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# A new banding technique for nesting adult Purple Martins

M. Kathleen Klimkiewicz<sup>1</sup> and Paul D. Jung<sup>2</sup>

## Introduction

Our interest in banding adult Purple Martins (*Progne subis*) began in 1972, the year of Hurricane Agnes. The devastation wrought by the rain and wind was widespread throughout the east coast and drastically affected martins in Maryland at a critical point in their nesting cycle (mid-June). Wind and rain caused nests to become waterlogged, eggs were cooled and adults and young died in the nests. After the weather cleared, many adults died from starvation and exhaustion as they frantically tried to feed the surviving young. The population crash which resulted from Hurricane Agnes delayed our adult martin banding until the breeding season of 1975. By that time, our three primary colonies had recovered sufficiently — Bowie, (12 young in 1972; 78 young in 1975); Kettering (5, 162) and Piney Glen (0, 278).

## Methods and materials

Mery (1966) captured adult martins in the nest box compartments; however, the technique was cumbersome, time-consuming, and seldom captured all of the nesting adults. The method presented in this paper is simple, quick, and captures all of the adults which are roosting in the nest box. Carter (1975) has also developed a similar method. There are two prerequisites — the nest box must open from the front (one or more compartments at a time) and the box must be on a telescoping pole. TRIO and SEARS boxes work well; but other boxes, even homemade wooden ones, can be used if they meet the prerequisites.

The boxes are lowered sometime between early morning and late afternoon (no later than 1600 to 1800 hours). Proper orientation of the box must be maintained at all times — even a 45° turn will confuse the adults and they may not be able to find the proper nest compartment. The adults will appear reluctant to land but as soon as one "brave soul"

ventures down, the flock will quickly resume normal activity. If normal activity has not been resumed after thirty or forty minutes the box should be returned to its original height.

After the birds are settled in the box and it is completely dark, the box is "closed". If the box has compartments on two sides only (e.g. TRIO MK-12), two persons approach the box from opposite ends (do not use a flashlight or wear light clothes). Always approach the solid sides on the ends of the box, stay low, and move slowly and quietly. If the birds are restless, both persons may have to stop and wait until the birds are quiet again. Pieces of masonite pegboard (17" x 4" for most 12-hole boxes) are used to cover the compartment entrance holes. Nylon reinforced strapping tape is used to hold the pegboard in place. Each person closes both sides of one tier. A prearranged silent signal is used so that all compartments are covered simultaneously (Figure 1). No birds will escape when this technique is properly executed (Figure 2).

A similar technique is used for a box with multiple compartments on all sides (e.g., TRIO or SEARS Castle). The pegboard is cut in 4" x 4" pieces. Two loops of tape are placed on the back edges of each

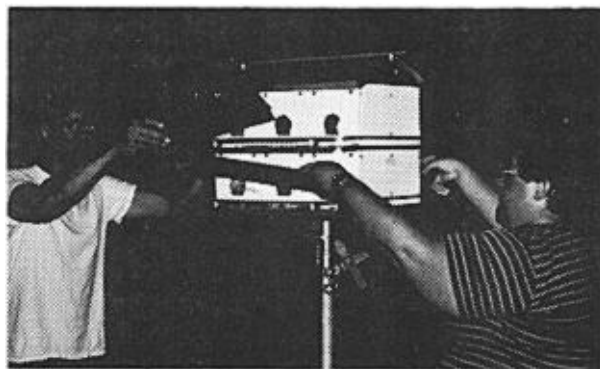


Fig. 1. A prearranged silent signal is used so that all compartments are covered simultaneously.



Fig. 2. The box is closed.

piece. One person should close the box — one vertical section at a time, starting at the bottom and proceeding to the top or one tier (4-6 compartments) at a time. Stay low and quietly cover one entrance hole; wait several minutes and cover the hole above or beside the closed one(s). Repeat until all compartments are closed in this section. Then start at the bottom again or on the next tier. Repeat until all compartments and all sections or tiers are closed. If any birds fly out of the box, cease all activity for thirty to forty-five minutes and then resume closing the box. Slow, deliberate, and quiet movements are of the utmost importance when closing a multicompartmented, multilayered box without closed ends. This is a tedious process; however, all compartments must be closed as adults will often roost in empty compartments.

Each compartment should be carefully checked and closed with a plug (metal, rag, or paper cup) if adults are present (Figure 3). Compartments can then be opened one at a time. Adults are removed, placed in holding boxes and contents of the nest are recorded on a diagram of the nest box (Figure 4). Compartments can be numbered with a black waterproof marker to facilitate recordkeeping. Age, sex, and band numbers are recorded for all adults on the box diagram. Additional information such as nest success, band numbers of young, age and/or sex of unbanded adults, can be added to the box diagram at a later time.

Adults with eggs and/or small young are immediately processed and returned to the nest. Age, sex, wing chord, brood patch condition, molt, and parasites are recorded. Weight is taken on a sample of 50-100 birds each year. All birds are returned to the proper compartment using the box diagram.

Opening of the boxes can be accomplished in two ways. First, the birds are allowed ample time to settle, plugs are quietly removed, and the boards are left resting over the compartments for 15-30

minutes or more. The boards are quietly removed by one person. Any birds which do fly will usually quickly return. The box is raised again at dawn. Desertion of eggs is most likely to occur with this technique. Two clutches in our 1976 study were abandoned when this method of box opening was used. However, this method is recommended if any females escaped during box closure.

The second method for opening requires replacement of either plugs or boards after the adults are returned to the compartments. The boxes are opened and raised at dawn. Any adults that did not roost in the box will be circling the boxes at dawn. The chatter of these birds is apparently a stimulus to the birds in the boxes. After release at dawn, all of the birds will circle and chatter before feeding. No desertions occurred when this method of box opening was used. However, several cautions and suggestions are necessary.

1. Remember that all boxes must be raised using the same orientation. The orientation of a box should never be changed once nesting has begun.
2. All activity, such as gardening, should be curtailed for the day after trapping and banding.
3. Trapping can be accomplished at two stages in the nesting cycle — (a) After all clutches are complete and incubation has begun. Carter (1976) experienced desertions which were most likely due to trapping prior to incubation and/or hatching. We also experience desertions at this stage of nesting. (b) After most or all of the eggs have hatched and the young still require brooding by the adults. This is recommended because nest attachment increases with the advance of nesting. No desertions have occurred in our study when trapping was done at this stage of nesting.
4. Trapping should not be done prior to nest building and/or egg laying. Mery (1966) experienced a high rate of desertion when trapping at this stage of the nesting season.

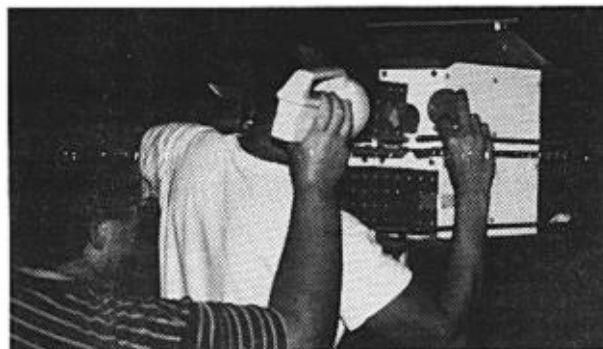


Fig. 3. Compartments are checked and closed.

5. Cool or slightly drizzly nights are preferable for trapping. Many adults, both male and female, roost in nearby trees on hot, humid nights. The pegboard allows good ventilation and should be used to close the box after banding on hot nights.

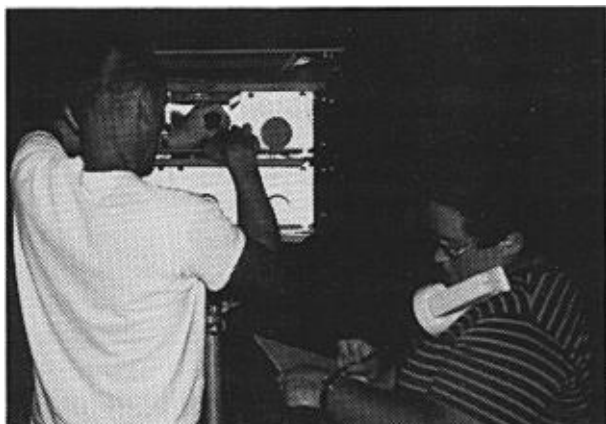


Fig. 4. Each compartment is emptied and records of the contents are kept on house diagrams.

## Results and discussion

Four-hundred nine adults have been banded — 208 in 1975 (4 colonies) and 201 in 1976 (6 colonies). Of these, 233 were females and 176 were males. There were 153 SY and 76 ASY females and 70 SY and 106 ASY males. Four females were aged AHY.

In 1975 and 1976 several birds, previously banded as locals, were trapped at their parent colony. Return rates are as follows, (colony name, 1975, 1976, total) — Bowie (3.7%, 0%, 1.4%); Kettering (1.8%, 3.3%, 4.3%); Piney Glen (3.4%, 3.1%, 4.6%); Patuxent 1976 only 11.8%); Saxis (1976 only 2.3%).

Several locals were recaptured at colonies other than their parent colony. Four were trapped in Bowie — 3 (2, 1975; 1, 1976) from Kettering (6 miles distant) and 1 (1975) from Piney Glen (25 miles to Bowie distant). Two of the three retraps in 1975 also returned in 1976. One retrap at Kettering (1976) was banded in 1975 at Patuxent (12.5 miles distant). One retrap at Patuxent (1976) was banded at Kettering (12.5 miles distant) in 1975. Four retraps in Potomac (1976) were banded at Piney Glen (4 miles distant) in 1975. The return rate for all locals, both to parent colony and other colonies, was 5%.

Adult return rates are as follows — Bowie, 17.9%; Kettering, 17.9%; Piney Glen, 20.8%; Patuxent, 12.5%. All returns were retrapped at the same colony — some in the same box and/or compart-

ment. One pair was mated for two consecutive years; however, they nested in a different box each year and this is very likely a random occurrence. Five adults (previously banded as locals) returned to the same colony (not necessarily the parent colony) for two consecutive years.

Many questions remain unanswered or only partially answered:

1. What is the average return rate of locals to the parent colony?
2. What is the average return rate of locals to nearby colonies?
3. What is the return rate of SY adults to the first season nesting colony?
4. What is the return rate of ASY adults to the nesting site of original capture?
5. Does age affect the pair bond?
6. Does the pair bond last for more than one season and if so, how frequently does this occur?
7. Does age affect clutch size?
8. Does age affect fertility of eggs?
9. Does age affect feeding rate?
10. Does age affect nest construction?
11. Does age affect overall nest success?
12. Does sex affect the attachment to the nest site?
13. Do adults return to the same box and/or compartment?
14. Does age affect selection of the nest compartment?
15. Are the sexes balanced in a stable colony?
16. What are the average age ratios in a stable colony?
17. What are the average age ratios in a new colony?
18. Are the sexes balanced in a new colony?
19. What is the saturation point in a colony and what is the limiting factor when saturation is reached?
20. Do adults and/or young use the boxes for roosting after nesting and fledging is completed?

## Conclusion and summary

Mery (1966) showed an almost equal sex ratio, males returned more frequently than females, over 50% of returns paired with other returns, an adult return rate of 20%, and no pair bonds maintained for more than one season. Her study lasted 13 years.

Our study has shown that the return rate of locals to parent colonies is 4.1%, sex ratios are nearly equal (combination of banding and observation), return rate of locals to nearby colonies is 0.9, one pair maintained the pair bond for two years, SY

females lay fewer eggs than ASY's, SY adults occasionally do not feed frequently enough to maintain the normal growth pattern of the young, SY adults often build poorly constructed nests with little or no mud, overall nest success is lower in SY adults, adults do indeed return to the same colony (19.6%) box and/or compartment, sexes are balanced in a stable colony, males or females are sometimes in excess in a new colony, SY adults are predominate in a new colony, the limiting factor in colony size is most likely the number of boxes and/or compartments available for nesting and, finally, adults and young do indeed use the boxes for roosting after nesting and fledging is complete (even boxes not their own).

All of our results are tentative and subject to change after further study. Much additional study will be required before we can come up with conclusive answers to many of these questions about the Purple Martin.

## Acknowledgements

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## Dark-eyed Junco with 13 rectrices

Robert P. Yunick

An immature female (wing chord 73 mm, pale gray plumage) Dark-eyed Junco (*Junco hyemalis*) possessing 13 rectrices was captured during the summer of 1974 on its natal grounds at Jenny Lake, near Corinth, Saratoga County, New York. When first captured and banded (1300-68024) on 3 August, the bird was still in streaked juvenal plumage and appeared to possess a normal complement of 12 rectrices. The outer three right rectrices (RR-4, 5 and 6) were plucked routinely as part of an ongoing study to determine changes in tail patterns of subsequent plumages.

On 20 August the bird was recaptured and found to have replaced RR-4 through 6 to the extent of 35 mm or 53.0 percent of total tail length after 17 days. In addition, beyond RR-6 was a partially regrown seventh rectrix which measured 56 mm or 84.8 percent of total tail length. The body molt was well advanced to give fresh, pale-gray plumage; the head molt was about one-half completed; the lesser coverts had been replaced; and the middle and greater coverts were in sheaths. By 2 September, after 30 days of regrowth, RR-4 through 6 were 95.3-percent regrown. RR-7 was completely regrown; and the body, head and covert molt were complete.

Using other data on the rate of rectrix replacement in this species (see Yunick, R.P. *Bird-Banding*: in press), the following can be reconstructed. At an

average regrowth rate of 3.14 mm/day, RR-7 which measured 56 mm on 20 August would have had to break through the skin about 18 days previous to capture, or on 2 August, one day before the bird's initial capture. However, this rate is variable in individuals and this date could be accurate to within only  $\pm$  two days. It is unlikely that the removal of RR-4 through 6 provided any stimulus for this additional rectrix to grow. An artificially plucked rectrix requires four to nine days to show measurable regrowth. Furthermore, of the more than 500 tails that have been plucked, regrowth patterns of 110 have been recorded, and in no case has there been any indication of this removal causing added feather growth.

At the time of initial capture this immature could have been up to one month out of the nest but more than likely, judging from its plumage condition, was only about two weeks out of the nest. It is possible that this bird fledged with 13 rectrices and, prior to capture on 3 August, accidentally lost RR-7, and was in the process of regrowing it. One cannot rule out completely, however, the possibility that some unknown stimulus prompted growth of this thirteenth rectrix after fledging.

There were no further captures of this bird during the summer of 1975.

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