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EGLIN AIR FORCE BASE RESERVATION, FLORIDA**

ENVIRONICS AND HUMAN FACTORS OFFICE

JANUARY 1976

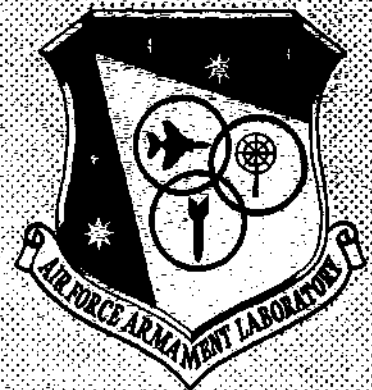
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EGLIN AIR FORCE BASE, FLORIDA



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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) During November and December 1975, a baseline study of fishes was conducted in streams draining various test ranges currently used for testing and evaluation of conventional munitions developed by the Air Force Armament Laboratory (AFATL). The purpose of the effort was to establish a species diversity for use in environmental documentation. Seventeen species of fishes and one lamprey species were collected and catalogued. The sailfin shiner (<u>Notropis hypselopterus</u> Gunther) was the most abundant species encountered. Many streams sampled were found to serve as the habitat for an endangered		

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species, the Okaloosa darter (Etheostoma okaloosae Fowler). Forty-eight Okaloosa darters were identified in the field and released unharmed. As a result of this study the confirmed range of the Okaloosa darter was extended. Because of the qualitative nature and the brevity of the study, plus the fact that no previous baseline data existed on the streams, no conclusions could be drawn concerning the possibility of changes in the stream ecology as a result of testing or other activities on the Eglin AFB reservation.

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PREFACE

This technical report discusses a portion of the work performed at the Air Force Armament Laboratory, Armament Development and Test Center, Eglin Air Force Base, Florida, under Exploratory Development Project 5066 during the period November 1975 through December 1975.

The sources and manufacturers of materials and equipment used in this study are identified for reference only and do not constitute endorsement of the companies or products by the United States Air Force.

The assistance in collection and identification of specimens during this study by Mr John Williams and Ms Karen Brockman of the University of West Florida, Department of Biology, is gratefully acknowledged.

This report has been reviewed by the Information Officer (IO) and is releasable to the National Technical Information Service (NTIS). At NTIS it will be available to the general public, including foreign nationals.

This technical report has been reviewed and is approved for publication.

FOR THE COMMANDER



JOE A. FARMER

Chief, Environics and Human Factors Office

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SECTION I

INTRODUCTION

The Air Force Armament Laboratory (AFATL) is engaged in research, development, test, and evaluation of conventional munitions. Testing of these munitions is conducted on various ranges located on the Eglin AFB reservation. Prior to initiation of each test, an environmental assessment is conducted and documented to determine the impact of the proposed action.

An essential component of any assessment is a description of the test site. To meet the Council of Environmental Quality (CEQ) guidelines and Air Force regulation requirements (Attachment 2, AFR 19-2) work is being done by AFATL to establish site characteristics data for the various Eglin AFB test ranges. In view of the large number of streams that originate on and flow through the ranges, a very important aspect of any site description is the establishment of an aquatic baseline. Of additional importance is the fact that several of the streams on Eglin serve as the habitat of an endangered species, the Okaloosa darter (Etheostoma okaloosae Fowler). For these reasons the study reported here was conducted to generate aquatic baseline data for use in evaluating the impact of proposed actions on the environment.

The approach to this study was to determine fish species diversity of the streams associated with each of the following ranges: TA B-70, TA B-71, TA C-64, TA C-64A, TA C-74, TA C-74L, TA C-72, TA C-52N, TA C-52C, and TA C-52A. Twenty-three creeks were sampled at 25 stations located on the various test ranges. The survey was conducted by personnel of the Environmental Research Facility aided by personnel of the University of West Florida, Department of Biology. Specimens collected were preserved and catalogued and will remain at the Environmental Research Facility, Building 574, as a permanent reference collection of these test ranges.

SECTION II

LOCATION AND DESCRIPTION OF TEST RANGES AND SAMPLING STATIONS

Following are descriptions of the test ranges and sampling stations involved in this study.

a. TA B-70 is located approximately 10 miles (16.1 km) from Eglin Main. The range is approximately 10 miles (16.1 km) long, 3 miles (4.8 km) wide at its widest point, and is oriented in a northeast to southwest direction. Live Oak Creek crosses the range from north to south and the headwaters of Indigo Creek arise on the northwest boundary of the range and flow into Boiling Creek.

Live Oak Creek flows through a portion of the range which is cleared of trees and maintained by periodic mowing operations. For this reason one sampling station was located at the cleared area at Road 239 and another station at the southern boundary where trees and overhanging vegetation at Road 239A provide partial cover. One station was sampled on Indigo Creek at Road 190 (Figure 1).

b. TA B-71 is located approximately 8 miles (12.9 km) west of Eglin Main and 4 miles (6.4 km) north of Wright, Florida. The range is approximately 3 miles (4.8 km) long, 2 miles (3.2 km) wide at its widest point, and is oriented northeast to southwest. There are no natural drainages (creeks or ponds) occurring directly on this range.

Turtle Creek flows west of the range near its west boundary. The headwaters of a small unnamed tributary arise just off the southwest perimeter, flow into an impoundment (Allison Pond), and eventually flow into Turtle Creek. One station was sampled above the impoundment near the headwaters of the unnamed tributary and another station sampled on Turtle Creek at Road 234 (Figure 2).

c. TA C-64 and TA C-64A are located approximately 14 miles (22.5 km) north of Eglin Main. Both ranges are approximately 250 acres (101 ha) in area and are cleared of trees. The ranges have no naturally occurring waters and are drained by two streams, Bull Creek to the west and Ramer Creek to the east. One sampling station was located on Bull and Ramer Creeks at Road 211 which passes over both creeks (Figure 3).

d. TA C-74 and TA C-74L are located approximately 17 miles (27.4 km) northeast of Eglin Main. C-74 is approximately 2-1/2 miles (4.0 km) long and 1-1/2 miles (2.4 km) wide at its widest point. C-74L is approximately 1 mile (1.6 km) long and 1/2 mile (0.81 km) wide.

The headwaters of a small branch arise on the west boundary of C-74L, flow into an impoundment on C-74 and continue into an unnamed tributary

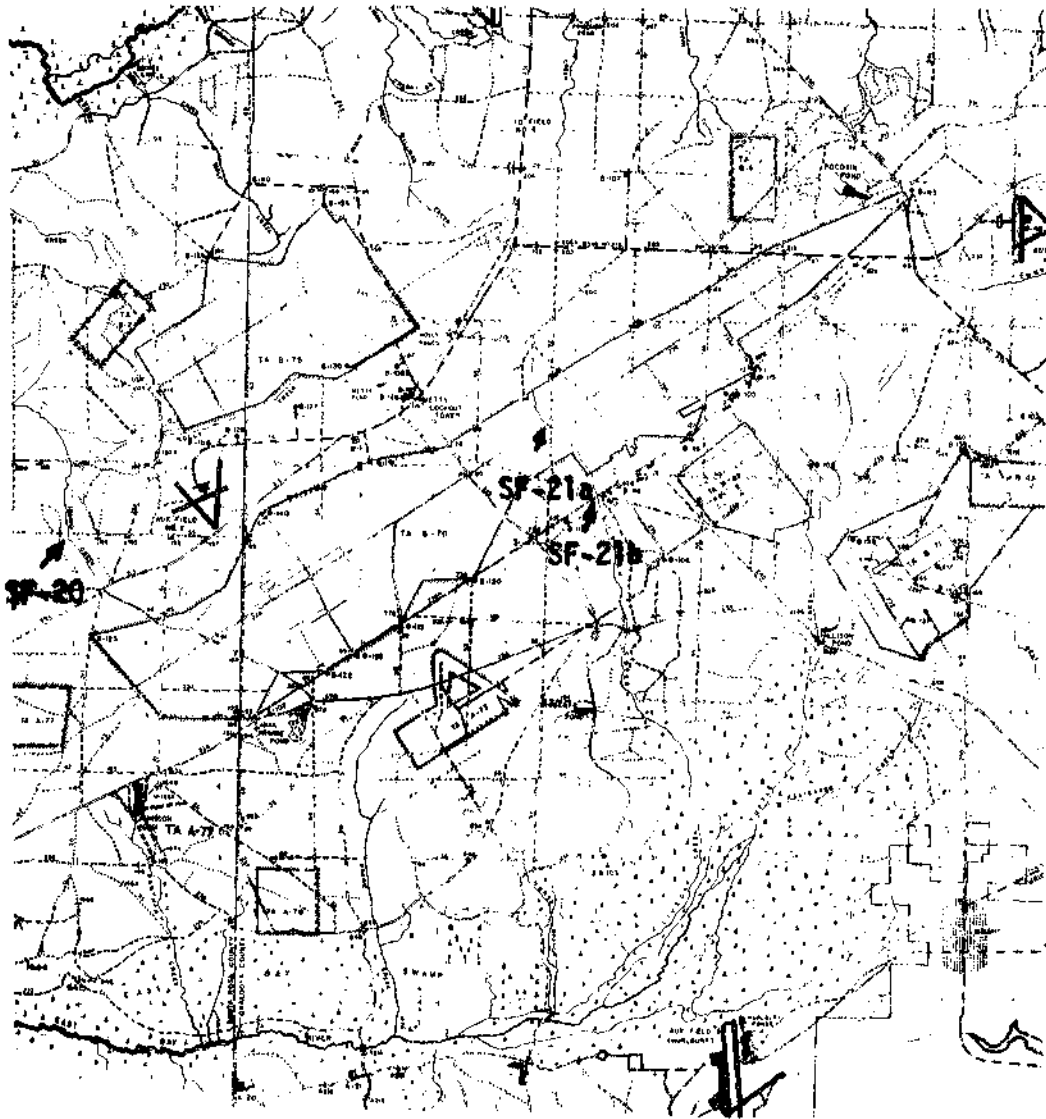


Figure 1. Test Area B-70

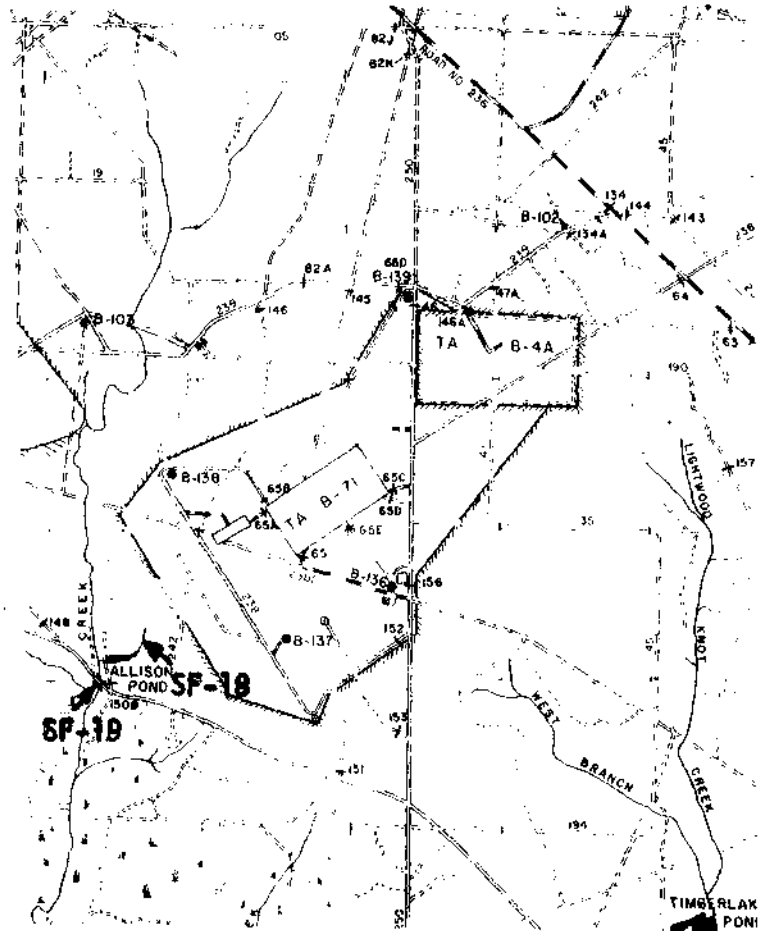


Figure 2. Test Area B-71

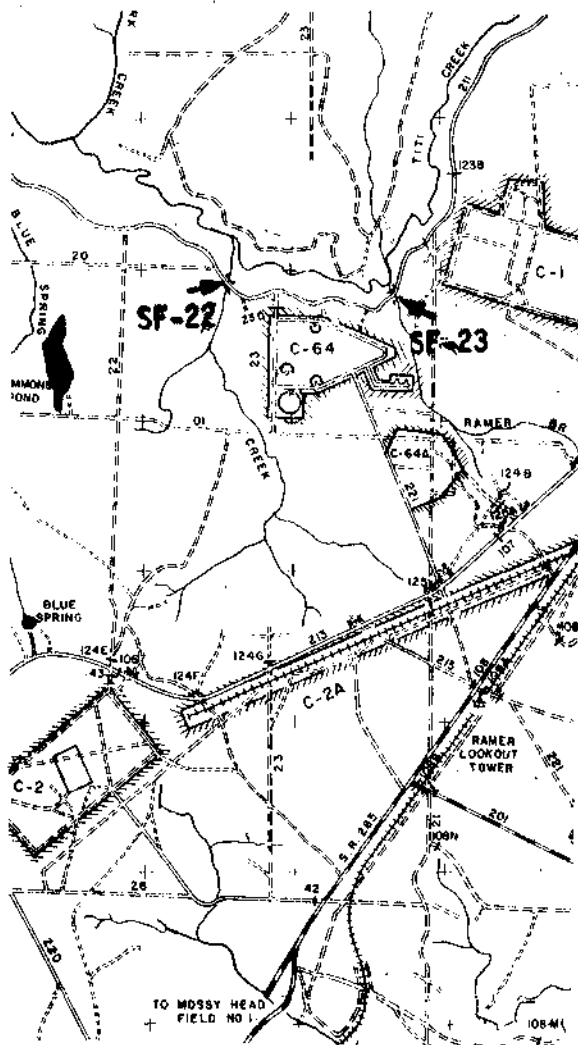


Figure 3. Test Areas C-64 and C-64A

of Rocky Creek near the west boundary of C-74. The headwaters of several small branches arise on C-74 and flow into two unnamed tributaries of Rocky Creek which transverse the center and southwest corner of the range. Both tributaries flow into an impoundment on the northeast boundary of C-72 and both were sampled upstream from the impoundment (Figure 4).

e. TA C-72 is located 14 miles (22.5 km) northeast of Eglin Main between C-74 to the north and C-52 to the south. The range is approximately 5 miles (8.0 km) long, 2 miles (3.2 km) wide, and is oriented in a northwest to southeast direction. The test range is transversed by Rocky Creek, Open Branch, and East Rocky Creek. The headwaters of Mattress Branch, a tributary of East Rocky, and three unnamed tributaries of the Little Alaqua Creek drainage occur in the southeast section of the range.

Rocky Creek, Open Branch, and East Rocky Creek were sampled on an unnumbered range road on the northeast boundary. Mattress Branch was sampled on sand road eleven, and the tributaries of Little Alaqua Creek were sampled on sand roads of unknown origin (Figure 4).

f. TA C-52 (N,C,A) is located approximately 11 miles (17.7 km) from Eglin Main and 3 miles (4.8 km) north of Choctawhatchee Bay. The range is approximately 5 miles (8.0 km) long, 2 miles (3.2 km) wide, and is oriented in a north-south direction. The headwaters of five unnamed tributaries of East Rocky Creek arise in the northernmost section of the range. The headwaters for Schoolhouse Branch, Hickory Branch, and Long Creek, all tributaries of Rocky Creek, arise along the west boundary. The headwaters of Mullet and Trout Creeks arise on the south boundary and flow into Choctawhatchee Bay. The headwaters of Coon Head Branch, Bay Head Branch, and an unnamed tributary arise in the north central area of the range and all join on the southeast edge of the range to form Basin Creek. The headwaters of Middle Creek, a tributary of Basin Creek, arise in the northeast corner and join Basin Creek off the range.

Sampling stations for Hickory Branch, Schoolhouse Branch, East Rocky Creek, Middle Creek, and Trout Creek were located at sand roads of unknown origin. Mullet Creek was sampled on Road 193, Long Creek on Road 219, and Basin Creek on an unnumbered range road (Figure 5).

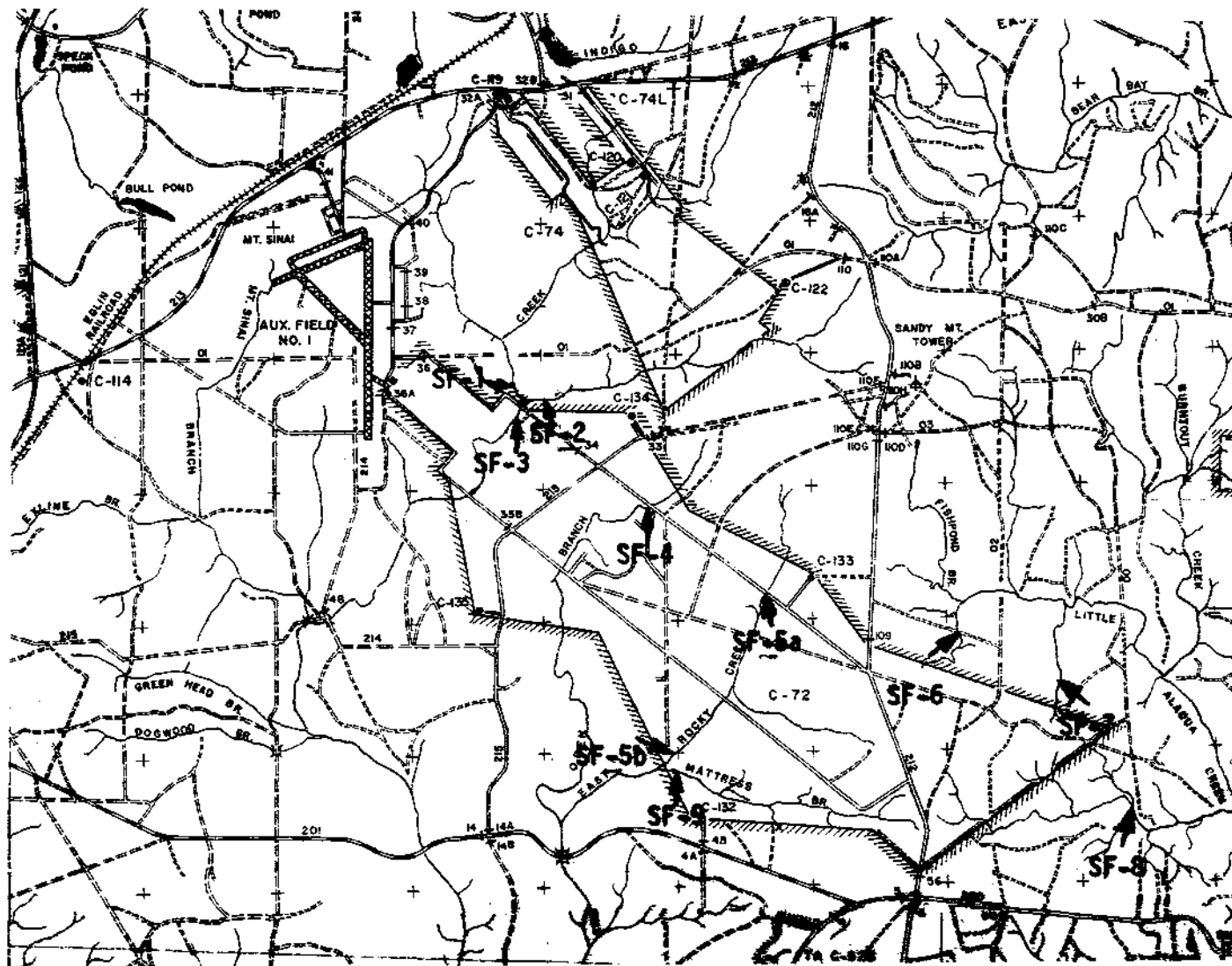


Figure 4. Test Areas C-74, C-74L and C-72

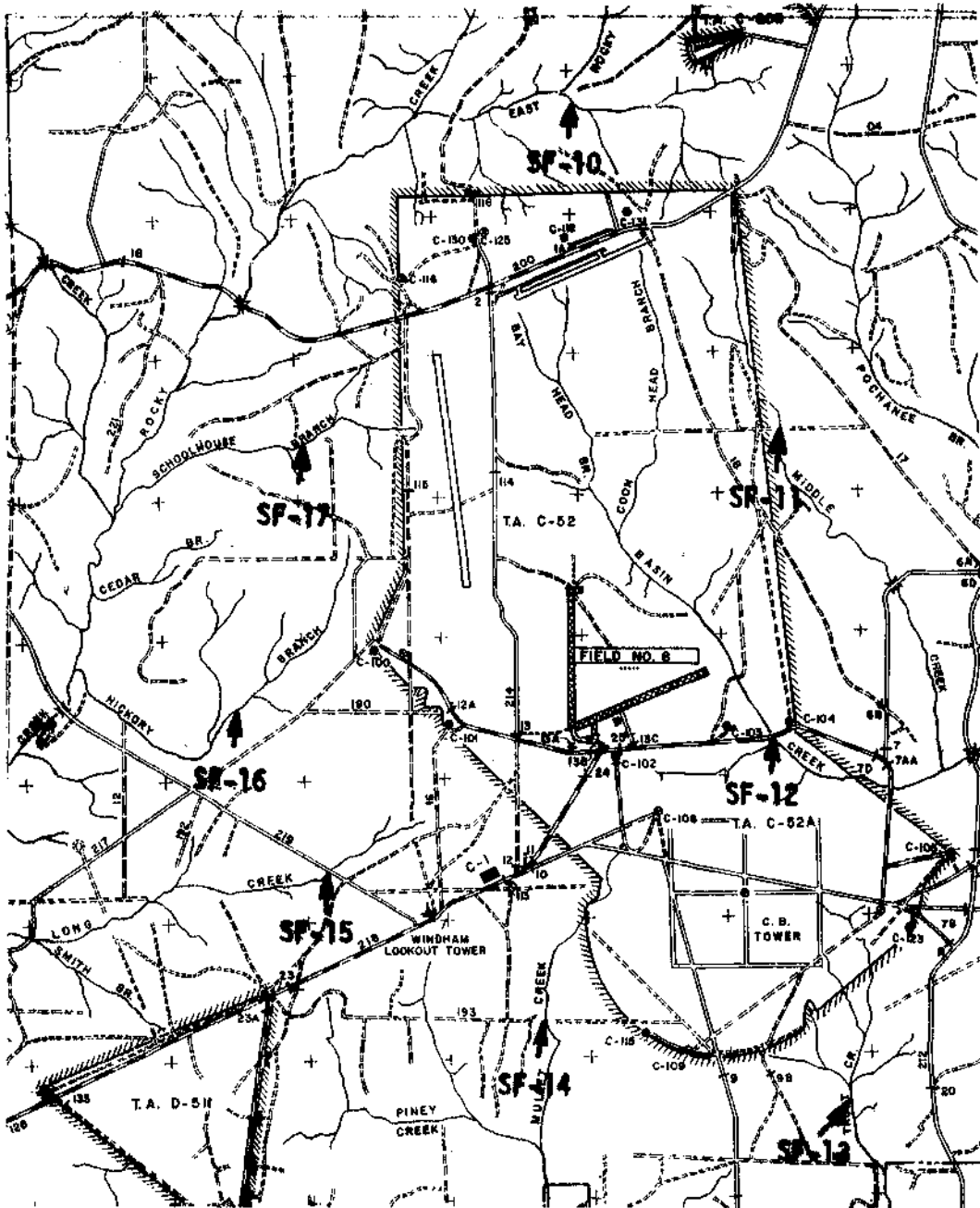


Figure 5. Test Area C-52(N,C,A)

SECTION III

MATERIALS AND METHODS

A species diversity study of the fish populations of 23 streams on various test ranges within the Eglin AFB reservation was conducted during November to December 1975. Twenty-five sampling stations were selected on 23 streams. The selection of station locations was determined primarily on the basis of their accessibility, variation of habitat within the stream, and apparent fish population. Because of the large number of sampling stations and the time required for collecting at each station, an average of only five stations was sampled per field trip. The collecting dates were dictated by range accessibility due to mission requirements and the other scheduled activities of the University of West Florida personnel. Table 1 lists the stations sampled.

Fish populations in the streams were sampled with a small mesh seine, and occasionally a small dip net for areas posing difficulties for seining operations. All specimens (except Etheostoma okaloosae) were preserved in 10 percent formalin and transported to the University of West Florida Biology Laboratory for identification (References 1 and 2). The specimens were identified to genus and species and a reference collection provided the Air Force Armament Laboratory as well as the University of West Florida.

It must be noted that many of the streams sampled were within the territory of the Okaloosa darter (Etheostoma okaloosae Fowler). All Okaloosa darter specimens were identified in the field with careful handling and returned to the stream with minimal habitat disturbance.

References:

1. Smith-Vaniz, William F., Freshwater Fishes of Alabama, Auburn University Agricultural Experiment Station, October 1968.
2. Carr, A., et al, Guide to the Reptiles, Amphibians and Freshwater Fishes of Florida, University of Florida Press, 1959.

TABLE 1. LIST OF SAMPLING STATIONS

Station No.	Name
SF-1	Unnamed Tributary of Rocky Creek
SF-2	Unnamed Tributary of Rocky Creek
SF-3	Rocky Creek
SF-4	Open Branch
SF-5A	East Rocky Creek
SF-5B	East Rocky Creek
SF-6	Unnamed Tributary Of Little Alaqua Creek
SF-7	Unnamed Tributary of Little Alaqua Creek
SF-8	Unnamed Tributary of Little Alaqua Creek
SF-9	Mattress Branch
SF-10	Unnamed Tributary of East Rocky Creek
SF-11	Middle Creek
SF-12	Basin Creek
SF-13	Trout Creek
SF-14	Mullet Creek
SF-15	Long Creek
SF-16	Hickory Creek
SF-17	School House Branch
SF-18	Unnamed Tributary of Turtle Creek
SF-19	Turtle Creek
SF-20	Indigo Creek
SF-21A	Live Oak Creek
SF-21B	Live Oak Creek
SF-22	Bull Creek
SF-23	Ramer Creek

SECTION IV

RESULTS

Seventeen species of fishes and one lamprey species were collected from 23 streams on selected test ranges within the Eglin AFB reservation (Table 2). The sailfin shiner (Notropis hypselopterus Gunter) was the most abundant species encountered. Also, the mosquitofish (Gambusia affinis Baird and Girard), blackbanded darter (Percina nigrofasciata Agassiz), speckled madtom (Noturus leptacanthus Jordon), and southern brook lamprey (Ichthyomyzon gagei Hubbs and Fraitman) were abundant in most of the streams.

The Okaloosa darter (Etheostoma okaloosae Fowler) was found at every station except station three on the Rocky Creek drainage system. Station three was deep and turbid--the turbidity apparently was caused by drainage into the stream from an impoundment 50 feet upstream from the sampling station. A total of 48 Okaloosa darters were caught and released unharmed, 26 of which were from Open Branch (Station 4) and East Rocky Creek (Station 5). A list of species collected from each station is provided in Appendix A.

TABLE 2. FISH SPECIES OBSERVED DURING STUDY

Scientific Name	Common Name
1. <u>Ambloplites rupestris</u>	Rock bass
2. <u>Aphredoderus sayanus</u>	Pirate perch
3. <u>Elassoma evergladei</u>	Everglade pigmy sunfish
4. <u>Erimyzon tenuis</u>	Sharpfin chubsucker
5. <u>Erimyzon succeta</u>	Creek chubsucker
6. <u>Etheostoma edwini</u>	Brown darter
7. <u>Etheostoma okaloosae</u>	Okaloosa darter
8. <u>Etheostoma (ulocentra) sp.</u>	Orangestripe darter
9. <u>Fundulus notti</u>	Starhead topminnow
10. <u>Heterandria formosa</u>	Least killifish
11. <u>Ichthyomyzon gagei</u>	Southern brook lamprey
12. <u>Lepomis punctatus</u>	Spotted sunfish
13. <u>Notropis hypselopterus</u>	Sailfin shiner
14. <u>Notropis signipinnis</u>	Flagfin shiner
15. <u>Noturus funebris</u>	Black madtom
16. <u>Noturus leptacanthus</u>	Speckled madtom
17. <u>Percina nigrofasciata</u>	Blackbanded darter

SECTION V

DISCUSSION

During this survey, 17 species of fishes and one lamprey species were collected or observed. Of these, the Okaloosa darter is an endangered species and is known to occur only in the streams flowing into Boggy and Rocky Bayous of Niceville and Valparaiso, Florida.

Prior to this study the only reported Okaloosa darter distribution on the Rocky Creek drainage system was south of Range Road 201. It was believed that the Okaloosa darter did exist above Range Road 201 but this was never verified. The findings reported here extend the known range to approximately 4 miles (6.4 km) above Range Road 201 which is well into the headwaters of Rocky Creek.

The Okaloosa darter streams sampled during this study were generally clear with moderately to swiftly flowing water. The bottoms were sandy with detritus and leaf litter along the edges and around patches of vegetation in areas of reduced circulation. Streams varied from 6 inches (15.2 cm) to 4 feet (121.9 cm) deep and were 4 feet (121.9 cm) to 20 feet (609.6 cm) wide. The water was slightly acidic (pH 5.3 to 5.7) with a temperature ranging from 14° to 19°C, depending upon the time during the day that the temperature reading was taken. Most Okaloosa darter streams were heavily shaded by trees and overhanging vegetation with the exception of Open Branch and East Rocky Creek. The edges along these streams were subjected to periodic mowing which destroyed the vegetative cover along the banks. The stream banks were undercut at places which, along with some aquatic vegetation, provided some protective cover. Removal of vegetative cover from these stream banks did not appear to be detrimental as more Okaloosa darters were collected from these two streams than from any others.

In addition to the Okaloosa darter, the blackbanded darter and the brown darter were collected. The blackbanded darter seemed to prefer the same sterile type habitat as the Okaloosa darter and consequently both species were collected together at many stations. The brown darter was collected along the edges of the creek where the water flow was reduced and detritus and leaf litter were abundant.

Dr Mettee (Reference 3) stated that the brown and Okaloosa darters could be ecological equivalents, and the competition and the possible hybridization between the two species could be detrimental to the Okaloosa

Reference:

3. Status Report on the Okaloosa Darter and Endangered Native Fish, US Fish & Wildlife Service, Division of Technical Assistance, Region 4, Atlanta, Ga., September 1974

darter. Hickory Branch (Station 16) and an unnamed tributary (Station 2) were the only two streams on the Rocky Creek drainage in which the brown darter was collected. Both species appeared to prefer different niches within the stream and were never collected together in the preferred habitat of either. The brown darter was collected around detritus and leaf litter in the slower moving water and the Okaloosa darter preferred the more sterile areas of the stream with the faster moving water.

Data from this study indicates that the Okaloosa darter is currently in no danger from competition or hybridization with the brown darter in the streams studied, but it must be remembered that only a small percentage of the overall Okaloosa darter territory was sampled.

Because of the qualitative nature and brevity of this study, plus the fact that no previous baseline data existed on the streams, conclusions could not be drawn concerning the possibility of changes in the stream ecology as a result of testing or other activities on the Eglin AFB reservation.

APPENDIX A

OBSERVED NUMBER OF FISH BY STATION

Collection Site	Number Collected	Common Name	Scientific Name
SF-1	3	Okaloosa darter	<u>Etheostoma okaloosae</u>
Rocky Creek	40	Sailfin shiner	<u>Notropis hypselopterus</u>
	3	Speckled madtom	<u>Noturus leptacanthus</u>
	6	Mosquitofish	<u>Gambusia affinis</u>
	1	Everglades pygmy sunfish	<u>Elassoma evergladei</u>
	13	Blackbanded darter	<u>Percina nigrofasciata</u>
SF-2	3	Okaloosa darter	<u>Etheostoma okaloosae</u>
Unnamed Tributary of Rocky Creek	16	Sailfin shiner	<u>Notropis hypselopterus</u>
	1	Speckled madtom	<u>Noturus leptacanthus</u>
	5	Mosquitofish	<u>Gambusia affinis</u>
	10	Blackbanded darter	<u>Percina nigrofasciata</u>
	1	Brown darter	<u>Etheostoma edwini</u>
	4	Southern brook lamprey	<u>Ichthyomyzon gagei</u>
SF-3	34	Sailfin shiner	<u>Notropis hypselopterus</u>
Rocky Creek	15	Mosquitofish	<u>Gambusia affinis</u>
	3	Spotted sunfish	<u>Lepomis punctatus</u>
	1	Rock bass	<u>Ambloplites rupestris</u>
	18	Blackbanded darter	<u>Percina nigrofasciata</u>
	1	Southern brook lamprey	<u>Ichthyomyzon gagei</u>
SF-4	10	Okaloosa darter	<u>Etheostoma okaloosae</u>
Open Branch	21	Sailfin shiner	<u>Notropis hypselopterus</u>
	9	Speckled madtom	<u>Noturus leptacanthus</u>
	5	Black madtom	<u>Noturus funebris</u>
	1	Pirate perch	<u>Aphredoderus sayanus</u>
	102	Mosquitofish	<u>Gambusia affinis</u>
	5	Spotted sunfish	<u>Lepomis punctatus</u>
	7	Blackbanded darter	<u>Percina nigrofasciata</u>
3	Southern brook lamprey	<u>Ichthyomyzon gagei</u>	
SF-5A	14	Okaloosa darter	<u>Etheostoma okaloosae</u>
East Rocky Creek	22	Sailfin shiner	<u>Notropis hypselopterus</u>
	4	Flagfin shiner	<u>Notropis signipinnis</u>
	5	Speckled madtom	<u>Noturus leptacanthus</u>
	46	Mosquitofish	<u>Gambusia affinis</u>
	2	Spotted sunfish	<u>Lepomis punctatus</u>
	1	Southern brook lamprey	<u>Ichthyomyzon gagei</u>

Collection Site	Number Collected	Common Name	Scientific Name
SF-5B Rocky Creek	2	Okaloosa darter	<u>Etheostoma okaloosae</u>
	20	Sailfin shiner	<u>Notropis hypselopterus</u>
	3	Speckled madtom	<u>Noturus leptacanthus</u>
	2	Mosquitofish	<u>Gambusia affinis</u>
	12	Blackbanded darter	<u>Percina nigrofasciata</u>
	2	Southern brook lamprey	<u>Ichthyomyzon gagei</u>
SF-6 Unnamed Tributary of Alaqua Creek	10	Mosquitofish	<u>Gambusia affinis</u>
	1	Black madtom	<u>Noturus funebris</u>
SF-7 Unnamed Tributary of Alaqua Creek	11	Mosquitofish	<u>Gambusia affinis</u>
SF-8 Unnamed Tributary of Alaqua Creek	46	Sailfin shiner	<u>Notropis hypselopterus</u>
	27	Flagfin shiner	<u>Notropis signipinnis</u>
	9	Speckled madtom	<u>Noturus leptacanthus</u>
	1	Black madtom	<u>Noturus funebris</u>
	13	Mosquitofish	<u>Gambusia affinis</u>
	3	Blackbanded darter	<u>Percina nigrofasciata</u>
	1	Southern brook lamprey	<u>Ichthyomyzon gagei</u>
SF-9 Mattress Branch	3	Okaloosa darter	<u>Etheostoma okaloosae</u>
	46	Sailfin shiner	<u>Notropis hypselopterus</u>
	13	Speckled madtom	<u>Noturus leptacanthus</u>
	1	Black madtom	<u>Noturus funebris</u>
	7	Mosquitofish	<u>Gambusia affinis</u>
	18	Blackbanded darter	<u>Percina nigrofasciata</u>
10	Southern brook lamprey	<u>Ichthyomyzon gagei</u>	
SF-10 Tributary of East Rocky	1	Okaloosa darter	<u>Etheostoma okaloosae</u>
	22	Sailfin shiner	<u>Notropis hypselopterus</u>
	2	Flagfin shiner	<u>Notropis signipinnis</u>
	2	Speckled madtom	<u>Noturus leptacanthus</u>
	7	Blackbanded darter	<u>Percina nigrofasciata</u>
	1	Southern brook lamprey	<u>Ichthyomyzon gagei</u>
SF-11 Middle Creek	10	Sailfin shiner	<u>Notropis hypselopterus</u>
	1	Speckled madtom	<u>Noturus leptacanthus</u>
	4	Mosquitofish	<u>Gambusia affinis</u>
	1	Blackbanded darter	<u>Percina nigrofasciata</u>
	1	Southern brook lamprey	<u>Ichthyomyzon gagei</u>

Collection Site	Number Collected	Common Name	Scientific Name
SF-12 Basin Creek	4	Sailfin shiner	<u>Notropis hypselopterus</u>
	2	Speckled madtom	<u>Noturus leptacanthus</u>
	1	Pirate perch	<u>Aphredoderus sayanus</u>
	15	Mosquitofish	<u>Gambusia affinis</u>
	5	Blackbanded darter	<u>Percina nigrofasciata</u>
SF-13 Trout Creek	46	Sailfin shiner	<u>Notropis hypselopterus</u>
	5	Speckled madtom	<u>Noturus leptacanthus</u>
	15	Mosquitofish	<u>Gambusia affinis</u>
	3	Blackbanded darter	<u>Percina nigrofasciata</u>
	3	Brown darter	<u>Etheostoma edwini</u>
SF-14 Mullet Creek	1	Sailfin shiner	<u>Notropis hypselopterus</u>
	2	Creek chubsucker	<u>Erimyzon succeta</u>
	4	Pirate perch	<u>Aphredoderus sayanus</u>
	9	Speckled madtom	<u>Noturus leptacanthus</u>
	169	Mosquitofish	<u>Gambusia affinis</u>
	4	Least killifish	<u>Heterandria formosa</u>
	3	Spotted sunfish	<u>Lepomis punctatus</u>
1	Brown darter	<u>Etheostoma edwini</u>	
SF-15 Long Creek	2	Okaloosa darter	<u>Etheostoma okaloosae</u>
	56	Sailfin shiner	<u>Notropis hypselopterus</u>
	6	Speckled madtom	<u>Noturus leptacanthus</u>
	29	Mosquitofish	<u>Gambusia affinis</u>
	3	Blackbanded darter	<u>Percina nigrofasciata</u>
	3	Southern brook lamprey	<u>Ichthyomyzon gagei</u>
SF-16 Hickory Branch	5	Okaloosa darter	<u>Etheostoma okaloosae</u>
	59	Sailfin shiner	<u>Notropis hypselopterus</u>
	2	Speckled madtom	<u>Noturus leptacanthus</u>
	5	Mosquitofish	<u>Gambusia affinis</u>
	3	Brown darter	<u>Etheostoma edwini</u>
	5	Southern brook lamprey	<u>Ichthyomyzon gagei</u>
SF-17 Schoolhouse Branch	5	Okaloosa darter	<u>Etheostoma okaloosae</u>
	55	Sailfin shiner	<u>Notropis hypselopterus</u>
	4	Flagfin shiner	<u>Notropis signipinnis</u>
	3	Speckled madtom	<u>Noturus leptacanthus</u>
	1	Mosquitofish	<u>Gambusia affinis</u>
	5	Blackbanded darter	<u>Percina nigrofasciata</u>
	1	Southern brook lamprey	<u>Ichthyomyzon gagei</u>
SF-18 Unnamed Tributary of Turtle Creek	2	Starhead topminnow	<u>Fundulus notti</u>
	3	Mosquitofish	<u>Gambusia affinis</u>

Collection Site	Number Collected	Common Name	Scientific Name
SF-19	26	Sailfin shiner	<u>Notropis hypselopterus</u>
Turtle	15	Flagfin shiner	<u>Notropis signipinnis</u>
Creek	6	Blackbanded darter	<u>Percina nigrofasciata</u>
	2	Brown darter	<u>Etheostoma edwini</u>
	3	Southern brook lamprey	<u>Ichthyomyzon gagei</u>
SF-20	22	Flagfin shiner	<u>Notropis signipinnis</u>
Indigo	22	Speckled madtom	<u>Noturus leptacanthus</u>
Creek	14	Mosquitofish	<u>Gambusia affinis</u>
	27	Blackbanded darter	<u>Percina nigrofasciata</u>
	1	Spotted sunfish	<u>Lepomis punctatus</u>
	2	Southern brook lamprey	<u>Ichthyomyzon gagei</u>
SF-21A	4	Speckled madtom	<u>Noturus leptacanthus</u>
Liveoak	6	Black madtom	<u>Noturus funebris</u>
Creek	1	Pirate perch	<u>Aphredoderus sayanus</u>
	6	Spotted sunfish	<u>Lepomis punctatus</u>
	7	Everglades pygmy sunfish	<u>Elassoma evergladei</u>
	21	Mosquitofish	<u>Gambusia affinis</u>
	16	Blackbanded darter	<u>Percina nigrofasciata</u>
SF-21B	1	Pirate perch	<u>Aphredoderus sayanus</u>
Liveoak	6	Mosquitofish	<u>Gambusia affinis</u>
Creek	3	Spotted sunfish	<u>Lepomis punctatus</u>
	1	Rock bass	<u>Ambloplites rupestris</u>
	14	Blackbanded darter	<u>Percina nigrofasciata</u>
	1	Southern brook lamprey	<u>Ichthyomyzon gagei</u>
SF-22	17	Flagfin shiner	<u>Notropis signipinnis</u>
Bull	1	Sharpfin chubsucker	<u>Erimyzon tenuis</u>
Creek	2	Speckled madtom	<u>Noturus leptacanthus</u>
	7	Blackbanded darter	<u>Percina nigrofasciata</u>
	1	Brown darter	<u>Etheostoma edwini</u>
	8	Southern brook lamprey	<u>Ichthyomyzon gagei</u>
SF-23	1	Sailfin shiner	<u>Notropis hypselopterus</u>
Ramer	5	Flagfin shiner	<u>Notropis signipinnis</u>
Creek	1	Speckled madtom	<u>Noturus leptacanthus</u>
	3	Blackbanded darter	<u>Percina nigrofasciata</u>
	1	Orangestripe darter	<u>Etheostoma (ulocentra)sp.</u>
	2	Southern brook lamprey	<u>Ichthyomyzon gagei</u>

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