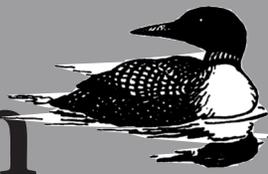


# Loon Caller



Summer 2014



## Vermont Loon Conservation Project

A program of  
the Vermont Center for Ecostudies and  
Vermont Fish and Wildlife Department



## Assessing the Importance of Rafts, Nest Signs, and Rescues on Our Loon Populations

By John Cooley, Loon Preservation Committee, NH and Eric Hanson, VCE

Have nesting rafts and nest warning sign buoys aided the recovery of New England's loon population? If we rescue a loon from entanglement in fishing line, it certainly matters to the individual loon, but does it impact the population as a whole? VCE and the Loon Preservation Committee (LPC) took a closer look at Vermont's and New Hampshire's loon productivity from territories with and without rafts and signs to evaluate the contributions of these management tools to loon population growth rates. We also considered the effect of loon rescues.

### Nesting rafts

The number of nesting rafts placed throughout the Northeast varies by state. Vermont and New Hampshire use the highest number of rafts per (loon) capita. In Vermont, we deployed relatively more rafts in the 1990s and 2000s, when loons were on the state endangered species list. Following Vermont's loon population recovery and formal delisting, we now only place new rafts when there is a direct conflict with land use or flooding from dams, preferring to encourage loons to use natural habitats



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whenever possible. In Maine, most rafts are used on reservoirs where water levels fluctuate over 1 foot. Very few rafts are used in New York or on non-reservoir water bodies in Maine.

Nesting rafts do bolster loon nesting success, as demonstrated in  
*(Continued on page 3)*

## What Have We Learned From Color-Marked Loons?

Edited by Eric Hanson from an interview with Dr. Walter Piper by Erica LaMoine, Wisconsin LoonWatch program, *Tremolo* Spring 2012.

My first foray into loon work took place in 1991 with a big net and powerful light, catching and banding loons in northern Michigan, Minnesota, and Wisconsin. Placing color bands on loons' legs (attaching 3 plastic color bands and a metal US Fish and Wildlife Service band) provides a unique color combination on each loon, allowing researchers to identify and follow individual birds for years. The Vermont Loon Conservation Project (VLCP) bands loons we rescue from fishing line entanglement, road crashes, or landing on ponds too small to permit take-off. Banded birds have yielded many discoveries about the life history of this iconic species, in Vermont and across the region. A few highlights:

### Life History: Aging and Mating

Despite the many challenges that loons face from habitat loss, human

disturbance, and exposure to lead and other toxic substances, some wild loons live well into their twenties. A loon I helped capture and band in 1991 on Little Bearskin Lake in Wisconsin was 25+ years old when last observed in 2010. Adult survivorship is about 92% per year. Loons do not necessarily mate for life, although a pair might stay together for many years.



### Territory Selection

Dr. Walter Piper of Chapman University has studied loon behavior for the past two decades on 100 northern Wisconsin lakes, where he has banded 1,187 loons since 1997. He has documented the return to their natal lake area of 239 adults banded as chicks. Of those 239 returning adults, 84 have settled on territories. The return rate of adult loons to their breeding lake is about 87% each year.

*(Continued on page 2)*

### Vermont Loon Conservation Project (VLCP)

We've changed our name to reflect our success and to continue taking on current and new conservation challenges in the future.

## Loon Caller 2014



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

**Vermont Center for Ecostudies**  
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### Vermont Loon Conservation Project

The 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](http://www.vtecostudies.org).

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

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(Color-Marked Loons - Continued from page 1)

Dr. Piper recently discovered that banded chicks returning as adults tend to select territories similar in lake size and pH to their natal territories. Piper has called this "natal site matching." If a chick was reared on a small acidic lake, for example, it will likely establish a territory on a lake of similar size and pH, even though these parameters may not represent the best available habitat and water quality. This is remarkable because when first-year Midwest loons leave their natal lake, they encounter a variety of water bodies and water quality during migration – from inland lakes, to the Great Lakes, to the Gulf of Mexico, where they stay for their first 2 to 3 years of life. Even so, their establishment of territories on lakes nearby and of similar quality to their natal lakes indicates that their experience as chicks creates an affinity for a particular habitat type and location.



Banded loon on Zack Woods Pond

Both males and females actively defend their territories from other loons who challenge their claim. If a challenge is successful, the loon that has been "evicted" might move to another territory nearby. Dr. Piper has found that the new territory will more closely resemble the previous territory rather than it will the natal one. Piper calls this "breeding site matching," and the key qualities appear to be pH and water clarity (rather than lake size). For example, if a loon learns to fish in murky waters on that first territory, it might specialize on feeding in murky waters (stealth hunters) and choose that type of lake again later in life. Clear water feeding specialists (chase hunters) tend to stay on clear lakes.

#### Vocalizations and Territory

Dr. Charles Walcott of Cornell University and Dr. Jay Mager of Ohio Northern University have extensively studied loon vocalizations. They discovered that the frequency of the yodel (the territorial call given by males) is directly proportional to an individual male's size. The yodel is an important signal that helps males claim and defend their territories. A low-frequency yodel may indicate to an intruder that the territorial male has a relatively small body mass and might therefore represent a good prospect for a territorial dispute and potential takeover.

#### Environmental Toxins

Between 1998 and 2003, VLCP participated in a regional study of mercury in loons, banding and sampling about 32 Vermont birds. Findings revealed that this potent neurotoxin bioaccumulates in loons, negatively affecting adult behavior and chick productivity. Vermont's loons were found to have low to moderate levels of mercury, relative to higher levels in birds of southeastern New Hampshire and parts of Maine. In the coming years, we plan to band and sample more Vermont loons as part of a national loon health assessment study to determine baseline parameters in blood and plasma chemistry (kidney and liver function measures), parasites, heavy metals, persistent contaminants (PCB, DDE), and other environmental stressors.

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	Vermont (statewide)	New Hampshire (statewide)	Maine (Rangely Lakes reservoir region)	New York (subset of highly monitored lakes)
# territorial pairs monitored	96	270	153	52
# rafts placed	38	79	70	10
% of territories with rafts	26%	12%	24%	10%
% chicks hatching from rafts	41%	20%	42%	21%
# territories with signs	41	76	0	0
% of territories with signs	43%	28%	0	0
% chicks hatching from territories w/ signs	57%	40%	0	0

Assessment of loon nesting raft and nest warning sign use in the northeaster U.S. from 2008-2013 (values are averages)



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Rescue of loon chick from small pond in Albany, VT

50% increase in success for nests with high exposure to people; this translates into many loon chicks over the years. New Hampshire uses warning signs on 79 of its 270 territories, whereas Maine and New York do not use nest warning signs .

(Rafts, Nest Signs, and Rescues - Continued from page 1)

a Maine and New Hampshire study, in which Chris DeSorbo et al. (2007) found that rafts increased successful nesting by an estimated 17-57%. These results are reflected in Vermont's average loon nesting success rates since 2008 (rafts 88%, islands 74%, shoreline/marsh 64%). Rafts likely reduce two of the largest sources of nest failure: predation on eggs and nest flooding.

**Nest Warning Signs**

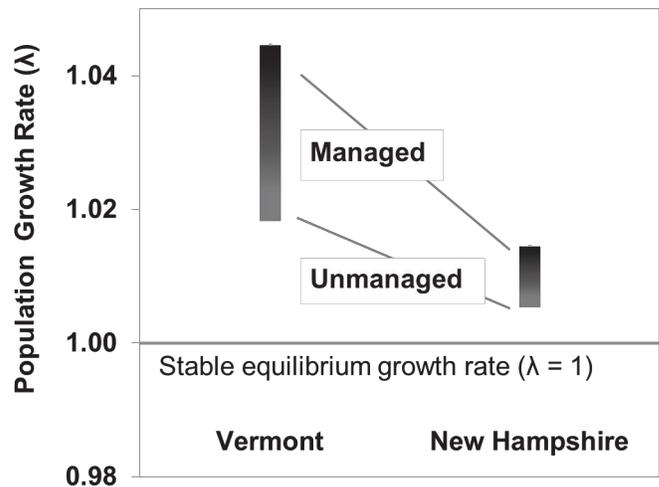
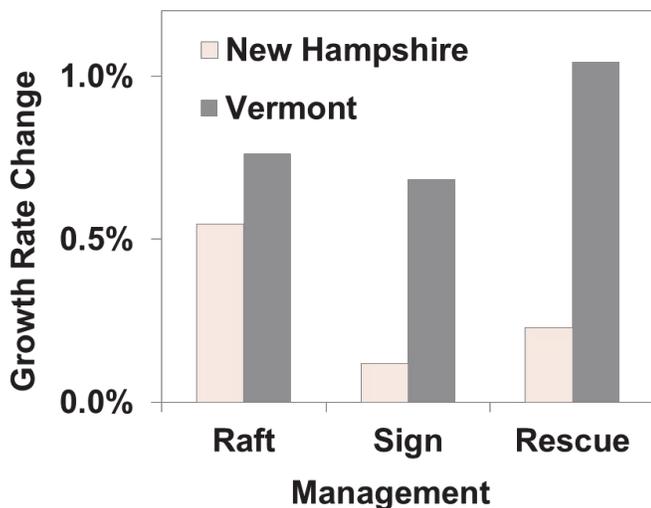
In Vermont, nest warning signs appear to positively affect loon productivity. A 2009 VCE study examined nest success from the 1980s to 2008 and found that nest sites with warning signs were 84% successful (n=580) compared to 72% for nests without signs (n=483). In a subset of sites considered to be "highly exposed" (i.e., those most prone to human disturbance), nests with signs had a success rate of 81% (n=246) compared to 55% for nests without signs (n=143). Signs contributed to a nearly

**Rescues**

Since 2000, VCE has rescued 45 loons in Vermont from crash landings (17), entanglement in fishing line (13), entrapment in ice (6), ponds too small to allow take-off (6), and other situations (3) – an average of about 3 loons per year. New Hampshire's LPC rescues about 2 loons per year, but often deals with over 15 mortalities annually. Many of these deaths are caused by lead fishing gear, despite regulations restricting its use. In Vermont, we have retrieved about 5 dead adult loons per year since the early 2000s. As noted in the graph below, rescues have a greater impact than either rafts or signs on growth of Vermont's loon population.

**Demographic models – assessing what factors contribute to a growing population**

John Cooley of LPC took Vermont's and New Hampshire's loon population data and used a two-stage density-independent matrix projection model (Gear *et al.* 2009 ) to estimate managed and



Impacts of management actions on Vermont's and New Hampshire's loon population growth rate

(Rafts, Nest Signs, and Rescues - Continued from page 3)

unmanaged population growth rates (Heppell *et al.* 2000). In the first graph, modeling results indicate that nest site management (raft or sign) and rescues have had a substantial impact in both states on the population growth rate. The second graph shows that management efforts in Vermont have likely increased the growth rate from about 1.02 (no rafts, signs or rescues) to 1.04 (with management and rescues). A loon population that is relatively stable would have a growth rate of 1.0 (no increases or decreases), and this difference, while numerically small, is important. Other factors that have contributed to Vermont's growing loon population include management benefits not included in the model (e.g., water level control, outreach to landowners and boaters, possible reduced lead fishing gear mortality). Vermont also had many unoccupied lakes in the 1990s, which set the stage for population expansion as the increasing loon population found plenty of available habitat.

What if we eliminated the use of rafts and signs, and stopped rescuing loons that were in trouble? It seems that Vermont's population might continue to increase more slowly for a while, but the effect on New Hampshire's population would be less certain, especially with their lower productivity and higher mortality rates than Vermont. There can be little doubt that the intangible benefits of these management tools are significant. These activities involve people; the connections people make with loons translate into conservation for both loons and lakes, building awareness and community. The enhanced success of loon nests in territories with signs and rafts surely reflects deepening stewardship by people who share the lake habitats on which loons depend.

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## The Updated Nest Warning Sign

We are in the process of replacing our loon nest warning signs. Some are over 20 years old and are showing their age, with weather-worn materials and even outdated information. Since last fall, we have raised enough funds to replace about one-third of the 260 signs. We started deploying new signs this spring, and will continue to do so over the next two years, as funds become available.

We are grateful to all the lake associations and individuals who have helped to purchase signs for their favorite lake, including Chittenden, Derby, Dunmore, Echo, Eden, Elligo, Green River, Groton, Harvey's, Holland, Joe's, Kettle, Little Hosmer, May, Metcalf, Newark, Nichols, Ninevah, No. 10, Peacham, Pensioner, Seymour, Spectacle, Sunset, and Woodbury. We received a grant from the Vermont Watershed Grant program of the Vermont Agency of Natural Resources to purchase and

install signs as well. If you would like to contribute to this effort, please either send VCE a check or go to the online fundraising site called "Crowdrise," where you can pick a lake and make a donation (<http://www.crowdrise.com/vtecostudies>). Scroll down and hit "more fundraisers" to see the entire list of 52 lakes, and watch the progress of your lake in raising funds for new signs.

### Please support the VLCP, VCE, and Vermont's loons through a tax-deductible contribution today.

#### Your donation supports:

- 1) statewide monitoring efforts
- 2) nesting platforms and nest warning signs,
- 3) volunteer coordination
- 4) public outreach programs
- 5) loon rescues and
- 6) research on threats to loons

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

#### Donations can be mailed to:

Vermont Center for Ecostudies  
PO Box 420, Norwich, VT 05055

#### Or Online:

[www.vtecostudies.org](http://www.vtecostudies.org)

(Include a note stating the donation is for the VLCP)

VLCP is funded in part by TransCanada, a VT Watershed Grant, the Nongame Wildlife Fund and private donations.

Please support the Nongame Wildlife Fund by purchasing the Conservation License Plate and through the tax check-off on your VT income tax form.

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

