

# OBSERVATIONS OF AERIAL HUNTING, FOOD CARRYING AND CROP SIZE OF MIGRANT RAPTORS

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## ABSTRACT

Evidence is presented that Broad-winged Hawks feed during their southward fall migration from the eastern United States. Some 26 individuals were seen to catch or eat insects on the wing, and 8 percent of 623 passing individuals that were seen clearly had distended crops.

## INTRODUCTION

Evidence that most species of North American raptor feed during migration is extensive (Clark 1973), but some researchers have suggested that the Broad-winged Hawk (*Buteo platypterus*) may fast for the duration of its migration from North America to South America (Hofslund 1973; Heintzelman 1975). Only a few observations of feeding by migrating Broadwings, and negligible crop and stomach content data from ringing stations, exist because this species is seldom lured to traps. The main purpose of this study was to determine by visual observation of crop distention and prey capture whether Broadwings feed during migration. Observations were also made on Red-tailed Hawks (*Buteo jamaicensis*), Sharp-shinned Hawks (*Accipiter striatus*) and Ospreys (*Pandion haliaetus*).

## STUDY PERIOD AND AREA

Observations were made between 3 September and 27 November 1981, totalling 295 hours over 47 days. Six lookout points in the Hawk Mountain Sanctuary, Pennsylvania, U.S.A. served as study sites. The sanctuary is situated on the Kittatinny Ridge, the longest ridge in the Appalachian Mountains, in eastern North America. The topography of the region helps to funnel migrating raptors toward the lookouts, situated at 3900–4820m above sea level. The landscape is mainly forested.

## METHODS

Direct visual observations with seven-power binoculars were used to evaluate the crop distention of each passing migrant. A crop was classed as full if there was a bulge in the ventral profile about the throat, evidence of recent ingestion. No bulge profile was classed as an empty crop. All migrants were potential candidates for study, but in practice only those which presented a profile allowing accurate crop appraisal were considered.

## RESULTS AND DISCUSSION

The weather patterns in North America during September 1981 caused the Broadwings to migrate on a broad front, rather than funnel through the usual concentration points along the Kittatinny Ridge. As a result, only 9879 individuals were seen from Hawk Mountain Sanctuary lookouts, the lowest tally in ten years (annual mean = 18,237). Of the birds which passed, only 623 could be used for assessment of crop size and 8 percent of these were seen to have distended crops.

In addition, on 25 occasions Broadwings were seen capturing, carrying or eating insect prey. On 9 September 1981, one bird was observed feeding in flight; on 10 September six were observed making captures and two were carrying insects in their talons; on 11 September twelve were seen making captures; on 12 September four made captures; and finally, on 24 September one was seen eating an insect while on the wing. Heintzelman (1975) at Bake Oven Knob, 26km north-east of Hawk Mountain, also saw Broadwings feeding on insects in flight.

About 6 percent of the Broadwings seen had distended crops during the first three weeks of September, while 17 percent had distended crops during the final week. Insects may be the principal prey early in migration, and Kerlinger (pers. comm.) suggests that crops containing insects will often not look full. Larger prey items may constitute a greater portion of the late migrants' diet, resulting in a higher proportion of crops appearing full. Our observations of 25 individuals with insects between 9 and 13 September, and only one individual with insect prey after 13 September, were also consistent with a shift in diet. Additionally, the proportion of birds with distended crops nearly tripled in the last week of September compared to earlier.

Evidence that Broadwings feed extensively on insects during migration is provided by Fisher's (1893) crop and stomach analysis of specimens shot along the Appalachian flyway in August and September. Of these birds, 92 percent contained prey, mainly insects. These included larvae of large moths such as *Cerotomia amyntor*, *Attacus cercropia* and *Telea polyphemus*, together with grasshoppers, crickets and beetles.

The larvae of insects, especially those that undergo complete metamorphosis, have large stores of energy-rich lipids, which are used to sustain the insects as they change from pupae to adults (Matheson 1951). Griffin (1974) observed that many insects are carried long distances with moving air masses. We observed that the Broadwing migration coincided with that of certain species of *Odonata*, such as the dragonfly *Epiaschna heros*, which frequently migrates in large numbers south from New England along the Appalachian Mountains (Lutz 1948).

In addition to the Broadwings, 297 (36%) of the 817 Sharp-shinned Hawks had distended crops, and 21 (41%) of 56 Red-tailed Hawks seen in September. Furthermore, 3 of 54 Ospreys had distended crops, 8 individuals were seen carrying fish, and 4 were feeding in flight. In the Great Lakes region, Hofslund

(1973) often saw Sharpshins hunting on migration, but seldom Red-tailed Hawks. The extent of feeding on migration may vary from one region to another and from year to year, depending on food availability, weather and migrants' condition.

We plan to continue this study and encourage observers at other hawk-watching stations across North America to conduct similar projects for comparative analysis. Such studies are necessary before generalizing about feeding behaviour of migrating raptors.

### ACKNOWLEDGEMENTS

We wish to thank James Olmes, Jay George, Paul Grotzinger and Richard Morton for their help in gathering data. We are especially grateful to Keith and Dora Shelley for their support and encouragement, and to Jim Brett and Hawk Mountain Sanctuary for their generosity in providing facilities and expert advice.

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