THE 2007 BREEDING STATUS OF COMMON LOONS IN VERMONT

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ABSTRACT: Vermont's Common Loon population continued to increase in 2007, 2 years after the Vermont Agency of Natural Resources removed the species from the state Endangered and Threatened Species list. The Vermont Loon Recovery Project, a program of the Vermont Center for Ecostudies and the Vermont Fish and Wildlife Department, documented a record high 62 loon nesting pairs and 82 territorial pairs statewide. Of the 62 pairs that attempted nesting, 47 successfully hatched 71 eggs, with 56 chicks surviving through August (chick survival rate 79%, 0.68 chicks surviving per territorial pair). The number of nest failures and chicks lost were slightly higher in 2007 than in 2006, resulting in the same number of chicks surviving through August. There were 71 known and 11 potential territorial pairs (82 total territories). Eight new nesting pairs and 7 new potential territorial pairs were identified. Seven pairs that had nested at least once during the previous 3 years were no longer present. Nine pairs that have nested recently did not nest because of intruder loon activity, high water, or lack of suitable nest sites. Twenty-three nest failures were documented, including 8 re-nests. Six of these re-nests were successful. Causes of nest failure include human disturbance (1 nest), possible predation (4 nests), and flooding (7 nests). The remaining failed nests were abandoned for unknown reasons. The causes of mortality of most chicks were unknown. Six chicks disappeared after interactions with intruder loons, and 1 chick disappeared after a large rain event. Five adult loons and 1 subadult were found or observed dead (2 eagle predation, 2 swallowing fishing gear/line, 2 unknown). An immature loon was observed dead in the ice in late April (Groton). A subadult that had ingested fishing gear was caught and released on Somerset Reservoir. Three loons observed with fishing line around the bill freed themselves. People reported loons caught in fishing line on several ponds, a mortality from a boat hit, and a dead loon in the water, but the loons freed themselves from the line and/or were not found during follow-up surveys. Two loons were rescued from lakes that froze. Four adult loons crash landed on roads or parking lots. Three were successfully released and one is being treated for a broken femur (December 2007). About 210 volunteers surveyed lakes throughout Vermont on 21 July as part of the Loonwatch program, an annual statewide loon count. Loons were observed on 86 of 149 surveyed lakes (occupancy rate of 58%), where observers counted 218 adult loons, 54 chicks, and 9 subadults, an increase in the number of adults from previous years. In 2004, 2005, and 2006, loons were observed on 68 of 98 lakes surveyed (69%), 69 of 122 lakes (57%), and 84 of 133 lakes (63%), respectively. Nineteen of the 62 breeding pairs nested on nesting platforms, 23 on islands, and 20 on shorelines. Thirty-three nesting platforms were placed. Warning sign buoys were placed around 37 of the 62 nests. Volunteers provided technical assistance through the placement and maintenance of nest warning signs and/or nesting platforms on 38 lakes. Twenty-two loon conservation programs were presented to over 510 adults and 200 children statewide.

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INTRODUCTION

In 1977, the Vermont Loon Recovery Project (VLRP) was initiated to assess the status of Common Loons *(Gavia immer)* in Vermont and found that the breeding population had significantly declined (Laughlin 1977). As a result, the VLRP began a loon monitoring and management program in 1978. Numbers of breeding pairs peaked at 19 in 1982, and then dropped sharply to 7 pairs in 1983 for unknown reasons. From 1983 to 1989, Vermont's breeding loon population gradually increased at an average rate of 1 pair per year, stabilized between 1989 and 1994 at 14-16 breeding pairs, then experienced a marked increase over the subsequent 13 years to 62 nesting pairs in 2007. The VLRP is a program of the Vermont Center for Ecostudies (VCE) and the Vermont Fish and Wildlife Department (VFWD). Prior to 2007, the VLRP was a program of the Vermont Institute of Natural Science (VINS).

A major accomplishment was reached in 2005 with the removal of the Common Loon from the Vermont Endangered and Threatened Species list. Thirty years of Common Loon conservation and education by many groups and individuals enabled the achievement of this milestone. Through the guidance of VCE/VINS and the VFWD Nongame and Natural Heritage Program (NNHP), monitoring and management programs were implemented throughout the 1980s and 1990s. In 1998, the Vermont Loon Recovery Plan (Borden and Rimmer 1998) was recommended for approval by the Vermont Scientific Advisory Group (SAG) on Birds and the Vermont Endangered Species Committee (ESC), and approved by the Vermont Agency of Natural Resources (ANR). The recovery plan recommended actions on management, monitoring, research, and education programs to promote the recovery of the species. The Common Loon was designated a state endangered species in 1987 following documentation of its population decline in the early 1980's. The target level to de-list as written in the Vermont Loon Recovery Plan was "40 nesting pairs averaged over 5 consecutive years", with a minimum of 5 nesting pairs in "2 geographically discrete areas." From 2000-2004, the average number of nesting loon pairs was 41, and 6 pairs nested in the southern half of Vermont. The removal of the loon from the Vermont Endangered Species list provides a new challenge of how to responsibly manage a species once it is delisted. The VFWD, with the help of the VCE/VINS and the SAG on Birds, has drafted a post-delisting monitoring and management plan to address the continued threats to loons in Vermont and the species' current dependence on the VLRP's management and educational efforts.

Current monitoring efforts have included locating territorial and breeding pairs, documenting nesting chronology and nest-site locations, recording numbers of eggs hatched and chicks surviving through August, and identifying potential nesting habitat on lakes not known to support breeding pairs. On the third Saturday of July, volunteers survey most lakes and ponds considered suitable for loons as part of the on-going Loonwatch, providing an annual statewide population estimate.

Public education efforts have included presenting slide lectures and discussions, distributing loon conservation fact sheets, educating and training volunteers, and placing signage about loon conservation at lake access areas. Over the past 9 years, extra efforts have been made to educate anglers about the threats of lead fishing gear and to encourage people to use non-lead alternatives. A ban on the sale and use of lead sinkers ½ ounce or less took effect in Vermont in 2006 and 2007, respectively. On most breeding and territorial lakes, volunteer observers have provided technical assistance by actively monitoring loon activity, assisting with management programs, and educating lake-users about appropriate boating behavior when near breeding loons.

Management efforts to increase loon nesting success have included enhancement of loon nesting habitat through placement of artificial nesting platforms, placement of warning sign buoys to reduce human disturbance, coordination with hydroelectric companies and other agencies to stabilize water levels during the nesting period, capture and rescue of injured loons or loons in distress, and law enforcement presence by state game wardens.

Since the mid-1980's, the VLRP has been a joint program between VCE and VFWD/NNHP. The Nongame Wildlife Fund has been the primary funding source for the VLRP (50-70% of budget) for many years, and VFWD has provided technical, law enforcement, and logistical support. Starting in 2006, the VFWD began utilizing federal State Wildlife Grant funding for the VLRP through a nongame bird project

grant. VCE annually hires the VLRP biologist, provides staff support, and raises the remaining VLRP budget through donations and grants.

METHODS

Monitoring and management activities

Monitoring of lakes with breeding and territorial loons

Collection of field data began in late April. The VLRP biologist, VFWD biologists and game wardens, or volunteers surveyed approximately 135 lakes with known histories of loon nesting, occupancy by territorial pairs, or high levels of loon activity on a regular basis (weekly to monthly). This represents an increase from 100-115 lakes over the past several years. Monitoring included recording data on loon behavior, nest-site location, water level, boating activity, and observation of other wildlife and human activity relevant to loon habitat or reproductive success. All observations were conducted with binoculars from a kayak, canoe, motorboat, or the shoreline. Observers collected information on standardized data forms, and regularly updated the VLRP biologist through phone calls, postcards, or e-mail. Over 120 volunteers participated in this intensive monitoring effort. New volunteers were sent detailed written instructions on conducting surveys (Hanson 1996). Nests were located by investigating traditional nest sites and carefully observing behavior of loons on the water. We categorized known territorial loon pairs as those non-nesting pairs present on a given lake in every year since the last documented breeding attempt on that lake. Potential territorial pairs were those that exhibited territorial behavior (e.g., observed together, acting defensively towards a third adult loon, nest searching, copulation) for at least a 6-week period on lakes that lacked a history of recent nesting or regular occupancy.

Management

Loon management practices included: 1) stabilization of water levels during the nesting period through cooperation with hydroelectric companies and others who control water levels; 2) placement of artificial nesting platforms in appropriate sites; 3) placement of warning sign buoys to discourage human intrusion at nest sites; 4) responding to all reports of distressed or dead loons, and 5) providing technical assistance to regulatory agencies. Volunteers provided important technical support for the first 4 of these practices.

The 7 hydroelectric companies and 3 agencies that regulate water levels on lakes where loons have historically nested were contacted in April by a VFWD biologist. A system of communication was established such that the VCE biologist informed the company when nesting had commenced and terminated (either due to hatching or failure). Each company was requested to stabilize water levels during the nesting period so that nests would not be flooded by high waters or left stranded by water drawdowns. Not all companies were able to stabilize water levels either because of hydroelectric needs or the inability to regulate water levels during large rain events.

Thirty-three artificial nesting platforms were placed on 31 lakes. These platforms provided an alternative nest site to natural sites where predation from terrestrial mammals and/or fluctuating water levels had caused nests to fail in previous years. Platforms were placed on some lakes with presumed territorial loon pairs, but where natural habitat is lacking (e.g., no suitable islands and/or marshes, highly developed shorelines). In cases where a potential pair is present and natural nest sites exist, platforms will not be considered unless the pair fails to nest after 4 or 5 consecutive years of occupancy. Platforms will also be considered on lakes where natural nests have failed 3 consecutive times and VLRP deems that platforms might prove beneficial. Six platforms have been removed since 2005 (Bald Hill, Brownington, Greenwood, Little Hosmer, Memphremagog, Newark), because natural nest sites were available. Season-long volunteers maintained or helped with 20 platforms. Placement of platforms was completed as soon after ice-out as possible, because loons may begin visiting nest sites shortly after returning from their wintering grounds. Warning sign buoys were placed around 37 of the 62 active nest sites to discourage human intrusion close to nests. These signs were also placed around 4 other nest sites

where loons ultimately did not nest in 2007. Sign buoys were used in areas where repeated human disturbance was likely to occur. The signs informed boaters that they were close to a loon nest site and that intrusion could contribute to nest failure. Buoys were typically placed 50 – 100 meters away from the nest site. Most incubating loons showed signs of being aware of a boater's presence at this distance, but did not crouch excessively or flush from the nest. Thus, stress on incubating loons was minimized, as was restriction of lake use by boaters and anglers. On several lakes, sign placement was determined by lake configuration and nest location. For example, if there was a large expanse of water around the nest, signs were placed up to 150 meters away. If the nest was in a channel, signs were placed as close as 10 meters. Most signs were placed prior to nesting in early May for pairs that used a traditional nest site. For loon pairs that often changed nest sites, sign buoys were not placed until nesting had begun. For pairs that did not nest, signs were removed by early July.

In responding to loon emergency calls, a communication protocol was established so that state police barracks and VFWD personnel initially contacted the VLRP biologist about injured, sick, or dead loons. If the biologist was unavailable, VFWD game wardens and biologists were next contacted to assess the reported incident. The St. Johnsbury Animal Hospital, the Lamoille Valley Veterinary Service, the Mad River Veterinary Service, the Country Animal Hospital in Bethel, Shelburne Veterinary Services, and the VT/NH Veterinary Clinic offered their services to conduct initial exams of sick or injured loons, in addition to the VINS Wildlife Services Department. A written protocol for assessing and handling loons was sent to all participating veterinarians and VFWD game wardens.

Education

Public education continued to be a vital part of loon management efforts. Twenty-two slide lectures and discussions on loon biology, conservation, and research were presented to audiences at lake associations, school groups, state parks, and other organizations (libraries, conservation groups, elderhostel, youth camps, and a resort). Approximately 510 adults and 200 children attended these programs. A sign designed by VFWD informing boaters and anglers how to help breeding loons was placed at lake access areas. Another sign cautioning boaters to be alert for loon chicks and to watch loons from a distance was also placed at access areas. The VLRP biologist provided mentoring for 5 high school, college, and post-college students. Biologists, staff educators, and the project's volunteer network regularly informed camp owners and other lake users about loon conservation measures.

In May 2004, Vermont passed a law banning the sale and use of lead sinkers ½ oz. or less beginning in 2006 and 2007, respectively. Lead jigs were not included in this law. In conjunction with VFWD, efforts to educate the public about the dangers of lead sinkers and jigs continued in 2007. The VFWD led efforts to educate anglers about the new lead fishing gear ban through posters, their website, and other outreach materials. VFWD "Get the lead out" brochures explaining the dangers of lead sinkers and non-lead sinker packets were distributed at presentations. VFWD distributed non-lead sinkers to many groups and at many different events throughout the spring and summer. A VFWD poster warning anglers about the risks posed by sinkers and discarded fishing line was placed at many lake access areas statewide.

VLRP conservation efforts received exposure in state and regional newspapers and radio programs.

Vermont Loonwatch

Vermont Loonwatch was initiated in 1983 to provide a mid-summer estimate of the statewide loon population. On the third Saturday in July each year, volunteers survey assigned lakes, ponds, and reservoirs from 8:00 to 9:00 a.m., recording the number of adult, subadult (1-2 year old loons), and loon chicks on the water body, as well as relevant human and wildlife activity. Observers on lakes larger than 300 acres were allowed a longer survey period. Data were recorded on standardized forms and returned to the VLRP biologist for summarization via standard mail or e-mail. The information has provided an annual statewide population estimate, an estimate of the number of non-breeding loons, and a check on lakes with previously undetected breeding pairs.

C*ontaminant sampling*

Abandoned eggs were collected and delivered to BioDiversity Research Institute (BRI) for methylmercury (MeHg) analysis (Evers et al. 1999). The contaminant data from eggs provide an indicator of mercury levels in Vermont lakes. The developmental stage of the embryos was also assessed. This research was part of a regional assessment of mercury throughout New England. Cooperators on this research include the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, BRI, the Vermont Department of Environmental Conservation, and several other state agencies, private organizations, and universities.

RESULTS

Distribution of territorial and nesting pairs

Seventy-two lakes supported 82 known and potential territorial loon pairs, 62 of which were confirmed to nest on 57 lakes (Table 1, Fig. 1). The highest concentration of breeding and territorial pairs occurred in the north-central and northeastern part of the state. Nesting was recorded for the first time on 8 new territories, including Bruce Pond (flooded nest), Chandler Pond (flooded nest), Lake Dunmore (1 chick), Green River Reservoir – SE (1 chick), Osmore Pond (flooded nest), Pensioner Pond (1 chick), Shadow Lake – Concord (failed nest and re-nest), and Woodbury Lake (lost chick). Loon chicks survived for the first time on 3 lakes, where nests failed in 2005 and/or 2006 (Chittenden, Maidstone - North, and Woodward), and 4 new nesting pairs from either 2005 or 2006 did not nest (Harvey's, Holland – North, Knapp Brook, Seymour Lake - West). In addition, 7 loon pairs that have nested recently no longer appear to be territorial (Greenwood, Hardwood, Knapp Brook, Memphremagog, Moore, Pigeon, Seymour – West), and 4 lakes with past pair activity are also no longer territorial (Marshfield, Neal, Wapanacki, and possibly Willoughby). Seven new potential territories were identified in 2007 (Curtis, Derby, Fairlee, Groton - North, Maidstone – SE, Wallace, and Warden). Observers reported 4 chicks in new locations, but none were found during follow-up surveys and none were reported later in the summer (Champlain [North Hero], Curtis, Dog/Valley [Woodbury], Shadow [Glover]). All of these sites will be monitored for pair activity in 2008, in case chicks did hatch in 2007 but disappeared soon after being reported.

Population levels and breeding success

Numbers of nesting and territorial pairs in 2007 continued to increase. Of the 62 pairs that attempted nesting, 47 successfully hatched 71 eggs, with 56 chicks surviving through August (Table 2, Fig. 2). There were 71 known territorial pairs on water bodies where nesting had occurred within the last 2 years, and 11 potential territorial pairs, each of which was observed consistently for 6 weeks or more. Eight pairs that have nested in at least 1 year from 2002-2006 did not nest, possibly because of intraspecific competition (Bald Hill, East Long, Little Averill – West, Norton – island), high water levels (Ewell, Holland – North), or lack of suitable nesting sites (Harvey's).

Twenty-three nest failures were documented, including 8 re-nests, of which 6 were successful. Causes of nest failure included human disturbance (Shadow [Concord]), likely predation (Echo [Charleston], Holland – S, Peacham – N, Ricker), and flooding (Bruce, Chandler, Echo [Charleston], Great Averill, Kettle, Osmore, South). Several pairs incubated their eggs beyond the expected hatch date and then abandoned their nest (Nichols, Spring). One nest failed after the nesting platform broke loose in a windstorm (Chittenden). The remaining failed nests were abandoned for unknown reasons, but the eggs were gone in all cases (Table 3).

The chick survival rate through August was 79%, with 0.68 chicks surviving per territorial pair. The causes of mortality of most chicks were unknown. Six chicks disappeared after interactions with intruder loons were observed (Maidstone – SW, Martins, Peacham – S [2], Seymour – S, Zack Woods), and 1 chick disappeared after a large rain event (Woodbury).

Five adult loons were found or observed dead (2 on Champlain – eagle predation, Clyde Res.- swallowing fishing gear/line, Willoughby, and Champlain-North Hero). One subadult died after ingesting

fishing gear/line (Dunmore). An immature loon was observed dead in the ice in late April (Groton). The final fate of a loon that crash landed on a road in Williston December 2007 and had a broken femur is unknown.

Loon Rescues

The VLRP biologist or professional wildlife rehabilitators assisted and/or monitored 15 loons in distress in 2007. At least 4 adult loons swallowed or were snagged by fishing gear. A subadult that had ingested fishing gear was caught and released on Somerset Reservoir. Three loons observed with fishing line around the bill freed themselves (Chittenden, No. 10, Willoughby). People reported loons caught in fishing line on several ponds, a mortality from a boat hit (Eden), and a dead loon in the water (Green River), but the loons freed themselves from the line and/or were not found during follow-up surveys. Two loons were rescued from ice-covered lakes on Lake Rescue and a small pond at Smugglers Notch ski resort. Several loons were monitored closely in December 2007 on lakes that were icing over. All the loons flew off without assistance. Four adult loon crash landed on roads or parking lots in Londonderry, Ludlow, Stowe, and Williston. The first three were successfully released and the latter is being treated for a broke femur (Dec 07).

The VLRP biologist spent over 70 hours conducting capture attempts and coordinating monitoring efforts with volunteers and game wardens. Volunteers were instrumental in the monitoring and capture attempts of all these birds.

Natural nesting sites and artificial nesting platforms

Of the 62 known nests, 20 (32%) were on shorelines, 23 (37%) were on natural islands, and 19 (31%) were on artificial nesting platforms. To reduce the use of platforms when natural nest sites are present (e.g., islands, marshes), the Bald Hill and Brownington platforms were removed. The Brownington Pond pair switched to a natural site, but the nest was abandoned. The Bald Hill Pond pair did not nest, but there was a likely switch in the female loon. The lack of nesting could be a result of the new loon on the pond or removal of the platform. Four pairs used natural sites instead of nesting platforms (Great Averill, Kettle, McConnell, South). Fifteen other pairs built nests in new locations either far from the 2006 nest site (Coles, Echo, Eligo, Great Averill, Little Hosmer, Maidstone - N, Wallingford) or close by (Island, Maidstone – S, Newark, Nichols, Somerset – N, Stiles, Wolcott, Woodward). Seven of the 8 new nesting pairs nested in natural locations, and 1 used a nesting platform (Woodbury).

Of the 33 artificial nesting platforms placed in 2007, 19 were used for nesting (Table 4). Of the remaining 14 platforms that were not used, 7 were located in areas where loons nested on natural sites (Great Averill, Kettle, McConnell, Somerset – N. Is., Shadow [Concord], South, Thurman Dix), 2 were located on lakes with known territorial pairs (Little Averill – W, Norton - Island), 5 were located in areas where loons were active but not necessarily territorial (Moore – Roaring Brook, Nelson, Pigeon, Salem, Seymour - W).

Volunteer Effort

Volunteers continued to play an important role in loon conservation efforts in Vermont. The efforts of season-long volunteers, who helped monitor over 70 lakes statewide, varied from a few surveys over the summer to daily observations. Loonwatch volunteer efforts are summarized below. Volunteers assisted with either loon nest warning signs and/or nesting platforms on 38 of the 54 lakes where these management tools were used. Volunteers also educated lake-users and lake associations about loon conservation, both formally and informally. Volunteers were critical in helping to inform the VLRP biologist about lakes and ponds with increased loon activity and potential territorial pair development. Volunteers or other citizens aware of the loon program detected 4 of 8 of the new nesting pairs and all 7 new potential territorial pairs.

Vermont Loonwatch

Vermont Loonwatch was conducted on 21 July, with 149 lakes (excluding Lake Champlain) surveyed by 210 volunteers. Several large lakes were divided into sections and surveyed by multiple observers. Loons were observed on 86 of 149 surveyed lakes (occupancy rate of 58%), where observers counted 218 adult loons, 54 chicks, and 9 subadults. In 2004, 2005, and 2006, loons were observed on 68 of 98 lakes surveyed (69%) and 69 of 122 lakes (57%), and 84 of 133 lakes (63%), respectively. High counts of adult loons in 2007 were obtained on Peacham Pond (10), Lake Memphremagog (8 adults, 1 subadult), Norton Pond (8), Seymour Lake (7 adults, 2 subadults), and Lake Dunmore (3 adults, 4 subadults).

Sampling for contaminants

Whole egg analysis

Unhatched eggs in nests were collected from 1997-2007. Analysis of 28 eggs collected from 2005-6 indicated low to moderate levels of methylmercury (MeHg; Table 7). In past years, eggs from Holland (1997) and McConnell (1998) ponds and Green River (1998), Moore (1998), and Somerset reservoirs (2003) had MeHg levels that are considered high or very high. The Holland Pond eggs from 1998 and the Green River Reservoir egg from 2000, however, had moderate concentrations of MeHg. In 2007, 9 eggs were recovered from 6 ponds, and these await laboratory analysis.

Description of loon activity on individual lakes in 2007

Lake and loon activity descriptions are provided for nesting pairs, known territorial pairs, and potential territorial pairs. Lakes with high levels of loon activity are listed. Management level refers to the need for warning sign buoys to be placed around nest locations because of the potential risk of human disturbance causing nest failure. For high management lakes, warning sign buoys were either placed prior to nesting or within days of the beginning of incubation. Sign buoys may be helpful, but are not essential for moderate management lakes, and warning signs are not needed for low management lakes. Education of lake users about appropriate boating behavior near nests and around chicks, and contact with lakeshore owners, are important for high management lakes. With warning signs present, lake residents can more effectively inform boaters about staying away from nest sites.

Status of nesting pairs in 2007

Baker Pond (Glover):	Nesting confirmed: 1 June	Chicks observed: 23 June
	Number chicks: 2	Number through Aug.: 2

Comments: The loons nested in the north marsh for the third year. The chicks likely flew off the pond and back again in early fall, possibly to nearby Lake Parker.
Management level: low. Sign buoys were not used; recreational use is light.

Bean Pond (Sutton):	Nesting confirmed: 29 May	Chicks observed: 25 June
	Number chicks: 2	Number through Aug.: 2

Comments: The loons nested on a small hummock island on the west side of the pond.
Management level: low. Sign buoys were not used; recreational use is light.

Beaver Pond (Holland):	Nesting confirmed: not obs.	Chicks observed: 7 July
	Number chicks: 1	Number through Aug.: 1

Comments: The loons nested on the traditional nest island.
Management level: low. Sign buoys were not used; recreational use is light.

Berlin Pond (Berlin): Nesting confirmed: 5 June Chicks observed: 6 July
Number chicks: 2 Number through Aug.: 1

Comments: The loon pair nested at the 2005 site on a marshy island at the west end. One chick disappeared in late July or August for unknown reasons. Observation of the pair on the water can be difficult because of the long viewing distances from shoreline observation points and because parts of the pond are not visible from these locations. Several surveys may be required to confirm the absence or presence of adult loons and/or chicks.
Management level: low. No public access is allowed on the pond, as it Montpelier's public water supply.

Bourn Pond (Sunderland): Nesting confirmed: not obs. Chicks observed: 30 June
Number chicks: 1 Number through Aug.: 1

Comments: The nest was not observed this year, but there was 1 chick present during the first survey in late June.
Management level: low. The pond has a hiking trail and campsites along its southern and western shores but is accessible only by a 3-mile hike from the nearest road.

Brownington Pond: (Brownington) Nesting confirmed: 7 June Nest failure confirmed: 15 July

Comments: The pair nested in a new location along the marshy shoreline in the southwest corner of the pond. The pair abandoned the nest by early July for unknown reasons, and the eggs disappeared. The nesting platform was removed in 2006, because adequate marsh habitat exists. The nest flooded twice in 2002, thus use of a platform in future years should be considered if flooding continues to occur regularly.
Management level: moderate. Sign buoys were not placed in an effort to reduce management needs. The lake is infested by Eurasian milfoil (*Myriophyllum spicatum)*.

Bruce Pond (Sheffield): Nesting confirmed: 1 July Nest failure confirmed: 8 August

Comments: A pair was consistently observed in 2006, thus we monitored the pond more frequently in 2007. The pair nested on the marshy shoreline on the north side of the pond. The pair was off the nest after a major rain event on 10 July, but continued incubating after this date. The pair abandoned the nest by early August. It is possible that the nest flooded briefly, but not enough to wash out the eggs. This was the first documented nest since monitoring began in 1978.
Management level: low. The pond is undeveloped and is only accessible by a ½-mile long logging road.

Chandler Pond (Wheelock): Nesting confirmed: 28 July Nest failure confirmed: 8 August

Comments: A pair was consistently observed in 2006, thus we monitored the pond more frequently in 2007. The pair nested on a hummock near the southwest shoreline. The pair was off the nest after a major rain event on 10 July, but continued incubating after this sighting. The pair abandoned the nest by late July. It is possible that the nest flooded briefly, but not enough to wash out the eggs. This was the first documented nest since monitoring began in 1978.
Management level: low. The pond is undeveloped and is accessible by a ¼ mile long field road to the dam.

Chittenden Reservoir:	Nesting confirmed: 25 May	Nest failure confirmed: 8 June
(Chittenden)	Re-nest confirmed: 17 June	Chicks observed: 15 July
	Number chicks: 2	Number through Aug.: 1

Comments: The loons nested on a platform on the eastern shore. The platform broke loose in a wind storm on 8 June despite the use of 3 cables and cement blocks. The platform was moved closer to the island for greater protection from wind and waves, and the pair re-nested soon afterward. One chick disappeared within a week hatching. This was the first time a loon chick hatched and survived since monitoring began in 1978. A loon pair had failed nests in 2005 and 2006. A subadult was observed with fishing line wrapped around its head in late July, but by early August, the line had fallen off.

Management level: high. 8 sign buoys were placed. The reservoir is heavily used by kayakers, canoeists, and anglers. There is a 5 mph speed limit on the reservoir. Central Vermont Public Service (CVPS) regulates the water levels in the priority of 1) dam safety, 2) energy production, and 3) other needs (e.g., recreation, wildlife). The large watershed and steep hillsides cause water levels to rise quickly with relatively small amounts of rain.

Coles Pond (Walden):	Nesting confirmed: 26 May	Chicks observed: 23 June
	Number chicks: 2	Number through Aug.: 2

Comments: The loon pair nested in a new location on the marshy shoreline in a western cove.

Management level: moderate. 3 sign buoys were placed; boat traffic is light to moderate.

Lake Dunmore:	Nesting confirmed: 9 July	Chicks observed: 16 July
(Leicester/Salisbury)	Number chicks: 1	Number through Aug.: 1

Comments: The loon pair nested on a large island in the south-central part of the lake. Pair activity was observed in 2006, thus we increased monitoring efforts in 2007. The loon pair did not seem to be present in May, but in early June the pair was observed near the island. Sign buoys were placed prior to nesting because the pair was observed nest searching. In late June, only a single adult was observed near the island, but no nest was visible. On 9 July, the nest was finally confirmed. This was the first documented nest since monitoring began in 1978. Nesting was reported in the literature in the early 1900s (Laughlin 1977). Four subadults occupied the lake all summer. One of them ingested a hook or lure in late July. The VFWD game warden and loon biologist conducted several unsuccessful capture attempts before finally catching the bird in mid-August. The loon was thin but was swimming relatively strongly, so it was released. The bird was found dead 2 days later.

Management level: moderate. 8 sign buoys were placed. Boat traffic is heavy, and the island is a popular picnic, fishing, and swimming spot. The VFWD game warden and volunteers had to ask people to leave the island several times.

Echo Lake (Charleston):	Nesting confirmed: 28 May	Nest failure confirmed: 7 June
	Re-nest confirmed: 28 June	Re-nest failure confirmed: 12 July

Comments: The pair nested on a peninsula west of the boat access area bay, but the nest was likely depredated. The pair re-nested across the lake on a gravel beach. The re-nest was likely flooded during the major rain event on 10 July. We will consider placing a nesting platform in 2008, now that there have been 4 consecutive failed nests caused by flooding and shoreline predators.

Management level: high. 6 sign buoys were placed. Both nest sites were located near many camps. The landowner of the first nest site was very cooperative in altering the family's activity near the point during the nesting period. Annual communication with the landowners will be necessary. Boat traffic is high. Great Bay Hydro maintains the dam, but water levels are not adjusted.

Lake Eden (Eden): Nesting confirmed: 31 May Chicks observed: late June
Number chicks: 2 Number through Aug.: 1

Comments: The pair nested on a platform for the third time in the north end near the boat access. One chick disappeared within 2 weeks of hatching for unknown reasons. A third loon frequented the lake. In early August, an adult was reportedly hit by a motorboat and killed, as the observer reported seeing the bird floating dead in the water. However, the original observer of the boat hit could not be located for an interview, and no dead loons were found during an extensive search.
Management level: high. 4 sign buoys were placed. The lake is highly developed and receives motorboat, water skier, canoe, and kayak traffic. A Boy Scout camp is also located on the lake.

Lake Eligo (Greensboro): Nesting confirmed: 24 May Chicks observed: 20 June
Number chicks: 1 Number through Aug.: 1

Comments: The loon pair nested in a new location on the east side of the larger island. The pair had nested on the smaller island for the past several years. The island's owner was contacted right away and avoided activity near the nest site. This nest site needs to be monitored thoroughly prior to each weekend in May and June since both islands have camps, and the owners will need to know whether the loons are nesting to reduce the likelihood of disturbance.
Management level: high. 6 signs buoys were placed. Anglers and waterskiers frequent the lake and go very near the island. The island has often been used for swimming. A highway is located along the entire west shoreline. The lake is infested by Eurasian milfoil. Annual communication with the landowners will be necessary.

Forest Lake (Averill): Nesting confirmed: 27 May Nest failure confirmed: early July

Comments: The pair used the nesting platform in the southern part of the lake. The pair incubated the eggs beyond the expected hatch date before abandoning the nest.
Management level: high. 3 sign buoys were placed. Anglers frequent the lake, and a resort is located on the southwestern shore, adjacent to the nest site.

Foster's Pond (Peacham): Nesting confirmed: 8 June Chicks observed: 30 June
Number chicks: 2 Number through Aug.: 2

Comments: The pair used the nesting platform in the southern part of the lake.
Management level: low. Anglers occasionally use the pond. There is only 1 camp on the pond, and it belongs to the loon volunteer.

Great Averill Lake - South: (Averill) Nesting confirmed: late June Nest failure confirmed: 15 July

Comments: A loon pair was observed nesting on the marshy shoreline at the south end in late June. The sighting was not reported until mid-July, and by then the nest had been abandoned, likely due to the major rain event on 10 July. The nesting platform along the northwest shore was not used. During 4 surveys, only single loons were observed at the north end in the traditional territory. A potential second pair has been observed in the inlet area in the central part of the lake.
Management level: moderate to high. 4 sign buoys were placed. Boat traffic can be high but usually only for short periods of time on weekends. Coaticook River Water Company controls the water level during the nesting season.

Green River Reservoir - NW: Nesting confirmed: 12 June Chicks observed: 4 July
(Hyde Park) Number chicks: 2 Number through Aug.: 2

Comments: The nest was located on the traditional nest island in the northwest bay. The eggs hatched about a week before the 10 July rain event, which flooded the nest.
Management level: high. 6 sign buoys were placed around the nesting island. Non-motorized boat traffic is high, and overnight camping is popular. Morrisville Water and Light stabilized the water level during the nesting season. Water levels were stabilized at higher levels beginning in 2003 to encourage nest building above the spillway.

Green River Reservoir - SE: Nesting confirmed: 10 June Chicks observed: 4 July
(Hyde Park) Number chicks: 1 Number through Aug.: 1

Comments: The nest was located on a small island in the southeast section of the reservoir near the only house. The landowner was contacted, since the dock was within 200 feet of the nest. After the chick hatched out, the pair moved to the western side of the lake near the big island and bay where the access area is located. This was the first documentation of a second nesting pair on the reservoir. The eggs hatched about a week before the 10 July rain event, which flooded the nest.
Management level: high. 4 sign buoys were placed around the nesting island. Non-motorized boat traffic is high, and overnight camping is popular. Morrisville Water and Light stabilized the water level during the nesting season. Water levels were stabilized at higher levels beginning in 2003 to encourage nest building above the spillway.

Lake Groton (Groton): Nesting confirmed: 26 May Chicks observed: 22 June
Number chicks: 1 Number through Aug.: 1

Comments: The loon pair nested on a platform placed on the eastern shore of the south bay. A potential second pair is forming at the north end of the lake. Both an immature and an adult Bald Eagle *(Haliaetus leucocephalus)* were observed swooping at the adults and chick.
Management level: high. 5 sign buoys were placed. Lake Groton is one of the busiest boating lakes in the region, with 2 state parks at the north end and much of the remaining shoreline developed with camps.

Hardwick Lake (Hardwick): Nesting confirmed: 28 May Chicks observed: 24 June
Number chicks: 2 Number through Aug.: 2

Comments: The loon pair nested on a nesting platform in the north end of the pond.
Management: low. Boaters infrequently use the pond. Water levels can rise rapidly after major rain events and can drop dramatically during drought periods. The reservoir is drawn down each fall as part of a flood management program for the town of Hardwick. In 2004, following a 4-foot drawdown shortly after 1 November (VT Department of Environmental Conservation drawdown date), there was still enough open water for the loons to take off. If loons are present after 1 November, they should be monitored closely during sub-freezing periods when the water surface could quickly turn to ice.

Holland Pond – South: Nesting confirmed: 10 June Nest failure confirmed: late June
(Holland)

Comments: The pair nested on the platform at the south end, but was likely predated. A Bald Eagle was observed sitting on a rock adjacent to the nest at the time the nest was abandoned. Gulls are common

on the pond, and Bald Eagles were observed frequently harassing the loons. We will consider placing an avian guard over the nesting platform in 2008.

Management level: moderate to high. 6 sign buoys were placed. Boat traffic can be heavy. The platform was placed because moderate rain events have flooded loon nests in previous years.

Island Pond (Brighton): Nesting confirmed: 29 May Nest failure confirmed: 30 June

Comments: The loon pair nested on the traditional island on the northwest side in a new location. The pair abandoned the nest for unknown reasons. Two to 3 other loons were usually on the pond.

Management level: high. 6 sign buoys were placed. 2 additional signs could be placed along the shorelines if necessary. Signs will only be placed when nesting is confirmed, because the loons have used 6 different nest sites in 7 years over a 600-meter area. The island is posted, which keeps most people off. Boat traffic is high.

Joe's Pond (Cabot): Nesting confirmed: 26 May Chicks observed: 21 June
Number chicks: 1 Number through Aug.: 1

Comments: The loon pair nested on the platform near the northwest inlet.

Management level: high. 3 sign buoys were placed along the edge of the boat channel. A 2 x 4 foot sign was installed at the entrance to the channel asking boaters to move slowly past the artificial nesting platform without stopping.

Keiser Pond: Nesting confirmed: 17 June Chicks observed: 15 July
(Danville / Peacham) Number chicks: 2 Number through Aug.: 1

Comments: The pair nested on the eastern shore in marsh habitat. One chick disappeared within 2 weeks after hatching, for unknown reasons.

Management level: moderate. 3 sign buoys were placed because canoeists and kayakers that circle this small pond were often observed close to the nest in 2006.

Kettle Pond (Groton): Nesting confirmed: 28 June Nest failure confirmed: 12 July

Comments: The pair nested in a new location on the north shore. The pair had used a nesting platform since the early 1990s in the west end of the pond. The nest flooded during the major rain event on 10 July.

Management level: moderate. No sign buoys were placed so as to not draw attention to the nest site. Hikers along a trail 20 feet away would likely walk past the nest, unless they knew it was there. Signage about breeding loons should be maintained at the two access points.

Little Hosmer Pond: Nesting confirmed: 3 June Nest failure confirmed: 7 June
(Craftsbury) Re-nest confirmed: 26 June Chicks observed: 19 July
Number chicks: 1 Number through Aug.: 1

Comments: The loon pair first nested in new location in the north marsh. The nest was abandoned for unknown reasons soon after it was found. The pair re-nested on the main small island in the northeast part of the pond.

Management level: moderate. 4 sign buoys were placed since the island used in 2007 is occasionally visited by people and boaters often go very close to the island. No sign buoys are necessary if the smallest island is used. Boat traffic is light to moderate. The owners of the 2 larger islands asked the VLRP to put up signage warning people to stay off the islands from May through July.

Long Pond (Westmore): Nesting confirmed: 9 June Chicks observed: 9 July
Number chicks: 2 Number through Aug.: 2

Comments: Nesting was confirmed on the traditional nest island on the west side at the 2006 site.
Management level: high. 8 signs were placed on (2) and around (6) the nesting island. Anglers and canoeists regularly use this pond and the island is next to the main boat channel.

Lower Symes Pond: Nesting confirmed: not obs. Chicks observed: 13 June
(Ryegate) Number chicks: 1 Number through Aug.: 1

Comments: The nest was located in a marsh in an isolated cove. The nest site was concealed such that observation of the incubating bird was not possible without risk of flushing.
Management level: low. Sign buoys were not placed. Small boats use the pond infrequently, and the nest is at the far end of a small bay out of the way of most boat traffic.

Maidstone Lake – North Nesting confirmed: 26 June Chicks observed: 13 July
(Maidstone) Number chicks: 1 Number through Aug.: 1

Comments: The loon pair nested for the third time in a new location on a spit of land between the boat access and a new house. This is the first time that a chick has survived from this territory. The north pair first attempted nesting in 2004. The female loon on this territory was banded in 2000 when she was part of the Maidstone Lake - South territory.
Management level: high. 3 sign buoys were placed. The new site was highly exposed within 200 m of the boat access and several camps across the channel.

Maidstone Lake - South: Nesting confirmed: not obs. Chicks observed: 8 July
(Maidstone) Number chicks: 1 Number through Aug.: 0

Comments: The nest was not visible on the traditional southwest nest island. The chick disappeared within 2 weeks of hatching. Extra loons were frequent on the lake, and a new potential pair might be forming within ½ mile.
Management level: high. 4 sign buoys were placed, 1 of which was needed in front of the boat landing to a popular picnic spot. 2 additional signs were placed on trees on the east side of the island opposite the nest site to keep picnickers off. Recreational pressure is high from Maidstone State Park visitors, lakeshore owners, and other lake users.

Martin's Pond (Peacham): Nesting confirmed: 20 June Chicks observed: 20 July
Number chicks: 1 Number through Aug.: 0

Comments: The loon pair nested on the platform in the central cove on the pond's north side. The female with the broken mandible tip was replaced, however she was observed on the pond with the new pair. Intruders were frequent on the pond, and the chick disappeared in August after fighting was observed.
Management level: high. 3 sign buoys were placed. Canoeists, anglers, and large motorboats frequent this small pond.

May Pond (Barton): Nesting confirmed: 9 June Chicks observed: 4 July
Number chicks: 1 Number through Aug.: 1

Comments: The pair nested on a hummock in the east end of the pond. Intraspecific competition, which may have prevented nesting in 2004, continued this year. It is unknown if the female, banded in 1998 and observed in 2002, returned in 2006.

Management level: moderate. 3 sign buoys were placed across the entrance to the nesting cove. Non-motorized boats and anglers frequently use this pond.

McConnell Pond (Brighton): Nesting confirmed: not obs. Chicks observed: 5 July
Number chicks: 2 Number through Aug.: 2

Comments: The pair nested in a new unknown location, as the nesting platform was not used. It is unknown whether the male, banded in 1999 and observed in 2003, returned in 2006.
Management level: low. No sign buoys were placed. Surrounding land is privately owned, much of it by the Conservation Fund. The pond is not heavily used. The Conservation Fund is based in Virginia, but has a Vermont office in Shrewsbury.

Miles Pond (Concord): Nesting confirmed: 28 May Chicks observed: 24 June
Number chicks: 2 Number through Aug.: 2

Comments: The pair nested on the platform after not nesting in 2006. The adult male banded in 2001 has moved to nearby Shadow Lake (Concord) and is part of a new nesting pair there. It is possible that this loon lost a territorial fight in 2006 and thus moved to Shadow Lake.
Management level: high. 5 sign buoys were placed. Boat traffic is often heavy. Rising water levels have flooded past nests. The VFWD has been authorized in the past to remove stop logs from the dam to prevent nest flooding if the loons select a natural nest site.

Mollys Falls Reservoir: (Cabot) Nesting confirmed: 28 May Chicks observed: 23 June
Number chicks: 1 Number through Aug.: 1

Comments: The loons nested on the platform among the boulders at the "elbow" off the west shore.
Management level: high. 4 sign buoys were placed. Boat traffic has increased substantially during the past 6 years. Part of this increase may be due to the drawdown at Waterbury Reservoir.

Newark Pond (Newark): Nesting confirmed: 29 May Chicks observed: 23 June
Number chicks: 2 Number through Aug.: 2

Comments: The pair nested at a new, higher location on the island after the platform was removed in 2005. The lower island nest likely flooded in 2006. It is unknown whether the male, banded in 1998 and last observed in 2005, returned in 2006 or 2007.
Management level: high. 7 sign buoys were placed around the island.

Nichol's Pond (Woodbury): Nesting confirmed: 9 June Nest failure confirmed: 22 July

Comments: The pair nested on the platform in the south cove. The pair incubated beyond the expected hatch date and finally abandoned the nest in mid-July. The male loon was replaced in 2007, because the 2006 male died after ingesting a hook and fishing line. The pond water levels were down 10 feet exposing 20-100 m of mudflats and rock around the pond. The dam will likely be repaired in 2008.
Management level: high. 5 sign buoys were placed. Canoe and motorboat traffic is moderate. A hiking trail is located around the north and west sides of the pond.

Lake Ninevah (Mt. Holly): Nesting confirmed: 3 June Chicks observed: 29 June
Number chicks: 1 Number through Aug.: 1

Comments: The loon pair nested on the traditional island nest site in the northwest part of the lake.

Management level: high. 3 sign buoys were placed because of heavy recreational use. The lake is infested by Eurasian watermilfoil.

Norton Pond - South Cove:	Nesting confirmed: 19 May	Chicks observed: mid June
(Norton)	Number chicks: 1	Number through Aug.: 1

Comments: The pair nested on the platform in the southeast cove.
Management level: moderate. No sign buoys were placed in an effort to reduce management needs. The loons could be disturbed if boaters approach the shore, but the nest site is located in shallow water. Coaticook River Water Company stabilized the water level during the nesting season.

No. 10 Pond (Mirror Lake):	Nesting confirmed: 3 June	Chicks observed: 29 June
(Calais)	Number chicks: 2	Number through Aug.: 2

Comments: The pair nested on the platform in the northeast cove. There are no islands or marsh habitat on the pond. One of the adult loons was observed with fishing line wrapped loosely around its body and neck in early August, but the bird was eventually able to free itself.
Management level: moderate. 3 signs buoys were placed. Boaters and anglers frequent the pond. There is a 5 mph speed limit for motorized boats.

Osmore Pond (Peacham):	Nesting confirmed: 22 June	Nest failure confirmed: 12 July

Comments: The pair nested on a northwest shoreline. The nest was flooded during a major rain event on 10 July. This was the first documented nest since 1980.
Management level: moderate. No sign buoys were placed so as to not draw attention to the nest site. Hikers along a trail 15 feet away would likely walk past the nest, unless they knew it was there. Boat traffic is minimal. Signage about breeding loons should be maintained at the access.

Peacham Pond – North Cove:	Nesting confirmed: 22 May	Nest failure confirmed: 22 May
(Peacham)	Re-nest confirmed: 4 June	Chicks observed: 1 July
	Number chicks: 2	Number through Aug.: 2

Comments: The pair used the traditional nest site on the south side of a small island in the north cove. The first nest attempt was likely depredated as shell fragments were found in the nest bowl.
Management level: moderate. 5 sign buoys were placed around the nest. 4 no wake signs were added after reports of waterskiers and motorboats coming within 50 m of the nest island. Green Mountain Power stabilized the water level during the nesting season. Volunteers reported an increase in motorboat traffic in the north cove in 2005 and 2006.

Peacham Pond - Southeast:	Nesting confirmed: 28 May	Nest failure confirmed: 22 June
(Peacham)		

Comments: The loon pair nested in a marsh in the southeast cove adjacent to 3 camps. One egg was knocked into the water for the second consecutive year.
Management level: moderate. No sign buoys were placed. Signs will be placed in 2008 because of increased small boat traffic into the cove. There is a chance the eggs could have been knocked into the water while the incubating loon flushed quickly off the nest during a disturbance event. Green Mountain Power stabilized the water level during the nesting season.

Peacham Pond - Southwest: (Peacham)	Nesting confirmed: 1 June Number chicks: 2	Chicks observed: 30 June Number through Aug.: 0

Comments: Nesting occurred in the traditional marsh area in the southwest corner of the pond. The nest site was concealed such that observation of the incubating bird was impossible without risk of flushing. Nesting was assumed based on behavior of the sentry bird and observations of presumed nest exchanges. The chicks disappeared after a territorial fight with intruder loons in early July.

Management level: moderate. No sign buoys were placed in 2006. More canoe and kayak traffic has been observed in the marsh since 2002. In an attempt to reduce management needs, the sign buoys were not placed in 2006. Green Mountain Power stabilized the water level during the nesting season.

Ricker Pond (Groton):	Nesting confirmed: 25 May Re-nest confirmed: 4 July Number chicks: 2	Nest failure confirmed: 20 June Chicks observed: 1 August Number through Aug.: 2

Comments: The pair nested on the nesting platform in the northeast cove between 2 camps. The first nest was abandoned for unknown reasons. No eggs were found in the nest.

Management level: high. 3 sign buoys were placed. The pond is small and frequented by small boats. Ricker State Park occupies the eastern shore. Water levels can vary by 6-12 inches during rain events.

Seymour Lake – Winape (Morgan)	Nesting confirmed: 9 June Re-nest confirmed: 4 July Number chicks: 1	Nest failure confirmed: 16 June Chicks observed: 27 July Number through Aug.: 0

Comments: A loon pair nested on the platform in the south part of the lake for the both the nest and re-nest. The chick disappeared by early August after territorial fights with intruder loons.

Management level: high. 5 sign buoys were placed, and 1 additional sign was placed on shore at the beginning of a trail that passes behind the nest site. Boat traffic on the lake is high.

Shadow Lake (Concord)	Nesting confirmed: 16 June Re-nest confirmed: 12 July	Nest failure confirmed: 23 June Re-nest failure confirmed: 12 August

Comments: A loon pair nested on a point next to a private dock in mid-June. The VLRP biologist successfully moved the nest onto a nesting platform on 19 June, but the pair abandoned that nest after the raft was moved down the shoreline 100 m on 23 July. The pair re-nested in a south cove between 2 houses in July and abandoned the nest for unknown reasons in early August. There is a chance the nest was flooded briefly. This was the first documented nest since monitoring began in 1978. The male loon in the territory was banded on Miles Pond in 2001.

Management level: high. 5 sign buoys were placed, and 1 additional sign was placed on shore at the beginning of a trail that passes behind the nest site. Boat traffic on the lake is high.

Somerset Reservoir: Dandeneau Bay (Somerset)	Nesting confirmed: 2 June Number chicks: 1	Chicks observed: 8 July Number through Aug.: 1

Comments: The breeding pair nested in its traditional territory in the western cove in the northern half of the reservoir. A male loon banded in 1999 on this territory now occupies the North Islands territory.

Management level: moderate. Boat traffic can be moderate on weekends. The water level was stabilized during the nesting season by Trans Canada Hydro.

Somerset Reservoir: Nesting confirmed: not obs. Chicks Observed: 8 July
North Islands (Somerset) Number chicks: 2 Number through Aug.: 1

Comments: This pair nested on one of the north islands. One chick disappeared by mid-July for unknown reasons. The male loon, banded in 1999 in the Somerset - Dandeneau territory, returned.
Management level: moderate. 2 sign buoys were placed. Boat traffic can be moderate on weekends. The water level was stabilized during the nesting season by Trans Canada Hydro.

South Pond (Eden): Nesting confirmed: 1 June Nest failure confirmed: 10 July

Comments: The pair switched from a nesting platform at the sound end to a new island site at the north end of the pond. The pair incubated beyond the expected hatch date. The pair abandoned the nest after it was flooded during a major rain event on 10 July. It is possible that the pair was nest building on 1 June and did not start nesting until mid-June since monitoring was periodic.
Management level: moderate. 2 sign buoys were placed. The pond has no public access but has many private camps on the shoreline.

Spectacle Pond (Brighton): Nesting confirmed: 15 May Chicks observed: 14 June
Number chicks: 2 Number through Aug.: 2

Comments: The pair nested on a platform that was placed north of the traditional nest island. The adult male, banded in 2002, returned.
Management level: high. 7 sign buoys were placed around the platform and traditional nesting island. The pond receives heavy recreational use. Brighton State Park staff made an intensive effort to educate park visitors to stay away from the island.

Spring Lake (Shrewsbury): Nesting confirmed: 24 May Nest failure confirmed: early July

Comments: The pair nested on a platform placed in the west end of the lake. The pair incubated beyond the expected hatch date before abandoning the nest.
Management level: moderate. No sign buoys were placed this year. In past years, 1 sign had been placed. The lake association closed a campsite and hiking trail near the western cove during nesting.

Stiles Reservoir: Nesting confirmed: 16 June Chicks observed: 7 July
(Waterford) Number chicks: 1 Number through Aug.: 1

Comments: The pair nested on a small hummock in a new location in the south end marsh.
Management level: low. The reservoir is not open to recreational use, because it is the drinking water supply for St. Johnsbury.

Thurman Dix Reservoir: Nesting confirmed: 29 May Chicks observed: 1 July
(Orange) Number chicks: 1 Number through Aug.: 1

Comments: For the second consecutive year, the pair nested on the large island. During the several previous years, the pair had nested on a platform near the small island.
Management level: low. The reservoir is not open to recreational use. The town of Barre stabilized the water level during the nesting season. If the 2001 island site near the road is used, a non-obtrusive sign should be placed along the road asking people to avoid disturbing the loons.

Wallingford Pond:	Nesting confirmed: 7 June	Chicks observed: 22 July
(Wallingford)	Number chicks: 2	Number through Aug.: 2

Comments: The loon pair nested in a new location in the northwest part of the pond. The pair on this pond has nested in 5 different locations during its 7 years of breeding. No islands are located on the pond.

Management level: low to moderate. Anglers and canoeists infrequently use the pond. The 2001, 2003, and 2006 nests were located away from the main body of water, thus boat traffic near these sites should be minimal. The 2004 site was located along a more exposed shoreline.

West Mountain Pond:	Nesting confirmed: 29 May	Chicks observed: 28 June
(Maidstone)	Number chicks: 2	Number through Aug.: 0

Comments: The nest was located on the traditional site on vegetation growing on a large fallen tree extending from shore. One chick disappeared in early July, and the second chick disappeared in August, both for unknown reasons.

Management level: low. No sign buoys were placed. There is no public access on this pond and few camps.

Wolcott Pond (Wolcott):	Nesting confirmed: 2 June	Chicks observed: 30 June
	Number chicks: 2	Number through Aug.: 1

Comments: The pair nested in a new location near the boat access. The male, banded in 2000, returned. The banded female has not been observed since 2001.

Management level: low to high. If loons nest near the boat access site, as in 1998-2001 and 2005-2007, 3 to 4 sign buoys should be placed to keep boaters away from the nest. If necessary, a hand-written sign should be posted at the boat ramp asking boaters to stay in the designated channel. The extensive marsh in the first traditional nesting area in the northeast bay provides good protection for nesting birds and may not require nest warning signs. The pond is not heavily used for recreational purposes, although the access area is a popular shoreline fishing site.

Woodbury Lake (Sabin Pond)	Nesting confirmed: 12 June	Chicks observed: 27 June
(Woodbury)	Number chicks: 1	Number through Aug.: 0

Comments: The loons nested on the platform at the south end of the lake. The chick disappeared after a major thunderstorm on 10 July. This was the first document nest since monitoring began in 1978.

Management level: moderate-high. 2 nest warning signs were placed. The lake is highly developed with heavy boat traffic, however, the nesting cove is in the quietest part of the lake.

Woodward Reservoir:	Nesting confirmed: 11 June	Nest failure confirmed: 16 June
(Plymouth)	Re-nest confirmed: 28 June	Chicks observed: 27 July
	Number chicks: 1	Chicks through Aug.: 1

Comments: The loon pair first nested in the third cove from the north end on the shoreline but soon abandoned the nest for unknown reasons. The pair re-nested on an exposed island hummock in the middle cove near the 2005-2006 nest site. This was the first time that a chick has hatched and survived since monitoring began in 1978.

Management level: high. 4 sign buoys were placed in the cove. Communication should be maintained with both the camp's main office and the Barn Day Camp program. Heavy recreational use occurs.

Zack Woods Pond:	Nesting confirmed: 28 May	Chicks observed: 24 June
(Hyde Park)	Number chicks: 2	Number through Aug.: 1

Comments: The loons nested on the island for the third year. One chick disappeared in late July or early August after intruder loons were on the pond. The adults spent more time off the pond this year when not on the nest or with the chick(s). It was not known whether the female, banded in 2001 and last sighted in 2006, returned.

Management level: high. 7 sign buoys were placed on the pond, and 3 additional "loon nesting" signs were placed at the access areas adjacent to the nest site and at the trailhead along the main road. Heavy recreational use occurs, especially on weekends.

Known territorial, non-breeding loon pairs in 2007

Loon pairs on these lakes have either nested or have been observed nest building in at least one year since 2003.

Bald Hill Pond (Westmore): A loon pair was present all summer, but the banded female, last confirmed on the pond in 2005, was found dead on Lake Willoughby in mid-July. Changes in mates often result in a year of no nesting. However, there is a chance this pair did not nest because the nesting platform was removed this year to promote natural nesting. The pair nested in 2006.

Management level: moderate. 4 sign buoys have been placed in the past. The pond receives moderate use by anglers and boaters.

Buck Lake (Woodbury): A loon pair was present all summer. Loons last nested in 2003. Observers reported seeing a third adult on the pond occasionally for the fourth year.

Management level: moderate. 4 sign buoys have been placed in the past. Staff at the Green Mountain Conservation Camp were asked to limit activity on the large boulder in the middle of the lake about 300 meters from the nest site. A hiking trail is located along the entire western shore.

East Long Pond (Woodbury): Many extraterritorial loons were observed throughout the season and likely prevented nesting for the second year. The pair last nested in 2005.

Management level: high. 6 sign buoys were placed. The nest site was in a vulnerable location facing the moderately- to heavily-used channel (primarily canoes and fishing boats). There is no public access on this pond. Hardwick Electric stabilized the water level during the nesting season.

Ewell Pond (Peacham): The pair was present all summer, but the 2006 nest site was underwater.

Management level: moderate. The pond is small, thus boaters circling the pond often pass near the nest site. 3 sign buoys were placed. It might be possible to forego use of warning signs on this pond.

Harveys Lake (Barnet): The loon pair was present all summer, but no nest searching activity was reported. The pair nested about 100 yards down the outlet channel in a dense marsh in 2006. Nesting habitat is very limited on the lake, thus a nesting platform should be considered if the pair does not nest in the next few years.

Management level: high. 3 sign buoys were placed in 2006 (2 at the lake entrance to the channel and 1 downstream). A public beach and a private campground are located within ¼ mile of the nest site, but the nest site itself was well-concealed in the marsh.

Holland Pond – North (Holland): The loon pair was present, but no nesting activity was observed. This pair nested for the first and only time in 2006.

Management level: moderate to high. The nest site is potentially vulnerable to boaters accessing the trail to Turtle Pond, thus sign buoys might be necessary in future years.

Jobs Pond (Westmore): A pair was frequently observed on the pond during the summer. The loons built a nest bowl in 2006, but no nesting activity was observed in 2007. One of the adults was the 1999 banded male from Bald Hill Pond. A pair last nested on Jobs Pond in 1999 on a nesting platform. The nesting platform is anchored near shore on the west side.
Management: moderate. Anglers and boaters occasionally use the pond.

Little Averill Lake - West (Averill): The pair was present along with 1 or 2 additional loons, whose presence might have prevented nesting. The pair last nested in 2005.
Management level: high. 3 sign buoys have been placed in the past. Anglers frequent the lake, and the inlet has sand beaches on either side, making it a popular destination. Coaticook River Water Company controlled water levels during the nesting season.

Norton Pond – Island (Norton): The pair was present along with several extra loons near the territory all summer. The pair nested in 2006.
Management level: high. 7 sign buoys were placed. Canoeists and anglers frequent the pond. Coaticook River Water Company stabilized the water level during the nesting season. During a large rain event in late June, Coaticook employees adjusted the dam 4 times over the weekend to prevent water levels from rising.

Potential territorial, non-breeding loon pairs in 2007

These lakes supported 2 adult loons through much of the summer but either had no recent history of nesting or had less consistent activity by pairs that previously nested. The process of territorial pair formation is not well understood, but repeated observations of 2 loons together over an extended period is a strong indication that nesting might occur in the future. From 2002-2007, volunteers and VLRP staff successfully located loon pairs prior to nesting on 21 water bodies. Identification of these pairs allowed for appropriate protective management measures to be initiated.

Caspian Lake (Greensboro): A pair was frequently observed in the west and northwest part of the lake from May through July. In addition, territorial behavior was observed, including male yodeling. Little or no suitable nesting habitat remains on the lake.
Curtis Pond (Calais): NEW. A resident on the pond reported seeing a loon chick in July, but it was not confirmed. It is possible the chick disappeared soon after the sighting. A loon pair was reported and observed several times. There is some marsh habitat along the shoreline.
Derby Pond (Derby): NEW. A pair of loons was observed nest searching by a small island on the south shore. The pair was present all summer.
Lake Elmore (Elmore): A pair of loons was observed throughout much of the summer, but less often than in 2006. Only single loons were observed in May and June by the VLRP biologist, but a volunteer reported a consistent pair in July and August. There is marsh habitat at the south end of this highly developed lake, which is infested with Eurasian milfoil.
Lake Fairlee (Fairlee): NEW. A pair of loons was reported often by a new VLRP volunteer. Several other surveys indicated primarily single adult loons. A nesting platform was put out by high school students and the volunteer, since nesting habitat is limited.
Great Averill Lake - Inlet (Averill): Two adult loons were observed regularly in the southern half of the lake and inlet region. The VLRP biologist found a natural nest in the southwest inlet cove in 2005. This site was underwater in 2006 and 2007. A nest was observed at the south end of the lake, but it was unknown whether this pair or the traditional north pair made the attempt.
Lake Groton – North (Groton): NEW. A second pair might be forming at the north end of Lake Groton. There is limited to no nesting habitat in this highly developed part of the lake with camps and 2 state parks.
Maidstone Lake – Southeast (Maidstone): A third pair might be forming on this relatively large, developed lake. This new pair is located near the traditional south pair. There is a small island with a

camp that would be the most likely nesting location. It is doubtful the pair could nest successfully without major cooperation from the camp owner.

Memphremagog - Holbrook Bay (Newport): A pair was observed regularly along the western shore of the lake. Little suitable nesting habitat is available in this region.

Wallace Pond (Canaan): NEW. Residents on the pond reported seeing a pair of loons many times in 2007. A chick was reported in 2006 but was not confirmed during several surveys. The best nesting habitat is a marsh located on the Canadian side of the lake.

Warden Pond (Barnet): NEW. A VLRP volunteer observed a loon pair on the pond throughout the summer. The pond is undeveloped but there are no marshy shorelines or islands.

Lakes and regions of lakes with high levels of loon activity in 2007

Forty-one lakes or regions of lakes were identified as having moderate to high levels of loon use in 2007. An asterisk (*) indicates that some pair activity was observed, but either too few surveys were conducted or pair sightings were too infrequent to determine if a potential territory was forming. Lake residents reported seeing loon chicks on Lake Champlain – North Hero, Curtis Pond, Dog Pond, and Shadow Lake (Glover), but no chicks were found during follow-up surveys.

Center Pond (Newark)	Knapp Brook (Reading)	Lake Parker (Glover)
Lake Champlain – North Hero	Little Averill - Northeast (Averill)	* Pigeon Pond
Lake Champlain - Isle La Motte Causeway	Lyford Pond (Walden)	* Lake Rescue (Ludlow)
Comerford Reservoir (Waterford)	* Lake Memphremagog - Bell Island (Newport)	* Lake Salem (Derby)
* Crystal Lake (Barton)	Marshfield Pond (Marshfield)	Seymour Lake (Morgan)
* Daniels Pond (Glover)	Metcalf Pond (Fairfield)	* Shadow Lake (Glover)
* Dog [Valley] Pond (Woodbury)	Miller Pond (Strafford)	Silver Lake (Leicester)
* Gale Meadows (Winhall)	Moore Reservoir (Concord/ Waterford)	Stratton Pond (Stratton)
* Great Hosmer (Craftsbury/Albany)	* Lake Morey (Fairlee)	Sugar Hill Res. (Goshen)
Greenwood (Woodbury)	Neal Pond (Lunenberg)	Sunset (Marlboro)
Halls Pond (Newbury)	* Nelson Pond (Woodbury)	Turtle Pond (Holland)
Hardwood Pond (Elmore)	* Norton Pond –North (Norton)	Wapanacki Pond (Wolcott)
Kent Pond (Killington)	Noyes Pond (Groton)	Waterbury Res. (Waterbury)
		Wheeler Pond (Brunswick)
		Lake Willoughby (Westmore)

DISCUSSION

Population Assessment

The number of Common Loon territorial and nesting pairs continued to increase in 2007. The increase in nesting rates can be attributed primarily to 8 new nesting pairs that were identified in 2007, despite the disbanding of several pairs that have nested during the past 4 years. The number of chicks surviving through August was similar to that in 2005 and 2006, because of more failed nests and a lower chick survival rate. There were a record 23 failed nests in 2007, but 6 of 8 re-nests were successful. Seven nests were flooded, mostly during a single rain event on 10 July, and eggs disappeared from 10 nests, where predation was a likely factor. Also, a higher percentage of nests were on natural sites versus nesting platforms compared to the previous 9 years. Many of the new breeding pairs nested on shorelines, because most of the newly occupied lakes lack islands. Natural nests, especially those on shorelines, tend to have higher rates of flooding and predation compared to nesting platforms.

While natural demographic processes (e.g., higher rates of recruitment and immigration) have likely led to the positive upswing in the last decade, these have been augmented by improved public awareness and stewardship through education and increased effectiveness of management efforts. More

than half of the 62 nesting pairs in 2007 directly benefited from management activities. Several of the new breeding and potential territorial pairs utilized lakes that were highly developed, indicating that management and education activities will continue to play a vital role for breeding loons.

The new nesting pair on Lake Dunmore highlighted the importance of VLRP's loon conservation efforts. The lake is highly developed and busy with boat traffic, especially on weekends. Some pair activity was identified in 2006, thus more surveys were conducted in May and June of 2007. A loon pair was observed nest searching near the one large island, which is often used by people for picnics, exploring, swimming, and fishing along the shorelines. The VLRP contacted the owner of this island and obtained permission to place warning signs prior to nesting. It was hoped the signs would reduce human activity near the island, encouraging the loon pair to build a nest. The VLRP and volunteers conducted an outreach campaign to the major lake user groups, including the state park, 2 marinas and private campgrounds, 2 summer camps for children, and the lake association. The VLRP biologist spoke at the lake association annual meeting. After the successful hatch of the egg, a press release was sent out and an article was written for the lake association fall newsletter. Throughout this process, 2 more season long volunteers were identified and dozens of inquiries were responded to from lakeshore owners. The VLRP will present a loon conservation program to the region early in 2008 and hopes to mail loon fact sheets to all lakeshore owners. The nest was successful and the chick survived, in part because of this intensive management and outreach effort. One of the few historical accounts of nesting loons in Vermont noted that loons occasionally nested on Lake Dunmore in the late 1800s and early 1900s (Laughlin 1977)

One outcome of higher population levels and increased interactions with intruder loons can be lower productivity rates, which have been documented in New Hampshire (K. Taylor, pers. comm.), but not yet in Vermont. Overall productivity and survival rates of Vermont's loons remain higher than those of other North American populations. In New Hampshire, where loon population data are collected using similar protocols, loons fledged an average of 0.525 chicks per territorial pair from 1974-2005, compared to Vermont's rate of 0.71 (range 0.35-0.96) over a similar time period (1979-2007). Overall, the average number of chicks fledged per territorial pair in North America is 0.53 (Evers 2003).

Although extraterritorial loon activity has not caused a detectable decline in productivity, interactions with other loons had apparent population impacts in 2006 and 2007. Nine pairs may have failed to attempt nesting because of conflict with other loons (Bald Hill, Buck, East Long [2 yrs.], Little Averill [2 yrs], Miles, Norton – Island, South). Intruder loons may have contributed to the loss of at least 8 chicks in 2006 and 2007. Chick deaths and territorial challenges can lead to mate switches, which reduce the chance that a pair will nest in that or the following year (Piper 2000, D. Evers, pers. comm.). One cause of extraterritorial conflicts in Vermont may be that most of the "high quality" territories are currently occupied by breeding pairs. As the numbers of non-breeders increase, more territorial challenges for historically successful breeding sites are likely (D. Evers, pers. comm.). Although research on the impact of extraterritorial loons on loon productivity has been limited, it is likely that in a healthy loon population, intruder loons will reduce nesting attempts, nesting success, and chick survival. Evidence that most high quality territories are occupied includes loons nesting on: (1) lakes with minimal or marginal nesting habitat (Echo [Charleston], Harveys, and Maidstone – North) and (2) lakes which are less than 40 acres (Baker, Bruce, Bean, Ewell, Keiser, Osmore). We are also beginning to see more loon pairs disbanding after being present for only 1 or 2 years. In 2007, potential loon pairs might have developed on 2 20-40 acre ponds (Curtis, Warden), and loons were observed on many 15-30 acre ponds (Coits, Hartwell, Lyford, Mansfield, Notch, Richards, Sodom).

The increase in the 2006 and 2007 Loonwatch number of adult loons can be accounted for by more lakes with moderate numbers of adults observed and more single loons utilizing ponds smaller than 50 acres. Almost 20 more lakes had loons reported in 2006 and 2007 compared to 2004 and 2005. Twenty-three more adults were counted in the Northeast Kingdom region in 2007 compared to 2006, while loon counts in other regions of the state remained stable. Nine subadults were observed in 2007, the highest number in 10 years if surveys from Lake Champlain are not included.

It has been documented that loons utilize Vermont's lakes during spring and fall migration. In 2007, 20 loons were counted on Lake Willoughby in early November. In 2006, about 40 loons landed on

Island Pond on 17 May, likely part of a late migration to northern Quebec lakes. In the spring, small numbers of loons have been observed on several slow moving rivers before ice-out. Over 500 loons have been counted on a single day in late October flying south over Lake Champlain (T. Murin, pers. comm..) and >70 loons have been observed on Lake Memphremagog in the fall (P. Spitzer, pers. comm.).

Locations of future loon activity

Only a few lakes larger than 40 acres in northern Vermont had little reported loon activity in 2007 (Clyde, Parker, Salem). Five water bodies that supported breeding loons in at least one of the previous 30 years had some loon activity in 2007 (Caspian in 1982, Gale Meadows in 1981, Noyes in 1979, Turtle in 1982, Waterbury in 1981) (Table 4). For the first time in 25 years, 2 adults were observed several times on Gale Meadows Reservoir. Many lakes or sections of lakes that had regular loon activity should be closely monitored for potential new territorial activity in the future.

Management Assessment

Artificial nesting platforms: Artificial nesting platforms continue to enhance habitat for loon nesting in Vermont. Through 2005, the VLRP policy has been to use platforms on lakes that are subject to water level fluctuations, where eggs have been lost to mammalian predation (mostly by raccoons [*Procyon lotor*]), and where there are presumed territorial loon pairs, but natural habitat is lacking (no suitable islands and/or marshes, highly developed shorelines). However, following the Common Loon's removal from the Vermont Endangered and Threatened Species list, the VLRP changed its platform placement policy to promote natural nest sites. This change more closely follows New Hampshire's Loon Preservation Committee (LPC) requirement that a nest needs to fail to flooding, stranding, or predation during 3 consecutive years before a platform is placed. For lakes that lack suitable natural habitat, we will wait until loons make a natural nest attempt before determining whether a platform is warranted. This protocol serves as a guideline for platform management activities, as there could be a need for exceptions. As a result, 18 of the 20 new nesting pairs from 2005-2007 nested in natural locations. Nesting platforms will be considered for Echo Lake (Charleston) and Harveys Lake, where loon pairs have had failed nests due in part to lack of habitat, flooding, and predation. Both lakes are highly developed. On lakes where loons have previously used nesting platforms, platforms were removed in the past 3 years on Bald Hill, Brownington, Little Hosmer, and Newark ponds. All but the Bald Hill pair have subsequently nested in natural locations.

Seventeen of the 45 new breeding pairs from 1998-2007 built nests on platforms (Bald Hill, Eligo, Fosters, Great Averill - North, Groton, Hardwick, Jobs, Joe's, Little Hosmer, Martins, Nichols, Pigeon, Ricker, Seymour – West, Seymour - Winape, Spring, and Woodbury). Two of these pairs now nest on islands after the platforms were removed, while 1 pair may have disbanded.

Warning sign buoys: The placement of warning sign buoys around nest sites likely enhanced the success of breeding loons for at least 32 nesting pairs during the last 6 years. On all these water bodies, the natural nest sites are located in areas that receive high levels of boat traffic, and/or the ponds themselves are small, so that even moderate boat traffic might disturb nesting loons. On other successful breeding lakes or ponds, sign buoys likely reduced the number of disturbances to the nesting pair.

Loon nests near cottages: Eight pairs nested near camps or developed areas in 2007 (Echo, Eligo, Green River – SE, Joe's, Maidstone - North, Martins, Peacham – SE, Shadow). On water bodies like these, volunteer cooperation by landowners has been essential. The Lake Eligo pair nested on the larger island for the first time, 30-40 meters from the cottage located there. Previous contact with that landowner allowed the VLRP to make contact immediately prior to their weekend visit. The Green River – SE pair, nested about 30 meters from the dock of the only house on the reservoir. The Shadow Lake pair nested 2 meters from a dock and moored boat. The VLRP attempted to move the nest onto a platform and move the platform 50 meters down the shoreline. The loons continued incubating the nest after it was moved to

the platform in the same location, but abandoned the nest when it was moved down the shoreline 100 m. The pair re-nested in a different location 5 meters from a mowed yard and 30 meters from the house on the property. The landowners reduced their activity in that area of the yard but the pair abandoned the nest for unknown reasons, although there is a chance the nest flooded. The other nest sites near cottages have been described in previous annual reports.

Our approach to communicate with landowners and provide them with information on how to promote successful nesting appears to be effective. All final decisions on how to deal with the nest site were left to the landowners. Although this approach required significant time and effort by the VLRP, most responses from landowners were positive. Detection of nesting sites and nest start dates is critical if management and education efforts are to be effective. In the future, we will consider loon nests next to camps as "experimental", in that they may or may not be successful. The loons may simply select a different, and more appropriate, nest location if they experience a failed nest. The placement of a nesting platform could offer a viable alternative if landowners cannot maintain an undisturbed area near the nest site. The VLRP has placed relatively few platforms on highly developed lakes with possible territorial activity and limited areas for platform placement (Joe's, Martins, Seymour). VLRP cooperators must continue to discuss how to approach situations like this in the future, especially on lakes like Caspian, Groton, Joe's, Maidstone, Salem, Seymour, Willoughby, Memphremagog, and possibly even Champlain.

Threats to Vermont's loons

Vermont's loons continue to face many short- and long-term threats to their viability, including: (1) water level fluctuations on lakes where water levels are regulated; (2) shoreline development and human disturbance; (3) mortality through lead poisoning, entanglement with monofilament fishing line, and fishing gear ingestion; and (4) possible contamination of Vermont waters (e.g., effects of acid precipitation and MeHg accumulation). Two natural sources of mortality include predation and intraspecific competition between breeding pairs and extraterritorial (rogue/intruder) loons. Background and historic information on these threats are provided in the Vermont Common Loon Recovery Plan (Borden and Rimmer 1998, pp. 5-10) and the VLRP 2000 annual report (Hanson et al. 2000).

Water level issues: Hydroelectric companies and others who control water levels continue to promote successful loon breeding by stabilizing levels. This was especially critical on water bodies where loons nested on natural sites (Green River, Norton, Peacham, and Somerset). Hydroelectric companies do not or cannot stabilize water levels on Hardwick Lake or Mollys Falls or Chittenden reservoirs for several reasons, thus platforms may be a required management tool for successful loon nesting on these water bodies.

Shoreline development and human disturbance: Several cases of people causing loons to leave their nests were reported to the VLRP in 2007. One case on Lake Dunmore resulted in the VFWD game warden issuing a fine after several people had asked the person walking on the island to leave. This person along with several others had disregarded the nest warning sign, did not respond to citizens asking them to leave the area, and had caused the loons to leave their nest. Fortunately, the loons resumed incubation and the egg hatched several days later. On Shadow Lake, the pair abandoned its nest after an intentional disturbance to move the nest from a landowners dock and beach area (see Loon Activity section for details). On Chittenden Reservoir, the pair abandoned its first nest on a platform after the platform broke free because of high winds.

Platforms have been used by loons on several ponds that appear to have marginal natural nesting habitat (Eligo, Fosters, Hardwick, Joe's, Martins, Nichols, No. 10, Ricker, and Seymour - Winape). However, from 2002-2007, loons have nested on natural sites on several highly developed lakes (Dunmore, Echo, Eden, Great Averill – North, Greenwood, Harveys, Memphremagog – Bell Island, Maidstone – North, Shadow), utilizing some of the last remaining undeveloped or suitable shoreline. Potential loon pairs were observed in 2007 on several other lakes where shorelines are highly developed (Caspian, Elmore, Groton, Maidstone – SE, Willoughby). These lakes provide good feeding habitat for

non-breeders, have limited natural nest sites available, and, in most cases, would require major educational and cooperative efforts with landowners in order to place nesting platforms.

Lead Poisoning, Monofilament Fishing Line Entanglement, and Fishing Gear Ingestion: The Vermont legislature passed a law in May 2004 banning the sale and use of lead sinkers ½ ounce or less, beginning in 2006 and 2007, respectively. This action was a major step to reduce the threat of lead fishing gear to loons and other water birds. Since 1984, 20 of 50 adult loons found dead in Vermont have died from lead poisoning and 9 of 50 from complications with fishing hooks, line, or nets. One additional adult has not yet been necropsied. In 2007, 2 loons died from complications after ingesting fishing gear and fishing line on Clyde Reservoir and Lake Dunmore. One subadult loon on Somerset Reservoir that had swallowed fishing line was captured and released. Several other loons were observed entangled in fishing line (Chittenden, No. 10, Willoughby), but intensive surveys indicated that the line likely fell off. Fishing gear will likely persist as a problem for Vermont's loon population, annually affecting a small number of birds.

VFWD, VCE, VINS, USFWS, NWF, Audubon Vermont, and other organizations will continue to collaboratively promote public awareness about the dangers of lead sinkers to loons and other waterbirds and to encourage the use of non-toxic alternatives. The VLRP will also continue to educate people about the threats caused by monofilament fishing line and fishhooks, by asking anglers to reel-in when loons are nearby and to properly dispose of fishing line. Mark Scott of the VFWD coordinated outreach efforts about the lead fishing gear ban.

Environmental Contaminants: We have documented MeHg levels in Vermont's loons and associated water bodies through the capture/banding program and analysis of abandoned eggs. From 1997-2007, various loon tissues (blood, feathers, and eggs) have been collected from 49 Vermont lakes and ponds.

Researchers from BRI and USFWS estimate that 13% of Vermont's loons are at a high or extra high risk of MeHg exposure (Evers 2003). Specific water bodies of concern include Bald Hill, Island, McConnell, and Wolcott ponds, and Mollys Falls and Somerset reservoirs, where adult loons had moderate MeHg feather and/or blood concentrations. MeHg concentrations in feathers indicate chronic body burdens; elevated levels indicate a steady accumulation over time. Other water bodies of concern include Green River and Moore reservoirs and Holland Pond, where MeHg levels in recovered eggs were high in some years. Egg MeHg is more difficult to interpret since it may reflect the female's body burden and not necessarily the Hg uptake from prey on the nesting lake for that year. For a more complete discussion of mercury contamination see the 2000 and 2006 annual reports.

Predation: Predation is a probable cause of egg and chick loss. Likelihood of egg or chick predation may be increased by human disturbance and intraspecific competition, which can keep adult loons off the nest or away from chicks. Without visible evidence of nest predation, however, the cause of egg loss must be considered unknown. Eggs disappeared from 10 nests in 2007 in addition to the 4 nests that had evidence of predation. Bald Eagles, although frequently sighted on several lakes throughout the summer, did not likely take any chicks in 2007, but might have depredated eggs (Holland). Eagles did kill 2 adult loons trapped in the ice on Lake Champlain near Ferrisburg in January of 2007. Bald Eagles were observed swooping down at the loon family on Lake Groton.

Intraspecific Competition: It is likely that extraterritorial loons interact with most breeding pairs at some time. In 2007, extraterritorial loons might have caused up to 4 pairs to forego nesting, and been responsible for the possible loss of 6 chicks. This is an increase over previous years and might account for the small decline in productivity in 2007 compared to the past several years.

Disease: Botulism continues to be an increasing source of waterbird mortality, including loons, on Lake Erie and Lake Ontario during fall migration. In 2006 and 2007, loons were found dead from botulism on Lake Michigan and Lake Huron. Thousands of loons have been found dead since the late 1990s.

Biologists and toxicologists from Canada and the United States are trying to understand why the outbreaks have been so severe. To date, no botulism outbreaks have been documented in Vermont, on Lake Champlain, or in eastern New York. However, there has been a localized population decline on Lake Umbagog in New Hampshire, the ultimate causes of which are unknown. LPC observed a decline from 31 to 15 territorial pairs on Lake Umbagog between 2000 and 2002 (J. Cooley, pers. comm..). In 2005, the number of pairs rebounded to 20, but dropped to 13 in 2006. Loon health could be a factor as West Nile virus, botulism E, and avian influenza (although not the highly contagious H5N1 strain) were found in several dead loons on Lake Umbagog.

RECOMMENDATIONS

Recent increases in the total loon population and numbers of nesting pairs provide evidence that conservation efforts have aided the loon recovery process in Vermont, in spite of threats such as MeHg contamination and lead fishing gear. Increasing numbers of territorial pairs and ponds with more consistent loon activity indicate a potential for further growth in the breeding population. The invaluable assistance of volunteer observers, camp owners, VFWD biologists and game wardens, and Vermont State Park and GMNF staff have greatly enhanced the effectiveness of statewide loon conservation efforts. Monitoring and management efforts, participation of volunteers, education of lake-users, and water level management should continue to be the primary tools for ensuring success of Vermont's breeding loons.

Implementation of the comprehensive Vermont Loon Recovery Plan (Borden and Rimmer 1998) has been ongoing and has helped the VLRP realize its population recovery goals. The majority of the short-term, high priority goals have been implemented since the mid-1990s. The post-delisting monitoring and management plan needs to address continued threats to loons in Vermont and the species' dependence on the VLRP's management and educational efforts. It should be emphasized that over 50% of the breeding loons in Vermont have directly benefited from VLRP management programs, and that many of these pairs would likely fail without such assistance. The Vermont Loon Recovery Plan will continue to help guide loon conservation efforts in the future. In recent years, the VLRP has focused its efforts on outreach and technical assistance (e.g., distribution of loon conservation fact sheets, programs targeted at lake associations, direct involvement with camp owners) and strengthening the volunteer program to assist with monitoring and management needs. In 2008, the VRLP will work with a Sterling College student to study the effectiveness of nest warning signs by assessing nest success rates at sites with and without nest warning signs across the northeastern U.S. A human development index will be created to factor in the vulnerability of each nest site.

With most short-term goals from the Recovery Plan having been achieved, the VLRP must now address the Plan's long-term, medium priority actions while monitoring potential changes due to delisting and the lead sinker ban. Many of the actions and recommendations below have been in place for several years, but resources of time and money have limited their implementation. These include:

1. An initiative involved contacting the Vermont Land Trust, the Vermont Housing and Conservation Board, and the Vermont Nature Conservancy about the use of conservation easements and land acquisition to permanently protect nest sites.
2. Individual landowners of nesting sites on northeastern lakes were identified in a 2000 study; this initiative should be expanded to all loon breeding lakes statewide.
3. Once a protocol is developed for both the donation and purchase of conservation easements, landowners should be approached with information about the program. An explicit protocol for the acquisition and/or long-term conservation of nest sites should be developed, so that opportunities can be quickly acted upon.
4. We will seek funding in 2008 to provide more detailed training packets for season-long volunteers.
5. Development of a comprehensive database in conjunction with the LPC in New Hampshire and BRI in Maine would allow us to better assess and summarize Vermont's loon population trends,

share and compare data with New Hampshire and Maine, develop a detailed population viability assessment for Vermont, and more efficiently coordinate volunteers.

6. BRI and several state and federal agencies may continue research on mercury bioavailability in the northeastern U.S. The VLRP would coordinate all capture/banding in Vermont for this study.
7. Other future initiatives to consider should focus on improving the awareness of lake users on busy lakes. Actions could include (a) developing an information sheet and set of management protocols for loon breeding lakes, especially those requiring intensive management and education, and (b) developing permanent displays at State Parks and on busy lakes.
8. A better understanding of Vermont's loon population dynamics would be gained by more closely examining the annual Loonwatch data, including creation of a database for all loon survey data.

It may be necessary to hire an assistant biologist to free time for new initiatives, as many of the above projects have been recommended in past years, but not implemented or completed due to insufficient VLRP staff time. Another option is to reduce some aspect of the current VLRP biologist's responsibilities (e.g., education programs, monitoring, volunteer coordination, Loonwatch) in order to concentrate on management activities, which should remain the primary focus of the VLRP.

The VLRP will continue its involvement with the Northeast Loon Study Working Group (NELSWG), a coalition of state and federal agency representatives, universities, non-profit organizations, and other interested parties addressing the conservation problems of loons in eastern North America. This is a valuable partnership and forum for information exchange.

Acknowledgments

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Volunteer assistance: We extend special thanks to the more than 200 Loonwatch and season-long volunteers who care so deeply about Vermont's loons. We received assistance from dozens of lakeshore owners in reporting loon sightings and allowing access to lakes. Numerous volunteers and State Park

staff helped distribute loon conservation fact sheets. Volunteers and staff spent hundreds of hours monitoring and attempting to catch loons in distress (e.g., those caught in fishing line/lures/hooks, landing on too-small ponds, or found dead). We sincerely thank all those who helped, including Lolita and David Forbes on Maidstone Lake, Don Fontana on Seymour Lake, Frank Wingate on Lake Rescue, Sally Wilson on Lake Morey, Sally Buteau and Linda and Howard Kelton on Lake Dunmore, Terry Davis on Chittenden Reservoir, Debby Haskins on No. 10 Pond, and several others who either initially reported loons in distress or helped with monitoring.

Vermont Wildlife Action Plan: The efforts of VFWD staff and many contributing partners resulted in the formal acceptance of the congressionally mandated Vermont Wildlife Action Plan in November 2005. The plan draws attention to the 323 Species of Greatest Conservation Need in Vermont, including the Common Loon. Now that the Common Loon has been removed from the Vermont Endangered and Threatened Species list due to many years of dedicated monitoring and management of this species, the Vermont Wildlife Action Plan provides for continued attention to our natural heritage. For more information, visit http://www.vtfishandwildlife.com/SWG_home.cfm.

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Figure 1a. The 2007 distribution of nesting and territorial loon pairs in northern Vermont

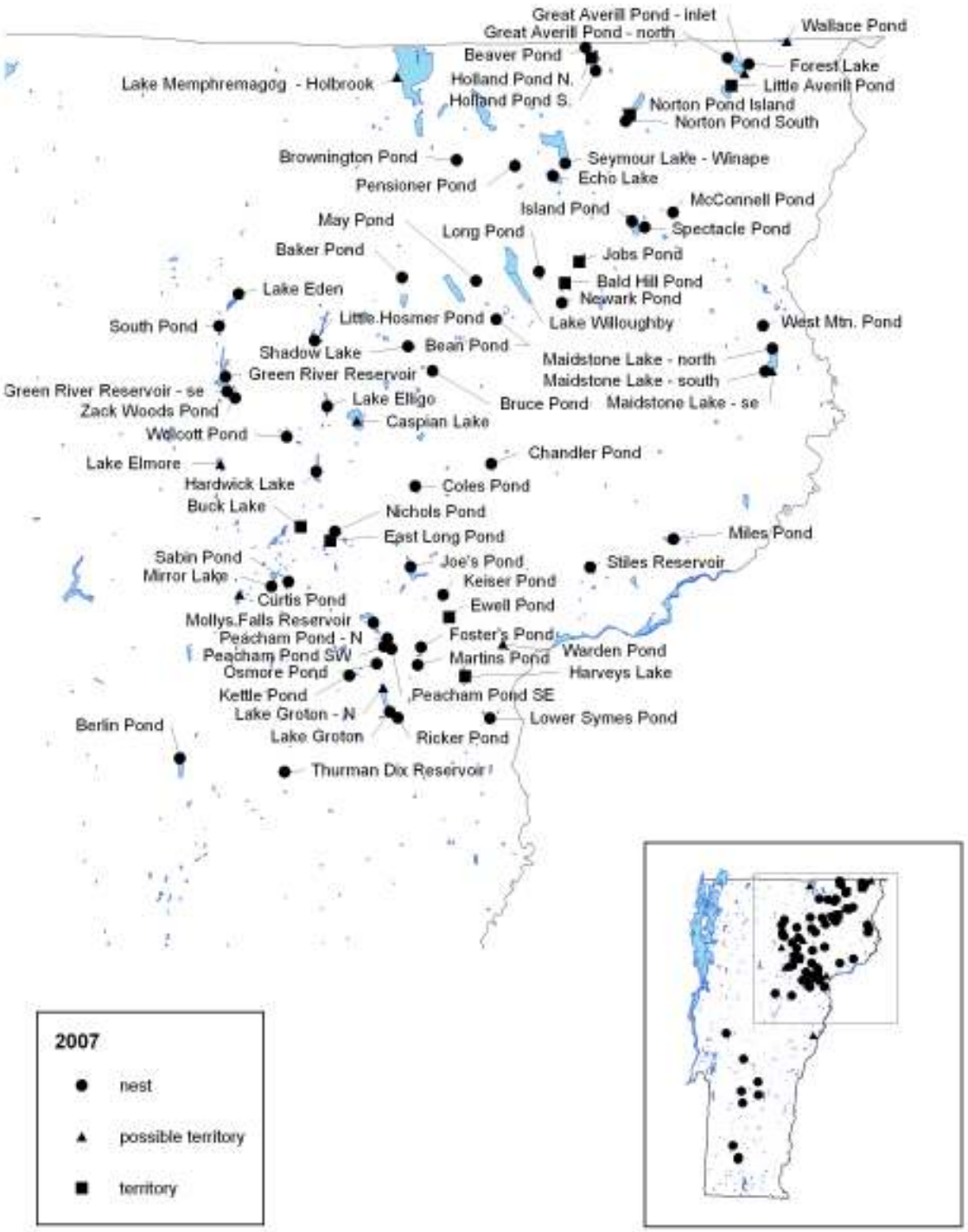


Figure 1b. The 2007 distribution of nesting and territorial loon pairs in central and southern Vermont.

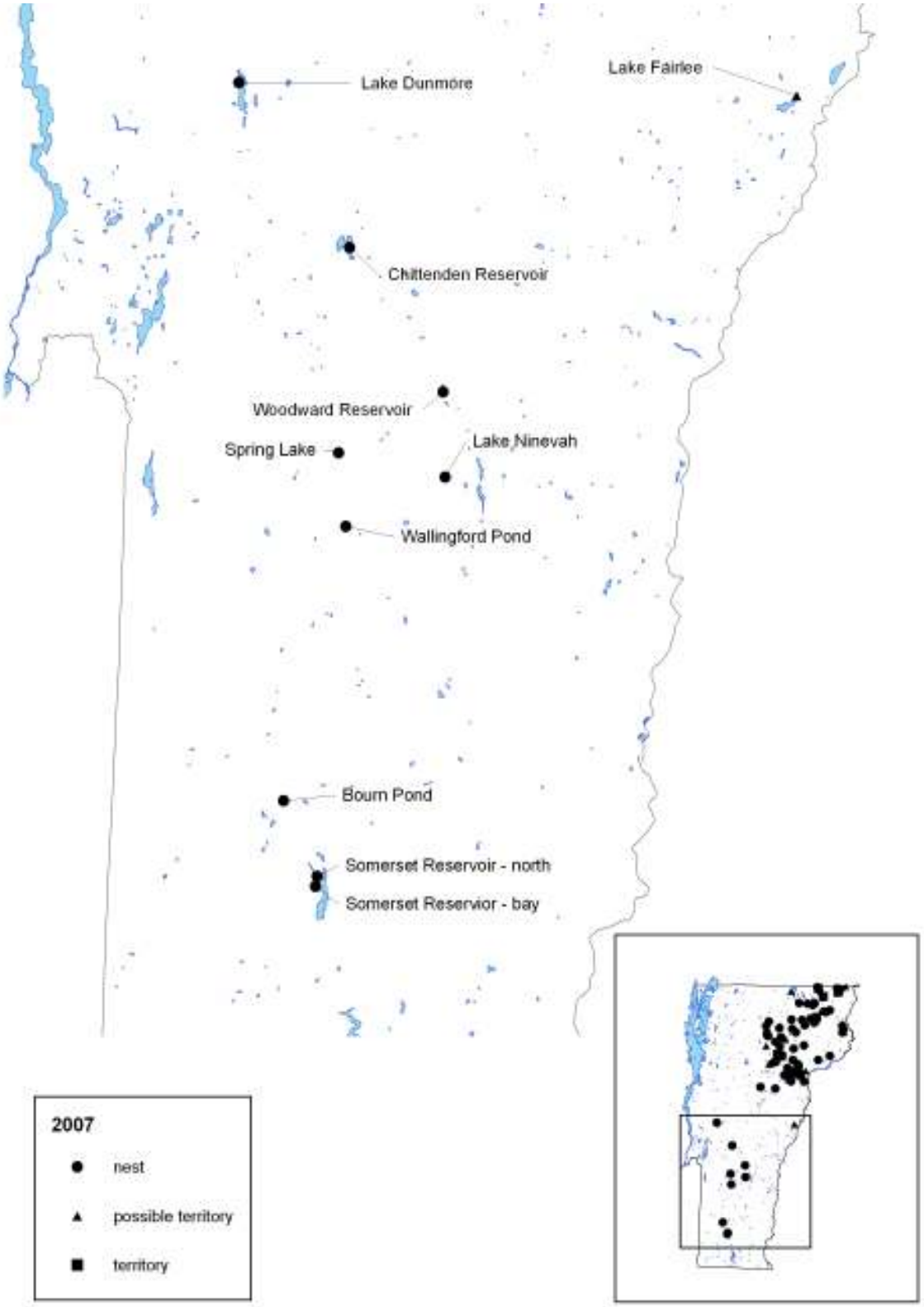
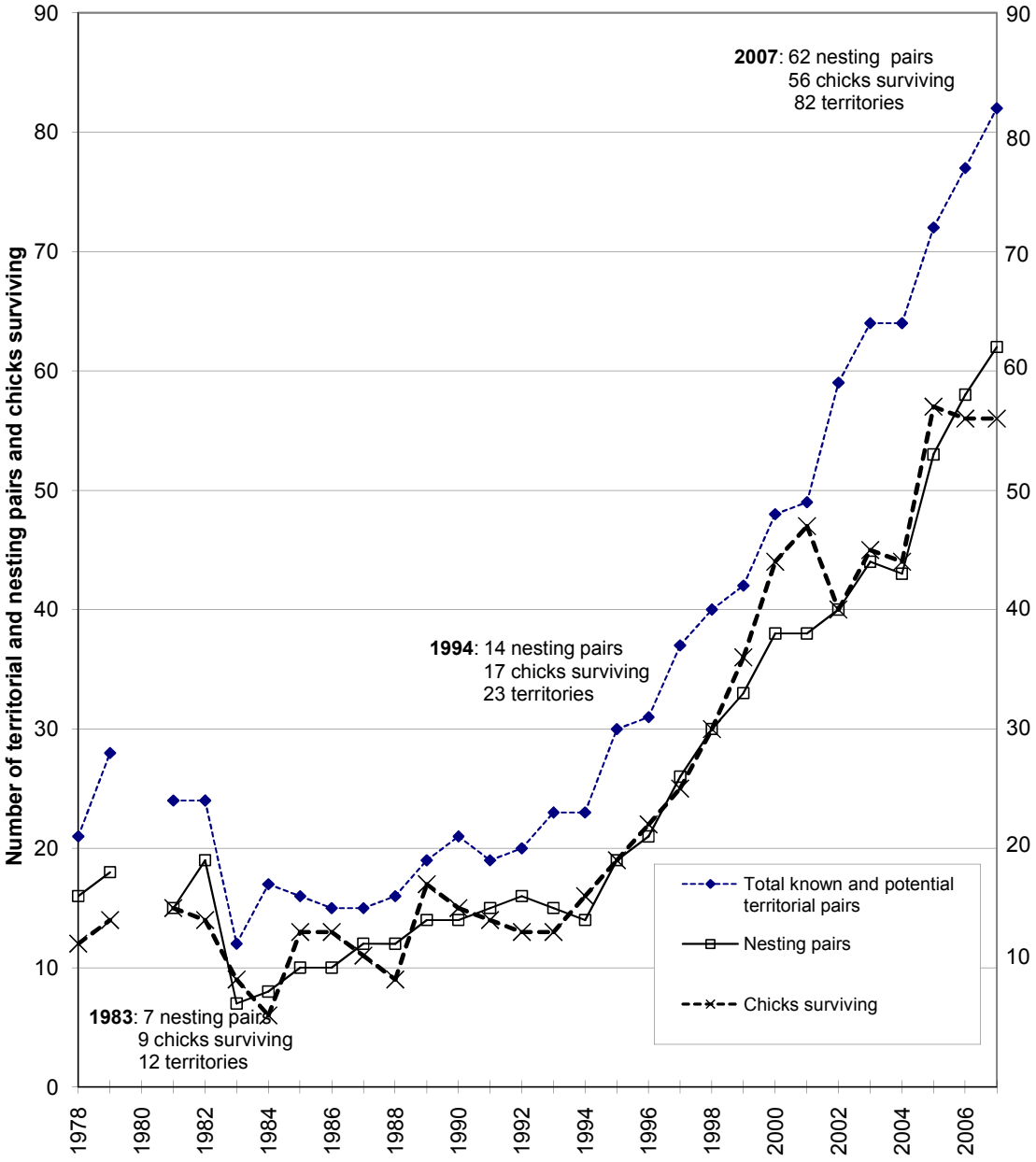
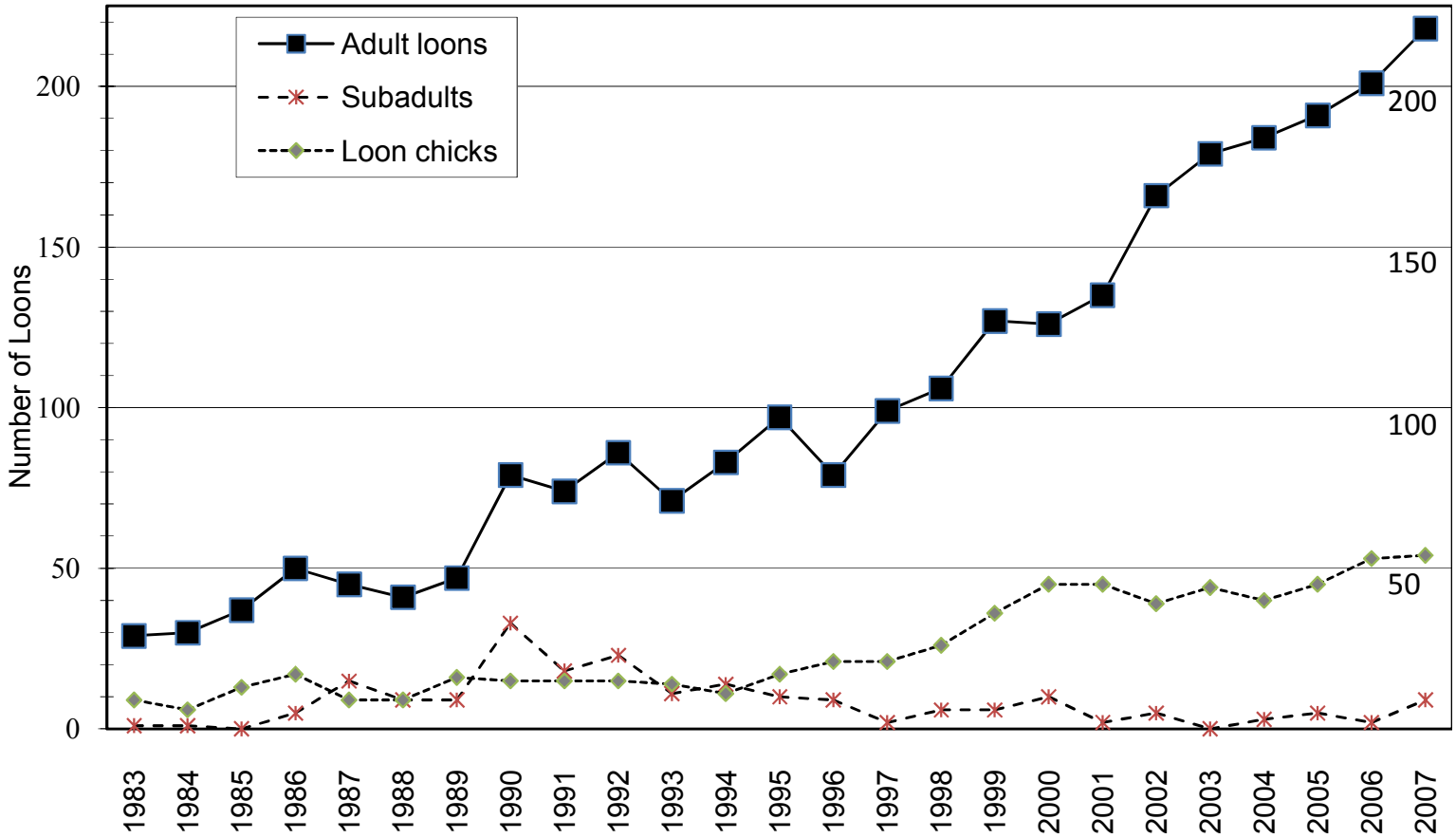


Figure 2. Summary of Common Loon breeding activity in Vermont, 1978-2007



Data for 1980 were incomplete

Figure 3. Vermont Loonwatch Results
(an annual statewide loon survey on the third Saturday of July)



The number of lakes surveyed for Loonwatch increased in 1999. It is possible survey numbers during the mid-1990s were slightly lower as only 70 to 80 lakes were surveyed each year.

Table 1. Summary of Common Loon breeding activity in Vermont, 2007

Nesting pairs: 62 Known territorial pairs: 71 Potential territorial pairs: 11 **Total territorials pairs: 82** **Chicks hatched: 71 Chicks surviving: 56**

Northeast Kingdom Region

Breeding Pairs

1	Bean P.	2 chicks from island nest site
2	Beaver P.	1 chick from traditional island nest; eagles present
3	Brownington P.	Shoreline nest abandoned (new location); egg(s) disappeared; nesting platform removed in 2006
4	Echo L. (Charleston)	Traditional shoreline nest depredated; re-nest across the lake likely flooded
5	Forest L.	Nesting platform abandoned; incubated too long
6	Great Averill L.	Shoreline nest flooded (new location)
7	Holland P.-South	Platform nest likely depredated by Bald Eagle
8	Island P.	Island nest abandoned; eggs disappeared
9	Long P.	2 chicks from traditional island nest
10	Maidstone L.-North	1 chick from shoreline nest (new location)
11	Maidstone L.-South	1 chick from unknown nest location; chick disappeared (intruder loons)
12	May P.	1 chick from traditional marsh nest
13	McConnell P.	2 chicks from shoreline nest (location unknown)
14	Miles P.	2 chicks from nesting platform
15	Newark P.	2 chicks from island nest (new location)
16	Norton P.-South	1 chick from nesting platform
17	* Pensioner P.	1 chick from shoreline nest; 1st recorded nest
18	Seymour L.-Winape	1 chick from nesting platform; chick disappeared (intruder loons)
19	* Shadow L. (Concord)	Shoreline nest abandoned after attempting to move the nest from private dock area to platform; re-nest abandoned; 1st recorded nest
20	Spectacle P.	2 chicks from nesting platform
21	Stiles Res.	1 chick from marsh nest
22	West Mountain P.	2 chicks from shoreline log nest; both chicks disappeared

Known Territorial Pairs - Northeast Kingdom (5)

Bald Hill P.	Pair present; nested in 2006; female from 2005 and maybe 2006 found dead on Lake Willoughby
Holland P.-North	Pair present; nested in 2006
Jobs P.	Pair present; built nest in 2006 but not used
Little Averill L.-West	Pair present; nested in 2005
Norton P.-Island	Pair present; nested in 2006

Potential Territorial Pairs - Northeast Kingdom (5)

Derby P.	L. Memphremagog - Holbrook Bay
Great Averill L.-Inlet	Wallace P.
Maidstone L.-SE	

North Central Region

Breeding Pairs

23	Baker P.	2 chicks from traditional marsh nest
24	Berlin P.	2 chicks from marsh nest; 1 chick survived
25	* Bruce P.	Marsh nest flooded; 1st recorded nest
26	* Chandler P.	Marsh nest flooded; 1st recorded nest
27	Coles P.	2 chicks from marsh nest (new location)
28	L. Eden	2 chicks from nesting platform; 1 chick survived
29	L. Eligo	1 chick from island nest (new island site)
30	Fosters P.	2 chicks from nesting platform
31	Green River Res.-N.	2 chicks from traditional island nest
32	* Green River Res.-SE.	1 chick from island nest; 1st recorded nest
33	L. Groton-South	1 chick from nesting platform
34	Hardwick L.	2 chicks from nesting platform
35	Joe's P.	1 chick from nesting platform
36	Keiser P.	2 chicks from traditional shoreline nest; 1 chick survived
37	Kettle P.	Shoreline nest flooded (new location)
38	Little Hosmer P.	1 chick from re-nest on small island; first nest abandoned
39	Lower Symes P.	1 chick from marsh nest; location unknown
40	Martins P.	1 chick from nesting platform; chick disappeared (intruder loons)
41	Molly's Falls Res.	1 chick from nesting platform
42	Nichols P.	Nesting platform abandoned; incubated too long
43	No. 10 P. (Mirror L.)	2 chicks from nesting platform; 1 adult caught in fishing line but line fell off
44	* Osmore P.	Shoreline nest flooded (new location); first recorded nest since 1980
45	Peacham P.-North	2 chicks from traditional island re-nest; first nest depredated

North Central Region (continued)

Breeding Pairs

46	Peacham P.-SE	Failed marsh nest; eggs knocked out (possible human disturbance)
47	Peacham P.-SW	2 chicks from traditional marsh nest; both chicks disappeared (intruder loons)
48	Ricker P.	2 chicks from re-nest on platform; 1st nest depredated
49	South P.	Island nest flooded (new location)
50	Thurman Dix Res.	1 chick from island nest
51	Wolcott P.	2 chicks from marsh nest (new location); 1 chick survived
52	* Woodbury L.	1 chick from nesting platform; chick disappeared after major storm; 1st recorded nest
53	Zack Woods P.	2 chicks from island nest; 1 chick survived (intruder loons)

Known Territorial Pairs - North Central (4)

Buck L.	Pair present; nested in 2003
East Long P.	Pair present; nested in 2005
Harveys L.	Pair present; nested in 2006
Ewell P.	Pair present; nested in 2006

Potential Territorial Pairs - North Central (6)

Caspian L.	L. Fairlee
Curtis P.	L. Groton-North
L. Elmore	Warden P.

Central and Southern Regions

Breeding Pairs

54	Bourn P.	1 chick from traditional island nest
55	Chittenden Res.	2 chicks from re-nest on platform; 1 chick survived; subadult caught in fishing line, but freed itself; 1st recorded chicks;
56	* L. Dunmore	1 chick from island nest; 1st recorded nest; subadult died from ingestion of fishing gear
57	L. Ninevah	1 chick from traditional island nest
58	Somerset Res.-Dandeneau Bay	1 chick from traditional large island nest; subadult rescued after ingestion of fishing gear
59	Somerset Res.-North Islands	2 chicks from island nest; 1 chick survived
60	Spring L.	Nesting platform abandoned; incubated too long
61	Wallingford P.	2 chicks from shoreline nest (new location)
62	Woodward Res.	1 chick from bog mat re-nest (new location); 1st shoreline nest abandoned

Lost Territories (7)

Greenwood L.	Occasional pair activity but not consistent
Knapp Brook P.	Single loons only
Marshfield P.	Single loons only
Neal P.	Single loons mostly
Seymour L.-West	Single loons mostly
L. Willoughby	Not enough observations to determine status
Wapanacki P.	Single loons only

* Indicates first recorded nest

Lakes to watch for future pair activity

(Some pair activity observed, but either intermittant or too few surveys to determine if potential territory)

Center P.	Marshfield P.
Comerford Res.	L. Memphremagog-Bell Is.
Crystal L.	Miller P.
Daniels P.	L. Morey
Dog P.	Nelson P.
Fairfield P.	Norton P. - North
Gale Meadows Res.	Noyes P.
Great Hosmer P.	Pigeon P.
Greenwood P.	L. Rescue
Halls P.	Salem L.
Hardwood P.	Shadow L. (Glover)
Kent P.	Silver L./Sugar Hills Res. (Leicester)
Knapp Brook P.	L. Willoughby
Little Averill L. - NE	

Table 2. Summary of population changes and reproductive success of Common Loons in Vermont, 1979-2007.

Year	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07
TOTAL territorial pairs	28	0	24	24	12	17	16	15	15	16	19	21	19	20	23	23	30	31	37	40	42	48	49	59	64	64	72	77	82
Known territorial prs.	21	--	18	19	9	12	11	11	12	13	16	17	16	18	17	21	22	24	29	34	39	44	44	49	53	57	60	65	71
Potential territorial prs.	7	--	6	5	3	5	5	4	3	3	3	4	3	2	6	2	8	7	8	6	3	4	5	10	11	7	12	12	11
Nesting pairs	18	--	15	19	7	8	10	10	12	12	14	14	15	16	15	14	19	21	26	30	33	38	38	40	44	43	53	58	62
Successful pairs	12	--	11	12	5	6	8	9	9	7	10	9	10	10	11	13	15	14	21	23	25	36	34	34	38	34	47	44	47
Chicks hatched	--	--	--	--	10	7	--	16	12	11	19	18	16	15	18	20	21	25	32	37	41	56	56	52	62	54	68	66	71
Chicks surviving through August	14	--	15	14	9	6	13	13	11	9	17	15	14	13	13	17	19	22	25	30	36	44	47	40	45	44	57	56	56
Chicks surviving per nesting pair	0.78	--	1.00	0.74	1.29	0.75	1.30	1.30	0.92	0.75	1.21	1.07	0.93	0.81	0.87	1.21	1.00	1.05	0.96	1.00	1.09	1.16	1.24	1.00	1.02	1.02	1.08	0.97	0.90
Chicks surviving per total territorial pair	0.50	--	0.63	0.58	0.75	0.35	0.81	0.87	0.73	0.56	0.89	0.71	0.74	0.65	0.57	0.74	0.63	0.71	0.68	0.75	0.86	0.92	0.96	0.68	0.70	0.69	0.79	0.73	0.68
% chick survival	--	--	--	--	90%	86%	--	81%	92%	82%	89%	83%	88%	87%	72%	85%	90%	88%	78%	81%	88%	79%	84%	77%	73%	81%	84%	85%	79%
Lakes with nesting pairs	17	--	14	19	7	8	10	10	11	11	13	13	14	15	14	14	18	21	25	29	32	36	36	38	41	39	49	52	57
Loonwatch results [a,b] (statewide annual survey)																													
Number of adults	--	--	--	--	29	30	37	50	45	41	47	79	74	86	71	83	97	79	99	106	127	126	135	166	179	184	191	201	218
Number of chicks	--	--	--	--	9	16	13	17	9	9	16	15	15	15	14	11	17	21	21	26	36	45	45	39	44	40	45	53	54
Number of subadults	8	--	11	6	7	1	0	5	15	9	9	33	18	23	11	14	10	9	2	6	6	10	2	5	0	3	5	2	9
Number of lakes surveyed																					150	107	131	133	123	98	122	133	148
Number of lakes occupied by loons																										68	69	84	86

[a] The number of lakes surveyed for Loonwatch increased in 1999. It is possible survey adult loon counts during the mid-1990s were slightly lower because many lakes were not surveyed regularly.

[b] Data since 2002 do not include Lake Champlain survey results, because of the large-scale survey effort conducted in that year.

On July 19 and 20 in 2002, 28 adult and 18 subadult loons were counted in non-overlap regions on Lake Champlain.

Table 3. Causes of Common Loon nest failures in Vermont, 1978-2007

	Average Annual Nest Failures						1 - year totals			Total	
Year	**78-82**	**83-87**	**88-92**	**93-97**	**98-02**	**03-07**	**2005**	**2006**	**2007**	**(78-07)**	
Average # failed nests per year	5.8	3.4	5	5	7	13.2	11	15	23	197	
Average # total nests per year (included re-nests)	15.2	9.6	14.6	19.6	37.4	55.2	58	59	70	758	
Nest failure rate (# failed nests/nest attempts)	38%	35%	34%	26%	19%	24%	19%	25%	33%	26%	
Specific causes of failed nests as a percent of total nest attempts										**Subtotal by cause**	
Year	**78-82**	**83-87**	**88-92**	**93-97**	**98-02**	**03-07**	**2005**	**2006**	**2007**	**# nests**	**% of total failed nests**
Depredation	9%	0%	4%	5%	2%	3%	2%	7%	*4%*	26	13%
Flooded	5%	4%	5%	7%	6%	5%	2%	11%	*10%*	42	21%
Stranded	0%	0%	4%	1%	0%	0%	0%	0%	*0%*	4	2%
Human disturbance	0%	0%	1%	0%	1%	2%	2%	2%	*1%*	7	4%
Intra-specific conflict	0%	0%	1%	0%	1%	2%	5%	0%	*0%*	7	4%
Egg(s) knocked out	0%	0%	0%	0%	2%	2%	2%	2%	*1%*	9	5%
Unknown: abandoned (eggs present)	0%	0%	5%	7%	3%	2%	3%	2%	*0%*	22	11%
Unknown: abandoned (eggs disappeared)	24%	31%	12%	5%	4%	9%	3%	9%	*16%*	79	40%

Table 4. Common Loon territories, nesting success, productivity, and recent breeding history in Vermont by location over 30 year period, 1978-2007

							2005			2006			2007		
Site	years w/ terr. pr.	years nested	years w/ chicks	total # surviving chicks	mean annual # surviving chicks per nesting yrs.	mean annual # surviving chicks per territory yrs.	Status	Nest Type	Surv. Chicks	Status	Nest Type	Surv. Chicks	Status	Nest Type	Surv. Chicks
Baker P	3	3	3	6	2.00	2.00	breed	shore	2	breed	shore	2	breed	shore	2
Bald Hill P	10	7	6	7	1.00	0.70	breed	platform	0	breed	platform	1	terr		
Bean P	3	3	3	4	1.33	1.33	breed	shore	1	breed	shore	1	breed	island	2
Beaver P	26	26	23	28	1.08	1.08	breed	island	0	breed	island	1	breed	island	1
Berlin P	10	6	5	7	1.17	0.70	breed	shore	1	breed	unknown	1	breed	shore	1
Bourn P	9	6	6	5	0.83	0.56	terr			breed	island	1	breed	island	1
Branch P	2	1	1	1	1.00	0.50	(1-2 adult)								
Brownington P	9	6	2	4	0.67	0.44	terr			breed	platform	fail nest	breed	shore	fail nest
Bruce P	2	1	0		0.00	0.00				potential terr			breed	shore	fail nest
Buck L	11	5	3	4	0.80	0.36	terr			terr			terr		
Caspian L	8	1	0	0	0.00	0.00	potential terr			potential terr			potential terr		
Cat's Bow P	1	1	1	1	1.00	1.00									
Champlain L	2	2	0	0	0.00	0.00				report of chick - N. Ferrisburgh; not confirmed					
Chandler P	2	1	0		0.00	0.00				potential terr			breed	shore	fail nest
Chittenden Res	3	3	1	1	0.33	0.33	breed	island	fail nest	breed	platform	fail nest	breed	platform	1
Coles P	12	10	9	12	1.20	1.00	breed	island	1	breed	island	1	breed	shore	2
Crystal L	2						(1-3 adults)			(1-3 adults)			(1-3 adults)		
Curtis P	1												potential terr		
Derby P	1												potential terr		
Dunmore L	1	1	1	1	1.00	1.00							breed	island	1
East Long P	28	25	17	21	0.84	0.75	breed	island	2	terr			terr		
Echo L (Charleston)	3	3	1	1	0.33	0.33	breed	shore	1	breed	shore	fail nest	breed	shore	fail nest
Eden L	7	4	3	3	0.75	0.43	breed	platform	1	breed	platform	1	breed	platform	1
Eligo L	6	6	4	4	0.67	0.67	breed	island	1	breed	island	1	breed	island	1
Elmore L	2									potential terr			potential terr		
Ewell P	8	2	2	1	0.50	0.13	potential terr			breed	shore	1	terr		
Fairlee L	1												potential terr		
Forest L	16	14	11	17	1.21	1.06	breed	platform	2	breed	platform	2	breed	platform	fail nest
Fosters P	5	5	5	6	1.20	1.20	breed	platform	1	breed	platform	1	breed	platform	2
Gale Meadows P	3	2	0	0	0.00	0.00	(0 adults)						(1-2 adults)		
Great Averill L - Inlet	2									potential terr			potential terr		
Great Averill L - North	15	14	8	9	0.64	0.60	breed	platform	2	breed	platform	2	breed	shore	fail nest
Green River Res - NW	30	29	23	34	1.17	1.13	breed	island	0	breed	island	1	breed	island	2
Green River Res - SE	1	1	1	1	1.00	1.00							breed	island	1
Greenwood L	5	1	1	1	1.00	0.20	potential terr			potential terr			(0-2 adults)		
Groton L - North	1												potential terr		
Groton L - South	9	8	7	10	1.25	1.11	breed	platform	fail nest	breed	platform	2	breed	platform	1
Hardwick L	6	5	5	7	1.40	1.17	breed	platform	1	breed	platform	1	breed	platform	2
Hardwood P	18	10	9	11	1.10	0.61							(0-2 adults)		
Harveys L	2	1	0	0	0.00	0.00	potential terr			breed	shore	fail nest	terr		
Holland P - North	2	1	0	0	0.00	0.00				breed	shore	fail nest	terr		
Holland P - South	28	15	8	10	0.67	0.36	breed	platform	1	breed	platform	fail nest	breed	platform	fail nest
Island P	10	8	6	8	1.00	0.80	terr			breed	island	0	breed	island	fail nest
Jobs P	10	4	3	3	0.75	0.30	potential terr			terr			terr		
Joe's P	14	8	8	9	1.13	0.64	breed	platform	1	breed	platform	1	breed	platform	1
Keiser P	3	3	3	3	1.00	1.00	breed	shore	0	breed	shore	1	breed	shore	1
Kettle P	22	19	13	18	0.95	0.82	breed	platform	1	breed	platform	1	breed	shore	fail nest
Knapp Brook P	1	1	1	1	1.00	1.00				breed	island	1	(0-1 adult)		
Little Averill L East	1						(2 adults)			(2 adults)			(1 adult)		
Little Averill L West	30	22	13	19	0.86	0.63	breed	platform	fail nest	terr			terr		
Little Hosmer P	11	9	5	4	0.44	0.36	breed	island	1	breed	island	fail nest	breed	island	1
Long P (Greensboro)	1						potential terr			(0-1 adult)			(0-1 adult)		
Long P (Westmore)	12	10	9	12	1.20	1.00	breed	island	1	breed	island	1	breed	island	2

(continued next page)

Table 4 (continued) Common Loon breeding history in Vermont by location

Site	years w/ terr. pr.	years nested	years w/ chicks	total # surviving chicks	mean annual # surviving chicks per nesting yrs.	mean annual # surviving chicks per territory yrs.	2005 Status	2005 Nest Type	2005 Surv. Chicks	2006 Status	2006 Nest Type	2006 Surv. Chicks	2007 Status	2007 Nest Type	2007 Surv. Chicks
Lower Symes P	7	7	7	11	1.57	1.57	breed	shore	2	breed	shore	2	breed	shore	1
Maidstone L - North	4	3	2	1	0.33	0.25	terr			breed	shore	fail nest	breed	shore	1
Maidstone L - South	30	26	25	31	1.19	1.03	breed	island	0	breed	island	1	breed	island	0
Maidstone L - SE	1												potential terr		
Marshfield P	1									potential terr			(0-1 adult)		
Martins P	13	11	11	14	1.27	1.08	breed	platform	2	breed	platform	1	breed	platform	0
May P	21	19	17	24	1.26	1.14	breed	shore	1	breed	shore	2	breed	shore	1
McConnell P	22	15	11	15	1.00	0.68	breed	platform	1	breed	platform	1	breed	unknown	2
Memphramagog L - Bell Is.	5	2	1	1	0.50	0.20	terr			(0-2 adults)			(0-2 adults)		
Memphramagog L - Holbrook Bay	5						potential terr			potential terr			potential terr		
Miles P	22	15	11	15	1.00	0.68	breed	platform	1	terr			breed	platform	2
No. 10 P (Mirror)	9	2	2	3	1.50	0.33	potential terr			breed	platform	1	breed	platform	2
Molly's Falls Res	22	13	12	16	1.23	0.73	breed	platform	1	breed	platform	1	breed	platform	1
Moore Res - Roaring Brook	8	4	3	0	0.00	0.00	terr			lost terr			(0-1 adult)		
Neal P	4						(0-2 adults)			potential terr			(1 adult)		
Nelson P							(1-3 adults)			(1-3 adults)			(0-3 adults)		
Newark P	25	18	11	15	0.83	0.60	breed	platform	2	breed	island	fail nest	breed	island	2
Nichols P	11	9	7	8	0.89	0.73	breed	platform	1	breed	platform	1	breed	platform	fail nest
Ninevah L	13	13	11	13	1.00	1.00	breed	island	2	breed	island	2	breed	island	1
Norton P Island	30	29	23	31	1.07	1.03	breed	platform	1	breed	island	1	terr		
Norton P South	10	8	8	12	1.50	1.20	breed	platform	2	breed	platform	1	breed	platform	1
Notch P	2						(0 adults)						(0-1 adult)		
Noyes P	3	1	0	0	0.00	0.00							(1-2 adults)		
Osmore P	8	2	1	0	0.00	0.00	(0-2 adults)			(0-2 adults)			breed	shore	fail nest
Peacham P North	30	30	25	31	1.03	1.03	breed	island	0	breed	island	2	breed	island	2
Peacham P SE	2	2	0	0	0.00	0.00				breed	shoreline	fail nest	breed	shore	fail nest
Peacham P SW	23	21	16	19	0.90	0.83	breed	shore	2	breed	shoreline	2	breed	shore	0
Pensioner	3	1	1	1	1.00	0.33	potential terr			potential terr			breed	shore	1
Pigeon P	8	1	0	0	0.00	0.00	potential terr			lost terr			(1-2 adults)		
Ricker P	7	5	4	5	1.00	0.71	breed	platform	0	breed	platform	fail nest	breed	platform	2
Salem L	2						(0-1 adult)			(0-2 adults)			(0-1 adult)		
Seymour L - West	4	1	1	2	2.00	0.50	breed	island	2	terr			(1-3 adults)		
Seymour L - Winape	15	10	9	12	1.20	0.80	breed	platform	2	breed	platform	1	breed	platform	0
Shadow L (Concord)	1	1	0	0	0.00	0.00							breed	shore	fail nest
Somerset Res - Dandeneau Bay	29	26	20	24	0.92	0.83	breed	island	2	breed	island	2	breed	island	1
Somerset Res North Islands	6	6	4	5	0.83	0.83	breed	island	1	breed	island	1	breed	island	1
Somerset Res South	1									(0-2 adults)			(1-3 adults)		
South P	13	10	8	10	1.00	0.77	breed	platform	2	terr			breed	island	fail nest
Spectacle P	21	13	11	15	1.15	0.71	breed	platform	1	breed	platform	2	breed	platform	2
Spring L	7	6	4	5	0.83	0.71	breed	platform	1	breed	platform	1	breed	platform	fail nest
Stiles Res	8	7	5	7	1.00	0.88	breed	island	2	breed	shoreline	fail nest	breed	shore	1
Thurman Dix Res	28	27	23	28	1.04	1.00	breed	platform	1	breed	island	1	breed	island	1
Turtle P	2	2	0	0	0.00	0.00	(0-1 adult)			(0-1 adult)			(0-1 adult)		
Wallingford P	8	8	6	9	1.13	1.13	breed	shore	0	breed	shoreline	0	breed	shore	2
Wapanacki P	1									potential terr			(1 adult)		
Warden P	1												potential terr		
Waterbury Res	4	3	1	1	0.33	0.25							(0-1 adult)		
West Mountain P	10	9	6	4	0.44	0.40	breed	shore	fail nest	breed	shoreline	fail nest	breed	shore	0
Willoughby L	4						potential terr			potential terr			(2-5 adults)		
Wolcott P	20	16	15	22	1.38	1.10	breed	shore	2	breed	shoreline	1	breed	shore	1
Woodbury P	5	1	1	0	0.00	0.00	potential terr			(0-2 adults)			breed	platform	0
Woodward Res	3	3	1	1	0.33	0.33	breed	island	fail nest	breed	island	fail nest	breed	island	1
Zack Woods P	14	12	11	18	1.50	1.29	breed	island	2	breed	island	2	breed	island	1

* Data not available for 1980 for most lakes.

Table 5. Common Loon banding data, current status, and mercury levels in Vermont

Date	Lake/Pond	Recap	Age	Sex	Feather MeHg (ppm)	Risk level [a]	d MeHg (ppm)	Risk level [a]	USFWS band #	left leg (combo)	right leg (combo)	2007 status
7/21/1999	Bald Hill P.	No	Adult	Male	16.6	moderate	1.14	moderate	898-098-27	blue/red	blue dot/silver	2005 on Jobs P (potential new territory)
7/21/1999	Bald Hill P. (mortality)	No	Adult	Female	6.25	low	0.248	low	898-098-22	white/white	silver/yellow dot	Found dead L. Willoughby 7/07 (cause unknown); replaced on Bald Hill
7/12/2000	Coles P.	No	Adult	Male	6.52	low	1.24	moderate	938-064-93	yellow dot	silver / white stripe	Returned 2003; unknown since
7/12/2000	Coles P.	No	Chick	Unknown	x	x	x	x				
2001-	Fosters P. (from Martins)		Adult	Male					938-064-58	orange / blue	silver / white stripe	return - 1 chick
8/1/2000	Island P. (mortality)	No	Adult	Female	13.20	moderate	1.08	moderate	938-064-85	orange / orange	silver / blue dot	na
8/1/2000	Island P. (mortality)	No	Adult	Male	12.10	moderate	1.77	moderate	938-064-84	red / yellow	silver / white stripe	na (mortality 2001 lead)
8/1/2000	Island P.	No	Chick	Unknown	0.00	low	0.03	low	Unbanded			
8/1/2000	Island P.	No	Chick	Unknown	0.00	low	0.81	extra high	Unbanded			
8/3/2001	Island P.	No	Adult	Female	14.90	moderate	0.73	low	898-099-68	green / red	silver / green strip	Returned 2003; unknown since
8/3/2001	Island P.	No	Chick	Unknown	x		<0.25	low-mod	Unbanded			
8/3/2001	Island P. (mortality)	Yes	Adult	Male	12.40	moderate	0.90	low	938-064-84	red / yellow	silver / white stripe	na
6/22/2000	Island P. (mortality)	No	Adult	Unknown	7.34	low	x	x	Unbanded			na
2005-	Jobs (from Bald Hill)		Adult	Male					898-098-27	blue/red	blue dot/silver	
8/2/1998	Jobs P.	No	Adult	Female	4.36	low	0.124	low	898-09124	red	yellow/silver	Returned 2000; unknown since
8/2/1998	Jobs P.	No	Chick	Unknown	x	x	0.013	low	Unbanded			
5/26/2000	Jobs P. (mortality)	No	Adult	Unknown	1.20	low	x	x	Unbanded			na
8/10/2001	Lower Symes P.	No	Chick	Unknown	x		<0.25	low-mod	Unbanded			
2005-	Maidstone L. - N (from Maidstone - S)		Adult	Female					938-064-57	red	silver / blue dot	return - 1 chick
7/11/2000	Maidstone L. - S	No	Adult	Female	4.99	low	0.58	low	938-064-57	red	silver / blue dot	nested Maidstone - N
7/11/2000	Maidstone L. - S	No	Chick	Unknown	0.00	low	0.12	low	Unbanded			
7/31/2000	Martin's P. (mortality)	No	Adult	Female	4.14	low	0.47	low	898-099-46	white / red	silver / white stripe	na
7/31/2000	Martin's P.	No	Adult	Male	4.39	low	0.51	low	938-064-58	orange / blue	silver / white stripe	nested Fosters
8/2/1998	May P.	No	Adult	Female	8.05	low	0.355	low	898-09111	blue/blue	yellow/silver	Returned 2002; unknown since
7/21/1999	McConnell P.	No	Adult	Male	6.53	low	1.27	moderate	898-098-13	red/white	silver/green	Returned 2003; unknown since
8/10/2001	Miles P.	No	Adult	Unknown	[b]		[b]		898-099-91	white	silver	moved to Shadow L (Concord) - fail nest
7/31/2000	Molly's Falls Res.	No	Adult	Female	5.80	low	1.03	moderate	938-064-83	red / red	white stripe / silver	did not return
7/31/2000	Molly's Falls Res.	No	Adult	Male	8.41	low	1.81	moderate	898-099-96	yellow / blue	white stripe / silver	did not return
7/31/2000	Molly's Falls Res. (mortality)	No	Chick	Unknown	0.00	low	0.19	moderate	938-064-56	yellow / red	silver / blue dot	Found dead East Long P 2006 (fishing line ingestion)
8/15/2000	Molly's Falls Res. (mortality)	No	Adult	Unknown	7.18	low	x	x	Unbanded			
7/11/2000	Moore Res. - Walker's Pit	No	Adult	Female	[b]		[b]		938-064-68	red / white	green dot / silver	Returned 2000; unknown since
7/11/2000	Moore Res. - Walker's Pit	No	Adult	Male	[b]		[b]		598-220-57	orange	silver / white stripe	Returned 2003; unknown since
7/11/2000	Moore Res. - Walker's Pit	No	Chick	Unknown	[b]		[b]		Unbanded			
8/7/2003	Moore Res. - Walker's Pit	Yes	Adult	Male	[b]		[b]		598-220-57	orange	silver / white stripe	Returned 2003; unknown since
8/7/2003	Moore Res. - Walker's Pit	----	Adult	Female	----	----	----	----	----	silver	yellow (numeric)	New female 2003 likely from New Hampshire; unknown since

(continued next page)

Table 5 (continued)

Date	Lake/Pond	Recap	Age	Sex	Feather MeHg (ppm)	Risk level [a]	d MeHg (ppm)	Risk level [a]	USFWS band #	left leg (combo)	right leg (combo)	2007 status
8/2/1998	Newark P.	No	Adult	Female	6.93	low	0.185	low	898-09126	red/yellow	yellow/silver	Returned 1999; unknown since
8/2/1998	Newark P.	No	Adult	Male	18	moderate	0.425	low	898-09100	green/orange	yellow/silver	Returned 2005; unknown since
8/2/1998	Newark P.	No	Chick	Unknown	x	x	0.013	low	898-09193	orange (v6)	silver	
8/2/1998	Newark P.	No	Chick	Unknown	x	x	0.013	low	898-09118	silver		
9/6/2001	Shadow L. (Concord)(recovery)	No	Adult	Unknown	11.30	moderate	x		??	green / blue	silver / green stripe	na
2007-	Shadow L. (Concord)(moved from Miles)		Adult	Unknown					898-099-91	white	silver	1st year observed - from Miles P - fail nest
7/28/1999	Somerset Res.- Dandeneau B.	No	Adult	Male	14.3	moderate	2.19	moderate	898-098-21	orange/yellow	silver/green	moved to Somerset - N Islands
2005-	Somerset Res. - N. Islands		Adult	Male					898-098-21	orange/yellow	silver/green	return - nest
7/31/2002	Spectacle P.	No	Adult	Male	na	na	0.6	low	649-088-13	green / red	red stripe / silver	return - nest
7/22/2002	Waitsfield (Berlin P. / Waterbury Res.?) (mortality)	No	Adult	Unknown	na	na	4.04	Xhigh	Unbanded			na
7/12/2000	Wolcott P.	No	Adult	Female	7.73	low	1.69	moderate	938-064-94	red	white / silver	Returned 2001; unknown since
7/12/2000	Wolcott P.	No	Adult	Male	5.27	low	2.19	moderate	898-099-85	yellow dot	silver / blue dot	return - nest
7/12/2000	Wolcott P.	No	Chick	Unknown	0.00	low	0.45	extra high	Unbanded			
7/12/2000	Wolcott P.	No	Chick	Unknown	0.00	low	0.82	extra high	Unbanded			
7/28/2001	Wolcott P.	Yes	Adult	Female	8.48	low	1.92	moderate	938-064-94	red	white / silver	Returned 2001; unknown since
7/28/2001	Wolcott P.	No	Chick	Unknown	x		0.32	moderate	Unbanded			
7/28/2001	Wolcott P.	No	Chick	Unknown	x		<0.25	low-mod	Unbanded			
7/28/2001	Zack Woods P.	No	Adult	Female	4.65	low	0.74	low	938-152-97	white / white	silver / green stripe	Returned 2003; unknown since
7/28/2001	Zack Woods P.	No	Chick	Unknown	x		<0.25	low-mod	938-152-19	silver	yellow "A5"	unknown
7/28/2001	Zack Woods P.	No	Chick	Unknown	x		<0.25	low-mod	Unbanded		yellow "C7"	unknown

Table 6. Risk categories for methylmercury (MeHg) (ppm) availability in the Common Loon (Evers et al. 1999).

Sample type	Low [a]	Moderate [a]	High [a]	Extra high [a]	Reference
Egg	0-0.5	0.5-1.0	1.0-2.0	>2.0	Barr 1986
Blood - Adult	0-1.0	1.0-3.0	3.0-4.0	>4.0	BRI [b], inferred by Barr 1986 [c]
Blood - Chick	0-0.1	0.1-0.3	0.3-0.4	>0.4	Meyer et al. 1998 [d]
Feather	0-9	9-20	20-35	>35	Thompson 1996, BRI [b]

a Definition of risk categories:

- Low risk: Background MeHg levels are minimally impacted by anthropogenic inputs.
- Moderate risk: MeHg levels likely do not impact individuals.
- High risk: Individuals are exposed to toxic levels of MeHg with potential molecular, organism, and/or population effects (e.g., reproductive, development, behavioral effects).
- Extra High risk: MeHg levels adversely effect loons and other birds base on known impacts (see references listed).

b BRI refers to unpublished data by BioDiversity Research Institute.

c Adult blood Hg levels are generally 10x higher than prey Hg levels (Evers and Reaman [1998] and Barr [1986] found lower reproduction of loons with prey Hg levels of 0.3 ppm and no reproduction at 0.4 ppm).

d Applies to 3-5 week-old chicks, only.

Table 7. Methylmercury (MeHg) levels in Common Loon eggs collected from Vermont lakes and ponds, 1997-2007. Samples in bold indicate high or extra high risk level.

Year	Lake/Pond	Town	MeHg (ppm) [a]	Risk level [b]	Incubation level [c]	Comments
2001	Bald Hill P.	Westmore	0.27	low	0	abandoned
2002	Bald Hill P.	Westmore	0.368	low	NA	failed to hatch; 1 ch successful
2005	Bean P.	Sutton	0.68	moderate	NA	failed to hatch; 1 ch successful
2006	Bean P.	Sutton	0.550	moderate	0	failed to hatch; 1 ch successful
1997	Beaver P.	Holland	0.43	low	1	flooded
2007	Bruce	Sheffield				1 egg left in flooded nest
1999	Buck L.	Woodbury	0.0047	low	NA	membrane and fluids from hatched egg
2005	Chittenden Res.	Chittenden	0.54	moderate	NA	abandoned - eggs knocked from nest
2005	Chittenden Res.	Chittenden	0.68	moderate	NA	abandoned - eggs knocked from nest
2006	Chittenden Res.	Chittenden	0.459	low	NA	abandoned
2001	Coles P.	Walden	0.52	moderate	0	egg knocked from nest; 1 chick successful
1999	East Long P.	Woodbury	0.426	low	1	abandoned
2003	East Long P.	Woodbury	0.431	low	0	abandoned - intraspecific competition
2003	East Long P.	Woodbury	0.68	moderate	0	abandoned - intraspecific competition
2002	Eden L.	Eden	0.389	low	0	flooded
2007	Elligo L.	Greensboro				2nd egg left in nest. 1 chick o.k.
2005	Elligo L.	Greensboro	0.32	low	3	failed to hatch; 1 ch successful
1999	Forest L.	Averill	0.662	moderate	1	abandoned
2003	Fosters P.	Peacham	0.46	low	NA	failed to hatch; 1 ch successful
2004	Fosters P.	Peacham	0.605	moderate	0	failed to hatch; 1 ch successful
2005	Fosters P.	Peacham	0.26	low	1	failed to hatch; 1 ch successful
1998	Great Averill L.	Averill	0.353	low	0	failed to hatch; 1 ch successful
2000	Great Averill L.	Averill	0.582	moderate	4	abandoned
2001	Great Averill L.	Averill	0.33	low	0	egg buried in nest
2003	Great Averill L.	Averill	0.658	moderate	0	1st nest abandoned; egg knocked from nest
2003	Great Averill L.	Averill	0.286	low	0	re-nest abandoned
2003	Great Averill L.	Averill	0.254	low	1	re-nest abandoned
1998	**Green River Res.**	**Hyde Park**	**1.24**	**high**	**NA**	**flooded**
2000	Green River Res.	Hyde Park	0.747	moderate	NA	failed to hatch; 1 ch successful
2007	Groton L.	Groton				2nd egg left in nest. 1 chick o.k.
2004	Hardwick L.	Hardwick	0.107	low	4	hatched chick found dead on nest
2005	Hardwick L.	Hardwick	0.38	low	3	failed to hatch; 1 ch successful
2006	Hardwick L.	Hardwick	0.347	low	0	failed to hatch; 1 ch successful
1999	Hardwood P.	Hardwick	0.43	low	NA	abandoned
1999	Hardwood P.	Hardwick	0.366	low	NA	abandoned
1997	**Holland P.**	**Holland**	**1.07**	**high**	**3**	**flooded**
1998	Holland P.	Holland	0.809	moderate	0	flooded
1998	Holland P.	Holland	0.828	moderate	4	flooded
2005	Holland P.	Holland	0.35	low	0	failed to hatch; 1 ch successful
1998	Island P.	Brighton	0.377	low	4	abandoned - eggs knocked from nest
1999	Jobs P.	Westmore	0.211	low	NA	failed to hatch; 1 ch successful
2005	Joe's	Cabot	0.27	low	NA	egg knocked from nest; 1 ch successful
1997	Kettle P.	Groton	0.362	low	3	failed to hatch; 1 ch successful
2000	Kettle P.	Groton	0.318	low	NA	failed to hatch; 1 ch successful
2002	Kettle P.	Groton	NA	NA	4	failed to hatch; 1 ch successful
1997	Little Averill L.	Averill	0.512	moderate	1	failed to hatch; 1 ch successful
2004	Little Averill L.	Averill	0.676	moderate	4	failed to hatch; 1 ch successful
1999	Little Hosmer P.	Craftsbury	0.354	low	NA	left in nest after 1st egg disappeared
2002	Little Hosmer P.	Craftsbury	0.197	low	0	failed to hatch; 1 ch successful
2004	Little Hosmer P.	Craftsbury	0.208	low	0	failed to hatch; 1 ch successful
2005	Little Hosmer P.	Craftsbury	0.21	low	1	abandoned; 2nd re-nest successful
2005	Little Hosmer P.	Craftsbury	0.06	low	1	1st nest abandoned; egg knocked from nest
2006	Little Hosmer P.	Craftsbury	0.284	low	0	nest likely flooded; egg left in nest
2006	Long Pond	Westmore	0.394	low	NA	failed to hatch; 1 ch successful
2006	Maidstone L. - N	Maidstone	0.235	low	0	abandoned; 2nd egg disappeared
2006	Maidstone L. - S	Maidstone	0.301	low	4	egg hatched but chick died in the egg; 1 ch successful
2005	May P.	Barton	0.48	low	3	failed to hatch; 1 ch successful
2007	Molly's Falls Res.	Cabot				2nd egg left in nest. 1 chick o.k.
2006	Newark P.	Newark	0.411	low	0	flooded
2006	Newark P.	Newark	0.471	low	1	flooded
1997	Ninevah L.	Mount Holly	0.453	low	2	egg knocked from nest; 1 chick successful
1999	Ninevah L.	Mount Holly	0.392	low	0	abandoned after conflict with other loons
2000	Ninevah L.	Mount Holly	x			failed to hatch; 1 ch successful
2005	Ninevah L.	Mount Holly	0.20	low	2	1st nest abandoned; intruder loons
2005	Ninevah L.	Mount Holly	0.35	low	1	1st nest abandoned; intruder loons
2005	Peacham P. - N	Peacham	0.41	low	NA	failed to hatch; 1 ch successful
2007	Peacham P. - SE	Peacham				knocked out of nest, failed nest
2006	Peacham P. - SE	Peacham	0.666	moderate	0	abandoned - eggs knocked from nest
2006	Peacham P. - SE	Peacham	0.713	moderate	0	abandoned - eggs knocked from nest
2007	Shadow (Concord)	Concord				re-nest abandoned, possible flooding
2007	Shadow (Concord)	Concord				1st nest abandoned, disturbance
2007	Shadow (Concord)	Concord				re-nest abandoned, possible flooding
2007	Shadow (Concord)	Concord				1st nest abandoned, disturbance
2006	Spring L.	Shrewsbury	0.260	low	3	failed to hatch; 1 ch successful
2005	Woodward R.	Plymouth	0.41	low	NA	abandoned
2005	Woodward R.	Plymouth	0.45	low	NA	abandoned