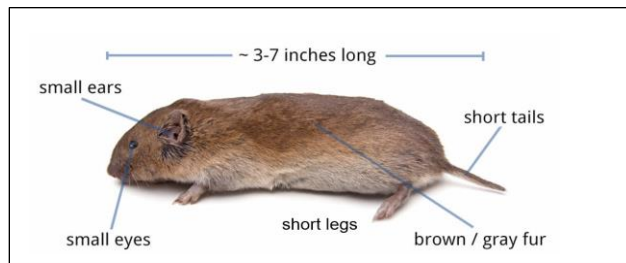


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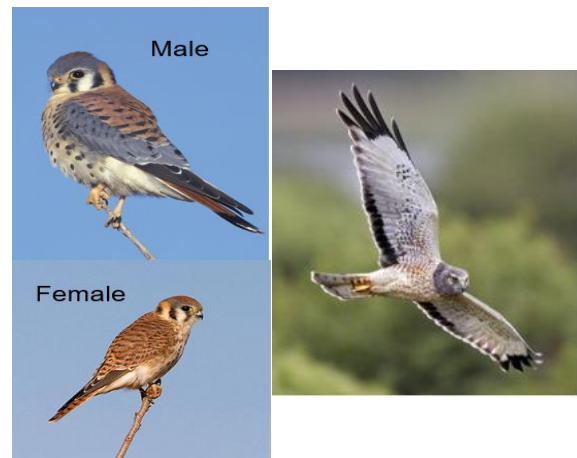
Introduction

Voles are a favorite diet of many predators such as owls, hawks, kestrels, snakes, foxes, and coyotes and many other natural predators. Voles are a keystone species that often comprise more than 40% of all the mammals in any above-ground Midwest ecosystem and are the primary diet of many predators. Creating beneficial habitat for these predators may significantly reduce vole numbers and the associated agricultural economic damage from reduced crop yields.

common hawk that lives year-round in the Midwest. They're named for their red tail. Rough-legged hawks migrate into the Midwest during winter and come in dark and light morphs. Red-tailed hawks eat more voles per year in the Midwest because they live year-round, but Rough-legged hawks may greatly reduce vole numbers during the winter, keeping their populations low going into the spring. Vole populations tend to peak in the fall and are at their lowest point at the end of the winter going into spring.



Red-tailed hawk (left) and Rough-Legged Hawk (right) Source: Purdue University



American Male & Female Kestrels (left) Northern Harrier (Male on right) Source: Purdue University.

Hawks, Falcons & Owls

In the Midwest, two major hawk species that prey on voles include the Red-tailed hawk and the Rough-legged hawk. Red-tails are the most

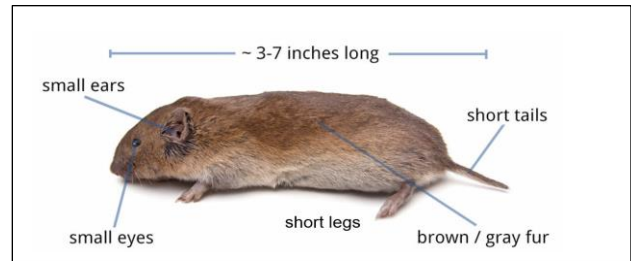
American kestrels are mourning-dove sized falcons that are common in Midwest farmlands. They often hunt from utility lines. The male has slate-gray wings, and the female's wings are rusty brown. Both have "mustache" and "sideburn" markings. The American kestrel is a

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year-round resident of the Midwest and have a smaller hunting range. They are a major consumer of meadow voles although they also consume insects and slugs as part of their diet.

Kestrels are a real bonus to agriculture and they should be promoted. Artificial perches and bird nesting houses are a good way to increase kestrel numbers and vole predation. Perches should be placed in large open areas near known vole colonies, especially near tile risers. Using a 10 foot brightly painted fence post with a two-foot bar bolted across the top makes a good perch for kestrels, hawks, and owls. Perches should be installed in fields where major vole damage has occurred. Beware: Deer like to scratch on these fence posts and may knock them down. Keep a map or GPs where perches with fence post are installed. Paint a bright color to minimize equipment damage!



Perches and Nesting Box

- 11-fold increase in kestrel numbers in Oregon with perches (Wolff et. al 1999)
- Kestrels used perches in open Texas landscape (Kim et. al 2004)

- 3-30X increase in kestrel breeding pairs with bird houses (Paz et. al 2013)
- Dead trees, perches (10' fence post), utility poles, den trees, and bird houses provide a home for both owls, hawks, and falcons but they also need a food source which is primarily voles.

Northern harriers are much less common but migrate into an area and winter throughout the Midwest and breed in the extreme northern part of the Midwest. They rarely hunt from perches; instead, they fly low over fields, often tacking or following field borders. They also will hover (like kestrels) before pouncing onto prey.

Hawks prey on voles during the day, have a large territory, and are generalist, eating anything that is available. Owls tend to feed in a smaller territory and specialize on eating voles (field mice). Field mice (voles) may be 90% of their diet. There are many breeds of owls that feed on voles. Owls are nocturnal which also coincides when voles are most active, especially during the summer.

The Great-horned owl is the largest owl in the Midwest although at low densities. The common somewhat smaller Barred owls are closely tied to forest. Barn owls are great vole predators but have declined sharply in much of the Midwest and are Endangered. The Eastern screech owl is a small owl that is common in the Midwest and lives there year-round consuming voles, large insects and small song

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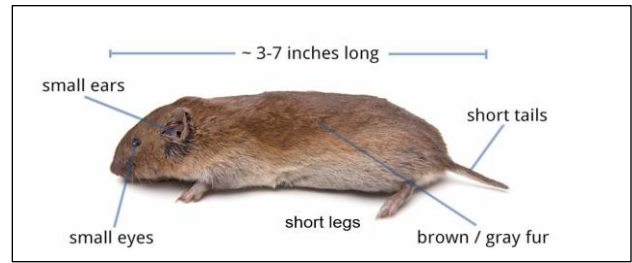


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birds. Short-eared owls migrate from northern tundra to overwinter in the Midwest. They roost in groups on the ground and hunt over open areas much like the Northern Harrier. In Wisconsin, 95% of short-eared owl diet was voles while in Ohio, 90% of the long-eared owl diet was voles. Owls regurgitate voles pellets of fur and bone. Owls are major vole predators so maintain den trees, perches, and dead trees to promote owl habitat. Wooded fence lines and nearby woods also provide good predator habitat.



Top Left: Great Horned; Top Right: Barred;
 Middle Left: Barn Owl; Middle Right: Eastern
 Screech Owl; Bottom: Short Ear Owl



Mammals (fox, coyote, shrew)

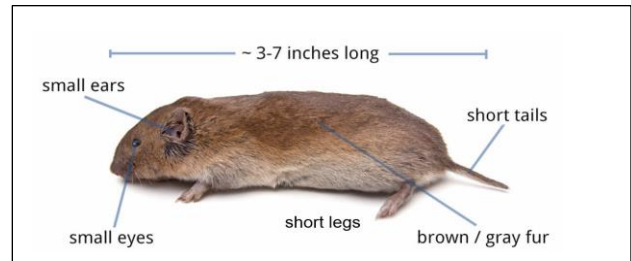
Fox, coyotes, and shrews are major mammal vole predators. A family of fox may eat 2.9 voles per acre or 10-15 voles per day. A family of coyotes eat 0.7 voles per acre or 10-20 voles per day. Fox are more localized than coyotes. Coyotes are free ranging, have a larger territory, and eat any meat source. Over hunting and hunting with specialized dogs have greatly reduced fox and coyote numbers in the Midwest. If voles are a problem, limited hunting of these species may help reduce vole populations. Predator numbers are positively correlated to lower vole numbers.



Top Left: Red Fox, Top Right: Coyote; Bottom
 Left: Northern Short-tailed Shrew; Bottom
 Right: Rat Terrier



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The North American Short Tailed shrew is a major predator to voles especially meadow voles. Shrews have reddish-brown thick fur, a pointed snout and short tail. Shrews forages after sunset and have poor eyesight and smell. Shrews eat 3X its weight daily and consumes mostly a carnivorous diet. The shrew's main diet consists of voles, house mice, slugs, and snails. Shrews need to consume 43% more food in the winter to survive the cold and live about 1 year. Shrews live in vole burrows and their density is 2-12/acre and cover 5 acres.

Other Vole Predators

Other Midwest vole predators include Gulls, Herons, Blue Jays, Crows & Ravens, Eagles, Raccoon, Skunks, Possum, Mink, Weasels, Badgers, Turtle, Bull Frogs, Salamanders, Garter Snakes, Gopher Snakes, Yellow Bellied Racer, Large Mouth Bass and Trout.

Other predators include cats and dogs. Feral cats consume voles but also many other beneficial species, especially song birds and other small mammals. Feral cats should not be promoted as a vole control strategy. Several dog species have been traditionally utilized to control rats, mice, and voles especially Rat terriers. Rat terriers may do a lot of tillage if vole numbers are high. Here are the **Top 10 Dog Breeds for Catching Rats/Voles:**

Rat Terrier, Cairn Terrier, Yorkshire Terrier, Norfolk Terrier, Jack Russell Terrier, West Highland White Terrier, Dachshund, Miniature Schnauzer,

Lakeland Terrier, and German Pinscher

Summary

Voles have many predators and are a key-stone species. Management practices that encourage vole predation assist in keeping vole populations under control.

Fact sheets in this Series:

- 1) Vole Biology FS-1
- 2) Vole Scouting FS-2
- 3) Vole Predators FS-3
- 4) Vole Repellants & Baits FS-4
- 5) Vole Management Practices FS-5

References

Fisher, BA; Shelton, V. Bailey, T April 2014. Agronomy Crib Notes: Vole Control, USDA-NRCS, Issue 11.

Hoorman, James J. (primary author), in collaboration with Barry Fisher and Dr. Brandon Smith, USDA-NRCS Soil Health Division.

Purdue University Extension, "Voiles don't eat like a mouse in No-till fields", Purdue News, May 31, 2002.

University of California, IPM Program, How to Manage Pests, Voiles (Meadow Mice) September, 2017.

University of Illinois, "Voiles and Lemmings", Living with Wildlife in Illinois, Wildlife Directory

Wikipedia, 2017, Meadow Voiles.

Young, C. Ohio State University, Entomologist, personal contact, reviewer, January 2018.



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