Some Observations

On The Tree Swallow (*Iridoprocne bicolor*)

by

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A report of an original investigation conducted as a requirement for Advanced Ornithology (Zoology 119) at the University of Michigan Biological Station

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INTRODUCTION

This study on the Tree Swallow Colony in the Biological Station area and immediate vicinity was undertaken during the summer session of 1947 at the University of Michigan Biological Station on Douglas Lake, Cheboygan County, Michigan. The study is a continuation of a similar study carried on by Robert O. Beatty during the summer of 1946. Records were kept of nesting box activity from June 23 to July 16, 1947.

Grateful acknowledgment is due Mrs. Burget who helped make routine check-ups in the boxes and also helped band the young birds.

New nest boxes were first erected in 1944; in that year 15 boxes were erected. In 1945 20 more boxes were added making a total of 35 boxes.

GENERAL CONSIDERATIONS

The Tree Swallows represent the greatest number of nesting pairs in the station area. They were more carefully observed than the other species. A total of five routine observations were made of each box. The time between observations varied from four to ten days. I believe much beter results would be obtained with a minimum of three days between each observation during the early part of the nesting period and a minimum of two days toward the close of the period.

For information relative to the dimensions of boxes, maps on location of boxes and photographs refer to the papers of Brewer (1945) and Beatty (1946). Miss Brewer

conducted a breeding bird census of the area in 1945 and Mr. Beatty made a study of box nesting birds during the summer of 1946.

The Tree Swallow is a strong defender of territory. Its territory is the box and the area within a radius of a few yards from the box. The adults would dive at me when in this area and make a sharp twittering sound. Bluebirds and House Wrens formerly nested in some of the boxes, but this year not one pair of either succeeded in maintaining territory in the colony. Evidently the size of the growing colony has crowded these birds out entirely.

The first observations were made on June 23 and June 24. I found 20 boxes occupied with Tree Swallows and one box occupied with Starlings.

One of the 20 boxes occupied by swallows was an old box on the side of a red pine which the swallows seemed to prefer to standard house(Number3) which is close by. This also was true in 1946. In that year the swallows successfully raised their family, but this year the young in this box met with disaster. On July 7 I found two of the five young dead and a third badly injured. The heads of the victims had been chewed partially or wholly off. The two uninjured and the adult were banded. On July 16 I found the two banded young victims of the same fate. Two of the boxes, Numbers 28 and 30, on the hillside revealed dead adults on the nest and they showed the same injuries. It is possible that the predator was a flying squirrel as these animals were found occupying some of the boxes on the hillside. They occupied Boxes 33b, 34, and 35.

Boxes placed in open situations and protected with tin guards showed depredation in only two cases.

The adult found dead in Box Number 28 on the hillside bore a band C-81266. A check of Beatty's banding records revealed that this swallow occupied the same box last year and successfully fledged a family of five. This is another striking example of the fact that birds do return to the same identical territory.

On the first check-up I found all of the birds either in the process of hatching or in the first stage with the exception of Box Numbers 2, 7, 10, 14, 19, 20, and 22. In six boxes no eggs had hatched and in one swallow box the young had nearly reached the second stage of development. In Box Number 2 three young Starlings were well-feathered.

Box Number 14 which contained five eggs on June 23, revealed five newly hatched young on June 27; on July 16, the date of the last observation, it was the only box from which the swallows had not departed. Presuming that these birds hatched on June 27, we find a nestling period of 20 days. Kuerzi's study (1941) shows a median nestling period of 20 days with a minimum of 15 days and a maximum of 24 days. This observation agrees very well with his results. Incubation averages 15 days. This makes a total nestling period of 35 days, probably 40, with nest building activity.

Percentage of boxes occupied has increased each year for the past three years.[1] Brewer listed eight boxes occupied, Beatty 13, and the first observation this year revealed 20 boxes occupied. This trend also agrees with

1. Refer to Table I

Kuerzi's observations.

The total number of eggs and young on the first observation was 86. The total number fledged was 60. This is somewhat lower than the reproductive efficiency shown by Kuerzi's data. Poor protection of some boxes and undesirable location on the hillside may account for this.

The total number of young banded was 57 and of these, two were later found dead in the nest. Three adults were banded. The adult will often "freeze" and remain on the nest; had I learned this earlier I would have banded more of the adults.

The nests were constructed of pine needles (Pinus strobus) and lined with white feathers from domestic fowl; in a few exceptions one or two black feathers were noted. Kuerzi found this to be true of the colonies on which he reported, but one colony far removed from human habitation lined the nests with feathers from the Herring Gull. One nest (Box Number 17) was constructed on top of a partially built House Wren nest from last year. I believe in most cases the swallow cleans out the nest but in the above case it probably could not handle the sticks.

The average number of birds fledged per box occupied was 2.8. The better protected and more desirable located boxes of the lake shore showed an average of 3.5 per box and those on the hillside only 1.6 per box. This is evidence enough to show that the hillside area is not desirable.

The latest date of known occupancy was July 16. The presence or activity of the Tree Swallows after this was not noted. Previous papers indicate that the nesting period

may have been somewhat later this year; Beatty reports fledglings leavingthe nest in 1946 as early as July 7th.

CHRONOLOGICAL RECORD OF NESTING BOX OBSERVATIONS, JUNE 23 to JULY 17

The following boxes were empty on the first observation:
Boxes - 1, 3, 4, 6, 8, 15, 16, 18, 24, 25, 27, 29, 31, 32, 33b, 34, 35.
Boxes 15, 18, and 27 contained House Wren nesting material from this year or past years.

Box 6 was empty, but last year housed a family of Flickers. This year a family of Flickers was found in a cavity in a Quercus borealis just a few feet from this box. Their presence may have kept the Tree Swallows away although Beatty reports that there was no noticeable friction between Tree Swallows and Flickers in that area last year.

Boxes 1 and 2 are of the deep type and have been inhabited only by Starlings or Flickers in the past.

Boxes 33b, 34, and 35 were inhabited by flying squirrels. A flying squirrel nest with young was found in Box 35.

Box 2

June 23-Three young Starlings well feathered. June 27 - Well fledged and ready to leave the nest. July - Starlings have flown.

Old House on Pine Tree near Box 3

June 23 - Hatching, three young present, two eggs unhatched.

July 27 - Five young had been present, two were dead and a third fatally injured. Heads had been chewed wholly or partially off. The two uninjured young and the adult were banded. Young: Bands 46230; 46231. Adult 46229.

July 16 - Two banded young dead in the nest, same fate as the others.

Box 5

June 23 - Two young, two eggs.

June 27 - two young, one egg.

July 2, - Two young, rolled-feather stage.

July 7 - Banded young. Bands 46232; 46233.

July 16 - Empty.

Box 7

June 23 - Six eggs.

June 27 - Two young, three infertile eggs.

July 2 - Feather tracts of the two young well-developed.

July 7 - Banded young. Bands 46234; 46235.

July 16 - One flushed from the nest as I approached.

Box 9

June 23 - Five young, first stage.

June 27 - Five young doing well.

July 2 - Five young well along, primaries open at tip one-half inch.

July 7 - Banded five young. Bands: 46236; 46237; 46238; 46239; 46240.

July 16 - Empty.

Box 10

June 23 - Five eggs.

June 27 - Four young, first stag, no trace of fifth egg.

July 2 - Feathers advanced roll stage.

July 7 - Banded four young. Bands: 46241; 46242; 46243; 46244.

July 16 - Empty.

Box 11

June 23 - Four young, two eggs.

June 27 - Six young present.

July 2 - Primaries open at tips.

July 7 - Banded six young. Bands: 46245; 46246; 46247; 46248; 46249; 46250.

July 16 - Empty.

Box 12

June 23 - Three young, two eggs.

June 27 - Four young several days old. Extra eg not in evidence.

July 2 - Primaries opening at tips.

July 7 - Banded four young. Bands: 46251; 46252; 46253; 46254;

July 16 - Empty.

Box 13

June 23 - Six young, several days old, older than those in any box. One black feather among the white teathers liningthe nest.

June 27 - Six young with feather tracts well developed.

July 2 - Pin feathers well developed; adult picked up by Mrs. Burget.

July 25 - H. Lewis Batts Jr. and I banded six young. I returned ahead of schedule to this nest to band young before flight. An odd numbered set of bands from some envelopes were used for these birds.

Bands: B 58755; B 58757; B 58758; B 58759; B 58760; B 58762.

One of these fledglings flushed the nest after banding and flew out over the lake where it fell in about a hundred yards from shore. When it began swimming toward shore it was picked up by a Herring Gull which dropped it on the first attempt but retrieved it and flew away.

July 7 - Harold Wing and I returned to this box on the routine check-up. On examining the birds we found that some of them were not banded. Two which escaped, apparently bore no bands. We banded one with 46255. Some of those previously banded were still present.

I do not know the explanation of this phenomenon; young swallows have been known to return to the box after leaving for the first time. Perhaps swallows from an adjoining box came into this box, but there

were no discrepancies in the numbers noted in the other boxes nearby.

July 16 - Empty.

Box 14

June 23 - Five eggs.

June 27 - Five newborn young.

July 2 - Pin feathers showing.

July 7 - Banded five young. Bands: 46256; 46257; 46258; 46259; 46260.

July 16 - Five young still in the box but very much like immature adults in appearance. Ready to leave at any moment.

Box 17

June 23 - Four young present in first stage. Nest built on remains of some wren nesting material.

June 27 - Well developed feather tracts; primaries in roll stage.

July 2 - Three dead, two with heads chewed off, one with no sign of injury. One missing completely. This house is protected by a tin guard but Populus branch extends past the entrance. This was one of two cases of depredation in the standard houses on the lake front.

Box 19

June 23 - Five eggs.

June 27 - Five young with some down and darkened feather tracts appearing.

July 2 - Pin feathers, but none unrolled yet.

July 9 - Banded five young, Bands: 46262; 46263; 46264; 46265; 46266.

July 16 - Empty.

Box 20

June 23 - Five eggs.

June 27 - Five young. Eyes not open; feather tracts appearing.

July 2 - Feathers beginning to spread at tips.

July 7 - Banded five young. Bands 46267; 46268; 46269; 46270; 46271.

July 16 - Empty.

Box 21

June 23 - Adult incubating five eggs.

June 27 - Five young.

July 2 - Primary feathers but not unrolled.

July 9 - Three dead with beaks chewed. Banded remaining two. Bands: 46272; 46273.

July 16 - Empty.

Box 22

June 23 - Four eggs.

June 27 - Same

July 2 - Same

July 7 - Three eggs; no sign of adults. On July 16th the eggs were still present. Evidently this nest was abandoned or some tragedy befell the adults.

Box 23 a

June 23 - This box was evidently overlooked on this date.

June 27 - Four young several days old; feather tracts showing.

July 2 - Feathers beginning to spread at tips.

July 9 - Birds had flown. The trampled condition around the box suggested that the birds may have been prematurely flushed.

Box 23b

Hillside area begins with this number.

June 23 - Three young, several days old.

June 29 - Eyes open, pin feathers.

July 2 - Feathers spreading at tips; short tail feathers present.

July 9 - Banded three young. Bands: 46295; 46296; 46297.

July 17 - Empty.

Box 26

June 23 - Six young, apparently just hatched. Adult picked up twice without protest.

June 27 - Six young with feather tracts showing.

July 2 - Primary feathers in rolls.

July 7 - Banded five young, count of six young apparently an error. Bands: 46224; 46225; 46226; 46227; 46228; Adult male banded - 46261.

July 17 - Empty

Box 28

June 23 - Dead adult female on the nest; she bore band C81266. This bird was banded by Beatty on July 1, 1946. She successfully reared a brood of five that summer.

Box 30

June 23 - Another adult dead on the nest. There were four eggs under this bird.

Box 33a

June 23 - Four eggs.

June 29 - Eggs missing; flying squirrel suspected, as one was present in the adjoining box, Box Number 32.

SUMMARY

1. This study of the Tree Swallow Colony was conducted as a part of the requirement for Advanced Ornithology at the University of Michigan Biological Station, Douglas Lake, Cheboygan County, Michigan. The study was conducted under the direction of Dr. Olin Sewall Pettingill, Jr. The study covers the period between June 23 and August 10, 1947.

2. The area covered in the study was the station area and immediate vicinity.

3. The Tree Swallow leads the list of breeding birds studied with 20 nests recorded.

4. The size of the Tree Swallow colony is increasing. It showed an increase from eight in 1945 to 20 in 1947. This represents an increase of 137.5% in three years.

5. The standard Tree Swallow boxes which are protected by tin guards and located in open areas show a lower mortality rate and a higher percentage of use than those otherwise placed.

6. The territory of the Tree Swallow is the nesting box and the surrounding area of a few yards. It is quite agressive in establishing and maintaining territory. Bluebirds and House Wrens which nested in some of the boxes in recent years have been crowded out by the growing colony. This year they failed to nest in any box.

7. The approximate nestling period is 20 days. Incubation period covers about 15 days and nest building and egg laying from two weeks to a month. The time for rearing one brood is about two months.

8. There is no evidence to indicate that more than one brood is reared in one season.

LITERATURE CITED

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Hofslund, Pershing B.

1944 Nesting Record of the Douglas Lake Region. University of Michigan Biological Station, Douglas Lake, Mich.

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1941 Life History Study of the Tree Swallows. Proceed. Linn. Soc. N. Y. No. 52-53: 1-52

Table I

OCCUPANCY OF NEW BIRD BOXES

House No.	1944	1945	1946	1947
1.	-	-	-	-
2.	-	-	-	Starlings
3.	-	* T.S.	-	-
4.	-	-	-	-
5.	-	T.S.	T.S.	T.S.
6.	T.S.	-	Flicker	-
7.	-	-	-	T.S.
8.	T.S.	-	-	-
9.	T.S.	T.S.	-	T.S.
10.	-	-	-	T.S.
11.	-	-	-	T.S.
12.	T.S.	T.S.	T.S.	T.S.
13.	T.S.	-	T.S.	T.S.
14.	-	T.S.	T.S.	T.S.
15.	T.S.	-	-	-
16.	-	-	-	-
17.	-	-	-	T.S.
18.	-	-	T.S.	-
19.		-	-	T.S.
20.		-	-	T.S.
21.		-	-	T.S.
22.		T.S.	-	T.S.
23.b.	-	-	-	T.S.
23. a		-	-	T.S.
24.		-	-	-
25.		T.S.	T.S.	-

* T.S.--Tree Swallow

1944	1945	1946	1947
	-	T.S.	T.S.
	T,S,	T.S.	House Wren (sticks)
	-	T.S.	T.S. (dead)
	-	T.S.	-
	-	-	T.S.(dead)
	-	-	House Wren(sticks)
	-	-	-
	-	T.S.	T.S.
	-	-	-Dense Shrub-bery
	-	-	"
	-	-	- "

[illegible]ly 15 houses had been erected.

[illegible]rea begins here.