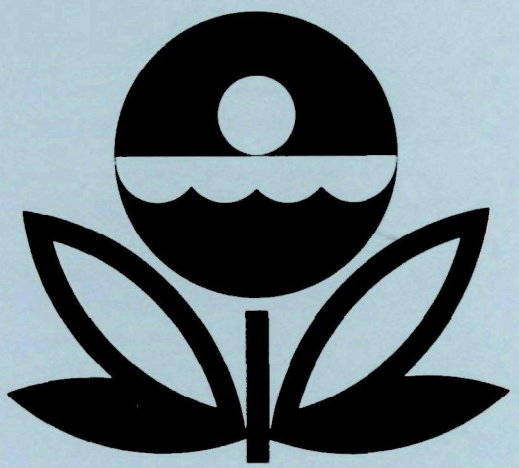
U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL EUTROPHICATION SURVEY

WORKING PAPER SERIES



REPORT

ON

HAUSER LAKE

KOOTENAI COUNTY

IDAHO

EPA REGION X

WORKING PAPER No. 780

CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY - CORVALLIS, OREGON

and

ENVIRONMENTAL MONITORING & SUPPORT LABORATORY - LAS VEGAS, NEVADA

REPORT
ON
HAUSER LAKE
KOOTENAI COUNTY
IDAHO
EPA REGION X
WORKING PAPER No. 780

WITH THE COOPERATION OF THE
IDAHO DEPARTMENT OF HEALTH AND WELFARE
AND THE
IDAHO NATIONAL GUARD

JULY, 1977

REPORT ON HAUSER LAKE

KOOTENAI COUNTY, IDAHO

EPA REGION X

by

National Eutrophication Survey

Water and Land Quality Branch
Monitoring Operations Division
Environmental Monitoring & Support Laboratory
Las Vegas, Nevada

and

Special Studies Branch
Corvallis Environmental Research Laboratory
Corvallis, Oregon

Working Paper No. 780

OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY

CONTENTS

FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point source discharge reduction and nonpoint source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's freshwater lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by the U.S. Environmental Protection Agency and to augment plans implementation by the states.

ACKNOWLEDGMENTS

The staff of the National Eutrophication Survey (Office of Research and Development, U.S. Environmental Protection Agency) expresses sincere appreciation to the Idaho Department of Health and Welfare for professional involvement, to the Idaho National Guard for conducting the tributary sampling phase of the Survey, and to those Idaho wastewater treatment plant operators who provided effluent samples and flow data.

The staff of the State of Idaho Department of Health and Welfare, Division of Environment, provided invaluable lake documentation and counsel during the Survey, reviewed the preliminary reports and provided critiques most useful in the preparation of this Working Paper Series.

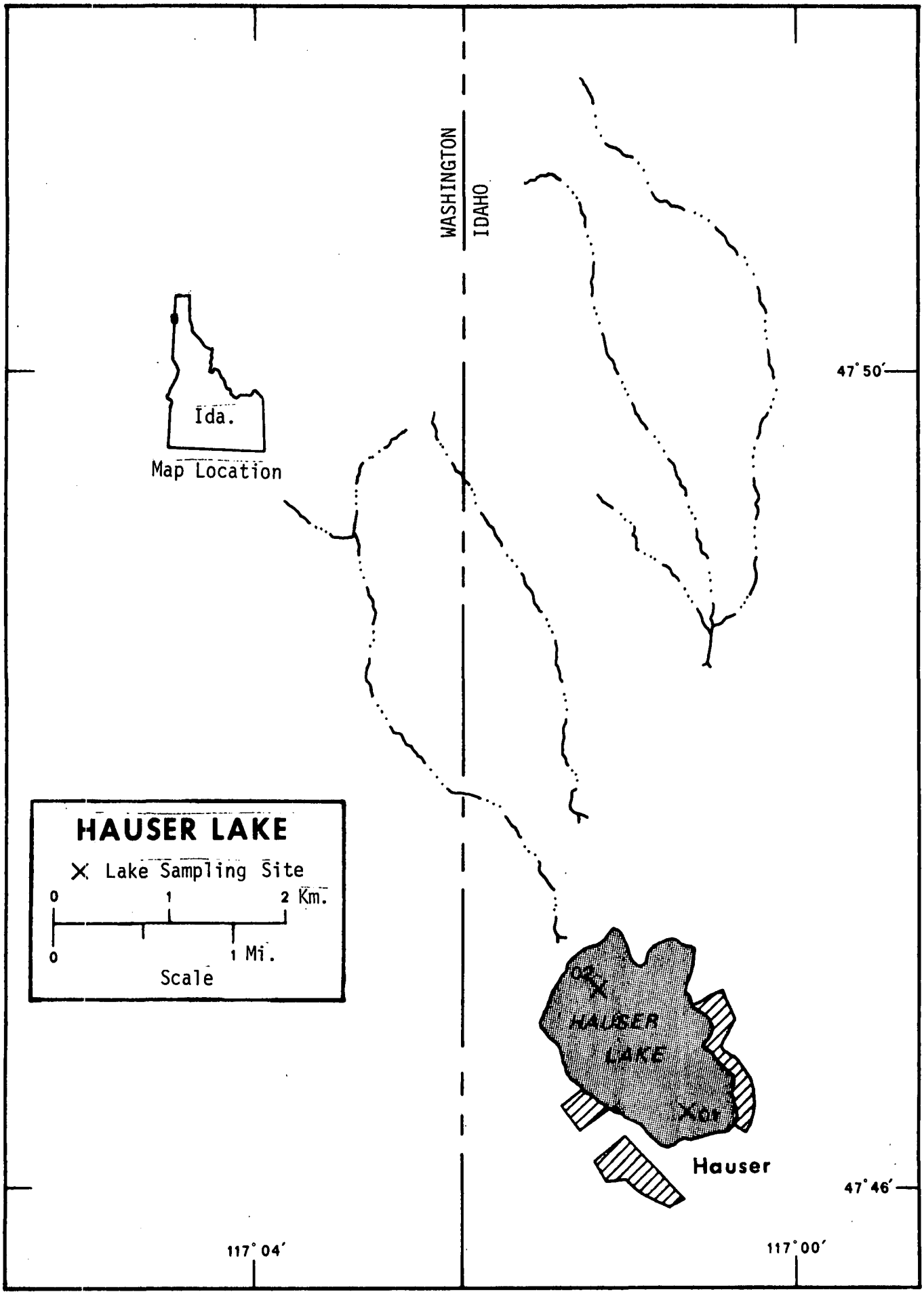
Major General James S. Brooks, Adjutant General of Idaho, and Project Officer Major Vestal L. Baker, who directed the volunteer efforts of the Idaho National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF IDAHO

LAKE NAME	COUNTY
American Falls Reservoir	Bannock, Bingham, Power
Cascade Reservoir	Valley
Coeur d'Alene Lake	Benewah, Kootenai
Dworshak Reservoir	Clearwater
Hauser Lake	Kootenai
Hayden Lake	Kootenai
Island Park Reservoir	Fremont
Lake Lowell (Deer Flat Reservoir)	Canyon
Magic Reservoir	Blaine, Camas
Palisades Reservoir	Bonneville (Lincoln in WY)
Payette Lake	Valley
Lower Twin Lake	Kootenai
Upper Twin Lake	Kootenai


WASHINGTON
IDAHO
Ida.
Map Location
47°50′
HAUSER LAKE
Lake Sampling Site
0 1 2 Km.
0 1 Mi.
Scale
HAUSER LAKE
Hauser
47°46′
117°04′
117°00′

REPORT ON HAUSER LAKE, IDAHO

STORET NO. 1605

I. INTRODUCTION

Hauser Lake was included in the National Eutrophication Survey (NES) as a water body of special interest to the Idaho Department of Health and Welfare. Tributaries and nutrient sources were not sampled, and this report relates only to the data obtained from lake sampling.

II. CONCLUSIONS

A. Trophic Condition:*

Based upon Survey data, Hauser Lake is considered eutrophic, i.e., nutrient rich and highly productive. Whether such nutrient enrichment is to be considered beneficial or deleterious is determined by its actual or potential impact upon designated beneficial water uses of each lake.

Chlorophyll a levels in the lake ranged from 1.8 µg/l to 35.6 µg/l with a mean of 11.1 µg/l. Hypolimnetic oxygen levels in the lake were severely depressed during September, and the potential for primary productivity as measured by algal assay control yields was high during September and October. Of the 13 Idaho lakes sampled in 1974, 5 had higher median total phosphorus, 4 had higher median inorganic nitrogen and 3 had higher median orthophosphorus levels than

*See Appendix C.

Hauser Lake; ammonia and phosphorus were especially high in the hypolimnion at Station 01 during September and October.

Survey limnologists reported algal blooms and floating algal mats throughout the lake in June and July, as well as some floating aquatic macrophytes (water lilies, duckweed). Other studies (Idaho Department of Water Resources, et al. 1975) indicate poor water quality in Hauser Lake can be mainly attributed to excessive residential development with inadequate septic systems, and agricultural runoff.

B. Rate-Limiting Nutrient:

The algal assay results indicate Hauser Lake was limited by available phosphorus during June sampling, but by nitrogen during September and October assay sample collections. The lake data suggest primary limitation by nitrogen on all sampling occasions.

III. LAKE CHARACTERISTICS

A. Lake Morphometry:*

1. Surface area: 2.43 km^2.
2. Mean depth: 1.2 meters.
3. Maximum depth: 12.2 meters.
4. Volume: 2.837 x 10^6 m^3.

B. Precipitation:

1. Year of sampling: 86.1 cm.
2. Mean annual: 84.2 cm.

*Lake surface area, mean depth and volume provided by Herman Ray (1976). Maximum depth was estimated on the basis of National Eutrophication Survey (NES) sampling data.

IV. LAKE WATER QUALITY SUMMARY

Hauser Lake was sampled four times during the open-water season of 1975 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from two stations on the lake and from a number of depths at each station (see map, page v). During each visit, depth-integrated samples were collected from each station for chlorophyll a analysis and phytoplankton identification and enumeration. During the first and last visits, 18.9-liter depth-integrated samples were composited for algal assays. Maximum depths sampled were 10.7 meters at Station 01 and 7.3 meters at Station 02. For a more detailed explanation of NES methods, see NES Working Paper No. 175.

The results obtained are presented in full in Appendix B and are summarized in III-A for waters at the surface and at the maximum depth for each site. Results of the phytoplankton counts and chlorophyll a determinations are included in III-B. Results of the limiting nutrient study are presented in III-C.

PHYSICAL AND CHEMICAL CHARACTERISTICS

(10/23/75)

S*** = 2

PARAMETER	N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)
TEMPERATURE (DEG CENT)				
0.-1.5 M DEPTH	4	11.7- 11.9	11.9	0.0- 1.5
MAX DEPTH**	2	9.0- 11.3	10.1	7.3- 10.7
DISSOLVED OXYGEN (MG/L)				
0.-1.5 M DEPTH	4	7.2- 7.8	7.5	0.0- 1.5
MAX DEPTH**	2	0.6- 7.8	4.2	7.3- 10.7
CONDUCTIVITY (UMHOS)				
0.-1.5 M DEPTH	4	43.- 46.	45.	0.0- 1.5
MAX DEPTH**	2	53.- 64.	59.	7.3- 10.7
PH (STANDARD UNITS)				
0.-1.5 M DEPTH	4	7.1- 7.8	7.3	0.0- 1.5
MAX DEPTH**	2	6.9- 7.1	7.0	7.3- 10.7
TOTAL ALKALINITY (MG/L)				
0.-1.5 M DEPTH	4	20.- 32.	24.	0.0- 1.5
MAX DEPTH**	2	18.- 28.	23.	7.3- 10.7
TOTAL P (MG/L)				
0.-1.5 M DEPTH	4	0.029-0.043	0.033	0.0- 1.5
MAX DEPTH**	2	0.026-0.632	0.329	7.3- 10.7
DISSOLVED ORTHO P (MG/L)				
0.-1.5 M DEPTH	4	0.010-0.016	0.013	0.0- 1.5
MAX DEPTH**	2	0.007-0.454	0.230	7.3- 10.7
NO2+NO3 (MG/L)				
0.-1.5 M DEPTH	4	0.020-0.020	0.020	0.0- 1.5
MAX DEPTH**	2	0.020-0.030	0.025	7.3- 10.7
AMMONIA (MG/L)				
0.-1.5 M DEPTH	4	0.070-0.090	0.080	0.0- 1.5
MAX DEPTH**	2	0.070-0.890	0.480	7.3- 10.7
KJELDAHL N (MG/L)				
0.-1.5 M DEPTH	4	0.400-0.400	0.400	0.0- 1.5
MAX DEPTH**	2	0.400-1.200	0.800	7.3- 10.7
SECCHI DISC (METERS)				
	2	2.7- 3.0	2.9	

* N = NO. OF SAMPLES
** MAXIMUM DEPTH SAMPLED AT EACH SITE
*** S = NO. OF SITES SAMPLED ON THIS DATE

HAUSER
STORET CODE 1605

PHYSICAL AND CHEMICAL CHARACTERISTICS

PARAMETER	N*	(6/ 3/75) S*** = 2 RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	N*	(7/23/75) S*** = 2 RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	N*	(9/10/75) S*** = 2 RANGE	MEDIAN	MAX DEPTH RANGE (METERS)
TEMPERATURE (DEG CENT)												
0.-1.5 M DEPTH	4	15.8- 16.4	16.1	0.0- 1.5	3	27.4- 27.5	27.5	0.0- 1.5	4	14.9- 15.4	15.1	0.0- 1.5
MAX DEPTH**	2	6.2- 8.6	7.4	7.3- 10.4	2	10.9- 13.8	12.3	6.7- 9.4	2	4.4- 10.3	7.3	6.7- 10.1
DISSOLVED OXYGEN (MG/L)												
0.-1.5 M DEPTH	4	8.8- 9.2	8.8	0.0- 1.5	3	8.4- 9.2	9.0	0.0- 1.5	4	8.6- 9.6	9.2	0.0- 1.5
MAX DEPTH**	2	6.6- 6.8	6.7	7.3- 10.4	2	8.8- 9.2	9.0	6.7- 9.4	2	0.2- 1.8	1.0	6.7- 10.1
CONDUCTIVITY (UMHOS)												
0.-1.5 M DEPTH	4	38.- 40.	40.	0.0- 1.5	3	48.- 52.	51.	0.0- 1.5	3	33.- 34.	33.	0.0- 1.5
MAX DEPTH**	2	34.- 35.	35.	7.3- 10.4	2	38.- 42.	40.	6.7- 9.4	2	33.- 42.	38.	6.7- 10.1
PH (STANDARD UNITS)												
0.-1.5 M DEPTH	4	7.8- 8.3	8.0	0.0- 1.5	3	8.2- 8.6	8.3	0.0- 1.5	4	7.5- 8.5	7.8	0.0- 1.5
MAX DEPTH**	2	7.1- 7.5	7.3	7.3- 10.4	2	7.2- 7.6	7.4	6.7- 9.4	2	7.1- 7.2	7.1	6.7- 10.1
TOTAL ALKALINITY (MG/L)												
0.-1.5 M DEPTH	4	23.- 24.	24.	0.0- 1.5	3	19.- 24.	20.	0.0- 1.5	4	21.- 24.	23.	0.0- 1.5
MAX DEPTH**	2	15.- 26.	21.	7.3- 10.4	2	22.- 23.	23.	6.7- 9.4	2	25.- 31.	28.	6.7- 10.1
TOTAL P (MG/L)												
0.-1.5 M DEPTH	4	0.024-0.040	0.027	0.0- 1.5	3	0.012-0.012	0.012	0.0- 1.5	4	0.017-0.035	0.019	0.0- 1.5
MAX DEPTH**	2	0.028-0.032	0.030	7.3- 10.4	2	0.011-0.015	0.013	6.7- 9.4	2	0.048-0.350	0.199	6.7- 10.1
DISSOLVED ORTHO P (MG/L)												
0.-1.5 M DEPTH	4	0.011-0.024	0.014	0.0- 1.5	3	0.012-0.013	0.012	0.0- 1.5	4	0.003-0.011	0.007	0.0- 1.5
MAX DEPTH**	2	0.013-0.018	0.015	7.3- 10.4	2	0.015-0.037	0.026	6.7- 9.4	2	0.014-0.255	0.134	6.7- 10.1
NO2+NO3 (MG/L)												
0.-1.5 M DEPTH	4	0.020-0.080	0.045	0.0- 1.5	3	0.020-0.030	0.020	0.0- 1.5	4	0.020-0.020	0.020	0.0- 1.5
MAX DEPTH**	2	0.020-0.020	0.020	7.3- 10.4	2	0.020-0.110	0.065	6.7- 9.4	2	0.020-0.020	0.020	6.7- 10.1
AMMONIA (MG/L)												
0.-1.5 M DEPTH	4	0.040-0.170	0.045	0.0- 1.5	3	0.030-0.040	0.040	0.0- 1.5	4	0.020-0.020	0.020	0.0- 1.5
MAX DEPTH**	2	0.030-0.040	0.035	7.3- 10.4	2	0.030-0.160	0.095	6.7- 9.4	2	0.020-0.400	0.210	6.7- 10.1
KJELDAHL N (MG/L)												
0.-1.5 M DEPTH	4	0.300-0.600	0.400	0.0- 1.5	3	0.300-0.400	0.300	0.0- 1.5	4	0.300-0.400	0.350	0.0- 1.5
MAX DEPTH**	2	0.400-0.400	0.400	7.3- 10.4	2	0.300-0.300	0.300	6.7- 9.4	2	0.400-0.800	0.600	6.7- 10.1
SECCHI DISC (METERS)												
	2	2.9- 3.2	3.0		1	4.3- 4.3	4.3		2	3.0- 4.6	3.8	

* N = NO. OF SAMPLES
** MAXIMUM DEPTH SAMPLED AT EACH SITE
*** S = NO. OF SITES SAMPLED ON THIS DATE

B. Biological Characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Algal Units per ml
06/03/75	1. Cryptomonas	459
	2. Ankistrodesmus	153
	3. Unidentified cell	92
	4. Nitzschia	61
	Other genera	---
	Total	765
07/23/75	1. Chroomonas	260
	2. Tabellaria	186
	3. Asterionella	74
	4. Cryptomonas	74
	5. Dinobryon	74
	Other genera	112
	Total	780
09/10/75	1. Aphanizomenon	2,225
	2. Melosira	805
	3. Euglena	284
	4. Chlamydomonas	189
	5. Tabellaria	189
	Other genera	568
	Total	4,260
10/23/75	1. Cryptomonas	217
	2. Chroomonas	186
	3. Melosira	186
	4. Schroederia	186
	5. Mallomonas	62
	Other genera	29
	Total	866

2. Chlorophyll *a* -

Sampling Date	Station Number	Chlorophyll *a* (µg/l)
06/03/75	01	1.8
	02	1.9
07/23/75	01	18.0
	02	11.1
09/10/75	01	35.6
	02	11.8
10/23/75	01	6.1
	02	2.6

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

a. 06/03/75

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum Yield (mg/l-dry wt.)
Control	0.010	0.040	0.6
0.05 P	0.060	0.040	2.0
0.05 P + 1.0 N	0.060	1.040	19.2
1.00 N	0.010	1.040	0.6

b. 09/10/75

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum Yield (mg/l-dry wt.)
Control	0.045	0.190	11.6
0.05 P	0.095	0.190	12.9
0.05 P + 1.0 N	0.095	1.190	37.4
1.00 N	0.045	1.190	15.6

c. 10/23/75

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum Yield (mg/l-dry wt.)
Control	0.095	0.220	10.3
0.05 P	0.145	0.220	10.6
0.05 P + 1.0 N	0.145	1.220	35.8
1.00 N	0.095	1.220	32.8

2. Discussion -

The control yields of the assay alga, Selenastrum capricornutum, indicate that the potential primary productivity in Hauser Lake was moderate during June sampling, but extremely high during September and October. In the June assay, a significant increase in yield occurred when phosphorus was added alone and in combination with nitrogen indicating phosphorus limitation. The addition of only nitrogen resulted in a yield which was not significantly greater than that of the control.

In the September and October assays, the addition of nitrogen alone produced significant increases in yield over those of the controls, indicating nitrogen limitation in the lake at those times.

The mean inorganic nitrogen to orthophosphorus ratios (N/P) in the lake data were less than 6/1 on all sampling occasions, suggesting nitrogen limitation (a mean N/P ratio of 14/1 or greater generally reflects phosphorus limitation).

V. LITERATURE REVIEWED

Idaho Department of Water Resources, Department of Health and Welfare, Department of Fish and Game, and Department of Budget, Policy Planning and Coordination. 1975. Idaho Environmental Overview. Boise, Idaho.

Ray, Herman. 1976. Personal communication. (morphometric data of selected Idaho water bodies). Boise, Idaho.

U.S. Environmental Protection Agency. 1975. National Eutrophication Survey Methods 1973-1976. Working Paper No. 175. National Environmental Research Center, Las Vegas, Nevada, and Pacific Northwest Environmental Research Laboratory, Corvallis, Oregon.

VI. APPENDICES

APPENDIX A

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX B

PHYSICAL AND CHEMICAL DATA

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

160501
47 46 28.0 117 00 45.0 3
HAUSER
16055 IDAHO

130391

11EPALES 2111202
0038 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/06/03	10 35	0000	16.2	8.8	114	40	8.00	24	0.170	0.300	0.070	0.012
	10 35	0005	15.8	9.2		38	7.80	23	0.040	0.300	0.080	0.011
	10 35	0015	10.9	5.4		36	7.30	27	0.040	0.500	0.080	0.021
	10 35	0034	6.2	6.8		34	7.50	26	0.040	0.400	0.020	0.018
75/07/23	15 55	0000	27.5	8.4		48	8.60	24	0.040	0.300	0.020K	0.012J
	15 55	0010	25.8	8.6		44	8.50	23	0.030	0.300	0.020K	0.011J
	15 55	0016	16.3	2.0		45	7.40	26	0.090	0.400	0.060	0.034
	15 55	0025	11.8	1.6		39	6.70	27	0.160	0.400	0.100	0.031
	15 55	0031	10.9	8.8		38	7.20	22	0.160	0.300	0.110	0.037K
75/09/10	09 15	0000	15.4	8.6	120	34	8.50	24	0.020K	0.300	0.020K	0.003
	09 15	0005	15.4	9.0			8.15	21	0.020K	0.300	0.020K	0.008
	09 15	0020	12.4	4.6		31	7.35	28	0.320	0.900	0.020K	0.190
	09 15	0033	4.4	0.2		42	7.10	31	0.400	0.800	0.020K	0.255
75/10/23	14 30	0000	11.9	7.8	108	45	7.80	21	0.070	0.400	0.020	0.010
	14 30	0005	11.9	7.6		46	7.50	26	0.080	0.400	0.020	0.014
	14 30	0016	11.8	10.0		42	7.35	20	0.090	0.400	0.020	0.020
	14 30	0035	9.0	0.6		64	6.95	28	0.890	1.200	0.020K	0.454

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/06/03	10 35	0000	0.024	1.8	
	10 35	0005	0.030		
	10 35	0015	0.043		
	10 35	0034	0.028		
75/07/23	15 55	0000	0.012	18.0	
	15 55	0010	0.014		
	15 55	0016	0.021		
	15 55	0025	0.054		
	15 55	0031	0.015		
75/09/10	09 15	0000	0.017	35.6	
	09 15	0005	0.021		
	09 15	0020	0.385		
	09 15	0033	0.350		
75/10/23	14 30	0000	0.031	6.1	
	14 30	0005	0.036		
	14 30	0016	0.043		
	14 30	0035	0.632		

K VALUE KNOWN TO BE LESS THAN INDICATED

J VALUE KNOWN TO BE ESTIMATED

STORET RETRIEVAL DATE 76/08/25
NATL EUTROPHICATION SURVEY
EPA-LAS VEGAS

160502
47 46 50.0 117 01 00.0 3
HAUSER
16055 IDAHO
130391

11EPALES 2111202
0028 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/06/03	11 00	0000	16.4	8.8	126	40	8.30	24	0.040	0.600	0.020K	0.024
	11 00	0005	16.1	8.8		40	8.00	24	0.050	0.500	0.020K	0.017
	11 00	0015	11.3	8.4		36	7.80	25	0.030	0.500	0.020K	0.008
	11 00	0024	8.6	6.6		35	7.10	15	0.030	0.400	0.020K	0.013
75/07/23	16 15	0000	27.5	9.2	168	51	8.20	20	0.040	0.400	0.030	0.013K
	16 15	0005	27.4	9.0		52	8.35	19	0.030	0.300	0.020K	0.012J
	16 15	0016	18.3	6.8		43	7.55	19	0.030	0.400	0.020K	0.013J
	16 15	0022	13.8	9.2		42	7.65	23	0.030	0.300	0.020	0.015K
75/09/10	09 40	0000	14.9	9.6	180	33	7.50	22	0.020K	0.400	0.020K	0.011
	09 40	0005	14.9	9.4		33	7.50	23	0.020K	0.400	0.020K	0.006
	09 40	0022	10.3	1.8		33	7.20	25	0.020K	0.400	0.020K	0.014
75/10/23	15 00	0000	11.9	7.2	120	44	7.10	32	0.090	0.400	0.020	0.016
	15 00	0005	11.7	7.4		43	7.10	20	0.080	0.400	0.020	0.013
	15 00	0015	11.7	7.6		42	7.10	21	0.060	0.400	0.020	0.010
	15 00	0024	11.3	7.8		53	7.10	18	0.070	0.400	0.030	0.007

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/06/03	11 00	0000	0.040	1.9	
	11 00	0005	0.025		
	11 00	0015	0.026		
	11 00	0024	0.032		
75/07/23	16 15	0000	0.012	11.1	
	16 15	0005	0.012		
	16 15	0016	0.030		
	16 15	0022	0.011		
75/09/10	09 40	0000	0.035	11.8	
	09 40	0005	0.017		
	09 40	0022	0.048		
75/10/23	15 00	0000	0.043	2.6	
	15 00	0005	0.029		
	15 00	0015	0.025		
	15 00	0024	0.026		

K VALUE KNOWN TO BE LESS THAN INDICATED

J VALUE KNOWN TO BE ESTIMATED

APPENDIX C

PARAMETRIC RANKINGS OF LAKES SAMPLED BY NES IN 1975

STATE OF IDAHO

Mean or median values for six of the key parameters evaluated in establishing the trophic conditions of Idaho lakes sampled are presented to allow direct comparison of the ranking, by parameter, of each lake relative to the others. Median total phosphorus, median inorganic nitrogen and median dissolved orthophosphorus levels are expressed in mg/l. Chlorophyll a values are expressed in µg/l. To maintain consistent rank order with the preceding parameters, the mean Secchi disc depth, in inches, is subtracted from 500. Similarly, minimum dissolved oxygen values are subtracted from 15 to create table entries.

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P
1601	AMERICAN FALLS RESERVOIR	0.105	0.080	463.800	15.379	14.700	0.035
1602	CASCADE LAKE	0.032	0.060	415.067	8.081	14.800	0.009
1603	LAKE COEUR D'ALENE	0.017	0.040	380.348	10.391	12.200	0.005
1604	DWORSHAK RESERVOIR	0.010	0.080	401.866	2.420	7.400	0.009
1605	HAUSER	0.028	0.075	366.286	11.112	14.800	0.013
1606	HAYDEN LAKE	0.010	0.040	243.500	2.787	11.800	0.003
1607	ISLAND PARK RESERVOIR	0.034	0.050	391.778	9.322	12.800	0.012
1608	LAKE LOWELL	0.070	0.070	477.111	25.389	14.600	0.015
1609	MAGIC RESERVOIR	0.062	0.130	400.750	7.322	14.700	0.020
1610	PALISADES RESERVOIR	0.024	0.080	345.428	2.067	12.800	0.007
1611	LOWER PAYETTE	0.013	0.060	234.000	4.600	9.600	0.007
1612	LOWER TWIN LAKES	0.016	0.050	370.000	2.318	13.600	0.009
1613	UPPER TWIN LAKES	0.017	0.045	369.143	4.986	8.200	0.004

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500= MEAN SEC	MEAN CHLORA	15- MIN DO	MEDIAN DISS ORTHO P
1601	AMERICAN FALLS RESERVOIR	0 (0)	17 (1)	8 (1)	8 (1)	21 (2)	0 (0)
1602	CASCADE LAKE	33 (4)	54 (6)	17 (2)	42 (5)	4 (0)	50 (5)
1603	LAKE COEUR D'ALENE	67 (8)	96 (11)	50 (6)	25 (3)	67 (8)	83 (10)
1604	DWORSHAK RESERVOIR	96 (11)	17 (1)	25 (3)	83 (10)	100 (12)	50 (5)
1605	HAUSER	42 (5)	33 (4)	75 (9)	17 (2)	4 (0)	25 (3)
1606	HAYDEN LAKE	96 (11)	96 (11)	92 (11)	75 (9)	75 (9)	100 (12)
1607	ISLAND PARK RESERVOIR	25 (3)	71 (8)	42 (5)	33 (4)	54 (6)	33 (4)
1608	LAKE LOWELL	8 (1)	42 (5)	0 (0)	0 (0)	33 (4)	17 (2)
1609	MAGIC RESERVOIR	17 (2)	0 (0)	33 (4)	50 (6)	21 (2)	8 (1)
1610	PALISADES RESERVOIR	50 (6)	17 (1)	83 (10)	100 (12)	54 (6)	75 (9)
1611	LOWER PAYETTE	83 (10)	54 (6)	100 (12)	67 (8)	83 (10)	67 (8)
1612	LOWER TWIN LAKES	75 (9)	71 (8)	58 (7)	92 (11)	42 (5)	50 (5)
1613	UPPER TWIN LAKES	58 (7)	83 (10)	67 (8)	58 (7)	92 (11)	92 (11)