SUMMARY

Short-term tagging in aquaria and in a quarter-acre pond indicated that the Petersen disc and spaghetti tags were more suitable for bluegill than the other tags tested. Bluegill tagged with these two tag types had a comparable growth rate, but this growth rate was lower than that of the control fish. Finclipped bluegills tagged with Petersen disc and spaghetti tags had a significantly lower weight gain than bluegills which were tagged with the same tag types but not finclipped by the removal of one pelvic fin.

A seven-month study indicated that none of the tags tested are suitable for any long-term tagging with the largemouth bass in Louisiana ponds. A four-month study with largemouth bass indicated that spaghetti, Petersen disc and Atkins tags are suitable for short-term studies with these fish.

None of the tag types, with the exception of part of a dart tag, was retained by Atlantic croakers in a five-month period from November, 1965, through March, 1966.

A tagging study with 40 bluegills tagged with the Petersen disc and spaghetti tags indicated that there was no significant difference in tag retention or growth of bluegills among fish which had been processed with a post-handling dip in malachite green solution, with the tags and tagging instruments sterilized with isopropyl alcohol before tagging, with both, or with neither.

There was a considerable amount of staining and/or algae growth on the tags tested. This was easily removed with the fingers from the strap, Atkins, and Petersen disc tags. The combination of staining and algae growth made reading of the identification numbers difficult on the yellow plastic tubing of the spaghetti and dart tags.

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LAKE MANAGEMENT ON MILITARY INSTALLATIONS

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The management of lakes on military installations is receiving more emphasis in providing opportunities for participation in enjoyable and healthy off-duty recreation activities for all personnel assigned.

Our own personal appreciation of this, as well as practical requirements have been clearly affirmed by recent pronouncement by the President of the United States, and by Congressional enactment of administration sponsored legislation to require positive action in the direction.

The policies of our Commander-in-Chief not only serve as a reaffirmation of moral responsibilities but serve for us who are under his command as a clear mandate for reemphasis of these endeavors. The policies demonstrate added attention on the part of activity personnel; a search for new, better and more efficient ways of managing the real estate entrusted to them; and reviewed efforts to improve our lakes and streams.

Personnel in position such as ours have a deep appreciation for the positive requirements to conserve our natural resources, to properly manage our land and waters; and to provide enjoyable and healthy recreational activities.

Planning is an important phase of lake management programs. Where waters are suitable for game fish, they should be managed within ecological limits to produce the most desirable of the game species, in the best size and number. Inventory of all streams, lakes and potential areas on the installation whose value for such fish be made and rehabilitated to the extent possible to provide year around fishing.

HISTORY AND BACKGROUND

Prior to the mid-1950's, organized Fish and Wildlife Management Programs existed only on a limited number of military installations (as on Eglin Air Force Base, Florida). Little public concern was voiced over the lack of adequate resource management on military installations until 1955, when the army attempted to incorporate 10,700 acres of the adjacent Wichita Mountain National Wildlife Refuge into the Fort Sill Military Reservation, Oklahoma. The resulting controversy over this Refuge prompted the conservationists to actively seek improvement resource management on military installations. Their concern was, in part, responsible for the proposed and eventual passage of the Engle Military Land Bill (Public Law 85-337) in 1958. The provisions of this bill were intended to relieve many basic conflicts between the military and the civilian conservation agencies, providing: (1) that all fishing, hunting, and trapping on military installations be in accordance with state and federal fish and game laws; (2) that state licenses be obtained for fishing, hunting, and trapping on military installations; and (3) that "subject to safety and military training and security requirements," state and federal conservation officials would be granted access to military installations to effect measures for the management, conservation, and harvesting of fish and game resources (U. S. Congress, House 1956:3).

In 1960 the Sikes Military Lands Bill, Public Law 86-797 (U. S. Congress 1960: 1052-1053) made provisions "to promote effectual planning, development, maintenance, and coordination of Fish and Wildlife Conservation and Rehabilitation." This bill authorized the collection of fees for fishing and hunting privileges on military installations, and instructed that the collected monies be used for fish and wildlife management on the installations where collected.

In 1962, the Department of Defense issued a directive to the three branches of the armed services for implementing Public Law 86-797 (U. S. Department of Defense 1960:4). The directive required that "all military installations which contain land and water areas suitable for the conservation and management of fish and wildlife" shall enter into cooperative agreement with appropriate state conservation agency and the Department of Interior to carry out these management practices. It further required each branch of the military to issue regulations instructing local commanders to take the initiative in seeking assistance from state and federal conservation agencies for carrying out management plans. The directive gave implied permission for each branch of military to place as much emphasis on fish and wildlife management programs as they deemed justified.

On July 24, 1962, the army published a regulation (AR 210-221) which prescribed general policies and procedures for the management of fish and wildlife resources on army installations and facilities. This regulation, a result of the recent Department of Defense directive (U. S. Department of Defense 1962) went far toward establishing a definite policy of Fish and Wildlife Conservation Programs on military installations.

On April 29, 1964, a revision of AR 210-221 was published which established a definite fish and wildlife conservation policy and spelled out guidelines to be followed in achieving sound productive fish and wildlife management on military installations.

On June 27, 1966, AR 420-74 superseded AR 210-221 with more definite guidelines in Fish and Wildlife Management.

PLANNING

To provide continuity in the progress of a lake management program, the following are a must:

1. A long-range lake management plan with definite objectives and goals.

2. A cooperative plan agreement for conservation and development of fish and wildlife between the Installation Commander, The Regional Director of the U. S. Fish and Wildlife Service, and the Director of the State Fish and Game Department.

3. Aggressive Command Support.

4. Procurement and utilization of interested, qualified personnel and continuity.

5. Procurement and budgeting of funds.

6. Program coverage, planning, continuity, coordination and compatibility with other command programs.

The first opportunity to launch a well-planned lake management program at Fort Gordon was in the summer of 1960 when an estimate of the fishing situation indicated that the fishing program had many zones for improvement.

In 1961 an active Lake Management Committee was organized with the Assistant Post Engineer as Lake Commissioner and the Post Agronomist as Assistant Lake Commissioner.

A detailed survey and study was conducted of existing facilities, the watershed areas and what could be accomplished economically under existing regulations.

The study revealed that there were three (3) streams considered large enough to support fish in suitable quantity and size. Sandy Run, Boggy Gut, and Brier Creeks with a combined total length of fifteen (15) miles. Fishing in these streams was limited to small holes on Beaver ponds other than the fifteen (15) impounded areas scattered over the installation. These lakes were not producing fish. All were completely weed infested. The waters were so acid they would not properly support fish nor marine life. The shorelines were shallow and heavily infested with weeds and undergrowth, and the dams and spillways needed repair, replacement or reconstruction. There were limited or no access roads to fishing areas.

A long range Lake Management Program was prepared with the thought of where waters are suitable for game fish they would be managed to provide the most desirable of game fishing the year around in the most economical way.

With this in mind, the primary objectives of the Lake Management Committee were:

1. Clear all lakes of aquatic weeds and vegetation.

2. Provide access roads to fishing areas.

3. Fertilize and manage all lakes.

4. Provide a system for water and land maintenance.

5. Renovate or construct at least one lake per year for ten years. (Depopulate waters and remove rough fish and restock with desired species.)

6. Establish a pioneering program on production of channel catfish, rainbow trout and other species through the U. S. Department of Interior Bureau of Sports Fisheries and Wildlife.

DEVELOPING

A vigorous effort for improving Fort Gordon fishing facilities has been made since the beginning of the Lake Management Program. Each year a careful analysis is made of the progress of the plan to determine progress made and areas in which improvements are most needed.

As the result of prior planning and the untiring effort and aggressive leadership of the Assistant Center Engineer, the Center Agronomist, the support of the Lake Committee, Fish and Wildlife Association, aggressive command support and the full cooperation of the U. S. Department of Interior Bureau of Sports Fisheries and Wildlife, we feel that we have developed one of the best Lake Management Programs in the South.

Planning included the development of Sandy Run Creek area. This area has undergone a complete renovation since 1961. Dams have been repaired; shorelines have been cleared; erosion control measures have been initiated; and access roads to all lakes provided. We now have twenty-two (22) lakes (333 acres) under some phase of management with one lake of 25 acres under construction and have approval for one other lake to be constructed in the Sandy Run Creek Area. Also others in proposed lake areas.

All lakes have a depth of 16 feet at dam and are equipped with inlets and outlets providing drainage of lakes when desired. All have emergency spillways.

Eleven (11) lakes (165 acres) in the Sandy Run development area are scientifically managed and controlled with entrance and exit road at check point, each lake has access road around lake with one-way traffic from entrance to first lake on Sandy Run chain of lakes.

All fishermen are checked in and out at check point. Creel check is made and the number of species and weight of each is recorded for record. This check gives information on species, growth and weight of fish taken from lakes. There are three (3) additional lakes on the installation under scientific management, totaling 42 acres, making a total of fourteen (14) lakes (207 acres) under extensive management control.

In the development of the Sandy Run Creek program, we developed the lakes so as to get full use of all fertilizer and lime. Some of the lakes on this chain require little or no fertilization, for example Little Beaver Lake (6 acres) and Fettig Lake (9 acres).

The twenty-two (22) lakes on the installation that are managed in some form are weed free. Twenty-one (21) have been stocked and many restocked since 1961. The advantage of closely managed lakes is bespoken by the results which have been achieved. Unmanaged waters normally support 100-150 pounds of fish per year per acre. Managed waters which Fort Gordon has will support 500-3,000 pounds of fish per year per acre.

Anglers recently had an opportunity to fish a nine (9) acre lake (Whittimore), a channel catfish lake, one of seven (7) lakes scientifically managed controlled catfish lakes at Fort Gordon. The lake was stocked with 21,000 catfish fingerlings 7 October 1965 (86 per lb.). It was open for fishing 1 July 1967. The first two (2) days of fishing, 637 anglers caught 1,888 catfish, weighing 2,875 lbs., 1,133 bream, weighing 764 lbs. Total fish caught—3,022. Total pounds—3,639. For period 1 July through 28 August 1967, 5,388 anglers caught a total of 15,001 channel catfish, weighing 26,535 lbs.; 2,688 bream, weighing 1,730 lbs.; total—17,689 fish, 28,265 lbs.

Largest catfish 4½ lbs., largest bream 2½ lbs. See Table 1 for detailed report.

TABLE 1

RECORD OF FISH TAKEN FROM WHITTIMORE LAKE
1 July-28 August 1967

Period	Channel Catfish No.	Channel Catfish Wt.	Bream No.	Bream Wt.	Other No.	Other Wt.	No. Personnel Fishing
1-2 July	1,888	2,857	1,133	764	0	0	637
3-9 July	5,572	10,200	1,230	840	0	0	1,493
10-15 July	4,500	7,239	111	38	0	0	1,295
16-23 July	1,050	2,200	110	48	1	½	607
24-30 July	826	1,763	74	28	2	1	569
31 Jul.-6 Aug.	467	930	30	12	0	0	337
7 Aug.-13 Aug.	337	631	..	..	..	..	220
14-20 Aug.	187	387	..	..	..	..	120
21-28 Aug.	174	328	..	..	..	..	110
TOTALS	15,001	26,535	2,688	1,730	3	1½	5,388

Largest catfish caught—4½ lbs.

Largest bream caught—2½ lbs.

Lake stocked 7 October 1965 with 21,000 blue channel catfish (86 catfish fingerlings per lb.).

MANAGEMENT

Our management practices include:

1. Daily and weekly checks of lakes and area, dams, spillways, access roads, picnic areas, police, checking pH factor, hardness and temperature of water.

2. Daily feeding of channel catfish and rainbow trout.

3. Applying fertilizer, lime, basic slag, chemicals and herbicides when needed.

4. Check balance of species twice annually or more often if necessary.

5. Study daily creel checks, record daily data, make study of reactions of lake treatment. The same as a medical doctor checks your health by studying your health history, here is no difference.

6. Follow recommendations of our biologist, U. S. Department of the Interior Fish and Wildlife Service Bureau of Sport Fisheries and Wildlife.

7. Keep close check and records on our pioneering programs.

PIONEERING

After draining, renovating of lakes or construction of new lake, we find the following helpful:

1. Check pH of soil within water line area (surface water area), and apply required amount of agricultural lime per acre to bring pH of soil in water surface area to 7.0 or better. Normal requirement in sandy soil is 2,000 to 3,000 lbs. per acre. The cost of broadcasting lime in lake area ranges from $7.00 to $8.00 per ton. The cost of applying lime to water after lake is filled ranges from $15.00 to $20.00 per ton. When lime is applied to soil before lake is filled we find it takes less lime than when applied to water after lake is filled. The pH factor remains constant and we obtain better results from fertilization programs.

2. We have obtained excellent results from the use of basic slag in obtaining and maintaining a constant pH factor and bloom in our lake. We have used as high as 600 lbs. per acre per year in applications of 100 to 200 lbs. per acre with our lime and fertilization program.

3. We are obtaining excellent results from our managed controlled channel catfish lake program. It has increased from one (1) lake (6 acres) 12,000 channel catfish in 1962 to seven (7) lakes (57 acres) 130,000 channel catfish in 1967. All channel catfish are supplementally fed auburn #2 formula pellets (3/8" dia.), freshly mixed (see Table 2 for report). We have one (1) lake (15 acres) stocked with 36,000 channel catfish (18,000 blue, 18,000 white). See Table 3 for record.

TABLE 2

RECORD OF UPPER WHITTIMORE LAKE, 15 ACRES

Construction:

Construction began 7 December 1964 on fire break around lake area.
Construction of lake completed 12 May 1966.
Soil test made of lake area 5 May 1966.
pH of soil in lake area 4.8.
Lake area limed by contract, broadcast 13 May 1966, 20 tons, $7.50 per ton.
Water area rotenoned 13 May 1966.
Lake fertilized 16 June 1966, 1600 lbs. 20-20-5.
Lake stocked 28 July 1966.
Species: channel catfish
Number: 36,000 (18,000 blue, 18,000 white).
Number catfish fingerlings, per lb., 92.
Lake kept in bloom (fertilized and limed). Average pH 7.2 during period.
Catfish fed 5 days per week.
Type of food—Auburn Number 2 formula pellets (3/8" dia.).
Fed fresh food (Feed mixed by local feed mill).
Amount of feed fed: Three (3) to four (4) percent of total weight of fish in lake. Weight of fish checked monthly. Did not exceed 25 pounds of feed per acre, per 2,000 fish per acre, regardless of weight of fish.
How fed: In three (3) to four (4) feet of water around lake from barge with feed hopper—never fed in deep water. Fed in same area around lake every other day.

TABLE 3

CHECKS MADE ON GROWTH OF FISH

1st check made on 29 August 1966—72 catfish, weight 1 lb.
2nd check made on 26 September 1966—52 catfish, weight 1 lb.
3rd check made on 13 October 1966—32 catfish, weight 1 lb.
4th check made on 15 November 1966—19 ca'fish, weight 1¼ lbs.
5th check made on 15 December 1966—18 catfish, weight 1½ lbs.
6th check made on 24 January 1967—11 catfish, weight 1¾ lbs.
7th check made on 20 February 1967—10 catfish, weight 2 lbs.
8th check made 20 March 1967—8 catfish, weight 2½ lbs.
9th check made 24 April 1967—8 ca'fish, weight 4 lbs.
10th check made 24 May 1967—5 catfish, weight 4 lbs.
1 catfish weighed 1⅛ lbs. (small bream found).
11th check made 23 June 1967—5 catfish, weight 6¾ lbs.
1 catfish weighed 1½ lbs. (adult bream found).
12th check made 28 July 1967—5 catfish, weight 8¼ lbs.
1 catfish weighed 1¾ lbs. (more adult bream found).
13th check made 28 August 1967—5 catfish, weight 8¾ lbs.
1 catfish weighed 2⅛ lbs. (more adult bream found).

4. On November 30, 1966, we stocked lake with 1,500 striped bass and on August 15, 1967. we stocked 20,000 hybrid channel catfish. Records are being maintained.

5. Probably the most interesting and ambitious of the various pioneering projects was the developing of a lake to support rainbow trout

the year round. This is entirely a new concept in Lake Management in this area.

Checks were made for one year on temperature of the stream under consideration to determine whether it would be suitable to stock rainbow trout before replacing the old dam. Twenty (20) springs form this stream and the temperatures check a high of 65° in the spring and 68° at the dam site. Outside temperature for that day was 98-100°.

The old dam was rebuilt and a 4.5 acre lake of water established with a maximum depth of 16'. The lake was stocked with 4,500 rainbow trout 4-5" fingerlings on 9 December 1962. The fish were hand-fed daily. Temperature readings were made daily from January through October 1963. Daily checks were made for several through the same period. Count of 212 were found dead. The maximum loss in one single day was 68. The outside temperature for that day was 99-100° and had been in this range for three (3) days.

The lake was open for fishing November 1963 and trout caught ranged from ¾ to 1¾ lbs. 10" to 15". This was the first time rainbow trout had been kept this far south in an artificial lake through the summer months. Creel check indicated 4,113 trout taken from lake by anglers; 2 when drained; 212 died and 173 unaccounted for—total weight 4,312 lbs.

Lake drained July 1964 and a close check made. All water from lake passed through box constructed of ½" wire mesh fastened to drain pipe. Fish taken from lake and box were 2 rainbow trout, 11 red fin pike and 1 shellcracker. Lake was chemically treated and restocked with 12,000 channel catfish in October 1964 and 4,000 rainbow fingerlings November 1964.

Rainbow Lake has attracted hundreds of curious fishermen to Fort Gordon. The rainbow trout is not a native of this section of the country, but our program has proven the angler with this fighter right at home.

CONCLUSION

Fort Gordon has followed their long range lake management program with definite objectives and goals, including budgeting of funds which are vital to a successful program. Our funds are derived from the sale of fishing and hunting permits, contributions from the Fish and Wildlife Association, contributions from non-appropriated funds and now from appropriated funds as outlined in AR 420-74 and Third U. S. Army regulation 420-79.

We have an up-to-date and active cooperative plan agreement for conservation and development of Fish and Wildlife between the Installation Commander, the Regional Director of U. S. Fish and Wildlife Service and the Georgia Director of Fish and Game Department.

Fort Gordon has had continued aggressive command support under the Installation Commander, Major General Walter B. Richardson since 1964, "The Golden Years at Fort Gordon." General Richardson is keenly interested in conservation programs. He is interested in the welfare of each person in his command and desires that good recreational facilities be available. He is especially interested in those off-duty activities that promote good physical conditioning and which are enjoyable to all members of his command. The Fish and Wildlife Conservation Program at Fort Gordon is such a program.

We have continued interested and qualified personnel in our management program. None more so than the present Center Engineer, Mr. Bruce L. Rogers, whose leadership, ability and support are tremendous in carrying out the Lake Management Program. Mr. Rogers now serves on the Fort Gordon Conservation Development Committee and is the key person in the continuity coordination and compatibility with other command programs on the Installation. This is a necessary and an important phase of a lake management program. I, Chief of Land Management Branch, have also worked very closely as Assistant Lake Commissioner and in the establishing and managing of the lake program

since the beginning. As Lake Commissioner, I see the future needs as well as the progress made and realize without the assistance and cooperation of the Interior Department, their supervisors and biologist, Mr. Bob Webb and Mr. Alex Montgomery, we could not have made the progress we have. With the continued cooperation of these men and other mentioned personnel, we feel we can accomplish all of the objectives in our long-range Lake Management Program at Fort Gordon.

SUMMARY OF FISH CAUGHT
(1 Oct. 62-8 Sept. 63)

Little Beaver Lake:

KIND OF FISH	QUANTITY	WEIGHT (Lbs.)
Channel Catfish	6,061	10,877
Bass	227	228
Other	2,204	1,905
TOTAL	8,492	13,010

Big Beaver & Whittimore Lakes:

Bluegill	15,001	8,715
Warmouth	3,124	2,111
Bass	2,508	2,230
Shellcracker	3,102	2,096
Catfish (speckled)	2,016	1,410
Other	585	478
TOTAL	26,336	17,040

DRAINING OF LITTLE BEAVER LAKE—9 September 1963
The following fish were taken out of Little Beaver Lake:

Channel Cat

Size	No. of Fish
0-1 lb.	775
1-2 lb.	525
2-3 lb.	1,662
3-4 lb.	250
4-5 lb.	75
5-6 lb.	5
TOTAL	3,292
Bass	50
Speckled or Mud Cat	2,500
Suckers	10,000
	GRAND TOTAL: 15,842

18,500 man-days fished in 1963 in controlled lakes on installation.

AN INEXPENSIVE BACKPACK SHOCKER FOR ONE-MAN USE

Monte E. Seehorn
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National Forests In Georgia
United States Forest Service

ABSTRACT

A small backpack fish shocker weighing 19 pounds was developed for use in sampling mountain trout streams on the National Forests in the Southern Appalachians. Power components include a small gasoline engine-generator combination and a step-up transformer. The completed backpack provides a choice of 125 volts, 300 volts, or 600 volts alternating current (AC).