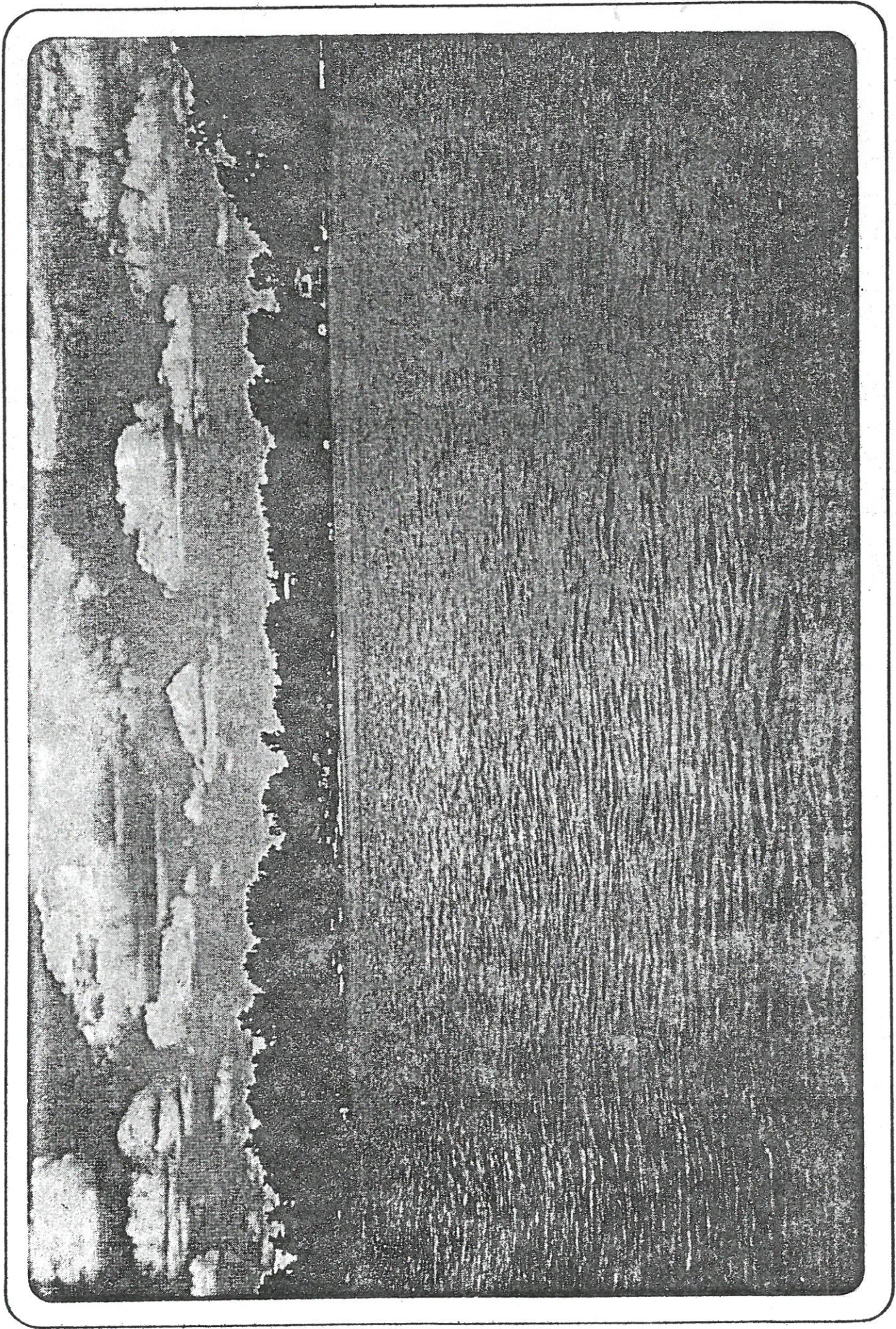


FISH STUDY
1979



Picture 1. Runyan Lake during 11 August 1979 sampling.

A LIMNOLOGICAL AND FISHERIES SURVEY OF RUNYAN LAKE
WITH RECOMMENDATIONS AND A MANAGEMENT PLAN

Study performed: 3 March 1979,
11 August 1979
Preliminary report submitted:
10 November 1979
Final report submitted:
11 February 1980

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TABLE OF CONTENTS

INTRODUCTION	1-3
HISTORY	4-5
METHODS AND EXPLANATIONS	6-22
Station Location	6-7
Physical Parameters	7-8
Depth	7
Acreage	7
Sediments	7
Light Penetration	7-8
Temperature	8
Stream Flows on Inlets and Outlets	8
Chemical Parameters	9-18
Temperature Stratification	9-11
Dissolved Oxygen	11-13
pH	13-14
Alkalinity	14-15
Hardness	15-16
Chlorides	16
Phosphorus	16-17
Nitrogen	17
Biological Parameters	18-22
Bacteria	18
Algae	18-19
Macrophytes	19-20
Zooplankton	20-21
Benthos	21-22
Fish	22
RESULTS	23-69
Introduction	23
Watershed Description	23
Station Location	23-27
Physical Parameters	27-34
Secchi Disc	27
Water Depth	33
Sediments	34
Chemical Parameters	34-50
Water Temperature	34-38
Dissolved Oxygen	38-39
pH	39-40
Alkalinity	40
Hardness	40-41
Chlorides	41-43
Phosphorus	43-47
Nitrogen	47-50
Hydrogen Sulfide	50
Biological Parameters	50-69
Bacteria	50-51
Phytoplankton (Algae)	51-53
Aquatic Macrophytes	54-56
Zooplankton	56

Biological Parameters (continued)	
Benthos	56-58
Fish	58-69
PROBLEMS, CAUSES AND SOLUTIONS	70-76
Eutrophication and enrichment of Runyan Lake	70-71
Hypolimnetic oxygen depletion	71-73
Deep sediments, dense aquatic plant beds and algae blooms in the station L (weedy embayment) area	74
Lack of abundant supply of sport fish in Runyan Lake	74-76
Lack of Northern Pike	76
MANAGEMENT RECOMMENDATIONS	77-80
Recognition and appreciation of the inherent beauty of Runyan Lake	77
Protect the long-term water quality of the lake	77-79
Fish management	80
Maintenance of access to the shallow embayment	80
APPENDICES	81-146
1. Chloride data	82-85
2. Eurasian milfoil	86-87
3. White and yellow grub cycle	88-89
4. Swimmer's itch life cycle	90-91
5. MDNR notes on Runyan Lake	92
6. MDNR publication on aquatic plants	93-103
7. 1970 water quality study on Runyan Lake	104-106
8. SEMCOG inland lake data	107-124
9. NPDES permit for sewage lagoon	125-134
10. Stage 1 analysis for sewers	135-143
11. Preliminary recommendations 15 November 1979	144-146
VITAE	147-151
J. L. Ervin	
D. J. Jude	

INTRODUCTION

Freshwater Physicians is dedicated to the preservation and maintenance of the quality of Michigan's water resources. It was for these reasons and an intense interest in the inter-relationship among organisms that live in and use water as their life medium that we entered this field in the beginning. When we study a lake or stream, we do so to construct as complete a picture as we can of the physical, chemical and biological characteristics of that waterway. From on-site examination of many parameters and discussions with long-term residents to gain historical information, we try to evaluate the present status of the lake, reconstruct past history and project the probable future of the lake. Then we construct a management plan, which through a series of short and long-term actions will help prevent degradation and hopefully begin restoration processes in lakes with serious problems. Property owners with lakes in good ecological balance are assisted in maintaining them in good condition. While our goals are dictated by a desire to achieve a good ecological balance, we do incorporate the needs and observed problems of property owners into our planning and recommendations.

Our study on Runyan Lake began with initial contact by Al Luchenbill in late 1978-early 1979. We were advised at that time of the concern and apprehension residents of the lake had about possible impacts on the water quality of Runyan Lake. Some developments in the watershed threatened to degrade water quality in the lake, so we were instructed to gather data to document present water quality and pinpoint any potential problems, either with water quality, plants or fish management. Runyan Lake is a lake in transition-- it has characteristics of oligotrophic lakes (lake herring, no dissolved oxygen depletions in winter, sparse plant growth, low nutrients) but many of eutrophic lakes (summer hypolimnetic anoxia, presence of yellow perch, sunfish, occasional algal blooms). It is thus critical to establish any inputs of nutrients to the lake which may cause the ultimate demise of the oligotrophic character of Runyan Lake. We sampled Runyan Lake in late winter and during late summer, times of maximum chemical stratification. Creeks and streams entering the lake were also monitored. During summer, we analyzed the biological character of the lake, collecting samples of algae, plants, benthos, zooplankton and fish. Our experience on the lake and discussion with lake residents established considerable interest in fish populations and possible ways to manage the fishery. Considerable water skiing, sail boating and speed boating activities were also observed.

We want to thank Al, Tom and Bob Luchenbill for assistance in providing contacts, a place from which to launch our sampling activities and assistance in setting gillnets

during August. Dennis Englehart is acknowledged for his help in orienting us to the lake and discussions about developments in the watershed. Your lake association president provided lake access in winter and much information about the fish, stream inputs and characteristics of Runyan Lake. We are thankful for their assistance and hope the efforts they have made to maintain Runyan Lake as a beautiful aquatic resource are appreciated by lake residents. Such concern is crucial to protect the integrity of Runyan Lake.

HISTORY

Runyan Lake is about a 200-acre lake with an outlet stream which eventually reaches the Shiawassee River. A number of creeks and culverts also enter the lake at a number of points. Runyan Lake has three very deep basins, ranging in depth from 40 to 55 ft. In an attempt to improve fishing, trout were introduced to the lake; however none (or very few) were ever recovered. A water quality study (Appendix 7) was conducted in 1970, which indicated some of the creeks entering the lake carried high levels of nutrients as well as high numbers of bacteria.

Some information (Appendix 5) provided by Michigan Department of Natural Resources records indicated that the depth was only 15 ft in 1890 and that the area was marshy. In 1954 some problems with dying mud puppies were investigated by MDNR personnel. No action was deemed necessary.

At present there are an estimated 300 residences on or near Runyan Lake, which represents a considerable change from earlier times. The large number of people put increased pressures on the capacity of the lake to resist change. Habitat is changed (wetlands altered), septic tank systems leak nutrients into the lake, the watershed's ability to absorb and take up nutrients is diminished, while the increased number of people demand more services (road salting, car washing, etc.) which causes more nitrogen and phosphorus to enter the lake. Our study should document the present