

NOTES

NESTLING MORTALITY IN SWALLOWS DUE TO INCLEMENT WEATHER

For two consecutive years 24 hours or more of continuous precipitation during early June resulted in mortality in nestling Tree Swallows (*Iridoprocne bicolor*) and Cliff Swallows (*Petrochelidon pyrrhonota*) in Marin County, California. There have been few reports of swallow nestling mortality caused by inclement weather in North America. Chapman (1955) reported abandoned eggs and death of nestling Tree Swallows at Princeton, Massachusetts in 1940. Paynter (1954) reported Tree Swallow nests with abandoned eggs due to a storm on 8-9 June at Kent Island, Wisconsin. Drury (1959) reported mass nestling mortality due to continuous rain from 12-20 June in Massachusetts.

At Point Reyes Bird Observatory (PRBO) 44 hours of continuous precipitation occurred beginning at 1200 on 8 June 1969. Tree Swallow boxes that I was observing contained 26 nestlings four to twelve days old. Sixteen nestlings were dead by mid-day of 9 June. One brood of five young was still alive but had been abandoned by the parents. Another brood of five was being fed by the male only. All of the nestlings eventually died. None of the banded adults returned the following year. One of them, a female, was found dead 5 miles east of her nest on 9 June 1969.

At a 65-nest Cliff Swallow colony 12 miles east of PRBO dead nestlings were found under some nests and observed dead at the entrances of others. Five of six nests inspected had from 2-5 dead nestlings in various stages of development and one nest contained two live young. Assuming that all 65 nests were active, one of six broods survived, and the average clutch size was 3 (Mayhew, 1958, found the clutch size in central California was 3-4), at least 160 of a possible 195 young may have died at this colony.

The following year (1970) on 8 and 9 June 24 hours of continuous precipitation again caused mortality in nestling swallows. Sixty-six Cliff Swallows were found dead under 178 nests and many more were observed at the entrances of nests at five locations within 12 miles of PRBO. Only one pair of Tree Swallows nested at PRBO in 1970 despite the addition of more nesting boxes. At the time of the rain on 8-9 June incubation had occurred for 11 days in this nest. The eggs never hatched presumably because the female did not incubate them during the storm.

As discussed by Drury (1959) the lack of flying insects during continuous rain makes it difficult for adults to find food. The female Tree Swallow found dead 5 miles from her nest in 1969 was probably miles outside her normal foraging area. She presumably died from hitting a window not from starvation. The adults in their attempt to find food abandoned their nestlings and the predominant cause of death in the young was starvation. This is supported by examination of the stomachs of one brood of four 10-day old nestlings in which I found one nestling with small amounts of food in the esophagus and gizzard, one nestling with food in the esophagus only, and two nestlings with no food in any part of the digestive tract. These nestlings were fully feathered and presumably would not have suffered from the cold if not brooded during

NOTES

the night. This could have been a contributing factor in the death of nestlings which had sparse body feathering, although night temperatures during the overcast periods in both years was constant around 50 degrees F in contrast to clear nights when the temperature normally dropped to as low as 40-44 degrees F. Minimizing this factor as a contributing cause of death in nestlings are Mayhew's (1958) observations that Cliff Swallow nest temperatures remained constant during the night even though the ambient temperature dropped considerably.

The 100 percent mortality of nestling Tree Swallows during 1969 and 1970 at PRBO and the considerable loss of nestling Cliff Swallows observed within 12 miles of the Observatory represent a small sample of what may have been mass mortality of nestling swallows in central coastal California during the summer of 1969 and 1970. This is Contribution 56 of Point Reyes Bird Observatory.

LITERATURE CITED

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