

Original: Fish Division
cc: Institute for Fisheries Research
Education-Game
Rifle River Area (Grousehaven)
INSTITUTE FOR FISHERIES RESEARCH Dr. D. S. Shetter
Mr. J. T. Wilkinson
DIVISION OF FISHERIES
MICHIGAN DEPARTMENT OF CONSERVATION
COOPERATING WITH THE
UNIVERSITY OF MICHIGAN

*C/ Mailed to
Wilkinson
Abel
May 2, 1947*

(W)

ALBERT S. HAZZARD, PH.D.
DIRECTOR

April 25, 1947

ADDRESS
UNIVERSITY MUSEUMS ANNEX
ANN ARBOR, MICHIGAN

Report No. 1108

The Use by the Public, Angling Results, and
Hunting Results on the Rifle River Area in 1946

by

David S. Shetter

The Rifle River Area, a 4,288-acre tract of wild land located in Ogemaw County 3 miles east of Rose City, was acquired by the Department of Conservation in March, 1945, to provide additional public fishing and hunting grounds and for research in fish and game management. Since the general public has had access to its streams, lakes, and hills, this state-owned area has been utilized by thousands of sightseers, anglers, and hunters. The results of the fishing and hunting in 1945 were summarized and presented in an earlier report (Institute for Fisheries Research Report No. 1032, "The use by the public and the fish and game taken from the Rifle River Area (Grousehaven) during 1945"). The present report will present the use statistics, the angling data, and the game kill figures for the calendar year 1946.

Rules and regulations, mode of operation, personnel

The rules in force on the Rifle River Area do not differ greatly from those in force on other state lands except for the following

exceptions: All persons entering the area are required to obtain a permit and to allow their game and fish taken to be tallied and inspected on leaving, camping is not allowed, nor is the use of outboard motors allowed.

The checking station was open daily from April 25 to November 30. From January 1 - April 24, and from December 1 - 31, the area was open daily except Wednesdays from 9 A.M. to 5 P.M. During the fishing and hunting seasons the hours during which the checking station was open varied with the length of the day. In so far as personnel permitted, it was kept open as long as needed so that as many sportsmen as possible could be accommodated.

Mr. Basil V. Hughes was in charge of the area and directed the registration, creel census and game kill census under the author's supervision. He was assisted by Robert M. Barber, Howard Van Oosten, and Charles J. Kohn. During the rifle season on deer, assistance in checking hunting pressure and deer kill was received from L. A. Davenport of the Game Division. Maintenance of the roads and physical properties was directed by F. A. Fanselow, Fish Division Engineer, and carried out under the supervision of Grant Thompson.

Use of the area, and residence of the registrants

During 1946, a total of 14,717 permits were issued for use of the Rifle River Area, or 1,653 less than in 1945 when 16,370 permits were issued. These permits were divided as follows: Sightseers, 8,988 (61.1 percent); fishermen, 2,997 (20.4 percent); hunters, 2,447 (16.6 percent); trappers, 75 (0.5 percent); and picnickers, 210 (1.4 percent). The number of permits issued for the various activities has been tabulated by two-week periods (except for the first and last periods) for 1946,

and will be found in Table 1. Compared with 1945, it will be noted that there was a marked decrease in the number of anglers registered, and a slight decrease among sightseers. However, the number of permits issued for hunting and trapping increased over 1945. Picnicking was not tabulated separately in 1945. The most permits were issued during the first part of the deer season (November 9-22), when 1943 permits were written, followed by the period July 20-August 2 (1,668 permits). The fewest permits (8) were requested during the period March 2-15.

The people who visited the Rifle River Area in 1946 came from 53 counties of the Lower Peninsula and 3 counties of the Upper Peninsula, 18 other states, and also from Canada and the Philippine Islands (Table 2). Michigan residents from the following counties led in the use of the Rifle River Area: Ogemaw (the county where the area is located), 3,304 permits; Wayne, 2,595 permits; Genesee, 1,819 permits; Saginaw, 1,410 permits; Oakland, 677 permits. Non-resident sportsmen and tourists from Ohio led the out-state registrants with 702 permits, followed by Pennsylvania (63 permits), Indiana (57 permits), Florida (28 permits), and New York (22 permits). The 975 non-resident permit-holders constituted 6.6 percent of the 1946 totals (in 1945 non-residents made up 4.3 percent of the total registrants).

For the ^{second} consecutive year more people registered for sightseeing than for all other forms of activity combined. This indicates that the majority of the people using the area are primarily interested in looking at the woods, lakes, and streams, and the birds and animals that live there, rather than pursuing them with rod and gun.

As in 1945, sightseeing and fishing were the two main activities pursued, and over 11,000 of the 1946 permits issued (11,717) were for these two activities.

Table 1.--Number of permits issued on Rifle River Area tabulated by two-week periods (except first and last periods) for the calendar year 1946, with comparative totals for 1945. (Percentages are given in parentheses).

Period, 1946	Activity for which registered					Totals
	Sightsee	Fish	Hunt	Trap	Picnic	
January 1 - 4	...	15	2	...	...	17
" 5 - 18	2	17	5	...	...	24
" 19 - February 1	13	39	...	...	...	52
February 2 - 15	16	22	...	...	...	38
" 16 - March 1	...	13	...	...	...	13
March 2 - 15	6	2	...	...	...	8
" 16 - 29	14	...	...	...	...	14
" 30 - April 12	84	...	...	...	...	84
April 13 - 26	122	...	...	...	...	122
" 27 - May 10	297	303	...	...	...	600
May 11 - 24	248	171	...	...	...	419
" 25 - June 7	509	232	...	...	...	741
June 8 - 21	366	169	...	...	20	555
" 25 - July 5	438	268	...	...	53	759
July 6 - 19	843	313	...	...	5	1,161
" 20 - August 2	1,187	456	...	...	25	1,668
August 3 - 16	1,136	359	...	...	37	1,532
" 17 - 30	1,136	253	...	...	66	1,455
" 31 - September 13	831	204	...	...	...	1,035
September 14 - 27	369	88	...	...	4	461
" 28 - October 11	377	23	51	...	...	451
October 12 - 25	276	36	125	...	...	437
" 26 - November 8	199	14	87	...	...	300
November 9 - 22	371	...	1,532	40	...	1,943
" 23 - December 6	132	...	633	28	...	793
December 7 - 20	14	...	10	7	...	31
" 21 - 31	2	...	2	...	...	4
Totals, 1946	8,988 (61.1)	2,997 (20.4)	2,447 (16.6)	75 (0.5)	210 (1.4)	14,717 (100.0)
Totals, 1945	9,784 (59.8)	4,339 (26.5)	2,207 (13.5)	40 (0.2)	...	16,370 (100.0)

Table 2.--Residence of permit-holders for various activities on the Rifle River Area, 1946

County or state of residence	Activity for which registered					Totals
	Sightsee	Fish	Hunt	Trap	Picnic	
Alcona	4	...	...	...	...	4
Allegan	7	...	2	3	...	12
Antrim	4	...	...	...	7	11
Arenac	47	14	65	14	12	152
Barry	12	...	2	...	...	14
Bay	468	81	62	...	36	647
Berrien	3	2	3	...	...	8
Branch	17	...	1	...	...	18
Calhoun	114	19	37	...	...	170
Charlevoix	...	...	1	...	...	1
Clare	5	...	...	...	...	5
Clinton	17	19	3	...	...	39
Dickinson	4	...	...	...	...	4
Eaton	41	9	9	...	5	64
Emmet	4	...	1	...	...	5
Genesee	1,047	316	432	...	24	1,819
Gladwin	4	1	1	...	...	6
Grand Traverse	4	1	...	...	...	5
Gratiot	6	...	10	...	...	16
Hillsdale	37	15	8	...	...	60
Houghton	3	...	...	...	...	3
Huron	33	6	39	...	5	83
Ingham	124	61	58	...	5	248
Ionia	6	...	...	...	...	6
Iosco	136	20	22	...	...	178
Isabella	18	6	1	...	...	25
Jackson	55	16	3	...	...	74
Kalamazoo	25	27	2	...	...	54
Kent	41	7	52	...	...	100
Lake	4	...	...	...	...	4
Lapeer	75	8	36	...	...	119
Lenawee	28	19	11	...	...	58
Livingston	24	11	13	...	...	48
Macomb	232	79	58	...	3	372
Mecosta	1	1	...	...	...	2
Midland	113	27	12	...	4	156
Missaukee	5	...	...	...	...	5
Monroe	59	16	57	...	...	132
Montmorency	8	5	1	...	...	14
Muskegon	7	...	...	...	...	7
Oakland	425	89	163	...	...	677
Oceana	2	...	...	...	...	2
Ogemaw	1,770	1,021	438	58	17	3,304
Oscoda	71	21	6	...	...	98
Ottawa	4	4	...	...	...	8
Roscommon	25	2	1	...	...	28
Saginaw	925	310	155	...	20	1,410
Sanilac	74	14	49	...	...	137
Schoolcraft	3	...	...	...	...	3
Shiawasee	180	8	57	...	...	245

Table 2 (Continued)

St. Clair	67	8	26	...	...	101
Tuscola	143	34	56	...	...	233
Van Buren	...	...	1	...	...	1
Washtenaw	106	13	29	...	...	148
Wayne	1,668	477	415	...	35	2,595
Wexford	3	...	1	...	...	4
Total resident	8,308	2,787	2,399	75	173	13,742
California	9	2	...	...	...	11
Florida	22	6	...	...	...	28
Illinois	17	3	...	...	...	20
Indiana	42	15	...	...	...	57
Iowa	4	2	...	...	...	6
Kansas	3	...	...	...	...	3
Kentucky	...	...	2	...	...	2
Maryland	...	...	7	...	...	7
New Mexico	...	3	...	...	...	3
New York	8	6	...	...	8	22
Ohio	512	125	36	...	29	702
Pennsylvania	25	38	...	...	...	63
Tennessee	10	4	...	...	...	14
Texas	5	...	...	...	...	5
Virginia	...	...	2	...	...	2
Washington	...	2	...	...	...	2
West Virginia	11	1	...	...	...	12
Distr. of Columbia	2	3	1	...	...	6
Philippine Islands	5	...	...	...	...	5
Canada	5	...	...	...	...	5
Total nonresident	680	210	48	...	37	975
Grand totals	8,988	2,997	2,447	75	210	14,717

Angling Results

Winter Ice Fishing - As 1946 was the first year in which spearing could be carried on in certain of the lakes of the area, there was considerable local interest previous to January 1 concerning Devoe and North Lake, two of the more highly regarded pike lakes. Several spear shanties were hauled to Devoe and North Lakes and were visited more or less regularly.

Results of the winter fishing, however, were disappointing, both for the spear-shanty fishermen and the more hardy hook-and-line anglers. On Devoe Lake, 75 anglers spent 339.0 hours of fishing and captured 4 northern pike weighing $23\text{-}1/4$ pounds for a catch per hour of 0.01 legal fish and 0.069 pounds per hour of legal fish. On North Lake 8 fishermen spent 44.0 hours and caught no fish. Dollar Lake winter anglers, of whom there were nine, spent 28.0 hours in catching 4 crappies and 3 bluegills whose total weight was $2\text{-}1/4$ pounds. Their catch per hour was 0.25 legal fish, and the pounds per hour caught amounted to 0.080 pounds of legal fish.

On the Devil's Wash Basin, South Pond, Teal Lake and on the Whirlpool of the Rifle River (open by special commission order) a total of 23 anglers spent 41 hours and caught 5 crappies weighing a total of 1.19 pounds (from the Devil's Wash Basin). Combining all results, we find that a total of 115 winter fishermen spent 452 hours on lakes in the area and removed 4 northern pike, 9 crappies and 3 bluegills with a total weight of 26.69 pounds, a catch per hour of 0.03 legal fish, or a pounds-per-hour removal of 0.059 pounds. Obviously the winter fishing was not removing very many legal fish in this locality. More winter fishing would have been carried on had the roads to the lakes been plowed out. Only high-wheeled models with chains were able to negotiate the trails to the lakes.

Trout Fishing Results, 1946 - Creel census data on the following streams as they flow through the area were obtained in 1946: Rifle River, Gamble Creek, Fontinalis Creek, Brown Trout Creek, Houghton Creek, and Skunk Creek. The method of taking the data has been described in a previous report (#1031).

Approximately 87 percent of all trout fishing was recorded for the Rifle River (Table 3) and the remainder was divided among the other streams previously mentioned, except Skunk Creek. A total of 1,427 angling days were spent on all the streams. Of this number, 1,125 or 79 percent reported capturing no legal fish. A total of 3,396 hours were expended on the trout streams in 1946, during which time a total of 1,066 trout and 98 warm-water fish were captured. This catch was distributed among the species as follows: 28 brook trout, 993 brown trout and 45 rainbow trout, 65 yellow perch, 2 largemouth black bass, 3 northern and pike, 8 rock bass, 20 common suckers. The total weight of the fish removed from trout streams amounted to 447.98 pounds, made up of 7.17 pounds of brook trout, 374.41 pounds of brown trout, 13.90 pounds of rainbow trout, and 52.50 pounds of warm-water fish (Table 3a).

Comparison of the 1946 records with those obtained during the 1945 trout season indicates that the 1946 trout fishing on the Rifle River Area was between two and three times better in 1946 than in 1945. Almost three times as many brown trout were caught, and over three times as many rainbow trout were captured in 1946 as in 1945. All of the trout streams except Skunk Creek and Houghton Creek provided angling of higher quality in 1946. The increase was most noticeable in the Rifle River, where the majority of the fishing was done. The total poundage removed from the Rifle River would have exceeded 500 pounds had all trout caught been kept.

Table 3a.--The number and weight of fish other than trout caught in trout streams of the Rifle River Area. Numbers in parentheses show number of fish returned to water.

Species	Rifle River [↓]	
	Number	Pounds
Largemouth black bass	2	7.56
Rock bass	8	1.69
Northern pike	3	12.94
Yellow perch	65(1)	11.56
Common suckers	20	18.75
Totals	98(1)	52.50

[↓] All fish, except 2 common suckers weighing 1.94 pounds from Houghton Creek, came from the Rifle River.

Since the Rifle River was the scene of the great majority of the angling, the trends in angling on the entire area were influenced mostly by the results obtained on this stream, (Table 4). It was most heavily fished during the opening two weeks (279 angling days, 693.5 hours). The lightest pressure came during the period July 6 - 19 (77 angling days, 161.5 hours). In the other seven periods, pressures ranged from 173.0 to 510.0 hours.

Angling quality was poor (0.061 pounds of fish per hour) during the first two weeks, but became better each two weeks until the period June 8 - 21, when it reached a peak of 0.204 pounds of fish per hour. From June 22 - July 19, it fell off to 0.122 to 0.129 pounds of fish per hour, and during the remainder of the season it dropped further to 0.088, 0.086 and 0.076 pounds of fish per hour.

The total catch of the Rifle River anglers amounted to 9 brook trout, 947 brown trout, and 44 rainbow trout or 1,000 legal trout of all species. Of these 129 legal trout (124 brown trout, 4 rainbow trout, and 1 brook trout were reported to have been returned to the water, so 871 trout were creeled. The total weight of these fish amounted to 374.69 pounds.

An analysis of the angling records from the Rifle River shows that the portion of the stream between Devoe Lake and the Ranch Bridge is poor trout water. Only 73 trout were caught in 1,158.0 hours of fishing on this upper part of the stream as compared with a catch of 926 trout in 1,975.5 hours from the Ranch Bridge to the South Boundary. However, this short stretch (approximately $3/4$ miles of stream) produced all but $2-3/8$ pounds of the warm-water fish taken from the Rifle River.

A small portion of the total catch of the Rifle River consisted of hatchery-reared trout which survived from previous plantings on the

drainage system outside the boundaries of the Rifle River. These hatchery-reared fish were recognizable because certain fins were missing. All brook trout captured were wild fish, but 20 brown trout and 10 rainbow trout came from the 1946 plantings of legal trout in the Rifle River and its tributaries (recognizable by the missing left pelvic fin). One rainbow trout, a survivor from the 1944 fall fingerling plantings (left pectoral fin missing) also was observed. Of the total catch of rainbow trout, 11 or 25 percent were the result of hatchery plantings, while 20 or 2.1 percent of the brown trout catch came from the hatchery plantings of 1946.

Although 7,054 right pelvic-clipped legal trout were planted in 1945 in the Rifle River drainage outside of the Area, no trout with this mark were observed in the catches on the Rifle River Area in 1946.

The increase in angling quality in 1946 appears to have been the results of lower water levels over much of the summer, and clearer water. These two factors were of considerable aid to the wading fly-fishermen. In 1945 many stretches of the lower Rifle River were not fishable because of relatively high, muddy water.

Comparatively speaking, the other streams on the Rifle River Area produced relatively few fish. The general increase in angling quality appears to be the result of a lighter angling pressure, since the total catch was approximately the same. The most pronounced increase in angling quality occurred in the Fontinalis Creek fishing, where 14 legal trout (3 brook trout, 11 brown trout) were taken in 1946 in 48.0 hours of angling as compared with one legal brown trout in 9.0 hours of fishing in 1945. The comparative results for all the streams will be found in Table 3. It does not appear necessary to discuss each stream in detail because of the small number of records obtained from these streams.

Average Size of Trout Taken (Table 5).- The average size of the trout taken during 1946 is shown in Table 5. All species averaged slightly smaller than in 1945. However, for no stream or species was the average size below 8.7 inches and about 4.7 ounces. Brook trout in the catches from various streams averaged from 8.6 inches and 4.1 ounces (Rifle River) to 9.8 inches and 7.4 ounces (Gamble Creek). Brown trout were of the smallest average size in Fontinalis Creek (8.7 inches, 4.9 ounces) and largest in Brown Trout Creek (11.4 inches, 9.2 ounces). All but one rainbow trout came from the Rifle River, where 40 fish of that species were of an average size of 9.5 inches and 5.4 ounces. The one specimen from Houghton Creek was 10.3 inches long and weighed 6.5 ounces. For the entire area, the average size of the three species of trout^{was} as follows: Brook trout, 8.9 inches and 4.7 ounces; brown trout, 10.2 inches and 6.7 ounces; rainbow trout, 9.5 inches and 5.4 ounces. The largest brown trout caught was 22.0+ inches long and weighed 3.22 pounds.

Yield of Trout per Mile of Stream (Table 6).- As no detailed map of the streams is available from which accurate acreage determinations might be made, yield data again were computed on a per mile-of-stream basis. These data are presented in Table 6, where the miles of stream on the area are shown by streams, together with the number and weight of the trout catch for both 1946 and 1945. In 1946, the trout catch varied from no trout in Skunk Creek to 215.5 trout per mile and 59.2 pounds of trout from the Rifle River. Houghton Creek (62.1 trout per mile, 23.7 pounds of trout per mile) and Gamble Creek (20.7 trout per mile, 6.7 pounds of trout per mile) followed the Rifle River in yield. They also were in the same order in 1945. For the 9.05 miles of stream

Table 5.--The average size of the trout taken in the various streams of the Rifle River Area during the 1946 season. (Lengths are given in inches, weights in ounces).

Stream	Brook trout			Brown trout			Rainbow trout		
	Number	Average length	Average weight	Number	Average length	Average weight	Number	Average length	Average weight
Rifle River	8	8.6	4.1	823	10.2	6.8	40	9.5	5.4
Gamble Creek	2	9.8	7.4	15	9.6	4.9	...	...	...
Brown Trout Creek	12	8.9	4.8	2	11.4	9.2	...	...	...
Houghton Creek	...	...	...	17	10.1	6.1	1	10.3	6.5
Fontinalis Creek	3	8.7	4.1	11	8.7	4.9	...	...	...
Totals, averages, 1946	25	8.9	4.7	868	10.2	6.7	41	9.5	5.4
Totals, averages, 1945	25	9.5	6.1	346	10.4	8.2	12	9.6	5.8

Table 6.--Comparative yield to the angler and comparative angling pressures on the various streams of the Rifle River Area for the 1945 and 1946 seasons.

Stream	Miles under census	Legal trout captured		Pounds of trout removed		Hours of angling		Trout captured per mile		Pounds of trout removed per mile	
		1946	1945	1946	1945	1946	1945	1946	1945	1946	1945
Rifle	4.64	1,000	346	374.69	171.91	3,133.5	2,939.5	215.5	74.6	59.2	37.0
Gamble	0.87	18	29	5.81	9.17	67.0	238.5	20.7	33.3	6.7	10.5
Brown Trout	1.75	16	25	4.74	9.45	77.0	166.0	9.1	14.3	2.7	5.4
Houghton	0.29	18	16	6.90	4.68	62.5	37.0	62.1	55.2	23.7	16.1
Fontinalis	0.86	14	1	3.34	0.16	48.0	9.0	16.3	1.2	3.8	0.2
Skunk	0.64	...	1	...	0.19	8.0	7.5	...	1.6	...	0.3
Totals, averages	9.05	1,066	418	395.48	195.56	3,396.0	3,397.5	117.7	46.2	43.7	21.6

under census, these trout waters yielded an average of 117.7 legal trout per mile, and the average weight of trout removed per mile of stream was 43.7 pounds, or over twice the yield removed per mile of stream in 1945.

Number and percentage of Angling Days Reporting Capture of Various Numbers

of Legal Trout (Table 7).- Table 7 shows the number of angling days during which from 0 to 15 legal trout were captured. Three anglers (0.2 percent of the total) took 15 trout, two fishermen caught 14 legal fish (0.2 percent), one removed 13 trout (0.1 percent) and 73 anglers caught between 5 and 12 trout (5.9 percent of the total). The number of unsuccessful days was about 8 percent less in 1946 than in 1945 (78.6 percent compared with 87.2 percent). The percentage of angling days when 1,2,3 and 4 fish were captured was 7.2, 2.7, 2.8, and 2.1 percent respectively in 1946.

Lake Fishing (Table 8).- The lakes of the Rifle River Area were, like other non-designated trout lakes north of M-46, open to fishing at any time for all species on which the season was not closed. A check of the angling records for the lakes discloses that only 32.5 hours of angling were prosecuted in the Area between the close of the ice-fishing season on February 28, and May 15 (when the pike season opened). As on most of the other experimental lakes in Michigan, there appeared to be little interest in the early spring fishing. Not until mid-May was there very much angling activity on any of the lakes of the Area. The great majority of the angling was done between May 15 and Labor Day. Fall fishing, except on Spring Lake, was very light.

In general, 1946 angling pressure decreased by 50 percent or more on the larger lakes (Devoe, North) and increased on the smaller lakes. The most striking change in the lake fishing was the discovery and exploitation of the yellow perch in Spring Lake. Where eight anglers had fished this lake unsuccessfully for 8 hours in 1945, a total of 603 anglers

Table 7.--Numbers of trout recorded on various numbers of angling days, Rifle River Area trout streams, 1946. (Percentages are given in parentheses).

Stream	Number of angling days reporting catches of various numbers of trout																Totals
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Rifle River	978 (78.8)	91 (7.2)	33 (2.7)	35 (2.8)	26 (2.1)	15 (1.2)	12 (1.0)	10 (0.8)	15 (1.2)	8 (0.7)	7 (0.6)	3 (0.2)	3 (0.2)	1 (0.1)	2 (0.2)	3 (0.2)	1,243
Gamble Creek	48 (84.2)	3 (5.2)	4 (7.0)	1 (1.8)	1 (1.8)	...	...	...	...	...	...	...	...	...	...	...	57
Brown Trout Creek	51 (87.9)	4 (7.0)	...	1 (1.7)	1 (1.7)	1 (1.7)	...	...	...	...	...	...	...	...	...	...	58
Houghton Creek	18 (66.7)	4 (14.8)	1 (3.7)	4 (14.8)	...	...	...	...	...	...	...	...	...	...	...	...	27
Fontinalis Creek	22 (64.7)	10 (29.4)	2 (5.9)	...	...	...	...	...	...	...	...	...	...	...	...	...	34
Skunk Creek	8 (100.0)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8
All streams	1,125 (78.9)	112 (7.8)	40 (2.8)	41 (2.9)	28 (2.0)	16 (1.1)	12 (0.8)	10 (0.7)	15 (1.1)	8 (0.6)	7 (0.5)	3 (0.2)	3 (0.2)	1 (0.1)	2 (0.1)	3 (0.2)	1,427 (100.0)

Table 8.--Pertinent angling statistics for the lakes of the Rifle River Area for 1946, with comparative totals for 1945.

Percentage of unsuccessful angling days shown in parentheses under actual number. Numbers in parentheses under various species of fish indicate numbers of fish returned to water.

Lake	Number of angling days	Number of unsuccessful angling days	Total hours of angling	Legal fish caught											Total fish caught	Total pounds removed	Quality index	
				Brown trout	Northern pike	Smallmouth bass	Largemouth bass	Rock bass	Bluegills	Pumpkin-seed	Yellow perch	Black crappies	Bullheads	Common suckers			Number per hour	Pounds per hour
Devoe	576	515 (89.4)	2,019.5	9	7	19 (1)	6	24	3	...	81 (9)	2	...	3	157 (10)	↓160.69	0.08	0.058
North	216	157 (72.7)	610.5	...	1	13	13	53 (1)	37	2	111 (5)	...	...	2	232 (6)	99.81	0.38	0.163
Dollar	383	163 (42.6)	1,140.5	...	...	1	28	43 (2)	887 (10)	150	184	116	52	...	1,521 (42)	338.53	1.31	0.297
Spring ²	603	286 (46.4)	1,837.5	...	...	...	...	...	1	2	2,960	...	40	...	3,052	↓3858.00	1.66	0.467
Loon	10	6 (60.0)	14.0	...	...	...	8	...	...	...	...	...	...	...	8	6.88	0.57	0.490
Teal	38	10 (26.3)	139.0	...	...	...	...	...	1	4	270	...	...	...	275	52.00	1.98	0.374
South Pond	14	9 (64.3)	18.0	...	...	...	1	3	3	2	2	...	1	...	12	4.67	0.67	0.259
Devil's Wash Basin	27	23 (85.2)	47.5	...	...	...	...	2	...	2	3	7	...	...	14	3.31	0.29	0.070
Totals, 1946	1,867	1,169 (62.6)	5,826.5	9	8	33 (1)	56	125 (3)	932 (10)	162	3,611 (14)	125	93	5	5,271 (58)	↓1,523.89	0.89	0.262
Totals, 1945	2,608	1,756 (67.3)	9,303.5	25	67	140	254	184	2,863	1,070	918	600	43	28	6,192	2,247.10	0.67	0.241

↓ Totals include 3 turtles with a weight of 43 pounds
² In Spring Lake, 30 unidentified fish were accidentally returned to the water when a stringer became unfastened.
³ Totals include 49 bullfrogs weighing 20 pounds
↓ Grand total of weights includes ↓ and ².

fished there in 1946 for 1,837.5 hours and removed 3,003 fish (all but 43 were yellow perch) and 49 bullfrogs for a total catch which weighed 858.00 pounds. A similar (but not as marked) increase in angling pressure, catch, and angling quality was noted also for Teal Lake (1945, 4 anglers, 5 hours, 2 largemouth bass weighing 2.4 pounds) where in 1946 a total of 38 fishermen spent 139.0 hours on the lake and took 270 yellow perch, 4 sunfish and 1 bluegill, the total weighing 52.00 pounds. On Leon Lake, three anglers spent 1.5 hours unsuccessfully in 1945; in 1946 ten anglers spent 14.0 hours catching eight largemouth black bass which weighed 6.88 pounds. Only these three lakes showed an increase in yield to the angler in 1946 when compared with their 1945 yields.

The most noticeable decrease in yield occurred on Dollar Lake. In 1945, 406 anglers removed 4,799 panfish weighing 1,071.50 pounds from the lake in 1,894.0 hours of fishing. In 1946, 383 anglers fished 1,140.5 hours and caught only 1,491 panfish weighing 338.53 pounds. In Devoe Lake, 1946 angling pressure was about 60 percent below 1945, yet both total catch and total pounds removed was approximately 80 percent less than in 1945. The 1946 trend in North Lake was similar to Devoe Lake, although not quite as severe. On South Pond and Devil's Wash-Basin, the yields were smaller in 1946 than in 1945, possibly because of a drop in the angling pressure on South Pond, and possibly the result of a change in the species composition of the catch on the Devil's Wash Basin.

If the data for all the lakes are combined, we find that 1,867 angling days were spent on eight lakes of the area, and 1,169 (or 62.6 percent) were unsuccessful. During these days, a total of 5,826.5 hours of fishing was done, and the following species caught: 9 brown trout,

8 northern pike, 33 smallmouth black bass, 56 largemouth black bass, 125 rock bass, 932 bluegills, 162 pumpkinseed sunfish, 3,611 yellow perch, 125 black crappies, 93 bullheads, and 5 common suckers, or a total of 5,241 legal fish. Of these 58 were returned to the water (1 smallmouth black bass, 3 rock bass, 10 bluegills, 14 yellow perch, 30 unidentified). The total weight of fish removed amounted to 1,523.89 pounds, which includes also 3 turtles (sp. ?) weighing 43 pounds and 49 bullfrogs weighing 20 pounds. Thus the number of legal fish caught per hour was 0.89 fish, and the number of pounds removed per hour of angling was 0.262 pounds.

Both of these indices to quality are higher than was noted for the 1945 lake fishing on the area, indicating that the fishing was of better quality for the average angler in 1946 despite a lower total yield. This increase in angling quality was solely the result of the very large increase (approximately 4 times) in the catch of yellow perch in Spring and Teal Lakes during 1946. Except for the catch of bullheads, which was over twice as large, all other species in the catches declined sharply during 1946.

Yield and Pressure per Acre on the Lakes of the Rifle River Area (Table 9).--

In Table 9 the areas, hours of angling and total pounds of fish removed are shown from which the angling pressure per acre and the pounds per acre yield to the lake fishermen can be determined for 1945 and 1946. These data indicate that the heaviest angling pressure in both 1945 (146.8 hours per acre) and 1946 (88.4 hours per acre) occurred on Dollar Lake; also Dollar Lake had the highest pounds per acre yield in both years (1946, 26.2 pounds; 1945, 83.1 pounds) although only about 1/3 as large in 1946 as in 1945. Loon Lake was fished the least (1946, 0.7 hours per acre;

Table 9.--Comparative per acre pressures and per acre yields of the lakes of the Rifle River Area for 1945 and 1946.

Lake	Area (acres)	Hours of angling		Pounds of fish taken		Pressure per acre		Pounds per acre taken	
		1946	1945	1946	1945	1946	1945	1946	1945
Devoe	130.0	2,019.5	5,676.5	160.7	798.2	15.5	43.7	1.2	6.1
North	87.6	610.5	1,661.5	99.8	361.6	6.9	18.9	1.1	4.1
Dollar	12.9	1,140.5	1,894.0	338.5	1,071.5	88.4	146.8	26.2	83.1
Spring	72.5	1,837.5	8.0	858.0	0.0	25.3	0.1	11.8	0
Loon	19.9	14.0	1.5	6.9	0.0	0.7	0.1	0.3	0
Teal	5.8	139.0	5.0	52.0	2.4	23.9	0.9	8.9	0.4
South Pond	1.3	18.0	32.0	4.7	5.5	13.8	24.6	3.6	4.2
Devil's Wash Basin	1.3	47.5	25.0	3.3	7.9	36.5	19.2	2.5	6.1
All lakes combined	331.3	5,826.5	9,303.5	1,523.9	2,247.1	17.6	28.1	4.6	6.8

1945, 0.1 hours per acre) in both years and also has had the lowest per acre yields (1946, 0.3 pounds, 1945, 0.0 pounds). In the other lakes, pressure per acre and per acre yields varied considerably between the two seasons. Considering the entire data from all the lakes, whose combined area is 331.3 acres, in 1946 an average angling pressure of 17.6 hours per acre produced an average yield to the lake fishermen of 4.6 pounds of fish; in 1945 under an average angling pressure of 28.1 hours per acre, the average yield per acre was 6.8 pounds of fish.

Hunting and Trapping Data (Table 10).--The total number of days of hunting on the Rifle River Area increased about 10 percent in 1946 over the previous year (2,447 as compared with 2,207); trapping activity also increased (75 as compared with 40). Much of the increase in hunting was among the deer hunters; 44 days were spent by bow-and-arrow deer hunters, 2,159 days by rifle deer hunters, and the remaining 244 days by small game nimrods. The total kill is summarized in Table 10. Of the total number of hunting days (2,447), 2,339 or 95.6 percent were unsuccessful. During the 1946 hunting seasons (January 1 - January 31, October 5 - December 31) a total of 10,962.0 hours of hunting of various types were recorded. The total legal kill checked was as follows: 52 legal deer (51 by rifle, 1 by bow and arrow), 6,280 pounds; 13 racoon, 163.88 pounds; 24 ducks, 59.75 pounds; 39 ruffed grouse, 50.44 pounds; 45 woodcock, 21.31 pounds; 4 rabbits, 12.81 pounds; 162 muskrats, 377.94 pounds; and 10 mink, 16.0 pounds; or a total of 349 pieces of game weighing 6,982.13 pounds. Three legal bucks were found dead in the woods during the rifle season whose weight may be estimated to be 361.8 pounds (using the average weight found for those checked of 120.6 pounds), so the total weight of legal game killed may be set at 7,343.2 pounds.

Table 10.--Hunting season statistics for the Rifle River Area for 1946, with comparative totals from 1945. Figures in parentheses show pounds of individual game birds and mammals taken.

Period 1946	Total hunting days	Unsuccessful hunting days	Total hours of hunting	Game and fur animals taken								Total game killed	Total pounds of game taken	
				Deer	Raccoon	Ducks ¹	Grouse	Woodcock	Rabbits ²	Musk-rat	Mink			
January 1-4	2	1	4.0	...	...	...	...	...	...	1 (3.25)	...	...	1	3.25
January 5-18	5	5	10.0	...	...	...	...	...	...	...	...	...	...	...
October 5-11	51	46	119.0	...	...	9 (21.25)	...	...	...	...	...	...	9	21.25
October 12-25	125	92	338.0	...	...	11 (26.56)	28 (36.31)	33 (15.75)	...	...	...	...	72	78.62
October 26- November 8	87	71	197.0	1 (130)	1 (15.88)	4 (11.94)	11 (14.13)	12 (5.56)	1 (3.00)	...	...	...	30	180.51
November 9 -22	1,532	1,482	7,239.0	50 (6,063)	8 (88.00)	...	...	...	...	137 (319.06)	6 (9.25)	...	201	6,479.31
November 23- December 6	633	632	3,029.0	1 (87)	4 (60.0)	...	...	...	...	25 (58.88)	4 (6.75)	...	34	212.63
December 7-20	10	8	22.0	...	...	...	...	...	...	2 (6.56)	...	...	2	6.56
December 21-31	2	2	4.0	...	...	...	...	...	...	...	...	...	...	...
Totals, 1946	2,447	2,339 (95.6)	10,962.0	52 (6,280)	13 (163.88)	24 (59.75)	39 (50.44)	45 (21.31)	4 (12.81)	162 (377.94)	10 (16.00)	...	349	6,982.13
Totals, 1945	2,207	2,109 (95.5)	10,008.5	55 (7,072)	3 (33.0)	25 (59.25)	51 (58.13)	8 (4.25)	3 (7.50)	10 (16.00)	2 (4.00)	...	101	7,255.87

¹ The kill of ducks by species was 16 black ducks, 4 mallards, 3 wood-ducks, and 1 blue-wing teal.

² The kill of rabbits was 3 snowshoe hares, 1 cottontail.

Nine does also were found dead in the woods whose weight may be estimated to be 1,085.4 pounds.

Comparison with the 1945 totals indicates that the deer kill in both years was identical if the three bucks not found by the 1946 hunters are counted.

The kill of ducks was almost identical in both years (25 in 1945, 24 in 1946).

The grouse kill was down about 40 percent (from 51 to 39) but as elsewhere in Michigan the hunters' bag of woodcock increased on the Rifle River Area about 5-1/2 times that of 1945 (from 8 to 45). The rabbit take was again small, increasing from 3 to 4 in 1946. The noticeable increase in the take of muskrats from 10 to 162, and of mink from 2 to 10, and of raccoons from 3 to 13 probably reflects the increased trapping activity in 1946.

Although it was thought that the 1945 kill of bucks would consist largely of older animals because of the 20-year closing of the Rifle River Area, the 1946 age data collected by L. A. Davenport indicates that the percentage of bucks killed which occurred in the various age groups was approximately the same in both 1945 and 1946. Antler measurements indicated that in both years slightly more than half of the bucks were 1-1/2 years old, approximately one-quarter were 2-1/2 years old, and the remainder 3-1/2 years and older. Also, the racks on the 1945 bucks were not any larger than the 1946 bucks. In 1946 two 14-point racks were taken, and a 10-point head, while in 1945 the best racks were two 9-pointers. Spike-horns and 8-point heads, divided about equally, made up about 60 percent of the kill in both years. Apparently if snow conditions and food conditions remain

comparable to the past few years, a kill of between 50 and 60 bucks can be harvested annually by hunters on the area.

There appears to be a difference of about 7 pounds in the average weight of the bucks killed in 1945 and 1946; those killed in 1945 were of an average weight of 128 pounds, while those killed in the 1946 season averaged 120.6 pounds. This difference is thought to have been due to the different scales used in the weighing operations. In 1945 steelyards which were erratic and hard to read were used, while in 1946 all deer were weighed on accurate platform scales.

Based on an estimated 3,910 acres (6.1 square miles) of land in the Rifle River Area, there was one buck killed for each 71 acres, or 9.0+ legal bucks per square mile, in both 1945 and 1946.

In both years, the number of successful hunting days was low; only on 4.4 percent of the total hunting days was some game taken in 1946, and on 4.5 percent of the total in 1945.

Total Fish and Game Removed (Table 11).-Table 11 summarizes the 1946 take of fish and game, by species. The total pounds of game and fish removed from the area was 8,954.00 pounds. The same data for 1945 are given for comparison, and it will be seen that the total pounds removed was 9,724.88. About 771 pounds more of fish and game were removed in 1945 than in 1946. Part of this decrease in 1946 was the failure of the lakes to yield as many pounds of fish as in 1945.

If the legal bucks lost (3) in 1946 are given the average weight determined for those observed (120.6 pounds), and the 9 does illegally shot are given the same weight, the total weight of game animals killed and fish taken may be estimated to be 10,401.26 pounds. In the same fashion it may be estimated that the 1945 total kill, including 16

Table 11.--Summary of pounds of fish and game killed in Rifle River Area,
1945 and 1946.

Item	1946		1945	
	Number	Total pounds	Number	Total pounds
Fish (from trout streams)	1,164	447.98	446	221.88
Fish (from lakes)	5,271	1,523.89	6,192	2,247.13
Legal buck deer	52	6,280.00	55	7,072.00
Ruffed grouse	39	50.44	51	58.12
Woodcock	45	21.31	8	4.31
Ducks	24	59.75	25	59.13
Cottontail rabbits	1	3.75	3	7.50
Snowshoe hare	3	9.06	...	...
Raccoon	13	163.88	3	33.00
Fox Squirrel	...	...	1	1.81
Muskrat	162	377.94	10	16.00
Mink	10	16.00	2	4.00
Total weight of fish and game taken	...	8,954.00	...	9,724.88
Legal bucks found spoiled ¹	3	361.88	...	...
Illegal does killed ¹	9	1,085.38	16	1,929.63
Total weight of fish and game killed	...	10,401.26	...	11,654.51

¹ Average weight of 120.6 pounds assigned to these deer.

illegal does, amounted to 11,654.51 pounds. On an acreage basis, the 4,288 acres of the Rifle River Area may be estimated to have yielded an average of 2.43 pounds of game and fish per acre in 1946 and 2.72 pounds per acre in 1945 for the rod and gun.

Maintenance of the area

During 1946, almost all road filling was completed and the roads and trails used by the public were improved. Unused and rotten fencing within the area boundaries was torn down and the old fence posts removed and piled for firewood stock. The old stables at North Lake were dismantled and considerable sheathing salvaged for use elsewhere by other units of the Fish Division. The old silo at the former ranch site was sold to and dismantled by a private party. The elimination of these aging properties has done much to improve the general appearance of the grounds. Additional directional signs were erected for the information of the public.

A screened porch was added to the checking station which makes the measuring and recording of the game and fish more convenient for the sportsmen and the employees in bad weather.

It is suggested that maintenance of the area be extended to keeping the roads plowed out during the winter months. Particularly during the past two months, Mr. Kohn has stated that he knows of many people who would have hunted or fished in the area if the roads had been open beyond the checking station. Perhaps some arrangement might be worked out with the Ogemaw County Road Commission or the State Highway Commission to undertake the snow removal. There is little question but that it would make possible additional fishing, and also rabbit, bob-cat, and

fox-hunting. Also it would provide access to additional public land for skiing, skating, tobogganning and snow-shoeing.

Acknowledgments

Game Biologist L. A. Davenport organized the collection of deer kill records, and compiled the data obtained during the deer season. The Fish Division staff of the Area assisted in collecting the data.

Game Biologists Donald W. Douglass and G. A. Amman inspected the area and arranged for the delivery of 300 mountain ash, 350 black cherry, 400 Michigan holly, and 100 juniper plants to augment the grouse food supply. The excellent cooperation by the public, which was noted in 1945, continued through 1946, and this cooperation is gratefully acknowledged.

INSTITUTE FOR FISHERIES RESEARCH

David S. Shetter

Approved by: A. S. Hazzard
Typed by: S. E. Bommer