Water-quality data
for Smith and Bybee Lakes, Portland, Oregon
June to November 1982

By Daphne G. Clifton

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METRIC-TO-ENGLISH CONVERSION FACTORS

(multiply metric unit	by	to obtain English inch-pound unit
Length		
micron (μ)	3.937×10^{-5}	inch (in)
millimeter (mm)	3.937×10^{-2}	inch (in)
meter (m)	3.281	feet (ft)
kilometer (km)	6.214×10^{-1}	miles (mi)
Area		
square meter (m^2)	2.471×10^{-4}	acre
cubic meter (m^3)	8.107×10^{-4}	acre-foot (acre-ft)
Volume		
milliliter (ml)	6.102×10^{-2}	cubic (in^3)
liter (l)	3.532×10^{-2}	cubic foot (ft^3)
Weight		
milligram (mg)	3.527×10^{-5}	ounce (oz)
kilogram (kg)	3.527×10^{1}	ounce (oz)
Temperature		
degrees Celsius (°C)	(°C)(1.8) + 32	degrees Fahrenheit (°F)

GLOSSARY OF SELECTED TERMS

[Definitions were obtained or modified from Greeson and others (1977), American Public Health Association and others (1976), Skougstad and others (1979), and Wetzel (1975)]

Benthic invertebrates--invertebrates living on, in, or near the sediment substrate (in lakes these can be nematodes, oligochaetes, chironomids, and ostracods).

Dissolved constituents--constituents that pass through a 0.45-micron pore-size filter.

Immediate oxygen demand--the depletion of dissolved oxygen in a standard water dilution of the sample in a specified time. In these analyses, 3 to 5 ml of wet sediments were placed in a 300 ml bottle for 10 minutes.

Gas chromatograph/mass spectrometer (GC/MS) scan--a semiquantitative analysis of organic material using special separation techniques (acid/base/neutral organic extraction), and chromatographic and spectral semiquantitative analyses.

Macrophytes--macroscopic forms of aquatic vegetation.

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, formally called "Mean Sea Level". NGVD of 1929 is referred to as sea level in this report.

Phytoplankton--the plant components of freshwater plankton, dominated by diatoms, green algae, and bluegreen algae.

Secchi disk transparency--the mean depth of the points where a 20 cm diameter, alternating white- and black-colored disk, disappears and reappears to view. This can be used as an estimation of the depth of the 5 percent light transmittance depth.

Species diversity index--mathematical expression which describes community structure and permits summarization of large amounts of information about numbers and kinds of organisms. The higher the number, the higher the diversity. The Shannon formula was used to calculate diversity indices in this report:

$$H' = - Pi \ln Pi$$

where Pi is estimated from n_i/N as the proportion of the total population of individuals (N) belonging to the ith species (n_i) using natural logarithms (Wetzel, 1975).

Volatile solids--a measurement which provides an estimate of the organic content of a sediment sample (Skougstad and others, 1979).

Zooplankton--the animal component of the freshwater plankton, dominated by rotifers, copepods and cladocerans.

WATER-QUALITY DATA FOR SMITH AND BYBEE LAKES, PORTLAND, OREGON JUNE TO NOVEMBER, 1982

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By Daphne G. Clifton

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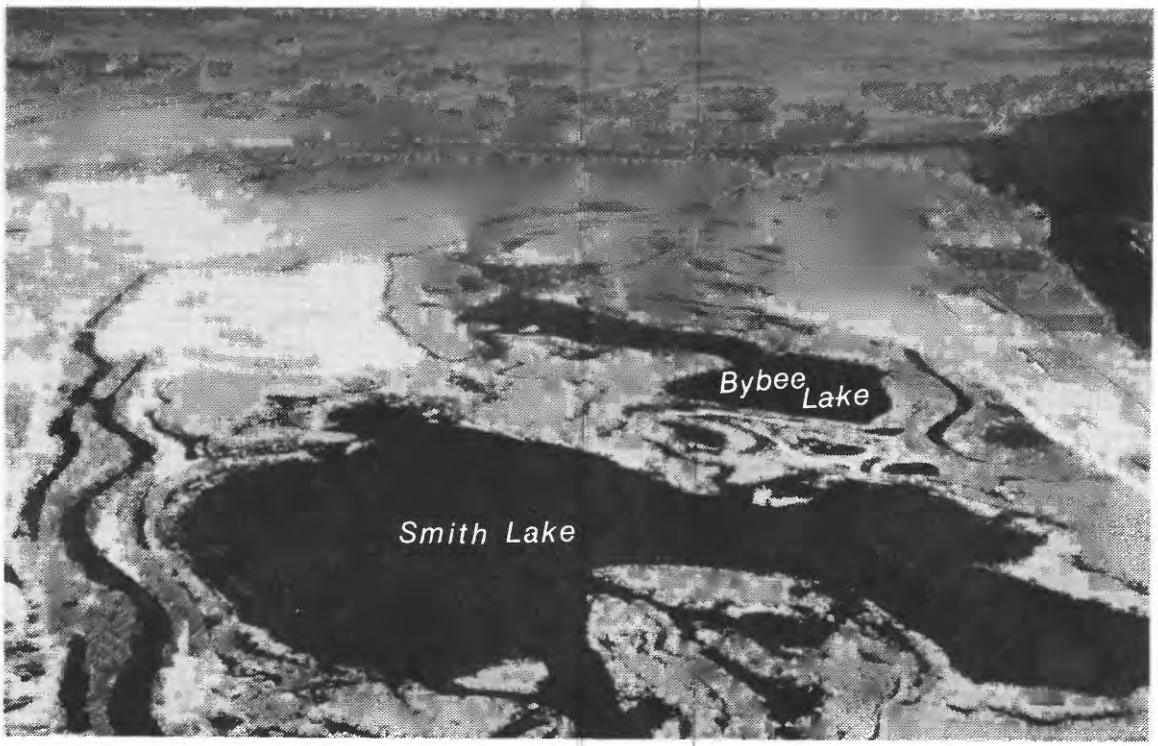
ABSTRACT

Water samples were collected from June to November, 1982, from Smith and Bybee Lakes (adjacent to the Columbia River near Portland, Oregon) for the analyses of physical, chemical, and biological characteristics.

Weekly water-quality monitoring at the two lakes included the measurement of water temperature, dissolved oxygen, percent oxygen saturation, pH, conductivity, lake depth. Alkalinity, dissolved carbon, total dissolved solids, secchi-disk light transparency, nutrients, and chlorophyll a and b were monitored at both lakes on a monthly basis. Diel studies were conducted at Smith Lake in July, August and October to measure temperature, dissolved oxygen, pH, specific conductance, and solar radiation continuously for a 24-hour period. Samples of the phytoplankton and zooplankton were collected at least twice a month and benthic invertebrate populations were collected once each month from both lakes. Lakebed sediment was sampled from each lake to determine particle size, percent organics, immediate oxygen demand, and concentrations of trace metals, nutrients, and organic constituents.



June 1982

November 1982

FIGURE 1. – Photographs of Smith and Bybee Lakes in June and November, 1982

INTRODUCTION

The U.S. Geological Survey (USGS) in cooperation with the U.S. Army Corps of Engineers (COE) made physical, chemical and biological measurements on Smith and Bybee Lakes from June through November of 1982.

The purpose of this report is to present data on the limnological conditions in Smith and Bybee Lakes. Water-quality monitoring included measurement of water temperature, dissolved oxygen concentration and percent saturation, pH, specific conductance, lake depth, alkalinity, dissolved carbon, total dissolved solids, secchi disk light transparency, nutrients, and chlorophyll a and b. In addition, phytoplankton, zooplankton, and benthic invertebrate populations were identified and enumerated. Lakebed sediment was analyzed for particle size, volatile solids, immediate oxygen demand, trace metals, total organic carbon, nutrients, and organic constituents.

Special thanks are due Douglas W. Larson, COE, for his assistance in the collection of water-quality samples.

Physiographic Setting

Smith and Bybee Lakes are located in the northwest corner of the city of Portland, and are part of the lower Columbia River drainage basin (fig. 1 and 2). The climate in the area is moderate. The average daily temperature (by month) ranges from 3.4°C in January to 19.5°C in July. Average annual precipitation is 95.5 cm, most of this occurring in the winter months.

Bybee Lake is connected to the Willamette River via the Columbia Slough, and a narrow channel connects Smith Lake to Bybee Lake. Tidal flushing occurs in Bybee Lake, but not in Smith Lake (COE, 1982).

Smith Lake has a flat, uniform bottom. Polygonum coccinum (a broad-leafed aquatic plant) and willow cover most of the lake in the summer months, with the majority of the willow around the periphery.

Bybee Lake has an uneven lake bottom and open water, with tidal changes of 0.3 to 0.6 meters per day throughout the summer. Phalaris arundaceae (reed canary grass), Saggitaria latifolia (wapato), Carex sitkensis, Polygonum spp. and spike rushes are found near the water's edge, and on the mudbars and small islands. Stands of willow are evident along the perimeter. Further information on vegetation is shown on a habitat map by Nancy Ellifrit, U.S. Fish and Wildlife (USFW) and Brian Lightcap (COE) (written communication, October 25, 1982).

Smith and Bybee Lakes are located in the midst of an industrial area near a sewage treatment plant, a sanitary landfill, and fill material from past dredging activities in the Columbia River. Historical land-use activities in the area are described in previous reports (COE, 1982; Oregon Department of Environmental Quality, 1974; and Sobolewski, 1971.) On August 31, 1982, a water control structure was placed on the Columbia Slough near Bybee Lake by the Port of

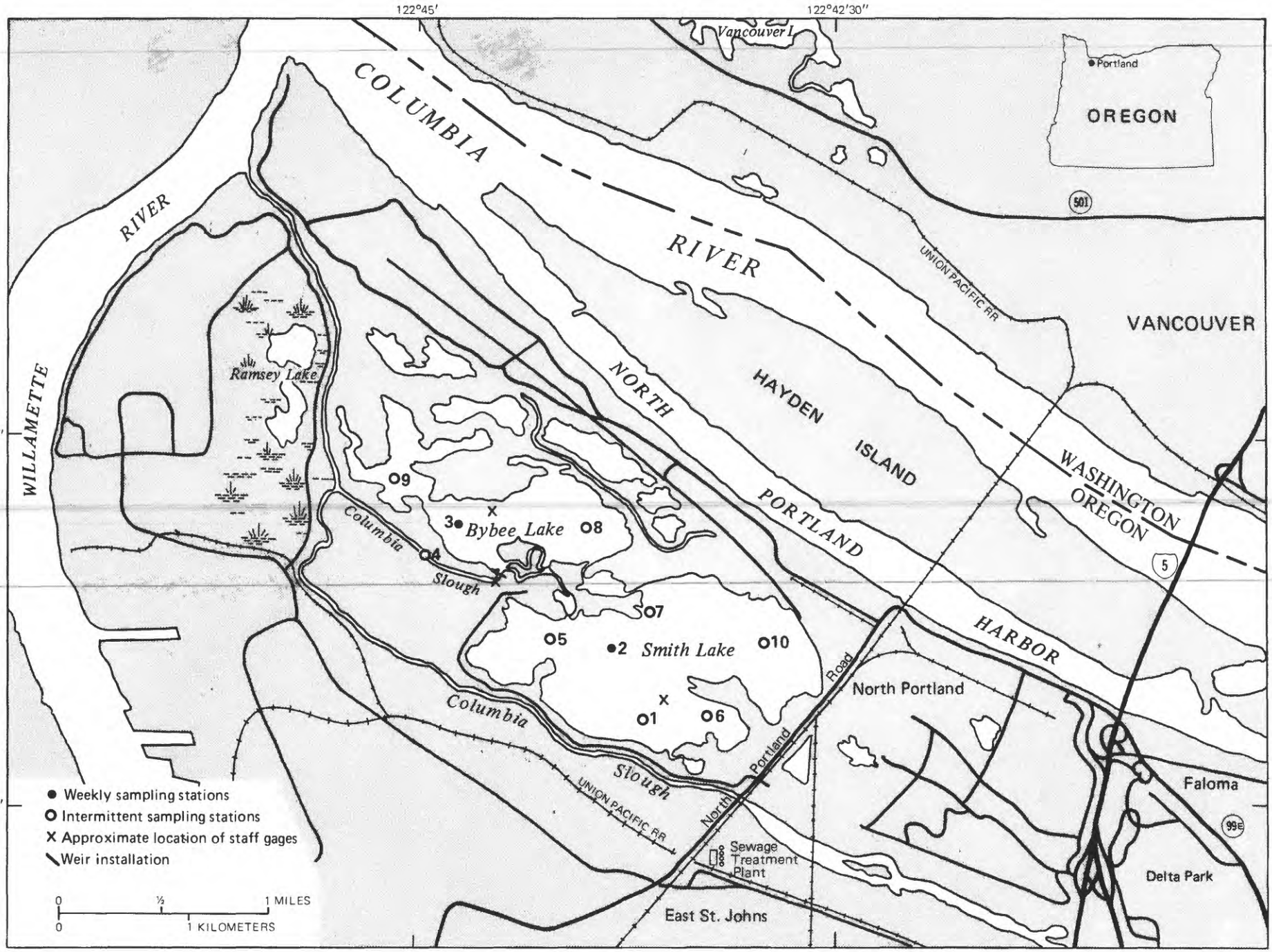


FIGURE 2. – Location map and sampling sites in Smith and Bybee Lakes

Portland for USFW. When in operation, this structure will eliminate tidal flushing in Bybee Lake, except during very high flows (COE, 1982).

METHODS OF SAMPLING AND ANALYSIS

Collection and analysis of the physical, chemical, and biological constituents in the lakes are described in the following section. Sample preparation and analysis followed standard USGS methods (Skougstad and others, 1979; Greeson and others, 1977; Guy, 1969; American Public Health Association and others, 1976). Locations of sampling sites are shown in figure 1 and table 1.

Physical and Chemical Water Quality Data

Field measurements of temperature and dissolved oxygen were made with a Yellow Springs Instrument Co. (YSI)1/ (Model 57) dissolved-oxygen meter. An Orion Research pH meter (Model 401) and probe was used to measure pH in the field. The YSI (Model 32) specific conductance meter connected to a Labline cell was used to measure conductivity in the field. A secchi disk was used to measure light transparency. Lake depth was measured using a weighted, calibrated line. A horizontal Van Dorn sampler was used to collect water samples at specific depths. Monthly samples for chlorophyll analyses were filtered through a glass-fiber (type A-E) filter and analyzed at the USGS Central Laboratory in Atlanta, Georgia.

A Martek (Mark 2) unit connected to an Elnik recorder was used during the diel (24-hour) studies for continuous monitoring of temperature, pH, dissolved oxygen, and conductivity. Solar radiation was measured with a Weathermeasure Star Pyranometer. The Martek probe was suspended from a boat, 0.1 to 0.3 meters below the water surface depending on maximum lake depth. Diel studies were done in July, August and October at site 2. When water levels were too low in September to use the Martek probe, instantaneous measurements were taken in late afternoon and early morning.

Water temperature, dissolved-oxygen concentration, percent oxygen saturation, pH, specific conductance, depth of samples, secchi disk readings, solar radiation and chlorophyll analyses are shown in table 2. Graphs in figures 3 and 4 show selected depth profiles of dissolved-oxygen saturation and temperature at sites 2 and 3. Solar radiation, water temperature, dissolved-oxygen saturation, and pH measurements are shown in figure 5 for the diel studies in July, August and October.

1/The use of brand names in this report is for identification purposes and does not imply endorsement by the U.S. Geological Survey.

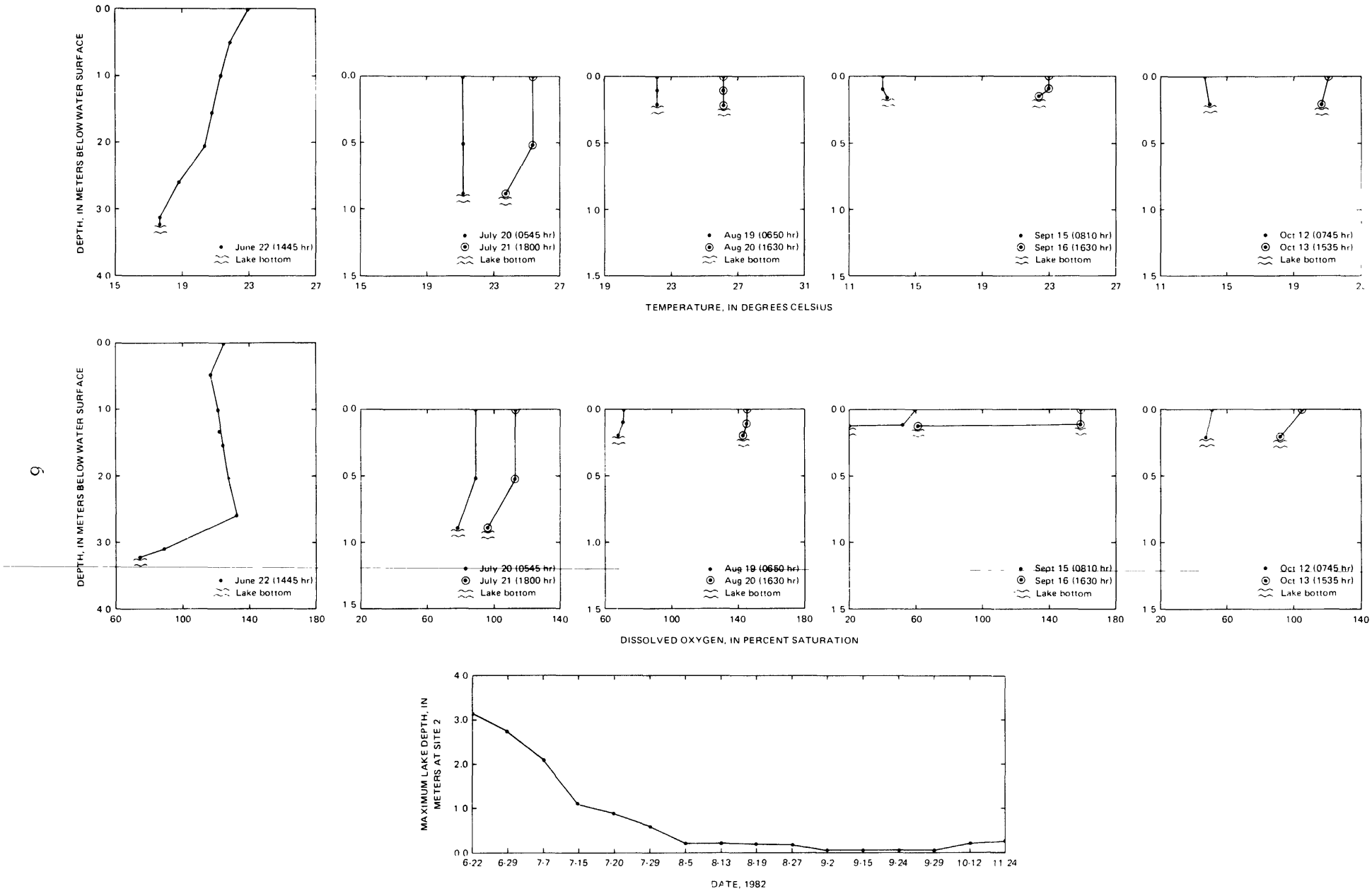


FIGURE 3. – Smith Lake depth profiles showing temperature and percentage dissolved oxygen saturation at site 2.

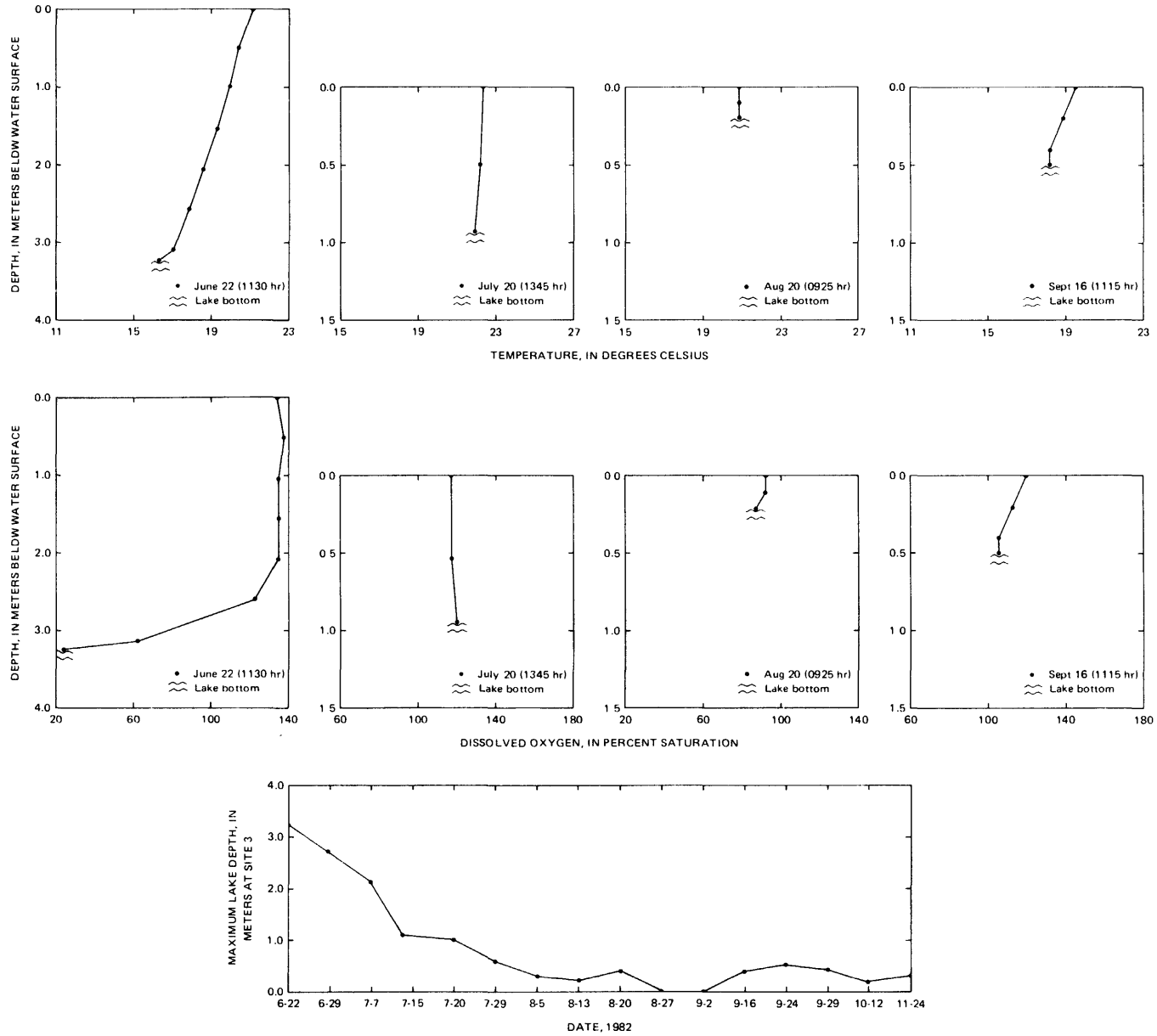


FIGURE 4. – Bybee Lake depth profiles showing temperature and percentage dissolved oxygen at site 3.

Samples were analyzed once per month for alkalinity, dissolved organic carbon, dissolved solids and nutrients at sites 2 and 3. Samples for dissolved organic carbon were filtered through a 0.45-micron pore-size silver membrane filter. Chemical analyses were made at the USGS Central Laboratory in Denver, Colorado. Dissolved nutrients, dissolved organic carbon, total dissolved solids, alkalinity, and turbidity data are presented in table 3.

Maximum and minimum values for data collected at sites 2 and 3 are presented in table 14.

The Port of Portland in cooperation with COE established staff gages in both lakes and in the Columbia Slough; locations are plotted in figure 1. Staff gage measurements are presented in table 5. During the period of study, the combined capacity of both lakes ranged from 260,000 cubic meters (1.8 meters, stage) to 460,000 cubic meters (3.6 meters, stage), based on staff gage measurements in table 5 and the area-capacity curve developed for the lakes by the Port of Portland (1981).

Biological Data

Phytoplankton samples were collected at least twice a month at sites 2 and 3. Samples were preserved in a 5 percent formalin - copper-sulfate solution and identified and counted using the membrane filter method, a compound microscope, and identification keys by Collins and Kalinsky (1977), Hilliard (1966), Hustedt (1930), Javornicky (1976), Patrick and Reimer (1966, 1975), Prescott (1962), and Smith (1950).

Phytoplankton abundance and species diversity are shown in table 6. Species diversity was calculated using the Shannon formula (Wetzel, 1975). Many phytoplankton species found in the two lakes are also found in the Columbia River according James Sweet, USGS, (personal communication, October 15, 1982).

Zooplankton samples were collected twice a month at sites 2 and 3 using a plankton net (.026 mm^2, mesh porosity). A column of water was sampled from a point just above the bottom sediment, by pulling the net up through the water, or by dipping a sample bottle and pouring its contents through the net. Zooplankton were preserved in formalin solution and identified using a compound microscope and identification manuals by Pennak (1978) and Edmundson (1959). Zooplankton were counted using a Sedgewick-Rafter cell on an Olympus 40-power dissecting microscope.

Zooplankton abundance and species diversity are shown in table 7. The presence of *Diaptomus reighardi* in a Pacific Coast lake represents an extension of range of distribution of this species (written communication, Harry Yeatman, The University of the South, Department of Biology, Sewanee, Tenn., Dec. 23, 1982).

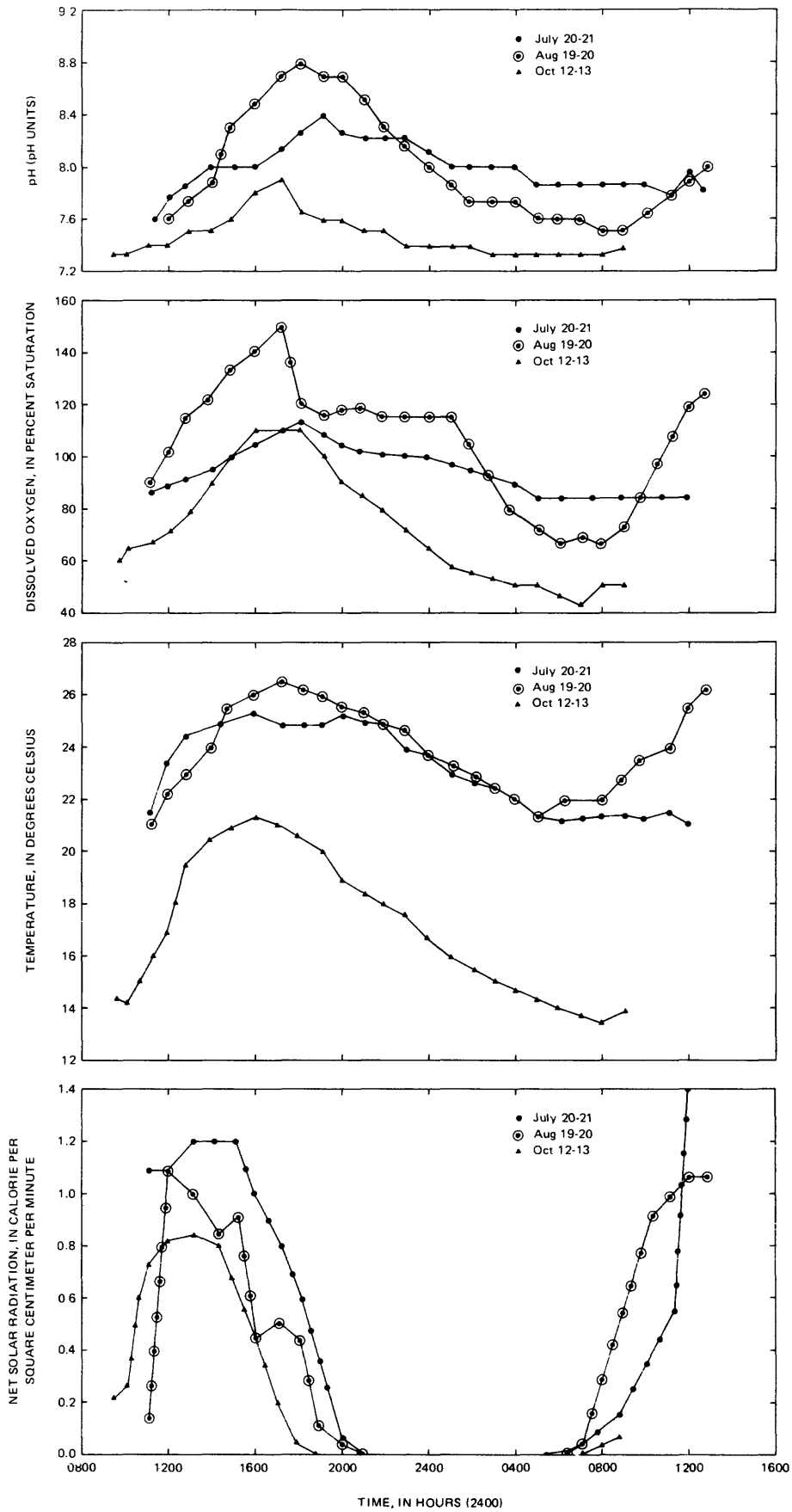


FIGURE 5. – Diel data collected at site 2 in Smith Lake.

Benthic invertebrates were collected once a month using an Ekman grab sampler (0.15 x 0.15 meters size). Samples were first rinsed through 0.351 mm sieves, then sorted, identified, and counted using the Olympus dissecting microscope, and identification keys by Pennak (1978), Brinkhurst (1964, 1965), Brinkhurst and Cook (1966) and Edmundson (1959). Abundance and species diversity of benthic invertebrates are listed in table 8.

Physical and Chemical Lakebed Sediment Quality Data

A sediment corer (3.5-cm I.D. diameter) was used to collect sediment samples at sites 2, 3, 8 and 10. The samples varied in depth from 0.2 to 0.5 meters. Near each site, four samples were composited after collection from open-pool and vegetated areas. Because the upper portion of the sediment core samples were less compacted than the sediments in the lower portion of the core, the upper and lower portions were analyzed separately.

Sediment samples were analyzed for particle-size, percent volatile solids, and immediate oxygen demand at the USGS laboratory in Portland, Oregon. Table 9 shows sample depth, description of sediment, immediate oxygen demand, and percent volatile solids in each sample. Particle-size analyses are presented in table 10.

At each of the four sites, upper portions of the sediments in the core were analyzed for trace metals, total organic carbon, and nutrients; these analyses are shown in table 11. A composited sample of upper-portioned sediments from Smith Lake sites 2 and 10, and a composite sample from Bybee Lake sites 3 and 8 were used for determination of organics with gas chromatograph-mass spectrometric semiquantitative (GC/MS) analyses. Results of the analyses for organic constituents are presented in Appendix I.

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Table 1.--Locations of sampling sites in Smith and Bybee Lakes
[Locations shown in figure 1]

Site No.	Site Name	Location	
		Latitude	Longitude
1	Smith Lake (south)	45°36'16"	122°43'38"
2	Smith Lake (center)	45°36'35"	122°43'48"
3	Bybee Lake (center)	45°37'09"	122°44'44"
4	Columbia Slough (near Bybee Lake)	45°37'00"	122°44'58"
5	Smith Lake (west)	45°36'41"	122°44'07"
6	Smith Lake (east)	45°36'20"	122°43'17"
7	Smith Lake (north)	45°36'48"	122°43'39"
8	Bybee Lake (east)	45°37'08"	122°44'00"
9	Bybee Lake (west)	45°37'22"	122°45'12"
10	Smith Lake (east)	45°36'30"	122°43'00"

Table 2.--Instantaneous and diel water-quality data from Smith and Bybee Lakes

[Sampling depth with no water-quality data indicates maximum lake depth at site]

SMITH LAKE SITE 1 (SOUTH) NEAR PORTLAND OR

WATER QUALITY DATA, JUNE TO NOVEMBER 1982

DATE	TIME	SAMPLING DEPTH (M)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	SPECIFIC CONDUCTANCE (UMHOS)	TRANSPARENCY (SECCHI DISK) (M)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L)
JUN										
17...	1115	2.0	17.5	10.0	104	--	--	.59	--	--
17...	1116	2.5	--	--	--	--	--	--	--	--
22...	1630	.00	24.5	9.3	113	8.4	152	.89	--	--
22...	1631	.50	24.5	9.3	113	--	--	--	--	--
22...	1632	1.0	24.2	9.3	112	--	--	--	--	--
22...	1633	1.5	22.1	9.6	111	8.3	153	--	--	--
22...	1634	2.0	21.4	10.7	123	--	--	--	--	--
22...	1635	2.5	19.4	5.6	62	--	--	--	--	--
22...	1636	3.0	18.5	1.0	1	8.4	150	--	--	--
22...	1637	3.0	--	--	--	--	--	--	--	--
29...	0940	.00	21.0	7.3	82	7.3	152	2.22	--	--
29...	0941	.50	21.0	7.3	82	--	--	--	--	--
29...	0942	1.0	21.0	7.3	82	7.4	151	--	--	--
29...	0943	1.5	21.0	7.4	83	--	--	--	--	--
29...	0944	2.0	21.0	7.2	81	7.4	152	--	--	--
29...	0945	2.5	21.0	6.4	72	--	--	--	--	--
29...	0946	2.8	20.2	1.2	13	--	--	--	--	--
29...	0947	2.8	--	--	--	--	--	--	--	--
JUL										
07...	1050	.00	20.1	7.0	77	7.5	170	1.25	--	--
07...	1051	.50	20.4	6.9	76	--	--	--	--	--
07...	1052	1.0	20.1	5.8	64	7.5	167	--	--	--
07...	1053	1.5	19.5	4.9	53	--	--	--	--	--
07...	1054	2.0	19.2	3.5	38	7.5	171	--	--	--
07...	1055	2.1	19.0	2.3	25	--	--	--	--	--
07...	1056	2.1	--	--	--	--	--	--	--	--
15...	0925	.00	20.5	6.0	66	7.3	173	.56	--	--
15...	0926	.50	20.2	6.1	67	7.3	--	--	--	--
15...	0927	1.0	20.2	6.4	70	7.3	--	--	--	--
15...	0928	1.2	20.2	6.4	70	--	--	--	--	--
15...	0929	1.3	20.2	4.4	48	--	--	--	--	--
15...	0930	1.3	--	--	--	--	--	--	--	--
20...	1400	.00	26.8	8.0	102	7.8	177	.47	--	--
20...	1401	.50	26.0	8.1	100	7.6	177	--	--	--
20...	1402	.90	23.5	7.7	91	--	--	--	--	--
20...	1403	.90	--	--	--	--	--	--	--	--
20...	1605	.00	26.8	8.0	102	7.7	177	--	22.0	<.100
20...	1610	.50	26.0	8.1	100	7.6	177	--	15.0	8.70
21...	1050	.00	21.0	6.8	75	7.5	174	--	--	--
21...	1051	.90	21.5	6.6	82	--	--	--	--	--
29...	1315	.00	21.8	7.1	80	7.6	182	.33	--	--
29...	1316	.20	21.5	7.2	81	7.6	180	--	--	--
29...	1317	.40	21.5	7.2	81	--	--	--	--	--
29...	1318	.50	21.0	6.6	73	--	--	--	--	--
29...	1319	.50	--	--	--	--	--	--	--	--
AUG										
05...	1430	.00	25.5	12.2	148	--	--	--	--	--
05...	1431	.10	25.5	11.4	138	--	--	--	--	--
05...	1432	.20	25.2	1.2	14	--	--	>.20	--	--
13...	1150	.00	20.2	7.1	78	7.5	183	--	--	--
13...	1151	.10	20.2	7.1	78	--	--	--	--	--
13...	1152	.20	20.2	7.1	78	7.5	184	--	--	--
13...	1153	.30	20.2	7.0	77	--	--	--	--	--
13...	1154	.35	20.3	.4	4	--	--	--	--	--
13...	1155	.35	--	--	--	--	--	>.35	--	--
19...	1000	.00	20.4	4.0	44	7.4	189	--	--	--
19...	1001	.10	20.3	4.1	45	7.4	189	--	--	--
19...	1002	.20	20.3	4.1	45	7.3	189	--	--	--
19...	1003	.27	--	--	--	--	--	>.27	--	--
19...	1015	.00	20.4	4.0	44	7.4	184	--	10.0	<.100
27...	1200	.00	21.5	7.4	84	7.4	191	--	--	--
27...	1201	.10	21.5	7.2	81	--	--	--	--	--
27...	1202	.20	21.5	7.1	80	--	--	--	--	--
27...	1230	.21	--	--	--	--	--	>.21	--	--
SEP										
02...	1050	.00	23.4	5.4	63	7.2	177	--	--	--
02...	1051	.05	23.3	5.3	62	7.2	--	--	--	--
02...	1052	.10	23.2	4.8	56	--	--	--	--	--
02...	1053	.15	23.1	4.5	52	--	--	--	--	--
02...	1054	.16	--	--	--	--	--	>.16	--	--
15...	1400	.00	20.8	11.9	132	8.5	177	--	--	--
15...	1401	.10	20.8	11.7	130	--	--	--	--	--
15...	1402	.11	20.5	5.6	62	--	--	--	--	--
15...	1640	.00	22.6	15.0	173	--	--	--	--	--
15...	1641	.10	22.6	14.8	171	--	--	--	--	--
15...	1642	.11	22.5	6.1	70	--	--	--	--	--
15...	1643	.12	--	--	--	--	--	--	--	--
16...	0825	.00	13.5	4.2	40	7.6	181	--	--	--
16...	0826	.10	13.5	4.2	40	--	--	--	--	--
16...	0827	.11	--	--	--	--	--	--	--	--
16...	1435	.00	25.0	--	--	8.3	175	--	8.30	4.40

Table 2.--Instantaneous and diel water-quality data for Smith and Bybee Lakes--Continued

SMITH LAKE SITE 1

DATE	TIME	SAMPLING DEPTH (M)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	SPECIFIC CONDUCTANCE (UMHOS)	TRANSPARENCY (SECCHI DISK) (M)
SEP								
24...	1030	.00	19.5	4.8	52	7.4	162	.17
24...	1031	.10	19.5	4.2	46	--	--	--
24...	1032	.18	19.5	3.9	42	--	--	--
24...	1033	.18	--	--	--	--	--	>.18
29...	1020	.00	11.6	7.7	70	7.0	165	.20
29...	1021	.10	11.6	7.8	71	--	--	--
29...	1022	.22	--	--	--	--	--	--
29...	1403	.12	--	--	--	--	--	>.12
OCT								
12...	1515	.00	21.0	9.4	105	8.0	153	--
12...	1516	.20	20.0	9.6	107	--	--	--
12...	1517	.22	--	--	--	--	--	>.22
13...	0805	.00	14.0	7.0	67	7.4	169	--
13...	0806	.20	14.0	6.7	64	--	--	--
13...	0807	.22	--	--	--	--	--	--

Table 2.--Instantaneous and diel water-quality data for Smith and Bybee Lakes--Continued

[Sampling depth with no water-quality data indicates maximum lake depth at site]

SMITH LAKE SITE 2 (CENTER) NEAR PORTLAND OR

WATER QUALITY DATA, JUNE TO NOVEMBER 1982

DATE	TIME	SAMPLING DEPTH (M)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	SPECIFIC CONDUCTANCE (UMHOS)	SOLAR RADIATION NET (CAL/SQ CM/MIN)	TRANSPARENCY (SECCHI DISK) (M)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L)
JUN											
17...	1010	.50	20.0	9.7	106	8.5	163	--	--	--	--
17...	1011	2.5	14.6	8.1	88	8.2	172	--	--	--	--
17...	1012	3.0	--	--	--	--	--	--	--	--	--
22...	1445	.00	23.0	10.4	122	8.4	152	--	.76	--	--
22...	1446	.50	22.0	10.0	115	--	--	--	--	--	--
22...	1447	1.0	21.5	10.4	119	--	--	--	--	--	--
22...	1448	1.5	21.0	10.8	122	8.6	141	--	--	--	--
22...	1449	2.0	20.5	11.1	125	--	--	--	--	--	--
22...	1450	2.5	19.0	12.0	130	--	--	--	--	--	--
22...	1451	3.0	18.0	8.2	87	8.5	141	--	--	--	--
22...	1452	3.1	18.0	6.9	74	--	--	--	--	--	--
22...	1453	3.2	--	--	--	--	--	--	--	--	--
29...	1055	.00	20.8	7.2	81	7.4	152	--	1.57	--	--
29...	1056	.50	20.8	7.1	80	--	--	--	--	--	--
29...	1057	1.0	20.8	7.1	80	7.3	153	--	--	--	--
29...	1058	1.5	20.8	7.0	127	--	--	--	--	--	--
29...	1059	2.0	20.7	6.6	74	7.4	152	--	--	--	--
29...	1100	2.5	20.4	6.7	75	--	--	--	--	--	--
29...	1101	2.6	20.2	4.0	44	--	--	--	--	--	--
29...	1102	2.7	--	--	--	--	--	--	--	--	--
JUL											
07...	1020	.00	20.0	7.8	86	7.6	166	--	1.27	--	--
07...	1021	.50	20.1	7.7	118	--	--	--	--	--	--
07...	1022	1.0	20.0	7.7	118	7.5	166	--	--	--	--
07...	1023	1.5	19.8	7.2	80	--	--	--	--	--	--
07...	1024	2.0	19.3	5.6	61	7.4	167	--	--	--	--
07...	1025	2.1	19.1	4.1	44	--	--	--	--	--	--
07...	1026	2.1	--	--	--	--	--	--	--	--	--
15...	1025	.00	20.0	7.3	80	7.4	169	--	.51	--	--
15...	1026	.50	19.9	7.3	80	7.5	169	--	--	--	--
15...	1027	1.0	19.9	7.4	81	7.5	169	--	--	--	--
15...	1028	1.1	19.9	7.1	78	--	--	--	--	--	--
15...	1029	1.2	--	--	--	--	--	--	--	--	--
20...	1120	.50	21.5	7.8	88	7.6	176	1.1	--	--	--
20...	1200	.30	23.3	7.8	92	7.8	173	1.1	--	--	--
20...	1300	.30	24.3	7.8	94	7.9	171	1.2	--	--	--
20...	1400	.30	24.7	8.1	97	8.0	174	1.2	--	--	--
20...	1500	.30	25.1	8.4	102	8.0	175	1.2	--	--	--
20...	1525	.00	26.0	8.7	107	8.1	173	--	.36	--	--
20...	1526	.50	25.1	8.4	102	8.1	175	--	--	--	--
20...	1527	.85	23.1	8.5	99	--	--	--	--	--	--
20...	1528	.85	--	--	--	--	--	--	--	--	--
20...	1530	.30	25.1	8.4	102	8.0	175	--	--	18.0	<.100
20...	1540	.30	26.0	8.7	107	8.1	173	--	--	2.50	5.50
20...	1600	.30	25.4	8.6	104	8.0	176	1.0	--	--	--
20...	1700	.30	25.0	8.9	108	8.1	175	.82	--	--	--
20...	1800	.00	25.0	9.2	111	8.3	175	.59	--	--	--
20...	1801	.50	25.0	9.2	111	8.1	175	--	--	--	--
20...	1802	.85	23.4	8.1	95	--	--	--	--	--	--
20...	1900	.30	25.0	8.8	107	8.4	180	.32	--	--	--
20...	2000	.30	25.5	8.6	105	8.3	179	.06	--	--	--
20...	2100	.30	25.2	8.6	104	8.2	176	.00	--	--	--
20...	2200	.30	24.6	8.6	103	8.2	178	.00	--	--	--
20...	2300	.30	23.9	8.6	102	8.2	178	.00	--	--	--
20...	2400	.30	23.5	8.5	100	8.1	175	.00	--	--	--
21...	0100	.30	23.2	8.4	98	8.0	176	.00	--	--	--
21...	0200	.30	23.0	8.2	95	8.0	176	.00	--	--	--
21...	0300	.30	22.3	8.1	93	8.0	175	.00	--	--	--
21...	0400	.30	21.9	7.9	90	8.0	176	.00	--	--	--
21...	0500	.30	21.0	7.8	87	7.8	175	.00	--	--	--
21...	0545	.00	21.0	7.8	87	--	--	--	--	--	--
21...	0546	.50	21.0	7.8	87	7.8	175	--	--	--	--
21...	0547	.90	21.0	7.0	78	--	--	--	--	--	--
21...	0548	.90	--	--	--	--	--	--	--	--	--
21...	0600	.30	20.8	7.7	86	7.8	174	.01	--	--	--
21...	0700	.30	20.3	7.7	85	7.8	176	.07	--	--	--
21...	0800	.30	20.9	7.7	85	7.8	176	.17	--	--	--
21...	0900	.30	20.9	7.7	85	7.8	174	.37	--	--	--
21...	1000	.30	20.7	7.7	85	7.8	175	.56	--	--	--
21...	1100	.30	21.0	7.7	85	7.7	173	.75	--	--	--
21...	1120	.00	21.0	8.1	90	--	--	--	--	--	--
21...	1121	.50	21.0	8.1	90	7.7	173	--	--	--	--
21...	1122	.90	21.0	8.2	91	--	--	--	--	--	--
21...	1200	.30	20.8	7.7	85	7.8	172	1.4	--	--	--
29...	1300	.00	21.0	9.0	100	8.0	183	--	.28	--	--
29...	1301	.20	21.0	9.0	100	7.9	180	--	--	--	--
29...	1302	.40	21.0	9.1	101	--	--	--	--	--	--
29...	1303	.50	21.0	8.9	99	--	--	--	--	--	--
29...	1304	.50	--	--	--	--	--	--	--	--	--

Table 2.--Instantaneous and diel water-quality data for Smith and Bybee Lakes--Continued

SMITH LAKE SITE 2

DATE	TIME	SAMPLING DEPTH (M)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	SPECIFIC CONDUCTANCE (UMHOS)	SOLAR RADIATION NET (CAL/SQ CM/MIN)	TRANSPARENCY (SECCHI DISK) (M)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L)
AUG											
05...	1400	.00	27.5	11.8	148	8.4	193	--	--	--	--
05...	1401	.10	27.2	12.2	153	--	--	--	--	--	--
05...	1402	.20	26.8	2.0	25	--	--	--	--	--	--
05...	1403	.20	--	--	--	--	--	--	>.20	--	--
13...	1020	.00	20.1	8.3	92	7.5	180	--	--	--	--
13...	1021	.10	20.1	8.4	93	--	--	--	--	--	--
13...	1022	.20	20.2	8.5	90	7.5	181	--	--	--	--
13...	1023	.30	20.2	8.2	91	7.5	--	--	--	--	--
13...	1024	.33	20.2	.2	2	--	--	--	--	--	--
13...	1025	.33	--	--	--	--	--	--	>.33	--	--
19...	1120	.30	21.1	8.1	91	7.6	196	.18	--	--	--
19...	1130	.00	22.6	8.4	97	7.6	196	--	--	17.0	<.100
19...	1131	.10	21.1	8.1	91	7.6	196	--	--	--	--
19...	1132	.15	21.1	8.1	91	7.7	196	--	--	--	--
19...	1133	.25	--	--	--	--	--	--	>.25	--	--
19...	1200	.30	22.6	9.2	106	7.6	196	1.1	--	--	--
19...	1215	.00	22.9	9.0	104	7.6	197	--	--	--	--
19...	1216	.10	22.6	9.4	109	--	--	--	--	--	--
19...	1217	.15	22.6	9.2	106	--	--	--	--	--	--
19...	1300	.30	23.2	10.0	117	7.8	198	1.0	--	--	--
19...	1400	.30	23.9	10.4	123	7.9	195	.82	--	--	--
19...	1500	.30	25.4	11.2	136	8.3	193	.92	--	--	--
19...	1600	.30	26.2	11.5	142	8.5	190	.45	--	--	--
19...	1630	.00	26.2	11.6	143	8.5	190	--	--	--	--
19...	1631	.10	26.2	11.5	142	8.5	189	--	--	--	--
19...	1632	.20	26.2	11.3	140	8.5	188	--	--	--	--
19...	1700	.30	26.4	11.9	148	8.7	189	.50	--	--	--
19...	1800	.30	26.3	9.8	121	8.8	188	.45	--	--	--
19...	1900	.30	26.1	9.1	113	8.7	188	.08	--	--	--
19...	2000	.30	25.9	9.4	116	8.7	186	.01	--	--	--
19...	2100	.30	25.7	9.6	117	8.6	188	.00	--	--	--
19...	2200	.30	24.6	9.4	113	8.3	190	.00	--	--	--
19...	2300	.30	24.3	9.5	113	8.1	188	.00	--	--	--
19...	2400	.30	23.5	9.4	110	8.0	190	.00	--	--	--
20...	0100	.30	23.4	9.3	109	7.8	188	.00	--	--	--
20...	0200	.30	23.1	8.8	102	7.7	189	.00	--	--	--
20...	0300	.30	22.3	8.1	93	7.7	192	.00	--	--	--
20...	0400	.30	21.9	7.0	79	7.7	190	.00	--	--	--
20...	0500	.30	21.1	6.6	74	7.6	193	.00	--	--	--
20...	0600	.30	22.1	6.1	70	7.6	188	.00	--	--	--
20...	0650	.00	22.1	6.3	72	7.5	180	--	--	--	--
20...	0651	.10	22.1	6.1	70	7.6	--	--	--	--	--
20...	0652	.20	22.1	5.9	68	7.6	--	--	--	--	--
20...	0700	.30	21.9	6.3	72	7.6	183	.07	--	--	--
20...	0800	.30	22.0	6.1	70	7.5	182	.30	--	--	--
20...	0900	.30	22.6	6.7	77	7.5	179	.55	--	--	--
20...	1000	.30	23.5	7.5	88	7.6	175	.88	--	--	--
20...	1100	.30	24.0	8.7	103	7.7	177	1.0	--	--	--
20...	1200	.30	25.7	9.9	121	7.9	173	1.1	--	--	--
20...	1245	.00	26.3	9.5	105	7.8	161	--	--	--	--
20...	1246	.05	26.1	9.9	122	--	--	--	--	--	--
20...	1247	.10	26.0	10.2	125	7.9	--	--	--	--	--
20...	1248	.15	25.8	10.4	127	7.9	--	--	--	--	--
20...	1249	.20	25.8	10.2	125	--	--	--	--	--	--
20...	1300	.30	25.5	10.0	124	8.2	161	1.1	--	--	--
20...	1305	.30	26.7	10.0	124	8.2	161	1.1	--	--	--
27...	1130	.00	21.5	7.8	88	7.7	193	--	--	--	--
27...	1131	.10	21.5	8.2	93	--	--	--	--	--	--
27...	1132	.20	21.5	8.0	90	--	--	--	--	--	--
27...	1133	.20	--	--	--	--	--	--	>.20	--	--
SEP											
02...	1020	.00	22.8	8.5	98	8.0	189	--	--	--	--
02...	1021	.05	22.5	8.5	98	8.0	--	--	--	--	--
02...	1022	.10	22.5	8.6	99	8.0	--	--	--	--	--
02...	1023	.15	22.6	8.2	94	--	--	--	--	--	--
02...	1024	.15	--	--	--	--	--	--	>.15	--	--
15...	1315	.00	21.0	11.7	131	8.8	172	--	--	--	--
15...	1316	.10	21.0	11.4	127	--	--	--	--	--	--
15...	1317	.11	20.8	8.0	89	--	--	--	--	--	--
15...	1318	.11	--	--	--	--	--	--	>.11	--	--
15...	1400	.00	20.8	11.9	132	8.5	177	--	--	--	--
15...	1401	.10	20.8	11.7	130	--	--	--	--	--	--
15...	1402	.11	20.5	5.6	62	--	--	--	--	--	--
15...	1630	.00	23.0	13.6	158	8.9	165	--	--	--	--
15...	1631	.10	23.0	13.6	158	--	--	--	--	--	--
15...	1632	.11	22.5	5.4	62	--	--	--	--	--	--
15...	1640	.00	22.6	15.0	173	--	--	--	--	--	--
15...	1641	.11	22.6	14.8	171	--	--	--	--	--	--
15...	1642	.12	22.5	6.1	70	--	--	--	--	--	--

Table 2.--Instantaneous and diel water-quality data for Smith and Bybee Lakes--Continued

SMITH LAKE SITE 2

DATE	TIME	SAMPLING DEPTH (M)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	SPECIFIC CONDUCTANCE (UMHOS)	SOLAR RADIATION NET (CAL/SQ CM/MIN)	TRANSPARENCY (SECCHI DISK) (M)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L)
SEP											
16...	0810	.00	13.2	6.2	59	7.7	181	--	--	--	--
16...	0811	.10	13.2	5.9	56	--	--	--	--	--	--
16...	0812	.11	13.2	2.0	20	--	--	--	--	--	--
16...	0825	.00	13.5	4.2	40	7.6	181	--	--	--	--
16...	0826	.10	13.5	4.2	40	--	--	--	--	--	--
16...	1415	.00	25.0	13.3	160	8.8	173	--	--	13.0	5.90
16...	1416	.10	25.0	13.3	160	--	--	--	--	--	--
24...	1010	.00	19.0	6.0	65	7.3	159	--	.17	--	--
24...	1011	.10	19.2	6.0	65	--	--	--	--	--	--
24...	1012	.18	19.2	4.4	48	--	--	--	--	--	--
24...	1013	.18	--	--	--	--	--	--	--	--	--
29...	0940	.00	11.0	7.1	64	7.5	164	--	.18	--	--
29...	0941	.10	11.2	6.9	62	--	--	--	--	--	--
OCT											
12...	0940	.00	14.4	6.3	61	7.3	165	.23	.20	--	--
12...	0941	.20	14.4	6.1	59	--	--	--	--	--	--
12...	0942	.22	--	--	--	--	--	--	--	--	--
12...	1000	.10	14.4	6.3	64	7.3	165	.27	--	29.0	12.0
12...	1020	.10	14.3	6.6	64	7.3	165	.60	--	--	--
12...	1100	.10	15.6	6.5	65	7.4	165	.72	--	--	--
12...	1200	.10	16.8	6.9	70	7.4	160	.82	--	--	--
12...	1300	.10	19.3	7.5	81	7.5	155	.85	--	--	--
12...	1400	.10	20.6	8.3	92	7.5	160	.79	--	--	--
12...	1500	.10	21.0	9.1	101	7.6	163	.66	--	--	--
12...	1530	.10	21.0	9.3	103	7.7	165	.56	--	--	--
12...	1535	.00	21.0	9.3	103	7.7	165	--	--	--	--
12...	1536	.20	20.5	8.2	90	--	--	--	--	--	--
12...	1600	.10	21.1	9.6	107	7.8	165	.47	--	--	--
12...	1700	.10	20.8	9.7	107	7.9	164	.24	--	--	--
12...	1800	.10	20.5	9.8	108	7.7	167	.04	--	--	--
12...	1900	.10	19.8	9.2	100	7.6	173	.00	--	--	--
12...	2000	.10	18.8	8.6	91	7.6	173	.00	--	--	--
12...	2100	.10	18.2	8.0	84	7.5	176	.00	--	--	--
12...	2200	.10	18.0	7.6	80	7.5	175	.00	--	--	--
12...	2300	.10	17.4	7.1	73	7.4	172	.00	--	--	--
12...	2400	.10	16.5	6.7	68	7.4	170	.00	--	--	--
13...	0100	.10	16.1	6.3	63	7.4	171	.00	--	--	--
13...	0200	.10	15.8	5.9	59	7.4	170	.00	--	--	--
13...	0300	.10	15.5	5.6	56	7.3	170	.00	--	--	--
13...	0400	.10	14.9	5.2	51	7.3	170	.00	--	--	--
13...	0500	.10	14.5	5.1	50	7.3	170	.00	--	--	--
13...	0600	.10	14.2	4.8	46	7.3	168	.00	--	--	--
13...	0700	.10	13.9	4.5	43	7.3	168	.00	--	--	--
13...	0745	.00	13.8	5.4	52	7.3	164	--	--	--	--
13...	0746	.20	14.0	5.0	47	--	--	--	--	--	--
13...	0750	.00	13.8	5.4	52	7.3	164	.04	--	--	--
13...	0800	.10	13.5	4.5	43	7.3	165	.06	--	--	--
13...	0825	.00	13.7	5.3	51	7.4	165	--	--	--	--
13...	0826	.20	13.8	4.9	48	--	--	--	--	--	--
13...	0830	.10	13.7	5.3	51	7.4	165	.08	--	--	--
NOV											
24...	1200	.00	2.0	12.0	87	7.1	170	--	--	--	--
24...	1201	.20	2.2	11.4	83	--	--	--	--	--	--
24...	1202	.30	--	--	--	--	--	--	--	--	--

Table 2.--Instantaneous and diel water-quality data for Smith and Bybee Lakes--Continued

[Sampling depth with no water-quality data indicates maximum lake depth at site]

SMITH LAKE SITE 6 (EAST) NEAR PORTLAND OR

WATER QUALITY DATA, JUNE TO NOVEMBER 1982

DATE	TIME	SAMPLING DEPTH (M)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	SPECIFIC CONDUCTANCE (UMHOS)	TRANSPARENCY (SECCHI DISK) (M)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L)
JUN										
17...	1050	.50	21.0	10.0	112	8.7	170	--	--	--
17...	1051	2.5	18.0	.7	7	7.8	175	--	--	--
17...	1052	2.8	--	--	--	--	--	--	--	--
JUL										
20...	1625	.00	26.0	9.2	113	8.0	175	.44	--	--
20...	1626	.50	25.4	9.3	112	8.2	175	--	--	--
20...	1627	.90	23.3	8.4	99	--	--	--	--	--
20...	1628	1.0	23.3	8.8	101	--	--	--	--	--
20...	1629	1.0	--	--	--	--	--	--	--	--
20...	1640	.50	25.4	9.3	112	8.2	175	--	28.0	<.100
SEP										
02...	1110	.00	25.0	7.2	87	7.9	--	--	--	--
02...	1111	.10	--	--	--	--	--	>.10	--	--

SMITH LAKE SITE 5 (WEST) NEAR PORTLAND OR

DATE	TIME	SAMPLING DEPTH (M)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	SPECIFIC CONDUCTANCE (UMHOS)	TRANSPARENCY (SECCHI DISK) (M)
JUN								
17...	1250	.50	21.0	12.4	140	8.4	131	.77
17...	1251	2.5	17.0	8.4	87	8.3	134	--
17...	1252	3.0	--	--	--	--	--	--
22...	1545	.00	24.0	9.4	112	8.1	141	.97
22...	1546	.50	22.4	9.6	113	--	--	--
22...	1547	1.0	21.5	10.1	116	8.1	136	--
22...	1548	1.5	20.8	10.4	118	--	--	--
22...	1549	2.0	20.0	11.8	131	--	--	--
22...	1550	2.5	18.5	10.9	117	8.2	132	--
22...	1551	3.0	17.8	1.2	13	7.9	--	--
22...	1552	3.0	--	--	--	--	--	--
SEP								
16...	0750	.00	10.0	3.8	34	7.6	247	--
16...	0751	.03	--	--	--	--	--	--

SMITH LAKE SITE 7 (NORTH) NEAR PORTLAND OR

DATE	TIME	SAMPLING DEPTH (M)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	SPECIFIC CONDUCTANCE (UMHOS)	TRANSPARENCY (SECCHI DISK) (M)
JUN								
17...	1130	.50	20.8	11.8	132	8.9	159	.67
17...	1131	2.0	19.0	11.7	126	--	--	--
17...	1132	2.2	--	--	--	--	--	--
22...	1310	.00	23.0	9.1	107	7.8	171	.79
22...	1311	.50	21.4	9.4	108	--	--	--
22...	1312	1.0	21.0	11.1	126	--	--	--
22...	1313	1.5	20.5	11.2	126	8.4	152	--
22...	1314	2.0	20.0	11.5	128	--	--	--
22...	1315	2.5	18.8	9.2	100	--	--	--
22...	1316	2.9	18.0	3.8	40	7.8	142	--
22...	1317	3.0	17.8	3.0	31	--	--	--
22...	1318	3.0	--	--	--	--	--	--
JUL								
20...	1455	.00	24.0	9.6	114	8.1	124	.48
20...	1456	.50	22.9	9.3	109	--	--	--
20...	1457	.80	21.5	9.8	111	--	--	--
20...	1458	.80	--	--	--	--	--	--

Table 2.--Instantaneous and diel water-quality data for Smith and Bybee Lakes--Continued

[Sampling depth with no water-quality data indicates maximum lake depth at site]

COLUMBIA SLOUGH SITE 4 NEAR BYBEE LAKE NEAR PORTLAND OR

WATER QUALITY DATA, JUNE TO NOVEMBER 1982

DATE	TIME	SAMPLING DEPTH (M)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	SPECIFIC CONDUCTANCE (UMHOS)	TRANSPARENCY (SECCHI DISK) (M)
JUN								
22...	0945	.00	17.3	11.4	119	8.1	134	.87
22...	0946	.50	17.2	11.5	118	--	--	--
22...	0947	1.0	17.2	11.4	117	--	--	--
22...	0948	1.5	17.2	11.4	117	--	--	--
22...	0949	2.0	17.2	11.6	119	8.1	133	--
22...	0950	2.5	17.1	11.5	118	--	--	--
22...	0951	3.0	17.1	11.5	118	--	--	--
22...	0952	3.5	17.1	11.5	118	--	--	--
22...	0953	4.0	17.1	11.5	118	--	--	--
22...	0954	4.5	17.1	11.5	118	8.0	136	--
22...	0955	4.8	--	--	--	--	--	--
29...	1510	.00	22.0	4.6	53	7.2	159	--
29...	1511	1.0	21.5	4.4	50	--	--	--
29...	1512	2.0	21.0	4.2	47	7.2	155	--
29...	1513	3.0	20.9	4.0	45	7.1	155	--
29...	1514	3.7	21.0	4.2	47	--	--	--
29...	1515	3.8	--	--	--	--	--	--
JUL								
07...	0845	.00	19.2	6.7	72	7.2	200	.64
07...	0846	.50	19.2	6.7	72	--	--	--
07...	0847	1.0	19.2	6.6	70	--	--	--
07...	0848	1.5	19.2	6.6	70	7.2	200	--
07...	0849	2.0	19.2	6.6	70	--	--	--
07...	0850	2.5	19.2	6.6	70	--	--	--
07...	0851	3.0	19.2	6.5	70	7.3	201	--
07...	0852	3.1	19.2	6.4	69	--	--	--
07...	0853	3.4	--	--	--	--	--	--
15...	1220	.00	19.9	6.4	70	7.2	203	.52
15...	1221	.50	19.9	6.5	71	7.2	196	--
15...	1222	1.0	19.9	6.4	70	7.2	195	--
15...	1223	1.5	19.9	6.4	70	7.2	195	--
15...	1224	2.0	19.9	6.4	70	--	--	--
15...	1225	2.5	19.9	6.4	70	--	--	--
15...	1226	2.6	19.9	5.8	63	--	--	--
15...	1227	2.6	--	--	--	--	--	--
20...	1300	.00	21.4	9.1	103	7.6	150	.38
20...	1301	.50	21.3	9.2	104	--	--	--
20...	1302	1.0	21.2	8.9	100	7.6	149	--
20...	1303	1.3	21.1	8.8	99	--	--	--
21...	0740	.50	19.0	9.6	102	7.9	119	--
29...	1000	.00	19.6	7.8	84	7.4	163	.47
29...	1001	.50	19.5	7.7	83	--	--	--
29...	1002	1.0	19.5	7.7	83	7.5	164	--
29...	1003	1.5	19.6	7.7	83	7.4	165	--
29...	1004	2.0	19.6	7.7	83	--	--	--
29...	1005	2.1	19.6	7.4	80	--	--	--
29...	1006	2.1	--	--	--	--	--	--
AUG								
05...	1020	.00	20.0	9.2	100	7.9	135	.46
05...	1021	.50	19.8	9.3	101	--	--	--
05...	1022	1.0	19.9	9.2	100	8.0	133	--
05...	1023	1.5	19.8	9.2	100	7.9	132	--
05...	1024	1.7	19.6	8.9	96	--	--	--
05...	1025	1.7	--	--	--	--	--	--
20...	0835	.00	20.5	6.9	76	7.9	124	--
20...	0836	.50	20.5	6.8	75	8.0	124	--
20...	0837	1.0	20.5	6.8	75	--	--	--
20...	0838	2.0	20.5	6.9	76	--	--	--
20...	0839	2.3	--	--	--	--	--	--
27...	1320	.00	22.0	8.0	91	7.3	221	--
27...	1321	.10	22.0	8.0	91	--	--	--
27...	1322	.20	--	--	--	--	--	--

Table 2.--Instantaneous and diel water-quality data for Smith and Bybee Lakes--Continued

[Sampling depth with no water-quality data indicates maximum lake depth at site]

BYBEE LAKE SITE 8

WATER QUALITY DATA, JUNE TO NOVEMBER 1982

DATE	TIME	SAMPLING DEPTH (M)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	SPECIFIC CONDUCTANCE (UMHOS)	TRANSPARENCY (SECCHI DISK) (M)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L)
JUN										
29...	1450	.00	22.0	7.2	83	7.4	146	1.82	--	--
29...	1451	.50	22.0	7.0	80	--	--	--	--	--
29...	1452	1.0	21.5	7.0	80	--	--	--	--	--
29...	1453	1.5	21.3	6.4	73	7.4	148	--	--	--
29...	1454	2.0	20.5	3.8	42	--	--	--	--	--
29...	1455	2.5	20.5	4.4	49	--	--	--	--	--
29...	1456	2.7	20.2	4.4	49	--	--	--	--	--
29...	1457	2.8	--	--	--	--	--	--	--	--
JUL										
20...	1415	.00	24.8	9.1	110	7.8	191	.38	--	--
20...	1416	.50	23.6	9.4	111	7.9	190	--	--	--
20...	1417	1.0	22.5	9.3	108	--	--	--	--	--
20...	1418	1.0	--	--	--	--	--	--	--	--
20...	1430	.50	23.6	9.4	111	7.8	190	--	28.0	7.00
AUG										
20...	1000	.00	22.2	7.1	83	7.3	172	--	18.0	<.100
20...	1001	.20	22.2	7.1	81	--	172	--	--	--
20...	1002	.40	21.9	5.0	57	7.3	--	--	--	--
20...	1003	.56	--	--	--	--	--	--	--	--
SEP										
16...	1005	.00	15.2	7.2	72	7.7	254	--	33.0	9.70
16...	1006	.04	15.0	7.2	71	--	--	--	--	--
16...	1007	.05	15.0	2.0	20	--	--	--	--	--
16...	1008	.08	--	--	--	--	--	--	--	--
24...	1340	.00	22.5	8.7	101	8.5	205	--	--	--
24...	1341	.10	22.5	7.8	90	--	--	--	--	--
24...	1342	.12	22.5	5.8	67	--	--	--	--	--
24...	1343	.12	--	--	--	--	--	--	--	--
29...	1230	.00	13.8	11.7	107	8.5	207	--	--	--
29...	1231	.10	13.8	11.7	107	--	--	--	--	--
29...	1232	.25	13.8	11.3	102	--	--	--	--	--
29...	1233	.29	--	--	--	--	--	--	--	--
NOV										
24...	1330	.00	4.0	12.4	94	7.3	178	--	--	--

Table 2.--Instantaneous and diel water-quality data for Smith and Bybee Lakes--Continued

[Sampling depth with no water-quality data indicates maximum lake depth at site]

BYBEE LAKE SITE 3 (CENTER) NEAR PORTLAND OR

WATER QUALITY DATA, JUNE TO NOVEMBER 1982

DATE	TIME	SAMPLING DEPTH (M)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	SPECIFIC CONDUCTANCE (UMHOS)	TRANSPARENCY (SECCHI DISK) (M)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L)
JUN										
17...	1205	.50	17.8	12.3	130	8.8	125	.67	--	--
17...	1206	2.0	16.5	8.8	90	8.6	126	--	--	--
17...	1207	2.5	--	--	--	--	--	--	--	--
22...	1130	.00	21.0	12.0	134	8.4	147	1.07	--	--
22...	1131	.50	20.3	12.6	137	--	--	--	--	--
22...	1132	1.0	19.8	12.3	135	--	--	--	--	--
22...	1133	1.5	19.2	12.9	136	8.6	147	--	--	--
22...	1134	2.0	18.6	12.8	136	--	--	--	--	--
22...	1135	2.5	17.8	11.6	122	--	--	--	--	--
22...	1136	3.0	17.0	6.3	65	--	--	--	--	--
22...	1137	3.1	16.5	2.6	26	7.7	142	--	--	--
22...	1138	3.2	--	--	--	--	--	--	--	--
29...	1345	.00	22.2	7.8	90	7.5	148	1.52	--	--
29...	1346	.50	22.0	7.9	91	--	--	--	--	--
29...	1347	1.0	21.5	8.0	91	7.6	154	--	--	--
29...	1348	1.5	21.2	7.4	83	--	--	--	--	--
29...	1349	2.0	20.8	6.2	70	7.4	151	--	--	--
29...	1350	2.5	20.4	6.2	69	--	--	--	--	--
29...	1351	2.6	19.8	3.6	40	--	--	--	--	--
29...	1352	2.7	--	--	--	--	--	--	--	--
JUL										
07...	0920	.00	19.2	7.0	75	7.4	157	1.07	--	--
07...	0921	.50	19.2	7.0	75	--	--	--	--	--
07...	0922	1.0	19.2	6.8	73	7.3	157	--	--	--
07...	0923	1.5	19.0	5.3	57	--	--	--	--	--
07...	0924	2.0	18.9	3.4	37	7.2	158	--	--	--
07...	0925	2.2	18.7	1.5	16	--	--	--	--	--
07...	0926	2.2	--	--	--	--	--	--	--	--
15...	1140	.00	19.8	7.3	80	7.3	188	.61	--	--
15...	1141	.50	19.8	7.2	79	7.3	185	--	--	--
15...	1142	1.0	19.7	7.0	76	7.3	184	--	--	--
15...	1143	1.1	19.7	6.4	69	--	--	--	--	--
15...	1144	1.2	--	--	--	--	--	--	--	--
20...	1345	.00	22.3	10.0	116	7.8	134	.52	--	--
20...	1346	.50	22.1	10.2	117	7.9	136	--	--	--
20...	1347	.90	21.9	10.4	119	--	--	--	--	--
20...	1348	1.0	--	--	--	--	--	--	--	--
20...	1400	.00	22.3	10.0	116	7.8	134	--	19.0	<.100
20...	1405	.50	22.1	10.2	117	7.8	136	--	17.0	<.100
21...	0900	.50	20.0	9.2	100	7.4	165	--	--	--
21...	0920	.00	20.5	9.0	99	7.4	165	--	--	--
21...	0921	.50	20.0	9.2	100	7.4	165	--	--	--
21...	0922	.90	19.8	8.6	11	--	--	--	--	--
21...	0923	1.0	--	--	--	--	--	--	--	--
29...	1045	.00	19.8	8.3	90	7.5	153	.41	--	--
29...	1046	.20	19.8	8.3	90	7.4	152	--	--	--
29...	1047	.40	20.0	8.3	90	7.5	166	--	--	--
29...	1048	.50	19.8	7.3	80	--	--	--	--	--
29...	1049	.55	--	--	--	--	--	--	--	--
AUG										
05...	1100	.00	21.9	10.1	114	8.1	132	--	--	--
05...	1101	.25	21.9	9.2	104	--	--	--	--	--
05...	1102	.35	21.9	10.0	113	8.1	132	--	--	--
05...	1103	.38	--	--	--	--	--	>.38	--	--
13...	1430	.00	19.8	9.0	99	--	--	--	--	--
13...	1431	.10	19.8	9.2	101	--	--	--	--	--
13...	1432	.20	19.8	9.2	108	7.5	181	--	--	--
13...	1433	.30	19.8	9.3	102	--	--	--	--	--
13...	1434	.32	19.8	1.0	110	--	--	>.32	--	--
20...	0925	.00	21.0	8.3	93	7.5	128	.42	8.60	<.100
20...	0926	.20	21.0	8.3	93	--	128	--	--	--
20...	0927	.40	21.0	7.8	87	7.5	--	--	--	--
20...	0928	.58	--	--	--	--	--	--	--	--
27...	1410	.00	23.5	11.0	129	8.8	264	--	--	--
27...	1411	.05	--	--	--	--	--	>.05	--	--
SEP										
02...	1230	.00	30.0	12.3	162	--	198	--	--	--
02...	1231	.05	29.5	12.5	163	8.8	--	--	--	--
02...	1232	.08	--	--	--	--	--	>.08	--	--
16...	1115	.00	19.5	11.0	119	8.8	189	.42	--	--
16...	1116	.20	19.0	10.9	117	--	--	--	--	--
16...	1117	.40	18.3	9.9	105	--	--	--	--	--
16...	1118	.50	18.2	9.9	105	--	--	--	--	--
16...	1119	.55	--	--	--	--	--	--	--	--
16...	1200	.00	19.5	11.0	119	8.8	189	--	31.0	16.0
24...	1230	.00	21.5	9.7	112	8.2	185	.40	--	--
24...	1231	.10	21.8	10.0	116	--	--	--	--	--
24...	1232	.20	21.8	9.8	114	--	--	--	--	--
24...	1233	.30	21.8	8.6	100	--	--	--	--	--
24...	1234	.40	21.7	7.8	90	--	--	--	--	--
24...	1235	.50	21.1	7.2	86	--	--	--	--	--

Table 2.--Instantaneous and diel water-quality data for Smith and Bybee Lakes--Continued

BYBEE LAKE SITE 3

WATER QUALITY DATA, JUNE TO NOVEMBER 1982

DATE	TIME	SAMPLING DEPTH (M)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	SPECIFIC CONDUCTANCE (UMHOS)	TRANSPARENCY (SECCHI DISK) (M)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L)
SEP										
24...	1236	.60	20.7	6.9	77	--	--	--	--	--
24...	1237	.70	--	--	--	--	--	--	--	--
29...	1330	.00	13.8	12.0	115	8.2	194	--	--	--
29...	1331	.10	12.8	12.1	113	--	--	--	--	--
29...	1332	.20	12.2	10.7	99	--	--	--	--	--
29...	1333	.30	12.2	10.8	100	--	--	--	--	--
29...	1334	.40	12.1	10.2	94	--	--	--	--	--
29...	1335	.50	12.1	6.0	55	--	--	--	--	--
29...	1336	.55	--	--	--	--	--	--	--	--
OCT										
12...	1140	.00	17.0	11.4	117	7.6	211	.20	--	--
12...	1141	.20	--	--	--	--	--	--	--	--
12...	1200	.00	17.0	11.4	117	7.6	211	--	40.0	12.0
NOV										
24...	1420	.00	3.1	15.4	115	7.3	211	--	--	--
24...	1421	.20	3.1	15.5	115	--	--	--	--	--
24...	1422	.40	--	--	--	--	--	--	--	--

BYBEE LAKE SITE 9 (WEST) NEAR PORTLAND OR

DATE	TIME	SAMPLING DEPTH (M)	TEMPERATURE (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	PH (UNITS)	SPECIFIC CONDUCTANCE (UMHOS)	TRANSPARENCY (SECCHI DISK) (M)
JUL								
29...	1200	.00	20.5	7.4	81	7.4	221	.29
29...	1201	.20	20.5	7.2	79	--	--	--
29...	1202	.30	20.5	7.4	81	--	--	--
29...	1203	.35	--	--	--	--	--	--

Table 3.--Water-quality chemical data for Smith and Bybee Lakes

DATE OF SAMPLE	TIME	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	PHOSPHORUS, DISSOLVED (MG/L AS P)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	ALKALINITY FIELD (MG/L AS CACO3)	TURBIDITY (FTU)
				Smith Lake Site 2						
82-07-21	0600	1.1	.108	.99	.050	.022	4.6	100	69	--
82-08-19	1130	.80	.110	.69	.050	.035	6.4	111	87	--
82-09-16	1415	1.4	<.010	1.4	.130	.082	8.1	108	45	--
82-10-12	1000	1.9	.070	1.8	.060	.056	7.0	110	77	83
				Bybee Lake Site 3						
82-07-21	0900	1.0	.090	.91	.030	.018	3.4	109	65	--
82-08-20	0925	.70	.140	.56	.070	.013	2.3	81	54	--
82-09-16	1200	1.5	.012	1.5	.100	.032	8.2	166	64	--
82-10-12	1200	.90	.100	.80	.070	.043	7.4	140	97	45

Table 4.--Summary of minimum and maximum values for water-quality data collected at sites 2 and 3

	Smith Lake site		Bybee Lake site	
	min	max	min	max
temperature (°C)	2.0	27.5	3.1	30.0
conductivity (umhos/cm)	141	198	125	264
dissolved oxygen (mg/L)	0.2	15.0	1.0	15.5
percent dissolved oxygen (%)	2	173	11	163
pH (pH units)	7.1	8.9	7.2	8.8
maximum lake depth at site (M)	0.1	3.2	0.05	4.5
secchi disk (M)	0.17	1.6	0.2	1.5
alkalinity (mg/L)	45	87	54	97
N as N organic (mg/L)	0.69	1.8	0.56	1.5
NH_3 as N (mg/L)	<.010	0.110	0.012	0.140
N, NH_3 + organic as N (mg/L)	0.80	1.9	0.70	1.5
P as P (mg/L)	0.050	0.130	0.030	0.100
ortho-P as P (mg/L)	0.022	0.082	0.013	0.043
organic carbon (mg/L)	4.6	8.1	2.3	8.2
solids, residue, 180°C (mg/L)	100	111	81	166
chlorophyll a (µg/L)	2.5	29	8.6	40
chlorophyll b (µg/L)	0.1	12	0.1	16
total phytoplankton (cells/ml)	431	10800	256	15400
total zooplankton (No./L)	66	3470	17	2880
total benthic invertebrates ($No./m^2$)	113	299	78	803
phytoplankton species diversity	2.98	4.80	2.99	4.73
zooplankton species diversity	1.19	1.81	1.00	1.87
benthic invertebrate species diversity	0.2	1.47	0.80	1.55

Table 5.--Staff gage measurements for Columbia Slough, Smith and Bybee Lakes, 1982

[Measurements are in meters above sea level, based on datum from Vancouver bridge gaging station. Locations of gages are plotted in figure 1. Time of measurement is shown in parenthesis.]

	Columbia Slough meters (hour)	Bybee Lake meters (hour)	Smith Lake meters (hour)
June 17		3.60(1205)	3.60(1250)
June 29	4.48(1525)		
July 7	3.89(0845)		
July 15	2.93(1215)	3.17(0920)	2.35(1100)
July 20	2.59(1300)	2.19(1210)	1.95(1525)
July 21	2.73(0730)		
July 21	2.68(1025)		
July 29	2.13(1425)	2.16(1100)	
Aug 5	2.04(1030)	1.95(1130)	1.95(1400)
Aug 5	2.01(1215)		
Aug 13	1/	1/	2.07(1020)
Aug 19	2.32(0910)		1.93(1000)
Aug 20	2.24(1025)	2.16(0925) 2/	2.01(1245)
Aug 27	1/	<1.82(1410) 2/	1.93(1200)
Sept 2	1/	<1.82(1230) 2/	1.86(0945)
Sept 15	1/	1.83(1200)	1.84(1400)
Sept 24	1/	1.89(1230)	1.93(1000)
Sept 29	1/	1.89(1330)	1.93(0940)
Oct 12	1/	1/	1.95(1030)

1/ Gage was inaccessable.
2/ Base of staff gage (1.82 meters) was above water level.

Table 6.--Phytoplankton identification, abundance, and diversity-index data for Smith and Bybee Lakes

[Phytoplankton identification by James Sweet, USGS, Portland, Oregon]

PHYTOPLANKTON DATA

SMITH LAKE, SITE 1

DATE	82/08/19	
SPECIES		
DIVERSITY	4.98	
DIVISION		
-CLASS		
--ORDER		
---FAMILY		
----GENUS SPECIES		
TOTAL COUNT	3075.	
CELLS/ML		
	COUNT	PCT
CHLOROPHYTA GREEN ALGAE		
-CHLOROPHYCEAE		
--VOLVOCALES		
---CHLAMYDOMONADACEAE		
----CHLAMYDOMONAS-LIKE	3	1.0
--CHLOROCOCCALES		
---CHLOROCOCCACEAE		
----TETRAEDRON REGULARE	30	1.0
---PALMELLACEAE		
----SPHAEROCYSTIS SCHROETERI	90	2.9
---OOCYSTACEAE		
----CLOSTERIOPSIS LONGISSIMA	30	1.0
----SELENASTRUM MINUTUM	30	1.0
---SCENEDESMACEAE		
----CRUCIGENIA QUADRATA	30	1.0
----CRUCIGENIA TETRAPEDIA	30	1.0
----SCENEDESMUS DENTICULATUS	30	1.0
----SCENEDESMUS QUADRICAUDA	151	4.9
---COCCOMYXACEAE		
----ELAKATOTHRIX GELATINOSA	30	1.0
EUGLENOPHYTA EUGLENOIDS		
-EUGLENOPHYCEAE		
--EUGLENALES		
---EUGLENACEAE		
----EUGLENA SPP.	30	1.0
----TRACHELOMONAS VOLVOCINA	30	1.0
CHRYSOPHYTA YELLOW-BROWN ALGAE		
-CHRYSOPHYCEAE		
--CHROMULINALES		
---CHROMULINACEAE		
----KEPHYRION SPP.	30	1.0
----KEPHYRION LITTORALE	30	1.0
----KEPHYRION SPIRALE	30	1.0
---CHRYSOCOCCACEAE		
----CHRYSOCOCCUS RUFESCENS	60	2.0
-BACILLARIOPHYCEAE DIATOMS		
--CENTRALES CENTRIC DIATOMS		
---COSCINODISCACEAE		
----CYCLOTELLA GLOMERATA	60	2.0
----CYCLOTELLA KUTZINGIANA	30	1.0
----CYCLOTELLA MENEGHINIANA	30	1.0
----MELOSIRA AMBIGUA	362	11.8
----MELOSIRA DISTANS	392	12.7
----MELOSIRA GRANULATA	60	2.0
----MELOSIRA ITALICA	30	1.0
----STEPHANODISCUS ASTREA MINUTULA	181	5.9
----STEPHANODISCUS HANTZSCHII	151	4.9
----STEPHANODISCUS SUBSALSUS	30	1.0
--PENNALES PENNATE DIATOMS	30	1.0
---FRAGILARIACEAE		
----AMPHICAMPA MIRABILIS	30	1.0
----FRAGILARIA CONSTRUENS	151	4.9
----FRAGILARIA PINNATA	60	2.0
----SYNEDRA RADIANS	30	1.0
----SYNEDRA RUMPENS	30	1.0
---ACHNANTHACEAE		
----ACHNANTHES MINUTISSIMA	60	2.0
---NAVICULACEAE		
----CALONEIS VENTRICOSA	30	1.0
----DIPLONEIS SMITHII	30	1.0
----NAVICULA SPP.	30	1.0
----NAVICULA BACILLUM	30	1.0
----NAVICULA MINUSCULA	30	1.0
----NAVICULA MINIMA	60	2.0
----NAVICULA PUPULA	30	1.0

Table 6.--Phytoplankton identification, abundance, and diversity-index data for Smith and Bybee Lakes--Continued

PHYTOPLANKTON DATA

SMITH LAKE, SITE 1

DATE	82/08/19	
SPECIES		
DIVERSITY	4.98	
DIVISION		
-CLASS		
--ORDER		
---FAMILY		
----GENUS SPECIES		
TOTAL COUNT	3075.	
CELLS/ML		
	COUNT	PCT
CHRYSOPHYTA YELLOW-BROWN ALGAE		
-BACILLARIOPHYCEAE DIATOMS		
--PENNALES PENNATE DIATOMS		
---NAVICULACEAE		
----PINNULARIA SPP.	30	1.0
---CYMBELLACEAE		
----CYMBELLA MINUTA	30	1.0
---NITZSCHIACEAE		
----NITZSCHIA SPP.	60	2.0
----NITZSCHIA AMPHIBIA	90	2.9
----NITZSCHIA FRUSTULUM	90	2.9
----NITZSCHIA PALEACEA	30	1.0

Table 6.--Phytoplankton identification, abundance, and diversity-index data for Smith and Bybee Lakes--Continued

PHYTOPLANKTON DATA

SMITH LAKE SITE 2

DATE	82/06/17		82/06/22		82/06/29		82/07/07		82/07/20		82/07/29	
SPECIES												
DIVERSITY	3.72		4.47		4.64		3.85		3.88		4.24	
DIVISION												
-CLASS												
--ORDER												
---FAMILY												
----GENUS SPECIES												
TOTAL COUNT	4179.		1428.		431.		894.		1088.		2274.	
CELLS/ML												
	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT
CHLOROPHYTA GREEN ALGAE												
-CHLOROPHYCEAE												
--VOLVOCALES												
---CHLAMYDOMONADACEAE												
----CHLAMYDOMONAS-LIKE	71	1.7	--	---	--	---	--	---	--	---	--	---
---VOLVOCACEAE												
----PANDORINA MORUM	--	---	--	---	--	---	--	---	11	1.0	--	---
--CHLOROCOCCALES												
---CHLOROCOCCACEAE												
----TETRAEDRON REGULARE	35	0.8	11	0.8	4	0.9	--	---	--	---	--	---
---PALMELLACEAE												
----SPHAEROCYSTIS SCHROETERI	35	0.8	33	2.3	31	7.3	218	24.8	229	21.0	365	16.6
---OOCYSTACEAE												
----ANKISTRODESMUS FALCATUS	--	---	22	1.6	4	0.9	--	---	22	2.0	--	---
----CLOSTERIOPSIS LONGISSIMA	35	0.8	--	---	4	0.9	--	---	--	---	--	---
----KIRCHNERIELLA SPP.	--	---	33	2.3	--	---	--	---	11	1.0	--	---
----OOCYSTIS PUSILLA	--	---	11	0.8	35	8.2	120	13.4	152	14.0	129	5.7
----SELENASTRUM MINUTUM	--	---	--	---	8	1.8	--	---	--	---	21	0.9
---SCENEDESMACEAE												
----COELASTRUM MICROPORUM	--	---	--	---	--	---	8	0.8	--	---	--	---
----CRUCIGENIA CRUCIFERA	--	---	45	3.1	12	2.7	8	0.8	--	---	--	---
----CRUCIGENIA QUADRATA	--	---	11	0.8	23	5.5	30	3.4	33	3.0	64	2.8
----CRUCIGENIA TETRAPEDIA	--	---	--	---	8	1.8	8	0.8	--	---	--	---
----SCENEDESMUS ACUMINATUS	--	---	--	---	4	0.9	--	---	--	---	--	---
----SCENEDESMUS BIJUGA	--	---	--	---	4	0.9	--	---	--	---	--	---
----SCENEDESMUS BIJUGA ALTERNANS	--	---	--	---	8	1.8	23	2.5	--	---	--	---
----SCENEDESMUS QUADRICAUDA	106	2.5	--	---	31	7.3	--	---	33	3.0	--	---
----TETRASTRUM STAUROGENIAFORME	--	---	--	---	8	1.8	--	---	--	---	--	---
---HYDRODICTYACEAE												
----PEDIASTRUM BORYANUM	--	---	--	---	16	3.6	--	---	--	---	--	---
----PEDIASTRUM DUPLEX	35	0.8	33	2.3	--	---	--	---	--	---	--	---
MISCELLANEOUS GREEN ALGAE	--	---	11	0.8	4	0.9	--	---	11	1.0	--	---
EUGLENOPHYTA EUGLENOIDS												
-EUGLENOPHYCEAE												
--EUGLENALES												
---EUGLENACEAE												
----TRACHELOMONAS SPP.	--	---	--	---	8	1.8	23	2.5	--	---	42	1.8
----TRACHELOMONAS ROBUSTA	--	---	--	---	8	1.8	--	---	--	---	--	---
----TRACHELOMONAS VOLVOCINA	71	1.7	11	0.8	31	7.3	53	5.9	--	---	64	2.8
CHRYSOPHYTA YELLOW-BROWN ALGAE												
-CHRYSOPHYCEAE												
--CHROMULINALES												
---CHROMULINACEAE												
----KEPHYRION SPP.	--	---	--	---	8	1.8	--	---	22	2.0	--	---
----KEPHYRION LITTORALE	35	0.8	45	3.1	--	---	--	---	--	---	--	---
----KEPHYRION SPIRALE	71	1.7	33	2.3	--	---	--	---	11	1.0	--	---
---CHRYSOCOCCACEAE												
----CHRYSOCOCCUS RUFESCENS	--	---	--	---	4	0.9	38	4.2	87	8.0	150	6.6
-BACILLARIOPHYCEAE DIATOMS												
--CENTRALES CENTRIC DIATIOMS												
---COSCINODISCACEAE												
----CYCLOTELLA GLOMERATA	390	9.3	134	9.4	--	---	45	5.0	33	3.0	21	0.9
----CYCLOTELLA MENEGHINIANA	--	---	--	---	--	---	23	2.5	11	1.0	--	---
----MELOSIRA AMBIGUA	602	14.4	100	7.0	20	4.5	90	10.1	131	12.0	150	6.6
----MELOSIRA DISTANS	319	7.6	112	7.8	55	13.1	23	2.5	44	4.0	300	13.2
----MELOSIRA GRANULATA	850	21.0	190	13.2	4	0.9	30	3.4	44	4.0	129	5.7
----MELOSIRA ITALICA	--	---	45	3.1	4	0.9	8	0.8	--	---	43	1.9
----STEPHANODISCUS ASTREA MINUTULA	602	14.4	67	4.7	12	2.7	30	3.4	33	3.0	43	1.9
----STEPHANODISCUS HANTZSCHII	106	2.5	22	1.6	16	3.6	--	---	11	1.0	86	3.8
---RHIZOSOLENIACEAE												
----RHIZOSOLENIA ERIENSIS	--	---	11	0.8	--	---	--	---	--	---	--	---
--PENNALES PENNATE DIATOMS												
---FRAGILARIACEAE												
----ASTERIONELLA FORMOSA	212	5.1	78	5.5	4	0.9	8	0.8	--	---	--	---
----DIATOMA TENUE	35	0.8	45	3.1	--	---	--	---	--	---	--	---

Table 6.--Phytoplankton identification, abundance, and diversity-index data for Smith and Bybee Lakes--Continued

PHYTOPLANKTON DATA

SMITH LAKE SITE 2

DATE	82/06/17		82/06/22		82/06/29		82/07/07		82/07/20		82/07/29	
SPECIES DIVERSITY	3.72		4.47		4.64		3.85		3.88		4.24	
DIVISION -CLASS --ORDER ---FAMILY ----GENUS SPECIES												
TOTAL COUNT CELLS/ML	4179.		1428.		431.		894.		1088.		2274.	
	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT
CHRYSOPHYTA YELLOW-BROWN ALGAE												
-BACILLARIOPHYCEAE DIATOMS												
--PENNALES PENNATE DIATOMS												
---FRAGILARIACEAE												
----FRAGILARIA BREVISTRIATA	35	0.8	--	---	--	---	--	---	--	---	21	0.9
----FRAGILARIA CAPUCINA	--	---	--	---	--	---	--	---	--	---	21	0.9
----FRAGILARIA CONSTRUENS	35	0.8	--	---	4	0.9	45	5.0	76	7.0	193	8.5
----FRAGILARIA LEPTOSTAURON	--	---	--	---	--	---	--	---	--	---	21	0.9
----SYNEDRA DELICATISSIMA	35	0.8	78	5.5	--	---	--	---	--	---	--	---
----SYNEDRA RADIANS	35	0.8	33	2.3	--	---	--	---	--	---	--	---
----TABELLARIA FENESTRATA	--	---	11	0.8	--	---	--	---	--	---	--	---
---ACHNANTHACEAE												
----ACHNANTHES EXIGUA	--	---	--	---	--	---	--	---	--	---	21	0.9
----ACHNANTHES MINUTISSIMA	--	---	--	---	--	---	8	0.8	11	1.0	43	1.9
---NAVICULACEAE												
----GYROSIGMA SPP.	--	---	--	---	--	---	--	---	--	---	21	0.9
----NAVICULA SPP.	--	---	--	---	--	---	--	---	11	1.0	--	---
----NAVICULA CRYPTOCEPHALA	--	---	--	---	--	---	--	---	--	---	21	0.9
----NAVICULA MINIMA	--	---	--	---	--	---	--	---	11	1.0	--	---
----NAVICULA PUPULA	35	0.8	--	---	--	---	--	---	--	---	--	---
----NAVICULA RHYNCHOCEPHALA	--	---	--	---	4	0.9	--	---	--	---	--	---
----NAVICULA SUBHAMULATA	--	---	--	---	--	---	--	---	11	1.0	--	---
---GOMPHONEMACEAE												
----GOMPHONEMA SUBCLAVATUM	--	---	--	---	--	---	--	---	--	---	43	1.9
---CYMBELLACEAE												
----AMPHORA OVALIS	--	---	--	---	--	---	--	---	--	---	64	2.8
----AMPHORA PERPUSILLA	--	---	--	---	4	0.9	--	---	--	---	--	---
----CYMBELLA AFFINIS	--	---	--	---	--	---	--	---	--	---	21	0.9
----CYMBELLA MINUTA	--	---	--	---	4	0.9	--	---	--	---	--	---
----CYMBELLA TRIANGULUM	--	---	--	---	--	---	--	---	--	---	21	0.9
---NITZSCHIACEAE												
----HANTZSCHIA AMPHIOXYS	--	---	--	---	--	---	--	---	--	---	21	0.9
----NITZSCHIA SPP.	--	---	22	1.6	--	---	--	---	--	---	21	0.9
----NITZSCHIA ACICULARIS	--	---	22	1.6	--	---	--	---	--	---	--	---
----NITZSCHIA AMPHIBIA	--	---	--	---	4	0.9	--	---	--	---	--	---
----NITZSCHIA ANGUSTATA	--	---	--	---	--	---	8	0.8	--	---	--	---
----NITZSCHIA FRUSTULUM	--	---	--	---	--	---	8	0.8	--	---	--	---
----NITZSCHIA PALEA	--	---	--	---	--	---	--	---	33	3.0	--	---
CYANOPHYTA BLUE-GREEN ALGAE												
-MYXOPHYCEAE												
--CHROOCOCCALES												
---CHROOCOCCACEAE												
----CHROOCOCCUS SPP.	71	1.7	67	4.7	12	2.7	8	0.8	--	---	--	---
--OSCILLATORIALES												
---OSCILLATORIACEAE												
----OSCILLATORIA SPP.	283	6.8	67	4.7	20	4.5	--	---	--	---	--	---
--NOSTOCACALES												
---NOSTOCACEAE												
----ANABAENA SPP.	--	---	11	0.8	--	---	--	---	11	1.0	107	4.7
----APHANIZOMENON FLOS-AQUAE	35	0.8	11	0.8	--	---	38	4.2	--	---	--	---

Table 6.--Phytoplankton identification, abundance, and diversity-index data for Smith and Bybee Lakes--Continued

PHYTOPLANKTON DATA

SMITH LAKE SITE 2

DATE	82/08/05		82/08/13		82/08/19		82/09/02		82/09/15		82/09/24	
SPECIES DIVERSITY	3.90		4.69		4.62		4.59		4.80		3.17	
DIVISION -CLASS --ORDER ---FAMILY ----GENUS SPECIES												
TOTAL COUNT CELLS/ML	3958.		4730.		5626.		6282.		4848.		10767.	
	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT
CHLOROPHYTA GREEN ALGAE												
-CHLOROPHYCEAE												
--VOLVOCALES												
---CHLAMYDOMONADACEAE												
----CHLAMYDOMONAS-LIKE	--	---	--	---	49	0.9	--	---	43	0.9	--	---
--CHLOROCOCCALES												
---PALMELLACEAE												
----SPHAEROCYSTIS SCHROETERI	--	---	45	0.9	--	---	59	0.9	215	4.4	--	---
---OOCYSTACEAE												
----ANKISTRODESMUS FALCATUS	--	---	223	4.7	--	---	--	---	--	---	--	---
----CHODATELLA WRATLAWIENSIS	--	---	--	---	--	---	--	---	43	0.9	--	---
----KIRCHNERIELLA SPP.	--	---	--	---	97	1.7	--	---	--	---	--	---
----OOCYSTIS PUSILLA	108	2.7	--	---	97	1.7	--	---	--	---	--	---
----SELENASTRUM MINUTUM	--	---	45	0.9	--	---	--	---	43	0.9	--	---
---SCENEDESMACEAE												
----CRUCIGENIA CRUCIFERA	--	---	45	0.9	--	---	--	---	--	---	--	---
----CRUCIGENIA QUADRATA	36	0.9	134	2.8	97	1.7	--	---	43	0.9	--	---
----CRUCIGENIA TETRAPEDIA	--	---	45	0.9	--	---	--	---	43	0.9	--	---
----SCENEDESMUS BIJUGA ALTERNANS	--	---	45	0.9	--	---	--	---	43	0.9	--	---
----SCENEDESMUS QUADRICAUDA	36	0.9	312	6.6	49	0.9	--	---	86	1.8	291	2.7
---COCCOMYXACEAE												
----ELAKATOTHRIX GELATINOSA	--	---	--	---	97	1.7	--	---	--	---	--	---
MISCELLANEOUS GREEN ALGAE	36	0.9	--	---	--	---	--	---	--	---	--	---
EUGLENOPHYTA EUGLENOIDS												
-EUGLENOPHYCEAE												
--EUGLENALES												
---EUGLENACEAE												
----TRACHELOMONAS SPP.	36	0.9	--	---	97	1.7	59	0.9	129	2.7	97	0.9
----TRACHELOMONAS LACUSTRIS	--	---	--	---	49	0.9	--	---	--	---	--	---
----TRACHELOMONAS ROBUSTA	--	---	89	1.9	--	---	--	---	--	---	--	---
----TRACHELOMONAS VOLVOCINA	--	---	45	0.9	49	0.9	117	1.9	86	1.8	--	---
CHRYSOPHYTA YELLOW-BROWN ALGAE												
-CHRYSOPHYCEAE												
--CHROMULINALES												
---CHROMULINACEAE												
----KEPHYRION SPP.	--	---	89	1.9	49	0.9	117	1.9	86	1.8	--	---
----KEPHYRION LITTORALE	--	---	--	---	--	---	--	---	43	0.9	--	---
---CHRYSOCOCCACEAE												
----CHRYSOCOCCUS RUFESCENS	36	0.9	--	---	146	2.6	294	4.7	386	8.0	97	0.9
-BACILLARIOPHYCEAE DIATOMS												
--CENTRALES CENTRIC DIATOMS												
---COSCINODISCACEAE												
----CYCLOTELLA GLOMERATA	216	5.5	178	3.8	291	5.2	411	6.5	257	5.3	4559	44.2
----CYCLOTELLA MENEGHINIANA	36	0.9	--	---	146	2.6	59	0.9	--	---	--	---
----CYCLOTELLA OCELLATA	--	---	45	0.9	--	---	--	---	--	---	--	---
----CYCLOTELLA PSEUDOSTELLIGERA	--	---	--	---	--	---	117	1.9	--	---	--	---
----CYCLOTELLA STELLIGERA	--	---	45	0.9	--	---	--	---	43	0.9	--	---
----MELOSIRA AMBIGUA	360	9.1	491	10.8	485	8.6	646	10.3	429	8.8	679	6.3
----MELOSIRA DISTANS	216	5.5	491	10.8	534	9.5	411	6.5	172	3.5	97	0.9
----MELOSIRA GRANULATA	144	3.6	89	1.9	388	6.9	411	6.5	172	3.5	291	2.7
----MELOSIRA ITALICA	--	---	89	1.9	49	0.9	--	---	43	0.9	--	---
----MELOSIRA VARIANS	--	---	--	---	--	---	59	0.9	--	---	--	---
----STEPHANODISCUS ASTREA MINUTULA	1331	31.8	312	6.6	243	4.3	705	11.6	215	4.4	582	5.4
----STEPHANODISCUS HANTZSCHII	216	5.5	357	7.5	437	7.8	411	6.5	472	9.3	--	---
--PENNALES PENNATE DIATOMS												
---FRAGILARIACEAE												
----ASTERIONELLA FORMOSA	--	---	134	2.8	--	---	117	1.9	--	---	--	---
----DIATOMA TENUE	--	---	--	---	49	0.9	--	---	--	---	--	---
----FRAGILARIA BREVISTRIATA	36	0.9	45	0.9	--	---	--	---	--	---	194	1.8
----FRAGILARIA CAPUCINA	--	---	--	---	--	---	--	---	43	0.9	--	---
----FRAGILARIA CONSTRUENS	216	5.5	402	8.6	582	10.3	352	5.6	300	6.2	485	4.5
----FRAGILARIA LEPTOSTAURON	--	---	--	---	--	---	--	---	43	0.9	--	---
----FRAGILARIA PINNATA	36	0.9	45	0.9	--	---	59	0.9	43	0.9	--	---
----SYNEDRA DELICATISSIMA	--	---	--	---	49	0.9	--	---	--	---	--	---
----SYNEDRA RADIANS	36	0.9	89	1.9	--	---	--	---	43	0.9	--	---

Table 6.--Phytoplankton identification, abundance, and diversity-index data for Smith and Bybee Lakes--Continued

PHYTOPLANKTON DATA

SMITH LAKE SITE 2

DATE	82/08/05		82/08/13		82/08/19		82/09/02		82/09/15		82/09/24	
SPECIES												
DIVERSITY	3.90		4.59		4.62		4.59		4.80		3.17	
DIVISION												
-CLASS												
--ORDER												
---FAMILY												
----GENUS SPECIES												
TOTAL COUNT	3958.		4730.		3626.		6282.		4848.		10767.	
CELLS/ML												
	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT
CHRYSOPHYTA YELLOW-BROWN ALGAE												
-BACILLARIOPHYCEAE DIATOMS												
--PENNALES PENNATE DIATOMS												
---FRAGILARIACEAE												
----SYNEDRA RUMPENS	72	1.8	--	---	--	---	--	---	43	0.9	--	---
---EUNOTIACEAE												
----EUNOTIA SPP.	--	---	--	---	--	---	--	---	43	0.9	--	---
---ACHNANTHACEAE												
----ACHNANTHES LANCEOLATA	--	---	45	0.9	--	---	--	---	43	0.9	--	---
----ACHNANTHES LINEARIS	72	1.8	--	---	--	---	--	---	--	---	97	0.9
----ACHNANTHES MINUTISSIMA	36	0.9	89	1.9	97	1.7	--	---	--	---	--	---
---NAVICULACEAE												
----CALONEIS VENTRICOSA	--	---	--	---	--	---	59	0.9	--	---	--	---
----GYROSIGMA SPP.	--	---	45	0.9	--	---	--	---	86	1.8	--	---
----GYROSIGMA ACUMINATUM	--	---	--	---	--	---	59	0.9	--	---	--	---
----NAVICULA SPP.	36	0.9	--	---	49	0.9	59	0.9	--	---	97	0.9
----NAVICULA CAPITATA	--	---	45	0.9	--	---	--	---	--	---	--	---
----NAVICULA CRYPTOCEPHALA	--	---	--	---	--	---	117	1.9	86	1.8	97	0.9
----NAVICULA HALOPHILA	--	---	--	---	--	---	--	---	43	0.9	--	---
----NAVICULA MINUSCULA	--	---	--	---	97	1.7	117	1.9	--	---	1649	15.3
----NAVICULA MINIMA	72	1.8	--	---	340	6.0	176	2.8	429	8.8	194	1.8
----NAVICULA PUPULA	36	0.9	89	1.9	--	---	235	3.7	--	---	--	---
----NAVICULA PYGMAEA	--	---	--	---	--	---	59	0.9	--	---	--	---
----NAVICULA RHYNCHOCEPHALA	36	0.9	--	---	--	---	59	0.9	43	0.9	--	---
----NAVICULA SALINARUM	--	---	--	---	49	0.9	--	---	--	---	--	---
----NAVICULA SEMINULUM	36	0.9	--	---	--	---	--	---	--	---	97	0.9
----NEIDIUM AFFINE	36	0.9	--	---	--	---	--	---	--	---	--	---
----STAURONEIS KRIEGERI	--	---	45	0.9	--	---	--	---	--	---	--	---
---GOMPHONEMACEAE												
----GOMPHONEMA PARVULUM	--	---	--	---	49	0.9	--	---	--	---	--	---
----GOMPHONEMA SUBCLAVATUM	--	---	--	---	--	---	--	---	43	0.9	--	---
---CYMBELLACEAE												
----AMPHORA OVALIS	36	0.9	--	---	--	---	117	1.9	--	---	--	---
----CYMBELLA AFFINIS	--	---	--	---	--	---	59	0.9	--	---	--	---
----CYMBELLA SINUATA	--	---	45	0.9	--	---	--	---	--	---	--	---
----CYMBELLA TRIANGULUM	36	0.9	--	---	--	---	--	---	43	0.9	--	---
---EPITHEMIACEAE												
----RHOPALODIA GIBBA	--	---	45	0.9	--	---	--	---	--	---	--	---
---NITZSCHIACEAE												
----HANTZSCHIA AMPHIOXYS	--	---	--	---	--	---	--	---	--	---	97	0.9
----NITZSCHIA SPP.	--	---	90	1.8	98	1.8	--	---	86	1.8	--	---
----NITZSCHIA ACICULARIS	144	3.6	--	---	291	5.2	59	0.9	--	---	291	2.7
----NITZSCHIA AMPHIBIA	--	---	--	---	--	---	--	---	--	---	194	1.8
----NITZSCHIA DISSIPATA	--	---	--	---	--	---	117	1.9	--	---	--	---
----NITZSCHIA FRUSTULUM	--	---	134	2.8	49	0.9	59	0.9	129	2.7	97	0.9
----NITZSCHIA LINEARIS	--	---	--	---	97	1.7	--	---	--	---	--	---
----NITZSCHIA PALEACEA	--	---	45	0.9	49	0.9	117	1.9	43	0.9	--	---
----NITZSCHIA PALEA	--	---	45	0.9	97	1.7	294	4.7	43	0.9	194	1.8
----NITZSCHIA SIGMOIDEA	--	---	45	0.9	49	0.9	--	---	86	1.8	97	0.9
--MISCELLANEOUS PENNATE DIATOMS	36	0.9	--	---	--	---	59	0.9	--	---	194	1.8
CYANOPHYTA BLUE-GREEN ALGAE												
-MYXOPHYCEAE												
--CHROOCOCCALES												
---CHROOCOCCACEAE												
----CHROOCOCCUS SPP.	--	---	--	---	97	1.7	59	0.9	--	---	--	---
----CHROOCOCCUS LIMNETICUS	36	0.9	--	---	--	---	--	---	--	---	--	---
----COELOSPHAERIUM NAEGELIANUM	36	0.9	--	---	--	---	--	---	--	---	--	---
--NOSTOCACALES												
---NOSTOCACEAE												
----ANABAENA SPP.	72	1.8	--	---	--	---	--	---	--	---	--	---

Table 6.--Phytoplankton identification, abundance, and diversity-index data for Smith and Bybee Lakes--Continued

PHYTOPLANKTON DATA

SMITH LAKE SITE 2

	82/09/29		82/10/12		82/11/24	
DATE						
SPECIES						
DIVERSITY	3.32		3.76		2.98	
DIVISION						
-CLASS						
--ORDER						
---FAMILY						
----GENUS SPECIES						
TOTAL COUNT	7600.		9068.		2028.	
CELLS/ML						
	COUNT	PCT	COUNT	PCT	COUNT	PCT
CHLOROPHYTA GREEN ALGAE						
-CHLOROPHYCEAE						
--CHLOROCOCCALES						
---PALMELLACEAE						
----SPHAEROCYSTIS SCHROETERI	70	0.9	--	---	--	---
---OOCYSTACEAE						
----SELENASTRUM MINUTUM	139	1.8	--	---	16	0.8
---SCENEDESMACEAE						
----SCENEDESMUS QUADRICAUDA	139	1.8	--	---	--	---
EUGLENOPHYTA EUGLENOIDS						
-EUGLENOPHYCEAE						
--EUGLENALES						
---EUGLENACEAE						
----TRACHELOMONAS SPP.	--	---	144	1.6	--	---
----TRACHELOMONAS VOLVOCINA	--	---	432	4.8	16	0.8
CHRYSOPHYTA YELLOW-BROWN ALGAE						
-CHRYSOPHYCEAE						
--CHROMULINALES						
---CHROMULINACEAE						
----KEPHYRION SPP.	209	2.8	288	3.2	62	3.0
----KEPHYRION LITTORALE	--	---	864	9.5	62	3.1
----KEPHYRION SPIRALE	--	---	72	0.8	31	1.5
---CHRYSOCOCCACEAE						
----CHRYSOCOCCUS RUFESCENS	349	4.6	576	6.3	1155	56.7
-BACILLARIOPHYCEAE DIATOMS						
--CENTRALES CENTRIC DIATIOMS						
---COSCINODISCACEAE						
----CYCLOTELLA GLOMERATA	3068	40.4	3239	35.4	109	5.4
----CYCLOTELLA MENEGHINIANA	70	0.9	--	---	--	---
----MELOSIRA AMBIGUA	627	8.3	216	2.4	31	1.5
----MELOSIRA DISTANS	209	2.8	288	3.2	47	2.3
----MELOSIRA GRANULATA	70	0.9	72	0.8	31	1.5
----MELOSIRA ITALICA	70	0.9	72	0.8	--	---
----STEPHANODISCUS ASTREA MINUTULA	349	4.6	216	2.4	47	2.3
----STEPHANODISCUS HANTZSCHII	70	0.9	144	1.6	16	0.8
--PENNALES PENNATE DIATOMS	70	0.9	--	---	--	---
---FRAGILARIACEAE						
----ASTERIONELLA FORMOSA	--	---	--	---	31	1.5
----FRAGILARIA CONSTRUENS	279	3.7	432	4.8	16	0.8
----FRAGILARIA PINNATA	--	---	--	---	16	0.8
----SYNEDRA DELICATISSIMA	--	---	72	0.8	--	---
----SYNEDRA RUMPENS	--	---	144	1.6	--	---
----TABELLARIA FENESTRATA	--	---	--	---	16	0.8
---ACHNANTHACEAE						
----ACHNANTHES LINEARIS	70	0.9	--	---	--	---
---NAVICULACEAE						
----GYROSIGMA SPP.	--	---	72	0.8	16	0.8
----NAVICULA SPP.	--	---	72	0.8	--	---
----NAVICULA BACILLUM	70	0.9	--	---	--	---
----NAVICULA CRYPTOCEPHALA	--	---	288	3.2	16	0.8
----NAVICULA MINUSCULA	906	11.9	216	2.4	--	---
----NAVICULA MINIMA	209	2.8	432	4.8	16	0.8
----NAVICULA PUPULA	--	---	--	---	16	0.8
----NAVICULA RHYNCHOCEPHALA	--	---	--	---	78	3.8
----NAVICULA SEMINULUM	70	0.9	--	---	--	---
----PINNULARIA SPP.	--	---	--	---	47	2.3
---GOMPHONEMACEAE						
----GOMPHONEMA GRACILE	--	---	144	1.6	16	0.8
----GOMPHONEMA INTRICATUM	--	---	--	---	16	0.8
---CYMBELLACEAE						
----AMPHORA OVALIS	--	---	--	---	16	0.8
----CYMBELLA TRIANGULUM	--	---	144	1.6	16	0.8
---NITZSCHIACEAE						
----NITZSCHIA SPP.	139	1.8	72	0.8	16	0.8
----NITZSCHIA ACICULARIS	139	1.8	72	0.8	31	1.5

Table 6.--Phytoplankton identification, abundance, and diversity-index data for Smith and Bybee Lakes--Continued

PHYTOPLANKTON DATA

SMITH LAKE SITE 2

	82/09/29		82/10/12		82/11/24	
DATE						
SPECIES						
DIVERSITY	3.32		3.75		2.98	
DIVISION						
-CLASS						
--ORDER						
---FAMILY						
----GENUS SPECIES						
TOTAL COUNT CELLS/ML	7600.		9068.		2028.	
	COUNT	PCT	COUNT	PCT	COUNT	PCT
CHRYSOPHYTA YELLOW-BROWN ALGAE						
-BACILLARIOPHYCEAE DIATOMS						
--PENNALES PENNATE DIATOMS						
---NITZSCHIACEAE						
----NITZSCHIA CONSTRICTA	--	---	--	---	16	0.8
----NITZSCHIA FRUSTULUM	209	2.8	72	0.8	--	---
----NITZSCHIA PALEACEA	--	---	72	0.8	16	0.8
----NITZSCHIA PALEA	--	---	144	1.6	--	---

Table 6.--Phytoplankton identification, abundance, and diversity-index data for Smith and Bybee Lakes--Continued

PHYTOPLANKTON DATA

BYBEE LAKE, SITE 8

DATE	82/08/20	
SPECIES		
DIVERSITY	4.34	
DIVISION		
-CLASS		
--ORDER		
---FAMILY		
----GENUS SPECIES		
TOTAL COUNT	6759.	
CELLS/ML		
	COUNT	PCT
CHLOROPHYTA GREEN ALGAE		
-CHLOROPHYCEAE		
--CHLOROCOCCALES		
---CHLOROCOCCACEAE		
----TETRAEDRON REGULARE	131	1.9
---SCENEDESMACEAE		
----SCENEDESMUS QUADRICAUDA	197	2.9
----TETRASTRUM STAUROGENIAFORME	66	1.0
CHRYSOPHYTA YELLOW-BROWN ALGAE		
-CHRYSOPHYCEAE		
--CHROMULINALES		
---CHROMULINACEAE		
----KEPHYRION SPP.	131	1.9
-BACILLARIOPHYCEAE DIATOMS		
--CENTRALES CENTRIC DIATOMS		
---COSCINODISCACEAE		
----CYCLOTELLA GLOMERATA	328	4.9
----CYCLOTELLA MENEGHINIANA	66	1.0
----MELOSIRA AMBIGUA	919	13.6
----MELOSIRA DISTANS	787	11.7
----MELOSIRA GRANULATA	262	3.9
----MELOSIRA ITALICA	66	1.0
----STEPHANODISCUS ASTREA MINUTULA	459	6.8
----STEPHANODISCUS HANTZSCHII	722	10.7
--PENNALES PENNATE DIATOMS		
---FRAGILARIACEAE		
----ASTERIONELLA FORMOSA	328	4.9
----FRAGILARIA CONSTRUENS	262	3.9
----FRAGILARIA PINNATA	66	1.0
----SYNEDRA DELICATISSIMA	262	3.9
----SYNEDRA RADIANS	131	1.9
----SYNEDRA ULNA	66	1.0
---ACHNANTHACEAE		
----ACHNANTHES MINUTISSIMA	131	1.9
---NAVICULACEAE		
----GYROSIGMA ACUMINATUM	328	4.9
----NAVICULA SPP.	66	1.0
----NAVICULA CRYPTOCEPHALA	66	1.0
----NAVICULA PUPULA	66	1.0
---CYMBELLACEAE		
----AMPHORA OVALIS	131	1.9
----CYMBELLA MINUTA	66	1.0
---NITZSCHIACEAE		
----NITZSCHIA ACICULARIS	197	2.9
----NITZSCHIA AMPHIBIA	197	2.9
----NITZSCHIA FRUSTULUM	131	1.9
----NITZSCHIA PALEA	131	1.9

Table 6.--Phytoplankton identification, abundance, and diversity-index data for Smith and Bybee Lakes--Continued

PHYTOPLANKTON DATA

BYBEE LAKE SITE 3

DATE	82/06/17		82/06/22		82/06/29		82/07/07		82/07/20		82/07/29	
SPECIES												
DIVERSITY	4.30		3.95		4.25		4.53		4.27		4.73	
DIVISION												
-CLASS												
--ORDER												
---FAMILY												
----GENUS SPECIES												
TOTAL COUNT CELLS/ML	5412.		5424.		256.		1238.		3259.		6445.	
	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT
CHLOROPHYTA GREEN ALGAE												
-CHLOROPHYCEAE												
--VOLVOCALES												
---CHLAMYDOMONADACEAE												
----CHLAMYDOMONAS-LIKE	--	---	154	2.8	2	0.9	23	1.9	29	0.9	--	---
---VOLVOCACEAE												
----PANDORINA MORUM	41	0.8	--	---	--	---	--	---	--	---	--	---
--CHLOROCOCCALES												
---CHLOROCOCCACEAE												
----TETRAEDRON SPP.	--	---	--	---	7	2.8	--	---	--	---	--	---
----TETRAEDRON REGULARE	83	1.5	38	0.7	2	0.9	12	0.9	--	---	62	1.0
---MICRACTINIACEAE												
----MICRACTINIUM PUSILLUM	41	0.8	38	0.7	--	---	--	---	--	---	--	---
---PALMELLACEAE												
----SPHAEROCYSTIS SCHROETERI	83	1.5	--	---	36	13.9	164	13.9	29	0.9	62	1.0
---OOCYSTACEAE												
----ANKISTRODESMUS FALCATUS	165	3.1	77	1.4	--	---	140	11.3	--	---	62	1.0
----CLOSTERIOPSIS LONGISSIMA	--	---	--	---	--	---	--	---	29	0.9	--	---
----KIRCHNERIELLA SPP.	83	1.5	--	---	2	0.9	--	---	--	---	62	1.0
----OOCYSTIS PUSILLA	83	1.5	--	---	7	2.8	35	2.8	--	---	--	---
----SELENASTRUM MINUTUM	--	---	--	---	--	---	--	---	--	---	62	1.0
---SCENEDESMACEAE												
----CRUCIGENIA CRUCIFERA	41	0.8	--	---	2	0.9	12	0.9	--	---	62	1.0
----CRUCIGENIA QUADRATA	--	---	--	---	--	---	12	0.9	--	---	--	---
----CRUCIGENIA TETRAPEDIA	--	---	--	---	--	---	12	0.9	--	---	--	---
----SCENEDESMUS SPP.	124	2.3	--	---	2	0.9	--	---	--	---	62	1.0
----SCENEDESMUS ABUNDANS	--	---	38	0.7	--	---	23	1.9	--	---	--	---
----SCENEDESMUS BIJUGA ALTERNANS	--	---	--	---	7	2.8	35	2.8	--	---	--	---
----SCENEDESMUS QUADRICAUDA	124	2.3	38	0.7	2	0.9	--	---	59	1.8	186	2.9
---HYDRODICTYACEAE												
----PEDIASTRUM BORYANUM	--	---	--	---	--	---	12	0.9	--	---	--	---
----PEDIASTRUM DUPLEX	--	---	77	1.4	--	---	12	0.9	--	---	--	---
---COCCOMYXACEAE												
----ELAKATOTHRIX GELATINOSA	--	---	--	---	2	0.9	--	---	--	---	62	1.0
MISCELLANEOUS GREEN ALGAE	41	0.8	--	---	--	---	12	0.9	--	---	--	---
EUGLENOPHYTA EUGLENOIDS												
-EUGLENOPHYCEAE												
--EUGLENALES												
---EUGLENACEAE												
----EUGLENA SPP.	--	---	38	0.7	2	0.9	12	0.9	--	---	--	---
----TRACHELOMONAS SPP.	41	0.8	38	0.7	14	4.6	35	2.8	--	---	--	---
----TRACHELOMONAS VOLVOCINA	41	0.8	38	0.7	50	19.8	47	3.8	--	---	186	2.9
PYRRHOPHYTA												
-DINOPHYCEAE DINOFLAGELLATES												
--DINOKONTAE												
---PERIDINIACEAE												
----PERIDINIUM CINCTUM	--	---	--	---	2	0.9	--	---	--	---	--	---
---CERATIACEAE												
----CERATIUM HIRUNDINIELLA	--	---	--	---	--	---	--	---	29	0.9	--	---
CRYPTOPHYTA												
-CRYPTOPHYCEAE												
--CRYPTOMONADALES												
---CRYPTOCHRYSIDACEAE	83	1.5	--	---	--	---	--	---	--	---	--	---
----RHODOMONAS MINUTA	--	---	38	0.7	--	---	12	0.9	--	---	--	---
---CRYPTOMONADACEAE												
----CRYPTOMONAS EROSA	--	---	115	2.1	--	---	--	---	--	---	--	---
CHRYSOPHYTA YELLOW-BROWN ALGAE												
-CHRYSOPHYCEAE												
--CHROMULINALES												
---CHROMULINACEAE												
----KEPHYRION SPP.	--	---	38	0.7	--	---	106	8.5	29	0.9	--	---
----KEPHYRION LITTORALE	41	0.8	--	---	--	---	--	---	--	---	--	---
----KEPHYRION SPIRALE	124	2.3	77	1.4	--	---	--	---	--	---	--	---
---CHRYSOCOCCACEAE												
----CHRYSOCOCCUS RUFESCENS	--	---	--	---	2	0.9	--	---	59	1.8	310	4.8

Table 6.--Phytoplankton identification, abundance, and diversity-index data for Smith and Bybee Lakes--Continued

PHYTOPLANKTON DATA

BYBEE LAKE SITE 3

DATE	82/06/17		82/06/22		82/06/29		82/07/07		82/07/20		82/07/29	
SPECIES												
DIVERSITY	4.30		3.95		4.25		4.53		4.27		4.73	
DIVISION												
-CLASS												
--ORDER												
---FAMILY												
----GENUS SPECIES												
TOTAL COUNT	5412.		5424.		256.		1238.		3259.		6445.	
CELLS/ML												
	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT
CHRYSOPHYTA YELLOW-BROWN ALGAE												
-BACILLARIOPHYCEAE DIATOMS												
--CENTRALES CENTRIC DIATOMS												
---COSCINODISCACEAE												
----CYCLOTELLA GLOMERATA	1074	19.5	1346	25.1	--	---	47	3.8	323	9.9	--	---
----CYCLOTELLA KUTZINGIANA	--	---	--	---	--	---	--	---	--	---	124	1.9
----CYCLOTELLA MENEGHINIANA	41	0.8	--	---	--	---	12	0.9	29	0.9	--	---
----MELOSIRA AMBIGUA	207	3.8	154	2.8	5	1.9	35	2.8	323	9.9	1116	16.5
----MELOSIRA DISTANS	--	---	--	---	19	7.4	58	4.7	117	3.6	248	3.8
----MELOSIRA GRANULATA	661	12.2	269	5.0	12	4.6	12	0.9	88	2.7	186	2.9
----MELOSIRA ITALICA	124	2.3	192	3.5	2	0.9	--	---	88	2.7	186	2.9
----STEPHANODISCUS ASTREA MINUTULA	578	10.7	269	5.0	2	0.9	152	12.3	469	12.5	248	3.8
----STEPHANODISCUS HANTZSCHII	165	3.1	423	7.8	21	8.3	70	5.7	264	8.1	434	6.7
----STEPHANODISCUS SUBSALSUS	--	---	--	---	--	---	--	---	--	---	62	1.0
--PENNALES PENNATE DIATOMS												
---FRAGILARIACEAE												
----ASTERIONELLA FORMOSA	413	7.6	731	13.5	--	---	--	---	382	11.7	62	1.0
----DIATOMA TENUE	248	4.6	462	8.5	--	---	--	---	29	0.9	124	1.9
----FRAGILARIA CONSTRUENS	83	1.5	38	0.7	5	1.9	12	0.9	323	9.9	682	10.6
----FRAGILARIA CROTONENSIS	--	---	--	---	2	0.9	--	---	29	0.9	--	---
----FRAGILARIA VAUCHERIAE	--	---	38	0.7	--	---	--	---	--	---	--	---
----SYNEDRA DELICATISSIMA	--	---	269	5.0	--	---	--	---	29	0.9	186	2.9
----SYNEDRA RADIANS	41	0.8	--	---	--	---	23	1.9	--	---	--	---
----SYNEDRA RUMPENS	--	---	38	0.7	--	---	--	---	29	0.9	124	1.9
----SYNEDRA ULNA	--	---	--	---	2	0.9	--	---	--	---	--	---
----TABELLARIA FENESTRATA	83	1.5	--	---	--	---	--	---	59	1.8	--	---
---ACHNANTHACEAE												
----ACHNANTHES LINEARIS	41	0.8	--	---	--	---	--	---	29	0.9	--	---
----ACHNANTHES MINUTISSIMA	--	---	38	0.7	--	---	--	---	--	---	--	---
----COCCONEIS PLACENTULA	--	---	--	---	--	---	--	---	29	0.9	--	---
----RHOICOSPHENIA CURVATA	--	---	--	---	--	---	--	---	--	---	62	1.0
---NAVICULACEAE												
----GYROSIGMA SPP.	--	---	--	---	--	---	--	---	--	---	62	1.0
----NAVICULA SPP.	--	---	--	---	--	---	--	---	29	0.9	--	---
----NAVICULA CONTENTA BICEPS	--	---	--	---	2	0.9	--	---	--	---	--	---
----NAVICULA CRYPTOCEPHALA	--	---	--	---	--	---	--	---	88	2.7	186	2.9
----NAVICULA MINIMA	83	1.5	--	---	2	0.9	--	---	--	---	248	3.8
----NAVICULA PUPULA	--	---	--	---	--	---	--	---	--	---	62	1.0
----NAVICULA RHYNCHOCEPHALA	41	0.8	--	---	--	---	--	---	--	---	62	1.0
----PINNULARIA SPP.	--	---	--	---	--	---	--	---	--	---	62	1.0
---GOMPHONEMACEAE												
----GOMPHONEMA ANGUSTATUM	--	---	--	---	2	0.9	--	---	29	0.9	62	1.0
----GOMPHONEMA SUBCLAVATUM	--	---	--	---	--	---	--	---	--	---	62	1.0
---CYMBELLACEAE												
----AMPHORA OVALIS	--	---	--	---	2	0.9	--	---	--	---	--	---
---EPITHEMIACEAE												
----EPITHEMIA SPP.	--	---	--	---	--	---	--	---	--	---	62	1.0
---NITZSCHIACEAE												
----NITZSCHIA SPP.	--	---	38	0.7	2	0.9	12	0.9	--	---	186	3.0
----NITZSCHIA ACICULARIS	83	1.5	38	0.7	--	---	12	0.9	29	0.9	62	1.0
----NITZSCHIA ANGUSTATA	--	---	--	---	--	---	12	0.9	--	---	--	---
----NITZSCHIA DISSIPATA	--	---	--	---	--	---	--	---	29	0.9	--	---
----NITZSCHIA FRUSTULUM	--	---	--	---	--	---	23	1.9	59	1.8	124	1.9
----NITZSCHIA HUNGARICA	--	---	--	---	--	---	12	0.9	--	---	--	---
----NITZSCHIA INNOMINATA	--	---	--	---	--	---	--	---	--	---	62	1.0
----NITZSCHIA PALEA	--	---	--	---	--	---	--	---	29	0.9	--	---
---SURIRELLACEAE												
----SURIRELLA ANGUSTA	41	0.8	--	---	--	---	--	---	--	---	--	---
--MISCELLANEOUS PENNATE DIATOMS	--	---	--	---	--	---	23	1.9	29	0.9	--	---
CYANOPHYTA BLUE-GREEN ALGAE												
-MYXOPHYCEAE												
--CHROOCOCCALES												
---CHROOCOCCACEAE												
----ANACYSTIS SPP.	--	---	--	---	2	0.9	--	---	--	---	--	---

Table 6.--Phytoplankton identification, abundance, and diversity-index data for Smith and Bybee Lakes--Continued

PHYTOPLANKTON DATA (CONTINUED)

BYBEE LAKE SITE 3

DATE	82/06/17		82/06/22		82/06/29		82/07/07		82/07/20		82/07/29	
SPECIES												
DIVERSITY	4.30		3.95		4.25		4.53		4.27		4.73	
DIVISION												
-CLASS												
--ORDER												
---FAMILY												
----GENUS SPECIES												
TOTAL COUNT	5412.		5424.		256.		1238.		3259.		6445.	
CELLS/ML												
	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT
CYANOPHYTA BLUE-GREEN ALGAE												
-MYXOPHYCEAE												
--CHROOCOCCALES												
---CHROOCOCCACEAE												
----CHROOCOCCUS SPP.	124	2.3	77	1.4	--	---	--	---	--	---	--	---
--OSCILLATORIALES												
---OSCILLATORIACEAE												
----OSCILLATORIA SPP.	41	0.8	154	2.8	24	9.3	--	---	--	---	62	1.0
--NOSTOCACALES												
---NOSTOCACEAE												
----ANABAENA SPP.	--	---	--	---	2	0.9	--	---	29	0.9	62	1.0
----APHANIZOMENON FLOS-AQUAE	--	---	--	---	--	---	12	0.9	--	---	--	---

Table 6.--Phytoplankton identification, abundance, and diversity-index data for Smith and Bybee Lakes--Continued

PHYTOPLANKTON DATA

BYBEE LAKE SITE 3

DATE	82/08/05		82/08/13		82/08/20		82/09/02		82/09/16		82/09/24	
SPECIES												
DIVERSITY	4.24		4.39		4.55		4.36		4.10		3.66	
DIVISION												
-CLASS												
--ORDER												
---FAMILY												
----GENUS SPECIES												
TOTAL COUNT CELLS/ML	4388.		10263.		4313.		10040.		14006.		15355.	
	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT
CHLOROPHYTA GREEN ALGAE												
-CHLOROPHYCEAE												
--VOLVOCALES												
---CHLAMYDOMONADACEAE												
----CHLAMYDOMONAS-LIKE	--	---	--	---	--	---	406	4.0	--	---	--	---
--CHLOROCOCCALES												
---PALMELLACEAE												
----SPHAEROCYSTIS SCHROETERI	--	---	--	---	--	---	101	1.0	620	4.4	394	2.6
---OOCYSTACEAE												
----ANKISTRODESMUS FALCATUS	37	0.8	--	---	37	0.9	--	---	--	---	131	0.9
----OOCYSTIS PUSILLA	--	---	--	---	--	---	--	---	124	0.9	--	---
---SCENEDESMACEAE												
----CRUCIGENIA CRUCIFERA	--	---	--	---	--	---	--	---	--	---	131	0.9
----SCENEDESMUS BIJUGA ALTERNANS	--	---	--	---	--	---	--	---	124	0.9	--	---
----SCENEDESMUS QUADRICAUDA	37	0.8	--	---	74	1.7	304	3.0	124	0.9	262	1.7
---COCCOMYXACEAE												
----ELAKATOTHRIX GELATINOSA	--	---	--	---	--	---	101	1.0	--	---	--	---
EUGLENOPHYTA EUGLENOIDS												
-EUGLENOPHYCEAE												
--EUGLENALES												
---EUGLENACEAE												
----TRACHELOMONAS SPP.	--	---	--	---	--	---	--	---	248	1.8	394	2.6
----TRACHELOMONAS VOLVOCINA	--	---	--	---	--	---	--	---	124	0.9	--	---
CHRYSOPHYTA YELLOW-BROWN ALGAE												
-CHRYSOPHYCEAE												
--CHROMULINALES												
---CHROMULINACEAE												
----KEPHYRION SPP.	--	---	89	0.9	--	---	--	---	--	---	131	0.9
---CHRYSOCOCCACEAE												
----CHRYSOCOCCUS RUFESCENS	--	---	--	---	--	---	203	2.0	248	1.8	394	2.6
-BACILLARIOPHYCEAE DIATOMS												
--CENTRALES CENTRIC DIATIOMS												
---COSCINODISCACEAE												
----CYCLOTELLA ATOMUS	37	0.8	--	---	--	---	--	---	--	---	--	---
----CYCLOTELLA GLOMERATA	595	13.6	535	5.2	446	10.3	1420	14.4	1116	8.0	3412	22.2
----CYCLOTELLA KUTZINGIANA	--	---	89	0.9	--	---	--	---	--	---	--	---
----CYCLOTELLA MENEGHINIANA	74	1.7	357	3.5	--	---	304	3.0	2231	15.7	1706	11.1
----MELOSIRA AMBIGUA	149	3.4	1160	11.3	409	9.5	811	8.1	1116	8.0	919	6.0
----MELOSIRA DISTANS	74	1.7	446	4.3	149	3.4	203	2.0	496	3.5	262	1.7
----MELOSIRA GRANULATA	74	1.7	625	6.1	186	4.3	101	1.0	744	5.3	525	3.4
----MELOSIRA ITALICA	149	3.4	357	3.5	37	0.9	101	1.0	124	0.9	--	---
----MELOSIRA VARIANS	74	1.7	--	---	--	---	--	---	--	---	--	---
----STEPHANODISCUS ASTREA MINUTULA	483	11.0	535	5.2	186	4.3	608	6.1	372	2.7	394	2.6
----STEPHANODISCUS HANTZSCHII	669	16.0	1339	12.6	483	11.2	710	7.1	2107	1.5	3544	22.6
----STEPHANODISCUS SUBSALSUS	74	1.7	--	---	37	0.9	--	---	--	---	--	---
--PENNALES PENNATE DIATOMS	--	---	89	0.9	--	---	--	---	--	---	--	---
---FRAGILARIACEAE												
----ASTERIONELLA FORMOSA	186	4.2	268	2.6	74	1.7	101	1.0	--	---	--	---
----DIATOMA TENUE	37	0.8	89	0.9	--	---	101	1.0	124	0.9	--	---
----FRAGILARIA BREVISTRIATA	--	---	--	---	--	---	--	---	248	1.8	--	---
----FRAGILARIA CONSTRUENS	558	12.7	1249	12.2	558	12.6	507	5.1	1240	8.8	525	3.4
----FRAGILARIA CROTONENSIS	--	---	--	---	--	---	--	---	124	0.9	--	---
----FRAGILARIA PINNATA	37	0.8	178	1.7	149	3.4	--	---	124	0.9	--	---
----FRAGILARIA VAUCHERIAE	--	---	89	0.9	37	0.9	101	1.0	--	---	--	---
----SYNEDRA DELICATISSIMA	112	2.5	--	---	--	---	--	---	--	---	--	---
----SYNEDRA MAZAMAENSIS	--	---	--	---	37	0.9	--	---	--	---	--	---
----SYNEDRA RADIANS	--	---	--	---	74	1.7	--	---	--	---	--	---
----SYNEDRA RUMPENS	--	---	--	---	37	0.9	--	---	--	---	--	---
----SYNEDRA ULNA	--	---	--	---	37	0.9	203	2.0	--	---	--	---
---ACHNANTHACEAE												
----ACHNANTHES LANCEOLATA	--	---	89	0.9	--	---	--	---	--	---	--	---
----ACHNANTHES LINEARIS	--	---	--	---	--	---	--	---	--	---	131	0.9
----ACHNANTHES MINUTISSIMA	37	0.8	89	0.9	112	2.6	--	---	--	---	--	---
----COCCONEIS PLACENTULA	--	---	--	---	37	0.9	--	---	--	---	--	---
----RHOICOSPHENIA CURVATA	--	---	89	0.9	--	---	--	---	--	---	--	---

Table 6.--Phytoplankton identification, abundance, and diversity-index data for Smith and Bybee Lakes--Continued

PHYTOPLANKTON DATA

BYBEE LAKE SITE 3

DATE	82/08/05		82/08/13		82/08/20		82/09/02		82/09/16		82/09/24	
SPECIES												
DIVERSITY	4.24		4.39		4.55		4.36		4.10		3.66	
DIVISION												
-CLASS												
--ORDER												
---FAMILY												
----GENUS SPECIES												
TOTAL COUNT	4388.		10263.		4313.		10040.		14006.		15355.	
CELLS/ML												
	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT
CHRYSOPHYTA YELLOW-BROWN ALGAE												
-BACILLARIOPHYCEAE DIATOMS												
--PENNALES PENNATE DIATOMS												
---NAVICULACEAE												
----CALONEIS VENTRICOSA	--	---	--	---	--	---	101	1.0	--	---	--	---
----GYROSIGMA ACUMINATUM	--	---	--	---	74	1.7	--	---	--	---	--	---
----NAVICULA SPP.	--	---	--	---	37	0.9	--	---	248	1.8	--	---
----NAVICULA CAPITATA	--	---	--	---	--	---	101	1.0	--	---	--	---
----NAVICULA CRYPTOCEPHALA	112	2.5	268	2.6	149	3.4	101	1.0	372	2.7	--	---
----NAVICULA CUSPIDATA	--	---	--	---	37	0.9	--	---	--	---	--	---
----NAVICULA DECUSSIS	--	---	89	0.9	--	---	--	---	--	---	--	---
----NAVICULA GRACILOIDES	--	---	89	0.9	--	---	--	---	--	---	--	---
----NAVICULA GREGARIA	--	---	--	---	37	0.9	--	---	--	---	--	---
----NAVICULA MINUSCULA	--	---	--	---	--	---	101	1.0	--	---	525	3.4
----NAVICULA MINIMA	37	0.8	89	0.9	37	0.9	304	3.0	--	---	131	0.9
----NAVICULA PUPULA	74	1.7	89	0.9	--	---	203	2.0	248	1.8	131	0.9
----NAVICULA RHYNCHOCEPHALA	--	---	89	0.9	--	---	--	---	--	---	--	---
----NAVICULA SEMINULUM	74	1.7	--	---	--	---	--	---	--	---	--	---
---GOMPHONEMACEAE												
----GOMPHONEMA SPP.	--	---	--	---	37	0.9	--	---	--	---	--	---
----GOMPHONEMA PARVULUM	--	---	--	---	37	0.9	--	---	--	---	--	---
---CYMBELLACEAE												
----AMPHORA OVALIS	--	---	--	---	37	0.9	--	---	--	---	--	---
----AMPHORA PERPUSILLA	--	---	--	---	37	0.9	--	---	--	---	--	---
----CYMBELLA MINUTA	--	---	89	0.9	--	---	--	---	--	---	--	---
----CYMBELLA SINUATA	--	---	--	---	37	0.9	--	---	--	---	--	---
---EPITHEMIACEAE												
----RHOPALODIA GIBBA	--	---	89	0.9	37	0.9	--	---	--	---	--	---
---NITZSCHIACEAE												
----NITZSCHIA SPP.	74	1.6	178	1.8	74	1.7	304	3.0	--	---	--	---
----NITZSCHIA ACICULARIS	112	2.5	535	5.2	74	1.7	608	6.1	--	---	131	0.9
----NITZSCHIA AMPHIBIA	--	---	--	---	--	---	101	1.0	--	---	--	---
----NITZSCHIA CLAUSII	37	0.8	89	0.9	--	---	--	---	124	0.9	--	---
----NITZSCHIA DISSIPATA	37	0.8	--	---	--	---	--	---	--	---	131	0.9
----NITZSCHIA FRUSTULUM	74	1.7	446	4.3	186	4.3	203	2.0	496	3.5	131	0.9
----NITZSCHIA HOLSATICA	37	0.8	--	---	--	---	--	---	--	---	525	3.4
----NITZSCHIA LINEARIS	37	0.8	--	---	--	---	--	---	--	---	--	---
----NITZSCHIA MICROCEPHALA	--	---	--	---	--	---	--	---	124	0.9	262	1.7
----NITZSCHIA PALEA	149	3.4	268	2.6	74	1.7	1318	13.1	620	4.4	--	---
----NITZSCHIA SIGMOIDEA	--	---	--	---	37	0.9	--	---	--	---	--	---
--MISCELLANEOUS PENNATE DIATOMS	37	0.8	--	---	74	1.7	--	---	--	---	131	0.9
CYANOPHYTA BLUE-GREEN ALGAE												
-MYXOPHYCEAE												
--CHROOCOCCALES												
---CHROOCOCCACEAE												
----CHROOCOCCUS SPP.	--	---	89	0.9	--	---	--	---	--	---	--	---
--NOSTOCACALES												
---NOSTOCACEAE												
----ANABAENA SPP.	--	---	--	---	--	---	203	2.0	--	---	--	---

Table 6.--Phytoplankton identification, abundance, and diversity-index data for Smith and Bybee Lakes--Continued

PHYTOPLANKTON DATA

BYBEE LAKE SITE 3

DATE	82/09/29		82/10/12		82/11/24	
SPECIES						
DIVERSITY	4.41		4.16		2.99	
DIVISION						
-CLASS						
--ORDER						
---FAMILY						
----GENUS SPECIES						
TOTAL COUNT	3078.		12271.		9232.	
CELLS/ML						
	COUNT	PCT	COUNT	PCT	COUNT	PCT
CHLOROPHYTA GREEN ALGAE						
-CHLOROPHYCEAE						
--VOLVOCALES						
---CHLAMYDOMONADACEAE						
----CHLAMYDOMONAS-LIKE	77	1.0	--	---	--	---
--CHLOROCOCCALES						
---MICRACTINIACEAE						
----MICRACTINIUM PUSILLUM	--	---	--	---	154	1.7
---PALMELLACEAE						
----SPHAEROCYSTIS SCHROETERI	462	5.7	248	2.0	--	---
---OOCYSTACEAE						
----ANKISTRODESMUS FALCATUS	77	1.0	124	1.0	154	1.7
----CLOSTERIOPSIS LONGISSIMA	154	1.9	--	---	--	---
----SELENASTRUM MINUTUM	154	1.9	--	---	--	---
---SCENEDESMACEAE						
----CRUCIGENIA TETRAPEDIA	77	1.0	--	---	--	---
----SCENEDESMUS QUADRICAUDA	308	3.8	124	1.0	77	0.8
EUGLENOPHYTA EUGLENOIDS						
-EUGLENOPHYCEAE						
--EUGLENALES						
---EUGLENACEAE						
----TRACHELOMONAS SPP.	--	---	620	5.1	--	---
----TRACHELOMONAS VOLVOCINA	--	---	124	1.0	--	---
CHRYSOPHYTA YELLOW-BROWN ALGAE						
-CHRYSOPHYCEAE						
--CHROMULINALES						
---CHROMULINACEAE						
----KEPHYRION SPP.	77	1.0	992	8.0	231	2.5
----KEPHYRION LITTORALE	--	---	868	7.1	154	1.7
----KEPHYRION SPIRALE	--	---	248	2.0	231	2.5
---CHRYSOCOCCACEAE						
----CHRYSOCOCCUS RUFESCENS	308	3.8	620	5.1	539	5.8
-BACILLARIOPHYCEAE DIATOMS						
--CENTRALES CENTRIC DIATOMS						
---COSCINODISCACEAE						
----CYCLOTELLA GLOMERATA	923	11.4	1983	15.2	1769	19.2
----CYCLOTELLA MENEGHINIANA	539	6.7	620	5.1	--	---
----MELOSIRA AMBIGUA	692	8.6	124	1.0	77	0.8
----MELOSIRA DISTANS	154	1.9	248	2.0	77	0.8
----MELOSIRA GRANULATA	385	4.8	248	2.0	231	2.5
----MELOSIRA ITALICA	154	1.9	--	---	--	---
----STEPHANODISCUS ASTREA MINUTULA	308	3.8	992	8.1	154	1.7
----STEPHANODISCUS HANTZSCHII	1077	12.7	1859	15.2	4231	46.0
----STEPHANODISCUS SUBSALSUS	--	---	--	---	77	0.8
--PENNALES PENNATE DIATOMS	--	---	--	---	77	0.8
---FRAGILARIACEAE						
----FRAGILARIA BREVISTRIATA	--	---	124	1.0	--	---
----FRAGILARIA CONSTRUENS	231	2.9	620	5.1	77	0.8
----FRAGILARIA PINNATA	77	1.0	124	1.0	77	0.8
----FRAGILARIA VAUCHERIAE	77	1.0	--	---	--	---
----SYNEDRA DELICATISSIMA	--	---	--	---	77	0.8
----SYNEDRA RADIANS	--	---	--	---	154	1.7
---ACHNANTHACEAE						
----ACHNANTHES MINUTISSIMA	77	1.0	--	---	154	1.7
---NAVICULACEAE						
----NAVICULA CRYPTOCEPHALA	231	2.9	248	2.0	77	0.8
----NAVICULA DECUSSIS	--	---	--	---	77	0.8
----NAVICULA GREGARIA	77	1.0	--	---	--	---
----NAVICULA MINUSCULA	154	1.9	--	---	--	---
----NAVICULA MINIMA	385	4.8	248	2.0	154	1.7
----NAVICULA PUPULA	--	---	372	3.0	--	---
---EPITHEMIACEAE						
----EPITHEMIA SOREX	77	1.0	--	---	--	---
---NITZSCHIACEAE						
----NITZSCHIA ACICULARIS	231	2.9	124	1.0	77	0.8

Table 6.--Phytoplankton identification, abundance, and diversity-index data for Smith and Bybee Lakes--Continued

PHYTOPLANKTON DATA

BYBEE LAKE SITE 3

DATE	82/09/29		82/10/12		82/11/24	
SPECIES						
DIVERSITY	4.41		4.16		2.99	
DIVISION						
-CLASS						
--ORDER						
---FAMILY						
----GENUS SPECIES						
TOTAL COUNT	3078.		12271.		9232.	
CELLS/ML						
	COUNT	PCT	COUNT	PCT	COUNT	PCT
CHRYSOPHYTA YELLOW-BROWN ALGAE						
-BACILLARIOPHYCEAE DIATOMS						
--PENNALES PENNATE DIATOMS						
---NITZSCHIACEAE						
----NITZSCHIA CLAUSII	--	---	124	1.0	--	---
----NITZSCHIA DISSIPATA	77	1.0	--	---	--	---
----NITZSCHIA FRUSTULUM	154	1.9	124	1.0	--	---
----NITZSCHIA PALEA	308	3.8	372	3.0	--	---
CYANOPHYTA BLUE-GREEN ALGAE						
-MYXOPHYCEAE						
--CHROOCOCCALES						
---CHROOCOCCACEAE						
----ANACYSTIS SPP.	--	---	--	---	77	0.8

Table 7.--Zooplankton identification, abundance and diversity-index data for Smith and Bybee Lakes

[Zooplankton identification by Jan Chappell, USGS, Portland, Oregon. The following zooplankton species identifications were verified by Y. C. Yeatman, The University of the South, Sewanee, Tenn.: Bosmina longirostris, Ceriodaphnia reticulata, Diaptomus reighardi, Cyclops vernalis. A 10 micron porosity plankton net was used in October and November, and a greater abundance of rotifers was observed in those samples.]

ZOOPLANKTON DATA

SMITH LAKE, SITE 1

DATE	82/06/22		82/06/29		82/07/07		82/07/29	
SPECIES DIVERSITY	1.41		1.55		1.43		1.68	
DIVISION -CLASS --ORDER ---FAMILY ----GENUS SPECIES								
TOTAL COUNT	643.		107.		38.		43.	
ORGANISMS/LITER	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT
ROTIFERA	--	---	6	5.6	--	---	2	4.6
-MONOGONONTA								
--PLOIMA								
---BRACHIONIDAE								
----BRACHIONUS	358	55.6	54	50.5	11	29.0	--	---
----KERATELLA	5	0.8	2	1.9	1	2.6	--	---
ARTHROPODA								
-CRUSTACEA								
--CLADOCERA								
---CHYDORIDAE								
----CHYDORUS SP.	82	12.8	2	1.9	--	---	--	---
----LEYDIGIA QUADRANGULARIS	7	1.1	--	---	--	---	--	---
---BOSMINIDAE								
----BOSMINA LONGIROSTRIS	89	13.8	9	8.4	2	5.3	11	25.6
---DAPHNIDAE								
----DAPHNIA SP.	--	---	1	0.9	--	---	--	---
----DAPHNIA RETROCURVA	--	---	--	---	1	2.6	--	---
----CERIODAPHNIA RETICULATA	38	5.9	10	9.3	2	5.3	4	9.3
----MOINA MICRURA	--	---	--	---	--	---	8	18.6
--COPEPODA								
---DIAPTOMIDAE								
----DIAPTOMUS REIGHARDI	10	1.6	3	2.8	3	7.9	11	25.6
---CYCLOPIDAE								
----CYCLOPS VERNALIS	54	8.4	20	18.7	18	47.3	7	16.3

Table 7.--Zooplankton identification, abundance and diversity-index data for Smith and Bybee Lakes--Continued

ZOOPLANKTON DATA

SMITH LAKE SITE 2

DATE	82/06/22		82/06/29		82/07/07		82/07/20		82/07/29		82/08/13	
SPECIES DIVERSITY	1.74		1.70		1.81		1.19		1.58		1.30	
DIVISION -CLASS --ORDER ---FAMILY ----GENUS SPECIES												
TOTAL COUNT ORGANISMS/LITER	1517.		1245.		677.		3465.		290.		93.	
	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT
ROTIFERA	73	4.8	--	---	16	2.4	--	---	--	---	--	---
-MONOGONONTA												
--PLOIMA												
---BRACHIONIDAE												
----BRACHIONUS	410	27.6	471	38.0	64	9.5	--	---	--	---	--	---
----KERATELLA	18	1.2	15	1.2	16	2.4	408	11.8	6	2.1	7	7.5
ARTHROPODA												
-CRUSTACEA												
--CLADOCERA												
---BOSMINIDAE												
----BOSMINA LONGIROSTRIS	263	17.3	61	4.8	145	21.4	204	5.8	85	29.4	--	---
---DAPHNIDAE												
----DAPHNIA PARVULA	--	---	46	3.7	97	14.3	--	---	--	---	--	---
----DAPHNIA RETROCURVA	6	0.4	30	2.4	32	4.7	249	7.2	3	1.1	--	---
----CERIODAPHNIA RETICULATA	251	16.5	182	14.4	113	16.7	23	0.7	25	8.6	--	---
----MOINA MICRURA	--	---	--	---	--	---	45	1.3	66	22.8	36	38.7
---SIDIDAE												
----DIAPHANOSOMA LEUCHTENBERGIANUM	--	---	--	---	--	---	--	---	--	---	4	4.3
---EURYCERCINAE												
----EURYCERCUS LAMELLATUS	42	2.8	15	1.2	--	---	--	---	--	---	--	---
--COPEPODA												
---DIAPTOMIDAE												
----DIAPTOMUS REIGHARDI	49	3.2	106	8.4	--	---	2243	64.7	85	29.4	36	38.7
---CYCLOPIDAE												
----CYCLOPS VERNALIS	397	26.2	319	25.9	193	28.6	294	8.5	19	6.6	10	10.8

Table 7.--Zooplankton identification, abundance and diversity-index data for Smith and Bybee Lakes--Continued

ZOOPLANKTON DATA

SMITH LAKE SITE 2

DATE	82/08/19		82/08/27		82/09/02		82/09/15		82/09/29		82/10/13	
SPECIES												
DIVERSITY	1.26		1.56		1.50		1.54		1.40		1.32	
-CLASS												
--ORDER												
---FAMILY												
----GENUS SPECIES												
TOTAL COUNT	141.		405.		364.		218.		366.		1379.	
ORGANISMS/LITER												
	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT
ROTIFERA												
-MONOGONONTA												
--PLOIMA												
---BRACHIONIDAE												
----KERATELLA	3	2.1	14	3.5	--	---	3	1.4	11	3.0	89	6.5
---ASPLANCHNIDAE												
----ASPLANCHNA	--	---	--	---	16	4.4	--	---	11	3.0	22	1.6
---TRICHOCERICIDAE												
----TRICHOCERA-LIKE	7	5.0	--	---	--	---	--	---	--	---	--	---
ARTHROPODA												
-CRUSTACEA												
--CLADOCERA												
---CHYDORIDAE												
----LEYDIGIA QUADRANGULARIS	--	---	3	0.7	--	---	3	1.4	--	---	--	---
---BOSMINIDAE												
----BOSMINA LONGIROSTRIS	14	9.8	71	17.4	40	11.0	64	29.4	57	15.6	944	68.5
---DAPHNIDAE												
----CERIODAPHNIA RETICULATA	--	---	--	---	--	---	--	---	--	---	37	2.7
----MOINA MICRURA	24	17.0	169	41.7	36	9.8	46	21.1	22	6.0	18	1.3
---SIDIDAE												
----DIAPHANOSOMA LEUCHTENBERGIANUM	--	---	24	5.8	8	2.2	3	1.4	--	---	--	---
---EURYCERCINAE												
----EURYCERCUS LAMELLATUS	--	---	--	---	4	1.1	--	---	--	---	--	---
--COPEPODA												
---DIAPTOMIDAE												
----DIAPTOMUS REIGHARDI	82	58.0	57	14.1	96	26.4	26	11.8	122	33.3	41	3.0
---CYCLOPIDAE												
----CYCLOPS VERNALIS	10	7.1	68	16.8	160	44.0	70	32.1	143	39.1	229	16.6
-ARACHNOIDEA												
--(HYDRACARINA)	--	---	--	---	4	1.1	3	1.4	--	---	--	---

Table 7.--Zooplankton identification, abundance and diversity-index data for Smith and Bybee Lakes--Continued

ZOOPLANKTON DATA

SMITH LAKE SITE 2

DATE	82/11/24	
SPECIES		
DIVERSITY	1.80	
DIVISION		
-CLASS		
--ORDER		
---FAMILY		
----GENUS SPECIES		
TOTAL COUNT	56.	
ORGANISMS/LITER		
	COUNT	PCT
ROTIFERA	15	24.2
-MONOGONONTA		
--PLOIMA		
---BRACHIONIDAE		
----KERATELLA	2	3.0
---ASPLANCHNIDAE		
----ASPLANCHNA	5	7.6
ARTHROPODA		
-CRUSTACEA		
--CLADOCERA		
---BOSMINIDAE		
----BOSMINA LONGIROSTRIS	21	32.0
---EURYCERCINAE		
----EURYCERCUS LAMELLATUS	7	10.6
--PODOCOPA		
---CYPRIDAE		
----CYPRIS SP.	3	4.5
--COPEPODA		
---DIAPTOMIDAE		
----DIAPTOMUS REIGHARDI	3	4.5
---CYCLOPIDAE		
----CYCLOPS VERNALIS	9	13.6

Table 7.--Zooplankton identification, abundance and diversity-index data for Smith and Bybee Lakes--Continued

ZOOPLANKTON DATA

BYBEE LAKE SITE 3

DATE	82/05/22		82/06/29		82/07/07		82/07/20		82/07/29		82/08/05	
SPECIES												
DIVERSITY	1.71		1.00		1.87		1.43		1.87		1.48	
DIVISION												
-CLASS												
--ORDER												
---FAMILY												
----GENUS SPECIES												
TOTAL COUNT	1182.		2876.		1006.		1473.		96.		37.	
ORGANISMS/LITER												
	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT
ROTIFERA	--	---	--	---	--	---	--	---	23	23.3	--	---
-MONOGONONTA												
--PLOIMA												
---BRACHIONIDAE												
----BRACHIONUS	75	6.2	214	7.4	104	10.3	--	---	--	---	--	---
----KERATELLA	193	16.5	39	1.4	121	12.0	--	---	4	4.2	--	---
---ASPLANCHNIDAE												
----ASPLANCHNA	--	---	--	---	--	---	28	1.9	--	---	--	---
ARTHROPODA												
-CRUSTACEA												
--CLADOCERA												
---BOSMINIDAE												
----BOSMINA LONGIROSTRIS	210	17.8	1787	62.1	330	32.8	425	28.9	23	23.6	5	13.5
---DAPHNIDAE												
----DAPHNIA RETROCURVA	--	---	39	1.4	52	5.2	28	1.9	2	2.1	13	35.1
----CERIODAPHNIA RETICULATA	119	10.1	175	6.1	104	10.3	113	7.7	9	9.4	5	13.5
----MOINA MICRURA	--	---	--	---	--	---	--	---	4	4.2	--	---
---EURYCERCINAE												
----EURYCERCUS LAMELLATUS	28	2.4	--	---	52	5.2	--	---	4	4.2	--	---
--COPEPODA												
---DIAPTOMIDAE												
----DIAPTOMUS REIGHARDI	9	0.8	--	---	52	5.2	481	32.7	5	5.2	11	29.8
---CYCLOPIDAE												
----CYCLOPS VERNALIS	449	37.9	622	21.6	191	19.0	396	26.9	18	18.8	3	8.1

Table 7.--Zooplankton identification, abundance and diversity-index data for Smith and Bybee Lakes--Continued

ZOOPLANKTON DATA

BYBEE LAKE SITE 3

DATE	82/08/13		82/08/20		82/08/27		82/09/16		82/09/29		82/10/12	
SPECIES DIVERSITY	1.27		1.43		1.46		1.51		1.39		1.62	
DIVISION -CLASS --ORDER ---FAMILY ----GENUS SPECIES												
TOTAL COUNT ORGANISMS/LITER	164.		17.		48.		522.		1248.		1224.	
	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT
ROTIFERA												
-MONOGONONTA												
--PLOIMA												
---BRACHIONIDAE												
----BRACHIONUS	--	---	--	---	--	---	8	1.5	10	0.8	--	---
----KERATELLA	--	---	--	---	--	---	43	8.2	--	---	155	12.6
---ASPLANCHNIDAE												
----ASPLANCHNA	--	---	7	40.0	--	---	27	5.2	83	6.6	214	17.5
---TRICHOCERICIDAE												
----TRICHOCERA-LIKE	--	---	4	25.0	--	---	--	---	--	---	--	---
ARTHROPODA												
-CRUSTACEA												
--CLADOCERA												
---BOSMINIDAE												
----BOSMINA LONGIROSTRIS	52	31.6	2	15.0	9	13.7	94	18.0	485	38.9	192	15.7
---DAPHNIDAE												
----DAPHNIA SP.	--	---	--	---	--	---	8	1.5	--	---	--	---
----DAPHNIA PARVULA	4	2.3	--	---	--	---	--	---	--	---	37	3.0
----DAPHNIA RETROCURVA	2	1.1	1	5.0	2	4.2	4	0.7	--	---	--	---
----CERIODAPHNIA RETICULATA	17	10.3	--	---	7	14.5	--	---	--	---	15	1.2
----MOINA MICRURA	--	---	--	---	--	---	51	9.8	289	23.2	52	4.2
--PODOCOPA												
---CYPRIDAE												
----CYPRIS SP.	--	---	--	---	2	4.2	--	---	--	---	15	1.2
--COPEPODA												
---DIAPTOMIDAE												
----DIAPTOMUS REIGHARDI	11	6.6	--	---	2	4.2	16	3.4	41	3.3	15	1.2
---CYCLOPIDAE												
----CYCLOPS VERNALIS	79	48.1	2	15.0	24	50.0	271	51.7	340	27.2	531	43.4
-ARACHNOIDEA												
--(HYDRACARINA)	--	---	--	---	2	4.2	--	---	--	---	--	---

Table 7.--Zooplankton identification, abundance and diversity-index data for Smith and Bybee Lakes--Continued

ZOOPLANKTON DATA

BYBEE LAKE SITE 3

DATE	82/11/24	
SPECIES		
DIVERSITY	1.35	
DIVISION		
-CLASS		
--ORDER		
---FAMILY		
----GENUS SPECIES		
TOTAL COUNT	390.	
ORGANISMS/LITER		
	COUNT	PCT
ROTIFERA		
-MONOGONONTA		
--PLOIMA		
---BRACHIONIDAE		
----KERATELLA	10	2.6
---ASPLANCHNIDAE		
----ASPLANCHNA	29	7.4
---TRICHOCERICIDAE		
----TRICHOCERA-LIKE	250	64.1
ARTHROPODA		
-CRUSTACEA		
--CLADOCERA		
---CHYDORIDAE	2	0.5
---BOSMINIDAE		
----BOSMINA LONGIROSTRIS	26	6.7
---DAPHNIDAE		
----CERIODAPHNIA RETICULATA	12	3.1
---SIDIDAE		
----SIDA CRYSTALLINA	5	1.3
---EURYCERCINAE		
----EURYCERCUS LAMELLATUS	22	5.6
--COPEPODA		
---DIAPTOMIDAE		
----DIAPTOMUS REIGHARDI	5	1.3
---CYCLOPIDAE		
----CYCLOPS VERNALIS	29	7.4

Table 8.--Benthic-invertebrate identification, abundance, and diversity-index for Smith and Bybee Lakes

[Benthic invertebrate identification by Jan Chappell, USGS, Portland, Oregon]

BENTHIC INVERTEBRATE DATA

SMITH LAKE, SITE 1

DATE	82/07/07		82/08/13	
SPECIES				
DIVERSITY	0.85		1.00	
DIVISION				
-CLASS				
--ORDER				
---FAMILY				
----GENUS SPECIES				
TOTAL COUNT	1220.		184.	
NO./SQUARE METER				
	COUNT	PCT	COUNT	PCT
NEMATODA	--	---	16	9.0
ANNELIDA				
-OLIGOCHAETA				
--HAPLOTAXIDA	--	---	8	4.3
---TUBIFICIDAE	880	72.1	128	69.4
ARTHROPODA				
-CRUSTACEA	300	24.6	--	---
-ARACHNOIDEA				
--HYDRACARINA	--	---	8	4.3
-INSECTA				
--DIPTERA				
---CHIRONOMIDAE	40	3.3	24	13.0

Table 8.--Benthic-invertebrate identification, abundance, and diversity-index for Smith and Bybee Lakes--Continued

BENTHIC INVERTEBRATE DATA

SMITH LAKE, SITE 2

	82/06/22		82/07/07		82/08/13		82/09/16		82/10/12	
DATE										
SPECIES										
DIVERSITY	1.47		0.20		1.19		1.09		1.27	
DIVISION										
-CLASS										
--ORDER										
---FAMILY										
----GENUS SPECIES										
TOTAL COUNT	580.		1196.		452.		788.		724.	
NO./SQUARE METER										
	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT
NEMATODA	--	---	4	0.3	116	25.7	176	22.3	48	6.6
ANNELIDA										
-OLIGOCHAETA										
--HAPLOTAXIDA	244	41.8	8	0.7	4	0.9	456	57.9	12	1.7
---NAIDIDAE										
----PRISTINA SP.	--	---	4	0.3	--	---	--	---	140	19.3
---TUBIFICIDAE	156	26.7	1152	96.0	168	37.2	--	---	--	---
----BRANCHIURA SOWERBYI	--	---	--	---	--	---	--	---	4	0.6
ARTHROPODA										
-CRUSTACEA										
--PODOCOPA	32	5.5	--	---	--	---	--	---	--	---
---CYPRIDAE										
----CYPRIS SP.	180	25.3	--	---	--	---	32	4.1	116	16.0
--HARPACTACOIDA	--	---	12	1.0	12	2.6	4	0.5	--	---
-ARACHNOIDEA										
--HYDRACARINA	4	0.7	8	0.7	28	6.2	--	---	8	1.1
-INSECTA										
--DIPTERA										
---CHIRONOMIDAE	--	---	8	0.7	124	27.4	116	14.7	396	54.7
BRYOZOA (STATOBLAST OR FLOATOBLAST)	--	---	--	---	--	---	4	0.5	--	---

Table 8.--Benthic-invertebrate identification, abundance, and diversity-index for Smith and Bybee Lakes--Continued

BENTHIC INVERTEBRATE DATA

BYBEE LAKE, SITE 3

DATE	82/06/22		82/07/07		82/08/05		82/09/16		82/10/12	
SPECIES DIVERSITY	0.80		1.00		0.30		1.55		1.02	
DIVISION -CLASS --ORDER ---FAMILY ----GENUS SPECIES										
TOTAL COUNT NO./SQUARE METER	2624.		312.		620.		3212.		1092.	
	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT	COUNT	PCT
NEMATODA	144	5.5	212	67.9	492	79.4	1096	34.1	48	4.4
ANNELIDA -OLIGOCHAETA										
--HAPLOTAXIDA	4	0.1	28	9.0	--	---	--	---	64	5.9
---NAIDIDAE										
----PRISTINA SP.	16	0.6	56	17.9	8	1.3	168	5.2	772	70.7
---TUBIFICIDAE	96	3.7	--	---	24	3.9	1120	34.8	20	1.8
----BRANCHIURA SOWERBYI	4	0.1	--	---	--	---	72	2.2	16	1.5
--LUMBRICULIDA										
---LUMBRICULIDAE										
----LUMBRICULUS SP.	--	---	4	1.3	--	---	--	---	--	---
-HIRUDINIA	--	---	4	1.3	12	1.9	--	---	--	---
ARTHROPODA -CRUSTACEA --PODOCOPA										
---CYPRIDAE										
----CYPRIS SP.	180	6.9	--	---	8	1.3	24	0.8	12	1.1
--HARPACTACOIDA	2136	81.5	--	---	--	---	388	12.1	--	---
--AMPHIPODA	4	0.1	--	---	--	---	--	---	--	---
-ARACHNOIDEA	--	---	--	---	4	0.6	--	---	--	---
--HYDRACARINA	--	---	--	---	56	9.0	12	0.4	--	---
-INSECTA --DIPTERA										
---CHIRONOMIDAE	40	1.5	8	2.6	--	---	304	9.5	160	14.6
BRYOZOA (STATOBLAST OR FLOATOBLAST)	--	---	--	---	16	2.6	28	0.9	--	---

Table 9.--Lakebed sediment; sample depth, description, immediate oxygen demand and volatile solids for Smith and Bybee Lakes

[Samples collected October 15, 1982]

	[1/] Sample depth (M)	Description	Immediate oxygen demand: Volume of wet sediment sample (mL)	Immediate oxygen demand: Sample temperature (°C)	Immediate oxygen demand: mgO_2/mL of sediment	Volatile solids (mg/kg) [for a 5 mL, wet sediment sample]
Smith Lake						
Site 2						
upper	.10 - .15	soft, fine, gray clay with iron oxide deposit	5	20.0	1.2	58,000
lower	.15 - .20	compact clay, no sand	5	19.7	0.1	46,700
total	.25 - .35					
Site 10						
upper	.13 - .20	soft, fine, gray clay with iron oxide (less than in site 2)	3	20.0	0.8	
			5	20.0	1.6	58,300
lower	.08 - .13	compact clay, no sand	5	19.7	0.2	56,400
total	.20 - .32					
Bybee Lake						
Site 3						
upper	.30 - .38	soft, fine, gray clay with fine sand	5	20.0	1.5	62,900
lower	.00 - .10	compact clay (less than in Smith Lake) with coarse sand, some red color	5	20.5	0.6	61,500
total	.32 - .46					
Site 8						
upper	.20 - .28	soft, fine, gray clay	5	20.0	0.9	57,000
lower	.08 - .10	compact clay (less than in Smith Lake) with no sand, slight red color	5	19.7	1.0	80,700
total	.30 - .39					

1/ Length of sediment layer collected by the core sampler.

Table 10.--Particle-size analysis of lakebed sediment in Smith and Bybee Lakes

[Collected October 15, 1982]

Site Location	Percentage of sediments by weight						
	Coarser[1/] than .053 mm diameter	Finer[2/] than .053 mm diameter	Finer[2/] than .031 mm diameter	Finer[2/] than .016 mm diameter	Finer[2/] than .008 mm diameter	Finer[2/] than .004 mm diameter	Finer[2/] than .002 mm diameter
Smith Lake							
Station 2 upper	2	98	101	81	53	33	23
lower							
1st run	5	95	93	82	62	45	29
2nd run	5	95	94	79	60	42	29
Station 10 upper	15	85	71	47	29	18	12
lower	5	95	91	71	50	29	20
Bybee Lake							
Station 3 upper	4	96	95	77	53	37	21
lower	16	84	75	52	34	26	16
Station 8 upper							
1st run	2	98	99	75	48	31	20
2nd run	2	98	96	73	46	23	19
lower							
1st run	1	99	97	80	64	44	31
2nd run	1	99	97	80	60	44	27

1/ Based on sieve diameter.
2/ Based on settling velocities in distilled water.

Table 11.--Sediment-quality data, including trace metals and nutrients for Smith and Bybee Lakes

[Samples were collected on October 15, 1982]

	TIME	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS)	BARIUM, RECOV. FM BOTTOM MATERIAL (UG/G AS BA)	BERYLLIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	CADMIUM RECOV. FM BOTTOM MATERIAL (UG/G AS CD)	CARBON, INORGANIC, TOT IN BOT MAT (G/KG AS C)	CARBON, INORG + ORGANIC TOT. IN BOT MAT (G/KG AS C)	CHROMIUM, RECOV. FM BOTTOM MATERIAL (UG/G)	COPPER, RECOV. FM BOTTOM MATERIAL (UG/G AS CU)	CYANIDE TOTAL IN BOTTOM MATERIAL (UG/G AS CN)
Smith Lake Site 2	1000	12	160	<1	1	<.1	17	7	33	<1
Smith Lake Site 10	1130	10	150	<1	2	<.1	17	6	30	<1
Bybee Lake Site 3	1300	12	100	<1	2	<.1	18	10	38	<1
Bybee Lake Site 8	1400	8	100	<1	1	<.1	18	8	35	<1

	IRON, RECOV. FM BOTTOM MATERIAL (UG/G AS FE)	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB)	MANGANESE, RECOV. FM BOTTOM MATERIAL (UG/G)	MERCURY RECOV. FM BOTTOM MATERIAL (UG/G AS HG)	NICKEL, RECOV. FM BOTTOM MATERIAL (UG/G AS NI)	NITROGEN, NH4 + ORG. TOT IN BOT MAT (MG/KG AS N)	NITROGEN, NH4 TOTAL IN BOT. MAT. (MG/KG AS N)	PHOSPHORUS, TOTAL IN BOT. MAT. (MG/KG AS P)	ZINC, RECOV. FM BOTTOM MATERIAL (UG/G AS ZN)
Smith Lake Site 2	7500	50	600	.18	10	870	31	790	110
Smith Lake Site 10	8500	40	440	.10	10	1200	<.4	750	120
Bybee Lake Site 3	8500	50	330	.19	20	1200	18	760	170
Bybee Lake Site 8	8500	40	350	.14	20	440	21	620	110

APPENDIX I

Gas-chromatograph and mass spectrometric analysis of lakebed sediments in Smith and Bybee Lakes

[Analysis by Mike Schroeder, USGS, Denver]

Sample Preparation:

Approximately 15 gm dry weight equivalent of bottom material from Smith Lake and Bybee Lake subsampled and extracted three times with methylene chloride and acetone, using an ultrasonic probe for sample agitation. 2-Fluoro-phenol and D_5-phenol were used as surrogate spiking compounds to check recoveries throughout the procedure. The extracts were combined and concentrated to 1.0 mL. D_{10}-biphenyl internal standard was added to the extracts prior to analysis on a Hewlett-Packard 5985 GC/MS system.

Analysis:

Separation of sample components was done on a 25m x 0.21mm ID SE-54 fused silica capillary column held at 35°C for 5 minutes after a 1 uL sample injection, programmed at 10°C per minute to 185°C, then at 4°C per minute to 300°C. The capillary column was coupled directly to the mass spectrometer, which was set to analyze from 35-450 atomic mass units with a scan time of 0.5 second.

Spectra corresponding to gas chromatographic peak maxima were compared by computerized library search versus the National Bureau of Standards library reference spectra. The best library matches were selected according to a "match factor" - a parameter used by the Hewlett-Packard library search algorithm to indicate the quality of the match between the sample and library spectra. Although other factors must be taken into consideration, the closer the match factor is to 1.00, the better the library match. The best computer matches were compared with the sample spectrum manually to ensure the best possible identification. Compounds identified were then categorized according to the certainty of identification, taking into consideration standards run, library matches, and whether they were present in the blank, or in the wrong chemical fraction. Compound concentrations are reported in mg/kg calculated relative to the concentration of the internal standard, a rough approximation for the purposes of a general organic GC/MS scan. The lower detection limit for neutral compounds is approximately 0.1 mg/kg, for acidic and basic compounds approximataely 1 mg/kg.

Results:

None of the EPA priority pollutants were positively identified as actually being in the samples. The major components of the samples appear to be aliphatic hydrocarbons (0.2 to 0.8 mg/kg); however, no specific identifications could be made due to the complexity of the spectra. Other major peaks were identified as sulfur (0.1 to 1.1 mg/kg).

*GPO 1983 694-932