

LOON CALLER

VERMONT CENTER FOR ECOSTUDIES



Vermont Loon Conservation Project



Intruder loon interacting with a pair

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Social Chaos and Struggling Loons on Squam Lake, NH

BY ERIC HANSON

In the spring of 2005, New Hampshire's Loon Preservation Committee (LPC) documented the disappearance of 7 of 16 loon pairs that had nested the previous summer on Squam Lake. The loss of so many established, experienced adults allowed new loons to fill vacant territories over the following several years; most of the territories from 2004 are now re-occupied.

This territorial turnover has led to what we might call social chaos. Non-breeding loons frequently intrude into the re-occupied territories, disrupting nesting, driving out the remaining established pairs, and in some cases, killing chicks. While these behaviors are typical of territorial disputes among loons, the effects on Squam Lake are amplified because of the number of territories in flux. In addition to 2005's disappearance of 7 loon pairs, mortality on Squam Lake has been unusually high ever since, perhaps compounding the instability among the recently established pairs. Causes of death have varied but include lead fishing gear (5 birds), collisions with boats (2), and gunshot wounds (1).

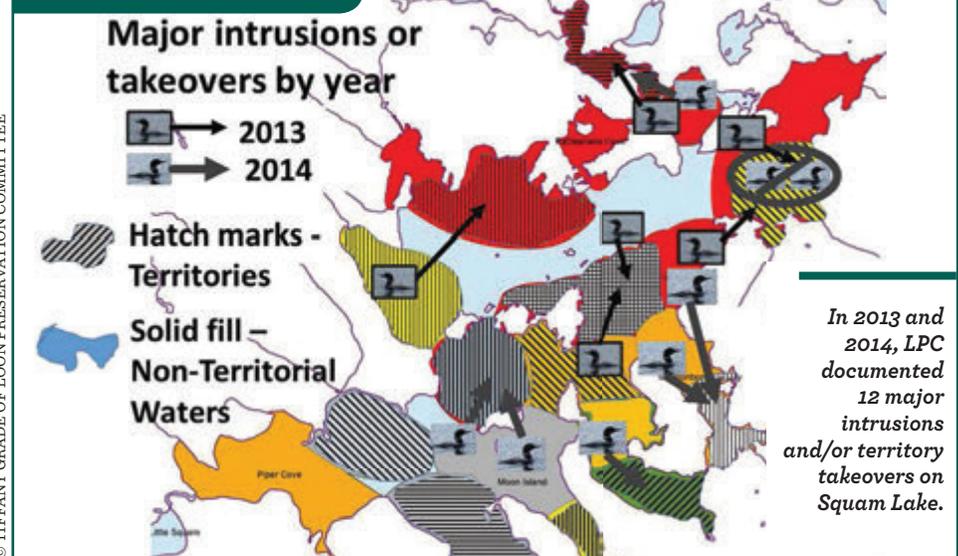
Loons thrive in stable lake environments with a stable social structure,

and Squam's loons have had neither since 2005. Their breeding success reflects this social instability. Between lack of nesting attempts, failed nests, and chick loss, an average of only about 2 chicks have fledged annually since 2008, from 10 to 15 territorial pairs, compared to an average of 7 chicks in the years 1995-2004. It has been 10 years since this chaos unfolded, and there is no indication that the social structure of Squam Lake loons will

stabilize anytime soon (see map of intruder activity in 2013-14, below).

Research is underway to determine what caused the major loon disappearance between 2004 and 2005. Did the birds die, or move to other territories? Whatever caused this crash, it appears to have been an episodic event, as we have not seen similar, severe population declines since. LPC has evaluated many potential factors: winter and summer mortality, movement of loons to nearby lakes, changes in lake food web structure, and environmental contaminants. While most of these causes have been ruled out, elevated contaminant levels (such as pesticides and flame retardants) in loon eggs and crayfish have been found in the territories from which most loons disappeared. The source of these contaminants remains a mystery (they have been detected in the least-developed and least-accessible parts of the lake), as is their role, if any, in the loon population crash. Research into this worrisome situation continues—visit www.loon.org/squam-lake-study.php to learn more.

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The Vermont Center for Ecostudies (VCE) is a nonprofit organization whose mission is to advance the conservation of wildlife across the Americas through research, monitoring, and citizen engagement.

Vermont Loon Conservation Project is a joint program of the Vermont Center for Ecostudies (VCE) and Vermont Fish and Wildlife Department (VFWD).

The VLCP's mission is to restore and maintain Vermont's Common Loon population through monitoring, management, education, and research.

The Vermont Fish and Wildlife Department's mission is to protect and conserve our fish, wildlife, plants, and their habitats for the people of Vermont.

Volunteer information and VLCP publications are available on the VCE website: www.vtecostudies.org

Communications about the VLCP and the *Loon Caller* may be addressed to:

ERIC HANSON,
VLCP Coordinator
PO Box 22, Craftsbury, VT 05826
(802) 586-8064
ehanson@vtecostudies.org



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VERMONT CENTER
OF ECOSTUDIES

Uniting People and
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PO Box 420,
Norwich, VT 05055

When Do Loons Depart in Autumn?

When do the loons leave your lake to migrate for the winter? People report loons departing as early as September and as late as December. We receive many questions about what drives the timing of fall migration and what explains the variation. There are many hypotheses, from limited resources on smaller lakes, to chick maturity, to ice formation. The truth is, no one knows for sure, and chances are, the reasons vary among sites, and perhaps among years.

In fact, it can be a challenge, when observing unbanded birds, to know whether absent loons have truly left for migration or just moved temporarily to another nearby body of water. In 2013-14, Lee Attix of the Biodiversity Research Institute monitored 32 loon territories in Maine and New Hampshire from September through late November. Most of the adults were banded, allowing him to differentiate males and females. Some of the major findings from his study include:

- Paired adults left separately – 62% of time females departed first, on average just over 2 weeks ahead of males.
- Youngest chick when first adult departed in early September: 8 weeks old.
- Average age of chick when last adult departed: 17 weeks old.
- In 2-chick clutches, one chick occasionally left before the second adult departed.



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➤ On average, the last chick left 3 days after the last adult. In 3 cases, the last chick left 22-37 days after the last adult. The last adult's departure might be a clue for the chick to follow suit, but apparently not always.

➤ When an adult leaves its breeding lake, it often moves to a nearby water body and not immediately to the ocean.

➤ *Average departure dates:* first adults: 10/10 (range 9/3-11/2), second adults: 10/27 (range 9/19-11/20 or later) and last chicks: 10/30 (range 9/19-11/20 or later)

Knowing more about migration departure schedules could improve our estimate of chick survival rates and help us understand the implications of climate change and changing weather patterns on loons.

For example, a few years ago when Lake Winnepausaukee remained unfrozen until January, loons remained there so long they began their winter molt, lost their flight feathers, and were unable to migrate when the lake eventually froze. About 20 loons perished on Winnepausaukee that winter.

—E.H.

Why Do Loon Pairs Take a Year Off from Nesting?

Each year, about 20 to 30 percent of Vermont's territorial loon pairs take the year off. The pair is present and defends its territory, but for some reason does not nest. What is behind these loon sabbaticals? Many factors could trigger a pair to take a break from raising chicks for one or more years, including changes in water levels, mate switches, intruder loon activity, and marginal habitat.

Over time, VLCP's monitoring has recorded seven pairs that did not nest for three or more consecutive years. Of these, four pairs occupy larger lakes with above-average intruder loon activity. Another inhabits May Pond, which frequently sees intruder, non-breeding loons from nearby Lake Willoughby or Crystal Lake. My theory is that the relative proximity of non-breeding loons has prevented formation of a strong, durable pair bond on these lakes.

In contrast, some lakes have been remarkably consistent and successful. VLCP has documented 19 territories that have seen breeding attempts in every year since they first supported loon nesting. Particularly notable are four such territories where nesting began in the late 1980s to mid-1990s: Peacham Pond north, Forest Lake, Spectacle Pond, and Zack Woods Pond. These territories have annually hosted nesting pairs, despite the likelihood that a few mate switches occurred through the years. —E.H.



LAKE PROFILES:

The Averills and Forest Lake

OVERVIEW: In a corner of Vermont few visitors reach, in the shadow of Brousseau Mountain near the Canadian border, lie the Averill Lakes (Great and Little) and Forest Lake. My father-in-law, Gilles Molleur, lived up the ridge from Great Averill as a boy. Now in his 70s, he joins me almost every spring to place nesting rafts and signs on these pristine waters. As we canoe across the 800-acre Great Averill, Gilles recounts stories of hardship and joy, living and farming on this tough land in the 1950s as the eldest of 15 siblings. He recalls hiking for miles around the lake and catching trout in remote beaver ponds for the family’s dinner. Today, both Averill Lakes host two loon pairs, catching fish to feed their families.

LOON HISTORY: Back in 1978, when monitoring of Vermont’s loons began in earnest, Great and Little Averill each supported a single loon pair. The Little Averill territorial pair has been present ever since, and a second pair established a territory in 2009. Despite the long-term nesting record, nests on natural sites have been largely unsuccessful, due to abandonment, shoreline predation, and water level fluctuations. When taking to rafts, however, Little Averill pairs have successfully fledged chicks in 12 of 14 nesting attempts.

The Great Averill pair that was present from 1978 to 1982 disappeared from 1983 until the late 1990s, when a pair re-colonized. A second pair has nested there since 2010.

On nearby Forest Lake, a loon pair took up residence in 1994 and has enjoyed more success than any of the Averill pairs, producing 24 chicks from 21 nesting attempts.

HUMAN IMPACT: Both Averill lakes provide water for the Coaticook River Power Company. Both are also prone to “flashing” – rapidly rising water during heavy rain events. On Little Averill, this results from a narrow outlet at the dam. On Great Averill, it is more due to the large watershed that feeds this lake. While Coaticook

Gilles and Willow on Little Averill Lake.



© ERIC HANSON

Power makes every effort to stabilize water levels during the loon nesting period, it is a real challenge to prevent flashing, due to dam design and the unpredictable nature of thunderstorms.

Given the propensity for rapid water level fluctuations when lakes “flash,” and the unsuccessful history of natural nest sites, the VLCP maintains four nesting rafts on the two Averill lakes. The natural nest site on Great Averill used in the early 2000s has been underwater for several years, due to maintenance of higher water levels. A nest on a raft will neither be flooded by a rapid water level rise, nor stranded and vulnerable to predation or abandonment when water levels drop. Loons on Forest Lake also use a nesting raft, which was placed after several years of shoreline predation in the mid-1990s.

Although there are now more people and cottages on these three lakes than in the 1950s, their remoteness has enabled them to remain relatively free of human disturbance. That’s good news for loons, and it means little management intervention is required by the VLCP. We place nest warning signs around the Little Averill – West pair’s nest site. The long, open sandy beach near this site is a popular destination for boaters and picnickers. The Forest Lake loons have provided much pleasure for guests at Quimby’s Resort, the lake’s only settlement, over the past 20 years. Maintaining rafts on each lake requires time and resources, but for me it’s a welcome excuse to paddle these waters with Gilles each May, when all is quiet and it’s almost possible to imagine we are still back in the 1950s. —E.H.

HOW YOU CAN HELP

Please support the Vermont Loon Conservation Project and Vermont's loons through a tax-deductible contribution to the Vermont Center for Ecostudies today.

YOUR DONATION SUPPORTS:

- Statewide loon monitoring
- Loon nesting platforms and nest warning signs
- Volunteer coordination
- Public outreach programs
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- Research on threats to loons

Constituents receive the *Loon Caller* and VCE's biannual *Field Notes*.

Mail your donation to:
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VLCP is funded in part by the Vermont Fish and Wildlife Department's Nongame Wildlife Fund.

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VLCP would like to thank its many volunteers and contributors for their continued support.



Red-Throated Loon



Pacific Loon



Yellow-beaked Loon

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Meet the Other Loons

Unlike Common Loons, the Northeast's only nesting loon, North America's four other loon species are largely confined as breeders to tundra lakes far north of Vermont. All loons are fish-eating divers and build mound-like nests of vegetation at the water's edge. Each species is territorial in summer, although Red-throated Loons have been known to nest close to one another on larger lakes.

RED-THROATED LOON (RTLO)

- The smallest loon at 2.5–5 pounds (Common Loons weigh 7–15 pounds).
- Nests on small ponds, usually less than 1 acre in size.
- Most widely distributed loon species, breeding in far northern Eurasia and North America.
- North American RTLO usually winter on the east and west coasts of North America. Eurasian RTLO winter as far south as the Mediterranean Sea and southern China. Migration routes vary; recent research revealed that two birds that nested near each other north of Hudson's Bay migrated to the Chesapeake and Japan, respectively.
- Unlike Common Loons, which undergo a complete molt on the ocean in February and early March, most RTLO molt in the fall on Hudson's Bay before migrating to the East coast.
- RTLO is the only loon species that does not carry young on its back and the only loon that will carry fish in flight to deliver to young.

PACIFIC LOON (PALO)

- Likely the most abundant loon globally, with upward of 1–1.5 million birds.
- Slightly larger than Red-throated Loon, at 2.5–6 pounds.
- Breeds from Hudson's Bay to Alaska, on boreal forest ponds and arctic tundra lakes.
- PALO have a purplish throat and gray head (Arctic Loons have greenish throat).

- PALO is the most social loon species – found in flocks of 1000+ during winter.
- PALO overwinters along the Pacific coast from Alaska to Mexico.

ARCTIC LOON (ARLO)

- ARLO is a very rare bird in North America, typically found only during the non-breeding season.
- ARLO overwinter on the east coast of Asia and the Mediterranean region.
- Very similar to Pacific Loon, with slightly different plumage coloration and calls. ARLO and Pacific loons were recently split into two separate species—they can be difficult to distinguish.
- Breeds in northern Asia and Europe.
- Rafts are used in Scotland to help prevent flooding of nests.

YELLOW-BILLED LOON (YBLO)

- YBLO overwinter on the west coast of North America and east coast of Asia
- YBLO are most closely related to Common Loon; similar size at 8–13 pounds.
- YBLO require larger lakes for nesting. Nests in high arctic tundra; avoids forested areas.
- Breeding distribution is almost circumpolar, across Asia and western North America.
- Has the smallest global population of any loon: estimated at 16,000–32,000.
- Conservation concerns include small population, oil and gas development, and commercial fishing by-catch.

(Excerpted from *Birds of North America* online species accounts by Cornell Lab of Ornithology and American Ornithologists' Union and Carrie Gray of Biodiversity Research Institute)