Michigan Department of Natural Resources
Status of the Fishery Resource Report 94-1, 1994.
Renumbered in 2024, Status of the Fishery Resource Report 0043

SOUTH BRANCH OF THE KALAMAZOO RIVER

Jackson County (T4S, R3W, Section 36)
Hillsdale County (T5S, R3W, Sections 1,2,9,10,11)
Surveyed July 23 and 24, 1991

Michael P. Herman

Environment

The South Branch of the Kalamazoo River is one of many large tributaries that empty into the main stream of the Kalamazoo River. The name "Kalamazoo" is Indian in origin and is from the Indian word Kikalamazoo, which means mirage or reflecting river. The South Branch is classified as a second- quality trout feeder stream. It is one of only five designated trout streams in the Jackson Fisheries District.

The South Branch of the Kalamazoo River originates just north of the city of North Adams in central Hillsdale County and flows in a northwesterly direction until it empties into the Kalamazoo River mainstream in the city of Albion. The map in Figure 1 shows the middle portion of the South Branch. There are several lakes that have a direct connection to the South Branch including Willits Lake, Cobb Lake, Hastings Lake, Gray Lake, Mill Lake, Mud Lake, Brail Lake, Bartelle Lake, Swains Lake, Gregory Lake and several small unnamed ponds. Although most of these lakes are small, they are significant because of their warmwater fisheries influence on the South Branch. Among the tributaries to the South Branch are Beaver Creek, Conger Drain, Swains Lake Drain, and an unnamed drain just south of the city of Homer.

The South Branch is approximately 43 miles long from its origin to its confluence with the Kalamazoo River mainstream. The total fall of the South Branch is approximately 200 feet.

Much of the South Branch flows through gently rolling farmland and small wood lots. The predominant land use in this watershed is agriculture and much of the surrounding area is rural. The soils contiguous to this river are mainly very poorly drained muck and sandy loams. The South Branch ranges from 2 to 75 feet wide with an average width of 25 feet and an average depth of approximately 2 feet. Discharge, as measured in cubic feet per second is estimated at 7 cfs in the upper portion of the river and at 81 cfs in the lower section.

The section of the South Branch of the Kalamazoo River that has historically been managed for brown trout is approximately 7 miles long. The best trout habitat exists just upstream from Figure 1, from the bridge at Stoney Point Road (T4S, R2W, S31) in southern Jackson County to the Mosherville Road bridge in Hillsdale County (T5S, R3W, S5). A good variety of high-quality trout habitat exists in that section of the river. Deep pools, shallow pools, runs, and riffles with rubble and gravel are all present which provide a diversity of habitat types for brown trout feeding, resting, and spawning. There is a continual flow of water in the South Branch throughout the year. The banks are moderately stable and are bordered predominantly with overhanging brush and shrub vegetation.

Although there is a considerable amount of favorable trout habitat in the managed section of the

South Branch, significant amounts of sand severely limit production in this stream. Sand covers from 30-90 % of the stream bottom in the area managed for trout; this negatively impacts the fish community.

Virtually all of the land that borders the South Branch is privately owned and no state land presently exists. There are approximately 4 miles of abandoned railroad grade which anglers routinely use to access this river. Nearly all of the bridge crossings within the trout-managed area are posted with "no trespassing" signs, however, many property owners allow anglers to access the stream via their property.

Except for the parts of the South Branch that lie within the city limits of Homer and Albion in Calhoun County, development in the watershed is limited to only a few residential homes and small businesses.

The section of the South Branch between the cities of Homer and Albion is popular with canoeists. The launch point is located on the southeast corner of the river and M&endash;60 in Homer. Some canoeing also occurs upstream from Homer. A notable bedrock formation is located about 300 yards south of the F&endash;Drive South bridge in Calhoun County. The rock exposure belongs to a geological formation known as the Marshall Sandstone and is the principal aquifer for the City of Albion.

Fishery Resource

The South Branch of the Kalamazoo River has been popular with mainly local anglers since the early 1950's when trout management through stocking began. It was stocked with legal-size rainbow trout from 1950 through 1954 and with brown trout yearlings from 1973 through 1993. This river has never been chemically rehabilitated.

The earliest survey on file was an electrofishing survey upstream from Hanover Road in Jackson County in 1952. No trout were captured. Species caught included northern pike, smallmouth bass, rock bass, grass pickerel, white sucker, hog sucker, redhorse sucker, lake chubsucker, bullhead, and stonecat, as well as several varieties of chubs and minnows. Many of these species reflect the influence that contiguous lakes have upon the South Branch in this section of the watershed.

A backpack shocker survey in November of 1973 below the Mosherville Road (west) site resulted in the capture of 14 brown trout ranging in size from 6 to 16 inches. Many other trout were observed but not captured during this survey. Numerous spawning redds were also noted.

Four sites were surveyed by electrofishing in October of 1980. The sites were upstream from Pope Road, Rowe Road, Cranberry Lake Road, and Mosherville Road (west). A 240-volt DC stream shocker unit with two probes and a four ampere output was used. Fifty&endash;two brown trout, including several wild young&endash;of&endash;the&endash;year, were caught during this survey. Also captured were white suckers, hog suckers, central mud minnows, mottled sculpins, and several different species of forage minnows. Numerous spawning redds were observed at the Pope Road site during this survey.

Several brown trout ranging in size from 2&endash;11 inches were caught during a July 1985 survey of the Concord Road and Mosherville Road sites. In July of 1986, brown trout ranging in size from 6-19 inches were found to be abundant upstream from the Rowe Road crossing of the South Branch. Drought conditions during the spring and summer of 1988 resulted in very few trout captured during a July survey of the Concord Road and Mosherville Road sites.

In July of 1991, the Grover Road, Pope Road, and Rowe Road sites of the South Branch were surveyed with a 240&endash;Volt DC stream electrofishing unit. The fish community was found to be similar to past surveys of these sites (Table 1). White suckers, creek chubs, and grass pickerel were common but were not considered overabundant.

The only growth rate information was from a stream electrofishing survey of the Pope Road and Rowe Road sites in March and October of 1993. Although brown trout growth was slightly below average, it is not considered poor. The fish sampled during this survey appeared healthy and in good condition.

A tagging study was conducted on the South Branch of the Kalamazoo River in 1991 in an effort to estimate angler harvest of stocked brown trout. Approximately 2300 (63 %) of the brown trout stocked into the South Branch in 1991 were marked with 1.25 inch Floy tags. Anglers returned only 38 tags between June and September 1991, representing a harvest rate of only 1.6 %. Tag loss was suspected to be high and may have occurred due to several reasons. Factors that could have contributed to the observed low number of tag returns include the following:

1) Tag loss (or shedding) after stocking;

2) High hooking mortality of sub&endash;legal tagged fish;

3) Mortality due to tagging;

4) Natural mortality of tagged trout before reaching legal size;

5) Tags not returned by anglers.

Tag loss may have been a major problem throughout this study. None of the trout lost their tags at the hatchery and none were lost at the access sites immediately after planting. However, 41% of brown trout stocked in a small spring&endash;fed pond shed their Floy tags over a 3&endash;month period during the summer of 1990 (Dexter 1990). The brown trout used in that pond experiment were similar in size to those used in the South Branch study, and the tags used were identical, except for color.

The trout tagged for the South Branch study averaged only 6.4 inches in total length, and their small size may have been a major reason for the suspected high tag losses. Several tag studies using larger fish and Floy tags similar to those used in the study on the South Branch have experienced higher tag retention rates (Ebner and Copes 1982; Franzin and McFarlane 1987).

Angler returns of Floy tags from brown trout tagged at a small size did not yield good estimates of angler harvest. Since tag loss was probably significant, harvest estimates were undoubtedly underestimated. However, I suspect the estimates would only be slightly higher because many of the small brown trout stocked probably do not survive to legal size. Future studies should emphasize quality control and uniformity in tagging technique to assure maximum tag retention. Additionally, it is also recommended that only fish over 8&endash;inches in total length be used for Floy tag harvest estimate experiments. More information regarding this study can be found in the Technical Report entitled "Use of Floy Tags to Determine Angler Harvest of Brown Trout in Two Southern Michigan Streams", Fisheries Technical Report No. 94-5.

Because of the apparently low angler harvest and the low number of tagged trout recovered during electrofishing surveys conducted in July of 1991, survival of stocked trout became suspect. On March 24, 1993, all of the hatchery yearling brown trout stocked into the South Branch of the Kalamazoo River were fin&endash;clipped. The objective of that study was to estimate the percent contribution these fish made to the existing fishery by monitoring their survival and abundance.

One week prior to stocking, on March 16 and 17, the Pope Road and Rowe Road sites, were electrofished with a stream shocker. A total of 126 browns were captured. The population estimates were 536 brown trout per acre at the Pope Road site and 126 brown trout per acre at the Rowe

Road site. Yearling brown trout, all resulting from natural reproduction of this wild fish stock, accounted for nearly 40% of the fish that were aged using fish scales. The other 60% were older fish of either wild or hatchery (carryover) origin. Population estimates for each site are in Table 2, and brown trout size structures are shown in Figure 2.

A post-stocking survey was conducted at the Pope Road study site on March 30 and 31,6-7 days after stocking. Only that site was sampled because of high water conditions. A total of 69 trout were captured during this survey, of which only 10 were recently stocked hatchery trout. The population of wild and carryover trout at this site was estimated at 436 trout per acre. The majority of the hatchery fish had either migrated from the stream sections where they had been stocked or had perished.

The Pope Road study site was electrofished again on October 27-28. Captured were 115 unclipped brown trout and only 9 clipped trout. Mark-and-recapture estimates, per acre, were 466 wild and carryover origin and 34 survivors from the 1991 planting. Population estimate data are summarized in Table 2 and size structure of wild and carryover brown trout captured during these surveys is illustrated in Figure 2.

Because of the apparent failure of the stocked brown trout to make a significant contribution to the existing fishery, annual plants were discontinued in 1994. This fishery will be monitored regularly to determine the status of brown trout reproduction, growth, and survival.

Informal angler surveys were conducted on opening day of trout season in 1991, 1992, and 1993. Whenever face&endash;to&endash;face interviews were not possible, trout survey forms were attached to the windshields of vehicles parked at bridge crossings of the South Branch. These surveys asked questions regarding frequency of angling, if catch&endash;and&endash;release was practiced, trip length, and number of trout caught. Also asked were questions regarding the existing trout stocking programs, trout regulations, and angler suggestions for improving the existing fisheries. Although several interviewed anglers had caught some legal-size trout on the day they fished, many anglers also reported catching and releasing many sub&endash;legal trout. The overall response from anglers participating in these face&endash;to&endash;face and mail survey interviews was very positive.

A biological survey was performed by the Surface Water Quality Division of the D.N.R. on the South Branch of the Kalamazoo River at the Pope Road site in July of 1990 to evaluate overall stream quality. An electrofishing survey of a 200&endash;foot section of river upstream from Pope Road resulted in the capture of 22 brown trout. Other species captured included grass pickerel, creek chub, white sucker, mottled sculpin, green sunfish, pumpkinseed, and largemouth bass. Benthic macroinvertebrates were also sampled and a total of 22 different varieties were collected. The most abundant invertebrates were amphipods, which resemble tiny shrimp&endash;like animals and are an important food source for trout. The diversity of benthic organisms at this site is considered very good.

During a routine stream shocking survey in July of 1988, odoriferous petroleum&endash;type residues were observed when the sediments were disturbed in an area immediately upstream from the Concord Road bridge site. Many Marathon Oil wells are in the general area and a Marathon Oil Company storage facility is located approximately one&endash;half mile upstream from the Concord Road site (Figure 1). A search of the DNR Surface Water Quality Division records resulted in the following. In June of 1990, an employee of the Marathon Oil Company reported a gas line leak at a well in Section 36 of Scipio Township. This site is approximately 4 miles south of the South Branch of the Kalamazoo River and because of the minor nature of the leak, likely had no negative impact on the river. In August of 1990, a report was filed by the Surface Water Quality Division regarding a small spill of brine and oil at a well located in Section 14 of Scipio Township. This site is approximately one&endash;half mile south of the South Branch of the Kalamazoo

River. The filed report indicates that this spill was minor and was entirely contained inside the working area dike of the well.

In August of 1957, the Aurora Gasoline Company and the McClure Oil Company were issued a permit by the Department of Conservation to drill an oil well in Section 10 of Scipio Township. This site is approximately one&endash;half mile east of the Concord Road bridge crossing of the South Branch of the Kalamazoo River (Figure 1).

A "blow&endash;out" of this well occurred which lasted a total of 25 hours. No estimate of how many gallons of gas and oil discharged from the well was recorded. Cleanup of the area was accomplished by pumping oil out of the river at the Concord Road bridge using suction pumps and by removal of oil and contaminated soil in the immediate area of the well. Clean sand was hauled in to fill the void around the oil rig created by removal of contaminated soils. Although control of the well was achieved after 25 hours of flowing wild, bubbling gas around the drilling rig and the adjacent swamp was reported to continue for some time.

Management Direction

The current management of the South Branch of the Kalamazoo River as a second-quality, cold-water designated trout stream should continue. Past surveys have indicated the ability of this stream to support large trout and the survival of trout through the winter has historically been good. Although there is limited natural reproduction in this river, it is probable that survival of naturally reproduced brown trout will increase subsequent to the discontinuation of stocking in 1994. Alternate year surveys conducted in early spring will enable us to monitor natural reproduction, growth, survival, and year&endash;class strength of brown trout in the South Branch.

The main goal of management of this river will be to create a larger population of brown trout than presently exists. A major obstacle to attainment of this goal is the large amount of sand in the river which severely limits aquatic invertebrate and fish production. A proposal to remove sand from the prime river sections of the South Branch of the Kalamazoo River is discussed in the **Management Plan** section of this document.

A second management goal is to maintain the existing excellent water quality in the trout-managed section of the South Branch. The large number of gas and oil wells in the immediate vicinity of this river will require continued coordination with Surface Water Quality Division personnel. Judicious water quality monitoring efforts in this environmentally sensitive area will ensure the continued protection of this vital resource.

Report completed: March, 1994.

REFERENCES

Dexter, J. L. 1002. Anger catch and densities of stocked and wild brown trout (*Salmo trutta*) in Augusta Creek, Michigan. Michigan Department of Natural Resources, Fisheries Technical Report 91-9, Ann Arbor.

Ebner, M. P. and F. A. Copes. 1982 Loss of Floy anchor tags from lake whitefish. North American Journal of Fisheries Management 2:90-93.

Franzin, W. G. and G. A. McFarlane. 1987. Comparison of Floy anchor tags for tagging white suckers. North American Journal of Fisheries Management 7:307-309.

Herman, M. P. 1994. Use of floy tags to determine angler harvest of brown trout (*Salmo trutta*) in two southern Michigan streams. Michigan Department of Natural Resources, Fisheries Technical

Report No. 94-5, Ann Arbor.

Table 1.-Species, relative abundance, and length of fish collected by stream electrofishing at three sites on the South Branch of the Kalamazoo River, July 23 and 24, 1991.

Species	Number	Percent	Length Range (Inches)
Brown trout	138	40.0	2&endash;20
Mottled sculpin	72	20.9	1&endash;3
White sucker	49	14.2	1&endash;14
Creek chub	23	6.6	1&endash;8
Grass pickerel	21	6.1	2&endash;10
Central mudminnow	15	4.3	1&endash;4
Northern hog sucker	8	2.3	8&endash;12
Johnny darter	4	1.1	1&endash;2
Common shiner	3	0.9	6&endash;7
Largemouth bass	3	0.9	2&endash;3
Green sunfish	2	0.6	2&endash;3
Rock bass	2	0.6	6&endash;7
Pumpkinseed	1	0.3	2
Blacknose dace	1	0.3	2
Yellow perch	1	0.3	2
Bluegill	1	0.3	2
Bowfin	1	0.3	20
TOTAL	345	100.0	

Table 2.&endash; Mark-recapture population estimates of brown trout from the south branch of the Kalamazoo River during 1993.

			Estimated number			
Date	Trout origin[a]	Site	Per mile	Per acre	Percent legal size	Pounds per acre
March 17	W + C	Pope Road	991	536	17	54.0
March 17	W + C	Rowe Road	246	126	47	37.4
	Hatchery Fish Stocked March 24, 1993					
March 31	W + C	Pope Road	806	436	14	39.2
March 31	H	Pope Road	82	45	0	2.3
October	W + C	Pope Road	862	466	46	118.9
October	H	Pope Road	63	34	53	7.2

[a]Trout origin:
(W) = wild fish

(C) = carryover trout from pre-1993 stocking
(H) = hatchery fish (stocked 3/24/93)

SOUTH BRANCH OF THE KALAMAZOO RIVER

Jackson County (T4S, R3W, Section 36)
Hillsdale County (T5S, R3W, Sections 1,2,9,10,11)

MANAGEMENT PLAN

based on
Status of the Fishery Resource Report 94-1

Michael P. Herman

Recent survey information collected on the South Branch of the Kalamazoo River indicated very low survival of stocked hatchery trout. Additionally, although survival of stocked trout is poor, the stocked fish have likely impacted the wild brown trout through direct competition for food and space and may have depressed the naturally reproduced brown trout population by predation. A primary goal of the Fisheries Division of the Department of Natural Resources is to promote the increase of wild trout where possible while maintaining or improving the existing fishery. Beginning in the spring of 1994, brown trout stocking will be discontinued. Alternate year electrofishing surveys beginning in 1995 will allow us to monitor natural reproduction, growth, survival, and year&endash;class strength of the wild brown trout population.

The main goal of management of the South Branch of the Kalamazoo River is to create a larger population of brown trout than presently exists. A major obstacle to attainment of this goal is the large amount of sand which presently exists in the river and which severely limits aquatic invertebrate and fish production.

The main source of sand is from farm fields which border the South Branch of the Kalamazoo River. Runoff from gravel road crossings of the river also contribute smaller amounts of sand. Inspection of the upper reaches the this river are planned to identify specific areas with significant erosion potential. Subsequent to this inspection, landowners will be contacted and plans for reducing erosion will be suggested. Natural buffer strips which effectively filter sediment, organic matter, and other pollutants from surface water runoff will be recommended. Direct benefits from buffer strips include: 1) collection of coarse grained sediment, thereby reducing off&endash;site sedimentation; 2) reduction of phosphorous, nitrogen, and organic matter loading; and 3) slowing the movement of water, thereby reducing water velocities and allow some percolation into the ground. Additionally, buffer strips can provide valuable wildlife habitat.

Results of investigations at Hunt Creek and Poplar Creek by Gaylord Alexander and associates (1982) indicate that sand has major negative impacts on trout populations. After sand was removed from Poplar Creek, trout production increased by over 40 percent. These investigations also illustrated how sand settling basins were able to reduce sand bedload sediments by as much as 86 percent.

A proposal to construct a sediment trap immediately above the Pope Road bridge crossing of South Branch of the Kalamazoo River was proposed in 1983 but was not accomplished. This proposal still has merit and should be attempted. The proposed site is on private property and will require an easement.

Size of the sediment basin size will be modeled after the basin constructed on Poplar Creek. Since average depth at this location is approximately 2 feet, the recommended basin depth is 4 feet. Recommended width is 25 feet (stream width) and recommended length is 160 feet. This will result in a storage capacity of approximately 300 cubic yards. If this basin is constructed, it will require periodic excavation if it is to continue to be effective.

The installation of natural buffer strips along the river, together with the removal of excess sand, will result in an increase of habitat that is suitable for the growth and survival of brown trout. This action will also result in the restoration of gravel spawning areas, thereby improving conditions for natural reproduction. If the proposed sediment basin proves successful, placement of additional basins will be considered.

References

Alexander, Gaylord R. and Edward A. Hansen. 1982. Sand Sediments in a Michigan Trout Stream Part II. Effects of Reducing Sand Bedload on a Trout Population. Michigan Department of Natural Resources, Fisheries Research Report No. 1902, Ann Arbor, MI.

Hansen, Edward A., Gaylord R. Alexander and William H. Dunn. 1982. Sand Sediments in a Michigan Trout Stream Part I. In&endash;Stream Sediment Basins: A Technique for Removing Sand Bedload from Streams. Michigan Department of Natural Resources Fisheries, Research Report No. 1901, Ann Arbor, MI.

Peterson, Amy, Ralph Reznick, Sally Hedin, Martin Hendges and Dennis Dunlap. 1992. Guidebook of Best Management Practices for Michigan Watersheds. Michigan Department of Natural Resources, Surface Water Quality Division, Lansing, MI.

Plan completed: March, 1994.
Approved: Kenneth E. Dodge, District Biologist, March, 1994.
E. John Trimberger, Regional Biologist, March, 1994.

Last Update: 08/05/02
Web Author: *Tina M. Tincher, Librarian*

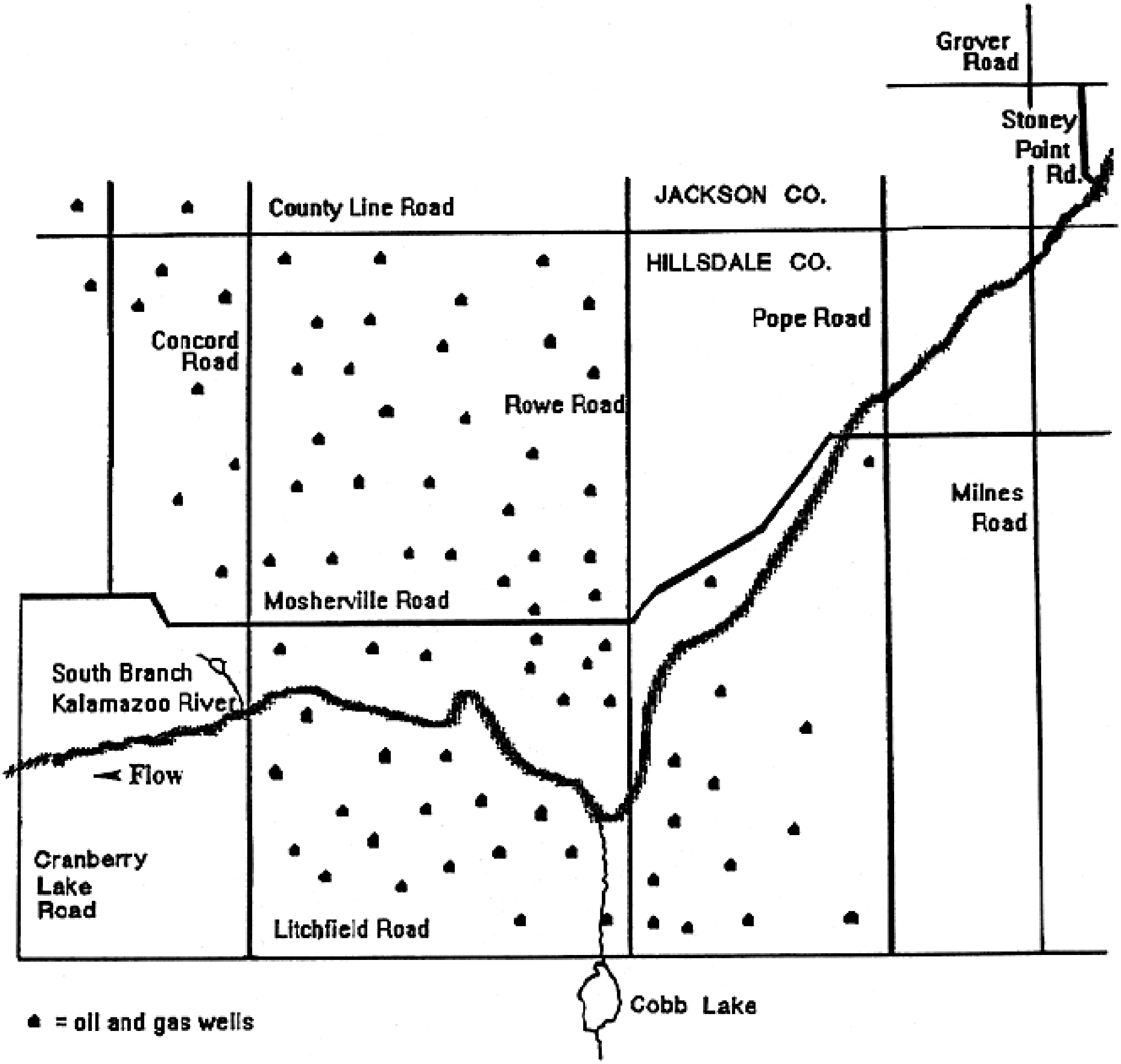

Figure 1—Middle section of the South Branch of the Kalamazoo River, showing trout-managed area and oil and gas wells.

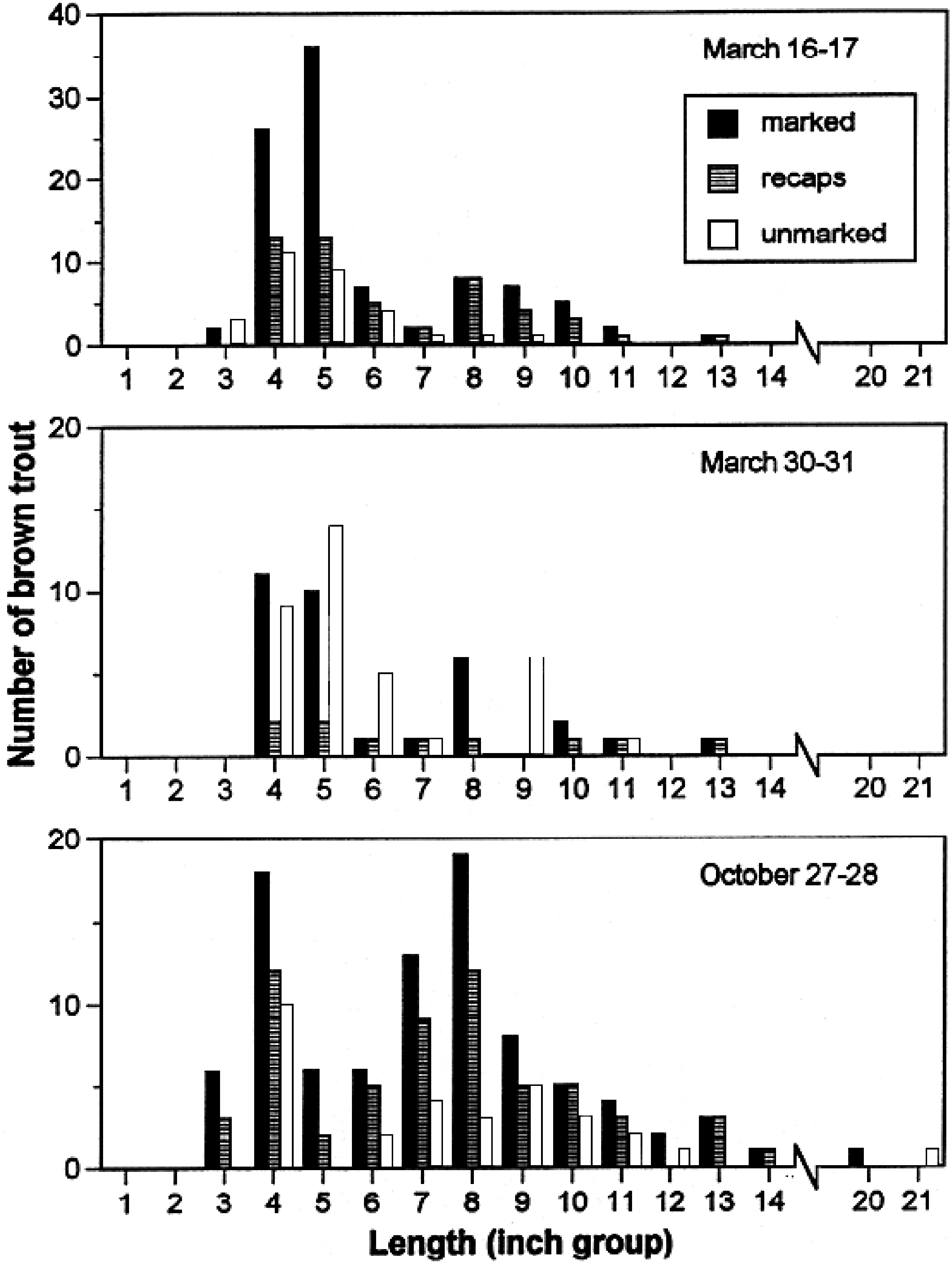

Figure 2. Length of wild and carry-over brown trout during mark-recapture electrofishing on three dates in 1993 at the Pope Road site on the South Branch of the Kalamazoo River.