

Survey of the range of avian families which occupy UNDERC,
including nesting activity and post-hatch care, with special
attention to *Gavia immer* and *Haliaeetus leucocephalus*

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Abstract

Although there is a high diversity of bird species living in the Wisconsin/Michigan region, no one has compiled a recent list of those species which occur within the boundaries of the UNDERC property. The purpose of this project was to begin a new species list for the property, and additionally, to observe and record nesting behavior and post-hatch care in *Gavia immer* and *Haliaeetus leucocephalus*. Seventy-four species were observed on the property between May 19 and July 20.

Gavia immer, a precocial bird, spent less time on the nest and allowed the young to be more independent. The chick left the nest and followed its parents in the water less than a day after hatching. *Haliaeetus leucocephalus*, a semi-altricial bird, continued to care for its young in the nest for several weeks after hatching. The chick did not leave the nest nor attempt to fly during this time. Both parents of each species shared incubation and parental responsibilities, including protection and feeding.

Introduction

Many of the birds that occupy northern Wisconsin and Michigan during the summer months are migratory species that are there to breed and raise their young before flying south again. Males tend to arrive earlier in the spring than females in order to establish their territories. They search for a safe area with an ample food supply nearby so that the parents do not have to leave the nest for long periods of time. However, competition for food and space is a concern. The territory must be protected from predators and rival birds.

Although the male chooses the territory, the female usually decides on a suitable nesting site. However, from this point on, most male birds take an active role in nesting and caring for the young. The parents usually make a nest of some sort to contain the eggs, whether it is simply a cleared patch on the ground or an intricate three-dimensional shelter. Often, they will conceal the nest, for protection from predators and harsh weather (Posquier, 1977). Nests are found in a number of places - on bare rocks, in the mud, and floating on the water, and may be home for a solitary pair or for a community (Skutch, 1976). Water birds like the loon and the eagle make their nests anywhere within half a mile of water (Jaques, 1960). Instead of building or repairing a nest, some birds just take over another's nest. The Bald Eagle and other raptors use the same nest year after year (Skutch, 1976).

After the eggs are laid, many species alternate incubation between the sexes. While one mate sits with the eggs, the other eats and brings back food for the one on the nest (Howard, 1964), or if both leave the nest, one may conceal the eggs by pulling loose material over them. Several times throughout the day the incubator stands up and turns the eggs with its bill to keep them heated evenly. The bill is also used to slide the eggs under the parent's incubation patch -- a bare patch of skin under its breast which heats the eggs more efficiently than feathers. At other times the parent shades the eggs from the hot sun, panting to vent excess heat (Skutch, 1976).

Water birds are generally larger than land birds. Many water birds are precocial and hatch with protective down feathers and the ability to walk, swim and feed themselves right away. This is necessary in ground and water-nesting birds because predators have easier access to them (Jaques, 1960). Precocial birds tend to have more young and lay larger eggs than altricial birds, whose chicks hatch helpless and featherless. Precocial birds have more young because they do not have to feed their independent chicks. The large precocial eggs contain more yolk, since the precocial chick develops further in the egg than an altricial chick (Skutch, 1976).

If a parent begins incubating before all eggs are laid, the first egg hatches before the others and the chicks are different

sizes. The chicks hatch together when incubation begins after the last egg is laid (Skutch, 1976). Predatory birds such as eagles and herons commonly exhibit asynchronous hatching, and the smaller young die when food is scarce because they cannot compete with siblings. Precocial birds are generally synchronous hatchers (Perrins and Birkhead, 1983).

After the eggs hatch, brooding is necessary to dry the chicks' feathers and keep them warm, or to shade them from the sun. Most young birds eat the same food their parents eat, but in smaller pieces. Others must be fed partially digested food (Skutch, 1976).

Nest cleaning is another component of post-hatch behavior. Since altricial birds must use the nest for a longer period while the chicks mature, they are more likely to keep the nest tidy by clearing away the egg shells. The parents must also clear the nest of droppings, which they often eat (Skutch, 1976).

In response to danger the parents will attack the intruder or distract it in order to defend the nest. If the parent on the nest is alarmed, it either attempts to leave the nest unobserved and hide or it waits and then suddenly leaves in a commotion, trying to draw attention away from the nest. When young chicks are threatened they crouch low in the nest as if trying to hide (Skutch, 1976).

One of the water birds which spends its summers in northern Wisconsin and Michigan is the Common Loon (*Gavia immer*). Loons migrate in pairs with their life-long mates (Bent, 1963a). They arrive around the first of April to claim their territory, which is rather large and expands as the young grow (McIntyre, 1988).

Loons nest in the same area each year, usually on a mound in the water (Harrison, 1978). Islands are ideal nesting sites (McIntyre, 1988). Because loons have trouble walking on land, they build their nests in or very near the water. As indeterminate layers, loon families raise one brood each season, but if the young are killed the parents rebuild the nest elsewhere and lay more eggs (Bent, 1963a). If the lake floods, they build up the nest with vegetation to accommodate high water levels (McIntyre, 1988).

Normal clutch size is 2 eggs (Harrison, 1978), but frequently one is infertile (Bent, 1963a). Incubation by both parents lasts about a month (Harrison, 1978), and then one egg hatches before the other (McIntyre, 1988). The precocial young move over the ground more easily than adults (Bent, 1963a), but they like to ride on their parents' backs for the first 2-3 weeks. Soon the parents lead the chicks from the nest to a nearby "nursery" in a sheltered bay, which is shallow and full of small fish. Here the young develop their diving and fishing skills. Adult loons must defend their young against

predators both above and below the surface (McIntyre, 1988). After 6 weeks the young can feed themselves completely, and they learn to fly at 12 weeks (Harrison, 1978). While the responsibilities are shared between the adults, one is usually more involved in the parental care, and sometimes the other leaves the family before the young are fully independent (Baicich and Harrison, 1997).

The Bald Eagle (*Haliaeetus leucocephalus*), a diurnal raptor, also spends its summer in the area, arriving in February or March. Using the same nest year after year, the female lays two to three eggs, and both parents take part in incubation and care of the young (Skutch, 1976). After 35 days the eggs hatch, but asynchronously (Bent, 1937). The chicks are semi-altricial, and remain in the nest until they are nearly as large as their parents, who return to the nest often. The young sometimes practice fratricide (common in raptors) and the smaller chick often does not survive. After a month the young begin to preen and jump in the nest. They practice "flight exercises" by spreading and flapping their wings (Bent, 1937). It is 73 days before the chick leaves the nest (Skutch, 1976), and then the parent may lure the eaglet away with fish. Later the young birds themselves learn to capture and eat fish.

The birds of Michigan and Wisconsin exhibit diverse behaviors during nesting and post-hatch care. They exist in a wide variety of sizes and colors, and methods of survival differ

greatly between species. The objective of this study is to determine the abundance and diversity of species that occupy the Land O' Lakes area between the months of May and July, and to document the detailed behaviors of two species as they nest and raise their young. The first working hypothesis is that the species observed during the study will correspond to previously sighted species in the area. The second working hypothesis is that the semi-altricial Bald Eagle young will receive different parental care than the precocial loon chicks because the Bald Eagle requires longer, more intensive care.

Methods

I spent ten weeks in the Land O' Lakes area, between May 18 and July 22. During this time I identified numerous bird species observed on the UNDERC property, and kept a daily log of the behaviors of each species. I noted the habitat which each species occupied, and where they nested. In order to cover the wide range of species in the area, I looked for them at various times throughout the day, and at different sites. For species identification, I used Petersen's Guide and the National Audubon Society CD. Characters such as color, size, shape, call, habitat, and behavior allowed me to identify each species.

Meanwhile, I observed as closely as possible the specific nesting and post-hatch behaviors of *Gavia immer* and *Haliaeetus leucocephalus*, including feeding frequencies, brooding periods, and behavioral training through social interactions. I began the summer observing the Common Loon and the Great Blue Heron, but switched from the heron to the Bald Eagle in June. For this reason I have more complete information on the loon than on the eagle.

My results come mainly from one family of each species, to which I returned for each observational period. I watched each species at several different times of day to establish whether there were daily behavioral patterns of feeding or caring for the young. The loons I watched from a row boat on Crampton Lake, while I observed the eagles from the edge of the bay or from a canoe in the bay on Tenderfoot Lake.

Results

Species observed

I documented 74 bird species on the property – all occurring on the list of expected species in the area. The common and scientific names are given in Table 1. Table 2 indicates the habitats in which selected species were seen most frequently, as well as their prominent behaviors. Most of the data were collected in early morning, from 4:00 A.M. to 10:00 A.M., and in the evening between 4:00 and 8:00 P.M., because the birds were most active at these times.

Loons

The loon family I observed nested on an island on Crampton Lake, but other couples were seen on Tenderfoot, Kickapoo, Brown, Roach and Bay lakes. I observed young on Tenderfoot and Crampton – two chicks on each lake. The nest on Crampton was a clear, flat spot hidden by reeds on the east edge of the island.

Before the eggs hatched the loons spent early morning hours (5:00 – 7:00 A.M.) diving for fish. One adult brooded the two eggs for most of the day, while the other swam near the island, diving for fish and occasionally swam around the lake. Once the loon which was not brooding flew around the perimeter of the lake before returning to dive near the nest. I

Table 1

FIELD LIST OF BIRDS OCCURRING ON THE UNDERC PROPERTY

<u>Latin Name</u>	<u>Common Name</u>	<u>Frequency of Observation</u>
Anseriformes		
<i>Aix sponsa</i>	Wood Duck	Twice
<i>Anas discors</i>	Blue-winged Teal	Once
<i>Anas platyrhynchos</i>	Mallard	Weekly
<i>Anas strepera</i>	Gadwall	Once
<i>Aythya collaris</i>	Ring-necked Duck	Once
<i>Mergus cucullatus</i>	Hooded Merganser	Once
<i>Mergus merganser</i>	Common Merganser	Once
Apodiformes		
<i>Archilochus colubris</i>	Ruby-throated Hummingbird	Twice
Caprimulgiformes		
<i>Caprimulgus vociferus</i>	Whip-poor-will	Once
Charadriiformes		
<i>Charadrius vociferus</i>	Killdeer	Once
<i>Scolopax minor</i>	American Woodcock	Once
Ciconiiformes		
<i>Ardea herodias</i>	Great Blue Heron	Weekly
<i>Botaurus lentiginosus</i>	American Bittern	Twice
Columbiformes		
<i>Zenaida macroura</i>	Mourning Dove	Twice
Coraciiformes		
<i>Megaceryle alcyon</i>	Belted Kingfisher	Weekly
Cuculiformes		
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	Once
Falconiformes		

<i>Buteo jamaicensis</i>	Red-tailed Hawk	Once
<i>Buteo lineatus</i>	Red-shouldered Hawk	Once
<i>Buteo platypterus</i>	Broad-winged Hawk	Twice
<i>Circus cyaneus</i>	Northern Harrier	Once
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Daily
<i>Pandion haliaetus</i>	Osprey	Weekly

Galliformes

<i>Bonasa umbellus</i>	Ruffed Grouse	Weekly
<i>Tympanuchus phasianellus</i>	Sharp-tailed Grouse	Once

Gaviformes

<i>Gavia immer</i>	Common Loon	Daily
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Passeriformes

<i>Bombycilla cedrorum</i>	Cedar Waxwing	Daily
<i>Corvus brachyrhynchos</i>	American Crow	Daily
<i>Corvus corax</i>	Common Raven	Twice
<i>Cyanocitta cristata</i>	Blue Jay	Daily
<i>Ammodramus savannarum</i>	Grasshopper Sparrow	Once
<i>Cardinalis cardinalis</i>	Northern Cardinal	Once
<i>Melospiza georgiana</i>	Swamp Sparrow	Once
<i>Melospiza melodia</i>	Song Sparrow	Weekly
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	Weekly
<i>Piranga olivacea</i>	Scarlet Tanager	Once
<i>Spizella passerina</i>	Chipping Sparrow	Daily
<i>Zonotrichia albicollis</i>	White-throated Sparrow	Daily
<i>Carduelis tristis</i>	American Goldfinch	Weekly
<i>Carpodacus purpureus</i>	Purple Finch	Once
<i>Loxia leucoptera</i>	White-winged Crossbill	Once
<i>Hirundo rustica</i>	Barn Swallow	Once
<i>Progne subis</i>	Purple Martin	Once
<i>Riparia riparia</i>	Bank Swallow	Once
<i>Tachycineta bicolor</i>	Tree Swallow	Once
<i>Agelaius phoeniceus</i>	Red-winged Blackbird	Daily
<i>Icterus galbula</i>	Northern Oriole	Once
<i>Molothrus ater</i>	Brown-headed Cowbird	Once
<i>Quiscalus quiscula</i>	Common Grackle	Weekly
<i>Parus atricapillus</i>	Black-capped Chickadee	Weekly
<i>Dendroica pensylvanica</i>	Chestnut-sided Warbler	Twice
<i>Geothlypis trichas</i>	Common Yellowthroat	Once
<i>Parula americana</i>	Northern Parula	Twice
<i>Seiurus noveboracensis</i>	Northern Waterthrush	Once
<i>Setophaga ruticilla</i>	American Redstart	Twice
<i>Vermivora chrysotera</i>	Gold-winged Warbler	Once
<i>Vermivora peregrina</i>	Tennessee Warbler	Once

<i>Sitta canadensis</i>	Red-breasted Nuthatch	Once
<i>Sitta carolinensis</i>	White-breasted Nuthatch	Twice
<i>Troglodytes troglodytes</i>	Winter Wren	Once
<i>Catharus guttatus</i>	Hermit Thrush	Once
<i>Sialia sialis</i>	Eastern Bluebird	Twice
<i>Turdus migratorius</i>	American Robin	Daily
<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher	Once
<i>Myiarchus crinitus</i>	Great Crested Flycatcher	Once
<i>Sayornis phoebe</i>	Eastern Phoebe	Once
<i>Tyrannus tyrannus</i>	Eastern Kingbird	Once
<i>Vireo gilvus</i>	Warbling Vireo	Once

Piciformes

<i>Colaptes auratus</i>	Northern Flicker	Daily
<i>Dryocopus pileatus</i>	Pileated Woodpecker	Once
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	Once
<i>Picoides pubescens</i>	Downy Woodpecker	Once
<i>Picoides villosus</i>	Hairy Woodpecker	Twice
<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker	Twice

Strigiformes

<i>Strix varia</i>	Barred Owl	Once
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Table 2

OBSERVATIONS OF SOME COMMON BIRDS AT UNDERC

Species	Habitat	Prominent Behavior
American Crow	woods	flying, calling
Bald Eagle	around lake	soaring, perching
Belted Kingfisher	lake, stream	fishing
Black-capped Chickadee	woods, shrub	singing
Blue Jay	grassland, open shrub	flying, calling
Cedar Waxwing	grassland, open shrub	perching, singing
Chipping Sparrow	grassland, open shrub	singing
Common Grackle	woods around lake	hopping near lake edge
Common Loon	on lake	swimming, diving
Great Blue Heron	stream	standing
Mallard	lake, stream	swimming, walking
Northern Flicker	woods	singing, pecking
Osprey	lake, stream	flying over lake
Redwing Blackbird	grassland, open shrub	perching, singing
Rose-breasted Grosbeak	stream, open shrub	perching, singing
Ruby-throated Hummingbird	open shrub	perching, flying
Ruffed Grouse	woods	walking, drumming
White-throated Sparrow	grassland, open shrub	singing

could not distinguish between the male and female. I never saw either adult feed the other; the brooding adult left the nest to dive for food. They usually dove together, disappearing under and then resurfacing within 2 meters of each other. The average dive lasted 20-60 seconds. They traveled far laterally underwater, sometimes reappearing 50 meters from where they dove. During the brooding period both loons stayed within 70 meters of the island.

Around 7:00 A.M. the adult who did most of the brooding approached the nest slowly, looking around before it rearranged the eggs with its beak, turned around to face the water, and sat down. When predators (eagles or osprey) flew over the lake the loon on the nest entered the water and joined its mate as both called loudly. Sometimes loons from nearby lakes also joined in calling.

Between June 18 and June 22 both eggs hatched. The loons never occupied the nest again. On June 22 I observed the down-covered chicks riding on their parents' backs. After this I usually saw the family swimming together around the lake. After June 29 I only saw one chick on the lake. This chick always stayed within 50 meters of the parents. The baby often rode on one parent's back while the other adult dove nearby. Sometimes both parents dove near the baby, always keeping within 3 meters. Both parents fed the chick small fish. On June 30 I saw the chick poke its head underwater and then it made

a few shallow dives (up to 20 seconds). After this I often watched the chick make short dives with its parents.

I first observed the family fishing in a small bay on the lake on July 1. Both adults dove and fed the chick, which waited near them. Then the adults poked their heads underwater while the chick dove. By this time the adults had extended their dives to 60 seconds or more, and the chick made more frequent dives.

On July 13 at 7:00 A.M. I observed only one adult on the lake with the chick. The parent dove and returned to the chick after each dive, sometimes with fish. Later the other adult flew in and landed in the water, where the first adult and baby joined it. At 8:30 A.M. three foreign adult loons circled overhead and landed in the water. The baby disappeared; I later saw it floating very close to the west shore, where it was camouflaged. The parents approached the newcomers and the group flocked together, diving and swimming in circles. They all began swimming toward the east shore. At this point there was some aggression and chasing between the new loons and the parents, but this was momentary, and the group moved on without further conflict. At 9:00 A.M. the foreign loons flew away and the parents returned to the baby on the east shore.

Bald Eagles

Bald Eagles were active on Brown, Tenderfoot and Plum lakes. I observed the family on Tenderfoot, whose nest was in a treetop on the edge of a bay on the east shore. I watched both adults care for the chick, but again could not determine the sexes. At least three to five times a day one adult returned to the nest, usually to give a fish to the baby. The rest of the time they either soared over the lake, where other adults and juveniles sometimes joined them, or perched. Both parents spent hours at a time perched in a treetop near the nest, occasionally calling. Before 6:30 A.M. one adult sat above the nest, on a branch, but by 7:00 it moved to another perch close to the nest. By July 3 the eagle chick was moving around in the nest and sitting on the edge. The chick made vocal noises by July 6, and on July 13 I saw it stretch its wings, flap them, and crawl onto the branch above the nest. On July 15 I noted the chick and one adult calling back and forth to each other.

The adults rarely spent time with each other; I only saw them together when they soared over the lake. One might sit in a tree while the other was off hunting or fishing. Usually one stayed near the nest, or in the lake.

Discussion

The list of birds at UNDERC now has 74 species, which correspond to the species found in the surrounding area. This number includes only those species observed from May to July of 1998, so only summer species, permanent species, and some migrant species were seen. The list should grow as winter species and fall migrants are added in the future.

The precocial loon chicks, as expected, began swimming and following their parents around immediately after hatching. The nest, which was not very protective, was abandoned, and the parents took the surviving chick to the shallow bay to teach it to fish. The chick made some dives itself, and learned to fend for itself as the parents dove for food. As time passed, the adults spent more time on their dives, and they allowed the chick to wander farther from them on the water. However, they continued to feed the baby, and I never saw the chick with food it had caught itself. It is possible that the chick ate some small fish on its short dives. The parents also remained quite protective of the chick; each time an eagle passed over, they placed the chick between them for safety. This never changed over the summer.

The semi-altricial eagle chick never fully left the nest (which was more developed and therefore more protective), so it could not follow its parents or learn to hunt and fish. The adults returned to the nest to feed the chick, which was

completely dependent on them for food. This chick also remained protected by its parents, as they perched within watching-distance of the nest.

The eagle chick was less independent, because it had not yet left the nest, and so it could not feed itself or learn to hunt. Neither chick could fly, although the eagle chick was probably closer to flying as a result of its flight exercises. Both chicks were still dependent on their parents for food. There were differences in the parental behavior of each species, but the loon chick was not much further than the eagle chick in development of skills by the middle of July.

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