

Bald Eagle Feeding and Breeding Ecology

By Karin D. Kozie and Dr. Raymond K. Anderson

The Apostle Islands National Lakeshore, located in northern Wisconsin along the southwest shore of Lake Superior, 47° N and 90° 45' W, is comprised of 20 islands and a 10-mile section of mainland shoreline. Islands range from 3 to 10,054 acres. The farthest island is 14.4 miles from the mainland. Their unique composition and habitat support populations of many endangered flora and fauna.

Conspicuous in its absence, however, has been the bald eagle. Aerial surveys conducted by the National Audubon Society from 1960 to 1969 documented 28 historic nest sites. Because previous data are limited, it cannot be assumed that each nest represented a breeding territory, but they do suggest that bald eagles were a fairly common breeder here in the past. Unfortunately, at the time of these surveys, eagle nesting in the Lake States already had begun to decline as a result of organochlorine pesticide use.

With the ban on DDT in 1972, inland populations in Wisconsin began to recover. The islands, however, remained devoid of eagles until 1980, when a pair attempted to nest on Madeline Island, an island adjacent to, but not included in the Apostle Islands National Lakeshore. Although this attempt ended in failure, breeding pairs over the next several years began establishing territories among the other islands. All nesting attempts were unsuccessful, however, until 1983 when, for the first time in nearly 20 years, an eagle fledged from the Apostle Islands National Lakeshore.

While this event was encouraging, the cause of unsuccessful nesting remained unknown. C. Sindelar, who had been monitoring Wisconsin eagles since 1974, reported that addled eggs from the Apostle Islands National Lakeshore and Lake Superior south shore nests contained many times more organochlorine compounds, PCBs, and mercury than eggs from inland Wisconsin. As the source of contamination was unknown, this study was initiated in the summer of 1984 to identify foods and feeding areas of nesting Apostle Islands National Lakeshore eagles. Other objectives included collection of relevant life history and behavior data and identification of potential factors that may affect productivity.

Methods

Active nests were located from the air in mid-April during the annual Wisconsin Bald Eagle Breeding Survey; a second aerial survey was conducted in mid-May to determine reproductive success. Three active nests were present; two were monitored by boat and the third was observed with a high power scope from atop a lighthouse tower. The latter nest situation provided an opportunity to make intensive observations of brood rearing behavior and food habits.

Prey remains were collected from in and below each nest during banding of young and from below nest and perch trees periodically afterwards until three weeks post-fledging. Food remains at the base of nest trees accurately reflected food habits of bald eagles in Maine although fish tended to be slightly underestimated since most parts, including bones, are digested. Direct and continuous observation of nests provided additional information on food types and behavior. As feeding areas were located, gill nets

were set to collect fish samples for contaminant analysis. Disturbance factors were recorded as they were observed.

Results

A preliminary analysis of observation and food collection data indicates that more than 90 percent of Apostle Islands National Lakeshore eagle diets consist of fish. Species include the longnose and common sucker, burbot and whitefish. Birds were the next most common food item and included bluejays, flickers, herring gulls and yet to be identified ducks. Mammals comprised an extremely small portion of the diet. During nesting and early post-fledging periods, eagles fed predominantly along the shores of respective nesting islands. Numerous sightings by park employees indicate that eagles may also feed along shorelines of other islands.

Feeding areas are most likely to change in response to food availability. Eagles also are highly mobile and may have used mainland sites in early spring before we began our observations. Feeding patterns of inland eagles in Minnesota were established at dawn and late afternoon. Apostle Islands National Lakeshore eagles brought food to the nest throughout the day.

Human disturbance by park visitors appears to be minimal during the critical periods of incubation and early hatching as tourism does not begin to increase until late June. Disturbance is minimal even then, as nests are located in isolated areas that do not invite

beaching of boats. Hiking trails are either nonexistent or more than .5 miles from the nest.

As with most eagles, tolerance to disturbance varied among individuals. One nest could be observed from a boat without disturbance at a distance of only 50 yards. The other nesting pairs required observation from distances of 100 to 150 yards. This year, two young were hatched in each of the three active nests. Of these birds, four fledged and two died in one nest of unknown causes. Current nest success may be related to decreased contaminants in food sources or it may be a product of younger birds, with low contaminant levels, dispersing from inland populations. In either case, trends of reproductive success are more accurate indicators of environmental quality than productivity of individual years. It is hoped that the current trend will continue.

Future Research

A more detailed study of movements and feeding behavior within the Park by radio-telemetry is planned. We expect to mount radios on tail feathers of two adult eagles. This also will allow us to follow the birds to their wintering areas to identify and collect food items there.

Recordings of eagle vocalizations were collected to identify individual eagles. This will permit future identification of individual birds without having to capture and mark them.

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Pride and joy of Apostle Islands personnel is this baby bald eagle, bright-eyed, banded, and surveying his world from the safety of his nest.