

**STATUS: ENDANGERED**

Endangered in Iowa

# Peregrine Falcon

*Falco peregrinus*

## Introduction

The Peregrine Falcon, listed by the State of Iowa as endangered, is the fastest flying bird in the world. In power-dives from great heights to strike prey, the peregrine has been timed traveling in excess of 200 miles per hour. Peregrines are regarded by falconers, ornithologists, and all who know this species, as one of the most noble and spectacular of all birds of prey (or raptors). Although widely distributed across six continents, the Peregrine Falcon is uncommon in most of its range. In North America it was seriously endangered in the early and mid-20th century because of overuse and misuse of DDT and various other persistent biocides.

The image of the peregrine as a symbol of wilderness diminishes when one sees this falcon breeding on urban bridges and skyscrapers, or watches one speed along only slightly above traffic-jammed streets chasing prey. But a Peregrine is truly special, and always worth watching. Humankind has long admired this species as nature's most perfect aerodynamic performer and a strikingly beautiful bird. The mere presence of this highly effective predator in a landscape has no doubt influenced the structural and behavioral evolution of countless avian species that are its prey.

The name peregrine means "wanderer," and northern-nesting peregrines are among North America's most amazing long-distance migratory species, some covering over 10,000 miles annually. It is difficult to characterize the resident status of the peregrine as a species. Most individuals spend just a few months in Iowa and in its northern breeding range, but others may remain sedentary in the north throughout the year.

LINK TO IOWA IBA: PEREGRINE FALCON

Few other North American species held such a high scientific and public profile during the twentieth century as the peregrine. Among the most studied of wild birds, Peregrine Falcons have been an icon of the environmental awakening since the 1970s. Ironically, its popularity increased with its disappearance as a breeding species in the eastern U.S.

Along with other birds of prey and some fish-eating birds, the peregrine was severely harmed by the widespread use after World War II of persistent chemicals that lowered reproduction and survival rates. By 1970, the peregrine was federally protected in the United States, and the chemicals that had caused so many problems were banned in North America by 1972. Peregrines have since made a steady recovery, aided by various restoration projects. But this species is still listed as endangered in Iowa.

Field observation data that documents confirmed or probable breeding of peregrines at a specific site for at least 2 years of the previous 6 years (the years being considered roll forward annually) is needed for Iowa's IBA Technical Committee to recognize that site as an Important Bird Area (IBA).

An abundance of natural history information and research data is readily available on the Internet for this species (as well as for other, less well-known IBA Criteria Species). The following information highlights some of the details that are most relevant to conservation of the Peregrine Falcon in Iowa.

## Habitat Preferences

Peregrine Falcons originally occupied most landscapes found across the Americas. But despite its wide distribution, this species was never common. After many years of study, researchers estimated that only about 350 nesting pairs were present east of the Mississippi River prior to the use of the biocides that caused the rapid decline of this species. Predators are never as numerous as their prey species, and peregrines are no exception. Because they fiercely defend nesting territories, and also hunt over hundreds of square miles for their prey, peregrine populations could never be what we would think of as being dense.

Most North American peregrines originally nested on cliffs from which they could see great distances and hunt for prey, and this innate attraction to such sites make them their preferred habitat. In Iowa, prior to the 1950's when biocides were widely used, the cliffs along the Upper Mississippi River supported the highest concentration of peregrines. The high cliffs found on the western edge of the Mississippi River valley between New Albin and Dubuque appears to have attracted the most peregrines in Iowa in those years, although nests were also found along the Cedar River and other bodies of water in interior counties.

Despite their affinity for natural cliffs, peregrines have been established as an urban species over the past two decades by dedicated individuals and collaborative restoration efforts by a host of public agencies and private organizations. These efforts have achieved positive results and have been well publicized in the media.

Years of work to restore peregrines to our state have focused on urban sites partly because of the availability of a ready supply of the peregrines favorite food – Rock Pigeons. These projects have shown that peregrines are fairly adaptable to man-built environments – so long as they have safe places to nest and an abundant food supply. From this we can conclude that in the 21st century, with understanding by our citizens and help from falcon specialists, peregrines are likely to continue using a variety of natural and man-built habitats. In addition to resident populations, which occupy breeding habitats, migratory peregrines may also occur in open habitats

that lack cliffs or other tall structures. They are often found near water where they prey on shorebirds, waterfowl and other species.

## Feeding Habits

Peregrine Falcons feed primarily on a wide variety of other birds. Around cities the often abundant Rock Pigeons (formerly known simply as pigeons) are a favorite source of nourishment. Peregrines are known to take prey as large as geese and large gulls, and as small as songbirds. Near water they prey on waterfowl and shorebirds, especially during migration. Occasionally a few small mammals will be eaten. Insects are seldom taken and carrion is rarely eaten.

Most prey is captured in the air, while peregrines are in flight. But this species also takes prey from the surface of water or ground; and may walk on ground is search of nestling birds or rodents.

Hunting may be best described as sequence of actions consisting of search, pursuit (attack), capture, killing, and eating. Usually peregrines search for food either from a perched position (most commonly) or while flying.

Especially during the breeding season, adults perch on a high vantage point or cliff, usually near the nest site, overlooking vast air space in which other birds fly. This position allows the falcon to dive (stoop) down easily on low-flying prey, or to maneuver upward into the sky to attack high-flying prey. The capture, killing and eating of prey is described thoroughly by a variety of books and Internet sources.

Some peregrines seem to fixate on 1–2 prey species to virtual exclusion of everything else. This sort of fixation on one kind of food probably leads to increased skill in capture this prey. Selective predation by peregrines very likely culls the weak, injured and unfit individuals from prey populations.

## Breeding Biology

As stated previously some peregrines may remain as resident birds through the winter, particularly in locations where sufficient prey occurs. This applies to birds in urban settings as well as those in natural habitats. Migratory peregrines are often back at nesting sites in Iowa in March of each year.

Peregrine Falcons may mate for life. Territorial and courtship displays include high circling flight by the male and spectacular dives and chases by both sexes. After the incredible aerial maneuvers, the male tries to lure the female to a nest ledge by offering her food. Breeding peregrines defend the immediate area of the nest from intruders but hunt over a much larger area.

Nesting is usually on a cliff ledge, broken-off tree snag, or in an old nest of other large birds in a tree. Peregrines also use ledges of buildings, bridges and other structures. No nest is built per se. During early courtship small items of substrate (soil, sticks, sand or gravel) are scraped together to form a shallow bowl. This process continues until egg-laying in the scrape.

Peregrines will renest (usually within 14 days of egg loss) if the first attempt fails, and may renest 2 or 3 times if clutches are lost or removed early in incubation. There are no records of more than one brood per season. Many first-time breeders in expanding populations select non-typical nest sites. Recovery projects often provide nest boxes or platforms on high smoke stacks or cliff faces. There is considerable attachment to a nest location, but alternate nest sites are frequently selected on the same cliff or structure.

Usually 3 or 4 eggs are laid, but sometimes

2-5, and rarely 6. Incubation is mainly by the female, and lasts for 32 to 35 days. The male brings food for the female during incubation. Females stays with the young at

first, while the male feeds both female and young; later the female hunts also. Five days after hatching the chicks have doubled their mass, their eyes are open, and they can sit up with relative ease. Young are brooded roughly 80% of the time up until 10 days of age, then brooding gradually decreases and ends at about 20 days of age. The young take their first flight at 39-49 days of age.

Within 10 days of first flight, young peregrines pursue adults to solicit food. Flight progresses from Butterfly-Flight (1–2 days after first flight) to Flutter-Glide (3–9 days) to Powered Flight (15–25 days). Adult pursuit is accompanied by begging calls. Young will even pursue parents for food during territorial defense. As the young become more aggressive, adults sometimes begin to drop both dead and live birds in air. The young learn to pursue and catch these items.

In migratory populations, dependency of young toward adults may continue until onset of migration which is approximately 5–6 weeks after fledging. The period of dependency is longer in non-migratory populations (9–10 weeks after fledging). Most released (hacked) peregrines from recovery programs have dispersed by 6 weeks after fledging.

## Concerns and Limiting Factors

The effects of human activity are the primary concern and the limiting factor for Peregrine Falcon populations. Pairs in more remote locations are most reactive to humans; while those breeding in urban areas or frequently visited sites become habituated to close human activities. In the distant past, some historical nest sites (eyries) were abandoned because of human encroachments or increased levels of nearby activity. Human presence near a nest site, especially during the critical breeding cycle, can be a major factor in the success or failure of a seasons nesting attempt.

Before legal protection, shooting, trapping and egg-collecting accounted for the loss of many hundreds of falcons and their eggs. Educational programs and broader public awareness have significantly reduced losses from these causes.

From the late 1940s to early 1970s, massive, continent-wide – and indeed, nearly global – use of organochlorine pesticides, particularly DDT, dieldrin and aldrin in agriculture, forestry and human disease control, resulted in the accumulation of toxic residues in prey species, which in turn contaminated falcons, causing both lethal and sub-lethal effects. Eggshell-thinning was a major and consistent cause of nesting failures. Banning DDT and many other biocides in the U.S. was very important; but unfortunately, peregrines that migrate to Latin America and elsewhere are still exposed to detrimental and poorly regulated or unregulated pesticides. Peregrines are also occasionally killed by eating birds poisoned by strychnine or other persistent toxic chemicals.

Urban-dwelling peregrines are killed or injured by flying into windows or other features of buildings while chasing prey, and occasionally by collision with moving motor vehicles, or aircraft at airports. Peregrines sometimes strike wires; recently fledged young sometimes fall down chimneys or are killed by air-conditioning equipment or other machinery on tops of buildings; and young in nests on bridges sometimes fall into the water, significantly reducing productivity at those sites.

Human encroachment is always a major concern, and can be a significant limiting factor. Inspection of nesting areas just

before or during egg-laying is likely to cause falcons to abandon that preferred nest site. Later in the breeding cycle,

careless attempts to get close to nests may result in injury or death for adults and young, or abandonment of eggs. Likewise, prolonged human activity that keeps parents away from their eggs or downy young for extended periods, can cause over-chilling, or over-heating, and death.

## Habitat Management Recommendations

Although the iconic Peregrine Falcon has made a substantial comeback after suffering near extermination from Iowa and the eastern U.S., many former nest sites, especially those on natural cliffs, have no peregrines. Restoring peregrines to their original nest sites along the Mississippi River will be an important step in expanding and securing populations in Iowa and the Midwest, and this is where much of today's conservation work is being focused. In addition, specific release sites for young peregrines are also the focus of re-introduction efforts in other parts of Iowa. The Iowa DNR, Wildlife Diversity Program, is actively working with numerous partners to restore peregrines to carefully selected locations within our state. These efforts are long-term, they've been quite successful, and they are deserving of strong support from the public.

It is difficult to assess the impact that habitat loss or degradation has had on Peregrine Falcons because they use such a wide range of habitats and landscapes, including those highly modified by humans. But generally, habitat management for peregrines comes down to the following two basic concepts:

First, peregrines are most affected by loss or modification of nesting sites, which are limited in number and often non-replaceable (e.g., specific cliff faces, and special, previously used broken tree snags; and certain towers, buildings or bridges, and the ledges found at these sites). Any site known to be used for nesting by Peregrine Falcons – whether historically, or in recent years – should be protected and maintained as it was when it was last used for nesting, wherever this is possible.

Second, like all other members of the animal kingdom, Peregrine Falcons need access to a sufficient amount of food. Being a bird of prey (raptor), peregrines hunt for a living. Their primary food is other birds, and Rock Pigeons are the number one food item when available. Peregrines in Iowa and the Midwest also consume starlings, coots, Blue Jays, flickers, meadow larks, House Sparrows and other species. Therefore, maintaining habitats that support an abundance of other birds constitutes part of good management for Peregrine Falcons.

Unlike for many species of birds, agricultural practices are not usually detrimental to peregrines (except for the use of biocides), as this species readily preys on birds attracted to cultivated landscapes. Owing to its hunting style peregrines no doubt benefited from the conversion of closed-canopy forests to agriculture. Migratory and wintering peregrines, and some resident birds, favor wetland areas that support concentrations of waterfowl and shorebirds; therefore, loss or degradation of these habitats is detrimental to peregrines.

Efforts to propagate and release Peregrine Falcons began in late 1960s, and these projects involved many public agencies and private conservation organizations. A species recovery plan prepared and implemented by the Iowa DNR, Wildlife Diversity Program, established methods and criteria for recovery; and Iowa relied heavily on captive propagation and release of captive-produced birds. The recovery plan also emphasized the need for a reduction in environmental contamination by organo-chlorine pesticide residues, especially DDT.

The long-term, continuing objectives under Migratory Bird Treaty Act, for Iowa, other states, and Canadian provincial jurisdictions include: 1) habitat protection, 2) habitat improvements, 3) monitoring population trends and productivity, and 4) sustained use for falconry.

Again, the most important component of habitats requiring special attention are traditional nesting sites (eyries), which should be protected from physical alteration or destruction and from excessive human disturbances that might cause abandonment or repeated reproductive failure.

General habitat improvements that increase the abundance and diversity of bird life are also beneficial to peregrines. Detailed guidelines for managing peregrines (to be implemented by falcon experts) include: survey and sampling techniques, banding, observing behavior, collecting tissue samples, aging young, and management of specific types of nest sites (eyries).

Once nesting populations stabilize at carrying capacity, little active management should be needed, as peregrines historically survived for centuries in the face of both natural and human-caused losses. The existence of a sizable number of adult, non-breeding birds represents potential for further increasing the size of the breeding population by providing additional suitable nesting sites at specific natural cliffs, and certain bridges, smokestacks, buildings and towers.