UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

WATER-QUALITY RECONNAISSANCE OF PATTON LAKE, JEFFERSON COUNTY, ARKANSAS

Open-File Report 81-806

Prepared in cooperation with the

U.S. SOIL CONSERVATION SERVICE

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UNITED STATES DEPARTMENT OF THE INTERIOR

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GEOLOGICAL SURVEY

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METRIC CONVERSIONS

Multiply inch-pound unit	By	To obtain metric unit
acre	0.4047	hectare
foot	.3048	meter
mile	1.609	kilometer
inch	25.40	millimeter

WATER-QUALITY RECONNAISSANCE OF PATTON LAKE, JEFFERSON COUNTY, ARKANSAS

By James C. Petersen

ABSTRACT

Results of a study (summer of 1980) of pesticides, nutrients, and other water-quality characteristics of the water and bottom material of Patton Lake indicate that the lake is nutrient enriched and that several pesticides are present in the bottom material. The high pH (9.0 to 9.3) and large dissolved-oxygen concentrations (8.7 to 10.8 milligrams per liter) on August 29 indicate significant primary production. Organic-nitrogen concentrations ranged from 1.1 to 3.0 milligrams per liter (as nitrogen). Ammonia-nitrogen concentrations ranged from 0.03 to 0.05 milligram per liter (as nitrogen). Orthophosphate concentrations ranged from 0.01 to 0.14 milligram per liter (as phosphorus). Total phosphorus ranged from 0.01 to 0.20 milligram per liter. In bottom-material samples, concentrations of organic-plus-ammonia nitrogen ranged from 5,400 to 10,000 milligrams per kilogram; total phosphorus concentrations ranged from 830 to 1,400 milligrams per kilogram; and inorganic-plus-organic carbon concentrations ranged from 70 to 106 grams per kilogram. Concentrations of DDT in bottom material did not exceed 43 micrograms per kilogram. Concentrations of DDD and of DDE exceeded 150 micrograms per kilogram in most bottom-material samples. Aldrin, chlordane, dieldrin, endrin, heptachlor, and lindane also were detected in bottom material. Toxaphene, a principal contaminant present in fish from the lake, was not detected in any bottom-material samples.

INTRODUCTION

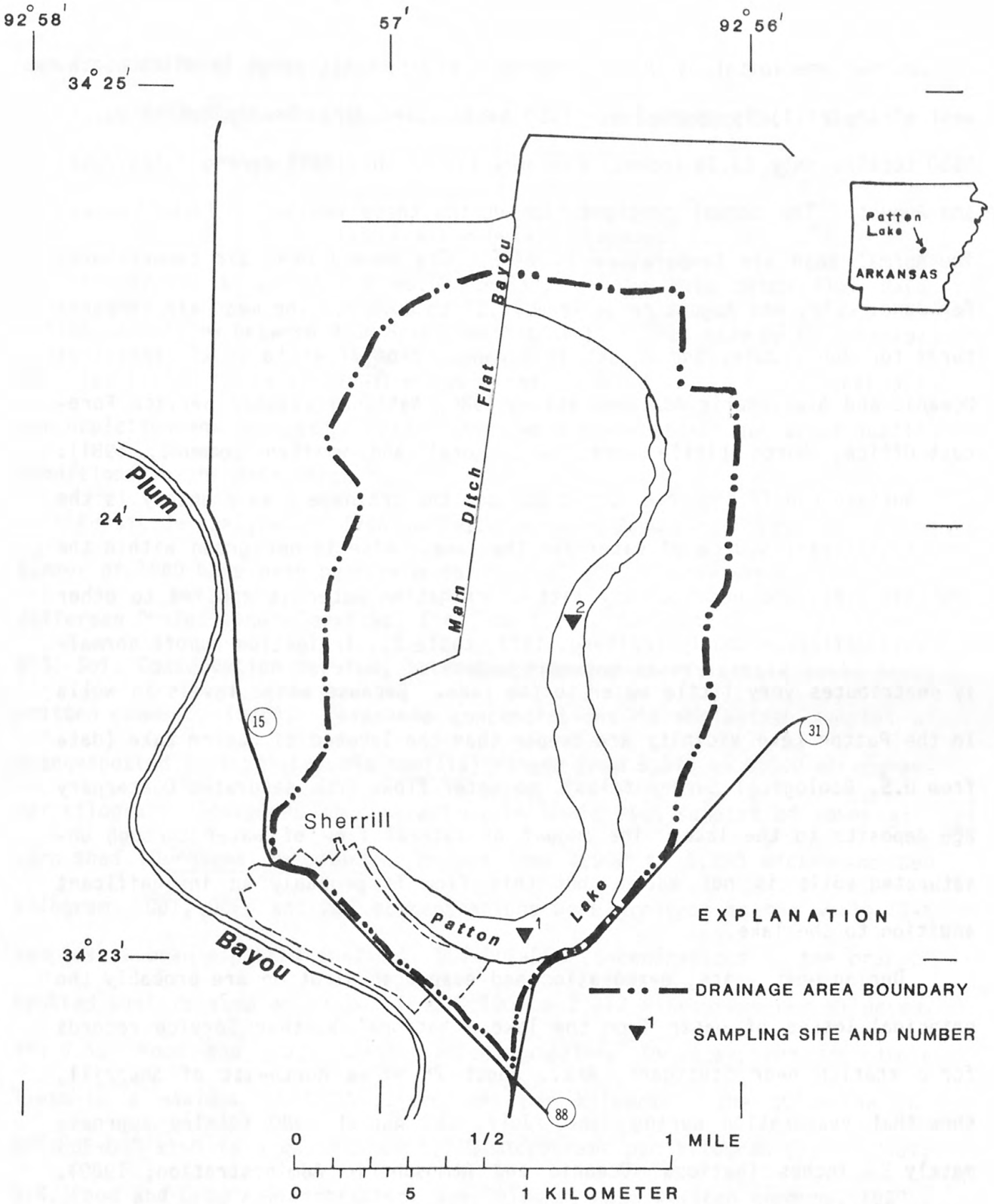
Purpose and Scope

This report documents the results of a study of pesticides, nutrients, arsenic, and lead in the water and bottom material of Patton Lake during the summer of 1980. The report was prepared by the U.S. Geological Survey, in cooperation with the U.S. Soil Conservation Service, to determine existing water quality. Identification of water-quality problems will allow the Soil Conservation Service to determine the feasibility of applying land-treatment practices for improving the water quality and the fish and wildlife habitat of the lake.

Description of Patton Lake and Its Drainage Area

Patton Lake is a small oxbow lake (approximately 160 acres) in Jefferson County, in southeast Arkansas (fig. 1). Previously the lake was probably connected with Plum Bayou. The lake is shallow (depth was generally 5 feet or less during the sampling period) and has a lakebed altitude of approximately 205 feet (National Geodetic Vertical Datum of 1929). Sherrill, Ark. (population approximately 200), borders the southern tip of the lake.

A drainage area of about 1,000 acres, which has a maximum land-surface altitude of about 215 feet (National Geodetic Vertical Datum of 1929), surrounds the lake. Approximately 56 percent of the area drained by the lake is planted in cotton, 37 percent is planted in soybeans, 5 percent is woodlands, and about 2 percent is used for other purposes. Some of this drainage area also is drained by the Main Ditch Flat Bayou (fig. 1). However, a pipe does connect Main Ditch with a drainage leading to the northern tip of Patton Lake, and some runoff flowing into Main Ditch may flow into Patton Lake (U.S. Soil Conservation Service Watershed Planning Staff, Little Rock, Ark., written and oral commun., 1980).



Base from U.S. Geological Survey
Sherrill, 1963

Figure 1.—Patton Lake drainage area and location of sampling sites.

Normal precipitation in the area (Pine Bluff, Ark., about 15 miles southwest of Sherrill) is approximately 50 inches per year. Precipitation during 1980 totaled only 29.39 inches, and only 1.75 inches fell during June, July, and August. The normal precipitation during these months is 10.56 inches. The normal mean air temperature is 64°F. The normal mean air temperatures for June, July, and August range from 77.5° to 80.0°F. The mean air temperatures for June, July, and August 1980 ranged from 78.4° to 87.2°F (National Oceanic and Atmospheric Administration, 1980; National Weather Service Forecast Office, North Little Rock, Ark., oral and written commun., 1981).

Surface runoff from precipitation upon the drainage area probably is the only significant source of water for the lake. Rice is not grown within the drainage area, and because very little irrigation water is applied to other crops in Jefferson County (Halberg, 1977, table 2), irrigation runoff normally contributes very little water to the lake. Because water levels in wells in the Patton Lake vicinity are deeper than the lakebed of Patton Lake (data from U.S. Geological Survey files), no water flows from saturated Quaternary age deposits to the lake. The amount of lateral flow of water through unsaturated soils is not known, but this flow is probably an insignificant addition to the lake.

During most years, evaporation and evapotranspiration are probably the principal losses of water from the lake. National Weather Service records for a station near Stuttgart, Ark., about 25 miles northeast of Sherrill, show that evaporation during June, July, and August 1980 totaled approximately 27 inches (National Oceanic and Atmospheric Administration, 1980). However, during 1980 some water was removed from the lake for irrigation. Because of the clay and sandy clay at the upper surface of the Quaternary

age deposits near Sherrill (Klein and others, 1950, fig. 2), loss of lake water to the ground water is probably minimal (M. E. Broom, U.S. Geological Survey, oral commun., 1981).

Previous Water-Quality Studies

A previous study of the water quality of the Main Ditch Flat Bayou (which originates between Plum Bayou and Patton Lake) was made by Lamb (1979). Results of chemical analyses from two sites on the ditch indicated that oxygen depletion and pesticide contamination were the most serious water-quality conditions in the Main Ditch.

Pesticide analyses of fish and mussels taken from Patton Lake during the summer of 1980 have been performed for the U.S. Soil Conservation Service by Jefferson Professional Services, Inc., of Little Rock, Ark., (D. R. Linder, U.S. Soil Conservation Service, Watershed Planning Staff, Little Rock, Ark., written commun., 1980). Toxaphene concentrations in whole-fish samples of orangespotted sunfish (*Lepomis humilis*) ranged from 5,010 to 8,090 micrograms per kilogram. Toxaphene concentrations in whole-fish samples of young gizzard shad (*Dorosoma cepedianum*) ranged from 1,900 to 5,290 micrograms per kilogram. DDT, DDE, and DDD concentrations were greatest in the whole-fish samples of orangespotted sunfish. DDT+DDE+DDD concentrations in the orangespotted sunfish samples ranged from 2,290 to 2,970 micrograms per kilogram. The U.S. Food and Drug Administration guideline for toxaphene in edible flesh is a maximum of 5,000 micrograms per kilogram. The guideline for DDT+DDE+DDD also is a maximum of 5,000 micrograms per kilogram (J. A. Gaul, U.S. Food and Drug Administration, New Orleans, La., written commun., 1980). However, because pesticide concentrations generally are greater in whole-fish

samples than in edible-flesh samples, it cannot be assumed that the Food and Drug Administration guideline for toxaphene in edible flesh was exceeded. Toxaphene, DDT, DDE, and DDD were present in smaller concentrations in whole-fish samples of golden shiner (Notemigonus crysoleucas), small yellow bullhead (Ictaluras natalis), small bluegill (Lepomis macrochirus), and in the flesh of large gizzard shad and mussels. No other species of fish were analyzed and no other organochlorine or organophosphorus pesticides were detected.

DATA COLLECTION

Two sampling sites on Patton Lake were selected (fig. 1): (1) Patton Lake at Sherrill, and (2) Patton Lake near Tucker. At each site water samples were collected from a depth of 1 foot and analyzed for 5-day biochemical oxygen demand, turbidity, specific conductance, pH, and selected forms of nitrogen and phosphorus. Fecal-coliform and fecal-streptococcal bacteria concentrations also were determined. In addition, the upper 1 to 2 inches of bottom material also was collected at each site using a US BMH-60 sampler. The bottom-material samples were analyzed for arsenic, lead, inorganic and organic carbon, selected forms of nitrogen, total phosphorus, polychlorinated biphenyls (PCB's), polychlorinated naphthalenes (PCN's), and selected organochlorine and organophosphorus pesticides. Reservoir depth (at the sampling site) and Secchi-disk transparency were measured as the samples were collected. Water temperature and dissolved-oxygen concentration were measured at the water surface and at a depth of 1 foot. Results of all analyses are shown in tables 1 and 2.

Table 1.--Chemical, physical, and biological data, Patton Lake at Sherrill, Ark. (site 1)

[Ft, feet; (5-digit number), National Water Data Storage and Retrieval System parameter code number; DEG C, degrees Celsius; MG/L, milligrams per liter; BIOCHEM UNINHIB, biochemical uninhibited; IN, inches; NTU, nephelometric turbidity units; UM, micrometers; MF, membrane filter; COLS., colonies; ML, milliliters; K, plate count outside ideal range; NH4, ammonia; BOT MAT, bottom material; MG/KG, milligrams per kilogram; ORG, organic; TOT, total; G/KG, grams per kilogram; UG/G, micrograms per gram; RECOV., recoverable; UG/KG, micrograms per kilogram]

DATE (1980)	TIME	SAMPLING DEPTH (FT) (00003)	RESERVOIR DEPTH (FEET) (72025)	TEMPERATURE, WATER (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	OXYGEN DEMAND, BIOCHEM UNINHIB 5 DAY (MG/L) (00310)
JUN							
11...	1040	.0	5.0	27.5	7.6	95	--
11...	1045	1.0	5.0	27.5	7.5	94	4.1
AUG							
29...	1225	.0	2.0	28.0	10.0	126	--
29...	1230	1.0	2.0	27.0	8.7	107	9.2

DATE (1980)	TRANSPARENCY (SECCHI DISK) (IN) (00077)	TURBIDITY (NTU) (00076)	SPECIFIC CONDUCTANCE (MICROMHOS) (00095)	PH FIELD (UNITS) (00400)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML) (31625)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	NITROGEN, ORGANIC TOTAL (MG/L AS N) (00605)
JUN							
11...	24.0	--	--	--	--	--	--
11...	--	13	52	7.5	4	6	1.1
AUG							
29...	5.0	--	--	--	--	--	--
29...	--	38	94	9.0	K44	K26	3.0

Table 1.--Chemical, physical, and biological data, Patton Lake at Sherrill, Ark. (site 1)--Continued

DATE (1980)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)	NITROGEN, NITRATE TOTAL (MG/L AS N) (00620)	NITROGEN, TOTAL (MG/L AS N) (00600)	NITROGEN,NH4 TOTAL IN BOT. MAT. (MG/KG AS N) (00611)	NITROGEN,NH4 + ORG. TOT IN BOT MAT (MG/KG AS N) (00626)	NITROGEN, NO2+NO3 TOT. IN BOT MAT (MG/KG AS N) (00633)
JUN 11...	.040	.000	.00	1.1	120	6430	3.6
AUG 29...	.050	.000	.00	3.0	220	5400	.0

DATE (1980)	PHOSPHORUS, ORTHOPHOSPHATE TOTAL (MG/L AS P) (70507)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, TOTAL IN BOT. MAT. (MG/KG AS P) (00668)	CARBON, INORGANIC, TOT IN BOT MAT (G/KG AS C) (00686)	CARBON, INORG + ORGANIC TOT. IN BOT MAT (G/KG AS C) (00693)	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS) (01003)	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB) (01052)
JUN 11...	.100	.200	830	.0	70	16	20
AUG 29...	.010	.010	1400	--	77	15	30

DATE (1980)	ALDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG) (39333)	CHLORDANE, TOTAL IN BOTTOM MATERIAL (UG/KG) (39351)	DDD, TOTAL IN BOTTOM MATERIAL (UG/KG) (39363)	DDE, TOTAL IN BOTTOM MATERIAL (UG/KG) (39368)	DDT, TOTAL IN BOTTOM MATERIAL (UG/KG) (39373)	DIAZINON, TOTAL IN BOTTOM MATERIAL (UG/KG) (39571)	DIELDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG) (39383)
JUN 11...	.0	0	250	240	18	.0	1.9
AUG 29...	.0	0	<120	<190	20	.0	.0

Table 1.--Chemical, physical, and biological data, Patton Lake at Sherrill, Ark. (site 1)--Continued

DATE (1980)	ENDO-SULFAN, TOTAL IN BOTTOM MATERIAL (UG/KG) (39389)	ENDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG) (39393)	ETHION, TOTAL IN BOTTOM MATERIAL (UG/KG) (39399)	HEPTA-CHLOR, TOTAL IN BOTTOM MATERIAL (UG/KG) (39413)	HEPTA-CHLOR EPOXIDE TOT. IN BOTTOM MATL. (UG/KG) (39423)	LINDANE TOTAL IN BOTTOM MATERIAL (UG/KG) (39343)
JUN 11...	.0	1.4	.0	.0	.0	.2
AUG 29...	.0	.0	.0	.0	.0	.0

DATE (1980)	MALA-THION, TOTAL IN BOTTOM MATERIAL (UG/KG) (39531)	METH-OXY-CHLOR, TOT. IN BOTTOM MATL. (UG/KG) (39481)	METHYL PARA-THION, TOT. IN BOTTOM MATL. (UG/KG) (39601)	METHYL TRI-THION, TOT. IN BOTTOM MATL. (UG/KG) (39791)	PARA-THION, TOTAL IN BOTTOM MATERIAL (UG/KG) (39541)	PCB, TOTAL IN BOTTOM MATERIAL (UG/KG) (39519)
JUN 11...	.0	.0	.0	.0	.0	0
AUG 29...	.0	.0	.0	.0	.0	0

DATE (1980)	PCN, TOTAL IN BOTTOM MATERIAL (UG/KG) (39251)	PER-THANE IN BOTTOM MATERIL (UG/KG) (81886)	TOXA-PHENE, TOTAL IN BOTTOM MATERIAL (UG/KG) (39403)	TRI-THION, TOTAL IN BOTTOM MATERIAL (UG/KG) (39787)	CHLOR-PYRIFOS, IN BOTTOM MATERIAL (UG/KG)	EPN, IN BOTTOM MATERIAL (UG/KG)
JUN 11...	.0	.00	0	.0	<.1	<.1
AUG 29...	.0	.00	0	.0	<.1	<.5

Table 2.--Chemical, physical, and biological data, Patton Lake near Tucker, Ark. (site 2)

[Ft, feet; (5-digit number), National Water Data Storage and Retrieval System parameter code number; DEG C, degrees Celsius; MG/L, milligrams per liter; BIOCHEM UNINHIB, biochemical uninhibited; IN, inches; NTU, nephelometric turbidity units; UM, micrometers; MF, membrane filter; COLS., colonies; ML, milliliters; K, plate count outside ideal range; NH4, ammonia; BOT MAT, bottom material; MG/KG, milligrams per kilogram; ORG, organic; TOT, total; G/KG, grams per kilogram; UG/G, micrograms per gram; RECOV., recoverable; UG/KG, micrograms per kilogram]

DATE (1980)	TIME	SAMPLING DEPTH (FT) (00003)	RESERVOIR DEPTH (FEET) (72025)	TEMPERATURE, WATER (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	OXYGEN DEMAND, BIOCHEM UNINHIB 5 DAY (MG/L) (00310)
JUN							
11...	1110	.0	4.0	27.0	7.8	96	--
11...	1115	1.0	4.0	26.5	7.7	94	3.3
AUG							
29...	1255	.0	2.0	30.0	10.6	138	--
29...	1300	1.0	2.0	29.5	10.8	139	8.4

DATE (1980)	TRANSPARENCY (SECCHI DISK) (IN) (00077)	TURBIDITY (NTU) (00076)	SPECIFIC CONDUCTANCE (MICROMHOS) (00095)	PH FIELD (UNITS) (00400)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML) (31625)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	NITROGEN, ORGANIC TOTAL (MG/L AS N) (00605)
JUN							
11...	18.0	--	--	--	--	--	--
11...	--	13	53	7.6	5	4	1.2
AUG							
29...	6.0	--	--	--	--	--	--
29...	--	25	108	9.3	4	10	2.7

Table 2.--Chemical, physical, and biological data, Patton Lake near Tucker, Ark. (site 2)--Continued

DATE (1980)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)	NITROGEN, NITRATE TOTAL (MG/L AS N) (00620)	NITROGEN, TOTAL (MG/L AS N) (00600)	NITROGEN,NH4 TOTAL IN BOT. MAT. (MG/KG AS N) (00611)	NITROGEN,NH4 + ORG. TOT IN BOT MAT (MG/KG AS N) (00626)	NITROGEN, NO2+NO3 TOT. IN BOT MAT (MG/KG AS N) (00633)
JUN 11...	.040	.000	.00	1.2	200	9250	.0
AUG 29...	.030	.010	.00	2.7	190	10000	.0

DATE (1980)	PHOSPHORUS, ORTHOPHOSPHATE TOTAL (MG/L AS P) (70507)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, TOTAL IN BOT. MAT. (MG/KG AS P) (00668)	CARBON, INORGANIC, TOT IN BOT MAT (G/KG AS C) (00686)	CARBON, INORG + ORGANIC TOT. IN BOT MAT (G/KG AS C) (00693)	ARSENIC TOTAL IN BOTTOM MATERIAL (UG/G AS AS) (01003)	LEAD, RECOV. FM BOTTOM MATERIAL (UG/G AS PB) (01052)
JUN 11...	.140	.200	1300	.1	74	15	40
AUG 29...	.010	.010	1100	.0	106	17	40

DATE (1980)	ALDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG) (39333)	CHLORDANE, TOTAL IN BOTTOM MATERIAL (UG/KG) (39351)	DDD, TOTAL IN BOTTOM MATERIAL (UG/KG) (39363)	DDE, TOTAL IN BOTTOM MATERIAL (UG/KG) (39368)	DDT, TOTAL IN BOTTOM MATERIAL (UG/KG) (39373)	DIAZINON, TOTAL IN BOTTOM MATERIAL (UG/KG) (39571)	DIELDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG) (39383)
JUN 11...	.1	0	300	150	43	.0	1.1
AUG 29...	.0	<60	<190	200	<25	.0	.0

Table 2.--Chemical, physical, and biological data, Patton Lake near Tucker, Ark. (site 2)--Continued

DATE (1980)	ENDO-SULFAN, TOTAL IN BOT-TOM MA-TERIAL (UG/KG) (39389)	ENDRIN, TOTAL IN BOT-TOM MA-TERIAL (UG/KG) (39393)	ETHION, TOTAL IN BOT-TOM MA-TERIAL (UG/KG) (39399)	HEPTA-CHLOR, TOTAL IN BOT-TOM MA-TERIAL (UG/KG) (39413)	HEPTA-CHLOR EPOXIDE TOT. IN BOTTOM MATL. (UG/KG) (39423)	LINDANE TOTAL IN BOT-TOM MA-TERIAL (UG/KG) (39343)
JUN 11...	.0	1.0	.0	.1	.0	.5
AUG 29...	.0	.0	.0	.0	.0	.4

DATE (1980)	MALA-THION, TOTAL IN BOT-TOM MA-TERIAL (UG/KG) (39531)	METH-OXY-CHLOR, TOT. IN BOTTOM MATL. (UG/KG) (39481)	METHYL PARA-THION, TOT. IN BOTTOM MATL. (UG/KG) (39601)	METHYL TRI-THION, TOT. IN BOTTOM MATL. (UG/KG) (39791)	PARA-THION, TOTAL IN BOT-TOM MA-TERIAL (UG/KG) (39541)	PCB, TOTAL IN BOT-TOM MA-TERIAL (UG/KG) (39519)
JUN 11...	.0	.0	.0	.0	.0	0
AUG 29...	.0	.0	.0	.0	.0	0

DATE (1980)	PCN, TOTAL IN BOT-TOM MA-TERIAL (UG/KG) (39251)	PER-THANE IN BOTTOM MATERIL (UG/KG) (81886)	TOXA-PHENE, TOTAL IN BOT-TOM MA-TERIAL (UG/KG) (39403)	TRI-THION, TOTAL IN BOT-TOM MA-TERIAL (UG/KG) (39787)	CHLOR-PYRIFOS, IN BOT-TOM MA-TERIAL (UG/KG)	EPN, IN BOT-TOM MA-TERIAL (UG/KG)
JUN 11...	.0	.00	0	.0	<.1	<.1
AUG 29...	.0	.00	0	.0	<.1	<.5

RESULTS AND INTERPRETATION OF DATA

Bacteriological sampling conducted during this study did not indicate that concentrations of fecal-coliform bacteria exceeded Arkansas water-quality standards (Arkansas Department of Pollution Control and Ecology, 1975). The greatest number of bacteria occurred on August 29, at site 1, when 44 fecal-coliform colonies per 100 milliliters and 26 fecal-streptococcal colonies per 100 milliliters were present.

Several analyses and measurements indirectly indicated that Patton Lake supported large algal populations during August 1980. Large dissolved-oxygen concentrations (8.7 to 10.8 milligrams per liter, 107 to 139 percent saturation) at the surface and at a depth of 1 foot indicated that photosynthesis was occurring at a high rate. Low dissolved-oxygen concentrations at night were probable (because of the oxygen needed by algae for respiration and because oxygen is not produced by photosynthesis at night). The biochemical oxygen demand and high pH (9.0 to 9.3) also indicated a high rate of photosynthesis. The Secchi-disk transparency (6 inches) and turbidity (25 to 38 nephelometric turbidity units) may have indicated the presence of large amounts of both suspended sediment and plankton.

Organic and ammonia nitrogen were the only forms of nitrogen detected in water samples at either site. The August 29 concentrations of organic nitrogen were approximately two to three times those on June 11, but concentrations on both dates indicated significant additions of nitrogen to the lake. The absence of nitrites and nitrates in the well-oxygenated water indicated that nitrate is used very rapidly by algae and that nitrate may be the limiting nutrient.

Concentrations of orthophosphate (0.10 to 0.14 milligram per liter) and total phosphorus (0.20 milligram per liter) in water samples were large on June 11, but total phosphorus concentrations were very small (0.01 milligram per liter) on August 29. The small concentrations of total phosphorus present on August 29 were not an indication that there was a large phytoplankton population (which was indicated by the dissolved-oxygen and pH measurements), because phosphorus stored within algal cells would have been detected in the analysis of total phosphorus. This discrepancy may be an indication that there were motile phytoplankton, concentrated less than 1 foot from the water surface, that were not collected in the water samples.

Nutrient concentrations in bottom-material samples were compared with concentrations in samples from lakes and streams of different trophic stages (from oligotrophic to eutrophic) and regions (Frey, 1963, p. 81; Konrad and others, 1970; Bortleson and others, 1974; U.S. Geological Survey, 1978, p. 180; Lamb, 1978a, 1978b; Bryant and others, 1979). Bottom-material samples contained moderately large to large concentrations of ammonia-plus-organic nitrogen (5,400 to 10,000 milligrams per kilogram). Nitrate and nitrite generally were nonexistent in the bottom material, and the absence is an indication that the bottom material was anaerobic. Moderate concentrations of phosphorus (830 to 1,400 milligrams per kilogram) and large concentrations of organic carbon (70 to 106 grams per kilogram) were present in bottom-material samples.

Concentrations of lead and arsenic in the bottom material were not large, but they may be somewhat greater than naturally occurring concentrations. Potential sources of lead and arsenic include exhaust emissions, lead shot, and arsenical pesticides.

DDT, DDE, and DDD concentrations in bottom-material samples from both sites greatly exceeded concentrations present in samples recently collected from several streambeds in eastern Arkansas (Lamb, 1978a; Bryant and others, 1979; Lamb, 1979; U.S. Geological Survey, 1978-80, see L'Anguille River near Colt, Cache River at Patterson, and Bayou DeView at Morton). Aldrin, chlordane, dieldrin, endrin, heptachlor, and lindane also were detected. Toxaphene was not detected in any bottom-material samples.

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