

Barn Owl (*Tyto alba*) Predation on Big Brown Bats (*Eptesicus fuscus*) in Pennsylvania

SUZANNE M. KHALAFALLA¹ and CARLOS A. IUDICA^{1,2}

¹Department of Biology, Susquehanna University, Selinsgrove, Pennsylvania 17870 USA

²Corresponding author (e-mail: casaiud@susqu.edu)

Khalafalla, Suzanne M., and Carlos A. Iudica. 2012. Barn Owl (*Tyto alba*) predation on Big Brown Bats (*Eptesicus fuscus*) in Pennsylvania. *Canadian Field-Naturalist* 126(1): 38–40.

Diet of the Barn Owl, *Tyto alba*, was determined through examination of pellets collected from a roost site in Port Trevorton, Snyder County, Pennsylvania (40°42'26"N, 76°51'58"W). Remains of a Big Brown Bat, *Eptesicus fuscus*, were positively identified in one of the 80 pellets from our site. To our knowledge, this is the first documented case of a Barn Owl preying on a bat in Pennsylvania.

Key Words: Barn Owl, *Tyto alba*, Big Brown Bat, *Eptesicus fuscus*, Pennsylvania.

Barn Owls (*Tyto alba*) are medium-sized predatory birds found on all continents except Antarctica. During the summer months, they are present in Pennsylvania, where they breed before migrating for the winter as far south as Georgia (Bent 1938). Barn Owls hunt strictly after dark over open grasslands. They will perch in the open and then drop down to capture prey. The size and strength of the talons of Barn Owls suggest that these owls have adapted to pin prey to the ground rather than to scoop prey like hawks (Sage 1962). However, Barn Owls have been known for some time now to prey on bats (Chiroptera) as well (see Twente (1954) and Escarlate-Tavares and Pessôa (2005), among many).

To feed on bats, Barn Owls must adjust their hunting methods to scoop prey. Evidence suggests that they are able to do so, as Barn Owls have been spotted in Iraq capturing House Sparrows (*Passer domesticus*) by the drop-down and scoop method (Sage 1962), which may also be used in the capture of bats. Documented studies in Great Britain (Speakman 1991; Love et al. 2000), the Bahamas (Buden 1974), Poland (Ruprecht 1979), and Madagascar (Goodman et al. 1993; Goodman and Griffiths 2006; Rasoma and Goodman 2007) have shown that Barn Owls are able to hunt bats effectively elsewhere.

Although bats are not common prey of Barn Owls, the opportunistic hunting style of Barn Owls allows them to make the best use of any available prey (Tores et al. 2005; Charter et al. 2009; Frey et al. 2011). In areas or times of low rodent population, Barn Owls must find alternate prey items. Despite the numerous reports of Barn Owls preying on bats in other countries (Glue 1974; Lopez-Formont and Urbano 1977; Morton et al. 1977; Bosé and Guidali 2001; Vargas et al. 2002; Sommer et al. 2005; Scheibler 2007; Wiley 2010) and in the U.S. (Hall and Blewett 1964; Colvin and McLean 1986; Hoetker and Gobalet 1999; Marti et al. 2005), there has been no documented report of Barn Owls feeding on bats in Pennsylvania.

Study Area and Methods

In 2005, 80 Barn Owl pellets were analyzed to determine their content. Pellets were collected during the spring of 1998 from a barn located within a rural area bordering the Susquehanna River. The barn that was being used by a pair of Barn Owls is more than 100 years old. It is part of a small farm within the town of Port Trevorton, Snyder County, central Pennsylvania (40°42'26"N, 76°51'58"W). No bat colonies were confirmed in the barn. Standard methodology was used to process the pellets, and identifications were done using comparative materials from the Carnegie Museum of Natural History, the Museum of Zoology at the University of Michigan, and the vertebrate collection at the State Museum in Harrisburg, Pennsylvania.

Results and Discussion

Analyses of the pellets indicated that approximately 74% of the diet was composed of rodent species and 26% was composed of insectivores. Remains of a Big Brown Bat (*Eptesicus fuscus*) made up 0.38% of the total collected. The most common species found in the pellets were Meadow Vole (*Microtus pennsylvanicus*) and Northern Short-tailed Shrew (*Blarina brevicauda*).

Accounts from southern North America and from Central and South America, Africa, Europe, and Asia report that the proportion of bats in Barn Owl diets ranges from 0.02% to over 60% of the total number of prey species (Vargas et al. (2002), among others). Within the continental U.S., studies from California, Colorado, Missouri, Kansas, Oklahoma, and Ohio report the presence of the bat genera *Myotis*, *Tadarida*, and *Antrozous* in Barn Owl diets (Huey 1926; Twente 1954; Hall and Blewett 1964; Marti 1974; Colvin and McLean 1986; Hoetker and Gobalet 1999).

The drop-down hunting technique described by Twente (1954) for hawks could be used to capture a bat at this location if the bat was caught when emerging from the barn or a nearby cave (Hall and Blewett

1964). In order to capture bats, owls must use a specialized method of hunting that requires more energy and is less beneficial than simply hunting prey that is not as difficult to capture (Sage 1962; Twente 1954). In a location such as Port Trevorton, where rodent and insectivore species are common, it is unlikely that Barn Owls would typically prey on bats, but Barn Owls are opportunistic feeders and it is possible that the captured bat was an inexperienced flier or was injured, allowing the owl to capture it with little trouble. In circumstances where preferred prey are rare, Barn Owls appear to be able to adapt to the type of prey that is available (Garcia et al. 2005).

Previous studies provide evidence that Barn Owls can prey on bats, and it is possible that this occurs more often than has been documented. In late summer, when young bats reach initial independence, they lack flying experience and become easy prey for Barn Owls. A large maternity colony of Little Brown Bats (*Myotis lucifugus*) and Big Brown Bats is located 13 km north of Port Trevorton. The number of bats emerging from the barn during the summer could provide Barn Owls with ample opportunities for practicing this method and capturing bats (Garcia et al. 2005). The abundant numbers of bats would provide the owls with an alternate prey source. In times of scarcity of otherwise more common prey items, such as rodents and insectivores, this food source may justify the extra energy required to develop a specialized hunting method.

Acknowledgements

We thank Dr. George Boone for providing the 80 owl pellets that we used for this study and Sarah Ignelzi for her early work on the original samples. Reference material was made available to us thanks to the generosity of Philip Myers (Museum of Zoology, University of Michigan), Suzanne McLaren and John Wible (Carnegie Museum of Natural History), and Walter Meshaka (State Museum of Pennsylvania). Two anonymous reviewers provided useful comments and we are thankful to them. Funding and other support were provided in part by grants and logistics from the Degenstein Foundation, the Susquehanna River Heartland Coalition for Environmental Studies, and Susquehanna University. This is contribution number 2 from the Susquehanna River Heartland Coalition for Environmental Studies (SRHCES).

Literature Cited

- Bent, A. C.** 1938. American barn owl. Pages 141-169 in *Five Histories of North American Birds of Prey*, Part 2. U.S. National Museum Bulletin Number 170. Reprinted 1961, Dover Publications, New York, USA.
- Bosé, M., and F. Guidali.** 2001. Seasonal and geographic differences in the diet of the barn owl in an agro-ecosystem in northern Italy. *Journal of Raptor Research* 35: 240-246.
- Buden, D. W.** 1974. Prey remains of barn owls in the southern Bahamas Islands. *Wilson Bulletin* 86: 336-343.
- Charter, M., I. Izhaki, K. Meyrom, Y. Motro, and Y. Leshem.** 2009. Diets of barn owls differ in the same agricultural region. *Wilson Journal of Ornithology* 121: 378-383.
- Colvin, B. A., and E. B. McLean.** 1986. Food habits and prey specificity of the common barn owl in Ohio. *Ohio Journal of Science* 86: 76-80.
- Escarlate-Tavares, F., and L. M. Pessôa.** 2005. Bats (Chiroptera, Mammalia) in barn owl (*Tyto alba*) pellets in northern Pantanal, Matto Grosso, Brazil. *Mastozoologia Neotropical* 12: 61-67.
- Frey, C., C. Sonnay, A. Dreiss, and A. Roulin.** 2011. Habitat, breeding performance, diet and individual age in Swiss barn owls (*Tyto alba*). *Journal of Ornithology* 152: 279-290.
- Garcia, A. M., F. Cervera, and A. Rodriguez.** 2005. Bat predation by long-eared owls in Mediterranean and temperate regions of southern Europe. *Journal of Raptor Research* 39: 445-453.
- Goodman, S. M., and O. Griffiths.** 2006. A case of exceptionally high predation levels of *Rousettus madagascariensis* by *Tyto alba* (Aves: Tytonidae) in western Madagascar. *Acta Chiropterologica* 8: 553-556.
- Goodman, S. M., O. Langrand, and C. J. Raxworthy.** 1993. The food habits of the barn owl *Tyto alba* at three sites on Madagascar. *Ostrich: Journal of African Ornithology* 64: 160-171.
- Glue, D. E.** 1974. Food of the barn owl in Britain and Ireland. *Bird Study* 21: 200-210.
- Hall, J. S., and C. H. Blewett.** 1964. Bat remains in owl pellets from Missouri. *Journal of Mammalogy* 45: 303-304.
- Hoetker, G. M., and K. W. Gobalet.** 1999. Predation on Mexican free-tailed bats by burrowing owls in California. *Journal of Raptor Research* 33: 333-335.
- Huey, L. M.** 1926. Bats eaten by short-eared owl. *The Auk* 43: 96-97.
- Lopez-Forment, W., and G. Urbano.** 1977. Restos de pequeños mamíferos recuperados en regurgitaciones de lechuza, *Tyto alba*, en México. *Anales del Instituto de Biología, Universidad Nacional Autónoma de México, Serie Zoológica* 48: 231-242.
- Love, R. A., C. Webbon, D. E. Glue, and S. Harris.** 2000. Changes in the food of British barn owls (*Tyto alba*) between 1974 and 1997. *Mammal Review* 30: 107-129.
- Marti, C. D.** 1974. Feeding ecology of four sympatric owls. *The Condor* 76: 45-61.
- Marti, C. D., A. F. Poole, and L. E. Bevier.** 2005. Barn owl (*Tyto alba*). *The Birds of North America online*. Edited by A. Poole. <http://bna.birds.cornell.edu/bna/species/001>, doi:10.2173/bna.1. (Accessed February 2012).
- Morton, S. R., M. Happold, A. K. Lee, and R. E. McMillen.** 1977. The diet of the barn owl, *Tyto alba*, in south-western Queensland. *Australian Wildlife Research* 4: 91-97.
- Rasoma, J., and S. M. Goodman.** 2007. Food habits of the barn owl (*Tyto alba*) in spiny bush habitat of arid south-western Madagascar. *Journal of Arid Environments* 69: 537-543.
- Ruprecht, A. L.** 1979. Bats (Chiroptera) as constituents of the food of barn owls *Tyto alba* in Poland. *Polish Academy of Sciences* 121: 489-494.
- Sage, B. L.** 1962. Barn owls catching sparrows at roost. *British Birds* 55: 237-238.

- Scheibler, D. R.** 2007. Habitat associations of small mammals in southern Brazil and use of regurgitated pellets of birds of prey for inventorying a local fauna. *Brazilian Journal of Biology* 67: 65-71.
- Sommer, R., H. Zoller, D. Kock, W. Böhme, and A. Griesau.** 2005. Feeding of the barn owl, *Tyto alba* with first record of the European free-tailed bat, *Tadarida teniotis* on the island of Ibiza (Spain, Balearics). *Folia Zoologica* 54: 364-370.
- Speakman, J. R.** 1991. The impact of predation by birds on bat populations in the British Isles. *Mammal Review* 21: 123-142.
- Tores, M., Y. Motro, U. Motro, and Y. Yom-Tova.** 2005. The barn owl: A selective opportunist predator. *Israel Journal of Zoology* 51: 349-360.
- Twente, J. W.** 1954. Predation on bats by hawks and owls. *Wilson Bulletin* 66: 135-136.
- Vargas, J., C. Landaeta A., and J. A. Simonetti.** 2002. Bats as prey of barn owls (*Tyto alba*) in a savanna in Bolivia. *Journal of Raptor Research* 36: 146-148.
- Wiley, J. W.** 2010. Food habits of the endemic ashy-faced owl (*Tyto glaucops*) and recently arrived barn owl (*T. alba*) in Hispaniola. *Journal of Raptor Research* 44: 87-100.

Received 7 July 2011

Accepted 2 January 2012