

NOTES ON THE COURTSHIP BEHAVIOR OF THE KING RAIL

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THE KING RAIL (*Rallus elegans*) has been well known to collectors, hunters, and bird watchers ever since its discovery by Audubon in the early 1800's but few detailed behavior studies have been made of this species.

The present paper, the third in a series based on observations in the rice fields of eastern Arkansas (Meanley, 1953 and 1956), presents information concerning the courtship behavior of this rail.

I made observations mostly during the months of February, March, and April, 1954 and 1955. At this season of the year King Rails in the rice belt are found chiefly in roadside ditches and in rice field canals, but in the course of feeding and courtship activity they sometimes wander into partially inundated rice stubbles, pastures, and fallow fields bordering such ditches and canals.

Many of the data were obtained by observing rails with 7×35 binoculars from an automobile parked along roadside ditches. In many cases the rail under observation wandered so close to the car (5 to 10 feet) that binoculars could not be focused. The greater part of the field work was done from dawn until about 9:00 A.M. and in the evening from 4:00 P.M. until dusk.

Using an automobile as a mobile blind made it possible to follow courting rails for long periods of time along a roadside ditch. On many occasions a pair of rails was kept under constant observation for two hours or longer. Four males provided data on pre-nuptial courtship while 20 pairs provided data during the nuptial courtship.

Sexes were distinguished in the field by continuous observation of individuals until the performance of some unquestionably distinguishing act; i.e., either copulation or attempted copulation; or during the earlier stages of courtship, by the behavior of the birds toward each other; as males obviously claiming territories responded to other males belligerently, while females were permitted to enter a territory unchallenged, at the same time evoking displays of white outer tail coverts, posturings, etc. One individual was so unusually small as to be recognizable. When this individual was determined to be a female, all previous and subsequent records could be easily specified.

The number of territories occupied by resident males in a given area was determined by recording the mating call of rails along a six-mile stretch of roadside ditch north of Stuttgart, Arkansas. Later in the season, nests were found on most of these territories.

TERRITORIES AND POPULATION DENSITY

During the breeding season territories occupied by King Rails in roadside ditches consisted of small strips of fresh-water marsh. The predominant plants in most of these small marsh strips (in order of relative abundance and consequently also of importance as nesting cover for the King Rail) were: *Juncus effusus*, *Carex stipata* (?), *Carex hylanopelis*, *Rhynchospora* sp., undetermined Gramineae, *Typha latifolia*, *Eleocharis palustris* (?), and *Polygonum* sp. Subdominants included several species of *Sagittaria* and Gramineae.

The schedule of arrival of males in the area and the stage of courtship determined the size and choice of territory. It is conceivable that the earlier arrivals manage to claim larger and more suitable territories than those which arrive later when competition is keener. However, territorial boundaries were rather fluid during the earlier part of the courtship and pairing period. As additional males moved into an area of suitable roadside ditch habitat, the large courtship-and-feeding territories of the first contingent tended to shrink.

During the last week in February and the first week in March, one male King Rail gave the mating call at various points along 975 feet of roadside ditch. By the second week in March its mating calls were heard from about 500 feet of roadside ditch; its territory was then about half its original size. The diminishing territory was caused by (a) pressure from another courting male, (b) burning of cover along part of a ditch bank within the original calling territory, and (c) relatively modest territorial requirements for nesting, particularly if there is plenty of water in the area about the nest where the rail can find ample aquatic animal life for food.

An idea of the size of nesting territories was determined by measuring the distances between 3 nests in the same ditch: from the nest in the center there was a distance of 298 feet to the nest on one side and 166 feet to that on the other. The ditch was about 30 feet wide at all three points.

There were 22 occupied nesting territories along 6 miles of continuous roadside ditch.

Defense of Territories.—King Rails defended their territories both inter- and intra-specifically. When another King Rail invaded a territory, the possessor often prepared to charge by coming to a "freeze," assuming a partial crouch, drawing in its neck, and slowly ruffling its feathers. Then it chased the intruder on foot and wing.

As additional King Rails moved into suitable nesting habitat, there was much fighting, particularly near boundaries of the more

desirable territories. I observed a typical skirmish in a narrow ditch bordering a secondary road, on April 21, 1955. At this unstable territory boundary, two males attacked each other, sparring like fighting cocks for about 20 seconds. Then the bout suddenly ended, and the birds moved in opposite directions.

On April 22 in a rice stubble which appeared to be a common feeding ground for the occupants of the adjacent section of roadside ditch, two males (each already paired) "squared off" in a bitter encounter that was timed at 3 minutes. There was much chasing, both on foot and on wing, and considerable clashing in "fighting cock style." W. E. D. Scott (Bent, 1926: 287-288) reported similar fighting by Clapper Rails (*Rallus longirostris scotti*) during the courtship period; according to Scott, "During the mating season the male birds are very pugnacious and resent any intrusions from others of the species. At such times I have seen them have pitched battles, and finally, one giving in and taking to flight, the victor would pursue the vanquished on the wing for several hundred feet."

Sora Rails (*Porzana carolina*) migrating through the Arkansas rice country in spring frequent roadside ditches occupied by King Rails on established nesting territories. One King Rail made 4 passes in running flight at a Sora in order to evict it. Virginia Rails (*Rallus limicola*) received the same treatment.

PRENUPTIAL COURTSHIP

The Mating Call.—During the first warm days of late February, the mating call of a King Rail was heard for the first time in the roadside ditches adjacent to rice stubbles or other fields. Rails fed in the shallow water of the ditch and used the grasses (often *Andropogon* spp.) on the ditch bank, or the outside levee of an old rice field, as a place of retreat or hiding. Moreover, the rails used little lanes or pathways, such as those made by a cottontail rabbit, for travelling in concealment along the ditch banks. In late February almost the only vegetation that offered concealment to the calling King Rail was the perennial *Andropogon* of the ditch bank; consequently, much of the early season calling emanated from behind or from among clumps of this grass. However, where there happened to be an old growth of cattails in the ditch, the rail called from this cover.

The male King Rail called its mate from concealed, partly concealed, and completely exposed positions. The purpose of this call presumably was first to attract a mate and later, after pair formation, to rally her.

The mating call is one of the least difficult calls of the King Rail to describe. It was most commonly given as a harsh *kik-kik-kik-kik-kik*. Occasionally it varied from a series of *kiks* to a series of *kuks*. The pitch of the call was steady, but the tempo increased from time to time. One bird under observation was heard to give the call continuously for 18 minutes.

I never heard the female give the mating call.

Other Calls.—Perhaps the most characteristic call of the King Rail, one that was heard throughout the breeding season, may be written as *jupe-jupe-jupe-jupe-jupe* or *cheup-cheup-cheup-cheup-cheup* or sometimes *gelp-gelp-gelp-gelp-gelp*. The first several notes were louder and higher in pitch than the succeeding notes. The tempo increased rapidly toward the end of the call, and the notes ran together. One rail gave 25 distinct *jupes* in a single series, not including those in the rapid ending, which could not be counted. This was a very loud call that carried a greater distance than the mating call. It was sometimes answered by a number of other King Rails, it was sometimes used when a bird was startled, and occasionally it served as an "all is well" call when a pair of separated birds were reunited; moreover, an incubating bird occasionally used the call when it wished to be relieved at the nest. Apparently the call served still other purposes.

A call that was heard sometimes during prenuptial courtship, but more frequently after pairing, was a soft and rapid *tuk-tuk-tuk-tuk-tuk*. Both the male and female uttered this sound, which reminded me somewhat of the clapping together of the mandibles of the Barred Owl (*Strix varia*). The call was seldom audible to the human ear beyond 20 or 30 feet. The King Rail used the "tuk" call as a rallying call or gave it to indicate its position to its mate.

Display.—The display of the male King Rail, as witnessed, was certainly not spectacular. Females observed during prenuptial courtship made no attempt to display.

The display of the male during this period was relatively simple and consisted mostly of walking about, tail uplifted and white under-tail coverts extended (see Figure 1, 1). Some males cocked their tails vertically, in a position which afforded a view of the white under-tail coverts from a considerable distance. While flashing its white under-tail coverts, the rail usually flicked its tail back and forth slightly.

There were other forms of posturing during the period of courtship and mating, but evidently the cocked tail and well-exposed white under-tail coverts (and the mating call) were the principal means of attracting a mate.

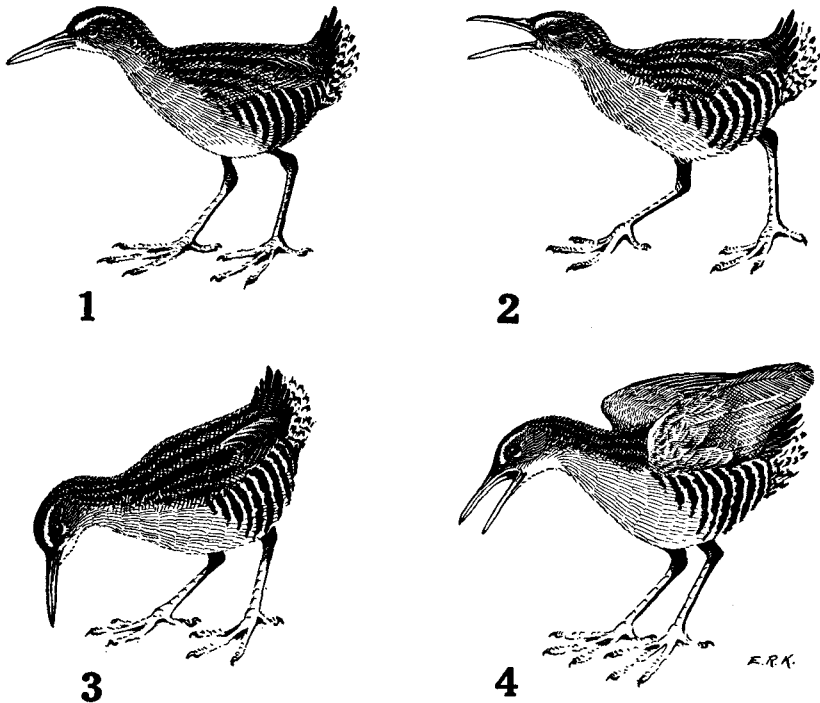


FIGURE 1. Displays of the King Rail. (1) Earliest form of display, and most frequent (Tail cocked and white under-tail coverts extended). (2) Pursuit Display (Male pursuing female during pre-nuptial courtship. Bird walking fast or running; with tail slightly cocked, white under-tail coverts extended; and bill wide open). (3) Invitational Display (Posture assumed by mated male upon close approach of female. Bill pointing downward and slowly swinging from side to side. Tail displayed). (4) Variation of Invitational Display (Wings arched; head turned to one side, bill open. Tail displayed).

I have on two occasions observed what appears to be another form of display, termed the "pursuit display" in this paper. The circumstances and the behavior of the male were essentially the same both times. Both males had been under observation almost since they had started sounding the mating call. In each case the male was one that apparently had not succeeded in attracting a mate to its territory. On March 1, 1955, at 8:30 A.M., I saw a small and very rufescent King Rail, later established to be a female, approaching a calling male along a rice levee bordering a roadside ditch. The female continued along the water's edge at a slow but steady gait and passed beyond the male that was standing in the ditch. As soon as she was ahead of him, the male followed her in a fast walk with head and neck outstretched, bill open (but emitting no sound

audible at 40 feet), tail cocked, and white under-tail coverts extended (see Figure 1, 2).

NUPTIAL COURTSHIP

Following pair formation much of the posturing and calling that characterized the period of prenuptial courtship continued, at least in the earlier phases of nuptial courtship. While pair formation was in progress, but infrequently during the nuptial courtship period, the female uttered a *purr* or *churr* sound, like the *purr* of a cat, especially after the male had given the mating call.

The male used the mating call (*kik-kik*) infrequently and with less vigor to rally the newly won mate that often strayed as it foraged. A good example of the use of this call shortly after pairing was observed on the evening of March 2, 1955. During an 18-minute period beginning at 5:30 P.M. a paired male, while standing partially concealed in the same position on a rice field border levee, uttered the complete mating call 7 times. Six of the 7 times its mate ran to the male from a distance of 100 feet or less where it had been feeding. When the female came up, the male spread its white under-tail coverts and bent its head and neck so that the bill was perpendicular and nearly touching the ground (Figure 1, 3). From this position it often turned its bent head with bill open toward the female. At one of these meetings it appeared to be about to mount the female and began to rise up with its bill still wide open; but the female evidently had not reached physiological readiness, and copulation did not occur.

Many times later other males assumed the posture just described, but most often they were standing in water, in which case the bill usually touched or slightly dipped into the water. The birds assumed the pose after pairing, when the feeding female that had been at some distance from the male came within 3 or 4 feet of her mate. On one occasion a male under such circumstances arched its partly opened wings (Figure 1, 4).

When feeding with a female during the courtship period, the male usually led the way and during the earlier part of this period continued to cock its tail and extend its white under-tail coverts. The mated pair seemed very devoted. During a two-hour period when mated birds were under constant observation, the male caught 7 crayfish (*Cambarus* sp.), 5 of which he presented to the female. I frequently observed the mated pair standing close together, gently nibbling at one another.

As the nesting period approached, the mating call and flashing of under-tail coverts by the male all but ceased, and a number of addi-

tional calls, mostly soft or subdued, increased the repertoire of the mated pair. Paired rails used such calls as a rallying device when separated and as a reassuring answer to one another when together.

A call frequently given by both birds, particularly as nesting approached, was a very soft *poyeek-poyeek-poyeek-poyeek-poyeek*, or *wyeek-wyeek-wyeek-wyeek-wyeek*, which seemed to be an inquiry as to the whereabouts of the mate.

Several males gave what seemed to me to be one of the most unusual calls uttered by a rail. It was a deep, booming sound requiring an effort that caused the body to appear to expand slightly. I have attempted to record this sound as *boom-boom-boom-boom-boom*. The purpose of the "booming" call is not known. It is not very loud, and the female was not nearby when it was uttered unless she was well concealed.

COMPARISON WITH THE COURTSHIP CALLS OF THE CLAPPER RAIL

During the spring of 1956 I had an opportunity to see and hear courting Louisiana Clapper Rails (*Rallus longirostris saturatus*) in the marshes just south of Grand Chenier, Cameron Parish, Louisiana. It is extremely interesting to observe the similarity in appearance and habits of the King and Clapper rails in this area. Where the fresh-water and brackish marshes meet, these species sometimes nest only a few yards apart. Lowery (1955: 227) refers to them as "ecological representatives of each other."

After listening to the calls of many Kings and Clappers in the Cameron Parish marshes, I concluded that their mating call (*kik-kik-kik*) was identical, as was the *jupe-jupe-jupe* (or *cheup-cheup-cheup* or *gelp-gelp-gelp*) call described above.

On one occasion when a mated pair of Clappers was feeding some 50 yards apart, the male stopped feeding, stood erect, and gave the mating call; the female immediately ran to him in the same manner as a responding female King Rail that I saw at Stuttgart, Arkansas.

Further investigation of the habits of these two closely related species would possibly reveal many other identical behaviorisms.

SUMMARY

I observed the courtship behavior of the King Rail at Stuttgart, Arkansas, during the spring of 1954 and 1955.

The mating call and the exposure of the white under-tail coverts were the principal means used by the male King Rail to attract a mate. During the nuptial phase of courtship several rather subdued

calls were given by the mated pair and the mating call was given less often. Posturing was more varied after mating.

The mating call and several other calls uttered by the King Rail during the courtship period sounded identical to those given by the Louisiana Clapper Rail at Grand Chenier, Louisiana.

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LITERATURE CITED

- AUDUBON, J. J. 1835. *Ornithological Biography*. Edinburg, Adam and Charles Black, Vol. III, 631 pp.
- BENT, A. C. 1926. Life histories of North American marsh birds. *U. S. Natl. Mus. Bull.* 135: 1-490.
- LOWERY, G. H., JR. 1955. *Louisiana Birds*. Baton Rouge, Louisiana State Univ. Press, 556 pp.
- MEANLEY, B. 1953. Nesting of the King Rail in the Arkansas rice fields. *Auk*, **70**: 261-269.
- MEANLEY, B. 1956. Food habits of the King Rail in the Arkansas rice fields. *Auk*, **73**: 252-258.

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