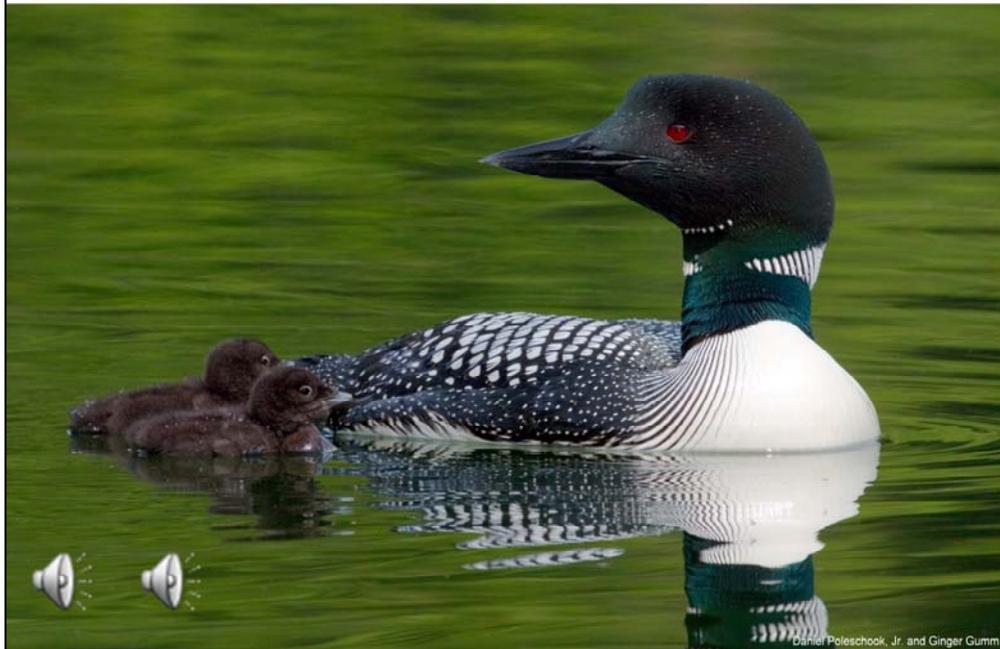


Common Loons in Glacier National Park



Common Loons in Glacier National Park

The Common Loon is often seen as a symbol of remote wilderness.

This presentation contains information about:

- General facts about Common Loons (*Gavia immer*)
- Threats and management concerns
- Status of Common Loons and loon research in Glacier National Park
- Common Loon identification and important behaviors for observers
- Life cycle of Common Loons

Click on speaker icons to play sounds.

Wail call (left) and Tremolo call (right) will be discussed later in presentation.



Facts about the Common Loon

Loons are members of an ancient group of fish eating birds that spend almost their entire lives in water.

Loons are not ducks. They are members of the Gaviidae family whose closest relatives are penguins and albatross. Similarities among these species include a long conical bill, legs that are set very far back on the body and lobed feet designed for swimming.

The name loon originated from the Scandinavian word *lom*, meaning “lame” referring to the awkward manner in which loons maneuver on land.

There are 5 types of loons in North America: Pacific Loon, Arctic Loon, Red-throated Loon and Yellow-billed Loon. Common loons are the only loon species commonly seen in Montana.

The Common Loon is listed as a “Species of Special Concern” in Montana, a Montana Fish, Wildlife and Parks listing that includes species “that are considered to be ‘at risk’ due to declining population trends, threats to their habitats, and/or restricted distribution.” Common Loons are listed as a Tier 1 species, a species of “Greatest Conservation Need” as identified by the 2005 Comprehensive Fish and Wildlife Conservation Strategy.

Because loons prefer breeding on isolated lakes surrounded by lots of water plants

Adaptations

- **Coloration**
- **Red eyes**
- **Necklace**
- **Fresh to salt water**
- **Submarine-like**
- **Wing span**



The Common loon is anything but common.

Loons have evolved with an amazing array of adaptations, making them well suited for their unique niche in the environment.

1. To begin with, their striking **coloration** is actually a wonderful camouflage. The black and white feathers on their back make them almost invisible in choppy water. Their white underbelly cannot be seen by fish in the water below.

Red eyes allow the loon to see better in low light, as when fishing in deep waters. While they may look intimidating, they actually appear gray underwater. Red eyes may be a means of attracting a mate.

The loon **necklace** is a distinctive trait, like a fingerprint; every bird has variations in pattern which are unique to that bird.

2. Most loons spend the breeding season on inland fresh water lakes and migrate to the coast each winter, living just off shore in saltwater inlets and bays. They adapt from drinking fresh water to salt water by excreting salt through their nostrils and utilizing glands to rid their system of excess salt. This photo shows the basic plumage of a Common Loon during winter after losing its showy breeding coloration, becoming mostly gray-brown with a white underside.
3. Loons have **submarine-like** abilities. They can compress the air out of their feathers and reduce the air in their lungs to sink below the water surface and snorkel or ride with just their head above the water. When submerged, the black head also adds to the loon ability to slink around undetected. This behavior can also indicate that a loon perceives a threat.
4. An adult Common Loon's **wingspan** is between 3.5 to 4 feet in Montana (larger in other portions of the range). A loon is similar in size and weight to a goose, but the surface area of a loon's wings are half that of a goose. This is another adaptation for more efficient diving; less surface area means less resistance while diving. However, if a loon loses just a few flight feathers, it can be grounded. Losing flight feathers could make the bird flightless until the following March when new feathers grow in.

The Great Northern Diver



Loons feed by diving in pursuit of their primary prey, fish.

The Common Loon is referred to in England as the “Great Northern Diver”. Most of their unique adaptations directly benefit their ability to dive.

Loons are heavy birds, weighing 8- 12 pounds. Most birds have hollow bones, reducing weight for flight. A **loon’s bones are more dense**, giving them added weight for diving. While loons typically dive 30 feet deep and stay under for 30 to 45 seconds, they can dive to depths of up to 200 feet and stay under water for up to 15 minutes. The long bill is used for grabbing – not stabbing – prey. Loons have ridges on the roof of the mouth and on top of the tongue for holding prey.

Fish are the main prey for loons, although they will also eat salamanders, frogs, leeches, snails and other invertebrates.

Preparing for Take-Off



Video by Darwin Long

The loons feet are huge, webbed feet with a lot of surface area.

These feet are great for swimming but are also used to provide extra propulsion on long runway takeoffs. Loons need hundreds of meters of water to take off. They can be seen running on water to get up the speed necessary for take off.

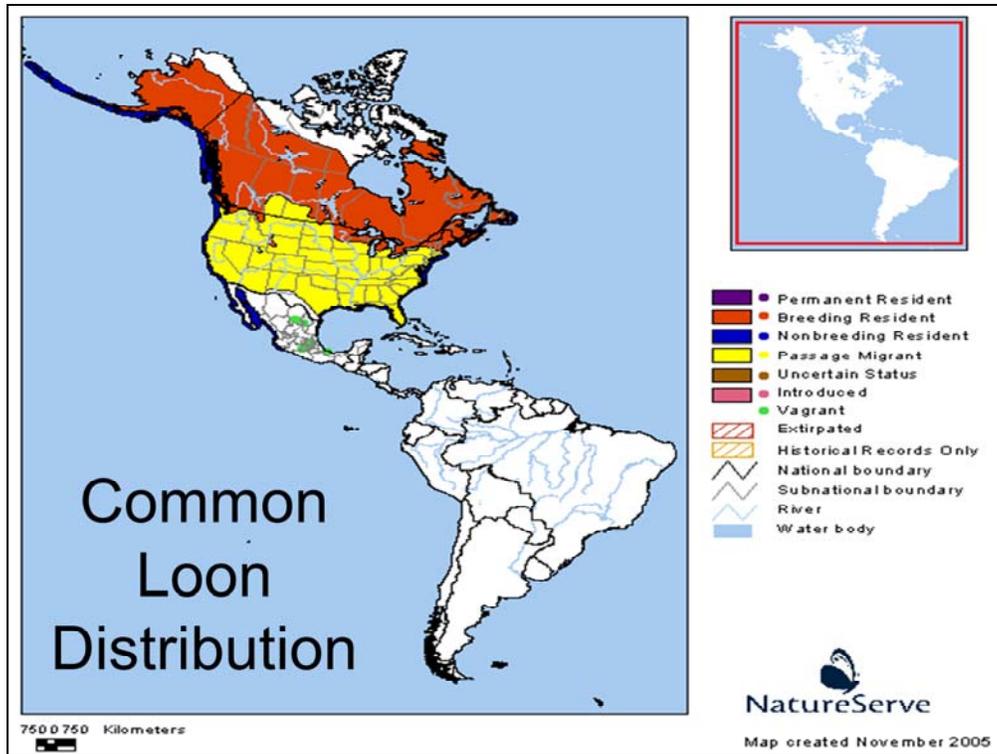
Loon legs are set far back on the body (similar to those of a penguin) and are joined to the equivalent of a human calf. This provides added propulsion when underwater, but makes the bird virtually unable to walk on land and very vulnerable. This is why nests are built on shore very close to the water's edge, allowing loons to launch themselves into the water if they sense danger. Loons must beach themselves in order to go on land. They are only found on land when they are incubating eggs or mating, or if they are sick or injured.

Weighing between 8-12 lbs (5.5 kg), the birds must have a runway for take off. Runways must be at least 30 meters long, and may be as long as $\frac{1}{4}$ mile, depending on the wind and the individual bird's weight. They cannot take off from land. When landing in water, they set their wings and glide in, crash landing on their bellies.

Video Clip: Common Loon taking off in flight at North Twin Lake, Ferry County, WA, on the Colville Indian Reservation.

Click twice on black area to play

Video clip courtesy of Darwin Long from <http://members.aol.com/djl4loons>



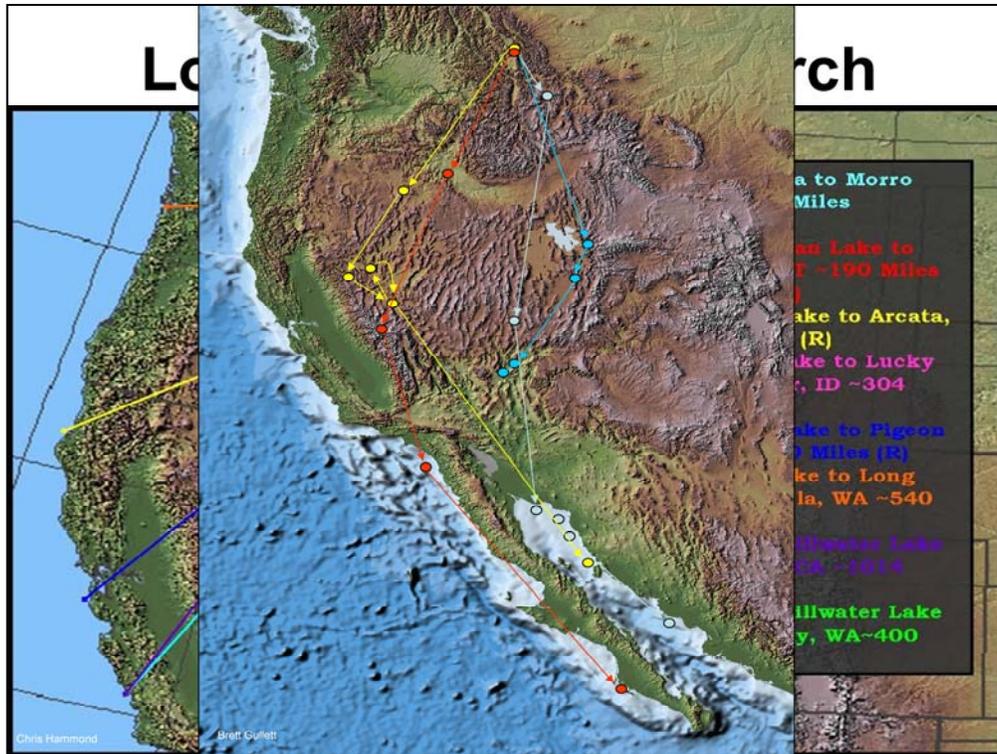
Where are Common Loons found?

Most Common Loons spend their summers (breeding season) on inland fresh water lakes. The **breeding region for Common Loons is shown in red** on this map. Loon arrival to breeding grounds relates directly to ice-off on inland lakes. Loons occupy these inland breeding areas from early spring through late fall, just before the ice returns to the lake.

Historically loons nested as far south as northern California, Colorado, Illinois, Indiana, Ohio and Pennsylvania. Due to habitat loss, now only the far northern areas of the USA are home to loons. *(The areas of extirpated range, or the historic areas where breeding loons are no longer found, are not shown on this map).*

In late fall loons migrate to the coast and live just off shore in saltwater inlets and bays, feeding on saltwater fish, crabs and mussels. The **blue outline indicates the winter range for loons**. On wintering grounds loons live mostly a solitary life or in loose association with each other and may raft together at night depending on weather and shelter needs.

Loons migrate each spring and fall once they reach sexual maturity at about 3 or 4 years of age. Chicks migrate to the coast during their first fall, when they are about 3 or 4 months old, where they will remain until they reach sexual maturity. Breeding pairs separate during fall migration and may winter hundreds of miles apart. The same pair will join again during the spring migration, returning to same lake year after year.



Common Loon Research

This map shows maps of recovered or sighted birds with bands compiled by Chris Hammond of the Montana Loon Ecology Project. Until recently little was known about loon migration or breeding requirements. Through observation researchers knew where the Common Loons' breeding and winter ranges were but had little specific information about where individual birds went or what routes they took. In the last two decades thousands of loons have been banded from Alaska to Maine, including many birds that breed in Montana. Banded birds have provided researchers with answers to some important questions, such as:

- What route do loons take to travel to and from breeding areas?
- Which birds return?
- Which breeding pairs are successful?
- Do loons display territory fidelity and mate fidelity?

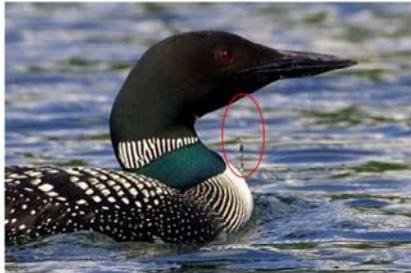
(Click on map to activate second graphic)

Banding research has also demonstrated that loons hopscotch from one lake to another all along their migration route. This second map shows data collected during a recent project spearheaded by Brett Gullett, a wildlife biologist with the Confederated Salish and Kootenai Tribes, is helping to identify specific stopover points. Gullett implanted satellite transmitters into four loons preparing for migration on Flathead lake. One of the loons made a 950 mile migration to the central California coast in less than 5 days, following a migration route similar to that used by many large raptors. Gullett's project also tracked a loon that stopped briefly at Walker lake, a stopover point on the California-Nevada line used by as many as 1400 loons each year. The loon did not stay to refuel, possibly due to the extreme drawdown of the lake for upstream irrigation. Research such as this emphasizes the importance of maintaining loon habitat across the entire migratory range.

Threats

Human Disturbance

- Development
- Water level fluctuation
- Recreational use/watercraft
- Discarded fishing line



Toxins

- Lead
- Mercury
- Acid rain
- Oil spills

Natural Factors

- Weather events
- Predation
- Disease



Photos by Daniel Poleschook, Jr. and Ginger Gumm

Threats to Loon Survival and Reproductive Success

•**Human disturbance**, such as shoreline development, leading to loss of loon nesting habitat, is the greatest cause of declines in loon populations. Loons prefer small lakes surrounded by reeds and brush. Clearing for docks and backyards that are landscaped to shoreline leave loons with limited resources for nests sites.

•Human-caused **water level fluctuations** can flood nests or nesting habitat. Nests and chicks can also be left high and dry when water levels are drawn down for irrigation.

•Lake **recreation and watercraft use** can also be very detrimental to loons' reproductive success. Motor boats disturb loons and cause them to leave the nest, and boat wakes can swamp nests or wash eggs off nests. Perhaps surprisingly, a fisherman or a canoe, float tube or other non-motorized craft may actually be more disturbing to a loon because they are often closer to the shore than motor boats and the loon may not be aware of their quiet approach until they are too close. The bird will often jump off the nest in haste, pushing the eggs off the nest into the water, where they are lost. A study by Lynn Kelly of the Montana Loon Society found that almost 60% of nest departures were caused by human activity and that average time off nests due to human activities was about three times longer than that caused by nonhuman causes.

•**Discarded fishing line** can entangle birds and other wildlife, often leading to fatality.

•**Lead** from fishing lures is the leading cause of death among adult loons. Loons, like many other birds, gather small rocks from the bottom of the lake to assist them in food digestion. Included in the mouthful of gravel are often small lead weights or fishing lures lost from the end of fishing line. A piece of lead smaller than a pencil eraser can kill an adult loon within weeks. **Alternative weights (made of steel are other materials) are much safer and have been required inside Glacier National Park since 2004.**

•**Mercury** exposure causes reproductive failure and affects chick behavior and development. Mercury is absorbed by fish who are in turn eaten by wildlife or humans. Mercury enters the atmosphere as a by-product of fossil fuel combustion and is transformed by bacteria in water into methylmercury, a neurotoxin. Methylmercury ingested by loons is stored in the kidney and liver of the bird, accumulating to potentially fatal levels over time. Adults with elevated levels of Hg have reduced or abnormal egg production. Chicks with elevated levels of Hg spend increased amount of time and energy preening which slows development.

•**Acid Rain** poses a risk to loons because it kills phytoplankton, which can result in the reduction of fish populations. Acid rain also causes the further release of mercury.

•**Oil spills** on the coast where loons winter cause gastrointestinal problems in waterfowl, leading to dehydration and death. Oil in feathers also reduces thermoregulation, leading to hypothermia and pneumonia.

•**Weather events** can affect chick survival and can impact loons especially during migration. Loons can adjust for natural fluctuation of lake levels during spring runoff by adding material to a nest site. However, flooding events can swamp nests. Loon "fallout" occurs when loons land on wet roads after mistaking them for ponds during heavy rains and are unable to take off again. If you see a loon stranded on land, they must be picked up and released back into water to recover and (hopefully) continue their migration.

•Loon eggs and chicks are extremely vulnerable to **predation**. Eggs are eaten by ravens, gulls, raccoons, fox, skunks, and otters (or other weasel family members). Young chicks can not fly or dive so are easy prey for bald eagles, snapping turtles and large fish such as pike, bass and musky. Adult loons have few predators other than an occasional opportunistic large carnivore or man.

•**Diseases:** West Nile virus is an inflammation of the brain spread among birds by mosquitoes. Botulism is caused by anaerobic bacteria that proliferate when lake temperatures rise. Both can be detrimental or fatal to loons as well as to other birds and wildlife.

Management Concerns

Species of Special Concern

- **Habitat preferences**
- **Low recruitment rate**
- **Slow to mature**



Why are we concerned about Common Loons?

The survival threats faced by Common Loons in combination with their own biological limitations make them a species of concern in many states where they are still present.

[Listed Federal Status](#) [United States Fish and Wildlife Service \(USFWS\) Migratory Nongame Bird of Management Concern](#)

[Listed State Status](#) [Endangered: Vermont and Oregon](#)

[Threatened: New Hampshire and Michigan](#)

[Species of Special Concern: Connecticut, Massachusetts, Montana, New York](#)

Biological limitations

Habitat preferences: Loons require breeding lakes with calm, clear water, relatively low disturbance, a good supply of fish and other prey, and adequate nesting areas.

Low recruitment rate: Recruitment refers to the rate at which young are added to the population. Montana boasts the largest population of loons in the western states, with an average yearly total of about 200 loons, with 60 nesting pairs. However, only about 25 of those nesting pairs are successful. Breeding loons lay only one to two eggs. Therefore, Montana loons typically produce less than 35 chicks each year. About 20%, or 7 of those 35 chicks, on average, will survive to return to Montana as mature breeding age (3 year old) loons.

Loons are slow to mature. A chick born in Montana will migrate to the coast and return three years later when it has reached reproductive age. A returning three year old loon needs to establish a new breeding territory. This can be difficult as the new territory must provide the habitat preferences listed above, as well as being very close to the loon's natal lake, or the lake where it hatched. While some returning loons may venture as far as 40 miles in search of new territory, they usually disperse less than 10 miles from their natal lake. Pioneering new lakes can be difficult due to factors such as the need for a long runway.

Once a suitable lake is found, the loon must often compete with other loons to establish its own breeding territory. Although loons can breed beginning at age 4, the average first breeding age is 7 years of age, due to the amount of time it takes to establish a new breeding territory. In areas where no suitable lakes exist within the small radius surrounding natal lakes or all territories are already taken, loons may not be able to establish new territories and breed.

Species of Special Concern: This listing indicates that Montana's loon population is considered to be at risk and may require ongoing management in order to ensure population health. Presence of loon pairs does not guarantee continued population growth. In Montana's small population, if nesting pairs are lost or are unsuccessful at breeding year after year due to disturbance, difficulty in establishing or maintaining a territory, or other factors, there may not be enough returning three year-old loons to augment the population. Local populations could disappear from drainages. Such a decline in population, may be masked by the presence of long-lived adults, with a lifespan of 20 to 30 years, who will stay on a territory throughout the breeding season, despite a nest failure.

Important management concerns include maintaining habitats suitable for nesting and rearing young, and mitigating disturbance to loons during breeding season.

Common Loons in Glacier National Park



How do we determine the population health of Common Loons in Glacier National Park?

Since 1986 Glacier National Park has participated in Montana Loon Day, an annual statewide Common Loon count that takes place in mid-July, after most chicks have hatched. During Glacier's Loon Day volunteers and Park staff survey as many as possible of the 45 high priority lakes that have been identified as potential Common Loon nesting habitat.

The population count provided by Loon Day has show that Glacier loons account for about 20% of Montana's population and are producing an average of 0.49 fledged young per pair each year or 0.15 fledged young per adult each year (based on statewide Loon Day data for 1999-2005). This number is lower than the reproductive average for the rest of the state of 0.70 fledged young per pair per year or 0.24 fledged young per adult per year. It is also lower than the 0.54 fledged young per pair each year that is necessary to maintain a stable population.

While Loon Day is a valuable and vital part of our understanding of Common Loon populations, it provides only a brief glimpse. The numbers of loons reported during Loon Day can vary from the actual population. Loons can be misidentified or missed, leading to under- or over-reporting of the population. It can also be difficult to determine whether two loons observed on a lake are actually a breeding pair.

2005- 2006 Citizen Science for Common Loons in Glacier



2005 to 2006 Citizen Science Project for Common Loons in Glacier National Park

In 2005 we began a pilot project to try to count Loons on each of the 45 priority lakes repeatedly throughout the season. The goal was to get a more robust dataset and determine whether the population estimate would be different if lakes were visited more than once each year. In 2006 we were able to more fully develop the 2005 pilot project.

The project trains the interested members of the public as well as GNP staff as Volunteer Loon Observers to improve accuracy and increase coverage of all 45 priority loon lakes throughout the nesting season. Our main scientific goal is to determine the number of loons in Glacier, the proportion of breeding pairs, and the number of successful nests. A secondary scientific goal is to determine the factors affecting nesting success by comparing nest locations and human activities at lakes with good reproduction to those with poor reproduction.

After receiving training volunteers conduct one hour long surveys of Glacier's loon lakes to determine if lakes have single loons, paired loons, or loons with young. In 2006, each of the 45 priority lakes was visited at least 3 times during the breeding season (prior to, during and after Loon Day).

2006 Citizen Science Project results: In 2006 we recruited and trained 77 Volunteer Loon Observers and gave educational presentations to 216 additional people. We conducted over 400 surveys on 72 of Glacier's Lakes.

Population estimates from Loon Day and season-long efforts differed substantially during 2006.

The 2006 Loon Day population estimate was 36 adults (including 9 pairs) and 4 chicks. This is a substantial difference from the season-long estimate of 45 adults (16 pairs, 13 singles) and 5 chicks. The chick lost in 2006 did not survive to be counted on Loon Day

Documenting chick loss is a critical factor in determining nesting success rates especially in an overall average state population of about 35 chicks per year. An understanding of where chick loss occurs can help to identify where to look for specific factors that may be affecting nesting success.

2005 Citizen Science Project results: Due to limited funding, we were unable to visit each of the lakes at least 3 times in 2005 and thus we were unable to get a reliable season-long estimate of the loon population. In 2005, only 4 chicks were counted on Loon Day, but 7 hatched chicks were documented through season-long efforts. This is a result of chicks that were lost both before and after Loon Day and an additional chick that was detected after Loon Day.

2007 Citizen Science for Common Loons in Glacier



2007 Loon Day: 43 adults, 10 pairs, 6 chicks

Season-long: 46 adults, 20 pairs, 10 chicks hatched (all fledged)

Citizen Science for Common Loons in Glacier National Park in 2007

In 2007, we continued to build upon the success of the project. Again we were able to survey each of the 45 priority lakes at least 3 times throughout the breeding season (prior to, during, and after Loon Day).

2007 Citizen Science Project Results: In 2007 we recruited and trained 156 people as Volunteer Loon Observers and gave educational presentations to 395 additional people. We conducted over 450 surveys on 79 lakes in Waterton-Glacier International Peace Park.

The 2007 season-long estimate was 46 adults (including 20 pairs) and 10 chicks. This is a substantial difference from the 2007 Loon Day estimate of 43 adults (including 10 pairs) and 6 chicks. In this case chicks were not lost; rather detection difficulty or errors accounted for the difference in chick numbers. Three of the chicks that were not detected on Loon Day were observed prior to Loon Day and verified to still be present during a follow-up survey after Loon Day. The fourth chick was detected for the first time after Loon Day. All of these chicks made it past 6 weeks old, the age at which they are typically considered to be fledged.

We also documented new information regarding nest sites, nursery areas and hatch and migration dates.

Spring Loon Day: Because we had a large numbers of volunteers who had been previously trained during the 2005 and/or 2006 project seasons, we were able to begin monitoring earlier in the season. We also gave returning volunteers additional training to teach them more about how to locate nests and how to identify territorial and nesting behavior.

By having a substantial number of volunteers available and ready prior to the end of May we were able to conduct the first annual Spring Loon Day in Glacier National Park. Spring Loon Day is a statewide event that takes place during the second or third weekend in May each year. The objective of Spring Loon Day is to determine which of the lakes, especially those with previous nesting activity, are currently occupied by loons. This helps to identify nesting attempts and gain a better understanding of our actual reproductive rate. It also helps focus efforts more heavily on monitoring those lakes with territorial pairs. All but three of the lakes in Glacier that have had historical nesting activity or pairs within the last 4 years were covered during the 2007 Spring Loon Day.

Monitoring in Waterton Lakes National Park: Volunteers were recruited and trained during two training sessions in Waterton Lakes National Park and one to three surveys each were conducted on eight of Waterton's lakes. This effort was done in order to begin getting a sense of the large picture of loon populations across the international boundary as well as to help Waterton initiate future Citizen Science projects.

Remote lakes with potential loon habitat: A grant was provided by the Glacier National Park Associates to hire an intern who would create a training manual for future project coordinators and survey remote lakes and water bodies that had not been surveyed previously due to their remote nature.

Photos: Top left- Training session in Waterton-Glacier International Peace Park

Top right- Early season training session for Volunteer Loon Observers in Glacier National Park

Observing Common Loons



What to look for when observing Common Loons?

The next portion of this presentation covers the life cycle and identification of Common Loons in greater detail to help you decipher loon observations.

Common Loon Breeding Habitat



Common Loon Breeding Habitat

Loons breed on inland freshwater lakes in boreal and mixed forest. They tend to prefer isolated clear water lakes of at least 10 acres in size and below 5000' elevation. The lake must be long enough to facilitate landings and take-offs. Ideal habitat includes deep-water and shallow-water areas, islands, and areas that allow protection from winds and waves. Loons also require ample fish or invertebrate populations for food along with suitable habitat for nesting.

Common Loon Life Cycle



Establishing or re-establishing nesting territory

Following ice-off in spring, loons return to their breeding area to begin establishing a nest or pioneering a new territory. Arrival in Montana typically begins in the end of March. Loons will often utilize the same nest year after year if no significant habitat change has occurred. Pairs often arrive together, immediately re-establishing territory used in previous years. Loons display high mate fidelity (79%). When mate switching does occur it is generally after a nest failure, or the death of a mate.

In Montana, courtship for loons typically occurs during the month of April. Courtship is subtle- the pair of loons may circle while facing each other and do a few shallow bill dips and mutual shallow dives. Nest site selection, building and initiation usually takes place between late April and early May. Loons that are in the process of selecting a nest site often swim very close to the shore while eyeing the shoreline for a nest site. They may also climb ashore to copulate, to test a potential nest site, or to begin building a nest

Nests are located on lake margins or on islands, a few feet from the water's edge, in places where the nesting adults can have good visibility to detect potential threats. Optimal nest sites provide overhead cover to shelter the nest from aerial predators like eagles and ravens and vegetative cover for protection from land predators. They also require protection from winds and waves. Loon nest sites are often close to inlets while nursery sites are often in shallow, protected coves with abundant small fish and insects.

This photo shows a territorial pair of common loons circling at the nest site prior to laying eggs.

Nest Building and Incubation



Nest Building

Both males and females will build the nest and incubate two eggs for about 26-28 days. The eggs are laid 1 day apart, so the first egg will hatch 12-24 hours before the second egg. Eggs are incubated using the feet and are turned each time an adult returns to the nest.

This is the most critical time for reproductive success. Eggs are susceptible to a whole host of predators. Ravens often steal loon eggs. Skunk, fox and raccoons can make an easy meal of a loon nest. If a pair of loons lose their first set of eggs, they may re-nest a second or third time, laying only one egg, provided the loss occurs early in the breeding season. Re-nesting usually occurs within 2 weeks of a nest failure. Loons usually don't re-nest after the third week in June in Montana.

Water level fluctuations can influence nest characteristics and nest success. Loons can adapt to gradual rises in water levels by adding vegetation to elevate the nest. Rapid rises in water often result in nest failure by flooding the nest. Reductions in water levels can make the nest unavailable to the adults, stranding the nest on dry land.

Nest disturbance is of primary concern. If loons are disturbed, they may leave the nest and don't return for an hour or more, the eggs can become chilled and are vulnerable to predation. Loons may also push eggs off a nest accidentally during disturbances, if forced to depart from the nest in haste.

Nest Characteristics



What does a loon nest look like?

Loon nests are found immediately adjacent to water in marshy backwaters or near inlets. Loons prefer deep-water so that they can enter or exit the nest without being detected. Nests are no more than three feet from shore. They are large structures often up to three feet across and composed of rootlets and mud from the lake bottom. Loons prefer areas of tall reeds and cattails or small islands and usually build the nest using nearby vegetation (grasses, moss and twigs), but the nest can also be built on bare dirt with no vegetation.

- Loon on a hummock nest. The loon is panting to help with temperature regulation.
- Common Loon eggs vary in color and speckled pigmentation and are about 3 to 4 inches in diameter
- The nest on the lower left is an example of a hummock nest.
- Small islands are strongly preferred by loons because they offer quick easy escape routes and protection from terrestrial predators (below center) .
- Loons will often deposit their eggs on bare ground with little or no vegetation protecting the eggs (below right).

How to look for loon nests: Keep your distance to prevent disturbance when looking for loon nests or observing loons.

Look for the profile of a loon's head near the shoreline to locate an incubating loon on an active nest. As nests are often very hard to detect it is also important to look for breeding behaviors that will help us to determine whether a pair will make a nesting attempt, and may provide clues about the location of the nest. Breeding behaviors to watch for include courtship, swimming very close to the shore, and climbing ashore to copulate, test a potential nest site, or build a nest. Courtship/nesting behavior is most likely to be observed in the early morning or late afternoon. Make note of and photograph any locations where loons go onto shore or engage in breeding behaviors.

Newly Hatched Chicks



Newly hatched chicks are covered with black downy feathers. Chicks leave the nest and begin swimming with the adults within 24 hours of hatching. Loon chicks typically hatch in Montana between late May and late June. Loon pairs that have re-nested due to a nest failure may hatch their chicks as late as mid-July.

Chick Nursery Areas



Nursery Areas

The parents often move the chicks to a nursery area characterized by shallow marshy backwater with abundant insect and small fish populations. The chicks stay with one or both adults in the nursery area for the first four weeks after they are hatched. They prefer a site that is protected from wind and waves that can separate the chicks from their parents. The time spent in the nursery area is critical as most chicks that are lost die within the first 4 weeks.

Nursery areas are also perfect for bass and pike habitat, so anglers need to be extra alert for loon families in these areas in June and July.

How to identify nursery areas: Keep your distance to prevent disturbance when observing loons with chicks.

Nursery areas can be hard to identify as they can be highly varied. However, if you see a loon chick, note and photograph the location on the lake.

Caring for Young Loon Chicks



Caring for young loon chicks

Adults carry the chicks on their backs 65% of the time for the first few weeks after hatching. In this way, the chicks are protected from aquatic predators and can get warm and dry after being exposed to cold water.

Newly hatched chicks stay close to their parents because their downy feathers can become water soaked quickly and lose their insulation value. Downy chicks are also too buoyant for diving at this stage. They require a large amount of parental care.

Feeding the Young Loons



Feeding the young loons

Both parents catch fish and feed the chicks for the first couple of weeks. The chicks use a begging call to indicate hunger. This call is also used when the loon chick is fearful or searching for other loons.

An adult pair of loons raising two chicks can consume up to a ton of fish while occupying their breeding lake.

The black downy feathers of the newly hatched chick are replaced by brownish-gray down feathers when the chicks are between 10-14 days old, such as the chick in this photo.

Click on speaker icons to play chick calls.

The first call (left) is a one week old chick.

The second call (center) is a chick begging its parents for food.

The last call (right) is an older chick.

Molting into Contour Feathers



Molting into Juvenile Plumage

The brownish-gray downy feathers are then replaced by smoother contour feathers of the same color, beginning at six weeks. This set of feathers will be retained by the chick until the next summer when it will experience its first complete molt. Loons in this age group are often referred to as juveniles.

After molting, chicks leave their natal lake their first fall, migrating to the coastal winter ranges. This year's chicks will stay on the coast for three years while the adults will return to their territories again next April.

They retain the gray/brown plumage as sub-adults until they reach three years of age and are ready to begin breeding.

Loon Chick – Just Before Migration



Learning to fly

By the time the young are 10-11 weeks old, flight feathers have erupted enough to allow flight practice. They start to fly 11-13 weeks after their hatch date, which means they are flightless until at least mid-August. Chicks begin to fend for themselves at about three to four months of age. At this point the chicks are almost as large as their parents but they lack the colorful plumage of the adult. Loons chicks in Montana typically leave their natal lake at 10 to 12 weeks, in mid to late September.

Reporting loon chicks: Keep your distance to prevent disturbance when observing loons with chicks.

If you see chicks make sure to get an accurate count of the number of chicks- they can be difficult to detect especially if away from adults. The raised tail of an adult loon (as seen during preening or mild distress) can often be mistaken for a back-riding chick. Photograph the chicks from a distance, even if they will be difficult to see in the photo, and do so through a spotting scope if possible.

Try to help us determine hatch date and chick age by looking for clues such as relative size, coloration, presence of downy feathers, and whether the chicks ride on adults' backs. Classify the age of chicks into one of the categories below (*this information is also included in a handout in your training packet*).

•**Downy young**- Chicks are less than 1/3 adult length (including bill) have dark grey down, and may ride on the parents' backs. (They may be difficult to see without binoculars). These chicks are less than three weeks old.

•**Small young**- Chicks are 1/3 to 2/3 adult length, have lighter brown/grey downy feathers, or mottled light and dark grey contour feathers, and do not ride on the parents' backs. These chicks are between three and six weeks old.

•**Large young**- Chicks are 2/3 adult length or longer and have a full coat of light and dark grey feathers forming a "scaloped" pattern along the back. These chicks will still be attended and fed by the parents and will not fly until they are at least 10 weeks old. Large young are at least six weeks old.

Migration Staging Areas



Preparing for Migration

In September and October, loons gather on staging lakes in preparation for the fall migration to the Pacific Coast. The first to arrive at staging lakes are the non-breeding adults and the unsuccessful breeding adults. The successful breeding adults move from their breeding lakes to staging lakes, leaving their chicks behind to fend for themselves.

Loon chicks of the year will be the last to migrate, having spent up to a month on their own on their natal lake, allowing the longest time possible to grow. They will be making their migration journey at only 3-4 months of age, as they must be off their natal lake before freeze-up occurs.

A few examples of local staging lakes include Flathead Lake, Pablo National Wildlife Reservoir, and Fort Peck Lake. Several of Glacier's larger lakes may also be used as staging lakes.

Staging lakes, also known as stopover lakes, are re-used if they have an adequate food supply. These lakes become part of the migration repertoire of Common Loons throughout their lifetimes. Some migration-staging lakes are visited by hundreds of common loons at a time.

The hoot call is commonly heard among flocks at staging lakes. It is often used in family groups to maintain contact.

Click on speaker icon to play hoot call.

Adult Loon in Breeding Plumage



Breeding Plumage

Once a Common Loon reaches breeding age it will look like the beautiful black and white speckled bird with which we are more familiar.

Identification of Common Loons



Identifying a Common Loon in flight

The loon is very distinctive in flight with its long legs trailing out from behind the tail, humped back (like the Concord Jet) and rapid wing beat. After take off, loons fly low at first and slowly start to gain elevation. They circle around the lake, often giving a tremolo call until they finally clear the trees.

Once underway, typical cruising speed is 75 MPH. They have been clocked at 100 MPH.

Common Loon vs. Similar Species

Common Loon ID Features:



- Sexes similar
- All black bill and head (no white on face)
- Black and white “necklace”
- White chest and belly
- Black back w/ white checkering and spotting
- Upperwings dark in flight; feet trail behind body

Similar Species:



Identifying Common Loons versus similar species

Always look for the combination of an all black head and a mostly black body. Both male and female adult Common Loons look similar and are rarely seen in very close proximity to other species.

Be certain of Loon identifications- use binoculars and/or a spotting scope and rule out all other species first.

In Glacier the most commonly seen similar species are the Common Merganser, the Barrow's Goldeneye and the Common Goldeneye (not pictured but similar to the Barrow's Goldeneye). To identify a Common Merganser, note the large amount of white on the body of the male and the brownish coloration of the female.

To identify the Barrow's or Common Goldeneye, note the white patch on the face of the male and the brownish coloration of the female.

Juvenile and Sub-adult Loons

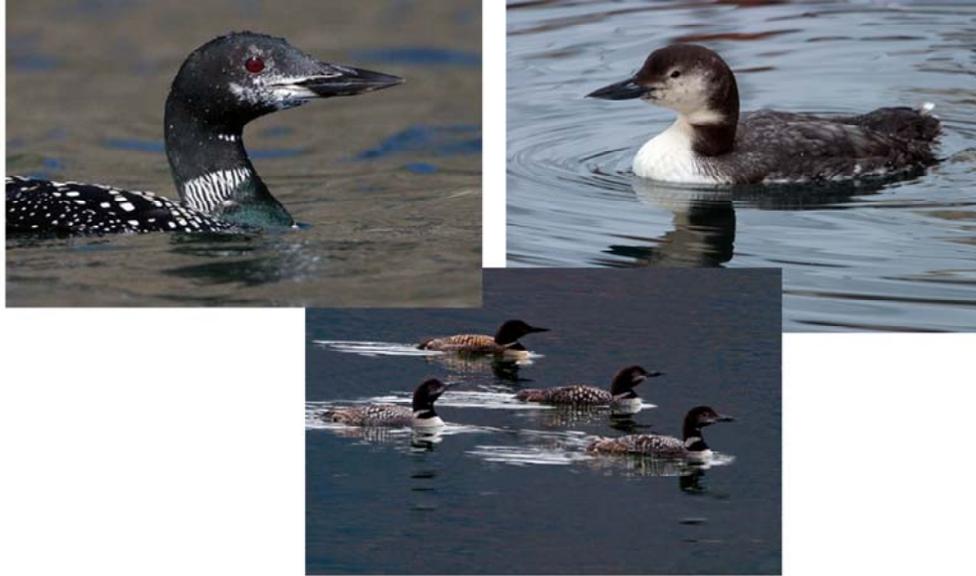


Identifying Sub-adult loons

Three Common Loons on a migration lake. Two (left and center) show plumage of 16-week-old juveniles while the other (right) is a two-year-old sub-adult.

Sub-adult loons are very similar in appearance to juveniles. It is not common to see sub-adult loons in our region during the breeding season. If a loon is seen with grey/brown plumage on a lake in close proximity to an adult loon it is most likely a chick.

Identifying Molting Adult Loons



Photos by Daniel Poleschook, Jr. and Ginger Gumm

Identifying Molting Loons

(Photo above left) Adult Common Loons start their fall/winter molt with the loss of pigmentation at the base of the bill, and loss of pigmentation in the facial feathers around the bill. Note other feather changes on the neck and the loss of some of the square patterns on the scapular feathers of the back.

Molting in Montana's loons typically begins in late August to early September.

(Photo above right) An adult Common loon molting from basic to breeding (alternate) plumage. Note how the bill has already regained nearly total pigmentation.

(Photo below center) This small group of adult common loons in varying stages of molt is swimming together before the final leg of their fall migration which takes them to the coastlines of North America. Molt cycles are highly variable for individual birds.

Identifying Loons at a Distance



Identifying Loons at a Distance

By now you have seen many sharp, close-range photos of Common Loons in various plumages. Here are a few photos of more typical distances and less than ideal lighting. It is important to develop your own search image for loons and be certain of your identification using binoculars or a spotting scope.

Banded Birds



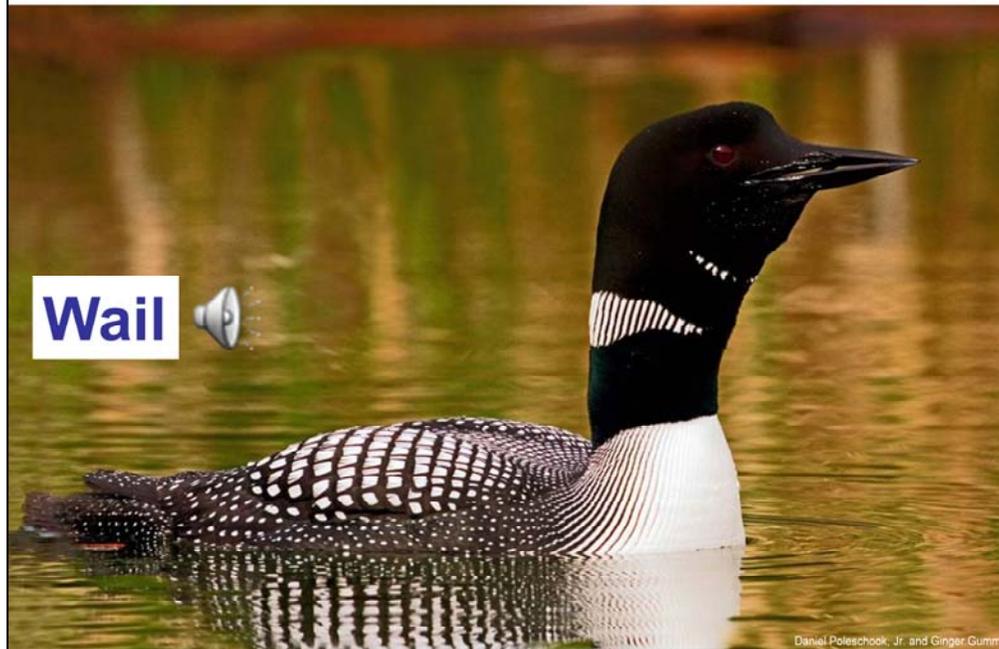
Look for bands on Common Loons

No banding of Common Loons is currently taking place in Glacier National Park. However, loons are being banded in nearby territories and could potentially show up in Glacier. Juvenile loons are also being banded while they are on their coastal wintering range. These birds may show up in Glacier when it is time to establish their own breeding territory.

The 13th-week chick in the upper photo displays its white/yellow right leg bands while bathing. This is an opportune time to determine if a Common Loon has been banded, as they often display their legs above the waterline while bathing.

How to look for bands on Common Loons: While a loon is bathing or preening and its legs are out of the water, use a spotting scope to look for flashes of color on the legs. If a band is spotted, watch for long enough to get a clear view of both legs. Record the color of each of the bands on both legs as well as the order that the bands are placed.

Loon Calls and Other Behaviors



Listen for loon calls

The loons distinctive calls have been identified as having several specific meanings, accentuated by the intensity, pitch and loudness. Each type of call has several variations.

The **Wail** is primarily an interaction call used to maintain contact and to communicate with other loons as in locating their chicks or mate. It can be thought of as “Hello, I’m over here.”

Variations of this call can be distinguished by their pitch and by how many parts there are to the call. When two notes are heard, the call becomes a warning call, indicating that the bird is disturbed by something such as an eagle, raven, or a person too close. A three note wail warns other loons of some disturbance and ends with a rise in inflection, like a question- “beware I am disturbed - where are you?”

Click on speaker icon to play the wail call.

The Tremolo Call- a Cry of Distress



The Tremolo call- a cry of distress

The **Tremolo** is the call most commonly used by Hollywood to denote peaceful lake settings. This call is actually an alarm call. When you hear a tremolo call coming from a bird on a lake, it means the bird is frightened. A single call at a low pitch indicates the bird is slightly frightened or disturbed. A higher pitched call means the bird is more frightened and an even higher pitch indicates a very excited frightened bird.

This call is also the only call the bird makes in flight and does not necessarily indicate distress when made during flight.

Click on the speaker icon to play the tremolo call.

The Yodel- a Territorial Call



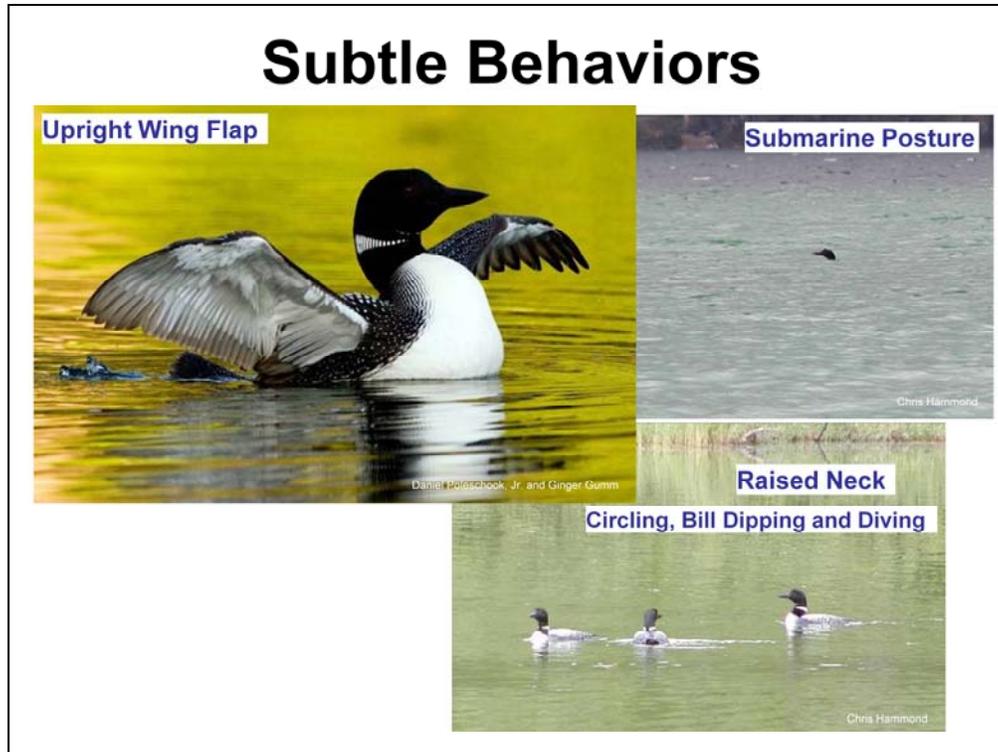
The **Yodel** call.

The yodel is the most complex call and is only given by the male. This call is strong language for loons and is used in territory issues. It can have a large number of repeated phrases; the greater the bird's excitement, the more phrases. These calls are very distinctive between birds, much like a fingerprint.

When the male yodels, he lowers his head across the water and usually faces whatever is causing the territorial problem or disturbance. Yodels can be directed at other loons that have entered the male loon's territory. Yodels can also be directed at anything that the male loon perceives as a threat, such as a boat or person approaching too close to a nest site, nursery area or chick.

In this photo an adult male loon is demonstrating the territorial and defensive yodel call while its chick listens and learns.

Subtle Behaviors



Watch for subtle changes in loon behavior that may indicate disturbance.

While loon calls offer auditory cues to help you understand a loon's behavior, it is important to also watch for visual behaviors. It is especially important to learn to understand those calls and behaviors that signal distress or disturbance. Being alert to subtle changes in behavior may prevent an observer from getting too close and possibly impacting nesting success or chick survival.

Upright wing flap (above left) and territorial approach

If a non-resident loon or a boat enters a claimed territory, a loon from a resident pair may raise up out of the water, face the intruder and flash its white chest and underwings. The message seems to be, "This territory is taken and I am prepared to defend it." Then the birds approach the intruder to communicate their territoriality a little more clearly. People have said, "The loons like me. They come right up to my boat". While loons are curious, their usual reason for approaching during nesting and chick-rearing seasons is territorial defense.

Submarine posture (above right) and moving off nest

When a loon wishes to remain undetected they often use the submarine posture, sinking underwater until just their head is surfaced. They may use this posture while trying to slip quietly off their nest without being detected and betraying the nest location.

During the nesting season (May1-June 30) if you see one bird in the water, the other one may be on a nest that could be nearby. If you see two birds in the water, you may have caused the nesting bird to leave the nest. Look around. Are you near a marshy shoreline or island or in a backwater? If so, move away from the shore line so the bird can return to the nest.

Alert raised neck (below right) and circling, bill dipping and diving

Concerned loons may raise their heads on an elongated neck to search for a loon or other intruder popping out of the water. They may also nervously bob their heads, looking under the water for an intruding loon attacking from that angle. They communicate the same way when a boat or person has come too close.

In this photo another loon has entered the territory of a pair. The pair will circle the intruder, dipping their bills and doing shallow dives. This behavior can look similar to courtship but can be distinguished by the presence of a third loon and/or by accompanying behaviors, such as the ones we've discussed, that indicate that the loons are disturbed.

Penguin Dance- Severe Disturbance



Penguin Dance- Severe Disturbance

Loons prefer quiet isolated places and are usually very sensitive to disturbance.

They are extremely territorial towards other loons, water birds and people on their lakes or near their nests.

The adult common loon in this photo is acting defensively to a stimulus that threatens its territory and/or its family by doing the upright defense display (penguin dance display). A loon demonstrating the upright defense display behavior arches upward, opens or extends its wings, stomps the water repeatedly and vigorously with its feet and places its bill in a threatening position. Tremolo or yodel calls are sometimes vocalized during this display. The penguin dance is loud, moves considerable water, and is usually highly effective at minimizing a threat.

This behavior can be directed at other loons that have entered a pair's territory. It is also directed at anything that gets too close to a nest or nursery area. If you see this behavior, move away from the shoreline or from the loons you are observing to make sure you are not the cause of the distress.

Reminders for Loon Observers

- Minimize disturbance
- Be certain of observations
- Report zeros
- Take photos for verification
- Preserve sensitive information



Reminders for Loon Observers

•**Minimize disturbance.** Approach each lake cautiously and stay as quiet as possible. Watch for any behaviors and listen for vocalizations that indicate stress. Also watch for changes in a loon's behavior that may indicate he/she is aware of your presence and may become distressed. If any of these things occur, increase your distance from the loons. Stay far away from nest sites and nursery areas.

•**Be certain of your observations, especially when reporting chicks.** Plan to spend an hour or more at each lake. You may see loons right away, or it may take up to an hour to confirm presence or absence of loons. Try to view lake from several observation points to ensure you are not missing anything. Report only what you see- don't make assumptions. If you feel you need additional guidance with identification or observation techniques contact the project coordinator.

•**Report all zeros.** Complete one form for each lake and one per visit even if you do not see loons. Data collected when not seeing loons is just as valuable and can help us determine critical information such as loon movement patterns and territory loss.

•**Take photos for verification of your sightings,** even if you feel the photo will be poor quality. Verification photos submitted by volunteers have helped us locate nests, pinpoint nursery areas, determine chick age, assess data quality, and verify unusual sightings such as large groups of loons outside of migration season.

•**Preserve sensitive information about nest sites, lakes with chicks and specific locations of loons** by not sharing with people outside of this project or those who are assisting you during observations. The project coordinator will share general information about Glacier's loon population with Volunteer Loon Observers but will not divulge information about nest locations or specific locations of chicks.

Bottom left- Verification photo of an adult loon with two young chicks in a nursery area from B. Board, the 2007 Loon Project intern. This pair was seen on three separate occasions localizing in the same area next to shore along the trail, indicating a probable nest attempt.

Top left- Verification photo of a pair of loons switching places on a nest from a Volunteer Loon Observer. This pair was later seen and photographed using a different nest site. This photo helped to verify that a nest failure had occurred.

Bottom right - Successful nest that hatched only one chick. The un-hatched loon egg (in foreground) was most likely ejected during a disturbance-related nest departure.

Questions?



Daniel Poleschook, Jr. and Ginger Gumm



Final Identification Test

1. *Common Loon preening as seen through spotting scope*
2. *Verification photo of a breeding pair from a Volunteer Loon Observer. This pair was seen on three separate occasions localizing in the same area next to shore along the trail, indicating a probable nest attempt.*
3. *Adult Common Loon attempting to feed chick. The chick is approximately 8 to 9 weeks old and falls into the "large young" category.*
4. *Pair of Common Loons with two chicks, approximately 2 weeks old. These chicks fall into the category of "small young" as they are still completely covered in down and are less than 1/3 the size of adults.*
5. *Female Common Goldeneye with chicks*
6. *Group of five adult Common Loons seen on Loon Day 2007. The least visible one can be seen on the far left with its head underwater. This verification photo from a Volunteer Loon Observer provided proof that adult loons do congregate in larger groups on certain lakes in mid-summer in Glacier NP.*
7. *Verification photo of a male Common Merganser that was reported as a loon by a Volunteer Loon Observer. Note the larger percentage of white on the neck, the thinner bill, and the larger area of white on the back.*
8. *Verification photo of a pair of Common Loons in foreground with a male Common Merganser in the background (near the shore towards the left of the photo), originally reported as three loons.*

