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# REMOVAL OF LONGNOSE GAR FROM RIVERS AND STREAMS WITH THE USE OF DYNAMITE

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ABSTRACT

During the summer and fall of 1957, experiments with dynamite were conducted to determine an effective method of removing concentrations of longnose gar, *Lepisosteus osseus*, from the large coastal streams of North Carolina. A "suspended series" of charges was the most effective method tested. Charge of 3 sticks of dynamite, suspended at depth of 8 to 10 feet produced the best lethal range. Selective blasting with this method provided efficent removal of longnose gar. During one day's operation, over 3½ tons of gar were removed while killing 8.3 pounds of game fish.

## INTRODUCTION

During the summer and fall of 1957, experiments with dynamite were conducted to determine an effective method of removing concentrations of longnose gar, *Lepisosteus osseus*, from the large coastal streams of North Carolina. The water in these streams is highly stained and has very low velocity. Wind tides affect the majority of these streams to the extent that it is not uncommon for the current to run upstream. The banks are low and bordered primarily by swamps. The tests were conducted in Pine Tree Creek, Brice's Creek, Batchler's Creek, Green's Thoroughfare, Turkey Quarter Creek, Taylor's Creek, Gar Creek and Hog Island Thoroughfare in Craven County, Tranters Creek, Old Tar River and Bear Creek in Pitt County, Bay River and Upper Broad Creek in Pamlico County and Trent River in Jones County.

## METHODS

Sixty percent dynamite was selected as the energy vehicle due to its stable properties and availability. The first series of tests were conducted with the use of electrical detonation. This proved ineffective due to the excessive amount of travel through the blasting area to rig wires and lay charges. The depths encountered in the streams, 10 to 35 feet at mid-channel, hindered anchoring of the charge end of the detonating wire on those charges suspended off the bottom.

The succeeding tests were conducted with fuse and No. 6 blasting caps as the detonator. The various methods of applying the dynamite were: (1) varying amounts in a single charge on the bottom, (2) varying amounts in a single charge suspended at various depths, (3) a series of charges on the bottom and (4) a series of charges suspended at various depths. The best results were obtained from a series of charges suspended at a depth of 8 to 10 feet.

Blasts were made only in areas where large concentrations of gar were found. The size of the blasting area was determined by the size of the area in which gar were observed breaking the surface of the water. The size of the individual charges was determined by the width and depth of the stream. A charge of three sticks of 60 percent dynamite, suspended at a depth of 8 to 10 feet, produces a lethal effect up to approximately 50 feet from the center of the charge. The size of the individual charges was varied to keep the banks of the stream, where the majority of the game species are found, outside of the lethal range of the blast.

The charges were attached to a float with a strong cord of desired length. A quart outboard oil can, with screw type cap, serves well as a float. Cork floats tend to break up due to the concussion. The cord was wound around the float to avoid entanglement during placement. The weight of two or more sticks of 60 percent Red Diamond dynamite will unroll the cord from the float to the desired depth. Caution should be noted at this point as some brands of dynamite will not sink or are not heavy enough to provide this desired feature. The fuses are cut to equal length and ignited at the same time to facilitate detonation of all charges simultaneously. The placement of the charges was accomplished during one continuous trip through the area. All fuses were ignited simultaneously after the boat obtained three-fourths power just prior to entering the area. This is the only trip necessary through the area and after its completion the gar have very little time to leave.

The dead fish were picked up immediately after the blast. Numbers and weights were recorded for all species collected. During the period when water temperatures were above 65° Fahrenheit, all fish were picked up and weighed on the first- and second-day pickups. On the third day the fish were counted and due to excessive decay the weights were only estimated. After water temperatures dropped below 65° Fahrenheit all fish were picked up and weighed. Large numbers of gar were separated into size classes and a calculated weight obtained.

## RESULTS

A total of 12,707 longnose gar weighing 47,142.3 pounds were removed with 7 cases of dynamite. The total game fish killed during the operation was 1,197 weighing 215.5 pounds. A total of 13,359 non-game fish weighing 48,347.5 pounds were removed during the test period (Table 1).

The cost of blasting materials used during these tests was approximately $150. Forty-three tests were conducted in 20 workdays during the period of August 13 to November 7, 1957. Fifty additional workdays were required for fish recovery.

From 1.4 to 10 percent of the total number of gar killed were recovered immediately after the blast during tests conducted in water above 65° Fahrenheit, whereas 96 percent of the game species were recovered immediately after the blast. Tests conducted in water below 65° Fahrenheit produces 40 to 74 percent immediate recovery of gar. There was little or no change in the recovery of game species at these temperatures. This change in recovery was attributed to the possible decrease in the metabolic rate and an increase in the water density. These factors could possibly provide a condition where a greater percentage of the gar would be killed with enough air in their air sac to provide the required bouyancy.

Six of the streams worked during the early portion of the study were rechecked to determine if gar had moved in again. Only Pine Tree Creek showed evidence of heavy concentrations. A total of 1,326 gar was removed from this stream during the first two weeks in September. The stream was reworked during October 28 to November 4, removing 2,704 gar.

## DISCUSSION

In comparing methods it was found that: 1. The energy from charges placed on a soft mucky bottom seemed to be absorbed to some extent. 2. Charges placed at depths less than 5 feet released the major portion of their energy straight up. 3. The size of the lethal area is not increased in proportion to the increased amount of explosive.

The "suspended series" method was 2½ times more effective than other methods tested. Charges of 3 sticks of dynamite, suspended at depths of 8 to 10 feet, produced the best lethal range. Selective blasting with this method provided efficient removal of longnose gar. One blast in Taylor's Creek, using 24 sticks of dynamite, removed 1,163 gar weighing 3,905.5 pounds while killing 3 pounds of game fish. During one day's operation in Old Tar River and Bear Creek, over 3½ tons of gar were removed while killing 8.3 pounds of game fish. This was not the maximum possible, as approximately 50 percent of the time was required to obtain data from the fish killed.

## PRECAUTIONS

1. *Never* use old dynamite or old fuse.
2. Test burn a measured length of every new roll of fuse.
3. In case of a malfunction, throw any ignited charges overboard and *stay in the boat.* Very little distance from the nearest charge is required for safety if you remain in the boat.
4. Never carry excess dynamite and caps in the boat during the placement of charges or fish recovery. Place the excess on the bank or in another boat.
5. Never carry detonators in the close vicinity of the explosive.
6. Obtain technical advice and assistance if you are not qualified to handle explosives.


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TABLE NUMBER 1.

RESULTS OF BLASTING

Total all streams

| *Species* | *Number* | *Weight* |
|---|---|---|
| Longnose gar *(Lepisosteus osseus)* | 12,707 | 47,142.3 lbs. |
| Gizzard shad *(Dorosoma cepedianum)* | 180 | 197.0 |
| Channel catfish *(Ictalurus lacustris)* | 83 | 122.4 |
| Jumping mullet *(Mugil cephalus)* | 79 | 133.7 |
| Brown bullhead *(Ictalurus nebulosus)* | 78 | 90.1 |
| Eastern redhorse *(Moxostoma macrolepidotum)* | 63 | 163.5 |
| Golden shiner *(Notemigonus crysoleucas)* | 63 | 13.5 |
| White catfish *(Ictalurus catus)* | 60 | 53.2 |
| Carp *(Cyprinus carpio)* | 41 | 331.2 |
| Bay anchovy *(Anchoa mitchilli)* | 3 | tr* |
| Bowfin *(Amia calva)* | 1 | 1.4 |
| American eel *(Anguilla rostrata)* | 1 | 0.2 |
| TOTAL NON-GAME SPECIES | 13,359 | 48,347.5 lbs. |
| Bluegill *(Lepomis macrochirus)* | 632 | 41.6 lbs. |
| Black crappie *(Pomoxis nigro-maculatus)* | 231 | 37.7 |
| White perch *(Morone americana)* | 101 | 55.4 |
| Pumpkinseed *(Lepomis gibbosus)* | 83 | 4.7 |
| Warmouth *(Chaenobryttus coronarius)* | 39 | 2.3 |
| Yellow perch *(Perca flavescens)* | 30 | 16.5 |
| Sand perch *(Bairdiella chrysura)* | 20 | 2.0 |
| Largemouth bass *(Micropterus salmoides)* | 15 | 13.6 |
| Spot *(Leiostomus xanthurus)* | 15 | 1.0 |
| Striped bass *(Roccus saxatilis)* | 12 | 30.9 |
| Atlantic croaker *(Micropogon undulatus)* | 12 | 1.7 |
| Chain pickerel *(Esox niger)* | 6 | 8.0 |
| Redbreast sunfish *(Lepomis auritus)* | 1 | 0.1 |
| TOTAL GAME SPECIES | 1,197 | 215.5 lbs. |

*tr-trace. Weight less than 0.1 lbs.