

Status of Common Loons on Squam Lake in 1999

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Introduction

By 1975 the Common Loon (*Gavia immer*) population in the state of New Hampshire was in notable decline. In 1976 the Loon Preservation Committee (LPC) was created to address concerns about the impact of human activities on loons. Over the next several years the LPC was able to document a decrease in the presence and productivity of loons in New Hampshire, resulting in the registration of the Common Loon as a state-listed threatened species in 1979. Today, the LPC continues to study the breeding success of loons in the state. A self-funded project of the Audubon Society of New Hampshire, LPC's mission is the restoration and maintenance of a healthy loon population, with the ultimate goal of reviving the role of New Hampshire's loons in the regional ecosystem.

The LPC annually conducts a statewide survey of loons. The survey grew from the efforts of Squam Lake residents to organize a loon census of Squam Lake (which includes Little Squam Lake), which is centrally located in Grafton County, New Hampshire. Squam Lake is unique among lakes in the statewide survey both historically and biologically. Squam Lake is considered a fairly well-developed lake that has heavy recreational use, yet it hosts one of the highest concentrations of breeding loons in the state. Prior to 1970, loons were considered nuisance birds that impacted local fishing, and game wardens were instructed to shoot the birds on sight (R. Wood, pers. comm.). The filming of the movie "On Golden Pond" at Squam Lake in 1981 helped to elevate the status of loons, and today loons help to define the Squam lakes region. Tourists attracted to the area have become very important to the region's economy.

Although LPC's mission has grown to encompass loon-monitoring statewide, data on the Squam Lake population represent the most complete subset of LPC's data archive. These birds are, however, the most intensively managed of any New Hampshire loons. Annual management techniques include providing alternative nest sites and restricting traffic. The LPC is also developing long-term interactive educational programs with the Squam lakes' residents.

Squam Lake requires a full-time LPC field biologist for surveying, in addition to residents who aid in protecting loon families facing increasing human disturbance. Squam's long-term data set, and the intensive monitoring system, provides a unique measure of changes in environmental quality, and an important foundation for studies of loon mortality and the impact of contaminants over time. Here we report the results of the 1999 field season at Squam Lake.

Study Area

Glacially formed 40,000 years ago, Squam Lake is the third largest lake in New Hampshire, totaling 6,770 acres. Debris carried by glacial melt water rivers formed

Squam's peninsula and islands (Noon 1990). The many islands and secluded coves of this lake provide habitat for a variety of birds, including Common Mergansers, Black Ducks, warblers, vireos, Killdeer, Barred Owls, kingfishers, hummingbirds, and Great Blue Herons (Ridgeley 1988). Recently, Bald Eagles have also been reported (C. Martin pers. comm.). Mammals such as mink, otter, and raccoon are quite common along the shoreline. It is thought that loons first appeared on Squam nearly 10,000 years ago (Noon 1990). Today, it hosts a population of 50-60 loons, with 16 territories established during the breeding season (Figure 1).

Figure 1. A Map and Chart of 1999 Territories



Chart of 1999 Loon Activity on Squam Lake

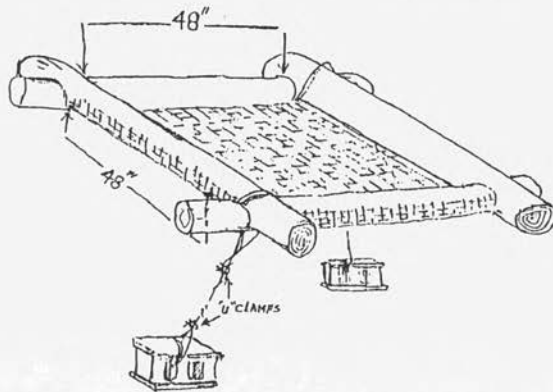
Code	Name of Territory	Rafts floated	Nesting Pairs	Chicks Hatched	Chicks Surviving in August
A	Little Squam	—	X	0	—
B	Piper Cove	X	X	1	1
C	Perch Island	—	X	1	1
D	Great Island	X	—	—	—
E	Heron Cove	X (2)	X	1	—
F	Moon/Bowman	—	X	1	—
G	Kimball Island	X	—	—	—
H	Sturtevant Bay	X	X	1	1
I	Moultenboro Bay	—	X	1	1
J	Yard islands	—	—	—	—
K	Long Point	X	—	—	—
L	Squaw Cove	—	X	0	—
M	Rattlesnake Cove	—	X	0	—
N	Five Finger Point	X	X	0	—
O	Long Island	—	—	—	—
P	Mink Island	X	X	1	1

Methods

In May 1999 a field biologist was hired to determine the abundance, distribution, and reproductive success of loons of Squam Lake. Data were collected on territorial pairs (defined as a pair of loons defending a territory for at least 4 weeks) and single birds (adults that had not established a pair bond lasting 4 weeks). Nest sites were mapped on 1:24,000 USGS topographical maps, and hatch dates were calculated by counting 29 days from the onset of incubation. Information gathered on successful nests included number of chicks, number of unhatched eggs, and chick survival. Field biologists also collected data on return chronology, adult return rates, mate fidelity, and territory faithfulness for banded birds, and speculated on the cause of failed nests (Taylor and Vogel 1997).

At the first sign of nesting, or with the establishment of a brood site, protective signs and float lines were placed in areas of high visibility to restrict boats from the area. When field biologists were present, they restricted boat traffic in sensitive areas under the authority of the New Hampshire Marine Patrol. Nesting platforms ("rafts"), which provide artificial nest sites, were constructed by volunteers or by field biologists according to specifications provided by LPC (Figure 2). Rafts were deployed at sites where established pairs had experienced successive nest failures due to artificial water level fluctuations or shoreline predation (LPC, 1985, 1990, 1997). Rafts do not serve to attract loons to water bodies with unsuitable territories (McIntyre 1975).

Figure 2. A Diagram of Loon Nesting Raft Configuration



Abandoned loon eggs were collected as part of the survey. Collection of eggs from nests occurred when birds were observed to be off-nest for over 24 hours. If an egg was cold or obviously addled, it was marked with an "X" in pencil. If the "X" was in the same position by the following day, indicating the egg had not been turned, the egg was collected. Eggs were frozen and stored in LPC's sample freezer for later processing. Each egg was accompanied by a biological collection report with information regarding history of the nest, number of eggs, reason for failure, and fate of other eggs in the clutch. All samples were sent to the University of Pennsylvania for mercury analysis.

LPC occasionally received reports from the public about dead or dying loons, and responded promptly. Live birds were brought to local veterinarians for examination and treatment or euthanasia. All carcasses, accompanied with observation data, were sent to Tufts University Wildlife Clinic in Grafton, MA for necropsy. Postmortem results were assigned to one of three categories: (1) "boat trauma," evidenced by massive internal injury incurred from blunt trauma, (2) "loon trauma," evidenced by punctures and lacerations on the head, neck or sternum, which are indicative of loon attacks, and (3) "other," including mortality due to predation, monofilament fishing line, lead, parasites, or infection (Pokras, In Press).

Loon families were captured at night using a combination of spotlighting and playback recordings (Evers 1993). Captured birds were banded for individual identification using unique color-marked bands and numbered USFWS aluminum bands. Each bird was weighed, two of the second secondary feathers were removed at the base of the quill, and a blood sample was taken from the leg vein.

Results and Discussion

During the 1999 field season, 65 person days were spent surveying Squam Lake. Return rates will be available in subsequent years as Squam's banded population increases. At Lake Umbagog in northern New Hampshire, a similar multiple territory lake, 90 percent of males and 91 percent of females returned to former territories (D.C. Evers pers. commun.). Of the 16 territories established by pairs on Squam, 11 (69 percent) of the territorial pairs attempted nesting in 1999. Seven (63 percent) of these pairs were successful in hatching a single chick. Five chicks (71 percent) survived. Four nest failures were recorded, with no re-nest attempts observed in any of these territories.

Nine loon-nesting rafts were floated on Squam Lake in 1999 (Figure 2). Five of these rafts were used for nesting, and these pairs fledged three chicks. Raft-hatched chicks on Squam contributed 60 percent of total surviving chicks. The 1999 data from Squam Lake are consistent with the 23-year state mean ratio of nests per territorial pair, both nearing 70 percent. However, the number of chicks hatched per territorial pair (44 percent) on Squam Lakes in 1999 is dramatically lower than the state average of 68 percent chicks per pair.



The character of Squam Lake is strongly identified with the presence of loons, and the economy benefits from the tourism industry related to them, but increasing human disturbance may be negatively impacting the birds. Two agencies run regular pontoon tours retracing key scenes from "On Golden Pond," and observing loon families. LPC received numerous phone calls reporting loon disturbance by tour boats, and the Squam field biologist several times requested that tours maintain a 500-foot distance from loon families.

Although analysis of eggs, feathers, and blood collected from loons on Squam Lake indicate that birds are not at risk of reproductive failure due to contaminants, the 1999 field data highlighted a sobering result of increased human activity. Statewide, lead poisoning from the ingestion of lead fishing weights resulted in the death of 10 adult loons, 2 of which were from Squam Lake. One loon was collected from the Heron Cove territory; the second was found in a nonterritorial area. Intensive education campaigns promoting the use of nonlead fishing tackle, a recent alternative to the lethal lead sinkers used by many anglers, have been in place for several years. However, it took loon mortality data, recorded by LPC and Tufts University of Veterinary Medicine, to help pass New Hampshire House Bill 1196 into law effective January 2000. The bill prohibits the use of lead sinkers weighing 1 ounce or less and jigs less than 1 inch along the axis on freshwater lakes and ponds. The reduction of this source of lead in the environment should decrease this type of mortality.

Aggressive interactions among loons at Squam, where the density is relatively high, also have a negative impact on reproductive success. Density-dependent pressures can increase loon intrusion rates, which can disrupt established pair bonds, interrupt nest attendance, and reduce parental care of chicks. Preliminary analysis of the past 12 years of reproductive data shows a tendency toward fewer chicks surviving to fledge, and fewer eggs hatched by pairs attempting to nest.

The LPC's work toward evaluating raft management on Squam Lake continues, as do our monitoring and education programs. Our stewardship efforts strive to restore and maintain New Hampshire's loon population as an important part of the region's ecosystem. We believe that a healthy coexistence of humans and loons can be a reality, and we continue working toward that goal. 🦉

References

- Evers, D. C. 1993. A replicable capture method for adult and juvenile Common Loons on their nesting lakes. In: *Proceedings From the 1992 Conference on the Loon and Its Ecosystem: Status, Management, and Environmental Concerns*. S. Stockwell (ed.). North American Loon Fund, Meredith, NH. pp. 214-220.
- Loon Preservation Committee. 1990. *Turning Point: The Calling Continues: Loon Preservation Committee 1976-1990 15-year report. Internal Report*. Loon Preservation Committee, Meredith, NH.
- McIntyre, J. 1975. *Biology and Behavior of the Common Loon (Gavia immer) with reference to its adaptability in a man-altered environment*. Ph.D Dissertation, University of Minnesota, Minneapolis.
- Noon, J. 1990. *The Squam Lakes and Their Loons*. Loon Preservation Committee, Moultonboro, NH.
- Pokras, M., R. Miconi, K.M. Taylor. In press. Mortality in breeding loons: how big a factor is trauma? *Loons: Old History and New Findings. Proc. 5th Symposium*, North American Loon Fund, Guilford, NH.
- Ridgeley, B.S. 1988. *Birds of the Squam Lakes Region*. Squam Lakes Association, Holderness, NH.

Taylor, K., and H. Vogel. 1997. *Summary of Loon Preservation Committee Research and Management Activities for the 1997 Field Season. Internal Report.* Loon Preservation Committee, Moultonboro, NH..

Wood, R., J. Fair, C. Mauhs-Pugh, and K. Neilsen. 1985. *The Calling Continues: Loon Preservation Committee 1976-1985 10-year report. Internal Report.* Loon Preservation Committee, Meredith, NH.

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Loon Proposal

At the March Fisheries and Wildlife Board meeting, MassWildlife Assistant Directors Dr. Mark Tisa and Dr. Tom French presented information relative to a proposed ban on the use of all lead sinkers for the taking of fish in Quabbin and Wachusett Reservoirs. The proposed ban is in response to necropsies of Common Loons conducted at Tufts University School of Veterinary Medicine which found ingested lead fishing gear to be the single largest cause of mortality for adult loons in New England. Quabbin and Wachusett are the two most important nesting sites for loons in Massachusetts.

MassWildlife News (4/14/00, #4)
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