

**STATUS: ENDANGERED**

Endangered in Iowa

**Short-eared Owl***Asio flammeus***Introduction**

One of the world's most widely distributed members of its family; the Short-eared Owl is an open country, ground nesting species that inhabits wetlands, grasslands, prairies and tundra throughout much of North America and Eurasia. It also breeds in many other portions of the world. Few data exist for populations other than the widely distributed nominate race *Asio flammeus flammeus* in North America, Europe, and Asia. Most other races are considered island endemics.

Reproduction and population dynamics of this species are closely linked to the density of its primary prey, small mammals such as *Microtus* voles. Like other birds of prey that depend on fluctuating numbers of prey species, the Short-eared Owl shows considerable local variation in its numbers and reproductive success, and is even nomadic at times. Although the literature on its diet in the non-breeding season is extensive, few studies have thoroughly addressed other facets of its biology, ecology, and life history.

The most diurnal of Iowa's owls, this species may be seen actively hunting day and night. It tends to hunt at low heights above the ground, often quartering an area on slightly dihedral wings or hovering. Although it generally uses acoustical cues to locate prey, it can rely on vision as well. Its conspicuous flights and calls during courtship are a distinctive feature of the landscapes it inhabits. Short-eared Owls have declined in many areas of North America. Habitat loss due to land use changes and other human activities appear to be the major causes. As a ground-nester, it may also be vulnerable to increases in levels of predation.



## Habitat Preferences

Short-eared Owls breed in, and are almost always associated with, open country that supports cyclical populations of small mammals. In Iowa these preferences typically include large expanses of marshland, native prairie or grasslands, but some agricultural areas are also utilized. As would be expected, this species tends to congregate where small mammal populations are highest.

This species is an opportunistic breeder, preferring to nest in areas with the most abundant prey. Nests are usually located on dry sites with enough vegetation to conceal the incubating female, and nests will be created on slight ridges or mounds if present.

Habitat preferences during migration or dispersal when prey populations have declined significantly are similar to habitats used when breeding, but may also include smaller open areas, if prey is available.

At other times when not nesting, Short-eared Owls may use small marshes, weedy fields, dumps, gravel pits, rock quarries, and shrub thickets which are surrounded by woodlands and other plant communities. Occasionally this species will roost in trees during winter, but it primarily roosts on the ground.

Short-eared Owls roost communally during winter, and groups of 8 to 20 have been reported in Iowa. Most winter reports are from the southern half of the state. Wintering areas often turn into breeding areas if food is plentiful.

## Feeding Habits

Short-eared Owls feed mainly on voles (*Microtus*), which are the dominant prey item throughout Iowa and most of North America. They also take other small mammals such as deer mice, pocket mice and gophers; and also shrews and rabbits. Bats and muskrats are only rarely taken.

This owl preys less frequently on birds than mammals, and there is a strong positive correlation between vole abundance and owl abundance.

This predator hunts by flying low over the ground (1 to 10 feet in height), and often hovers slightly higher before dropping onto prey. Hunting flight is by buoyant, floppy wingbeats, which may give the appearance of a giant moth. Hunting may take place by day (especially on dark, overcast days), but mostly these birds are crepuscular, or most active near dawn and near dusk. Time of hunting is probably dictated by hunger, prey density, and nestlings' hunger. Research indicates that prey is found primarily by sound, but also by sight.

Small mammals are usually swallowed whole or by clipping off the head and eviscerating the prey. During the infrequent times when small birds are taken, the wings are clipped off and the body is swallowed whole. Pellet analysis provides reliable insights into actual diet and is the best method for quantifying small mammalian prey. Diet varies little throughout the range of this species, with apparently little difference in food eaten seasonally or by sex or age of individuals.

Food storage or caching of prey has been infrequently reported, but this behavior may be common. Adult birds feed flightless (dispersed) young, and have been known to stock-pile up to five prey items during these times. The lack of a crop in owls may also contribute to selection for this behavior.

## Breeding Biology

Pair formation usually begins in mid-February and continues through June. The male's courtship includes flying in tight circles, making "barking like calls," diving, and "wing clapping" and male and female preen each other. This performance may be repeated for an hour or more, and prior to copulation, the male offers the female food.

Communal winter roost sites may turn into local breeding territories.

Short-eared Owls can be colonial nesters when location of prey and nesting cover make this the most feasible option. Nests are usually on dry ground and often on a raised hummock or ridge, especially in marshy habitats. The nest is built by the female and consists of a depression in the soil, lined with grass and feathers. These nests are usually concealed in tall grass or under a shrub, and are very rarely above ground level.

Eggs may range from 3 to 11, but more commonly are 6-8, with more eggs produced when prey is very abundant. Egg laying usually takes place from April through June. Incubation takes 24-37 days and is thought to be by the female only. Males feed incubating and brooding females, and bring food to the nest for the female to feed to the young.

The young may leave the nest on foot at 12-18 days of age. Once fledged, young form communal family groups and roost together during the day. Adults may participate at first, but it is not known for how long. As a ground nester, Short-eared Owls are vulnerable to mammalian predation. Selective pressure may favor rapid growth, development, and pre-fledging dispersal of young as an anti-predator adaptation to ground nesting. The young are able to fly at 27-36 days of age.

### **Concerns and Limiting Factors**

Reports from Iowa in the late 1800's and early 1900's indicated that Short-eared Owls were common. But by the 1930's this species was considered to be a rare summer resident and an uncommon winter resident. And this has been the pattern until the present day.

As with most declining birds and other wildlife species, the primary concerns and limiting factors are specifically related to

preferred habitats. In the case of Short-eared Owls, a huge percentage of the native prairies, wetlands, and grasslands that previously supported this species have been converted to crop fields, housing developments, transportation systems, and other human activities. Habitat that hasn't been lost may be severely altered, fragmented or degraded by these same factors, plus other forces. Consequently, the habitats available to this interesting species in Iowa have been sharply reduced.

Ground nesting and nomadic travels in search of prey make this species particularly vulnerable to habitat loss at any season. Reforestation in some areas may also contribute to habitat loss. Increased predation by skunks and raccoons on eggs and nestlings (especially likely to occur in small and fragmented habitats) is suspected of being an important reason for population declines. Disturbances at nests by domestic and feral cats and dogs are also known to be a problem at certain locations.

Illegal shooting occurs, but probably has less impact on populations than it did in years past. Although residues from pesticides and other contaminants magnify with successive trophic levels in the food chain, birds of prey such as Short-eared Owls that eat herbivorous mammals usually accumulate low levels of these man-made compounds. These low levels of contamination generally have little effect on eggshell thickness and breakage, tissue damage, or embryo mortality.

### **Habitat Management Recommendations**

Management suggestions have included: maintaining large contiguous tracts of wetland, prairie and grassland habitat for these owls and their prey, controlling human disturbance and predation as well as possible, public education, and continued field research.

This species has benefited from the USDA Conservation Reserve Program, and indirectly from protection and restoration of nesting cover to support waterfowl populations.

Burning and maintenance of native prairies and grasslands to provide nesting and foraging cover has also benefited this endangered owl.