

**STATUS: ENDANGERED**

Listed as Endangered by Federal and State Agencies but at this writing, may be removed from the Federal List

**Bald Eagle**

*Haliaeetus leucocephalus*

**Introduction**

Because of its recent endangered status, when a habitat in Iowa supports confirmed or probable breeding Bald Eagles in at least 2 of the previous 6 years – that habitat will qualify for Important Bird Area (IBA) status. However, this species has made a strong comeback across our state, and it may be removed from the Threatened and Endangered Species list at some point in the future.

The Bald Eagle was selected by Congress in 1782 to be the national emblem of the United States. With a wingspan of seven feet and a snow-white head and tail that contrasts with a large dark brown body, the Bald Eagle is a magnificent national symbol that citizens should be proud of. The Bald Eagle has long been revered by a variety of human cultures, and parts have shown up regularly in archaeological investigations across North America. In recent years, the Bald Eagle has served as a symbol of freedom associated with democracy, wilderness and an environmental ethic.

Being one of the most studied North American birds, with well over 2,000 individual published articles on various aspects of its life history and biology, and being the subject of a large number of contemporary books, the Bald Eagle is more easily recognized and is better known than are the other 36 priority species that are part of Iowa's Important Bird Areas (IBA) Program.

During the past two centuries the Bald Eagle has undergone wide and dramatic population fluctuations in the United States. Early explorers of North America often reported it as being abundant, especially in areas with large expanses of aquatic habitat. In fact, Bald Eagles were so abundant in Alaska that a 50¢ bounty was placed on them in 1917. That was increased to \$2 in 1949 and many thousands of Bald Eagles were purposely killed before the bounty was overruled by federal

regulation in 1952. Prior to 1830, Bald Eagles were common in and nested throughout Iowa but there was no nesting in the state between 1892 and 1905.

The species was listed for protection under the Bald Eagle Protection Act in 1940 and the southern subspecies was listed as Endangered in 1966 under protection of the Endangered Species Preservation Act. The entire Bald Eagle population in the contiguous United States was listed for protection in 1978 under the Endangered Species Act of 1973. In those places where this species continued to breed at mid-century, unusually high numbers of nest failures were noted following World War II. Pesticides, primarily DDT but also other man-made materials that were poisons, were proven to have drastically lowered reproductive success.

In the mid-1970's Bald Eagles began nesting in Iowa again, and their sharp and dramatic recovery in our state and elsewhere is attributed to the ban on DDT in 1972. Persecution in all of its many forms slowed as environmental awareness increased. The majority of nesting still occurs near large bodies of water such as the Mississippi River, but it has expanded rather quickly into the interior of our state. This rapid recovery is one of the continent's most successful conservation stories. It is a story that should be remembered as efforts to protect and restore other, less well-known species – that are also priorities species, begin to take place through Iowa's IBA Program and other bird conservation activities.

### **Habitat Preferences**

The largest numbers of Bald Eagles occur in Iowa during the colder months when birds from northern states and Canada migrate south to utilize food and roosting resources along Iowa's larger rivers and reservoirs. Severe winters push the eagles

further south, while mild winters allow them to remain further north.

In Iowa, Bald Eagles generally prefer tall trees in wooded areas adjacent to bodies of water for nesting. Most nests are placed within larger wooded tracts, away from human dwellings and roads. In some cases, distance from nest to water is not as critical as the quality of feeding opportunities found nearby. Preferred feeding areas provide diverse, abundant, and vulnerable prey species and little if any human development or disturbance.

The size of woodlands providing a potential nest tree may be of little importance if the wooded area is isolated from human development and disturbance, and food is readily available. Bald Eagles prefer to nest in large trees with relatively open canopies. Eagles tend to use as perch sites tall, easily accessible trees adjacent to water bodies where dead or dying fish can be located with their excellent eyesight.

Habitat use during migration is similar to habitat used in winter. Suitability of stopover habitat is mostly related to food availability rather than vegetation type. These sites may feature consistent fish-kills or water turbulence such as that found below dams or near the outfalls from electricity generation facilities, or possibly the presence of large mammals as carrion – especially where piglets and other livestock are disposed of in open fields. Most stopover sites have traditional, long-used roost sites, which are often clumps of mature deciduous trees near water bodies that are protected from human disturbance and near feeding opportunities.

Concentrations of several hundred Bald Eagles have been recorded at roost sites and areas of seasonally concentrated food along the Mississippi River and in adjacent counties in Iowa. Large winter concentrations may also be found along interior bodies of water that remain ice-free.

The preferred winter habitat has available food, roost sites that provide protection from severe storms, and the absence of human disturbance. Bald Eagles will tolerate some human activity in areas where fish are readily available for food.

Our national bird selects large roost trees that are open and accessible. Roosts are generally associated with aquatic feeding areas, but they are not located nearly as close to water as nests are. Eagles may roost many miles from feeding areas, but such sites are located away from areas of consistent human disturbance. The major factor driving roost-site selection may be the ability to save energy during winter, and most roosts are located in areas that are protected from prevailing winter winds.

The key to maintaining healthy numbers of breeding Bald Eagles in Iowa is unmolested nesting sites and availability of food – which is primarily fish.

### **Feeding Habits**

The Bald Eagle is an opportunistic forager that eats a wide variety of prey. It prefers dead or dying fish over other types of food; and scavenges prey items, takes food from other species (including other Bald Eagles) when it can, and usually as a last resort, captures its own living prey.

Bald Eagles hunt from perches or while soaring over suitable water habitat, and sometimes over agricultural fields. They often attempt to take small prey on the wing (e.g., fish, waterfowl, small mammals) but success varies greatly. Carrion of many different kinds of fish, birds, and mammals are used extensively when encountered at sites that allow disturbance-free access to the ground. As an opportunistic feeder, the food habits of Bald Eagles are highly varied and based primarily on availability of particular prey species.

Hunting for prey over shallow water increases the likelihood that live fish will be

seen and captured. Gizzard shad and other shallow water species seem to make up a large proportion of the diet of Bald Eagles in Iowa.

Any natural or human-caused event that kills or stuns fish or other potential prey species may also provide food. For this reason Bald Eagles commonly feed below large outflows from dams and electricity generating facilities, especially in winters when other bodies of water are ice-bound. High water temperatures and oxygen depletion in shallow areas during hot periods in summer, or oxygen depletion in shallow, iced-over areas during severe winters, often lead to sporadic fish-kills and concentrated feeding opportunities for Bald Eagles. This predator/scavenger also watches traditional waterfowl concentration areas in winter where hunter-induced mortality leads to a reliable supply of waterfowl carcasses for scavenging.

Adults are more apt to capture live prey than immatures because of superior foraging ability and experience. To capture live prey, Bald Eagles soar overhead to visually locate an item, then suddenly stoop (dive) and attempt to capture the food with their talons (feet). Most prey is taken to a nearby perch for consumption, although small items may be consumed on the wing.

Some large food items such as mammal carcasses may be fed on for many days. This species can consume large amounts of food at one time (gorging); and individuals may store food in their crop and digest it over several days. Bald Eagles are also capable of fasting for many days. There are very few documented cases of hazing attacks against living livestock; and very few, if any cases where Bald Eagles have been blamed for the death of livestock.

### **Breeding Biology**

Bald Eagles usually construct a nest made of sticks in the fork of a large tree. Nests

are frequently reused year after year, with new sticks and other materials being added throughout the year, and specially during courtship and mating. Because the addition of new sticks is a part of their courtship ritual, nests can ultimately measure as much as 7 feet across by 12 feet deep, and may weigh two tons. These are among the largest nests of any bird.

Adult Bald Eagles can be seen perched near their large and conspicuous nests as early as late fall or early winter prior to the breeding season. In Iowa our national symbol may be on nests by mid to late-February. The female lays one to three white eggs. Two eggs are most common. Both adults incubate. Incubation lasts about 35 days.

Only 1 brood is raised per year. Replacement clutches are possible if eggs are destroyed during incubation. One egg is laid per day and incubation begins when the first egg is laid, thus young hatch over a period of several days. The difference in hatch date gives the first hatchling a significant advantage in competition for food. Both parents bring food to the nest and feed the young.

For several weeks prior to first flight from the nest (fledging), the nestlings flap their wings vigorously and walk to adjacent limbs to practice flight, and to develop muscle strength, flight coordination, and landing ability. Up to half of nest departures are unsuccessful; such young may remain on the ground for weeks before flying. In most cases, parents will continue to feed these young on the ground.

The young normally stay in the nest for 11 to 12 weeks, but nest departure can occur from week 8 to 14. Adults may “encourage” nest departure by flying near the nest with prey items vocalizing when young are hungry. Humans climbing to nests with eaglets more than 6 weeks old can cause premature departure.

Immediately after leaving the nest, the young are dependent on adults for all food, and often follow adults to feeding sites. The body mass of the young may peak prior to leaving the nest, and may decrease after fledging, depending on food availability. For about two months after first flight, the young remain in the adult’s territory and may return to the nest to be fed by the parents. Fledglings develop hunting/scavenging skills by trial and error rather than learning from adults. First they scavenge fish carcasses along shorelines and then by picking up floating dead fish when in flight. During this period fledglings require fish as food almost exclusively.

Immature Bald Eagles require a prolonged period of time to reach maturation. After the young go through brown and mottled plumages for three to five years they gradually attain the characteristic white head and tail of adults, and reach sexual maturity.

Juvenile Bald Eagles apparently have little or no fidelity for any one area. Dispersal movements from nest sites are largely opportunistic and may be related primarily to local food availability, and weather conditions. Patterns of movement then develop that may be repeated year after year, with the same immatures using the same areas in summer and winter, as well as for migratory stopover sites.

### **Concerns and Limiting Factors**

One of the obvious limiting factors for Bald Eagle populations, is that it takes much longer for the young of this large bird of prey to reach full physical maturity than it does the young of song birds and other types of birds found in Iowa. Therefore, human activity within 400 to 500 yards of nest sites, during courting, incubating or rearing young, is one of the most significant sources of mortality for this species. Bald Eagle nests should be avoided if at all possible, from February through July. And



then any alteration to trees and other vegetation should be minimized. Overall, persecution of eagles from hunting and trapping is thought to have steadily declined since the 1970s. Public understanding of wildlife conservation and the value of predators, including raptors, has likely led to the reduction in intentional human-caused problems. Another reason is improved law enforcement including protection under the Endangered Species Act after 1973. Fortunately, the payment of bounties (for any form of wildlife), is becoming a thing of the past. The ongoing decline in furbearer trapping that began toward the end of the 20<sup>th</sup> century has probably led to decreased eagle mortality as well, although few reliable data exist.

Egg-collecting generally stopped with passage of Bald Eagle Protection Act in 1940. But since that time eagles experienced decreased reproduction and survival from intentional and unintentional effects of a wide range of pesticides and environmental contaminants. Raptors such as Bald Eagles become secondarily poisoned through consumption of prey killed or sickened by pesticides. Misuse and overuse of biocides leads to accumulations of poisons in all forms of wildlife that exist as predators or scavengers, and for this reason man-made chemicals continue to be a concern and a potential limiting factor. Nationwide research over the past several decades indicate that DDT, closely related DDE, and dieldrin, each contributed to reproductive failures and declines in populations of Bald Eagles.

Eggshell-thinning data have shown improvement for most Bald Eagle populations since the ban on DDT and other poisons in 1972. Eliminating or greatly reducing these poisons from the environment accounted for most of the improvement in reproductive performance across the eagle's entire range. Despite this positive trend, a wide range of pesticides,

heavy metals, and other environmental contaminants continue to pose threats to the survival and reproduction of Bald Eagles, and thus man-made compounds continue to be a concern. Because new chemical formulations are introduced regularly and other environmental contaminants change in significance over time, monitoring of reproduction and survival of Bald Eagles is warranted to detect possible problems in the future.

Other concerns and potential local-level limiting factors in Iowa include lead poisoning (reported in at least 34 states) which is considered a significant source of sickness and death in Bald Eagles. Sources of lead are typically pellets and bullets in hunter-shot waterfowl, deer, and other game species. The incidence of lead poisoning in Bald Eagles did not decrease after the 1991 ban on use of lead shot for waterfowl hunting, suggesting that non-waterfowl sources of lead (e.g., lead fishing sinkers and hunting away from water), may be important. Up to 1/5 of dead Bald Eagles that have been studied die from impact injuries. As eagle habitat becomes more human-developed, the importance of this form of mortality is likely to increase. Bald Eagles are susceptible to collisions with power lines, telephone lines and other obstructions, and these may lead to injury and death from the collision or from electrocution.

Human disturbance is always a limiting factor and a concern. This is defined as any human activity that produces a change in eagle behavior, in contrast to human developments that directly alter the structure or composition of habitat. Disturbances take many forms, including mere presence of humans, human recreational activities, research activities, noise from various sources, forestry activities, farming activities, or construction activities. In general, humans on foot evoke the strongest negative reaction in eagles. In

winter, any disturbance increase energy demands and may reduce survival if feeding opportunities are limited; and during nesting and rearing of young from February to July, disturbances may lead to nest abandonment and reproductive failure.

### **Habitat Management Recommendations**

The Bald Eagle is protected under the Bald Eagle Protection Act of 1940 (now the Bald and Golden Eagle Protection Act); which prohibits taking or possessing a Bald Eagle or any parts including feathers, eggs, and nests. The dramatic Bald Eagle population recovery has been due to passage of this act and the Endangered Species Act of 1973, which has maintained endangered status for this species, and many other species that had similarly rapid population declines.

Because of significant increases in nesting pairs, increases in productivity, and expanded distribution in Iowa and 47 other contiguous states, recovery goals for the Bald Eagle have largely been met. As this text is being written a nationwide effort is underway to remove the Bald Eagle from Federal Threatened and Endangered species list.

It can only be hoped that the Endangered Species Act will be strengthened and continued into the future so that numerous other listed species with decimated populations will be able to make recoveries similar to that made by the Bald Eagle.

Management recommendations for Bald Eagles are officially outlined in regional recovery plans. Management is based primarily on protection of nest sites using buffer zones, protection of individuals via legislative measures, and monitoring of populations through counts of breeding pairs and young produced annually. Buffer zones around nest sites are comprised of 2 or 3 concentric circles of specified distance in which land uses and human activities are

restricted. The buffer-zone concept also applies to communal roost sites. We recommend consulting with staff of the Iowa Department of Natural Resources, Wildlife Diversity Program, or the U.S. Fish and Wildlife Service for current regulations.

In various areas forestry has been implicated in reduced nesting densities and reduced productivity. We recommend avoiding logging practices near nests and communal roosts.

The impacts of human development on or near shorelines and in adjacent large wooded areas are cumulative over time and therefore are ultimately detrimental. In general, any type of landscape impact should be avoided or minimized wherever possible if Bald Eagles breed, roost, or feed nearby.

Tolerance of human development varies widely and may be increasing in some parts of Iowa. If direct negative impacts by humans are reduced, Bald Eagles may be more tolerant of human development in the future, thus increasing the amount of available habitat.

In summary, a combination of management strategies is recommended in order to strengthen and sustain populations of our national bird. Reduction in shooting, trapping, and poisoning, protection of nesting habitat with buffer zones, and restoration of aquatic environments, including reduction of biocides and other environmental contaminants, are all positive contributions. Human development on the shorelines of Iowa's rivers, streams and reservoirs may ultimately limit habitat availability and hence the carrying capacity for Bald Eagles where habitat is not otherwise protected. Encroachment of development toward key areas used by Bald Eagle should therefore be prevented, or at least strongly discouraged. Future population monitoring is needed to document the extent of Bald Eagle

recovery. Additional research/monitoring is needed where contamination problems occur, and where there is a risk from unwise human development. Research is also needed to better define tolerable limits of human development that will not compromise population viability, and to identify woodland management practices that do not have a detrimental impact to Bald Eagles.