

JOB COMPLETION REPORT

As required by

FEDERAL AID IN FISHERIES RESTORATION ACT

TEXAS

Federal Aid Project No. F-6-R-11

FISHERIES INVESTIGATIONS AND SURVEYS OF THE WATERS OF REGION 5-B

Job No. E-6 Experimental Stocking of Largemouth Bass
and Threadfin Shad in Ponds in South Texas

Project Leader: Charles T. Menn

J. Weldon Watson
Executive Director
Parks and Wildlife Department
Austin, Texas

Marion Toole
D-J Coordinator

Eugene A. Walker
Director, Program Planning

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ABSTRACT

Five ponds ranging from 1 to 3 acres in size were selected for use in this experiment. After the ponds were treated with rotenone, they were stocked with 20 adult threadfin shad per surface acre. Approximately two weeks later largemouth bass fry were stocked at the rate of 50, 100, 150, 200 and 250 per surface acre.

Ten specimens of bass were seined at each pond at monthly intervals beginning in August. Length and weight statistics were recorded.

At this time it is obvious that this job is being conducted under conditions which are most probable in South Texas and not under the ideal circumstances which were intended. For example, the water levels have fluctuated in all five ponds. However, this job should be continued in order to learn as much as possible about the five stocking ratios in South Texas.

A more detailed analysis will be made when more data are available.

JOB COMPLETION REPORT

State of Texas

Project No. F-6-R-11

Name: Fisheries Investigations and Surveys
of the Waters of Region 5-B

Job No. E-6

Title: Experimental Stocking of Largemouth
Bass and Threadfin Shad in Ponds
in South Texas

Period Covered: January 1, 1963 through December 31, 1963

Objectives:

To determine growth rates and fishing success for largemouth bass stocked with threadfin shad as forage.

Techniques Used:

Five ponds, ranging from 1 to 3 acres in size, were selected for this study. Before final selection, however, the owners assured the project leader that the ponds would be kept at their maximum capacity.

Of the five ponds, three are located within 15 miles of Mathis and the other two are located within 60 miles of Mathis.

Pond No. 1, approximately 2.7 surface acres in size, is located on Weaver's Ranch about 12 miles east of Mathis in San Patricio County. This pond is an abandoned caliche pit and its major source of water is seepage from the Nueces River about one-fourth of a mile away.

Secchi disc readings ranged from 11 to 24 inches with a mean average of 16.5 inches. Minimum and maximum values for chemical constituents are as follows: dissolved oxygen 1.4 to 8.8 p.p.m., chlorinity 85.0 to 92.0 p.p.m., carbon dioxide 0.4 to 4.0 p.p.m., ph-th alkalinity 120.0 to 128.0 p.p.m., and ph 7.8 to 8.2.

Even though the water level fluctuated about 18 inches in the summer, it did not affect the dense stands of Chara along the shoreline. Figure 1 is an outline map of this pond.

In May, shortly after the pond had been treated with rotenone, large numbers of Gambusia were seen; they apparently survived the rotenone treatment.

Figure 2 is an outline map of Pond No. 2. It is approximately 2.6 surface acres in size and is also located on Weaver's Ranch.

Fig. 1 Experimental Pond No. 1 - 50 Bass Per Surface Acre

Weaver's Pond No. 1

Scale 1" = 100'

Area = 2.71 acres (October 11, 1963)

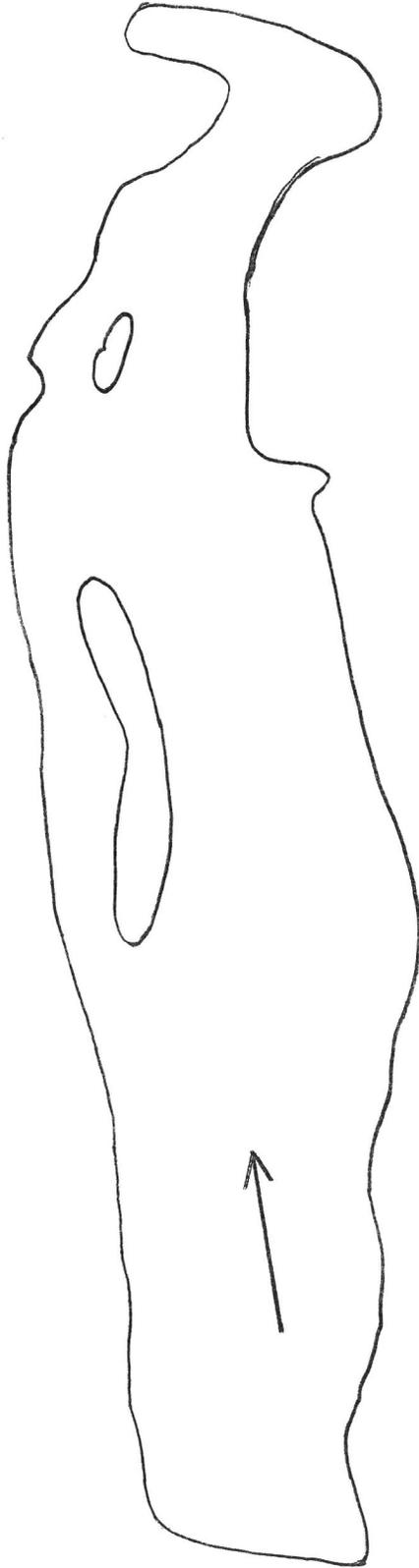


Fig. 2 Experimental Pond No. 2 - 100 Bass Per Surface Acre

Weaver's Pond No. 2

Scale 1" = 100'

Area = 2.62 acres



Secchi disc readings ranged from 10 to 15 inches with a mean average of 13.1 inches. The minimum and maximum values for chemical constituents are as follows: dissolved oxygen 2.0 to 6.6 p.p.m., chlorinity 86.0 to 89.0 p.p.m., carbon dioxide 0.2 to 1.4 p.p.m., ph-th alkalinity 125 to 130 p.p.m., and pH 7.8 to 8.0.

Submerged vegetation, Potamogeton and Chara, is not as abundant in this pond as in Pond No. 1 due to more turbid water. Also, the water level fluctuated nearly 2 feet during the summer of 1963. The owner used some of the water for irrigation purposes during the summer drought.

Pond No. 3, as shown in Figure 3, is approximately 2.3 surface acres in size and is located on the Abercrombie Ranch in Atascosa County, nearly 60 miles from Mathis. This pond, originally built to store water for livestock, gets its water from a windmill. However, in September 1963 the water level began dropping due to evaporation and use by livestock. By October the pond had lost nearly two-third's of its water but it refilled in November. The shaded area in Figure 3 shows the water area in October.

Secchi disc readings ranged from 3½ to 7 inches with a mean average of 5.0 inches. Minimum and maximum values for chemical constituents are as follows: dissolved oxygen 0.0 to 6.2 p.p.m., chlorinity 97.0 to 103.0 p.p.m., carbon dioxide 0.0 to 0.1 p.p.m., ph-th alkalinity 162.0 to 172.0 p.p.m., and pH 7.8 to 8.6.

Due to the high turbidity, caused by a colloidal suspension, aquatic vegetation is not a problem in this pond.

Pond No. 4, as outlined in Figure 4, is approximately 1.5 acres in size, and is also located on the Abercrombie Ranch in Atascosa County. Like Pond No. 3, its original purpose was to provide storage for livestock. Water is pumped into the lake from a nearby windmill.

Secchi disc readings ranged from 4 to 7 inches with a mean average of 5.2 inches. The minimum and maximum values for chemical constituents are as follows: dissolved oxygen 2.4 to 8.0 p.p.m., chlorinity 96.0 to 103.0 p.p.m., carbon dioxide 0.2 to 6.0 p.p.m., ph-th alkalinity 140.0 to 175.0 p.p.m., and pH 8.2 to 8.4. Water temperatures ranged from 63° to 88° F.

Submerged vegetation is not a problem in this lake. However, the water level fluctuated nearly 3 feet due to the drought. The lake was refilled in November and has stayed full since.

Despite efforts to remove the existing fish population with rotenone, black bullheads (Ictalurus melas) and Gambusia survived the treatment.

Pond No. 5 (Figure 5) is located on the Sides' Farm less than 15 miles from Mathis in San Patricio County. This pond, an irrigation reservoir, is 0.97 surface acre in size. Its major source of water is from a nearby well. However, the pump broke down and the water level had dropped nearly 3 feet by the end of December. The owner has assured the project leader that the pump will be in operation as soon as possible and the pond will be refilled to capacity.

Fig. 3 Experimental Pond No. 3 - 150 Bass Per Surface Acre

Abercrombie's Pond No. 1

Scale 1" = 50'

Area = 2.3 acres (April 22, 1963)

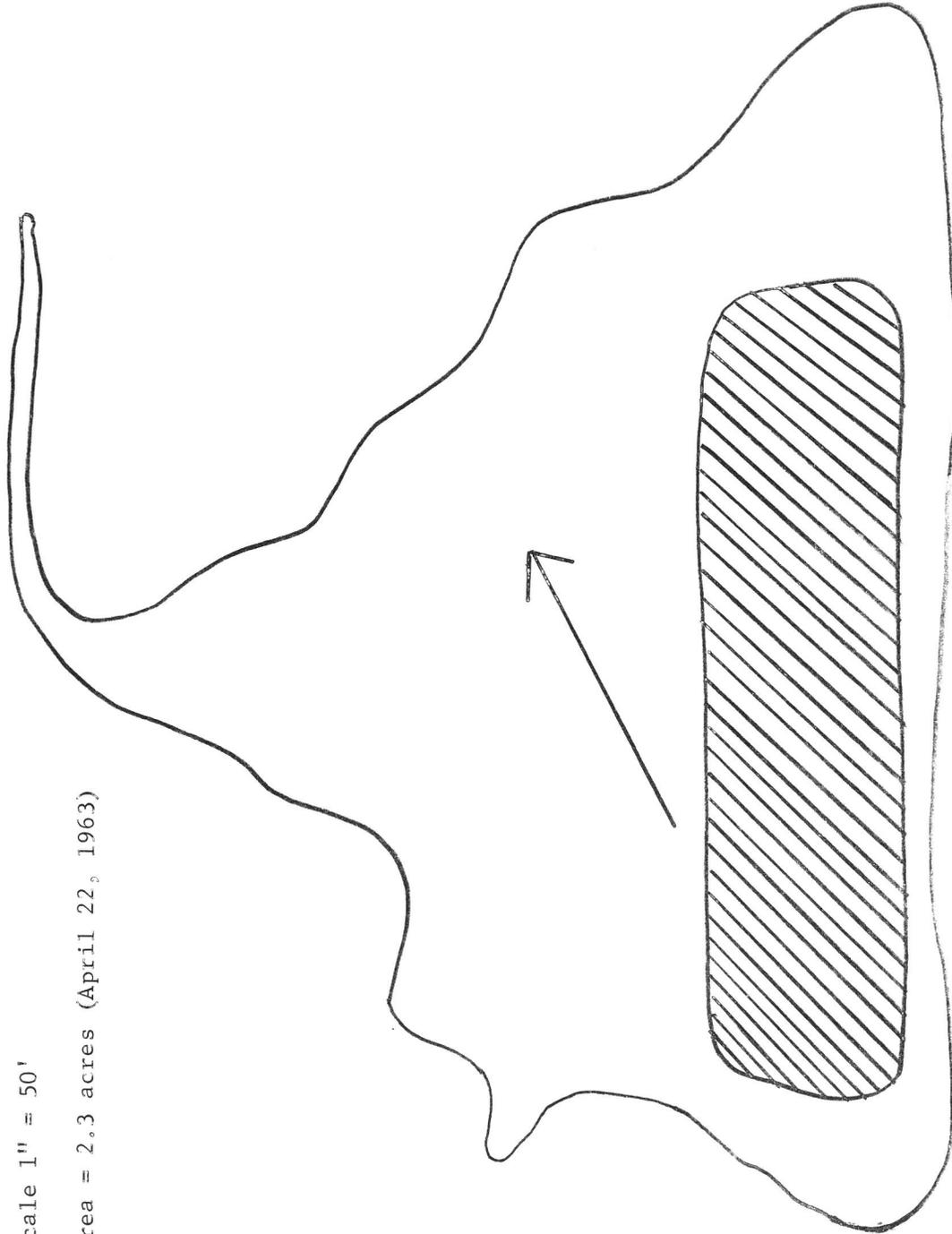


Fig. 4 Experimental Pond No. 4 - 200 Bass Per Surface Acre

Abercrombie's Pond No. 2

Scale 1" = 52'

Area = 1.5 acre (April 22, 1963)

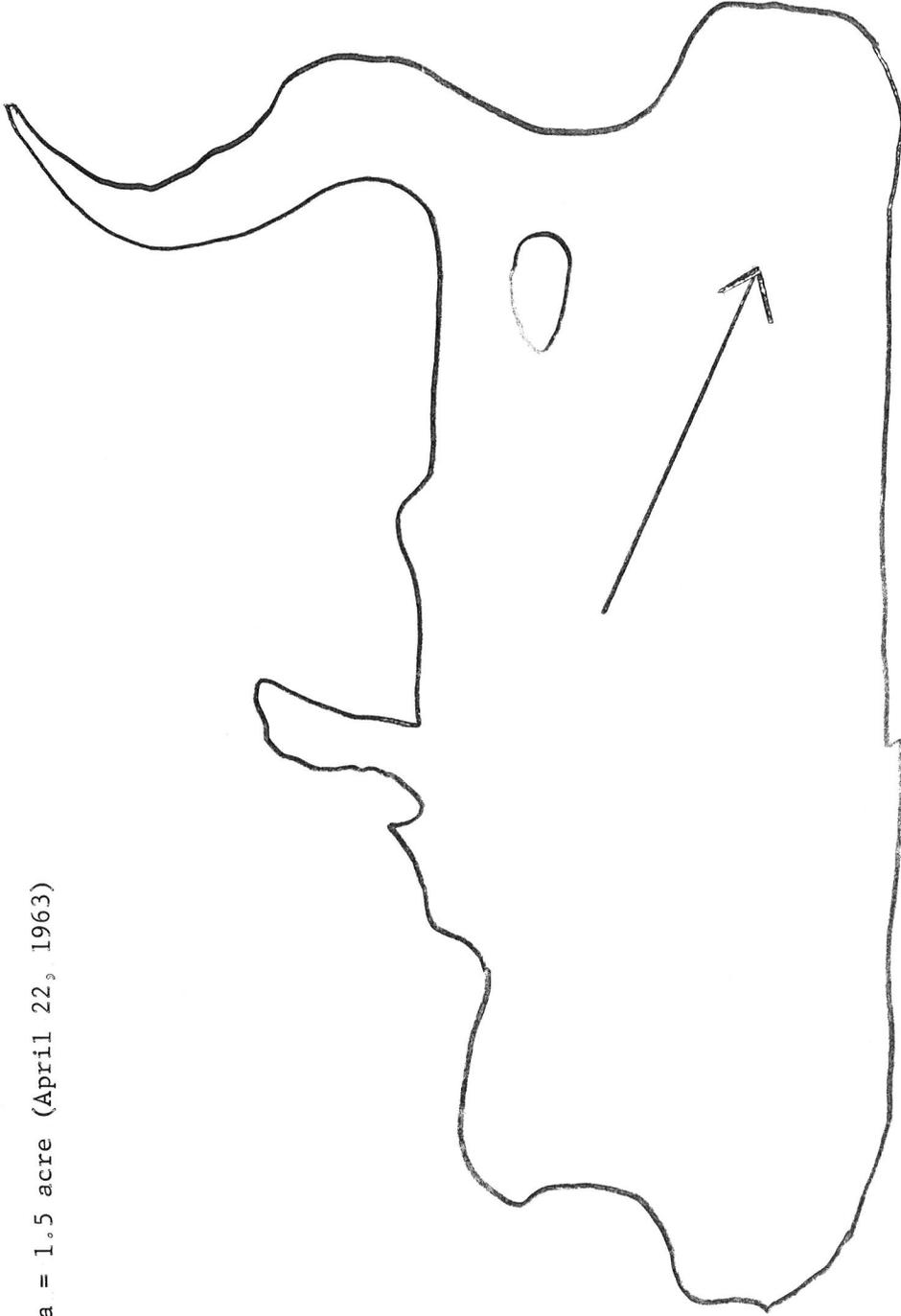
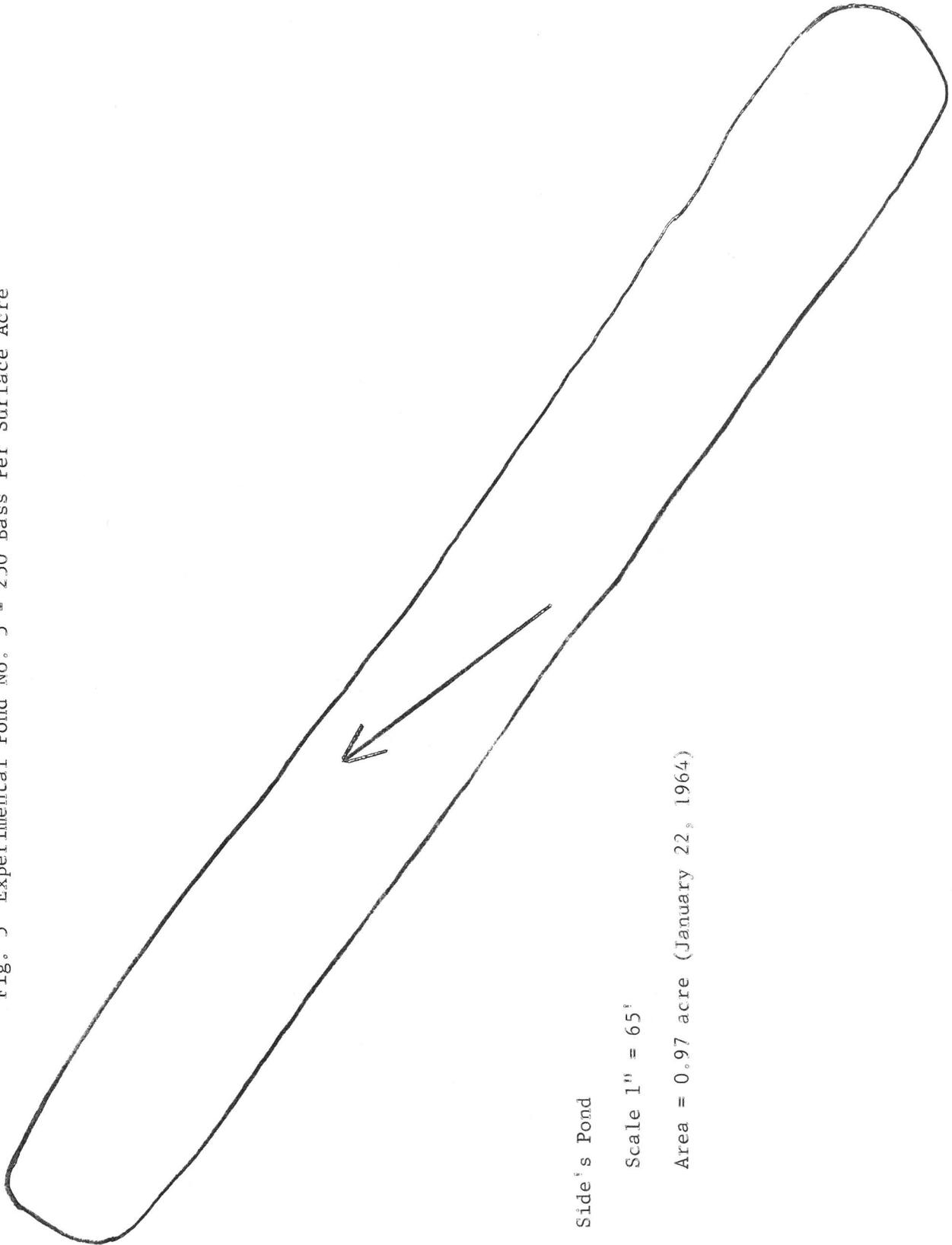


Fig. 5 Experimental Pond No. 5 - 250 Bass Per Surface Acre



Side's Pond

Scale 1" = 65'

Area = 0.97 acre (January 22, 1964)

Secchi disc readings were all greater than 36 inches. Because of this relatively clear water, cattails are somewhat of a problem in the pond. The minimum and maximum values for chemical constituents are as follows: dissolved oxygen 1.6 to 6.0 p.p.m., chlorinity 83.0 to 87.0 p.p.m., carbon dioxide 0.0 to 1.0 p.p.m., ph-th alkalinity 120 to 130.0 p.p.m., and pH 8.0 to 8.4.

In addition to cattails, there is some algae and Chara in this pond, but it is not considered a problem at this time.

All five ponds were treated with 5 per cent rotenone powder just prior to stocking with adult threadfin shad at the rate of 20 per surface acre. Approximately two weeks later largemouth bass, about 2 inches in total length, were stocked at the rate of 50, 100, 150, 200 and 250 per surface acre.

During the first two months after the bass were stocked, sight observations were made at each pond at two-week intervals and notes were made of each visit. Beginning in August, the third month after the bass were stocked, 10 specimens of bass were seined at each pond at monthly intervals. The bass were held in a No. 3 wash tub filled with lake water until their length and weight measurements were recorded. Then they were returned to the ponds alive.

Temperature, turbidity and water quality were recorded at monthly intervals in conjunction with the bass sampling. Due to limitations of the electronic thermometer, water temperatures were taken at the surface only. The electronic thermometer's maximum range is 90° F. Since the average depth of these ponds is less than 4 feet, the project leader decided to analyze surface samples only. It was felt that there would not be any appreciable difference in the quality of bottom and surface samples.

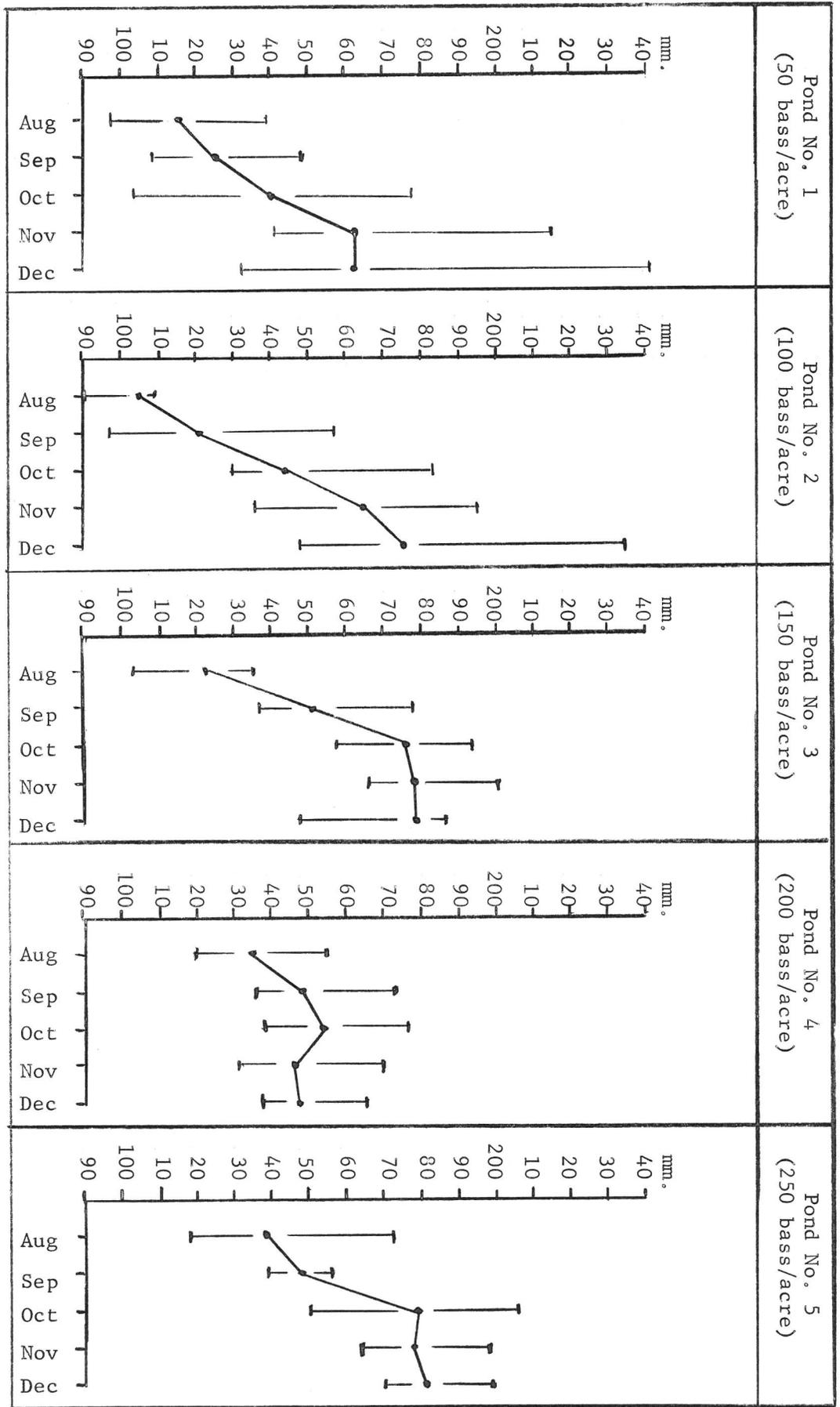
Discussion:

At this point in the experiment it is obvious that this job is being conducted under conditions which occur most frequently in South Texas and not under the ideal circumstances which were intended. For example, the water levels in all ponds have fluctuated, and all fish were not removed by chemical treatment in four of the ponds.

Adult threadfin shad were stocked the first of May and the bass were stocked about two weeks later. Sufficient evidence was found to indicate that the shad had spawned before the bass were stocked. Despite the fact that the shad had spawned, they "disappeared" during the latter months of this segment. In fact shad were found only in Pond No. 4 during the December sampling. Further study will be necessary in order to determine whether or not the bass have actually cropped all the shad.

Table 1 is a comparison of the five stocking rates. At this time the steadiest rate of growth appears to be in 100 bass per acre ratio.

Table 1. Growth rates of largemouth bass with threadfin shad as forage



Recommendations:

This job should be continued to learn as much as possible about the five stocking ratios in South Texas. A more detailed analysis should be made when more data are available.

Prepared by Charles T. Menn
Project Leader

Approved by Marion Toole
Coordinator

Date February 11, 1964

Kenneth C. Jurgens
Regional Supervisor