Capturing Breeding Male Tree Swallows With Feathers

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Few studies on Tree Swallows *(Tachycineta bicolor)* have included extensive banding of the breeding males. Males are more difficult to trap in the nest box than females, partly because males do not incubate the eggs and do not enter the nest cavity regularly before hatching occurs (Low 1933; Weydemeyer 1934). Here I describe a method to motivate males to enter the nest box for capture before the nestling phase, by providing feathers for them as nesting material. I also describe aspects of Tree Swallow feather-gathering behavior that bear on the development and use of this method, and I present data that indicate the incidence of nest desertion by males due to capture during various phases of nesting.

Study areas and methods

Since 1975 I have conducted a banding study on a Tree Swallow population nesting in ca 400 nest boxes in several study areas in the mountains of north-central Colorado. The study areas are open valleys at 2560 to 2680 m elevation, one to several kilometers in dimensions, separated by forested ridges, in Gilpin and Boulder counties. During 1982 through 1984 the boxes were mostly on fenceposts along public roads and stationed ca 50 m apart, and the Tree Swallow breeding population averaged 280 pairs.

Tree Swallows nests are composed mainly of grass and are lined with feathers (Wilson 1812); feathers are brought from before egg-laying through incubation (Weydemeyer 1934; Kuerzi 1941; Sheppard 1977), mainly by the males (Sheppard 1977; Cohen unpubl. observ.). Between 1975 and 1982, several males in my study areas took feathers into nest boxes while I stood within 5 m of the box, which suggested to me that males could be captured before the nestling period by providing feathers near the box. This method proved quite successful; I used feathers to capture 433 males during 1982 through 1984.

In developing this method during 1982 through 1984 I experimented with variations in time of capture during the breeding season, size and color of feathers, and manner and location of feather presentation. I used chicken, turkey, and duck feathers ranging in length from 2 to 15 cm and in color from white to black. I attempted captures from late in nest construction through the first few days of the nestling period. I presented feathers singly in some cases and in larger numbers in other cases, placing them on the next box, on a nearby fence post or fence wire, on the ground near the box or distant from the box, on vegetation near the box, on a pond surface, and by casting them into the wind. Almost all males that I had not captured by the time of hatching were then captured as they entered the nest box to feed the nestlings.

I distinguished males from brightly-colored females, for selective capture of the male, according to behavioral and coloration criteria (Cohen 1984), and I trapped most males in the nest box with a manually-operated hole-blocking device (Cohen and Hayes 1984) operated from distances up to 150 m.

During 1982 and 1983 I checked each nest box at least weekly to record nesting progress and success until I banded the nestlings at 12 to 14 days of age, and then I visited the boxes after fledging to assess fledging success on the basis of the condition of the nest at that time (Cohen, unpubl. observ.). During 1984 I continued the weekly checks through fledging. For my analysis of the incidence of nest desertion by the males due to capture I assumed, according to previous observations in these study areas (unpubl.), that the male's desertion will probably cause obvious nesting failure or at least an apparent delay of over 10 days in nesting progress, and that desertion of males would consequently raise the incidence of nesting failures and prolonged delays above the background level caused by severe weather, predation, desertion of the female, and other lesser factors. For nests at which no nesting failure or prolonged delay was obvious I did not recapture most males to verify that they did not desert; however, on some occasions I captured males unintentionally later in nesting and almost all were the same males I had captured at the box earlier.

Results and Discussion

As noted by Forbush (1929), Weydemeyer (1934), Kuerzi (1941) and others, Tree Swallows nesting near each other compete vigorously for feathers; a bird flying toward its nest site with a feather is chased by other Tree Swallows who attempt to steal the feather in mid-air or when the bird reaches the hole and hesitates before entering. Approximately half of my attempts to capture males with feathers were successful, with most failures being due to competition for the feathers by the females or by other Tree Swallows nesting nearby.

I was able to reduce this competition in several ways. Most females gathered feathers avidly from near the nest box, from late in nest construction through egg-laying, but they then showed little interest in feathers once they began incubation. Some males showed an interest in feathers from late in nest construction through egg-laying, but in many of those cases the female began gathering feathers and consequently the male reverted to guarding, advertising, and defending the box, expecially when other tree swallows approached the box in attempts to steal the feather from the female. Almost all males showed a strong interest in feathers during the incubation phase. Therefore, the incubation phase was the most effective time to capture males by this method. A small proportion of males were not feeding their nestlings during the first few days of the nestling phase but were still interested in feathers at that time. Most males showed little interest in feathers once they began feeding their nestlings.

As Forbush (1929) and Sheppard (1977) noted, white feathers were most noticeable or most attractive to the males; also, larger feathers were more attractive. However, many attempts to capture males with large white feathers were unsuccessful because those feathers attracted more nearby-nesting Tree Swallows and because larger feathers were more difficult for the male to handle and hence more easily stolen by rival males either in the air or at the nest-box entrance. Therefore I was most successfull using feathers of intermediate size and color and using large white feathers only as a last resort when the male was not interested in smaller or darker feathers.

I further reduced competition for feathers by placing the feather as close as possible to the male and the nest site without the male becoming too alarmed to retrieve the feather and take it into the box. Most males that I had not previously handled as adults were not alarmed as I approached and released the feather within 8 m of the box; many of them retrieved the feather immediately, sometimes flying within 1 or 2 m of me to do so, and took it directly into the box before other males could arrive to give chase. At the other extreme, some males were so alarmed at my presence that they would not retrieve feathers if I was within 50 m of their nest box. I captured many of those males by releasing many feathers at a location just beyond that distance, reducing the male's competition for feathers by giving feathers to all feather-seeking swallows of the vicinity.

Males seldom retrieved feathers that fell into tall grass or other vegetation, but they took feathers fairly readily from bare ground, roads, tips of vegetation, water surfaces, and other open locations. However, they took feathers most readily from the air; thus I was most successful on windy days, especially when I was able to release a feather into the air upwind of the male as he sat or flew near the nest box.

A few males were found dead on a paved road by a collegue, and one by myself, apparently having been struck by rapidly-moving vehicles as they attempted to retrieve feathers that I had left on the road earlier that day after some capture attempts at that location; thereafter I removed all remaining feathers from such locations before leaving.

The literature contains no extensive accounts of the incidence of nest desertion by males due to capture in the various phases of nesting. In each of two studies (Austin and Low 1932; Chapman 1955), several males were captured before or during nest construction and most of them deserted the nest site. Low (1934), Chapman (1935, 1939, 1955), and Sheppard (1977) captured larger numbers of males during the nestling phase but made no mention of desertion, which would seem to indicate that desertion by males captured at that time is rare.

Although my study was not designed to measure directly the incidence of nest desertion by the males, my records of nesting progress and nesting success during 1982 through 1984 allow estimates of this variable through a comparison of the incidence of nesting failure and prolonged nesting delay following capture of the male (Table 1) to the overall frequency of nesting failure and prolonged nesting delay (Table 2), for each of the various phases of nesting. During those three years I used feathers to capture 38 males before egg-laying, 108 males during egg-laying, and 277 males during incubation. In addition, I captured 298 males during the nestling phase, almost all as they entered the box to feed nestlings.

Table 1. Incidence of nesting failure and prolonged nesting delay* in Tree Swallows during week following capture of male

Nesting phase in which male captured	Number of males captured	Nesting failures and prolonged nesting delays	
		n	%
Pre-egg-laying**	38	11	29
Egg-laying	108	9	8
Incubation	277	10	4
Nestling phase	298	18	6

*Includes failures and delays due to all causes; see text for further description.

**Includes last week of nest construction and interval between nest construction and egg-laying; the latter averaged 1 wk in length during 1982-1984.

Nesting failures and prolonged nesting delays were caused by many factors, including predation, severe weather, disturbances at the nest site by people or domestic animals, and desertion due to capture of the female or the male. Severe weather was unusually frequent during nest construction through incubation all three years and appeared to be the greatest cause of failures and delays during nest construction through egg-laying. In many cases there was every indication that the same pair resumed nesting when the weather ameliorated. Predation was the greatest cause of delays and failures during incubation through the nestling phase. This was mostly nocturnal nest predation by mammals, resulting in nest failure. However, some predation was egg predation by House Wrens (Troglodytes aedon); repeated captures of one or both Tree Swallows of the pair, before and after egg loss due to House Wrens, indicated that many pairs re-laid in the same nest without any additional nest construction. Some of the nests listed as being active during egg-laying in Table 2 are not included in the number active before egg-laying, for that reason, and also because some nests were already in or approaching egg-laying when I first checked them.

A comparison of the percent-columns of Tables 1 and 2 shows no indication of increased incidence of nesting failure or delay due to capture of the male during any nesting phase except before egg-laying, when perhaps as many as 20 percent of males deserted due to capture. The higher incidence of failures and delays following capture of the male before egg-laying, compared to the overall incidence of failures and delays before egg-laying, is statistically significant (Yates X^2 test, Langley 1970; $P < 0.002$).

It appears that during egg-laying and the first week of incubation the incidence of desertion due to capture is much lower in males than in females. Burtt and Tuttle (1983) reported desertion by 9 of 18 females captured during egg-laying, 5 of 21 females captured during the first 5 days of incubation, and 0 of 10 females captured later in incubation. I have observed (unpubl.) similar incidences of desertion in the females of my study population captured during those nesting phases, and accordingly in recent years I have avoided capturing females before the fourth or fifth day of incubation. This difference is consistent with the female's much greater risk of predation in the nest box, as only the female incubates the eggs and broods the nestlings, and the male does not roost in the box at night.

Table 2. Overall incidence of nesting failure and prolonged nesting delay* in Tree Swallows

Nesting phase and week	Number of active nests	Nesting failures and prolonged nesting delays per week $\bar{X}$	%
Pre-egg-laying**	1025	73	7
Egg-laying***	999	136	14
Incubation wk 1	922	87	9
Incubation wk 2	832	70	8
Nestling phase wk 1	762	40	5
Nestling phase wk 2	721	40	6
Nestling phase wk 3	682	34	5

*Includes failures and prolonged delays due to all causes; see text for further description.
**See Table 1 for definition.
***Mean duration: 5 dys.

Summary

Although male Tree Swallows do not enter the nest box regularly before the nestling period, they bring feathers to line the nest cup before egg-laying, during egg-laying, and especially during incubation. Consequently one can stimulate them to enter the nest box for capture before the nestling period by providing feathers. I captured 433 males by this method in my study areas in north-central Colorado during 1982, 1983, and 1984. I reduced competition for feathers from the female and neighboring Tree Swallows by (1) using feathers of intermediate size and color, (2) providing the feather as close as possible to the nest box and the male without alarming the male, (3) attempting captures on windy days so that the wind would carry the feather to the male, (4) attempting most captures during the incubation phase of nesting, and (5) flooding the vicinity with feathers when males were extremely alarmed by my presence near the nest box. Some males may have been struck by rapidly-moving vehicles while attempting to retrieve feathers from paved roads after I neglected to retrieve the feathers before leaving. The results of monitoring nesting progress and success during 1982 through 1984 indicate that males had no significant tendency to desert the nest due to being captured during egg-laying, incubation, or the nestling phase, but the same may not be true for males captured late in nest construction or during the interval between nest construction and egg-laying.

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News, Notes, Comments

Color-banded Evening Grosbeak

Frank C. Layton, a bander at P.O. Box 2851, Casper, Wyoming 82602, has received a report from a bird feeder in Casper concerning the occurrence of a color-banded male Evening Grosbeak "about a month ago" (October 1984). This bird had a standard aluminum band on the right leg and a yellow and black band on the left leg. Mr. Layton would appreciate receiving information about this bird and the color-banding project concerning it.

ATTENTION BANDERS: In 1982, while working as a ringing assistant at the Falsterbo Bird Observatory in Sweden, I had the opportunity of meeting and ringing with Lars Svensson. A pertinent topic of our discussions was the need for some sort of American counterpart to his *Identification Guide to European Paserines,* (See review on p.22) and indeed, on page 6 he asks, "when do we get an American guide?". With the encouragement of Lars and many North American banders, and the support of the Point Reyes Bird Observatory, I plan to compile such a guide, hoping to be finished by winter 1985-6.

A thorough compilation would necessarily involve the contributions of banders across the continent. If any of you have any unpublished information on identifying, aging, or sexing birds in the hand; or any other general suggestions; I would greatly appreciate hearing from you. The more complete the guide is, the more useful it will be for all of us. All contributions will, of course, be acknowledged.

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