

The New Hampshire Loon Recovery Plan: Year Five Final Report for Blake-Nuttall Fund



Harry Vogel
Senior Biologist and Executive Director
Loon Preservation Committee
P.O. Box 604, Lee's Mills Road
Moultonborough, NH 03254
603-476-5666 www.loon.org

August 2016

The New Hampshire Loon Recovery Plan: Year Five Final Report for Blake-Nuttall Fund

Background

The loon is an iconic symbol of New Hampshire's pristine lakes and ponds and an important part of New Hampshire's natural character and natural resource-based economy. The New Hampshire Business and Industry Association recognized the importance of loons when it cited our loon population as a key indicator of the quality of life in our state.

Loons are also recognized as sentinels of environmental quality because they are sensitive to contaminants and other hazards in lakes and ponds. Declines in loon populations or breeding success like those recently observed in New Hampshire may indicate impairments to lake ecosystems and could foretell declines of fisheries and other wildlife as well.

The Loon Preservation Committee (LPC) was created in 1975 because of concerns about dramatic declines in New Hampshire's loon population. The Committee consists of a network of dedicated individuals who work to further the organization's mission of restoring and maintaining a viable population of loons throughout New Hampshire; monitoring the health and productivity of loons and loon populations as sentinels of environmental quality; and promoting a greater understanding of loons and the natural world. Through its long-term monitoring LPC has created the most comprehensive database of loon population and productivity statistics in the world, and our management and outreach activities have more than tripled New Hampshire's loon population, despite dramatic increases in shoreline development and human use of lakes.

Current Status and Threats

The Loon Preservation Committee has monitored loon populations and productivity throughout the state since 1975 to assess threats to loons and to measure our success in recovering New Hampshire's loon population. LPC's monitoring recorded five consecutive years of declines in the number of loon chicks on New Hampshire's lakes from 2004 to 2008 and significant population declines or mortality incidents on the state's three largest lakes from 2001 to 2008. These declines threatened to undo the hard-won gains that LPC's research, management, and educational efforts had achieved and were the impetus for the creation of the Loon Recovery Plan (LRP).

In 2014, the fifth year of the Loon Recovery Plan's implementation, Loon Preservation Committee staff and volunteers counted 289 pairs of loons on lakes in New Hampshire. Despite an impressive increase in numbers since LPC's inception, loons remain a threatened species in the state and face growing challenges. Lead fishing tackle continues to be the largest documented cause of death of adult loons in the state; and other anthropogenic stressors, including mercury, other contaminants, and human disturbance, continue to affect loon breeding success. LPC's groundbreaking research has revealed high levels of PBDE (flame retardants), PFOS (stain repellants), and a host of other contaminants in eggs that failed to hatch.

The Loon Recovery Plan

The Loon Preservation Committee developed its Loon Recovery Plan to inform and direct LPC's work to promote a healthy and growing loon population throughout New Hampshire. The Loon Recovery Plan includes:

1. Analyses that estimate New Hampshire's state-wide carrying capacity for loons to establish the number of loons New Hampshire's lakes can and should support;
2. Population models that measure the effects of man-made stressors on loon survival and breeding success to target our limited resources toward mitigating these stressors;
3. An assessment of our ability to help loons cope with these challenges through research, management, and outreach/education; and,
4. Strategies that will be implemented to increase loon populations to historical, pre-decline levels of an estimated 450 loon pairs – almost 200 pairs above recent levels.

The goal of the Loon Recovery Plan is to recover a viable population of loons in New Hampshire as a component of a healthy regional population and ecosystem. We anticipate that the achievement of this goal will require increased and sustained levels of monitoring, research, management, and outreach activities in New Hampshire for the foreseeable future. LPC's progress in achieving this goal will be monitored on an annual basis. The Loon Recovery Plan will be revised and updated to reflect LPC's success in achieving its two major objectives (below) in support of this goal, and to address new challenges facing loons in New Hampshire.

Objective #1: Decrease mortality of adult loons resulting from lead fishing tackle, boat collisions, and other human causes from pre-Loon Recovery Plan levels of approximately 8 yearly mortalities to an average of 5.5 mortalities annually (a 31% decrease in human-caused mortality).

Year Five (April 2014 to March 2015) Results: In 2014, LPC staff recovered 19 deceased adult loons. Ingested lead fishing jigs were a confirmed cause of death of five adults. Despite our intensive outreach and legislative efforts, lead fishing tackle remains the largest avoidable cause of death of adult loons in the state. One loon died from lead poisoning from an unknown object; three loons died from fishing line entanglement; and one loon died from a fishing hook injury. Three loons died from trauma: one from injuries caused by another loon and two from unknown trauma. The causes of death of six other loons could not be determined. Therefore, a minimum of ten adult loons collected by LPC died as a direct result of human activity. Human-caused mortality of loons is still disturbingly high, particularly the continuing deaths from lead fishing tackle.

Objective #2: Increase reproductive success of loon pairs to a minimum of 48 chicks surviving to fledge per 100 loon pairs (the breeding rate needed to maintain a stable population) from pre-Loon Recovery Plan levels of 41 chicks surviving per 100 loon pairs (a 17% increase in reproductive success of loon pairs).

Year Five (April 2014 to March 2015) Results: The 289 pairs of loons on New Hampshire's lakes hatched a total of 203 chicks in 2014; 154 of these chicks were surviving as of mid-August and presumed to have fledged from their natal lakes. This represents a

breeding success of 53 surviving chicks per 100 loon pairs – a 29% increase over pre-Loon Recovery Plan levels. This significant improvement lifted loon reproductive success above the breeding rate needed to maintain a stable loon population in 2014.

Strategies to Meet the Objectives

The Loon Recovery Plan outlines specific, measurable strategies to achieve the two major objectives outlined above. These strategies and LPC's progress in carrying them out in Year Five of the Loon Recovery Plan (April 2014 to March 2015) are outlined below:

- a. Increase the number of nesting loon pairs protected by floating signs and ropelines from the pre-LRP level of 61 pairs to 80 pairs. Signs and ropelines educate lake users and provide a barrier to the close approach to nesting loons, thus increasing nest success. Up to five signs are floated around active loon nests.

Year Five Activities: LPC protected 105 nesting pairs of loons with signs and ropelines in 2014, an 88% increase in the number of pairs protected with these measures compared to pre-Loon Recovery Plan levels. Loon pairs protected by signs and ropelines hatched 109 chicks, 54% of the total number of chicks hatched in New Hampshire. New buoy-type signs were tested in 2014 and helped produce chicks from protected nests on Lake Winnepesaukee and lakes in the Monadnock, Seacoast and Lakes regions. These new signs are durable, reliable, and recognizable by boaters because of their similarity to regulatory markers like No Wake Zone buoys, and were clearly effective.

- b. Increase the total number of loon nesting rafts floated in New Hampshire from the pre-LRP level of 54 rafts to 75 rafts each year. These rafts provide alternate nesting sites to loons displaced from traditional natural sites as a result of shoreline development and help protect eggs from water level fluctuations and increased populations of opportunistic predators, such as raccoons and foxes.

Year Five Activities: LPC floated 87 loon nesting rafts in 2014, a 71% increase over the number of rafts floated before implementation of the Loon Recovery Plan. Loons nesting on these rafts hatched 37 chicks, 18% of the total number of chicks hatched in New Hampshire.

- c. Increase the number of LPC exhibits and public presentations made by LPC staff from the pre-LRP level of 58 to 75 per year. These exhibits and presentations encourage a culture of respect and appreciation for loons; illustrate the challenges facing loons in New Hampshire from lead fishing tackle, irresponsible boating, and other human practices that directly and indirectly affect loons; and increase awareness and support for loons and LPC's efforts to preserve them.

Year Five Activities: LPC staff and volunteers gave 129 presentations and exhibits for diverse audiences throughout the state from April of 2014 through March of 2015, a 102% increase over pre-Loon Recovery Plan levels.

- d. Increase the awareness of the public, legislators and decision-makers to challenges facing loons in order to encourage informed discussion and actions that protect loons and other wildlife in New Hampshire.

Year Five Activities: LPC distributed over 2,600 packets of non-lead tackle at The Loon Center, to presentation audiences and in the field in 2014 to educate and encourage anglers to use loon-safe tackle. LPC is a founding member of the New Hampshire Lead and Loons Working Group (partners include NH LAKES, NH Audubon, NH Fish & Game, NH Department of Environmental Services, and US Fish and Wildlife Service). This group was created to ensure a comprehensive and unified message on the dangers of lead fishing tackle to loons and other wildlife and to implement actions to replace lead tackle with environmentally responsible alternatives. As part of this effort LPC provided guidance and secured grant funds to support a Plymouth State University graduate student researching barriers to the use of non-lead tackle and how to most effectively overcome those barriers to safeguard loons and other wildlife. LPC also secured a Senate proclamation for a “Loon Appreciation Day” to focus the attention of Legislators and the public on loons and their challenges and worked with the Environmental Policy Committee of New Hampshire Audubon to comment on other legislation potentially affecting lakes and loons.

LPC distributed 17 press releases in 2014 to inform the public about loons, their challenges, and LPC’s work in support of loons. These efforts resulted in press coverage on New Hampshire and Massachusetts television stations, the New Hampshire Union Leader, The Concord Monitor, The Boston Globe, and news outlets across the country through the Associated Press. LPC’s work was featured on New Hampshire Public Radio and on the “Living on Earth” program, a nationwide public radio program.

LPC’s Facebook page following has grown to 1,320 people (a 54% increase over 2013), and its e-newsletter is now sent to 2,974 people (a 17% increase over 2013). Each e-newsletter directs viewers to the LPC website and the average daily number of visits to the website increased to 567 in 2014 (a 27% increase over 2013). LPC launched its first loon-nest webcam in the summer of 2014 which gave the public and LPC an intimate look into the life of a loon family. We included links to the webcam on the web page, e-newsletter and Facebook page. The webcam resulted in the rescue of an adult loon after the loon’s entanglement in monofilament fishing line was reported on LPC’s Facebook page. This rescue also saved the loon’s nest and resulted in two loon chicks.

- e. Investigate new and increasing challenges to loon survival and reproductive success, including but not limited to contaminants in loon eggs and adult loons; increased weather and temperature extremes predicted in global and regional climate models; and the direct and indirect effects of increasing human populations.

Year Five Activities: LPC continued its collaborative work with Tufts University to collect and necropsy dead loons to determine causes of mortality and its work with the Biodiversity Research Institute and Tufts University to band loons in order to track individual birds and gather blood samples to test for heavy metals, blood parasites, and indicators of general health of loons. Temperature loggers were placed at ten active nests in 2014, at four other

nest sites that remained inactive, and used experimentally in artificial eggs to compare incubation temperatures at raft and natural sites. They remain the best way to pinpoint the impact of temperature extremes associated with climate change on loon nest success. Small geolocator devices that record daily locations throughout breeding, migration, and wintering periods have been placed on six New Hampshire loons over the past three years. The loons must be recaptured and the devices retrieved in order to download the location data. To date, one device has been retrieved. Nest site cameras were placed at 10 nest sites and a live-streaming web-cam was placed at an additional site to document incubation behavior and causes of nest failures. LPC has sent nine unhatched loon eggs from failed loon nests to a laboratory to test for a wide range of contaminants in eggs and help determine possible effects of these contaminants on the health, reproductive success, and survival of loons.

- f. Investigate our ability to mitigate these challenges through new management and outreach activities and enhancements to LPC's current management and outreach efforts.

Year Five Activities: LPC monitored the effectiveness of its expanded site-specific management (nesting rafts, protective signs, and ropelines), including new buoy-type signs and new materials and designs of nesting rafts; continued its work with dam owners to maintain stable water levels during critical loon nesting periods; dramatically increased its traditional and electronic communications through exhibits, presentations, press releases, Facebook and e-Newsletters to inform audiences about loon life history, challenges, and actions that could help loons; and expanded its end-of-season volunteer appreciation events to thank volunteers, reinforce the value of their efforts, and foster a sense of community among LPC volunteers.

Resources/Budget

Funds raised to carry out Year Five Loon Recovery Plan initiatives allowed LPC to employ a part-time seasonal Staff Biologist, a part-time, year-round Outreach/Volunteer Coordinator, and an additional seasonal field biologist to carry out the work outlined in the "Strategies" section above. Year Five funding also allowed the construction and placement of new rafts, signs and ropelines; the development and printing of new educational products; a dramatically increased outreach effort through traditional and electronic media; and the coordination and evaluation of Loon Recovery Plan progress by the Senior Biologist/Executive Director. Blake-Nuttall funds were expended between 2/28/14 and 9/12/14 to fund transport of field biologists and nesting rafts, ropes, and signs to active loon territories; to test loon blood and tissue samples for lead; and to help cover the oversight of monitoring, management, and research activities (see detailed budget, below).

LPC's work to implement the Loon Recovery Plan also benefitted from the in-kind efforts of numerous volunteers who helped monitor loons; built and floated loon nesting rafts; protected nesting loons with "Loon Nesting Area" signs; and educated lake users. A network of more than 900 active field volunteers contributed over 5,800 hours to LPC's field program in 2014. We expect these trends to continue as our volunteers receive improved support and coordination from LPC's expanded outreach & volunteer program. In-kind donations were also received from the Biodiversity Research Institute, LPC's collaborator in banding loons to identify individual

birds and collecting small blood and feather samples for analyses of pathogens and contaminants; and from the Tufts University School of Veterinary Medicine for additional analyses of loon blood samples and necropsies of loons to determine causes of death.

Expense Budget

Item	Total	Blake- Nuttall Funds
Staff (1 seasonal Staff Biologist; 1 part-time Outreach/Volunteer Coordinator; 1 extended season Field Biologist)	\$37,601	\$368.24
Field supplies (rafts; signs; boat gas; mileage)	\$15,118	\$3,500.00
Research (analysis of eggs, livers; \$2,500/sample)	\$22,497	\$131.76
Presentations and volunteer recruitment/coordination equipment and supplies	\$14,315	
Administration (Executive Director & office staff)	\$10,000	
Professional conferences & meetings	\$2,500	
Infrastructure (22% of above)	\$22,447	
Total	\$124,478	\$4,000.00