# RESULTS OF GEORGIA'S CLAPPER RAIL BANDING PROGRAM

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*Abstract*: From 1973 through 1976, 2,066 clapper rails (*Rallus longirostris*) were banded at eight locations on the Georgia coast, using an airboat and night-lighting technique. Banding success was high with a maximum 2-hour catch of 87 rails, and an average banding rate of approximately 16 birds per hour. Most rails were banded during the preseason period with migration-winter banding limited by winter tide conditions.

Band recoveries of Georgia clapper rails (*R. l. waynei*) suggested significantly more movement than was previously recorded in the literature. A direct recovery rate of 0.63 percent was determined.

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Georgia's clapper rail population has long been an abundant yet unharvested game bird resource. Bent (1926) presented accounts of earlier workers' observations of unbelievable numbers of rails in coastal marshes during the 1800's. While most of these reports were for the northern clapper rail (*R. l. crepitans*), the southern subspecies, Wayne's clapper rail (*R. l. waynei*) was apparently as abundant. Hunting pressure in Georgia was very light during this period. The advent of automobiles and motor powered boats, and increasing human population, and decreasing game populations, all contributed to the rail's increase in popularity as a game bird. Oney (1954) reported that in 1947, 10,200 mandays of hunting produced a harvest of nearly 86,000 birds. The following year federal regulations prohibiting the use of power driven boats for hunting migratory birds caused a sharp decline in the number of rail hunters, a decline from which the sport has been slow to recover. A survey of Georgia rail hunters in 1973 (Odom 1974) indicated that 70,000 birds were harvested during 11,000 mandays of hunting.

Clark (1970) pointed out that although the clapper rail continues to be a "low priority" game bird in harvest and hunter participation, it is anticipated that as opportunities for hunting other game bird species diminish the rail resource will receive greater utilization. A need for banding studies to provide harvest rates and trends on which to base management regulations was emphasized.

In the past, most attempts to capture clapper rails in the Southeast have met with little success. Oney (1954) tried funnel type bait traps, drive trapping, and pursuing them with a long handled dip net during high tides. None of these methods were successful. Blandin (1963) in South Carolina tried trapping without much success, but was moderately successful with night-lighting. Bateman (1965) used cloverleaf and drop door traps to capture rails in Louisiana, again with nominal success. U.S. Fish and Wildlife Service banding records (Spencer Amend, pers. comm.) as of 1973 showed a nationwide total of under 5,000 clappers, most of which had been banded in New Jersey. Only one rail had been banded in Georgia.

Night-lighting using an airboat proved very effective for capturing rails in the coastal marshes of New Jersey (Mangold 1972). In a five year investigation, information was gathered on reproductive success, hunting pressure, and population status of the northern clapper rail in that state (Mangold 1974). Banding results and field investigations demonstrated that rails were very lightly harvested by hunters in New Jersey. Limiting factors were determined to be losses during migration and severe storms during the breeding season.

In July, 1972, the Georgia Department of Natural Resources, in cooperation with the U.S. Fish and Wildlife Service, initiated a rail banding project with the following objectives: (1) to evaluate and refine clapper rail banding techniques for maximum efficiency of banding effort, and (2) to accumulate data relative to harvest rates, annual mortality, and migration habits. Information accumulated during the study through December, 1976, serves as the basis for this report.

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## STUDY AREA

Banding activities were conducted in tidal marshes of four coastal Georgia counties. Georgia's coastal marshland comprises approximately 159,000 ha in a band between the mainland areas and barrier islands. Of this total, about 146,000 ha are considered salt marsh proper, of which the bulk (79 percent) is covered by smooth cordgrass (*Spartina alterniflora*) growing in nearly pure stands. Needlerush or black rush (*Juncus roemerianus*) is the principal plant species of remaining salt marsh except for a fraction of one percent which is represented by salt flats and salt meadows (Johnson et al. 1974).

Tidal action along Georgia's coast exerts a strong influence on the marsh system. Tidal currents produced by flooding and ebbing waters form an extensive drainage system of tidal creeks and rivers. A considerable range exists between high and low tides, with a normal tidal amplitude of 2.1 m. During monthly periods of "spring" tides the range increases to 2.4 m and more. Easterly or northeasterly winds in excess of 16 km per hour, such as those generated by offshore storms or low pressure cells, have a synergistic effect on spring tides, producing a tidal rise sometimes exceeding 3 m. During the hunting season these are referred to as "marsh hen tides" since large expanses of marsh are inundated, concentrating and exposing rails and creating ideal hunting conditions (Oney 1954).

Banding locations were selected by observations of marshes and reports of rail concentrations by law enforcement personnel and hunters. During the study period, rails were banded at eight locations on the Georgia coast (Fig. 1).

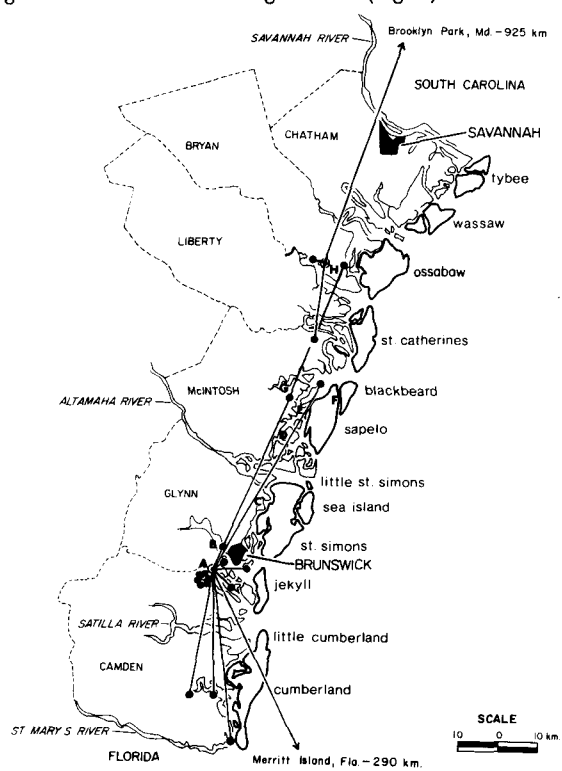


Fig. 1. Banding and recovery locations of clapper rails banded in Georgia. Banding location: (A) South Brunswick River, (B) Turtle River, (C) Troop Creek, (D) Meridian, (E) Duplin River, (F) Sapelo - Blackbeard, (G) Creighton Island, (H) Demeries Creek.

## MATERIALS AND METHODS

*Capture Equipment*

Initially, several night-lighting attempts were made using a two man team in a 3.7 m aluminum jon boat powered by a 9.5 h.p. outboard motor. Both men wore a hard-hat mounted 12 volt sealed beam lamp (General Electric No. 4416), powered by an automotive battery. Each man had an aluminum handle dip net for capturing rails.

Small tidal creeks were searched on spring high tides in areas known to support large rail populations. Very few rails were captured with this method because most birds were located further into the marsh in areas largely inaccessible with an outboard.

In January 1973 a 3.2 m airboat, with fiberglass hull and 85 h.p. engine, was purchased for rail banding. Design of the airboat allowed the "catch man" to be seated in front, providing him with an excellent view of the marsh and a capture radius exceeding 180°. To facilitate quick banding and release, bands were pre-opened and placed on dowel rods mounted within easy reach of the operator. The catch man held the bird over his shoulder allowing the operator to affix the band. This quick release method allowed rails to return to their nests or broods with a minimum of disturbance.

The small size of the airboat made travel in open, rough water hazardous, and limited banding activities to periods of calm and moderate weather conditions. A deck platform was added to provide a more adequate capture platform while repelling water which splashed over the bow.

A landing net with a 1 m aluminum handle and an 0.5 m hoop was found to be of sufficient size yet easily maneuvered in the boat. Polyethylene plastic netting with a stretched mesh of 6.4 cm was preferred since this material shed water well and did not collapse when wet. The sock of the net was 61 cm deep, allowing captured birds to be "bagged" in the bottom of the net. With a rotation of the net the mouth could be closed to prevent escape of the bird. In instances when several birds were encountered simultaneously, as with broods, several birds could be captured and held in the net.

*Capture Conditions and Methods*

Nighttime tides with a predicted natural rise of 2.5 m or greater were most productive for banding. Tides of this magnitude occurred on approximately 25 nights annually, during the period of March through October. Weather conditions determined the actual number of nights suitable for banding. Wind direction and velocity were particularly important. Easterly and northeasterly winds of sufficient force enhanced both tide height and duration by "holding" water in the marsh longer. Wind from west quadrants adversely affected tides and eliminated banding opportunities.

Good banding tides forced rails to swim or take refuge on floating "racks" of dead cordgrass and other debris in the marsh, whereas lower tides allowed many birds to escape undetected through tall cordgrass which was not totally inundated. Careful observation of movements in the grass would often indicate fleeing rails. These birds could then be followed and forced into lower vegetation or open water for capture. Attempts to capture rails swimming in dense vegetation were seldom successful since grass deflected the net rim allowing birds to dive to safety.

The speed of approach often influenced how easily a rail was captured. Birds approached at idle speed would usually perk up slightly but would remain motionless. Once within range the net was thrown over the bird. Birds frightened by the approaching boat would usually swim away from the disturbance. These were overtaken and scooped out of the water. Occasionally birds would flush, particularly when approached at higher rates of speed. Flight was usually short and by marking the landing spot they could be followed and captured.

Both men carried nets, and although the catchman captured most rails, the operator also contributed to the night's catch. When groups of rails were encountered, as with broods, both men simultaneously captured rails. Several birds were caught in each net and additional young birds were sometimes caught by hand. With a large number of rails aboard, the engine was stopped momentarily until banding was completed.

## RESULTS AND DISCUSSION

*Banding Success and Locations*

From January 1973 through October 1976, 2,066 clapper rails were banded in 65 night-lighting attempts at 8 locations (Fig. 1). With actual banding time limited to slightly less than 2 hours per night this represented a capture rate of approximately 16 rails per hour. Nightly banding success ranged from 0 to 87 birds.

Preseason banding accounted for 79.6 percent (1,644 birds) of banding totals (Table 1). High concentrations of rails were found at the Brunswick-Turtle River estuary during the nesting and brood season. Young birds contributed substantially (18.4%) to preseason totals. Ninety-eight percent of all young birds ("L" designation) were banded at this location. Oney (1954) observed that in early spring rails concentrated on certain breeding areas leaving sections of the marsh deserted. Poor banding success at most locations during spring and early summer (Fig. 1 Locations D,E,G,H) substantiated Oney's observation. The Brunswick-Turtle River estuary is apparently a preferred nesting area.

Table 1. Summary of clapper rails banded in Georgia, showing age class and banding periods.

| | *Banding Period* | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| *Banding Year* | *Pre-season* | | *(Mar.-Aug.)*[a] | | *Migration-Winter* | | *(Sept.-Feb.)* | *Annual Totals* |
| | *AHY* | *L* | *U* | *TOTAL* | *AHY* | *U* | *TOTAL* | |
| 1973 | 496 | 104 | 0 | 600 | 1 | 0 | 1 | 601 |
| 1974 | 343 | 112 | 122 | 577 | 10 | 248 | 258 | 835 |
| 1975 | 76 | 68 | 37 | 181 | 0 | 151 | 151 | 332 |
| 1976 | 267 | 19 | 0 | 286 | 0 | 12 | 12 | 298 |
| Total | 1,182 | 303 | 159 | 1,644 | 11 | 411 | 422 | 2,066 |

[a]Age codes are from U.S. Banding Manual: AHY—"After Hatching Year"—bird hatched before calendar year of banding; L—"Local"—young bird incapable of sustained flight; U—"Unknown"—birds banded after breeding season and before January 1.

Suitable tides for banding occurred each month of the preseason period and an average of 12.5 banding attempts were made from March through August each year. Nightly banding totals averaged 32.9 birds.

Migration-winter period banding success compared closely (average of 28.1 birds per night) with that of the preseason. High concentrations were encountered at Demeries Creek site, moderate numbers were found at the Duplin River site, and low populations occurred at four other fall and winter banding areas (Locations B,C,D,G). On 16 September 1974, 87 rails were banded at Demeries Creek, representing the highest banding success in the study. Fewer banding attempts were made during the migration-winter period (average of 3.8 nights per year), since tides during most of this period were of insufficient magnitude.

*Recovery Rates*

Band recoveries to date were received for 20 of the 2,066 clapper rails banded. Of these, 14 resulted from direct recoveries made by the public. Twelve were recovered by hunters in Georgia, one was shot in Florida, and one was found dead in Maryland. Six additional banded birds were collected at the South Brunswick River site by Georgia Department of Natural Resources personnel during this and other studies.

Thirteen hunter shot recoveries constitute a recovery rate of 0.63 percent. Recovery rates for preseason and migration-winter bandings were 0.67 percent and 0.49 percent respectively. Mangold (1974) reported a shot recovery rate of 2.3 percent (72 recoveries from 3,115 bandings) for clapper rails banded in New Jersey. Of the 72, only 9 were recovered in New Jersey, 31 were shot in Georgia, 19 in South Carolina, 7 in Virginia, 5 in northern Florida, and 1 in North Carolina. The 31 recoveries in Georgia amounted to a 1.15 percent recovery rate for birds banded in New Jersey.

Banding locations and circumstances during the present study may have contributed to the low shot recovery rate for Georgia banded birds. As mentioned earlier, the majority of preseason banding was accomplished at the Brunswick-Turtle River estuary. Excessive concentrations of mercury found in specimens of rails and other wildlife collected from that estuary between 1971 and 1973 (Odom 1974) prompted the Georgia Department of Natural Resources to issue a warning to hunters not to eat rails taken in the area during the 1973 season. With mercury levels remaining high, warnings were issued prior

to the 1974 and 1975 hunting seasons as well. As a result, very little hunting occurred in the estuary during the study. Evidence that hunting pressure in the area would have caused an increase in band returns came from collections made by the Department of Natural Resources to determine mercury levels in rails. Five of 11 birds collected in December, 1976 were banded. All of the birds had been banded at South Brunswick River, four in 1976 and one in 1974. A sixth bird, which had been banded at South Brunswick River in July 1974, was recaptured during banding activities on 17 August 1974. The bird was diseased and was euthanized. These 6 recoveries are represented in Fig. 1 by the cluster of dots at the South Brunswick River location.

*Recovery Locations*

Recoveries for birds banded during the migration-winter period came from three rails banded at Demeries Creek on 16 September 1974. One was shot 23 km south of the banding site on 29 October 1974. The second was found dead at Brooklyn Park, Maryland the following May. This was the most distant recovery for the study (a straight line distance of 925 km) and was the only report of a northern summer range for a rail banded during the study. The third rail was shot near the banding site one year after banding.

Hunter recoveries (11 total) of preseason banded rails consisted of birds banded at the Brunswick-Turtle River estuary. Four recoveries were made within a few km of the banding area. Six recoveries came from areas on the Georgia coast north and south of the banding site, at distances of up to 77 km. Average dispersal distance for the 6 birds was 51 km. One rail, banded as a young bird on 8 August 1975, was shot 1 November 1975 at Merritt Island, Florida, 290 km south of its banding location.

These returns suggest that the South Brunswick-Turtle River rail population undergoes a degree of postbreeding season dispersal. From such a small sample it cannot be determined if this dispersal represents a limited migration, emigration of a segment of the nesting marsh population, or a shift to wintering range. Irrespective of precipitating factors, these movements represent considerably more mobility than has previously been attributed to the subspecies. Accounts in the literature view populations of the southern subspecies as non-migratory or exhibiting little movement (Mangold 1977). In light of present findings, additional banding is warranted to determine if movements exhibited by Brunswick area birds are common to all resident Georgia rails and other southeastern populations. A concerted effort among the coastal southeastern states is needed to gather this and other basic information on clapper rails residing in our marshes.

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