THE 2010 BREEDING STATUS OF COMMON LOONS IN VERMONT

Eric W. Hanson[1,2] and John Buck[3]

ABSTRACT: Vermont's Common Loon population continued to increase in 2010, 5 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 72 loon nesting pairs and 92 territorial pairs statewide. Of the 72 pairs that attempted nesting, 57 successfully hatched 85 eggs, with 70 chicks surviving through August (chick survival rate 82%, 0.76 chicks surviving per territorial pair). Five new nesting pairs and 1 new potential territorial pair were identified. Thirteen pairs that have nested in recent years did not nest in 2010 because of intruder loon activity, high water, or lack of suitable nest sites. Of 18 pairs whose first nest attempts failed, 3 re-nested, and all were successful. Causes of nest failure included flooding (4 nests) and depredation (at least 2 nests). The remaining failed nests were abandoned for unknown reasons, although human disturbance, intruder loons, water level draw down, and flooding may have been contributing factors. The causes of mortality of most chicks were unknown. Four chicks disappeared after interactions with intruder loons, 2 were taken by a bald eagle, and at least 1 died because of sibling rivalry. Four adult loons were reported to be entangled in fishing line, but none were found after intensive searches. Three adult loons were rescued and released after crashing on roads (2) and landing on a pond too small to fly from (1). Three other loons were monitored closely after either landing on very small ponds (2) or becoming exhausted after a territorial conflict (1). All 3 moved on to other ponds. Six adults were found dead or died shortly after being rescued as a result of aspergillosis (Dunmore, Plainfield), trauma from fights with other loons (Mollys Falls, Sunset), likely lead poisoning from gun pellets found in wounds that had healed over (Maidstone), and from unknown causes (Kettle). About 175 volunteers surveyed lakes throughout Vermont on 17 July as part of the Loonwatch program, an annual statewide loon count. Loons were observed on 76 of 129 surveyed lakes, where observers counted 201 adults, 53 chicks, and 0 subadult loons. The total adult loons decreased by 12% from 2009 when 228 adults were counted. Some potential reasons for the decline include high winds early in the morning, and more lakes than usual that were not surveyed. To provide a historical perspective, volunteers counted 135 and 191 adult loons in 2000 and 2005, respectively. Twenty-six of the 72 breeding pairs nested on nesting rafts, 22 on islands, and 24 on shorelines. Forty-two nesting rafts were placed on known or potential nesting waterbodies. Warning sign buoys were placed around 41 of the 72 nests. Volunteers provided technical assistance through the placement and maintenance of nest warning signs and/or nesting rafts on 44 lakes as part of the adopt-a-lake program. Thirteen loon conservation programs were presented to over 425 people statewide, including a 25 minute radio interview and 30 minute public access television program.

[1] *Vermont Center for Ecostudies, P.O. Box 420, Norwich, VT 05055; 802-649-1431*
[2] *Vermont Loon Recovery Project Coordinator, P.O. Box 22, Craftsbury, VT 05826; 802-586-8064*
[3] *Vermont Fish and Wildlife Department, McFarland State Office Building, 5 Perry St. Suite 40, Barre, VT 05641; 802-476-0196*

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, and then experienced a marked increase over the subsequent 16 years to 72 in 2010. The VLRP is a program of the Vermont Center for Ecostudies (VCE) and the Vermont Fish and Wildlife Department (VFWD).

A major accomplishment was reached in 2005 with the removal of the Common Loon from the Vermont Endangered and Threatened Species list. Thirty-three years of Common Loon conservation and education by many groups and individuals enabled the achievement of this milestone. Through the guidance of VCE and the VFWD, 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.

Since the mid-1980's, the VLRP has been a joint program between VCE and VFWD. The Nongame Wildlife Fund has been the primary funding source for the VLRP (40-70% 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 of lakes with breeding and territorial loons

The VLRP biologist, VFWD biologists and game wardens, and 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). Over 150 adopt-a-lake volunteers provided technical assistance in this intensive monitoring effort. Vermont Loonwatch day 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 loons, subadult loons (1-2 year olds), and loon chicks on the water body, as well as relevant human and wildlife activity. 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.

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 rafts 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 8 hydroelectric companies and 3 agencies that regulate water levels on lakes where loons have historically nested were contacted in April by VFWD staff. Each company was requested to stabilize water levels during the nesting period so that nests would not be flooded by rising water levels or left stranded by water drawdowns.

Forty-two artificial nesting rafts were placed on 38 lakes. These rafts 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. Rafts 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, rafts will not be considered unless the pair fails to nest after 4 or 5 consecutive years of occupancy. Rafts are considered on lakes where natural nests have failed 3 consecutive times, and the VLRP deems that rafts might prove beneficial. Adopt-a-lake volunteers maintained or helped with 25 rafts.

Warning sign buoys were placed around 41 of the 72 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 2010. Sign buoys were used in areas where repeated human disturbance was likely to occur. The VLRP biologist coordinated responses to loons in distress with volunteers, VFWD game wardens, wildlife rehab personnel, and veterinarians (e.g., caught in monofilament, injured, road crashes, landed on ponds too small to fly from, caught in ice, other).

Education

Public education continued to be a vital part of loon management efforts. The VLRP biologist contacted landowners of new nesting sites as soon as nesting was suspected or observed. Thirteen slide lectures and discussions on loon biology, conservation, and research were presented to audiences at lake associations, school groups, state parks, other organizations (libraries, conservation groups, Road Scholar), and radio and television interviews. Approximately 422 adults and 10 children attended these programs. A sign informing boaters and anglers how to help nesting 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 some access areas. Biologists, staff educators, and the project's volunteer network regularly informed camp owners and other lake users about loon conservation measures. The *Loon Caller* newsletter and a loon fact sheet were mailed to volunteers and distributed at all programs.

C*ontaminant sampling*

Abandoned eggs were collected and delivered to BioDiversity Research Institute (BRI,19 Flaggy Meadow Road, Gorham, ME 04038-1203) for methylmercury (MeHg) analysis (Evers et al. 1999). Seven eggs were collected in 2010. 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 AND DISCUSSION

Description of loon activity on individual lakes in 2010

Lake and loon activity descriptions are provided for nesting pairs, known and potential territorial pairs, and lakes with high levels of loon activity in Table 1. Territorial pairs have nested in recent years and were present during most surveys. Lakes where 2 adult loons were observed through much of the summer but had no recent history of nesting are considered potential territories.

Table 1. Summary of Common Loon breeding activity in Vermont, 20

Nesting pairs: 72 Known territorial pairs: 85 Potential territorial pairs: Total territorials pairs: 92

Chicks hatched: 85 Chicks surviving through August: 70

Lake list divided into sections: 1) nesting pairs, 2) known and potential territorial pairs, and 3) loon active lakes.

Lake Name	Town	Status	Nest Type	Nest Outcome	Nest Warning Sign Buoys	Chicks hatched out	Chicks through August	Chick Mortality Cause	Adult Mortality	Comments	# years nested	# years nest success	total # surviving chicks
Baker P.	Barton	nesting	marsh	successful		1 Ch	1 Ch			Loons fly over to Lake Parker frequently.	6	6	10
Bald Hill P.	Westmore	nesting	shore	depredated 20 June						Egg shells found on shore away from nest.	10	8	8
Bean P.	Sutton	nesting	marsh	successful		1 Ch	1 Ch				6	6	7
Beaver P.	Holland	nesting	island	successful		1 Ch	1 Ch				29	26	33
Berlin P.	Berlin	nesting	marsh	successful		1 Ch	1 Ch			Nest site unknown. Adult loo that crash landed on road nearby on 12 May stayed muc of summer, appeared lethargic early summer but healthy late	9	8	11
Bourn P.	Sunderland	nesting	island	successful		2 Ch	1 Ch	Unknown		Nest site change to north side of island.	9	8	7
Brownington P.	Brownington	nesting	marsh	successful	signs	1 Ch	1 Ch			Nest site change to NE shore.	9	4	6
Bruce P.	Sheffield	nesting	marsh	abandoned – unknown						Nest either flooded or eggs knocked out. Pair has yet to be successful in 3 nest attempts.	3	0	
Chandler P.	Wheelock	nesting	marsh	successful		1 Ch	1 Ch			Nest site change to western marsh shoreline.	3	2	2
Chittendon Res.	Chittenden	nesting	raft	successful	signs	1 Ch	0 Ch	Unknown – lost early		Raft broke loose during nesting; pair still successful after moving raft back.	6	4	4
Coles P.	Walden	nesting	marsh	successful	signs	2 Ch	2 Ch			Nest site change to marsh because bog mat island falling apart.	13	12	18
Daniels /Rodgers P.	Glover	nesting	marsh	flooded 7 June						Pair left Rodgers Pond after nest failure likely moving to Daniels Pond.	2	1	1
Derby P.	Derby	nesting	marsh	abandoned – incubated too long	signs					Nest site change to busier boa channel; possible disturbance. Signs placed for first time.	3	1	1
Dunmore L. / Mud P.	Leicester/ Salisbury	nesting	raft	successful	signs	2 Ch	2 Ch		Aspergillosis	Nest site change to raft in cov of island. Non-breeding loon rescued 24 August but died later.	4	4	5
East Long P.	Woodbury	nesting	island	successful		1 Ch	1 Ch				30	22	26
Eden L.	Eden	nesting	raft	successful	signs	2 Ch	2 Ch				7	6	8
Eligo L.	Greensboro	nesting	island	successful	signs	2 Ch	1 Ch	Intruder loons likely		1 chick disappeared in early July during a week when conflict with other loons observed.	9	7	8
Ewell P.	Peacham	nesting	marsh	successful		1 Ch	1 Ch			Nest site change to inlet area; 1st nest since 2006.	3	3	2
Forest L.	Averill	nesting	raft	successful		2 Ch	2 Ch			Occasional bald eagle observed.	17	14	20
Fosters P.	Peacham	nesting	raft	successful		1 Ch	1 Ch				8	8	11
Great Averill L. North	Averill	nesting	raft	abandoned – unknown	signs					Drawdown possibly stranded raft.	17	10	12
Great Averill L. South	Averill	territory	shore	flooded 7 June						First recorded nest in this area on SW shoreline.	1	0	
Great Hosmer P	Albany/ Craftsbury	nesting	island	successful	signs	2 Ch	2 Ch				2	2	3

(Continued) Table 1. Summary of Common Loon breeding activity in Vermont, 2010

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Green River Res. - NW	Hyde Park	nesting	island	re-nest successful	signs	2 Ch	2 Ch			First nest attempt flooded 3 June. Re-nest on traditional nest island; 1st nest site located 400 m NW on small island.	32	24	36
Green River Res. - South	Hyde Park	nesting	island	re-nest successful	signs	2 Ch	2 Ch			First nest attempt flooded 6 June. Nest site change to western bay.	3	2	3
Groton L. - North	Groton	nesting	shore	successful	signs	1 Ch	1 Ch			First recorded nest in this area. Nest site close to many cottages.	1	1	1
Groton L. - South	Groton	nesting	raft	successful	signs	1 Ch	1 Ch			Intruder loons occasional	11	10	13
Hardwick L.	Hardwick	nesting	raft	successful		2 Ch	2 Ch				8	8	11
Island P.	Brighton	nesting	island	successful	signs	1 Ch	1 Ch				11	9	11
Jobs P.	Westmore	nesting	shore	depredated mid June						First nest attempt on Jobs since 1999 when pair used nesting raft.	5	3	3
Joe's P - inlet	Cabot / Danville	nesting	raft	successful	signs	1 Ch	1 Ch				11	11	13
Joe's P. - 1st Pond	Cabot / Danville	nesting	shore	successful		2 Ch	1 Ch	sibling rivalry		First nest attempt recorded in this area. One chick found alive on shore but died later. Sibling rivalry likely cause for it being left alone.	1	1	1
Keiser P.	Danville / Peacham	nesting	marsh	successful	signs	1 Ch	1 Ch				6	6	7
Kent P.	Killington	nesting	island	abandoned - unknown	signs					Pair has yet to be successful in 2 nest attempts.	2	0	
Kettle P.	Groton / Marshfield	nesting	raft	abandoned - unknown					Unknown - not analyzed yet	An adult was found dead in the water on 9 August.	21	14	19
Little Averill L. - West	Averill	nesting	raft	successful	signs	1 Ch	1 Ch				24	15	22
Little Hosmer P.	Craftsbury	nesting	island	abandoned - unknown						Nest possibly flooded for short period in June.	12	7	6
Long P.	Westmore	nesting	island	successful	signs	2 Ch	2 Ch				12	11	16
Lyford P.	Walden	nesting	raft	successful		2 Ch	2 Ch			First recorded nest.	1	1	2
Maidstone L. - South	Maidstone	nesting	island	abandoned - unknown	signs						29	27	33
Martins P.	Peacham	nesting	raft	successful	signs	1 Ch	1 Ch			Some intruder loon activity.	14	14	19
Miles P.	Concord	nesting	island	successful	signs	1 Ch	1 Ch				18	14	18
Molly's Falls Res.	Cabot	nesting	raft	successful	signs	2 Ch	2 Ch		Trauma - attack by other loon	Non-breeding female adult found dead on shore late June and was likely killed by other loon.	16	15	21
Newark P.	Newark	nesting	island	successful		2 Ch	1 Ch	Unknown - lost early			21	14	19
Nichols P.	Woodbury	nesting	raft	successful	signs	1 Ch	0 Ch	Intruder loons likely		Chick disappeared after conflict with intruder loons.	12	10	10
Ninevah L.	Mount Holly	nesting	island	successful	signs	2 Ch	2 Ch				16	14	19
No. 10 P. (Mirror L.)	Calais	nesting	raft	successful	signs	2 Ch	1 Ch	Intruder loons likely		Chick disappeared after conflict with intruder loons.	4	4	5
Norton P. - Island	Norton	nesting	raft	successful	signs	2 Ch	1 Ch	Unknown - 6 wks			32	25	32
Norton P. - North	Norton	nesting	raft	abandoned - incubated too long	signs					Pair has yet to be successful in 3 nest attempts.	3	0	
Norton P. - South	Norton	nesting	raft	successful		2 Ch	0 Ch	Depredated - bald eagle			11	11	14

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Peacham P. - SE	Peacham	nesting	marsh	successful		1 Ch	1 Ch			Nested on other side of beave dam. First successful hatch recorded.	3	1	1
Peacham P. - SW	Peacham	nesting	marsh	successful		2 Ch	2 Ch				24	18	23
Pensioner P.	Charleston	nesting	raft	successful	signs	1 Ch	1 Ch				4	3	4
Ricker P.	Groton	nesting	raft	successful	signs	1 Ch	1 Ch				8	7	9
Seymour L. - Winape	Morgan	nesting	raft	successful	signs	2 Ch	2 Ch				13	11	15
Shadow L.	Concord	nesting	shore	successful	signs	1 Ch	1 Ch				4	2	2
Somerset Res. - Dandeneau Cove	Somerset	nesting	island	successful	signs	1 Ch	0 Ch	Unknown - lost early			29	23	28
Somerset Res. - Narrows	Somerset	nesting	island	abandoned - unknown						First recorded nest in this area	1		
South P.	Eden	nesting	raft	successful	signs	2 Ch	0 Ch	Intruder loons likely		Chicks disappeared after conflict with intruder loons.	13	11	13
Spectacle P.	Brighton	nesting	raft	successful	signs	1 Ch	1 Ch				16	14	19
Spring L.	Shrewsbury	nesting	raft	re-nest successful	signs	2 Ch	2 Ch			There is a possibility that first nest was successful and chicks lost right away according to anglers. Little monitoring of pond.	9	6	8
Stiles Res.	Waterford	nesting	marsh	successful		2 Ch	2 Ch				9	7	10
Sunset L.	Marlboro	nesting	island	successful	signs	2 Ch	2 Ch		Trauma - attack by other loon	Non-breeding femal adult foun dead in water around 22 June and was killed by another loon Report of loon caught in fishin line in mid-August, but both adults were healthy upon checking.	2	2	4
Thurman Dix Res.	Orange	nesting	island	successful		1 Ch	1 Ch				30	26	30
Wallingford P.	Wallingford	nesting	shore	successful		2 Ch	2 Ch			Nest near 2003 site.	11	8	13
Wantastiquet P.	Weston	nesting	island	successful		1 Ch	1 Ch				2	2	2
West Mountain P.	Maidstone	nesting	shore	abandoned - unknown							12	7	6
Wolcott P.	Wolcott	nesting	marsh	successful		2 Ch	1 Ch	Unknown		Peck marks observed on chick, but not obvious if cause of death. Emaciated thus possibly ignored by parents.	19	18	24
Zack Woods P.	Hyde Park	nesting	island	successful	signs	2 Ch	2 Ch				15	13	21
Buck L.	Woodbury	territory			signs					Pair built 3 nest bowls in east mash and south end. Last nested in 2003.	5	3	4
Curtis P.	Calais	potential territory								Pair started building 2 nest bowls at both far north and south ends.			
Echo L. - South	Charleston	territory								Pair present; last nested 2008.	4	2	2
Elmore L.	Elmore	potential territory								Pair often observed.			
Flagg P.	Wheelock	potential territory								Pair built nest bowl near road. Chick reported in Sept. but no confirmed. No chicks observed 10 August.			
Greenwood L.	Woodbury	potential territory								Pair often observed; last neste in 2002	1	1	1
Harveys L.	Barnet	territory								Pair likely present along with many non-breeders. Nesting habitat limited and new raft f from outlet where there have been several failed nests.	2	0	

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Holland P. – North	Holland	territory								Pair present; last nested in 2009. Pair has never been successful in 2 nest attempts.	2	0	
Holland P. – South	Holland	territory			signs					Pair observed on nesting raft but never nested; last nested i 2009	17	10	13
Little Averill L. – North	Averill	territory								Pair present. Nesting raft placed 600 m from failed 2009 nest site, but not used. Area has many cottages and lacks good natural habitat.	1	0	
Lower Symes P.	Ryegate	territory								Intruder loons frequent.	8	8	12
Maidstone L. – North	Maidstone	territory			signs				Lead poisoning from gun shot	Pair present. Last nested in 2009. Non-breeding adult rescued 30 June, but died later 3 pellets found in loon; possibly died from lead poisoning. Wounds had healed over.	5	4	2
Maidstone L. – SE	Maidstone	territory								Pair present. Last nested in 2009.	2	2	3
May P.	Barton	territory			signs					Pair present. Last nested in 2007. Intruder loons frequent.	19	17	24
McConnell P.	Brighton	potential territory								Chance that loons no longer territorial, but few surveys conducted. Nesting raft removed since marsh shorelines abundant.	15	11	15
Memphramagog L. – John's River	Derby	territory								Pair likely present; last nested in 2009. Habitat in area is minimal because of development on islands.	4	2	1
Miller P.	Strafford	potential territory								New potential pair observed frequently in May and June.			
Osmore P.	Peacham	territory								Pair present. Last nested in 2008. Natural nest sites minimal.	2	1	0
Somerset Res. – North Islands	Somerset	territory								Pair present. Last nested in 2009.	7	5	6
Wallace P.	Canaan	potential territory								Report of chick being fed by adult in September, but not confirmed. If pair nested, the location was probably the marsh on Canadian side.			
Carmi L.	Franklin	loon active								Some sightings of 2 adults together.			
Caspian L.	Greensboro	loon active								Some sightings of 2 adults together. Nested once in 1981.	1	0	
Center P.	Newark	loon active								Some sightings of 2 adults together. Report of chick but not resighted or confirmed.			
Crystal L.	Barton	loon active								Some sightings of 2 adults together.			
Dunmore L. – North	Leicester / Salisbury	loon active								Some sightings of 2 adults together.			
Echo L. – North	Charleston	loon active								Some sightings of 2 adults together.			

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Fairlee L.	Fairlee	loon active								Some sightings of 2 adults together.			
Gale Meadows	Winhall	loon active								Some sightings of 2 adults together. Report of nesting in 1981.	2	0	
Grout P.	Stratton	loon active								Some sightings of 2 adults together.			
Lewis P.	Lewis	loon active								Some sightings of 2 adults together.			
Morey L.	Fairlee	loon active								Some sightings of 2 adults together.			
Neal P.	Lunenberg	loon active								Some sightings of 2 adults together.			
Nelson P.	Woodbury	loon active								Some sightings of 2 adults together.			
Notch P.	Ferdinand	loon active								Some sightings of 2 adults together.			
Noyes P.	Groton	loon active								Some sightings of 2 adults together. Nested once in late 1970s.	1	0	0
Parker L.	Glover	loon active								Some sightings of 2 adults together.			
Rescue L.	Ludlow	loon active								Some sightings of 2 adults together.			
Salem L.	Derby	loon active								Some sightings of 2 adults together.			
Seymour L. - West	Morgan	loon active								Some sightings of 2 adults together. Nested once in 2005; pair dissolved.	1	1	2
Shadow L.	Glover	loon active								Some sightings of 2 adults together.			
Warden P.	Barnet	loon active								Some sightings of 2 adults together.			
Willoughby L.	Westmore	loon active								Some sightings of 2 adults together.			
Branch P.	Sunderland	occasional loons								Nested once around 1980.	1	1	1
Cat's Bow P.	Lunenberg	unknown								Report of nest in late 1970s.	1	1	1
Champlain L.	various	loon active								Report of nest in early 1990s.	2	0	
Hardwood P.	Elmore	occasional loons								Occasional loon sightings; territory dissolved in 2004.	10	9	11
Knapp Brook P.	Reading	no loons									1	1	1
Long P.	Greensboro	occasional loons								Occasional loon sightings.			
Marshfield P.	Marshfield	occasional loons								Occasional loon sightings.			
Memphramagog L. - Holbrook Bay	Newport	loon active								Occasional loon sightings.			
Moore Res. - Roaring Brook	Concord	occasional loons								Last nested in 2003. Territory dissolved in 2005.	4	3	0

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Pigeon P.	Groton	unknown								Nested once in 2004; current status unknown.	1	0	
Somerset Res. - South	Somerset	occasional loons								Occasional loon sightings.			
Turtle P.	Holland	unknown								No loons observed during 2 surveys. Nested in 1981 and 1982.	2	0	
Wapanacki P.	Wolcott	occasional loons								Occasional loon sightings.			
Waterbury Res.	Waterbury	occasional loons								Occasional loon sightings. Nested from 1979 to 1981.	3	1	1

Distribution of territorial and nesting pairs
Seventy-eight lakes supported 92 known and potential territorial loon pairs, 72 of which were confirmed to nest on 63 lakes (Fig. 1, Table 1). Nesting was recorded for the first time on 5 new territories, including Great Averill L. - South, Lake Groton – North, Joe's Pond – 1st Pond, Lyford Pond, and Somerset Reservoir - Narrows. Pairs nested for the first time since 1999 on Jobs Pond and 2006 on Ewell Pond. The Buck Lake pair, which last nested in 2003, built 3 nest bowls but never nested. Nest bowls were also built by the Curtis Pond and Flagg Pond loon pairs. Loon chicks were reported on Flagg and Wallace ponds, but were not observed during follow-up surveys. On Flagg Pond, incubating loons were never observed and there were no egg shells in nest bowl. One new potential territory was identified in 2010 on Miller Pond in Strafford.

Population levels and breeding success
The number of nesting and territorial pairs increased in 2010. Of the 72 pairs that attempted nesting, 57 successfully hatched 85 eggs, with 70 chicks surviving through August (Fig. 2, Table 2). There were 85 known territorial pairs on water bodies where nesting had occurred within the last 3 years, and 7 potential territorial pairs, each of which was observed consistently for 6 weeks or more. Thirteen pairs that have nested in at least 1 year from 2002-2009 did not nest, possibly because of intraspecific competition, water fluctuation, or lack of suitable nesting sites.

Of 18 pairs whose first nest attempts failed, 3 re-nested, and all were successful (Green River – NW, Green River - South, Spring). Causes of nest failure included flooding (Daniels/Rodgers, Great Averill – South, Green River – NW, Green River – South) and depredation (Bald Hill, Jobs, Woodward). The remaining failed nests were abandoned for unknown reasons although possible causes include flooding for 2, intruder loons for several, disturbance for a few, and possible drawdown on 1.

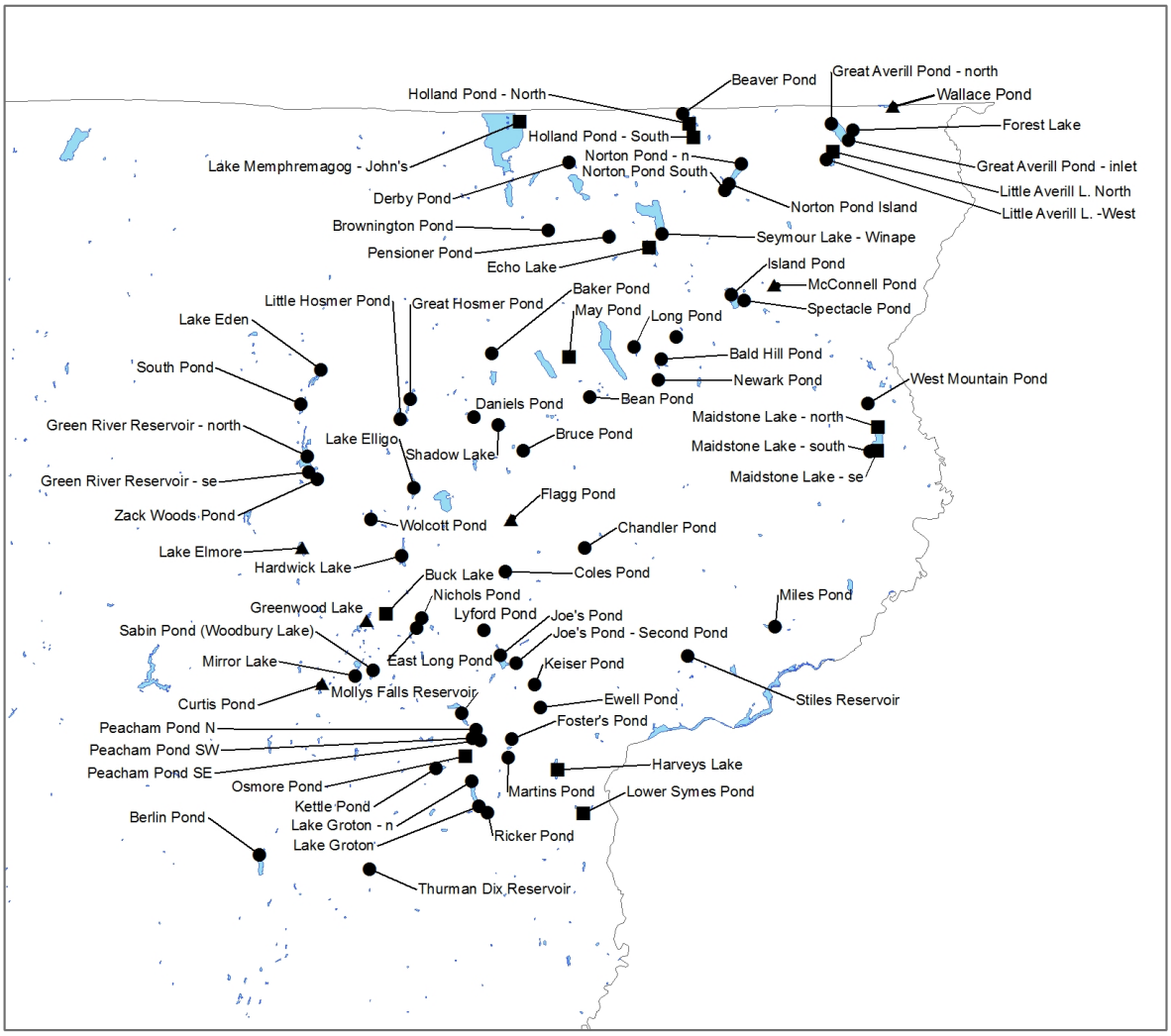
The chick survival rate through August was 82% with 0.76 chicks surviving per territorial pair in 2010. Since 1979, the average chick survival rate is 83% with 0.71 chicks per territorial pair. The causes of mortality of most of the 15 lost chicks were unknown. Four chicks disappeared after interactions with intruder loons (Nichols, No. 10, South [2]), and at least 1 died from sibling rivalry (Joe's – 1st Pond). Six adults were found dead or died shortly after being rescued as a result of aspergillosis (Dunmore, Plainfield), and trauma from fights with other loons (Mollys Falls, Sunset), likely lead poisoning from gun pellets found in wounds that had healed over (Maidstone), and unknown causes (Kettle).

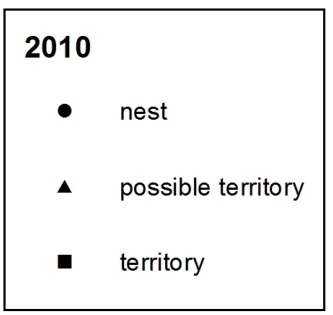
Management Results: artificial nesting rafts and nest warning sign buoys
Of the 72 known nests, 26 were on artificial nesting rafts (88% successful, 77% chicks survived), 22 on islands (82% successful, 86% chicks survived), and 24 were on shorelines (71% successful, 92% chicks survived). Four of the 5 new nesting pairs built nests in natural locations.

Nests with warning sign buoys had a 79% success rate compared to 71% for nests without signs. However, warning sign buoys are more frequently used for islands and rafts which tend to have a higher success rates than shoreline nests where fewer signs are used.

Vermont Loonwatch Day
Vermont Loonwatch day was conducted on 17 July when 175 volunteers surveyed 129 lakes (excluding Lake Champlain). Loons were observed on 76 of the 129 lakes surveyed, where observers counted 201 adult loons, 53 chicks, and 0 subadults (Table 2, Fig. 3). The total adult loons decreased by 12% from 2009 when 228 adults were counted. Some potential reasons for the decline include high winds early in the morning, and more lakes than usual that were not surveyed. High counts of adult loons in 2010 were obtained on Peacham Pond (11 adults), Norton Pond (8 adults), and Great Averill Lake, Holland Pond, and Lake Willoughby (7 adults).

Figure 1a. Common Loon Nesting and Territorial Pairs in Vermont





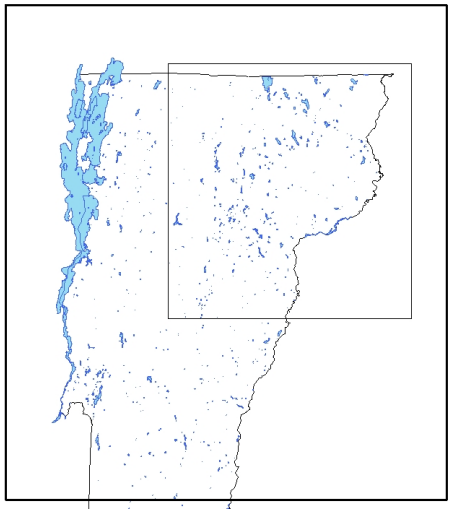
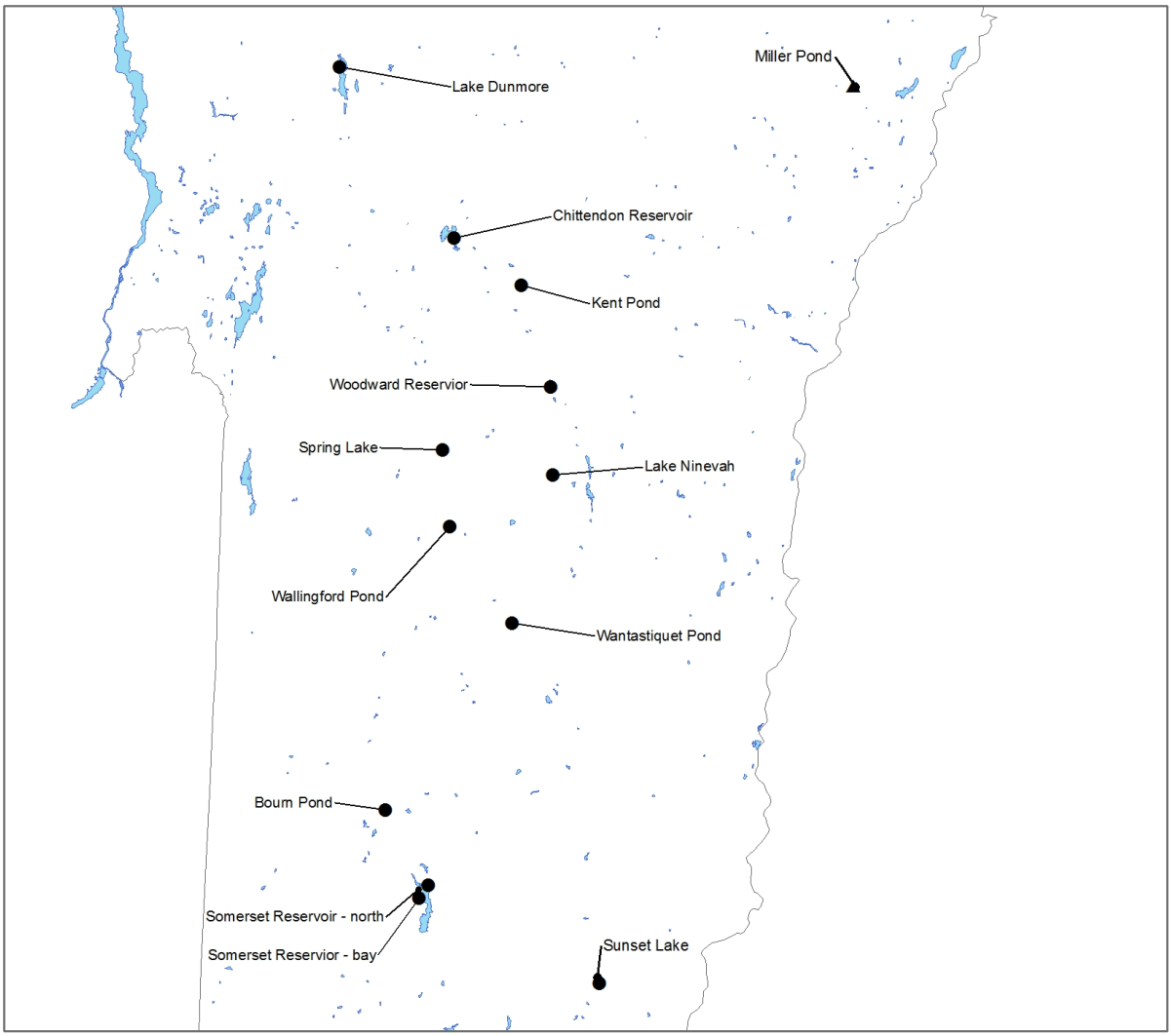
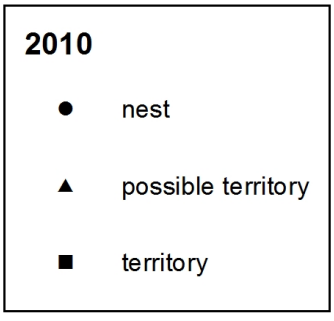


Figure 1b. Common Loon Nesting and Territorial Pairs in Vermont





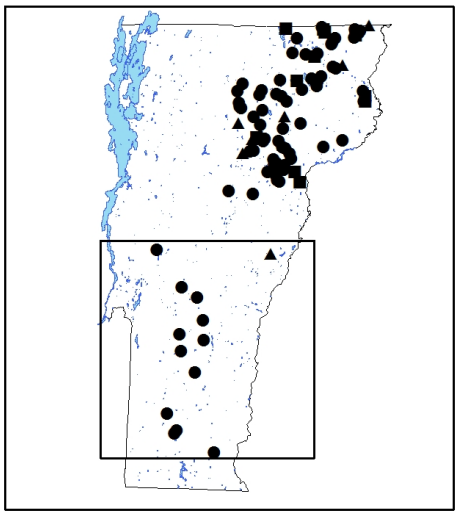


Figure 2. Summary of Common Loon breeding activity in Vermont, 1978-2010