# POST-FLEDGING ACTIVITY OF THE RED-TAILED HAWK*

by
**Sara Jane Johnson**
**Department of Zoology and Entomology**
**Montana State University**
**Bozeman, Montana 59715**

**ABSTRACT.** During a two-year study of post-fledging activity of Red-tailed Hawks (*Buteo jamaicensis*) in the Gallatin Valley, Montana, in 1971 and 1972, data were collected on mortality, length of time the fledglings remain within the home territory, and characteristics of their movements out from, and possibly, back to their home territory. Mortality was found to be low during the first 18-25 days after fledging, when the young were quite inactive. Mortality also may be low until the young begin leaving the home territory. The length of time the young remained associated with the adults ranged from 30 to 70 days after fledging for all fledglings observed. For nest-mates, time spans between departures ranged from zero to 31 days after fledging. Movements of the fledglings out from and back to the home territory were variable. Some young made no movements out from the home territory until they left permanently, while others left and returned up to five times. The length of time the young remained associated with the adults, and thus within the home territory, did not determine the number of movements it made into the areas surrounding the home territory, before it left it permanently.

A study was conducted during the summers of 1971 and 1972 on the post-fledging activities of Red-tailed Hawks (*Buteo jamaicensis*). The study area was located in the Gallatin Valley, Gallatin County, in southwestern Montana. The objectives of the study were to gather information on mortality, length of time the fledglings remained within the adult territory, their movements both within and outside of the adult territory, and the development of hunting and social behaviors. In this paper hunting and social behavior are not considered.

*Methods*

The study area included approximately 145 sq. km (56 sq. miles) and, during each summer, contained a maximum of 18 pairs of nesting Red-tailed Hawks. In 1971, eight successful nests were observed soon after the young fledged, but after they became more active, fledglings from only three nests were observed. All young were color-marked for identification. In 1972, eight nests were observed from the time the young fledged until they could no longer be located.

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All young were color-marked and nine were radio-tagged.

Color-marking involved spraying the undersides of the wings and tail with non-toxic spray paint. The transmitters, purchased from the AVM Instrument Company and weighing approximately 20 g, were attached to the fledglings by a harness. Life of the transmitters was approximately three months. The harness was attached with dissolvable gut-suture, which would in time wear away and cause the transmitter to fall off the bird. These transmitters were placed on nine fledglings from seven nests at seven to eight weeks of age. All of the radio-tagged young were then located three times daily during the first and second day of a three-day cycle; just the young from a single nest were observed throughout the third day.

*Mortality*

Results on mortality of fledglings from the time they left the nest until they could no longer be located are given in Table 1. After the young fledged, they remained within a limited area, a post-nesting area, until from 18 to 25 days

**Table 1.** Length of time fledglings observed after fledging when no mortality occurred.

| Nest | Year observed | Time spent in post-nesting area | Number of young in the nest | Days AF[1] when all nestmates known alive |
|---|---|---|---|---|
| 61 | 1972 | 18 | 4 | 41 |
| 7 | 1971 | 25 | 3 | 54 |
| 34 | 1971 | | 3 | 33 |
| 7 | 1972 | 25 | 3 | 32 |
| 34 | 1972 | 23 | 3 | 47 |
| 11 | 1971 | 24 | 2 | 33 |
| 9 | 1972 | 17 | 2 | 31 |
| 11 | 1972 | 21 | 2 | 42 |
| 33 | 1972 | | 2 | 34 |
| 62 | 1972 | 20 | 2 | 39 |
| 8 | 1972 | 18 | 2 | 18[2] |
| 24 | 1971 | 23 | 3 | 23[2] |
| 25 | 1971 | 18 | 2 | 26[2] |
| 26 | 1971 | 22 | 3 | 27[2] |
| 15 | 1971 | | 3 | 25[2] |
| 36 | 1971 | | 2 | 23 |

[1]days after fledging.

[2]Observations were discontinued at that age due to difficulty in locating the fledglings.

after fledging as measured from 13 nests during the two-year study. During this post-nesting period, the young attempted no hunting, remaining completely dependent upon the adults for food. The tendency of the adults to bring food less and less often as the post-nesting period progressed, and the increased development of the young, were probably two important factors causing the young to leave the post-nesting area and to move out where the adults were hunting. A total of 41 young from 16 nests were observed at least up to the end of the post-nesting period. During this time no mortality was observed. The earliest age when observations were discontinued on young from a nest was 18 days after fledging; thus, no mortality was observed for 41 young up to 18 days after fledging. Of 10 nests containing 26 young (all observed throughout the summer until the young could no longer be located), the latest date that all young were observed, and thus known to be alive, was 31 days after fledging. For these 26 young, no mortality had occurred at least through the first 31 days after fledging. The average age of these 26 young when last observed was 43 days after fledging. For fledgling Red-tailed Hawks in the Gallatin Valley it appears that mortality is very low for the first 17 to 25 days after fledging, during the post-nesting period, and, possibly, mortality is low until the young begin leaving the home territory.

*Length of Time Young Remain Home*

The ages in days after fledging when the 26 fledglings from the 10 nests which were observed until the fledglings could no longer be located, are given in Table 2. As only nine of the 26 young were radio-tagged, the reason for the

**Table 2.** Age after fledging when fledglings last observed in the home territory.

| Nest | Year Observed | Number of young in nest | Days after fledging fledglings last observed | | | |
|---|---|---|---|---|---|---|
| | | | 1st | 2nd | 3rd | 4th |
| 61 | 1972 | 4 | 39[r] | 41 | 42 | 70[r] |
| 34 | 1971 | 3 | 31 | 42 | 42 | |
| 7 | 1971 | 3 | 53 | 53 | 53 | |
| 7 | 1972 | 3 | 30[r] | 37 | 61[r] | |
| 34 | 1972 | 3 | 46 | 46 | 51[r] | |
| 11 | 1971 | 2 | 33 | 47 | | |
| 9 | 1972 | 2 | 31[r] | 31* | | |
| 11 | 1972 | 2 | 42[r] | 43* | | |
| 33 | 1972 | 2 | 34[r] | 35* | | |
| 62 | 1972 | 2 | 38 | 51[r] | | |

[r]Fledgling was radio-tagged.
*Fledgling was not checked after that age.

disappearance of the remaining 17 young from the home territory was not known. This may have been due to their death or their leaving the home territories. The ages of disappearance fell within the age range at which radio-tagged young left, which was from 30 to 70 days after fledging. The age at which the first nestmate from a nest left the home territory permanently ranged from 30 to 53 days after fledging. The first day that all nestmates from one nest were permanently gone from the home territory ranged from 47 to 70 days. Concerning the permanent departure of nestmates, only two nests contained more than one radio-tagged young, enabling a definite determination of the age both nestmates left the home territory. For these nests, time spans between departures of nestmates were 31 days in both cases. When the ages of permanent departure of all 26 young are considered, there appears to be no pattern for departure of nestmates. In three nests in which a single radio-tagged young left first, the nestmates were not further observed. In the remaining seven nests, departure of nestmates was staggered (at least five days between departures) for three nests containing two, two, and three young. It was simultaneous (leaving on the same day or within several days later) for one nest containing three young. In the remaining three nests, containing three, three, and four young, departures of nestmates were both simultaneous and staggered. Thus, permanent departure of fledglings, whether nestmates or not, from the home territory appears to be quite variable, with a 40-day range between all departures, and a 31-day range between departures of nestmates.

*Movement of Fledglings Outside of the Home Territory*

Eight of the nine radio-tagged fledglings, and three color-marked, untagged fledglings were located at least once away from the home territory. A total of 23 movements away from the home territory were recorded; these are given in Table 3. In 91.3% of these movements, the direction traveled was south, west, east, and a combination of these three directions. Only 8.7% of the movements involved a northerly direction.

Of these 23 recorded movements, 17 of them included the return of fledglings back to the home territory. Movements out where the fledglings later returned were generally of two patterns. Eighty-nine percent of the movements out were of short duration, where the fledgling returned either on the same day or within two days. These movements (88.9% of the total) ranged from 1.6 to over 8 kilometers (1 to over 5 miles) and averaged 3.06 kilometers (1.9 miles). The second type of movement out (11.1% of the total movements) was of longer duration, five to seven days. Distances traveled from the home territory were 28.4 and 35.4 kilometers (17 and 22 miles) in the two cases observed. The two fledglings involved in these two longer movements out from the home territory were older than when either they or the other radio-tagged young made shorter movements out.

The amount of movement out from and back to the home territory was variable for the nine radio-tagged young. Three young did not leave once until they left permanently. Three other young left and returned once before leaving permanently. Three remaining young left and returned four, four, and five times

**Table 3.** Description of movements of young out of the home territory, including age in days after fledging when they left, and the direction and maximum distance traveled from the home territory. Unradioed young which were occasionally observed away from the home territory are included.

| Young | Age left<br>Direction and distance<br>Age returned | Age left<br>Direction and distance<br>Age returned | Age left<br>Direction and distance<br>Age returned | Age left<br>Direction and distance<br>Age returned | Age left<br>Direction and distance<br>Age returned | Age left |
|---|---|---|---|---|---|---|
| r34 | 35 SW 36<br>1mi(1.6) | 38 SW 39<br>1mi(1.6) | 39 SW 40<br>1mi(1.6) | 45 SW 45<br>1mi(1.6) | 49 SW 49<br>1mi(1.6) | 51* |
| r11[b] | 34 SE,SW34<br>1.5mi(2.4) | 36 NW 36<br>4.5mi(7.2) | 37 NW *<br>4.5mi(7.2) | 40 S 40<br>< 5mi(< 8) | 42 * | |
| r7[o] | 26 SE 27<br>2mi(3.2) | 51 SW 52<br>1.2mi(1.9) | 55 SW 56<br>1.2mi(1.9) | 57 S,SW 61<br>17mi(27) | * | |
| r61[o] | 59 S,SE 66<br>22mi(35) | 70 SE<br>MIG | | | | |
| r62 | 51 MIG | | | | | |
| r33 | 32 S 33<br>1mi(1.6) | 34 SE<br>MIG | | | | |
| r61[g] | 39 S *<br>0.5mi(0.8) | | | | | |
| r9 | 28 * 29 | 31 * | | | | |
| r7[b] | 40 E *<br>4mi(6.4) | | | | | |
| 11[o] | 39 SE 39<br>3.5mi(5.6) | | | | | |
| 7[nc] | 28 SE 29<br>2mi(3.2) | | | | | |
| 11 | 53 SW *<br>3.4mi(5.5) | | | | | |

r = radio-tagged
mi = miles; kilometers in ()
* = bird lost, unless it later returned to the home territory
MIG = bird migrated out of the Gallatin Valley

before leaving permanently. The magnitude of movements out from and back to the home territory did not appear to be related to the length of time the young remained within the home territory and associated with the adults. The young that left and returned the greatest number of times, five, remained home the same number of days that a second young did, and this second young never left the home territory once, until it left permanently. Both young were home until 51 days after fledging. Another young remained home until 59 days after fledging without leaving.

Considering only the three radio-tagged young which remained associated with the adults in the home territory for 42, 51, and 61 days after fledging (and left and returned four, five, and four times, respectively), two of them had a tendency to return to the same area outside of the home territory again and again. The third young traveled mostly to different areas each time.

The three radio-tagged young which were followed up to their migration out of the valley migrated at 34, 51, and 70 days after fledging. Thus the age for migration appears to be variable. These young also had different degrees of experience away from the home territory–from zero to seven days away. These three young all made direct migrations from the valley, leaving both the home territory and the Gallatin Valley on the same day. This is probably not the case with all young. Three young, two radio-tagged and one just color-marked, were observed still only several miles from the home territory two days after leaving there permanently. Also, groups of from five to seven fledged Red-tailed Hawks have been observed hunting together for several days, within the valley. Apparently some fledglings leave the home territory permanently, but remain within the valley for an unknown period of time before migrating.

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