

**Gavia immer: Forming a Family**

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## ABSTRACT

This study uses observation to learn more about *gavia immer*, the common loon. By observing two families in detail, along with several other waterfowl in the area, the loons behaviors and needs can be compared. Many similarities exist between the two families and the expected loon behavior. With continued studies and careful observations, perhaps using safer methods from a distance, even more information will be found about the life of the common loon and the families they form.

## INTRODUCTION

*Gavia immer*, the common loon, is a very prevalent bird species in the northern areas of North America. The loons have been very active on the UNDERC property of Wisconsin and Michigan for many years and therefore provide a relevant topic of study. It is believed that most loon pairs join year after year, needing only a recognition ceremony once they return to their nesting areas. They return to these territorial breeding areas once the water is open enough from the ice. Prime areas for loons are approximately 100 acres of clear water, varied depths and bottom types, and a good fish supply. The pair spends time fishing, preening, swimming, and resting together until they are ready to nest. Loons nest in areas with a good view of their territory and where the drop-off is steep for quick and secretive approaches and getaways, since they are not good walkers on land. Islands have the additional advantage of protection from predators such as main land mammals and human disturbances (McIntyre, 1988).

This project studies these behaviors and progression around nesting times of two specific loon families on the UNDERC property. One family at Crampton Lake and one family at Bergner Lake were observed and photographed to

identify as many of these behaviors as possible. Other loons were also be watched to see the familiar actions of several different animals.

## **MATERIALS AND METHODS**

Two common loon families on the UNDERC property were observed in detail from June 3 to July 12 of 1999. One family nested on the southern side of the island of Crampton Lake and the other on the western shore of Bergner Lake. Other common loons were observed on the property for basic behaviors from the end of May to mid July. Binoculars were used to watch from a distance and from the docks. Other times, a boat was used to approach more closely and photograph. Preening, feeding, nesting, defending, resting, and rearing behaviors were studied closely, comparing the two families' actions in relation to time of hatching. A detailed account of the loons' behavior was recorded every minute there was a change. Each session was at least one hour to allow for ample observations. The Crampton loons were observed approximately twelve different days and the Bergner loons for twenty days due to weather and schedule restraints. Approximately fifteen days were spent observing other loons and different bird species.

## **RESULTS**

Throughout the nine weeks spent on the UNDERC property many typical loon behaviors were observed and repeated allowing for closer study. At first actions were merely recorded in as much detail as possible. Later, the observations were analyzed and compared with other research to find

similarities. A chart of the main actions observed each day compares the two loon families' behaviors around times of hatching (Table 1). Similarities such as when the chicks were left alone or when both adults were present can be seen by the underlined segments. Each family was observed as much as possible, weather and schedule permitting. A list of the bird species observed throughout this period was also compiled (Table 2).

The resonating calls of the loons were constantly heard all over the property, each having their own meaning and identity. The loon song is the familiar yodel, given only by the male as a territorial call. Yodels are used most during nesting. Wails are used to reduce the distance between loons. Tremelos, many times used by the pair in defense of their territory, indicate conflict. Loons utilize a shorter call, the hoot, to contact one another. The chicks are also capable of calling to beg or merely keep in touch with their parents. Peeping begins within the eggs right before hatching. Yelping, another form of begging starts right after hatching. After about one week, the chicks begin to wail signifying distress or more intense begging. It is not until three or four months after hatching that the wails and tremelos begin to sound like the adults (McIntyre, 1988). All of these calls were used by the loons and noted, later being analyzed (Table 1). The calls were then useful to explain what was happening between the loons.

Both members of the pair usually help build the nest out of vegetation from around the lake and the lake bottom. The nests are large enough for the adult loon, measuring 0.2 meters from belly to back on average, to sit on for

approximately four weeks (McIntyre, 1988). Although the time of building the nests was not observed, pictures of the empty nests were taken and show this vegetative composition (Figure 1). Loons usually lay two deep olive colored eggs weighing approximately 140-160 grams and having a length around 90mm and width of 55mm. One and three-egg clutches also occur, but are less common. Sometimes the one-egg clutches result from a larger clutch in which all of the chicks do not hatch or survive due to predation, natural causes, or extreme weather, such as flooding (McIntyre, 1988). Both of the pairs had a clutch of two eggs (Figure 2). However, even though it is rare, only one egg hatched on Bergner Lake, leaving the other unattended two days after the first hatch (Figure 3).

Studies have shown that incubation lasts for about 26-31 days (McIntyre, 1988). In this case fourteen days prior to hatching was the longest observation of incubation due to time on the property. Since the adult loons are not sexually dimorphic, a difference in which parent was incubating was not feasibly recorded. However, on June 18 a switch between parents was observed. The parent that was on the nest then went diving away and the one that was previously diving took its turn rotating and incubating the eggs. The adults rarely left the nest, only when changing shifts, quickly bathing, or avoiding intruders. Several typical positions were used on the nest, most often being the "normal" position (Figure 4). When disturbed the loon stretched its neck and looked around the territory. The loon also flattened out and hung its head low over the edge of the nest if the disturbance continued so that it could easily enter the water (Figures 5&6). The

adult loon can also cool itself on the nest by spreading its wings and panting. Often in the heat of the day, the incubating parent could be seen with its mouth open, panting (Figure 7). These patterns continue for approximately one month until the chicks hatch (McIntyre, 1988). While one parent was incubating on the nest, the other mate was often seen diving in a nearby cove occasionally approaching the nest. This adult spent time fishing and preening itself, stretching and flapping its wings at the end (Figures 8,9,&10).

After hatching, the chicks on Crampton Lake were observed for several hours one afternoon. They were fluffy and black and approximately four inches long. The chicks swam along side of the adults and also rood on the backs of the adults (Figures 11&12). It became obvious that one chick was a little more aggressive and outgoing. It swam in the water more than it rood on the parent's back and also seemed to be fed more often. However, on Bergner Lake these differences were not able to be compared because only one chick hatched.

Separate nursery areas, away from the nest, were observed on both lakes. On Crampton Lake the family spent the first few days in the northeast corner of the lake. They later expanded into the entire lake most likely because they were the only loon family living there. On Bergner Lake the loons stayed slightly north of the nest immediately after hatching. Within several days they moved to the southern end of the Lake and remained there, fishing and rearing the chicks.

Most of the time during the first week at least one adult was always at the surface with the chicks. Later both adults dove and left the chicks temporarily

alone. The adults surfaced with a small fish horizontally placed in their mouth and swam to the chick. Sometimes the chick took the food directly from the parent's mouth. Other times the adult dropped the food and retrieved it several times trying to teach the chick to catch the food. As time went by the adults went farther away for longer amounts of time, but they still came rushing back if the chicks begged or seemed to be in danger. Fourteen days after hatching the first chick was observed diving, progressing in its ability to feed itself.

One of the last observations at Crampton Lake was approximately one month after hatching. At this time the chicks had grown significantly and were almost one half the size of the adults and a lighter brown color (Figures 13&14). Even though the chicks were probably capable of taking care of themselves, they were still swimming and diving with their parents. At one point another loon flew overhead and all four loons submerged together. The chicks surfaced near the shore for safety and the adults surfaced away from them aggressively calling and defending their territory. Later, all four swam back together. Overall the family seemed much less threatened by the boat this time and continued to swim around while being observed, progressing towards the chicks' lives as adult loons.

## **DISCUSSION**

The information gathered on the UNDERC property was particularly interesting because the two families showed similarities which coincided with expected behaviors in current research. Photographs were taken, capturing

some of these typical behaviors. Also, possible reasons for the actions of the loons could be seen to back up the current literature on loon behavior.

For example, the location of nests, incubation, diving, feeding, and protection behaviors observed closely resembled those to be expected. Also several unique actions, such as the favoring of one chick or the hatching of only one egg provided a close look at situations that do not occur as often.

According to Yonge, chicks that hatch within 18 to 24 hours of each other have the best chance of surviving (McIntyre, 1988). Once a chick starts to poke through the shell, it will completely hatch within 24 hours. When chicks within one brood hatch too far apart, the first chick is favored and becomes larger and stronger than the second one. This could have been part of the case on Crampton Lake where the one chick seemed more active at first. However, sometimes when both hatch simultaneously, they may not both survive due to a lack of food (McIntyre, 1988). Another family was observed a few times on Tenderfoot Lake. This family was particularly interesting because there were originally two chicks, but after a few weeks, only one chick was with the parents. Perhaps that chick died from lack of food or attention. However, the strong presence of two Bald Eagle families also suggests that this may have been an instance of predation, a recorded happening in similar situations (Paruk *et al.* 1999).

Since the one egg did not hatch on Bergner Lake, there could be reason to believe that this was caused by disturbances during the incubation time. Perhaps the repeated vacancies of the nest, caused by fishermen or this study,



resulted in insufficient incubation of both eggs. Also, during large storms or colder times of the day and night the eggs could have been exposed to unfavorable conditions. Most of the days when incubating was observed the temperature was around 60 or 70 degrees. However, the temperatures were significantly lower during the unwatched periods of the night. On the other hand, there could have also been a physiological problem within the egg having nothing to do with the surroundings. This prediction is probably most likely because of the success of the one egg hatching. It would seem that if both eggs were exposed to poor conditions, both eggs would have the same fate. Predation is probably not likely in this case since the egg remained on the nest unwatched and seemingly unharmed for weeks after the first hatching. However, the parents did continue to incubate the one egg for two days after the first hatch allowing even longer time than the normal span between siblings. Usually, either both eggs or neither hatch. In this case the pair continued to care for the first chick, disregarding the lost egg. If the first clutch is lost, the pair will usually renest in a nearby location. The following year the pair is more likely to renest at the successful sight (McIntyre, 1988). It would be interesting to see if this family nests again in this location even though it was only partly successful.

Other actions such as moving to a nursery area and the immediate behaviors of the chicks agreed with current literature on loons. Nurseries are often in back bays or shallow water with vegetation and many small fish. For the first few days one adult stays on the surface with the chicks while the other dives for food consisting of aquatic insects, small fish, and crayfish (McIntyre, 1988).

Also, 50 to 65% of the first two weeks are spent riding on the backs of the adults (Crowley and Link, 1987). According to Christoff, young chicks are often with just one adult, usually the female. After approximately eight weeks the young are left alone periodically to care for themselves and catch about one half of their food (McIntyre 1988). However, the chicks will continue to beg for food even up to eleven weeks when they already acquire most of their own food (Crowley and Link, 1987).

Adult loons defend the chicks from large turtles, fish, and humans by carrying them on their back and using calls and defensive positions to intimidate predators. The adults also protect the chicks under their wing while swimming (McIntyre, 1988). When the loons sense danger they will perform the "penguin dance", rising up on legs and flapping wings signifying great anxiety (Crowley and Link, 1987). Although it was difficult to know exactly what the adults were worried about, it was possible to note times of distress by recognizing these calls and actions.

In the late 1980's studies were being done on the loon's call using sonograms and comparing the calls of one area from year to year. Since they can be studied from a distance, this procedure causes less stress on the loons than capture and release (Crowley and Link, 1987). Studies such as these will help to further analyze and appreciate the beauty of the loons without disturbing them. Some of the behaviors seen throughout the summer were signs of distress. Hopefully in the future more people will be aware of these signals and give the animals the space they need.

Although many dates and times were recorded for behaviors and the progression of the chicks it is obvious that not all actions occurred for the first time when they were observed for the first time. Therefore, there is a flexible time span for the occurrence of the observed behaviors. However, the observations are still valuable for comparing similarities between the two families and general loon behaviors. Hopefully these kinds of studies will continue on the UNDERC property and people will continue to learn more about these particular families and others in the area. By using new methods and possibly recording calls more studies could determine if the same families are returning to the area. From these studies we might be able to better understand the loons and help to maintain safe and productive environments for them.

**Table 1: Loon Family Behaviors**

This table shows the behaviors of the two loon families relative to their hatching dates. Several similarities or significant behaviors are shown by the underlined segments. The time of day listed is the starting time of observation, continuing for at least one hour. The loons were not watched on days that are blank. The question marks after some of the calls are due to an untrained ear, therefore, the probable calls are noted. Other times the behaviors or calls were significantly identified.

LAKE	CRAMPTON	BERGNER
DAY		
-14		6/10 1pm-one adult on nest, mate flies in to South cove
-13		6/11 1pm-one adult on nest
-12		6/12 8am-one adult leaves nest as I approach, guarding, splashing, mate approaches and taps water communicating, 3 calls-wails?, 2 adults now stay close, preening approaching nest, dipping heads, diving, one gets on nest
-11		6/13 6pm-one adult on nest, no mate present
-10		6/14 3pm-one adult on nest, mate preening and guarding, some calls
-9		
-8		
-7		6/17 10am-one adult on nest, head low and upright, panting
-6		6/18 12pm-one adult on nest, 4pm-one adult on nest, mate to left diving and guarding nest, switch positions, rotate eggs, one adult flies away
-5		6/19 3pm-one adult on nest, no mate present
-4		6/20 9am-one adult on nest 6pm-one adult on nest panting no mate present
-3	6/3 4pm-one adult diving, one guarding nest, alarm calls-tremolo, flat over nest	6/21 5pm-one adult on nest, no mate present
-2	6/4 12pm-one adult on nest, one fishing & staying <u>low on water</u> , preening, head tucked in wing, wing stretch	6/22 9am-one adult on nest, mate <u>low in water</u> , diving
-1	6/5 6am-one adult on nest	6/23 5pm-one adult on nest
HATCH	2 chicks 6/5-7/99	1 chick 6/24-25/99
1	6/7 7pm-chicks <u>on&amp;off back</u> , adults dive, Calling when I'm too close, preening, Hurrying back to chicks, <u>light calls to Each other</u> , feeding, territorial call as Another loon flew overhead-yodel	6/25 12pm-both adults <u>calling-tremelos</u> , chick under wing, NW cove, one adult diving&feeding chick, wing stretch, dipping head, <u>hoots back and forth</u> , one adult gets on nest (other egg) 3pm-one adult on nest panting, one with <u>chick on back</u> 9pm-one adult on nest, no mate

15-Jun  
16-Jun

2		8-Jun	present 6/26 1pm-one chick with two adults, one egg on nest alone, loons calling while bald eagle flies around-tremelos, chick swimming&on back, one adult diving&feeding 8pm-both adults diving&feeding chick in E cove	
3	6/9 2pm-chicks swimming&on back, calls And other adult appears-wails, hoots, Chicks soft calls, <u>begging-yelping</u> Chick wing stretch, adults dive&preen Adults call&come closer-wail, dip heads At each other when approaching, <u>Chicks peeping</u>		6/27 4pm-W cove one adult preening mate with chick near shore, resting, adults feed chick <u>begging-peeps</u>	
4	6/10 5pm-chicks swimming, one adult Resting, one adult <u>diving&amp;feeding</u> chicks, Drop and retrieve to chicks, soft calls as Approaching chicks- <u>hoot</u>			28-Jun
5		11-Jun	6/29 4pm-one adult by dock with chick, mate SE cove, call to each other- <u>hoots&amp;wails</u> , all 3 swim together, adults <u>diving&amp;feeding</u> chick, dipping heads, chick on back	
6		12-Jun		30-Jun
7		13-Jun		Jun-31
8	6/14 2pm- <u>adults diving</u>		7/1 5pm-adult with chick on back SE cove, resting, chick wing stretch, chick swimming&dipping head, <u>adult diving</u> , wing stretch, feeding, other loon flies in, calling to each other-wails, hoots, yodels?	
9	6/15 1pm- <u>adults diving</u>			2-Jul
10		16-Jun		3-Jul
11		17-Jun		4-Jul
12		18-Jun		5-Jul
13		19-Jun	7/6 1pm-one adult with chick SE cove	
14	6/20 5pm-adults diving, chicks call-yelp Or wails, adults hoot back, feeding, Drop and retrieve to chicks, <u>chicks DIVE</u> , And <u>wing stretch</u> , some splashing while Trying to dive, adult preening		7/7 10am-all 3 in S cove, adults diving&feeding, one egg still alone on nest, <u>chick and adult wing flap</u>	
15		21-Jun		
16		22-Jun		
17		23-Jun		
18	6/24 8am-chicks frequently dipping heads, About 1/2 size of parents, chicks dive About 20 seconds long, chick wing Stretch, adult call and all surface-wail, Chicks preening, adults continue dive& Feed, chicks light calls-yelping, adults Preen 7/7 7pm-all 4 in cove to right of dock, adults Still diving and feeding the chicks, when Another loon flew over <u>all 4 immediately</u> <u>Submerged and chicks went to shore.</u>			

Wails & hoots brought them back together,  
 Later one adult flew off-yodeling

**Table 2: Species Identified on UNDERC Property**

Common Name	Scientific Name	Date	Location
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	5/22/99	Tenderfoot Lake
Bald Eagle	<i>Haliaetus leucocephalus</i>	5/22/99	Tenderfoot Lake
Common Loon	<i>Gavia immer</i>	5/22/99	Tenderfoot Lake
Common Merganser	<i>Mergus merganser</i>	5/22/99	Tenderfoot Creek
Mallard	<i>Anas platyrhynchos</i>	5/22/99	Tenderfoot Lake
Caspian Tern	<i>Hydroprogne caspia</i>	5/22/99	Tenderfoot Lake
Common Raven	<i>Corvus corax</i>	5/22/99	Tenderfoot Lake
American Crow	<i>Corvus brachyrhynchos</i>	5/22/99	Tenderfoot Lake
Belted Kingfisher	<i>Megaceryle alcyon</i>	5/22/99	Gravel Pit
Hairy Woodpecker	<i>Picoides villosus</i>	5/31/99	Gravel Pit
Eastern Kingbird	<i>Tyrannus tyrannus</i>	5/31/99	Gravel Pit
Song Sparrow	<i>Melospiza melodia</i>	6/13/99	Plum Lake
Yellow-Bellied Sapsucker	<i>Sphyrapicus varius</i>	6/13/99	Plum Lake
Swainson's Thrush	<i>Catharus ustulatus</i>	6/13/99	Plum Lake
White-Throated Sparrow	<i>Zonotrichia albicollis</i>	6/13/99	Plum Lake
Ruffed Grouse	<i>Bonasa umbellus</i>	6/13/99	Plum Lake
American Goldfinch	<i>Carduelis tristis</i>	6/13/99	Plum Lake
Hooded Merganser	<i>Mergus cucullatus</i>	6/1/99	Bog Pot
Evening Grosbeak	<i>Coccothaustes vespertinus</i>	6/1/99	Peter/Paul Lakes
Common Grackle	<i>Quiscalus quiscula</i>	6/1/99	Peter/Paul Lakes
Northern Waterthrush	<i>Serurus noveboracensis</i>	6/1/99	Riffle
Black-and-White Warbler	<i>Mniotilta varia</i>	6/15/99	Hummingbird Lake
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	6/15/99	Plum Loop
Bank Swallow	<i>Riparia riparia</i>	6/15/99	Plum Loop
Downy Woodpecker	<i>Picoides pubescens</i>	6/15/99	Crampton
Black-Throated Green Warbler	<i>Dendroica virens</i>	6/15/99	Crampton
Northern Flicker	<i>Colaptes auratus</i>	6/15/99	Plum Loop
Ruby-Throated Hummingbird	<i>Archilochus colubris</i>	6/16/99	Riffle
Ruff Winged Swallow	<i>Stelgidopteryx serripennis</i>	6/16/99	Riffle
Myrtle Warbler (Yellow-Rumped)	<i>Dendroica coronata</i>	6/16/99	Riffle
Blue Jay	<i>Cyanocitta cristata</i>	6/16/99	Riffle
American Redstart	<i>Setophaga ruticilla</i>	6/16/99	Riffle
Blackburnian Warbler	<i>Dendroica fusca</i>	6/16/99	Riffle
Ovenbird	<i>Seiurus aurocapillus</i>	6/17/99	Lab
Chipping Sparrow	<i>Spizella passerina</i>	6/17/99	Bergner
Great Blue Heron	<i>Ardea herodias</i>	6/17/99	Crampton
Cedar Waxwing	<i>Bombycilla cedrorum</i>	6/17/99	Tenderfoot Creek
Veery	<i>Catharus fuscescens</i>	6/18/99	Grassy Knoll
American Tree Sparrow	<i>Spizella aborea</i>	6/18/99	Grassy Knoll
Black Capped Chickadee	<i>Parus atricapillus</i>	6/18/99	Grassy Knoll
Black Phoebe	<i>Sayornis phoebe</i>	6/18/99	Lab
Brown-Headed Cowbird	<i>Molothrus ater</i>	6/18/99	Lab

## REFERENCES CITED

- Crowley, Kate and Mike Link. 1987. Love of Loons. Voyageur Press, Minnesota.
- McIntyre, Judith W. 1988. The Common Loon: Spirit of Northern Lakes. University of Minnesota Press, Minneapolis.
- Paruk, James D., Seanfield, Dean, and Mack, Tara. 1999. Bald Eagle Predation on Common Loon Chick. *Wilson Bull.* 111:115-116.
- Paruk, James D. 1999. Territorial takeover in Common Loons (*Gavia immer*). *Wilson Bull.* 111:116-117.