FISHERY MANAGEMENT PLAN

CHAUTAUQUA NATIONAL WILDLIFE REFUGE

Havana, Illinois

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I. INTRODUCTION

Chautauqua National Wildlife Refuge is located in Mason County in central Illinois along the Illinois River Valley. This region is an area of rolling terrain with the river valley being a great terraced trough several miles in width and about 150 feet lower than the surrounding upland. The eastern edge of the refuge is located along the east bluff of the valley. The western edge borders the Illinois River. The elevation of the refuge varies from 430 feet to 460 feet msl. The refuge is 45 miles southwest of Peoria and 9 miles northeast of Havana, Illinois. It is in the 18th U. S. Congressional District.

Chautauqua Refuge was authorized by Executive Order 7524 on December 23, 1936, as a migratory waterfowl refuge. Total acreage is 4,488 acres of which the primary feature is Lake Chautauqua containing 3,600 acres. There are an additional 800 acres of ditches and seasonally flooded forestlands. Habitat types are mixed bottomland softwoods and hardwoods, buttonbush, willow swamps and sedge marshes. Woodlands consist of oak-hickory hardwoods on the upland areas, grading downward to cottonwood, red maple, silver maple, sycamore, ash and finally, black willow on the floodplain.

The climate for the refuge is typical of middle latitude, mid-continental areas, with a wide annual variation in temperature and rainfall. The average annual precipitation is 34.5 inches. Over half of the precipitation normally falls in the months of April through August. Annual snowfall normally accounts for less than 10% of the annual precipitation. Winter temperatures as low as -20° F. and summer temperatures as high as 100° F. have been recorded. Summer humidity varies from moderate to high.

The soils in the area are unconsolidated glacial drift approximately 75 feet thick consisting mostly of sand and gravel. The principal bedrock aquifers are contained in Devonian, Silurian, and Ordovician Systems. A shallow limestone layer underlies the headquarters area at a depth of 100 feet. The area surrounding the refuge is composed primarily of agricultural land. The major farming activity is the production of soybeans, corn, melons and hogs.

The area now occupied by Lake Chautauqua was formerly a series of eight bottomland lakes connected with the Illinois River. The water levels of these lakes fluctuated with the river. These natural lakes supported an abundance of fish and wildlife resources. In 1916, the Lake Chautauqua Drainage and Levee District was formed and leveed off the area from the Illinois River. The lake beds were drained and leveled for conversion to agriculture. Flood waters in the fall of 1926 broke the levees surrounding the Chautauqua District and flooded the area. A fishery from the Illinois River became established in the newly formed lake. The area was not reclaimed for agriculture, leading to Federal acquisition in 1936. By 1940, the levee system

was restored and water control structures installed to regulate Lake Chautauqua. Abundant aquatic vegetation and an excellent sport fishery had developed.

However, in the spring and early summer months of 1943 and 1944, record floods again damaged the levee system and deposited large amounts of silt and sediments into the lake. The basic ecology of the lake was changed and the aquatic vegetation never fully recovered. The levee system was never fully restored to provide complete protection from floodwaters. Repeated inundation by the Illinois River has resulted in continuing habitat deterioration from siltation.

A cross dike was constructed across Lake Chautauqua in 1969 separating the lake into a north pool of approximately 1,200 acres and a south pool of approximately 2,400 acres. The two pools provided the refuge with increased management options and one pool was to be developed for fishery resources. However, wind and wave action created a 200 ft. breach in the cross dike in 1971 which was not repaired.

The fishery in Lake Chautauqua during this period varied from year to year depending on specific year class survival rates, flooding, lake levels and other variables. However, the overall trend since the late 1940's has been downward. The abundant bass and crappie sport fishery is gone, and has been replaced by a large rough fish population, augmented by movements of fish from the Illinois River into the lake during high water periods.

Conventional fishery management techniques are not considered practical at Chautauqua. The open system with the Illinois River, the continual problems of sedimentation and siltation, wind generated turbidity and summer drainage for waterfowl management all preclude intensive fishery management. The 1969 and 1979 master plans for Chautauqua Refuge described several different proposals for refuge development. A workshop conducted by the National Ecology Center in 1987 on water management alternatives also described different development and management options. If one of these alternatives is selected and the associated construction work funded in the future, then a revised fishery management plan would be required.

The purpose of this fishery management plan is to outline the steps that can be taken under present refuge conditions to improve fishery values and increase fishing opportunities for the public.

II. RELATIONSHIP OF FISHERY MANAGEMENT TO REFUGE OBJECTIVES

A. Objectives and Strategies

The primary objective of the refuge is to provide optimum habitat conditions for migratory waterfowl, particularly National

Species of Special Emphasis (NSSE) using the Illinois River Valley. Populations of 40,000 Canada geese and over 100,000 ducks have been recorded during peak migration periods. The mallard (NSSE) is the primary duck utilizing the refuge, and is the most important waterfowl species in the Mississippi Flyway.

Other refuge objectives include:

1. Provide nesting and brood habitat for wood ducks (NSSE) and hooded mergansers.

2. Protect and maintain winter roosting habitat for bald eagles (NSSE).

3. Assist in achieving distribution objectives established for the Mississippi Valley Population of Canada geese in the flyway management plan.

4. Provide habitat for the great blue heron (NSSE) and other wetland migratory birds.

5. Preserve the bottomland forest ecosystem.

6. Provide interpretive and environmental education information to the public.

7. Provide recreational opportunities for public use with emphasis on wildlife related uses such as wildlife observation, waterfowl hunting, and fishing where such uses are compatible with the primary objectives of the refuge.

Sport fishing is the most popular recreational activity at Chautauqua accounting for 24,893 visits and 74,664 activity hours in 1986. Fishing accounted for 58% of the total visits to the refuge and 70% of the total activity hours. The objective level set in 1979 for fishing was 24,700 visits and 74,000 activity hours; however, the capacity of the refuge to support fishing is much higher, particularly if associated facilities such as parking lots are also developed.

The present fishery management objectives for Chautauqua Refuge 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.

Attainment of the first objective is heavily dependent on future rehabilitation or development work on the refuge's levee and water control systems. Any improvements in protecting the lake from further flooding and sedimentation for better waterfowl management will also benefit the fishery resource.

The second objective can be improved over present conditions by opening the entire refuge to bank fishing except from October 16 through December 14.

B. Wildlife Use and Production

To meet wildlife refuge objectives, the refuge maintains and manipulates water levels on 3,600 acre Lake Chautauqua. The lake often provides excellent fishing opportunities, particularly in the spring, and during periods when water is flowing in or out of the lake.

Primary waterfowl use of the lake is during the fall migration period and to a lesser extent, during the spring migration period. The fall period extends from September to freeze-up which usually occurs in mid-December. Teal are the first birds to arrive in mid-September. Mallard numbers usually peak between October 20 and November 20. Lake Chautauqua is closed to all public use from October 16 to December 15, to provide a sanctuary area during this important migration time. The spring period of use extends from mid-February through mid-April depending on the severity of the winter and spring weather conditions. No sanctuary areas are provided in the spring since there is no hunting and waterfowl habitat is usually abundant in the Illinois River Valley due to spring flooding. Resident and migratory Canada geese also use the refuge during these periods; however, Canada geese will stay much later into the winter if pockets of open water are available. In recent years, the fall peak waterfowl populations have averaged 15,000 Canada geese and 94,000 ducks.

Bald eagles use the refuge and Lake Chautauqua from October through March, with the period of most intensive use being November through January. Peak numbers have averaged 25 - 50 over the last five years. The most important function of the refuge is to provide mature roost trees relatively unaffected by human disturbance. Food is also provided in the form of fish in the shallow waters of the lake, migratory waterfowl, and fish in the Illinois River injured by barge traffic.

Some conflicts exist between management of the refuge for waterfowl and having an optimum fisheries program. Lake Chautauqua is closed to all boats from October 16 through December 14 of each year to provide a sanctuary for migratory waterfowl and eagles. This period corresponds to the main migration time when extensive waterfowl numbers are present. This closure will be continued in the future. During the closure, fishing opportunities are reduced; however, public interest in fishing is also low due to poor weather conditions and the availability of other outdoor activities such as hunting. Bank fishing is permitted southeast of the cross dike to the break, at the Recreation Area and at Boatyard No. 3. In the spring, when fishing activity increases sharply, all waterfowl except nesting wood ducks have left the refuge, and conflicts are minimal.

Fishing use in the spring often takes place in flooded timber containing wood duck nesting boxes. However, no disturbance to nesting ducks has been observed. Wood duck broods concentrate along the lake shoreline in the spring and summer months and are disturbed by passing boats. However, the birds usually move only a short distance into heavy cover and are not harmed.

The primary conflict between waterfowl management and fisheries on the refuge has been the annual dewatering of Lake Chautauqua each summer for moist soil plant growth. The drainage program adversely affects fishing by reducing boat access, limiting bank fishing opportunities and by limiting the size of the fish population below what would be expected under stable water levels. During the drawdown, large numbers of fish, especially carp and shad, are observed going over the spillway. Fish remaining in the lake are subject to being killed if rainfall is low and summer temperatures high. Kills can be a serious problem since they greatly increase the possibility of a botulism outbreak. They also become very controversial with local residents and the general public. The elevation of the west spillway prevents a complete drawdown of the lake. It also inhibits the exit of all fish from the lake. Drawdown techniques which allow fish time to escape will not be effective without an engineering design change to the spillway.

During the winter months, fish populations are also subject to mortality if the ice cover is especially thick and covered with snow for long periods. Winterkills are a recurring event but are less severe than summer fish kills. The winter mortality is usually limited to a few species like gizzard shad that are less tolerant to low dissolved oxygen levels. During the spring high water periods, large numbers of fish move back into the lake and the fish population is restocked. The lake then serves as a spawning and nursery area.

Fish populations cannot be managed at Chautauqua under the current water management regime for moist soil plant production, and the frequent floods from the Illinois River. Changes in the refuge's regulations allowing more bank fishing and commercial fishing will permit better utilization of the fishery resource, but will not significantly affect fish population levels.

C. Public Use

Fishing is the main form of public use on the refuge and complements most other public use programs. Visitors coming to fish also engage in other activities such as boating, canoeing, wildlife observation and picnicking.

A total of 24,893 fishing visits were recorded for the refuge in 1986. This was 11.5% above the number of visits in 1985; however, it was 13% below the current five-year average of 28,492 visits. June is the peak month for fishing on the refuge and 5,047 visits were recorded in 1986. Over 85% of the total fishing visits occur between the months of March and August. Catfish, bullheads, crappie, bluegill and white bass are the most popular game fish taken by sport fishermen.

Lake Chautauqua provides fishing opportunities and experiences similar to that available in a series of backwater lakes throughout the Illinois River Valley. These areas are periodically inundated by flooding of the Illinois River and have been degraded by siltation and sedimentation. Most of the lakes are classified as navigable waters or are managed by the Illinois Department of Conservation as public hunting and fishing areas. As on Chautauqua, opportunities to directly manipulate fisheries are very limited due to the flooding and sedimentation problems. Management actions are directed towards providing maximum recreational opportunities on these lands.

The potential exists to greatly increase fishing opportunities on Chautauqua Refuge. The capacity of the lake to provide fishing far exceeds present levels of use despite the fact that fishing visits and activity hours are close to the 1979 Master Plan objectives. Three changes in refuge regulations for public use during the non-waterfowl period are recommended. These changes would allow more bank fishing, the use of larger motors up to 25 HP, and commercial fishing in accordance with state laws. These changes would not increase conflicts with the waterfowl program beyond those already discussed. There are no conflicts between the fishing program and other refuge public use programs.

D. Commercial Fishing

Commercial fishing was once a popular activity on Chautauqua Refuge in the 1950's and 1960's. Fishing was permitted in accordance with state regulations under a special use permit issued by the Refuge Manager with a charge of $1.00 per net. All commercial fishing was terminated on December 31, 1973, due to funding reductions which precluded effective administration and enforcement of the program. At that time, there were seven commercial fishing permittees.

Since closure of the commercial fishing program, there has been a series of continual requests from a small, mostly local, group of commercial fishermen that would like to see the program reinstituted. The Service's response to these requests has been no decision would be made prior to the development and approval of a refuge fishery management plan.

Surveys of Lake Chautauqua by both the Illinois Department of Conservation and the Service's fishery biologist have shown a large rough fish population dominated by carp and buffalo, the two most common commercial fish species. Both reports recommended a commercial fishing harvest program to promote the wise use of this under-utilized renewable natural resource.

In June 1098, 14 special use permits were issued for salvage commercial fishing in Lake Chautauqua to reduce the impacts of a fish kill during the summer drawdown period. Eight of the permittees reported removing a total of 25,008 lbs. of fish during the two week period. Carp made up 13,288 lbs. and buffalo 10,845 lbs. of the total. The majority of the fishermen reported that the fishing was some of the best in the Illinois River Valley and requested the program be continued in the future.

This plan recommends a commercial fishing program be instituted under a special use permit system administered by the refuge. (See Appendix E). Refuge specific regulations would be included in addition to state regulations to avoid conflicts with waterfowl use and sport fishermen. State enforcement personnel have indicated a willingness to assist with field checks and enforcement of the program. The program would require increasing the allowable horsepower limit on Lake Chautauqua, which is also recommended, and new boat launching facilities which have already been completed in October 1987.

E. Legal and Political Considerations

There are no existing legal considerations or constraints presently affecting the refuge fishing program. Water for refilling Lake Chautauqua in the fall is obtained from impounding water on Quiver

Creek and diverting it into the lake. Scheduled replacement of the weir on Quiver Creek will require new flowage easements on private land. Failure to obtain these easements could seriously affect the refuge's ability to provide waterfowl habitat in the fall, and subsequently, a supply of water for overwintering fish.

The dewatering of Lake Chautauqua each summer remains the most potentially controversial issue at the refuge. When the drawdown affects the fisheries directly through a fish kill, it generates public criticism, including Congressional inquiries. The Illinois Department of Conservation faces a similar situation on several of their conservation areas that are managed primarily for waterfowl. They are supportive of the moist soil system of waterfowl habitat management.

The Department's commercial fishery biologist has requested a commercial fishing program on the refuge for several years. His recommendation is supported by local commercial fishing organizations and businesses. Cooperation can be expected from the Department if such a program is initiated.

III. SPECIFIC UNIT PLANS

The refuge may be divided into the following four water areas: Quiver Creek, Liverpool Lake, Goofy Ridge Ditch, and Lake Chautauqua (See Appendix A). The first three areas are mainly ditches connected to the Illinois River and contribute very little to the refuge's overall fishing program. There is no water management or fishery management capabilities on these areas and they were not included in the fishery management recommendations received from Fishery Assistance (Appendix D). However, they are considered in the proposed fishing regulation changes. Therefore, Lake Chautauqua is the only water unit specifically addressed in this plan.

A. Unit Description - Lake Chautauqua

Lake Chautauqua is a large, shallow impoundment located within the floodplain of the Illinois River. It is the prominent feature of the Chautauqua National Wildlife Refuge. The lake covers approximately 3,562 surface acres at a normal pool elevation of 435.0 feet msl., with a maximum depth of 4.5 feet. The lake is between 1/2 and 1-1/2 miles wide and 6 miles long. A sand cross dike formerly divided the lake into two parts; a 1,120 acre north pool and a 2,422 acre south pool. The center portion of the dike was breached in 1971 and never repaired.

Water levels in the lake are manipulated through the following water control structures: four 12-foot wide radial gates with a flow line elevation of 433.5 ft. at the Goofy Ridge Ditch dike; the west spillway with three 6-foot wide stoplog bays at flow line elevation of 432.5 ft. and a flood elevation of 437.5 ft.; the 500-ft. south spillway at elevation 437.5 ft., and a 3 ft. x 3 ft. concrete box culvert with a screw valve control in the Quiver Creek dike with a flow line elevation of 433.0 ft. In addition, a sheet piling weir with a crest elevation of 438.0 ft. is located in Quiver Creek outside the lake's perimeter dike. Water impounded behind the weir can be gravity fed into Lake Chautauqua through the 3' x 3' structure.

The levee system of Lake Chautauqua is normally overtopped each spring by floodwaters of the Illinois River, when the river stage exceeds a 437.5 ft. level at the south spillway or west spillway. Because the lake is considered a floodway by the U. S. Army Corps of Engineers, the effective levee height cannot be raised beyond 437.5 ft. msl. Allowing the river to flow into Lake Chautauqua during flood periods protects diked agricultural lands on the opposite side of the river by lowering flood crests through the area.

From 1926 to 1942, aquatic vegetation was abundant in the lake. Sago Pondweed, longleaf pondweed, duck potato, marsh smartweed, coontail, and American lotus occupied 30 percent of the basin during this period. The highest flood on record occurred in the spring of 1943, cresting at nearly 17.5 feet over normal lake level. The flood eradicated all pondweeds and coontail declined greatly. Smartweed and bulrush declined and never recovered. American lotus recovered but subsequently declined in the early 1960's. Following the flood, aquatic vegetation was reduced to 13 percent of the lake surface area. Duck potato is now recovering with a few beds along the east shore of the north pool and the northeast side of the south pool. American lotus and sago pondweed now occur in the vicinity of the cross dike and other sections of the lake. Chufa, pigweeds, and teal grass are common along the shoreline when the lake is drawn down in the summer.

The once thriving sport and commercial fishery has declined. Service electrofishing in 1985 revealed game species accounting for only 14 percent by number and 10 percent by weight of the sample. These figures are high estimates of game species relative abundance since gizzard shad were not picked up, carp were only partially sampled, and a large buffalo population was not sampled by this method. An electrofishing sample collected by the Illinois Department of Conservation in 1965 showed that game species comprised 47 percent of the fish community. White crappie and bluegill were the dominant species collected.

Further documentation of the decline is seen in the results of three trap nets set overnight in 1985. Efficiency of this gear is high in shallow water for crappie and bluegill, with catch-per-unit effort and size structure reflecting the quality of the fishery for these species. The traps captured a total of only 8 white crappie, 17 black crappie and 3 bluegills. Good crappie angling can be expected when catches in the range of 30 - 60 fish per trap net day occur, while good bluegill fisheries reflect similar values.

Angler hours of fishing were estimated in 1984 to be 107,712, down from the previous 7-year mean of 110,218 angler hours. The lake is closed to boat fishing from October 16 - December 14. Areas outside the Lake Chautauqua levees are open to year-round public use except Quiver Creek. Bank fishing is permitted year round only on the south half of the cross dike and a portion of the north levee along Goofy Ridge ditch. Outboard motors are currently restricted to 10 horsepower or less (See Appendix B). A new concrete boat ramp was constructed on the south pool in the summer of 1987.

Commercial fishing was permitted on Lake Chautauqua from 1956 - 1973. Approximately 25 pounds per acre per year were harvested during that period. The fishery was terminated in 1973 for administrative reasons. The commercial fishery of the lake was assessed by Illinois Department of Conservation biologists during May 1985. Four 300-ft. long trammel nets of 2-inch, 2.5 inch, 3-inch, and 4-inch bar mesh and one 300-ft. gill net (4-inch bar mesh) were fished overnight in the south pool. Over 200 buffalo (15.1%), carp (33.0%), paddlefish (2.1%), freshwater drum (7.0%), channel catfish (3.0%) and carpsuckers (5.0%) along with 100 non-commercial gizzard shad, redhorse suckers, and 1 white bass comprising 32 percent of the sample were collected. Carp were 42% commercial size, buffalo 92%, carpsuckers 92%, channel catfish 91%, freshwater drum 63%, and paddlefish 100%. All fish were in good to average physical condition. The economic value of the potential commercial fishing catch was estimated at about $31,000 per year. Based on this survey, it was concluded the lake could support a viable commercial fishery which could be harvested at about 25 pounds per acre, the mean rate for years 1956 - 1971.

B. Wildlife Conflicts and Complements

Aspects of this topic have previously been discussed in Section II. B. above. In general, the fishing program on Lake Chautauqua does not adversely affect waterfowl or bald eagle use of the refuge. The fishing program complements the refuge's other public use programs by providing an activity that can be done in conjunction with other recreational pursuits.

The inherent conflict is between dewatering the lake each year for moist soil plant production and the requirements needed for developing an excellent fishery.

C. Fishery Management Problems

As stated above, the approved water management plan for Lake Chautauqua requires the entire lake to be managed as a single moist soil unit. Annual summer drawdowns are attempted as soon as water levels in the Illinois River permit gravity flow out of the lake. The remaining water area in the lake is too shallow and water temperatures too warm to sustain a diverse fish community.

Repeated flooding of the lake from the Illinois River deposits large quantities of silt and sediments which preclude the establishment of any significant stands of aquatic vegetation.

Wind generated turbulence in the shallow water keeps the flocculent bottom sediments of the lake in constant suspension severely reducing the production of submergent aquatic vegetation and reducing the quality of the fishery.

The toxicity of the bottom sediments has not been evaluated; however, this might also be a factor affecting the lake's fishery. Sediment sampling and analysis has been scheduled for FY 1988 by Ecological Services.

The rough fish population of the lake is under-utilized because commercial fishing has been prohibited. Bad public relations have resulted in the local community. Local commercial fishermen, who formerly used this historical fishing area, feel large numbers of commercial fish die during annual drawdowns and are wasted. However, a commercial fishing program would put an additional administrative burden on the refuge, and if unregulated, may cause conflicts with primary refuge objectives.

Current refuge sport fishing regulations limit fishing opportunities below their potential.

D. Objectives and Tasks

The immediate goal of fishery management at Chautauqua National Wildlife Refuge will be to manage the fishery of Lake Chautauqua to provide for increased recreational and commercial fishing opportunities which do not conflict with the primary refuge objectives. Emphasis will be placed on increasing bank fishing opportunities in areas currently closed to fishing, such as

Quiver Creek and the Lake Chautauqua perimeter dike. Future rehabilitation of the perimeter dike system, the cross dike, and the construction of new water control structures would greatly increase the potential for fishery management on Chautauqua and require a revision of this plan.

1. Increase the quality of sport fish populations.

   a. Under the current water management plan and the existing refuge facilities (dikes, spillways and water control structures), no improvement in the quality of sport fishing is possible. No facility construction or rehabilitation projects are approved or funded at this time.

      Target Date - Unknown

      Responsibility - Refuge
      Regional Office

      Funds - Unknown

      Staff Days - Unknown

2. Increase sport fishing opportunities.

   a. Develop a new set of sport fishing regulations that will increase public fishing opportunities without adversely impacting other refuge resources.

      Target Date - FY 1988

      Responsibility - Refuge

      Funds - $500.00

      Staff Days - 5

      The benefits from this change would be a better utilization of the refuge's renewable fish resources and better public relations with refuge visitors and the local community.

      Proposed new regulations include expanding bank fishing to include the entire refuge except for the October 16 through December 14 period, and the use of larger motors up to 25 HP.

3. Initiate a refuge commercial fishing program.

Target Date	-	FY 1988
Responsibility	-	Refuge
Funds	-	$500 - $1,000
Staff Days	-	3 - 10

This program would provide economic benefits to the Federal Government and the local community from an under-utilized renewable natural resource, and improve public relations with local commercial fishing groups.

IV. COOPERATION AND COORDINATION

The development of this fishery management plan was coordinated with Charles Surprenant, Fisheries Assistance Office, Carterville, Illinois, through a series of meetings and telephone calls. The fishery management recommendations (Appendix D) provided by FA were closely followed.

Development of a commercial fishing program on Lake Chautauqua was discussed with Bill Fritz, Illinois Department of Conservation Commercial Fisheries Biologist, Carlyle, Illinois. Sampling reports, letters and recommendations concerning commercial fishing previously furnished to the refuge by Mr. Fritz were reviewed.

Field enforcement problems of a commercial fishing program were discussed with Rick Schulte, Illinois Department of Conservation Officer for Mason County, Illinois.

Numerous unsolicited public comments, suggestions and recommendations concerning sport and commercial fishing were received at the refuge during 1987. Refuge files on fishery management were also reviewed.

V. EVALUATION AND UPDATE

Progress toward achievement of the stated objectives will be reviewed and evaluated annually by the Refuge Manager with the assistance of the Fishery Assistance Office. Fishery Assistance will conduct annual population sampling in Lake Chautauqua to provide biological information for the review. The plan will be revised or updated as needed to assure continued achievement of objectives.

A thorough review and update of the plan will be made every three years. The target date for the first update is January 1, 1991.

VI. LITERATURE REVIEW

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Mills, Harlow B., and William C. Starrett, and Frank C. Bellrose, 1966. Man's effect on the fish and wildlife of the Illinois River. Illinois Natural History Survey Biological Notes No. 57, 24 p.

Roelle, J. E., D. B. Hamilton, G. T. Auble, and D. A. Asherin. 1987. Refuge management analyses: water management alternatives at Chautauqua National Wildlife Refuge. U. S. Fish Wildl. Serv., National Ecology Center, Fort Collins, CO. NEC-87/13. 35 p.

Starrett, William C., and Arnold W. Fritz, 1965. A biological investigation of the fishes of Lake Chautauqua, Illinois. Illinois Natural History Survey Bulletin, Volume 29, Article 1, 104 p.

Starrett, William C., and Perl L. McNeil, Jr., 1952. Sport fishing at Lake Chautauqua near Havana, Illinois, in 1950 and 1951. Illinois Natural History Survey Biological Notes No. 30, 31 p.

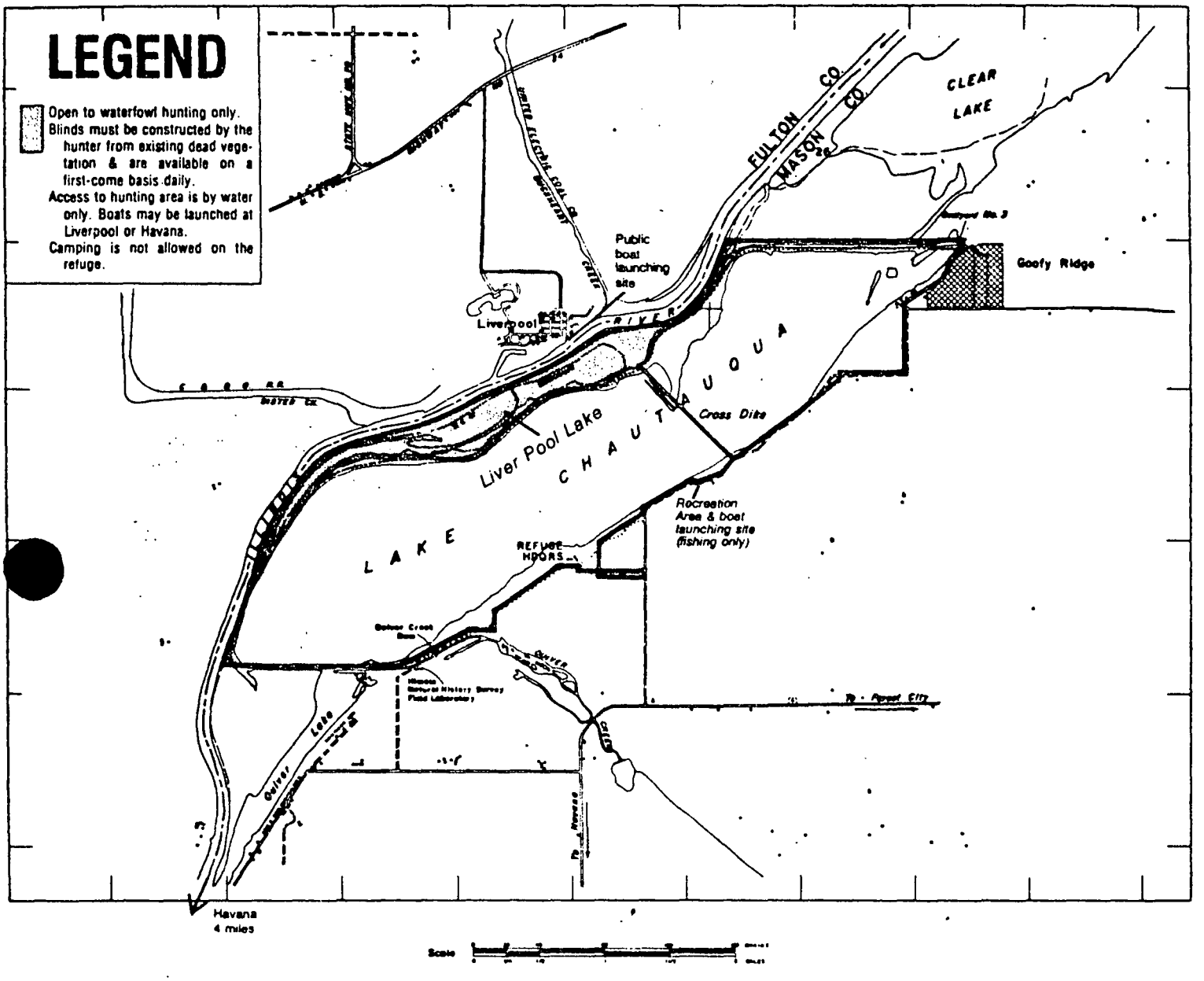
VII. APPENDICES

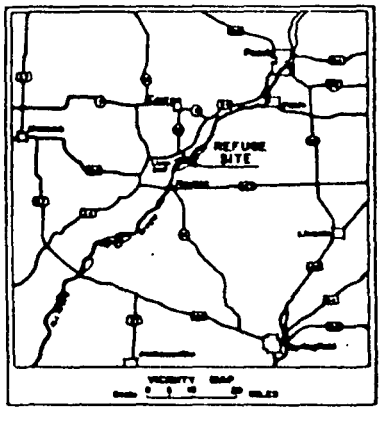
A. Refuge Map
B. Current Fishing Regulations/Leaflet
C. Proposed Fishing Regulations/Leaflet
D. Fishery Management Recommendations
E. Proposed Commercial Fishing Regulations

REFUGE MAP

CHAUTAUQUA NATIONAL WILDLIFE REFUGE

MASON COUNTY, ILLINOIS





Additional information regarding the Chautauqua National Wildlife Refuge may be obtained at the Refuge Headquarters, which is located nine miles northeast of Havana, Illinois, or by writing to:

Refuge Manager
U. S. Fish and Wildlife Service
Chautauqua National Wildlife Refuge
Havana, Illinois 62644
Telephone: 309/535-2290

REFUGE REGULATIONS

ALL ACTIVITIES ARE LIMITED TO DAY USE ONLY (SUNRISE TO SUNSET)

FISHING

From December 15 through October 15, **all waters of the refuge are open for fishing from a boat or through the ice. Bank fishing is permitted along the cross dike, at the Recreation Area, and at Boatyard No. 3 as posted. All other areas of Chautauqua Refuge are closed to bank fishing. Outboard motors not to exceed 10 H.P. are permitted. Fires are not permitted on the refuge. Small boats are not permitted, due to safety requirements and Coast Guard regulations.**

Private boats used must be removed overnight or moored at Boatyard No. 3 or the Recreation Area.

From October 16 through December 14, **fishing is permitted:**

- **Recreation Area cross dike to break in dike and Boatyard No. 3 as posted.**
- **Goofy Ridge Ditch**
- **Waters within the Public Hunting Area**

WILDLIFE OBSERVATION

From December 15 through October 15, **all of the refuge is open for wildlife observation**

From October 16 through December 14, **the land area from the observation tower up to and including all of the cross dike, and Boatyard No. 3 (north dike) is open for wildlife observation.**

NUT, BERRY AND MUSHROOM PICKING

Is permitted in areas open to wildlife observation.

HUNTING

Waterfowl hunting is permitted in Liverpool Lake section of refuge (located outside main dike). Regulations and map are on reverse side. Public boat launching sites located in Havana and Liverpool. State regulations apply. Access to area prior to sunrise.

General Regulations

Visitors are permitted in open portions of the refuge from sunrise to sunset.

Motorized vehicles are permitted on the refuge entrance roads and parking areas at the refuge headquarters, recreation area and boatyard #3. All other roads and trails are closed to any type of motorized vehicles.

Firearms, bows and fireworks are prohibited on the refuge except as designated for waterfowl hunting.

Destruction and/or disturbance of plant or animal life is prohibited.

Trespass into closed portions of the refuge is prohibited.

Fires, swimming, wading, camping and any other activity not specifically authorized is prohibited.

Sport Fishing

Sport fishing is permitted in accordance with State regulations as specified below.

December 15- October 15
The entire refuge is open to boat and bank fishing.

October 16 -December 14
Chautauqua Lake is closed to all fishing except bank fishing which is permitted along the south half of the cross dike and along the north (Goofy Ridge Ditch) dike.

Quiver Creek is closed to all fishing.

Liverpool Lake Public Hunting Area is closed to all bank fishing.

Commercial Fishing

Commercial fishing is permitted by special use permit only. Contact refuge headquarters for information.

Pets

Pets are permitted on the refuge but must be under the owner's control at all times.

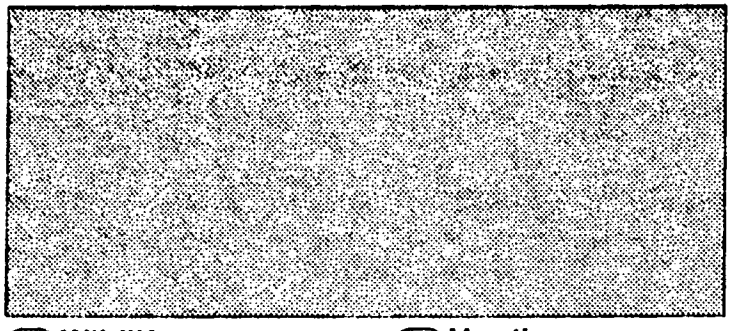
Picnicking

Picnic tables are available at refuge headquarters.

Boats

Refuge waters are open to boats in accordance with State regulations and refuge sport fishing regulations.

Boat motors larger than 25 horsepower are prohibited on Chautauqua Lake.



Wildlife Observation

December 15-October 15
The entire refuge is open to wildlife observation, photography and hiking.

October 16-December 14
Wildlife observation is permitted on the land area from the observation tower up to and including the south half of the cross dike and along the north (Goofy Ridge Ditch) dike.

Mushroom Collecting

Nuts, berry and mushroom collecting are permitted in areas open to wildlife observation.

Hunting

Waterfowl hunting is permitted in the Liverpool Lake portion of the refuge in accordance with State and Federal regulations and the special conditions listed below.

Access to the hunting area is only permitted from the Illinois River.

Hunters are allowed on the area from one hour before sunrise until sunset.

Retriever dogs are permitted.

The retrieval zone ends at the river side or the Chautauqua Lake perimeter dike. Hunters are not permitted on the dike.

Only temporary structures or blinds constructed of existing dead vegetation are permitted.

Cameron- Billsbach Unit

The Cameron-Billsbach Unit is located adjacent to the Illinois River approximately 70 miles north of Chautauqua Refuge.

Sport fishing is permitted from a boat in navigable waters from December 15 through October 15.

The land portion of the refuge is closed to all public use.

Meredosia Refuge

The Meredosia National Wildlife Refuge is located 60 miles south of Chautauqua NWR along the Illinois River near the city of Meredosia.
This refuge is closed to all public use activities.

APPENDIX D

FISHERY MANAGEMENT RECOMMENDATIONS

FOR

CHAUTAUQUA NATIONAL WILDLIFE REFUGE

Submitted by: Charles J. Surprenant
Project Leader
Fisheries Assistance Office
Carterville, IL
9/2/87

I. INTRODUCTION

Chautauqua National Wildlife Refuge is located in central Illinois along the Illinois River Valley 45 miles southwest of Peoria. This region is in an area of rolling terrain with the Illinois River Valley being a great, terraced trough several miles in width and about 150 feet lower than the surrounding upland. The eastern edge of the refuge is located along the east bluff of the valley. The land slopes to the southwest. the elevation of the refuge varies from 430 to 460 M.S.L.

The climate is typical of middle latitude, mid-continental areas, with a wide annual variation in temperature and rainfall. The average annual precipitation is 34.5 inches. Over one-half of the precipitation normally falls in the months of April through August. Annual snowfall normally accounts for less than 10 percent of the annual precipitation. Winter temperatures as low as -20°F. and summer temperatures as high as 110°F. have been recorded. Summer humidity varies from moderate to high.

The soils in the area are unconsolidated glacial drift approximately 75 feet thick consisting mostly of sand and gravel. The principal bedrock aquifers are contained in the Devonian, Silurian, and Ordovician Systems. A shallow limestone layer underlies the headquarters at a depth of 100 feet. The surrounding land is composed primarily of agricultural land. The major farming activity is the production of soybeans, corn, melons, and hogs.

A variety of habitat types are found within the refuge boundary. These are mixed bottomland hardwoods, buttonbush, willow swamps, and sedge marshes. The bluff area is vegetated at the top with oak-hickory upland hardwoods, grading downward to cottonwood, red maple, silver maple, sycamore, ash, and finally, black willow on the floodplain.

Primary Refuge Objectives include:

a. Protect and enhance refuge habitat to maintain or increase use by endangered or threatened species primarily the bald eagle.

b. Provide optimum conditions for mallards during the fall migration to achieve maximum production for birds returning to the breeding grounds.

c. Provide optimum conditions for migrating Canada geese consistent with distribution objective established for the Mississippi Valley Population in the Flyway Management Plan.

d. Increase woodduck production.

Secondary Refuge Objectives include:

a. Provide habitat and maintenance requirements for maximum number of species of migrating birds at optimum production levels.

b. Preserve bottom land hardwood ecosystems.

c. Provide opportunities to view and appreciate refuge wildlife populations.

d. Expand visitor understanding and appreciation of wildlife and Man's role in the environment.

e. Provide hunting and fishing opportunities.

Water areas under management by Chautauqua NWR include Meredosia Slough on the Meredosia Unit, Goofey Ridge Ditch, Quiver Creek and Lake Chautauqua on the main refuge unit. The principal water area is the 3,562 surface acre Lake Chautauqua. The lake is separated from the Illinois River by a nine mile levee system.

Meredosia Slough is a shallow side channel off of the Illinois River. The area is closed to all public use as a covenant in the acquisition deed. No fisheries objectives are set for this site and the area will not be treated in this report.

Goofey Ridge Ditch and Quiver Creek are open continuously to the Illinois River system with no fishery management potential.

The purpose of these recommendations is to assist the Refuge Manager in determining goals, set objectives, and formulate tasks necessary to restore and/or maintain quality fishing on Lake Chautauqua and other Refuge waters.

II. RELATIONSHIP OF FISHERY MANAGEMENT TO REFUGE OBJECTIVES

A. Objectives and Strategies
B. Wildlife Use and Production
C. Public Use
D. Commercial Fishing
E. Legal and Political Considerations

NOTE: Part II. A.-E. to be completed in Refuge Fishery Management Plan.

III. UNIT PLANS

A. UNIT PLAN 1. - LAKE CHAUTAUQUA

1. UNIT DESCRIPTION

Lake Chautauqua is located in Mason County, Illinois within the floodplain of the Illinois River and is part of Chautauqua NWR. At normal lake stage(435.0 feet M.S.L.) the lake covers 3,562 surface acres, is between one-half and one and one-half miles wide and over 6.0 miles long. A breached cross dike divides the lake into two parts, a 1,120 acre North Pool and a 2,442 acre South Pool.

The area now covered by the Lake was formerly a series of lakes and marshes connected to the Illinois River. In 1916, the Chautauqua Levee and Drainage District was formed, and between 1917 and 1922 this group had the water areas leveed and drained for agricultural purposes. In the fall of 1926, flood waters from the river washed out sections of the levee system and flooded the area. The District was not reclaimed. In 1936, the U. S. Biological Survey initiated purchase of the area for use as a National Wildlife Refuge. The Biological Survey had the levees repaired, and constructed spillways and control gates. The most recent major levee rehabilitation was completed in 1985 when the levees were restored to a uniform height of 440 feet M.S.L. In 1969, the cross dike was completed. Floodwaters in 1973 breached the cross dike and South Pool Levees. From 1973 to 1975, the dike was annually breached and repaired by robbing sand fill from adjacent levee areas and filling the hole. The hole was left unfilled in 1976 and remains so to this date. During 1983 and 1984, work on the west spillway was completed and a new control structure added. Also in 1984, a re-hab project was completed on the West Dike to raise its elevation to 438.5 feet M.S.L.

The levee system of Lake Chautauqua is normally overtopped each spring by floodwaters of the Illinois River, when the river stage exceeds 437.5, the level of the South Spillway. Because the lake is considered a floodway by the U.S. Army Corps of Engineers, the levees cannot be raised beyond 440 feet M.S.L. Allowing the river to flow into Lake Chautauqua during flood periods, protects diked agricultural lands on the opposite side of the river by lowering flood crests through the area.

From 1926 to 1942, aquatic vegetation was abundant in the lake. Sago Pondweed, longleaf pondweed, duck potato, marsh smartweed, coontail, and american lotus occupied 30 percent of the basin during this period. The highest flood on record occurred in the spring of 1943, cresting at nearly 17.5 feet over normal lake level. the flood eradicated all pondweeds and coontail declined greatly. Smartweed and bulrush declined and never recovered. American lotus recovered but subsequently declined in the early 1960's. Following the flood, aquatic vegetation was reduced to 13 percent of the lake surface area. Duck potato is now recovering with large beds along the east shore of the North Pool and the Northeast side of the South Pool. American lotus and sago pondweed now occurs in the vicinity of the cross-dike and other sections of the lake. Chufa, pigweeds, and teal grass are common.

The once thriving sport and commercial fishery has declined. Electrofishing in 1985(Table 1.) revealed game species accounting for only 14 percent by number and 10 percent by weight of the sample. These figures are high estimates of game species relative abundance since gizzard shad were not picked up, carp were only partially sampled, and a large buffalo spp. population was not sampled by this gear. An electrofishing sample collected by the Illinois Department of Conservation in 1965 is compared to our 1985 sample and presented in Figure 1. for historical comparison. In 1965, game species comprised 47 percent of the fish community. White crappie and bluegill were the dominant species collected.

Further documenting the decline are the results of three trap net sets over night in 1985(Table 2.). Efficiency this gear is high in shallow water for crappie spp and bluegill with catch-per unit effort and size structure reflecting the quality of the fishery for these species. Traps captured a total of 8 white crappie, 17 black crappie and 3 bluegills. Good crappie angling can be expected when catches in the range of 30-60 fish per trap net day occur, while good bluegill fisheries reflect similar values.

Angler-hours of fishing was estimated in 1984 to be 101,712, down from the previous 7 year mean of 110,128 angler-hours. The lake is closed to boat fishing from December 15 to March 15. Areas outside the Lake Chautauqua levees are open to year round public use. Bank fishing is permitted year-round on the south half of the cross dike and the north levee. Outboard motors are restricted to 10 horsepower or less. An existing boat ramp on the South Pool has recently been improved.

Commercial fishing was permitted on Lake Chautauqua from 1956 - 1971. Approximately 25 pounds per acre per year was harvested during that period. The fishery was terminated in 1972 for administrative reasons. The commercial fishery of the lake was assessed by Illinois Department of Conservation Biologists during May, 1985. Four 300 feet long trammel nets of 2-inch, 2.5-inch, 3-inch, and 4-inch bar mesh and one 300-foot gill net(4-inch bar mesh were fished overnight in the South Pool. Over 200 buffalo(15.1%), carp(33.0%), paddlefish(2.1%), freshwater drum(7.0%), channel catfish(3.0%), and carpsuckers(5.0%), along with 100 non-commercial gizzard shad, redhorse suckers, and 1 white bass comprising 32 percent of the sample were collected(table 3. and figure 2.). Carp were 42% commercial size, buffalo 92%, carpsuckers 92%, channel catfish 91%, freshwater drum 63% and paddlefish 100%. All fish were in good to average physical condition. The economic value of the potential commercial fishing catch was estimated at about $31,000 per year (Figure 3.). Based on this survey it was concluded the lake could support a viable commercial fishery which could be harvested at about 25 pounds per acre, the mean rate for years 1956-1971.

2. WILDLIFE CONFLICTS AND PROBLEMS

This Section to be completed in Refuge FMP.

3. FISHERY MANAGEMENT PROBLEMS

a. Current Water Management Plan requires the entire lake to be managed as a single moist soil unit. Annual spring drawdowns are attempted as soon as water levels on the Illinois River permit gravity flow from the lake.

b. Wind generated turbidity reduces production of submerged aquatic vegetation and reduces the quality of the fishery.

c. The rough fish of Lake Chautauqua are underutilized because of a ban on commercial fishing. Bad public relations result. Local commercial fishermen, who are barred from an historical fishing area, feel large numbers of commercial fish die during annual drawdowns. However, an unregulated commercial fishery may cause conflicts with refuge objectives.

d. Current refuge sport fishing regulations limit fishing opportunities below their potential.

4. FISHERY MANAGEMENT GOALS AND OBJECTIVES

The goal of fishery management at Chautauqua National Wildlife Refuge will be to manage the fishery of Lake Chautauqua to provide for recreational and commercial fishing opportunities which do not conflict with Primary Refuge Objectives and the current Master Plan. Emphasis should be placed on increasing bank fishing opportunities in areas currently closed to fishing, such as Quiver Creek and the Lake Chautauqua Levee system.

OBJECTIVE 1. Increase the quality of sport fish populations.

TASKS

Under the current Water Management Plan and the existing Refuge facilities(dikes, spillways and control structures), no improvement in the quality of sport fishing is possible.

Tasks related to the improvement of the quality of sport fishing should be re-evaluated if proposed development projects under EMP, ARMM, or RP programs are funded and provide water management options.

OBJECTIVE 2. Increase sport fishing opportunities.

TASKS

a. Develop a new set of sport fishing regulations that increase public fishing opportunities without adversely impacting other refuge resources.

BENEFITS

a. Better utilization of the refuge's renewable fish resources.

b. Better public relations with refuge visitors and the local community.

OBJECTIVE 3. Return an economic gain from and under-utilized resources,the commercial fishery.

TASKS

a. Develop a regulated commercial fishing program to harvest commercial species on the refuge.

b. Develop a permit fee to recoup administrative costs.

BENEFITS

a. Better utilization of the refuge's renewable commercial fishery resources.

b. Better public relations with the local commercial fishing groups.

c. Economic return to local community.

5. COOPERATION AND COORDINATION

Development of these recommendations was closely coordinated with Tom Sanford, former Refuge Manager and Eric Sipco, current Refuge Manager. Field assistance in sampling and advice on commercial fishing programs was provided by Mr. Arnold(Bill) Fritz, Commercial Fishery Biologist, Illinois Department of Conservation, Caryle, Illinois.

6. EVALUATION AND UPDATE

Annual population monitoring of Lake Chautauqua will be completed by the Fishery Assistance Office in cooperation with the Illinois Department of Conservation. Fishery Management Recommendations will be updated every five years unless required sooner because of biological necessity.

7. ALLOCATION OF RESOURCES

This section to be completed in Refuge Fishery Management Plan.

APPENDIX A

Proposed changes in refuge fishing regulations to increase sport fishing opportunities.

1. Bank fishing will be permitted in all portions of Lake Chautauqua, Liverpool Lake and Quiver Creek during periods when the areas are open to fishing.

2. Outboard motor horsepower limit will be increased from a maximum of 10 to 25 horsepower.

3. No restrictions will be placed on "small boats" that meet Illinois boating regulations.

APPENDIX B

Proposed commercial fishing regulations:

1. Commercial fishing is permitted in accordance with State and Federal regulations and the following special conditions.

2. Licensed commercial fishermen must obtain a refuge special use permit. The fee is $100.00 per permit.

3. Each commercial fishermen may have one assistant whose name is listed on the special use permit. No other individual may assist without prior notification of the refuge manager.

4. Only gill nets, trammel nets and hoop nets may be used on the refuge.

5. Commercial fishing is permitted from March 1 to September 1 each year.

6. Only carp, drum, buffalo, carpsuckers, shad, gar(except alligator gar), bowfin, and goldeye may be taken. All other species must be released immediately upon raising each net.

7. No other species may be possessed by commercial fishermen or their assistants on the refuge.

8. Nets may not be set prior to one hour before sunrise and all nets must be removed from the refuge by sunset each day.

9. From March 1 through April 30, all gill nets and trammel nets must be under the immediate supervision of the permittee or his assistant.

10. All commercial fishermen must submit a signed weekly catch report to the refuge office on forms provided showing species and poundage of all fish taken on the refuge. All non-target species accidentally killed by commercial fishing activities shall also be reported.

11. Boats with motors up to 50 horsepower may be used only for commercial fishing activities. "No Wake" speeds will be used when near any other boats.

12. No nets may be set within 300 feet of any shoreline.

13. Violation of any applicable State or Federal regulation or any condition of the special use permit will result in immediate termination of the permit without refund of permit fee. Individuals will not be eligible for future special use fishing permits.

Table 1. Results of 1.3 hours of A.C. electrofishing at Lake Chautauqua on 5/22/85
(Note: gizzard shad not picked up)

SPECIES	NUMBER	CPUE (FISH/HOUR)	MEAN LENGTH*	LENGTH RANGE*	MEAN WEIGHT**	TOTAL WEIGHT**	PERCENT NUMBER	PERCENT WEIGHT
Carp	127	98.0	13.9	6.7 - 11.6	1.41	179.0	42.1	72.7
Freshwater drum	52	40.0	9.7	4.0 - 13.3	0.47	24.5	17.2	10.0
Carpsucker spp.	40	30.8	4.6	2.9 - 7.9	0.60	2.4	13.2	1.0
Largemouth bass	16	12.3	11.4	5.6 - 16.7	1.04	16.6	5.3	6.7
River carpsucker	19	14.6	8.7	3.7 - 13.9	0.40	7.7	6.3	3.1
Shorthead redhorse	5	3.8	14.1	10.5 - 16.3	1.19	6.0	1.7	2.4
Black bullhead	5	3.8	10.5	9.5 - 11.9	0.73	3.7	1.7	1.5
White crappie	4	3.1	10.1	9.6 - 10.5	0.49	1.9	1.3	0.8
Bluegill sunfish	14	10.8	4.5	3.0 - 7.0	0.11	1.5	4.6	0.6
Smallmouth buffalo	10	7.7	5.2	3.8 - 6.4	0.12	1.2	3.3	0.5
Walleye	1	0.8	12.0	-	0.63	0.6	0.3	0.2
White bass	2	1.5	5.8	5.0 - 6.6	0.12	0.2	0.7	0.1
Yellow bullhead	1	0.8	6.1	-	0.30	0.3	0.3	0.1
Hybrid sunfish	1	0.8	6.6	-	0.30	0.3	0.3	0.1
Green sunfish	1	0.8	5.9	-	0.15	0.2	0.3	Tr
Emerald shiner	3	2.3	2.1	2.0 - 2.3	Tr	Tr	1.0	Tr
Golden shiner	1	0.8	5.1	-	Tr	Tr	0.3	Tr
TOTAL	302	232.0				246.1		

* Measured in inches

** Measured in pounds

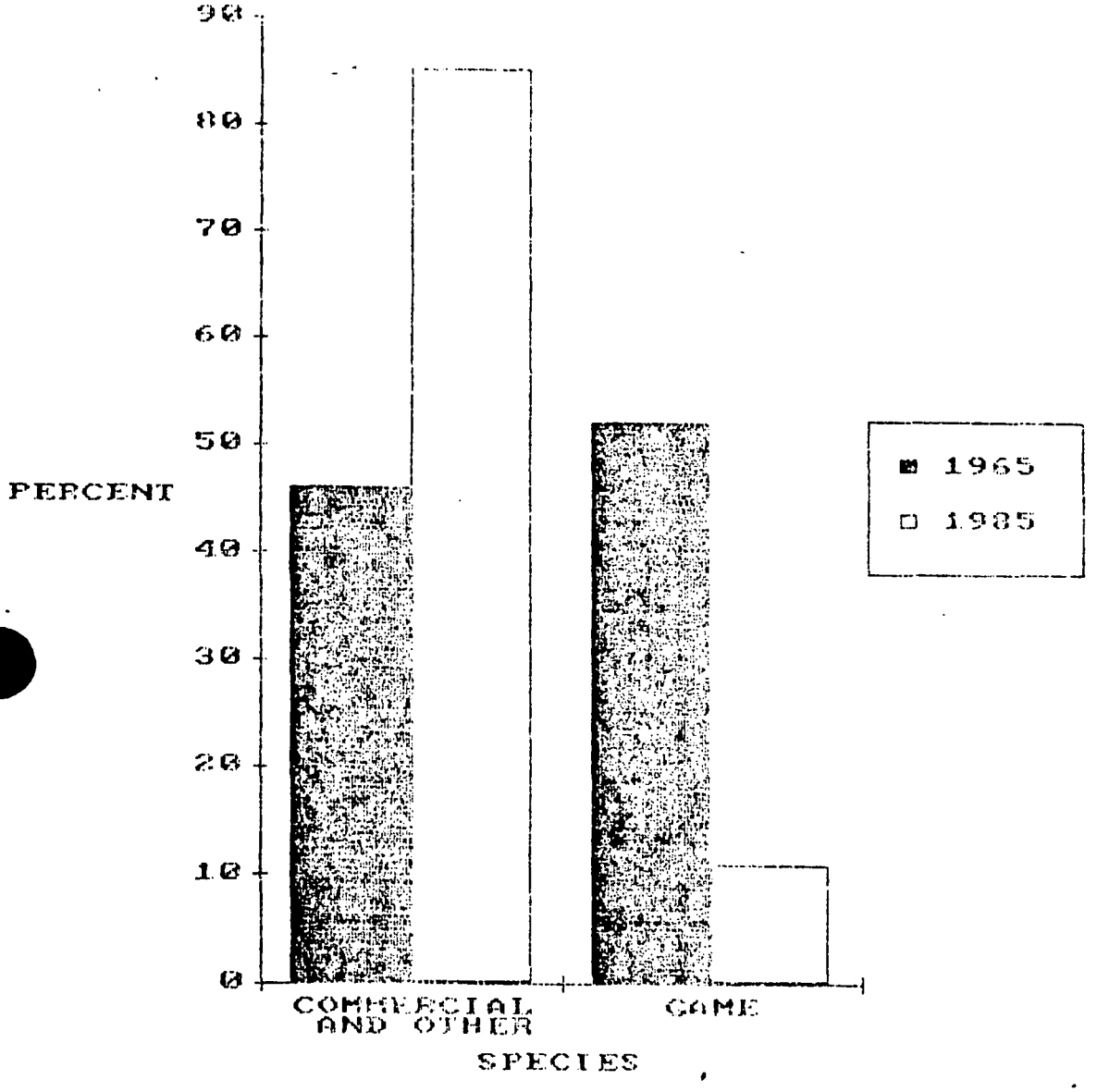


Figure 1. Percent composition of game, commercial and other species from electrofishing data collected in 1965 and 1985.

Table 2. Results of 3 trap net-days at Lake Chautauqua on 5/22/85

SPECIES	NUMBER	MEAN TOTAL LENGTH*	LENGTH RANGE*	MEAN WEIGHT**	TOTAL WEIGHT**	PERCENT OF TOTAL NUMBER	PERCENT OF TOTAL WEIGHT
Gizzard shad	190	10.3	4.7 - 14.1	0.40	76.0	66.7	56.3
Carp	21	14.1	10.3 - 17.2	1.22	25.7	7.4	19.0
Shorthead redhorse	6	15.7	14.7 - 23.2	1.36	8.2	2.1	9.0
White crappie	8	9.8	8.8 - 11.1	0.51	4.1	2.8	3.0
Bowfin	1	23.2	-	3.93	3.9	0.4	2.9
Black crappie	1	6.6	5.1 - 9.3	0.22	3.7	6.0	2.8
River carpsucker	4	10.7	6.1 - 12.8	0.91	3.6	1.4	2.7
Smallmouth buffalo	15	4.7	3.0 - 14.5	0.14	2.1	5.3	1.6
Freshwater drum	5	6.9	3.7 - 12.2	0.38	1.9	1.8	1.4
Sauger	1	12.3	-	1.18	1.2	Tr	0.9
Yellow bass	4	8.4	7.1 - 9.0	0.29	1.2	1.4	0.9
Goldfish	2	9.2	8.2 - 10.2	0.56	1.1	0.7	0.8
Black bullhead	2	10.0	9.5 - 10.5	0.56	1.1	0.7	0.8
Largemouth bass	1	10.6	-	0.62	0.6	0.4	0.5
Bluegill sunfish	3	4.4	3.9 - 6.4	0.11	0.3	1.1	0.2
White bass	2	4.5	4.4 - 4.7	0.04	0.1	0.7	Tr
Bigmouth buffalo	1	5.2	-	0.04	Tr	0.4	Tr
Green sunfish	1	3.9	-	0.03	Tr	0.4	Tr

* Measured in inch

** Measured in pounds

Table 3. Results of 4 trammel nets and 1 gill net set overnight on 5/22/85

SPECIES	NUMBER	MEAN WEIGHT*	TOTAL WEIGHT*	PERCENT OF TOTAL NUMBER	PERCENT OF TOTAL WEIGHT
Bigmouth buffalo	51	5.80	296.8	15.1	35.2
Carp	113	1.72	194.6	33.4	23.1
Paddlefish	7	20.00	140.0	2.1	16.6
Gizzard shad	97	0.76	74.3	28.7	8.8
Freshwater drum	24	1.84	44.0	7.1	5.2
Channel catfish	11	2.83	31.2	3.3	3.7
River carpsucker	12	1.83	22.0	3.6	2.6
Shorthead redhorse	10	1.70	16.7	3.0	2.0
Smallmouth buffalo	7	2.12	14.9	2.1	1.8
Quillback carpsucker	5	1.23	6.1	1.5	0.7
White bass	1	1.65	1.7	0.3	0.2

* Measured in pounds

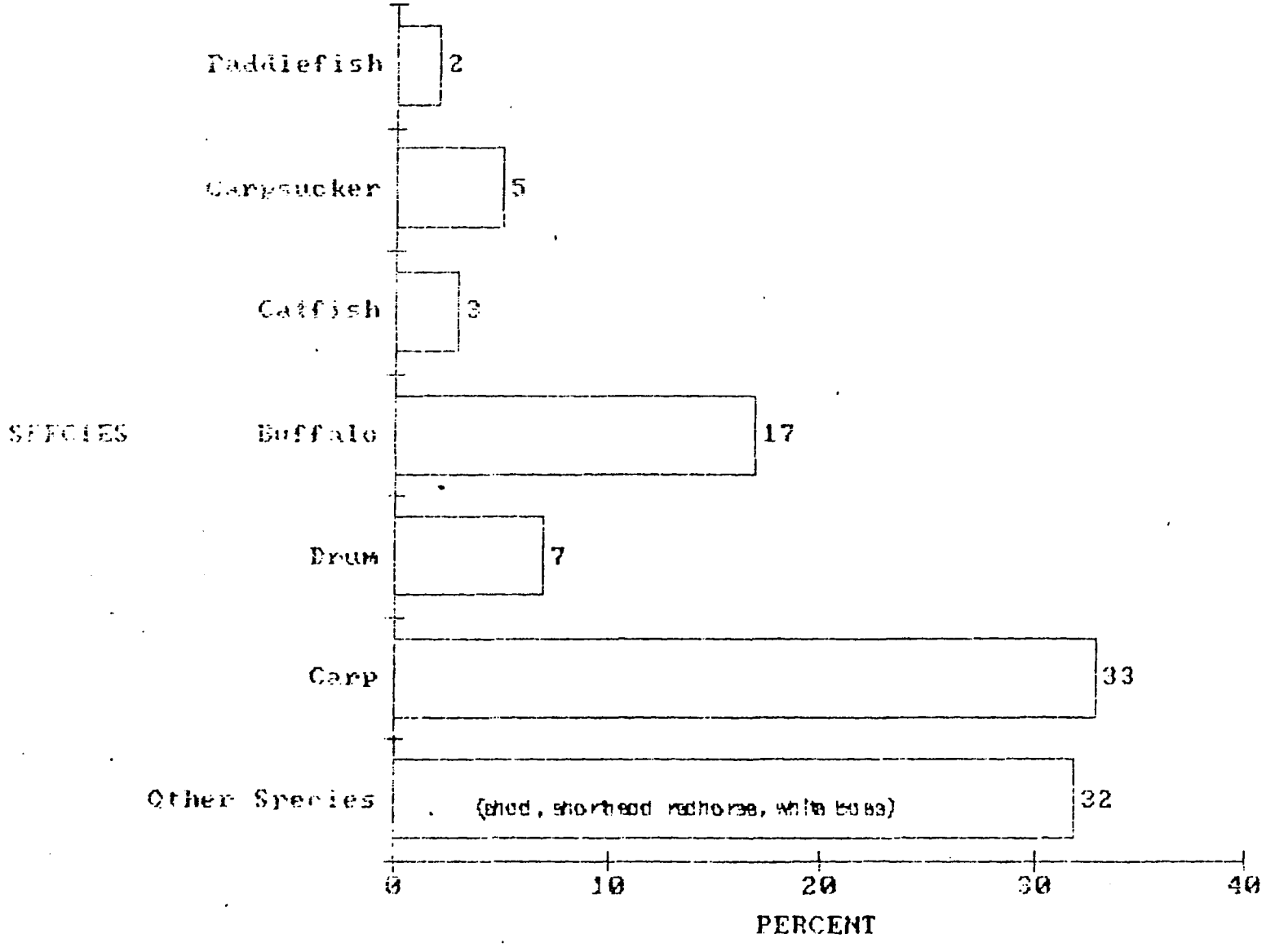


Figure 2. Percent composition by number of gill and trammel net catches on 5/22/85.

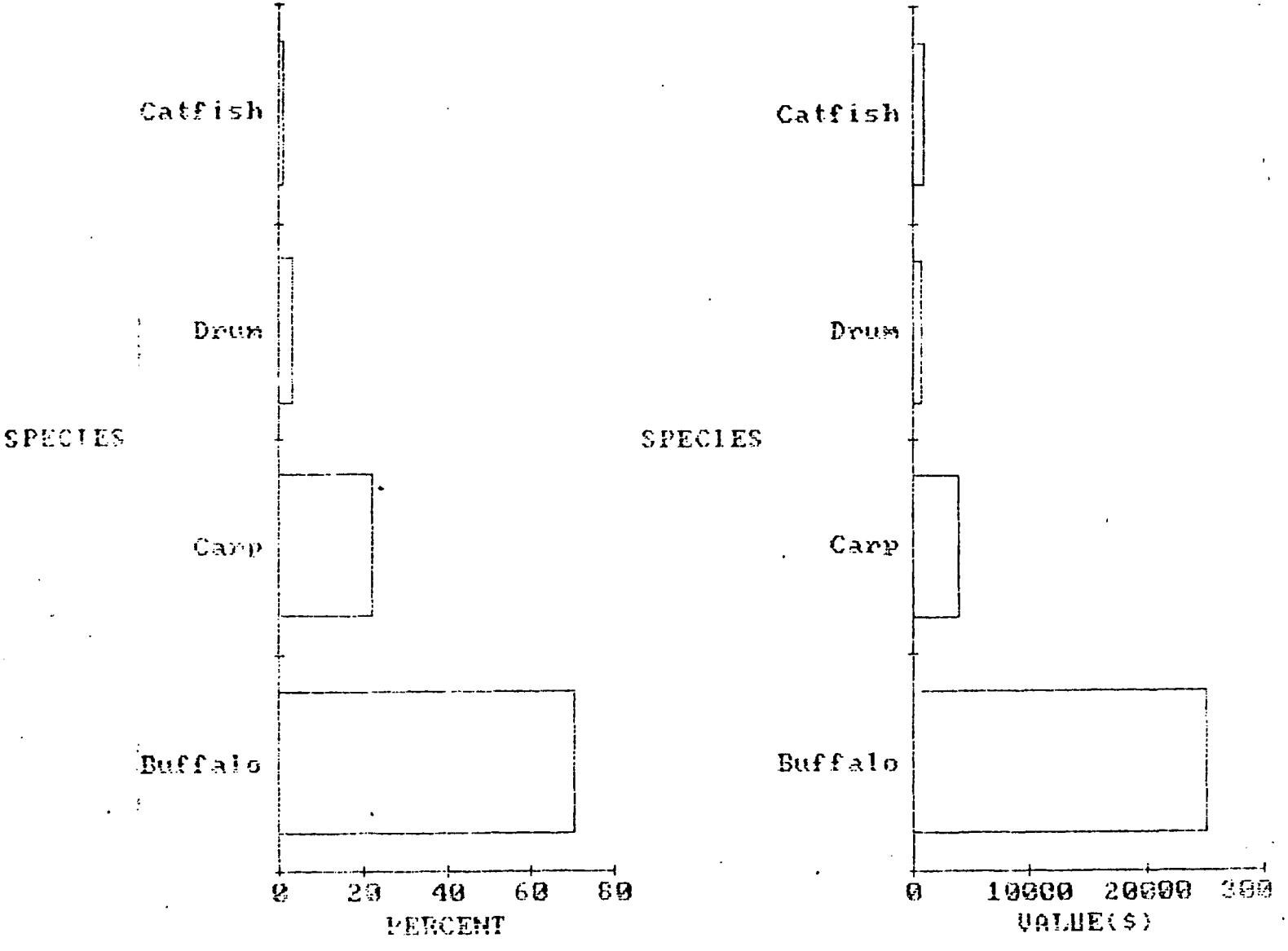


Figure 3. Percent composition and value of the commercial harvest from 1956 to 1971.

TAKE PRIDE IN AMERICA

[redacted]

United States Department of the Interior

FISH AND WILDLIFE SERVICE
FEDERAL BUILDING, FORT SNELLING
TWIN CITIES, MINNESOTA 55111

RECEIVED SEP 15 1987

IN REPLY REFER TO:
FWS/AF-FS1

SEP 10 1987

Memorandum

To: Assistant Regional Director (ARW)

From: Acting Assistant Regional Director (AF)

Subject: Revised Fishery Management Recommendations, Chautauqua National Wildlife Refuge - ACTION.

The subject report has been completed by Mr. Surprenant at the Carterville, Illinois, Fishery Assistance Office and is submitted for your review. These recommendations update those submitted in September 1985 and reflect discussions held during the February workshop in Fort Collins, Colorado. The recommendations point out that no improvement in the quality of sport fish populations is possible without completing dikes, spillways or other water control structures. However, several tasks are recommended to increase the opportunity for sportfishing and for utilization of commercial fish species.

We suggest that if your review of the attached plan results in approval, you proceed to develop the fishery management plan. To assist you, the recommendations are submitted in fishery management plan format.

Daniel H Bumgarner

Attachment

cc: Crab Orchard OFA

APPENDIX E

Proposed Commercial Fishing Regulations

Commercial fishing is permitted in accordance with State and Federal regulations and the following special conditions:

1. Licensed commercial fishermen must obtain a refuge special use permit. The fee is $100.00 per permit.

2. Each commercial fisherman may have one assistant whose name is listed on the special use permit. No other individuals may accompany commercial fishermen on the refuge.

3. All commercial fishing gear must be properly licensed and be the property of the commercial fisherman obtaining the special use permit. All equipment tag numbers must be recorded on the special use permit.

4. In addition to Illinois tagging requirements, all hoop nets and the beginning and end of all gill and trammel nets shall be marked with a clearly visible float showing the fisherman's name and special use permit number.

5. Only gill nets, trammel nets and hoop nets may be used on the refuge.

6. Only carp, drum, buffalo, carpsuckers, shad, gar (except alligator gar), bowfin, and goldeye may be taken. All other species must be released immediately upon raising each net.

7. No other fish species may be possessed by commercial fishermen or their assistants while on the refuge, regardless of where or how taken.

8. Commercial fishing is permitted from March 1 to September 1 each year.

9. Nets may not be set prior to sunrise, and must be removed from the refuge by sunset each day.

10. From March 1 through April 30, all gill nets and trammel nets must be under the immediate supervision of the permittee or his assistant, if licensed.

11. No nets may be set within 150 feet of any shoreline.

12. All special use permittees must submit a signed weekly catch report to the refuge headquarters on forms provided showing species and poundage of all fish taken on the refuge. Reports for each week shall be submitted no later than Wednesday of the following week. Signed reports will be submitted even if no fishing was done.

13. All animals other than fish (turtles, ducks, mammals, etc.) accidentally caught shall also be reported. Carcasses of all non-target species, except fish, accidentally killed shall be salvaged and turned over to the Refuge Manager on the day taken.

14. Boats with motors up to 50 horsepower may be used only for commercial fishing activities. "No Wake" speeds will be used when near any other boats.

15. All boats and trailers must be properly registered and the numbers recorded on the special use permit.

16. Violation of any applicable State or Federal regulation or any condition of the special use permit will result in the immediate termination of the special use permit without refund of the permit fee. In addition, individuals will not be eligible for a commercial fishing special use permit the following year.

Mail To

Bureau of Sport Fisheries and Wildlife
Division of Fishery Services

Annual Project Report, 1972
Fishery Management Program

Chautauqua National Wildlife Refuge
Mason County, Illinois

by

James S. Harrison
Fishery Management Biologist

Description of Area: Chautauqua National Wildlife Refuge occupies about 4,500 acres adjacent to the east bank of the Illinois River 10 miles northeast of Havana in central Illinois. Lake Chautauqua, a shallow, turbid, flood plain lake accounts for nearly 80 percent of the Refuge holdings. Historical records show that Lake Chautauqua was once an important commercial and sport fishing area but heavy siltation, primarily from flooding on the Illinois River, has reduced the lake depth by over 50 percent in the past 30 years. In 1968-69, a cross dike dividing Lake Chautauqua into a 1,200 acre north pool and a 2,400 acre south pool was completed. The north pool is now isolated from the Illinois River except during severe flooding and fishery potentials should be re-examined.

Year Fishery Management Began: 1967

Total of Lakes, Ponds, Reservoirs on Management Area: No. 2 Acres: 3,600

Total of Lakes, Ponds, Reservoirs Under Management: No. 2 Acres: 3,600

Number of New Lakes, Ponds, Reservoirs Developed Since Last Report: No. None Acres: --

Total Number of Streams on Management Area: No. None Miles: -- Acres: --

Total Number of Streams Managed: No. None Miles: -- Acres: --

Dates Visited: October 12, 13 and 14, 1972

Total Man-days Expended per Management Area: 5

Total Man-days Fishing this Year: 3,562 Last Year: 3,562

Is Public Fishing Permitted? Yes

Persons Contacted: John Toll, Refuge Manager

MANAGEMENT RECORD

Body of Water			Stocking Record		
Name of Lake, Pond, or Stream	Acres/Miles	Species Managed	Species	Number	Average Length (inches)
Lake Chautauqua	3600 acres	BLG, CCF	None		
Lower pool	2400 acres	YLB, CAP Crappie Buffalo			
Upper pool	1200 acres	CAP, CCF BLG, LMB FRD, OSF Crappie	None		

CHEMICALS USED IN BIOLOGICAL CONTROL

Name of Lake, Pond, or Stream	Chemical	Target	Pond's Active Ingredients	Surface Acres or Miles	Acre-feet Treated
None					

Recommendations:

1. Determine the apparent changes in water quality, composition of fish populations and other ecological factors resulting from the construction of the cross dike and division of Lake Chautauqua into two separate basins.

2. Investigate sources of domestic enrichment that may be entering the north pool from housing developments along the east shore.

3. Investigate drawdown potentials for the north pool and determine the costs and benefits that could accrue from renovation of this isolated basin.

4. Determine those factors that might contribute to the high density of yearling largemouth bass present in the slough adjacent to the headgate in mid-October and if these fish might be utilized in Lake Chautauqua.

5. Determine if dock and shoreline development along the west bank of the Illinois River may be contributing to the erosion of the dike that once isolated Lake Chautauqua.

6. Following the death of Dr. William Starrett in 1972, Dr. Sparks was named by the Illinois Natural History Survey to continue the survey work on the Illinois River. Management coordination should be developed with Dr. Sparks.

Summary:

During the management visit to the Chautauqua National Wildlife Refuge in October of 1972, it was apparent that construction of the cross dike and isolation of the 1,200 surface acre north pool caused several changes in the fishery potential associated with this basin. A severe phytoplankton bloom had imparted a deep green color to the water in north pool that contrasted with the silt turbidity common to the entire basin shortly after completion of the dike and still present in the south pool. Plankton sampling also revealed a high density of zooplankton in the north pool. No comparisons were made with conditions in the south pool which remains open to the Illinois River via an eroded section of the main dike.

Water clarity has decreased in the north pool due to the abundance of phytoplankton. Only in a small area just below the headgate, where some seepage was occurring, was the plankton density reduced. A high percentage of game fishes sampled by electrofishing were collected from this site (table 1). Whether changes in water quality resulting from the isolation of the north pool have contributed to this eutrophic condition is undertermined. This stagnating condition along with possible sources of domestic enrichment from residential areas along the east shore of the basin warrant further investigations.

A rapid die-off of phytoplankton as the water cools could reduce dissolved oxygen levels to critical levels prior to ice cover and decomposition may enhance winterkill potentials. Mid-winter measurement of both plankton density and dissolved oxygen levels should be considered.

Fish population sampling using electrofishing gear indicated excessive numbers of 14 to 20 inch carp in the north pool. Although complete pick up of this species was impossible they accounted for about 68 percent of the total weight recovered (table 1). Based on observations during this sampling, carp account for more than 90 percent of the standing crop in north pool. Gizzard shad ranked behind carp at about 19 percent by weight of the same recovered sample. Both adult gizzard shad up to 15 inches in total length and young-of-the-year fish averaging 3.6 inches in total length were common but not abundant. No other species contributed significantly to this sample although shortnose gar were frequently observed. Reports of a strong channel catfish population were not substantiated by this sampling technique and will require variable sampling gear.

Depending on the results of water quality tests and more detailed fish population sampling, it is possible that a complete renovation of north pool may be undertaken. Preliminary discussions with the refuge staff suggest that the north basin can be protected from normal high water limiting flooding to a 20 or 30 year frequency. Initial cost estimates indicate that the 1,200 surface acre north pool can be drained without pumping to approximately 700 surface acres averaging about one foot in depth. The cost of rotenone for complete renovation would then range from $2,000 to $3,000.

Before such a project is initiated several questions, in addition to those mentioned above, must be resolved.

1. Can water levels in the north pool be maintained at desired levels by normal runoff and spring flow without making frequent adjustments by opening the headgate?

2. Could public fishing and boating be incorporated into the management plan for Lake Chautauqua?

3. Are funds available for the purchase of the fish toxicant?

In assessing the fishery potential associated with the north pool, it is extremely doubtful whether an acceptable sport fishery can be established and sustained in this shallow basin. However, when compared to the present marginal fishery, some improvement can be made. Whether this improvement, along with a possible reduction in turbidity following the removal of the excessive numbers of carp, can be justified will be determined through more intensive survey work and detailed discussions with the refuge staff.

Submitted By:

Ingrid A. Harrison

Fishery Management Biologist
Date: October 30, 1972

Reviewed By:

R. L. McLain

Acting Regional Supervisor
Division of Fishery Services
Date: October 31, 1972

Distribution: FS-RO (1)
FS-CO (2)
FS-Princeton (1)
RF-RO (1)
Chautauqua NWR (1)
Illinois Dept. of Conservation (1)

Table 1. Fish Sampled by Electrofishing from the North Pool of Lake Chautauqua on October 12, 1972

Species	Number	Average Total Length (Inches)	Average Weight (Pounds)	Total Weight (Pounds)	Total Length Range (Inches)
Carp 1/	38	16.4	2.3	87.0	14.4-18.8
Green Sunfish	3	7.0	.3	.9	6.4- 7.8
Freshwater Drum	9	7.6	.3	2.5	5.5-12.8
Bluegill	9	4.9	.2	1.4	2.6- 8.0
Largemouth Bass	2	14.2	1.8	3.6	13.0-15.4
Black Crappie	4	10.1	.8	3.2	7.8-11.7
Gizzard Shad 1/	18	14.4	1.3	23.9	11.5-15.0
Channel Catfish	1			.2	9.1
White Bass	1			1.2	13.1
Shortnose Gar	3	21.7	1.5	4.4	19.5-23.0
	88			128.3	

1/ Partial pick up of this species

Species & Abbreviations

Alewife (ALW)
American Eel (AEL)
Atlantic Salmon (ATS)
Bigmouth Buffalo (BIB)
Black Bullhead (BLB)
Black Crappie (BLC)
Blue Catfish (BCF)
Bluegill (BLG)
Bowfin (BON)
Brook Trout (BKT)
Brown Bullhead (BRB)
Brown Trout (BNT)
Carp (CAP)
Chain Pickerel (CHP)
Channel Catfish (CCF)
Coho Salmon (COS)
Fall Chinook Salmon (FCS)
Fathead Minnow (FHM)
Flathead Catfish (FCF)
Freshwater Drum (FRD)
Gizzard Shad (GZS)
Golden Shiner (GOS)
Goldfish (GOF)
Green Sunfish (GSF)
Kokanee (KOE)
Lake Trout (LAT)
Largemouth Bass (LMB)
Longear Sunfish (LSF)
Mooneyes (MOE)
Muskellunge (MUE)
Northern Hog Sucker (NHS)
Northern Pike (NOP)
Paddlefish (PAH)
Pumpkinseed (PUS)
Rainbow Trout (RBT)
Redbreast Sunfish (RBS)
Redear Sunfish (RSF)
Rock Bass (ROB)
Sauger (SAR)
Sea Lamprey (SLY)
Smallmouth Bass (SMB)
Smallmouth Buffalo (SAB)
Sockeye Salmon (SOS)
Orangespotted Sunfish (OSF)

Species & Abbreviations

Spotted Bass (SPB)
Spring Chinook Salmon (SCS)
Steelhead Trout (STT)
Striped Bass (STB)
Threadfin Shad (TFS)
Walleye (WAE)
Warmouth (WAM)
White Bass (WHB)
White Catfish (WCF)
White Crappie (WHC)
White Perch (WHP)
White Sucker (WHS)
Winter Chinook Salmon (WCS)
Yellow Bass (YLB)
Yellow Bullhead (YEB)
Yellow Perch (YEP)

Leader

FISHERY MANAGEMENT PLAN

PART I

Summary of Refuge Objectives Prospectus

The major portion of the 5,124 acre Chautauqua National Wildlife Refuge was established in 1936 for the protection and preservation of the migratory waterfowl resource. Lake Chautauqua was formerly known as the Chautauqua Drainage and Levee District. It was one of the many backwater areas along the Illinois River that was diked and drained for agricultural purposes shortly after 1900. After disastrous floods occurred in 1926, the area reverted to almost natural conditions. The Glen J. Cameron Division, which is located on the Illinois River 55 river miles upstream, was donated to the United States in 1960.

The ten year average (1956-65) fall peak mallard population has been near 177,000 birds and annual duck use days average 7,000,000. Management is directed primarily toward providing food, cover and protection for ducks and geese during migration periods and providing wood duck nesting and rearing habitat.

Objective Number One: Provide as near optimum conditions for resting waterfowl as is biologically and economically feasible. Such conditions should provide adequate aquatic food and water for large numbers of field feeding waterfowl such as mallards.

Objective Number Two: Provide as near optimum conditions for wood

duck production and rearing as is biologically feasible.

The third most important objective of the refuge management program is to provide a setting for wildlife orientated recreation such as bird watching, photography and nature study. Provision of submergent vegetation for diving duck food is also an important objective. The provision of maximum hunting opportunity on refuge lands is the fifth most important objective.

PART II

Policy on Fishery Management

Sport fishing is recognized as a nature orientated activity, but it can only be permitted as long as it does not interfere with the above mentioned primary refuge objectives. Commercial fishing provides economic gains to participating fishermen and fish as food for man. A satisfactory fishery management plan must provide for maximum sport fishing opportunity without endangering the primary objectives of the refuge.

All sport and commercial fishing shall be in accordance with State of Illinois laws. Any additional requirements for sport fishing shall be included as special conditions in the special regulations published in the Federal Register each year. Restrictions on commercial fishing activity shall be included as Special Conditions on Special Use Permits issued to individual fishermen.

Objective

The objective of the Fishery Management plan shall be directed primarily toward controlling the removal of fish by sport fishermen, commercial fishermen and the Illinois Department of Conservation. Management of water levels and development of suitable habitat conditions for the growth and reproduction of fishes shall be accomplished only when such management will not interfere with the present or future needs of waterfowl.

Sport Fishing

License Requirements

Each person who fishes on portions of the refuge open to sport fishing shall have a valid Illinois Hook and Line Fishing License or Trot Line License in possession for immediate presentation for inspection to Bureau of Sport Fisheries and Wildlife or Illinois Department of Conservation enforcement personnel. Persons under sixteen (16) years of age may fish without a license.

Season

Lake Chautauqua - From January 1 until March 14, ~~xxxxx~~ fishing through the ice or from a boat shall be allowed within an area 1/8 mile wide adjacent to the southeast edge of the lake between refuge headquarters and the north dike. During the March 15-September 30 period, fishing shall be allowed throughout the lake. From October 1 until December 31, fishing shall only be allowed withing an 1/8 mile radius of the Recreation Area and Boatyard No. 3.

10

Borrow Ditch and backwater areas - Fishing shall be allowed in the borrow ditch adjacent to the main dike from Boatyard No. 3 to the Quiver Creek dam and unmanaged backwater areas of the Illinois River during the January 1 - September 30 period only.

Illinois River - Fishing shall be allowed in the main channel of the river all year.

Liverpool Lake Pool A - No fishing shall be allowed in this managed waterfowl impoundment.

Quiver Creek - No fishing shall be allowed in the creek from the refuge boundary downstream to the Quiver Creek dam.

Weis Lake - No fishing shall be allowed in this shallow lake.

Methods of Fishing

Fishing devices that may be used for sport fishing are as follows: pole and line, throw line, trot line and buoyed ganging devices. Any other methods of taking fish shall not be allowed.

Additional Restrictions - Only one fifty (50) hook trot line shall be allowed per person. No bank poles shall be authorized. Use of spears, gigs or bow and arrow shall not be authorized for the taking of any fish or frogs. Bank fishing shall be allowed only within an 1/8 mile radius of the Recreation Area and Boatyard No. 3.

Commercial Fishing

License Requirements

Each person who fishes on portions of the refuge open to commercial fishing must have a valid Illinois Commercial Fishing Device License for each fishing device used on the refuge. Such licenses shall be in possession for immediate presentation for inspection to Bureau of Sport Fisheries and Wildlife or Illinois Department of Conservation enforcement personnel.

Special Use Permit

Commercial fishing by any person on any portion of the refuge shall be authorized only when a Special Use Permit is issued. Only those persons who are professional commercial fishermen (one who fishes for his livelihood) or helpers shall be issued permits. Neither the permittee nor his helper may have been implicated with the violation of any Federal game or fish law. Those persons who have been convicted for the violation of any provisions of the Illinois Game or Fish Codes within the past five (5) years shall not be issued a Special Use Permit for commercial fishing or be allowed to help a permit fisherman.

A total of not more than ten (10) fishermen with not more than one helper each shall be issued special use permits to fish commercially on the refuge.

Each fisherman shall remit three dollars ($3.00) for each commercial fishing device he uses on the refuge. Payment shall be made at the time the permit is issued. Minimum charge for each permittee shall be thirty dollars ($30.00). Helper's permits shall be issued without charge.

Each permittee shall keep a weight record by species of fish caught and shall submit a report to the Refuge Manager at the end of each month. A sample copy of the forms provided by the Bureau may be found on the next page.

Season

Lake Chautauqua - Hoop net fishing shall be permitted in the lake during the March 15 - September 30 period. Roundup fishing with hoop nets shall be permitted between July 1 or when the lake level reaches 435.00 m.s.l., whichever date is latest, and September 30. No commercial fishing shall be permitted within 1/8 mile of the southeast shore between refuge headquarters and the north dike.

Borrow Ditch and backwater areas - Hoop net and trammel net fishing shall be permitted in the borrow ditch adjacent to the main dike from the radial gate control structure to the Quiver Creek dam and unmanaged backwater areas of the Illinois River during the January 1 - September 30 period only. upper pool March 15 - Sept.

Illinois River - Hoop net, trammel net and basket trap fishing shall be allowed in the main channel of the river all year.

Liverpool Lake Pool A - No fishing shall be allowed in this managed waterfowl impoundment.

Quiver Creek - No fishing shall be allowed in the creek from the refuge boundary downstream to the Quiver Creek dam.

Weis Lake - No fishing shall be allowed in this shallow lake.

Methods of Fishing

Hoop nets with or without wings or leads may be used.

Fishes allowed to be taken

The following fish may be removed from refuge waters: carp, buffalo, freshwater drum, catfish, ~~paddlefish~~, bullhead, carpsuckers, ~~dogfish~~, bowfin, gar, redhorse, suckers and gizzard shad. No other fish or turtles may be removed.

Additional Restrictions

All hoop nets fished in Lake Chautauqua shall have a mesh size of 2½ inch bar measurement or greater.

No fishing shall be allowed in Lake Chautauqua on Sundays.

Fishing is only permitted between sunrise and sunset.

Fish Removal for Restocking

Fish may be removed from Lake Chautauqua by the Illinois Department of Conservation for the restocking of public, free-use ponds and lakes.

Authority

Authority for removal of fish from Lake Chautauqua for restocking is a Cooperative Agreement between the Illinois Department of Conservation and the Bureau of Sport Fisheries and Wildlife which was entered into April 24, 1962 and amended December 8, 1964.

Season

Removal of fish shall be allowed during the March 15 - October 15 period within an area 1/8 mile wide adjacent to the southeast shore and south dike between refuge headquarters and the south spillway.

Methods of Fishing

Fish removal shall be accomplished with hoop nets. Such nets shall be plainly marked as State property.

Fishes Allowed to be Taken

Any species of fish except largemouth bass may be removed from refuge waters.

Reporting

A report showing the number of each species removed and their distribution within the State of Illinois shall be submitted to the Refuge Manager by the Supervisor, State Fisheries Field Station, Havana, at the end of each month during the removal program.

Fish Removal for Exhibition Purposes

Fish may be removed for display at the Illinois State Fair by the Illinois Department of ~~Agriculture~~ Conservation.

Special Use Permit

Upon notification of the state biologist in charge, a Special Use Permit shall be issued for the removal of fish for exhibition purposes. No charge shall be made for the permit.

Fishes Allowed to be Taken

Any species of fish or eel may be taken.

Season

Removal operations usually take place in early August about one week prior to the opening of the State Fair.

Methods of Taking

All fish shall be taken with electric shockers and transferred to storage tanks at the State Fisheries Field Station, Havana, as soon as possible.

Reporting

A report showing the number of each species removed shall be submitted to the Refuge Manager by the State Biologist in charge within one week of removal.

Stocking

Stocking of fishes in refuge waters, if necessary, shall be based upon Bureau of Sport Fisheries and Wildlife, Division of Fisheries Services' recommendations only.

Chemical Control

No chemical control of fish populations in refuge waters shall be accomplished without written approval of the Regional Director.

Research

Research projects may be initiated on a short-term basis, but shall

not exceed 5 consecutive years. If research projects or censuses are necessary, it is desirable that they be planned and carried out by Division of Fisheries Services personnel. Projects that are conducted by the Illinois Natural History Survey or the Illinois Department of Conservation shall be fully outlined in a memorandum of understanding and shall be approved by the Regional Director and Director of the Bureau of Sport Fisheries and Wildlife.

Temporary Restrictions

Temporary restrictions may be made by the Refuge Manager to suspend sport fishing, commercial fishing, fish removal for restocking or exhibition, and research activities when it may be necessary to protect wildlife, wildlife habitat and/or refuge facilities such as roads, trails and dikes.

PART III

Program Description, Problems and Solutions

History

Sport Fishing

Sport fishing has always been permitted with very few restrictions. Until 1941, the fishermen concentrated in Haven's Slough (adjacent to Boatyard No. 2) and in the north borrow ditch. Although the entire refuge was opened to fishing in 1942, only a few fishermen fished in Melz Slough or in other areas more than a half mile from the three established boatyards.

During 1950, the Illinois Natural History Survey initiated a fisheries research program on the refuge. The Illinois Department of Conservation, through news releases and radio programs, informed anglers of the fishing possibilities at Lake Chautauqua. An effort to increase the hook and line yield was made in 1951, when a fishing "college" for anglers was conducted at Lake Chautauqua by Illinois Natural History Survey personnel, Bureau personnel and local "expert" fishermen. In 1952, a report was released by the Illinois Natural History Survey on the sport fishing. The report described successful methods of fishing, with the purpose of increasing the hook and line yield.

Average annual use of the refuge for fishing increased from 2500 use days (average annual use prior to 1950) to 10,500 use days for 1950. Use increased again in 1951 when outboard motors were authorized. As a result of interest aroused by the above mentioned studies, use continued to increase. In 1954, trotline fishing and year long fishing adjacent to the boatyards was authorized. This action also contributed towards an increase in use by fishermen. Approximately 40,000 fishermen used the refuge in 1955. A steady decline of use during the 1956-66 period was evident. By 1966 only about 15,000 fishermen used the refuge; however, use in 1967 jumped to 24,000 days.

Weis Lake on the Cameron District has been closed to sport fishing since the Bureau obtained the area in 1960. Prior to 1960 the lake was part of a private waterfowl hunting club. No records are available as to whether or not sport fishing was allowed.

Commercial Fishing

Commercial fishing was authorized with very little control until 1942 when the fishermen were required to obtain free Special Use Permits. As a result of Illinois Natural History Survey studies, it was determined that ~~the~~ Lake Chautauqua had a sustained fishery. That is, commercial fishing pressure had no effect on the size of the carp and buffalo population. Therefore, if commercial fishing was to be allowed, it was determined that the Bureau should realize some financial gain. In 1960, Special Use Permits were issued for a fee of $1.00 per fishing device, with the minimum fee being $10.00.

Carp and buffalo were the only species that could be removed during 1942. During 1943, taking of bowfin was authorized. Gar, drum, channel catfish and turtles were also approved ~~from~~ for removal in 1944. In 1955, flathead catfish, blue catfish, bullheads, eels and carpsuckers were also allowed to be removed.

Experimental commercial fishing of crappies was allowed in Lake Chautauqua in the 1951-54 period. During the 1955-63 period, commercial fishing of crappies was legalized in Illinois, but their removal was only authorized in Liverpool Lake.

Following is a tabulation of fish removed from the Chautauqua Division during the 1942-1967 period by commercial fishing permittees.

Year	Pounds Removed Lake Chautauqua	Pounds Removed Liverpool Lake	Total Pounds Removed	Number Permittees
1942	54,746		54,746	7
1943	49,977		49,977	7
1944	60,795		60,795	8
1945	73,375		73,375	7
1946	32,733		32,733	16
1947	21,912		21,912	19
1948	123,106		123,106	12
1949	91,921		91,921	20
1950	256,200		256,200	12
1951	233,796		233,796	11
1952	279,669		279,669	12
1953	229,045		229,045	8
1954	323,561		323,561	12
1955	267,953		267,953	13
1956	217,718		217,718	16
1957	327,758		327,758	14
1958	222,023		222,023	16
1959	153,660		153,660	10
1960	206,670	83,253	289,923	10
1961	137,481	71,147	208,628	11
1962	135,786	83,462	219,248	10
1963	188,408	43,407	231,815	10
1964	95,274	111,410	206,684	9
1965	213,202	74,894	288,096	10
1966	288,346	51,902	340,248	11
1967	188,534	70,507	267,041	11

All fishing in Lake Chautauqua has been done with hoop nets, while all fishing in Liverpool Lake has been done with hoop nets, basket traps and trammel nets except during the 1951-58 period when seining was allowed on the entire refuge.

Weis Lake on the Cameron Division has been closed to commercial fishing since the Bureau obtained the area in 1960. Prior to 1960, the lake was part of a private waterfowl hunting club. No records are available as to whether or not commercial fishing was allowed.

Fish Removal for Restocking and Exhibition

Fish removal for restocking by the Illinois Department of Conservation has taken place at the Chautauqua Division since the refuge was established. No restrictions have been placed on species to be removed except in 1967 when removal of black bass was prohibited. Following is a tabulation of fish removed during the 1942-1967 period.

Year	Number Fish Removed
1942	18,636
1943	37,305
1944	20,546
1945	20,716
1946	18,411
1947	16,142
1948	17,298
1949	26,600
1950	1,854
1951	3,926
1952	15,801
1953	157
1954	0
1955	7,283
1956	4,741
1957	4,151

Year	Number Fish Removed
1958	8,139
1959	6,686
1960	5,805
1961	4,750
1962	5,507
1963	6,164
1964	9,512
1965	8,239
1966	9,788
1967	10,326

Fish removal for exhibition purposes at the Illinois State Fair by the Illinois Department of Conservation has taken place since 1959. No restrictions have been placed on species to be removed.

Habitat Management

Brush pile construction

FWS/ARW-RF2

SEP 19 1988

Memorandum

To: Refuge Manager, Chautauqua National Wildlife Refuge

From: Regional Refuge Supervisor, RF2

Subject: Fishery Management Plan

The subject plan is being returned approved and with two "ATTABOY" awards!

You and your staff are to be commended on your cooperation and coordination with the Fishery Assistant Office at Carterville, Illinois.

Increased fishery management on refuges is one of Director Dunkle's recent initiatives and was also included in the FY90 budget tasks.

Thanks to you, your staff and Mr. Charles Surprenant for a job well done.

MATTHIAS KERSCHBAUM

Matthias A. Kerschbaum

Attachment

RF2:BHutchinson:mm:9/15/88:x3701