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FISHERY MANAGEMENT PLAN

Banks Lake National Wildlife Refuge

Prepared by: Laura G. Jenkins 12/15/88
U.S. Fish & Wildlife Field Office Date
Panama City, Florida

Concurrences: James M. Barkuloo 12/15/88
Project Leader Date
U.S. Fish & Wildlife Field Office
Panama City, Florida

Don R. Perkuchin 2/6/89
Refuge Manager Date
Okefenokee National Wildlife Refuge
Folkston, Georgia

______________________ __________
Fishery Division Supervisor (FS-2) Date
Fisheries and Federal Aid
Atlanta, Georgia

______________________ __________
Refuge Division Supervisor (RF-5) Date
Refuges and Wildlife
Atlanta, Georgia

Approvals:

______________________ __________
Assistant Regional Director Date
Fisheries and Federal Aid
U.S. Fish and Wildlife Service
Atlanta, Georgia

______________________ __________
Assistant Regional Director - Date
Refuges and Wildlife
U.S. Fish and Wildlife Service
Atlanta, Georgia

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Banks Lake National Wildlife Refuge

Executive Statement

Banks Lake National Wildlife Refuge, a satellite refuge of Okefenokee National Wildlife Refuge, is located in Lanier County one mile west of Lakeland, Georgia on Highway 122 (Appendix A). At one time Banks Lake was owned by the Rivers Estate and later sold to the Nature Conservancy. In 1980 the lake was leased to the U.S. Fish and Wildlife and became a National Wildlife Refuge in 1985.

The Banks Lake/Grand Bay area is one of the largest freshwater swamp systems in the coastal plains of Georgia. The refuge alone contains 3,550 acres of open water, marshes, and hardwood swamps; flatwoods, hammocks, and creek swamps (Appendix B). The majority of wetland consists of pond cypress and swamp shrub scattered in open water with an average depth of seven feet. Approximately 13 percent of the lake is classified as a deep cypress pond, while 59 percent is shallow cypress pond and shrub swamp (Banks Lake Sport Fishing Plan, 1980). (Wetland Classification[1]: System, lacustrine; Subsystems, limnetic, littoral; Classes, unconsolidated bottom, aquatic bed, emergent wetland.)

The only public access to the lake is at the refuge entrance near the intersection of Highways 122 west and 221 north. A privately run concession at the entrance provides a dock, boat ramp, boat and motor rentals and refreshments. Several private docks and access points are located along the lake. Banks Lake receives runoff from Milltown Bayou, Gator Run, Lee Pond and Berryhill Pond.

One water-control structure is located near the refuge entrance where overflow waters drain into a tributary of Alapaha River.

Fishing is the primary recreational activity of Banks Lake National Wildlife Refuge with largemouth bass and bluegill being the most sought after sport fish. Species of fish known to inhabit Banks Lake include:

Largemouth bass	*Micropterus salmoides*
Bluegill	*Lepomis macrochirus*
Chain pickerel	*Esox niger*
Brook silverside	*Labidesthes sicculus*
Swamp darter	*Etheostoma fusiform*
Lake chubsucker	*Erimyzon sucetta*
Florida gar	*Lepisosteus platyrhincus*
Bowfin	*Amia calva*

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1. Cowardin, Lewis M., Virginia Carter, Francis C. Golet, and Edward T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. Fish and Wildlife Service, Office of Biological Services, Washington, D.C., 103 pp.

Aquatic plant species known to inhabit Banks Lake include:

Lemon bacopa	Bacopa caroliniana	-	Emergent
Fanwort	Cabomba sp.	-	Submerged
Dollar bonnet	Brasenia schreberi	-	Emergent
Fragrant water-lily	Nymphaea odorata	-	Emergent
Banana-lily	Nymphoides aquatica	-	Emergent
Spatterdock	Nuphar luteum	-	Emergent
Water hyacinth	Eichhornia crassipes	-	Floating

The purpose of this plan is to describe the fishery resources of Banks Lake National Wildlife Refuge and to present a management scheme with supporting goals and objectives to best achieve the refuge's primary objectives which are as follows:

1. To provide optimum habitat and protection for endangered and threatened species.
2. To provide optimum habitat for a wide diversity of birds, mammals, reptiles and amphibians.
3. To provide protection to the unique natural qualities of the area.
4. To provide opportunities for wildlife-oriented recreation, interpretation, and environmental education.

Organizational Units- Total Effort

Organization Units	Total Effort (Staff days)				
	1988	1989	1990	1991	1992
Banks Lake NWR	10	10	15	15	20
Panama City, Fisheries Asst.(FAO)	30	7	7	7	25

Introduction

The fishery management plan for Banks Lake National Wildlife Refuge was prepared by the U.S. Fish and Wildlife Field Office, Panama City, Florida. Information and data to prepare the plan was provided or obtained by refuge staff, and a Panama City fishery biologist.

Prior to a three month winter drawdown in 1988, aquatic vegetation was abundant in the relatively shallow lake. Nearly sixty percent of the open water bottom was covered with fanwort, while floating and emergent plant types covered forty percent of the surface waters. The dense vegetation was a nuisance to fishermen and was becoming a threat to the fishery. In 1987-1988, the winter drawdown greatly reduced the amount of aquatic vegetation which improved the aquatic habitat and fish populations. The reduction of vegetation allowed the predator species to utilize forage fish more efficiently and the competition for food and space was reduced. In addition, the potential for an oxygen deficient fish kill was reduced.

Water quality analysis in Banks Lake indicates the habitat is low in fertility and productivity because of the watershed, but it is adequate to sustain and propagate warm water sport fish. The total alkalinity (50 mg/l) and hardness (12 mg/l) levels are in the lower ranges for more productive waters which are 125-400 mg/l in both total alkalinity and hardness (Appendix C).

Goals	Objectives	Task	Date	RF	FAO
Goal A. Manage, maintain and enhance the fishery resources as directed by refuge policies related to associated programs, objectives and available funding and staffpower.	Objective A. To maintain fish populations at a level to utilize a renewable resource and provide high quality wildlife oriented recreation.	Strategy A. Surveys and Inventories:			
		Task A-1. Compile a comprehensive fish species inventory and update as needed.	1989	S	L
		Task A-2. Compile a comprehensive aquatic and wetlands plant inventory and update as needed.	1989	S	L
	Objective B. To manage Banks Lake using a minimum combination of methods and equipment that would not degrade the value of the land	Strategy B. Habitat Management:			
		Task B-1. Continue to monitor and record water quality, being aware of any changes which may alter the aquatic environment (Appendix D).	Annual	L	S
		Task B-2. Increase the emphasis on aquatic vegetation control while remaining compatible with the intended refuge management objectives. Winter drawdown is proposed.	As Needed	L	S
		Task B-3. Document natural or unnatural loss of aquatic habitat.	As Needed	L	S

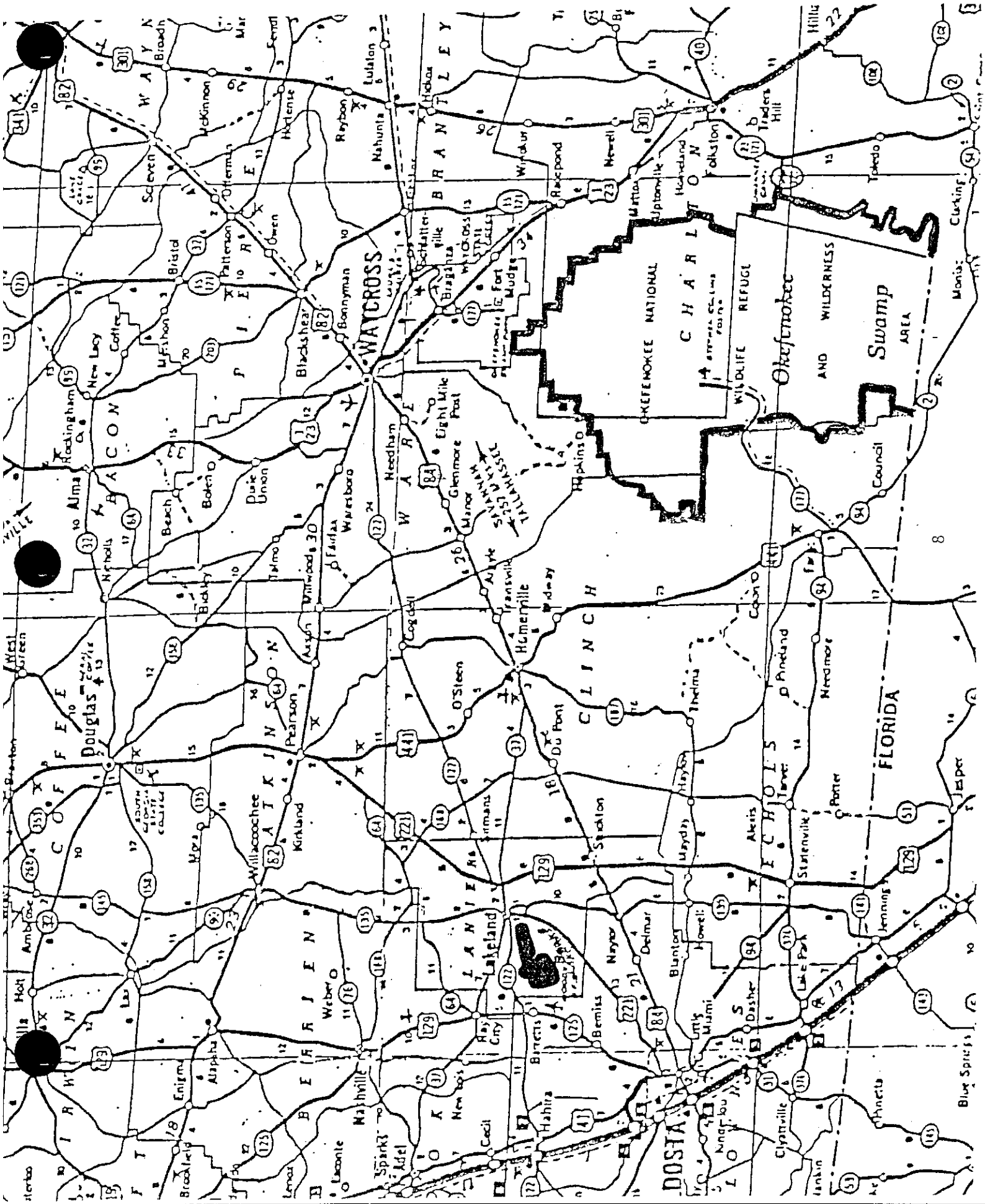
Goals	Objectives	Task	Date	RF	FAO
		Task B.4 Monitor water level fluctuations by installing a stationary water level gauge.	As Needed	L	S
	Objective C. Maintain a balanced, self-sustaining fish population and provide sport fishing opportunities which will emphasis the quality of the fishing experience.	Strategy C. Population Management:			
		Task C-1. Annually evaluate reproduction, population density, growth, and physical condition of the fishery and submit to the refuge manager a comprehensive report with findings and recommendations.	Annual	S	L
		Task C-2. Manage the harvest of sport fish in accordance with State laws. Refuge specific regulations will be implemented if necessary to maintain and provide public sport fishing.	As Needed	S	L
		Task C-3. Utilize spot creel checks randomly throughout the fishing season to monitor species diversity, and determine the quality of fishing and angler success (Appendix E). Creel checks should be randomly conducted during peak fishing hours at the convenience of refuge staff.	Annual	L	S

Goals	Objectives	Task	Date	RF	FAO
		Task C-4. Utilize self directed creel checks to determine quality of fishing and angler success (Appendix F), by providing creel forms for fishermen to fill out and return to a suitable location.	Annual	L	S
	Objective D. Protect the aquatic habitat and its fauna.	Strategy D. Protection:			
		Task D-1. Utilize available law enforcement capabilities to protect the aquatic habitat and its fauna according to State and Federal regulations/policies.	As Needed	S	L
	Objective E. To provide education research, solitude and recreational opportunities to the public which are compatible with refuge purposes.	Strategy E. Education:			
		Task E-1. Continue to use the concession stand as contact point for fishing information.	As Needed	L	S
		Task E-2. Provide an updated fishing pamphlet handout with a map of the area, areas open for fishing, boat launch area, any special fishing regulations, and fish species and aquatic vegetation lists.	1991	L	S

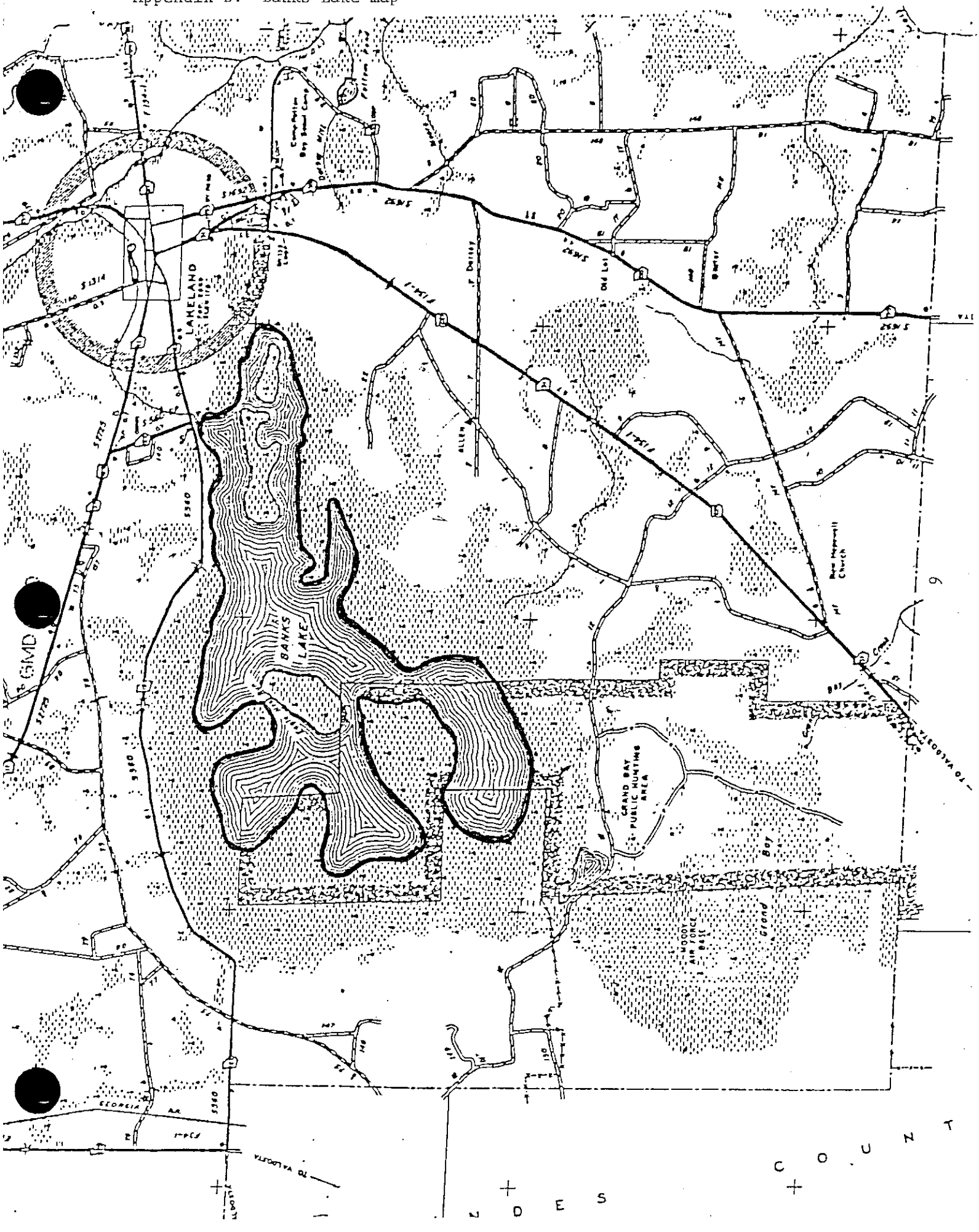
Goals	Objectives	Task	Date	RF	FAO
		Task E-4. Initiate a contaminant survey on refuge resources.	1990	L	S
	Objective F. To provide the general public with high quality, wildlife-oriented recreation with an opportunity to utilize a renewable resource.	Strategy F. Public Use:			
		Task F-1. Maintain present boat access site and surrounding area.	Annual	L	S
		Task F-2. Host aquatic/fishing oriented events.	Annual	L	S
Goal B. Fishery biologist annually meet with refuge staff to evaluate, update and change the fishery management plan as needed.	Objective G. Maintain the quality of angling opportunities available on the refuge.	Strategy G. Evaluation:			
		Task G-1. Review tasks associated with the fishery management plan and make necessary changes to meet stated objectives.	Annual	S	L

APPENDICES

Appendix A: Location map



Appendix B: Banks Lake map



Appendix C: Water Quality Ranges for Warmwater Fish

Good quality water is essential to successful fish production in warmwater ponds. Water quality checks should be conducted on a bi-weekly basis during the summer months and monthly thereafter. However, additional water quality investigations may be necessary as the need arises. The water quality checks and parameters recommended are as follows:

Water Quality Checks	Chemical-Range-Values-for-Warmwater-Fish *
Dissolved oxygen (ppm)	5 - saturation
Carbon dioxide (ppm)	0 - 15
Total alkalinity (mg/l)	50 - 400
Total hardness (mg/l)	50 - 400
pH	6.5 - 9.0
Temperature	

* (Piper, 1982; Water Quality Criteria, 1968)

The water quality tests can be accomplished using an inexpensive field ecology kit.

Water quality measurements should be made in the early morning hours when oxygen values are generally at their lowest point.

Appendix D: Limnological Data

DATE

TIME

LOCATION

MANGT. AREA (POND)

ACREAGE

INVESTIGATOR

WEATHER

WATER TEMP. (F°)

AIR TEMP. (F°)

DISSOLVED OXYGEN (mg/l)

pH - WATER (units)

TOTAL ALKALINITY (mg/l)

TOTAL HARDNESS (mg/l)

SECCHI DISK (ft)

WATER COLOR

AQUATIC VEGETATION (%)

REMARKS

Appendix E: Spot creel census to be accomplished by refuge staff.

A self-imposed or roving spot-creel census can provide valuable information concerning:

A. Quality (size of fish) of the sport fishery

B. Overall harvest (pounds and numbers of sport fish caught)

C. Angler success

D. Fishing pressure

E. Number of channel catfish removed from a pond (fish food adjustments and restocking data can be determined according to the number of fish remaining in the pond)

Pond Population Analysis From Angler Catch

Catch		Population Condition
a.	Bluegill 6 inches and larger Bass - all sizes caught (average 1 to 2 pounds)	Desirable and balanced
b.	Bluegill 3 to 5 inches Bass very few 2 pounds and larger	Overcrowded with bluegill
c.	Bluegill exceed 0.3 pounds average Bass less than 1 pound	Overcrowded with bass
d.	Small crappie, sunfish, bullheads, carp, suckers, golden shiner	Species competing

Spot Creel Survey Data Form

Instructions: Please interview as many anglers as possible whenever encountered on the Installation. Conduct the interview regardless of whether or not the angler has finished fishing. A log should be made for each angler even if no fish were caught. Record total lengths of all fish and hours fished to nearest 0.25 hour.

FISHING LOG MONTH: YEAR: AREA OR LAKE:

	license #	date	time in	time out	length (inches) / species	#caught/#kept 4.	5	6	7	8	10	12	14	16	18
					catfish										
					bass										
					bream										
					other										
					catfish										
					bass										
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					other										

Appendix F: Example of angler survey card to be used at check-out boxes.

Attention: Your cooperation is needed to help improve the quality of fishing. Please complete one per angler after each fishing trip. Please place completed card into check-out box here. Thank you.

Installation _____

Water fished _____

Date fished _____

Check if in military service or a military dependent _____

Hours fished: Day ____ Night ____

Total _____ (to nearest 0.25 hr.)

I fished mainly for (check one):

bass ____ sunfish ____ catfish ____

crappie ____ other _____

(list kind) _____

I would rate the overall quality of fishing today as (check one):

Good ____ Fair ____ Poor ____

Check here if no fish were caught ____

Optional

Name _____

Street _____

City & State _____ zip ____

RECORD NO. (e.g. IIII) of fish caught & RELEASED:

KIND	*SIZE GROUPS		
BASS	8-11.9"	12-14.9"	15" & over
SUNFISH	under 6"	6-7.9"	8" & over
CATFISH	11-14.9"	15-17.9"	18" & over
CRAPPIE	under 8"	8-9.9"	10" & over
OTHERS			

RECORD NO. (e.g. IIII) of fish caught & KEPT:

KIND	*SIZE GROUPS		
BASS	8-11.9"	12-14.9"	15" & over
SUNFISH	under 6"	6-7.9"	8" & over
CATFISH	11-14.9"	15-17.9"	18" & over
CRAPPIE	under 8"	8-9.9"	10" & over
OTHERS			