

FISHERY MANAGEMENT PLAN

Mingo National Wildlife Refuge

Puxico, Missouri 63960

Submitted By: *David J. Claron* Date: 1/4/84  
Refuge Manager

Concurrence: *James F. Shephard* Date: 1/21/85  
*John W. Elt* Date: 1/21/85  
Division Supervisor

*John P. Powski* Date: 1/21/85  
Assistant Regional Director (AF)

*David J. Claron* Date: 1/21/85  
Assistant Regional Director (AW)

Approval: *James C. Clanton* Date: JAN 22 1985  
Active Regional Director

## I. Introduction

Mingo National Wildlife Refuge is located in portions of Stoddard and Wayne counties in southeast Missouri, approximately 150 miles south of St. Louis. It was established in 1944 under authority of the Migratory Bird Treaty Act as a migration and wintering area for migratory waterfowl. The refuge contains 21,676 acres and lies in a linear basin formed in an ancient abandoned channel of the Mississippi River. The area is predominately a bottomland hardwood swamp bordered on the west by the foothills of the Ozark Uplift and on the east by a terrace called Crowley's Ridge. Elevations along the top of these ridges range as high as 405' msl compared to the below 340' msl elevation of the basin.

Historically, the Mingo Swamp area was a haven for fish and wildlife before logging, drainage, and conversion to agriculture altered the area. Bankruptcy of the Mingo Drainage District in the 1930's set the stage for Federal acquisition and subsequent restoration of the swamp and its productivity.

## II. Relationship of Fishery Management to Refuge Objectives

### A. Objectives and Strategies

Mingo Refuge is located at the north end of the Mississippi Flyway's wintering grounds. This area extends along the historic Mississippi River delta lying between Cape Girardeau, Missouri and the Gulf of Mexico.

The primary objective of the refuge is to provide migration and wintering habitat for waterfowl, particularly National Species of Special Emphasis (NSSE), using this flyway. Up to 250,000 ducks, primarily mallards, have used the refuge at peak population periods. The refuge also lies between the migration/wintering corridors for the Eastern Prairie Population and Mississippi Valley Population of Canada geese. The refuge has provided wintering habitat for up to 30,000 geese. Approximately 1,275 acres of cropland and moist soil units, 700 acres of grassland and 5,000 acres of water impoundments are managed for this main objective.

Other refuge objectives include:

1. Provide nesting habitat for wood ducks (NSSE) and hooded mergansers.
2. Provide nesting and winter habitat for bald eagles (NSSE) and participate in an eagle hacking program.
3. Participate with the Missouri Department of Conservation in a reintroduction program for restoring wintering trumpeter swans (NSSE) in Missouri.
4. Provide habitat for the great blue heron (NSSE) and other wading birds.
5. Provide quality interpretive and environmental education programs for school groups and the general public through the refuge Visitor Center.
6. Provide opportunities for public use with emphasis on wildlife related uses such as wildlife observation and hunting and fishing, where such uses are compatible with the primary objectives of the refuge.

Within this context, the specific broad objectives of the fishery management program on Mingo are to:

1. Maintain and improve the quality of aquatic habitats for a well balanced community of fish and other water oriented wildlife species.
2. Provide quality recreational fishing opportunities which are compatible with the primary refuge objectives listed above.

#### B. Wildlife Use and Production

Fishing generally complements the wildlife management program on the refuge. To meet wildlife objectives the refuge maintains and manipulates large areas of water and management units which often provide excellent fishing areas and opportunities. The entire refuge is open to fishing between March 15 and September 30 each year. This time period includes the spring to early summer season when fishing is at its best. There is no direct conflict between fisheries and wildlife since all migratory waterfowl, except nesting wood ducks, have left the refuge. From October 1 to March 14 a major portion of the refuge, including the main impoundments of Monopoly Lake and Rockhouse Marsh, are closed to fishing to serve as waterfowl sanctuary areas. This period corresponds with the time

of the year when interest in fishing is at a minimum due to poor fishing conditions. Therefore, there is little conflict between fishing and other refuge programs. In addition, the refuge's two most scenic fishing/canoe areas, Stanley Creek and Old Mingo River, are open all year. These areas have been more than adequate to handle the demand for fishing opportunities at this time of year.

The main conflict between wildlife management and fisheries on the refuge has been the periodic drainage of Monopoly Lake for moist soil plant production to provide food for waterfowl. The drainage limits the size of the fish population below what could be expected to develop under stable water levels. Fishing opportunities are decreased during the popular summer fishing season when the lake is drained. When the drainage is accompanied by a fish kill, the issue can become extremely controversial and vocal with much criticism leveled against the refuge. Drawdown techniques which allow the fish time to escape and disperse into the drainage ditch system are used as much as possible to reduce the possibility of a fish kill. Continuation of the drawdown program is essential to providing quality waterfowl habitat in the fall.

Another conflict occurred in 1983 and 1984 when Monopoly Lake was closed in the spring and summer period to reduce disturbance to a pair of nesting bald eagles. This is also considered an unsolvable conflict where wildlife must take precedent over fisheries.

#### C. Public Use

Fishing is a major form of public use on the refuge. It generally complements all public use objectives. Visitors coming to the refuge for the main purpose of fishing also engage in other activities such as boating, canoeing, wildlife observation and picnicking.

In general, fishing preference on Mingo is largely for non-game fish, as defined by the Missouri Department of Conservation, by older individuals without using boats. Bank fishing locations that are easily accessible to motor vehicles receive the highest amount of visitor use. Two public fishing areas located in the vicinity of the refuge provide the majority of recreational sport fishing. These areas are the Corps of Engineers' Lake Wappapello located within one mile of the refuge which contains 8,400 acres and Pool #1 (1,773 acres) on the Duck Creek Wildlife Management Area located adjacent to the refuge. Both areas receive a large amount of fishing pressure, especially in the spring, for traditional sport fishes like largemouth bass and crappie.

The refuge fishing program is small compared to these two areas both in terms of total visitor and number of fish caught. Future efforts to improve fishing on the refuge should center more on improving access and increasing fishing opportunities rather than trying to directly manipulate fish populations. The refuge will never become a major fishing attraction compared to these other locations.

Some complaints have been received from fishermen wanting to fish in the refuge hunting area from October 1 to December 31. The hunting area is only open to properly registered archery hunters. Fishermen are excluded to reduce disturbance to the hunters and waterfowl on open water areas, and as a safety measure to reduce the chances for a hunting related accident. Suitable fishing areas within the hunting area are limited to ditches #1, #2, and #3 which make up only a small part of the fishing areas on the entire refuge. The policy of keeping hunters separate from other types of visitor activities should be continued in the future.

#### D. Commercial Fishing

Commercial fishing in Missouri is limited by the Missouri Department of Conservation only to portions of the Missouri River, the Mississippi River and the St. Francis River. The refuge has had a special regulation, approved by the Missouri Department of Conservation, in effect for many years which allows fishermen to take non-game fish on the refuge using commercial fishing equipment. All fish taken by commercial fishing methods (nets and seines) must be for personal use only and cannot be sold. This regulation has been very popular with the public and allows fishermen to harvest a large number of the rough fish so abundant on the refuge which would otherwise be underutilized.

Authorization to allow commercial fishing on the refuge could probably be obtained from the Missouri Department of Conservation if requested. However, it is questionable if this form of fishing would significantly increase visitor use or the removal of rough fish. The refuge is removed from the main commercial areas in the state where commercial fish markets are available. In addition, most refuge waters will not permit use of the large boats preferred by commercial fishermen because of logs, shallow areas and primitive

launching facilities. No motors are permitted on the refuge which would also severely limit the use of commercial fishing equipment and greatly increase the length of time required to conduct commercial activities. These restrictions and limitations probably make commercial fishing as presently conducted in Missouri economically unfeasible on the refuge.

#### E. Legal and Political Considerations

In 1976, 7,730 acres of the refuge were designated as a Wilderness Area. This area included Monopoly Lake, Stanley Creek and the Old Mingo River. Under wilderness regulations no motors of any kind are permitted within the Wilderness Area. The refuge also prohibits the use of motors in all other refuge waters to maintain a wilderness type of fishing experience throughout the area. Many complaints have been received from individuals wanting to use motors, especially within the Wilderness Area. Development or improvement of fishery resources on the refuge will increase demands for allowing motors so fishermen can reach desired fishing locations more easily. This same desire has also resulted in demands for increasing vehicle access to additional portions of the refuge.

In 1983 a congressional inquiry was received based on a petition to open a new refuge entrance at Stanley Creek adjacent to the Wilderness Area. The stated purpose of the request was to gain easy access to Stanley Creek for fishing. A large increase in fishermen at Stanley Creek would seriously degrade the esthetic qualities that now make it so attractive to fishermen and canoeists.

As population pressure increases the demand for wildlife/wildland opportunities in the future, additional political pressure can be expected for providing more fishing opportunities and greater access. Such actions, if permitted, would degrade the Wilderness Area.

### III. Unit Plans

#### A. May Pond

##### 1. Description

May Pond is a 21 acre impoundment constructed under the Job Corps program in 1976 with fishing as the major objective. Maximum depth is about 14 feet. Dead timber dominates the upper half of the pond. Clear water during most of the year allows the growth of submerged vegetation, but steep shoreline contours limit its expansion.

In accordance with initial plans, the pond has been stocked with and managed for a bass, bluegill, and channel catfish fishery. Sampling by electroshocking and gill netting has been carried out by Missouri Department of Conservation and Fish and Wildlife Service fishery biologists to monitor the status of the fish populations. In addition to the stocked species, warmouth, green sunfish, brown and black bullheads, golden shiner and mosquitofish have been introduced by persons unknown.

The pond was opened to fishing during 1980 with a 12 inch minimum size limit on largemouth bass and a daily limit of 20 fish in the aggregate. Twenty-five hundred 2 inch redear sunfish were also stocked in 1980 to provide additional forage fish for the bass.

Fishing pressure on May Pond is usually moderate to heavy from the opening date of March 15 until early summer. Most fishing is for bass early in the season with a shift to bluegill fishing in late spring during the spawning season. The majority of the fishing for the remainder of the season until November 30 is for channel catfish. This is usually bank fishing by retired individuals from the local area.

The most recent sampling results indicate that 12 inch largemouth bass were abundant and were "breaking through" the 12 inch size barrier. Fish up to 18 inches in length were present. Fishing pressure on bluegill had severely reduced the number of quality sized individuals, but sufficient reproduction was noted for normal recruitment. Sufficient channel catfish were present to yield satisfactory angling and ranged from 13-17 inches in length.

## 2. Wildlife Conflicts and Complements

The May Pond fishing program does not present any conflicts with other programs.

## 3. Fishery Management Problems

Low fertility and clear water limit the production of the principal game species, and heavy fishing pressure would result in an over-harvest of largemouth bass in the absence of protective regulations.

## 4. Objectives and Tasks

Objective: To maintain a quality bass/bluegill and channel catfish fishery at May Pond.

Task: 1. Maintain and enforce a 12 inch minimum size limit on largemouth bass.  
 2. Maintain and enforce regulation permitting fishing by pole and line only.  
 3. Stock 8-10 inch channel catfish sufficient to maintain a gill net index of at least 8 fish per net-day.

## B. Fox Pond

### 1. Description

Fox Pond is a 12 acre impoundment constructed under the Job Corps program in 1973 with fishing as the major objective. As with May Pond, it has been stocked with and managed for largemouth bass, bluegill and channel catfish fishing. Shoreline erosion and erosion in the watershed contribute to a high degree of clay turbidity in the water. Submerged vegetation is sparse.

The pond was opened to fishing in 1977 with a 12 inch minimum size limit on largemouth bass and a daily limit of 20 fish in the aggregate. Access is gained by a ½-mile walk-in on the refuge or from private property adjacent to the pond.



Overall fishing pressure on Fox Pond is light. Most of the fishing is for bass early in spring after the pond opens on March 15. Fishing later in the year is mostly for channel catfish.

Electroshocking sampling since the pond was opened to fishing showed that the bass population was deteriorating in number, and a large stunted bluegill population was deteriorating in quality. Channel catfish remained abundant. In October, 1982 87 largemouth bass adults, weighing 162 pounds, were stocked at a rate of 13.5 pounds per acre. The pond was closed to fishing in 1983 to permit the bass population to recover. In 1984 the pond was reopened to fishing with an 18 inch minimum size limit on bass.

## 2. Wildlife Conflicts and Complements

In 1982 a hacking tower was constructed near Fox Pond to release bald eagles. During the time the eagles are in the tower and in the vicinity of Fox Pond following release, the pond is closed to all fishing.

## 3. Fishery Management Problems

Low fertility and high turbidity limit game species production.

## 4. Objectives and Tasks

1. Open Fox Pond to fishing in 1984 with an 18 inch minimum size limit on largemouth bass.
2. Discontinue channel catfish stocking.
3. Reduce turbidity by eliminating watershed erosion and protecting the shoreline from erosion.
4. Conduct annual electroshocking sampling to monitor condition of the fishery.

## C. Monopoly and Rockhouse Pools

### 1. Description

Monopoly Lake, 3,500 acres, and Rockhouse Marsh, 1,500 acres, are the two main water areas on the refuge. Shallow water levels of two to six feet are maintained by radial gates in the refuge ditch system. Both pools are naturally filled from large watersheds to

the northwest of the refuge. Lick Creek runoff enters Monopoly via ditch #10. Rockhouse is watered primarily from McGee Creek via ditch #2 and Brush Creek via ditch #1.

One of these pools is alternately drawn down in the spring to encourage the production of moist soil plants, while the other is held at a relatively constant level to assure the availability of resting habitat for fall migratory waterfowl. Fish are able to exit each pool into ditch #11 during drainage. In the event of an oxygen depletion in ditch #11, water can be diverted from the Duck Creek Wildlife Management Area located north of the refuge via ditch #2.

Prior to the construction of radial gates and water control structures in 1980, water levels were kept up on each pool on an alternate three-year cycle. Currently an one-year rotation cycle is used.

Rockhouse receives very little fishing pressure except from some trotlining and bank fishing along ditch #11. Monopoly is popular in the spring for trotlining and netting.

Electroshocking samples in 1982 indicated a low density fish community dominated by rough fish species. It is unlikely that a significant fisheries will develop or can be developed under the current water management scheme.

## 2. Wildlife Conflicts and Complements

Monopoly Lake was closed to all access in the spring of 1983 and 1984 to reduce disturbance to a pair of bald eagles that showed signs of attempted nesting. This closure conflicted directly with the prime time for fishing the area.

Annual drainage of either impoundment, but especially Monopoly, has the potential for a fish kill if environmental conditions are correct. A large kill in 1969 resulted in a large amount of adverse publicity for the refuge. Drainage is essential for proper waterfowl management and cannot be modified.

### 3. Fishery Management Problems

Rough fish contamination, shallow water, and dewatering limit development of quality sport fisheries at both pools.

### 4. Objectives and Tasks

Periodically monitor the fisheries of both pools for refuge public use information.

#### D. Gum Stump Pool

##### 1. Description

Gum Stump Pool comprises 650 surface acres and is located at the north end and within the drainage of Monopoly Lake. It is bounded on the west by the ditch #4 dike road and on the south by the ditch #3-#4 lateral dike road. A stop log water control structure in the ditch #4 dike road and surface overflow control the water level. Maximum water depth is eight feet in the borrow areas adjacent to the dikes. The major portion of the pool is less than 2.5 feet and covered with woody vegetation.

The water level in Gum Stump is partially lowered when Monopoly is drained. However, sufficient water is left in the borrow ditches to maintain the fish population. The drawdown benefits the fishery by concentrating predators and prey, and limiting year class strength of rough species.

The water control structure in Gum Stump is an extremely popular fishing area in the spring. Access is gained by a 2.5 mile walk from ditch #2 or by paddling a canoe in the lateral ditches between ditches #2 and #4. Numerous fallen trees, limbs, and log jams often block these lateral ditches making boat travel difficult. Because of this remoteness, overall fishing pressure is light.

Sampling in April 1982 revealed a community dominated by rough fish species with buffalo and carp comprising 32% by number and 77% by weight of the sample. Game species accounted for nearly 44% of the sample by number. Over 75% of the channel catfish, bluegill, white crappie, largemouth bass, and warmouth sunfish collected were of catchable size.

## 2. Wildlife Conflicts and Complements

There are no conflicts associated with the fishing program at Gum Stump Pool.

## 3. Fishery Management Problems

The long walk or difficult boat travel required to reach Gum Stump effectively isolates fishing opportunities from the majority of anglers.

Access to the area could be improved by opening the ditch #3 dike road to one-way vehicle traffic. This would reduce the 2.5 mile access distance by one mile including the most difficult section of ditch to paddle. This change would increase use at Gum Stump but still not make it available to everyone. Parking would be a problem along the ditch #3 dike road without the construction of additional facilities.

Fishing in Gum Stump is from one side of a  $\frac{1}{2}$  mile section of the ditch #4 dike road or from a boat in the adjacent borrow ditch. Space for additional people could be a limiting factor at Gum Stump, especially if a quality fishing opportunity is to be preserved. Increased accessibility should be implemented only on a trial basis while monitoring public reaction and affects on the fishery.

## 4. Objectives and Tasks

1. Improve canoe access by clearing obstructions in lateral ditches leading to Gum Stump Pool.
2. Evaluate the potential for reducing the required walk-in distance to Gum Stump by one mile, by allowing vehicles one-way access and parking along the ditch #3 dike road.

## E. Drainage Ditch System

### 1. Description

A system of north-south ditches and laterals provide the primary drainage system for the refuge. Ditches #1 through #6 drain interior water to the south, emptying into ditch #11 which moves

it to the southwest corner of the refuge. Ditch #10 collects runoff from the foothills of the Ozarks along the western boundary of the refuge and connects with ditch #11 near the south boundary of the refuge. The two ditches form ditch #15 which runs off the refuge approximately 15 miles to the St. Francis River. Water control in the ditches is provided by a series of radial gates, screw valves and stop log structures at key locations. Water levels in the ditches range from one to nine feet depending on runoff and the level of water in adjacent pools. A minimum level of water is maintained in the ditches at all times to prevent the loss of fish and to provide wildlife habitat diversity.

Popular fishing areas on the ditches include the northern section of ditch #1, the southern half of ditch #2 and ditch #5, ditch #10 south of the Monopoly access, and almost all of ditch #11. Distribution of ditch anglers is closely correlated with access. All areas where a road closely parallels a ditch are fished. Areas that provide picnic tables or shade trees are fished the hardest. More refuge visitors fish in the ditches than any other habitat type.

Sampling was conducted during 1982 in portions of ditch #5, ditch #10 and ditch #11. Ditch #10 revealed a good population and variety of game fishes. The other ditch areas are dominated by rough fish.

## 2. Wildlife Conflicts and Complements

There are no conflicts associated with the ditch fishing program as currently conducted.

## 3. Fishery Management Program

The refuge ditch system is characterized by free fish movement through water control structures during spring/fall flooding, pool water level manipulations, and during natural recruitment periods. This exchange of fish makes managing this system as a discrete unit impossible. Fishing pressure is probably stimulated more by ease of access rather than by the quality of the fish populations. Increase in fishermen use in specific areas could be attained by

increasing access, constructing parking areas, and providing facilities such as steps and platforms. It is questionable if the cost of the changes would be justifiable given the large amount of bank fishing opportunities currently available.

#### 4. Objectives and Tasks

None identified.

#### F. Old Mingo River Channel Complex

##### 1. Description

The Old Mingo River was once the primary drainage stream of the area. It is blocked by the roadbed for County Highway T prior to its former confluence with the St. Francis River southeast of the refuge. Ditch #15 now provides drainage for water leaving the refuge. Two earthen plugs further subdivide the channel on the refuge. The river is about 75 feet wide with an average depth of eight feet. The Old Mingo River, its two tributaries Stanley Creek and Kentucky Slough, along with ditch #10 are all interconnected and form the Mingo River Channel Complex. A stable water level of 336 feet msl is maintained in the complex by an earthen plug near the south end of ditch #10. The complex lies within the Mingo Wilderness Area and is the most scenic and secluded fishing area on the refuge. The area is very popular with both fishermen and canoeists.

Electroshocking samples in 1981 and 1982 and experimental gill netting in 1983 revealed a diverse river fish community. A total of 19 species were collected with two species of buffalo comprising 42% of the sample by number and 78% by weight. Game species accounted for 34% of the sample by number and 1% by weight. Bluegill, white crappie, black crappie, largemouth bass, and chain pickerel were the dominant game species. Channel catfish and pickerel were taken in the netting samples. Four of the channel catfish taken had been previously stocked to increase fishing success for this popular species. The stocking was apparently successful.

## 2. Wildlife Conflicts and Complements

There are no conflicts associated with the fishery program at the Old Mingo River Channel Complex.

## 3. Fishery Management Problems

The relatively clear, brown stained waters of the Old Mingo River Complex offer a fishery rather unique to Missouri; ie. a cypress lined, swamp type stream offering good bluegill, largemouth bass and chain pickerel fishing. The free movement of rough fish species between habitats on the refuge make management of the system as a discrete unit impossible. Annual spring flooding and drawdowns have a far more profound impact than standard fish management practices.

The experimental stocking of subadult channel catfish in 1982 was apparently successful, as reflected by the gill net samples. This program should be continued for another three years with annual evaluations.

## 4. Objectives and Tasks

Stock 1,000 8-10 inch channel catfish per year and evaluate with annual gill netting and informal creel censuses.

## G. Red Mill Pond

### 1. Description

Red Mill Pond is a 145 acre impoundment constructed under the Job Corps program. The pond is surrounded by refuge roads on three sides and State Highway 51 on the other. It is very shallow (less than 2 feet) except for the borrow areas adjacent to the roads. The pond has been open to fishing each year from March 15 to September 30. The roads around the pond are open all year. A stable water level is maintained with a stop log control structure. A portion of drainage ditch #11 runs parallel to the pond on its west border.

The pond has not been surveyed by electroshocking. Most fishing pressure is from bank fishermen in the spring and early summer. Heavy weed/algae concentrations limit fishing by mid-summer. Creel checks indicate bullhead catfish and sunfish are the main fishes caught. Seine sampling has documented the presence of the Bantam sunfish, Lepomis symmetricus, in the pond. This fish is classified as rare by the Missouri Department of Conservation and has only been found on Mingo and the Duck Creek Wildlife Management Area.

## 2. Wildlife Conflicts and Complements

There are no conflicts between the fishing program at Red Mill Pond and other refuge activities.

## 3. Fishery Management Problems

Shallow water depths permit excessive vegetation growth which makes fishing difficult. Pond closure between October 1 and March 14 limits fishing opportunities in one of the most accessible and popular spots on the refuge.

## 4. Objectives and Tasks

1. To preserve the Bantam sunfish population, no habitat manipulations will be performed in Red Mill Pond.
2. To increase fishing opportunities, bank fishing in Red Mill Pond and the adjacent section of ditch #11 should be permitted year-round.

## H. Battleshell Lake

### 1. Description

Battleshell Lake is a natural five acre lake located next to the west side road on the southwest boundary of the refuge. Approximately 1.5 acres of the lake are located off the refuge on private land. No water level manipulation is performed in the lake. It is connected to the refuge ditch system by a borrow ditch paralleling the west side road. Water levels depend on precipitation but remain fairly stable. The pond is open to fishing year-round. Access is from the Old Wappapello road a tenth of a mile from the pond, or by a 1½ mile walk from the refuge spillway parking lot.



The pond has not been sampled by electroshocking. Fishing pressure is extremely light. Creel checks indicate most fish taken are non-game species.

2. Wildlife Conflicts and Complements

None identified.

3. Fishery Management Problems

The pond is subject to the free movement of rough fish from the ditch system. The pond is usually turbid as a result of runoff from adjoining pastureland. Private ownership of part of the pond would limit management potential.

4. Objectives and Tasks

None identified.

IV. Allocation of Resources

Following is a summary table of all fishery management tasks identified in this plan. All tasks for which the refuge is responsible can be implemented during the current fiscal year with no additional increase in funds.

Task	Responsibilities	Target Date
A.4.1 & 2	Mingo NWR	Annually (enforce refuge regulation-May Pond)
A.4.3	FAO	--- (stock channel catfish-May Pond)
B.4.1	Mingo NWR	Accomplished
B.4.2	FAO	Accomplished
B.4.3	Mingo NWR	Summer 1985 (YCC, reduce turbidity-Fox Pond)
B.4.4	FAO	Annually (sample population-Fox Pond)
C.4	FAO	Biannually (monitoring-Monopoly & Rockhouse)
D.4.1	Mingo NWR	Summer 1985 (YCC, improve canoe access-Gum Stump Pool)
D.4.2	Mingo NWR	March 15, 1986 (evaluate vehicle access-Gum Stump Pool)
F.4	FAO	Annually (stock channel catfish-Mingo River)
G.4.1	Mingo NWR	--- (maintain existing conditions-Red Mill Pond)
G.4.2	Mingo NWR	Accomplished

#### V. Evaluation and Update

This plan will be reviewed and updated every three years. Individual unit plans will be reviewed yearly. Recommendations by FAO based on new sampling data will be incorporated into the plan yearly. Emergency changes will be documented and implemented as soon as possible. Public comments received on the fishing program will be documented and considered during the annual review process.

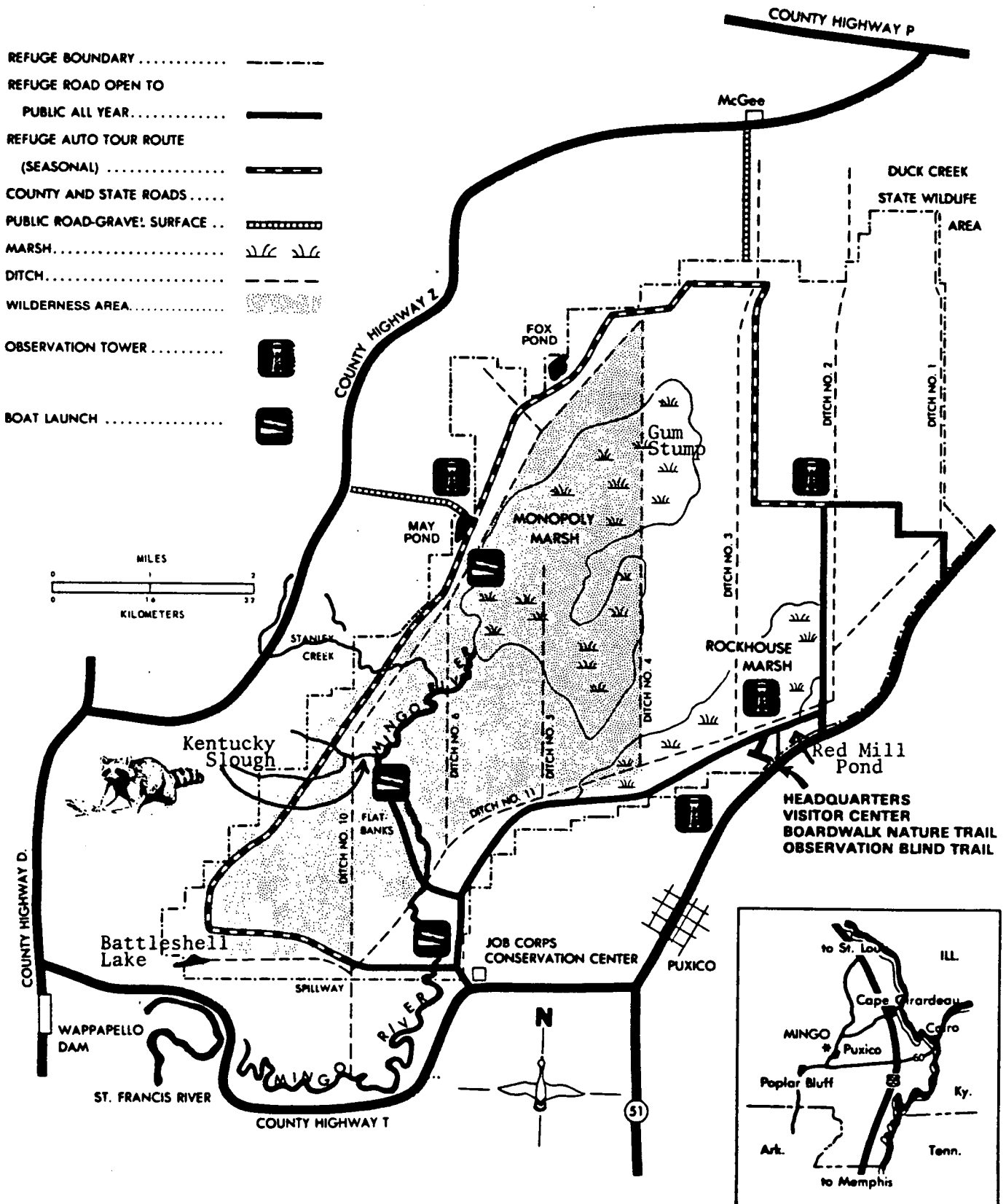
VI. Cooperation and Coordination

There are no cooperative agreements relating to the fishery program with other public or private organizations.

VII. Appendix

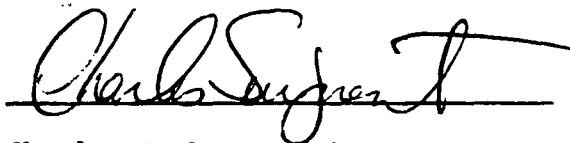
1. Refuge Map
2. FAO Recommendations

## MINGO NATIONAL WILDLIFE REFUGE



~~PROPOSED~~  
FISHERY MANAGEMENT ~~PLAN~~ *Recommendations.*  
MINGO NATIONAL WILDLIFE REFUGE

Prepared by:



Charles J. Surprenant  
Project Leader  
FAO-Carterville, IL 62918

## I.

The 22,000 acre Mingo National Wildlife Refuge is located in the southeastern "Bootheel" region of Missouri. The Bootheel lies in the Lowland Faunal Region of the state. This flat lowland plain is separated from the Ozark Region to the north by a steep rocky bluff. Elevations of up to 1,400 feet are common in the Ozarks but much of the lowlands are less than 300 feet above sea level. Bedrock is exposed in a few locations, but most of the area is covered to depths of up to 2,700 feet with clay, sand, and gravel, deposited by the Mississippi and Ohio Rivers as they shifted their courses over the centuries.

Before settlement, cypress swamps dominated the landscape, drained by Ozark streams entering from the north. In the spring the lowlands were inundated by floodwaters of the Mississippi River. During the 1900's serious efforts were made to drain the swamps and clear the timber. Over 1,200 miles of drainage ditches were constructed to this end. Today the swamps are but a remnant with only 50,000 out of 2.5 million acres remaining. Twenty-eight thousand acres are preserved in second growth at Mingo and the adjacent Duck Creek State Wildlife Area.

The aquatic resources of the refuge consist of two shallow impoundments totaling 5,500 acres managed by annual drawdown for moist soil waterfowl food plant production, 13 miles of cutoff stream channel, 45 miles of drainage ditches, and two artificial impoundments totaling 34 acres.

Fishing pressure is estimated by refuge personnel to be over 71,000 angler-days per year. Public fishing opportunities within a 20 mile radius of the refuge include: Lake Wappello (8,400 acres), Duck Creek Pool #1 (1,773 acres), the Castor River, and the Saint Francis River.

The entire Monopoly Pool, Ditches #4, #5, #6, #10, and part of Ditch #11, the Mingo River, Stanley Creek, and Kentucky Slough lie within a designated wilderness area. Gasoline outboards and electric trolling motors are prohibited. Dirt and gravel boat ramps are provided on the Mingo River, Monopoly Pool, and May Pond.

Fishing is permitted year-round on all waters west of Ditch 6 which generally includes the entire Mingo River complex. All other waters are open from March 15 through September 30. Fox Pond is occasionally closed within the open season to permit a raptor hacking program to proceed undisturbed adjacent to the lake. Rough fish may be harvested with nets and seines for personnel use only, from all waters except May and Fox Ponds during the open fishing season. Commercial fishing is excluded by state law.

Public access is excellent to Monopoly Pool, the Mingo River, May Pond, Ditch #11, Ditch #2, and Rockhouse Pool. There are various required walk-in distances within the ditch system, i.e., 0.5 mile walk-in to Fox Pond and 2.0 mile walk-in to Gum Stump Pool.

## II.

### UNIT PLAN 1. - May Pond

#### A. UNIT DESCRIPTION

May Pond is a 21 surface acre artificial impoundment located on the northwest side of the refuge. [Figure 1]. Direct access is gained from a public road from March 15 through September 30. Maximum depth is about 19 feet. Standing timber dominates the upper half of the pond. Clear water during most of the year allows the growth of submerged vegetation, but steep shoreline contours limit its expansion and related problems.

The pond was constructed in 1976. Initial stocking was completed in 1977 with largemouth bass, bluegill sunfish, and channel catfish planted at rates recommended by the Missouri Department of Conservation. Warmouth, green sunfish, brown bullhead, black bullhead, golden shiners and mosquitofish have since been introduced by persons unknown.

Electrofishing during 1979 revealed a population dominated by small, slow growing largemouth bass (PSD 28%) and large bluegill (PSD 85%).

The pond was opened to fishing during 1980 with a 12" minimum size limit on largemouth bass. A daily limit of 20 fish in the aggregate was also imposed. No sampling was performed in 1980. Twenty-five hundred two-inch redear sunfish were stocked during the year by the Corning National Fish Hatchery. Channel catfish were stocked by the Missouri DOC.

Electrofishing in May 1981 revealed a decline in the largemouth bass PSD to 5% as a result of the harvest of 12"+ fish in the population. Numbers of small bass remained high. Bluegill density was down but large fish were present (PSD = 83%). The refuge manager reported adequate enforcement and compliance with the 12" minimum size limit on largemouth bass.

Electrofishing during fall 1982 revealed excellent growth of largemouth bass which were "breaking through" the 12" barrier in large numbers, with 12" fish abundant, and fish up to 18" present (PSD = 83%). Fishing pressure on bluegill had severely reduced the number of quality size individuals (PSD = 0), but sufficient reproduction was noted and recruitment to the fishery predicted in 1983. Channel catfish, maintained by annual stocking, are entering the fishery at 13-17 inches. The species is indexed by annual gill netting with one to two experimental gill nets. Eight to twelve fish per net-day yields satisfactory angling for the species.

#### B. FISH MANAGEMENT PROBLEMS

Low fertility and clear water limit production of the principal game species, and heavy fishing pressure assures largemouth bass overharvest in the absence of protective regulations.

### C. TASKS

1. Maintain and enforce the current 12-inch minimum size limit on largemouth bass.
2. Stock 8-10-inch channel catfish sufficient to maintain a gill net index of at least 8 fish per net-day and restrict fishing to pole and line only.

## III.

### UNIT PLAN 2. - FOX POND

#### A. UNIT DESCRIPTION

Fox Pond is a 12 surface acre artificial impoundment located in the northwest corner of the refuge. Shoreline erosion and erosion in the watershed contribute to a high degree of clay turbidity. Submerged vegetation is sparse. Access is gained by a 1/2-mile walk-in.

The pond was constructed during the fall of 1973 and filled by early 1974. Original stocking included largemouth bass, bluegill sunfish and channel catfish.

Electrofishing in 1977 by the Missouri DOC revealed a well-structured largemouth bass population (PSD=26%) and quality bluegill (PSD=98%). High turbidity due to eroding banks was also noted. The pond was opened to public fishing with a 12" minimum size limit on largemouth bass.

In 1978, following one year of fishing, the largemouth bass population was deteriorating in structure and density with low reproduction (PSD=73%). Bluegill structure remained good (PSD=84%) although high survival of young of the year and two plus fish was noted.

Following the 1978 fishing season, 1979 electrofishing revealed further deterioration in the bass population and drastic reductions in bluegill quality (PSD=7.0%). No sampling was performed in 1980.

Electrofishing in 1981 revealed further declines in both species with only eight bass collected with no reproduction and a bluegill population PSD of 3%. Plans were made to renovate the pond following the 1982 fishing season to allow anglers a chance to harvest channel catfish which remained abundant.

During October, 1982, plans were changed when a source of largemouth bass became available during a local bass tournament. Eighty-seven largemouth bass adults (11" to 21"), weighing 162 lbs., were stocked at a rate of 13.5 lbs. per acre. Increased predation and reproduction are expected during 1983 when the pond will be closed to fishing.



**B. FISH MANAGEMENT PROBLEMS**

Low fertility and high turbidity limit game species production.

**C. TASKS**

1. Open the lake to public fishing during 1984.
2. Maintain and enforce an 18-inch minimum size limit on largemouth bass until the bluegill population achieves target population structure (PSD=20-40%).
3. Discontinue channel catfish stocking.
4. Reduce turbidity by eliminating watershed erosion and protecting the shoreline from erosion.

**IV.**

**MONOPOLY AND ROCKHOUSE POOLS**

**A. UNIT DESCRIPTION**

Monopoly (3,500 acres), [Figure 3], and Rockhouse Pools (1,500 acres), [Figure 2] occupy the central portion of the refuge. Shallow water levels are maintained by radial gates on the refuge ditch system. Both pools are naturally filled from large watersheds to the northwest of the refuge. Lick Creek runoff enters Monopoly via Ditch #10, McGee Creek via Ditch #2, and Brush Creek via Ditch #1. Rockhouse is watered primarily from McGee Creek (Ditch #2). Fish exit both pools and enter Ditch #11 when the pools are drained. In the event of an oxygen depletion, water can be diverted from the Duck Creek Management Area via Ditch #2 either from Pool #1 or from two wells located to the north of the refuge.

Prior to the installation of radial gates and water control structures in the early 1980's, water levels were kept up on both pools on an alternative three-year cycle. Currently one one-year cycle is used. Monopoly was full during 1983, while Rockhouse was left dry. The reverse is scheduled for 1984. It is doubtful if significant fisheries will develop or can be developed under this water management scheme.

An electrofishing sample collected in April 1982, just prior to draining, revealed a low density fish community dominated by rough species [Table 1].

**B. FISH MANAGEMENT PROBLEMS**

Rough fish contamination, shallow water, and biennial dewatering will limit development of quality sport fisheries at both pools.

### C. TASKS

Periodically monitor the fisheries of both pools for Refuge Public Use information.

## V.

### UNIT PLAN #4 - GUM STUMP POOL

#### A. UNIT DESCRIPTION

Gum Stump Pool [Figure 5] comprises 650 surface acres and is located at the north end and within the drainage of Monopoly Pool. Gum Stump is bounded by a 1.5 mile earthen levee running north and south along Ditch #4 and east-west along a lateral ditch between Ditch #3 and #4. A stop log water control structure and surface overflow controls the water level. Deep water (max.-8 ft.) is found adjacent to the levees in borrow pits, but the majority of the surface is less than 2.5 feet deep and covered with woody vegetation.

Gum Stump is lowered every other year at the same time as Monopoly. Approximately three feet of water is removed, draining the brushy flats but leaving sufficient water in the borrow ditches to maintain the fish population. This drawdown benefits the fish population by concentrating predators and prey, and limiting year class strength of rough species.

The pool is a popular fishing area, although the 2.5 mile required walk-in limits fishing pressure. Canoe access can be gained by running lateral ditches between Ditches #2 and #4. Numerous fallen trees and log jams often block these laterals making canoe travel tedious.

Gum Stump Pool was sample by A.C. electrofishing in April 1982 [Table 2]. The survey revealed a community dominated by rough species with buffalo and carp comprising 32% by number and 77% by weight. Game species were well represented accounting for nearly 44% of the sample by number. Over 75% of the channel catfish, bluegill sunfish, white crappie, largemouth bass, and warmouth sunfish collected were of catchable size.

#### B. FISH MANAGEMENT PROBLEMS

Gum Stump Pool contains one of the highest quality wild game fish communities found on the refuge. The only problem identified is one of access. The long walk required to reach the pool effectively isolated fishing opportunities from the majority of anglers, and as stated above, canoe travel is difficult and hazardous.

### C. TASKS

1. Improve canoe access by clearing obstructions in ditches leading to Gum Stump Pool.
2. Evaluate the potential of reducing the required walk-in to one mile or less by allowing vehicles one-way access around Pool #5 and by building an additional parking lot at the northwest corner of Pool #5.

## VI.

### UNIT PLAN # 5 - THE DITCH SYSTEM

#### A. UNIT DESCRIPTION

A system of north-south ditches and laterals provide the primary drainage system for the refuge. [Figure 6] Ditches #1 through #10 drain interior water to the south, emptying into Ditch #11 which moves it to the southwest corner. Ditch #11 becomes Ditch #15 after the junction with Ditch #10 and runs off the refuge approximately 15 miles to the St. Francis River. Water control is provided by a series of radial gates, screw valves, and stop log structures at key locations. Ditch bottom elevations are generally 328 feet above sea level, although siltation has filled some above this mark. Water levels in the ditches depend primarily on the level of water selected for the adjacent pools. For example, Monopoly Pool would require approximately eight feet of water in Ditches #5 and #6 to reach pool stage of 335.0. At least four feet of water is maintained at all times to prevent loss of fish and to provide wildlife habitat diversity.

Popular fishing areas included northern sections of Ditch #1, the southern one-half of Ditch #2, and Ditch #11. Distribution of ditch anglers is closely correlated with access. Wherever a public road closely parallels a ditch, fishermen can be found. More refuge fishermen fish ditches than any other habitat type.

A.C. electrofishing was employed to sample fish populations in Ditch #5, Ditch #10 and Ditch #11 during 1982 [Tables 3-6]. Relative abundance of game species ranged from 91% in upper Ditch #10 to a low of 24% at the mouth of Ditch #5.

#### B. FISH MANAGEMENT PROBLEMS

The Mingo refuge ditch system is populated by fish movement during spring flooding, movement upstream through water control structures, movement downstream during pool water level manipulations, and natural recruitment. This free exchange of fish makes managing this system as a discrete unit impossible. Fishing pressure is probably stimulated more by ease of access than by the quality of the fish populations. Increases in fishermen use can be attained by increasing access, improving parking areas adjacent to the ditches and providing

facilitites such as steps and platforms. If the refuge desires to increase fishermen use changes should be treated in a more appropriate planning document such as the Refuge Public Use Plan.

### C. TASKS

NONE IDENTIFIED.

## VII.

### UNIT PLAN 6 - OLD MINGO RIVER CHANNEL COMPLEX

#### A. UNIT DESCRIPTION

Once the primary drainage stream of the area, with fluctuating water levels, the 5.5 mile stream channel [Figure 7] is now closed by an earthen plug immediately prior to its former confluence with the St. Francis River southeast of the refuge. Two earthen plugs further subdivide the channel on the refuge proper. Stanley Creek and Kentucky Slough, are tributaries to the Mingo River and enter in the northwest corner of the refuge. The river is about 75 feet wide with an average depth of eight feet. Stable water levels are maintained by water control structures.

Electrofishing was employed during 1981 and 1982, and experimental gill netting was employed in 1983 to sample the river fish community. [Tables 7 and 8]. A total of 19 species were collected during electrofishing and gill netting. Buffalo spp. dominated the electrofishing sample comprising 42% by number and 78% by weight. Game species accounted for 34% of the sample numbers but only slightly more than 1% of the sample weight. Bluegill sunfish, white crappie, black crappie, largemouth bass, and chain pickerel were the dominant game species. Because of gear avoidance, channel catfish and chain pickerel were underrepresented in the electrofishing sample. Two experimental gill nets captured three pickerel from 18.5 to 22.7 inches and five channel catfish. Four of the channel catfish were from a plant of 1,000 nonvulnerable fish stocked in the fall of 1982, while one 18.1 individual was natural recruitment.

#### B. FISH MANAGEMENT PROBLEMS

The relatively clear, brown stained waters of the Old Mingo River channel offer a fishery rather unique to Missouri; i.e., a cypress lined, swamp type stream offering good bluegill, largemouth bass and chain pickerel fishing. The free movement of rough species between habitats on the refuge make management of the system, like the pools and ditches, as a discrete unit impossible. Annual spring flooding and periodic drawdowns have a far more profound impact than standard fish management practices. The experimental stocking of subadult channel catfish in 1982 was apparently successful, as reflected by

gill net samples. We recommend continuing this program for another three years with annual evaluation.

C. TASKS

Stock 1,000 8-10 inch channel catfish per year and evaluate with annual gill netting and informal creel census.

Table 1 : Mingo NWR - Monopoly Lake - West Side. 4/28/82  
AC Electrofishing

SPECIES SIZE RANGE	%	N	MEAN TOTAL LENGTH	MEAN WEIGHT	LENGTH RANGE	WEIGHT RANGE	TOTAL WEIGHT	% TOTAL WEIGHT
Bigmouth buffalo	(1.7)	1	15.4	2.20	-	-	2.20	3.4
Smallmouth buffalo	(3.4)	2	15.3	2.00	15.2-15.3	1.90-2.10	4.00	6.1
Shortnose gar	(1.7)	1	23.5	1.50	-	-	1.50	2.3
Freshwater drum	(10.2)	6	6.7	0.23	4.7-8.5	0.15-0.30	1.40	2.1
Gizzard shad	(8.5)	5	10.2	0.34	8.9-11.7	0.20-0.50	1.70	2.6
Bowfin	(1.7)	1	22.3	3.70	-	-	3.70	5.7
Brown bullhead	(45.8)	27	8.5	0.32	6.9-11.7	0.15-0.75	8.70	13.4
Yellow bullhead	(1.7)	1	12.2	1.00	-	-	1.00	1.5
White crappie	(13.6)	8						
1.0-5.9	50.0	4	4.6	-	3.9-5.7	-	-	-
6.0 +	50.0	4	6.9	0.16	6.7-7.2	0.15-0.20	0.65	1.0
TOTAL		52						

Table 2 : Ditch 11 - From Mouth of Ditch 5 to First Tree (200 yards)  
4/28/82. AC Electrofishing

SPECIES			MEAN TOTAL	MEAN	LENGTH	WEIGHT	TOTAL	% TOTAL
SIZE RANGE	%	N	LENGTH	WEIGHT	RANGE	RANGE	WEIGHT	WEIGHT
Bigmouth buffalo	(6.3)	4	20.7	5.93	19.7-22.0	4.30-6.70	23.70	49.0
Smallmouth buffalo	(3.2)	2	20.6	5.90	14.5-26.7	1.80-9.90	11.70	24.2
Carp	(1.6)	1	18.4	3.20	-	-	3.20	6.6
Spotted gar	(1.6)	1	20.0	1.10	-	-	1.10	2.3
Flier	(20.6)	13	5.4	0.20	3.4-6.7	-	2.60	5.4
Freshwater drum	(4.8)	3	11.8	0.80	7.5-18.2	-	2.40	5.0
Gizzard shad	(22.2)	14	9.7	-	8.2-17.4	-	-	-
Brown bullhead	(6.3)	4	7.9	-	6.8-8.7	-	-	-
Bluegill sunfish	(11.1)	7						
3.5-5.9	14.9	1	3.2	-	-	-	-	-
6.0 +	85.7	6	7.0	0.36	6.0-7.5	0.30-0.41	2.16	4.5
Warmouth	(6.3)	4						
3.5-5.9	75.0	3	4.9	-	4.5-5.2	-	-	-
6.0 +	25.0	1	6.5	-	-	-	-	-
White Crappie	(15.9)	10						
1.0-5.9	50.0	5	5.0	-	4.2-5.8	-	-	-
6.0 +	50.0	5	7.4	0.31	6.6-8.1	-	1.55	3.2
TOTAL		63						

Table 3 : Mingo NWR - Gum Stump Pool North of Horn. 4/29/82  
AC Electrofishing. (57 minutes)

SPECIES			MEAN TOTAL	MEAN	LENGTH	WEIGHT	TOTAL	% TOTAL
SIZE RANGE	%	N	LENGTH	WEIGHT	RANGE	RANGE	WEIGHT	WEIGHT
Bigmouth buffalo	(22.1)	49	14.5	2.60	10.8-21.4	1.04-5.40	126.91	51.3
Smallmouth buffalo	(5.9)	13	14.2	2.10	12.0-22.0	0.25-7.00	27.30	11.0
Carp	(3.6)	8	19.7	4.55	15.9-24.0	2.50-6.80	36.40	14.7
Spotted gar	(2.3)	5	15.9	0.65	13.2-18.0	-	3.25	1.3
Chain pickerel	(0.5)	1	18.0	1.65	-	-	1.65	0.7
Freshwater drum	(0.5)	1	11.6	0.82	-	-	0.82	0.3
Gizzard shad	(13.1)	29	9.0	-	5.5-12.0	-	-	-
Bowfin	(1.4)	3	22.0	3.73	17.5-27.5	1.40-7.10	11.20	4.5
Brown bullhead	(4.5)	10	10.1	0.70	7.7-13.2	0.30-1.06	7.03	2.8
Golden shiner	(1.4)	3	2.8	-	2.5-3.0	-	-	-
Channel catfish	(0.9)	2	13.5	0.90	12.5-14.5	-	1.80	0.7
Bluegill sunfish	(20.1)	46						
3.4-5.9	(23.9)	11	4.6	-	3.4-5.6	-	-	-
6.0 +	(76.1)	35	6.9	0.34	6.0-7.6	0.22-0.45	11.87	4.8
Warmouth	(1.8)	4						
3.5-5.9	25.0	1	4.1	-	-	-	-	-
6.0 +	75.0	3	6.9	0.30	6.3-7.3	0.24-0.35	0.89	0.4
White crappie	(5.4)	12						
1.0-5.9	25.0	3	3.1	-	3.0-3.2	-	-	-
6.0 +	75.0	9	7.5	0.17	6.7-9.5	0.14-0.20	1.50	0.6
Black crappie	(13.1)	29						
1.0-5.9	6.9	2	5.8	-	-	-	-	-
6.0 +	93.1	27	8.1	0.28	6.1-10.2	0.12-0.45	7.56	3.1
Largemouth bass	(3.2)	7						
3.0-7.9	0.0	0						
8.0-11.9	28.6	2	10.2	0.65	9.0-11.4	0.45-0.85	1.30	0.5
12.0 +	71.4	5	14.1	1.57	13.2-14.7	1.23-1.90	7.85	3.2
TOTAL		222						



Table 4 : Mingo NWR Mouth Ditch 5. 4/28/82. AC Electrofishing.

SPECIES			MEAN TOTAL	MEAN	LENGTH	WEIGHT	TOTAL	% TOTAL
SIZE RANGE	%	N	LENGTH	WEIGHT	RANGE	RANGE	WEIGHT	WEIGHT
Bigmouth buffalo	(4.7)	3	15.5	2.33	13.0-17.5	1.30-3.20	7.00	19.2
Carp	(9.4)	6	19.4	3.66	16.9-21.3	2.40-5.20	22.00	60.3
Spotted gar	(6.3)	4	16.7	0.59	13.1-20.2	0.25-1.10	2.35	6.5
Flier	(18.8)	12	5.0	-	-	-	-	-
Freshwater drum	(1.6)	1	12.0	0.68	-	-	0.68	1.9
Gizzard shad	(12.5)	8	9.3	-	8.2-10.5	-	-	-
Bowfin	(1.6)	1	14.1	1.10	-	-	1.10	3.0
Mississippi silversides	(1.6)	1	-	-	-	-	-	-
Golden shiner	(1.6)	1	3.1	-	-	-	-	-
Pirate perch	(1.6)	1	4.0	-	-	-	-	-
Brown bullhead	(15.6)	10	7.6	-	6.9-8.5	-	-	-
Black bullhead	(1.6)	1	12.5	0.90	-	-	0.90	2.5
Channel catfish	(1.6)	1	8.5	0.20	-	-	0.20	0.5
Spotted bass	(1.6)	1	13.2	1.30	-	-	1.30	3.6
Bluegill sunfish	(7.8)	5						
3.5-5.9	20.0	1	4.9	-	-	-	-	-
6.0 +	80.0	4	7.3	-	6.8-7.8	-	-	-
Wormouth	(6.3)	4						
3.5-5.9	50.0	2	4.5	-	4.2-4.8	-	-	-
6.0 +	50.0	2	6.7	-	-	-	-	-
White crappie	(4.7)	3						
1-5.9	100.0	3	5.1	-	3.8-5.8	-	-	-
Black crappie	(1.6)	1						
6.0 +	100.0	1	11.3	0.90	-	-	0.90	2.5
<b>TOTAL</b>		<b>64</b>						

Table 5 : Mingo NWR Ditch 10 between Kentucky Slough and St nley Creek.  
10/28/82. DC Electrofishing. 37 minutes.

SPECIES			MEAN TOTAL	MEAN	LENGTH	WEIGHT	TOTAL	% TOTAL
SIZE RANGE	%	N	LENGTH	WEIGHT	RANGE	RANGE	WEIGHT	WEIGHT
Spotted gar	(8.0)	4	15.5	-	12.0-20.9	-	-	-
Chain pickerel	(2.0)	1	10.3	0.10	-	-	0.10	0.8
Spotted sucker	(2.0)	1	13.4	0.92	-	-	0.92	7.0
Bluegill sunfish	(56.0)	28						
3.0-5.9	89.3	25	4.8	0.14	3.4-5.9	-	3.50	26.7
6.0 +	10.7	3	6.4	0.18	6.0-6.7	0.16-0.20	0.55	4.2
Redear sunfish	(2.0)	1						
3.5-5.9	100.0	1	4.5	-	-	-	-	-
Black crappie	(2.0)	1						
6.0 +	100.0	1	7.3	0.20	-	-	0.20	1.5
Largemouth bass	(28.0)	14						
3.0-7.9	14.3	2	5.9	0.90	5.6-6.2	0.08-0.10	0.18	1.4
8.0-11.9	71.4	10	10.2	0.55	8.5-11.6	0.27-0.77	5.50	42.0
12.0 +	14.3	2	12.6	1.07	12.1-13.1	0.89-1.25	2.14	16.3
TOTAL		50						

COMMENTS:

1. No carp or buffalo seen
2. 10 shad turned - not picked up
3. missed:
  - 1 spotted sucker
  - 3 largemouth bass : 1 - 3"
  - 2 - 10-13"
  - 2 spotted gar: 1 - 15"-20"
  - 1 - 12"-14"
  - 1 chain pickerel: 15" +

Table 6 : Mingo NWR Ditch 11 below radial gates. 4/28/82. AC Electrofishing.

SPECIES			MEAN TOTAL	MEAN	LENGTH	WEIGHT	TOTAL	% TOTAL
SIZE RANGE	%	N	LENGTH	WEIGHT	RANGE	RANGE	WEIGHT	WEIGHT
Carp	(7.9)	5	17.4	2.57	14.8-20.3	1.60-3.90	12.85	48.2
Chain pickerel	(1.6)	1	6.3	-	-	-	-	-
Flier	(6.3)	4	4.1	0.14	2.8-5.9	-	0.56	2.1
Freshwater drum	(6.3)	4	7.2	0.23	4.7-8.1	0.22-0.25	0.93	3.5
Gizzard shad	(27.0)	17	8.4	0.27	5.3-10.8	0.05-0.50	4.53	17.0
Tadpole madtom	(1.6)	1	2.0	-	-	-	-	-
Brown bullhead	(1.6)	1	7.0	0.15	-	-	0.15	0.6
Black bullhead	(1.6)	1	3.0	-	-	-	-	-
Channel catfish	(3.2)	2	8.5	0.18	8.1-8.9	0.15-0.20	0.35	1.3
Bluegill sunfish	(15.9)	10						
3.5-5.9	70.0	7	4.4	0.08	5.3-5.5	0.50-0.11	0.56	2.1
6.0 +	30.0	3	7.0	0.31	6.7-7.3	0.27-0.36	0.93	3.5
Warmouth	(14.3)	9						
3.5-5.9	44.4	4	4.8	0.13	3.7-5.9	0.05-0.18	0.51	1.9
6.0 +	55.6	5	6.7	0.27	6.0-7.3	0.17-0.34	1.35	5.1
Largemouth bass	(12.7)	8						
3.0-7.9	25.0	2	7.6	0.22	7.3-7.8	0.19-0.25	0.44	1.6
8.0-11.9	62.5	5	8.8	0.37	8.6-8.9	0.30-0.45	1.83	6.9
12.0 +	12.5	1	14.1	1.68	-	-	1.68	6.3
TOTAL		62						

TABLE 7 Electrofishing on the old Mingo River channel 1981-82

Species	number	percent frequency (%)	mean length (ins)	mean weight (lbs)	estimated total weight	weight frequency
Bigmouth buffalo	253	42	17.2	4.1	1037	78
Smallmouth buffalo	38	6	17.0	3.0	114	9
Carp	33	5	19.1	3.4	111	8
Spotted gar	7	1	18.1	0.8	6	tr
Shortnose gar	6	1	21.0	1.4	8	1
Freshwater drum	5	1	13.9	1.5	8	1
Gizzard shad	39	6	9.0	0.2	9	1
Bowfin	6	1	16.8	1.6	10	1
Brook silversides	8	1	3.3	tr	tr	tr
Pirate perch	1	tr	3.7	tr	tr	tr
Flier sunfish	1	tr	6.7	0.2	tr	tr
Chain pickerel	2	tr	18.0	1.2	2	tr
Bluegill sunfish	170	28	6.0	0.1	17	1
3.0-5.9	131					
6.0+	39					
Warmouth sunfish	3	tr	3.4	tr	tr	tr
White crappie	11	2	7.7	0.2	3	tr
3.0-5.9	1					
6.0+	10					
Black crappie	3	tr	7.9	0.2	1	tr
Largemouth bass	11	2	8.6	0.3	4	tr
3.0-7.9	4					
8.0-11.9	7					
12.0+	0					
Brown bullhead	10	2	11.1	0.6	6	tr
Golden shiner	1	tr	7.6	tr	tr	tr
Total	602				1336	

TABLE 8 Two experimental gillnets overnight in the Mingo River 5/24/83

SPECIES	NUMBER	LENGTH RANGE (ins)	PERCENT FREQUENCY
Chain Pickerel	3	18.5 - 22.7	10%
Bowfin	1	24.2	3
Smallmouth buffalo	1	12.3	3
Gizzard shad	6	7.7 - 12.7	20
Goldeye	1	14.1	3
Channel catfish	5	6.8 - 18.1	17
Spotted gar	3	12.9 - 21.5	10
Black crappie	4	4.7 - 4.9	13
White crappie	3	5.0 - 6.7	10
Brown bullhead	3	8.8 - 9.9	10
TOTAL	30		

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1/23/85

JAN 23 1985

Regional Refuge Supervisor, FWS, Twin Cities, MN (RF2)

Fishery Management Plan

Refuge Manager, Mingo NWR, Puxico, MO

The subject plan has been reviewed in this office and approved as written. The document was well prepared and provides realistic guidance for managing Mingo's fishery resource. You should proceed with preparation and submission of IPWs to fully implement the plan.

Please consider incorporating the attached comments when the plan is revised in the future. Thanks for a job well done.

/s/ John W. Ellis

John W. Ellis

Attachment

cc: FS-2  
PSW-TS  
Chuck Surprenant  
RF(WO) Operations (Plan only)

RF2:J.Ellis:sz:1/23/85:x4701

Ellis  
10/2/84

October 2, 1984

Regional Refuge Supervisor, FWS, Twin Cities, MN (RF2)

Fishery Management Plan

Refuge Manager, Mingo NWR, Puxico, MO

The attached Fishery Management Recommendations, prepared by Chuck Surprenant, should be used in preparing the Fishery Management Plan for Mingo NWR. Please submit the plan to the Regional Office for review and approval by December 21, 1984. You should work closely with Chuck in preparing this plan.

John W. Ellis

Attachment

cc: Memo only to:  
Chuck Surprenant  
FS1 (RO)

## memorandum

DATE:

1/22/85

REPLY TO  
ATTN OF:


Fisheries Supervisor, Division 1, Twin Cities, MN (AF/FS-1)

SUBJECT: Mingo Fishery Management Plan

TO: Assistant Regional Director, Twin Cities, MN (AF)



Chuck Surprenant and I have both reviewed the Mingo Fishery Management Plan and agree with the concept and implementation required in the unit plans. I recommend it be concurred with.





## memorandum

DATE:

JAN 15 1984

REPLY TO  
ATTN OF:

Senior Staff Biologist, Twin Cities, MN (PSW-TS)

SUBJECT:

Mingo Fishery Management Plan

TO:

Division Supervisor, RF 2

Per your request we have reviewed Mingo's fishery management plan dated January 4, 1985. It was apparent that the refuge had coordinated closely with Fisheries Assistance and had used the latest regional guidance (Mr. Gritman's July 8, 1983 notice, Subject: "Interim Refuge Fishery Management Planning Guidelines") in preparing the plan. The product will be a real help when we begin to modify the "Guideline" for issuance later as a Regional Refuge Manual release. Some of our comments are as much a reflection of weaknesses in the Guidelines as they are weaknesses in Mingo's plan. They should be read in that light, and are provided here both for reference the next time Mingo's plan is revised and when the regional Guidelines are finalized.

Specific comments follow:

Page 1

Section I, "Introduction" is unnecessary and should be deleted with the next revision. Section II, A, "Objectives and Strategies" should have been confined primarily to fishery management objectives. (The Guidelines are unclear on this point, however.)

Pages 2-5

Sections B through E are excellent and provide the desired information. The second paragraph on page 4 discusses a perceived need to exclude fishermen from bow hunting areas. This policy may warrant reevaluation. It seems unnecessarily restrictive unless the main point is to prevent fishermen from disturbing waterfowl; and if that's the case, it should be stated that way. Any conflict between archers and fishermen would seem to be minor.

Pages 6-16

The unit plans are well prepared and realistic. The "Description" sections are written in a manner that will allow them to be reused in future years without much revision. In that vein, we suggest that when the plan is next revised, each unit plan be typed on separate pages. That way, changes to one unit plan would not affect the others.

The sections on fishery management problems should be more detailed and specific and preferably be arranged in a list (1, 2, 3, etc.) format. It would then be easier to relate the "Objectives and Tasks" items to the individual problems.

Page 16

Section IV. "Allocation of Resources" is inadequately developed. The intent here should be to show specific costs of the fishery management program. Giving the specifics accomplishes two things: 1) it forces refuge staff to think carefully and in depth about the program and decide who will do the work, when, how much time will be needed, and what other activities might need to be eliminated or modified to accomodate the fishery management tasks. 2) it enables regional office staff to help evaluate whether the costs are worth the benefits. For example, will the law enforcement effort be sufficient to ensure that the 12-inch size limit is maintained? Will the informal creel censuses be made often enough to give meaningful results?

Throughout the document there is emphasis on controlling fishing pressure so that it does not degrade the wild quality of the experience or the wilderness nature of the refuge. Part of this control can be achieved by concentrating the fishing pressure at fewer locations through providing better quality facilities at places where fishing is already popular. Better planned facilities can sometimes alleviate other associated problems also, such as littering and erosion from foot traffic. Contrary to the statement made at the top of page 13, we think further investigation of improved facilities such as steps, platforms, and parking areas, might indeed be worthwhile.

Overall, the plan's general approach and philosophy of fishery management on Mingo is appropriate and sufficient. On that basis we recommend approval of the plan without modification. You may want to send a copy of this memorandum to the refuge for use in the next revision. Please pass on our compliments to the refuge staff for a fine effort.

*R. Wayne Weier*

Wayne Weier