 feet

Twin, South Lake, Pierce County. Photo taken June 3, 1981, view northeasterly.  
Bathymetric map from U.S. Geological Survey, May 27, 1981.

WHITMAN LAKE

PIERCE COUNTY

WRIA 11

T17N-R04E-14

LATITUDE 46° 57' 54" LONGITUDE 122° 15' 18"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.97 mi <sup>2</sup> |
| Altitude                | 601 ft               |
| Lake Area               | 30 acres             |
| Lake Volume             | 350 acre-ft          |
| Mean Depth              | 12 ft                |
| Maximum Depth           | 20 ft                |
| Shoreline Length        | 0.95 mi              |
| Shoreline Configuration | 1.2                  |
| Development of Volume   | 0.58                 |
| Bottom Slope            | 1.5 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

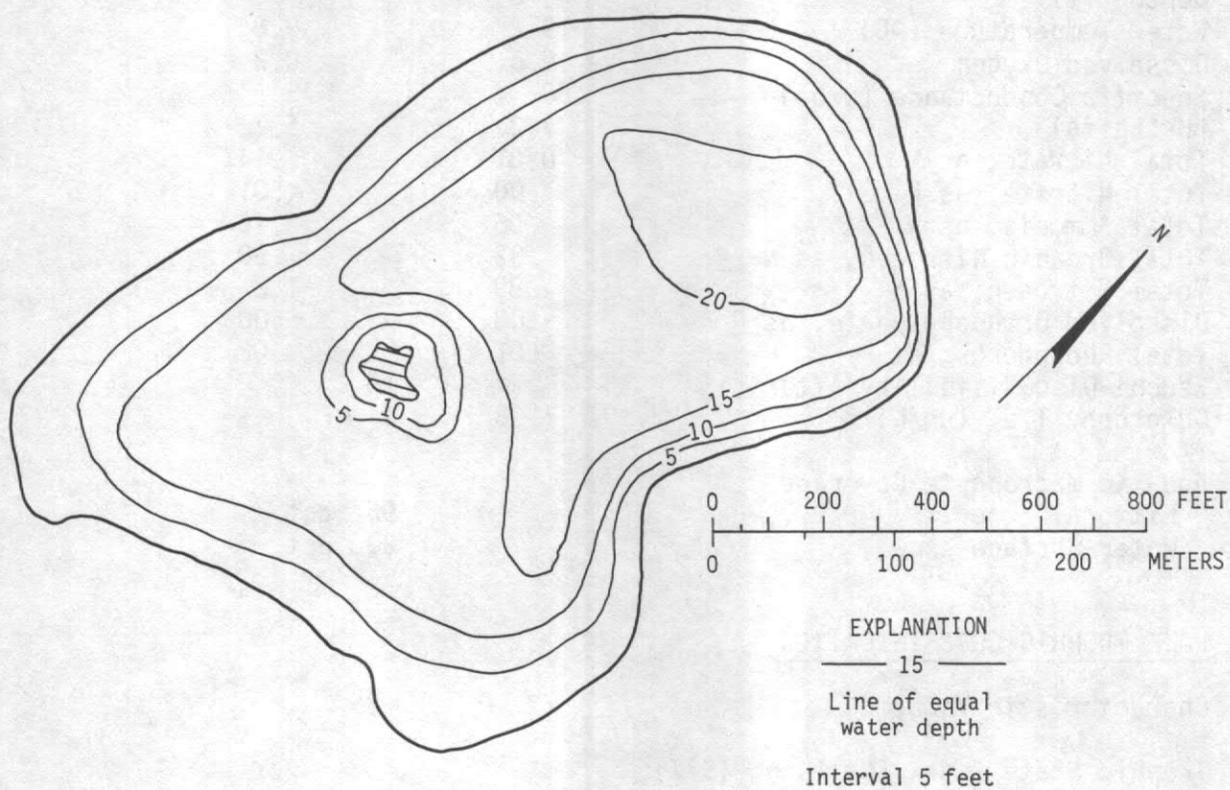
|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 85  | pct |
| Number of Nearshore Homes  | 49  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 5   | pct |
| Agricultural               | 27  | pct |
| Forest or Unproductive     | 63  | pct |
| Lake Surface               | 5   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |               |     |
|--------------------------------|---------------|-----|
| Date                           | June 23, 1981 |     |
| Depth (ft)                     | 3             | 17  |
| Water Temperature (oC)         | 16.9          | 9.5 |
| Dissolved Oxygen               | 9.5           | 0.2 |
| Specific Conductance (umho)    | 78            | 108 |
| pH (units)                     | 7.4           | 6.7 |
| Total Nitrate, as N            | 0.01          | .01 |
| Total Nitrite, as N            | .00           | .00 |
| Total Ammonia, as N            | .07           | .29 |
| Total Organic Nitrogen, as N   | 1.0           | .63 |
| Total Nitrogen, as N           | 1.1           | .93 |
| Dissolved Orthophosphate, as P | .02           | .03 |
| Total Phosphorus, as P         | .04           | .07 |
| Secchi-Disc Visibility (ft)    |               | 9   |
| Chlorophyll <u>a</u> (ug/L)    | 4.6           | --  |
| Aquatic Macrophyte Coverage    |               |     |
| Littoral Zone                  | 40            | pct |
| Water-Surface Zone             | 10            | pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 140 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 45  |
| TSI <sub>TP</sub>                   | 57  |
| TSI <sub>Chl</sub>                  | 46  |



Whitman (17N-4E-14) Lake, Pierce County. Photo taken June 23, 1981, view northwesterly. Bathymetric map from U.S. Geological Survey, May 2, 1973.

CLEAR LAKE

SKAGIT COUNTY

WRIA 03

T34N-R05E-07

LATITUDE 48° 27' 15" LONGITUDE 122° 13' 26"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 2.40 mi <sup>2</sup> |
| Altitude                | 30 ft                |
| Lake Area               | 200 acres            |
| Lake Volume             | 4,600 acre-ft        |
| Mean Depth              | 23 ft                |
| Maximum Depth           | 44 ft                |
| Shoreline Length        | 2.4 mi               |
| Shoreline Configuration | 1.2                  |
| Development of Volume   | 0.52                 |
| Bottom Slope            | 1.3 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 25  | pct |
| Number of Nearshore Homes  | 9   |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 5   | pct |
| Residential-Suburban       | 4   | pct |
| Agricultural               | 24  | pct |
| Forest or Unproductive     | 54  | pct |
| Lake Surface               | 13  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

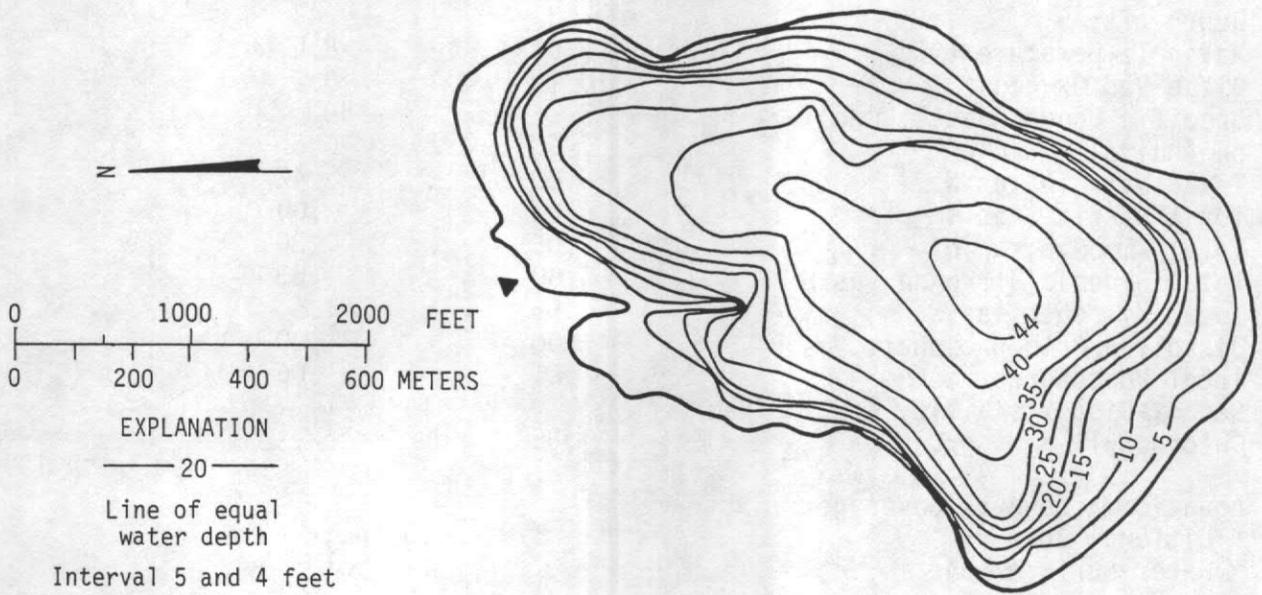
Date

July 9, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 39     |
| Water Temperature (°C)         | 19.2 | 9.8    |
| Dissolved Oxygen               | 9.6  | 0.2    |
| Specific Conductance (umho)    | 68   | 75     |
| pH (units)                     | 7.2  | 6.7    |
| Total Nitrate, as N            | 0.01 | .14    |
| Total Nitrite, as N            | .00  | <.01   |
| Total Ammonia, as N            | .06  | .10    |
| Total Organic Nitrogen, as N   | .82  | .90    |
| Total Nitrogen, as N           | .89  | 1.2    |
| Dissolved Orthophosphate, as P | .00  | .00    |
| Total Phosphorus, as P         | .01  | .02    |
| Secchi-Disc Visibility (ft)    |      | 15     |
| Chlorophyll <u>a</u> (ug/L)    | 1.98 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 95 pct |
| Water-Surface Zone             |      | 20 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 86 |
| Trophic State Index (Carlson, 1977) |    |
| TSI <sub>SD</sub>                   | 38 |
| TSI <sub>TP</sub>                   | 37 |
| TSI <sub>Chl</sub>                  | 37 |



Clear (34N-5E-7) Lake, Skagit County. Photo taken June 2, 1978.  
 Bathymetric map from Washington Department of Game, June 28, 1948.

MCMURRAY LAKE

SKAGIT COUNTY

WRIA 03

T33N-R05E-30

LATITUDE 48° 19' 28" LONGITUDE 122° 13' 22"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 3.25 mi <sup>2</sup> |
| Altitude                | 158 ft               |
| Lake Area               | 160 acres            |
| Lake Volume             | 4,500 acre-ft        |
| Mean Depth              | 29 ft                |
| Maximum Depth           | 52 ft                |
| Shoreline Length        | 2.6 mi               |
| Shoreline Configuration | 1.5                  |
| Development of Volume   | 0.56                 |
| Bottom Slope            | 1.8 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 50  | pct |
| Number of Nearshore Homes  | 50  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 3   | pct |
| Agricultural               | 11  | pct |
| Forest or Unproductive     | 79  | pct |
| Lake Surface               | 7   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

July 9, 1981

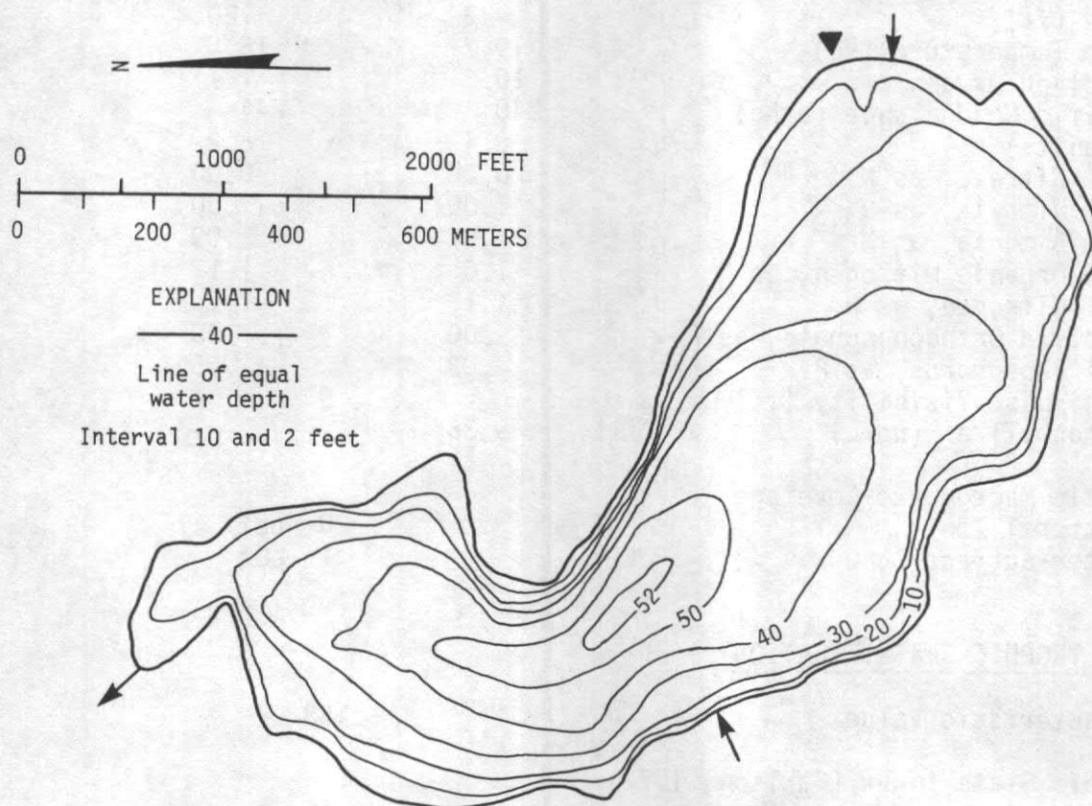
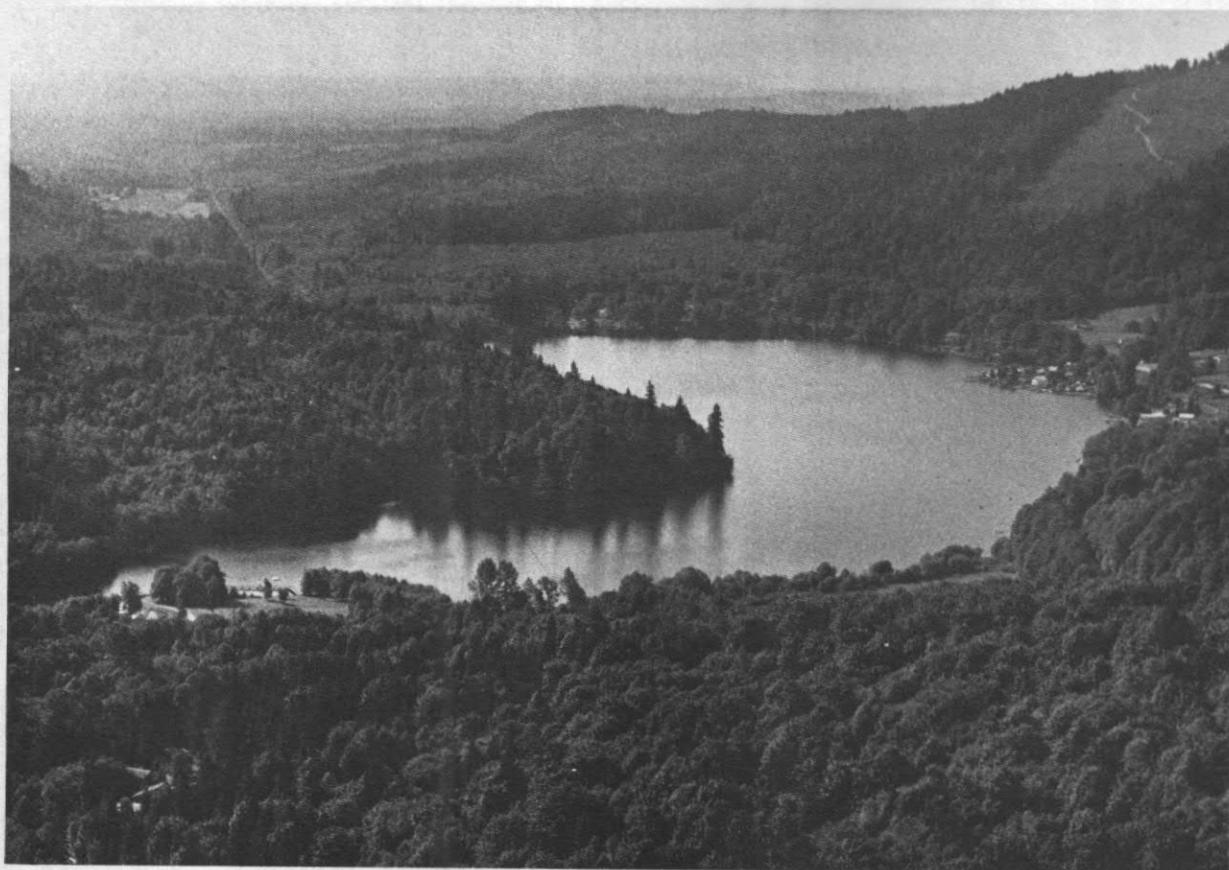
|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 43     |
| Water Temperature (°C)         | 18.6 | 8.0    |
| Dissolved Oxygen               | 10.1 | 0.2    |
| Specific Conductance (umho)    | 73   | 84     |
| pH (units)                     | 7.4  | 6.6    |
| Total Nitrate, as N            | 0.00 | .42    |
| Total Nitrite, as N            | .00  | .00    |
| Total Ammonia, as N            | .05  | .30    |
| Total Organic Nitrogen, as N   | .80  | .63    |
| Total Nitrogen, as N           | .85  | 1.4    |
| Dissolved Orthophosphate, as P | .00  | .00    |
| Total Phosphorus, as P         | .01  | .06    |
| Secchi-Disc Visibility (ft)    |      | 14     |
| Chlorophyll <u>a</u> (ug/L)    | 1.86 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 10 pct |
| Water-Surface Zone             |      | <1 pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value (Bortleson, 1978) 86

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 39 |
| TSI <sub>TP</sub>  | 37 |
| TSI <sub>Chl</sub> | 37 |



McMurray Lake, Skagit County. Photo taken July 9, 1981, view southeasterly. Bathymetric map from Washington Department of Game, March 10, 1956.

PASS LAKE

SKAGIT COUNTY

WRIA 03

T34N-R01E-23

LATITUDE 48° 25' 01" LONGITUDE 122° 38' 30"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.61 mi <sup>2</sup> |
| Altitude                | 130 ft               |
| Lake Area               | 98 acres             |
| Lake Volume             | 1,500 acre-ft        |
| Mean Depth              | 15 ft                |
| Maximum Depth           | 20 ft                |
| Shoreline Length        | 1.9 mi               |
| Shoreline Configuration | 1.3                  |
| Development of Volume   | 0.77                 |
| Bottom Slope            | 0.86 pct             |
| Surface Inflow          | Yes                  |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 5   | pct |
| Number of Nearshore Homes  | 1   |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 0   | pct |
| Agricultural               | 9   | pct |
| Forest or Unproductive     | 66  | pct |
| Lake Surface               | 25  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

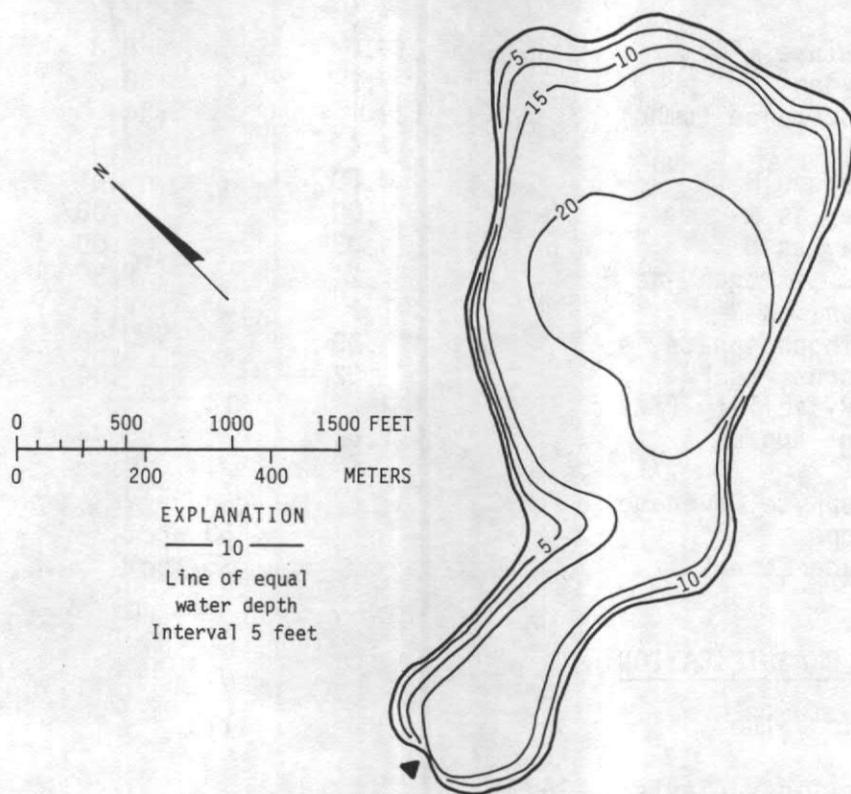
Date

July 9, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 20     |
| Water Temperature (°C)         | 19.2 | 18.0   |
| Dissolved Oxygen               | 10.5 | 1.7    |
| Specific Conductance (umho)    | 240  | 244    |
| pH (units)                     | 8.4  | 8.2    |
| Total Nitrate, as N            | 0.00 | 0.00   |
| Total Nitrite, as N            | .00  | .00    |
| Total Ammonia, as N            | .07  | .09    |
| Total Organic Nitrogen, as N   | 1.0  | 1.1    |
| Total Nitrogen, as N           | 1.1  | 1.2    |
| Dissolved Orthophosphate, as P | .00  | .00    |
| Total Phosphorus, as P         | .03  | .05    |
| Secchi-Disc Visibility (ft)    |      | 9      |
| Chlorophyll <u>a</u> (ug/L)    | 9.36 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 20 pct |
| Water-Surface Zone             |      | <1 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 153 |
| Trophic State Index (Carlson, 1977) |     |
| TSISD                               | 45  |
| TSITP                               | 53  |
| TSICh1                              | 53  |



Pass Lake, Skagit County. Photo taken July 9, 1981, view northeasterly.  
Bathymetric map from Washington Department of Game, June 14, 1940.

TRAFTON (BESTS) LAKE

SKAGIT COUNTY

WRIA 03

T34N-R01E-14

LATITUDE 48° 26' 13" LONGITUDE 122° 38' 32"

PHYSICAL DATA

Drainage area 0.26 mi<sup>2</sup>  
 Altitude 382 ft  
 Lake Area 14 acres  
 Lake Volume 238 acre-ft  
 Mean Depth 17 ft  
 Maximum Depth 38 ft  
 Shoreline Length 0.61 mi  
 Shoreline Configuration 1.2  
 Development of Volume 0.44  
 Bottom Slope 4.3 pct  
 Surface Inflow No  
 Surface Outflow No

CULTURAL DATA

Residential Development 0 pct  
 Number of Nearshore Homes 0  
 Land Use in Drainage Basin  
 Residential-Urban 0 pct  
 Residential-Suburban 3 pct  
 Agricultural 9 pct  
 Forest or Unproductive 79 pct  
 Lake Surface 9 pct  
 Public Boat Access to Lake Yes

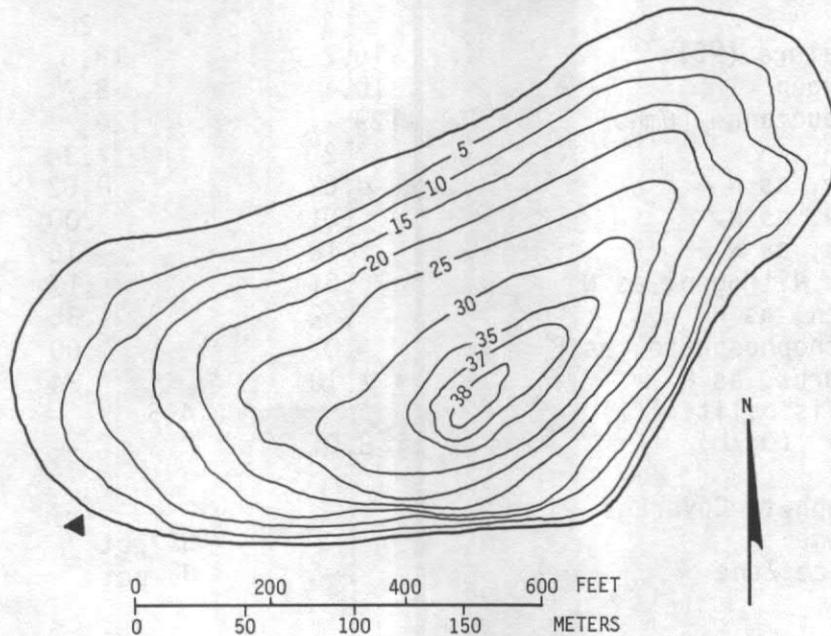
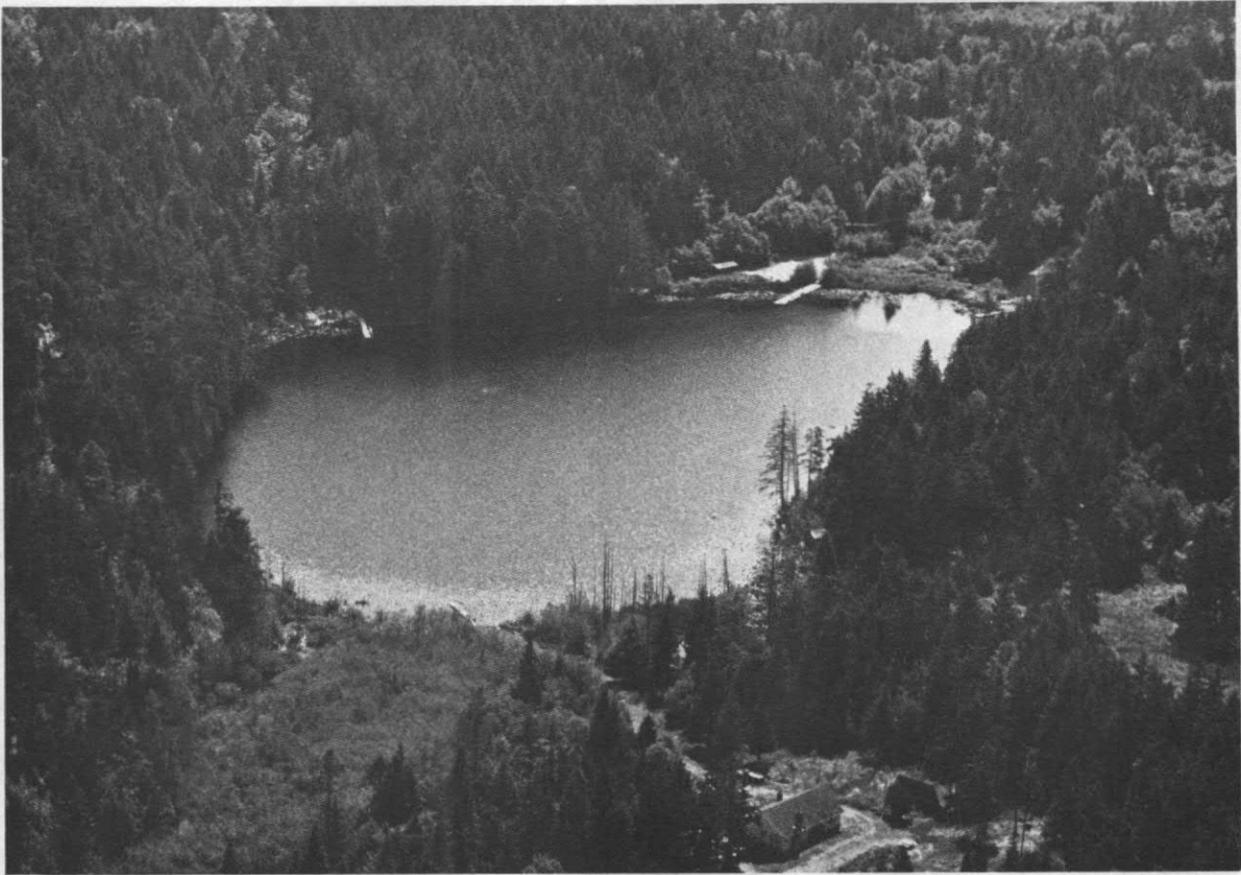
WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date July 9, 1981

Depth (ft) 3 24  
 Water Temperature (°C) 19.0 8.8  
 Dissolved Oxygen 9.2 0.2  
 Specific Conductance (umho) 129 134  
 pH (units) 7.4 7.0  
 Total Nitrate, as N 0.00 .01  
 Total Nitrite, as N .00 .00  
 Total Ammonia, as N .03 .09  
 Total Organic Nitrogen, as N 1.2 1.3  
 Total Nitrogen, as N 1.2 1.4  
 Dissolved Orthophosphate, as P .00 .00  
 Total Phosphorus, as P .02 .04  
 Secchi-Disc Visibility (ft) 14  
 Chlorophyll a (ug/L) 1.64 --  
 Aquatic Macrophyte Coverage  
 Littoral Zone 60 pct  
 Water-Surface Zone 5 pct

LAKE TROPHIC CLASSIFICATION

Characteristic Value 118  
 Trophic State Index (Carlson, 1977)  
 TSI<sub>SD</sub> 39  
 TSI<sub>TP</sub> 47  
 TSI<sub>Chl</sub> 35



EXPLANATION  
— 10 —  
Line of equal  
water depth  
Interval, in feet, variable

Trafton (Bests) Lake, Skagit County. Photo taken July 9, 1981, view southwesterly. Bathymetric map from U.S. Geological Survey, June 16, 1981.

ASHES LAKE

SKAMANIA COUNTY

WRIA 29

T02N-R07E-11

LATITUDE 45° 40' 16" LONGITUDE 121° 54' 51"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 3.82 mi <sup>2</sup> |
| Altitude                | 75 ft                |
| Lake Area               | 54 acres             |
| Lake Volume             | 740 acre-ft          |
| Mean Depth              | 14 ft                |
| Maximum Depth           | 25 ft                |
| Shoreline Length        | 1.5 mi               |
| Shoreline Configuration | 1.5                  |
| Development of Volume   | 0.55                 |
| Bottom Slope            | 1.4 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 0  | pct |
| Number of Nearshore Homes  | 0  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 98 | pct |
| Lake Surface               | 2  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

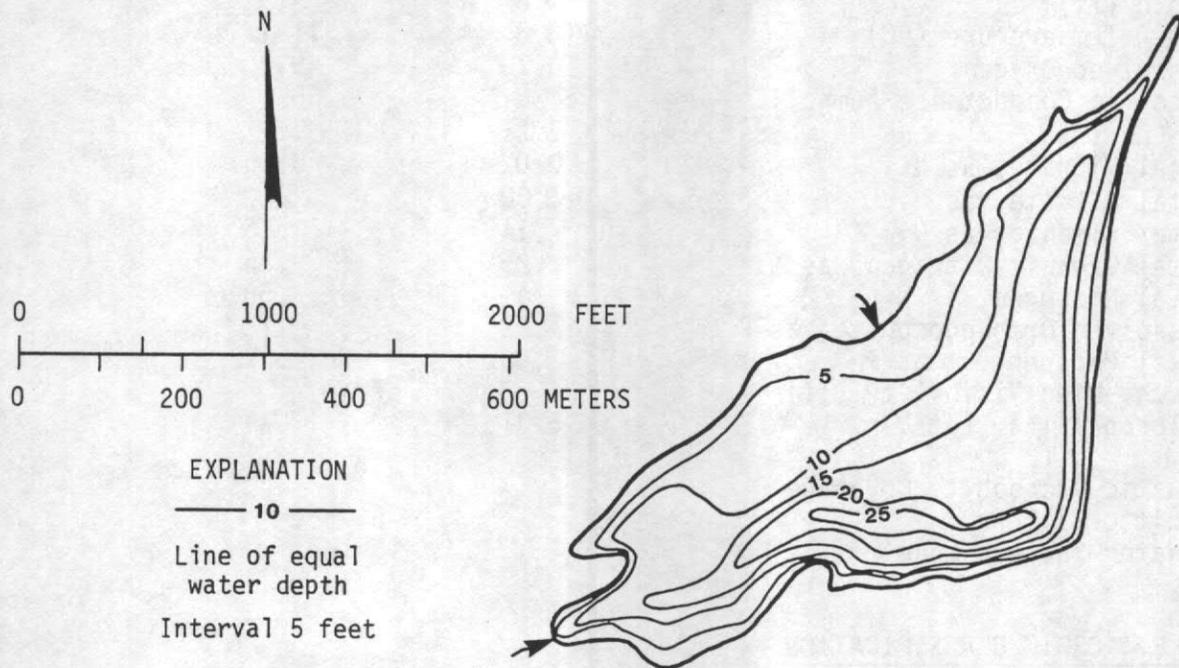
Date

June 16, 1981

|                                |      |         |
|--------------------------------|------|---------|
| Depth (ft)                     | 3    | 20      |
| Water Temperature (°C)         | 16.2 | 13.8    |
| Dissolved Oxygen               | 10.4 | 8.7     |
| Specific Conductance (umho)    | 129  | 120     |
| pH (units)                     | 7.2  | 7.3     |
| Total Nitrate, as N            | 0.02 | 0.02    |
| Total Nitrite, as N            | .01  | .00     |
| Total Ammonia, as N            | .18  | .16     |
| Total Organic Nitrogen, as N   | .31  | .17     |
| Total Nitrogen, as N           | .52  | .35     |
| Dissolved Orthophosphate, as P | .01  | .00     |
| Total Phosphorus, as P         | .10  | .34     |
| Secchi-Disc Visibility (ft)    |      | 4.5     |
| Chlorophyll <u>a</u> (ug/L)    | 8.04 | --      |
| Aquatic Macrophyte Coverage    |      |         |
| Littoral Zone                  |      | < 5 pct |
| Water-Surface Zone             |      | 0 pct   |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 177 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 55  |
| TSI <sub>TP</sub>                   | 71  |
| TSI <sub>Chl</sub>                  | 51  |



Ashes Lake, Skamania County. Photo taken June 24, 1974.  
 Bathymetric map from Washington Department of Game, November 24, 1947.

GREENLEAF LAKE

SKAMANIA COUNTY

WRIA 28

T02N-R07E-20

LATITUDE 45° 38' 36" LONGITUDE 121° 58' 33"

PHYSICAL DATA

Drainage area 7.53 mi<sup>2</sup>  
 Altitude 65 ft  
 Lake Area 54 acres  
 Lake Volume 600 acre-ft  
 Mean Depth 11 ft  
 Maximum Depth 24 ft  
 Shoreline Length 2.9 mi  
 Shoreline Configuration 2.9  
 Development of Volume 0.46  
 Bottom Slope 1.4 pct  
 Surface Inflow Yes  
 Surface Outflow Yes

CULTURAL DATA

Residential Development 10 pct  
 Number of Nearshore Homes 13  
 Land Use in Drainage Basin  
 Residential-Urban 0 pct  
 Residential-Suburban <1 pct  
 Agricultural <1 pct  
 Forest or Unproductive 99 pct  
 Lake Surface 1 pct  
 Public Boat Access to Lake Yes

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

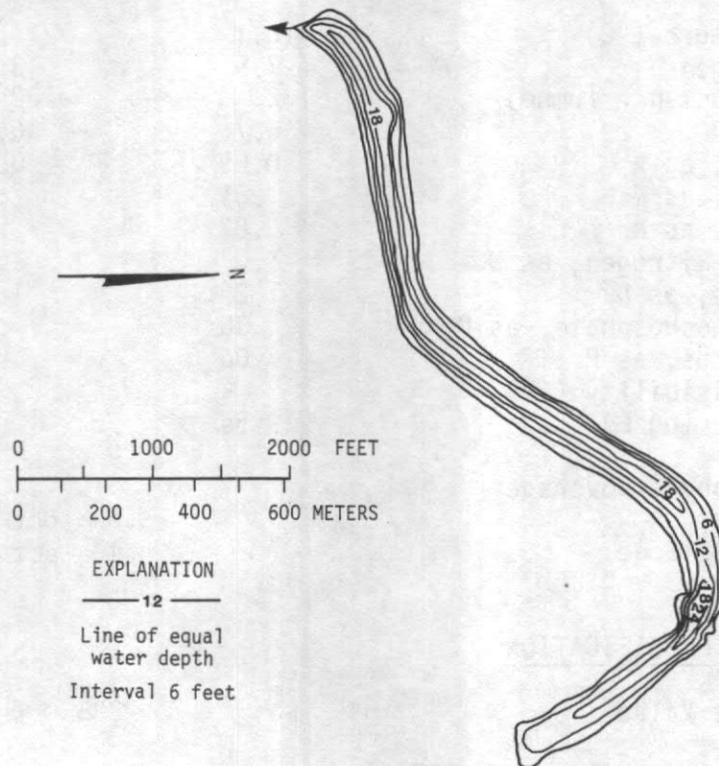
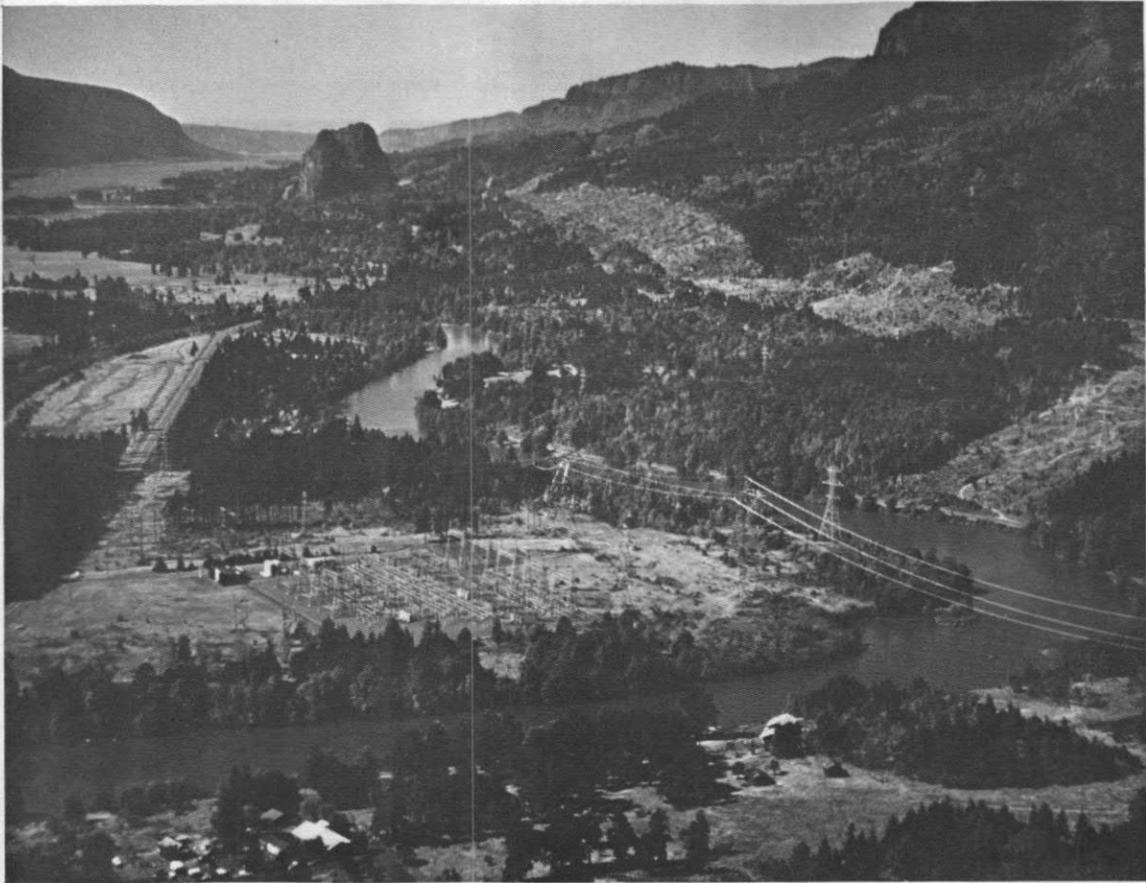
Date

June 16, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 19     |
| Water Temperature (°C)         | 13.3 | 11.1   |
| Dissolved Oxygen               | 10.7 | 9.2    |
| Specific Conductance (umho)    | 87   | 65     |
| pH (units)                     | 7.2  | 7.1    |
| Total Nitrate, as N            | 0.02 | 0.06   |
| Total Nitrite, as N            | .00  | .00    |
| Total Ammonia, as N            | .14  | .16    |
| Total Organic Nitrogen, as N   | .25  | .36    |
| Total Nitrogen, as N           | .41  | .58    |
| Dissolved Orthophosphate, as P | .02  | .12    |
| Total Phosphorus, as P         | .06  | .12    |
| Secchi-Disc Visibility (ft)    |      | 7      |
| Chlorophyll <u>a</u> (ug/L)    | 5.31 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 5 pct  |
| Water-Surface Zone             |      | <5 pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 110  
 Trophic State Index (Carlson, 1977)  
     TSI<sub>SD</sub> 49  
     TSI<sub>TP</sub> 63  
     TSI<sub>Chl</sub> 47



Greenleaf Lake, Skamania County. Photo taken September 1974, view southwesterly. Bathymetric map from Washington Department of Game, July 6, 1946.

BEECHER LAKE

SNOHOMISH COUNTY

WRIA 07

T27N-R06E-07

LATITUDE 47° 50' 37" LONGITUDE 122° 05' 15"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 4.65 mi <sup>2</sup> |
| Altitude                | 13 ft                |
| Lake Area               | 20 acres             |
| Lake Volume             | 105 acre-ft          |
| Mean Depth              | 5 ft                 |
| Maximum Depth           | 10 ft                |
| Shoreline Length        | 1.6 mi               |
| Shoreline Configuration | 2.4                  |
| Development of Volume   | 0.51                 |
| Bottom Slope            | 0.94 pct             |
| Surface Inflow          | Yes                  |
| Surface Outflow         | No                   |

CULTURAL DATA

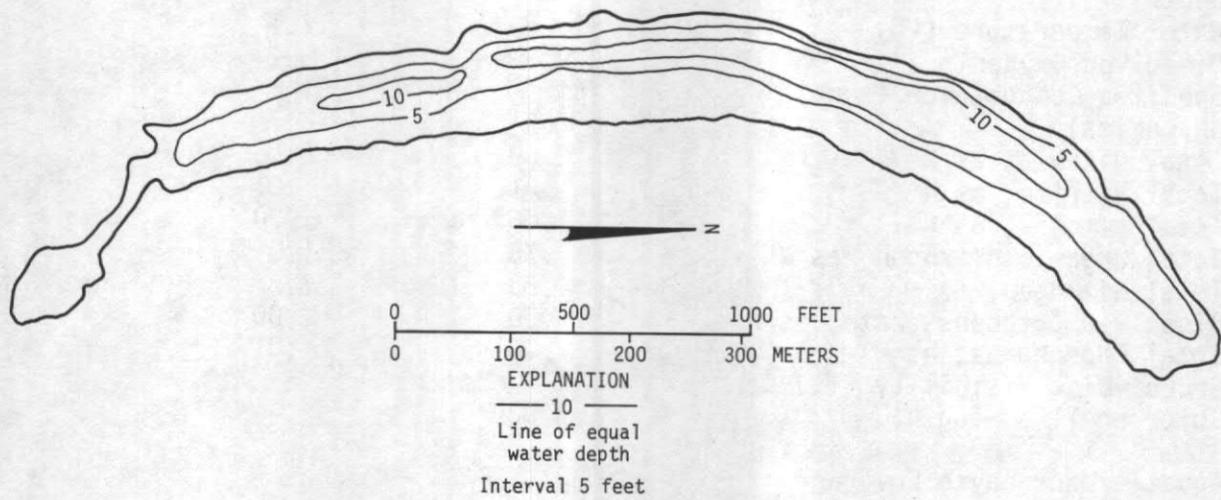
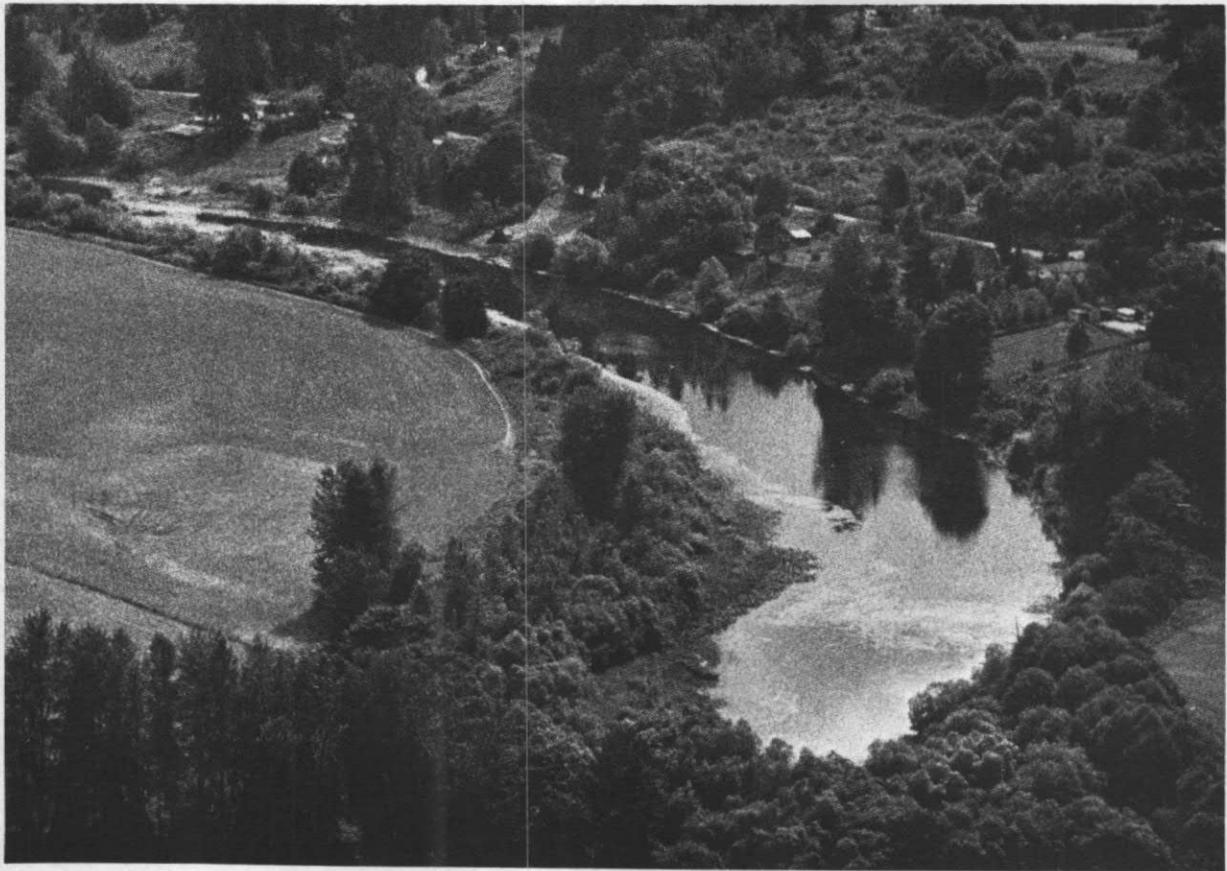
|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 20 | pct |
| Number of Nearshore Homes  | 9  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 8  | pct |
| Agricultural               | 29 | pct |
| Forest or Unproductive     | 62 | pct |
| Lake Surface               | 1  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |              |      |
|--------------------------------|--------------|------|
| Date                           | July 6, 1981 |      |
| Depth (ft)                     | 3            | 6    |
| Water Temperature (°C)         | 16.1         | 14.2 |
| Dissolved Oxygen               | 7.9          | 3.0  |
| Specific Conductance (umho)    | 132          | 132  |
| pH (units)                     | 6.7          | 6.6  |
| Total Nitrate, as N            | 0.09         | 0.06 |
| Total Nitrite, as N            | .01          | .01  |
| Total Ammonia, as N            | .07          | .09  |
| Total Organic Nitrogen, as N   | 1.0          | 1.0  |
| Total Nitrogen, as N           | 1.2          | 1.2  |
| Dissolved Orthophosphate, as P | .00          | .00  |
| Total Phosphorus, as P         | .06          | .09  |
| Secchi-Disc Visibility (ft)    | 4            |      |
| Chlorophyll <u>a</u> (ug/L)    | 9.54         | --   |
| Aquatic Macrophyte Coverage    |              |      |
| Littoral Zone                  | 80           | pct  |
| Water-Surface Zone             | 40           | pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 235 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 57  |
| TSI <sub>TP</sub>                   | 63  |
| TSI <sub>Chl</sub>                  | 53  |



Beecher Lake, Snohomish County. Photo taken July 6, 1981, view southwesterly. Bathymetric map from U.S. Geological Survey, June 11, 1981.

BLACKMANS LAKE

SNOHOMISH COUNTY

WRIA 07

T28N-R06E-07

LATITUDE 47° 55' 47" LONGITUDE 122° 05' 32"

PHYSICAL DATA

Drainage area 0.81 mi<sup>2</sup>  
 Altitude 140 ft  
 Lake Area 57 acres  
 Lake Volume 800 acre-ft  
 Mean Depth 14 ft  
 Maximum Depth 29 ft  
 Shoreline Length 1.5 mi  
 Shoreline Configuration 1.4  
 Development of Volume 0.49  
 Bottom Slope 1.6 pct  
 Surface Inflow Yes  
 Surface Outflow Yes

CULTURAL DATA

Residential Development 55 pct  
 Number of Nearshore Homes 20  
 Land Use in Drainage Basin  
 Residential-Urban 0 pct  
 Residential-Suburban 8 pct  
 Agricultural 69 pct  
 Forest or Unproductive 12 pct  
 Lake Surface 11 pct  
 Public Boat Access to Lake Yes

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date July 7, 1981

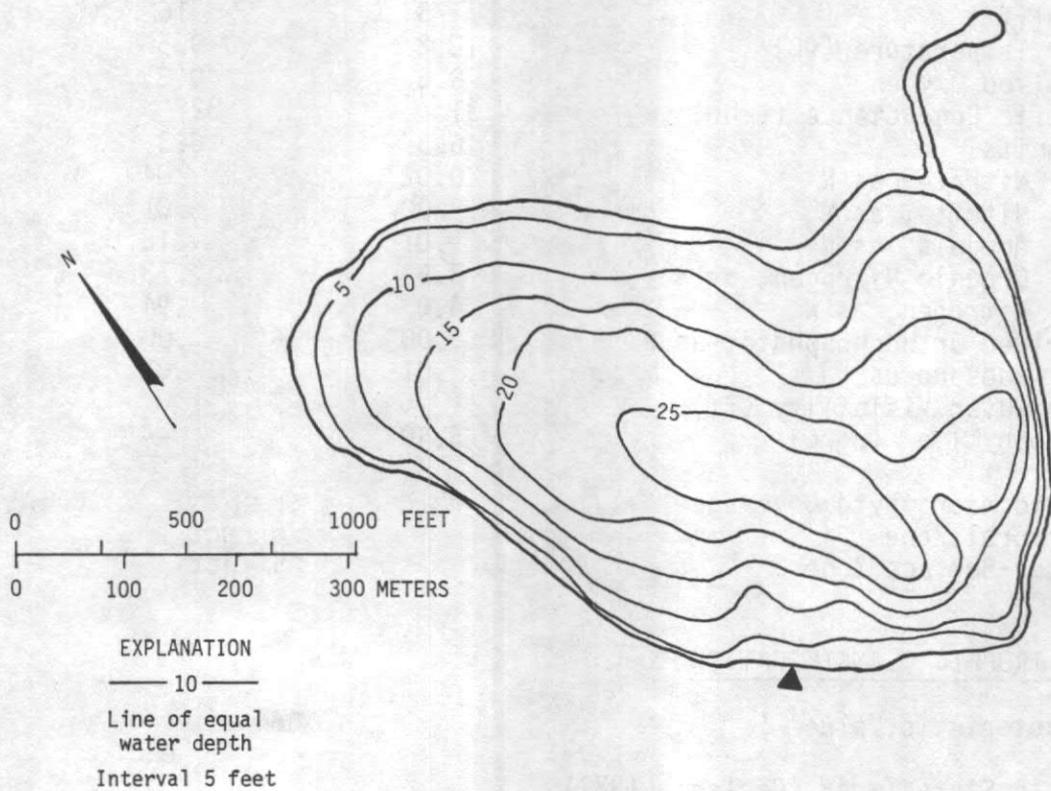
|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 23   |
| Water Temperature (°C)         | 19.5 | 12.1 |
| Dissolved Oxygen               | 9.3  | 0.2  |
| Specific Conductance (umho)    | 84   | 91   |
| pH (units)                     | 7.0  | 6.7  |
| Total Nitrate, as N            | 0.00 | .00  |
| Total Nitrite, as N            | .01  | .01  |
| Total Ammonia, as N            | .06  | .30  |
| Total Organic Nitrogen, as N   | .76  | 1.0  |
| Total Nitrogen, as N           | .83  | 1.3  |
| Dissolved Orthophosphate, as P | .00  | .00  |
| Total Phosphorus, as P         | .00  | .01  |
| Secchi-Disc Visibility (ft)    |      | 14   |
| Chlorophyll <u>a</u> (ug/L)    | 3.82 | --   |

Aquatic Macrophyte Coverage  
 Littoral Zone 60 pct  
 Water-Surface Zone 10 pct

LAKE TROPHIC CLASSIFICATION

Characteristic Value (Bortleson, 1978) 87

Trophic State Index (Carlson, 1977)  
 TSI<sub>SD</sub> 39  
 TSI<sub>TP</sub> 0  
 TSI<sub>Chl</sub> 44



Blackmans Lake, Snohomish County. Photo taken May 13, 1973.  
Bathymetric map from U.S. Geological Survey, July 18, 1973.

BOYD LAKE

SNOHOMISH COUNTY

WRIA 07

T30N-R07E-28

LATITUDE 48° 03' 30" LONGITUDE 121° 55' 15"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 1.19 mi <sup>2</sup> |
| Altitude                | 520 ft               |
| Lake Area               | 11 acres             |
| Lake Volume             | 123 acre-ft          |
| Mean Depth              | 11 ft                |
| Maximum Depth           | 17 ft                |
| Shoreline Length        | 0.61 mi              |
| Shoreline Configuration | 1.3                  |
| Development of Volume   | 0.63                 |
| Bottom Slope            | 2.1 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 10 | pct |
| Number of Nearshore Homes  | 1  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 97 | pct |
| Lake Surface               | 3  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

July 7, 1981

|                                |      |     |
|--------------------------------|------|-----|
| Depth (ft)                     | 3    | 16  |
| Water Temperature (°C)         | 18.2 | 9.5 |
| Dissolved Oxygen               | 8.6  | 0.3 |
| Specific Conductance (umho)    | 31   | 32  |
| pH (units)                     | 6.3  | 6.3 |
| Total Nitrate, as N            | 0.02 | .04 |
| Total Nitrite, as N            | .00  | .01 |
| Total Ammonia, as N            | .07  | .16 |
| Total Organic Nitrogen, as N   | 3.9  | .73 |
| Total Nitrogen, as N           | 4.0  | .94 |
| Dissolved Orthophosphate, as P | .00  | .00 |
| Total Phosphorus, as P         | .01  | .01 |
| Secchi-Disc Visibility (ft)    |      | 7   |
| Chlorophyll <u>a</u> (ug/L)    | 5.49 | --  |

Aquatic Macrophyte Coverage

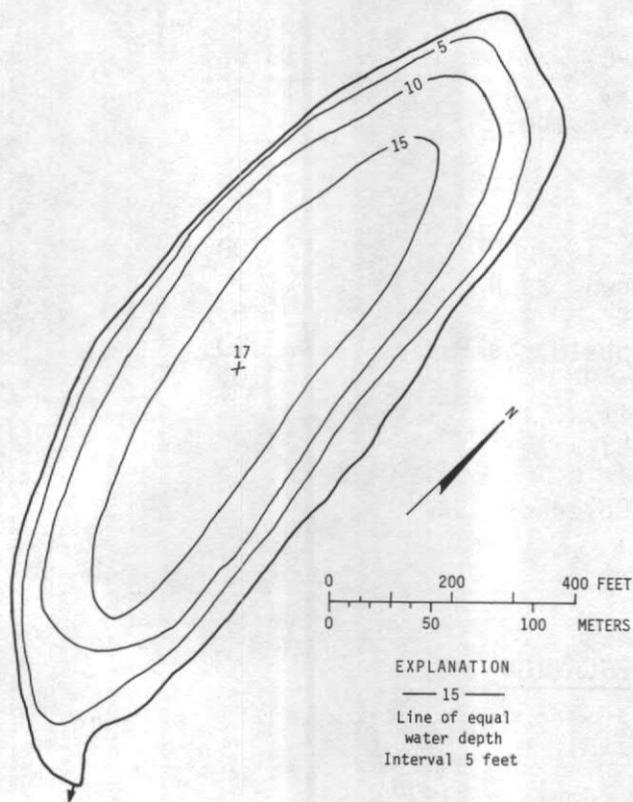
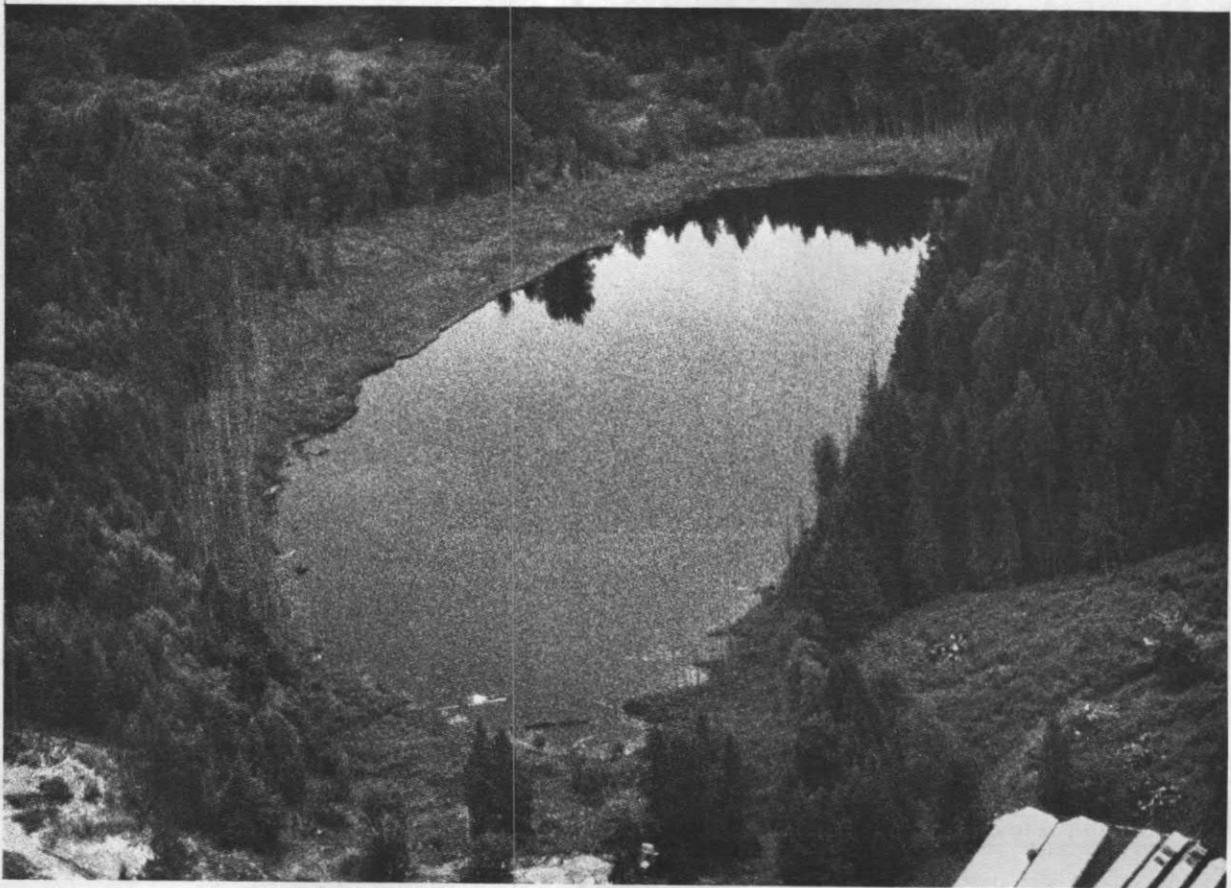
|                    |    |     |
|--------------------|----|-----|
| Littoral Zone      | 75 | pct |
| Water-Surface Zone | <5 | pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 364

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 49 |
| TSI <sub>TP</sub>  | 37 |
| TSI <sub>Chl</sub> | 47 |



Boyd Lake, Snohomish County. Photo taken July 7, 1981, view northwesterly.  
Bathymetric map from Washington Department of Game, January 27, 1949.

BRYANT LAKE

SNOHOMISH COUNTY

WRIA 05

T32N-R05E-27

LATITUDE 48° 13' 57" LONGITUDE 122° 08' 53"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.92 mi <sup>2</sup> |
| Altitude                | 146 ft               |
| Lake Area               | 37 acres             |
| Lake Volume             | 520 acre-ft          |
| Mean Depth              | 14 ft                |
| Maximum Depth           | 23 ft                |
| Shoreline Length        | 0.89 mi              |
| Shoreline Configuration | 1.0                  |
| Development of Volume   | 0.61                 |
| Bottom Slope            | 1.6 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 0  | pct |
| Number of Nearshore Homes  | 0  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 4  | pct |
| Agricultural               | 40 | pct |
| Forest or Unproductive     | 50 | pct |
| Lake Surface               | 6  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

July 7, 1981

|                                |      |     |
|--------------------------------|------|-----|
| Depth (ft)                     | 3    | 18  |
| Water Temperature (°C)         | 18.6 | 9.1 |
| Dissolved Oxygen               | 10.4 | 0.3 |
| Specific Conductance (umho)    | 95   | 110 |
| pH (units)                     | 7.0  | 6.5 |
| Total Nitrate, as N            | 0.36 | .81 |
| Total Nitrite, as N            | .02  | .01 |
| Total Ammonia, as N            | .09  | .08 |
| Total Organic Nitrogen, as N   | 1.1  | .75 |
| Total Nitrogen, as N           | 1.6  | 1.7 |
| Dissolved Orthophosphate, as P | .00  | .00 |
| Total Phosphorus, as P         | .01  | .01 |
| Secchi-Disc Visibility (ft)    |      | 3   |
| Chlorophyll <u>a</u> (ug/L)    | 11.4 | --  |

Aquatic Macrophyte Coverage

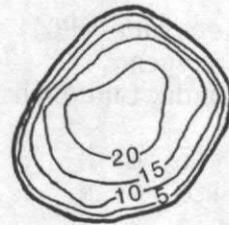
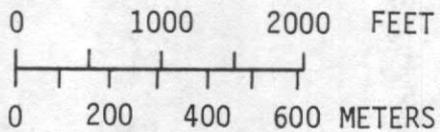
|                    |     |     |
|--------------------|-----|-----|
| Littoral Zone      | 75  | pct |
| Water-Surface Zone | < 5 | pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 278

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 61 |
| TSI <sub>TP</sub>  | 37 |
| TSI <sub>Chl</sub> | 54 |



EXPLANATION

— 10 —

Line of equal  
water depth

Interval 5 feet

Bryant Lake, Snohomish County. Photo taken July 7, 1981, view southwesterly.  
Bathymetric map from U.S. Geological Survey, May 21, 1971.

CASSIDY LAKE

SNOHOMISH COUNTY

WRIA 07

T30N-R06E-31

LATITUDE 48° 02' 51" LONGITUDE 122° 05' 28"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 4.56 mi <sup>2</sup> |
| Altitude                | 319 ft               |
| Lake Area               | 120 acres            |
| Lake Volume             | 1,300 acre-ft        |
| Mean Depth              | 11 ft                |
| Maximum Depth           | 20 ft                |
| Shoreline Length        | 1.8 mi               |
| Shoreline Configuration | 1.2                  |
| Development of Volume   | 0.55                 |
| Bottom Slope            | 0.77 pct             |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 25  | pct |
| Number of Nearshore Homes  | 19  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | < 1 | pct |
| Agricultural               | 14  | pct |
| Forest or Unproductive     | 82  | pct |
| Lake Surface               | 4   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

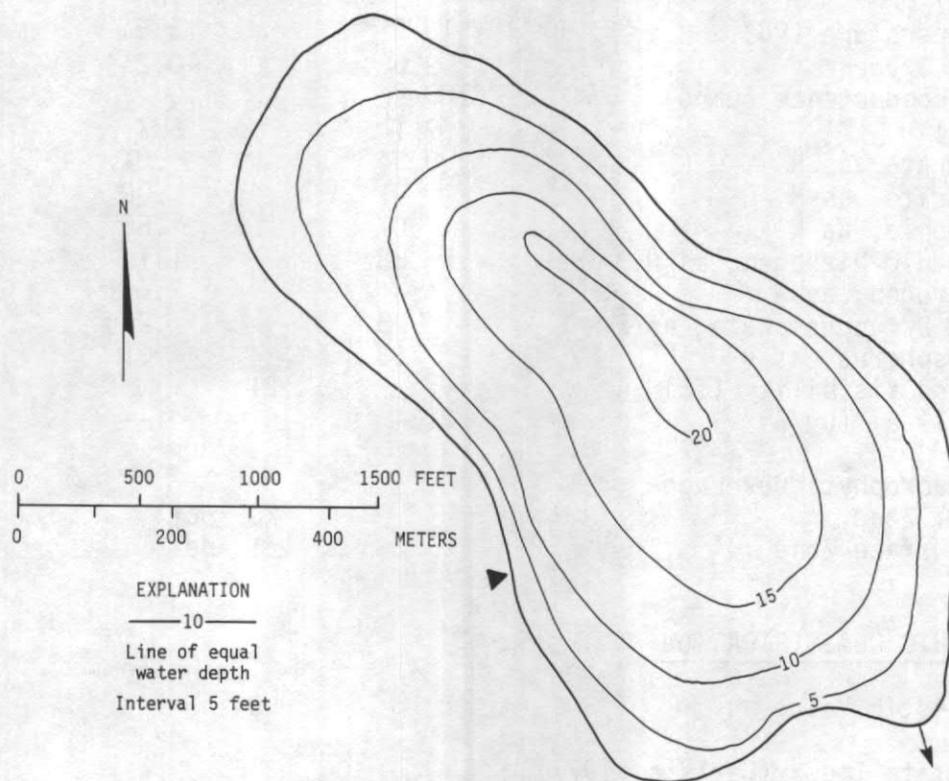
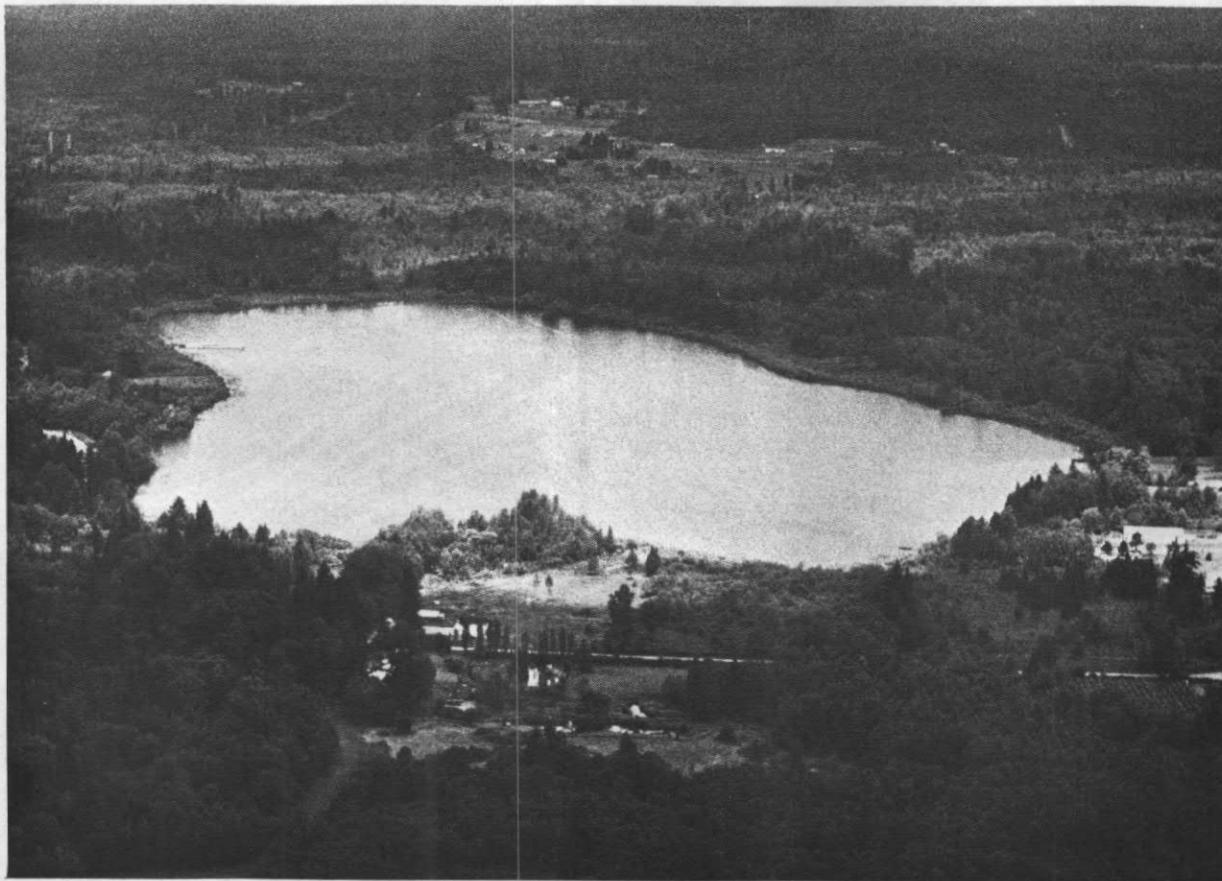
Date

July 7, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 18     |
| Water Temperature (°C)         | 18.5 | 11.9   |
| Dissolved Oxygen               | 8.8  | 0.2    |
| Specific Conductance (umho)    | 38   | 43     |
| pH (units)                     | 6.9  | 6.3    |
| Total Nitrate, as N            | 0.00 | .06    |
| Total Nitrite, as N            | .01  | .02    |
| Total Ammonia, as N            | .10  | .19    |
| Total Organic Nitrogen, as N   | 1.4  | .91    |
| Total Nitrogen, as N           | 1.5  | 1.2    |
| Dissolved Orthophosphate, as P | .00  | .03    |
| Total Phosphorus, as P         | .02  | .06    |
| Secchi-Disc Visibility (ft)    |      | 2      |
| Chlorophyll <u>a</u> (ug/L)    | 21.1 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 90 pct |
| Water-Surface Zone             |      | 5 pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 422 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 67  |
| TSI <sub>TP</sub>                   | 47  |
| TSI <sub>Chl</sub>                  | 60  |



Cassidy Lake, Snohomish County. Photo taken July 7, 1981, view northerly. Bathymetric map from Washington Department of Game, July 23, 1956.

HOWARD LAKE

SNOHOMISH COUNTY

WRIA 05

T31N-R04E-20

LATITUDE 48° 09' 30" LONGITUDE 122° 19' 42"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.46 mi <sup>2</sup> |
| Altitude                | 238 ft               |
| Lake Area               | 28 acres             |
| Lake Volume             | 790 acre-ft          |
| Mean Depth              | 29 ft                |
| Maximum Depth           | 50 ft                |
| Shoreline Length        | 0.87 mi              |
| Shoreline Configuration | 1.2                  |
| Development of Volume   | 0.56                 |
| Bottom Slope            | 4.0 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 65  | pct |
| Number of Nearshore Homes  | 29  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 4   | pct |
| Agricultural               | 4   | pct |
| Forest or Unproductive     | 83  | pct |
| Lake Surface               | 9   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

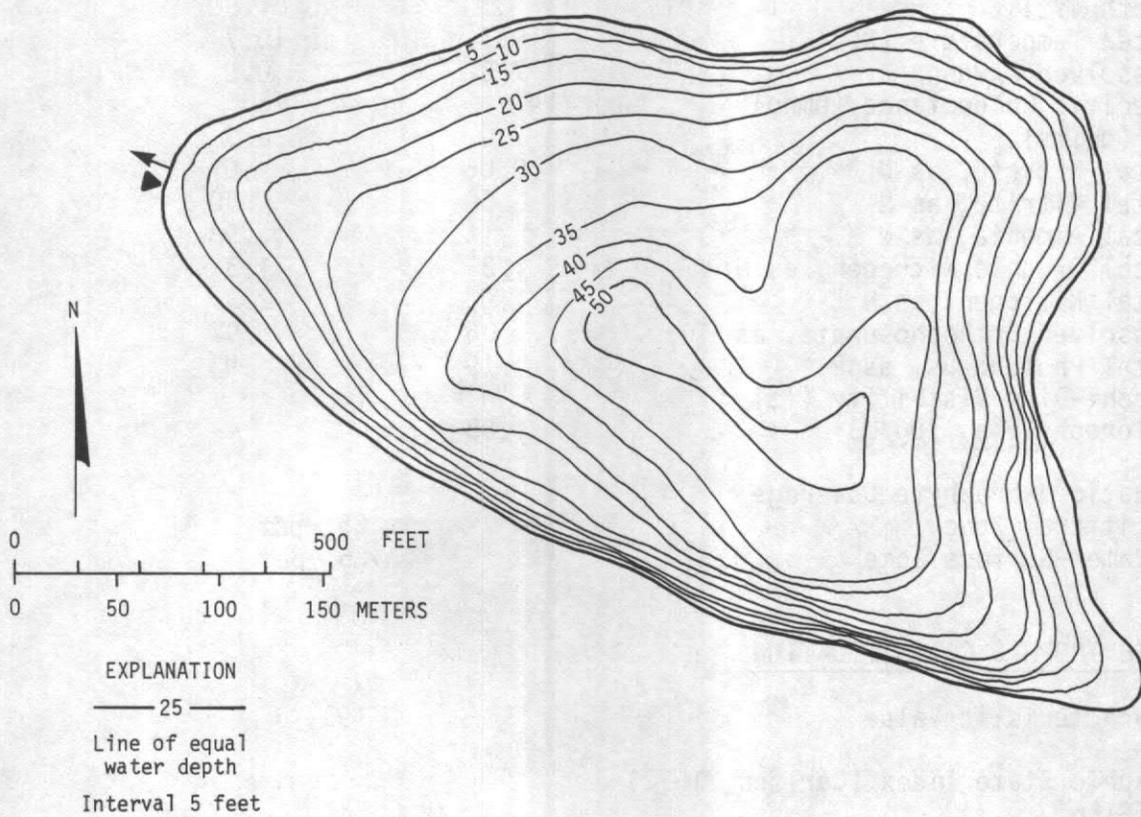
Date June 30, 1981

|                                |      |     |
|--------------------------------|------|-----|
| Depth (ft)                     | 3    | 52  |
| Water Temperature (°C)         | 19.0 | 5.8 |
| Dissolved Oxygen               | 9.6  | 0.2 |
| Specific Conductance (umho)    | 100  | 110 |
| pH (units)                     | 7.1  | 6.7 |
| Total Nitrate, as N            | 0.34 | .01 |
| Total Nitrite, as N            | .01  | .00 |
| Total Ammonia, as N            | .07  | .86 |
| Total Organic Nitrogen, as N   | .88  | 1.1 |
| Total Nitrogen, as N           | 1.3  | 2.0 |
| Dissolved Orthophosphate, as P | .03  | .26 |
| Total Phosphorus, as P         | .02  | .31 |
| Secchi-Disc Visibility (ft)    |      | 21  |
| Chlorophyll <u>a</u> (ug/L)    | 2.34 | --  |

|                             |    |     |
|-----------------------------|----|-----|
| Aquatic Macrophyte Coverage |    |     |
| Littoral Zone               | 20 | pct |
| Water-Surface Zone          | <1 | pct |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 84 |
| Trophic State Index (Carlson, 1977) |    |
| TSISD                               | 33 |
| TSITP                               | 47 |
| TSICh1                              | 39 |



Howard (31N-4E-20) Lake, Snohomish County. Photo taken July 14, 1973.  
Bathymetric map from Washington Department of Game, July 30, 1947.

KETCHUM LAKE

SNOHOMISH COUNTY

WRIA 03

T32N-R04E-07

LATITUDE 48° 16' 48" LONGITUDE 122° 20' 27"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.52 mi <sup>2</sup> |
| Altitude                | 190 ft               |
| Lake Area               | 24 acres             |
| Lake Volume             | 296 acre-ft          |
| Mean Depth              | 12 ft                |
| Maximum Depth           | 21 ft                |
| Shoreline Length        | 1.3 mi               |
| Shoreline Configuration | 1.9                  |
| Development of Volume   | 0.58                 |
| Bottom Slope            | 1.82 pct             |
| Surface Inflow          | Yes                  |
| Surface Outflow         | No                   |

CULTURAL DATA

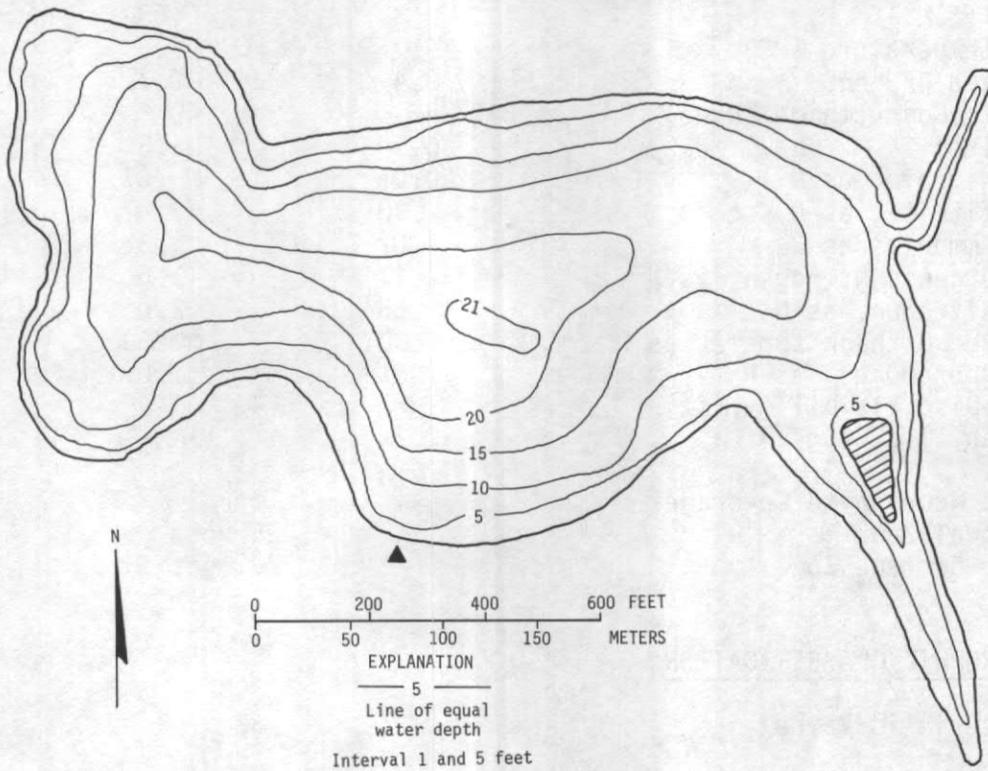
|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 60  | pct |
| Number of Nearshore Homes  | 59  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 23  | pct |
| Agricultural               | 17  | pct |
| Forest or Unproductive     | 54  | pct |
| Lake Surface               | 6   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in mg/L unless otherwise indicated)

|                                |              |         |
|--------------------------------|--------------|---------|
| Date                           | July 9, 1981 |         |
| Depth (ft)                     | 3            | 18      |
| Water Temperature (°C)         | 19.1         | 10.7    |
| Dissolved Oxygen               | 7.2          | 0.0     |
| Specific Conductance (umho)    | 147          | 175     |
| pH (units)                     | 7.0          | 6.9     |
| Total Nitrate, as N            | 0.05         | .01     |
| Total Nitrite, as N            | .00          | .00     |
| Total Ammonia, as N            | .16          | .98     |
| Total Organic Nitrogen, as N   | 1.3          | 1.3     |
| Total Nitrogen, as N           | 1.6          | 2.3     |
| Dissolved Orthophosphate, as P | .06          | .92     |
| Total Phosphorus, as P         | .19          | .95     |
| Secchi-Disc Visibility (ft)    |              | 10      |
| Chlorophyll <u>a</u> (ug/L)    | 1.98         | --      |
| Aquatic Macrophyte Coverage    |              |         |
| Littoral Zone                  |              | 25 pct  |
| Water-Surface Zone             |              | < 5 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 193 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 44  |
| TSI <sub>TP</sub>                   | 80  |
| TSI <sub>Chl</sub>                  | 37  |



Ketchum Lake, Snohomish County. Photo taken July 9, 1981, view southwesterly.  
 Bathymetric map from U.S. Geological Survey, June 15, 1981.

KI LAKE

SNOHOMISH COUNTY

WRIA 05

T31N-R04E-23

LATITUDE 48° 09' 25" LONGITUDE 122° 15' 45"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.72 mi <sup>2</sup> |
| Altitude                | 414 ft               |
| Lake Area               | 98 acres             |
| Lake Volume             | 3,300 acre-ft        |
| Mean Depth              | 33 ft                |
| Maximum Depth           | 70 ft                |
| Shoreline Length        | 1.9 mi               |
| Shoreline Configuration | 1.3                  |
| Development of Volume   | 0.47                 |
| Bottom Slope            | 3.0 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 85 | pct |
| Number of Nearshore Homes  | 87 |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 11 | pct |
| Agricultural               | 6  | pct |
| Forest or Unproductive     | 62 | pct |
| Lake Surface               | 21 | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

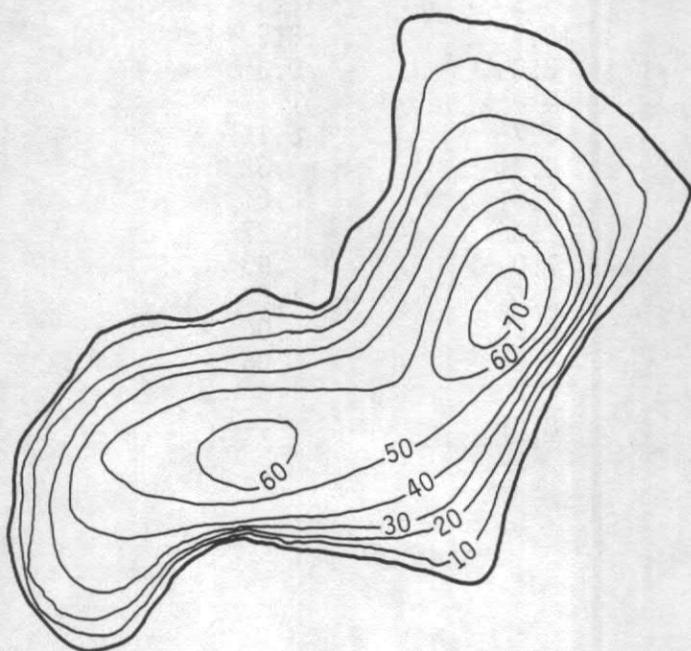
Date

July 6, 1981

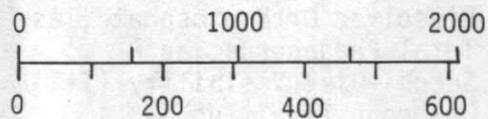
|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 63     |
| Water Temperature (°C)         | 19.7 | 7.6    |
| Dissolved Oxygen               | 9.4  | 0.7    |
| Specific Conductance (umho)    | 38   | 40     |
| pH (units)                     | 6.3  | 5.8    |
| Total Nitrate, as N            | 0.01 | .07    |
| Total Nitrite, as N            | .00  | .01    |
| Total Ammonia, as N            | .07  | .31    |
| Total Organic Nitrogen, as N   | .47  | 1.6    |
| Total Nitrogen, as N           | .55  | 2.0    |
| Dissolved Orthophosphate, as P | .00  | .00    |
| Total Phosphorus, as P         | .01  | .09    |
| Secchi-Disc Visibility (ft)    |      | 14     |
| Chlorophyll <u>a</u> (ug/L)    | 2.22 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 25 pct |
| Water-Surface Zone             |      | 20 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 63 |
| Trophic State Index (Carlson, 1977) |    |
| TSI <sub>SD</sub>                   | 39 |
| TSI <sub>TP</sub>                   | 37 |
| TSI <sub>Chl</sub>                  | 38 |



N



EXPLANATION

— 40 —

Line of equal  
water depth

Interval 10 feet

Ki Lake, Snohomish County. Photo taken June 3, 1978.  
Bathymetric map from Washington Department of Game, June 13, 1950.

LOMA LAKE

SNOHOMISH COUNTY

WRIA 07

T31N-R04E-35

LATITUDE 48° 08' 03" LONGITUDE 122° 15' 15"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.15 mi <sup>2</sup> |
| Altitude                | 565 ft               |
| Lake Area               | 21 acres             |
| Lake Volume             | 230 acre-ft          |
| Mean Depth              | 11 ft                |
| Maximum Depth           | 28 ft                |
| Shoreline Length        | 0.93 mi              |
| Shoreline Configuration | 1.4                  |
| Development of Volume   | 0.39                 |
| Bottom Slope            | 2.3 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 95  | pct |
| Number of Nearshore Homes  | 53  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 17  | pct |
| Agricultural               | 0   | pct |
| Forest or Unproductive     | 61  | pct |
| Lake Surface               | 22  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

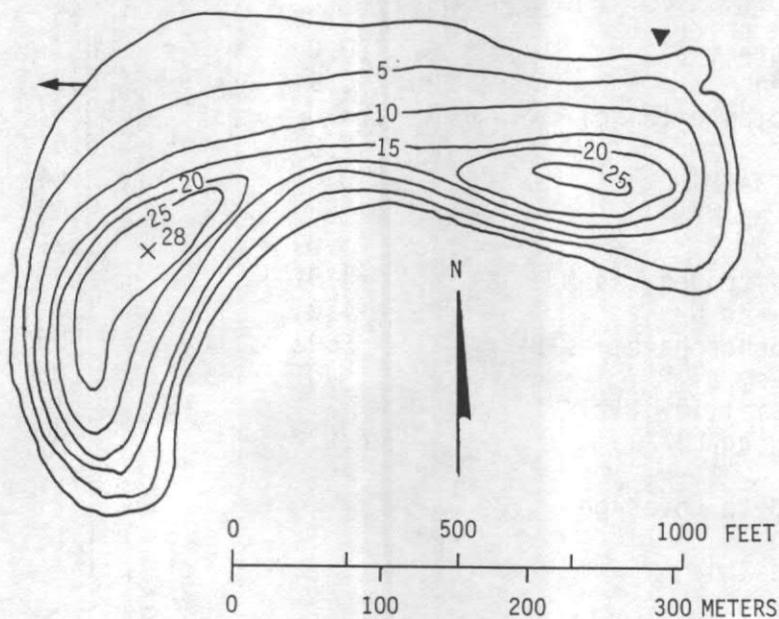
Date

June 30, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 24     |
| Water Temperature (°C)         | 18.7 | 8.7    |
| Dissolved Oxygen               | 8.8  | 0.3    |
| Specific Conductance (umho)    | 44   | 51     |
| pH (units)                     | 6.7  | 6.1    |
| Total Nitrate, as N            | 0.41 | .32    |
| Total Nitrite, as N            | .01  | .01    |
| Total Ammonia, as N            | .06  | .27    |
| Total Organic Nitrogen, as N   | 1.0  | .93    |
| Total Nitrogen, as N           | 1.5  | 1.5    |
| Dissolved Orthophosphate, as P | .05  | .06    |
| Total Phosphorus, as P         | .04  | .06    |
| Secchi-Disc Visibility (ft)    |      | 5      |
| Chlorophyll <u>a</u> (ug/L)    | 8.01 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 80 pct |
| Water-Surface Zone             |      | 5 pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 198 |
| Trophic State Index (Carlson, 1977) |     |
| TSISD                               | 54  |
| TSITP                               | 57  |
| TSICh1                              | 51  |



EXPLANATION  
 — 10 —  
 Line of equal  
 water depth  
 Interval 5 feet

Loma Lake, Snohomish County. Photo taken July 30, 1973.  
 Bathymetric map from Washington Department of Game, July 10, 1952.

MARTHA LAKE

SNOHOMISH COUNTY

WRIA 05

T31N-R04E-18

LATITUDE 48° 10' 03" LONGITUDE 122° 20' 46"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 1.63 mi <sup>2</sup> |
| Altitude                | 186 ft               |
| Lake Area               | 62 acres             |
| Lake Volume             | 2,000 acre-ft        |
| Mean Depth              | 33 ft                |
| Maximum Depth           | 70 ft                |
| Shoreline Length        | 1.8 mi               |
| Shoreline Configuration | 1.6                  |
| Development of Volume   | 0.47                 |
| Bottom Slope            | 3.8 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 80  | pct |
| Number of Nearshore Homes  | 71  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 5   | pct |
| Agricultural               | 13  | pct |
| Forest or Unproductive     | 73  | pct |
| Lake Surface               | 9   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

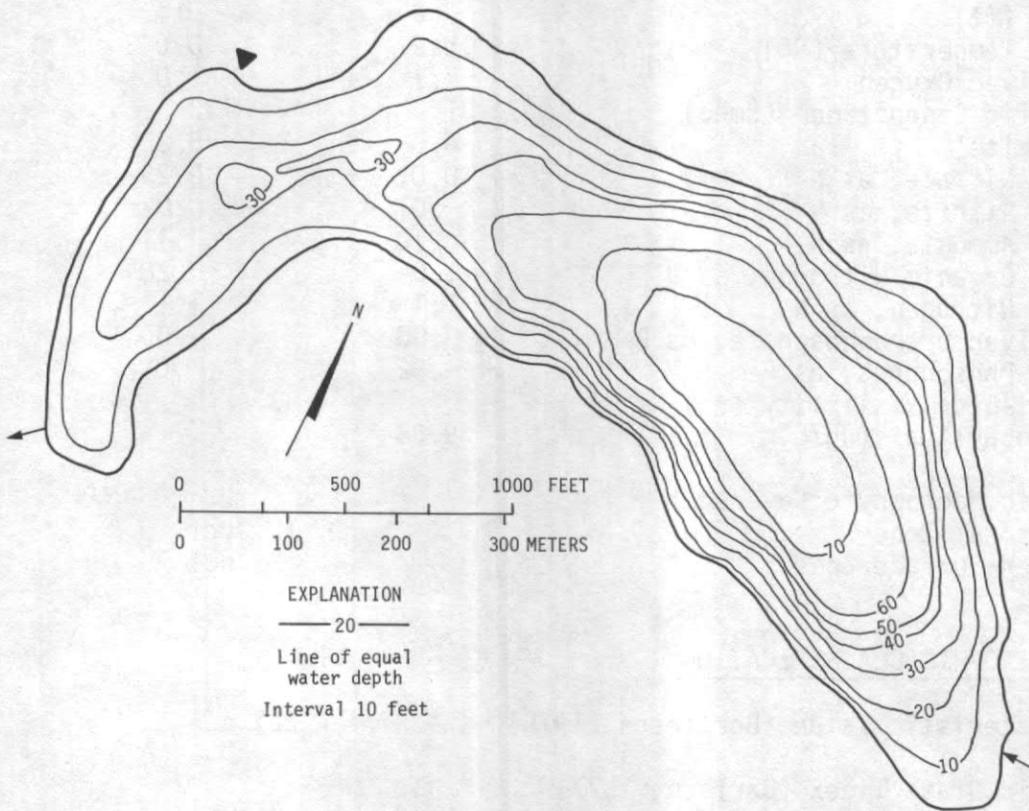
Date

June 30, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 65     |
| Water Temperature (°C)         | 20.0 | 6.7    |
| Dissolved Oxygen               | 10.5 | 0.3    |
| Specific Conductance (umho)    | 85   | 89     |
| pH (units)                     | 7.6  | 6.6    |
| Total Nitrate, as N            | 0.01 | .04    |
| Total Nitrite, as N            | .00  | .03    |
| Total Ammonia, as N            | .09  | .21    |
| Total Organic Nitrogen, as N   | .91  | .99    |
| Total Nitrogen, as N           | 1.0  | 1.3    |
| Dissolved Orthophosphate, as P | .02  | .06    |
| Total Phosphorus, as P         | .01  | .08    |
| Secchi-Disc Visibility (ft)    |      | 10     |
| Chlorophyll <u>a</u> (ug/L)    | 6.02 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 5 pct  |
| Water-Surface Zone             |      | <1 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 123 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 44  |
| TSI <sub>TP</sub>                   | 37  |
| TSI <sub>Chl</sub>                  | 48  |



Martha (31N-4E-18) Lake, Snohomish County. Photo taken May 31, 1978. Bathymetric map from Washington Department of Game, January 31, 1948.

MEADOW LAKE

SNOHOMISH COUNTY

WRIA 07

T28N-R07E-18

LATITUDE 47° 54' 50" LONGITUDE 121° 57' 52"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.73 mi <sup>2</sup> |
| Altitude                | 500 ft               |
| Lake Area               | 12 acres             |
| Lake Volume             | 170 acre-ft          |
| Mean Depth              | 14 ft                |
| Maximum Depth           | 21 ft                |
| Shoreline Length        | 1.1 mi               |
| Shoreline Configuration | 2.3                  |
| Development of Volume   | 0.66                 |
| Bottom Slope            | 2.6 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 0  | pct |
| Number of Nearshore Homes  | 0  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 8  | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 89 | pct |
| Lake Surface               | 3  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

July 7, 1981

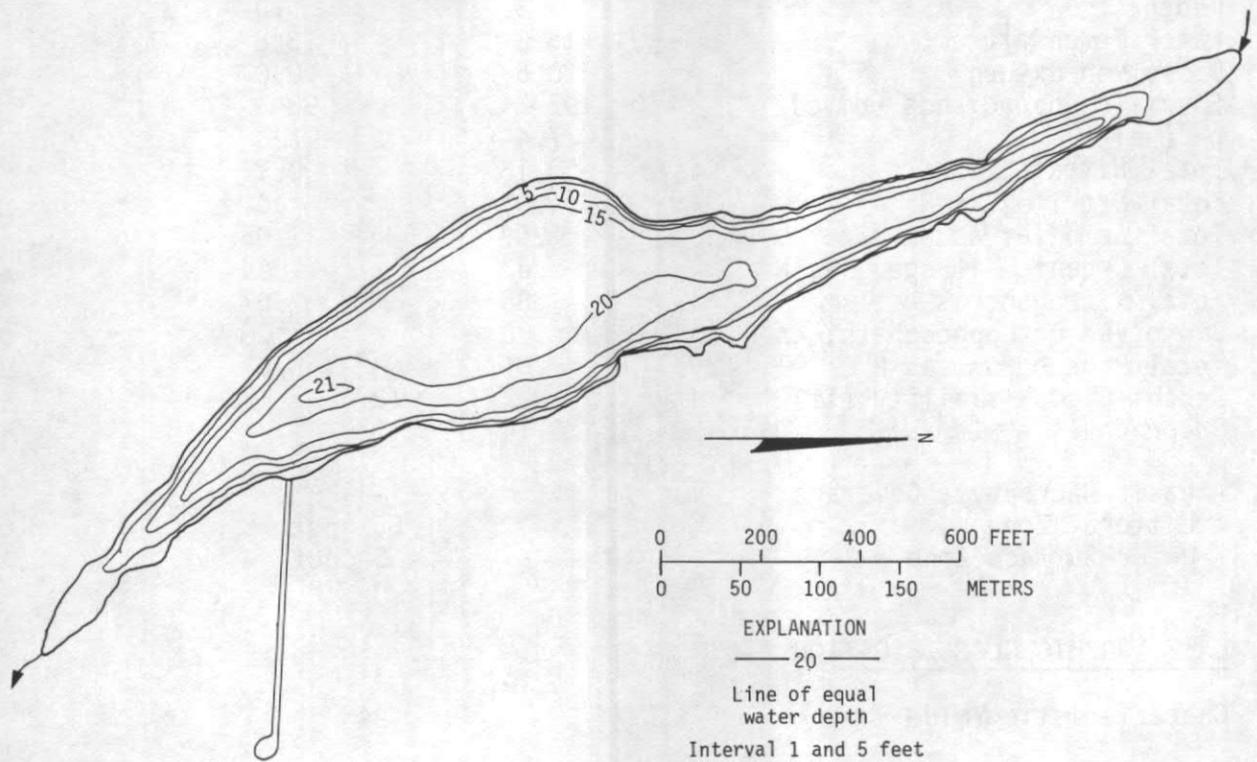
|                                |      |         |
|--------------------------------|------|---------|
| Depth (ft)                     | 3    | 14      |
| Water Temperature (°C)         | 16.9 | 8.0     |
| Dissolved Oxygen               | 7.1  | 1.0     |
| Specific Conductance (umho)    | 31   | 33      |
| pH (units)                     | 6.0  | 5.8     |
| Total Nitrate, as N            | 0.01 | 0.23    |
| Total Nitrite, as N            | .01  | .02     |
| Total Ammonia, as N            | .10  | .11     |
| Total Organic Nitrogen, as N   | 1.0  | .28     |
| Total Nitrogen, as N           | 1.1  | 1.1     |
| Dissolved Orthophosphate, as P | .00  | .00     |
| Total Phosphorus, as P         | .02  | .01     |
| Secchi-Disc Visibility (ft)    |      | 3       |
| Chlorophyll <u>a</u> (ug/L)    | 9.38 | --      |
| Aquatic Macrophyte Coverage    |      |         |
| Littoral Zone                  |      | 10 pct  |
| Water-Surface Zone             |      | < 2 pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value (Bortleson, 1978) 267

Trophic State Index (Carlson, 1977)

|        |    |
|--------|----|
| TSISD  | 61 |
| TSITP  | 47 |
| TSICh1 | 53 |



Meadow Lake, Snohomish County. Photo taken July 7, 1981, view northwesterly. Bathymetric map from U.S. Geological Survey, June 11, 1981.

MUD (TROUT) LAKE

SNOHOMISH COUNTY

WRIA 05

T31N-R07E-29

LATITUDE 48° 08' 43" LONGITUDE 121° 55' 42"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 1.29 mi <sup>2</sup> |
| Altitude                | 665 ft               |
| Lake Area               | 29 acres             |
| Lake Volume             | 166 acre-ft          |
| Mean Depth              | 6 ft                 |
| Maximum Depth           | 12 ft                |
| Shoreline Length        | 1.4 mi               |
| Shoreline Configuration | 1.8                  |
| Development of Volume   | 0.48                 |
| Bottom Slope            | 0.95 pct             |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

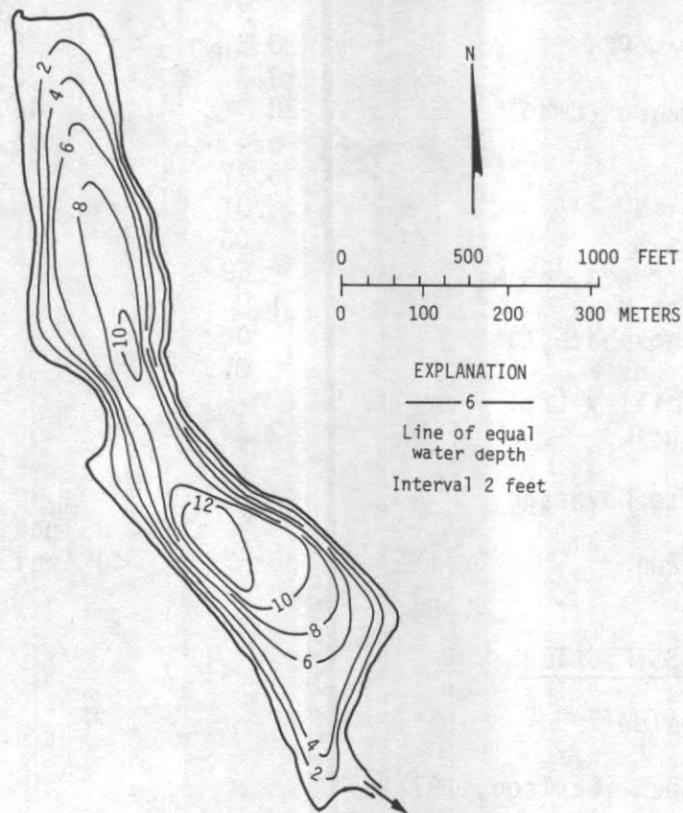
|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 0  | pct |
| Number of Nearshore Homes  | 0  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 95 | pct |
| Lake Surface               | 5  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |              |      |
|--------------------------------|--------------|------|
| Date                           | July 7, 1981 |      |
| Depth (ft)                     | 3            | 10   |
| Water Temperature (°C)         | 15.2         | 13.8 |
| Dissolved Oxygen               | 10.6         | 10.0 |
| Specific Conductance (umho)    | 92           | 96   |
| pH (units)                     | 7.4          | 7.3  |
| Total Nitrate, as N            | 0.16         | 0.17 |
| Total Nitrite, as N            | .01          | .01  |
| Total Ammonia, as N            | .08          | .05  |
| Total Organic Nitrogen, as N   | .63          | .44  |
| Total Nitrogen, as N           | .88          | .67  |
| Dissolved Orthophosphate, as P | .00          | .00  |
| Total Phosphorus, as P         | .01          | .01  |
| Secchi-Disc Visibility (ft)    | >12          | --   |
| Chlorophyll <u>a</u> (ug/L)    | 3.14         | --   |
| Aquatic Macrophyte Coverage    |              |      |
| Littoral Zone                  | 85           | pct  |
| Water-Surface Zone             | 5            | pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 84 |
| Trophic State Index (Carlson, 1977) |    |
| TSI <sub>SD</sub>                   | 41 |
| TSI <sub>TP</sub>                   | 37 |
| TSI <sub>Chl</sub>                  | 42 |



Mud (Trout) (31N-7E-29) Lake, Snohomish County. Photo taken July 7, 1981, view northerly. Bathymetric map from Washington Department of Game, April 20, 1956.

ROESIGER LAKE (NORTH ARM)

SNOHOMISH COUNTY

WRIA 07

T29N-R07E-28

LATITUDE 47° 59' 17" LONGITUDE 121° 55' 04"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 1.95 mi <sup>2</sup> |
| Altitude                | 570 ft               |
| Lake Area               | 200 acres            |
| Lake Volume             | 9,600 acre-ft        |
| Mean Depth              | 48 ft                |
| Maximum Depth           | 110 ft               |
| Shoreline Length        | 2.9 mi               |
| Shoreline Configuration | 1.5                  |
| Development of Volume   | 0.43                 |
| Bottom Slope            | 3.3 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 100 | pct |
| Number of Nearshore Homes  | 200 |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 9   | pct |
| Agricultural               | 0   | pct |
| Forest or Unproductive     | 75  | pct |
| Lake Surface               | 16  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in mg/L unless otherwise indicated)

Date

July 6, 1981

|                                |      |     |
|--------------------------------|------|-----|
| Depth (ft)                     | 3    | 88  |
| Water Temperature (°C)         | 20.3 | 5.1 |
| Dissolved Oxygen               | 9.3  | 0.2 |
| Specific Conductance (umho)    | 28   | 48  |
| pH (units)                     | 6.4  | 6.0 |
| Total Nitrate, as N            | 0.27 | .01 |
| Total Nitrite, as N            | .01  | .01 |
| Total Ammonia, as N            | .06  | .38 |
| Total Organic Nitrogen, as N   | .68  | .43 |
| Total Nitrogen, as N           | 1.0  | .83 |
| Dissolved Orthophosphate, as P | .00  | .00 |
| Total Phosphorus, as P         | .01  | .01 |
| Secchi-Disc Visibility (ft)    |      | 17  |
| Chlorophyll <u>a</u> (ug/L)    | 2.34 | --  |

Aquatic Macrophyte Coverage

Littoral Zone

1 pct

Water-Surface Zone

&lt;1 pct

LAKE TROPHIC CLASSIFICATION

Characteristic Value

72

Trophic State Index (Carlson, 1977)

TSISD

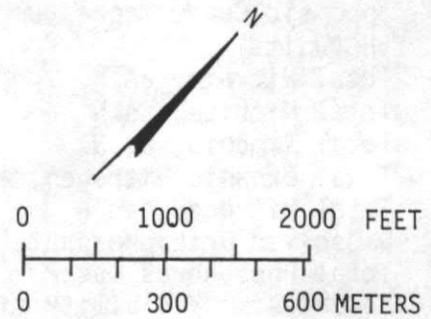
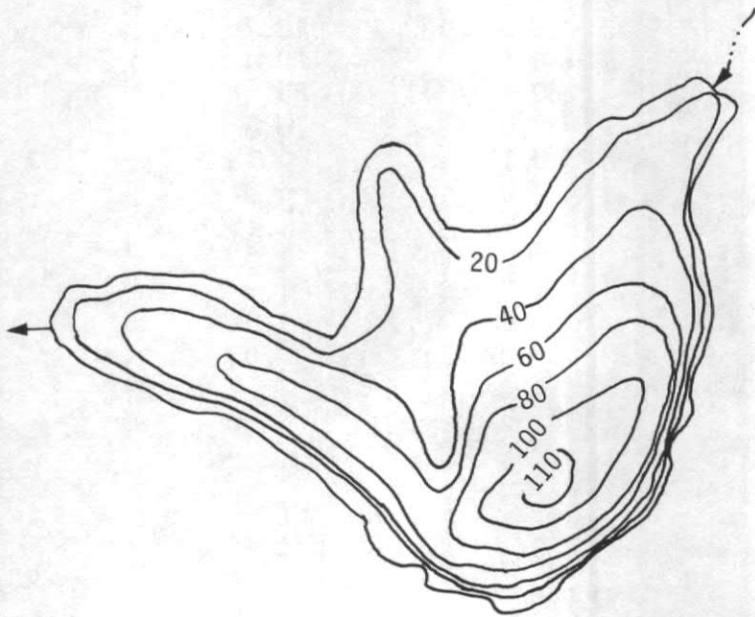
36

TSITP

37

TSICh1

39



EXPLANATION  
 40  
 Line of equal  
 water depth  
 Interval 20 and 10 feet

Roesiger (north arm) (29N-7E-28) Lake, Snohomish County. Photo taken July 6, 1981, view northwesterly. Bathymetric map from Washington Department of Game, February 5, 1952.

RUGGS LAKE

SNOHOMISH COUNTY

WRIA 07

T28N-R05E-29

LATITUDE 47° 52' 58" LONGITUDE 122° 11' 25"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.90 mi <sup>2</sup> |
| Altitude                | 390 ft               |
| Lake Area               | 11 acres             |
| Lake Volume             | 77 acre-ft           |
| Mean Depth              | 7 ft                 |
| Maximum Depth           | 16 ft                |
| Shoreline Length        | 0.59 mi              |
| Shoreline Configuration | 1.3                  |
| Development of Volume   | 0.45                 |
| Bottom Slope            | 2.1 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 70 | pct |
| Number of Nearshore Homes  | 20 |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 67 | pct |
| Agricultural               | 7  | pct |
| Forest or Unproductive     | 24 | pct |
| Lake Surface               | 2  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

July 1, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 13   |
| Water Temperature (°C)         | 18.5 | 13.7 |
| Dissolved Oxygen               | 6.6  | 0.4  |
| Specific Conductance (umho)    | 80   | 85   |
| pH (units)                     | 7.0  | 6.8  |
| Total Nitrate, as N            | 0.19 | .18  |
| Total Nitrite, as N            | .01  | .01  |
| Total Ammonia, as N            | .12  | .15  |
| Total Organic Nitrogen, as N   | .73  | 1.2  |
| Total Nitrogen, as N           | 1.1  | 1.5  |
| Dissolved Orthophosphate, as P | .02  | .02  |
| Total Phosphorus, as P         | .01  | .03  |
| Secchi-Disc Visibility (ft)    |      | 8    |
| Chlorophyll <u>a</u> (ug/L)    | 2.48 | --   |

Aquatic Macrophyte Coverage

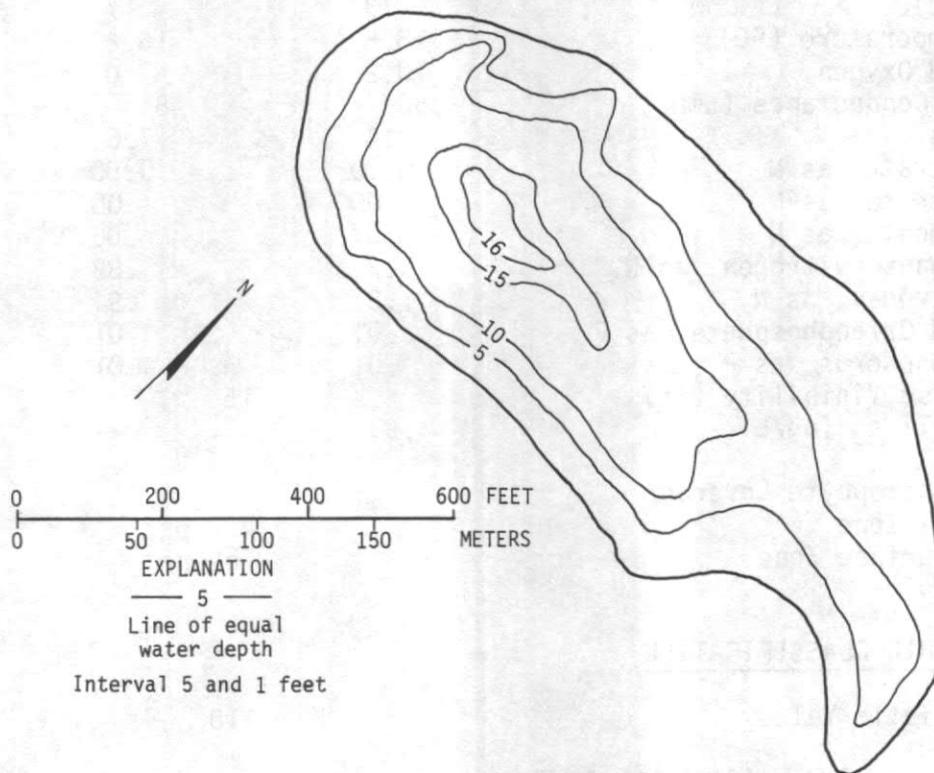
|                    |    |     |
|--------------------|----|-----|
| Littoral Zone      | 98 | pct |
| Water-Surface Zone | 40 | pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 111

Trophic State Index (Carlson, 1977)

|        |    |
|--------|----|
| TSISD  | 47 |
| TSITP  | 37 |
| TSICh1 | 39 |



Ruggs Lake, Snohomish County. Photo taken July 1, 1981, view northwesterly.  
Bathymetric map from U.S. Geological Survey, June 21, 1981.

SERENE LAKE

SNOHOMISH COUNTY

WRIA 08

T28N-R04E-34

LATITUDE 47° 52' 18" LONGITUDE 122° 17' 20"

PHYSICAL DATA

Drainage area 0.46 mi<sup>2</sup>  
 Altitude 535 ft  
 Lake Area 42 acres  
 Lake Volume 580 acre-ft  
 Mean Depth 14 ft  
 Maximum Depth 23 ft  
 Shoreline Length 1.3 mi  
 Shoreline Configuration 1.4  
 Development of Volume 0.60  
 Bottom Slope 1.5 pct  
 Surface Inflow No  
 Surface Outflow Yes

CULTURAL DATA

Residential Development 95 pct  
 Number of Nearshore Homes 89  
 Land Use in Drainage Basin  
 Residential-Urban 6 pct  
 Residential-Suburban 50 pct  
 Agricultural 12 pct  
 Forest or Unproductive 18 pct  
 Lake Surface 14 pct  
 Public Boat Access to Lake Yes

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date July 1, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 17   |
| Water Temperature (°C)         | 18.5 | 16.6 |
| Dissolved Oxygen               | 10.2 | 7.0  |
| Specific Conductance (umho)    | 80   | 81   |
| pH (units)                     | 7.4  | 7.6  |
| Total Nitrate, as N            | 0.00 | 0.00 |
| Total Nitrite, as N            | .00  | .00  |
| Total Ammonia, as N            | .07  | .06  |
| Total Organic Nitrogen, as N   | 1.2  | .88  |
| Total Nitrogen, as N           | 1.3  | .94  |
| Dissolved Orthophosphate, as P | .01  | .01  |
| Total Phosphorus, as P         | .01  | .01  |
| Secchi-Disc Visibility (ft)    |      | 15   |
| Chlorophyll <u>a</u> (ug/L)    | .93  | --   |

Aquatic Macrophyte Coverage

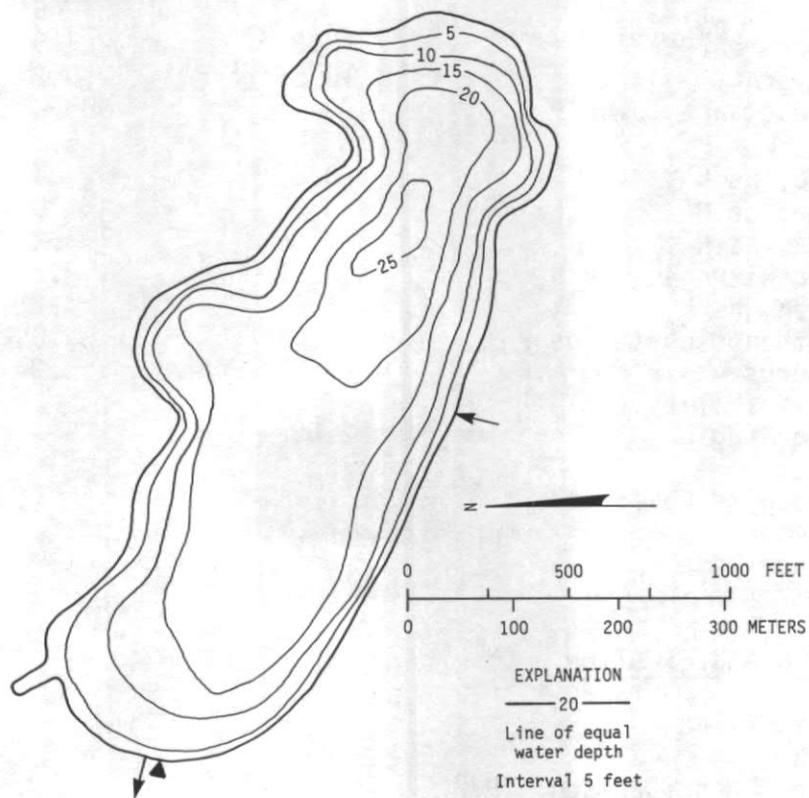
|                    |        |
|--------------------|--------|
| Littoral Zone      | 40 pct |
| Water-Surface Zone | 5 pct  |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 110

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 38 |
| TSI <sub>TP</sub>  | 37 |
| TSI <sub>Chl</sub> | 30 |



Serene (28N-4E-34) Lake, Snohomish County. Photo taken July 1, 1981, view southeasterly. Bathymetric map from Washington Department of Game, January 21, 1948.

SILVER LAKE

SNOHOMISH COUNTY

WRIA 08

T28N-R05E-30

LATITUDE 47° 53' 18" LONGITUDE 122° 12' 31"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 1.09 mi <sup>2</sup> |
| Altitude                | 426 ft               |
| Lake Area               | 110 acres            |
| Lake Volume             | 2,500 acre-ft        |
| Mean Depth              | 24 ft                |
| Maximum Depth           | 51 ft                |
| Shoreline Length        | 1.8 mi               |
| Shoreline Configuration | 1.2                  |
| Development of Volume   | 0.47                 |
| Bottom Slope            | 2.1 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 85  | pct |
| Number of Nearshore Homes  | 76  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 8   | pct |
| Residential-Suburban       | 31  | pct |
| Agricultural               | 9   | pct |
| Forest or Unproductive     | 37  | pct |
| Lake Surface               | 15  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

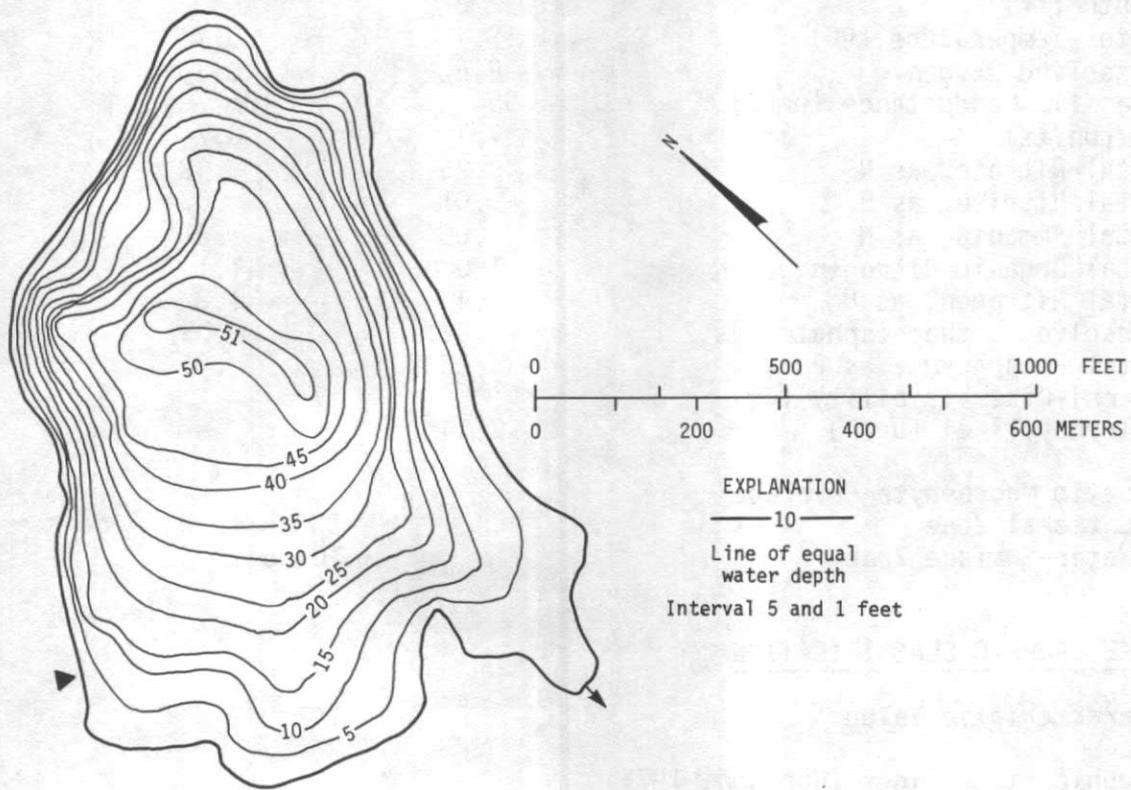
Date

July 1, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 46     |
| Water Temperature (°C)         | 18.8 | 7.9    |
| Dissolved Oxygen               | 10.3 | 0.2    |
| Specific Conductance (umho)    | 78   | 83     |
| pH (units)                     | 7.2  | 6.6    |
| Total Nitrate, as N            | 0.05 | .13    |
| Total Nitrite, as N            | .00  | .02    |
| Total Ammonia, as N            | .06  | .22    |
| Total Organic Nitrogen, as N   | .91  | .77    |
| Total Nitrogen, as N           | 1.0  | 1.1    |
| Dissolved Orthophosphate, as P | .01  | .04    |
| Total Phosphorus, as P         | .01  | .04    |
| Secchi-Disc Visibility (ft)    |      | 16     |
| Chlorophyll <u>a</u> (ug/L)    | 2.85 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 10 pct |
| Water-Surface Zone             |      | <2 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 93 |
| Trophic State Index (Carlson, 1977) |    |
| TSI <sub>SD</sub>                   | 37 |
| TSI <sub>TP</sub>                   | 37 |
| TSI <sub>Chl</sub>                  | 41 |



Silver (28N-5E-30) Lake, Snohomish County. Photo taken July 1, 1981, view northeasterly. Bathymetric map from Washington Department of Game, July 18, 1947.

STICKNEY LAKE

SNOHOMISH COUNTY

WRIA 08

T28N-R04E-35

LATITUDE 47° 52' 29" LONGITUDE 122° 15' 25"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 3.56 mi <sup>2</sup> |
| Altitude                | 450 ft               |
| Lake Area               | 19 acres             |
| Lake Volume             | 280 acre-ft          |
| Mean Depth              | 15 ft                |
| Maximum Depth           | 34 ft                |
| Shoreline Length        | 0.96 mi              |
| Shoreline Configuration | 1.6                  |
| Development of Volume   | 0.45                 |
| Bottom Slope            | 3.4 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 60  | pct |
| Number of Nearshore Homes  | 27  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 4   | pct |
| Residential-Suburban       | 18  | pct |
| Agricultural               | 8   | pct |
| Forest or Unproductive     | 69  | pct |
| Lake Surface               | 1   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

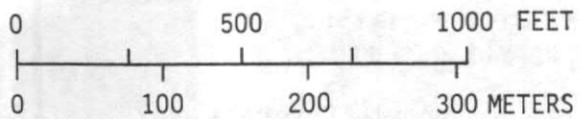
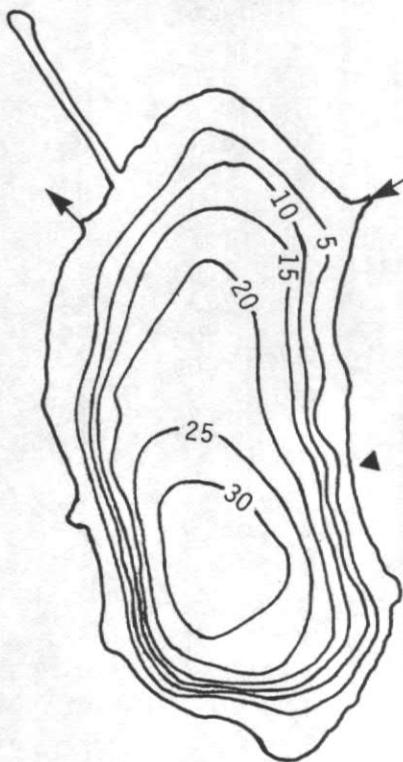
Date July 1, 1981

|                                |      |     |
|--------------------------------|------|-----|
| Depth (ft)                     | 3    | 30  |
| Water Temperature (°C)         | 19.1 | 6.7 |
| Dissolved Oxygen               | 8.6  | 0.3 |
| Specific Conductance (umho)    | 95   | 106 |
| pH (units)                     | 7.1  | 6.7 |
| Total Nitrate, as N            | 0.25 | .42 |
| Total Nitrite, as N            | .01  | .03 |
| Total Ammonia, as N            | .08  | .21 |
| Total Organic Nitrogen, as N   | 1.0  | 1.1 |
| Total Nitrogen, as N           | 1.4  | 1.8 |
| Dissolved Orthophosphate, as P | .02  | .03 |
| Total Phosphorus, as P         | .02  | .04 |
| Secchi-Disc Visibility (ft)    |      | 7   |
| Chlorophyll <u>a</u> (ug/L)    | 2.14 | --  |

|                             |    |     |
|-----------------------------|----|-----|
| Aquatic Macrophyte Coverage |    |     |
| Littoral Zone               | 85 | pct |
| Water-Surface Zone          | 10 | pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 142 |
| Trophic State Index (Carlson, 1977) |     |
| TSISD                               | 49  |
| TSITP                               | 47  |
| TSICh1                              | 38  |



EXPLANATION  
 — 10 —  
 Line of equal  
 water depth  
 Interval 5 feet

Stickney (28N-4E-35) Lake, Snohomish County. Photo taken July 1, 1981, view northwesterly. Bathymetric map from U.S. Geological Survey, April 17, 1973.

SWARTZ LAKE

SNOHOMISH COUNTY

WRIA 07

T30N-R07E-20

LATITUDE 48° 04' 22" LONGITUDE 121° 56' 05"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 1.54 mi <sup>2</sup> |
| Altitude                | 520 ft               |
| Lake Area               | 24 acres             |
| Lake Volume             | 408 acre-ft          |
| Mean Depth              | 17 ft                |
| Maximum Depth           | 29 ft                |
| Shoreline Length        | 1.07 mi              |
| Shoreline Configuration | 1.6                  |
| Development of Volume   | 0.58                 |
| Bottom Slope            | 2.5 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 20 | pct |
| Number of Nearshore Homes  | 8  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 5  | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 93 | pct |
| Lake Surface               | 2  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

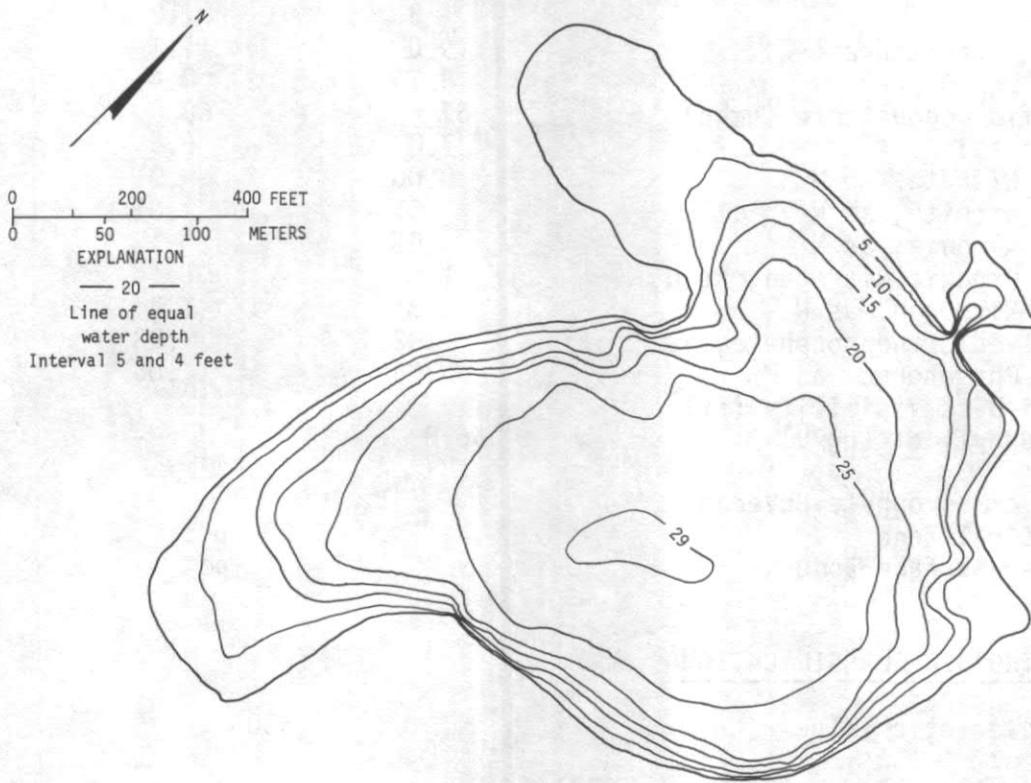
Date

July 7, 1981

|                                |      |     |
|--------------------------------|------|-----|
| Depth (ft)                     | 3    | 26  |
| Water Temperature (°C)         | 17.8 | 7.0 |
| Dissolved Oxygen               | 11.2 | 0.2 |
| Specific Conductance (umho)    | 54   | 110 |
| pH (units)                     | 6.7  | 6.4 |
| Total Nitrate, as N            | 0.19 | .02 |
| Total Nitrite, as N            | .01  | .02 |
| Total Ammonia, as N            | .06  | 1.7 |
| Total Organic Nitrogen, as N   | .77  | 1.0 |
| Total Nitrogen, as N           | 1.0  | 2.7 |
| Dissolved Orthophosphate, as P | .00  | .04 |
| Total Phosphorus, as P         | .01  | .09 |
| Secchi-Disc Visibility (ft)    |      | 8   |
| Chlorophyll <u>a</u> (ug/L)    | 4.74 | --  |
| Aquatic Macrophyte Coverage    |      |     |
| Littoral Zone                  | 80   | pct |
| Water-Surface Zone             | 15   | pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 122 |
| Trophic State Index (Carlson, 1977) |     |
| TSISD                               | 47  |
| TSITP                               | 37  |
| TSICh1                              | 46  |



Swartz Lake, Snohomish County. Photo taken July 7, 1981, view northwesterly. Bathymetric map from U.S. Geological Survey, June 11, 1981.

THOMAS LAKE

SNOHOMISH COUNTY

WRIA 08

T28N-R05E-33

LATITUDE 47° 52' 07" LONGITUDE 122° 11' 01"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.74 mi <sup>2</sup> |
| Altitude                | 387 ft               |
| Lake Area               | 8 acres              |
| Lake Volume             | 76 acre-ft           |
| Mean Depth              | 10 ft                |
| Maximum Depth           | 13 ft                |
| Shoreline Length        | 0.44 mi              |
| Shoreline Configuration | 1.1                  |
| Development of Volume   | 0.75                 |
| Bottom Slope            | 2.0 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 0  | pct |
| Number of Nearshore Homes  | 0  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 15 | pct |
| Agricultural               | 27 | pct |
| Forest or Unproductive     | 56 | pct |
| Lake Surface               | 2  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

July 1, 1981

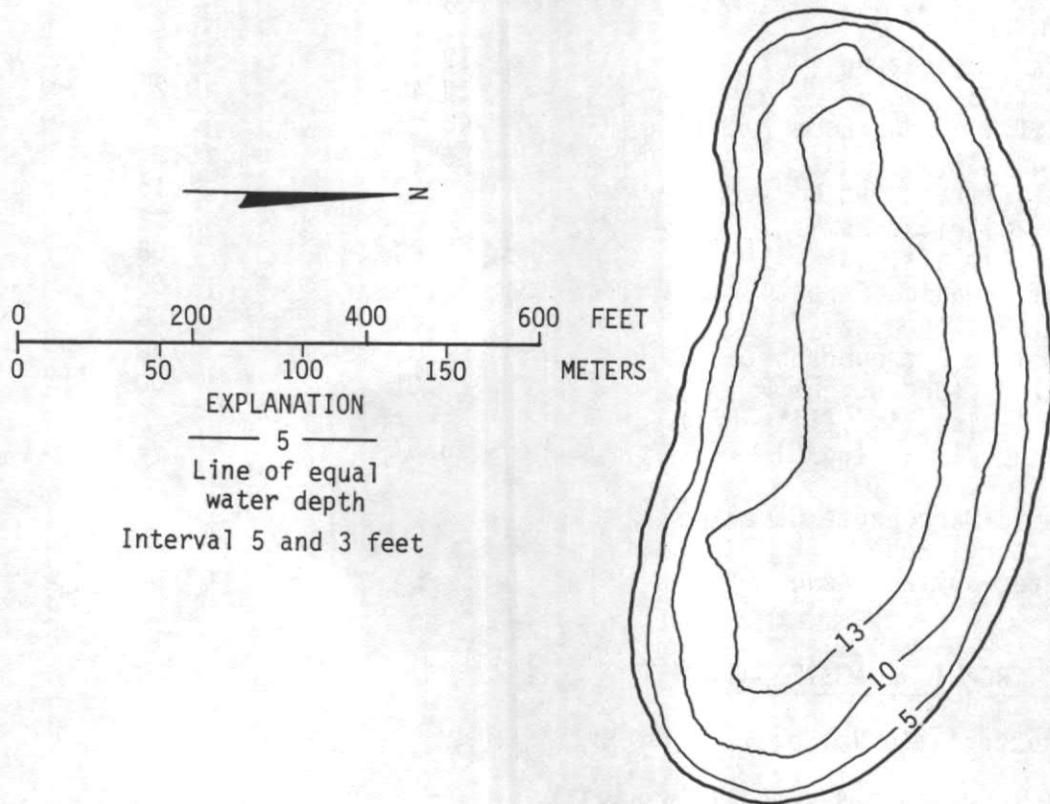
|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 12     |
| Water Temperature (°C)         | 19.0 | 11.1   |
| Dissolved Oxygen               | 8.1  | 0.4    |
| Specific Conductance (umho)    | 67   | 68     |
| pH (units)                     | 7.0  | 6.5    |
| Total Nitrate, as N            | 0.00 | .01    |
| Total Nitrite, as N            | .01  | .01    |
| Total Ammonia, as N            | .05  | .17    |
| Total Organic Nitrogen, as N   | 1.8  | 1.1    |
| Total Nitrogen, as N           | 1.8  | 1.3    |
| Dissolved Orthophosphate, as P | .02  | .03    |
| Total Phosphorus, as P         | .06  | .06    |
| Secchi-Disc Visibility (ft)    |      | 3      |
| Chlorophyll <u>a</u> (ug/L)    | 66.8 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 20 pct |
| Water-Surface Zone             |      | 1 pct  |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 530

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 61 |
| TSI <sub>TP</sub>  | 63 |
| TSI <sub>Chl</sub> | 72 |



Thomas Lake, Snohomish County. Photo taken July 1, 1981, view southwesterly. Bathymetric map from U.S. Geological Survey, June 12, 1981.

WAGNER LAKE

SNOHOMISH COUNTY

WRIA 07

T28N-R07E-29

LATITUDE 47° 52' 55" LONGITUDE 121° 56' 03"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.47 mi <sup>2</sup> |
| Altitude                | 300 ft               |
| Lake Area               | 22 acres             |
| Lake Volume             | 283 acre-ft          |
| Mean Depth              | 13 ft                |
| Maximum Depth           | 22 ft                |
| Shoreline Length        | 0.74 mi              |
| Shoreline Configuration | 1.1                  |
| Development of Volume   | 0.58                 |
| Bottom Slope            | 2.0 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 20  | pct |
| Number of Nearshore Homes  | 6   |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 31  | pct |
| Agricultural               | 0   | pct |
| Forest or Unproductive     | 63  | pct |
| Lake Surface               | 6   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

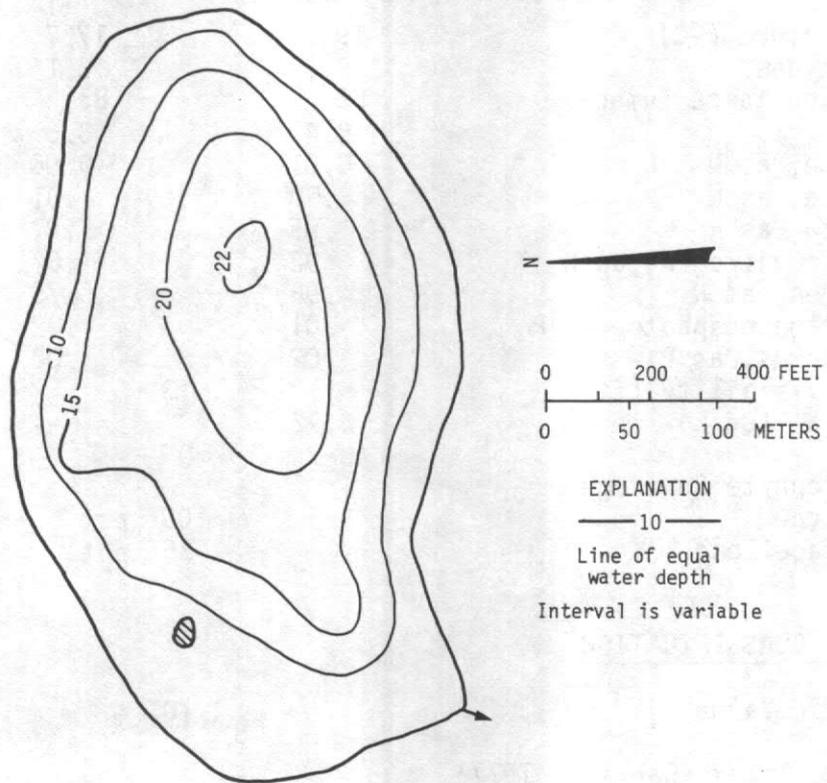
Date

July 7, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 17     |
| Water Temperature (°C)         | 19.0 | 10.4   |
| Dissolved Oxygen               | 9.4  | 0.2    |
| Specific Conductance (umho)    | 45   | 47     |
| pH (units)                     | 6.7  | 6.2    |
| Total Nitrate, as N            | 0.00 | .15    |
| Total Nitrite, as N            | .01  | .02    |
| Total Ammonia, as N            | .09  | .08    |
| Total Organic Nitrogen, as N   | .54  | .63    |
| Total Nitrogen, as N           | .64  | .88    |
| Dissolved Orthophosphate, as P | .00  | .00    |
| Total Phosphorus, as P         | .01  | .00    |
| Secchi-Disc Visibility (ft)    |      | 10     |
| Chlorophyll <u>a</u> (ug/L)    | 6.57 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 15 pct |
| Water-Surface Zone             |      | <2 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 98 |
| Trophic State Index (Carlson, 1977) |    |
| TSISD                               | 44 |
| TSITP                               | 37 |
| TSICh1                              | 49 |



Wagner Lake, Snohomish County. Photo taken July 7, 1981, view southeasterly.  
Bathymetric map from Washington Department of Game, May 24, 1949.

ELOIKA LAKE

SPOKANE COUNTY

WRIA 55

T29N-R43E-15

LATITUDE 48° 00' 34" LONGITUDE 117° 21' 52"

PHYSICAL DATA

|                         |                     |
|-------------------------|---------------------|
| Drainage area           | 111 mi <sup>2</sup> |
| Altitude                | 1,905 ft            |
| Lake Area               | 660 acres           |
| Lake Volume             | 6,000 acre-ft       |
| Mean Depth              | 9 ft                |
| Maximum Depth           | 15 ft               |
| Shoreline Length        | 5.9 mi              |
| Shoreline Configuration | 1.6                 |
| Development of Volume   | 0.61                |
| Bottom Slope            | 0.25 pct            |
| Surface Inflow          | Yes                 |
| Surface Outflow         | Yes                 |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 30  | pct |
| Number of Nearshore Homes  | 50  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | <1  | pct |
| Agricultural               | 8   | pct |
| Forest or Unproductive     | 89  | pct |
| Lake Surface               | 3   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

July 13, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 11   |
| Water Temperature (°C)         | 19.8 | 17.7 |
| Dissolved Oxygen               | 9.8  | 3.1  |
| Specific Conductance (umho)    | 82   | 83   |
| pH (units)                     | 8.4  | 8.6  |
| Total Nitrate, as N            | 0.01 | 0.00 |
| Total Nitrite, as N            | .00  | .01  |
| Total Ammonia, as N            | .05  | .07  |
| Total Organic Nitrogen, as N   | .92  | .67  |
| Total Nitrogen, as N           | .98  | .75  |
| Dissolved Orthophosphate, as P | .01  | .02  |
| Total Phosphorus, as P         | .02  | .02  |
| Secchi-Disc Visibility (ft)    |      | 13   |
| Chlorophyll <u>a</u> (ug/L)    | 3.72 | --   |

Aquatic Macrophyte Coverage

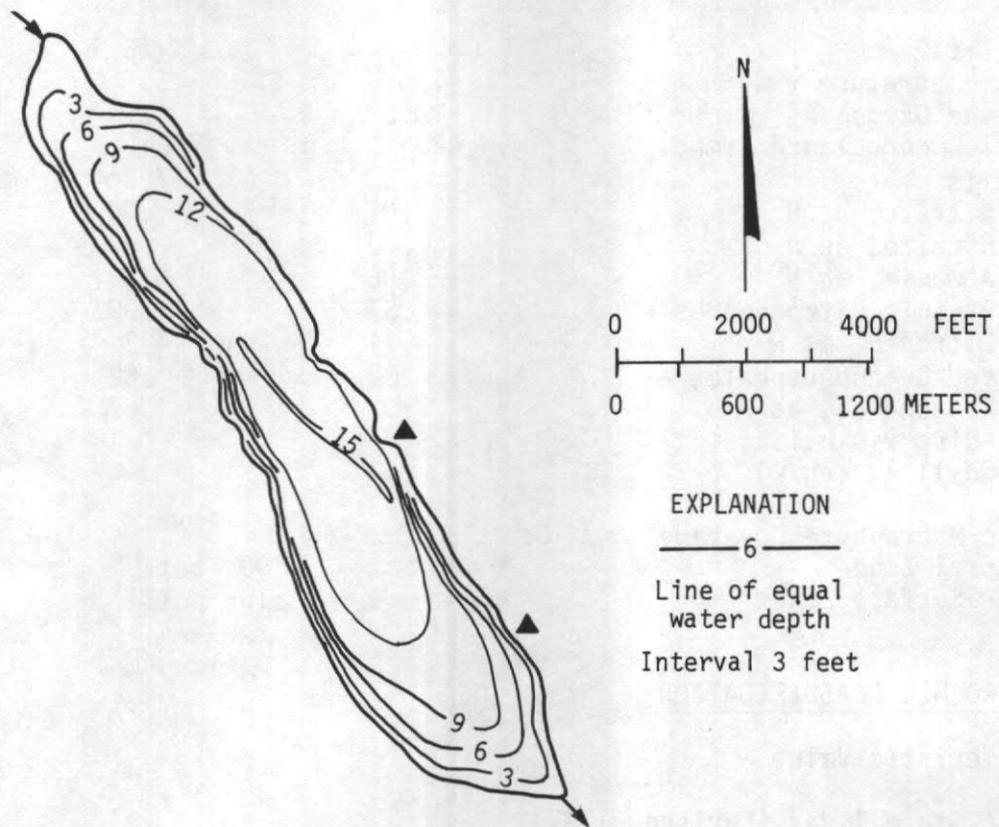
|                    |     |     |
|--------------------|-----|-----|
| Littoral Zone      | 100 | pct |
| Water-Surface Zone | 35  | pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 107

Trophic State Index (Carlson, 1977)

|        |    |
|--------|----|
| TSISD  | 40 |
| TSITP  | 47 |
| TSICh1 | 43 |



Eloika Lake, Spokane County. Photo taken June 20, 1978.  
Bathymetric map from Washington Department of Game, January 29, 1958.

BROWNS LAKE

STEVENS COUNTY

WRIA 59

T32N-R40E-31

LATITUDE 48° 13' 58" LONGITUDE 117° 48' 20"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 4.52 mi <sup>2</sup> |
| Altitude                | 2,037 ft             |
| Lake Area               | 21 acres             |
| Lake Volume             | 675 acre-ft          |
| Mean Depth              | 32 ft                |
| Maximum Depth           | 82 ft                |
| Shoreline Length        | 1.1 mi               |
| Shoreline Configuration | 1.7                  |
| Development of Volume   | 0.39                 |
| Bottom Slope            | 7.6 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 0   | pct |
| Number of Nearshore Homes  | 0   |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 0   | pct |
| Agricultural               | 0   | pct |
| Forest or Unproductive     | 98  | pct |
| Lake Surface               | 2   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

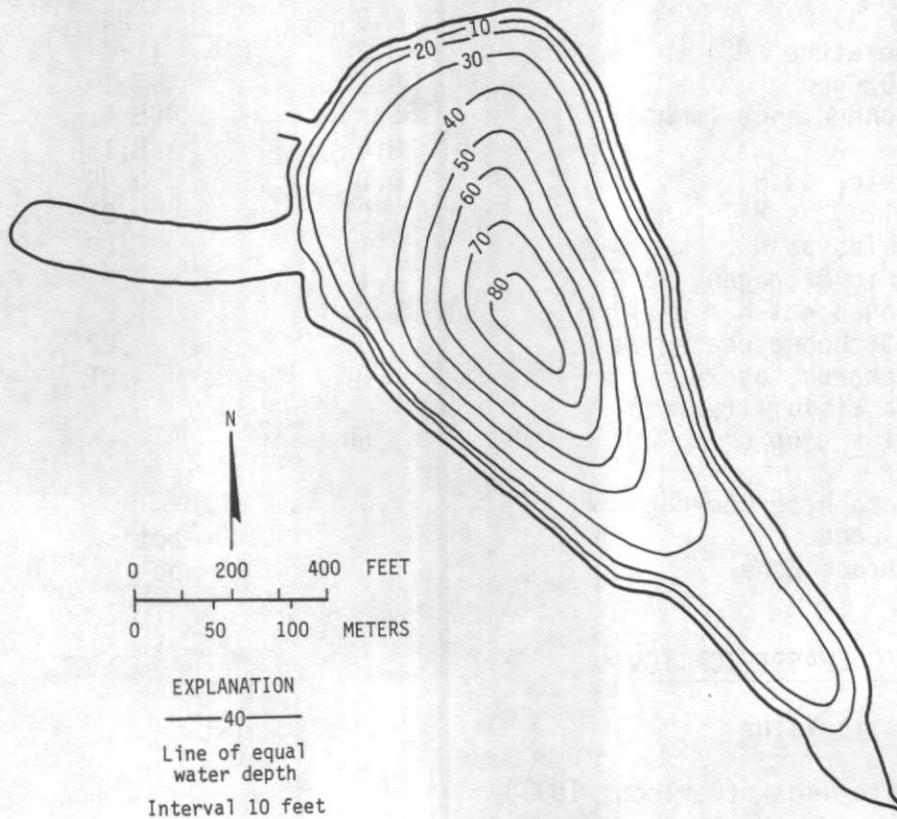
Date

July 14, 1981

|                                |      |         |
|--------------------------------|------|---------|
| Depth (ft)                     | 3    | 75      |
| Water Temperature (°C)         | 19.1 | 5.5     |
| Dissolved Oxygen               | 10.6 | 0.1     |
| Specific Conductance (umho)    | 420  | 700     |
| pH (units)                     | 8.3  | 7.2     |
| Total Nitrate, as N            | 0.01 | .00     |
| Total Nitrite, as N            | .00  | .00     |
| Total Ammonia, as N            | .06  | 4.5     |
| Total Organic Nitrogen, as N   | .67  | .00     |
| Total Nitrogen, as N           | .74  | 4.3     |
| Dissolved Orthophosphate, as P | .02  | .62     |
| Total Phosphorus, as P         | .01  | .67     |
| Secchi-Disc Visibility (ft)    |      | 27      |
| Chlorophyll <u>a</u> (ug/L)    | .53  | --      |
| Aquatic Macrophyte Coverage    |      |         |
| Littoral Zone                  |      | 90 pct  |
| Water-Surface Zone             |      | <10 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 54 |
| Trophic State Index (Carlson, 1977) |    |
| TSISD                               | 30 |
| TSITP                               | 37 |
| TSICh1                              | 24 |



Browns Lake, Stevens County. Photo taken July 14, 1981, view northerly.  
Bathymetric map from Washington Department of Game, March 10, 1952.

BUZZARD LAKE

STEVENS COUNTY

WRIA 59

T31N-R41E-14

LATITUDE 48° 11' 08" LONGITUDE 117° 35' 22"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.22 mi <sup>2</sup> |
| Altitude                | 2,730 ft             |
| Lake Area               | 13 acres             |
| Lake Volume             | 200 acre-ft          |
| Mean Depth              | 15 ft                |
| Maximum Depth           | 30 ft                |
| Shoreline Length        | 0.67 mi              |
| Shoreline Configuration | 1.3                  |
| Development of Volume   | 0.50                 |
| Bottom Slope            | 3.5 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 0  | pct |
| Number of Nearshore Homes  | 0  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 6  | pct |
| Forest or Unproductive     | 85 | pct |
| Lake Surface               | 9  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

July 14, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 24   |
| Water Temperature (°C)         | 18.2 | 11.5 |
| Dissolved Oxygen               | 9.5  | 7.1  |
| Specific Conductance (umho)    | 365  | 405  |
| pH (units)                     | 8.4  | 8.1  |
| Total Nitrate, as N            | 0.01 | 0.00 |
| Total Nitrite, as N            | .01  | .01  |
| Total Ammonia, as N            | .12  | .09  |
| Total Organic Nitrogen, as N   | 1.1  | 1.1  |
| Total Nitrogen, as N           | 1.2  | 1.2  |
| Dissolved Orthophosphate, as P | .01  | .02  |
| Total Phosphorus, as P         | .01  | .01  |
| Secchi-Disc Visibility (ft)    |      | 17   |
| Chlorophyll <u>a</u> (ug/L)    | 1.64 | --   |

Aquatic Macrophyte Coverage

Littoral Zone

100 pct

Water-Surface Zone

10 pct

LAKE TROPHIC CLASSIFICATION

Characteristic Value

101

Trophic State Index (Carlson, 1977)

TSISD

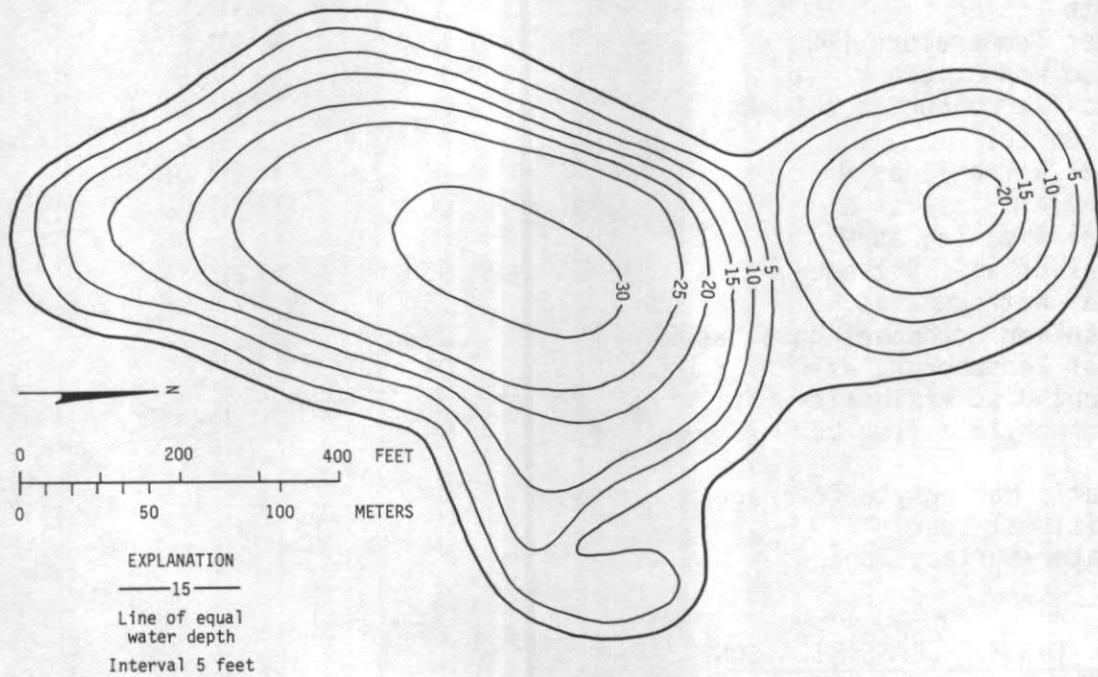
36

TSITP

37

TSICh1

35



Buzzard Lake, Stevens Lake. Photo taken July 14, 1981, view southwesterly. Bathymetric map from Washington Department of Game, January 13, 1947.

DEER LAKE

STEVENS COUNTY

WRIA 59

T30N-R41E-11

LATITUDE 48° 06' 28" LONGITUDE 117° 36' 18"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 18.2 mi <sup>2</sup> |
| Altitude                | 2,474 ft             |
| Lake Area               | 1,100 acres          |
| Lake Volume             | 57,000 acre-ft       |
| Mean Depth              | 52 ft                |
| Maximum Depth           | 75 ft                |
| Shoreline Length        | 8.6 mi               |
| Shoreline Configuration | 1.8                  |
| Development of Volume   | 0.69                 |
| Bottom Slope            | 0.96 pct             |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 85  | pct |
| Number of Nearshore Homes  | 376 |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 4   | pct |
| Agricultural               | 4   | pct |
| Forest or Unproductive     | 82  | pct |
| Lake Surface               | 10  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

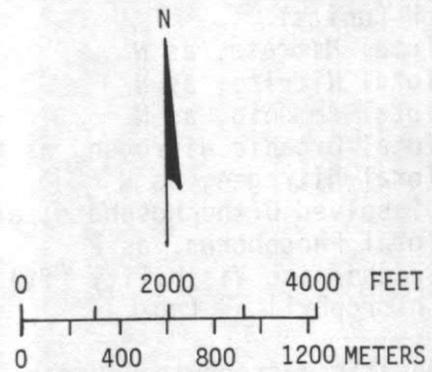
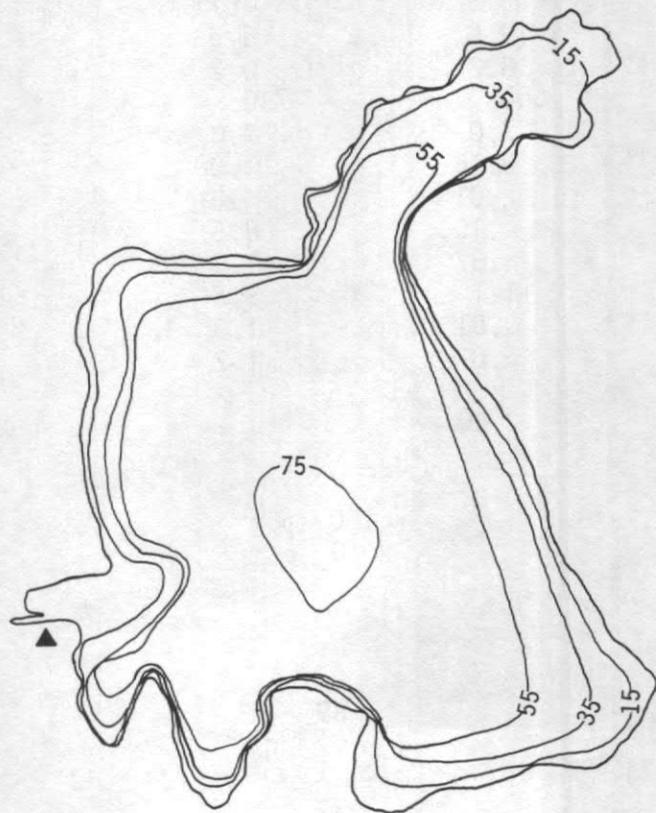
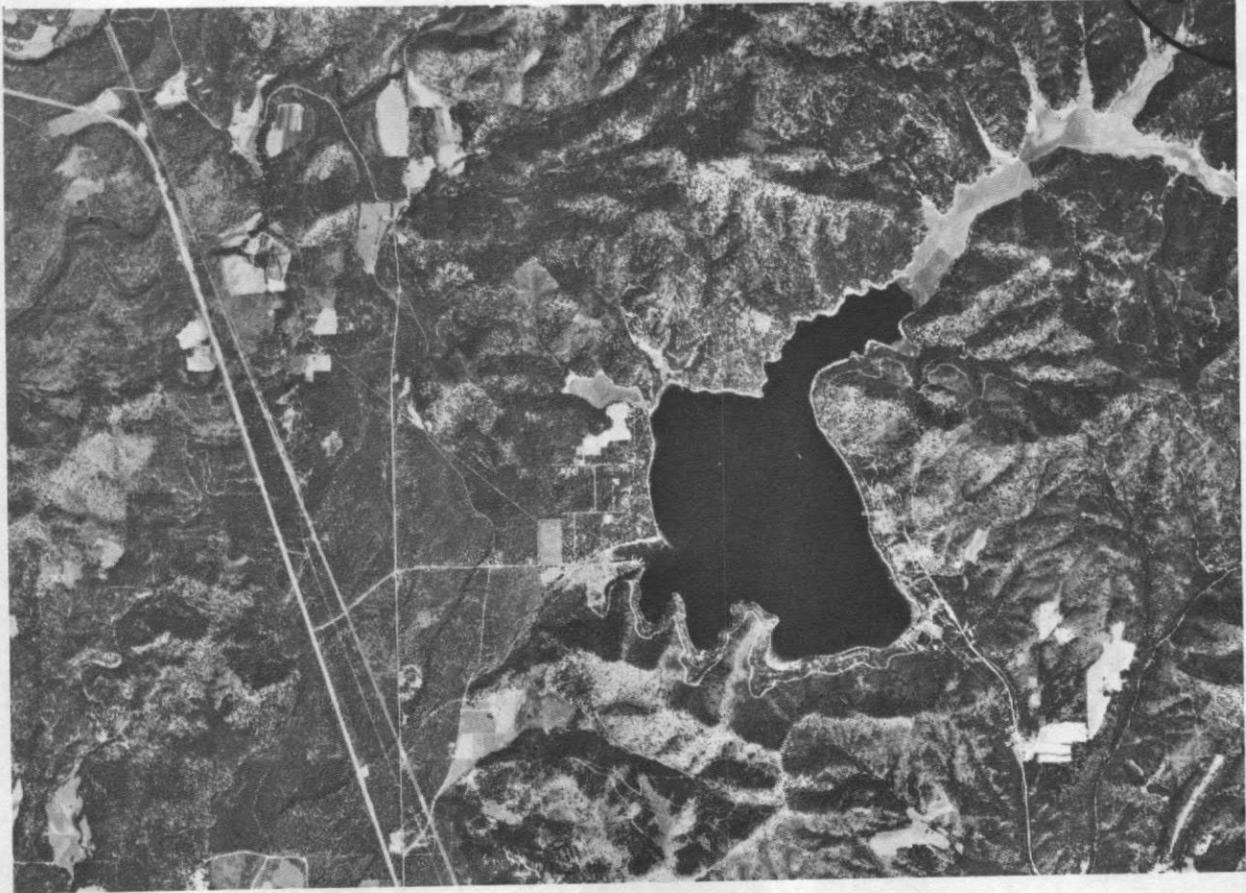
Date July 14, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 70   |
| Water Temperature (°C)         | 17.5 | 5.5  |
| Dissolved Oxygen               | 9.1  | 2.5  |
| Specific Conductance (umho)    | 79   | 81   |
| pH (units)                     | 7.5  | 6.9  |
| Total Nitrate, as N            | 0.02 | 0.01 |
| Total Nitrite, as N            | .00  | .00  |
| Total Ammonia, as N            | .08  | .06  |
| Total Organic Nitrogen, as N   | .65  | .64  |
| Total Nitrogen, as N           | .75  | .71  |
| Dissolved Orthophosphate, as P | .02  | .02  |
| Total Phosphorus, as P         | .01  | .03  |
| Secchi-Disc Visibility (ft)    | 27   |      |
| Chlorophyll <u>a</u> (ug/L)    | .99  | --   |

|                             |     |     |
|-----------------------------|-----|-----|
| Aquatic Macrophyte Coverage |     |     |
| Littoral Zone               | 10  | pct |
| Water-Surface Zone          | < 5 | pct |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 54 |
| Trophic State Index (Carlson, 1977) |    |
| TSI <sub>SD</sub>                   | 30 |
| TSI <sub>TP</sub>                   | 37 |
| TSI <sub>Chl</sub>                  | 30 |



EXPLANATION  
 — 15 —  
 Line of equal  
 water depth  
 Interval 15 and 20 feet

Deer Lake, Stevens County. Photo taken August 1, 1977.  
 Bathymetric map from Washington Department of Game, February 22, 1955.

KEOGH LAKE

STEVENS COUNTY

WRIA 59

T35N-R40E-19

LATITUDE 48° 30' 44" LONGITUDE 117° 48' 31"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 5.75 mi <sup>2</sup> |
| Altitude                | 2,180 ft             |
| Lake Area               | 18 acres             |
| Lake Volume             | 660 acre-ft          |
| Mean Depth              | 36 ft                |
| Maximum Depth           | 60 ft                |
| Shoreline Length        | 0.90 mi              |
| Shoreline Configuration | 1.5                  |
| Development of Volume   | 0.61                 |
| Bottom Slope            | 6.0 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 5  | pct |
| Number of Nearshore Homes  | 1  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 1  | pct |
| Agricultural               | 7  | pct |
| Forest or Unproductive     | 91 | pct |
| Lake Surface               | 1  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

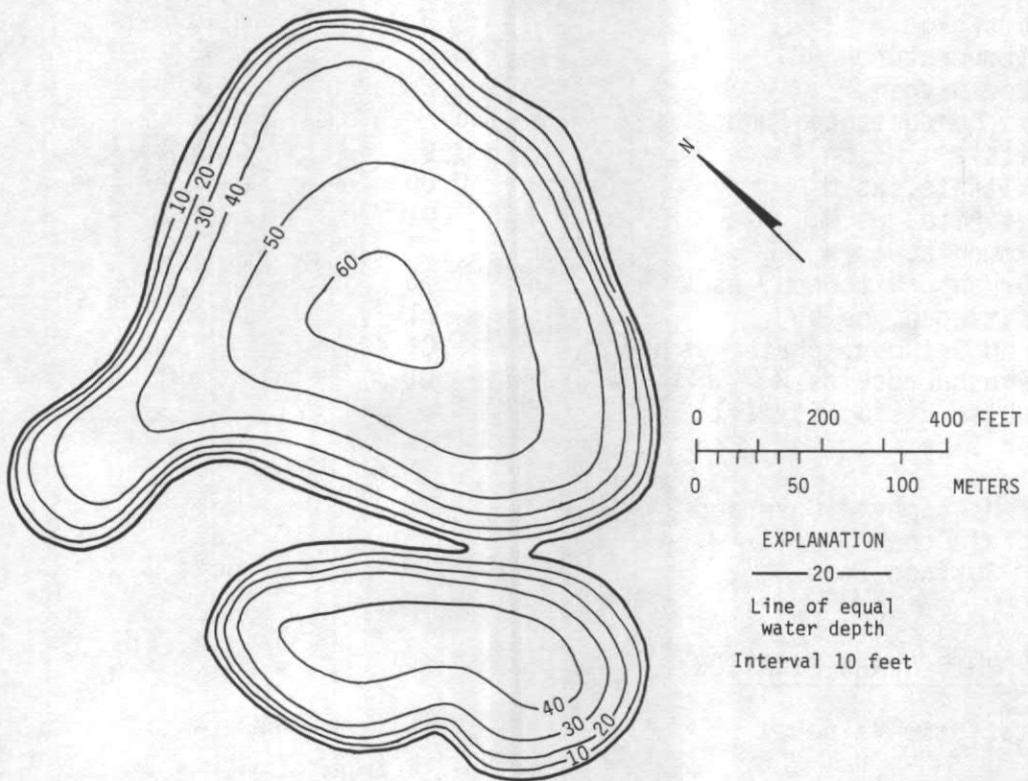
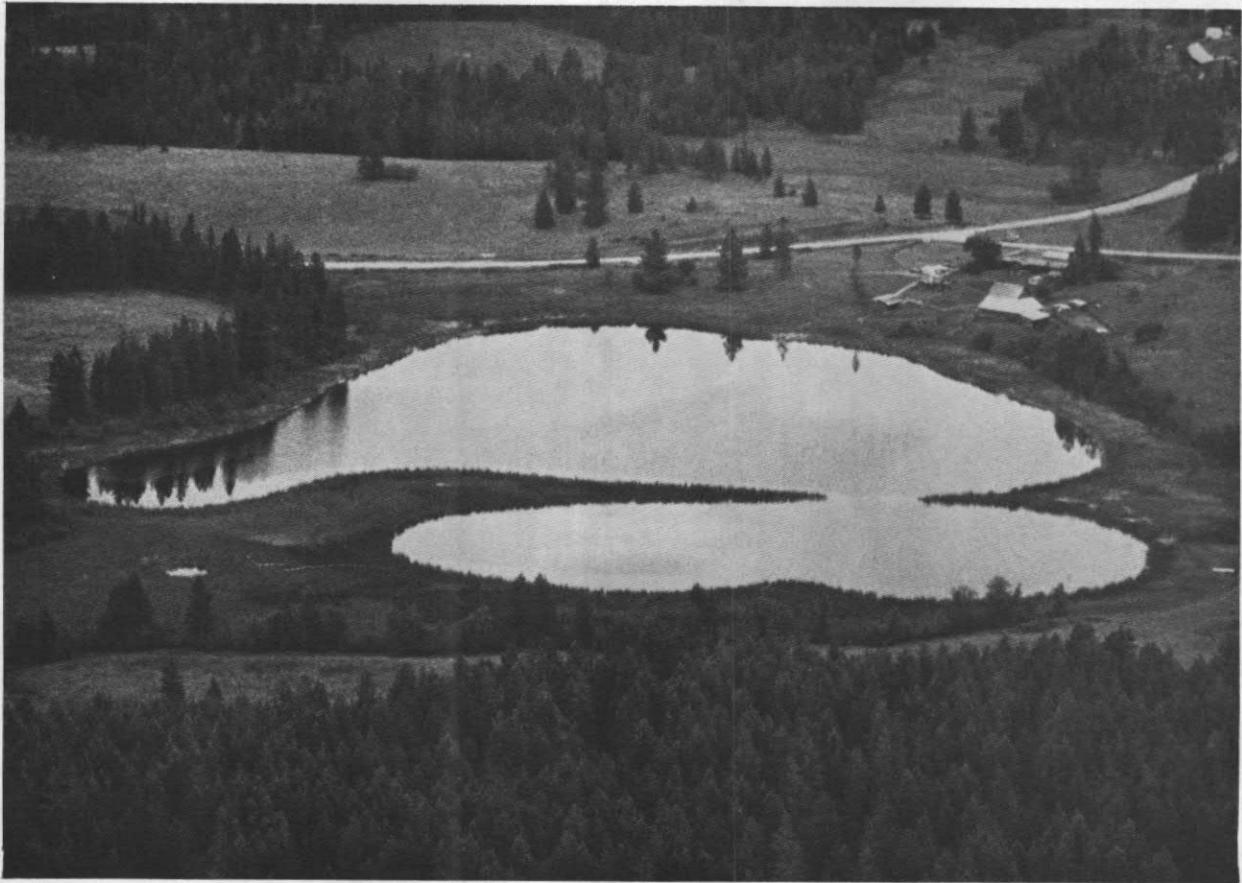
Date

July 14, 1981

|                                |      |         |
|--------------------------------|------|---------|
| Depth (ft)                     | 3    | 57      |
| Water Temperature (°C)         | 19.0 | 5.6     |
| Dissolved Oxygen               | 8.2  | 0.2     |
| Specific Conductance (umho)    | 600  | 740     |
| pH (units)                     | 7.0  | 7.0     |
| Total Nitrate, as N            | 0.10 | .00     |
| Total Nitrite, as N            | .01  | .01     |
| Total Ammonia, as N            | .10  | 8.5     |
| Total Organic Nitrogen, as N   | .87  | 1.0     |
| Total Nitrogen, as N           | 1.1  | 9.5     |
| Dissolved Orthophosphate, as P | .01  | 1.0     |
| Total Phosphorus, as P         | .01  | 1.2     |
| Secchi-Disc Visibility (ft)    |      | 16      |
| Chlorophyll <u>a</u> (ug/L)    | 2.40 | --      |
| Aquatic Macrophyte Coverage    |      |         |
| Littoral Zone                  |      | 100 pct |
| Water-Surface Zone             |      | 10 pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 89 |
| Trophic State Index (Carlson, 1977) |    |
| TSI <sub>SD</sub>                   | 37 |
| TSI <sub>TP</sub>                   | 37 |
| TSI <sub>Chl</sub>                  | 39 |



Keogh Lake, Stevens County. Photo taken July 14, 1981, view northeasterly. Bathymetric map from Washington Department of Game, March 15, 1950.

LOON LAKE

STEVENS COUNTY

WRIA 59

T30N-R41E-33

LATITUDE 48° 03' 20" LONGITUDE 117° 38' 30"

PHYSICAL DATA

Drainage area 14.1 mi<sup>2</sup>  
 Altitude 2,381 ft  
 Lake Area 1,100 acres  
 Lake Volume 52,000 acre-ft  
 Mean Depth 46 ft  
 Maximum Depth 100 ft  
 Shoreline Length 7.9 mi  
 Shoreline Configuration 1.7  
 Development of Volume 0.46  
 Bottom Slope 5.4 pct  
 Surface Inflow Yes  
 Surface Outflow Yes

CULTURAL DATA

Residential Development 85 pct  
 Number of Nearshore Homes 459  
 Land Use in Drainage Basin  
 Residential-Urban 0 pct  
 Residential-Suburban 4 pct  
 Agricultural 13 pct  
 Forest or Unproductive 71 pct  
 Lake Surface 12 pct  
 Public Boat Access to Lake Yes

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date July 14, 1981

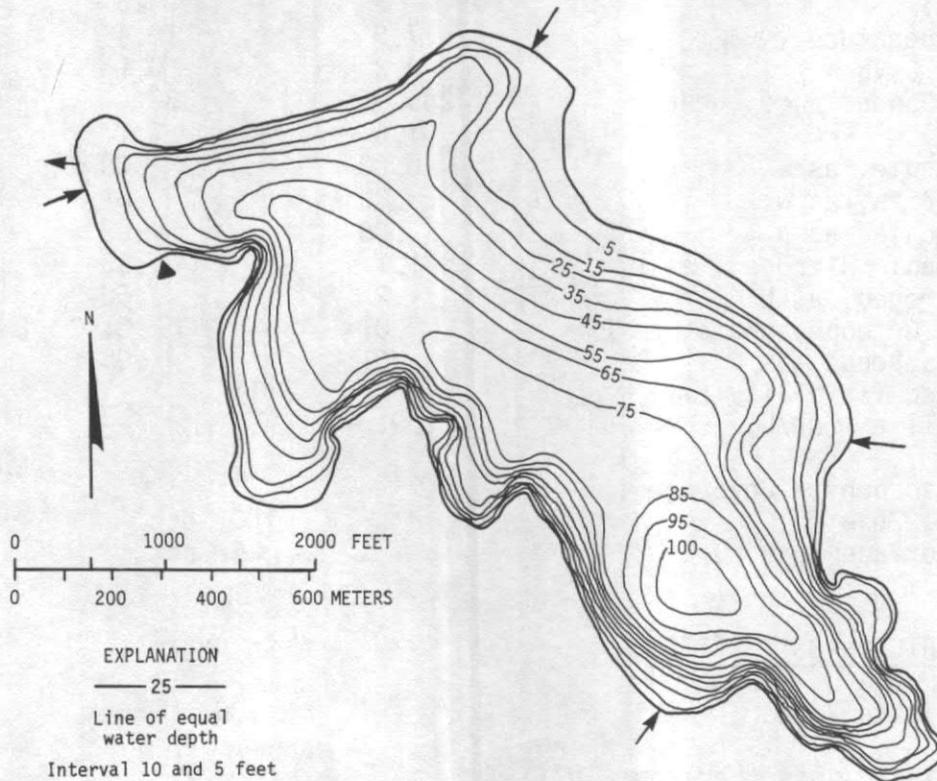
|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 85   |
| Water Temperature (°C)         | 18.0 | 6.0  |
| Dissolved Oxygen               | 9.2  | 3.3  |
| Specific Conductance (umho)    | 165  | 172  |
| pH (units)                     | 7.9  | 7.2  |
| Total Nitrate, as N            | 0.00 | 0.06 |
| Total Nitrite, as N            | .01  | .01  |
| Total Ammonia, as N            | .07  | .25  |
| Total Organic Nitrogen, as N   | .73  | .47  |
| Total Nitrogen, as N           | .81  | .79  |
| Dissolved Orthophosphate, as P | .01  | .00  |
| Total Phosphorus, as P         | .01  | .05  |
| Secchi-Disc Visibility (ft)    |      | 21   |
| Chlorophyll <u>a</u> (ug/L)    | .44  | --   |

Aquatic Macrophyte Coverage  
 Littoral Zone 10 pct  
 Water-Surface Zone <5 pct

LAKE TROPHIC CLASSIFICATION

Characteristic Value 64

Trophic State Index (Carlson, 1977)  
 TSI<sub>SD</sub> 33  
 TSI<sub>TP</sub> 37  
 TSI<sub>Chl</sub> 23



Loon Lake, Stevens County. Photo taken July 11, 1981, view southerly. Bathymetric map from Washington Department of Game, February 14, 1955.

PHALON LAKE

STEVENS COUNTY

WRIA 61

T38N-R39E-21

LATITUDE 48° 46' 50" LONGITUDE 117° 53' 45"

PHYSICAL DATA

Drainage area 2.1 mi<sup>2</sup>  
 Altitude 2,380 ft  
 Lake Area 23 acres  
 Lake Volume 346 acre-ft  
 Mean Depth 15 ft  
 Maximum Depth 25 ft  
 Shoreline Length 0.95 mi  
 Shoreline Configuration 1.4  
 Development of Volume 0.59  
 Bottom Slope 2.1 pct  
 Surface Inflow Yes  
 Surface Outflow Yes

CULTURAL DATA

Residential Development 0 pct  
 Number of Nearshore Homes 0  
 Land Use in Drainage Basin  
 Residential-Urban 0 pct  
 Residential-Suburban 0 pct  
 Agricultural 0 pct  
 Forest or Unproductive 98 pct  
 Lake Surface 2 pct  
 Public Boat Access to Lake No

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

July 15, 1981

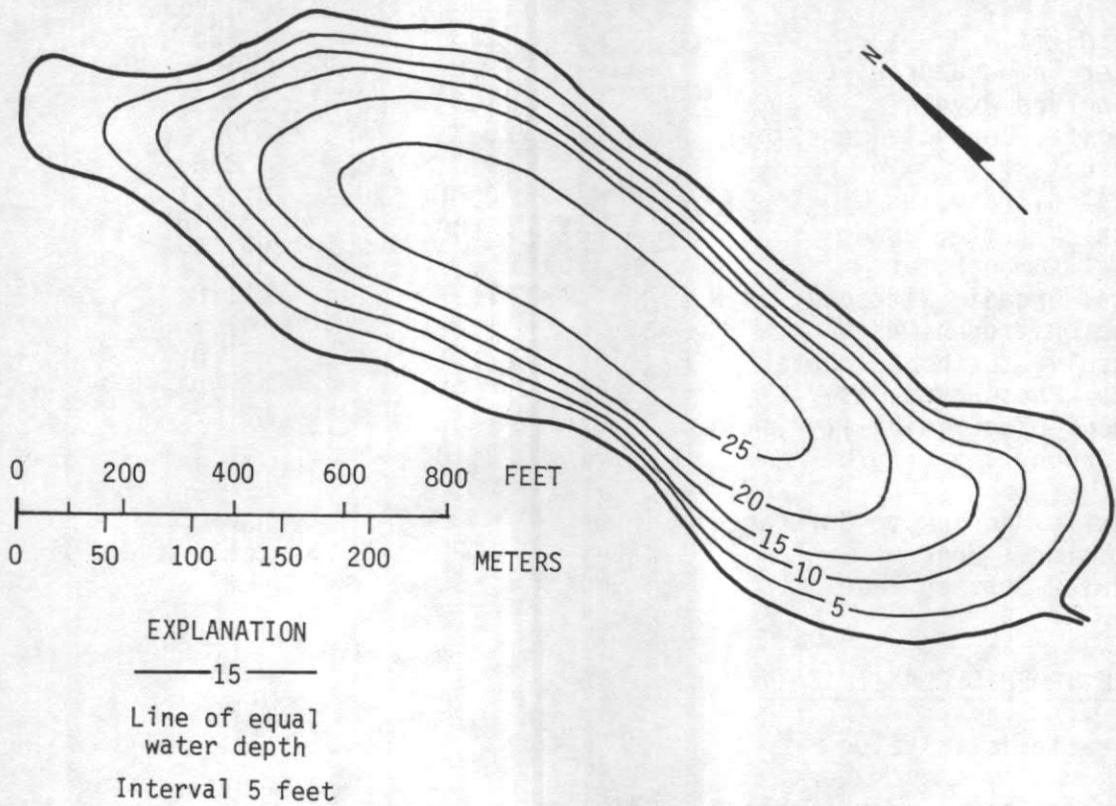
|                                |      |         |
|--------------------------------|------|---------|
| Depth (ft)                     | 3    | 26      |
| Water Temperature (°C)         | 17.9 | 10.4    |
| Dissolved Oxygen               | 8.3  | 0.1     |
| Specific Conductance (umho)    | 285  | 330     |
| pH (units)                     | 7.4  | 7.1     |
| Total Nitrate, as N            | 0.00 | .00     |
| Total Nitrite, as N            | .00  | .01     |
| Total Ammonia, as N            | .08  | .03     |
| Total Organic Nitrogen, as N   | 1.1  | .53     |
| Total Nitrogen, as N           | 1.2  | .56     |
| Dissolved Orthophosphate, as P | .01  | .01     |
| Total Phosphorus, as P         | .01  | .00     |
| Secchi-Disc Visibility (ft)    |      | 15      |
| Chlorophyll <u>a</u> (ug/L)    | 1.91 | --      |
| Aquatic Macrophyte Coverage    |      |         |
| Littoral Zone                  |      | 100 pct |
| Water-Surface Zone             |      | < 5 pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 106

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 38 |
| TSI <sub>TP</sub>  | 37 |
| TSI <sub>Chl</sub> | 37 |



Phalon Lake, Stevens County. Photo taken July 15, 1981, view northeasterly. Bathymetric map from Washington Department of Game, February 8, 1958.

ROCKY LAKE

STEVENS COUNTY

WRIA 59

T35N-R39E-34

LATITUDE 48° 29' 37" LONGITUDE 117° 52' 26"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.28 mi <sup>2</sup> |
| Altitude                | 2,220 ft             |
| Lake Area               | 20 acres             |
| Lake Volume             | 218 acre-ft          |
| Mean Depth              | 11 ft                |
| Maximum Depth           | 33 ft                |
| Shoreline Length        | 1.20 mi              |
| Shoreline Configuration | 1.9                  |
| Development of Volume   | 0.33                 |
| Bottom Slope            | 3.1 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 0   | pct |
| Number of Nearshore Homes  | 1   |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 0   | pct |
| Agricultural               | 43  | pct |
| Forest or Unproductive     | 47  | pct |
| Lake Surface               | 10  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

July 14, 1981

|                                |      |     |
|--------------------------------|------|-----|
| Depth (ft)                     | 3    | 28  |
| Water Temperature (°C)         | 19.8 | 6.7 |
| Dissolved Oxygen               | 11.4 | 0.4 |
| Specific Conductance (umho)    | 725  | 800 |
| pH (units)                     | 9.3  | 8.6 |
| Total Nitrate, as N            | 0.01 | .01 |
| Total Nitrite, as N            | .00  | .00 |
| Total Ammonia, as N            | .07  | .27 |
| Total Organic Nitrogen, as N   | 1.7  | 1.8 |
| Total Nitrogen, as N           | 1.8  | 2.1 |
| Dissolved Orthophosphate, as P | .01  | .01 |
| Total Phosphorus, as P         | .01  | .04 |
| Secchi-Disc Visibility (ft)    |      | 13  |
| Chlorophyll <u>a</u> (ug/L)    | 2.18 | --  |

Aquatic Macrophyte Coverage

  Littoral Zone

95 pct

  Water-Surface Zone

<10 pct

LAKE TROPHIC CLASSIFICATION

Characteristic Value

157

Trophic State Index (Carlson, 1977)

  TSI<sub>SD</sub>

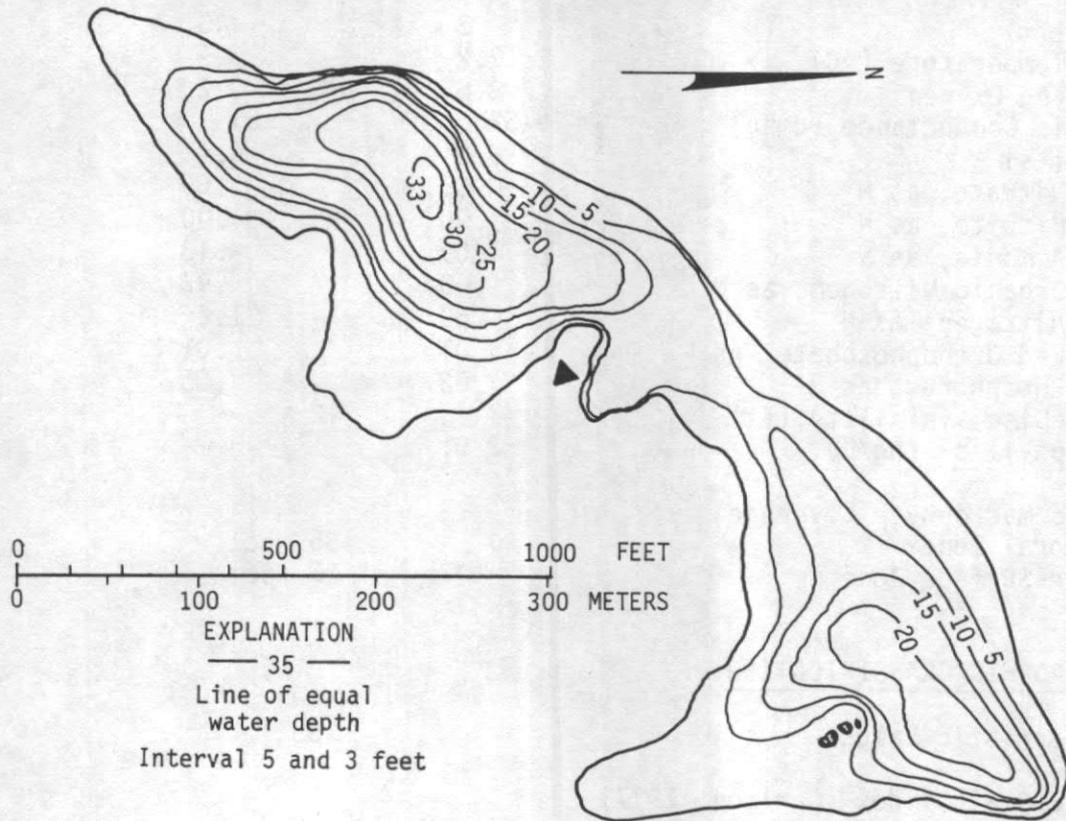
40

  TSI<sub>TP</sub>

37

  TSI<sub>Chl</sub>

38



Rocky Lake, Stevens County. Photo taken July 14, 1981, view westerly.  
Bathymetric map from U.S. Geological Survey, June 30, 1981.

THOMAS LAKE

STEVENS COUNTY

WRIA 59

T36N-R42E-18

LATITUDE 48° 37' 07" LONGITUDE 117° 32' 39"

PHYSICAL DATA

Drainage area 12.7 mi<sup>2</sup>  
 Altitude 3,147 ft  
 Lake Area 170 acres  
 Lake Volume 4,000 acre-ft  
 Mean Depth 23 ft  
 Maximum Depth 55 ft  
 Shoreline Length 3.3 mi  
 Shoreline Configuration 1.8  
 Development of Volume 0.42  
 Bottom Slope 1.8 pct  
 Surface Inflow Yes  
 Surface Outflow Yes

CULTURAL DATA

Residential Development 80 pct  
 Number of Nearshore Homes 80  
 Land Use in Drainage Basin  
 Residential-Urban 0 pct  
 Residential-Suburban 1 pct  
 Agricultural 0 pct  
 Forest or Unproductive 95 pct  
 Lake Surface 4 pct  
 Public Boat Access to Lake Yes

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

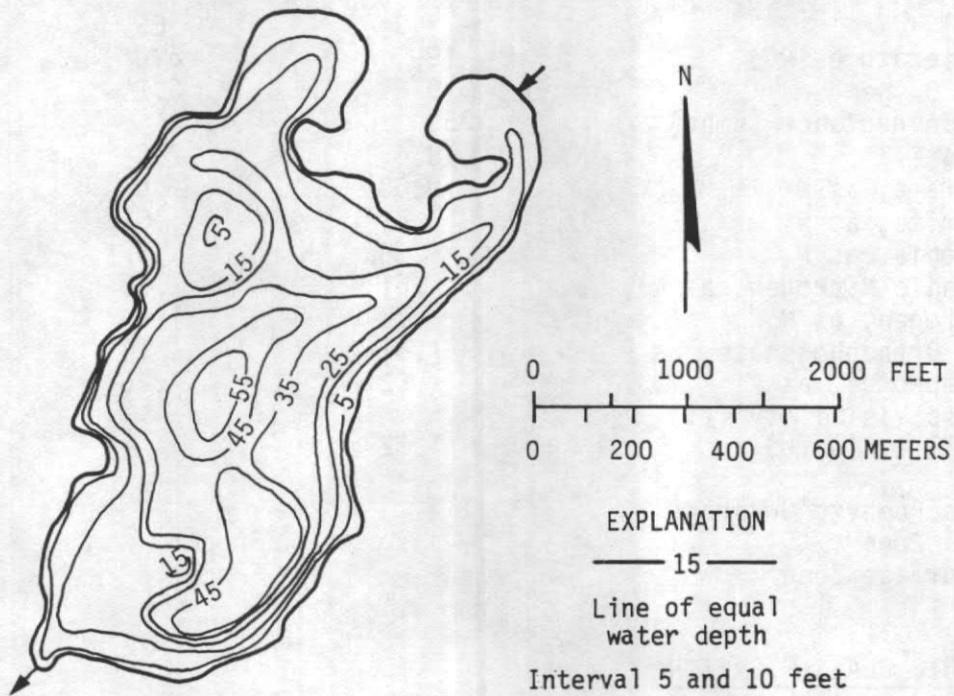
Date

July 15, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 40     |
| Water Temperature (°C)         | 17.2 | 6.9    |
| Dissolved Oxygen               | 8.6  | 0.2    |
| Specific Conductance (umho)    | 52   | 61     |
| pH (units)                     | 6.8  | 6.4    |
| Total Nitrate, as N            | 0.00 | .05    |
| Total Nitrite, as N            | .00  | .00    |
| Total Ammonia, as N            | .09  | .13    |
| Total Organic Nitrogen, as N   | .60  | .97    |
| Total Nitrogen, as N           | .69  | 1.2    |
| Dissolved Orthophosphate, as P | .01  | .01    |
| Total Phosphorus, as P         | .02  | .06    |
| Secchi-Disc Visibility (ft)    |      | 12     |
| Chlorophyll <u>a</u> (ug/L)    | 3.01 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 85 pct |
| Water-Surface Zone             |      | 25 pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 85  
 Trophic State Index (Carlson, 1977)  
 TSI<sub>SD</sub> 41  
 TSI<sub>TP</sub> 47  
 TSI<sub>Chl</sub> 41



Thomas Lake, Stevens County. Photo taken July 15, 1981, view northerly.  
Bathymetric map from Washington Department of Game, March 11, 1950.

WAITTS LAKE

STEVENS COUNTY

WRIA 59

T31N-R40E-17

LATITUDE 48° 11' 09" LONGITUDE 117° 46' 48"

PHYSICAL DATA

Drainage area 11.7 mi<sup>2</sup>  
 Altitude 1,946 ft  
 Lake Area 470 acres  
 Lake Volume 19,000 acre-ft  
 Mean Depth 40 ft  
 Maximum Depth 68 ft  
 Shoreline Length 3.3 mi  
 Shoreline Configuration 1.1  
 Development of Volume 0.59  
 Bottom Slope 1.3 pct  
 Surface Inflow Yes  
 Surface Outflow Yes

CULTURAL DATA

Residential Development 55 pct  
 Number of Nearshore Homes 67  
 Land Use in Drainage Basin  
 Residential-Urban 0 pct  
 Residential-Suburban 1 pct  
 Agricultural 14 pct  
 Forest or Unproductive 79 pct  
 Lake Surface 6 pct  
 Public Boat Access to Lake Yes

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date July 14, 1981

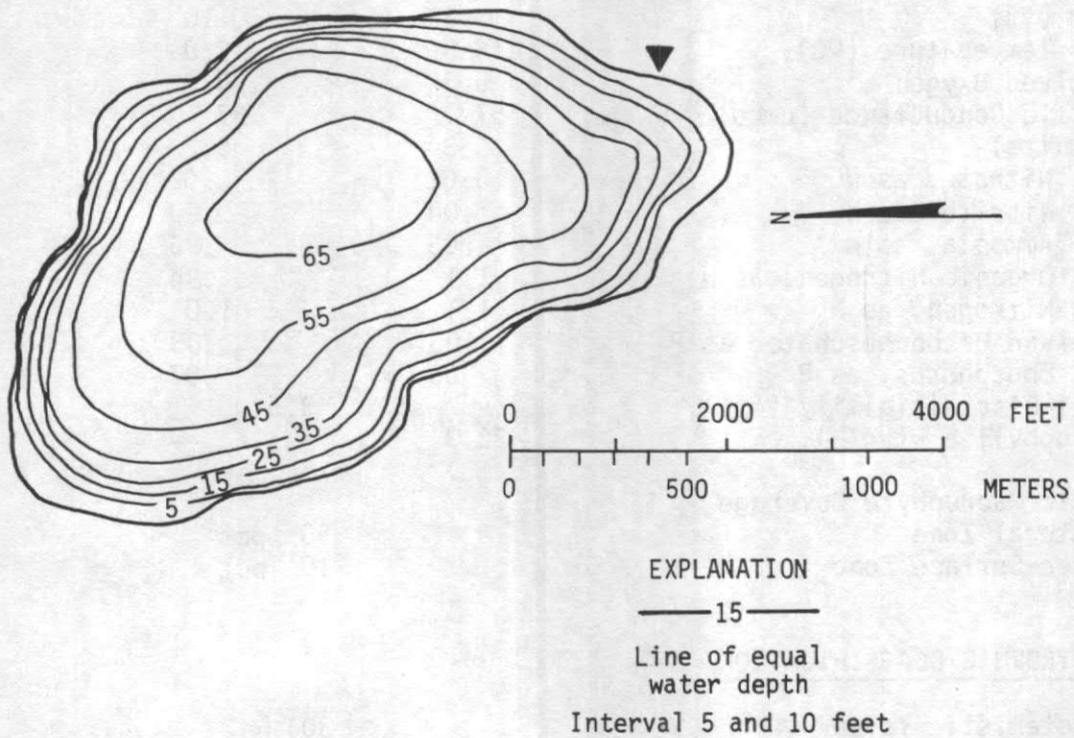
|                                |      |     |
|--------------------------------|------|-----|
| Depth (ft)                     | 3    | 65  |
| Water Temperature (°C)         | 19.1 | 6.0 |
| Dissolved Oxygen               | 9.6  | 0.2 |
| Specific Conductance (umho)    | 259  | 300 |
| pH (units)                     | 8.4  | 7.3 |
| Total Nitrate, as N            | 0.00 | .00 |
| Total Nitrite, as N            | .01  | .01 |
| Total Ammonia, as N            | .08  | .87 |
| Total Organic Nitrogen, as N   | .61  | .63 |
| Total Nitrogen, as N           | .70  | 1.5 |
| Dissolved Orthophosphate, as P | .01  | .14 |
| Total Phosphorus, as P         | .02  | .16 |
| Secchi-Disc Visibility (ft)    |      | 17  |
| Chlorophyll <u>a</u> (ug/L)    | 1.52 | --  |

Aquatic Macrophyte Coverage  
 Littoral Zone 75 pct  
 Water-Surface Zone < 5 pct

LAKE TROPHIC CLASSIFICATION

Characteristic Value 68

Trophic State Index (Carlson, 1977)  
 TSI<sub>SD</sub> 36  
 TSI<sub>TP</sub> 47  
 TSI<sub>Chl</sub> 35



Waitts Lake, Stevens County. Photo taken August 1, 1977.  
Bathymetric map from Washington Department of Game, February 9, 1954.

BIGELOW LAKE

THURSTON COUNTY

WRIA 13

T18N-R02W-12

LATITUDE 47° 03' 23" LONGITUDE 122° 51' 57"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.38 mi <sup>2</sup> |
| Altitude                | 151 ft               |
| Lake Area               | 13 acres             |
| Lake Volume             | 124 acre-ft          |
| Mean Depth              | 10 ft                |
| Maximum Depth           | 15 ft                |
| Shoreline Length        | 0.65 mi              |
| Shoreline Configuration | 1.3                  |
| Development of Volume   | 0.64                 |
| Bottom Slope            | 1.8 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 0  | pct |
| Number of Nearshore Homes  | 0  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 38 | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 57 | pct |
| Lake Surface               | 5  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 10, 1981

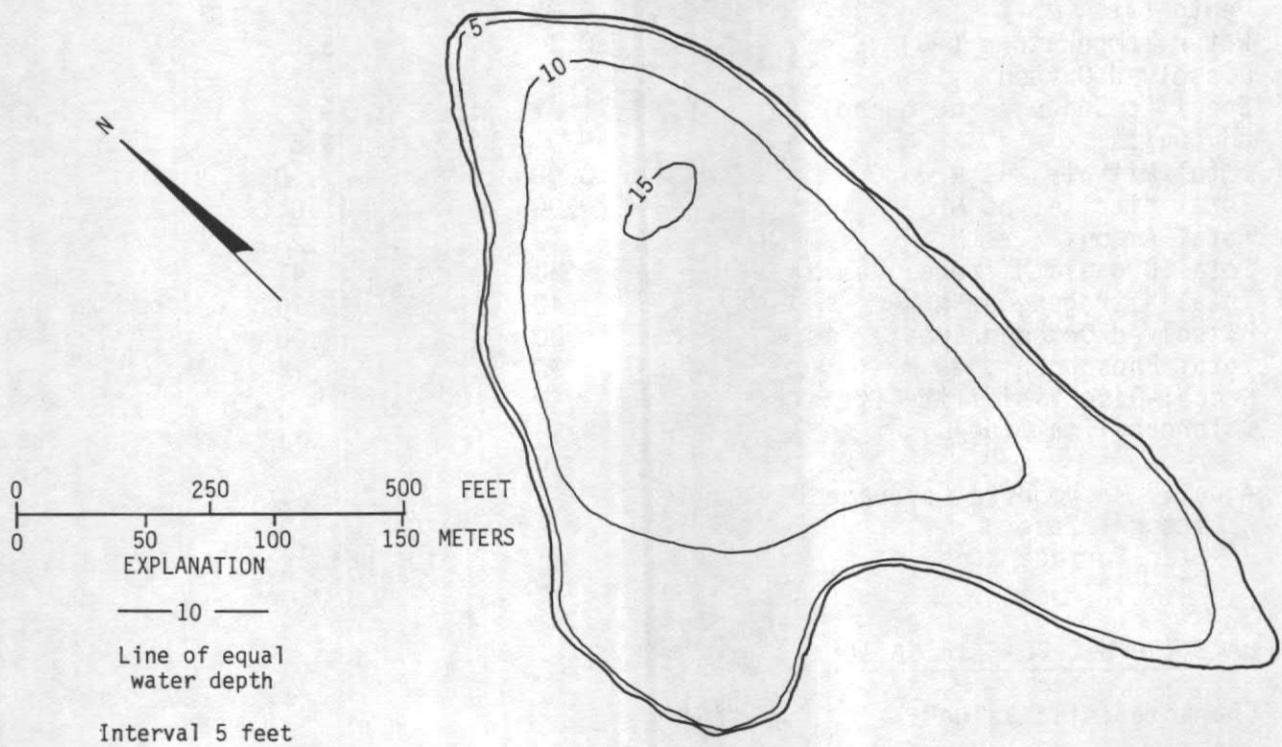
|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 10     |
| Water Temperature (°C)         | 16.3 | 12.0   |
| Dissolved Oxygen               | 6.3  | 0.2    |
| Specific Conductance (umho)    | 57   | 67     |
| pH (units)                     | 6.3  | 6.2    |
| Total Nitrate, as N            | 0.02 | .02    |
| Total Nitrite, as N            | .00  | .00    |
| Total Ammonia, as N            | .05  | .06    |
| Total Organic Nitrogen, as N   | 1.1  | .94    |
| Total Nitrogen, as N           | 1.1  | 1.0    |
| Dissolved Orthophosphate, as P | .03  | .03    |
| Total Phosphorus, as P         | .06  | .07    |
| Secchi-Disc Visibility (ft)    |      | 3.5    |
| Chlorophyll <u>a</u> (ug/L)    | 22.3 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 90 pct |
| Water-Surface Zone             |      | 10 pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 304

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 59 |
| TSI <sub>TP</sub>  | 63 |
| TSI <sub>Chl</sub> | 61 |



Bigelow Lake, Thurston County. Photo taken June 10, 1981, view northeasterly. Bathymetric map from U.S. Geological Survey, June 2, 1981.

BLACK LAKE

THURSTON COUNTY

WRIA 13

T18N-R02W-32

LATITUDE 47° 00' 36" LONGITUDE 122° 57' 50"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 10.1 mi <sup>2</sup> |
| Altitude                | 131 ft               |
| Lake Area               | 570 acres            |
| Lake Volume             | 11,000 acre-ft       |
| Mean Depth              | 19 ft                |
| Maximum Depth           | 29 ft                |
| Shoreline Length        | 6.0 mi               |
| Shoreline Configuration | 1.8                  |
| Development of Volume   | 0.65                 |
| Bottom Slope            | 2.8 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 85  | pct |
| Number of Nearshore Homes  | 140 |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 1   | pct |
| Residential-Suburban       | 2   | pct |
| Agricultural               | 33  | pct |
| Forest or Unproductive     | 55  | pct |
| Lake Surface               | 9   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

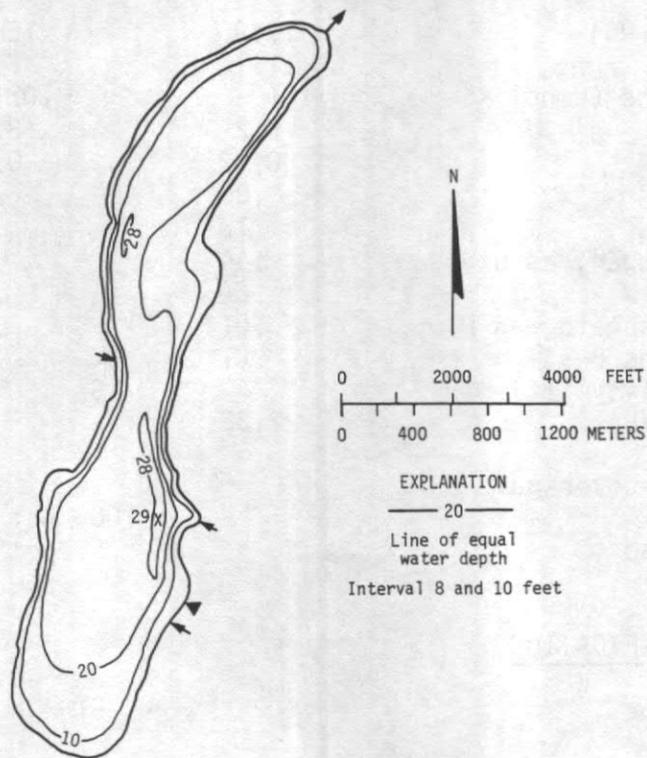
Date

July 21, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 25     |
| Water Temperature (°C)         | 20.1 | 15.0   |
| Dissolved Oxygen               | 8.9  | 0.1    |
| Specific Conductance (umho)    | 71   | 79     |
| pH (units)                     | 5.9  | 6.6    |
| Total Nitrate, as N            | 0.00 | .00    |
| Total Nitrite, as N            | .00  | .01    |
| Total Ammonia, as N            | .12  | .28    |
| Total Organic Nitrogen, as N   | .30  | .41    |
| Total Nitrogen, as N           | .42  | .70    |
| Dissolved Orthophosphate, as P | .00  | .00    |
| Total Phosphorus, as P         | .00  | .14    |
| Secchi-Disc Visibility (ft)    |      | 9      |
| Chlorophyll <u>a</u> (ug/L)    | 9.92 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 40 pct |
| Water-Surface Zone             |      | 10 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |    |
|-------------------------------------|----|
| Characteristic Value                | 94 |
| Trophic State Index (Carlson, 1977) |    |
| TSISD                               | 45 |
| TSITP                               | 0  |
| TSICh1                              | 53 |



Black Lake, Thurston County. Photo taken July 21, 1981, view southerly.  
Bathymetric map from U.S. Geological Survey, August 23, 1971.

ELBOW LAKE

THURSTON COUNTY

WRIA 11

T16N-R03E-32

LATITUDE 46° 49' 59" LONGITUDE 122° 27' 15"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.44 mi <sup>2</sup> |
| Altitude                | 479 ft               |
| Lake Area               | 86 acres             |
| Lake Volume             | 920 acre-ft          |
| Mean Depth              | 11 ft                |
| Maximum Depth           | 25 ft                |
| Shoreline Length        | 2.8 mi               |
| Shoreline Configuration | 2.1                  |
| Development of Volume   | 0.42                 |
| Bottom Slope            | 1.1 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 0   | pct |
| Number of Nearshore Homes  | 0   |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 0   | pct |
| Agricultural               | 0   | pct |
| Forest or Unproductive     | 69  | pct |
| Lake Surface               | 31  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date June 4, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 21   |
| Water Temperature (°C)         | 17.9 | 15.8 |
| Dissolved Oxygen               | 11.1 | 6.7  |
| Specific Conductance (umho)    | 101  | 102  |
| pH (units)                     | 8.2  | 8.0  |
| Total Nitrate, as N            | 0.02 | 0.02 |
| Total Nitrite, as N            | .00  | .00  |
| Total Ammonia, as N            | .18  | .19  |
| Total Organic Nitrogen, as N   | .44  | .44  |
| Total Nitrogen, as N           | .64  | .65  |
| Dissolved Orthophosphate, as P | .01  | .01  |
| Total Phosphorus, as P         | .01  | .02  |
| Secchi-Disc Visibility (ft)    |      | 19   |
| Chlorophyll <u>a</u> (ug/L)    | 2.32 | --   |

Aquatic Macrophyte Coverage

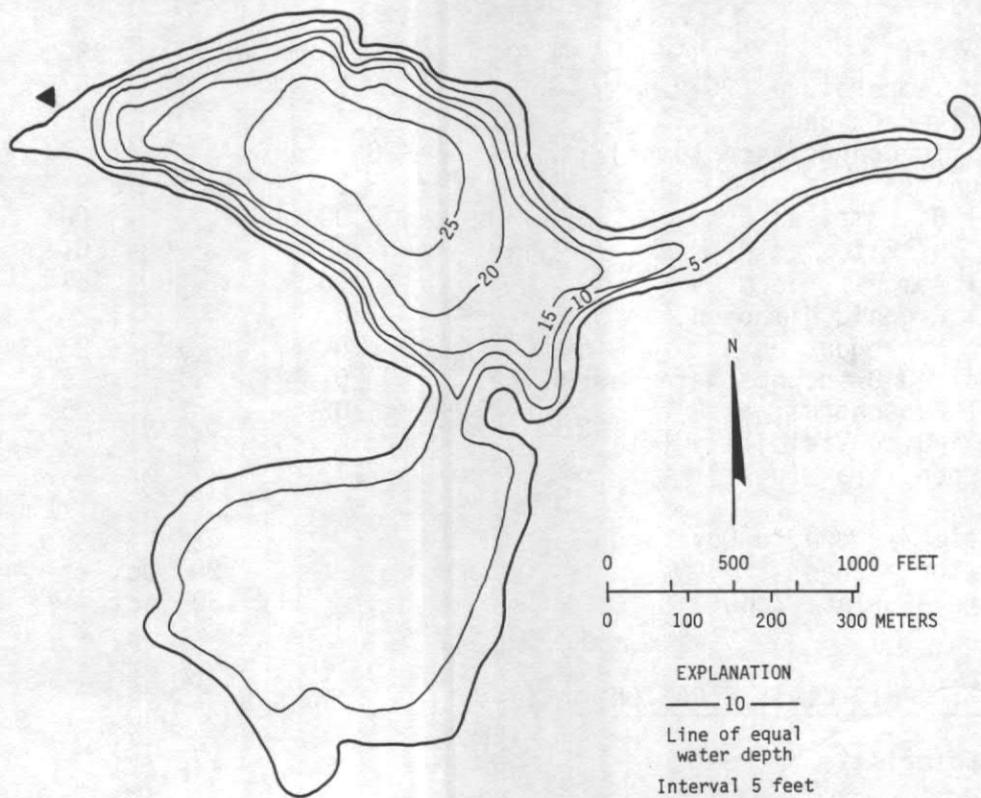
|                    |     |     |
|--------------------|-----|-----|
| Littoral Zone      | 100 | pct |
| Water-Surface Zone | 5   | pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 51

Trophic State Index (Carlson, 1977)

|        |    |
|--------|----|
| TSISD  | 35 |
| TSITP  | 37 |
| TSICh1 | 39 |



Elbow Lake, Thurston County. Photo taken August 16, 1974, view northerly.  
Bathymetric map from U.S. Geological Survey, February 6, 1974.

HICKS LAKE

THURSTON COUNTY

WRIA 13

T18N-R01W-27

LATITUDE 47° 01' 02" LONGITUDE 122° 47' 42"

PHYSICAL DATA

Drainage area 1.80 mi<sup>2</sup>  
 Altitude 162 ft  
 Lake Area 160 acres  
 Lake Volume 2,700 acre-ft  
 Mean Depth 18 ft  
 Maximum Depth 35 ft  
 Shoreline Length 2.4 mi  
 Shoreline Configuration 1.4  
 Development of Volume 0.51  
 Bottom Slope 1.2 pct  
 Surface Inflow No  
 Surface Outflow Yes

CULTURAL DATA

Residential Development 80 pct  
 Number of Nearshore Homes 100  
 Land Use in Drainage Basin  
 Residential-Urban 16 pct  
 Residential-Suburban 33 pct  
 Agricultural 31 pct  
 Forest or Unproductive 6 pct  
 Lake Surface 14 pct  
 Public Boat Access to Lake Yes

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date July 21, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 33   |
| Water Temperature (°C)         | 20.3 | 10.6 |
| Dissolved Oxygen               | 9.4  | 0.1  |
| Specific Conductance (umho)    | 28   | 41   |
| pH (units)                     | 8.0  | 6.8  |
| Total Nitrate, as N            | 0.00 | .00  |
| Total Nitrite, as N            | .00  | .01  |
| Total Ammonia, as N            | .16  | .67  |
| Total Organic Nitrogen, as N   | 1.6  | 1.2  |
| Total Nitrogen, as N           | 1.8  | 1.9  |
| Dissolved Orthophosphate, as P | .01  | .18  |
| Total Phosphorus, as P         | .02  | .25  |
| Secchi-Disc Visibility (ft)    |      | 11   |
| Chlorophyll <u>a</u> (ug/L)    | 7.73 | --   |

Aquatic Macrophyte Coverage

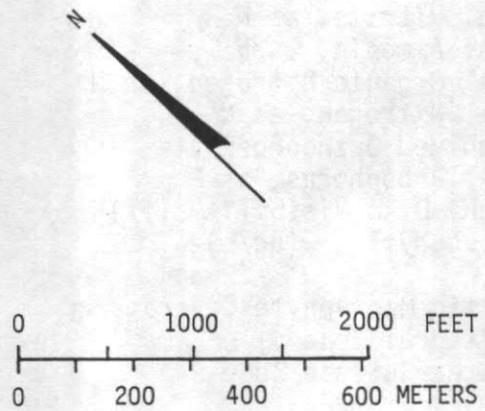
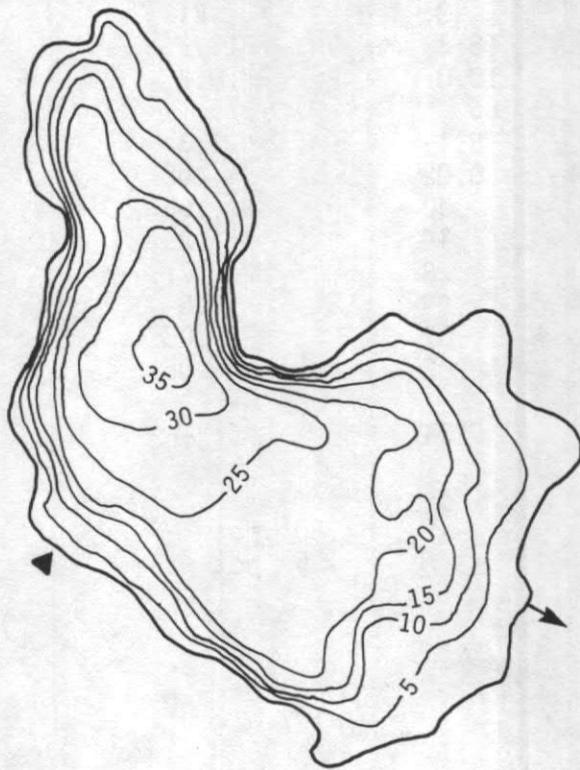
|                    |        |
|--------------------|--------|
| Littoral Zone      | 90 pct |
| Water-Surface Zone | 30 pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 178

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 43 |
| TSI <sub>TP</sub>  | 47 |
| TSI <sub>Chl</sub> | 51 |



EXPLANATION  
— 10 —  
Line of equal  
water depth  
Interval 5 feet

Hick Lake, Thurston County. Photo taken July 21, 1981, view northeasterly. Bathymetric map from Washington Department of Game, June 12, 1949.

LAWRENCE LAKE

THURSTON COUNTY

WRIA 13

T16N-R02E-29

LATITUDE 46° 50' 57" LONGITUDE 122° 34' 51"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 3.35 mi <sup>2</sup> |
| Altitude                | 421 ft               |
| Lake Area               | 330 acres            |
| Lake Volume             | 4,400 acre-ft        |
| Mean Depth              | 13 ft                |
| Maximum Depth           | 26 ft                |
| Shoreline Length        | 4.0 mi               |
| Shoreline Configuration | 1.6                  |
| Development of Volume   | 0.51                 |
| Bottom Slope            | 0.61 pct             |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

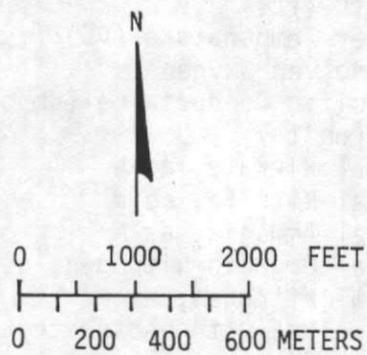
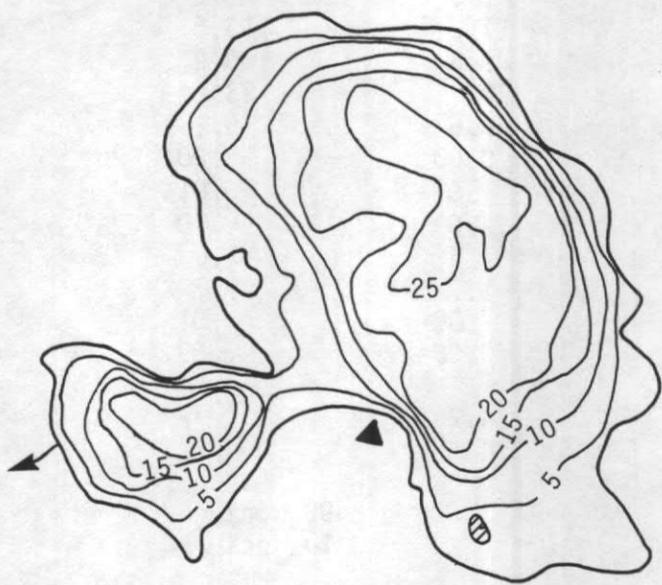
|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 50  | pct |
| Number of Nearshore Homes  | 120 |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 4   | pct |
| Agricultural               | 19  | pct |
| Forest or Unproductive     | 63  | pct |
| Lake Surface               | 14  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |              |      |
|--------------------------------|--------------|------|
| Date                           | June 4, 1981 |      |
| Depth (ft)                     | 3            | 21   |
| Water Temperature (°C)         | 18.3         | 13.2 |
| Dissolved Oxygen               | 10.0         | 0.2  |
| Specific Conductance (umho)    | 66           | 75   |
| pH (units)                     | 8.1          | 7.3  |
| Total Nitrate, as N            | 0.02         | .02  |
| Total Nitrite, as N            | .00          | .00  |
| Total Ammonia, as N            | .19          | .29  |
| Total Organic Nitrogen, as N   | .78          | .71  |
| Total Nitrogen, as N           | .99          | 1.0  |
| Dissolved Orthophosphate, as P | .02          | .03  |
| Total Phosphorus, as P         | .02          | .05  |
| Secchi-Disc Visibility (ft)    | 8            | --   |
| Chlorophyll <u>a</u> (ug/L)    | 5.34         | --   |
| Aquatic Macrophyte Coverage    |              |      |
| Littoral Zone                  | 80           | pct  |
| Water-Surface Zone             | < 5          | pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 127 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 47  |
| TSI <sub>TP</sub>                   | 47  |
| TSI <sub>Chl</sub>                  | 47  |



EXPLANATION  
 — 10 —  
 Line of equal  
 water depth  
 Interval 5 feet

Lawrence Lake, Thurston County. Photo taken August 12, 1977.  
 Bathymetric map from Washington Department of Game, June 5, 1951.

MUNN LAKE

THURSTON COUNTY

WRIA 13

T17N-R02W-01

LATITUDE 46° 58' 56" LONGITUDE 122° 52' 49"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.67 mi <sup>2</sup> |
| Altitude                | 139 ft               |
| Lake Area               | 34 acres             |
| Lake Volume             | 350 acre-ft          |
| Mean Depth              | 10 ft                |
| Maximum Depth           | 19 ft                |
| Shoreline Length        | 1.1 mi               |
| Shoreline Configuration | 1.3                  |
| Development of Volume   | 0.53                 |
| Bottom Slope            | 1.4 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | No                   |

CULTURAL DATA

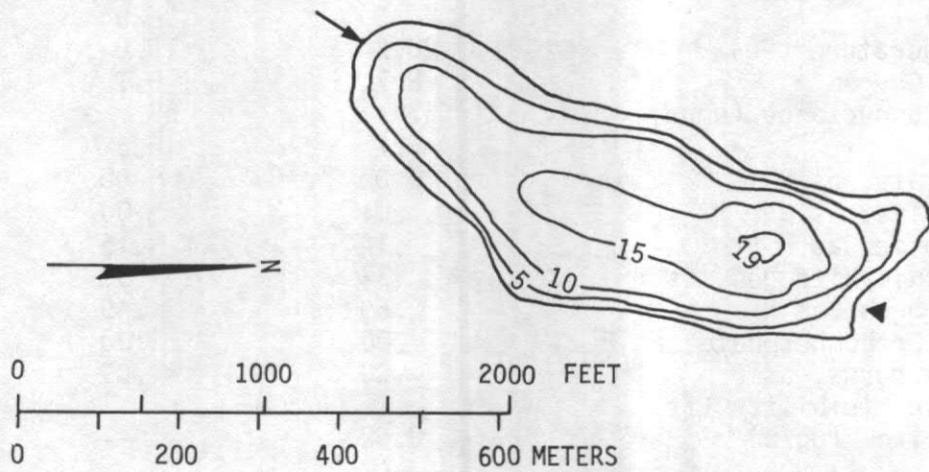
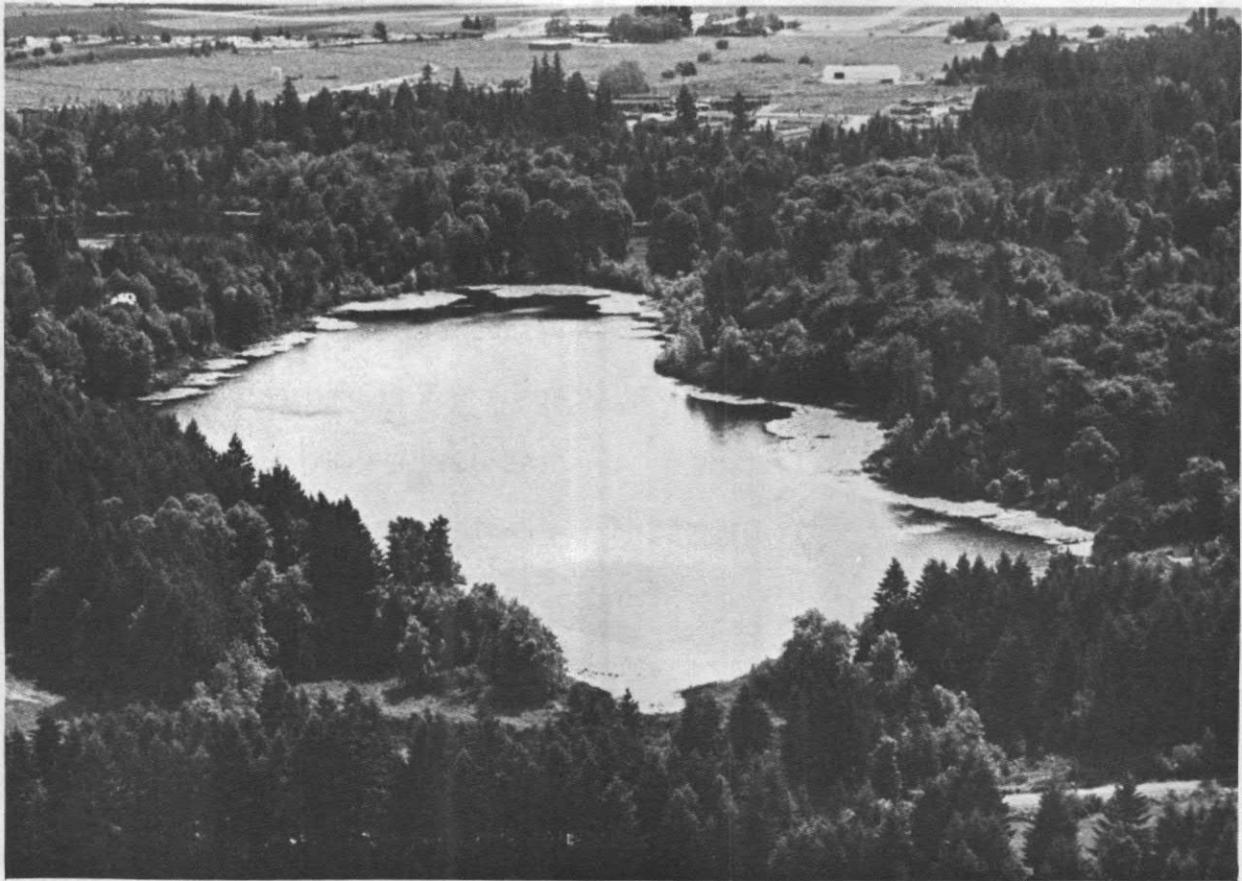
|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 40  | pct |
| Number of Nearshore Homes  | 14  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 3   | pct |
| Residential-Suburban       | 4   | pct |
| Agricultural               | 42  | pct |
| Forest or Unproductive     | 42  | pct |
| Lake Surface               | 9   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in mg/L unless otherwise indicated)

|                                |              |        |
|--------------------------------|--------------|--------|
| Date                           | June 9, 1981 |        |
| Depth (ft)                     | 3            | 12     |
| Water Temperature (°C)         | 17.2         | 13.5   |
| Dissolved Oxygen               | 9.3          | 0.2    |
| Specific Conductance (umho)    | 20           | 23     |
| pH (units)                     | 6.6          | 6.1    |
| Total Nitrate, as N            | 0.00         | .00    |
| Total Nitrite, as N            | .01          | .01    |
| Total Ammonia, as N            | .09          | .10    |
| Total Organic Nitrogen, as N   | 1.6          | 1.6    |
| Total Nitrogen, as N           | 1.7          | 1.7    |
| Dissolved Orthophosphate, as P | .00          | .01    |
| Total Phosphorus, as P         | .06          | .09    |
| Secchi-Disc Visibility (ft)    |              | 5      |
| Chlorophyll <u>a</u> (ug/L)    | 24.2         | --     |
| Aquatic Macrophyte Coverage    |              |        |
| Littoral Zone                  |              | 90 pct |
| Water-Surface Zone             |              | 10 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 303 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 54  |
| TSI <sub>TP</sub>                   | 63  |
| TSI <sub>Chl</sub>                  | 62  |



EXPLANATION  
 — 10 —  
 Line of equal  
 water depth  
 Interval 5 and 4 feet

Munn Lake, Thurston County. Photo taken June 9, 1981, view southwesterly.  
 Bathymetric map from Washington Department of Game, May 31, 1950.

OFFUTT LAKE

THURSTON COUNTY

WRIA 13

T17N-R01W-33

LATITUDE 46° 55' 06" LONGITUDE 122° 49' 04"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 2.70 mi <sup>2</sup> |
| Altitude                | 230 ft               |
| Lake Area               | 200 acres            |
| Lake Volume             | 2,900 acre-ft        |
| Mean Depth              | 15 ft                |
| Maximum Depth           | 25 ft                |
| Shoreline Length        | 2.9 mi               |
| Shoreline Configuration | 1.5                  |
| Development of Volume   | 0.60                 |
| Bottom Slope            | 0.76 pct             |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 50  | pct |
| Number of Nearshore Homes  | 68  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 5   | pct |
| Agricultural               | 15  | pct |
| Forest or Unproductive     | 69  | pct |
| Lake Surface               | 11  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

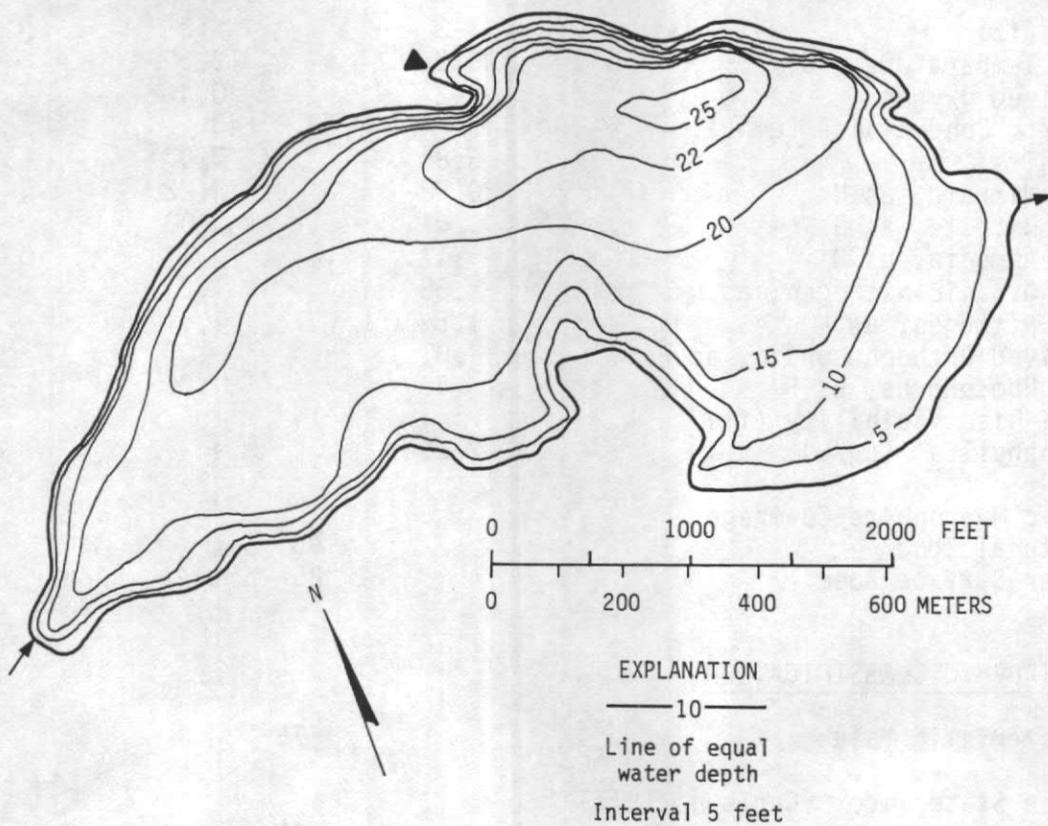
Date

July 21, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 20     |
| Water Temperature (°C)         | 20.2 | 15.0   |
| Dissolved Oxygen               | 8.7  | 0.1    |
| Specific Conductance (umho)    | 57   | 68     |
| pH (units)                     | 6.7  | 6.6    |
| Total Nitrate, as N            | 0.00 | .00    |
| Total Nitrite, as N            | .01  | .00    |
| Total Ammonia, as N            | .14  | .16    |
| Total Organic Nitrogen, as N   | .37  | .33    |
| Total Nitrogen, as N           | .59  | .49    |
| Dissolved Orthophosphate, as P | .00  | .00    |
| Total Phosphorus, as P         | .00  | .09    |
| Secchi-Disc Visibility (ft)    |      | 7      |
| Chlorophyll <u>a</u> (ug/L)    | 8.62 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 30 pct |
| Water-Surface Zone             |      | 10 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 106 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 49  |
| TSI <sub>TP</sub>                   | 0   |
| TSI <sub>Chl</sub>                  | 52  |



Offutt Lake, Thurston County. Photo taken May 19, 1978.  
Bathymetric map from Washington Department of Game, May 24, 1949.

PATTERSON LAKE (NORTH ARM)

THURSTON COUNTY

WRIA 13

T18N-R01W-34

LATITUDE 46° 59' 48" LONGITUDE 122° 46' 56"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 2.90 mi <sup>2</sup> |
| Altitude                | 154 ft               |
| Lake Area               | 81 acres             |
| Lake Volume             | 1,100 acre-ft        |
| Mean Depth              | 14 ft                |
| Maximum Depth           | 22 ft                |
| Shoreline Length        | 1.7 mi               |
| Shoreline Configuration | 1.3                  |
| Development of Volume   | 0.63                 |
| Bottom Slope            | 1.0 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 80  | pct |
| Number of Nearshore Homes  | 75  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 11  | pct |
| Residential-Suburban       | 23  | pct |
| Agricultural               | 21  | pct |
| Forest or Unproductive     | 32  | pct |
| Lake Surface               | 13  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

July 21, 1981

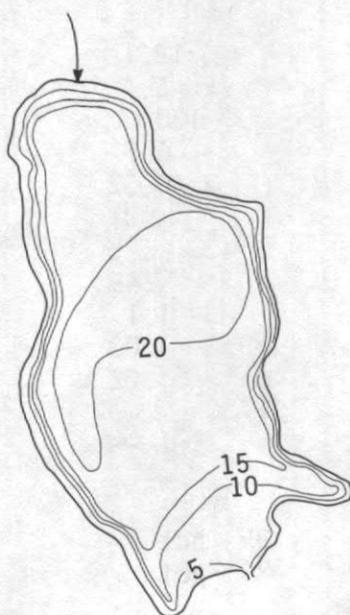
|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 18     |
| Water Temperature (°C)         | 20.2 | 12.6   |
| Dissolved Oxygen               | 9.2  | 0.4    |
| Specific Conductance (umho)    | 112  | 140    |
| pH (units)                     | 6.8  | 7.0    |
| Total Nitrate, as N            | 0.73 | .22    |
| Total Nitrite, as N            | .01  | .00    |
| Total Ammonia, as N            | .11  | .11    |
| Total Organic Nitrogen, as N   | .65  | 1.2    |
| Total Nitrogen, as N           | 1.5  | 1.5    |
| Dissolved Orthophosphate, as P | .01  | .00    |
| Total Phosphorus, as P         | .00  | .09    |
| Secchi-Disc Visibility (ft)    |      | 14     |
| Chlorophyll <u>a</u> (ug/L)    | 2.86 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 90 pct |
| Water-Surface Zone             |      | 25 pct |

LAKE TROPHIC CLASSIFICATION

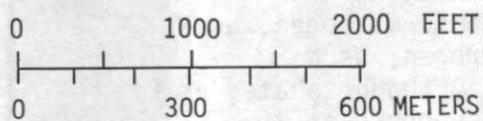
Characteristic Value 75

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 39 |
| TSI <sub>TP</sub>  | 0  |
| TSI <sub>Chl</sub> | 41 |



N



EXPLANATION

— 10 —  
 Line of equal  
 water depth  
 Interval 5 feet

Patterson (north arm) Lake, Thurston County. Photo taken May 18, 1978.  
 Bathymetric map from U.S. Geological Survey, December 12, 1973.

PATTERSON LAKE (SOUTH ARM)

THURSTON COUNTY

WRIA 13

T18N-R01W-35

LATITUDE 46° 59' 54" LONGITUDE 122° 46' 15"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 3.77 mi <sup>2</sup> |
| Altitude                | 154 ft               |
| Lake Area               | 190 acres            |
| Lake Volume             | 2,500 acre-ft        |
| Mean Depth              | 13 ft                |
| Maximum Depth           | 19 ft                |
| Shoreline Length        | 4.6 mi               |
| Shoreline Configuration | 2.4                  |
| Development of Volume   | 0.70                 |
| Bottom Slope            | 0.59 pct             |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 60  | pct |
| Number of Nearshore Homes  | 85  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 8   | pct |
| Residential-Suburban       | 20  | pct |
| Agricultural               | 16  | pct |
| Forest or Unproductive     | 35  | pct |
| Lake Surface               | 21  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

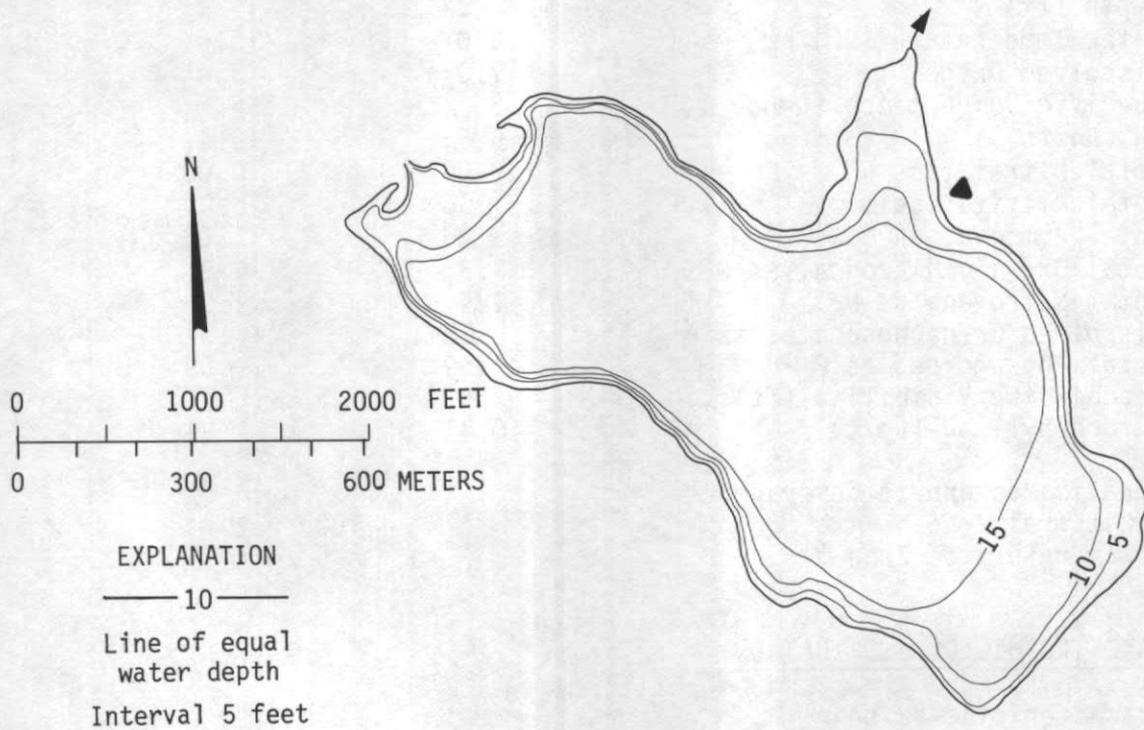
Date

July 21, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 15   |
| Water Temperature (°C)         | 20.6 | 18.1 |
| Dissolved Oxygen               | 8.8  | 5.4  |
| Specific Conductance (umho)    | 122  | 130  |
| pH (units)                     | 7.2  | 6.9  |
| Total Nitrate, as N            | 0.16 | 0.32 |
| Total Nitrite, as N            | .01  | .01  |
| Total Ammonia, as N            | .19  | .25  |
| Total Organic Nitrogen, as N   | 1.0  | .49  |
| Total Nitrogen, as N           | 1.4  | 1.1  |
| Dissolved Orthophosphate, as P | .03  | .03  |
| Total Phosphorus, as P         | .03  | .02  |
| Secchi-Disc Visibility (ft)    |      | >17  |
| Chlorophyll <u>a</u> (ug/L)    | 3.39 | --   |
| Aquatic Macrophyte Coverage    |      |      |
| Littoral Zone                  | 95   | pct  |
| Water-Surface Zone             | 20   | pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 106 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 36  |
| TSI <sub>TP</sub>                   | 53  |
| TSI <sub>chl</sub>                  | 43  |



Patterson (south arm) Lake, Thurston County. Photo taken May 18, 1978.  
Bathymetric map from U.S. Geological Survey, December 12, 1973.

PITMAN LAKE

THURSTON COUNTY

WRIA 23

T17N-R02W-35

LATITUDE 46° 55' 01" LONGITUDE 122° 53' 22"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 2.57 mi <sup>2</sup> |
| Altitude                | 198 ft               |
| Lake Area               | 33 acres             |
| Lake Volume             | 320 acre-ft          |
| Mean Depth              | 10 ft                |
| Maximum Depth           | 16 ft                |
| Shoreline Length        | 0.85 mi              |
| Shoreline Configuration | 1.0                  |
| Development of Volume   | 0.60                 |
| Bottom Slope            | 1.2 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 0  | pct |
| Number of Nearshore Homes  | 0  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 0  | pct |
| Agricultural               | 18 | pct |
| Forest or Unproductive     | 80 | pct |
| Lake Surface               | 2  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 9, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 9    |
| Water Temperature (°C)         | 16.0 | 15.6 |
| Dissolved Oxygen               | 7.0  | 3.4  |
| Specific Conductance (umho)    | 55   | 56   |
| pH (units)                     | 6.6  | 6.4  |
| Total Nitrate, as N            | 0.00 | 0.03 |
| Total Nitrite, as N            | .00  | .00  |
| Total Ammonia, as N            | .09  | .06  |
| Total Organic Nitrogen, as N   | 1.3  | 1.8  |
| Total Nitrogen, as N           | 1.4  | 1.9  |
| Dissolved Orthophosphate, as P | .05  | .01  |
| Total Phosphorus, as P         | .09  | .08  |
| Secchi-Disc Visibility (ft)    |      | 5    |
| Chlorophyll <u>a</u> (ug/L)    | 10.4 | --   |

Aquatic Macrophyte Coverage

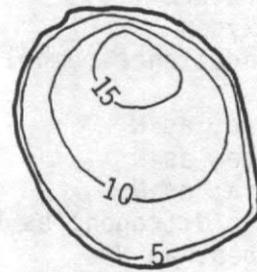
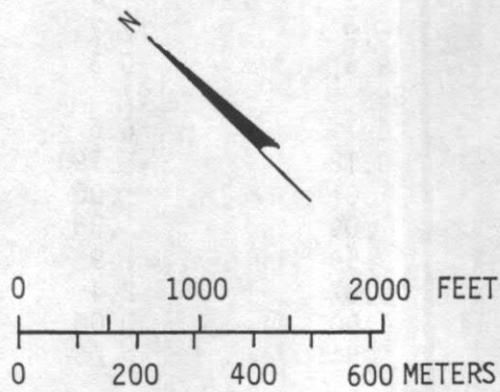
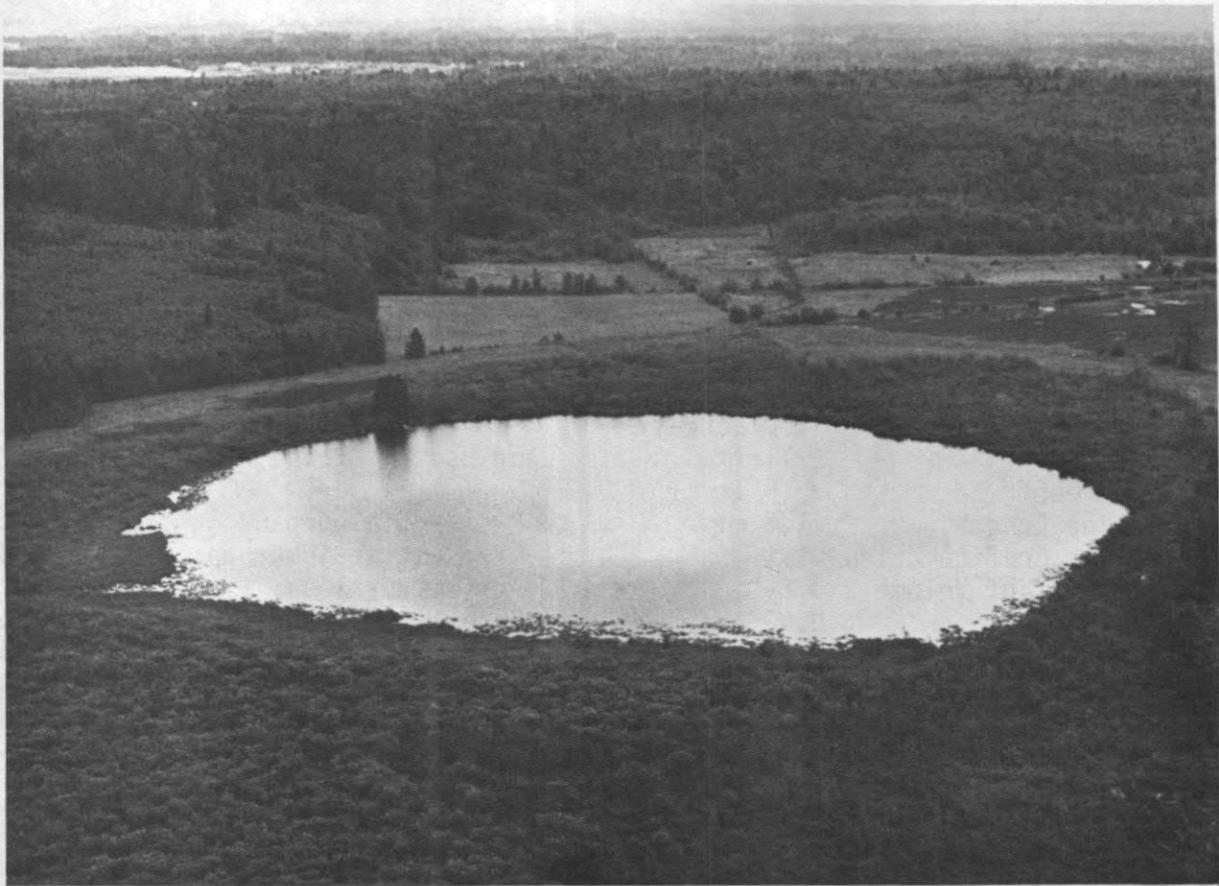
|                    |     |     |
|--------------------|-----|-----|
| Littoral Zone      | 100 | pct |
| Water-Surface Zone | 5   | pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 244

Trophic State Index (Carlson, 1977)

|        |    |
|--------|----|
| TSISD  | 54 |
| TSITP  | 69 |
| TSICh1 | 54 |



EXPLANATION  
—— 10 ——  
Line of equal  
water depth  
Interval 5 feet

Pitman Lake, Thurston County. Photo taken June 9, 1981, view northeasterly.  
Bathymetric map from U.S. Geological Survey, January 16, 1974.

SCOTT LAKE

THURSTON COUNTY

WRIA 23

T17N-R02W-33

LATITUDE 46° 55' 12" LONGITUDE 122° 56' 07"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 2.52 mi <sup>2</sup> |
| Altitude                | 189 ft               |
| Lake Area               | 69 acres             |
| Lake Volume             | 760 acre-ft          |
| Mean Depth              | 11 ft                |
| Maximum Depth           | 18 ft                |
| Shoreline Length        | 1.3 mi               |
| Shoreline Configuration | 1.1                  |
| Development of Volume   | 0.69                 |
| Bottom Slope            | 0.92 pct             |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 75  | pct |
| Number of Nearshore Homes  | 23  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 1   | pct |
| Agricultural               | 26  | pct |
| Forest or Unproductive     | 65  | pct |
| Lake Surface               | 8   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 9, 1981

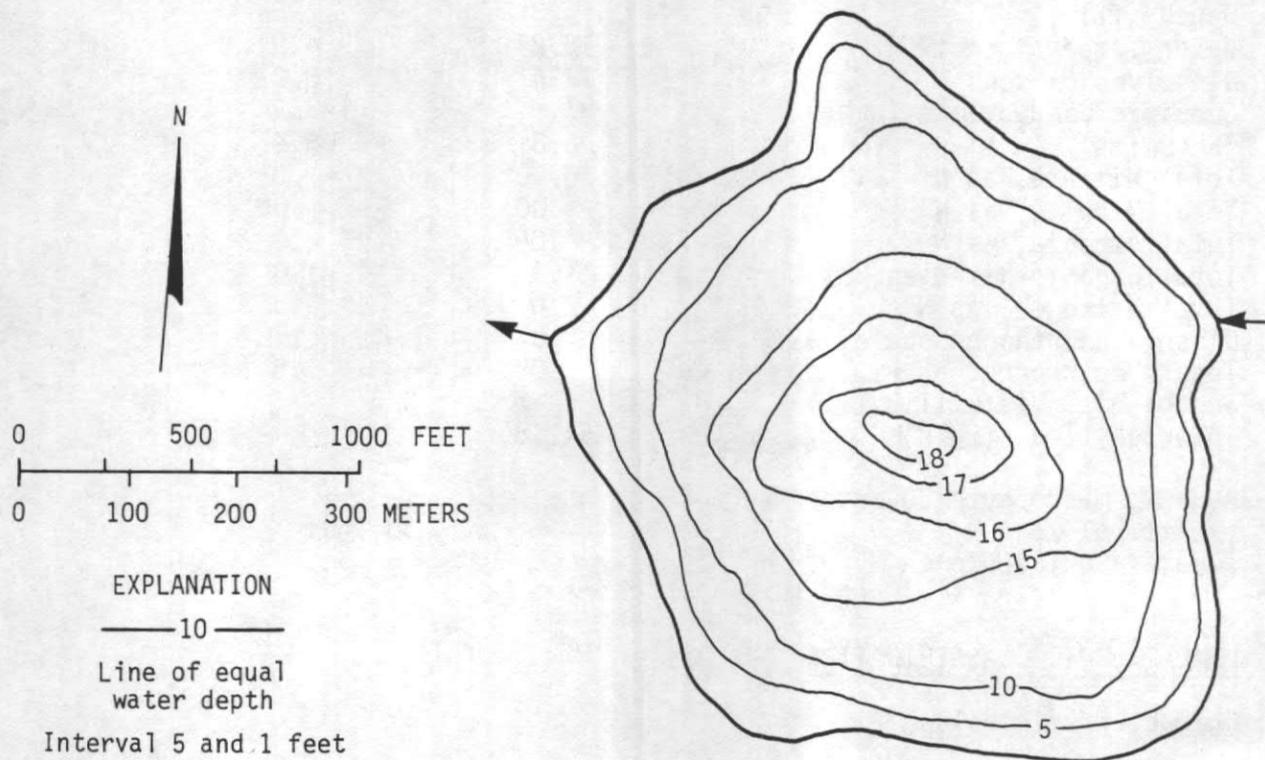
|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 14     |
| Water Temperature (°C)         | 15.9 | 12.7   |
| Dissolved Oxygen               | 9.6  | 0.3    |
| Specific Conductance (umho)    | 89   | 97     |
| pH (units)                     | 6.7  | 6.6    |
| Total Nitrate, as N            | 0.18 | .19    |
| Total Nitrite, as N            | .01  | .00    |
| Total Ammonia, as N            | .09  | .33    |
| Total Organic Nitrogen, as N   | .59  | 1.9    |
| Total Nitrogen, as N           | .87  | 2.4    |
| Dissolved Orthophosphate, as P | .00  | .00    |
| Total Phosphorus, as P         | .04  | .06    |
| Secchi-Disc Visibility (ft)    |      | 5      |
| Chlorophyll <u>a</u> (ug/L)    | 18.3 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 80 pct |
| Water-Surface Zone             |      | 5 pct  |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 203

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 54 |
| TSI <sub>TP</sub>  | 57 |
| TSI <sub>Chl</sub> | 59 |



Scott Lake, Thurston County. Photo taken May 19, 1978.  
Bathymetric map from Washington Department of Game, May 27, 1950.

ST. CLAIR LAKE (SOUTH ARM)

THURSTON COUNTY

WRIA 11

T17N-R01E-06

LATITUDE 46° 59' 31" LONGITUDE 122° 43' 22"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 14.5 mi <sup>2</sup> |
| Altitude                | 73 ft                |
| Lake Area               | 88 acres             |
| Lake Volume             | 3,600 acre-ft        |
| Mean Depth              | 40 ft                |
| Maximum Depth           | 110 ft               |
| Shoreline Length        | 2.9 mi               |
| Shoreline Configuration | 2.2                  |
| Development of Volume   | 0.37                 |
| Bottom Slope            | 4.8 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 50  | pct |
| Number of Nearshore Homes  | 75  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | <1  | pct |
| Agricultural               | 29  | pct |
| Forest or Unproductive     | 70  | pct |
| Lake Surface               | 1   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

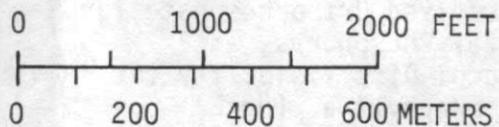
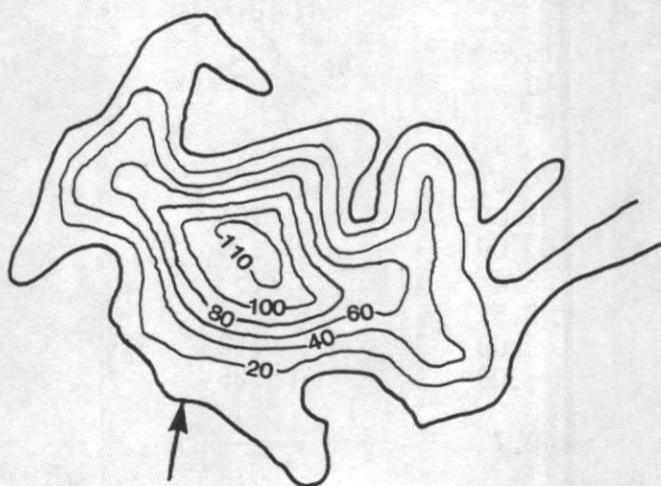
Date

June 9, 1981

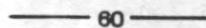
|                                |       |        |
|--------------------------------|-------|--------|
| Depth (ft)                     | 3     | 95     |
| Water Temperature (°C)         | 16.2  | 4.9    |
| Dissolved Oxygen               | 13.4  | 0.2    |
| Specific Conductance (umho)    | 97    | 143    |
| pH (units)                     | 8.8   | 6.9    |
| Total Nitrate, as N            | 0.00  | .01    |
| Total Nitrite, as N            | .00   | .00    |
| Total Ammonia, as N            | .09   | 2.0    |
| Total Organic Nitrogen, as N   | 1.9   | 1.3    |
| Total Nitrogen, as N           | 2.0   | 3.3    |
| Dissolved Orthophosphate, as P | .07   | .78    |
| Total Phosphorus, as P         | .08   | 1.6    |
| Secchi-Disc Visibility (ft)    |       | 3.5    |
| Chlorophyll <u>a</u> (ug/L)    | 54.18 | --     |
| Aquatic Macrophyte Coverage    |       |        |
| Littoral Zone                  |       | 30 pct |
| Water-Surface Zone             |       | <5 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 476 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 59  |
| TSI <sub>TP</sub>                   | 67  |
| TSI <sub>Chl</sub>                  | 70  |



EXPLANATION



Line of equal  
water depth

Interval 10 and 20 feet

St. Clair (south arm) Lake, Thurston County. Photo taken June 9, 1981, view northeasterly. Bathymetric map from Washington Department of Game, February 12, 1951.

TEMPO (BUSHMAN) LAKE

THURSTON COUNTY

WRIA 13

T17N-R01W-28

LATITUDE 46° 55' 43" LONGITUDE 122° 48' 26"

PHYSICAL DATA

Drainage area 0.96 mi<sup>2</sup>  
 Altitude 255 ft  
 Lake Area 32 acres  
 Lake Volume 400 acre-ft  
 Mean Depth 13 ft  
 Maximum Depth 24 ft  
 Shoreline Length 1.0 mi  
 Shoreline Configuration 1.3  
 Development of Volume 0.52  
 Bottom Slope 1.8 pct  
 Surface Inflow No  
 Surface Outflow Yes

CULTURAL DATA

Residential Development 70 pct  
 Number of Nearshore Homes 24  
 Land Use in Drainage Basin  
 Residential-Urban 0 pct  
 Residential-Suburban 0 pct  
 Agricultural 5 pct  
 Forest or Unproductive 90 pct  
 Lake Surface 5 pct  
 Public Boat Access to Lake No

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

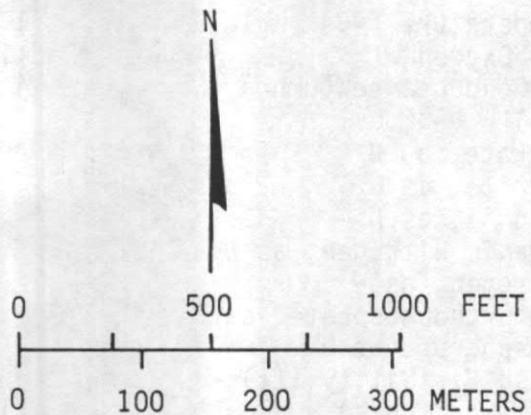
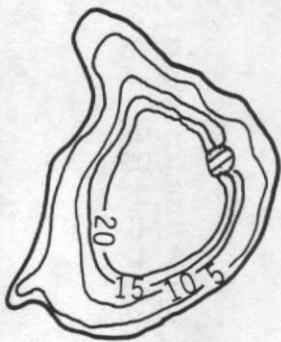
Date

June 9, 1981

|                                |      |        |
|--------------------------------|------|--------|
| Depth (ft)                     | 3    | 21     |
| Water Temperature (°C)         | 16.6 | 8.0    |
| Dissolved Oxygen               | 8.3  | 0.2    |
| Specific Conductance (umho)    | 63   | 80     |
| pH (units)                     | 6.7  | 6.3    |
| Total Nitrate, as N            | 0.01 | .09    |
| Total Nitrite, as N            | .00  | .01    |
| Total Ammonia, as N            | .09  | .53    |
| Total Organic Nitrogen, as N   | 2.4  | 2.6    |
| Total Nitrogen, as N           | 2.5  | 3.2    |
| Dissolved Orthophosphate, as P | .00  | .12    |
| Total Phosphorus, as P         | .09  | .25    |
| Secchi-Disc Visibility (ft)    |      | 3      |
| Chlorophyll <u>a</u> (ug/L)    | 40.7 | --     |
| Aquatic Macrophyte Coverage    |      |        |
| Littoral Zone                  |      | 60 pct |
| Water-Surface Zone             |      | 5 pct  |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 496  
 Trophic State Index (Carlson, 1977)  
 TSI<sub>SD</sub> 61  
 TSI<sub>TP</sub> 69  
 TSI<sub>chl</sub> 67



EXPLANATION  
——15——  
Line of equal  
water depth  
Interval 5 feet

Tempo (Bushman) Lake, Thurston County. Photo taken June 9, 1981, view northerly. Bathymetric map from U.S. Geological Survey, January 3, 1974.

## TRAILS END LAKE

THURSTON COUNTY

WRIA 13

T17N-R02W-12

LATITUDE 46° 58' 44" LONGITUDE 122° 52' 46"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.36 mi <sup>2</sup> |
| Altitude                | 134 ft               |
| Lake Area               | 12 acres             |
| Lake Volume             | 194 acre-ft          |
| Mean Depth              | 16 ft                |
| Maximum Depth           | 40 ft                |
| Shoreline Length        | 0.50 mi              |
| Shoreline Configuration | 1.0                  |
| Development of Volume   | 0.41                 |
| Bottom Slope            | 4.9 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 25 | pct |
| Number of Nearshore Homes  | 6  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 25 | pct |
| Agricultural               | 49 | pct |
| Forest or Unproductive     | 21 | pct |
| Lake Surface               | 5  | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 10, 1981

|                                |      |     |
|--------------------------------|------|-----|
| Depth (ft)                     | 3    | 32  |
| Water Temperature (°C)         | 17.5 | 5.0 |
| Dissolved Oxygen               | 11.1 | 0.2 |
| Specific Conductance (umho)    | 41   | 90  |
| pH (units)                     | 6.9  | 6.3 |
| Total Nitrate, as N            | 0.02 | .02 |
| Total Nitrite, as N            | .00  | .00 |
| Total Ammonia, as N            | .03  | 3.0 |
| Total Organic Nitrogen, as N   | .80  | .40 |
| Total Nitrogen, as N           | .85  | 3.4 |
| Dissolved Orthophosphate, as P | .03  | .54 |
| Total Phosphorus, as P         | .04  | .69 |
| Secchi-Disc Visibility (ft)    |      | 6   |
| Chlorophyll <u>a</u> (ug/L)    | 11.0 | --  |

Aquatic Macrophyte Coverage

Littoral Zone

95 pct

Water-Surface Zone

5 pct

LAKE TROPHIC CLASSIFICATION

Characteristic Value

176

Trophic State Index (Carlson, 1977)

TSI<sub>SD</sub>

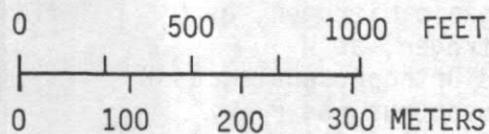
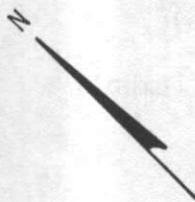
51

TSI<sub>TP</sub>

57

TSI<sub>Chl</sub>

54



EXPLANATION

— 20 —

Line of equal  
water depth

Interval is variable

Trails End Lake, Thurston County. Photo taken June 10, 1981, view northeasterly.  
Bathymetric map from Washington Department of Game, May 31, 1950.

TROSPER LAKE

THURSTON COUNTY

WRIA 13

T18N-R02W-33

LATITUDE 46° 59' 52" LONGITUDE 122° 55' 43"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 1.40 mi <sup>2</sup> |
| Altitude                | 150 ft               |
| Lake Area               | 18 acres             |
| Lake Volume             | 189 acre-ft          |
| Mean Depth              | 11 ft                |
| Maximum Depth           | 15 ft                |
| Shoreline Length        | 0.72 mi              |
| Shoreline Configuration | 1.2                  |
| Development of Volume   | 0.70                 |
| Bottom Slope            | 1.5 pct              |
| Surface Inflow          | No                   |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 40 | pct |
| Number of Nearshore Homes  | 9  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 40 | pct |
| Agricultural               | 4  | pct |
| Forest or Unproductive     | 54 | pct |
| Lake Surface               | 2  | pct |
| Public Boat Access to Lake |    | No  |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

June 10, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 17   |
| Water Temperature (°C)         | 16.5 | 11.0 |
| Dissolved Oxygen               | 9.7  | 0.2  |
| Specific Conductance (umho)    | 88   | 100  |
| pH (units)                     | 6.3  | 6.4  |
| Total Nitrate, as N            | 0.04 | .07  |
| Total Nitrite, as N            | .00  | .00  |
| Total Ammonia, as N            | .18  | .13  |
| Total Organic Nitrogen, as N   | .22  | .52  |
| Total Nitrogen, as N           | .44  | .72  |
| Dissolved Orthophosphate, as P | .02  | .03  |
| Total Phosphorus, as P         | .04  | .05  |
| Secchi-Disc Visibility (ft)    |      | 8    |
| Chlorophyll <u>a</u> (ug/L)    | 5.68 | --   |

Aquatic Macrophyte Coverage

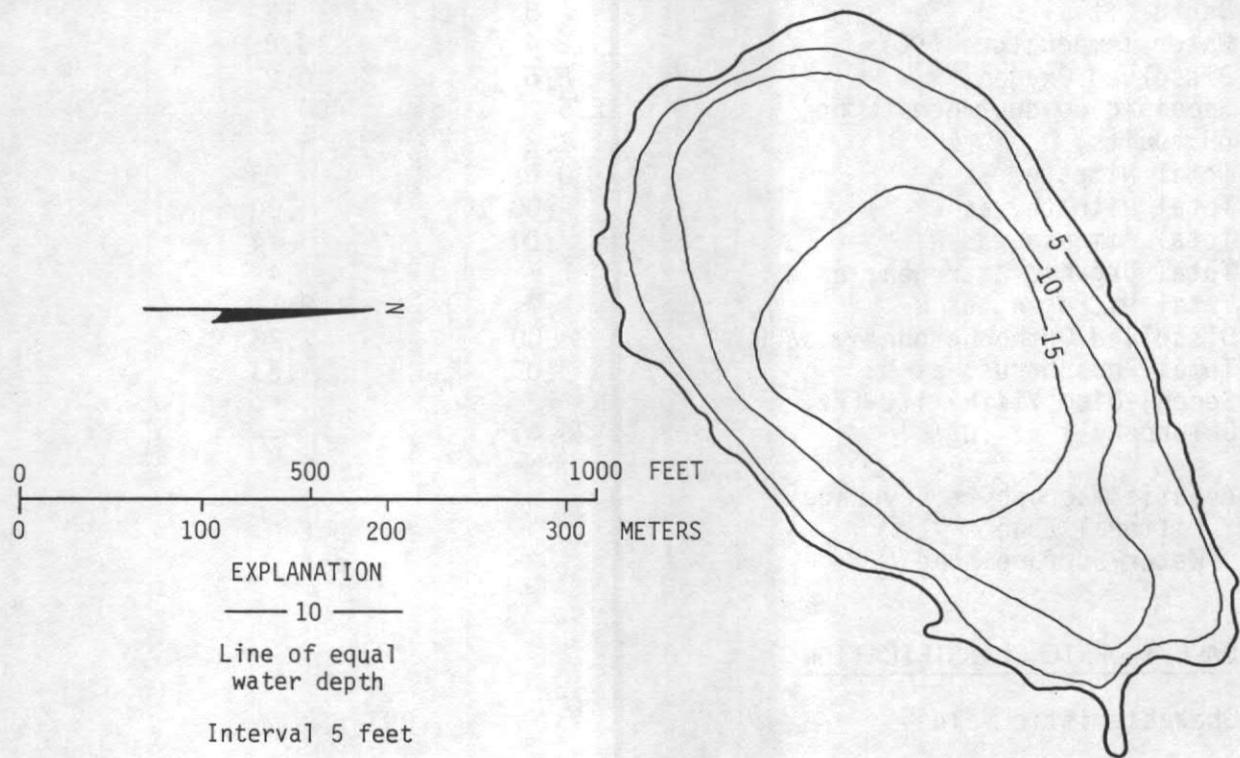
|                    |    |     |
|--------------------|----|-----|
| Littoral Zone      | 70 | pct |
| Water-Surface Zone | 5  | pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 93

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 47 |
| TSI <sub>TP</sub>  | 57 |
| TSI <sub>Chl</sub> | 48 |



Troser Lake, Thurston County. Photo taken June 10, 1981, view southwesterly. Bathymetric map from U.S. Geological Survey, May 27, 1981.

FAZON LAKE

WHATCOM COUNTY

WRIA 01

T39N-R03E-13

LATITUDE 48° 51' 52" LONGITUDE 122° 22' 04"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.97 mi <sup>2</sup> |
| Altitude                | 128 ft               |
| Lake Area               | 31 acres             |
| Lake Volume             | 300 acre-ft          |
| Mean Depth              | 10 ft                |
| Maximum Depth           | 17 ft                |
| Shoreline Length        | 0.89 mi              |
| Shoreline Configuration | 1.1                  |
| Development of Volume   | 0.57                 |
| Bottom Slope            | 1.3 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 0   | pct |
| Number of Nearshore Homes  | 0   |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 0   | pct |
| Agricultural               | 55  | pct |
| Forest or Unproductive     | 40  | pct |
| Lake Surface               | 5   | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date

July 8, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 16   |
| Water Temperature (°C)         | 18.4 | 10.8 |
| Dissolved Oxygen               | 8.6  | 0.2  |
| Specific Conductance (umho)    | 275  | 400  |
| pH (units)                     | 7.2  | 6.7  |
| Total Nitrate, as N            | 0.02 | .03  |
| Total Nitrite, as N            | .00  | .00  |
| Total Ammonia, as N            | .04  | .74  |
| Total Organic Nitrogen, as N   | 1.7  | 1.4  |
| Total Nitrogen, as N           | 1.7  | 2.1  |
| Dissolved Orthophosphate, as P | .00  | .26  |
| Total Phosphorus, as P         | .09  | .53  |
| Secchi-Disc Visibility (ft)    |      | 3    |
| Chlorophyll <u>a</u> (ug/L)    | 26.4 | --   |

Aquatic Macrophyte Coverage

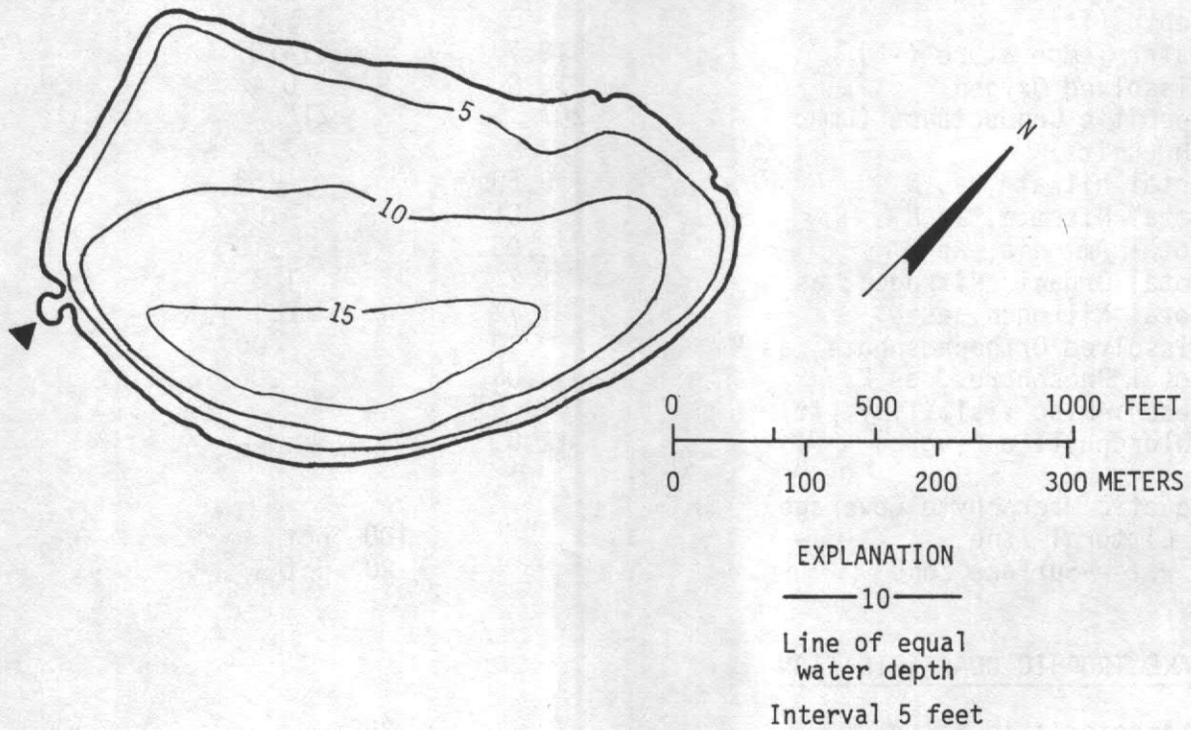
|                    |    |     |
|--------------------|----|-----|
| Littoral Zone      | 90 | pct |
| Water-Surface Zone | 10 | pct |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 397

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 61 |
| TSI <sub>TP</sub>  | 69 |
| TSI <sub>Chl</sub> | 63 |



Fazon Lake, Whatcom County. Photo taken July 8, 1981, view northwesterly. Bathymetric map from U.S. Geological Survey, October 11, 1973.

FOUNTAIN LAKE

WHATCOM COUNTY

WRIA 01

T39N-R03E-04

LATITUDE 48° 54' 10" LONGITUDE 122° 25' 35"

PHYSICAL DATA

Drainage area 0.37 mi<sup>2</sup>  
 Altitude 68 ft  
 Lake Area 17 acres  
 Lake Volume 129 acre-ft  
 Mean Depth 7 ft  
 Maximum Depth 14 ft  
 Shoreline Length 0.61 mi  
 Shoreline Configuration 1.0  
 Development of Volume 0.53  
 Bottom Slope 1.4 pct  
 Surface Inflow No  
 Surface Outflow Yes

CULTURAL DATA

Residential Development 0 pct  
 Number of Nearshore Homes 0  
 Land Use in Drainage Basin  
 Residential-Urban 0 pct  
 Residential-Suburban 5 pct  
 Agricultural 67 pct  
 Forest or Unproductive 22 pct  
 Lake Surface 6 pct  
 Public Boat Access to Lake No

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date July 8, 1981

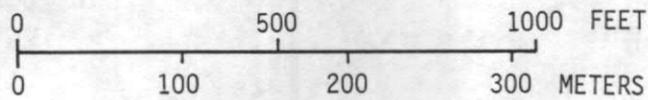
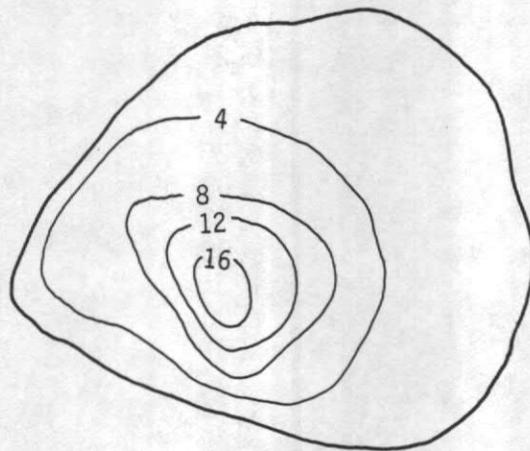
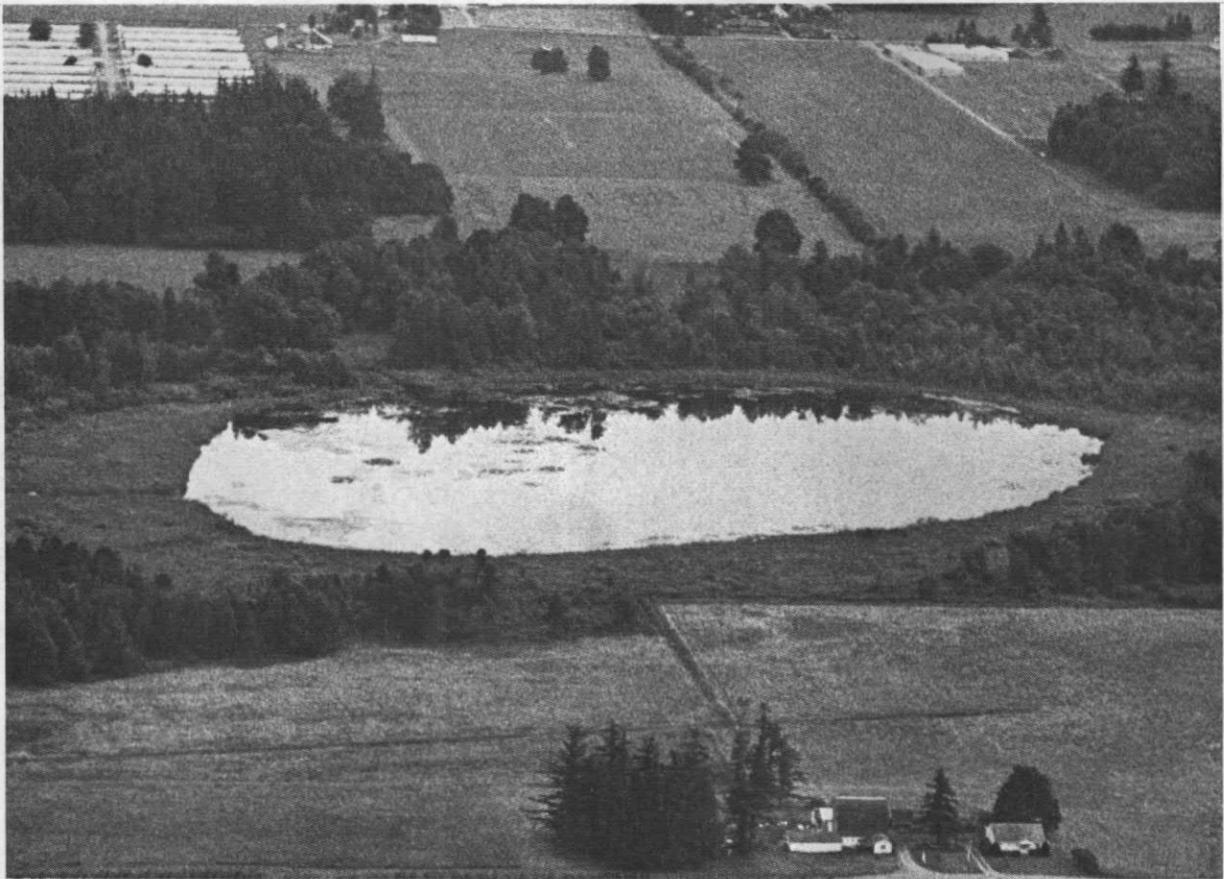
|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 10   |
| Water Temperature (°C)         | 18.7 | 14.8 |
| Dissolved Oxygen               | 10.8 | 0.4  |
| Specific Conductance (umho)    | 207  | 215  |
| pH (units)                     | 7.8  | 7.4  |
| Total Nitrate, as N            | 0.50 | .59  |
| Total Nitrite, as N            | .01  | .06  |
| Total Ammonia, as N            | .05  | .15  |
| Total Organic Nitrogen, as N   | 1.2  | 1.3  |
| Total Nitrogen, as N           | 1.7  | 2.1  |
| Dissolved Orthophosphate, as P | .00  | .00  |
| Total Phosphorus, as P         | .06  | .06  |
| Secchi-Disc Visibility (ft)    |      | 4    |
| Chlorophyll <u>a</u> (ug/L)    | 12.0 | --   |

Aquatic Macrophyte Coverage  
 Littoral Zone 100 pct  
 Water-Surface Zone 20 pct

LAKE TROPHIC CLASSIFICATION

Characteristic Value 258

Trophic State Index (Carlson, 1977)  
 TSI<sub>SD</sub> 57  
 TSI<sub>TP</sub> 63  
 TSI<sub>Chl</sub> 55



EXPLANATION  
— 8 —  
Line of equal  
water depth  
Interval 4 feet

Fountain Lake, Whatcom County. Photo taken July 8, 1981, view southerly.  
Bathymetric map from U.S. Geological Survey, June 15, 1981.

LOUISE LAKE

WHATCOM COUNTY

WRIA 01

T37N-R04E-08

LATITUDE 48° 42' 26" LONGITUDE 122° 19' 39"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 0.32 mi <sup>2</sup> |
| Altitude                | 330 ft               |
| Lake Area               | 29 acres             |
| Lake Volume             | 1,000 acre-ft        |
| Mean Depth              | 34 ft                |
| Maximum Depth           | 91 ft                |
| Shoreline Length        | 1.0 mi               |
| Shoreline Configuration | 1.4                  |
| Development of Volume   | 0.38                 |
| Bottom Slope            | 7.2 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | No                   |

CULTURAL DATA

|                            |    |     |
|----------------------------|----|-----|
| Residential Development    | 20 | pct |
| Number of Nearshore Homes  | 9  |     |
| Land Use in Drainage Basin |    |     |
| Residential-Urban          | 0  | pct |
| Residential-Suburban       | 2  | pct |
| Agricultural               | 0  | pct |
| Forest or Unproductive     | 84 | pct |
| Lake Surface               | 14 | pct |
| Public Boat Access to Lake | No |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

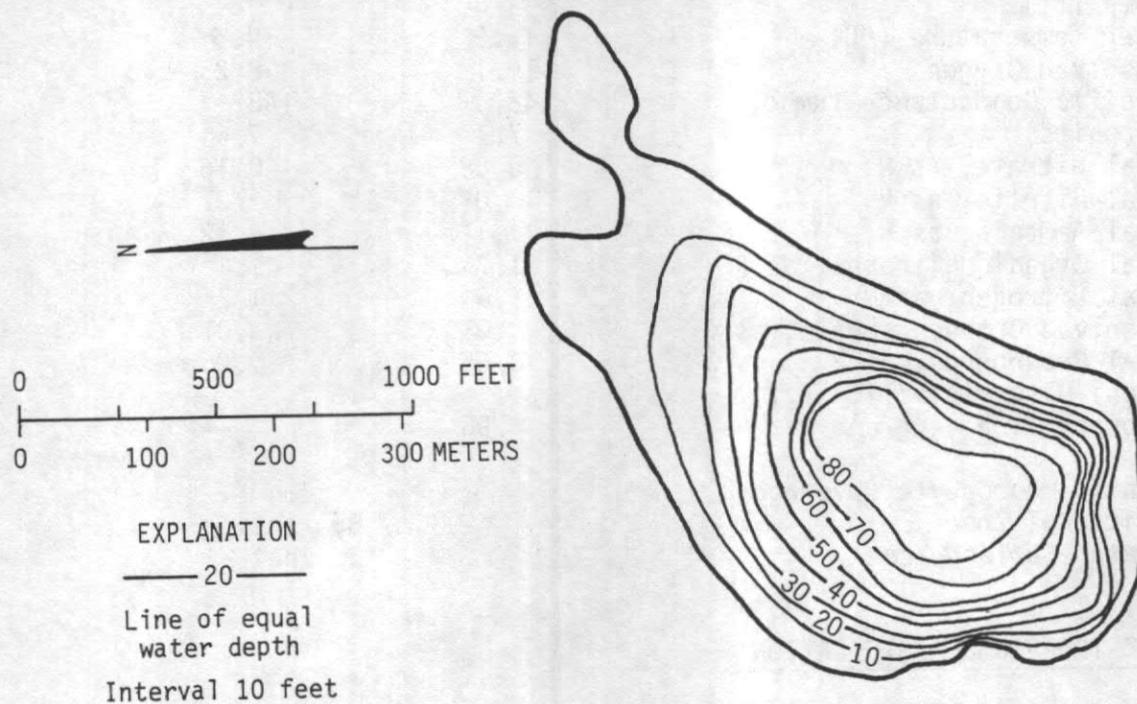
Date

July 8, 1981

|                                |      |         |
|--------------------------------|------|---------|
| Depth (ft)                     | 3    | 87      |
| Water Temperature (°C)         | 19.4 | 4.8     |
| Dissolved Oxygen               | 10.2 | 0.2     |
| Specific Conductance (umho)    | 75   | 81      |
| pH (units)                     | 6.9  | 6.6     |
| Total Nitrate, as N            | 0.20 | .65     |
| Total Nitrite, as N            | .00  | .00     |
| Total Ammonia, as N            | .03  | .11     |
| Total Organic Nitrogen, as N   | .80  | .68     |
| Total Nitrogen, as N           | 1.0  | 1.4     |
| Dissolved Orthophosphate, as P | .00  | .00     |
| Total Phosphorus, as P         | .01  | .01     |
| Secchi-Disc Visibility (ft)    |      | 10      |
| Chlorophyll <u>a</u> (ug/L)    | 3.94 | --      |
| Aquatic Macrophyte Coverage    |      |         |
| Littoral Zone                  |      | 70 pct  |
| Water-Surface Zone             |      | < 5 pct |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 108 |
| Trophic State Index (Carlson, 1977) |     |
| TSISD                               | 44  |
| TSITP                               | 37  |
| TSICh1                              | 44  |



Louise Lake, Whatcom County. Photo taken July 8, 1981, view easterly.  
Bathymetric map from U.S. Geological Survey, October 9, 1973.

SILVER LAKE

WHATCOM COUNTY

WRIA 01

T40N-R06E-07

LATITUDE 48° 58' 02" LONGITUDE 122° 04' 11"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 2.14 mi <sup>2</sup> |
| Altitude                | 757 ft               |
| Lake Area               | 180 acres            |
| Lake Volume             | 3,100 acre-ft        |
| Mean Depth              | 17 ft                |
| Maximum Depth           | 30 ft                |
| Shoreline Length        | 3.3 mi               |
| Shoreline Configuration | 1.7                  |
| Development of Volume   | 0.55                 |
| Bottom Slope            | 0.94 pct             |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

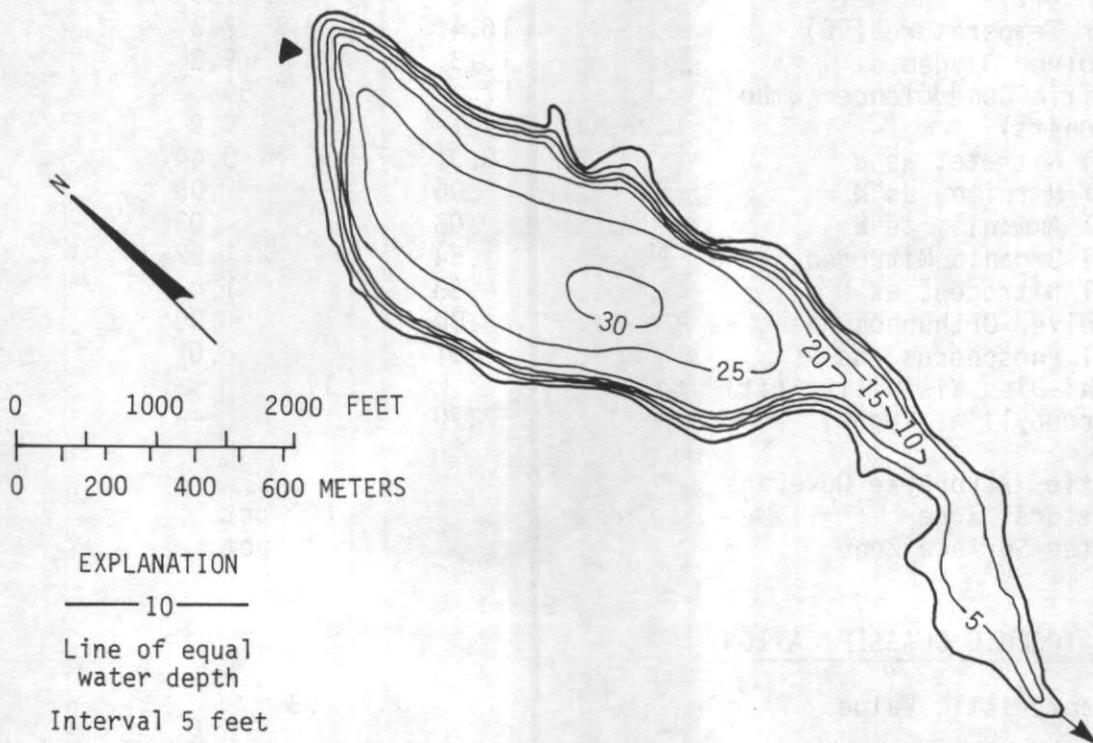
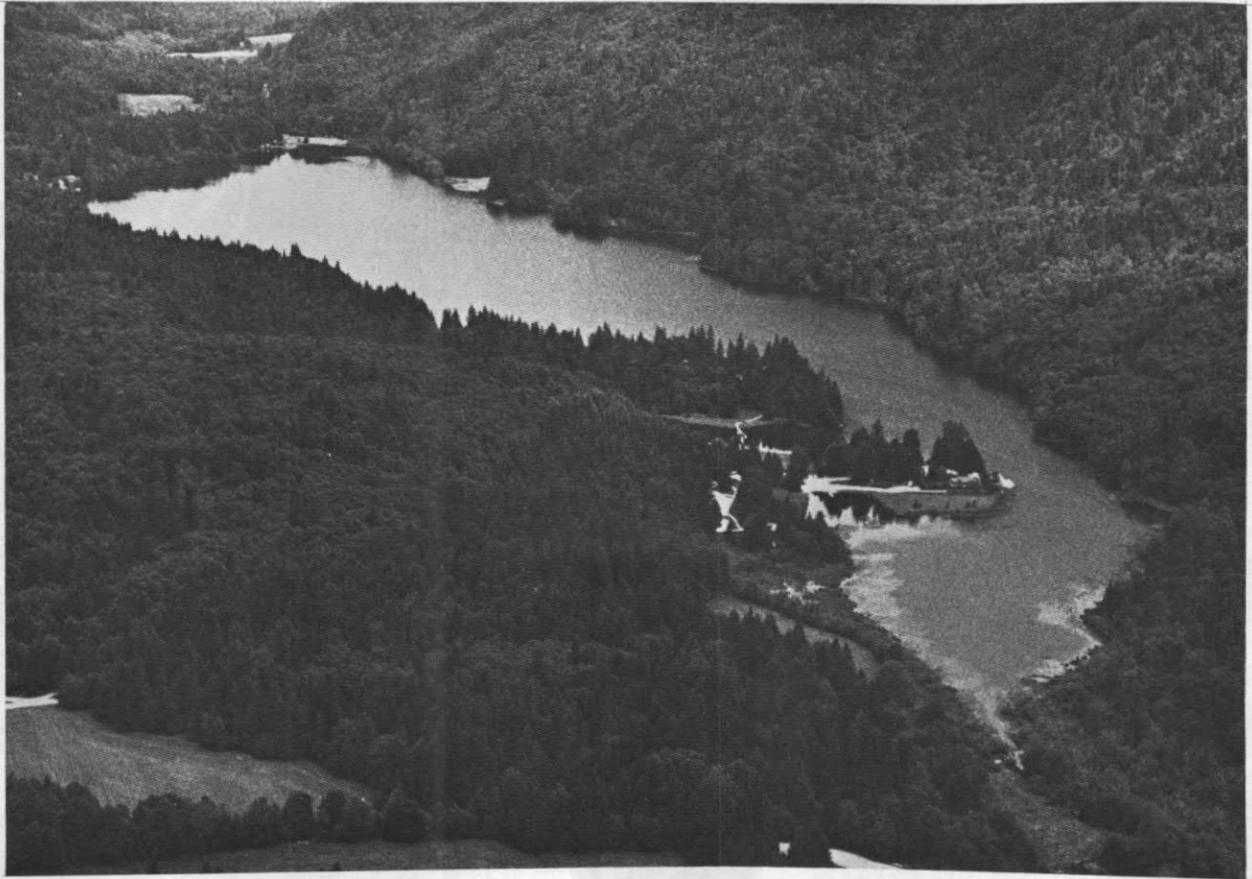
|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 25  | pct |
| Number of Nearshore Homes  | 31  |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 0   | pct |
| Residential-Suburban       | 3   | pct |
| Agricultural               | 7   | pct |
| Forest or Unproductive     | 77  | pct |
| Lake Surface               | 13  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

|                                |              |      |
|--------------------------------|--------------|------|
| Date                           | July 8, 1981 |      |
| Depth (ft)                     | 3            | 24   |
| Water Temperature (°C)         | 16.9         | 14.6 |
| Dissolved Oxygen               | 10.1         | 8.2  |
| Specific Conductance (umho)    | 148          | 148  |
| pH (units)                     | 7.7          | 7.6  |
| Total Nitrate, as N            | 0.08         | 0.16 |
| Total Nitrite, as N            | .01          | .01  |
| Total Ammonia, as N            | .11          | .12  |
| Total Organic Nitrogen, as N   | 1.7          | 1.4  |
| Total Nitrogen, as N           | 1.9          | 1.7  |
| Dissolved Orthophosphate, as P | .01          | .01  |
| Total Phosphorus, as P         | .05          | .05  |
| Secchi-Disc Visibility (ft)    | 15           |      |
| Chlorophyll <u>a</u> (ug/L)    | .96          | --   |
| Aquatic Macrophyte Coverage    |              |      |
| Littoral Zone                  | 85           | pct  |
| Water-Surface Zone             | 20           | pct  |

LAKE TROPHIC CLASSIFICATION

|                                     |     |
|-------------------------------------|-----|
| Characteristic Value                | 159 |
| Trophic State Index (Carlson, 1977) |     |
| TSI <sub>SD</sub>                   | 38  |
| TSI <sub>TP</sub>                   | 61  |
| TSI <sub>Chl</sub>                  | 30  |



Silver (40N-6E-7) Lake, Whatcom County. Photo taken July 8, 1981, view northerly. Bathymetric map from Washington Department of Game, July 22, 1950.

WHATCOM LAKE

WHATCOM COUNTY

WRIA 01

T38N-R03E-28

LATITUDE 48° 45' 28" LONGITUDE 122° 25' 17"

PHYSICAL DATA

|                         |                      |
|-------------------------|----------------------|
| Drainage area           | 55.9 mi <sup>2</sup> |
| Altitude                | 315 ft               |
| Lake Area               | 5,000 acres          |
| Lake Volume             | 770,000 acre-ft      |
| Mean Depth              | 150 ft               |
| Maximum Depth           | 330 ft               |
| Shoreline Length        | 27 mi                |
| Shoreline Configuration | 2.7                  |
| Development of Volume   | 0.47                 |
| Bottom Slope            | 2.0 pct              |
| Surface Inflow          | Yes                  |
| Surface Outflow         | Yes                  |

CULTURAL DATA

|                            |     |     |
|----------------------------|-----|-----|
| Residential Development    | 55  | pct |
| Number of Nearshore Homes  | 500 |     |
| Land Use in Drainage Basin |     |     |
| Residential-Urban          | 1   | pct |
| Residential-Suburban       | 2   | pct |
| Agricultural               | 2   | pct |
| Forest or Unproductive     | 82  | pct |
| Lake Surface               | 14  | pct |
| Public Boat Access to Lake | Yes |     |

WATER-QUALITY DATA (in milligrams per liter unless otherwise indicated)

Date July 8, 1981

|                                |      |      |
|--------------------------------|------|------|
| Depth (ft)                     | 3    | 195  |
| Water Temperature (°C)         | 16.4 | 7.3  |
| Dissolved Oxygen               | 10.3 | 9.6  |
| Specific Conductance (umho)    | 57   | 59   |
| pH (units)                     | 7.1  | 6.9  |
| Total Nitrate, as N            | 0.31 | 0.44 |
| Total Nitrite, as N            | .00  | .00  |
| Total Ammonia, as N            | .03  | .03  |
| Total Organic Nitrogen, as N   | .54  | .57  |
| Total Nitrogen, as N           | .88  | 1.0  |
| Dissolved Orthophosphate, as P | .00  | .00  |
| Total Phosphorus, as P         | .01  | .01  |
| Secchi-Disc Visibility (ft)    |      | 17   |
| Chlorophyll <u>a</u> (ug/L)    | 2.70 | --   |

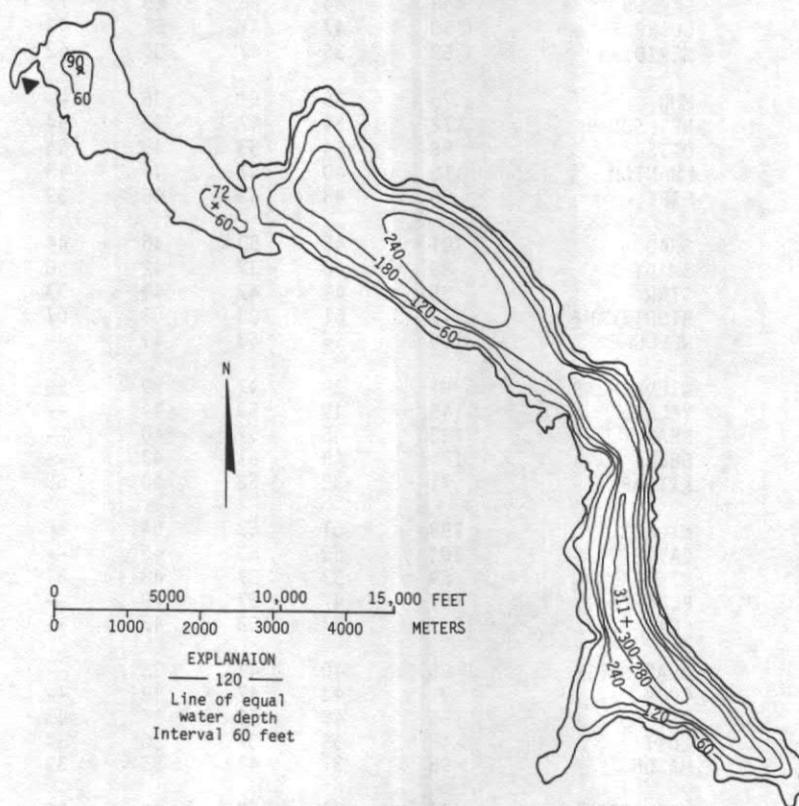
|                             |        |
|-----------------------------|--------|
| Aquatic Macrophyte Coverage |        |
| Littoral Zone               | 60 pct |
| Water-Surface Zone          | 1 pct  |

LAKE TROPHIC CLASSIFICATION

Characteristic Value 63

Trophic State Index (Carlson, 1977)

|                    |    |
|--------------------|----|
| TSI <sub>SD</sub>  | 36 |
| TSI <sub>TP</sub>  | 37 |
| TSI <sub>Chl</sub> | 40 |



Whatcom Lake, Whatcom County. Photo taken July 26, 1974.  
 Bathymetric map from Western Washington University, 1964.

APPENDIX B.--Current (1981) characteristic values and TSI's based on historic and current data, listed alphabetically by county

| COUNTY    | LAKE         | 1981 CV | 1981 TSI |     |     | 1976 TSI <sup>1</sup> |    |     |
|-----------|--------------|---------|----------|-----|-----|-----------------------|----|-----|
|           |              |         | SD       | TP  | CHI | SD                    | TP | CHI |
| CLARK     | DEAD         | 146     | 51       | 61  | 53  | --                    | -- | --  |
| CLARK     | LACKAMAS     | 199     | 57       | 71  | 46  | 47                    | 59 | 54  |
| FERRY     | CURLEW       | 98      | 45       | 47  | 39  | 42                    | 50 | --  |
| FERRY     | FRENCH JOHNS | 45      | 38       | 37  | 34  | --                    | -- | --  |
| GRANT     | THOMPSON     | 304     | 49       | 61  | 61  | --                    | -- | --  |
| ISLAND    | CRANBERRY    | 178     | 45       | 53  | 51  | 50                    | 55 | --  |
| ISLAND    | DEER         | 93      | 35       | 63  | 31  | 39                    | 38 | 40  |
| ISLAND    | OLIVER       | 125     | 43       | 61  | 38  | --                    | -- | --  |
| ISLAND    | SILVER       | 304     | 67       | 37  | 39  | --                    | -- | --  |
| JEFFERSON | ANDERSON     | 639     | 61       | 75  | 74  | 47                    | 63 | --  |
| JEFFERSON | GIBBS        | 147     | 45       | 57  | 51  | 53                    | 49 | --  |
| JEFFERSON | LELAND       | 196     | 49       | 63  | 48  | --                    | -- | --  |
| KING      | BASS         | 278     | 57       | 61  | 59  | 52                    | 47 | --  |
| KING      | BEAVER NO. 2 | 118     | 47       | 47  | 46  | 43                    | 38 | --  |
| KING      | BITTER       | 76      | 40       | 37  | 37  | 46                    | 53 | --  |
| KING      | BLACK        | 90      | 39       | 53  | 37  | 54                    | 54 | --  |
| KING      | BOREN        | 120     | 41       | 61  | 51  | 47                    | 47 | 47  |
| KING      | BOW          | 146     | 45       | 67  | 47  | --                    | -- | --  |
| KING      | DEEP         | 80      | 43       | 53  | 31  | 38                    | 38 | --  |
| KING      | DOLLOFF      | 395     | 61       | 61  | 65  | 61                    | 53 | --  |
| KING      | DUBOIS       | 147     | 51       | 37  | 44  | --                    | -- | --  |
| KING      | ECHO         | 104     | 44       | 47  | 36  | 43                    | 53 | 44  |
| KING      | LARSEN       | 453     | 64       | 86  | 48  | 77                    | 97 | --  |
| KING      | LUCERNE      | 150     | 47       | 47  | 56  | 43                    | 30 | --  |
| KING      | MERIDIAN     | 59      | 36       | 47  | 36  | 42                    | 37 | --  |
| KING      | MUD          | 76      | 35       | 57  | 36  | --                    | -- | --  |
| KING      | NEILSON      | 172     | 51       | 47  | 53  | 54                    | 50 | --  |
| KING      | OTTER        | 98      | 44       | 53  | 48  | 44                    | 24 | --  |
| KING      | PHANTOM      | 116     | 40       | 57  | 44  | 43                    | 42 | --  |
| KING      | PIPE         | 86      | 43       | 63  | 43  | 39                    | 37 | --  |
| KING      | SHADOW       | 101     | 45       | 53  | 46  | 44                    | 42 | 43  |
| KING      | SHADY        | 89      | 40       | 37  | 42  | 50                    | 30 | --  |
| KING      | STAR         | 85      | 43       | 47  | 49  | 33                    | 70 | --  |
| KING      | STURTEVANT   | 777     | 61       | 106 | 63  | 67                    | 93 | --  |
| KING      | WELCOME      | 199     | 54       | 63  | 49  | --                    | -- | --  |
| KING      | WILDERNESS   | 97      | 39       | 47  | 39  | 36                    | 37 | --  |
| KING      | YELLOW       | 145     | 49       | 53  | 44  | --                    | -- | --  |
| KITSAP    | BEAR         | 133     | 45       | 57  | 40  | --                    | -- | --  |
| KITSAP    | BUCK         | 171     | 49       | 61  | 43  | --                    | -- | --  |
| KITSAP    | KITSAP       | 71      | 38       | 53  | 40  | 50                    | 47 | --  |
| KITSAP    | MILLER       | 298     | 61       | 63  | 54  | 60                    | 54 | --  |
| LEWIS     | DAVIS        | 204     | 59       | 63  | 45  | --                    | -- | --  |
| LEWIS     | MINERAL      | 69      | 37       | 37  | 48  | 37                    | 47 | 48  |
| LEWIS     | PLUMMER      | 197     | 47       | 57  | 49  | --                    | -- | --  |
| LINCOLN   | FLAT         | 1047    | 67       | 108 | 47  | --                    | -- | --  |
| MASON     | BLACKSMITH   | 86      | 40       | 47  | 33  | --                    | -- | --  |
| MASON     | COON         | 91      | 43       | 47  | 38  | --                    | -- | --  |
| MASON     | ISLAND       | 66      | 40       | 53  | 37  | 43                    | 38 | --  |
| MASON     | LOST         | 46      | 33       | 37  | 30  | 33                    | 44 | 34  |
| MASON     | MASON        | 93      | 37       | 47  | 35  | 39                    | 40 | 43  |
| MASON     | NAHWATZEL    | 75      | 40       | 57  | 35  | 36                    | 32 | --  |
| OKANOGAN  | BLUE         | 85      | 33       | 37  | 28  | --                    | -- | --  |
| OKANOGAN  | BONNER       | 228     | 47       | 53  | 42  | --                    | -- | --  |
| OKANOGAN  | CASTOR       | 169     | 37       | 47  | 27  | --                    | -- | --  |
| OKANOGAN  | MUD          | 201     | 44       | 53  | 32  | --                    | -- | --  |

APPENDIX B.--Current (1981) characteristic values and TSI's based on historic and current data, listed alphabetically by county--Continued

| COUNTY       | LAKE            | 1981 CV | 1981 TSI |    |     | 1976 TSI <sup>1</sup> |    |     |
|--------------|-----------------|---------|----------|----|-----|-----------------------|----|-----|
|              |                 |         | SD       | TP | CH1 | SD                    | TP | CH1 |
| OKANOGAN     | OSOYOOS         | 105     | 45       | 47 | 42  | 49                    | 40 | --  |
| PEND OREILLE | DIAMOND         | 59      | 33       | 37 | 26  | 34                    | 37 | 42  |
| PEND OREILLE | LUCERNE         | 64      | 30       | 37 | 27  | --                    | -- | --  |
| PEND OREILLE | SACHEEN         | 131     | 43       | 47 | 52  | 43                    | 45 | --  |
| PIERCE       | BONNEY          | 76      | 37       | 47 | 38  | 43                    | 43 | --  |
| PIERCE       | CARNEY          | 77      | 32       | 37 | 35  | 38                    | 58 | --  |
| PIERCE       | CLEAR           | 50      | 31       | 47 | 31  | 33                    | 35 | --  |
| PIERCE       | CRANBERRY       | 223     | 57       | 47 | 47  | 61                    | 56 | --  |
| PIERCE       | CRESCENT        | 261     | 44       | 47 | 39  | 54                    | 41 | --  |
| PIERCE       | HARTS           | 534     | 54       | 92 | 53  | 43                    | 53 | --  |
| PIERCE       | LOUISE          | 78      | 41       | 47 | 0   | 34                    | 35 | 38  |
| PIERCE       | MORGAN          | 333     | 57       | 72 | 60  | 70                    | 52 | --  |
| PIERCE       | OHOP            | 256     | 54       | 63 | 58  | 46                    | 53 | --  |
| PIERCE       | SILVER          | 572     | 61       | 63 | 73  | 52                    | 47 | --  |
| PIERCE       | SPANAWAY        | 87      | 39       | 37 | 35  | 47                    | 52 | 49  |
| PIERCE       | STEILACOOM      | 104     | 43       | 57 | 43  | 43                    | 47 | --  |
| PIERCE       | STIDHAM         | 423     | 64       | 74 | 59  | 67                    | 61 | --  |
| PIERCE       | TANWAX          | 253     | 57       | 53 | 59  | 49                    | 47 | --  |
| PIERCE       | TAPPS           | 73      | 44       | 47 | 31  | 59                    | 43 | --  |
| PIERCE       | TWENTYSEVEN     | 74      | 39       | 0  | 42  | 52                    | 48 | --  |
| PIERCE       | TWIN, NORTH     | 304     | 57       | 63 | 58  | --                    | -- | --  |
| PIERCE       | TWIN, SOUTH     | 264     | 54       | 61 | 58  | --                    | -- | --  |
| PIERCE       | WHITMAN         | 140     | 45       | 57 | 46  | 40                    | 41 | --  |
| SKAGIT       | CLEAR           | 86      | 38       | 37 | 37  | 38                    | 27 | 39  |
| SKAGIT       | MCMURRAY        | 86      | 39       | 37 | 37  | 39                    | 45 | 47  |
| SKAGIT       | PASS            | 153     | 45       | 53 | 53  | 57                    | 66 | --  |
| SKAGIT       | TRAFTON         | 118     | 39       | 47 | 35  | --                    | -- | --  |
| SKAMANIA     | ASHES           | 177     | 55       | 71 | 51  | 60                    | 59 | --  |
| SKAMANIA     | GREENLEAF       | 110     | 49       | 63 | 47  | 60                    | 57 | --  |
| SNOHOMISH    | BEECHER         | 235     | 57       | 63 | 53  | --                    | -- | --  |
| SNOHOMISH    | BLACKMANS       | 87      | 39       | 0  | 44  | 38                    | 34 | --  |
| SNOHOMISH    | BOYD            | 364     | 49       | 37 | 47  | --                    | -- | --  |
| SNOHOMISH    | BRYANT          | 278     | 61       | 37 | 54  | 65                    | 52 | --  |
| SNOHOMISH    | CASSIDY         | 422     | 67       | 47 | 60  | 55                    | 65 | 56  |
| SNOHOMISH    | HOWARD          | 84      | 33       | 47 | 39  | 49                    | 63 | 43  |
| SNOHOMISH    | KETCHUM         | 193     | 44       | 80 | 37  | --                    | -- | --  |
| SNOHOMISH    | KI              | 63      | 39       | 37 | 38  | 41                    | 32 | 37  |
| SNOHOMISH    | LOMA            | 198     | 54       | 57 | 51  | 59                    | 53 | 48  |
| SNOHOMISH    | MARTHA          | 123     | 44       | 37 | 48  | 45                    | 45 | 43  |
| SNOHOMISH    | MEADOW          | 267     | 61       | 47 | 53  | --                    | -- | --  |
| SNOHOMISH    | MUD             | 84      | 41       | 37 | 42  | --                    | -- | --  |
| SNOHOMISH    | ROESIGER, NORTH | 72      | 36       | 37 | 39  | 43                    | 52 | 39  |
| SNOHOMISH    | RUGGS           | 111     | 47       | 37 | 39  | --                    | -- | --  |
| SNOHOMISH    | SERENE          | 110     | 38       | 37 | 30  | 49                    | 47 | --  |
| SNOHOMISH    | SILVER          | 93      | 37       | 37 | 41  | 40                    | 48 | --  |
| SNOHOMISH    | STICKNEY        | 142     | 49       | 47 | 38  | 49                    | 44 | --  |
| SNOHOMISH    | SWARTZ          | 122     | 47       | 37 | 46  | --                    | -- | --  |
| SNOHOMISH    | THOMAS          | 530     | 61       | 63 | 72  | --                    | -- | --  |
| SNOHOMISH    | WAGNER          | 98      | 44       | 37 | 49  | --                    | -- | --  |
| SPOKANE      | ELOIKA          | 107     | 40       | 47 | 43  | 46                    | 52 | --  |
| STEVENS      | BROWNS          | 54      | 30       | 37 | 24  | --                    | -- | --  |
| STEVENS      | BUZZARD         | 101     | 36       | 37 | 35  | --                    | -- | --  |
| STEVENS      | DEER            | 54      | 30       | 37 | 30  | 32                    | 37 | 38  |
| STEVENS      | KEOGH           | 88      | 37       | 37 | 39  | --                    | -- | --  |
| STEVENS      | LOON            | 64      | 33       | 37 | 23  | 31                    | 37 | --  |

APPENDIX B.--Current (1981) characteristic values and TSI's based on historic and current data, listed alphabetically by county--Continued

| COUNTY   | LAKE             | 1981 CV | 1981 TSI |    |     | 1976 TSI <sup>1</sup> |    |     |
|----------|------------------|---------|----------|----|-----|-----------------------|----|-----|
|          |                  |         | SD       | TP | CH1 | SD                    | TP | CH1 |
| STEVENS  | PHALON           | 106     | 38       | 37 | 37  | --                    | -- | --  |
| STEVENS  | ROCKY            | 157     | 40       | 37 | 38  | --                    | -- | --  |
| STEVENS  | THOMAS           | 85      | 41       | 47 | 41  | 39                    | 51 | --  |
| STEVENS  | WAITTS           | 68      | 36       | 47 | 35  | 38                    | 45 | --  |
| THURSTON | BIGELOW          | 304     | 59       | 63 | 61  | --                    | -- | --  |
| THURSTON | BLACK            | 94      | 45       | 0  | 53  | 48                    | 47 | --  |
| THURSTON | ELBOW            | 51      | 35       | 37 | 39  | 44                    | 48 | --  |
| THURSTON | HICK             | 178     | 43       | 47 | 51  | 45                    | 47 | 45  |
| THURSTON | LAWRENCE         | 127     | 47       | 47 | 47  | 53                    | 54 | 53  |
| THURSTON | MUNN             | 303     | 54       | 63 | 62  | 49                    | 60 | 56  |
| THURSTON | OFFUTT           | 106     | 49       | 0  | 52  | 44                    | 47 | 43  |
| THURSTON | PATTERSON, NORTH | 75      | 39       | 0  | 41  | 49                    | 42 | 51  |
| THURSTON | PATTERSON, SOUTH | 106     | 36       | 53 | 43  | 47                    | 46 | 54  |
| THURSTON | PITMAN           | 244     | 54       | 69 | 54  | 57                    | 55 | --  |
| THURSTON | SCOTT            | 203     | 54       | 57 | 59  | 50                    | 53 | 51  |
| THURSTON | ST CLAIR, SOUTH  | 476     | 59       | 67 | 70  | 52                    | 53 | 50  |
| THURSTON | TEMPO            | 496     | 61       | 69 | 67  | 52                    | 51 | --  |
| THURSTON | TRAILS END       | 176     | 51       | 57 | 54  | --                    | -- | --  |
| THURSTON | TROSPER          | 93      | 47       | 57 | 48  | --                    | -- | --  |
| WHATCOM  | FAZON            | 397     | 61       | 69 | 63  | 54                    | 68 | --  |
| WHATCOM  | FOUNTAIN         | 258     | 57       | 63 | 55  | --                    | -- | --  |
| WHATCOM  | LOUISE           | 108     | 44       | 37 | 44  | 57                    | 48 | --  |
| WHATCOM  | SILVER           | 159     | 38       | 61 | 30  | 46                    | 48 | --  |
| WHATCOM  | WHATCOM          | 63      | 36       | 37 | 40  | 38                    | 30 | --  |

<sup>1</sup> Raw data from Bortleson and others (1976a, 1976b, 1976c, and 1976d) and Dion and others (1976a, 1976b, and 1976c).

APPENDIX C.--Characteristic values and TSI's based on historic data,  
listed alphabetically by county

| County | Lake                     | CV <sup>1</sup> | TSI <sup>2</sup> |     |     |
|--------|--------------------------|-----------------|------------------|-----|-----|
|        |                          |                 | SD               | TP  | Chl |
| ADAMS  | AKLALI (PINES) LAKE      | 506             | 65               | 111 | .   |
| ADAMS  | BLACK LAKE               | 70              | 50               | 49  | .   |
| ADAMS  | COW LAKE                 | 191             | 65               | 76  | .   |
| ADAMS  | FINNEL LAKE              | 177             | 65               | 70  | .   |
| ADAMS  | FOURTH OF JULY LAKE      | 138             | 38               | 65  | .   |
| ADAMS  | GREEN LAKE               | 144             | 59               | 67  | .   |
| ADAMS  | HALLIN LAKE              | 241             | 67               | 84  | .   |
| ADAMS  | LINDA LAKE               | 113             | 59               | 62  | .   |
| ADAMS  | MCELROY LAKE             | 563             | 67               | 114 | .   |
| ADAMS  | NIGGER LAKE              | 951             | 93               | 106 | .   |
| ADAMS  | OWL LAKE                 | 328             | 73               | 80  | .   |
| ADAMS  | PALM LAKE                | 254             | 60               | 87  | .   |
| ADAMS  | RODEO LAKE               | 316             | 73               | 90  | .   |
| ADAMS  | SPRAGUE LAKE             | 142             | 60               | 72  | 60  |
| ADAMS  | THREAD LAKE              | 58              | 45               | 53  | .   |
| ADAMS  | TWELVE MILE LAKE         | .               | .                | 58  | .   |
| ADAMS  | TWELVE-MILE SLOUGH LAKE  | 267             | 70               | 74  | .   |
| ADAMS  | UNNAMED (16N-29E-29)     | 237             | 65               | 77  | .   |
| ADAMS  | UNNAMED (19N-38E-15)     | 186             | 63               | 67  | .   |
| BENTON | MOUND LAKE               | 80              | 57               | 67  | .   |
| BENTON | YELLEPIT LAKE            | 93              | 56               | 65  | .   |
| CHELAN | ANTILON LAKE             | 23              | 37               | 42  | .   |
| CHELAN | CHELAN LAKE              | .               | 28               | 24  | .   |
| CHELAN | CHIWAUKUM LAKE           | 5               | 26               | 4   | .   |
| CHELAN | COLCHUCK LAKE            | .               | 40               | 36  | .   |
| CHELAN | CORTEZ (THREE) LAKE      | 68              | 52               | 50  | .   |
| CHELAN | DRY (GRASS) LAKE         | 87              | 47               | 60  | .   |
| CHELAN | EIGHTMILE LAKE           | 5               | 25               | 20  | .   |
| CHELAN | ENCHANTMENT 2 LAKE       | .               | 27               | 34  | .   |
| CHELAN | FISH LAKE                | 37              | 43               | 55  | 45  |
| CHELAN | INSPIRATION LAKE         | .               | 62               | 24  | .   |
| CHELAN | ISOLATION LAKE           | .               | 21               | 34  | .   |
| CHELAN | KLONAQUA, LOWER LAKE     | 2               | 20               | 14  | .   |
| CHELAN | KLONAQUA, UPPER LAKE     | 4               | 18               | 4   | .   |
| CHELAN | LOCH EILEEN LAKE         | 4               | 25               | 20  | .   |
| CHELAN | MEADOW LAKE              | 288             | 70               | 79  | .   |
| CHELAN | NADA LAKE                | .               | 26               | 18  | .   |
| CHELAN | PERFECTION LAKE          | .               | 26               | 28  | .   |
| CHELAN | ROSES (ALKALI) LAKE      | 37              | 50               | 66  | .   |
| CHELAN | SHIELD LAKE              | .               | 21               | 24  | .   |
| CHELAN | SNOW, LOWER LAKE         | .               | .                | 20  | .   |
| CHELAN | SNOW, UPPER LAKE         | 13              | 24               | 20  | .   |
| CHELAN | SPRING HILL (BLACK) LAKE | 37              | 47               | 50  | .   |
| CHELAN | STUART LAKE              | .               | 30               | 36  | .   |

## APPENDIX C--Continued

| County  | Lake                 | CV <sup>1</sup> | TSI <sup>2</sup> |     |     |
|---------|----------------------|-----------------|------------------|-----|-----|
|         |                      |                 | SD               | TP  | Ch1 |
| CHELAN  | WAPATO LAKE          | 61              | 49               | 52  | 45  |
| CHELAN  | WENATCHEE LAKE       | 8               | 34               | 24  | 33  |
| CHELAN  | WHEELER, UPPER LAKE  | 30              | 37               | 48  | .   |
| CLALLAM | ALDWELL LAKE         | 23              | 47               | 24  | .   |
| CLALLAM | BEAVER LAKE          | 42              | 46               | 40  | .   |
| CLALLAM | DICKEY LAKE          | 45              | 46               | 43  | .   |
| CLALLAM | ELK LAKE             | 44              | 46               | 40  | .   |
| CLALLAM | OZETTE LAKE          | 37              | 45               | 27  | 40  |
| CLALLAM | PLEASANT LAKE        | 25              | 40               | 35  | .   |
| CLALLAM | SEAFIELD LAKE        | 120             | 65               | 48  | .   |
| CLALLAM | SUTHERLAND LAKE      | 5               | 27               | 30  | .   |
| CLALLAM | WENTWORTH LAKE       | 46              | 47               | 32  | .   |
| CLARK   | BATTLEGROUND LAKE    | 28              | 35               | 35  | 38  |
| CLARK   | LACKAMAS LAKE        | 47              | 47               | 59  | 54  |
| CLARK   | MERWIN LAKE          | 10              | 33               | 20  | .   |
| CLARK   | MUD LAKE             | .               | 83               | 95  | .   |
| CLARK   | ROUND LAKE           | 99              | 59               | 52  | .   |
| CLARK   | UNNAMED (2N-1E-9)    | 274             | 77               | 79  | .   |
| CLARK   | YALE LAKE            | 12              | 33               | 30  | .   |
| COWLITZ | FAWN LAKE            | 11              | 33               | 20  | .   |
| COWLITZ | HORSESHOE LAKE       | 162             | 70               | 66  | .   |
| COWLITZ | MERRILL LAKE         | 5               | 27               | 37  | .   |
| COWLITZ | SACAJAWEA LAKE       | 147             | 70               | 65  | .   |
| COWLITZ | SILVER LAKE          | .               | 62               | 50  | .   |
| DOUGLAS | BLACK LAKE           | .               | .                | 142 | .   |
| DOUGLAS | CORNEHL LAKE         | .               | .                | 66  | .   |
| DOUGLAS | ELBOW LAKE           | 302             | 47               | 97  | .   |
| DOUGLAS | GRIMES LAKE          | 558             | 40               | 117 | .   |
| DOUGLAS | HAYNES LAKE          | 315             | 48               | 91  | .   |
| DOUGLAS | JAMESON LAKE         | 124             | 46               | 62  | 56  |
| DOUGLAS | JAMESON POTHOLE LAKE | 120             | 42               | 65  | .   |
| DOUGLAS | MURPHY LAKE          | 308             | 65               | 65  | .   |
| DOUGLAS | SMITH LAKE           | 183             | 44               | 75  | .   |
| DOUGLAS | STALLARD LAKE        | 1259            | 61               | 130 | .   |
| DOUGLAS | UNNAMED (29N-27E-17) | 218             | .                | 84  | .   |
| DOUGLAS | UNNAMED (29N-27E-20) | 460             | 63               | 110 | .   |
| DOUGLAS | UNNAMED (29N-29E-2)  | .               | 55               | 125 | .   |
| DOUGLAS | UNNAMED (29N-29E-22) | 574             | 63               | 123 | .   |
| DOUGLAS | UNNAMED (30N-29E-36) | .               | 83               | 109 | .   |
| DOUGLAS | WILSON LAKE          | 500             | 60               | 112 | .   |
| FERRY   | CURLEW LAKE          | 44              | 42               | 50  | .   |
| FERRY   | MUD LAKE             | 119             | 56               | 56  | .   |
| FERRY   | SANPOIL LAKE         | 56              | 44               | 70  | .   |

## APPENDIX C --Continued

| County   | Lake                   | CV <sup>1</sup> | TSI <sup>2</sup> |     |     |
|----------|------------------------|-----------------|------------------|-----|-----|
|          |                        |                 | SD               | TP  | Chl |
| FRANKLIN | BAILIE LAKE            | 621             | 83               | 88  | .   |
| FRANKLIN | CLARK LAKE             | 272             | 63               | 72  | .   |
| FRANKLIN | EAGLE LAKE             | 64              | 49               | 59  | .   |
| FRANKLIN | HENDRICKS LAKE         | .               | 54               | 53  | .   |
| FRANKLIN | KAHLOTUS LAKE          | 119             | 37               | 77  | .   |
| FRANKLIN | LONG LAKE              | 152             | 56               | 70  | .   |
| FRANKLIN | MESA LAKE              | 177             | 65               | 70  | .   |
| FRANKLIN | SCOOTNEY LAKE          | 98              | 60               | 60  | .   |
| FRANKLIN | SULPHUR LAKE           | .               | 83               | 128 | .   |
| FRANKLIN | "T" LAKE               | 59              | 46               | 60  | .   |
| FRANKLIN | UNNAMED (12N-30E-20)   | 109             | 65               | 61  | .   |
| FRANKLIN | UNNAMED (13N-29E-5)    | 415             | 73               | 83  | .   |
| FRANKLIN | UNNAMED (13N-29E-15)   | 138             | 63               | 64  | .   |
| FRANKLIN | UNNAMED (14N-29E-11)   | 95              | 57               | 60  | .   |
| FRANKLIN | UNNAMED (14N-30E-14)   | 97              | 50               | 68  | .   |
| FRANKLIN | UNNAMED (14N-30E-33)   | 361             | 73               | 78  | .   |
| FRANKLIN | UNNAMED (14N-30E-34)   | 97              | 60               | 58  | .   |
| FRANKLIN | WASHTUCNA LAKE         | 114             | 37               | 63  | .   |
| FRANKLIN | WEIR LAKE              | 87              | 54               | 50  | .   |
| GRANT    | ALKALI LAKE            | 61              | 39               | 55  | .   |
| GRANT    | ANCIENT LAKE           | 105             | 56               | 66  | .   |
| GRANT    | ARTESIAN LAKE          | .               | 93               | 130 | .   |
| GRANT    | BABCOCK RIDGE LAKE     | .               | 63               | 69  | .   |
| GRANT    | BANKS LAKE             | 41              | 50               | 56  | .   |
| GRANT    | BEDA LAKE              | .               | 32               | 34  | .   |
| GRANT    | BILLY CLAPP LAKE       | 42              | 49               | 49  | .   |
| GRANT    | BLACK LAKE             | 570             | 77               | 106 | .   |
| GRANT    | BLACK ROCK LAKE        | .               | 93               | 116 | .   |
| GRANT    | BLUE LAKE              | 50              | 39               | 45  | .   |
| GRANT    | BROKEN ROCK LAKE       | 317             | 70               | 72  | .   |
| GRANT    | BROOK (STRATFORD) LAKE | 126             | 56               | 70  | .   |
| GRANT    | BURKE LAKE             | 42              | 41               | 50  | .   |
| GRANT    | CANAL LAKE             | 75              | 49               | 55  | 58  |
| GRANT    | COFFEE LAKE            | 623             | 56               | 119 | .   |
| GRANT    | CORRAL LAKE            | 56              | 45               | 47  | .   |
| GRANT    | COULEE LAKE            | .               | 52               | 124 | .   |
| GRANT    | CRATER LAKE            | .               | 55               | 62  | .   |
| GRANT    | CRESCENT BAY LAKE      | 268             | 39               | 109 | .   |
| GRANT    | DEEP LAKE              | 10              | 25               | 35  | .   |
| GRANT    | DRY FALLS LAKE         | 46              | 37               | 54  | .   |
| GRANT    | DUSTY LAKE             | 33              | 38               | 54  | .   |
| GRANT    | EPHRATA LAKE           | 107             | 40               | 55  | .   |
| GRANT    | EVERGREEN LAKE         | 34              | 42               | 55  | .   |

## APPENDIX C --Continued

| County       | Lake                               | CV <sup>1</sup> | TSI <sup>2</sup> |     |     |
|--------------|------------------------------------|-----------------|------------------|-----|-----|
|              |                                    |                 | SD               | TP  | Ch1 |
| GRANT        | FLAT LAKE                          | 97              | 54               | 50  | .   |
| GRANT        | FRENCHMAN HILLS LAKE               | 150             | 70               | 70  | .   |
| GRANT        | GOOSE, LOWER LAKE                  | 65              | 54               | 50  | .   |
| GRANT        | GOOSE, UPPER LAKE                  | 46              | 35               | 44  | 43  |
| GRANT        | HEART LAKE                         | 61              | 43               | 47  | 45  |
| GRANT        | HILLTOP LAKE                       | .               | 60               | 68  | .   |
| GRANT        | LENICE LAKE                        | .               | .                | 47  | .   |
| GRANT        | LENORE LAKE                        | 121             | 48               | 64  | .   |
| GRANT        | LONG (17N-29E-32) LAKE             | 51              | 42               | 56  | .   |
| GRANT        | LONG (28N-30E-25) LAKE             | 279             | 54               | 100 | .   |
| GRANT        | MERRY LAKE                         | .               | .                | 57  | .   |
| GRANT        | MOSES LAKE                         | 103             | 46               | 73  | .   |
| GRANT        | NUNNALLY LAKE                      | 149             | 59               | 63  | .   |
| GRANT        | PARK LAKE                          | 39              | 42               | 49  | .   |
| GRANT        | POTHOLES LAKE                      | 137             | 62               | 64  | .   |
| GRANT        | QUINCY LAKE                        | 70              | 38               | 54  | .   |
| GRANT        | ROUND LAKE                         | .               | 44               | 66  | .   |
| GRANT        | SAND LAKE                          | 69              | 41               | 51  | .   |
| GRANT        | SOAP LAKE                          | 261             | 52               | 94  | .   |
| GRANT        | SOAP, LITTLE LAKE                  | 650             | 70               | 112 | .   |
| GRANT        | SODA LAKE                          | 66              | 44               | 70  | 56  |
| GRANT        | STAN COFFIN LAKE                   | 256             | 70               | 77  | .   |
| GRANT        | SUSAN LAKE                         | 63              | 44               | 62  | .   |
| GRANT        | TABLE LAKE                         | .               | 54               | 94  | .   |
| GRANT        | UNNAMED (18N-25E-31)               | .               | .                | 50  | .   |
| GRANT        | UNNAMED (20N-28E-4)                | 219             | 73               | 70  | .   |
| GRANT        | UNNAMED (20N-28E-10)               | 227             | 73               | 75  | .   |
| GRANT        | UNNAMED (21N-27E-16)               | .               | .                | 42  | .   |
| GRANT        | UNNAMED (22N-29E-26)               | 651             | 83               | 102 | .   |
| GRANT        | VIRGIN LAKE                        | .               | .                | 50  | .   |
| GRANT        | WARDEN LAKE                        | 87              | 54               | 51  | .   |
| GRANT        | WARDEN, SOUTH LAKE                 | .               | .                | 56  | .   |
| GRANT        | WILLOW LAKE                        | 153             | 65               | 72  | .   |
| GRANT        | WILLOW, SOUTH LAKE                 | 169             | 67               | 72  | .   |
| GRANT        | WINCHESTER WASTEWAY LAKE           | 134             | 65               | 65  | .   |
| GRANT        | WINCHESTER WASTEWAY EXTENSION LAKE | 134             | 57               | 59  | .   |
| GRANT        | WINDMILL LAKE                      | 119             | 60               | 62  | .   |
| GRANT        | WINDMILL, NORTH LAKE               | 88              | 53               | 59  | .   |
| GRAYS HARBOR | ABERDEEN LAKE                      | .               | .                | 36  | .   |
| GRAYS HARBOR | DUCK LAKE                          | 282             | 73               | 74  | .   |
| GRAYS HARBOR | FAILOR LAKE                        | 43              | 50               | 44  | .   |
| GRAYS HARBOR | SYLVIA LAKE                        | 42              | 50               | 42  | .   |
| ISLAND       | CRANBERRY LAKE                     | 113             | 50               | 55  | .   |
| ISLAND       | CROCKETT LAKE                      | 195             | 73               | 89  | .   |
| ISLAND       | DEER LAKE                          | 18              | 39               | 38  | 40  |

APPENDIX C --Continued

| County    | Lake                 | CV <sup>1</sup> | TSI <sup>2</sup> |     |     |
|-----------|----------------------|-----------------|------------------|-----|-----|
|           |                      |                 | SD               | TP  | Chl |
| ISLAND    | GOSS LAKE            | 17              | 39               | 38  | 43  |
| ISLAND    | KRISTOFERSON LAKE    | 141             | 57               | 55  | .   |
| ISLAND    | LONE LAKE            | 174             | 65               | 66  | .   |
| ISLAND    | UNNAMED (31N-1E-6)   | .               | .                | 55  | .   |
| ISLAND    | UNNAMED (33N-2E-7)   | 127             | 60               | 60  | .   |
| JEFFERSON | ANDERSON LAKE        | 141             | 47               | 63  | .   |
| JEFFERSON | CROCKER LAKE         | 62              | 48               | 57  | .   |
| JEFFERSON | GIBBS LAKE           | 88              | 53               | 49  | .   |
| JEFFERSON | KAM TAI LAKE         | 625             | 80               | 106 | .   |
| JEFFERSON | LELAND LAKE          | 92              | 48               | 63  | .   |
| JEFFERSON | LORDS LAKE           | .               | .                | 20  | .   |
| JEFFERSON | PETERSON LAKE        | 51              | 44               | 34  | .   |
| JEFFERSON | SANDY SHORE LAKE     | 31              | 38               | 35  | .   |
| JEFFERSON | TARBOO LAKE          | 41              | 41               | 37  | .   |
| KING      | ALICE LAKE           | 21              | 39               | 38  | 35  |
| KING      | AMES LAKE            | 33              | 42               | 32  | .   |
| KING      | ANGELINE LAKE        | .               | 12               | 28  | .   |
| KING      | ANGLE LAKE           | 29              | 37               | 34  | 41  |
| KING      | ANNETTE LAKE         | 2               | 21               | 24  | .   |
| KING      | BASS LAKE            | 55              | 52               | 47  | .   |
| KING      | BEAVER LAKE          | 58              | 52               | 47  | .   |
| KING      | BEAVER NO.1 LAKE     | 52              | 49               | 44  | .   |
| KING      | BEAVER NO.2 LAKE     | 33              | 43               | 38  | .   |
| KING      | BITTER LAKE          | 39              | 46               | 53  | .   |
| KING      | BLACK LAKE           | 90              | 54               | 54  | .   |
| KING      | BLACK DIAMOND LAKE   | .               | 67               | 69  | .   |
| KING      | BOREN LAKE           | 53              | 47               | 47  | 47  |
| KING      | BOYLE LAKE           | 52              | 49               | 38  | .   |
| KING      | BRIDGES LAKE         | 67              | 52               | 43  | .   |
| KING      | BURIEN LAKE          | 37              | 43               | 38  | .   |
| KING      | CALLIGAN LAKE        | 16              | 36               | 27  | .   |
| KING      | CAROLINE LAKE        | 2               | 13               | 14  | .   |
| KING      | COTTAGE LAKE         | 44              | 46               | 50  | .   |
| KING      | DEEP LAKE            | 21              | 38               | 38  | .   |
| KING      | DELTA LAKE           | .               | 21               | 18  | .   |
| KING      | DERRICK LAKE         | .               | 24               | 14  | .   |
| KING      | DESIRE LAKE          | 78              | 54               | 45  | 60  |
| KING      | DOLLOFF LAKE         | 118             | 61               | 53  | .   |
| KING      | EAGLE LAKE           | 18              | 38               | 42  | .   |
| KING      | ECHO (23N-7E-2) LAKE | 31              | 43               | 41  | .   |
| KING      | ECHO (26N-4E-6) LAKE | 44              | 43               | 53  | 44  |
| KING      | FENWICK LAKE         | 33              | 39               | 41  | .   |
| KING      | FINDLEY LAKE         | 5               | 20               | 4   | .   |
| KING      | FISH LAKE            | 35              | 47               | 45  | .   |

## APPENDIX C --Continued

| County | Lake                       | CV <sup>1</sup> | TSI <sup>2</sup> |    |     |
|--------|----------------------------|-----------------|------------------|----|-----|
|        |                            |                 | SD               | TP | Chl |
| KING   | FIVEMILE LAKE              | 74              | 54               | 41 | .   |
| KING   | FRANCIS LAKE               | 59              | 49               | 43 | .   |
| KING   | GENEVA LAKE                | 178             | 61               | 51 | .   |
| KING   | GRANITE LAKE               | .               | .                | 14 | .   |
| KING   | HANCOCK LAKE               | .               | 36               | 4  | .   |
| KING   | HEART, BIG LAKE            | .               | 14               | 28 | .   |
| KING   | HEART, LITTLE LAKE         | .               | 15               | 24 | .   |
| KING   | ILSWOOT LAKE               | .               | 27               | 18 | .   |
| KING   | JONES LAKE                 | .               | 52               | 52 | .   |
| KING   | JOY LAKE                   | 49              | 52               | 32 | .   |
| KING   | KALEETAN LAKE              | .               | 23               | 20 | .   |
| KING   | KATHLEEN LAKE              | 33              | 52               | 37 | .   |
| KING   | KILLARNEY (NORTH ARM) LAKE | 35              | 52               | 52 | 46  |
| KING   | KILLARNEY (SOUTH ARM) LAKE | 33              | 46               | 48 | 42  |
| KING   | KLAUS LAKE                 | 33              | 42               | 41 | .   |
| KING   | KULLA KULLA LAKE           | .               | 20               | 14 | .   |
| KING   | LANGLOIS LAKE              | 18              | 39               | 38 | 36  |
| KING   | LARSEN LAKE                | 610             | 77               | 97 | .   |
| KING   | LEOTA LAKE                 | 40              | 42               | 40 | .   |
| KING   | LOCH KATRINE LAKE          | .               | 22               | 4  | .   |
| KING   | LOCH KATRINE, UPPER LAKE   | 2               | 18               | 4  | .   |
| KING   | LOCKET LAKE                | .               | 14               | 24 | .   |
| KING   | LUCERNE LAKE               | .               | 43               | 30 | .   |
| KING   | LYNCH LAKE                 | 20              | 39               | 24 | .   |
| KING   | MALACHITE LAKE             | .               | 13               | 38 | .   |
| KING   | MARGARET LAKE              | 20              | 40               | 43 | 35  |
| KING   | MARIE LAKE                 | 56              | 49               | 46 | .   |
| KING   | MARTEN LAKE                | .               | 25               | 8  | .   |
| KING   | MASON LAKE                 | 7               | 21               | 14 | .   |
| KING   | MCDONALD LAKE              | 34              | 52               | 45 | .   |
| KING   | MERIDIAN LAKE              | 46              | 42               | 37 | .   |
| KING   | MIRROR LAKE                | 42              | 47               | 41 | .   |
| KING   | MONEYSMITH LAKE            | 123             | 63               | 55 | .   |
| KING   | MOOLOCK LAKE               | 3               | 24               | 20 | .   |
| KING   | MORTON LAKE                | 51              | 47               | 45 | .   |
| KING   | NADEAU LAKE                | 10              | 33               | 24 | .   |
| KING   | NEILSON (HOLM) LAKE        | 71              | 54               | 50 | .   |
| KING   | NORTH LAKE                 | 24              | 45               | 40 | 49  |
| KING   | NUMBER TWELVE LAKE         | 45              | 49               | 38 | .   |
| KING   | OTTER (SPRING) LAKE        | 42              | 44               | 24 | .   |
| KING   | PANTHER LAKE               | .               | 56               | 48 | .   |
| KING   | PARADISE LAKE              | 65              | 57               | 47 | .   |
| KING   | PHANTOM LAKE               | 35              | 43               | 42 | .   |

## APPENDIX C --Continued

| County   | Lake                   | CV <sup>1</sup> | TSI <sup>2</sup> |    |     |
|----------|------------------------|-----------------|------------------|----|-----|
|          |                        |                 | SD               | TP | Chl |
| KING     | PHILLIPPA LAKE         | °               | 17               | 4  | °   |
| KING     | PINE LAKE              | 71              | 52               | 45 | 53  |
| KING     | PIPE LAKE              | °               | 39               | 37 | °   |
| KING     | PORTAGE BAY LAKE       | 31              | 46               | 40 | °   |
| KING     | RACHOR LAKE            | °               | °                | 20 | °   |
| KING     | RATTLESNAKE LAKE       | 8               | 27               | 24 | °   |
| KING     | RAVENSDALE LAKE        | °               | °                | 38 | °   |
| KING     | RETREAT LAKE           | 29              | 40               | 37 | 44  |
| KING     | ROCK LAKE              | °               | 17               | 24 | °   |
| KING     | SAWYER LAKE            | 19              | 39               | 48 | 37  |
| KING     | SHADOW LAKE            | 46              | 44               | 42 | 43  |
| KING     | SHADY LAKE             | 51              | 50               | 30 | °   |
| KING     | SMC LAKE               | 9               | 26               | 24 | °   |
| KING     | STAR LAKE              | 34              | 33               | 70 | °   |
| KING     | STEEL LAKE             | 30              | 40               | 45 | °   |
| KING     | STURTEVANT LAKE        | 292             | 67               | 93 | °   |
| KING     | THOMPSON LAKE          | °               | °                | 14 | °   |
| KING     | TROUT LAKE             | 57              | 46               | 40 | °   |
| KING     | TUSCOHATCHIE LAKE      | 10              | 24               | 14 | °   |
| KING     | UNION LAKE             | 36              | 45               | 41 | °   |
| KING     | WALKER LAKE            | 23              | 20               | 47 | 45  |
| KING     | WEBSTER LAKE           | 30              | 49               | 43 | °   |
| KING     | WILDCAT, UPPER LAKE    | 6               | 18               | 4  | °   |
| KING     | WILDERNESS LAKE        | °               | 36               | 37 | °   |
| KITSAP   | HORSESHOE LAKE         | 16              | 37               | 32 | 41  |
| KITSAP   | ISLAND LAKE            | 22              | 43               | 47 | °   |
| KITSAP   | KITSAP LAKE            | °               | 50               | 47 | °   |
| KITSAP   | LONG LAKE              | 51              | 55               | 57 | 52  |
| KITSAP   | MILLER LAKE            | 95              | 60               | 54 | °   |
| KITSAP   | MISSION LAKE           | °               | 36               | 30 | °   |
| KITSAP   | PANTHER LAKE           | °               | 44               | 41 | °   |
| KITSAP   | TAHUYA LAKE            | 40              | 47               | 24 | °   |
| KITSAP   | TWIN LAKE              | 31              | 45               | 27 | °   |
| KITSAP   | UNION RIVER LAKE       | 12              | 30               | 20 | °   |
| KITSAP   | WILDCAT LAKE           | 20              | 40               | 37 | °   |
| KITSAP   | WILLIAM SYMINGTON LAKE | 44              | 48               | 41 | °   |
| KITSAP   | WYE LAKE               | 30              | 39               | 37 | 39  |
| KITTITAS | CLE ELUM LAKE          | 26              | 29               | 24 | °   |
| KITTITAS | COOPER LAKE            | 14              | 28               | 27 | °   |
| KITTITAS | EASTON LAKE            | 11              | 37               | 24 | °   |
| KITTITAS | KACHESS LAKE           | 19              | 25               | 20 | °   |
| KITTITAS | KEECHELUS LAKE         | 9               | 29               | 14 | °   |
| KITTITAS | LOST LAKE              | 5               | 26               | 20 | °   |

## APPENDIX C --Continued

| County    | Lake                      | CV <sup>1</sup> | TSI <sup>2</sup> |     |     |
|-----------|---------------------------|-----------------|------------------|-----|-----|
|           |                           |                 | SD               | TP  | Ch1 |
| KITTITAS  | MANASTASH LAKE            | .               | .                | 53  | .   |
| KITTITAS  | TUCQUALA LAKE             | .               | .                | 24  | .   |
| KLICKITAT | CARP LAKE                 | 57              | 52               | 40  | .   |
| KLICKITAT | SPEARFISH LAKE            | 56              | 52               | 57  | .   |
| LEWIS     | BORST PARK LAKE           | 43              | 47               | 45  | 54  |
| LEWIS     | CARLISLE LAKE             | .               | 59               | 78  | .   |
| LEWIS     | DAVISSON (MOSSYROCK) LAKE | 13              | 38               | 14  | .   |
| LEWIS     | MAYFIELD LAKE             | 20              | 40               | 24  | .   |
| LEWIS     | MINERAL LAKE              | 31              | 37               | 47  | 48  |
| LEWIS     | PACKWOOD LAKE             | .               | 40               | 37  | .   |
| LEWIS     | WALUPT LAKE               | 11              | 30               | 37  | .   |
| LINCOLN   | AMES LAKE                 | 199             | 56               | 86  | .   |
| LINCOLN   | BERGEAU LAKE              | 305             | 60               | 93  | .   |
| LINCOLN   | BOBS (TULE) LAKE          | 250             | 60               | 72  | .   |
| LINCOLN   | BROWNS LAKE               | 109             | 46               | 74  | .   |
| LINCOLN   | COFFEE POT LAKE           | 97              | 49               | 58  | 65  |
| LINCOLN   | CORMANA LAKE              | 206             | 60               | 83  | .   |
| LINCOLN   | DEER (DEER SPRINGS) LAKE  | 85              | 46               | 60  | .   |
| LINCOLN   | DOWNS LAKE                | 131             | 56               | 59  | .   |
| LINCOLN   | DRAPER LAKE               | .               | .                | 61  | .   |
| LINCOLN   | FISHTRAP LAKE             | 65              | 40               | 56  | .   |
| LINCOLN   | FLORENCE LAKE             | 310             | 65               | 101 | .   |
| LINCOLN   | GOETZ LAKE                | 576             | 83               | 82  | .   |
| LINCOLN   | "H" LAKE                  | 400             | 77               | 87  | .   |
| LINCOLN   | MEADOW LAKE               | 251             | 59               | 82  | .   |
| LINCOLN   | NEVES LAKE                | 234             | 62               | 72  | .   |
| LINCOLN   | PACIFIC LAKE              | 186             | 65               | 62  | .   |
| LINCOLN   | PETERSON LAKE             | 819             | 93               | 85  | .   |
| LINCOLN   | PHILLIPS LAKE             | 299             | 60               | 92  | .   |
| LINCOLN   | SULLIVAN LAKE             | 500             | 73               | 92  | .   |
| LINCOLN   | SWANSON (25N-34E-32) LAKE | 297             | 52               | 84  | .   |
| LINCOLN   | SWANSON (25N-34E-33) LAKE | 218             | 52               | 73  | .   |
| LINCOLN   | SYLVAN LAKE               | .               | .                | 66  | .   |
| LINCOLN   | TAVARES LAKE              | 258             | 62               | 73  | .   |
| LINCOLN   | TWIN, LOWER LAKE          | 167             | 62               | 61  | .   |
| LINCOLN   | TWIN, UPPER LAKE          | 79              | 38               | 64  | .   |
| LINCOLN   | UNNAMED (21N-39E-5)       | .               | .                | 87  | .   |
| LINCOLN   | UNNAMED (21N-39E-26)      | 106             | 53               | 62  | .   |
| LINCOLN   | UNNAMED (23N-32E-7)       | .               | .                | 90  | .   |
| LINCOLN   | UNNAMED (24N-33E-31)      | .               | .                | 92  | .   |
| LINCOLN   | UNNAMED (24N-34E-22)      | 121             | 49               | 63  | .   |
| LINCOLN   | UNNAMED (24N-35E-4)       | 168             | 54               | 69  | .   |
| LINCOLN   | UNNAMED (25N-34E-27)      | .               | .                | 56  | .   |
| LINCOLN   | UNNAMED (25N-35E-9)       | 201             | 54               | 86  | .   |
| LINCOLN   | UNNAMED (25N-39E-9)       | 544             | 63               | 117 | .   |

## APPENDIX C --Continued

| County   | Lake                   | CV <sup>1</sup> | TSI <sup>2</sup> |     |     |
|----------|------------------------|-----------------|------------------|-----|-----|
|          |                        |                 | SD               | TP  | Ch1 |
| LINCOLN  | UNNAMED (25N-39E-15)   | 156             | 55               | 70  | .   |
| LINCOLN  | UNNAMED (26N-34E-34)   | .               | .                | 68  | .   |
| LINCOLN  | UNNAMED (26N-38E-33)   | .               | 93               | 115 | .   |
| LINCOLN  | WAGNER LAKE            | .               | 83               | 98  | .   |
| LINCOLN  | WALL LAKE              | 214             | 60               | 73  | .   |
| LINCOLN  | WEBLEY (WOOLEY) LAKE   | 481             | 73               | 86  | .   |
| LINCOLN  | WHITTAKER LAKE         | 213             | 60               | 72  | .   |
| LINCOLN  | WILLS LAKE             | 166             | 60               | 82  | .   |
| MASON    | BENNETTSEN LAKE        | 63              | 45               | 32  | .   |
| MASON    | BENSON LAKE            | 20              | 38               | 34  | .   |
| MASON    | CRANBERRY LAKE         | .               | .                | 49  | .   |
| MASON    | CUSHMAN LAKE           | 23              | 31               | 24  | .   |
| MASON    | CUSHMAN, LOWER LAKE    | .               | 29               | 24  | .   |
| MASON    | DEVEREAUX LAKE         | 24              | 33               | 24  | .   |
| MASON    | FAWN LAKE              | 77              | 45               | 49  | .   |
| MASON    | FORBES LAKE            | 89              | 46               | 38  | .   |
| MASON    | HANKS LAKE             | .               | .                | 40  | .   |
| MASON    | HAVEN LAKE             | 11              | 35               | 27  | .   |
| MASON    | ISLAND LAKE            | 47              | 43               | 38  | .   |
| MASON    | ISABELLA LAKE          | 22              | 43               | 37  | 47  |
| MASON    | LIMERICK LAKE          | 50              | 43               | 34  | .   |
| MASON    | LOST LAKE              | 13              | 33               | 44  | 34  |
| MASON    | LYSTAIR LAKE           | 63              | 52               | 40  | .   |
| MASON    | MAGGIE LAKE            | 9               | 31               | 32  | .   |
| MASON    | MASON LAKE             | 27              | 39               | 40  | 43  |
| MASON    | MELBOURNE LAKE         | .               | .                | 37  | .   |
| MASON    | NAHWATZEL LAKE         | 27              | 36               | 32  | .   |
| MASON    | PHILLIPS LAKE          | 34              | 37               | 43  | 41  |
| MASON    | PRICE LAKE             | 47              | 48               | 37  | .   |
| MASON    | PRICKETT LAKE          | 41              | 41               | 35  | .   |
| MASON    | SIMPSON LAKE           | .               | .                | 38  | .   |
| MASON    | SPENCER LAKE           | 75              | 44               | 35  | .   |
| MASON    | STUMP LAKE             | 76              | 48               | 57  | .   |
| MASON    | TEE LAKE               | 41              | 47               | 37  | .   |
| MASON    | TIGER LAKE             | .               | 41               | 24  | .   |
| MASON    | TIMBER LAKE            | 66              | 54               | 42  | .   |
| MASON    | WOOTEN LAKE            | 38              | 38               | 27  | .   |
| OKANOGAN | AENEAS LAKE            | 62              | 45               | 46  | .   |
| OKANOGAN | ALKALI LAKE            | 126             | 67               | 42  | .   |
| OKANOGAN | ALTA LAKE              | 49              | 32               | 37  | 48  |
| OKANOGAN | BLUE (37N-25E-22) LAKE | 44              | 47               | 55  | .   |
| OKANOGAN | BLUE (39N-26E-1) LAKE  | 81              | 52               | 38  | .   |
| OKANOGAN | BONAPARTE LAKE         | 40              | 41               | 42  | .   |
| OKANOGAN | BOOHER LAKE            | 58              | 45               | 34  | .   |

## APPENDIX C --Continued

| County   | Lake                         | CV <sup>1</sup> | TSI <sup>2</sup> |    |     |
|----------|------------------------------|-----------------|------------------|----|-----|
|          |                              |                 | SD               | TP | Chl |
| OKANOGAN | BROWN LAKE                   | 94              | 45               | 57 | .   |
| OKANOGAN | CHOPAKA LAKE                 | 93              | 44               | 43 | 36  |
| OKANOGAN | CONCONULLY (35N-25E-18) LAKE | 31              | 40               | 45 | 45  |
| OKANOGAN | CONCONULLY (SALMON) LAKE     | 36              | 42               | 46 | .   |
| OKANOGAN | DAVIS LAKE                   | 65              | 40               | 46 | .   |
| OKANOGAN | DUCK (BIDE-A-WEE) LAKE       | 39              | 42               | 42 | .   |
| OKANOGAN | EVANS LAKE                   | 84              | 42               | 50 | .   |
| OKANOGAN | FANCHERS DAM LAKE            | .               | 46               | 61 | .   |
| OKANOGAN | FIELDS LAKE                  | .               | 44               | 42 | .   |
| OKANOGAN | FISH LAKE                    | 113             | 59               | 53 | .   |
| OKANOGAN | GREEN LAKE                   | 45              | 36               | 42 | .   |
| OKANOGAN | HORSESHOE (35N-26E-17) LAKE  | 119             | 47               | 32 | .   |
| OKANOGAN | HORSESHOE (39N-27E-27) LAKE  | 152             | 70               | 59 | .   |
| OKANOGAN | "L" LAKE                     | .               | 41               | 40 | .   |
| OKANOGAN | LEADER LAKE                  | 80              | 53               | 54 | .   |
| OKANOGAN | LEMANASKY LAKE               | 56              | 43               | 51 | .   |
| OKANOGAN | MEADOW LAKE                  | .               | .                | 42 | .   |
| OKANOGAN | MEDICINE LAKE                | 61              | 42               | 32 | .   |
| OKANOGAN | MOCCASIN LAKE                | 39              | 37               | 47 | .   |
| OKANOGAN | MOLSON LAKE                  | 131             | 42               | 54 | .   |
| OKANOGAN | MUSKRAT LAKE                 | .               | 55               | 61 | .   |
| OKANOGAN | OSOYOOS LAKE                 | 52              | 49               | 40 | .   |
| OKANOGAN | PALMER LAKE                  | 56              | 47               | 47 | 51  |
| OKANOGAN | PATTERSON LAKE               | 21              | 37               | 37 | 41  |
| OKANOGAN | PEARRYGIN LAKE               | 39              | 42               | 40 | 55  |
| OKANOGAN | PENINSULA LAKE               | 78              | 38               | 40 | .   |
| OKANOGAN | RAT LAKE                     | 50              | 37               | 57 | .   |
| OKANOGAN | ROBERTS LAKE                 | 140             | 44               | 50 | .   |
| OKANOGAN | ROUND LAKE                   | .               | 40               | 38 | .   |
| OKANOGAN | SIDLEY LAKE                  | 130             | 42               | 55 | .   |
| OKANOGAN | SPECTACLE LAKE               | 43              | 44               | 45 | 50  |
| OKANOGAN | TWIN, BIG LAKE               | 29              | 45               | 47 | 41  |
| OKANOGAN | TWIN, LITTLE LAKE            | 56              | 40               | 40 | .   |
| OKANOGAN | UNNAMED (36N-27E-30)         | 311             | 70               | 73 | .   |
| OKANOGAN | UNNAMED (39N-27E-27)         | .               | .                | 49 | .   |
| OKANOGAN | UNNAMED (40N-25E-16)         | .               | .                | 40 | .   |
| OKANOGAN | WALKER LAKE                  | 210             | 55               | 60 | .   |
| OKANOGAN | WANNACUT LAKE                | 55              | 38               | 34 | 27  |
| OKANOGAN | WHITESTONE LAKE              | 57              | 46               | 42 | .   |
| PACIFIC  | BLACK LAKE                   | 47              | 52               | 46 | .   |
| PACIFIC  | BREAKER LAKE                 | 272             | 65               | 98 | .   |
| PACIFIC  | ISLAND LAKE                  | 111             | 63               | 46 | .   |
| PACIFIC  | LOOMIS LAKE                  | .               | .                | 50 | .   |

## APPENDIX C --Continued

| County       | Lake                   | CV <sup>1</sup> | TSI <sup>2</sup> |    |     |
|--------------|------------------------|-----------------|------------------|----|-----|
|              |                        |                 | SD               | TP | Ch1 |
| PEND OREILLE | BOUNDARY LAKE          | 57              | 57               | 47 | .   |
| PEND OREILLE | BROWNS LAKE            | 10              | 32               | 30 | .   |
| PEND OREILLE | CALISPELL LAKE         | 98              | 52               | 88 | .   |
| PEND OREILLE | CHAIN LAKE             | 14              | 35               | 40 | .   |
| PEND OREILLE | DAVIS LAKE             | 41              | 44               | 45 | .   |
| PEND OREILLE | DIAMOND LAKE           | 54              | 34               | 37 | 42  |
| PEND OREILLE | FAN LAKE               | 47              | 42               | 52 | .   |
| PEND OREILLE | FRATER LAKE            | 99              | 54               | 45 | 43  |
| PEND OREILLE | HORSESHOE LAKE         | 57              | 46               | 53 | .   |
| PEND OREILLE | KENT MEADOWS LAKE      | 63              | 44               | 50 | .   |
| PEND OREILLE | KINGS LAKE             | 9               | 25               | 27 | .   |
| PEND OREILLE | LEDBETTER LAKE         | .               | .                | 36 | .   |
| PEND OREILLE | LOST LAKE              | 133             | 62               | 59 | .   |
| PEND OREILLE | MARSHALL LAKE          | 15              | 27               | 24 | .   |
| PEND OREILLE | MILL LAKE              | 54              | 57               | 38 | .   |
| PEND OREILLE | NILE LAKE              | 29              | 43               | 48 | .   |
| PEND OREILLE | PARKER LAKE            | 53              | 52               | 50 | .   |
| PEND OREILLE | POWER LAKE             | 25              | 43               | 45 | .   |
| PEND OREILLE | SACHEEN LAKE           | 40              | 43               | 45 | .   |
| PEND OREILLE | SCOTCHMAN LAKE         | 8               | 27               | 30 | .   |
| PEND OREILLE | SHEARER LAKE           | .               | .                | 47 | .   |
| PEND OREILLE | SKOOKUM, SOUTH LAKE    | 27              | 40               | 45 | .   |
| PEND OREILLE | SULLIVAN LAKE          | .               | 37               | 32 | .   |
| PEND OREILLE | TRASK LAKE             | .               | .                | 58 | .   |
| PEND OREILLE | TROUT LAKE             | 45              | 45               | 44 | .   |
| PEND OREILLE | YOCUM LAKE             | 27              | 33               | 32 | .   |
| PIERCE       | ALDER LAKE             | 95              | 65               | 52 | .   |
| PIERCE       | AMERICAN LAKE          | .               | 33               | 4  | .   |
| PIERCE       | BAY LAKE               | 129             | 54               | 84 | .   |
| PIERCE       | BONNEY LAKE            | 45              | 43               | 43 | .   |
| PIERCE       | BOWMAN LAKE            | .               | .                | 34 | .   |
| PIERCE       | CARNEY LAKE            | 18              | 38               | 38 | .   |
| PIERCE       | CEDAR LAKE             | 7               | 29               | 14 | .   |
| PIERCE       | CLEAR LAKE             | .               | 33               | 35 | .   |
| PIERCE       | COPLAY LAKE            | 13              | 37               | 30 | .   |
| PIERCE       | CRANBERRY LAKE         | 114             | 61               | 56 | .   |
| PIERCE       | CRESCENT LAKE          | .               | 54               | 41 | .   |
| PIERCE       | ECHO LAKE              | .               | .                | 40 | .   |
| PIERCE       | FLORENCE LAKE          | 50              | 41               | 37 | .   |
| PIERCE       | FOREST LAKE            | .               | 47               | 44 | .   |
| PIERCE       | GRAVELLY LAKE          | .               | 26               | 51 | .   |
| PIERCE       | GREENWATER, UPPER LAKE | .               | .                | 53 | .   |
| PIERCE       | HARTS LAKE             | .               | 43               | 53 | .   |

## APPENDIX C --Continued

| County   | Lake                      | CV <sup>1</sup> | TSI <sup>2</sup> |    |     |
|----------|---------------------------|-----------------|------------------|----|-----|
|          |                           |                 | SD               | TP | Ch1 |
| PIERCE   | JACKSON LAKE              | .               | 54               | 47 | .   |
| PIERCE   | JOSEPHINE LAKE            | 41              | 37               | 35 | .   |
| PIERCE   | KAPOWSIN LAKE             | 39              | 47               | 43 | .   |
| PIERCE   | KREGER LAKE               | .               | 67               | 92 | .   |
| PIERCE   | LAGRANDE LAKE             | 111             | 67               | 51 | .   |
| PIERCE   | LILY LAKE                 | 7               | 28               | 32 | .   |
| PIERCE   | LITTLE (LITTLE HART) LAKE | .               | .                | 48 | .   |
| PIERCE   | LONESOME LAKE             | .               | .                | 14 | .   |
| PIERCE   | LOST LAKE                 | .               | .                | 46 | .   |
| PIERCE   | LOUISE LAKE               | 17              | 34               | 35 | 38  |
| PIERCE   | MINTERWOOD LAKE           | .               | .                | 56 | .   |
| PIERCE   | MORGAN LAKE               | .               | 70               | 52 | .   |
| PIERCE   | MUD LAKE                  | 209             | 65               | 73 | .   |
| PIERCE   | MUD MOUNTAIN LAKE         | 156             | 73               | 59 | .   |
| PIERCE   | NISQUALLY LAKE            | .               | 57               | 60 | 53  |
| PIERCE   | OHOP LAKE                 | .               | 46               | 53 | .   |
| PIERCE   | RAPJOHN LAKE              | 114             | 57               | 50 | .   |
| PIERCE   | SEQUALITCHEW LAKE         | 53              | 47               | 48 | .   |
| PIERCE   | SILVER LAKE               | .               | 52               | 47 | .   |
| PIERCE   | SPANAWAY LAKE             | 32              | 47               | 52 | 49  |
| PIERCE   | STANSBERRY LAKE           | 30              | 44               | 43 | .   |
| PIERCE   | STEILACOOM LAKE           | .               | 43               | 47 | .   |
| PIERCE   | STIDHAM LAKE              | 166             | 67               | 61 | .   |
| PIERCE   | SUMMIT LAKE               | 1               | 14               | 30 | .   |
| PIERCE   | SURPRISE (18N-7E-25) LAKE | .               | .                | 24 | .   |
| PIERCE   | SURPRISE (20N-4E-4) LAKE  | 35              | 35               | 38 | .   |
| PIERCE   | TANWAX LAKE               | .               | 49               | 47 | .   |
| PIERCE   | TAPPS LAKE                | 60              | 59               | 43 | .   |
| PIERCE   | TULE LAKE                 | .               | 61               | 62 | .   |
| PIERCE   | TWENTYSEVEN LAKE          | 71              | 52               | 48 | .   |
| PIERCE   | WAPATO LAKE               | 61              | 52               | 62 | 53  |
| PIERCE   | WAUGHOP LAKE              | 400             | 61               | 96 | .   |
| PIERCE   | WHITMAN LAKE              | 30              | 40               | 41 | .   |
| SAN JUAN | BRIGGS LAKE               | 83              | 47               | 45 | .   |
| SAN JUAN | CASCADE LAKE              | 33              | 34               | 30 | .   |
| SAN JUAN | HORSESHOE LAKE            | 47              | 33               | 34 | .   |
| SAN JUAN | HUMMEL LAKE               | 382             | 70               | 76 | .   |
| SAN JUAN | MARTINS LAKE              | 77              | 46               | 50 | .   |
| SAN JUAN | MOUNTAIN LAKE             | 21              | 32               | 34 | .   |
| SAN JUAN | SPENCER LAKE              | 33              | 31               | 57 | .   |
| SAN JUAN | SPORTSMAN LAKE            | .               | .                | 27 | .   |
| SAN JUAN | TROUT LAKE                | 37              | 35               | 30 | .   |
| SAN JUAN | ZYLSTRA LAKE              | 158             | 55               | 72 | .   |
| SKAGIT   | BEAVER LAKE               | .               | .                | 44 | .   |
| SKAGIT   | BIG LAKE                  | 46              | 47               | 44 | 48  |

## APPENDIX C --Continued

| County    | Lake                   | CV <sup>1</sup> | TSI <sup>2</sup> |    |     |
|-----------|------------------------|-----------------|------------------|----|-----|
|           |                        |                 | SD               | TP | Chl |
| SKAGIT    | BLUFF LAKE             | 7               | 25               | 14 | .   |
| SKAGIT    | CAMPBELL LAKE          | 134             | 57               | 59 | .   |
| SKAGIT    | CASKEY LAKE            | 53              | 49               | 41 | .   |
| SKAGIT    | CAVANAUGH LAKE         | .               | 42               | 4  | .   |
| SKAGIT    | CLEAR (34N-5E-7) LAKE  | 15              | 38               | 27 | 39  |
| SKAGIT    | CLEAR (36N-9E-23) LAKE | 6               | 28               | 38 | .   |
| SKAGIT    | CRANBERRY LAKE         | 65              | 49               | 54 | .   |
| SKAGIT    | DAY LAKE               | 26              | 48               | 38 | 32  |
| SKAGIT    | DEVILS LAKE            | 52              | 49               | 41 | .   |
| SKAGIT    | ERIE LAKE              | .               | 42               | 63 | .   |
| SKAGIT    | FALLS, LOWER LAKE      | 2               | 19               | 4  | .   |
| SKAGIT    | FALLS, UPPER LAKE      | 3               | 24               | 27 | .   |
| SKAGIT    | GRANDY LAKE            | .               | .                | 36 | .   |
| SKAGIT    | GRANITE LAKE           | .               | .                | 36 | .   |
| SKAGIT    | HEART (35N-1E-36) LAKE | 66              | 61               | 20 | .   |
| SKAGIT    | HEART (36N-7E-5) LAKE  | 139             | 30               | 79 | .   |
| SKAGIT    | JORDAN, LOWER LAKE     | 8               | 22               | 27 | .   |
| SKAGIT    | JUG LAKE               | .               | .                | 4  | .   |
| SKAGIT    | MCMURRAY LAKE          | 16              | 39               | 45 | 47  |
| SKAGIT    | MINKLER LAKE           | .               | 53               | 48 | .   |
| SKAGIT    | MYRTLE LAKE            | 20              | 38               | 44 | .   |
| SKAGIT    | PASS LAKE              | 146             | 57               | 66 | .   |
| SKAGIT    | SAUK LAKE              | .               | .                | 27 | .   |
| SKAGIT    | SHANNON LAKE           | 48              | 52               | 37 | .   |
| SKAGIT    | SIXTEEN LAKE           | 36              | 41               | 45 | .   |
| SKAGIT    | SPRINGSTEEN LAKE       | .               | .                | 27 | .   |
| SKAGIT    | TEN LAKE               | 21              | 32               | 35 | .   |
| SKAGIT    | WHALE LAKE             | 4               | 22               | 24 | .   |
| SKAMANIA  | ASHES LAKE             | 82              | 60               | 59 | .   |
| SKAMANIA  | DRANO LAKE             | 27              | 45               | 42 | .   |
| SKAMANIA  | ELK LAKE               | 8               | 28               | 20 | .   |
| SKAMANIA  | FRANZ LAKE             | .               | 93               | 74 | .   |
| SKAMANIA  | GREENLEAF LAKE         | 87              | 60               | 57 | .   |
| SKAMANIA  | HANAFORD LAKE          | 3               | 23               | 4  | .   |
| SKAMANIA  | NORTHWESTERN LAKE      | 13              | 37               | 51 | .   |
| SKAMANIA  | SPIRIT LAKE            | 9               | 25               | 14 | 27  |
| SKAMANIA  | STEVENSON LAKE         | 77              | 60               | 57 | .   |
| SKAMANIA  | SWIFT LAKE             | 26              | 43               | 34 | .   |
| SKAMANIA  | UNNAMED (2N-6E-35)     | 147             | 67               | 64 | .   |
| SKAMANIA  | VENUS LAKE             | 8               | 17               | 14 | .   |
| SKAMANIA  | WAUNA LAKE             | 28              | 38               | 40 | .   |
| SNOHOMISH | ARMSTRONG LAKE         | 58              | 46               | 45 | .   |
| SNOHOMISH | BALLINGER LAKE         | 42              | 44               | 46 | .   |
| SNOHOMISH | BLACKMANS LAKE         | 32              | 38               | 34 | .   |

## APPENDIX C --Continued

| County    | Lake                      | CV <sup>1</sup> | TSI <sup>2</sup> |    |     |
|-----------|---------------------------|-----------------|------------------|----|-----|
|           |                           |                 | SD               | TP | Chl |
| SNOHOMISH | BLANCA LAKE               | 38              | 54               | 24 | .   |
| SNOHOMISH | BOARDMAN LAKE             | 11              | 35               | 20 | .   |
| SNOHOMISH | BOARDMAN, EAST LAKE       | 2               | 22               | 20 | .   |
| SNOHOMISH | BOSWORTH LAKE             | 27              | 40               | 24 | .   |
| SNOHOMISH | BOULDER LAKE              | 0               | 0                | 14 | .   |
| SNOHOMISH | BRYANT LAKE               | 148             | 65               | 52 | .   |
| SNOHOMISH | CASSIDY LAKE              | 107             | 55               | 65 | 56  |
| SNOHOMISH | CHAIN LAKE                | 55              | 52               | 54 | .   |
| SNOHOMISH | COCHRAN LAKE              | 30              | 44               | 32 | .   |
| SNOHOMISH | COPPER LAKE               | 5               | 26               | 24 | .   |
| SNOHOMISH | CRABAPPLE LAKE            | 45              | 44               | 45 | 39  |
| SNOHOMISH | CRYSTAL LAKE              | 66              | 52               | 46 | .   |
| SNOHOMISH | CUP LAKE                  | 6               | 16               | 24 | .   |
| SNOHOMISH | DAGGER LAKE               | 29              | 40               | 27 | .   |
| SNOHOMISH | DEVILS LAKE               | 49              | 49               | 38 | .   |
| SNOHOMISH | ECHO LAKE                 | 53              | 49               | 43 | .   |
| SNOHOMISH | FLOWING LAKE              | 39              | 46               | 32 | .   |
| SNOHOMISH | FONTAL LAKE               | 34              | 43               | 37 | .   |
| SNOHOMISH | GOAT LAKE                 | 6               | 31               | 14 | .   |
| SNOHOMISH | GOODWIN LAKE              | 47              | 40               | 27 | 49  |
| SNOHOMISH | GREIDER, BIG LAKE         | 9               | 25               | 14 | .   |
| SNOHOMISH | HANNAN LAKE               | 29              | 42               | 32 | .   |
| SNOHOMISH | HELENA LAKE               | 7               | 25               | 20 | .   |
| SNOHOMISH | HOWARD LAKE               | 166             | 49               | 63 | 43  |
| SNOHOMISH | HUGHES LAKE               | 38              | 47               | 34 | .   |
| SNOHOMISH | INDIGO LAKE               | 5               | 21               | 4  | .   |
| SNOHOMISH | ISABEL LAKE               | 6               | 27               | 30 | .   |
| SNOHOMISH | JANUS LAKE                | 16              | 37               | 24 | .   |
| SNOHOMISH | KELCEMA LAKE              | 9               | 29               | 24 | .   |
| SNOHOMISH | KELLOGG LAKE              | 55              | 44               | 37 | .   |
| SNOHOMISH | KI LAKE                   | 32              | 41               | 32 | 37  |
| SNOHOMISH | KING LAKE                 | 34              | 43               | 45 | 39  |
| SNOHOMISH | LOMA LAKE                 | 62              | 59               | 53 | 48  |
| SNOHOMISH | MARTHA (27N-4E-1) LAKE    | 33              | 40               | 20 | .   |
| SNOHOMISH | MARTHA (31N-4E-18) LAKE   | 47              | 45               | 45 | 43  |
| SNOHOMISH | MENZEL LAKE               | 32              | 44               | 44 | .   |
| SNOHOMISH | NORTH LAKE                | 10              | 23               | 14 | .   |
| SNOHOMISH | PANTHER LAKE              | 50              | 49               | 41 | .   |
| SNOHOMISH | PEACH LAKE                | 4               | 19               | 14 | .   |
| SNOHOMISH | PEAR LAKE                 | 3               | 23               | 32 | .   |
| SNOHOMISH | PEEK-A-BOO LAKE           | 6               | 21               | 14 | .   |
| SNOHOMISH | RILEY LAKE                | 48              | 52               | 30 | .   |
| SNOHOMISH | ROESIGER (NORTH ARM) LAKE | 48              | 43               | 52 | 39  |

## APPENDIX C --Continued

| County    | Lake                      | CV <sup>1</sup> | TSI <sup>2</sup> |     |     |
|-----------|---------------------------|-----------------|------------------|-----|-----|
|           |                           |                 | SD               | TP  | Ch1 |
| SNOHOMISH | ROESIGER (SOUTH ARM) LAKE | 41              | 43               | 27  | 41  |
| SNOHOMISH | ROSS LAKE                 | .               | 39               | 18  | 30  |
| SNOHOMISH | SAUCER LAKE               | 5               | 19               | 14  | .   |
| SNOHOMISH | SERENE (27N-10E-31) LAKE  | 3               | 12               | 4   | .   |
| SNOHOMISH | SERENE (28N-4E-34) LAKE   | 48              | 49               | 47  | .   |
| SNOHOMISH | SHOECRAFT LAKE            | 19              | 41               | 42  | 46  |
| SNOHOMISH | SILVER (28N-5E-30) LAKE   | 32              | 40               | 48  | .   |
| SNOHOMISH | SILVER (29N-11E-28) LAKE  | 4               | 15               | 54  | .   |
| SNOHOMISH | SOUTH LAKE                | 6               | 20               | 24  | .   |
| SNOHOMISH | STEVENS LAKE              | 38              | 36               | 27  | 43  |
| SNOHOMISH | STICKNEY LAKE             | 61              | 49               | 44  | .   |
| SNOHOMISH | STORM LAKE                | 55              | 49               | 41  | .   |
| SNOHOMISH | SUNDAY LAKE               | 48              | 44               | 45  | .   |
| SNOHOMISH | SUNSET LAKE               | 1               | 14               | 4   | .   |
| SNOHOMISH | TOMTIT LAKE               | 18              | 38               | 24  | .   |
| SNOHOMISH | TWENTYTWO LAKE            | .               | .                | 14  | .   |
| SNOHOMISH | TWIN, LOWER LAKE          | 3               | 19               | 14  | .   |
| SNOHOMISH | TWIN, UPPER LAKE          | 3               | 15               | 14  | .   |
| SNOHOMISH | WALLACE LAKE              | 68              | 37               | 14  | .   |
| SNOHOMISH | WEALLUP LAKE              | 53              | 47               | 49  | .   |
| SNOHOMISH | WOODS LAKE                | 41              | 47               | 38  | .   |
| SPOKANE   | ALKALI LAKE               | 339             | 67               | 68  | .   |
| SPOKANE   | AMBER LAKE                | 303             | 35               | 53  | 45  |
| SPOKANE   | BADGER LAKE               | 52              | 43               | 46  | 48  |
| SPOKANE   | BEAR (KUESTER) LAKE       | 85              | 46               | 43  | .   |
| SPOKANE   | CHAPMAN LAKE              | 114             | 60               | 54  | .   |
| SPOKANE   | CLEAR LAKE                | 75              | 55               | 61  | 53  |
| SPOKANE   | ELOIKA LAKE               | 61              | 46               | 52  | .   |
| SPOKANE   | FEUSTAL LAKE              | 322             | 60               | 101 | .   |
| SPOKANE   | FISH LAKE                 | 65              | 42               | 72  | .   |
| SPOKANE   | GRANITE LAKE              | .               | 62               | 119 | .   |
| SPOKANE   | HOG (HOG CANYON) LAKE     | 83              | 43               | 66  | .   |
| SPOKANE   | HORSESHOE LAKE            | 108             | 40               | 59  | .   |
| SPOKANE   | KNIGHT LAKE               | 56              | 38               | 40  | .   |
| SPOKANE   | LIBERTY LAKE              | 31              | 35               | 42  | .   |
| SPOKANE   | MASON LAKE                | 147             | 59               | 61  | .   |
| SPOKANE   | MASON, LITTLE LAKE        | 163             | 56               | 63  | .   |
| SPOKANE   | MEADOW LAKE               | .               | .                | 4   | .   |
| SPOKANE   | MEDICAL LAKE              | 238             | 63               | 87  | 59  |
| SPOKANE   | MEDICAL, WEST LAKE        | 470             | 52               | 119 | .   |
| SPOKANE   | NEWMAN LAKE               | 91              | 54               | 55  | .   |
| SPOKANE   | OTTER LAKE                | 340             | 55               | 64  | .   |
| SPOKANE   | PHILLED LAKE              | 200             | 48               | 90  | .   |

APPENDIX C --Continued

| County   | Lake                     | CV <sup>1</sup> | TSI <sup>2</sup> |     |     |
|----------|--------------------------|-----------------|------------------|-----|-----|
|          |                          |                 | SD               | TP  | Chl |
| SPOKANE  | QUEEN LUCAS LAKE         | 352             | 63               | 100 | .   |
| SPOKANE  | REFLECTION LAKE          | .               | .                | 54  | .   |
| SPOKANE  | RING LAKE                | 286             | 50               | 56  | .   |
| SPOKANE  | SHELLEY LAKE             | 129             | 60               | 65  | .   |
| SPOKANE  | SILVER LAKE              | 102             | 36               | 54  | 53  |
| SPOKANE  | UNNAMED (21N-40E-7)      | .               | .                | 62  | .   |
| SPOKANE  | UNNAMED (22N-40E-6)      | 245             | 60               | 79  | .   |
| SPOKANE  | UNNAMED (22N-41E-21)     | .               | .                | 75  | .   |
| SPOKANE  | UNNAMED (22N-41E-27)     | 718             | 83               | 115 | .   |
| SPOKANE  | UNNAMED (22N-41E-32)     | 91              | 46               | 64  | .   |
| SPOKANE  | UNNAMED (23N-42E-14)     | .               | .                | 65  | .   |
| SPOKANE  | UNNAMED (24N-40E-21)     | .               | 67               | 92  | .   |
| SPOKANE  | WILLIAMS LAKE            | 40              | 52               | 51  | 43  |
| SPOKANE  | WILLOW LAKE              | .               | 57               | 100 | .   |
| SPOKANE  | WOODS LAKE               | 566             | 62               | 106 | .   |
| STEVENS  | BLACK LAKE               | 29              | 41               | 35  | .   |
| STEVENS  | CEDAR LAKE               | 56              | 42               | 55  | .   |
| STEVENS  | CLARK LAKE               | 25              | 33               | 38  | .   |
| STEVENS  | DEEP LAKE                | 17              | 35               | 38  | .   |
| STEVENS  | DEER LAKE                | 33              | 32               | 37  | 38  |
| STEVENS  | DILLY LAKE               | 76              | 38               | 40  | .   |
| STEVENS  | FALLS, LITTLE LAKE       | 55              | 56               | 52  | .   |
| STEVENS  | FOURMILE (RAINBOW) LAKE  | 36              | 35               | 32  | .   |
| STEVENS  | GILLETTE LAKE            | 62              | 40               | 45  | 47  |
| STEVENS  | HATCH LAKE               | 57              | 42               | 55  | .   |
| STEVENS  | HERITAGE LAKE            | 53              | 44               | 50  | .   |
| STEVENS  | JUMPOFF JOE LAKE         | 31              | 41               | 42  | .   |
| STEVENS  | LED LAKE                 | 43              | 43               | 50  | 49  |
| STEVENS  | LOON LAKE                | .               | 31               | 37  | .   |
| STEVENS  | MISSION LAKE             | .               | .                | 51  | .   |
| STEVENS  | NELSON LAKE              | 21              | 37               | 38  | .   |
| STEVENS  | NEWBELL LAKE             | 109             | 42               | 70  | .   |
| STEVENS  | PERKINS LAKE             | 85              | 47               | 42  | .   |
| STEVENS  | PIERRE LAKE              | 27              | 34               | 38  | 52  |
| STEVENS  | RYAN LAKE                | 85              | 35               | 46  | .   |
| STEVENS  | SHERRY LAKE              | 37              | 37               | 52  | 45  |
| STEVENS  | STARVATION LAKE          | .               | .                | 62  | .   |
| STEVENS  | THOMAS LAKE              | 83              | 39               | 51  | .   |
| STEVENS  | TWIN (SPRUCE) LAKE       | 55              | 49               | 48  | .   |
| STEVENS  | WAITTS LAKE              | 35              | 38               | 45  | .   |
| STEVENS  | WHITE MUD LAKE           | 40              | 36               | 42  | .   |
| STEVENS  | WILLIAMS LAKE            | 68              | 43               | 48  | .   |
| THURSTON | BALD HILL LAKE           | .               | 83               | 61  | .   |
| THURSTON | BLACK LAKE               | .               | 48               | 47  | .   |
| THURSTON | CAPITOL (NORTH ARM) LAKE | 93              | 60               | 58  | .   |

## APPENDIX C --Continued

| County      | Lake                       | CV <sup>1</sup> | TSI <sup>2</sup> |     |     |
|-------------|----------------------------|-----------------|------------------|-----|-----|
|             |                            |                 | SD               | TP  | Ch1 |
| THURSTON    | CHAMBERS LAKE              | 104             | 55               | 51  | 52  |
| THURSTON    | CHAMBERS, LITTLE LAKE      | 99              | 54               | 49  | 52  |
| THURSTON    | CLEAR LAKE                 | .               | 39               | 37  | .   |
| THURSTON    | DEEP LAKE                  | 58              | 40               | 42  | 54  |
| THURSTON    | ELBOW LAKE                 | 58              | 44               | 48  | .   |
| THURSTON    | HEWITT LAKE                | 41              | 32               | 37  | .   |
| THURSTON    | HICKS LAKE                 | 49              | 45               | 47  | 45  |
| THURSTON    | LAWRENCE LAKE              | 105             | 53               | 54  | 53  |
| THURSTON    | LONG LAKE                  | .               | 43               | 37  | .   |
| THURSTON    | MCINTOSH LAKE              | 34              | 47               | 56  | 40  |
| THURSTON    | MUNN LAKE                  | 32              | 49               | 60  | 56  |
| THURSTON    | OFFUTT LAKE                | 43              | 44               | 47  | 43  |
| THURSTON    | PATTERSON (NORTH ARM) LAKE | 50              | 49               | 42  | 51  |
| THURSTON    | PATTERSON (SOUTH ARM) LAKE | 54              | 47               | 46  | 54  |
| THURSTON    | PERCIVAL COVE LAKE         | 167             | 60               | 85  | .   |
| THURSTON    | PITMAN LAKE                | 112             | 57               | 55  | .   |
| THURSTON    | SCOTT LAKE                 | 43              | 50               | 53  | 51  |
| THURSTON    | SIMMONS (KEN) LAKE         | 79              | 52               | 50  | .   |
| THURSTON    | SKOOKUMCHUCK LAKE          | 33              | 49               | 41  | .   |
| THURSTON    | SOUTHWICK LAKE             | 95              | 53               | 52  | .   |
| THURSTON    | ST. CLAIR (NORTH ARM) LAKE | 52              | 46               | 47  | 43  |
| THURSTON    | ST. CLAIR (SOUTH ARM) LAKE | 71              | 52               | 53  | 50  |
| THURSTON    | SUMMIT LAKE                | .               | 37               | 37  | .   |
| THURSTON    | SUNWOOD LAKE               | 130             | 63               | 59  | .   |
| THURSTON    | TEMPO (BUSHMAN) LAKE       | 82              | 52               | 51  | .   |
| THURSTON    | WARD LAKE                  | 32              | 41               | 37  | 43  |
| WALLA WALLA | CASEY LAKE                 | .               | 73               | 77  | .   |
| WALLA WALLA | CURLEW LAKE                | 613             | 83               | 92  | .   |
| WALLA WALLA | "J" LINE LAKE              | 164             | 67               | 69  | .   |
| WALLA WALLA | MILL CREEK LAKE            | .               | 93               | 103 | .   |
| WHATCOM     | BLUE LAKE                  | 5               | 28               | 20  | .   |
| WHATCOM     | CAIN LAKE                  | 40              | 44               | 42  | .   |
| WHATCOM     | CANYON LAKE                | 31              | 46               | 32  | .   |
| WHATCOM     | FAZON LAKE                 | 101             | 54               | 68  | .   |
| WHATCOM     | LOUISE LAKE                | 79              | 57               | 48  | .   |
| WHATCOM     | MAIDEN LAKE                | 6               | 19               | 24  | .   |
| WHATCOM     | PADDEN LAKE                | 29              | 40               | 34  | 38  |
| WHATCOM     | PINE LAKE                  | 59              | 52               | 44  | .   |
| WHATCOM     | REED LAKE                  | 40              | 46               | 42  | .   |
| WHATCOM     | SAMISH (EAST ARM) LAKE     | .               | 44               | 4   | .   |
| WHATCOM     | SAMISH (WEST ARM) LAKE     | .               | 42               | 4   | .   |
| WHATCOM     | SHUKSAN LAKE               | 12              | 33               | 24  | .   |
| WHATCOM     | SILVER LAKE                | 42              | 46               | 48  | .   |
| WHATCOM     | SQUALICUM LAKE             | 94              | 52               | 65  | .   |

APPENDIX C --Continued

| County  | Lake                           | CV <sup>1</sup> | TSI <sup>2</sup> |     | Chl |
|---------|--------------------------------|-----------------|------------------|-----|-----|
|         |                                |                 | SD               | TP  |     |
| WHATCOM | TENNANT LAKE                   | .               | 65               | 80  | .   |
| WHATCOM | TERRELL LAKE                   | 95              | 56               | 54  | .   |
| WHATCOM | TOAD (EMERALD) LAKE            | 35              | 45               | 41  | 47  |
| WHATCOM | TOMYHOI LAKE                   | 8               | 28               | 20  | .   |
| WHATCOM | TWIN, LOWER LAKE               | 6               | 22               | 14  | .   |
| WHATCOM | TWIN, UPPER LAKE               | 5               | 21               | 20  | .   |
| WHATCOM | WHATCOM LAKE                   | 23              | 38               | 20  | .   |
| WHATCOM | WISEMAN LAKE                   | 2               | 16               | 4   | .   |
| WHATCOM | WISER LAKE                     | .               | 57               | 57  | .   |
| WHITMAN | ALKALI (MILLER) LAKE           | 194             | 59               | 89  | .   |
| WHITMAN | BONNIE LAKE                    | 69              | 45               | 60  | .   |
| WHITMAN | CROOKED KNEE LAKE              | 124             | 53               | 62  | .   |
| WHITMAN | FOLSOM LAKE                    | 351             | 73               | 101 | .   |
| WHITMAN | INTERMITTENT (18N-40E-17) LAKE | .               | 83               | 115 | .   |
| WHITMAN | LAVISTA LAKE                   | 179             | 47               | 63  | .   |
| WHITMAN | ROCK LAKE                      | 161             | 70               | 80  | .   |
| WHITMAN | SHEEP LAKE                     | 444             | 62               | 107 | .   |
| WHITMAN | SNYDER LAKE                    | 138             | 47               | 58  | .   |
| WHITMAN | STEVENS LAKE                   | .               | 93               | 96  | .   |
| WHITMAN | TEXAS LAKE                     | 195             | 55               | 72  | .   |
| WHITMAN | TULE LAKE                      | .               | .                | 90  | .   |
| WHITMAN | UNNAMED (19N-40E-23)           | 369             | 83               | 83  | .   |
| WHITMAN | UNNAMED (20N-39E-16)           | 176             | 55               | 66  | .   |
| YAKIMA  | BYRON LAKE                     | 191             | 63               | 79  | .   |
| YAKIMA  | FREEWAY LAKE                   | 104             | 59               | 64  | .   |
| YAKIMA  | GIFFIN LAKE                    | 306             | 77               | 86  | .   |
| YAKIMA  | HORSESHOE (9N-22E-22) LAKE     | 467             | 83               | 95  | .   |
| YAKIMA  | HORSESHOE (9N-22E-25) LAKE     | 271             | 73               | 85  | .   |
| YAKIMA  | MORGAN LAKE                    | 343             | 77               | 78  | .   |
| YAKIMA  | OLEYS (WASHINGTON) LAKE        | .               | 83               | 107 | .   |
| YAKIMA  | UNNAMED (14N-19E-31)           | 71              | 56               | 59  | .   |
| YAKIMA  | WENAS LAKE                     | 64              | 56               | 66  | .   |

<sup>1</sup>Based on Secchi-disc transparency and concentrations of total organic nitrogen and total phosphorus (Bortleson, 1978).

<sup>2</sup>Raw data from Bortleson and others (1976a, 1976b, 1976c, and 1976d) and Dion and others (1976a, 1976b, and 1976c).

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\*Not visited previously--bathymetric map prepared 1981.

