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**Assessment of the Sport Fishery at  
Meldahl Pool and Tailwater of the Ohio River**

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by

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## ABSTRACT

Surveys of the fishery resource at Meldahl Pool and tailwater in the Ohio River were conducted from 1978 through 1985 as part of the Ohio River Sport Fishery Investigation Project. Survey methods included the use of rotenone, gill nets, and boat-mounted electrofishing equipment. Mean standing crop for a backwater embayment of the Meldahl Pool was 5,481 fish and 534 pounds per acre. Game fish standing crops for 4 years of cove-rotenone studies were dominated by white crappie. Biomass of harvestable-sized black and white crappie was greater than 88% of the standing crop figures for eight Kentucky reservoirs. Electrofishing in main stem areas produced only 55% as many fish per hour as did similar sampling in backwater areas. Gillnetting, on the other hand, showed almost identical numbers of fish per net day between the two types of habitat. Freshwater drum dominated the gillnetting harvest in both main stem and backwater areas. Expanded creel survey totals for Meldahl Pool indicated that anglers expended 3.2 man-hours per acre to harvest 1.3 fish per acre and 0.9 pound per acre. More than twice as many freshwater drum were creeled than any other species. One third of the pounds of all fish creeled were carp. Freshwater drum and channel catfish represented 18.3 and 18.0 percent of the yield as the second and third most creeled species by weight. Tailwater anglers expended 57.1 man-hours per acre to harvest 12.9 fish and 21.4 pounds per acre. The major fish species creeled by number in the tailwater were freshwater drum, channel catfish, and carp. The exploitation rates for largemouth bass and white crappie in Meldahl Pool were 26.5% and 20.0%, respectively. Both of these species showed little movement between time of tagging and recapture and were generally recaptured in the same backwater in which they were tagged. The striped bass stocking program has achieved good results thus far, with a good fishery being reported below most of the locks and dams on the Ohio River, including the Meldahl Pool tailwater.

## INTRODUCTION

The Ohio River arises at Pittsburg, Pennsylvania with the confluence of the Monongahela and Allegheny rivers and flows 981 miles in a southwesterly direction to its juncture with the Mississippi River at Cairo, Illinois. The lower 664 miles of the Ohio River forms the northernmost boundary of the Commonwealth of Kentucky (Fig. 1). This vast river system provides approximately 170,000 acres of water to the angler in the main stem alone. This figure does not include over 9,000 acres of shallow backwater habitat formed when impounded waters backed up the tributaries. With the exception of the lower 18.4 miles, all of the Ohio River bordering Kentucky is impounded by a series of eight high-lift dams and two of the older type moveable wicket dams.

The Ohio River underwent an extended period of severe degradation lasting in excess of 100 years until the late 1940's. A commitment to clean up the river was made with the formation of the Ohio River Valley Water Sanitation Commission (ORSANCO). In more recent years, pollution abatement has resulted in noticable improvement of the fisheries in the river (Pearson and Krumholz 1984).

In 1977, the Kentucky Department of Fish and Wildlife Resources initiated Dingell-Johnson Project F-47 to study the fishery in the Ohio River. Since 1978, fishery investigations on the river have been performed under Subsection III (Ohio River Sport Fishery Investigation) of Dingell-Johnson Project F-40 (Statewide Fisheries Research).

This report addresses the fishery investigated in the Meldahl Pool and tailwater. The construction of Meldahl Dam in 1964 created a pool above the dam that is 95 miles long with 21,809 surface acres, 1,182 acres of which are in backwater embayments.

The amount of angler use and abundance of backwater habitat led to Meldahl Pool being among the first pools to be studied. Study results at Meldahl Pool and its tailwater are the second to be reported from the Ohio River Sport Fishery Investigations. The remaining pools and tailwaters will be reported after data collection is completed at each of those areas.

## METHODS

Cove-rotenone sampling was conducted in Meldahl Pool from 1978-1981. A description of the standard methods employed in cove-rotenone sampling is in Table 1. Sampling was conducted in a 2.29 acre site at Big Turtle Creek. Rotenone sampling was conducted during July and August.

Electrofishing studies were conducted using a boat-mounted, 230 volt A.C. generator boosted by a Chenault electrofisher. Electrodes were constructed of weighted, tinned copper, cable shielding and were suspended from booms affixed to the bow of the boat. Whenever possible, electrofishing sites were randomly selected and effort was kept constant between backwater and mainstem areas. All fish were weighed, measured, and recorded, with data being reported on a per hour basis. An electrofishing study was performed in the tailwater below Meldahl Locks and Dam in the fall of 1984. In the spring of 1981, fish

captured at Meldahl Pool by electrofishing were used in a tagging study. Black bass, sauger, white bass, crappie, carp, freshwater drum, and channel catfish were selected for tagging. Creel surveys indicate these species are most actively sought by Ohio River anglers. Tagging was accomplished utilizing a Floy FD-68B anchor tag inserted into the dorsal musculature so that the "T" portion of the tag locked between the fin ray bases of the soft dorsal fin. Initial plans were to tag 100 fish of each of the above-mentioned species. Total length, weight, species, tag number, location, and date of tagging were recorded for each fish. Captured fish were processed and returned to the same backwater area from which they were originally captured.

In an effort to encourage fishermen to report tag recaptures, tags were assigned reward values of 1, 5, 10, 25, 50, 100, or 1,000 dollars by random drawing. A publicity program was conducted to notify anglers of the reward program. Postage-paid, self-addressed, envelopes were distributed to individual anglers, bait shops, and conservation officers for tag return data.

Gillnetting was conducted in both backwater and main stem areas in conjunction with electrofishing. Sampling gear consisted of experimental gill nets having five panels with bar-mesh sizes of 0.5, 1.0, 1.5, 2, and 2.5 in. Four nets used in backwater areas had 25-ft panels for a total of 125 ft each, while an equal number of nets used in the main stem had 50-ft panels and totaled 250 ft each. Numbers and weights of fish were reported on a per net day basis, where one net day is equal to 300 ft of net fished for one 24-hour period.

Systematic creel surveys, using non-uniform probability, were conducted at Meldahl Pool and its tailwater. The Meldahl Pool survey was an intensive 5-day per week survey of the roving-clerk type, utilizing a hired creel clerk from 29 March to 31 October 1981. The tailwater survey was conducted from 6 February to 2 November 1980. The tailwater survey was a 2-day per week survey utilizing departmental conservation officers. Creel survey data was analyzed using a Fortran IV program. Each survey period consisted of two time segments: (1) an interview portion for interviewing fishermen on an individual basis and (2) a count portion for making a count of all fishermen within the survey area for that day. The Meldahl Pool was divided into five survey areas of near equal size, with one area being surveyed per survey period. The Meldahl tailwater survey encompassed an area of approximately 266 acres from the dam downstream to Ohio River Mile 437.7. The total area was surveyed during each survey period.

Scale samples were taken from selected species of sport fish during fish sampling of the Meldahl Pool from 1978-1985. Total length to the nearest 0.1 in was recorded for each fish. This information, along with the date, location, and other pertinent information, were recorded on scale envelopes within which approximately 5 scales from each fish were placed. Scales were taken below the lateral line posterior to the tip of the pectoral fin. Striped bass data were compiled from angler responses to the Fisheries Division's mail-in survey program. Scales were cleaned with water and read on an Eberbach scale viewer or a MicroDesign, Model 150, microfiche reader. Annuli were identified and measured to the nearest 0.1 in. Annual growth was computed assuming the Dahl-Lea direct proportion method.

Table 2 is the standard form used for reporting cove-rotenone data. All fish were classified in size groups according to this form.

## RESULTS AND DISCUSSION

### Fish Population Structure

Cove-rotenone studies were conducted in 1978-1981 in backwater embayments of Meldahl Pool. These data are presented in Tables 3-6. Although these studies were conducted in the same location and on approximately the same dates during the 4 years, total standing crop values varied widely from a low of 276 pounds per acre (lb/a) in 1979 to 747 lb/a in 1980. Standing crops of harvestable-size fish remained relatively constant for most species groups from year to year. Exceptions to this include the game fish in 1979 and the forage fish in 1980. The greatest variations in standing crop values for harvestable-size fish occurred in the commercial fishes group. Variability in total standing crop values for each of the studies is primarily a result of fluctuations in the biomass of commercial and forage species present in the study area.

With the exception of 1979, total numbers of harvestable-size crappie in Meldahl Pool were much greater than were reported in Markland Pool for the same period. The majority of crappie were white crappie; black crappie were also collected each year, except in 1979. Cove-rotenone data does not always accurately reflect the fish population levels and Big Turtle Creek embayment is not believed to be representative of the entire Meldahl Pool. A comparison of fish standing crops at Meldahl Pool and eight of Kentucky's largest reservoirs show harvestable-size crappie from Meldahl Pool outnumbered those from reservoirs in 50% of the cases. Likewise, biomass of harvestable-size crappie was higher than 88% of the standing crop figures in reservoirs.

Typically, fish standing crop data from Ohio River cove-rotenone studies are dominated by a single species, such as gizzard shad, whose presence or absence dictates the magnitude of the study. The magnitude of the total standing crop at Meldahl Pool tended to be more dependent on commercial species, particularly bigmouth and smallmouth buffalo, river carpsucker, and carp.

The mean fish biomass at Meldahl Pool during the 4 study years was 534 lb/a, with a mean number of fish per acre (no/a) of 5,481. The Kentucky Department of Natural Resources, Division of Water classified several Kentucky reservoirs according to their trophic level in 1984. These reservoirs, classified as eutrophic, all exhibited total standing crops in excess of 300 lb/a. Mean standing crops of 249 lb/a and 112 lb/a occur in lakes that have been classified as mesotrophic and oligotrophic, respectively. The above-mentioned study did not address the trophic status of the various pools on the Ohio River; however, total standing crops of backwater embayments in Meldahl Pool, Markland Pool (362 lb/a), Cannelton Pool (362 lb/a), and Greenup Pool (329 lb/a) fall within the range of values exhibited by reservoirs classified as eutrophic. Cove-rotenone studies in the Ohio River have been conducted in backwater areas that are not truly representative of the main stem, at least in terms of species composition.

The Y/C ratio of forage fish to carnivorous fish ranged from 0.11 to 0.79 during the study period (Table 7). These figures fall well within the 0.02 to 4.8 range of balanced populations, but they are less than ideal. The Y/C values generated from Meldahl Pool study data are indicative of populations having too few forage fish for the carnivores present. The ATL values for

balanced population should fall within the range of 33 to 90. The present study exhibited ATl values ranging from 45.7 to 90.7, which fell well within the balanced range. It should be noted that these indices were formulated from data obtained from small closed systems and may not be applicable to an open riverine environment. The principal forage species is gizzard shad. Much of the fluctuation found in standing crop data can probably be attributed to ingress and egress of gizzard shad from the study embayment.

Data contained in tables 8 and 9 show the results of electrofishing in the main stem and backwater areas of Meldahl Pool in 1979, 1980, and 1985. A total of 22 species of fish were captured in the backwaters as compared to 20 species from the main stem. Backwater and main stem sampling produced 15 species in common; of these, only 5 species were more numerous in the main stem. In terms of total fish per hour captured, mainstem sampling produced only 55% as many fish as did backwater sampling. Four species of gamefish - white bass, largemouth bass, spotted bass, and sauger, were common to both main stem and backwater samples. These four species, taken collectively, were 2.7 times more numerous in the backwater than in the main stem. As might be expected, sauger were more numerous in the main stem.

Gillnetting was conducted in close proximity and at the same time as the above mentioned electrofishing studies (Tables 10, 11). Mainstem gillnetting produced 24 species of fish compared to only 16 species captured from embayments. Additionally, the total number fish per net day were almost identical between the two types of habitat. This is a fairly unusual occurrence in that other studies (Jackson 1985) generally showed backwater areas to be vastly more productive than mainstem areas. Fourteen species were common to both types of habitat, with only five of those species being more numerous in backwater embayments. White bass, white crappie, and sauger were captured in both areas and were the only game species that were susceptible to gillnetting. Freshwater drum and gizzard shad dominated the harvest in backwater samples, while freshwater drum and river carpsucker were the most numerous species in mainstem samples.

Relative weight ( $W_r$ ), an index of condition, is the actual weight of a fish compared to a standard weight for that particular length (Wedge and Anderson 1978). Electrofishing was conducted for largemouth bass in the fall of 1982 in six navigational pools of the Ohio River. Table 12 lists the results of those studies. The total  $W_r$  values for all size groups indicate that largemouth bass were in good condition at all six pools. A  $W_r$  value of 95-100 is considered satisfactory for largemouth bass, while those values above 100 represent fish heavier than the standard weight. Sample size was relatively low in some instances; however, it was considered sufficient to indicate that largemouth bass at Meldahl Pool were in good condition.

The results of fall electrofishing efforts in the tailwater of Meldahl Pool in 1984 are shown in Table 13. A total of 117 species were captured at a rate of 127 fish per hour as compared to 92 fish per hour and 16 species captured in the Markland tailwater during the same period. Six species of game fish were captured, with only sauger and striped bass being harvestable size. An electrofishing trip in the spring of 1985 for the purpose of striped bass broodstock acquisition resulted in the capture of 28 striped bass, 16.2 to 23.8 inches long, in 0.75 hour of electrofishing effort. Unfortunately, none of the females captured were sexually mature. The tailwater below Meldahl Locks and Dam is perhaps the most hazardous to be found in the Kentucky

portion of the river. This, coupled with the restrictions imposed upon boat traffic on the riverward side of the lock wall by the U.S. Army Corps of Engineers, has restricted all angling to only bank fishermen. Hopefully, access site development in the future will allow the construction of fishing piers to enable the bank fishermen to better utilize this fishery. Also, the policy will hopefully be changed to allow boat anglers to fish in the immediate tailwater.

Gillnetting in the Meldahl tailwater produced a total of 19 species and 54.3 fish per net day. Five species of game fish were captured that included 25 sauger, 4 striped bass, and 3 walleye of harvestable size. As in a similar report on the Markland Pool and tailwater (1985), the presence of striped bass and walleye were of particular interest. The Department's striped bass stocking program is apparently a success as fish sampling efforts and anglers' creels regularly include this species. Walleye are likewise becoming more numerous in the Ohio River based on gillnetting results and angler reports.

Table 15 is a summary of the species of fish collected in Meldahl Pool and tailwater during 1978-1985. A total of 44 species were collected by all methods of sampling. The Markland Pool and tailwater (1985), in contrast, produced 51 species during the same period. Slightly fewer species were collected in 1983 and 1984 due to the limited sampling in the tailwater area only. Several species were likely hidden in the 1978-1981 cove-rotenone data due to the grouping of some members of the families cyprinidae and percidae under common headings labeled miscellaneous cyprinids and darters. Pearson and Krumholz (1984) listed a total of 94 species that had been reported during the period 1970-1983 from the middle portion (ORM 328-654) of the river. It is likely that many of the differences in numbers of species reported is due to sampling for target species and to sampling methods which are biased against smaller species.

#### Fish Harvest

Expanded creel survey results from Meldahl Pool in 1981 are contained in Table 16. Anglers made 41,315 fishing trips, of which 25.6% were successful. Slightly over three man-hours per acre were expended to harvest 1.3 fish per acre and 0.9 pound per acre. Data relative to the harvest of selected species is contained in Table 17. The majority (71.3%) of anglers surveyed were "anything" fishermen. These anglers when interviewed, indicated they had no particular preference as to species. "Anything" anglers were typically still fishing with natural bait from the bank. The majority of these anglers were probably fishing for catfish, carp, and freshwater drum. Anglers who indicated that they were seeking particular species to catch listed channel catfish (13.7%), carp (6.6%), black bass (4.0%), and crappie (2.5%) as target species. All other species accounted for less than 1% each of the total trips. The greatest success rates were enjoyed by anglers seeking bluegill (83.9%), white bass (77.8%), and crappie (59.1%).

Creel surveys were likewise conducted in Markland Pool (1980), Cannelton Pool (1982), and McAlpine Pool (1983). A summary of data relative to selected species from these three pools and Meldahl Pool are presented in Table 18. When all four surveys are considered collectively, the fish most often creeled are freshwater drum, channel catfish, carp, and crappie in terms of both numbers and biomass harvested. A recreational use survey of the upper Ohio



River conducted by the West Virginia Division of Wildlife Resources (Pierce 1983) revealed that channel catfish, freshwater drum, and carp were the major contributors to the creel in that portion of the river. It may very well be that this situation exists throughout the length of the Ohio River.

Fishing effort (man hours/acre) on Meldahl Pool was greater than that expended at McAlpine Pool, but less than was observed at Cannelton. The amount of backwater acreage was also between the acreage present at the other two pools, which probably has some influence on fishing effort (Table 19). Those pools having more backwater acreage attract more anglers. Harvest rates and fish yields, however, were not greater for each pool that held more backwater area, except at Markland Pool where there is more backwater than at any other pool.

Creel survey data at Meldahl Pool tailwater are shown in Table 20. A total of 27 fishing trips per acre were made to Meldahl Pool tailwater, of which 19.4% were considered successful. Much of these data are generated using incomplete trip data, therefore, success may be greater. Tailwater anglers expended almost 18 times more pressure (man hours/acre) than pool anglers at Meldahl Pool and harvested 10 times more fish and 24 times more pounds per acre. The high percentage (98.3%) of bank versus boat anglers is due to restrictions by the Huntington District of the U.S. Corps of Engineers on not allowing boats to enter the immediate tailwater area.

Harvest of selected species of fish from Meldahl tailwater is presented in Table 21. Crappie was the only species, of those common to both pool and tailwater surveys, which was not harvested in greater numbers and pounds per acre in the tailwater. The major contributions to the harvest in terms of both numbers and pounds per acre were freshwater drum, channel catfish, and carp.

Fish tagging efforts in the Meldahl Pool resulted in the tagging of a total of 334 fish (Table 22). The total exploitation rate for all species combined was 14.5%. The annual exploitation rate for largemouth bass was 26.5%. This value is in agreement with a statewide exploitation rate of 27.5% in 1978-79 during a study of several water bodies (Crowell 1984). The exploitation rates at Markland Pool in 1983 and 1978-79 were 29% and 23.7%, respectively. Tag return data revealed that recaptured largemouth bass had traveled an average of 1 mile from the point of tagging. Mean "time-out" between tagging and recapture was 20 days, with the range being from 2 to 88 days. Tagging studies in other pools likewise showed that largemouth bass were almost invariably recaptured near the same area in which they were tagged.

The exploitation rate on white crappie was 20% compared to 27% in Markland Pool (1983) and 10% in Cannelton Pool (1982). The mean distance traveled by white crappie was 3.0 miles, with a mean "time-out" of 26 days. Markland and Cannelton Pool data revealed that the mean miles traveled in these pools was 2.0 miles and 1.0 mile, respectively.

Difficulty was encountered in tagging the target number of channel catfish, with only 20 individuals being captured. A single channel catfish tag was returned after 56 days from the date of tagging. This fish had traveled a distance of 4.0 miles.

A total of 95 carp were tagged; the exploitation rate was 2.1%. In most of the tagging studies to date, there has been little difficulty in approaching

the desired number of 100 carp tagged. Carp are plentiful in the backwater areas of pools on the Ohio River but the exploitation rates range from 0 to 2.1%. Creel surveys on the other hand, indicate that carp are sought by a large percentage of Ohio River anglers and are harvested in good numbers.

Freshwater drum, like channel catfish, were difficult to capture. Difficulty in capture of this species by electrofishing and high mortality of fish from gillnetting resulted in only 46 fish being tagged. The exploitation rate was 4.3% and the mean "time-out" was 13 days.

Channel catfish, carp, and freshwater drum are the major contributors to the harvest according to creel surveys conducted in several pools of the Ohio River. In contrast, these three species exhibit the lowest exploitation rates. These low exploitation rates are primarily a function of a very large population size, an insufficient number of tagged individuals, and a poor response from anglers who catch tagged fish.

Striped bass were first stocked into the Ohio River by the Kentucky Department of Fish and Wildlife Resources in 1976. Few numbers of harvested striped bass were reported several years due to a low stocking rate. Striped bass stockings during 4 years were a result of introductions from fingerlings produced at a sub-impoundment to the Ohio River located in the Markland Pool. In 1980, a larger stocking rate of 4-5 fish/acre, 1.5 to 2.0 inches long, was implemented; as a result, striped bass fisheries in tailwaters throughout the river have steadily improved. Back-calculated mean lengths for striped bass captured in the tailwater of Meldahl Pool are presented in Table 23. Approximately 75% of the 165 striped bass utilized in the compilation were captured by anglers and returned via mail-in survey. This injects some error into determining age and growth due to the failure on the part of the anglers to measure fish accurately. Analysis of age-growth data revealed that the 1980 year-class did not contribute many individuals to the survey. Mean back-calculated growth indicated that striped bass reached a minimum legal harvestable-size of 15 inches in their second year of life at age 1+. Growth of Ohio River striped bass closely parallels that exhibited by striped bass in Herrington Lake and Lake Cumberland (Axon 1979, Kinman 1984) up through their third year of life. Reduced growth rate after their third year of life in the river is possibly the result of not enough individuals to make an accurate assessment of growth at this time. As more fish become age 3 and older in the population in the future, a better indication of growth for these fish can be made.

Back-calculated lengths for sauger are in Table 23. Growth rates for Meldahl Pool sauger are similar to growth rates exhibited by 282 fish captured throughout the length of the Ohio River during the same period. Kentucky does not have a minimum legal size on sauger; however, 12 inches has been arbitrarily selected as a minimum "keeper" size by most anglers. Data indicate that sauger reach this length in the Ohio River late in their third year of life at age 2+.

Very few walleye were captured during the study period, although this species is reportedly becoming more common in the anglers creel. The limited number of scale samples would seem to indicate that growth of walleye in the river is slower than that reported from Lake Cumberland (Kinman 1984). Minimum legal size of 15 inches was attained at age 3+.

Growth of largemouth bass at Meldahl Pool is slightly less at all ages than mean growth reported from reservoirs in Kentucky (Buynak 1984). Growth for spotted bass was slower when compared to growth in reservoirs.

#### CONCLUSIONS

The pools of the Ohio River are riverine in nature and not reservoirs as some authors suggest. Many commonly accepted management practices used in reservoirs are not readily adaptable to the Ohio River system. Management of the fisheries in the Ohio River are primarily limited to predator stocking, harvest restrictions, water quality improvements through pollution abatement, increasing fishing opportunities through access development, public relations efforts to promote the fishery, and allowing boat anglers to fish in the immediate tailwaters below Greenup and Meldahl pools, which is now not allowed by the U.S. Corps of Engineers (Huntington District).

The stocking of striped bass at the present level should be continued until stocking success can be fully evaluated. Good striped bass fishing has been developed at several locations, primarily at tailwaters below the locks and dams on the river. A creel survey of the tailwater at Markland Locks and Dam will be repeated in 1986-87 in order to determine the fishery that now exists and to assist in the evaluation of striped bass stocking success. The development of a self-sustaining striped bass population may not be a reasonable expectation for the Ohio River. In the event that this does not occur, annual stockings should be continued to achieve our management objectives of at least 1 lb/acre creel or a 10% addition to the total fish yield in the tailwater areas.

Recent court actions have mandated that ownership of the Ohio River should be shared with the states of Ohio and Indiana. Regulations developed in the future to control harvest on the river will have to be coordinated with these states. Future fishing regulations on the Ohio River will hopefully be common to all of the concerned states.

A concern has developed over the conflict of commercial netting and the striped bass fishery in the river. Commercial nets will harvest adult striped bass and possibly impact the adult population.

The fishery resources in the backwaters of Markland Pool compared favorably to that found in several major reservoirs in Kentucky. The Meldahl Pool exhibits game fish standing crops equal to or better than those found in many of the major reservoirs throughout the state.

Creel survey results indicate that fishing pressure (3.2 m-h/acre) and pounds of fish harvested per acre (0.90 lb/acre) are very low when compared to data from reservoirs or the Markland Pool. Harvest rates (numbers and pounds of fish per hour) and yield do not equal those reported from reservoirs, but are slightly more comparable. This indicates the fishery at Meldahl Pool is being underutilized. Many anglers are laboring under the misconception that the river will not provide a quality fishing experience and that the fish are not fit for consumption. This is likely an underlying reason for low angler pressure. To rectify this situation, a concerted public relations program must be implemented to change the anglers attitudes. Additionally reasons for

underutilization of this resource includes turbidity, poor water conditions for fishing, and the lack of proper access sites in many areas. Turbidity and poor water conditions are an inherent characteristic of a river fishery on a seasonal basis and cannot be altered by the fishery manager. Access, on the other hand, can and should be developed in those prime fishing areas such as the tailwaters.

Creel survey data for Meldahl Pool in 1981 indicated less than 12% of the anglers interviewed were boat fishermen. Similar data from five Kentucky reservoirs indicated 84% of the fishermen contacted were boat anglers. With improved access, it is possible that fishing pressure by boat anglers could be increased severalfold. The greatest potential for improving the fishery in tailwaters is by developing better access and additional fishing opportunities such as by stocking striped bass. Where the Corps of Engineers prevents boat traffic in the tailwater area, such as below Greenup and Meldahl locks and dams, access development will be limited to the development of improved access for the bank fishermen. If boat fishing is allowed in these tailwaters, use and harvest of fish should more than double. A concrete fishing platform or walkway running parallel with the line of the bank has been constructed at Greenup Pool tailwater, and the Department has requested a similar arrangement in conjunction with hydroelectric development at Meldahl tailwater. The Department plans to promote the development of boat launching facilities to service tailwater areas. The mean annual pounds of fish creeled per acre in reservoir tailwaters in Kentucky is 5,694 compared to 21.4 lb/acre creeled in Meldahl tailwater in 1980. It is unlikely that the tailwaters of the Ohio River will ever approach those of reservoirs in terms of harvest, but, with proper access, there is potential for considerable improvement.

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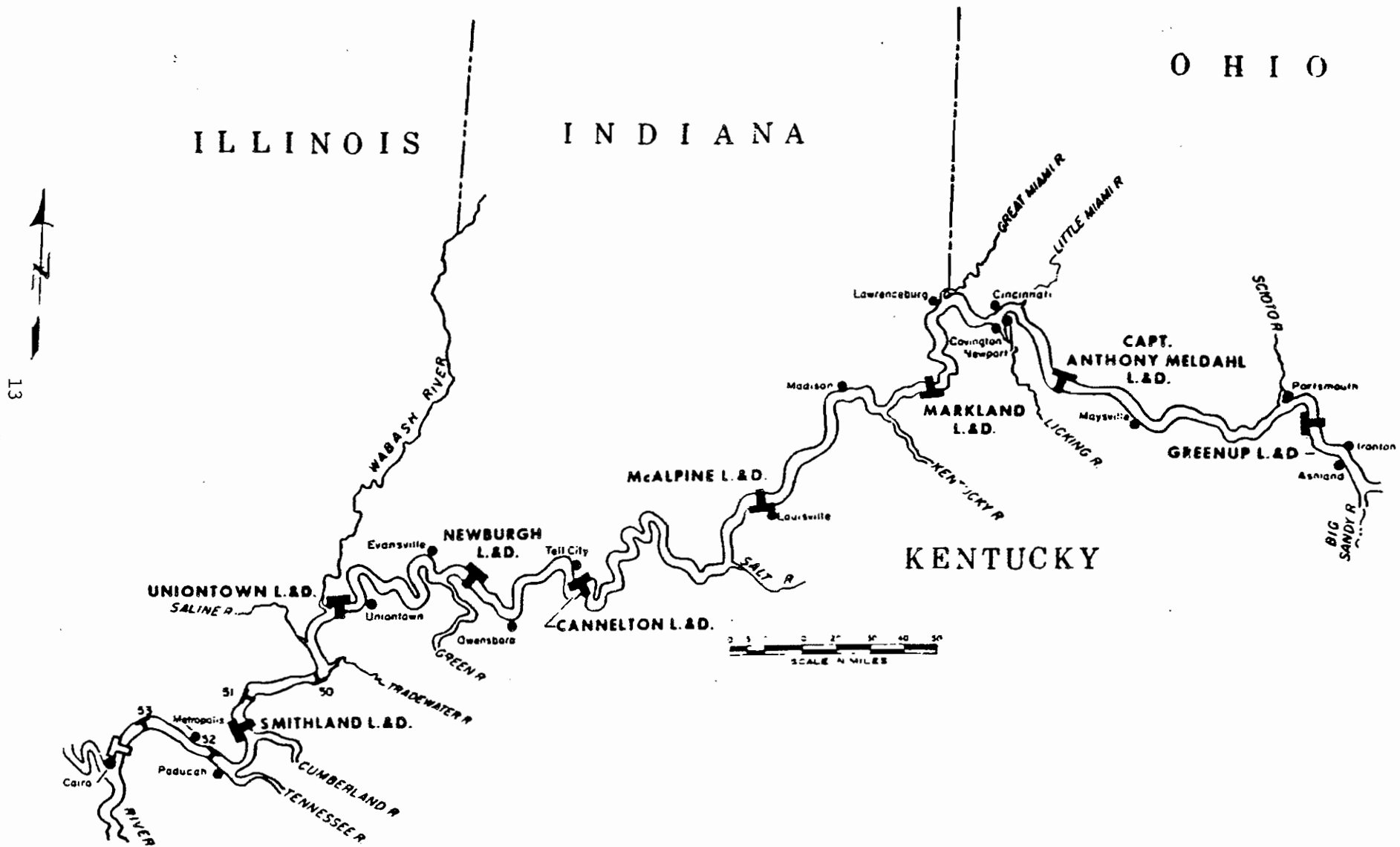


Figure 1. The lower section of the Ohio River that forms the northern boundary of Kentucky.

Table 1. Standard methods for conducting cove-rotenone studies.

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1. Cove selected for fish population sampling will be at least one acre in size; two-acre areas are preferable. The sample area should have a mean depth that is similar to the mean depth of the adjacent open water.
  2. Coves will be measured by accepted surveying methods, not by visual estimation. Soundings will be made to determine the average depth.
  3. A net that effectively blocks the cove mouth from shore to shore and from surface bottom will be used. The most widely-used net is 300 feet long, 20 feet deep, with 1/2 inch bar-measure mesh.
  4. All population studies will begin between the hours of 7:00 and 8:00 am, the earliest hour being preferable. The block net is positioned before other activities relevant to the study are to begin.
  5. Population studies will not be conducted in water having a surface temperature less than 70F.
  6. Liquid fish toxicants will be mixed with water at a 1:10 ratio and applied through the propeller wash via a venturi-type boat trailer. In deep coves, the mud-ball method (powdered cubes) will be used for better penetration of the thermocline.
  7. Fish within the study area will be picked up for three days (50-60 hours). Freshly-killed fish will not be counted on the second and third days. Sanitary and esthetical considerations require disposal of floating extra-territorial fish before leaving the lake.
  8. Fish will be sorted according to species, measured in inch group, 0.1" to 1.4" = 1 inch, 1.5" to 2.4" = 2 inches, etc., and weighed to the nearest 0.01 pound. Small species, as well as questionable larger specimens, will be preserved in formalin for later identification. Weights will be taken only during the first day.
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Table 2. Standard form used by Kentucky Division of Fisheries for reporting fish population study data.  $A_{TL}$  ("legal total availability") applied only to those species that have a legal size limit.

Group/Species	Fingerling size (inch group)	Intermediate size (inch group)	Harvestable size (inch group)
<b>GAME FISHES</b>			
Rainbow trout	0-4	4-7	8
Ohio muskellunge	0-4	5-29	30 ( $A_{TL}$ )
Chain pickerel	0-4	5-11	12
Grass pickerel	0-4	5-9	10
White bass	0-4	5-8	9
Striped bass	0-4	5-14	15 ( $A_{TL}$ )
Sauger	0-4	5-11	12 ( $A_{TL}$ )
Walleye	0-4	5-14	15 ( $A_{TL}$ )
Largemouth bass	0-4	5-11	12 ( $A_{TL}$ )
Smallmouth bass	0-4	5-11	12 ( $A_{TL}$ )
Spotted bass	0-4	5-11	12 ( $A_{TL}$ )
Black crappie	0-4	5-7	8
White crappie	0-4	5-7	8
<b>FOOD FISHES</b>			
Blue catfish	0-4	5-9	10
Channel catfish	0-4	5-9	10
Flathead catfish	0-4	5-9	10
<b>PREDATORY FISHES</b>			
Skipjack herring	0-4	5-9	10
Goldeye	0-4	5-9	10
Mooneye	0-4	5-9	10
Longnose gar	0-4	5-23	24
Shortnose gar	0-4	5-23	24
Spotted gar	0-4	5-23	24
Bowfin	0-4	5-13	14
American eel		8-15	16
<b>PANFISHES</b>			
Rock bass	0-2	3-5	6
Bluegill	0-2	3-5	6
Green sunfish	0-2	3-5	6
Hybrid sunfish	0-2	3-5	6
Longear sunfish	0-2	3-5	6
Redear sunfish	0-2	3-5	6
Warmouth	0-2	3-5	6
<b>COMMERCIAL FISHES</b>			
Sturgeons	0-7	8-23	24
Paddlefish	0-7	8-23	24
Buffalofishes	0-4	5-11	12
Carpsuckers	0-4	5-11	12



Table 2 continued.

Group/Species	Fingerling size (inch group)	Intermediate size (inch group)	Harvestable size (inch group)
Northern hog sucker	0-4	5-11	12
Redhorses	0-4	5-11	12
White sucker	0-4	5-11	12
Spotted sucker	0-4	5-11	12
Carp	0-4	5-11	12
Bullhead	0-4	5-8	9
Freshwater drum	0-4	5-9	10
<b>FORAGE FISHES</b>			(Above forage size)
Lampreys	0-3	4-7	8
Gizzard shad	0-3	4-7	8
Threadfin shad	0-3	4-7	8
Shiners	0-3	4-7	8
Miscellaneous cyprinids	0-3	4-7	8
Madtom	0-3	4-7	8
Topminnows	0-3	4-7	8
Darters	0-3	4-7	8
Orangespotted sunfish	0-3	4-7	8
Brook silverside	0-3	4-7	8
Scupins	0-3	4-7	8

Table 3. Fish standing crop in the backwater area of Big Turtle Creek in Meldahl Pool during 1978.

	Harvestable size (per acre)		Total (per acre)		Percent of total population	
	No.	Lb	No.	Lb	No.	Lb
<b>GAME FISHES</b>						
Largemouth bass	2	2.36	126	5.76	3.8	1.0
White bass	3	1.39	12	3.42	0.1	0.6
Black crappie	4	1.55	8	1.97	0.2	0.4
White crappie	16	5.28	324	6.88	9.8	1.2
Sauger	t	0.48	4	1.53	0.1	0.3
<b>Total</b>	<b>25</b>	<b>11.06</b>	<b>474</b>	<b>19.56</b>	<b>14.4</b>	<b>3.5</b>
<b>FOOD FISHES</b>						
Channel catfish	9	5.55	10	5.65	0.30	1.0
Flathead catfish	6	10.26	10	10.57	0.30	1.9
<b>Total</b>	<b>15</b>	<b>15.81</b>	<b>20</b>	<b>16.22</b>	<b>0.60</b>	<b>2.9</b>
<b>PREDATORY FISHES</b>						
Longnose gar			7	0.82	0.2	0.1
Skipjack herring	2	1.29	2	1.29	0.1	0.2
<b>Total</b>	<b>2</b>	<b>1.29</b>	<b>9</b>	<b>2.1</b>	<b>0.3</b>	<b>0.4</b>
<b>PISCIVOROUS TOTAL</b>	<b>42</b>	<b>28.16</b>	<b>503</b>	<b>37.89</b>	<b>15.2</b>	<b>6.7</b>
<b>PANFISHES</b>						
Bluegill	55	8.10	308	16.11	9.3	2.9
Green sunfish			16	0.20	0.5	t
Longear sunfish	t	t	54	2.14	1.6	0.4
Warmouth	3	0.68	39	1.68	1.8	0.3
<b>Total</b>	<b>58</b>	<b>8.78</b>	<b>417</b>	<b>20.13</b>	<b>12.6</b>	<b>3.6</b>
<b>COMMERCIAL FISHES</b>						
Paddlefish	3	5.87	3	5.87	0.1	1.0
Carp	23	93.77	24	94.45	0.7	16.8
River carpsucker	55	98.70	69	104.40	2.1	18.6
Quillback	5	7.59	6	8.04	0.2	1.4
Smallmouth buffalo	52	152.41	136	166.78	4.1	29.7
Bigmouth buffalo	3	46.10	4	46.63	0.1	8.3
Black buffalo	10	39.86	19	40.30	0.6	7.2
Spotted sucker	1	1.57	3	1.86	0.1	0.3
Silver redhorse			1	0.06	t	t
Golden redhorse	1	0.72	3	0.96	0.1	0.2
Yellow bullhead			4	0.36	0.1	0.1
Freshwater drum	3	1.86	112	8.05	3.7	1.4
<b>Total</b>	<b>156</b>	<b>448.45</b>	<b>387</b>	<b>477.76</b>	<b>11.7</b>	<b>85.0</b>
<b>FORAGE FISHES</b>						
Gizzard shad	124	25.49	1,945	26.29	59.0	4.7
Misc. cyprinids			35	t	1.0	t

Table 3 continued.

	Harvestable size (per acre)		Total (per acre)		Percent of total population	
	No.	Lb	No.	Lb	No.	Lb
Orangespotted sunfish			14	0.18	0.4	t
Logperch			1	t	t	t
Total	124	25.49	1,995	26.47	60.0	4.7
NON-PISCIVOROUS TOTAL	338	482.72	2,799	524.36	84.8	93.3
GRAND TOTAL	380	510.88	3,302	562.25	100.0	100.0

Table 4. Fish standing crop in the backwater area of Big Turtle in Meldahl Pool during 1979.

	Harvestable size (per acre)		Total (per acre)		Percent of total population	
	No.	Lb	No.	Lb	No.	Lb
<b>GAME FISH</b>						
White bass	t	0.29	1	0.42	0.1	0.2
Sauger			2	0.23	0.2	0.1
Largemouth bass			21	1.42	1.7	0.5
Spotted bass			14	0.25	1.1	0.1
White crappie	2	6.45	91	10.15	7.4	3.7
<b>Total</b>	<b>2</b>	<b>6.74</b>	<b>129</b>	<b>12.47</b>	<b>10.5</b>	<b>4.5</b>
<b>FOOD FISH</b>						
Channel catfish	7	10.91	8	11.04	0.6	4.0
Flathead catfish	4	13.62	7	14.48	0.6	5.2
<b>Total</b>	<b>11</b>	<b>24.53</b>	<b>15</b>	<b>25.52</b>	<b>1.2</b>	<b>9.2</b>
<b>PREDATORY FISH</b>						
Longnose gar			4	0.96	0.3	0.3
Shortnose gar			t	0.24	t	0.1
Skipjack herring	1	0.95	1	0.95	t	0.3
<b>Total</b>	<b>1</b>	<b>0.95</b>	<b>5</b>	<b>2.15</b>	<b>t</b>	<b>0.8</b>
<b>PISCIVOROUS TOTAL</b>	<b>14</b>	<b>32.22</b>	<b>149</b>	<b>40.14</b>	<b>12.1</b>	<b>14.5</b>
<b>PANFISH</b>						
Bluegill	53	12.45	197	17.47	16.0	6.3
Green sunfish	1	0.23	8	6.00	0.6	2.2
Longear sunfish	1	0.07	34	0.85	2.8	0.3
Warmouth			28	0.87	2.3	0.3
<b>Total</b>	<b>55</b>	<b>12.75</b>	<b>267</b>	<b>25.19</b>	<b>21.7</b>	<b>9.1</b>
<b>COMMERCIAL FISH</b>						
Carp	12	55.10	20	59.62	1.6	21.6
River carpsucker	7	14.42	10	15.36	0.8	5.6
Smallmouth buffalo	10	24.92	45	39.17	3.7	14.2
Bigmouth buffalo	2	23.46	3	23.50	0.2	8.5
Spotted sucker	2	1.95	2	1.95	0.2	0.7
Golden redhorse	1	0.92	1	0.92	0.1	0.3
Black bullhead			2	0.11	0.2	t
Drum	4	3.10	56	7.49	4.5	2.7
<b>Total</b>	<b>38</b>	<b>123.87</b>	<b>139</b>	<b>148.12</b>	<b>11.3</b>	<b>53.6</b>
<b>FORAGE FISH</b>						
Gizzard shad	162	27.33	653	62.68	53.0	22.7
Misc. cyprinids			24	t	1.9	t
Darters			t	t	t	t
<b>Total</b>	<b>162</b>	<b>27.33</b>	<b>676</b>	<b>62.68</b>	<b>55.0</b>	<b>22.7</b>
<b>NON-PISCIVOROUS TOTAL</b>	<b>255</b>	<b>163.95</b>	<b>1,082</b>	<b>235.99</b>	<b>87.9</b>	<b>85.5</b>
<b>GRAND TOTAL</b>	<b>269</b>	<b>196.17</b>	<b>1,231</b>	<b>276.13</b>	<b>100.0</b>	<b>100.0</b>

t ≤ 0.5 fish/acre, 0.005 lb/acre.

Table 5. Fish standing crop in the backwater area of Big Turtle Creek in Meldahl Pool in 1980.

	Harvestable size (per acre)		Total (per acre)		Percent of total population	
	No.	Lb	No.	Lb	No.	Lb
<b>GAME FISHES</b>						
White bass	1	0.44	43	1.29	0.3	0.2
Largemouth bass	1	0.93	86	4.24	0.7	0.6
Spotted bass			31	0.77	0.2	0.1
White crappie	21	7.03	869	9.45	6.9	1.3
Black crappie	4	1.58	9	1.93	0.1	0.3
Sauger	1	0.89	1	0.97	t	0.1
<b>Total</b>	<b>28</b>	<b>10.87</b>	<b>1,039</b>	<b>18.65</b>	<b>8.3</b>	<b>2.5</b>
<b>FOOD FISHES</b>						
Channel catfish	7	8.17	15	10.15	0.1	1.4
Flathead catfish	4	15.42	7	15.50	0.1	2.1
<b>Total</b>	<b>11</b>	<b>23.59</b>	<b>22</b>	<b>25.65</b>	<b>0.2</b>	<b>3.4</b>
<b>PREDATORY FISHES</b>						
Longnose gar	1	1.21	7	2.45	0.1	0.3
Skipjack herring			81	0.43	0.6	0.1
<b>Total</b>	<b>1</b>	<b>1.21</b>	<b>88</b>	<b>2.88</b>	<b>0.7</b>	<b>0.4</b>
<b>PISCIVOROUS TOTAL</b>	<b>40</b>	<b>35.67</b>	<b>1,149</b>	<b>47.18</b>	<b>9.2</b>	<b>6.3</b>
<b>PANFISHES</b>						
Rockbass			1	0.03	t	t
Bluegill	61	11.44	867	19.52	6.9	2.6
Green sunfish	4	0.71	6	0.82	t	0.1
Longear sunfish	1	0.12	73	1.77	0.6	0.2
Warmouth	1	0.35	35	1.47	0.3	0.2
<b>Total</b>	<b>67</b>	<b>12.62</b>	<b>982</b>	<b>23.61</b>	<b>7.8</b>	<b>3.2</b>
<b>COMMERCIAL FISHES</b>						
Carp	30	86.08	31	86.32	0.2	11.5
River carpsucker	17	32.35	30	38.43	0.2	5.1
Highfin carpsucker	1	1.93	3	2.55	t	0.3
Smallmouth buffalo	32	74.02	193	108.20	1.5	14.5
Bigmouth buffalo	3	26.69	3	26.69	t	3.6
Spotted sucker	2	1.88	3	2.25	t	0.3
Golden redhorse	1	0.83	1	0.83	t	0.1
Yellow bullhead	t	0.16	1	0.23	t	t
Brown bullhead			t	0.06	t	t
Freshwater drum	5	3.54	359	9.51	2.9	1.3
<b>Total</b>	<b>91</b>	<b>227.48</b>	<b>624</b>	<b>275.07</b>	<b>5.0</b>	<b>36.8</b>
<b>FORAGE FISHES</b>						
Gizzard shad	1,643	319.46	6,333	400.31	50.4	53.6
Misc. cyprinids			3,466	1.26	27.6	0.2

Table 5 continued.

	Harvestable size (per acre)		Total (per acre)		Percent of total population	
	No.	Lb	No.	Lb	No.	Lb
Log perch			1	0.01	t	t
Total	1,643	319.46	9,800	401.58	78.1	53.7
NON-PISCIVOROUS TOTAL	1,801	559.56	11,406	700.26	90.8	93.7
GRAND TOTAL	1,841	595.23	12,555	747.44	100.0	100.0

t =  $\leq$  0.5 fish/acre or 0.05%.

Table 6. Fish standing crop in the backwater area of Big Turtle Creek in Meldahl Pool in 1981.

	Harvestable size (per acre)		Total (per acre)		Percent of total population	
	No.	Lb.	No.	Lb.	No.	Lb.
<b>GAME FISHES</b>						
Largemouth bass	1	0.85	14	2.29	0.3	0.4
Spotted bass			9	0.44	0.2	0.1
White crappie	21	5.82	237	11.14	4.9	2.0
Black crappie	3	1.02	43	3.54	0.9	0.6
Sauger			1	0.12	t	t
<b>Total</b>	<b>25</b>	<b>7.69</b>	<b>304</b>	<b>17.53</b>	<b>6.3</b>	<b>3.1</b>
<b>FOOD FISHES</b>						
Channel catfish	6	12.72	11	13.04	0.2	2.4
Flathead catfish	7	34.12	12	34.20	0.2	6.2
<b>Total</b>	<b>13</b>	<b>46.84</b>	<b>23</b>	<b>47.24</b>	<b>0.5</b>	<b>8.6</b>
<b>PREDATORY FISHES</b>						
Longnose gar			6	1.00	0.1	0.2
<b>Total</b>			<b>6</b>	<b>1.00</b>	<b>0.1</b>	<b>0.2</b>
<b>PICIVOROUS TOTAL</b>	<b>38</b>	<b>54.53</b>	<b>333</b>	<b>65.77</b>	<b>6.9</b>	<b>12.0</b>
<b>PANFISHES</b>						
Bluegill	44	8.77	556	18.05	11.5	3.3
Green sunfish			2	0.06	t	t
Longear sunfish	1	0.18	49	1.27	1.0	0.2
Warmouth	4	0.88	82	2.49	1.7	0.5
<b>Total</b>	<b>49</b>	<b>9.83</b>	<b>689</b>	<b>21.87</b>	<b>14.3</b>	<b>4.0</b>
<b>COMMERCIAL FISHES</b>						
Paddlefish	1	9.63	1	9.63	t	1.8
Carp	15	70.80	15	70.80	0.3	12.9
River carpsucker	8	15.78	10	16.64	0.2	3.0
Highfin carpsucker	t	0.44	2	0.97	t	0.2
Quillback	1	0.96	4	1.42	0.1	0.3
Smallmouth buffalo	7	17.55	28	22.06	0.6	4.0
Bigmouth buffalo	4	46.42	6	46.43	0.1	8.5
Spotted sucker			t	0.09	t	t
Golden redhorse			4	0.16	0.1	t
Freshwater drum	5	5.18	253	11.06	5.2	2.0
<b>Total</b>	<b>41</b>	<b>166.76</b>	<b>323</b>	<b>179.26</b>	<b>6.7</b>	<b>32.7</b>
<b>FORAGE FISHES</b>						
Gizzard shad	101	19.37	3,301	281.74	68.3	51.3
Misc. cyprinids			188	0.07	3.9	t
Darters			1	t	t	t
<b>Total</b>	<b>101</b>	<b>19.37</b>	<b>3,490</b>	<b>281.81</b>	<b>72.2</b>	<b>51.4</b>
<b>NON-PICIVOROUS TOTAL</b>	<b>191</b>	<b>195.96</b>	<b>4,502</b>	<b>482.94</b>	<b>93.1</b>	<b>88.0</b>
<b>GRAND TOTAL</b>	<b>139</b>	<b>250.49</b>	<b>4,835</b>	<b>548.71</b>	<b>100.0</b>	<b>100.0</b>

t ≤ 0.005 lb/acre or 0.05%.

Table 7. Standing crop,  $AT_1$ , and Y/C values of the fish population derived from coverotenone studies in Meldahl Pool in 1978-1981.

Year	No./acre	Lb/acre	$A_{t1}$	Y/C
1978	3,302	562.25	90.7	0.11
1979	1,231	276.13	72.5	0.20
1980	12,555	747.44	79.7	0.79
1981	4,835	548.71	45.7	0.37



Table 8. Fish captured during 3.0 hours of electrofishing effort in the mainstem of Meldahl Pool in 1979, 1980, and 1985.

	Inch group																							Number of fish	Fish per hour	% of total number
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
White bass		1	1			1							1											4	1.3	1.5
Largemouth bass								1																1	0.3	0.3
Spotted bass			1				1			2														4	1.3	1.5
Smallmouth bass			1			1																		2	0.7	0.8
Sauger				3	1								1											5	1.7	2.0
Longnose gar																	1							1	0.3	0.3
Skipjack herring	1				1																			2	0.7	0.8
Channel catfish	1										1	1				1			1				5	1.7	2.0	
Flathead catfish							1				1			1				1					4	1.3	1.5	
Bluegill		1		1	2	1																	5	1.7	2.0	
Longear sunfish			1																				1	0.3	0.3	
Carp												1					1	1		2	1	2	8	2.7	3.1	
River carpsucker											1			1	3	3	3	2		1			14	4.7	5.4	
Highfin carpsucker												1	1	1	3	1							7	2.3	2.6	
Quillback						1					1	1	1	1	3	1							9	3.0	3.4	
Smallmouth buffalo							1				6	4	3	1	2	1							18	6.0	6.9	
Spotted sucker														1									1	0.3	0.3	
Freshwater drum	2	1			2	5	8	5	1	1	4	1	1	1	1			1				1	35	11.7	13.4	
Gizzard shad	3	20	7	4	3	14	23	33	18	5	3												133	44.3	50.9	
Emerald shiner	1		1																				2	0.7	0.8	
Total																							261	87.0	100.0	

Table 9. Fish captured during 3.94 hours of electrofishing effort in backwater areas of the Meldahl Pool in 1979, 1980, and 1985.

	Inch group																								Number of fish	Fish per hour	% total number
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	22	23	24					
White bass		1		3				2		1															7	1.8	1.1
Largemouth bass			3				4	1	1	2	6	6	1	1				1							26	6.6	4.2
Spotted bass		3	2	1			3	2			1														12	3.0	1.9
White crappie				1	3	2	4	5	1			1													17	4.3	2.7
Sauger			1	1	1																				3	0.8	0.5
Channel catfish										2					1		1								4	1.0	0.6
Flathead catfish																2		2					1		5	1.3	0.8
Skipjack herring			2																						2	0.5	0.3
Bluegill	1	21	22	18	38	8																			108	27.4	17.4
Longear sunfish		5	7	8	1																				21	5.3	3.4
Warmouth						3																			3	0.8	0.5
Carp				3	2	1				3		1	2	1	6	1	3	7	5	3	1				38	9.6	6.1
River carpsucker					4	2	1			1	1	1	1		1	2	1								15	3.8	2.4
Highfin carpsucker											1														1	0.3	0.2
Smallmouth buffalo		2	1			6	1	1	11	19	8	1	1			2								1	54	13.7	8.7
Spotted sucker													1												1	0.3	0.2
Black redhorse													1		1										2	0.5	0.3
Golden redhorse												2													2	0.5	0.3
Freshwater drum	1	2		2	18	23	13	3	4		1	1		1	1	1			1						72	18.3	11.6
Gizzard shad	7	60	42	6	13	26	41	22	5	4															226	57.4	36.4
Silver chub		1																							1	0.3	0.2
Logperch		1																							1	0.3	0.2
Total																									621	157.8	100.0

Table 10. Fish captured during 37.33 net days of gillnetting in the main stem of Meldahl Pool in 1979, 1980, and 1985.

	Inch group																												Number of fish	Fish per net day	% of total number
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	27	29	31	39	47			
White bass	1	2							5		1	1	1		2														13	0.35	4.9
Smallmouth bass		1																											1	0.03	0.4
Spotted bass											1																		1	0.03	0.4
White crappie								1	1																				2	0.05	0.7
Black crappie							1																						1	0.03	0.4
Sauger									1	1	2		4	5	3	1													17	0.46	6.4
Blue catfish	1																											1	0.03	0.4	
Channel catfish			2	1	1	1	1	2	1		2	2	2	1		1	1	2						1				21	0.56	7.8	
Fathead catfish						1		1		2	1	1	1	1	1	2	1	4	5									21	0.56	7.8	
Longear sunfish		4	1																									5	0.13	1.8	
Longnose gar																								1	1	1	1	1	5	0.13	1.8
Skipjack herring			5									1	1															7	0.19	2.6	
Mooneye									2	9	3	3																17	0.46	6.3	
Carp									1		1		1		1	2	5	3	4	3	2					2		25	0.67	9.3	
River carpsucker					1		4	10	5	1	3	2	3	3	4	1												37	0.99	13.7	
Quillback	1									1		1	1	2	1													7	0.19	2.6	
Smallmouth buffalo									1	3			1	1	2	4		1										14	0.37	5.1	
Golden redhorse							1					1	1	2	1			1		1								8	0.21	2.9	
Shorthead redhorse												1																1	0.03	0.4	
Freshwater drum	1	4			8	6	3	7	1				1	1	3													35	0.94	13.0	
Silver lamprey						1																						1	0.03	0.4	
Gizzard shad		1			1	2	4	4	6	1	2																	21	0.56	7.8	
Silver chub		1	4																									5	0.13	1.8	
Log perch			3																									3	0.08	1.1	
Total																												269	7.21	100.0	

Table 11. Fish captured during 34.44 net-days of gilletting in backwater areas of Meldhal Pool in 1979, 1980, and 1985.

	Inch group																												Number of fish	Fish per net day	% of total number
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	28	32				
White bass		4	1				1	1	3		1	1	2	2	1														17	0.49	6.7
White crappie		3	1			1		1			1	1																	8	0.23	3.1
Sauger				1			1		2	2			1	2		1	1												11	0.32	4.4
Channel catfish								1	1			3						1	1			2		1					10	0.29	3.9
Flathead catfish															1	1			2			2							6	0.17	2.3
Skipjack herring												3	1																28	0.81	11.0
Longnose gar				7	17																		1			1			2	0.06	0.8
Paddlefish																											1		1	0.03	0.4
Carp																		2	3	2	2		2	1	1				13	0.38	5.2
Smallmouth buffalo												2	1			1		1	1		1								7	0.20	2.7
River carpsucker						1	1		1	1	1		1			1	4	7	6										24	0.70	9.5
Quillback																1													1	0.03	0.4
Highfin carpsucker																			1	1									2	0.06	0.8
Freshwater drum			7	1	2	28	10	1	11	1	1	2	1	1	1	1		1											68	1.98	26.9
Gizzard shad		20	15			2	1	1	5	5	2	1	2																54	1.57	21.4
Silver chub				1																									1	0.03	0.4
<b>Total</b>																													<b>253</b>	<b>7.35</b>	<b>100.0</b>

Table 12. Relative weight (Wr) for largemouth bass captured during fall electrofishing in selected pools of the Ohio River in 1982.

	Length group						Total Wr
	8.0-11.9		12.0-14.9		≥15.0		
	Wr	No. of fish	Wr	No. of fish	Wr	No. of fish	
Greenup	105	30	103	5	110	3	105
Meldahl	106	10	105	7	110	2	106
Markland	104	4	101	16	101	4	101
Cannelton	99	12	92	3	94	2	97
Newburgh	119	8	117	3	122	1	119
Smithland	118	19	109	6	103	1	115

Table 13. Fish captured in 1.25 hr of electrofishing in Meldahi Pool tailwater in 1984.

	Inch group																				Number of fish	Fish per hour	% of total no.		
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21				22	32
White bass			1		6																		7	5.6	4.4
Striped bass			1																	1			2	1.6	1.3
White bass x striped bass			1	1	2																		4	3.2	2.5
Spotted bass				1	1			2															4	3.2	2.5
Largemouth bass									1	2													3	2.4	1.9
Sauger											1	1											2	1.6	1.3
Bluegill		1		1																			2	1.6	1.3
Longnose gar																					1	1	2	1.6	1.3
Skipjack herring													2										2	1.6	1.3
River carpsucker						1																	1	0.8	0.6
Quillback												1	1										2	1.6	1.3
Highfin carpsucker							1	2		1													4	3.2	2.5
Smallmouth Buffalo									1					1					1				3	2.4	1.9
Black Redhorse																1				1			1	0.8	0.6
Freshwater drum									1				1										2	1.6	1.3
Gizzard shad		3	24	33	2	2	19	14	9														106	84.8	66.7
Emerald shiner	1	6	1																				8	6.4	5.0
<b>Total</b>																							<b>155</b>	<b>127.2</b>	<b>100.0</b>

Table 14. Species composition and relative abundance of fish captured by gillnetting in Meldahl Pool tailwater in 1983.

	Inch group																																						No. of fish	No. per net day	% of total number				
	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43							
White bass		1	2								3	1																												7	1.1	2.0			
Striped bass																								3	1																4	0.6	1.1		
White crappie		1																																							1	0.2	0.4		
Sauger			1		1	4	10	5	5	4						1																									31	4.7	8.7		
Walleye													1	2	4	4	6	2	2	2	2	2			1	1														3	0.5	0.9			
Channel catfish				1									1	2	4	4	6	2	2	2	2	2																			28	4.2	7.7		
Flathead catfish								1			2	1	2	2	2	2	3					1																			14	2.1	3.9		
Longnose gar																1		1	3	9	12	11	18	12	14	8	10	4	4	3	4	3	4	1		3		1	3	129	19.5	35.9			
Bluegill	2																																								2	0.3	0.5		
Paddlefish																																									1	0.2	0.4		
Carp														2	4	8	14	9	10	3		3																				57	8.6	15.8	
Smallmouth buffalo								1	2				5	2			2	1																								13	2.0	3.7	
River carpsucker							1	1				3	5	4																												14	2.1	3.9	
Quillback												1																														1	0.2	0.4	
River redhorse																					1																					1	0.2	0.4	
Shorthead redorse												1																														1	0.2	0.4	
Freshwater drum									4	1	3		2	2																												15	2.3	4.2	
Gizzard shad			1	1		2	10	13	1	4																																32	4.8	8.8	
Log perch			3																																							3	0.5	0.9	
Total																																											357	54.3	100.0

Table 15. Summary of fishes collected in Meldahl Pool from the following methods of sampling: cove-rotenone, electrofishing, and gillnetting.

Species	78	79	80	81	83	84	85
<u>Polyodontidae</u> - paddlefishes							
<u>Polyodon spathula</u> (Walbaum) Paddlefish	X		X	X	X		
<u>Lepisosteidae</u> - gars							
<u>Lepisosteus osseus</u> (Linnaeus) Longnose gar	X	X	X	X	X	X	
<u>Lepisosteus platostomus</u> Rafinesque Shortnose gar		X					
<u>Clypidae</u> - herrings							
<u>Alosa chrysochloris</u> (Rafinesque) Skipjack herring	X	X	X			X	X
<u>Dorosoma cepedianum</u> (Lesueur) Gizzard shad	X	X	X	X	X	X	X
<u>Hiodontidae</u> - mooneyes							
<u>Hiodon tergisus</u> Lesueur Mooneye							X
<u>Cyprinidae</u> - minnows and carp							
<u>Cyprinus carpio</u> Linnaeus Common carp	X	X	X	X	X		X
<u>Hybopsis storeriana</u> (Kirtland) Silver chub		X					X
<u>Notropis atherioides</u> Rafinesque Emerald shiner		X	X			X	
<u>Catostomidae</u> - suckers							
<u>Carpionodes carpio</u> (Rafinesque) River carpsucker	X	X	X	X	X	X	X
<u>Carpionodes cyprinus</u> (Lesueur) Quillback	X	X	X	X	X	X	X
<u>Carpionodes velifer</u> (Rafinesque) Highfin carpsucker		X	X	X		X	
<u>Ictiobus bubalus</u> (Rafinesque) Smallmouth buffalo	X	X	X	X	X	X	X
<u>Ictiobus cyprinellus</u> (Valenciennes) Bigmouth buffalo	X	X	X	X			
<u>Ictiobus niger</u> (Rafinesque) Black buffalo	X						
<u>Minytrema melanops</u> (Rafinesque) Spotted sucker	X	X	X	X			X
<u>Moxostoma anisurum</u> (Rafinesque) Silver redhorse	X						
<u>Moxostoma carinatum</u> (Cope) River redhorse					X		



Table 15 continued.

		78	79	80	81	83	84	85
<u>Moxostoma duquesnei</u> (Lesueur)	Black redhorse		X				X	X
<u>Moxostoma erythrurum</u> (Rafinesque)	Golden redhorse	X	X	X	X			X
<u>Moxostoma macrolepidotum</u> (Lesueur)	Shorthead redhorse					X		X
<u>Ictaluridae</u> - freshwater catfishes								
<u>Ictalurus furcatus</u> (Lesueur)	Blue catfish		X					
<u>Ictalurus melas</u> (Rafinesque)	Black bullhead		X					
<u>Ictalurus natalis</u> (Lesueur)	Yellow bullhead	X		X				
<u>Ictalurus nebulosus</u> (Lesueur)	Brown bullhead		X	X				
<u>Ictalurus punctatus</u> (Rafinesque)	Channel catfish	X	X	X	X	X		X
<u>Pylodictus olivaris</u> (Rafinesque)	Flathead catfish	X	X	X	X	X		X
<u>Percichthyidae</u> - temperate bass								
<u>Morone chrysops</u> (Rafinesque)	White bass	X	X	X		X	X	X
<u>Morone saxatilis</u> (Walbaum)	Striped bass					X	X	
<u>Centrarchidae</u> - sunfishes								
<u>Ambloplites rupestris</u> (Rafinesque)	Rock bass			X				
<u>Lepomis cyanellus</u> Rafinesque	Green sunfish	X	X	X	X			
<u>Lepomis gulosus</u> (Cuvier)	Warmouth	X	X	X	X			X
<u>Lepomis humilis</u> (Girard)	Orangespotted sunfish	X						
<u>Lepomis macrochirus</u> Rafinesque	Bluegill	X	X	X	X	X	X	X
<u>Lepomis megalotis</u> (Rafinesque)	Longear sunfish	X	X	X	X			X
<u>Micropterus dolomieu</u> Lacepede	Smallmouth bass			X				X
<u>Micropterus punctatus</u> (Rafinesque)	Spotted bass		X	X	X		X	X
<u>Micropterus salmoides</u> (Lacepede)	Largemouth bass	X	X	X	X		X	X
<u>Pomoxis annularis</u> Rafinesque	White crappie	X	X	X	X	X		X
<u>Pomoxis nigromaculatus</u> (Lesueur)	Black crappie	X		X	X			X

Table 15 continued.

	78	79	80	81	83	84	85
<u>Percidae</u> - perches							
<u>Percina caprodes</u> (Rafinesque)      Logperch	X		X		X		X
<u>Stizostedion canadense</u> (Smith)      Sauger	X	X	X	X	X	X	
<u>Stizostedion vitreum</u> (Mitchill)      Walleye					X		
<u>Sciaenidae</u> - drum							
<u>Aplodinotus grunniens</u> Rafinesque      Freshwater drum	X	X	X	X	X	X	X
Total	28	30	31	23	19	16	25
<p>*1983 data reflects a gillnetting effort in the tailwater below Meldahl Lock and Dam.</p> <p>**1984 data reflects a fall electrofishing effort in the tailwater below Meldahl Lock and Dam.</p>							

Table 16. Expanded creel survey totals from the creel survey conducted at Meldahl Pool Ohio River from 29 March through 31 October 1981.

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<u>Anglers</u>	
Number of fishing trips (per acre)	41,315 (1.90)
% successful	25.6
<u>Fishing pressure</u>	
Total man-hours (m-h)	68,828
M-h/acre	3.2
<u>Harvest</u>	
Number of fish	27,937
Pounds of fish	19,662
<u>Harvest rate</u>	
Fish/hour	0.45
Lb/hour	0.29
Fish/acre	1.30
Lb/acre	0.90
<u>Misc. characteristics (%)</u>	
Male	92.1
Female	7.9
Resident	42.4
Non-resident	57.6
<u>Method (%)</u>	
Still fishing	92.2
Casting	7.6
Fly fishing	0.1
Trolling	
Other	0.1
<u>Mode (%)</u>	
Boat	11.7
Bank	88.3

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Table 17. Harvest of selected species from Meldahl Pool, Ohio River, derived from expanded creel survey data collected between 29 March and 31 October 1981.

	Black bass	Crappie	Sauger	Bluegill	White bass	Flathead catfish	Channel catfish	Freshwater drum	Carp	Buffalo	Anything <sup>a</sup>
Number harvested (per acre)	376 (0.02)	2,617 (0.12)	43 (t)	2,917 (0.13)	3,731 (0.17)	207 (0.01)	3,327 (0.15)	8,395 (0.39)	3,437 (0.16)	131 (0.01)	14,609 (0.67)
% of total catch	1.3	9.4	0.2	10.4	13.4	0.7	11.9	30.0	12.3	0.5	52.3
Pounds harvested (per acre)	561 (0.03)	846 (0.04)	17 (t)	441 (0.02)	2,318 (0.11)	408 (0.02)	3,546 (0.16)	3,591 (0.16)	6,482 (0.30)	732 (0.03)	9,759 (0.45)
% of total weight	2.9	4.3	0.1	2.2	11.8	2.1	18.0	18.3	33.0	3.7	49.6
No. anglers fishing for	1,671	1,018	0	271	312	0	5,651	24	2,713	0	29,442
% of total anglers	4.0	2.5	0.0	0.7	0.8	0.0	13.7	0.1	6.6	0.0	71.3
Hr. fished for (per acre)	4,627 (0.21)	2,659 (0.12)	0 (0)	402 (0.02)	895 (0.04)	0 (0)	8,510 (0.39)	64 (t)	4,647 (0.21)	0 (0)	46,658 (2.14)
No. caught fishing for	343	2,435	0	1,786	3,653	0	1,713	0	828	0	14,609
Lb caught fishing for	530	830	0	367	2,273	0	2,692	0	1,945	0	9,759
No./hr caught fishing for	0.07	0.92	0.00	4.44	4.08	0.00	0.20	0.00	0.18	0.00	0.31
% success fishing	15.3	59.1	0.0	83.9	77.8	0.0	13.7	0.0	22.6	0.0	24.2

<sup>a</sup>Includes all species caught by "anything" fishermen having no preference.

Table 18. Harvest of selected fish species per acre from Markland, Cannelton, McAlpine and Meldahl pools of the Ohio River, derived from expanded creel survey data. The ranking of each kind of fish is in parentheses.

	Markland (1980)		Cannelton (1982)		McAlpine (1983)		Meldahl (1981)	
	No.	Lb	No.	Lb	No.	Lb	No.	Lb
White bass	0.06(7)	0.04(8)	0.01(9)	0.01(7)	0.17(4)	0.10(3)	0.17(2)	0.11(4)
Striped bass					0.03(7)	0.08(4)		
Black bass	0.14(5)	0.23(5)	0.06(6)	0.07(4)	0.07(6)	(0.07(6)	0.02(7)	0.03(6)
Bluegill	0.07(6)	0.01(9)	0.10(4)	0.01(7)	0.30(3)	0.08(4)	0.13(5)	0.02(8)
Crappie	0.68(3)	0.29(4)	0.78(1)	0.01(7)	0.45(1)	0.15(2)	0.12(6)	0.04(5)
Sauger	0.04(8)	0.01(9)	0.04(8)	0.02(6)	0.02(8)	0.02(8)	t (10)	t (10)
Channel catfish	0.92(2)	1.14(2)	0.17(3)	0.15(2)	0.37(2)	0.39(1)	0.15(4)	0.16(3)
Flathead catfish	0.04(8)	0.12(6)					0.01(8)	0.02(8)
Carp	0.38(4)	1.28(1)	0.05(7)	0.06(5)			0.16(3)	0.30(1)
Freshwater drum	1.00(1)	0.54(3)	0.32(2)	0.19(1)	0.08(5)	0.07(6)	0.39(1)	0.16(2)
Buffalo	0.03(10)	0.06(7)	0.09(5)	0.13(3)			0.01(8)	0.03(6)
Total	3.35	3.71	1.62	0.79	1.50	0.91	1.16	0.87

Table 19. Expanded totals from creel surveys conducted at Markland, Cannelton, McAlpine, and Meldahl pools of the Ohio River.

	Markland (1980)	Cannelton (1982)	McAlpine (1983)	Meldahl (1981)
Mainstem acreage	21,700	22,800	18,800	21,800
Backwater acreage	3,087	2,189	394	1,184
% of total area in backwater	12.5	8.8	2.1	5.4
Angler trips (per acre)	74,542 (3.01)	56,632 (2.27)	15,539 (0.83)	41,315 (1.90)
Man-hours/acre	7.90	3.60	2.00	3.20
Fish/hour	0.37	0.45	0.74	0.45
Fish/acre	3.00	1.46	1.50	1.30
Pounds/acre	3.30	0.79	0.90	0.90

Table 20. Expanded creel survey data from Meldahl Pool tailwater during 6 February through 2 November 1980.

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<u>Anglers</u>	
Number of fishing trips (per acre)	7,301 (27.44)
% successful	19.4
<u>Fishing pressure</u>	
Total man-hours (m-h)	15,181
M-h/acre	57.1
<u>Harvest</u>	
Number of fish	3,436
Pounds of fish	5,689
<u>Harvest rate</u>	
Fish/hr	0.23
Lb/hr	0.37
Fish/acre	12.9
Lb/acre	21.4
<u>Misc. characteristics (%)</u>	
Male	91.9
Female	8.1
Resident	92.3
Non-resident	7.7
<u>Method (%)</u>	
Still fishing	95.7
Casting	4.3
Fly fishing	0.0
Trolling	0.0
Other	2.0
<u>Mode (%)</u>	
Boat	1.7
Bank	98.3

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Table 21. Harvest of fish from Meldahl tailwater, Ohio River, as derived from expanded creel survey data collected between 6 February through 2 November 1980.

	Sauger	Crappie	White bass	Freshwater drum	Channel catfish	Blue catfish	Carp	Anything <sup>a</sup>
Number harvested (per acre)	293 (1.10)	11 (0.04)	334 (1.26)	1,647 (6.19)	538 (2.02)	54 (0.20)	524 (1.97)	1,642 (6.17)
% of total catch	8.5	0.3	9.7	47.9	15.7	1.6	15.3	47.8
Pounds harvested (per acre)	111 (0.42)	4 (0.02)	169 (0.64)	1,899 (7.14)	1,034 (3.89)	200 (0.75)	2,136 (8.03)	1,859 (6.99)
% of total weight	2.0	0.1	3.0	33.4	18.2	3.5	37.5	32.7
No. of anglers fishing for	1,156		194	327	417		258	4,799
% of total anglers	15.8		2.7	4.5	5.7		3.5	65.7
Hr. fished for (per acre)	3,039 (11.42)		259 (0.97)	880 (3.31)	1,021 (3.84)		869 (3.27)	8,916 (33.52)
No. caught fishing for	182		219	469	321		429	1,642
Lb caught fishing for	78		136	937	792		1,801	1,859
No./hr caught fishing for	0.06		0.85	0.53	0.31		0.49	0.18
% success fishing for	10.0		38.7	55.8	37.2		54.3	13.8

<sup>a</sup>Includes all species caught by the "anything" fishermen.

Table 22. Summary of mark-recapture data collected from the Meldahl Pool during 1981.

	No. tagged	Exploitation rate (%)	Time-out range (days)	Time-out range (days)	Miles traveled (range)	Miles traveled (mean)
Largemouth bass	74	26.5	2-88	20	0-5	1
White crappie	99	20.2	3-221	26	0-19	3
Channel catfish	20	5.0	56	56	4	4
Carp	95	2.1	44-49	47	4-8	6
Freshwater drum	46	4.3	4-22	13	0-70	35
Total	334	14.5				



Table 23. Back-calculated mean lengths for selected sport fishes captured in 1978-1985 in Meldahl Pool tailwater.

	No.	Age									
		I	II	III	IV	V	VI	VII	VIII	IX	X
Striped bass	165	8.6	16.6	21.4	21.3	22.8					
Sauger	164	7.4	10.0	12.1	13.3	14.5	16.3	17.5	21.4		
Walleye	9	8.0	10.8	12.8	15.5	19.1	21.1	22.7			
Largemouth bass	127	4.9	7.7	10.1	11.9	13.6	15.1	16.3	17.7	18.4	18.0
Spotted bass	13	3.9	5.8	8.8	7.9	12.2					
White crappie	34	3.2	6.0	8.6	10.5	11.4					