

**The Life of a Loon:**  
**A Study of *Gavia Immer***

BIOS 569 – Practicum in Aquatic Biology

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## ABSTRACT

The purpose of this project was to study and observe *Gavia immer*, or the common loon. A variety of bird species were also identified compiled into a life list. Research took place at various lakes on the UNDERC property. The loon behaviors primarily studied were swimming, diving, preening, territoriality, nesting, and rearing behaviors. Continual studies and close observations of the common loon may make it possible to decipher what type of environment is best for the loons and their families to live in.

## INTRODUCTION

The common loon, or *Gavia immer*, is one of North America's most beloved birds. This waterfowl species has several specialized traits required for living and breeding in aquatic environments. Their streamlined body shape and rear-positioned legs allow for maximum efficiency when swimming and diving. Loons have large webbed feet that push gallons of water with every few strokes. Their solid bones make them heavier in the water and more proficient at diving. However, these traits also make them extremely awkward on land (Strong 1995).

Loons are large, sexually dimorphic birds that feed on fish and invertebrates. They migrate singly, spending their winters by the southern coast of North America. Loons breed in freshwater lakes ranging from Alaska to Iceland, and further south into portions of the United States. Loons are monogamous and females lay two eggs around mid-May. The eggs incubate for twenty-six to twenty-eight days. Loon chicks are semi-precocial and are fed small fish by both parents for the first eight to ten weeks of their lives (Strong 1995). Chicks will ride on the backs of their parents up to two weeks after hatching. The purpose of back-riding is believed to be for warming the chicks and protecting against predators (McIntyre 1988).

For this project I intend to study and observe the behavior of the common loon. I will especially be monitoring the behavior and success of loon families on the UNDERC property. Thus, most of my research will take place on the various property lakes, particularly Bergner, Brown, Crampton, Roach, and Tenderfoot lakes. I also plan on navigating the UNDERC property to observe and identify as many different species of birds as possible.

## MATERIALS AND METHODS

Various species of birds were observed and identified on the UNDERC property between the dates of May 30 and July 26 of 2000. The species name, location and date of the sighting were recorded. In addition, the species *Gavia immer* (Common Loon) was studied in detail at various lakes on the UNDERC property. Observations were taken from six different lakes including Bay Lake, Bergner Lake, Brown Lake, Crampton Lake, Roach Lake, and Tenderfoot Lake. All birds were watched with binoculars. Loon observations were taken from either a boat or canoe in order to watch them more closely on the lakes. When possible, photographs of loon behaviors and loon habitats were taken for documentation. The loons were watched in periods of at least one hour to allow for sufficient observations. The behaviors primarily studied were swimming, diving, preening, territoriality, nesting, and rearing.

## RESULTS

The birds identified between the dates of May 27 and July 26 of 2000 can be found in Table 1. Overall, a total of thirty-eight birds were observed and identified. The Common Loon, *Gavia immer*, was studied in detail at various locations throughout the property (Figure 1). Observations of single loons, loon pairs, and groups of loons were made on Bay, Bergner, Brown, Crampton, Roach, and Tenderfoot Lakes (Figure 2). Most observations were taken at Bergner Lake, predominantly of nesting and parental behaviors. Approximately three to five hours were spent making observations on each lake, exclusive of Bergner. Approximately twenty hours of observations were taken at Bergner Lake.

Several behaviors were seen repeatedly of the loons. Swimming and diving behaviors were observed most frequently. Loons on every lake were found to exhibit these behaviors at all times of the day. Loons seemed to prefer swimming and diving around the alcoves and islands of lakes, seeing as that is where they tended to be found. Before diving, the loons usually swam very low in the water. At times only their heads were visible because their bodies were submerged. Head-dipping sometimes accompanied swimming and diving, as though the loon was looking for food before diving for it (Figure 3). Typically, the loons dipped their heads two or three times before

diving. It was noted among swimming and diving loon pairs that sometimes one loon would continuously swim and dive at various locations on the lake, while the second loon remained in the same spot of the lake and dove infrequently. These behaviors were found in pairs on Bay, Brown, and Crampton Lakes. Occasionally a loon would wag its leg while swimming or "stretch" its wings by flapping them several times and raising its body out of the water (Figure 4).

Dives of the loons were sometimes timed and the location and environment noted to see if any correlation existed between the dive length and lake conditions. Dives ranged from less than one second in length to fifty-four seconds in length. However, there were instances where a loon would be observed diving but not resurfacing. These loons often came up in different areas of the lake, opposite of where observations were currently being made. Thus, it is suspected that loons are able to remain underwater for longer than fifty-four seconds. Loons were usually observed diving anywhere between three to seven meters from shore. In these instances, dives lasted an average of thirty-three seconds. When loons were found diving farther from shore, the average length of their dives was forty-four seconds.

Another frequently observed behavior among the loons was preening. Preening typically accompanied swimming and diving behaviors. Like the swimming and diving behaviors, preening behaviors were observed on all lakes and at all times of the day. A loon was always seen preening itself and never any other adults or a chick. The loon used its beak to pick under its wings, and at its back and belly (Figure 5). A loon would also dip its head into the water and rub it along its back as part of the preening ritual (Figure 6). Preening could be a quick gesture that took place between dives or an extensive session that lasted up to twenty minutes in length.

On June 26<sup>th</sup>, such a preening "session" was observed in one loon on Crampton Lake. The loon would begin by picking under its wing. It would then start to slap the water with its other wing, roll over onto its back, and dive briefly underwater, usually for less than five seconds. Occasionally, the loon would kick its feet up in the air when rolled onto its back. The dive would be extremely short and sometimes followed immediately by a second short dive. Upon closer examination, the loon was found to be rolling from side to side, not quickly diving as previously thought. The loon repeated this

behavior for approximately twenty minutes and then proceeded to swim and dive as before. However, it did continue to preen between dives by picking at its wings, back, and belly.

Observations were also made of territoriality behaviors in loons and their reactions to predators and intruders. The loon's call, usually either a wail or a tremelo, was the typical indicator that the loon was distressed or nervous. This was observed on Brown, Roach, and Tenderfoot Lakes when a bald eagle or hawk was spotted flying overhead. The loon would also dive for a shorter amount of time or stop diving completely. The loon's body would become higher in the water and its neck would stretch up, making it appear more upright. Typically, when the boat came too close to the loon, it would dive and come up at a greater distance from the boat. On average, a safe distance for observations was between ten to seventeen meters from the loons. The distance varied from lake to lake.

Social behaviors of loons were observed on Bergner, Crampton, and Roach Lakes. Loon calls were frequently heard in groups of loons, specifically wails, tremelos, and hoots. Continual head-dipping was observed between loons, usually followed by short dives with water splashes. The loons would typically swim in large circles in which they all faced the center. This was characteristically seen as the loons approached each other for the first time. The "circle" behavior was not seen on Crampton Lake, but the two pairs of loons were interacting through calls and head-dipping. At Bergner, a third adult loon flew onto the lake and was approached by the adult loon pair currently on the territory. Calls, head-dipping, and the "circle" behavior were all observed in the interactions between these loons. Eventually the "visitor" loon left the lake, soon followed by both adults. At Roach Lake, the same behaviors were observed as on Bergner Lake, but in a group of five loons. In all cases, the group behaviors were observed either early in the morning, between 6 and 7:30am, or early evening, between 6 and 7:30pm.

In addition to these general loon behaviors, nesting and parental behaviors were observed on Bergner Lake and Brown Creek. Two loon nests were found on the UNDERC property. One was located May 30<sup>th</sup> at Bergner Lake on an island along the western bank. A second nest was discovered June 8<sup>th</sup>, approximately 400 meters

northwest up Brown Creek. The nest on Bergner Lake was surrounded by a marshy area and well hidden by tall, semi-dense grasses. The number of eggs in the nest is not known since one of the adult loons was always observed sitting on the nest. However, there was a successful hatch of one chick on either June 10<sup>th</sup> or 11<sup>th</sup>. The nest on Brown Creek was located on a bend in the creek and was more open than the Bergner nest. It could be approached from either land or the creek and was surrounded by fewer grasses. Two eggs were in the nest. The eggs were olive-brown in color with greenish spots (Figure 7). They appeared to be slightly larger than chicken eggs in size. On June 13<sup>th</sup> the eggs were found missing from the nest. No shells were present or major disturbances seem to have occurred. Both nests were composed of vegetation from the surrounding habitat. Grasses, shrubs, and some sticks were the main components of either nest (Figures 8 and 9).

The loons on Bergner Lake were very protective of their nest. The only time one of the adults was not sitting on the nest would be when something startled it off, usually the boat coming too close (Figure 10). However, the boat would have to come very near the nest (three to five meters) in order to cause the loon to slip off into the water. Because both sexes of loons look very similar it was not possible to distinguish which parent was on the nest and how often. The posture of the loon would change as the boat came closer. Initially, its head would change from a "normal" position to one that was very upright and alert. Then the loon would lay its head down on the nest, hanging it over the edge and making its body very flat against the ground. The loon sitting on the nest typically gave out a wail or tremolo call as the boat approached. The second adult loon, who was usually observed swimming and diving, then came over toward the nest and dove less frequently or stopped diving entirely. On two occasions at Bergner Lake, June 2<sup>nd</sup> and June 9<sup>th</sup>, the loon was observed sitting on the nest had its beak open, as though it was panting.

On May 30<sup>th</sup>, the wind was stronger than anticipated and blew the boat almost directly into the loons' nest. The adult dove out of the nest and appeared approximately seven meters away from the boat with the second adult nearby. As I struggled to move the boat farther away from the nest the second adult began slapping the water with its wings, "stood" on the lake's surface, and moved toward the boat, the entire time making

a loud screeching noise. After carrying on for five seconds or so, the loon dove underwater and I rowed closer to the middle of the lake. I observed the adult loon resurface almost directly where the boat had been. Both loons continued to swim around, diving occasionally and for short amounts of time (no more than eight seconds). The first adult loon returned to the nest as soon as the boat was at a safe distance and had stayed there for awhile. The second loon continued to "watch" the boat and gave an occasional hoot.

The loons on Brown Creek acted in a similar manner in that the adult fled whenever the canoe came down the creek toward the nest. However, the second adult loon was always spotted on Brown Lake, quite a distance away from the nest, and never followed the canoe as it traveled toward the nest or came to check on things when the sitting adult left the nest (as the second adult did on Bergner Lake). The angle of the nest on the creek made it nearly impossible to observe the loon on the nest because by the time the nest was in view the loon had already left. Both times the loon was only seen on the nest for a few seconds before it gave a rather loud and intense tremolo call and dove into the water (Figure 11). The loon could be found again on Brown Lake swimming and diving with the second adult. It began swimming back to the nest once the canoe was at least ten meters from the creek and had been there for awhile (Figure 12).

As stated earlier, the loon eggs on Brown Creek were found missing from the nest on June 13<sup>th</sup> and no chicks were ever observed with the adult pair on the lake. The nest on Bergner Lake was found empty on June 12<sup>th</sup>. Eggshell remains were in the nest, but scattered in such a way that it was unclear if there had been one egg or two. At that time the loon adults and chick(s) could not be seen on the lake. However, the next day two adults and a chick were found swimming and diving along the southern bank in an alcove of the lake (Figures 13 and 14). The chick probably hatched on either June 10<sup>th</sup> or June 11<sup>th</sup>, thereby making it two or three days old. The chick was extremely small in comparison to its parents and was covered in black-gray down feathers. It swam along beside the parents, never getting more than a foot away from either adult. The adults dove opposite of each other so that one parent was always with the chick. Rarely did they dive at the same time and if they did it was for no more than five seconds.

For the next two weeks the loons were found in the same general area of the lake, the alcove along the southern bank. They never returned to the nest or the nesting area (which includes the island and the marshy waters around it). However, after two weeks the swimming and diving area of the loon family grew from the little alcove to the entire southern area of the lake. Although the loons were seen diving along the banks of the lake most of the time, occasionally they were observed swimming in the center of the lake. After nearly three weeks the loons swam and dove in all parts of the lake, but still seemed to prefer the banks to the center of the lake.

Twice the loon chick was observed riding the back of a parent. On June 16<sup>th</sup> the chick appeared to be "sleeping" on the parent's back (Figure 15). It didn't sleep with its head tucked into its back feathers, as had been observed of the parents. Rather, the chick's head was laid on its side. The second time the chick was observed on the parent's back was June 19<sup>th</sup> (Figure 16 and 17). The adult was feeding the baby chick by dipping its head in the water, coming up with food held crosswise in its mouth and offering it to the chick. June 19<sup>th</sup> was the last time the chick (who was eight or nine days old) was observed riding one of the parent's backs.

Both parents were always seen with the chick for the first nineteen or twenty days of the chick's life. The three swam in a configuration that placed at least one parent close to the chick (within 1 meter) (Figures 18 and 19). The second parent was located between them and the boat. If the boat came too close to the loons, or if something flew overhead (usually a hawk, eagle, or another loon) one or both of the parents would wail or tremble as if to signal the chick of danger (Figure 20). Wherever the adult went the chick followed instantly. When the chick reached nineteen or twenty days it was frequently found on the lake with only one parent, especially in the late mornings and early afternoons (Figures 21 and 22). The adult stayed close to the chick and was usually never any farther away than 1 meter. By this time the chick was diving for an average of thirteen seconds. It dove whenever the boat seemed to be coming too close. The first time the chick was observed diving was June 16<sup>th</sup>. The dive only lasted two seconds and the reason for the dive is unknown. The chick was first observed alone on the lake July 13<sup>th</sup>. The chick was extremely hard to approach when it was alone. The boat was only able to come within 17 meters of the chick without it diving to move farther away.

The feeding patterns of the loon chick changed as it became older. Initially, the parents would dive for food, usually bringing up small to medium sized fish, crayfish, or plant matter. They would offer the food to the chick by holding it crosswise in its beak. The chick would either pick at the food with its beak or allow the adult to place it in its beak. On June 29<sup>th</sup> the adult loon was observed diving for food, shaking it, and offering it to the chick. The adult would then drop the food into the water and the chick would dive after it. In one instance the adult offered a fish to the baby who did not accept it and then ate the fish itself. On July 13<sup>th</sup> the chick was observed diving alone for its own food. The size of the fish eaten by the loon chick got larger as the chick got older and bigger. Throughout the feeding process the chick could be heard peeping and whistling at the adults as if it was begging for food. The chick would even swim into or nudge the parent with its beak. The adults would beckon the chick with gentle hoots.

As the chick got older it also started to develop more variation in its feathers. On June 25<sup>th</sup> it was observed that the chick's neck and belly were clearly white, while the rest of its body had become more gray-brown (Figure 23). This was also the first day the chick was seen preening itself. The chick seemed to grow at a very fast rate. By the time it reached a month old the chick was about two-thirds the size of the adult (Figure 24). Its feet seemed to develop particularly quickly. By July 21<sup>st</sup>, when the loon chick was forty-one or forty-two days old, some juvenile feathers were clearly visible.

## DISCUSSION

The behaviors observed and described are all typical of loons. Loons spend most of the day swimming and diving. The head-dipping behavior refers to "peering." Loons are visual predators and will lower their heads into the water to look around for a prey item. Once something is sighted the loon will dive underwater to catch it (McIntyre 1988). Loons primarily feed on fish but have also been known to feed on frogs, salamanders, crayfish, leeches, and aquatic greens (Klein 1985).

The leg wagging and "stretching" behaviors observed are maintenance behaviors. A loon will raise a leg out of the water, stretch it, and shake it several times. The foot is then placed under the loon's wing, probably as a way of reducing heat loss to the water. The "stretch" behavior is actually called a "wing flap." The loon will face into the wind,

raise its body out of the water, and flap both wings several times before settling back into the sitting position. The purpose of the wing flap is to shake out excess water and straighten feathers (Strong 1995).

The observed times of the loon dives were relatively typical. Most loon dives are quite brief. The length of a dive is affected by several variables, particularly the availability of prey (Klein 1985). A feeding dive has an average length of less than a minute, which correlates with the results (no dive was longer than fifty-four seconds). Instances where dives were ten seconds or less were probably part of a social display. Loons are believed to have the ability to stay underwater for as long as five minutes (Strong 1995). This means that in those instances where the loon did not appear to resurface it was probably underwater for a rather long time and came up unnoticed on another part of the lake.

Adult loons preen several times a day. They are solo preeners, which explains why a loon was never observed preening any other bird but itself (Klein 1985). The loons possess an oil gland at the base of their tail that they squeeze to release the oil. The oil is then passed through the feathers with their beak, making their coats more water repellent (Strong 1995). The dipping of the head into the water before preening refers to "water dipping." The preening "session" observed on June 26<sup>th</sup> was a "rolling or belly preen." The loon will roll from side to side, and almost onto its back, in order to preen its abdomen feathers (McIntyre 1988).

The loon calls heard during observations were also typical of the bird's behavior. The "wail call" is given by the male or female and lasts for about two seconds. It is a long, drawn-out wail that sounds like the howl of a coyote or wolf. There may be either one or two distinct rises in pitch, with a drop down in pitch at the end. The call is given when a bird is trying to locate its mate or when an adult is trying to locate a chick. The "tremolo call" is given by the male or female and lasts for only about half a second. It is a short, tremulous or vibrating call on one or more pitches that is often referred to as the loon's "laughter." The call indicates a loon's alarm due to any kind of disturbance (Stokes 1989).

The loons also displayed characteristic social behavior. Most gatherings are found to take place in the early morning or late afternoon. These meetings are usually

held on a neutral site, a location not included in the territory of any one pair. Hoot calls signal the beginning of a gathering, followed by bill dipping, head turning, pelican posturing, jerk swimming, and splash diving. All these behaviors are performed while the loons are circling. After all participants circle, one loon dives and the others remain on the surface, and then dive themselves after a few seconds. These mutual dives are repeated several times and then the entire group may shift its position and gradually move across the lake (McIntyre 1988).

Loon nests are always close to the water's edge, as was observed in the nests on Bergner Lake and Brown Creek. This reduces the distance loons have to travel on land. Nest sites near deep water are generally considered superior to those adjacent to shallow water because the risk of predation decreases. Small islands are favorite sites for loon nests since the chance of a predator finding the nest decreases considerably. Some researchers have found that loon pairs like to locate their nests in narrow, slow-moving inlet or outlet streams called "deadwaters." They speculate the reason for this to be that the incubating adult would not be disturbed by the many other animals always crawling around or in the lake (Strong 1995).

Loons use chunks of vegetation and whatever else is present at the site to construct their nests. The nest is usually over half a meter in diameter. Two is the normal clutch size for loons, but sometimes only one egg is laid. The eggs are sub-elliptical to ovoid in shape and the color varies from deep olive to light brown. Most eggs are deep olive brown and have dark brown or black irregular spots (McIntyre 1988). Both parents will incubate the eggs for nearly a month. Because the sexes are nearly impossible to tell apart it isn't clear if one parent incubates more than the other (Strong 1995).

Nests are rarely left unattended but the loon will slide off into the water when an intruder approaches too closely. The eggs are fully exposed when the loon is off the nest, making them extremely vulnerable to predation. Loons have several "incubation postures." The normal posture is the one seen most frequently. The upright posture is an alert position. The neck is extended and it usually follows the recognition of a disturbance. The hangover posture occurs directly before the loon leaves the nest. The loon does this when approached or if a disturbance is prolonged. In the hangover posture:

the loon places its head over the edge of the nest so it can quietly slip into the water from this position. Panting is observed when the weather is particularly warm. The loon will spread its wings away from the body, open its bill, and pant (McIntyre 1988).

The behavior observed May 30<sup>th</sup> on Bergner Lake was found to be an aggressive posturing. Referred to as "rushing" or the "penguin dance," the loon will hold its wings rigid and outstretched while the head is straight with the bill pointing horizontally. The loon will then run along the water charging its opponent (McIntyre 1988). The behavior is performed when a loon feels great anxiety. In this case, the loon pair was extremely distressed because the nest seemed to be in danger.

Earlier it was mentioned the nest on Brown Creek was found empty on May 30<sup>th</sup>. This could have been due to several factors. Loons, and especially loon eggs, have several predators. Raccoons, crows, ravens, gulls, skunks, mink, otters, and potentially muskrats and beavers all feed on loon eggs (Klein 1985). Avian predators are a special threat to loon nests because they can abduct eggs even from island nesting sites. Repeated disturbances during incubation time could have led to the loon accidentally knocking the eggs out of the nest. In some instances, loons have been known to move their nests and transfer their eggs to the new site when too much commotion exists around the first nest (McIntyre 1988). The eggs could have been lost during this translocation as well.

Only one chick was seen on Bergner Lake. From the nest it was unclear how many eggs had been laid and hatched. Although most clutches have two eggs, "partial clutches" (i.e. one egg in nest) do occur. It could also be possible that two eggs were laid and hatched but only one chick survived. The chick was first observed when it was two or three days old. In that time, its sibling chick could have hatched and been eaten by predators, such as large fish, snapping turtles, or eagles (Klein 1985). Perhaps the surviving chick was born first and preferred by the parents. When chicks within one brood hatch too far apart from each other the first chick is favored and quickly becomes stronger and larger than the second one. The second chick could have died from lack of food and care from the parents. The chick could have also died from harsh weather conditions. Young loons are extremely vulnerable to a severely cold environment (McIntyre 1988).

The rearing behaviors that were observed of the family on Bergner Lake were quite typical of most loon families. Loon chicks can swim, shake their wings, and dive a little just a few hours after hatching (McIntyre 1988). Parents tend to the chicks almost constantly when they are first born, explaining why neither parent dove at the same time when the chick was two or three days old. The area of the lake the family was always observed swimming in is known as the "nursery area." Nursery areas play important roles in the first few weeks of a chick's development. A good nursery area has protection from strong winds and waves, an abundance of small fish, and is somewhat shallow with both emergent and submergent vegetation (McIntyre 1988). Here adults can constantly catch insects and fish to feed to the chicks.

Chicks are allowed to ride on the backs of parents for the first three weeks of their lives. During the first week of a chick's life it can spend more than half of the day getting a free ride from one of its parents (Strong 1995). The purpose of this behavior is to protect the chick from chilly waters and predators both in the sky and underwater. Chicks lose heat and energy to the chilly northern lake water through their enormous feet. Riding on the parents' backs helps conserve heat and also allows the parents more freedom in their movement (Klein 1985). Chicks will sleep on the backs of their parents as well. Unlike adult loons, small chicks sleep with their heads turned to one side rather than over their backs (McIntyre 1988).

Loon parents are extremely protective of their young and will both stay with them for the first week after hatching. By the second week at least one adult is with the young, usually the female. Chicks are left alone more and more frequently and for longer amounts of time as they grow older. Younger chicks remain in the same place of a lake when they are left. Older chicks will swim close to the edge of the lake, diving occasionally for food. If alerted to danger, chicks will crouch low in the water with their heads lying along the surface (McIntyre 1988). This matches closely with what was observed of the chick on Bergner Lake.

Typical feeding behaviors were also observed at Bergner Lake. Chicks rely on their parents for nearly all of their food for the first six to eight weeks of their lives. Small chicks are fed aquatic insects, small fish, and crayfish. Initially, when the chick is only a few days old, one adult will stay on the surface of the water while the other hunts

underwater. Chicks will beg by pecking next to their parent's bill or at the side of their head. Begging is also done through peeping like chickens. The calls are a series of single notes that increase in intensity if the food is not presented quickly (Stokes 1989). The adult holds the fish crosswise in its bill and offers it to the chick. As the chick grows older, the adult will drop an impaired fish in front of them and the young must pick it up themselves. The process teaches chicks how to capture their own prey. Adults also beckon chicks through gently hooting (McIntyre 1988).

The feathers initially observed on the chick were typical of the first downy plumage. Feathers are primarily black, except for the white feathers on their bellies. The second down feathers are brownish-gray and come out when the chick is ten to fourteen days old. These are replaced by juvenile contour feathers at around one month and nearly complete by ten to eleven weeks (McIntyre 1988).

A final issue to comment on is that the Bergner Lake nest was the only successful nest found on the UNDERC property for the summer of 2000. During 1999 three nests were found on different lakes. Bergner, Crampton, and Tenderfoot Lakes all had successful loon nests (Hodrick 1999). Although loon pairs were observed on Crampton and Tenderfoot Lakes this summer no nests were found. However, this is the first year a nest was found on Brown Creek. Reasons why nests were not found on Crampton and Tenderfoot Lakes could be that new loon pairs occupied either lake. Some loons that fill in vacant territories are part of a pool of unpaired and non-territorial adults that move around in large or small loose groups during the summer (Strong 1995). This could be possible because usually at least two pairs of loons were seen on both of these lakes. Other reasons for a lack of nesting could have been unfavorable weather conditions or nests being ruined and no re-nesting taking place. Whatever the cause may be, one can only hope that future summers on the UNDERC property are more productive for these fascinating and awe-inspiring birds.

**Table 1: Bird Species Identified on the UNDERC Property**

Common Name	Scientific Name	Location	Date
Common Loon	<i>Gavia immer</i>	Crampton Lake	5/27/00
American Bald Eagle	<i>Haliaeetus Leucocephalus</i>	Tenderfoot Lake	5/30/00
American Crow	<i>Corvus brachyrhynchus</i>	Bergner Lake	6/2/00
Great Blue Heron	<i>Ardea herodias</i>	Crampton Lake	6/6/00
Common Raven	<i>Corvus corax</i>	Student Apartments	6/7/00
Red-Winged Blackbird	<i>Agelaius phoeniceus</i>	Brown Creek	6/8/00
Tree Swallow	<i>Tachycineta bicolor</i>	Brown Creek	6/12/00
Song Sparrow	<i>Melospiza melodia</i>	Crampton Lake	6/12/00
Mallard	<i>Anas platyrhynchos</i>	Crampton Lake	6/12/00
Ruffed Grouse	<i>Bonasa umbellus</i>	Plum Loop	6/12/00
Northern "Yellow-Shafted" Flicker	<i>Colaptes auratus</i>	Plum Loop	6/12/00
Eastern Kingbird	<i>Tyrannus tyrannus</i>	Grassy Knoll by Cranberry Lake	6/13/00
Yellow-Bellied Sapsucker	<i>Sphyrapicus varius</i>	Grassy Knoll by Cranberry Lake	6/13/00
Ruby-Throated Hummingbird	<i>Archilochus colubris</i>	Tenderfoot Creek by Gravel Pit	6/13/00
Blue Jay	<i>Cyanocitta cristata</i>	Tenderfoot Creek by Gravel Pit	6/13/00
American Robin	<i>Turdus migratorius</i>	Tenderfoot Creek by Gravel Pit	6/13/00
American Redstart	<i>Setophaga ruticilla</i>	Tenderfoot Creek by Gravel Pit	6/13/00
Eastern Phoebe	<i>Sayornis phoebe</i>	Faculty Cabin	6/14/00
Northern/Baltimore Oriole	<i>Icterus galbula</i>	Tenderfoot Creek	6/14/00
Hooded Merganser	<i>Lophodytes cucullatus</i>	Tenderfoot Creek	6/14/00
Canada/Gray Jay	<i>Perisoreus canadensis</i>	Tenderfoot Creek	6/14/00
Belted Kingfisher	<i>Ceryle alcyon</i>	Tenderfoot Creek	6/14/00
Blue-Winged Teal	<i>Anas discors</i>	Tenderfoot Creek by Fish Pit	6/15/00
Chestnut-Sided Warbler	<i>Dendroica pennsylvanica</i>	Tenderfoot Creek by Fish Pit	6/15/00
American Bittern	<i>Botaurus lentiginosus</i>	Kickapoo Creek	6/15/00
Osprey	<i>Pandion haliaetus</i>	Brown Lake	6/27/00
Red-Breasted Merganser	<i>Mergus serrator</i>	Near Northeast Gate	6/28/00
Chipping Sparrow	<i>Spizella passerina</i>	Near Northeast Gate	6/28/00
Common Merganser	<i>Mergus merganser</i>	Roach Lake	6/29/00

**Table 1: Bird Species Identified on the UNDERC Property (cont.)**

Common Name	Scientific Name	Location	Date
Broad-Winged Hawk	<i>Buteo platypterus</i>	Tenderfoot Creek	7/4/00
Cedar Waxwing	<i>Bombycilla cedrorum</i>	Tenderfoot Creek by Fish Pit	7/14/00
Red-Breasted Nuthatch	<i>Sitta canadensis</i>	Tenderfoot Creek by Fish Pit	7/14/00
Black-Capped Chickadee	<i>Parus atricapillus</i>	Crampton Lake	7/15/00
Spruce Grouse	<i>Dendragapus canadensis</i>	Faculty Cabin	7/17/00
Bank Swallow	<i>Riparia riparia</i>	Tenderfoot Creek by Gravel Pit	7/17/00
Common Grackle	<i>Quiscalus quiscula</i>	Tenderfoot Creek by Fish Pit	7/18/00
Solitary Vireo	<i>Vireo solitarius</i>	Tenderfoot Creek by Fish Pit	7/18/00
American Goldfinch	<i>Carduelis tristis</i>	Student Apartments	7/18/00

- Figure 1: Common Loon on Crampton Lake
- Figure 2: Adult loon pair on Crampton Lake
- Figure 3: Peering
- Figure 4: Wing-flap
- Figure 5: Preening
- Figure 6: Preening
- Figure 7: Nest with two loon eggs on Brown Creek
- Figure 8: Nest on Bergner Lake
- Figure 9: Empty nest on Brown Creek
- Figure 10: Loon on nest (Bergner Lake)
- Figure 11: Loon in cautious position (Brown Creek)
- Figure 12: Loon returning to nest (Brown Creek)
- Figure 13: Bergner family (2-3 days old)
- Figure 14: Chick with adult (2-3 days old)
- Figure 15: Chick riding on back (6-7 days old)
- Figure 16: Chick riding on back (9-10 days old)
- Figure 17: Chick riding on back (9-10 days old)
- Figure 18: Bergner family (9-10 days old)
- Figure 19: Bergner family (15-16 days old)
- Figure 20: Loon in flight
- Figure 21: Chick with adult (19-20 days old)
- Figure 22: Chick with adult (19-20 days old)
- Figure 23: Loon chick (19-20 days old)
- Figure 24: Chick with adult (33-34 days old)

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