

when they tried to leave the barn through closed windows (K. A. Nash, personal communication). The cats are fed cat food ad libitum and thus their hunting instinct probably explains their predation on fledgling Barn Swallows, rather than hunger. Adult Barn Swallows will often mob a cat, both in and outside the barn. Occasionally a cat will respond by leaping high in the air in an attempt to catch a mobbing Barn Swallow (L.E.B. personal observations, Bent 1942). However, I have never seen a successful in-flight capture of the agile Barn Swallows.

Potential Predators Within the Barn — Three native species have been observed in the barn (Table 1) that are potential predators on Barn Swallows. Raccoons (*Procyon lotor*) and opossums (*Didelphis marsupialis*) are adept at climbing trees and sometimes enter the barn, but there has been no evidence that either species preyed on adults or nests of the Barn Swallows. However, raccoons have sometimes killed poultry on the floor of the barn.

Fox snakes (*Elaphe vulpina*) occasionally enter the barn and are potential predators on the eggs and/or young of Barn Swallows. This snake species was formerly considered to be terrestrial until L. Brown and J. Brown (1975) reported an individual exploring the nest of a House Sparrow high in the haymow. (In their usual habitat in central Illinois [e.g., former prairie] fox snakes have not been reported to be arboreal.) Occasional fox snakes have also been seen climbing along the top of the concrete wall in the lower level of the barn. However, none has been observed near any of the Barn Swallow nests. This may reflect the nests' locations on the sides of beams which may be difficult for fox snakes (as well as raccoons and opossums) to access because of obstruction from numerous crossing

beams. However, I have observed fox snakes entering the opening of bird houses outside the barn.

Two non-native species are also potential predators. Brown and Brown (1999) noted that "rats (*Rattus spp.*)" prey on Barn Swallows. Norway Rats (*Rattus norvegicus*; introduced) and also dogs (*Canis familiaris*) occasionally enter the barn but neither has been observed to prey on Barn Swallows.

Potential Predators Outside the Barn — Twenty-six native potential predator species (not already mentioned) on Barn Swallows occur on the farm but have not been seen in the barn (Table 1). These include eight mammalian species, sixteen avian species, one reptilian species, and one amphibian species. Probably the most destructive known predation on Barn Swallows was reported by Lohofener (1978) who found about 40 nests in culverts destroyed by a bobcat.

However, in my study none of the potential mammalian, avian, reptilian, and amphibian predators (other than raccoon, opossum, and fox snake already mentioned) on Barn Swallows has been seen in or near the barn during diurnal hours (the barn is unusually completely closed at night) and none of the native potential predators has ever been observed to attack Barn Swallows or their nests. Furthermore, cross beams within the barn provide protection from the three native potential predators known to enter the barn. It is thus likely that the barn affords considerable shelter for Barn Swallows from many potential native predators (n=29 species).

Hazards — Hanging strips of fly paper are a pesticide-free method of helping to control the innumerable flies that are inevitably attracted to livestock barns. However, these strips pose a serious hazard for Barn Swallows. In spite of their superior flying abilities, the

Table 1.

Raccoon ^{1,2,3} (<i>Procyon lotor</i>)	Bald Eagle ² (<i>Haliaeetus leucocephalus</i>)	Barn Owl ^{2,4} (<i>Tyto alba</i>)
Least Weasel ^{2,3} (<i>Mustela rixosa</i>)	Golden Eagle ² (<i>Aquila chrysaetos</i>)	Great Horned Owl ² (<i>Bubo virginianus</i>)
Longtail Weasel ^{2,3} (<i>Mustela frenata</i>)	Broad-winged Hawk ^{2,3} (<i>Buteo platypterus</i>)	Barred Owl ² (<i>Strix varia</i>)
Mink ² (<i>Mustela vison</i>)	Red-tailed Hawk ^{2,3} (<i>Buteo jamaicensis</i>)	Common Grackle ^{2,3} (<i>Quiscalus quiscula</i>)
Striped Skunk ² (<i>Mephitis mephitis</i>)	Red-shouldered Hawk ^{2,3} (<i>Buteo lineatus</i>)	House Wren ^{2,3,5} (<i>Troglodytes aedon</i>)
Coyote ² (<i>Canis latrans</i>)	Sharp-shinned Hawk ^{2,3} (<i>Accipiter striatus</i>)	Brown-headed Cowbird ^{2,3,6} (<i>Molothrus ater</i>)
Red Fox ² (<i>Vulpes vulpes</i>)	Cooper's Hawk ^{2,3} (<i>Accipiter cooperii</i>)	Black Rat Snake ^{2,7} (<i>Elaphe obsoleta</i>)
Bobcat ^{2,3} (<i>Lynx rufus</i>)	Northern Harrier ^{2,3} (<i>Circus cyaneus</i>)	Fox Snake ^{1,2} (<i>Elaphe vulpina</i>)
Eastern Fox Squirrel ^{2,3} (<i>Sciurus niger</i>)	American Kestrel ^{2,3} (<i>Falco sparverius</i>)	Bullfrog ^{2,3} (<i>Rana catesbeiana</i>)
Opossum ^{1,2} (<i>Didelphis marsupialis</i>)	Eastern Screech-Owl ^{2,3} (<i>Otus asio</i>)	

¹ Observed in the barn. ² Observed outside the barn. ³ Also reported by C. Brown and M. Brown (1999) and/or Bent (1942).

⁴ Heard in the 1970s; rare in Illinois at present. ⁵ Punctures eggs (Bent 1942). ⁶ Brood parasitism. ⁷ Accomplished climber that is a well-known predator on birds and their eggs (Phillips, Brandon, and Moll 1999).

Potential native predators on Barn Swallows (Hirundo rustica) observed in or outside the old dairy barn.