BREEDING SORAS ON A LONG ISLAND SALT MARSH

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We report here the recent discovery of a breeding population of Soras *(Porzana carolina)* on a Long Island salt marsh. This occurrence is notable for two reasons: (1) it represents evidence of recent breeding by this species on Long Island, and (2) it may constitute the first record of Soras using a salt marsh as nesting habitat.

OCCURRENCE ON LONG ISLAND

During June 1980, we located three concurrently active nests (Figure 1) of Soras in a localized section of a large salt marsh fringing the southern edge of Great South Bay at Oak Beach, Suffolk County. The population in 1980 probably consisted of only the three pairs responsible for these nests.

There is evidence of a prior recent history of Soras at Oak Beach Marsh. Post (1970) reported a summering Sora in 1970 in a breeding bird survey of the marsh. He did not find a nest of this species although he was able to locate seven nests of the Virginia Rail *(Rallus limicola)* in the same area. In the spring and summer of 1979, we saw at least one Sora and heard its distinctive calls on repeated occasions. Apparently this was the same bird that we netted and banded on 15 May 1979.

Our observations suggest that the Soras of Oak Beach Marsh constitute a "fugitive" population that may disappear for a year or more and then be re-established through dispersal from unknown sources. Although we worked almost daily on the marsh from May to July in 1977 and 1978, we did not notice or hear Soras. In each of those years, we recorded Clapper Rails *(Rallus longirostris)* on the outer portion of the marsh, and several pairs of Virginia Rails and at least one Black Rail *(Laterallus jamaicensis)* on the inner marsh where Soras might have been expected. Also, we failed to find Soras at Oak Beach Marsh this past summer, 1981.

This report of nesting Soras evidently represents the first confirmed breeding for the species on Long Island since 1935 (Bull 1974). Bull (1974) identifies only six prior nesting localities on Long Island, including three within the limits of New York City. Gardiner's Island, where it is conceivable that a population still occurs, and Fort Salonga are the sole localities listed for Suffolk County.

It seems evident from the older literature that Soras were at one time more common (at least locally) on Long Island than they have

Figure 1. Closeup of Sora nest containing a full clutch of 10 eggs on Oak Beach Marsh.

been in recent decades (Giraud 1844, Bull 1974). However, in the late 1800s or early 1900s its populations in the region began to decline, finally reaching the point where Griscom in 1923 was forced to describe it as probably extirpated as a breeding bird on Long Island. Since then the Sora evidently has occurred only sporadically during the summer on the island although a population of a dozen or more pairs (Bull 1964) has persisted to the present time at Troy Meadows in nearby northern New Jersey.

SALT MARSH HABITAT

The Sora is generally considered to be restricted to freshwater habitats during the nesting season throughout its continental range across the northern United States and adjacent Canada. The characteristic vegetation of these habitats varies from place to place, but

commonly includes sedge *(Carex)*, bulrush *(Scirpus)*, and cattail *(Typha)* communities associated with environments where standing water is prevalent. In a few areas, it has been found breeding in brackish marshes near the sea and even rarely in upland sites such as grass or grain fields (Forbush 1925). Except during migration, it appears to shun coastal salt marshes where certain other rallids typically occur.

Oak Beach Marsh is a low and relatively wet unditched marsh covered mainly by Smooth Cordgrass *(Spartina alterniflora)* and bounded along its upland side by a zone of *Phragmites australis (=communis)*. It has been described in some detail elsewhere (*e.g.*, Post and Enders 1970), so it seems necessary only to consider its special significance to Soras (and to Virginia Rails as well [Post and Enders 1970]) here.

The Soras and Virginia Rails were confined to a southeastern section of the marsh along the edge of the *Phragmites* about 250 m from the bay. Their activity spaces included both the *Spartina* and adjacent *Phragmites* communities. In this part of the marsh, the *Spartina* is irregularly interrupted by muddy openings and shallow pools of water harboring abundant aquatic life (Merriam, MS in preparation). Also, because the elevation of the marsh is at or very near mean high water and the relief on the marsh is gradual, drainage on the inner marsh is poor. There is usually standing water, a few centimeters deep, that is little affected by normal tidal cycles. Occasional high spring or storm-driven tides flood the area, but, except for the deeper pools, it may just as readily dry up during a period of drought. As a result then of the marsh's hydrological characteristics, the salinity of the water around the rail nests probably was quite variable.

The Soras nested and foraged on the marsh in *Spartina*, or in a combination of *Spartina* and *Phragmites*, and foraged and sought refuge in the neighboring *Phragmites* stand. Undisturbed feeding birds seemed to favor the edges of open mud pools along the margin of the *Phragmites*. From a physiognomic standpoint, the occupied portion of the salt marsh at Oak Beach may not be altogether unusual as a breeding habitat for Soras. It exhibits the basic feature that is frequently found in inland marshes used by them, namely a fine-grained mosaic formed by patches of open standing water and mud adjacent to areas containing erect marsh vegetation dominated by plants with a grass-like life form. The parts of Oak Beach Marsh covered by unbroken expanses of *Spartina* were not frequented by the Soras.

TABLE 1
HISTORIES OF TWO SALT MARSH SORA NESTS

Variable	Nest no. 1	Nest no. 2
1. Date discovered	27 May	28 May
2. Status of nest, date of discovery	egg-laying	clutch completed
3. No. eggs, date of discovery	6	10
4. Clutch size	10	10
5. Laying sequence	1 egg/day	unknown
6. Time of laying	before 07:00[1]	unknown
7. Date (est.) first egg laid	22 May	17 May[2]
8. Start full incubation[3]	laying 4th egg	laying 4th egg
9. Start of hatching	12 June, 16:55 - 13 June, 09:45	06 June, 13:00 - 07 June, 13:15
10. No. eggs hatching during 9.	4	4
11. Hatching sequence After 9.	1 egg/day, except for ultimate and penultimate eggs (see text)	1 egg/day, except for penultimate egg
12. Total hatching interval[4]	187.9±22.03 hrs.	144.4±20.47 hrs. (last egg failed to hatch)
13. Total no. eggs hatching	10[5]	9
14. Incubation period (days) (eggs 4-10)	18.8±0.35 to 20.6±0.56[6]	Unknown

1 On several early visits to nest 1 during egg-laying, the egg laid that day had already been deposited by 07:00. For purposes of calculating incubation periods from laying to hatching (see note 6), I use 06:00 as an arbitrary and standardized laying time for all eggs.

2 Back calculated from hatching of egg 4 (incubation started with egg 4), assuming an 18-day incubation period and 1 egg laid/day.

3 Inferred from hatching schedule (see text).

4 Calculated from the midpoint of consecutive visits bracketing hatching of the first egg to the midpoint of those of the last egg to hatch ± mean error (cf. Nolan [1978] for definition and calculation of mean error).

5 The last young hatched out and then died in the nest.

6 Calculated from laying to hatching of eggs laid after inferred incubation commenced, in days ± mean error.

NOTES ON BREEDING BIOLOGY

Bent (1926) summarized early information on the breeding biology of the Sora. Since then a number of studies have made substantive additions to our knowledge of reproductive patterns in the species (Mousley 1937; Pospichal and Marshall 1954; Tanner and Hendrickson 1956; Walkinshaw 1935, 1940, 1957). Gullion (1954) provided a convenient summary of the comparative breeding behavior of rallids generally, including the Sora.

Two of the three Sora nests found at Oak Beach Marsh were built 39 meters apart in erect green and persistent *Spartina alterniflora.* One nest was about 9 meters from the nearest *Phragmites,* and the other was 15 meters from *Phragmites.* Both nests were situated near large mud pools over 200 meters from the bay. The third nest was built in short *Spartina* within a small, isolated clump of *Phragmites* about 2 meters onto the edge of the marsh. The two marsh nests were successful but the *Phragmites* nest was not. The histories of the two successful nests are summarized in Table 1.

One of the two marsh nests was well concealed by overtopping vegetation (0.75 m tall) but the other was partly exposed in a patch or dwarf *Spartina* with only about 40% cover overhead. Both nests had a loose canopy over them formed by the intermeshed leaves of adjacent plants. Walkinshaw (1940: 156) reported canopied Sora nests in freshwater habitats, while Post and Enders (1970) observed canopies over some Virginia Rail nests at Oak Beach Marsh.

The marsh nests were thick, well-formed masses of dead, interwoven *Spartina,* bearing shallow, saucer-like nest cups lined with finer stems of *Spartina.* The *Phragmites* nest was a loose affair of dead *Phragmites* stems. All three nests were placed on a platform of similar material built directly on the mud. None of the nests was attached to surrounding erect stems, as often is the case in Sora nests built over water in inland areas. The platforms raised the nests above the mud and low water so that suspension was unnecessary. None of the nests had a ramp leading up to the nest lip, a structure often present at nests built in freshwater marshes (Pospichal and Marshall 1954: 12). This may be because the salt marsh nests were built on low pads of vegetation, making it possible for the adults to step directly onto the nests from the mud substrate. In a suspended nest over deep standing water, adults leaping or scrambling up onto its rim without the aid of a ramp might tend to tilt the nest during the course of incubation and perhaps spill the eggs into the water. Thus,

ramp-building behavior may be viewed as a facultative adaptation that circumvents this problem, stabilizing the nest and permitting the attending adults to step directly into the nest cup.

SUMMARY

A small, perhaps transitory breeding population of Soras was located in a salt marsh on Long Island, New York. This occurrence constitutes the first confirmed breeding of this species on Long Island since 1935. The recent history of the species as a summering bird on the island is covered and aspects of the breeding biology of the salt marsh population are reported.

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CORRIGENDA

The following corrections should be made to "The Report of the New York State Avian Records Committee," (*The Kingbird* Vol. 31, No. 4; 1981):

pg. 202: Correct year of the Redwing record is 20-24 Feb 1959, not 1954.
pg. 202: Correct year of the citation in *The Wilson Bulletin* 71: 382-383 is 1959, not 1971.
pg. 205: Correct Latin name of South Polar Skua is *Catharacta maccormicki* and not *C. skua skua.*