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Report No. 1326

PRELIMINARY REPORT ON A BIOLOGICAL SURVEY OF THE PINE RIVER SYSTEM

IN MANISTEE, WEXFORD, LAKE AND OSCEOLA COUNTIES, MICHIGAN

by

Edward E. Schultz

Abstract

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During the summer of 1951, two survey parties made extensive biological surveys on four Michigan watersheds. The purposes of the surveys were: (a) To inventory some of the biological conditions bearing on game fish production. (b) To determine the need for and the general extent of environmental improvements required to make better fishing. (c) To learn the fish stocking needs of the watershed. (d) To assemble information of value in future public fishing site acquisitions.

From July 31 to September 19, a three-man crew made a partial survey of the Pine River system in Manistee, Wexford, Lake and Osceola counties. Using A. C. shocking equipment, fish were collected and information gathered at thirty-eight stations on the Pine and its tributaries.

Brook, brown and rainbow trout were found, including young-of-the-year, indicating that they were spawning successfully. Using the annuli on scales, the fastest rate of growth observed was in fish from the main stream of the Pine River; trout of Poplar Creek, Silver Creek and Big

Beaver Creek also showed good growth rates. Other streams produced trout showing moderate to slow growth, with the lowest rates occurring in Hoxey Creek and the upper part of Coe Creek.

Population density varied widely, but was only moderate to low in most places. Hoxey Creek had a dense population of brook trout, followed by Silver Creek and Nigger Creek. Poplar Creek had a large population of brown trout. Several streams, all in farming country, lacked trout altogether. They were Sprague Creek, Edgett Creek, Rose Lake Outlet, the upper part of the East Branch of the Pine River, the upper part of Big Beaver Creek, and the center section of Coe Creek. All of these areas were silted in, and the species of fish taken indicated that the waters were too warm for trout. Brook trout were found in all other streams, but rainbows were not found along the entire length of several of them and were not present in Elm Creek and Sixteen Creek. Brown trout were found in the main stream, in Poplar Creek, Silver Creek and the lower end of the East Branch of the Pine River. Brown trout have never been officially planted in the Pine River watershed, but rainbow trout and brook trout are planted extensively.

Stronach Dam marks the lowest limit of fish migration in the Pine River, being a complete barrier to all upstream fish movements. The sand-filled reservoir and shifting sand below the dam eliminate spawning facilities for all trout for a great distance on each side of the dam. Tippy Dam, several miles below this point, is also a complete barrier. Some lake-run rainbow trout are lifted at Tippy Dam and placed in the Pine River above Stronach Dam. Sea lampreys apparently cannot get over either barrier, the only lamprey found being the American brook lamprey which is not parasitic.

Most of the streams showing slow growth or low populations had sand bottoms. Some of this sand had been deposited in the bed on top of gravel. Farmed-out land and cutting of the stream banks are contributing much sand and clay to the river. More important, however, is the rapid run-off of water on the areas of clay soil. This is well shown in nearly all streams by the high turbidity immediately following even a light rain. Some of this clay is from the adjacent farm lands, but the most noticeable effects of these farms is the lack of cover shading the streams, the addition of silt and the caving down of the banks by cattle. A few farms now have active blowing sand.

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During the summer of 1951, from July 31 to September 19, a three-man crew made an extensive biological survey of the Pine River system. Actually the Pine River is part of the Big Manistee River watershed and is the south branch of that river. The downstream end of the Pine River is at Cooley Bridge on highway M-55, Manistee County, where the Pine flows into Tippy Dam reservoir. The watershed drains areas in Manistee, Wexford, Lake and Osceola counties.

All collections of fishes in this report were made with a 110 volt, 60-cycle, A. C. shocker. The tables contain information on the species of fishes taken, the calculated number of each species taken per hour of effort for the three-man crew, the actual number captured, the average length of all fish of a given species, and the size range for each species. The identification of most of the specimens was verified by Dr. Robert R. Miller, Assistant Curator of Fishes, Fish Division, Museum of Zoology, University of Michigan.

The length of each sample area shocked is the linear length of stream through which the shocker was operated and fish collected. Shocker operation is the total time it took to make the collection for the length given.

In many places hatchery trout had recently been planted at or near the location where the sample was taken. Some hatchery trout were not fin clipped and therefore not all hatchery trout could be recognized as such. Hatchery trout were not scale sampled or preserved except where they might have been unrecognized as hatchery fish. All fish planted prior to the survey, at the points where samples were taken, are given in a second table for each location.

Two maps at the end of this report give a summary of trout collections and their locations in the Pine River system. The first map gives the distribution of the three species of trout, while the second map gives only the distribution of the young of the year (Age Class 0).

No noxious fish were found in the entire system. Sea lampreys are stopped by two very effective barriers, Tippy Dam and Stronach Dam. The American brook lamprey is found over the entire area, but being non-parasitic it is listed as a forage fish.

Pine River, Below Stronach Dam

Geographically the Pine River ends at Tippy Dam reservoir, but biologically it ends at Stronach Dam a mile above that point. This dam is a complete barrier to all upstream movements of fish. The river below the dam has a shifting sand bottom lacking in spawning facilities for all trout. Above the dam shifting sand has covered all spawning sites for one-half mile upstream. This sand has filled in the reservoir up to the edge of the dam. Water coming downstream is not impounded, but goes through the turbines immediately.

Pine River. Field No. ES-91

Manistee County, Michigan, T21N., R13W., Sec. 17.

September 19, 1951, 2:59 to 3:42 P.M.

Length of sample, 835 feet. Shocker operation, 43 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<hr/>					
<u>Game fish</u>					
Smallmouth bass	4	3	4.3	3.5	4.7
Rock bass	3	2	2.9	2.7	3.0
<u>Coarse fish</u>					
White sucker	289	207		1.6	11.5
<u>Forage fish</u>					
Longnose dace	17	12		1.6	2.9
Bigmouth shiner	20	14		2.1	2.5
Bluntnose minnow	4	3		1.1	2.5
Johnny darter	18	13		1.3	2.5
Blackside darter	3	2		2.8	3.5
Northern muddler	3	2	2.1	2.1	2.1
Slimy muddler	6	4		1.8	2.8
Brook stickleback	1	1	1.7		
American brook lamprey	14	10		4.3	7.0

Pine River, Mainstream

The mainstream of the Pine River is quite similar throughout most of its length. The lower stretches contain very rapid water while the upper parts are slightly slower with more stream obstructions in the form of logs and down trees. Gravel and rocks make up much of the bottom, with sand and hard clay included in some places. The stream is normally clear and quite colorless except for a slight green tinge, noticeable where the water is deep. However, after even a light rain it is very turbid with suspended clay.

Scale samples from brook, brown and rainbow trout indicate that growth is very good throughout the mainstream. All three species are spawning in the watershed as is indicated by the number of young fish found. Brown trout have never been officially planted, but the numbers have been slowly increasing over the years.

The samples from the mainstream contain few trout, but this is not because of a lack of fish, but because the depth and strength of the current reduced collecting efficiency. More work will be done in this area in the future with other equipment.

Gill lice were not found on brook trout except for collection 72, the highest station on the mainstream.

Pine River. Field No. ES-90

Wexford County, Michigan, T21N., R12W., Sec. 19.
 September 18, 1951, 1:15 to 2:07 P.M.
 Length of sample, 870 feet. Shocker operation, 52 minutes

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	1	1	11.7		
Age class 0	0	0			
Age class I	0	0			
Age class II	1	1	11.7		
Pumpkinseed	1	1	2.5		
<u>Coarse fish</u>					
White sucker	73	63		1.6	4.7
<u>Forage fish</u>					
Longnose dace	6	5		1.3	2.6
Blacknose shiner	1	1	1.8		
Bluntnose minnow	14	12		1.7	2.5
Northern muddler	11	10		1.7	3.6
Slimy muddler	62	54		1.5	4.3
American brook lamprey	3	3	5.0	4.6	5.3

Trout planted at this station before the survey

Species	Number of fish	Average length	Date planted	Remarks
Rainbow trout	40	14.7	March 22, 1951	
Rainbow trout	38	26.0	April 16, 1951	Tippy Dam transfer
Rainbow trout	325	7.8	May 29, 1951	
Rainbow trout	1,125	7.4	June 19, 1951	

Pine River. Field No. ES-89

Wexford County, Michigan, T21N, R12W., Sec. 21.

September 18, 1951, 10:19 to 11:03 A.M.

Length of sample, 1,150 feet. Shocker operation, 44 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	7	6	6.1	3.7	12.4
Age class 0	5	4	4.0	3.7	4.2
Age class I	1	1	8.1		
Age class II	1	1	12.4		
Rainbow trout, total	3	2	3.2	3.1	3.3
Age class 0	3	2	3.2	3.1	3.3
<u>Coarse fish</u>					
White sucker	4	3		1.6	1.9
<u>Forage fish</u>					
Blacknose dace	5	4		0.9	2.1
Northern muddler	31	23		1.4	3.9
Slimy muddler	60	44		1.5	4.3
American brook lamprey	7	5		3.5	5.2

Trout planted at this station before the survey

Species	Number of fish	Average length	Date planted	Remarks
Rainbow trout	60	14.7	March 22, 1951	
Rainbow trout	19	26.0	April 16, 1951	Tippy Dam transfer
Rainbow trout	562	7.8	May 29, 1951	
Rainbow trout	705	7.4	June 19, 1951	

Pine River. Field No. ES-88

Wexford County, Michigan, T21N., R12W., Sec. 28.

September 17, 1951, 2:29 to 2:50 P.M.

Length of sample, 245 feet. Shocker operation, 21 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Coarse fish</u>					
White sucker	6	2	4.0	3.9	4.0
<u>Forage fish</u>					
Blacknose dace	9	3	2.8	2.0	3.6
Longnose dace	9	3	2.5	2.4	2.7
Golden shiner	3	1	2.5		
Northern muddler	20	7		2.5	3.0
Slimy muddler	46	16		1.8	4.1
American brook lamprey	9	3	4.1	2.9	5.1

Trout planted at this station before the survey

Species	Number of fish	Average length	Date planted	Remarks
Rainbow trout	20	14.7	March 22, 1951	
Rainbow trout	19	26.0	April 16, 1951	Tippy Dam transfer
Rainbow trout	788	7.8	May 29, 1951	
Rainbow trout	550	7.4	June 19, 1951	

Pine River. Field No. ES-86

Lake County, Michigan, T20N., R12W., Sec. 12 and 13.

September 12, 1951, 11:00 to 11:45 A.M.

Length of sample, 825 feet. Shocker operation, 45 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	4	3	4.7	4.0	5.9
Age class 0	3	2	4.1	4.0	4.1
Age class I	1	1	5.9		
Brown trout, total	9	7	6.4	3.3	11.8
Age class 0	5	4	3.9	3.3	4.3
Age class I	1	1	7.6		
Age class II	3	2	10.8	9.8	11.8
Rainbow trout, total	8	6	5.9	3.0	8.9
Age class 0	4	3	3.6	3.0	4.1
Age class I	4	3	8.1	7.2	8.9
<u>Coarse fish</u>					
White sucker	13	10	5.3	3.3	11.8
<u>Forage fish</u>					
Creek chub	1	1	4.6		
Blacknose dace	8	6		1.9	3.4
Longnose dace	9	7		1.6	4.7
Northern muddler	47	35		1.4	4.0
Slimy muddler	44	33		1.3	4.3
American brook lamprey	15	11		3.8	6.1

Trout planted at this station before the survey

Species	Number of fish	Average length	Date planted	Remarks
Rainbow trout	1,100	7.8	May 29, 1951	
Rainbow trout	650	7.4	June 19, 1951	

Pine River. Field No. ES-85

Lake County, Michigan, T20N., R11W., Sec. 30.

September 11, 1951, 2:17 to 3:10 P.M.

Length of sample, 1,250 feet. Shocker operation, 53 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	1	1	4.8		
Age class 0	0	0			
Age class I	1	1	4.8		
Brown trout, total	5	5	7.4	4.4	9.3
Age class 0	2	2	4.6	4.4	4.8
Age class I	3	3	9.3	9.3	9.3
Rainbow trout, total	7	6	7.2	2.5	8.5
Age class 0	1	1	2.5		
Age class I	6	5	8.1	7.6	8.5
<u>Coarse fish</u>					
White sucker	20	18	8.4	3.4	16.5
Black bullhead	1	1	6.6		
<u>Forage fish</u>					
Blacknose dace	5	4		2.9	3.9
Northern muddler	9	8		1.6	3.4
Slimy muddler	33	29		1.7	4.1
American brook lamprey	6	5		3.0	5.5

Trout planted at this station before the survey

Species	Number of fish	Average length	Date planted	Remarks
Rainbow trout	800	7.8	July 24, 1951	Fin-clipped
Rainbow trout	350	7.4	August 17, 1951	Fin-clipped

Pine River. Field No. ES-84

Lake County, Michigan, T19N., R11W., Sec. 1 and 2.
 September 11, 1951, 10:57 to 11:45 A. M.
 Length of sample, 875 feet. Shocker operation, 48 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	8	6	4.4	3.2	6.3
Age class 0	5	4	3.4	3.2	3.5
Age class I	3	2	6.3	6.2	6.3
Hatchery brook trout	1	1	6.9		
Rainbow trout, total	1	1	2.8		
Age class 0	1	1	2.8		
<u>Coarse fish</u>					
White sucker	11	9	5.8	1.8	14.3
<u>Forage fish</u>					
Blacknose dace	17	14		1.1	3.8
Johnny darter	3	2	2.5	2.2	2.8
Northern muddler	25	20		1.5	3.8
Slimy muddler	63	50		1.6	4.0
Brook stickleback	3	2	1.5	1.4	1.5
American brook lamprey	41	33		3.6	5.8

Trout planted at this station before the survey

Species	Number of fish	Average length	Date planted	Remarks
Rainbow trout	800	7.1	April 17, 1951	
Brook trout	600	7.1	July 19, 1951	Fin-clipped
Brook trout	800	7.2	August 15, 1951	Fin-clipped

Pine River. Field No. ES-72.

Osceola County, Michigan, T19N., R10W., Sec. 6.

August 16, 1951, 12:52 to 2:06 P. M.

Length of sample, 1,180 feet. Shocker operation, 74 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	3	3	9.3	7.8	12.2
Age class 0	0	0			
Age class I	2	2	7.9	7.8	7.9
Age class II	0	0			
Age class III	1	1	12.2		
Brown trout, total	8	10	11.7	6.8	19.8
Age class 0	0	0			
Age class I	3	4	7.9	6.8	8.7
Age class II	3	4	12.0	11.6	12.2
Age class III	1	1	17.4		
Age class IV	1	1	19.8		
<u>Coarse fish</u>					
White sucker	19	23	12.4	3.8	16.2
<u>Forage fish</u>					
Creek chub	1	1	1.0		
Blacknose dace	9	11		1.0	3.5
Longnose dace	2	3	3.4	2.7	3.9
Northern muddler	60	74		1.0	4.3
Slimy muddler	45	56		1.3	4.4
Brook stickleback	1	1	1.8		
American brook lamprey	19	23		3.6	5.7

Trout planted at this station before the survey

Species	Number of fish	Average length	Date planted	Remarks
Brook trout	600	7.4	June 18, 1951	

Pine River, North Branch

The lower stretch of the North Branch is definitely inferior to the mainstream of the Pine with regard to trout. The growth is slower, but most noticeable is the great decrease in the number of trout. The current is not as rapid as the mainstream and the bottom is mostly sand with some silt. Spawning areas are few. Gill lice are common. The brook trout is apparently the only trout that spawns successfully in this branch.

Pine River, North Branch. Field No. ES-74

Osceola County, Michigan, T20N., R10W., Sec. 17.

August 17, 1951, 1:07 to 1:30 P. M.

Length of sample, 410 feet. Shocker operation, 23 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	2	1	2.6		
Age class 0	2	1	2.6		
<u>Coarse fish</u>					
White sucker	2	1	3.5		
<u>Forage fish</u>					
Creek chub	8	3	4.4	4.2	4.8
Blacknose dace	16	6	2.6	2.3	2.9
Longnose dace	8	3	3.4	2.7	4.0
Northern muddler	18	7	2.4	1.9	3.0
Slimy muddler	16	6	2.6	2.3	3.0
American brook lamprey	5	2	4.9	4.6	5.1

Trout planted at this station before the survey

Species	Number of fish	Average length	Date planted	Remarks
Brook trout	150	7.3	July 26, 1951	Fin-clipped

Pine River, North Branch. Field No. ES-56.

Osceola County, Michigan, T20N., R10W., Sec. 4 and 9.

August 2, 1951, 1:27 to 3:05 P. M.

Length of sample, 535 feet. Shocker operation, 98 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	2	2	9.2	7.1	11.2
Age class 0	0	0			
Age class I	1	1	7.1		
Age class II	1	1	11.2		
Hatchery brook trout	9	14	7.2	6.9	7.6
Rainbow trout, total	1	1	6.1		
Age class 0	0	0			
Age class I	1	1	6.1		
Pumpkinseed	1	1	4.6		
<u>Coarse fish</u>					
White sucker	3	5	7.4	2.9	12.0
<u>Forage fish</u>					
Creek chub	1	1	2.0		
Blacknose dace	32	52		1.8	3.8
Longnose dace	4	6	4.3	4.0	4.7
Northern muddler	22	36		1.4	4.0
Slimy muddler	37	60		1.8	4.2
American brook lamprey	9	15	4.8	3.5	5.7

Trout planted at this station before the survey

Species	Number of fish	Average length	Date planted	Remarks
Brook trout	300	7.3	July 26, 1951	Fin-clipped

Pine River, North Branch. Field No. ES-50

Wexford County, Michigan, T21N., R10W., Sec. 35.

July 31, 1951, 11:07 A. M. to 12:12 P. M.

Length of sample, 595 feet. Shocker operation, 65 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	9	9	6.7	3.0	9.3
Age class 0	2	2	3.2	3.0	3.4
Age class I	3	3	6.3	6.3	6.4
Age class II	4	4	8.8	8.1	9.3
Hatchery brook trout	16	17	7.1	6.5	8.1
<u>Coarse fish</u>					
White sucker	8	9	5.8	1.2	9.4
<u>Forage fish</u>					
Creek chub	1	1	0.9		
Blacknose dace	47	51		0.8	3.6
Mudminnow	1	1	2.9		
Northern muddler	64	69		1.0	3.9
Slimy muddler	61	66		1.2	4.2
American brook lamprey	23	25		3.4	5.7

Trout planted at this station before the survey

Species	Number of fish	Average length	Date planted	Remarks
Rainbow trout	400	8.1	March 30, 1951	
Brook trout	200	7.4	July 27, 1951	Fin-clipped

Pine River, North Branch. Field No. ES-55

Wexford County, Michigan, T21N., R10W., Sec. 24.

August 2, 1951, 10:14 to 11:07 A. M.

Length of sample, 210 feet. Shocker operation, 53 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	36	32	5.3	2.0	9.6
Age class 0	11	10	2.6	2.0	3.8
Age class I	15	13	5.1	4.0	6.5
Age class II	9	8	7.8	6.7	8.9
Age class III	1	1	9.6		
Hatchery brook trout	50	44	7.2	6.7	7.8
Rainbow trout, total	5	4	7.9	6.9	9.2
Age class 0	0	0			
Age class I	0	0			
Age class II	5	4	7.9	6.9	9.2
Hatchery rainbow trout	1	1	7.9		
<u>Forage fish</u>					
Slimy muddler	70	62		0.9	3.4
American brook lamprey	41	36	4.6	2.8	6.0

Trout planted at this station before the survey

Species	Number of fish	Average length	Date planted	Remarks
Brook trout	75	7.8	May 4, 1951	
Rainbow trout	75	7.8	May 4, 1951	
Brook trout	200	7.4	July 27, 1951	Fin-clipped

Pine River, East Branch

The East Branch of the Pine River is not trout water. Of the few trout found in the lower part, none were young-of-the-year, but their growth was good. Apparently there is no spawning in this branch. The upper part of the stream is devoid of trout, the current is slow and most of the bottom is covered with a deep layer of silt. The larval form of the American brook lamprey was found here in prodigious numbers. Only a small part of those shocked were actually taken.

Pine River, East Branch. Field No. ES-79

Osceola County, Michigan, T20N., R10W., Sec. 22.

August 23, 1951, 1:07 to 1:48 P. M.

Length of sample, 450 feet. Shocker operation, 41 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	3	2	8.5	8.4	8.5
Age class 0	0	0			
Age class I	3	2	8.5	8.4	8.5
Brown trout, total	1	1	8.1		
Age class 0	0	0			
Age class I	1	1	8.1		
Rainbow trout, total	1	1	8.5		
Age class 0	0	0			
Age class I	1	1	8.5		
<u>Coarse fish</u>					
White sucker	53	36	5.1	2.8	8.6
<u>Forage fish</u>					
Creek chub	41	28		0.9	7.4
Blacknose dace	140	96		1.0	3.3
Longnose dace	9	6		3.0	4.8
Johnny darter	66	45		1.3	2.7
Northern muddler	154	105		1.1	3.5
American brook lamprey	22	15		3.7	6.2

Pine River, East Branch. Field No. ES-73

Osceola County, Michigan, T20N., R10W., Sec. 14 and 15.

August 17, 1951, 10:31 to 11:12 A. M.

Length of sample, 290 feet. Shocker operation, 41 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<hr/>					
<u>Coarse fish</u>					
White sucker	28	19	5.2	1.4	8.8
<u>Forage fish</u>					
Creek chub	70	48		1.5	6.3
Pearl dace	61	42		1.9	4.8
Blacknose dace	23	16		1.3	3.2
Redbelly dace	3	2	2.4	2.3	2.5
Common shiner	7	5	2.7	2.4	2.8
Mudminnow	7	5	2.4	1.6	3.0
Johnny darter	3	2	2.5	2.4	2.6
Northern muddler	78	53		1.1	4.4
American brook lamprey	104	74		2.4	6.0

Hoxey Creek

Hoxey Creek is a small, clear, rapid trout stream. The sample from this stream was apparently overpopulated with many hatchery fish, particularly in the young-of-the-year class. Evidence seems to show slow growth for the creek.

The banks are grazed for the entire length of the stream by cattle and horses. Fishermen use this stream extensively.

Hoxey Creek. Field No. ES-60

Wexford County, Michigan, T21N., R12W., Sec. 25.
 August 6, 1951, 11:14 A. M. to 12:08 P. M.
 Length of sample, 358 feet. Shocker operation, 54 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	145	131	2.6	1.2	7.8
Age class 0	124	112	2.2	1.2	3.8
Age class I	11	10	4.2	4.0	5.3
Age class II	10	9	6.5	5.6	7.8
Rainbow trout, total	21	19	4.7	1.6	8.8
Age class 0	3	3	1.9	1.6	2.3
Age class I	12	11	4.4	3.5	5.9
Age class II	5	4	6.6	6.2	7.1
Age class III	1	1	8.8		
<u>Forage fish</u>					
Slimy muddler	66	59		1.0	4.0
American brook lamprey	10	9	4.2	2.5	7.5

Trout planted at this station before the survey

Species	Number of fish	Average length	Date planted	Remarks
Brook trout	250	7.8	March 30, 1951	
Rainbow trout	50	8.1	March 30, 1951	
Brook trout	75	7.8	June 8, 1951	
Brook trout	1,500	1.25	June 8, 1951	
Brook trout	50	7.8	July 26, 1951	

Poplar Creek and Dowling Creek

Poplar Creek is the most heavily fished single stream for its size in the Pine River system. It is clear and swift over its entire length with good cover throughout. There are many native fish present and the hatcheries stock it often. All three species of trout breed here and grow rapidly. It appears that the brown trout is the most successful in numbers, but few are caught by the local fishermen. Brown trout were found only in the mainstream, with brook trout and rainbow trout in the small headwater streams and Dowling Creek.

All brook trout taken in the two small headwater streams were heavily infested with gill lice, while those from the eastern stream had shortened opercles in addition.

Dowling Creek, a small tributary to Poplar Creek, does not compare to Poplar in quality. It is clear, but much slower, with a great amount of sand bottom. No brown trout are in this stream, and rainbow trout and brook trout show only moderate growth. Young-of-the-year brook trout taken were probably not native, but a remnant left from an earlier hatchery planting.

Poplar Creek. Field No. ES-57

Wexford County, Michigan, T21N., R12W., Sec. 36.

August 3, 1951, 9:43 to 10:46 A. M.

Length of sample, 585 feet. Shocker operation, 63 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	4	4	5.9	2.4	7.3
Age class 0	1	1	2.4		
Age class I	3	3	7.1	6.7	7.3
Brown trout, total	36	38	4.6	2.2	10.0
Age class 0	21	22	3.1	2.2	3.8
Age class I	14	15	6.5	5.8	7.3
Age class II	1	1	10.0		
Rainbow trout, total	21	21	5.2	1.3	9.2
Age class 0	5	5	1.6	1.3	1.9
Age class I	10	10	5.2	4.5	7.4
Age class II	3	3	7.4	7.3	7.6
Age class III	3	3	9.1	8.9	9.2
<u>Forage fish</u>					
Slimy muddler	73	77		1.7	4.5
American brook lamprey	1	1	5.6		

Trout planted at this station before the survey

Species	Number of fish	Average length	Date planted	Remarks
Brook trout	100	7.8	March 30, 1951	
Rainbow trout	100	8.1	March 30, 1951	
Rainbow trout	100	7.8	June 8, 1951	
Brook trout	100	7.8	July 26, 1951	

Poplar Creek. Field No. ES-58

Wexford County, Michigan, T21N., R11W., Sec. 28.

August 3, 1951, 2:20 to 3:27 P. M.

Length of sample, 435 feet. Shocker operation, 67 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	11	12	7.4	6.6	8.3
Age class 0	0	0			
Age class I	8	9	7.1	6.6	7.8
Age class II	3	3	8.1	8.0	8.3
Brown trout, total	45	51	4.3	1.7	12.2
Age class 0	21	24	2.4	1.7	3.0
Age class I	17	19	5.1	4.0	6.0
Age class II	6	7	7.5	6.9	8.3
Age class III	1	1	12.2		
<u>Forage fish</u>					
Slimy muddler	94	105		1.5	4.5

Trout planted at this station before the survey

Species	Number of fish	Average length	Date planted	Remarks
Brook trout	100	7.8	March 30, 1951	
Rainbow trout	100	8.1	March 30, 1951	
Rainbow trout	100	7.8	June 8, 1951	
Brook trout	200	7.8	July 26, 1951	

Poplar Creek, East Tributary. Field No. ES-54

Wexford County, Michigan, T21N., R11W., Sec. 34.

August 1, 1951, 1:10 to 1:28 P. M.

Length of sample, 190 feet. Shocker operation, 18 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	30	9	4.6	3.4	7.0
Age class 0	0	0			
Age class I	23	7	3.9	3.4	4.6
Age class II	7	2	7.0	7.0	7.0
<u>Forage fish</u>					
Slimy muddler	30	9		1.7	3.3

Trout planted at this station before the survey

Species	Number of fish	Average length	Date planted	Remarks
Rainbow trout	100	7.8	June 8, 1951	
Brook trout	100	7.8	July 26, 1951	

Poplar Creek, North Tributary. Field No. ES-70

Wexford County, Michigan, T21N., R11W., Sec. 27.

August 10, 1951 11:21 to 11:53 A. M.

Length of sample, 325 feet. Shocker operation, 32 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<hr/>					
<u>Game fish</u>					
Brook trout, total	13	7	2.6	1.8	3.0
Age class 0	13	7	2.6	1.8	3.0
Rainbow trout, total	4	2	1.7	1.5	1.8
Age class 0	4	2	1.7	1.5	1.8
<u>Forage fish</u>					
Slimy muddler	15	8	2.5	2.1	3.5

Dowling Creek. Field No. ES-61

Wexford County, Michigan, T21N., R11W., Sec. 20.

August 6, 1951, 2:04 to 2:36 P. M.

Length of sample, 225 feet. Shocker operation, 32 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	19	10	3.9	1.6	7.0
Age class 0	8	4	1.8	1.6	2.0
Age class I	9	5	4.9	4.2	5.8
Age class II	2	1	7.0		
Rainbow trout, total	30	16	3.4	1.7	6.2
Age class 0	15	8	2.3	1.7	2.6
Age class I	13	7	4.4	3.8	5.1
Age class II	2	1	6.2		
<u>Forage fish</u>					
Slimy muddler	43	23		0.9	3.9

Trout planted at this station before the survey

Species	Number of fish	Average length	Date planted	Remarks
Brook trout	50	7.8	March 30, 1951	
Rainbow trout	100	8.1	March 30, 1951	
Brook trout	1,500	1.25	June 8, 1951	
Brook trout	200	7.8	July 26, 1951	

Elm Creek

This is a small, clear, swift-flowing stream with good cover. Trees and brush shade its entire length. Very few fish were taken in the sample, but it is believed that this was because of the high turbidity caused by rain before and during the shocking. The two fish taken indicate that it possibly is a brook trout stream.

Elm Creek. Field No. ES-83

Lake County, Michigan, T20N., R12W., Sec. 1.

September 10, 1951, 1:05 to 1:20 P. M.

Length of sample, 315 feet. Shocker operation, 15 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<hr/>					
<u>Game fish</u>					
Brook trout, total	4	1	5.8		
Age class 0	0	0			
Age class I	4	1	5.8		
<u>Forage fish</u>					
Slimy muddler	4	1	4.0		

Silver Creek

At present this stream is producing all three species of trout and they all show good growth. Greater production is probably possible, but is held down by the sand that now covers the bottom and the clay that is washed in when it rains. The adjacent country is farmed and the banks are heavily grazed by cattle.

Most of the brook trout had gill lice and shortened opercles.

Silver Creek. Field No. ES-82

Lake County, Michigan, T20N., R11W., Sec. 16.

September 10, 1951, 11:06 to 11:35 A. M.

Length of sample, 524 feet. Shocker operation, 29 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	56	27	5.5	2.7	9.7
Age class 0	17	8	3.2	2.7	3.6
Age class I	37	18	6.3	4.5	8.6
Age class II	2	1	9.7		
Brown trout, total	4	2	6.3	3.2	9.4
Age class 0	2	1	3.2		
Age class I	0	0			
Age class II	2	1	9.4		
Rainbow trout, total	6	3	7.5	5.5	9.1
Age class 0	0	0			
Age class I	2	1	5.5		
Age class II	4	2	8.5	7.8	9.1
<u>Forage fish</u>					
Blacknose dace	8	4		2.4	3.1
American brook lamprey	6	3		4.5	5.3

Coe Creek

Coe Creek originates from a bog. It flows over muck through a cedar swamp and into Olga Lake. This part of the stream contains a heavy population of stunted brook trout. Olga Lake is a shallow impoundment maintained by the United States Forest Service, but the qualities of the lake are unknown. Below Olga Lake are more brook trout with a slow rate of growth. The stream then enters a cedar swamp, and emerges from this to enter a sheep pasture, with no trout. The surrounding land from here on down is cultivated or pastured. Wind erosion is active on the sand of some of the adjacent farms.

Brook trout and a few rainbows, of moderate growth, are found at the lower end. Most of the brook trout here have gill lice.

Coe Creek is unique in the Pine River system because it is the only dark brown-water stream.

Coe Creek. Field No. ES-76

Lake County, Michigan, T20N., R11W., Sec. 35.

August 22, 1951, 10:50 to 11:44 A. M.

Length of sample, 325 feet. Shocker operation, 54 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	23	21	5.1	2.3	10.1
Age class 0	11	10	3.0	2.3	3.5
Age class I	10	9	6.5	5.3	8.0
Age class II	1	1	9.3		
Age class III	1	1	10.1		
Rainbow trout, total	4	4	6.2	5.3	7.2
Age class 0	0	0			
Age class I	4	4	6.2	5.3	7.2
<u>Coarse fish</u>					
White sucker	1	1	1.6		
<u>Forage fish</u>					
Creek chub	7	6		1.6	5.2
Blacknose dace	61	55		1.4	3.7
Blacknose shiner	1	1	2.1		
Northern muddler	62	56		1.4	3.8
Slimy muddler	2	2	2.4	2.4	2.4
American brook lamprey	24	22		3.0	6.0

Coe Creek. Field No. ES-77

Lake County, Michigan, T20N., R11W., Sec. 25.

August 22, 1951, 1:54 to 3:00 P. M.

Length of sample, 515 feet. Shocker operation, 66 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<hr/>					
<u>Game fish</u>					
Brook trout, total	7	8	6.3	2.7	8.8
Age class 0	1	1	2.7		
Age class I	5	6	6.4	5.9	7.3
Age class II	1	1	8.8		
<u>Coarse fish</u>					
White sucker	3	3		3.2	5.4
<u>Forage fish</u>					
Creek chub	19	21		3.4	6.5
Blacknose dace	73	30		0.8	3.6
Northern muddler	45	49		1.1	3.8
American brook lamprey	25	28		3.6	5.8

Coe Creek, North Branch. Field No. ES-78

Osceola County, Michigan, T20N., R10W., Sec. 19.

August 23, 1951, 11:01 to 11:46 A. M.

Length of sample, 215 feet. Shocker operation, 45 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<hr/>					
<u>Coarse fish</u>					
White sucker	1	1	6.2		
<u>Forage fish</u>					
Creek chub	8	6		3.6	5.6
Pearl dace	20	15		2.7	4.0
Blacknose dace	198	148		1.4	3.7
Blacknose shiner	4	3	1.9	1.9	1.9
Iowa darter	4	4		2.0	2.2
Northern muddler	7	5		1.9	4.0
American brook lamprey	13	10		3.7	6.1

Coe Creek, North Branch. Field No. ES-62

Lake County, Michigan, T20N., R11W., Sec. 12.

August 7, 1951, 10:33 to 11:07 A. M.

Length of sample, 145 feet. Shocker operation, 34 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	19	10	5.7	2.5	9.1
Age class 0	2	1	2.5		
Age class I	11	6	5.1	4.5	5.6
Age class II	4	2	7.2	7.1	7.3
Age class III	2	1	9.1		
<u>Forage fish</u>					
Creek chub	11	6		3.2	6.2
Pearl dace	4	2	3.2	3.1	3.3
Blacknose dace	26	15	2.9	2.3	3.2
Blacknose shiner	2	1	1.8		
Iowa darter	14	8	2.0	1.9	2.2
Northern muddler	4	2	3.6	3.5	3.7
American brook lamprey	12	7	4.7	3.5	5.6

Coe Creek, North Branch. Field No. ES-59

Wexford County, Michigan, T21N., R11W., Sec. 36.

August 4, 1951, 10:54 to 11:37 A. M.

Length of sample, 280 feet. Shocker operation, 43 minutes

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<hr/>					
<u>Game fish</u>					
Brook trout, total	60	43	1.8	1.2	3.7
Age class 0	54	39	1.7	1.2	2.3
Age class I	6	4	3.2	2.7	3.7
<u>Coarse fish</u>					
Yellow perch	1	1	1.9		
<u>Forage fish</u>					
Pearl dace	57	41		2.1	3.9
Iowa darter	8	6	2.1	1.8	2.3

Big Beaver and Little Beaver Creeks

Actually, Little Beaver Creek is a small tributary to Big Beaver Creek, flowing into it from the south. It flows at a moderate rate over a bottom of sand and silt. Most of the land in this area is cultivated or grazed. Both brook trout and rainbow trout of moderate growth were found in it, but no young-of-the-year rainbows were seen. Gill lice were found on many of the brook trout.

The upper end of Big Beaver Creek flows through heavily grazed farmland and the stream at that point flows slowly over a bottom of silt. No trout were found here, but after it flowed through a dense alder swamp both brook trout and rainbow trout of good growth were taken. From that point to the Pine River the stream flows at a rapid rate over gravel and sand.

Big Beaver Creek. Field No. ES-67

Osceola County, Michigan, T19N., R10W., Sec. 17.

August 8, 1951, 2:01 to 2:52 P. M.

Length of sample, 445 feet. Shocker operation, 51 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	25	21	7.5	3.2	12.6
Age class 0	2	2	3.6	3.2	3.9
Age class I	11	9	6.3	5.0	7.3
Age class II	11	9	9.1	8.2	9.6
Age class III	1	1	12.6		
Rainbow trout, total	7	6	7.6	5.8	11.1
Age class 0	0	0			
Age class I	5	4	6.4	5.8	7.0
Age class II	1	1	9.2		
Age class III	1	1	11.1		
<u>Coarse fish</u>					
White sucker	52	44	9.0	4.5	13.5
<u>Forage fish</u>					
Creek chub	12	10		1.8	5.6
Pearl dace	1	1	3.4		
Blacknose dace	80	68		1.4	3.5
Northern muddler	122	104		0.9	3.5
Slimy muddler	31	26		1.2	4.3
American brook lamprey	69	59		3.2	5.7

Trout planted at this station before the survey

Species	Number of fish	Average length	Date planted	Remarks
Rainbow trout	200	7.3	July 26, 1951	Fin-clipped

Big Beaver Creek. Field No. ES-66

Osceola County, Michigan, T19N., R10W., Sec. 10.

August 8, 1951, 11:09 A. M. to 12:13 P. M.

Length of sample, 360 feet. Shocker operation, 64 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Coarse fish</u>					
White sucker	87	93	3.7	1.2	6.0
<u>Forage fish</u>					
Creek chub	57	61		1.6	7.2
Pearl dace	63	67		1.0	4.2
Blacknose dace	277	307		0.8	3.2
Brassy minnow	4	4	2.4	2.2	2.5
Northern muddler	144	153		1.1	3.8
Brook stickleback	2	2	1.6	1.5	1.6
American brook lamprey	20	21	4.9	3.6	6.0

Little Beaver Creek. Field No. ES-71

Osceola County, Michigan, T19N., R10W., Sec. 18 and 19.

August 16, 1951, 10:20 to 11:17 A. M.

Length of sample, 290 feet. Shocker operation, 54 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<hr/>					
<u>Game fish</u>					
Brook trout, total	14	12	5.1	2.6	8.5
Age class 0	6	5	3.0	2.6	3.2
Age class I	6	5	6.1	5.4	6.6
Age class II	2	2	8.2	7.8	8.5
Rainbow trout, total	1	1	5.1		
Age class 0	0	0			
Age class I	1	1	5.1		
<u>Forage fish</u>					
Blacknose dace	1	1	1.3		
Northern muddler	32	29		1.8	3.1
Slimy muddler	15	14		0.8	3.6

Sprague Creek

This is a small, clear stream flowing through open pasture. No trout were taken or seen in this stream. The bottom was sand, silt and clay.

Sprague Creek. Field No. ES-75

Osceola County, Michigan, T20N., R10W., Sec. 33.

August 20, 1951, 11:45 A. M. to 12:23 P. M.

Length of sample, 305 feet. Shocker operation, 38 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<hr/>					
<u>Forage fish</u>					
Blacknose dace	11	7	2.1	1.4	2.0
Mudminnow	5	3	3.0	2.4	3.9
Brook stickleback	13	8	1.5	1.3	1.7

Nigger Creek

Draining a swamp, Nigger Creek is a clear, swift stream flowing over a sand bottom. It has a good population of fairly slow-growing brook trout and rainbow trout. Most of the brook trout taken had gill lice and short opercles. One young-of-the-year brook x brown trout hybrid, taken at station 80, also had gill lice. No brown trout were found in this stream.

Nigger Creek. Field No. ES-80

Wexford County, Michigan, T21N., R10W., Sec. 33.

August 24, 1951, 10:36 to 11:33 A. M.

Length of sample, 310 feet. Shocker operation, 57 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	25	24	5.3	1.9	7.0
Age class 0	2	2	2.0	1.9	2.0
Age class I	16	15	5.3	4.1	6.9
Age class II	7	7	6.5	5.9	7.0
Rainbow trout, total	1	1	9.2		
Age class 0	0	0			
Age class I	0	0			
Age class II	1	1	9.2		
Brook x Brown trout hybrid	1	1	2.6		
Age class 0	1	1	2.6		
<u>Forage fish</u>					
Slimy muddler	100	96		0.9	3.8
American brook lamprey	4	4		2.3	5.0

Nigger Creek. Field No. ES-53

Wexford County, Michigan, T21N., R10W., Sec. 19.

August 1, 1951, 10:02 to 10:45 A. M.

Length of sample, 210 feet. Shocker operation, 43 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	12	8	6.2	1.1	8.6
Age class 0	3	2	1.7	1.1	2.2
Age class I	6	4	7.4	7.0	7.8
Age class II	3	2	8.3	8.0	8.6
Hatchery brook trout Not fin clipped.	14	10	7.6	7.1	8.0
Rainbow trout, total	14	10	5.8	4.2	7.6
Age class 0	0	0			
Age class I	13	9	5.6	4.2	6.4
Age class II	1	1	7.6		
<u>Forage fish</u>					
Pearl dace	26	19		3.0	4.4
Mudminnow	15	11		1.8	3.0
Slimy muddler	26	19		1.6	3.4
Brook stickleback	13	9		1.7	2.1
American brook lamprey	17	12	4.3	3.0	6.1

Trout planted at this station before the survey

Species	Number of fish	Average length	Date planted	Remarks
Brook trout	150	7.8	March 30, 1951	
Rainbow trout	100	8.1	March 30, 1951	
Brook trout	200	7.8	July 26, 1951	

Nigger Creek, East Branch. Field No. ES-81

Wexford County, Michigan, T21N., R10W., Sec. 34.

August 24, 1951, 1:56 to 2:32 P. M.

Length of sample, 235 feet. Shocker operation, 36 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<hr/>					
<u>Game fish</u>					
Brook trout, total	22	13	4.4	1.7	8.4
Age class 0	7	4	1.8	1.7	2.0
Age class I	8	5	4.4	3.2	5.0
Age class II	7	4	7.0	5.4	8.4
Rainbow trout, total	4	2	4.3	1.3	7.3
Age class 0	2	1	1.3		
Age class I	0	0			
Age class II	0	0			
Age class III	2	1	7.3		
 <u>Forage fish</u>					
Slimy muddler	20	12		0.9	3.5
American brook lamprey	3	2	3.0	2.1	3.9

Sixteen (Spaulding) Creek

Although three brook trout were taken in this stream, it was not impressive as trout water. The bottom was soft muck, over waist deep in many places.

Sixteen Creek. Field No. ES-63

Wexford County, Michigan, T21N., R10W., Sec. 27.
 August 7, 1951, 2:42 to 3:23 P. M.
 Length of sample, 165 feet. Shocker operation, 41 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Brook trout, total	4	3	5.2	2.6	8.0
Age class 0	2	1	2.6		
Age class I	1	1	5.1		
Age class II	1	1	8.0		
<u>Forage fish</u>					
Creek chub	53	36		1.1	5.3
Blacknose dace	20	14		1.6	3.4
Mudminnow	12	8		2.1	4.1
Northern muddler	56	38		1.0	3.5
American brook lamprey	10	7	5.9	5.2	6.7

Trout planted one-half mile from this station before the survey

Species	Number of fish	Average length	Date planted	Remarks
Brook trout	100	7.8	March 30, 1951	
Rainbow trout	100	8.1	March 30, 1951	
Brook trout	300	7.8	July 26, 1951	

Rose Lake Outlet

Rose Lake Outlet is a slow, warm stream. At times during the summer the water ceases to flow at the upper end, leaving about five miles of the stream as disconnected pools. The northern pike found in this stream probably came downstream from Rose Lake in the spring as did several of the other fish in the sample. Because of the intermittent quality of this stream, it most likely will never be made into trout water. Its principle purpose is to serve as a drain from a small dam that maintains the water level of Rose Lake.

Rose Lake Outlet. Field No. ES-69

Osceola County, Michigan, T20N., R10W., Sec. 14 and 15.

August 9, 1951, 12:30 to 1:25 P. M.

Length of sample, 310 feet. Shocker operation, 55 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Game fish</u>					
Northern pike	2	2	9.1	6.5	11.7
Pumpkinseed	1	1	3.1		
<u>Coarse fish</u>					
White sucker	99	91	5.7	1.3	11.5
<u>Forage fish</u>					
Creek chub	119	109		1.9	7.5
Blacknose dace	191	175		0.9	3.4
Longnose dace	1	1	2.8		
Common shiner	36	33		2.0	4.4
Bluntnose minnow	10	9		2.3	2.8
Soneroller	1	1	3.9		
Johnny darter	72	66		1.0	2.7
Northern muddler	33	30		1.3	4.1
American brook lamprey	25	23	5.2	3.3	6.2

Rose Lake Outlet. Field No. ES-51

Osceola County, Michigan, T20N., R10W., Sec. 24.

July 31, 1951, 2:27 to 3:03 P. M.

Length of sample, 288 feet. Shocker operation, 36 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<hr/>					
<u>Game fish</u>					
Northern pike	3	2	8.0	4.7	11.3
Pumpkinseed	2	1	3.3		
<u>Coarse fish</u>					
White sucker	20	12	9.0	6.5	14.6
Black bullhead	2	1	5.7		
<u>Forage fish</u>					
Creek chub	13	8	3.0	1.2	4.3
Bluntnose minnow	2	1	3.0		
Mudminnow	10	6	2.3	1.2	3.8
Johnny darter	53	32		0.9	2.7
Northern muddler	3	2	2.4	1.3	3.5
American brook lamprey	7	4	5.9	3.6	6.7

Edgett Creek

Edgett Creek is a slow-moving, warm stream flowing into the lower end of the Rose Lake Outlet. Some of its length appears to have been dug to serve as a drainage ditch. At Tustin there is a small dam impeding the flow of the stream. Most of the bottom is silt except for sand where digging has been done.

Edgett Creek. Field No. ES-68

Osceola County, Michigan, T20N., R10W., Sec. 35

August 9, 1951, 10:56 to 11:18 A. M.

Length of sample, 185 feet. Shocker operation, 22 minutes.

	Fish per hour	Number of fish shocked	Average length	Size range	
				Minimum	Maximum
<u>Coarse fish</u>					
White sucker	85	31	3.0	2.2	4.0
<u>Forage fish</u>					
Creek chub	308	113		1.6	6.3
Pearl dace	142	52		1.8	4.5
Blacknose dace	126	46		1.6	3.3
Redbelly dace	16	6		1.7	2.0
Common shiner	79	29		1.7	3.5
Johnny darter	19	7		1.8	2.2
Northern muddler	3	1	2.4		
American brook lamprey	5	2	5.3	4.9	5.6

List of Common and Scientific Names of Fishes Referred to in this Report

Game fish

Brook trout
Brown trout
Rainbow trout
Northern pike
Smallmouth bass
Pumpkinseed
Rock bass

Salvelinus fontinalis
Salmo trutta
Salmo gairdneri
Esox lucius
Micropterus dolomieu
Lepomis gibbosus
Ambloplites rupestris

Coarse fish

White sucker
Black bullhead
Yellow bullhead

Catostomus commersoni
Ameiurus melas
Ameiurus natalis

Forage fish

Creek chub
Pearl dace
Blacknose dace
Longnose dace
Redbelly dace
Common shiner
Blacknose shiner
Golden shiner
Bigmouth shiner
Bluntnose minnow
Brassy minnow
Stoneroller
Mudminnow
Johnny darter
Blackside darter
Iowa darter
Northern muddler
Slimy muddler
Brook stickleback
American brook lamprey

Semotilus atromaculatus
Margariscus margarita
Rhinichthys atratulus
Rhinichthys cataractae
Chrosomus eos
Notropis cornutus
Notropis heterolepis
Notemigonus crysoleucas
Notropis dorsalis
Hyborhynchus notatus
Hybognathus hankinsoni
Campostoma anomalum
Umbra limi
Boleosoma nigrum
Hadropterus maculatus
Poeciliichthys exilis
Cottus bairdi
Cottus cognatus
Eucalia inconstans
Entosphenus lamottei

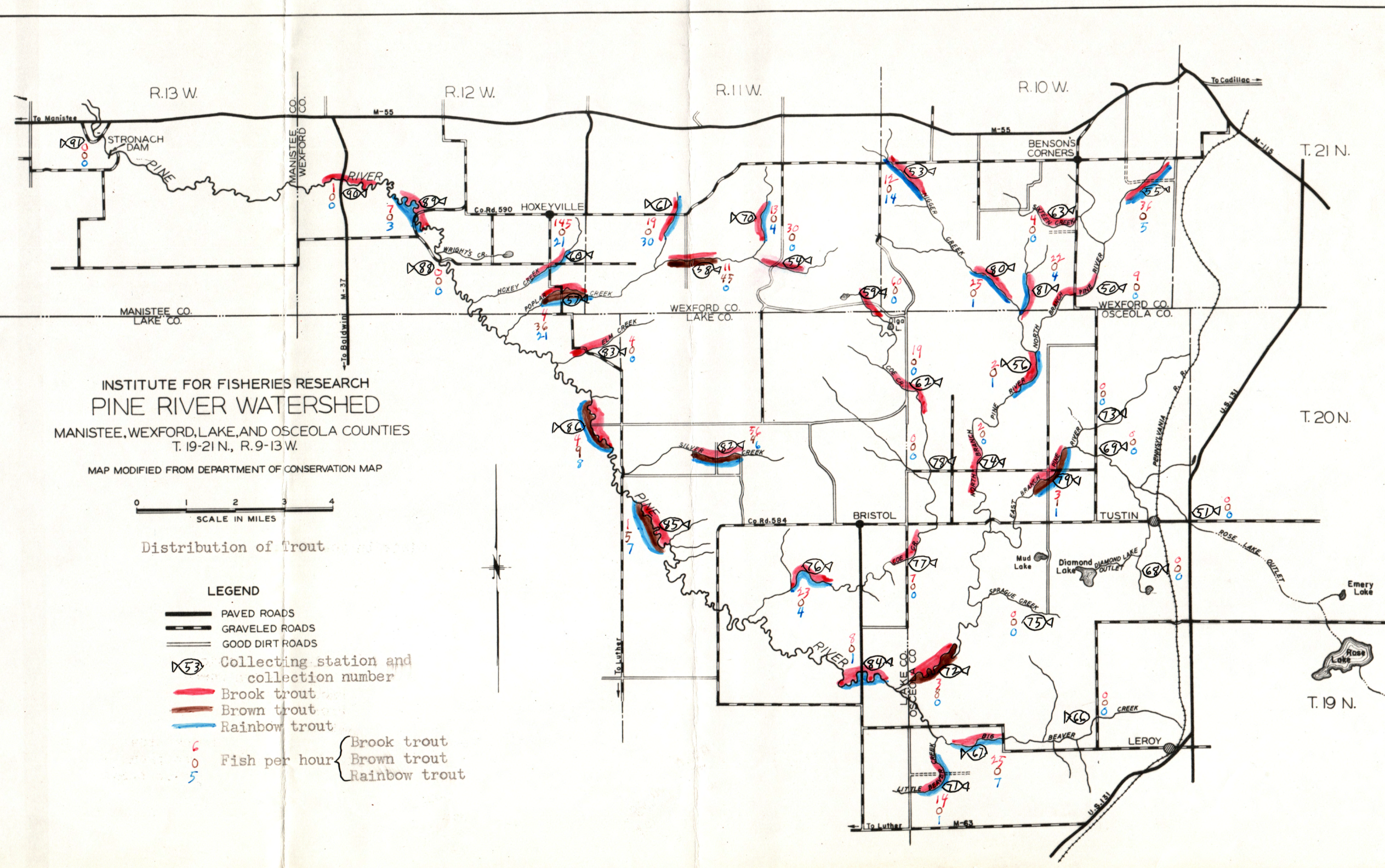
✧ All scientific names follow Hubbs and Lagler, 1941, except for recent approved changes in name endings.

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Edward E. Schultz

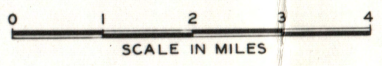
Approved by: A. S. Hazzard

Typed by: M. C. Tait



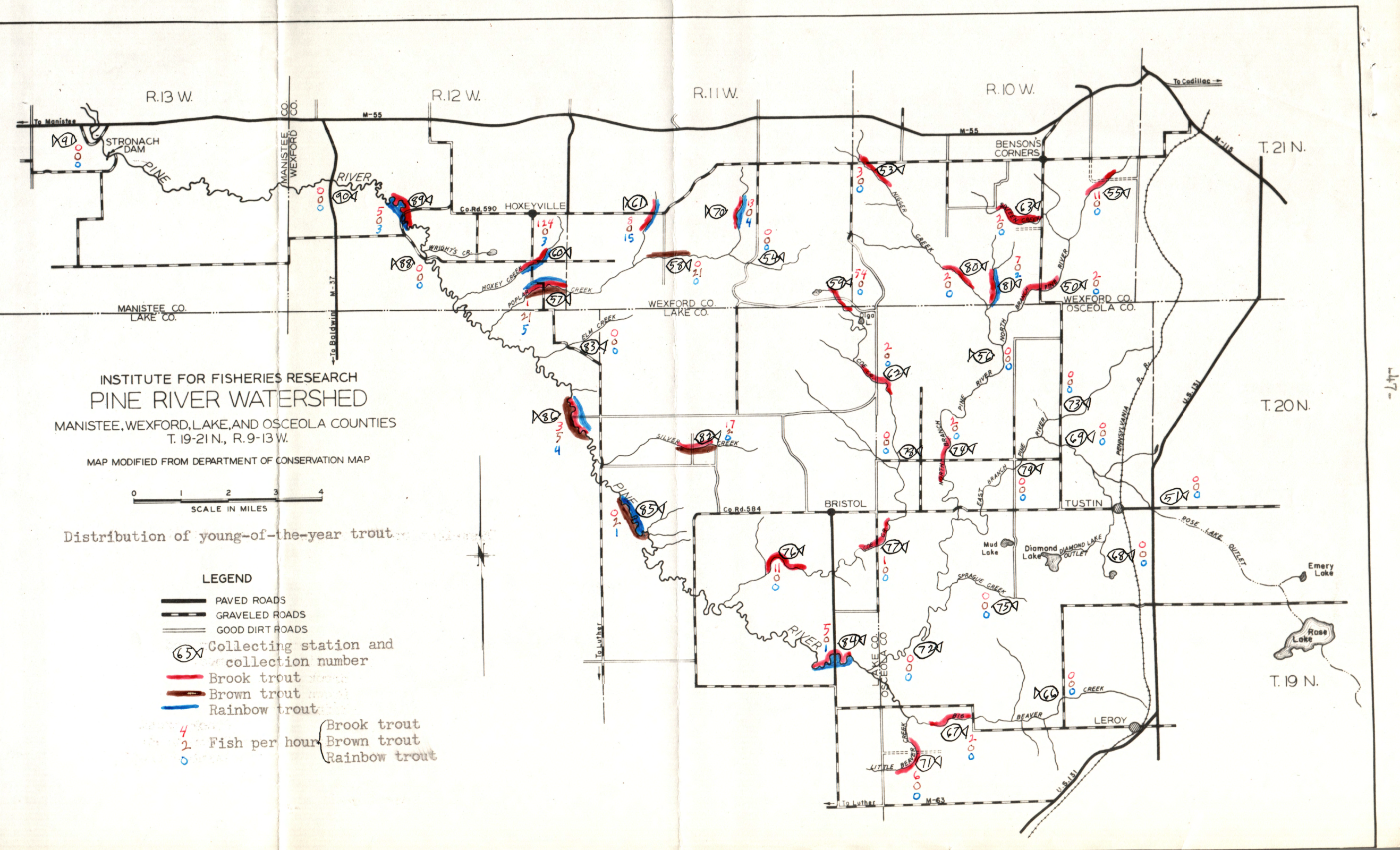
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PINE RIVER WATERSHED
 MANISTEE, WEXFORD, LAKE, AND OSCEOLA COUNTIES
 T. 19-21 N., R. 9-13 W.

MAP MODIFIED FROM DEPARTMENT OF CONSERVATION MAP



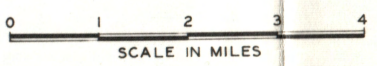
Distribution of Trout

- LEGEND**
- PAVED ROADS
 - GRAVELED ROADS
 - GOOD DIRT ROADS
 - Collecting station and collection number
 - Brook trout
 - Brown trout
 - Rainbow trout
- 6
0
5
- Fish per hour {
 Brook trout
 Brown trout
 Rainbow trout



INSTITUTE FOR FISHERIES RESEARCH
 PINE RIVER WATERSHED
 MANISTEE, WEXFORD, LAKE, AND OSCEOLA COUNTIES
 T. 19-21 N., R. 9-13 W.

MAP MODIFIED FROM DEPARTMENT OF CONSERVATION MAP



Distribution of young-of-the-year trout

- LEGEND**
- PAVED ROADS
 - GRAVELED ROADS
 - GOOD DIRT ROADS
 - Collecting station and collection number
 - Brook trout
 - Brown trout
 - Rainbow trout
- 4 } Brook trout
 2 } Fish per hour } Brown trout
 0 } Rainbow trout