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REPORT NO. 858

SUMMARY OF THE RESULTS OF FISHERIES MANAGEMENT  
OF LAKES IN THE PIGEON RIVER STATE FOREST  
(INCLUDING INVESTIGATION MADE  
JULY 13 TO JULY 24, 1942)

by

Walter R. Crowe

Lakes in the Pigeon River State Forest have been the object of a fairly extensive program of investigation by the Institute for Fisheries Research. Investigation was initiated in 1931, the biological inventory having been made on one lake at that time, and the other lakes were inventoried in the summer of 1932.

In Institute Report No. 438 (Eschmeyer, 1937) the results of the early inventory are presented, and a preliminary management program is set forth. In Institute Report No. 620 (Shetter, 1940) the management history of the lakes up to the time of the 1942 investigation is summarized and suggestions for future stocking policy are given. The management recommendations made in this report (No. 620) have been followed with some slight modifications.

The object of the present investigation was to determine, in so far as possible, the success of management practices which had been initiated in the past, and to determine if any changes in policy should be inaugurated. That some changes might be made was suggested by reports of thin and poorly conditioned trout captured in certain of the trout lakes in the Pigeon River State Forest. Thin trout had been reported by fishermen, and by members of the Conservation Department, and it was therefore decided that the District Biologist should make an examination of the lakes as soon as the opportunity presented itself. Special attention was given the trout lakes, warm water lakes were examined also.

The 1942 investigation was made primarily through the use of 125 ft. experimental gill nets. Creel census slips were secured whenever possible and fishermen were questioned as to their knowledge of the lakes. Shallow margins of the lakes were examined for the young of game species and for forage minnows. Notations were made of competing species when they were found to be present. All fish captured, except minnows, were weighed, measured, and scale samples were taken. Nets were set in most lakes for a

period of 48 hours, the nets being lifted twice in that period. Netting results were generally poor because of the difficulty of making good sets of the nets in lakes with little or no shoal area. The following lakes were examined on the dates given:

North Twin Lake	T32N, R1W, Sec. 10	July 15, 16	1942
South Twin Lake	T32N, R1W, Sec. 10	July 14, 15	1942
Lost Lake	T32N, R1W, Sec. 2, 3	July 15, 16, 17	1942
West Lost Lake	T32N, R1W, Sec. 3	July 16, 17	1942
Section 4 Lake	T32N, R1W, Sec. 4	July 15, 20, 21	1942
Hemlock Lake	T32N, R1W, Sec. 34, 35	July 17, 18	1942
Ford Lake	T32N, R1W, Sec. 8	July 17, 21, 22	1942
Devils Soup Bowl	T32N, R1W, Sec. 5	July 20, 21, 22	1942
Pickereel Lake	T32N, R2W, Sec. 11	July 16, 23, 24	1942
Grass Lake	T32N, R1W, Sec. 5	July 21, 22	1942
Round Lake	T32N, R1W, Sec. 29	July 21, 23	1942
Hardwood Lake	T32N, R1W, Sec. 11, 14	July 22	1942
Two Acre Lake	T32N, R1W, Sec. 3	July 23	1942

North Twin Lake

Management history:

- 1932 - biological inventory, and physical survey. Stunted perch very abundant. 7000 8 month old brook trout planted.
- 1933 - 6,300 5 to 8 month brook trout planted.
- 1934 - experimental netting showed trout to have met with poor success in competition with stunted perch. Consequently 250 lbs. of "Farm Bureau Fertilizer" were added during the summer.
- 1937 - rainbow trout first introduced, 100 adults being planted.
- 1938 - 150 adult rainbow trout planted. Intensive creel census initiated.
- 1939 - 148 adult rainbows planted in July. Left pelvic clipped. 150 adult rainbows planted in October. Right pelvic clipped.
- 1941 - 200 adult rainbows and 50 yearling rainbows planted.
- 1942 - 200 adult rainbow trout with clipped adipose planted in June. 150 adult rainbow trout planted in September.

Management suggestions (from Report 620)

North Twin Lake should be stocked with 150 adult rainbows in the fall, and with 100 rainbow trout about June 1 of the following year. Season to be closed till May 15.

Known results to date from creel census, etc.:

- 1936 - 22 hours of fishing yielded 21 brook trout, averaging  $11\frac{1}{2}$  inches in length, and 48 perch averaging  $6\frac{1}{2}$  inches in length.
- 1938 - combined results from North and South Twin lakes used by 354 anglers for 1,139 hours  
181 rainbow trout, and 518 yellow perch removed  
61 undersized fish (mostly perch) returned to water  
catch per hour of legal fish was 0.60 fish  
angling pressure was 114 man-hours per acre for season  
71 legal fish (19.2 trout, 51.8 perch) removed per acre  
6.1 undersized fish caught per acre  
60 per cent of the anglers took no fish.
- 1939 - Combined results: North and South Twin Lakes lakes used by 457 anglers for 1,441 hours  
154 rainbow trout, and 581 perch removed  
catch per hour of legal fish was 0.66  
angling pressure was 144 man-hours per acre for season  
73.5 legal fish (15.4 rainbow, 58.5 perch) caught per acre  
84 per cent of anglers took no fish
- 1940 - Combined results: North and South Twin (April 27-May 5) lakes used by 96 anglers for 340.25 hours  
111 rainbow trout, 6 perch removed  
catch per hour of legal fish was 0.53  
angling pressure was 34 man-hours per acre  
11.7 legal fish (11.1 rainbow, 0.6 perch) removed per acre  
63 per cent of anglers took no fish  
creel census indicated fish from 1939 and previous plantings to be present.
- 1942 - thin fish lacking in fight reported by Mr. Wilkinson.  
This fish was one from 1939 planting. Also various anglers using the lake reported thin fish.

Results of 1942 investigation:

The lake was netted for 48 hours. During this period 2 rainbow trout, and 10 perch were captured. One rainbow was a marked fish from the 1942 spring planting. It had a length of 13.8 inches, and weighed 13.75 ounces, and was therefore a well conditioned fish. The other, unmarked trout, probably from a 1941 planting had a length of 12.3 inches, and weighed 8.75 ounces, indicating that the fish was in fair condition as compared with rainbow trout of the same length captured in Pickerel Lake. The ten perch captured averaged 6.5 inches in length (6.0 - 6.9) and weighed from 1.0 to 1.25 ounces. These perch appeared to be stunted, and were very thin.

Management recommendations:

1. Stocking should be discontinued for at least one year.

350 adult rainbow trout were planted in 1942, and fish from 1939 plantings are known to be still present. Fishing pressure will probably be light for at least one season, and the present supply of trout is considered adequate. Overstocking, plus light fishing pressure and a scanty food supply makes it difficult for trout to maintain condition in this lake. Starting in the fall of 1943 or as soon thereafter as fish are available, 200 legal-sized brook trout should be planted. In following years 100 legal-sized brook trout should be stocked about June first.

South Twin Lake

Management history:

- 1932 - The lake was mapped and inventoried by the Institute for Fisheries Research. Small stunted perch very abundant.
- 1933 - 6,500 fingerling brook trout planted.
- 1934 - experimental netting in 1934 showed that the trout had not grown well, and appeared to be reduced in numbers, since 263 perch were captured to only 21 small trout. The lake was poisoned and dynamited in September at which time only 2 trout were recovered to 3,615 perch.
- 1935 - 5000 blunt-nosed minnows were introduced, and also 50 killifish. In the fall 100 adult rainbow trout were planted.
- 1936 - initiation of creel census - no stocking
- 1937 - 200 adult rainbows planted in the fall.
- 1938 - 150 adult rainbows planted in the lake.
- 1939 - 150 adult rainbows planted in July, left pelvic clipped.  
150 adult rainbows planted in October, right pelvic clipped.
- 1941 - 200 adult rainbows, and 50 yearling rainbows planted.
- 1942 - 200 adult rainbows with adipose clipped planted in June  
150 adult rainbows planted in September

Management suggestions (from Report 620)

same as for North Twin Lake

Known results to date from creel census, etc.

- 1936 - 62 of 100 rainbow trout planted captured by fishermen.
- 1937 - 9 rainbows from the original planting were recovered, indicating a known survival of 73 per cent from the original planting of 100 adult rainbow trout.
- 1938 - results of creel census are combined with those from North Twin Lake (see above). However, perch again appeared in the catch. 191 perch caught were reported as having an average length of 8.4 inches, which would indicate that the perch had not yet become abundant enough to inhibit growth.
- 1939 - results of creel census combined with those from North Twin (see above)
- 1940 - creel census results combined with those from North Twin Lake (see above)
- 1942 - thin fish reported by fishermen

Results of 1942 investigation:

This lake was also netted for 48 hours, with a total catch of 1 rainbow trout from the 1942 spring planting. The fish was 12.2 inches in length, and weighed 8.75 ounces, indicating that it was in fair condition. No perch were captured in the gill net but they are known to be present in fairly large numbers. Two fishermen contacted had each caught about 15 perch in  $1\frac{1}{2}$  hours of fishing effort. These perch were thin, and about  $6\frac{1}{2}$  inches long. It can be safely assumed that the lake has again become over populated with perch. The stomach of the rainbow was examined, but was quite empty.

Management recommendations:

A few fish from 1939 or previous plantings are known to have been caught by fishermen in 1942. 350 adult trout were added in 1942, a part after the fishing season closed and the present supply is considered adequate for the expected light pressure. No stocking should be done until the fall of 1943 when 150 legal-sized brook trout should be planted. Half this number should be stocked about June first the following year.

Lost Lake

Management history:

- 1927 - the lake was stocked with 200 brook trout fingerlings by Mr. William Green, of Hillman

- 1931 - the lake was inventoried, and designated as a trout lake
- 1933 - 5,500 brook trout fingerlings stocked
- 1934 - 6,000 brook trout fingerlings planted
- 1935 - 5,000 brook trout fingerlings planted
- 1936 - 3,125 brook trout fingerlings planted
- 1938 - 3,000 brook trout fingerlings planted
- 1941 - 200 yearling brook trout, planted in May - rt. pelvic clipped  
200 adult brook trout-planted in fall - left pelvic clipped
- 1942 - 250 19 month brook trout planted, Sept. 21. (mostly legal)

Management suggestions from Report 620.

If fingerling brook trout are used plant 4,000 8-9 month old fish.  
If adults plant 200 in the fall.

Known results to date from creel census, etc.

- 1931 - 58 trout removed by fishermen before the season had opened.  
On June 25, 104 more trout, averaging 10 inches in length  
were removed by fishermen in 104 hours of fishing effort.
- 1932-33 The lake was very little fished.
- 1934 - the lake was fished to a considerable extent, but information  
on results is lacking.
- 1935 - 387 used the lake for 1,157.75 hours  
461 brook trout averaging 8.9 inches caught  
100.2 fish per acre caught, yield per acre by weight was 30.2  
pounds.
- 1936 - yield per acre was only 11.85 pounds, a considerable decline  
over the previous year. Yield for the two seasons represented  
only 5.7 per cent of the trout stocked in this lake in 1934  
and 1935, indicating a high mortality of the planted fish.
- 1938 - (results of Lost and West Lost combined)  
283 anglers fished the lakes for 860 hours  
505 legal brook trout, and 692 undersized fish caught.  
catch per hour was 0.53 brook trout  
angling pressure was 112 man-hours per acre for season  
58.7 legal brook trout caught per acre  
80.5 undersized fish caught per acre  
59 per cent of the anglers took no fish

1939 - (results for Lost and West Lost combined)  
367 fishermen fished the lakes for 865.75 hours  
445 legal brook trout removed  
catch per hour of legal brook trout was 0.51  
angling pressure was 100 man-hours per acre per season  
51.7 legal brook trout caught per acre  
62.7 undersized fish caught per acre, these returned to water.  
63 per cent of the anglers took no fish.

Results of 1942 investigation:

Lost Lake was netted for 72 hours. During this period 1 marked brook trout, and two suckers were captured. This brook trout was planted in May, 1941. It was 11.2 inches in length, and weighed 10.5 ounces, a fat and well conditioned fish. The suckers were 16.2 inches long and weighed  $1\frac{1}{2}$  pounds. One family of fishermen (4 people) fishing from shore with worms had caught no fish in  $\frac{1}{2}$  hour of fishing effort.

Management recommendations:

Besides fish from the 1941 planting known to be present 250 legal brook trout were stocked in September, 1942. The present supply is considered adequate for the expected light fishing pressure. The lake should not be stocked for at least one year. If the supply of legal brook trout is limited, this lake might be stocked in preference to the Twin Lakes in the fall of 1943, because the brook trout present, judged from a very inadequate sample seem to be in excellent condition, and the lake can therefore be expected to furnish better fish than some of the other trout lakes. A planting of 250 legal-sized brook trout should be made in the fall followed by 125 of the same size the next year about June first.

West Lost Lake

Management history:

- 1932 - inventory, designation as a trout lake.
- 1933 - initial stocking with brook trout - general creel census slips obtained showed legal trout to be present in 1934.
- 1934 - 6,000 brook trout fingerlings introduced.
- 1935 - 5,000 brook trout fingerlings planted.
- 1936 - 3,125 brook trout fingerlings planted.
- 1938 - 3,000 brook trout (9 mo.) planted
- 1941 - 2,000 8 mo. fingerlings with left pelvic clipped. These were planted in fall.
- 1942 - 250 19 mo. brook trout planted in September.

Management recommendations from Report 620:

same as for Lost Lake.

Known results from creel census, etc.

1934 - legal trout reported caught by general creel census.

1935 - 164 fishermen caught 199 legal trout (average length 10.5 inches) in 582.25 hours, at the rate of 0.33 fish per hour. Yield per acre was 23.5 pounds.

1936 - 200 fishermen caught 254 legal brook trout, in 658.25 hours at the rate of 0.3 fish per hour. Yield per acre was 22.5 pounds. 4.5 per cent of the trout stocked in 1934 and 1935 were caught in 1935 and 1936.

1938-39-40 Results combined with those of Lost Lake. (See above)

Results of 1942 investigation:

West Lost Lake was netted for 48 hours, during which period 4 marked brook trout, and 1 sucker were captured. The brook trout were all planted in the fall of 1941. The lengths and weights of the brook trout captured are given below:

8.2 inches	2.75 ounces
7.6 inches	2.25 ounces
6.7 inches	1.5 ounces
6.5 inches	1.5 ounces

These brook trout have apparently grown fairly well since being planted, for probably few were of legal size when planted. Also they are in fair condition, although perhaps slightly light for their length.

This lake was also stocked with 250 adult brook trout in September, 1942. Fish from 1941 planting are present in fair numbers.

Management recommendations:

Stock 200 legal-sized brook trout in the fall of 1943 and 100 of the same next June.

Section 4 Lake

Management history:

1932 - inventory, and designation as a trout lake  
1,100 8 mo. brook trout stocked.



- 1933 - 300 8 mo. brook trout stocked
- 1934 - experimental netting
- 1935 - the lake was poisoned, and adult rainbow trout introduced
- 1937, 38, 39 - 100 adult rainbows planted each year, those planted in 1939 having the right pelvic fin removed.  
Also in 1937 1000 adult grayling were planted.
- 1941 - 100 adult rainbows, and 100 yearling rainbow were planted.
- 1942 - 100 rainbow trout with clipped adipose planted in June, and 100 more adult rainbows added in September.

Management suggestions in Report 620

100 adult rainbow trout to be planted in spring and fall.

Known results to date from creel census, etc.

- 1934 - experimental netting showed that trout planted had not been very successful, 39 perch being captured to 3 trout. The lake was reported as being very little fished in 1934. Anglers took very few trout.
- 1935 - the lake yielded very few trout to anglers. The poisoning showed only perch to be present, although as pointed out by Eschmeyer, perhaps not all fish were killed, and not all of those killed were collected.
- 1936 - experimental gill net captured 2 rainbow trout in excellent condition. No perch were captured in the net.
- 1939 - 190 fishermen fishing for 502 hours caught 74 legal fish at the rate of 0.15 fish per hour. The catch consisted of 41 brook trout, and 26 rainbow trout. 9 undersized brook trout were returned to the water. Catch per acre of legal fish was 22.4. Angling pressure was 152 man-hours per acre for the season. 88 per cent of the fishermen took no legal fish.
- 1940 - (one week) 49 anglers fished the lake for 133.75 hours. 11 legal rainbows, and 1 undersized rainbow were caught. Catch per hour was 0.08. The lake yielded 3.3 legal fish per acre. Angling pressure was 41 man-hours per acre. 88 per cent of the anglers took no fish.

Results of 1942 investigation:

The lake was netted for 24 hours, and no fish were captured. On

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\*These were probably rainbows, but were misidentified by clerk.

July 15, three fishermen contacted had captured 1 adult rainbow about 13 inches in length. The fish was planted in the spring of 1942, and was in very poor condition. Fishing by the biologist failed to capture any more fish. Small perch were observed to be abundant.

Management recommendations:

Fish from 1942 stocking of adult rainbows are presumably present in fair numbers. In view of the expected light fishing pressure, and the poor condition of the fish present all stocking should be discontinued for at least one year. Stocking should be resumed in the fall of 1943 planting 100 legal brook trout then and 50 the following June.

Hemlock Lake

Management history:

- 1927 - the lake was stocked with brook trout by Mr. William Green, of Hillman.
- 1932 - inventory and designation of trout lake given.
- 1933 - 5,000 5 mo. brook trout stocked.
- 1934 - 10,000 5 mo. brook trout stocked
- 1935 - 5,000 5 mo. brook trout stocked
- 1936 - 3,750 7 mo. brook trout stocked
- 1937 - 5,000 8 mo. brook trout stocked, also 1000 adult grayling~~y~~
- 1938 - 200 adult brook trout stocked
- 1939 - 200 adult rainbow trout introduced in July, left pelvic clipped; 200 more in October, rt. pelvic clipped.
- 1941 - 200 yearling rainbows, and 300 adult rainbows.
- 1942 - 201 rainbows with adipose fin clipped planted in June, 300 adult rainbows planted in September.

Management suggestions from Report 620:

Stock 300 adult rainbows in fall, stock 200 adult rainbows in June of the following year.

The season should not be opened until May 15.

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As no grayling were taken by experimental netting the year following the supposed planting and as none was reported by the creel census clerk there is some question as to the accuracy of this planting record.

Known results to date from creel census, etc.

- 1932 - the survey party took 6 large brook trout, which had apparently come from the 1927 introduction.
- 1934 - brook trout fishing is reported to have been good that year, but detailed information is not available.
- 1935 - 215 legal brook trout caught, or 1 fish per fisherman-day. Yield per acre was 8 pounds.
- 1936 - 52 legal trout were taken, or less than 1 fish per fisherman-day. Yield per acre was 4.3 pounds. 1.8 per cent of the fish stocked in 1934 and 1935 were recovered in 1935 and 1936.
- 1938 - 117 anglers used the lake for 340.25 hours  
204 legal fish caught (203 brook trout, 1 perch)  
297 undersized brook trout returned to the water  
catch per hour was 0.60 fish,  
catch per acre of legal fish was 35.7, and of undersized fish it was 49.6.  
angling pressure was 57 man-hours per acre for season  
50 per cent of the fishermen took no fish.
- 1939 - 206 fishermen fished for 616.25 hours  
408 legal fish captured (311 brook trout, 97 rainbows)  
catch per hours was 0.66 fish  
catch per acre of legal fish was 68, and of undersized fish it was only 4.  
angling pressure was 103 man-hours per acre for season  
65 per cent of the anglers took no fish
- 1940 (one week) - 121 anglers fished for 299.5 hours  
120 legal trout (113 rainbows, 7 brook trout) caught  
catch per hour 0.40  
catch per acre was 20 legal trout  
angling pressure was 50 man-hours per acre.  
74 per cent of fishermen took no fish.

Results of 1942 investigation:

The lake was netted for 48 hours, and one trout from the 1942 spring planting was captured. This fish was 11.6 inches long, and weighed 7.25 ounces less than fish of the same length from Pickerel Lake. Mr. William Horsell reported thin fish as being present in this lake early in 1942 trout season. From the appearance of the shore the lake was fished more than some of the other pot-hole lakes in the forest. No fish were captured by the investigator in 2 hours of fishing effort, with both natural and artificial bait.

Management recommendations:

No stocking for at least one year. The present supply of trout, 500 stocked in 1942, is considered to be adequate. Since the fish are apparently thin it is to be hoped that the present population will be somewhat reduced, if stocking is discontinued for a while. In the fall of 1943 plant with 300 legal-sized brook trout and 150 about June first in 1944.

Ford Lake

Management history:

- 1932 - The lake was inventoried. 1,200 8 mo. brooks planted.
- 1933 - 500 8 mo. brook trout planted.
- 1934 - experimental netting revealed that the trout had grown but slowly, and that the survival had been poor. Consequently, 1,137 perch, and 15 brook trout were removed by netting. 15,500 forage minnows were introduced, and then the lake was planted with trout: 6,000 6 mo. brook trout, 600 yearling rainbows, and 600 8 mo. brown trout.
- 1935 - 300 adult rainbow trout planted
- 1936 - information received showed trout to be very thin, and in September the lake was poisoned. After the poisoning the lake was stocked with 5,000 5 month grayling.  
From 1937 to 1941 lake closed to fishing for grayling experiment.
- 1941 - 5,000 8 mo. old brook trout were introduced.

Management suggestions from Report 620:

Stock 600 adult brook trout in the fall.

Known results from creel census, etc.

- 1932 - at the time of the survey the lake was very little used by fishermen.
- 1934 - experimental netting revealed that trout had grown very poorly, and that their survival was low.
- 1936 - results of the poisoning showed that the perch had improved slightly in condition (due to their reduction by netting) and that the forage fish had doubled in number. None of the rainbows are mentioned as having been recovered at the time

of the poisoning. The grayling stocked after the poisoning grew well, but had practically disappeared three years after planting in spite of the fact that the lake was closed to all fishing.

Results of 1942 investigation:

Ford Lake was netted for 48 hours during which time 2 small brook trout (from the 1941 planting) and 4 small bluegills were captured. Five additional bluegills were captured with hook and line. The two brook trout captured were 7.0 and 5.4 inches in length, and weighed 1.5 and 0.5 ounces respectively. They appeared to be rather thin. Mr. William Horsell reported that the lake was fished to a considerable extent in the early part of the 1942 trout season; that few legal trout were captured; and that they were uniformly thin. Perch did not appear to be present in the lake, so that the bluegill must be considered as the main competitor of the trout. The bluegills, introduced accidentally sometime after 1936 have not been very successful either. Shetter reports (Report 620, page 22) that these bluegills and their first progeny grew well, some taken in 1938 having reached legal size by the end of their second summer. Scales from those taken in 1942 were examined with a toy microscope, and none had reached legal size by the end of the 5th. or 6th. summer of life. They are therefore not growing normally. Forage minnows were found to be abundant in the lake, but it must be considered that these are unavailable to the bluegills; or to the trout. Many additional bluegills were seen swimming in the open lake, and few if any were of legal size. The bluegills, since their introduction have populated the lake to the place where the available food supply is no longer adequate. Many young of the year were seen, and also numerous spawning beds. None of the experiments in Ford Lake has met with marked success. Because of its isolation unauthorized stocking (of bluegills) and possibly illegal fishing have clouded the results.

Recommendations:

In order that sport fishing may be permanently improved in Ford Lake, it is obviously necessary to introduce some species which can reproduce in the lake and utilize the food available. Trout in the past have not met with marked success (although each planting was made in the face of competition from stunted warm-water species so perhaps this conclusion is not valid) and evidence from other lakes indicates that even adult trout do not do well in competition with other species, particularly perch. It is possible that adult brook trout might be fairly successful particularly if the stunted bluegills were first removed, but Ford Lake differs from other lakes in the area in that much of it is shallow, 1/3 of the entire lake may be considered as shoal water, unsuited to trout during the summer. Consequently it is recommended that Ford Lake be stocked at the first opportunity with adult northern pike. If adult pike are not available, those planted should be sufficiently large to be able to feed on bluegills up to 3-4 inches in length. A planting of about 50 pike is suggested.

Treating the lake as a warm water lake could have two beneficial effects, first the pike should be able to maintain growth and condition on the food already present (bluegills and forage minnow), and secondly, the pike could perhaps reduce the bluegill population to the point where the remaining bluegills could grow to suitable size and thereby furnish additional sport to the fishermen. Ecologically, the lake appears fairly well suited to the northern pike, having an ample supply of vegetation, and a certain amount of low swampy shore line. A check should be made in the spring following the introduction of pike, to determine whether they have been able to reproduce. The pike should be tagged and individually measured and scale sampled so that subsequent recovery may furnish evidence as to the validity of the scale method of growth study.

If pike become established the present trout designation should be dropped.

#### Devils Soup Bowl

##### Management history:

- 1932 - inventory and designation as trout lake
- 1933 - 5,000 5 mo. brook trout stocked
- 1934 - 500 6 mo. old brook trout planted
- 1939 - 200 adult brown trout planted.

##### Management suggestions from Report 620

no suggestions

##### Known results from creel census, etc.

- 1934 - excellent brook trout fishing reported in 1934, but details are not available. The lake was apparently considerably frequented.
- 1938 - 6 trout (4 rainbow, 2 brown) reported caught.
- 1939 - 18 fishermen fishing for 34 hours caught no trout or any other fish of any kind.

##### Results from 1942 investigation:

Netting for 48 hours failed to produce any fish of any kind. That the lake had been frequented to some extent was noticed. Forage minnows were found to be abundant. No authentic records of any trout being captured could be gathered from fishermen.

Recommendations:

The lake should not be stocked for at least one year. It is considered doubtful that many trout are present now, and fishing with bait and artificial lures failed to reveal the presence of any trout. The lake should be examined to determine if it is still suitable for trout. In this small lake it is quite possible that conditions have changed since 1934, when brook trout fishing is reported to have been excellent. It was not good in 1938, and in 1939 was apparently very poor. It has been reported by various Institute for Fisheries Research staff members that the water level was much lower from 1935 to 1940 than in earlier years. Some recovery was noted in 1941 and 1942.

Pickereel Lake

Management history:

- 1925 - survey by Metzelaar, reported brook trout, perch, smallmouth bass
- 1932 - inventory - brook trout, smallmouth bass, perch present with only perch abundant. 2,500 8 mo. brooks stocked
- 1934 - 7000 brook trout fingerlings, 600 rainbow trout yearlings, 600 8 mo. brown trout, 500 4 mo. smallmouth, 3000 4 mo. bluegills.
- 1935 - 500 6 month, and 400 adult brook trout; 100 adult rainbows; 1,500 4 month bluegills. Installation of brush shelters, and bass spawning boxes.
- 1937 - 20,000 3 month bluegills, and the application of 2 tons of fertilizer.
- 1939 - 400 rainbow adult with right pelvic clipped.
- 1941 - 300 yearling rainbows, and 300 adult rainbows.
- 1942 - in June 300 adult rainbows with adipose marked, in September 500 adult rainbows added.

Management suggestions from Report 620:

500 adult rainbows to be stocked in fall, 300 in June of following year.

Known results from Creel census, etc.

- 1932 - 14 brook trout, from 9 - 19 inches taken in gill net set for 17 hours.
- 1936 - a partial creel census (about half the fishermen) revealed that 123 legal fish (17 brook trout, 103 perch, 1 smallmouth, 2 bullheads) were taken in 170 hours of fishing at the rate of 0.7 fish per hour.

1940 - 23.25 per cent of the adult rainbows planted in 1939 were taken in the first week of the season. During the first week 53 fishermen fishing for 214.5 hours caught 112 trout (104 rainbow, 8 brown trout)  
catch per hour was 0.52  
catch per acre of legal fish was 2.8  
angling pressure was 5 man-hours per acre.

1942 - July 21, 22 - 10 fishermen fishing for 40 hours caught 25 rainbow trout averaging 14 inches in length. Two of these were marked with rt. pelvic clipped, and came therefore from 1939 planting.  
July 23 12 fishermen fishing about 36 hours caught 19 rainbows averaging 13 inches in length.

Results of 1942 investigation:

A gill net set for 24 hours caught 6 rainbow trout, 1 brook trout, and 1 sucker. Scale samples were also secured from 2 bluegills, 2 largemouth bass, and 1 smallmouth bass, besides a few additional scale samples from rainbow trout. Significantly, Pickerel Lake is at present furnishing good fishing for both warm water species (especially bluegills, but also large and smallmouth bass) and for trout. Pickerel Lake apparently represents some very successful fisheries management, for it appears that the installation of brush shelters and the addition of fertilizer, along with the introduction of desirable species has greatly increased the productivity of the lake in respect to return to the sport fisherman. Which practice or practices produced the results is not known.

The one brook trout caught in the net had a length of 13 inches, and weighed 13.75 ounces. It was a well conditioned fish. Of 62 rainbow trout known to have been caught between July 21 and July 24 by nets and by fishermen, eight were marked; 6 with the adipose fin clipped (planted in June, 1942) and 2 with the rt. pelvic missing (planted October 1939). Fish from the 1942 spring planting averaged 11.2 inches (222 to 321 mm. total length) in length, and 9.2 ounces (3.0 - 11.0 ounces) in weight. Lengths of 24 unmarked rainbows averaged 14.3 inches (302 - 510 mm.). Weights of 12 unmarked rainbows averaged 15.5 ounces (9.0 - 36.0 oz.). Dressed weight of three unmarked rainbows were 11.0, 11.75, and 33.25 ounces. The two fish with the right pelvic clipped were reported as having lengths of 18 inches, which seems quite reasonable. The lengths and weights given above illustrate that the trout fishing in Pickerel Lake is of excellent quality, at least in so far as the size of the fish captured is concerned. All rainbows seen were in excellent condition. Fishermen contacted at the lake reported that bigger fish were present in the spring and it was thought that these might have moved in from the Sturgeon River, to which the outlet of the lake is tributary. However, upon further consideration, this seems unlikely, for had rainbows migrated into the lake they would have probably been present at the time of the 1932 survey. However, the above does not preclude the



possibility that natural reproduction takes place in the lake for gravel was observed to be present at the mouth of the outlet, and the trout may be able to make use of this for spawning purposes. Also it would be well to check the outlet in the spring to learn if there is any movement into or out of the lake. At present it seems much more likely that the fishing in the lake is largely maintained through artificial means (stocking).

Fishing for warm water species is also excellent, many fine catches of bluegills having been reported. Several large bluegills were seen but at the time of the investigation, the fishermen on the lake were concentrating on the trout, and few bluegills were caught. Many spawning beds of bass and bluegills were seen, and there is no doubt that these species can maintain their numbers.

#### Management recommendations

At the time of the investigation in 1942 Pickerel Lake was being fished more than the rest of the lakes in the forest combined. Mr. Horsell reported that this had been true throughout the season. The camp ground and camping facilities make the lake attractive to out-of-state anglers, and even with the present emergency it is expected that Pickerel Lake will be fished to some extent. Fish from the 1942 planting, and from 1939 planting are known to be present, and many of the unmarked fish probably represent fish planted in 1940 and 1941. The trout in the lake are obviously able to maintain growth and condition. It is therefore recommended that stocking of trout be continued in this lake as recommended in Report 620 except that the numbers planted should be increased to 2,000 adult (rainbows) in the fall, and 1,000 in June of the following year. It is also recommended that stocking of warm water species be discontinued for the bass and bluegills will be able to maintain their numbers through natural propagation. The rainbows planted should be marked.

The open season for this lake should be May 15 to Nov. 30. This lake has been placed on the list recommended to be opened by legislative act to fall fishing.

#### Grass Lake

##### Management history:

- 1932 - inventory
- 1934 - 4,000 4 mo. bluegills stocked
- 1935 - 1,000 4 mo. bluegills stocked
- 1937 - 65 adult smallmouth bass planted

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▼It is of interest to note that the greater part of the trout were captured still fishing with bait in about 20 feet of water, although large trout were noted coming to the surface.

Management suggestions from Report 620

No further stocking.

Known results from creel census, etc.:

1939 - 131 anglers fishing for 343.5 hours caught  
306 legal fish at the rate of 0.89 fish per hour.  
The catch was composed of 30 largemouth bass (11.6" av. length);  
13 smallmouth bass (10.9" av. length); 99 bluegills (6.7"  
av. length); 101 sunfish (6.4" av.); 7 yellow perch (6.7" av.);  
54 bullheads (8.1" av.); and 2 suckers (12" av.).  
Catch per acre was 10.8 fish, and angling pressure was 12  
man-hours per acre for the season. (June 25-Labor day).  
The above represents better than average fishing.

Results of 1942 investigation:

The fishing in this lake has apparently changed little since 1939. A net set for 24 hours caught 6 large suckers, ranging from 15.8 to 18.0 inches, and weighing 24 to 33 ounces. Measurements of 5 bluegills showed them to be from 7.0 to 7.5 inches long; 4 pumpkinseeds were from 5.5 to 7.5 inches long; 1 bluegill by pumpkinseed hybrid was 6.0 inches long. The fish (bluegills, pumpkinseeds) appear to be holding their own very well for those taken in 1939 were slightly shorter in average length, and it therefore may be assumed that the bluegills and sunfish are growing well. There is some indication that the bass population is at present light, none having been caught during the period of the investigation (July 21, 22, 1942). A few fishermen were contacted. However, young of the year largemouth and bluegills were found to be numerous among the weeds at the margin of the lake. Bullheads are still present, and are apparently caught in fair numbers.

Management recommendations:

It is suggested that stocking be discontinued, for the bass and bluegills can maintain an adequate crop of legal fish through natural reproduction. If it becomes evident that the bass are not holding their own, an additional stocking of largemouth can be made in the future, but it is considered very unlikely that this will be necessary. Smallmouth should not be planted, for although adults were introduced at one time (1937) the shallow weed filled basin of this lake does not seem well suited to this species, and no young smallmouth were observed.

Round Lake

Management history:

This lake has not been inventoried.

1933 - 7,500 ¼ mo. bluegills planted

1934 - 2,000 ¼ mo. bluegills planted

1935 - 1,000 ¼ mo. smallmouth planted  
500 ¼ mo. bluegills planted

1937 - 15,000 ¼ mo. bluegills planted

No recommendations in Report 620.

Known results to date from Creel census, etc.

None

Results of 1942 investigation

The lake was netted for 48 hours, during which time ¼ perch and one walleye were captured. The perch ranged in length from 5.9 inches to 8.4 inches. The walleye was 23.6 inches long. A few additional perch, and ¼ bluegills were captured by angling. One of the bluegills, a large specimen, was 10½ inches long and weighed 1¼ ounces. No record of the introduction of walleyes can be found, at least not within the last 10 years, and they may have been introduced as bait, or as adults by fishermen. No large perch were captured, but fishermen reported their presence, and remains of good sized specimens were noted around the camp ground. The most interesting report by a fisherman was the presence of catfish in this lake; they were described as having a forked tail and a weight of 4-6 pounds. None were captured, but the fisherman reported that the lake is considerably fished at night for this species and for walleyes. The lake was being fished to some extent at the time of the investigation. Seining revealed the presence of young of the year bluegills, pumpkinseeds, perch, and a very abundant supply of golden shiners. No bass were seen or captured, though they are reported to be present. The lake is in need of further investigation.

Recommendations:

The lake is at present furnishing fair sport fishing for bluegills, perch, walleyes; and probably for bass and catfish. It is doubtful that the walleye is able to reproduce, but those present, should be able to do well on the golden shiners, and other small fish present. It is recommended that stocking be discontinued at least until the lake can be further investigated. The present supply of fish is furnishing fair sport, and it is believed that stocking with additional numbers of the present species will not improve the fishing, and no new species should be introduced without further investigation.

Hardwood Lake

Management history:

1932 - inventory

1933 - 7,500 1/4 month bluegills, and 250 1/4 mo. smallmouth bass planted. There has been no stocking since that time.

Results:

Seining in 1934 failed to produce any fish of any kind. In 1942 the lake was examined and no fish of any kind could be observed. No net was set.

Recommendations:

Because of its extreme shallowness, and apparent high acidity it is doubtful that game species can survive in this body of water, and it is suggested that no fish be planted, for as a fishing lake it must be considered valueless.

Two Acre Lake

Management history:

1932 - inventory. No fish have been planted.

Recommendations:

The lake was examined July 23, 1942. No evidence of the presence of fish could be found. The lake is very near extinction and no management recommendations are made. As fishing lake it is worthless. The water is very shallow, and filling with organic matter rapidly.

General discussion

The poor condition of trout in some of the pot-hole lakes in the Pigeon River State Forest may be attributed to several factors as suggested by Dr. Hazzard in a letter to Mr. Wilkinson on June 12, 1942. The small food supply in most of the lakes, the presence of competing species, and the possibility of overstocking all contribute towards making the management of these trout lakes difficult. Lakes where the trout are thin are: Sec. 4, North Twin, South Twin, Hemlock, and Ford Lake. Small perch are present and abundant in the first three lakes mentioned. Ford Lake is densely populated with stunted bluegills. The situation in respect to competing species in Hemlock Lake is not known. It should be pointed out that the rainbows captured from the Twin Lakes were in fair condition, but also that they were from 1942 plantings. Pumpkinseed sunfish were found to be abundant in the Lost Lakes. Many of the trout lakes have a good supply of minnows, (Twin Lakes, Lost Lakes, Hemlock Lake, and Ford Lake) and these minnows should be a satisfactory food supply, but it is probably true that throughout much of the season the minnows are unavailable to the trout, since the minnows will be in the warm surface waters, while the trout will be in the cold water below the thermocline. Considering the above factors, it seems wise to let most of the trout lakes in the

Pigeon River State Forest lie dormant for at least a year. There are two reasons for this: first, fishing pressure is likely to be very light at least for the next season because of the national emergency, and the difficulty of travel; second it is believed that the present supply of trout in the lakes is adequate for the amount of fishing, and even if the populations were reduced to some extent, the remaining trout would perhaps benefit in growth and condition. As suggested in the body of the report Pickerel Lake should be stocked, for in this lake the trout have done very well and it is furnishing fishing of better than average quality at the present time. The warm water lakes, (Grass, Round) can be considered as self sufficient at present.

Brook trout have been recommended for all of the trout lakes in the Pigeon River Forest except for Pickerel Lake for which a later opening is proposed. Since these pot-hole lakes are popular with early season anglers and since the present trout season is designed for the taking of fall-spawning species the brook trout is suggested. It is known that brook trout will do as well or better than rainbows in the smaller trout lakes and are in fairly good condition when the present trout season opens whereas rainbow trout are not.

After the war when derris is once more available it may be well to poison out all trout lakes which have been over-run by competing species. Ford Lake should be included in this program if the proposed introduction of pike does not result in a balanced warm-water fish population. Limited stocking with the proper species of trout and rigid exclusion of all other fish should maintain good trout fishing. Restriction of the catch to five trout per day per anglers should also be considered for these lakes. (A.S.H.)

INSTITUTE FOR FISHERIES RESEARCH

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