TREE SWALLOW BREEDING BIOLOGY AT A COASTAL AND INLAND AREA

By Frederick S. Schaeffer

Over the years, many studies have been conducted on the breeding biology of the Tree Swallow (Iridoprocne bicolor), particularly in New England (Paynter, 1954) and more recently, in northern New York State (Yunick, 1971). Recently, a study of this type was published covering an area known as the Tinicum Marsh Wildlife Preserve in Philadelphia, Pennsylvania (Stocek, 1970).

This paper presents tree swallow breeding data taken in two areas: (1) the outer beach area on the South Shore of Long Island, N.Y., and (2) an area in the coastal plain of New Jersey.

STUDY AREAS

Although my field studies on Long Island took place during 1968 and 1969, only the 1969 data are useable here. The New Jersey study took place during 1971. The Long Island nesting site is located in the John F. Kennedy Memorial Wildlife Refuge (JFKMWR), adjacent to Tobay Beach, some 4 miles south of Massapequa, New York. The refuge is in Nassau County, most of the beach in Suffolk County. The coordinates are: 403-0732. The study was assisted by the New York State Department of Environmental Conservation located in Ronkonkoma, New York.

The New Jersey nesting site is located at the New Land Research Reserve (NLRR), owned and operated by the Stonybrook-Millstone Watershed Association. The Reserve, part of the Stonybrook Watershed, is located 1.5 miles south of Hopewell, Mercer County, New Jersey. The coordinates are: 402-7440. The study was (and still is) sponsored by the New Jersey State Museum.

In both areas, Tree Swallows have been known to nest previous to the establishment of these nesting sites. In New Jersey, an earlier study by Kenneth W. Prescott and Trudy Prescott (unpublished) took place from 1968 through 1970. The comparison of nesting success of 1968 through the present will be discussed in a seperate paper.

Habitat

The Long Island area features coastal scrub, Poison Ivy (Rhus radicans) about 6-8 feet high, Bayberry (Myrica pensylvanica) and Greenbrier (Smilax spp.). It has one large brackish pond and, in 1970, another sizeable fresh water pond was added (see figure 1).

The New Jersey area is mainly consistent of fallow fields, closed in on three sides by woods, some of which is solid and some open deciduous woodland. Several farm buildings are located on the property adjacent to a medium (3 acre) sized pond. Unlike the Long Island site, the

New Jersey site is closed to the general public and virtually undisturbed. The Long Island site covers some 400 acres, but boxes were set only on a 10 acre portion of this. The New Jersey property spans over 350 acres and boxes are set over approximately 20% of the area.

Nestboxes

At the JFKMWR boxes were located near the mosquitoe drainage ditches of which there are hundreds. Two colonies, known as A and B, were set out with 12 boxes each (see fig. 1). The boxes were between 40 and 80 feet apart. Four boxes were set in the open salt marsh, all others were within the vegetated areas.

At NLRR boxes are located around the pond (three in the pond on tall steel poles) and around the periphery of the area closest to the pond. In addition, seven clusters of four boxes each and one cluster of three boxes, are set on the fallow fields which are located further away from the pond (see fig. 2). The boxes are approximately 100 feet apart. A total of 52 boxes were initially available to tree swallows and other species vs. 24 boxes (and some additional boxes in nearby areas) at the JFKMWR. Boxes used at either area were built according to the same standards, with the exception that the entrance hole at NLRR is 1 1/2 inches in diameter, and the entrances at JFKMWR were 1 1/4 inches in diameter. The Long Island boxes opened from the top; those in New Jersey open by swinging the front panel upwards.

RESULTS

Nest Building

At JFKMWR, birds arrived in two distinct groups around March 15th and April 15th. The first group consisted of mostly steelblue-backed birds, presumably males, whereas the brown-backed birds, presumably females, came on the later date (Kuerzi, 1941; Stocek, 1970). At NLRR all birds arrived around May 3rd. Birds captured were banded on earlier occasions (Prescott, unpubl.) and some were not banded. Table 1 summarize these data.

Territories were chosen about one week after arrival of the second group at the JFKMWR and around May 12th at New Land. As at Tinicum (Stocek,1970) Swallows at both colonies arrived on warmer days. Nests at both colonies were constructed mainly of grasses and matted with down and other feathers. These feathers came presumably from Gulls at JFKMWR (There are Herring and Great Black-backed Gull colonies nearby) but could also very possibly have come from the Heron colonies at the southern periphery of the refuge. At NLRR, the feathers were from chickens at nearby farms.

Unfortunately, not much data were gathered at either location between arrival and egg laying. "Billing", a form of pre-copulatory behavior was observed at Tobay (Schaeffer, 1970).

Box	Adult/Female*	Young
6	75-42257*	79-58527 thru 58532
19		79-58519 thru 58523
20		79-58349 thru 58353
3	75-43250*	79-58524 thru 58526
27	79-58502	79-58513 thru 58518
35		79-58508 thru 58512
44	79-58501	79-58503 thru 58507
49		79-58538 thru 58542 (#42 known youngest)
13	79-58533	79-58534 thru 58537
33	79-58543	

*No males were captured. Adult-Female 75-42257 was banded on June 6, 1970, on Nest 15 where it was a young of the year. The boxes are approx. 300 meters apart. Adult-Female 75-43250 was banded on June 14, 1969 on nest 1 where it was a young of the year. In 1970, it used box 18 with Adult-Male 75-42263 and produced 6 young, which were all banded. Box 1 is approximately 250 meters from box 18; however, box 18 is only about 20 M. from box 3. The 1969/70 banding was done by Kenneth W. Prescott.

TABLE 1. New Land Research Reserve - banding summary

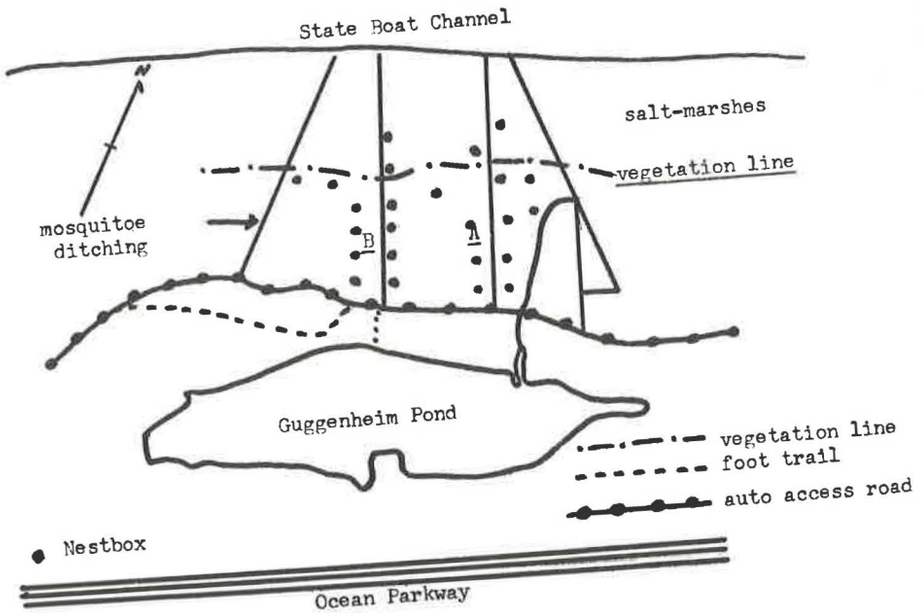

FIG.1. JOHN F. KENNEDY MEMORIAL WILDLIFE REFUGE

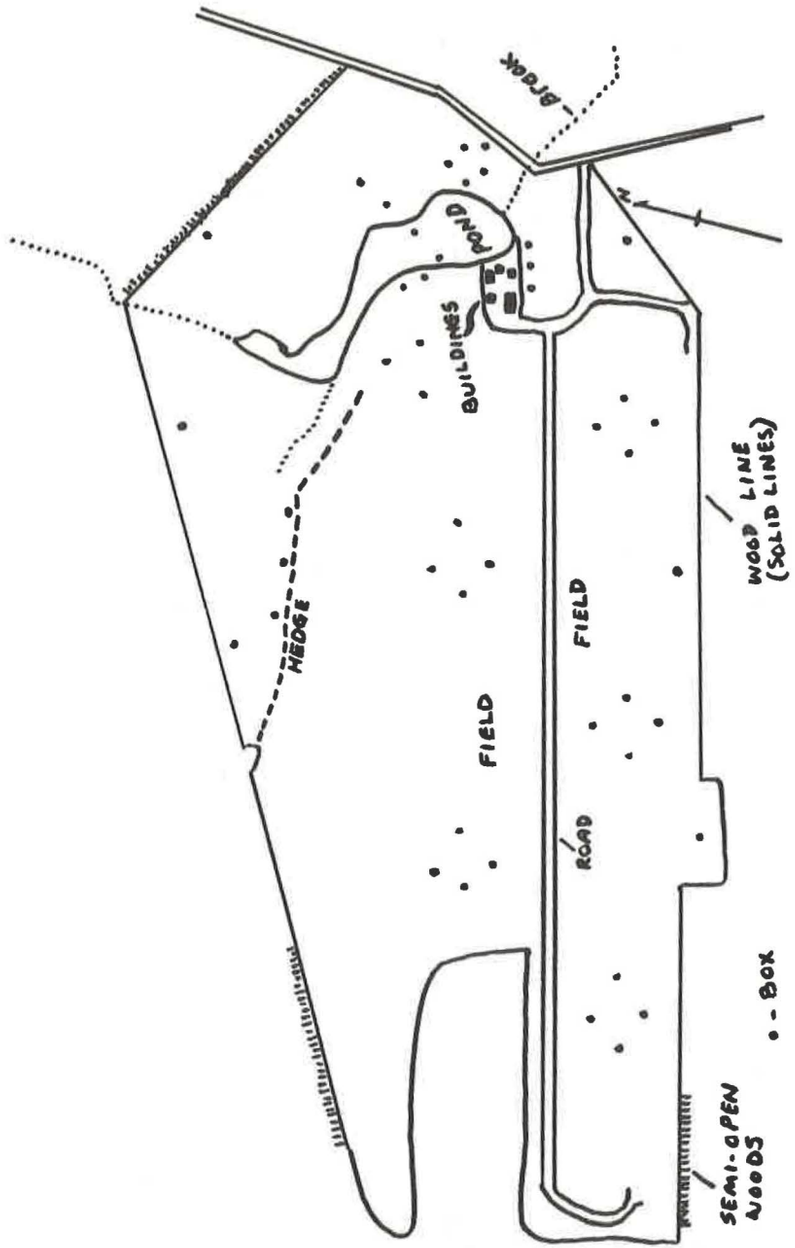

FIG. 2. NEW LAND RESEARCH PRESERVE

Egg Laying

The first egg at the JFKMWR appeared on May 6, 1969. At NLRR, the first eggs appeared in the fourth week in May. Observations were not begun regularly until May 29, 1971 when there were four nests with 6 eggs, one with 5 and one with 4 eggs, two with 6 young and 5 young respectively. At JFKMWR on May 29 (1969) there were many nests with several eggs and young as summarized in Table 2. Observations were aided by Roy Barth of Malverne, New York without whose loyal help, the study at JFK MW Refuge would have been impossible.

Incubation

At the JFKMWR incubation began on most nests on May 14th; there was no tangible evidence of a second brood, rather, several birds re-nested due to egg destruction (human caused). At the NLRR incubation began largely on May 24th, the two nests with young on May 29th, were destroyed except for two young (from a total of 11). The causes are not positively known although it is felt that poor weather in the earlier part of May and heavy densities of lice (Mallophaga spp.) are causitive factors. On several occasions at both colonies it was noted that the Adult-Female remained in the box, brooding, during the hottest part of the day, and was often away, presumably feeding, during early evening hours when it was cooler. At JFKMWR thermometers were attached to the insides of two empty boxes and these were noted to read up to the extremely high temperature of 89 degrees Fahrenheit, during the hottest part of the day on several occasions. Boxes at either location have been checked at various hours, early in the morning (5-6 A.M.), at noon and late in the evening (8-9 P.M.). At no time was the Adult-Male ever flushed from any box in use. Rather, the male was always found in a nearby tree or shrub or in an empty box on a shallow bed of dried grasses.

Hatching

The first egg hatched at both locations some 12-14 days after the last egg was layed. As mentioned in connection with Barn Swallows(Hirundo Rustica Erythrogaster), the male stayed conspicuously away during hatching (Schaeffer, 1968). This is also the case with Tree Swallows, so noted at both locations. Apparently, the female goes out to feed(as nests with eggs just hatched have often been found unattended) and the males do not make attempts to feed their partners during this period. Hatching generally is completed in a 48 hour period (Kuerzi, 1941). At JFKMWR hatching sometimes took as long as 72 hours as was noted with several nests.

Fledging

At the JFKMWR, June 18th was the date on which most young fledged. At NLRR, most fledged on/about June 23rd, despite the later arrival. It is suspected that the coastal weather which is very unstable causes the

various delays(which mostly occur during egg-laying)but this subject is so complex that many more seasons are needed to study this matter.

At JFKMWR the young were never found back in the boxes from which they were known to fledge (determined by means of banding) and I have no idea where they kept themselves at night. At the NLRR however, young of about 50% of the boxes return to their home box to roost during the night as indicated by observations made just before it turned completely dark (9 P.M.). At NLRR, young were observed on July 17th, very close to the area where they hatched but even at this late date there was no evidence of a second brood.

Nest Cleaning and Mortality

As mentioned in regards to Barn Swallows (Schaeffer, 1968), Tree Swallows attend to some nest cleaning during the early fledging period. When the young start flying, however, little or no cleaning is done. The result is that insects, lice, etc., are attracted to the box and this apparently caused the death of one young (Box 49 at NLRR), the last hatched (youngest) which apparently was too weak to take to flight at the same time as the others of this nest. This young was found dead on July 8th covered liberally with lice and ants. Barn Swallows, when all young have fledged, remove the nest lining, leaving the nest ready for re-use; Tree Swallows do not, and these feathers along with the excrement begin to rot. The two nests which were used earlier at NLRR, as mentioned above, lost a total of 9 young, Box 49 lost one and Box 19 lost three; hence, a total of 13 young were lost and two eggs were infertile. At JFKMWR, however, there were five infertile eggs and, four were destroyed and 9 young died. The total number of eggs at NLRR was 41 and at JFKMWR it was 60 (see Table 3).

JFKMWR summary (1969) - Table 2.

Nest boxes available:	25
Nest boxes occupied:	
by Tree Swallows:	15
other species:	0
Eggs laid(number of nests):	60(12)
Average clutch size:	5.00
Eggs hatched (%):	85%
Nestlings fledged (%):	82.35%
Average young per clutch:	2.80
Number Banded	
Young:	21
Adult:	10
Adult retraps:	3*

NLRR summary (1971) - Table 3.

Nest boxes available:	52(44&)
Nest boxes occupied:	
by Tree Swallows:	11
by Bluebirds:	1
Eggs laid(number of nests):	41(8)
Average clutch size:	5.13
Eggs hatched (%):	95.12%
Nestlings fledged (%):	66.67%
Average young per clutch:	3.25
Number Banded**	
Young:	45
Adult:	4
Adult retraps:	2**

* 75-08526 banded on July 8, 1967 by Mr. Frank Enders at JFKMWR
56-57838 banded on May 8, 1966 by the author at JFKMWR
70-05844 banded on May 4, 1966 by Mr. Fred Heath at JFKMWR

& Eight boxes were not counted. They slid down the poles(not fastened securily) and were rendered useless.

** See table 1.

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