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Note: An abridgement of this report (Report BRI 2010-04) was submitted to NextEra Energy Maine Hydro, Hallowell, Maine.
AZISCOHOS LAKE COMMON LOON POPULATION AND PRODUCTIVITY SURVEY AND MANAGEMENT REPORT
2010 SEASON FINAL REPORT
(FULL REPORT)

(Report BRI 2010-04F)

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January 2011
1.0 EXECUTIVE SUMMARY .................................................................................................................. ii

2.0 INTRODUCTION ................................................................................................................................. 1

   2.1 STUDY AREA ................................................................................................................................... 1
   2.2 HISTORY AND PURPOSE OF STUDY ............................................................................................. 2

3.0 OBJECTIVES ........................................................................................................................................... 3

4.0 METHODS ............................................................................................................................................. 3

   4.1 LOON POPULATION, NESTING, AND PRODUCTIVITY SURVEYS ....................................................... 3
   4.2 LOON MANAGEMENT EFFORTS ......................................................................................................... 5
       4.2.1 Artificial Nesting Islands (Rafts) .............................................................................................. 5
       4.2.2 Informational Signs ................................................................................................................. 5
   4.3 COLOR-BANDING AND MONITORING MARKED INDIVIDUALS ..................................................... 5
   4.4 ABANDONED EGG COLLECTION .................................................................................................... 7

5.0 RESULTS AND DISCUSSION ............................................................................................................... 7

   5.1 LOON POPULATION, NESTING, AND PRODUCTIVITY ON AZISCOHOS LAKE, 2010 ................. 7
       5.1.1 Nest Failures ............................................................................................................................ 10
       5.1.2 Assessment of the Effects of Lake-level Changes on Common Loon Nesting Success on Aziscohos Lake in 2010 ............................................................ 10
   5.2 ARTIFICIAL NESTING ISLANDS (RAFTS) USE AND EFFECTIVENESS ........................................... 11
       5.2.1 Informational Signs ................................................................................................................. 14
   5.3 COLOR BANDING AND MONITORING MARKED INDIVIDUALS .................................................. 14
   5.4 ABANDONED EGG COLLECTION .................................................................................................... 14

6.0 RECOMMENDATIONS ......................................................................................................................... 14

   6.1 POPULATION MONITORING .......................................................................................................... 14
   6.2 RAFT MANAGEMENT AND PLACEMENT ......................................................................................... 14
   6.3 COLOR-MARKING INDIVIDUALS ..................................................................................................... 15
   6.4 INFORMATIONAL SIGNS ................................................................................................................. 15

7.0 LITERATURE CITED ............................................................................................................................. 16

LIST OF TABLES
Table 1: Survey Record, Aziscohos Lake, 2010 ....................................................................................... 4
Table 2: Causes and Characterization of Common Loon Nest Failures ..................................................... 4
Table 3: 2010 Aziscohos Lake Loon Nesting and Productivity by Territory ................................................. 10
Table 4: Common Loon Nesting Summary: Raft vs. Natural Nests, Aziscohos Lake, 2010 ......................... 12
Table 5: Comparative Loon Population and Productivity on Aziscohos Lake 2005-2010 .......................... 10

LIST OF FIGURES
Figure 1: Rangeley Lakes Study Area ........................................................................................................ 1
Figure 2: Map of Raft Sites and Status for 2010........................................................................................ 6
Figure 3: Distribution of Common Loon Territories on Aziscohos Lake 2010 ........................................... 8
Figure 4: General Nest Location and Substrates on Aziscohos Lake 2010 ................................................. 9
Figure 5: Daily Reservoir Water Level for Aziscohos Lake May 1- August 31, 2010 .................................. 12
Figure 6: Numbers of Rafts Floated and Used on Aziscohos Lake, 1987-2010 ......................................... 12
Figure 7: Percent Common Loon Nesting Success on Rafts vs. Natural Sites on Aziscohos Lake 1987-2010 .......................................................... 13
Figure 8: Percent Contribution to Common Loon Productivity by Raft- Borne Nests on Aziscohos Lake 1987-2010 .......................................................... 13

APPENDICES
Appendix 1: Definition of Terms ............................................................................................................. 17
Appendix 2: Loon Nest Site Location on Aziscohos Lake 2010 ............................................................... 20
Appendix 3: Qualitative Population and Productivity Summary by Loon Territory, Aziscohos Lake 2010 ........................................................................ 27
Appendix 4: Band Information for Common Loons Banded in 2010 ........................................................ 29
1.0 EXECUTIVE SUMMARY

Twenty-one territorial pairs of common loons were observed on Aziscohos Lake in 2010. Sixteen (76%) of 21 pairs nested, initiating 17 nesting attempts. Eight (50%) of 16 nesting pairs successfully hatched a total of 13 chicks, of which eight (62%) survived to fledge. Productivity in 2010 was 0.38 chicks fledged/territorial pair, below the rate necessary over the long term to maintain a loon population. Nine (53%) of 17 attempted nests failed on Aziscohos Lake in 2010: two (22%) due to mammalian predation, one (11%) to water level increase, one (11%) to human disturbance and five (56%) nests were abandoned due to unknown causes.

Daily lake levels on Aziscohos Lake in 2010 exhibited an increase of ≥ 0.5 feet June 3-8 causing one nest failure by inundation. During the prime nest initiation season May 25 - June 20, nests initiated on nonfloating sites on eight (30%) of 27 days would have suffered ≥ 0.5 vertical foot lake-level increases according to an assessment of daily lake levels. During the usual nest initiation season of May 15 - July 15, nests initiated on nonfloating sites during 25 (41%) of 61 days would have suffered ≥ 0.5 vertical foot lake-level increase or a water-level decrease of ≥ 1.0 vertical feet.

Twelve (75%) of 16 nesting loon pairs used rafts as nest sites on Aziscohos Lake in 2010. Nesting loon pairs on 12 (71%) of 17 territories with rafts offered used rafts for nesting substrate. Seven (58%) of 12 nesting attempts on rafts were successful, compared to one (20%) of five nesting attempts on natural nonfloating sites. Raft-borne nests contributed 92% of loons fledged on Aziscohos Lake in 2010. Under the current Aziscohos water-level management regime, artificial nesting islands make a significant contribution to loon nesting success and overall productivity.
2.0 INTRODUCTION

2.1 STUDY AREA

Aziscohos Lake is an artificial impoundment of 11.53 square miles (7,379 acres) extending approximately 12 miles across Parkertown, Lynchtown and Lincoln townships in northwestern Maine (Figure 1). It was created behind Aziscohos Dam on the Magalloway River in 1911 to increase water storage in the Upper Androscoggin Storage System and to facilitate transport of timber downriver. The reservoir, rimmed with substrates ranging from boulders at the south end to granular sand in areas of the north end, provides habitat for many lacustereine wildlife species, including the common loon (*Gavia immer*) and several species of its prey. Water-level management regimes on Aziscohos Lake required for minimum flows and flood control downriver can cause water-level fluctuations on the reservoir during the loons’ nesting season that can negatively affect loon nesting success. A hydroelectric facility downstream of the dam became commercially operational in 1989.

Figure 1: Rangeley Lakes Study Area
2.2 History and Purpose of Study

The common loon is a piscivorous water bird possessing adaptations for underwater locomotion including heavy bones and posterior attachment of large webbed feet, which reduce terrestrial mobility. Loons come to shore only for copulation, nest construction and incubation of eggs. Shoreline nest placement and limited mobility on land make loon nests vulnerable to failure caused by water level fluctuations.

Hydroelectric generation development at Aziscohos Dam required Federal Energy Regulatory Commission (FERC) licensing of the Aziscohos Project. The common loon’s susceptibility to water-level changes during the nesting period prompted the U.S. Fish & Wildlife Service (USFWS) and the Maine Department of Inland Fisheries & Wildlife to identify the common loon as a species to be evaluated as part of the licensing process. In 1986, the Androscoggin Reservoir Company (ARCO) and Aziscohos Hydro Company, Inc. conducted the first common loon population and productivity survey on Aziscohos Lake, documenting the negative impacts of water level fluctuations on the nesting success of loons, and submitted a loon management plan to FERC that was approved and incorporated into Article 33 of FERC License No. 4026-002ME (Fair 1986). This plan evaluated the necessity and feasibility of the use of artificial nesting islands on Aziscohos Lake and created directives for the manufacture, placement, and maintenance of artificial nesting islands determined necessary.

From 1986-1999, common loon populations and productivity on Aziscohos Lake were surveyed and water level fluctuations mitigated using artificial nesting islands by Jeff Fair (Fairwinds Wildlife Services) and Bill Hanson (Senior Biologist, then Central Maine Power Co.) in accordance with the FERC order. In 1999, NextEra Energy (NEE), then known as FPL Energy Maine Hydro, became a partial owner of the Aziscohos Dam and assumed responsibility for the project. At that time, BioDiversity Research Institute (BRI) assumed the responsibility of loon surveys, management, and the preparation of annual reports. BRI biologists worked with Jeff Fair (Fairwinds) and Bill Hanson (now with NEE) to ensure thorough standardization of survey techniques and definitions to minimize observer bias and to maximize mitigation effectiveness during the transition period. This long-term cooperative initiative between ARCO, FPLE, NEE,
USFWS, Fairwinds, and BRI has resulted in one of the most thoroughly monitored loon populations in North America.

3.0 OBJECTIVES

1. To continue ongoing loon monitoring on Aziscohos Lake by quantifying breeding activities and factors negatively affecting productivity.
   a. To survey the common loon population throughout Aziscohos Lake to determine number of territorial pairs, number of nesting pairs, frequency of nesting and nest success, hatch rates, survival of fledglings, and productivity;
   b. To identify, attribute, and quantify causes of nest failure including water-level fluctuation; and
   c. To assess the effects of lake-level changes on loon nesting success.

2. To enhance loon nesting success through deployment of artificial nesting islands (rafts) with avian guards in loon territories most impacted by nest failures using strategies and techniques described by DeSorbo et al. (2008).
   a. To anchor, vegetate, and maintain rafts in appropriate sites;
   b. To post informational signs as deemed necessary;
   c. To assess the effectiveness of raft deployment and its contribution to loon productivity; and
   d. To make recommendations for the improvement, removal, and/or placement of rafts and signs according to guidelines formulated in the management plan.

3. To continue loon demographic monitoring by color-banding and tracking known individuals.

4. To collect abandoned loon eggs for subsequent analysis.

4.0 METHODS

4.1 LOON POPULATION, NESTING, AND PRODUCTIVITY SURVEYS

Survey methods were consistent with those reported by Fair (1995) and ongoing studies throughout the Northeast (see Evers 2007). All known or potential loon territories and surrounding areas were surveyed by boat or from shore using 10X binoculars or a 15-45X spotting scope. Surveys were made every five to seven days, when possible, during peak loon
nesting and hatching periods from May through July, and through September to determine chick survival (Table 1). All known nesting sites were checked regularly for nesting evidence, both above and below the waterline in response to fluctuating water levels.

**Table 1: Survey Record, Aziscohos Lake, 2010**

<table>
<thead>
<tr>
<th>Month</th>
<th>Survey Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>May</td>
<td>21, 26</td>
</tr>
<tr>
<td>June</td>
<td>4, 15, 22, 30</td>
</tr>
<tr>
<td>July</td>
<td>9, 14, 22, 30</td>
</tr>
<tr>
<td>August</td>
<td>5, 12, 22</td>
</tr>
<tr>
<td>September</td>
<td>8, 14</td>
</tr>
</tbody>
</table>

Loon pairs were considered territorial for the season when occupying a territory \( \geq \) four weeks. Nesting pairs were defined as those laying at least one egg; a nesting attempt was evidenced by a constructed nest dish or scrape with at least one egg present or current year eggshell fragments or other evidence of current year egg presence. Successful nesting pairs hatched at least one chick. Causes of nest failure (Table 2) were attributed according to evidence observed and/or water-level records.

**Table 2: Causes and Characterization of Common Loon Nest Failures**

1. Avian predation (AP): characterized by a small hole in the egg.
2. Mammalian predation (MP): characterized by smashed eggs/egg shells, tracks around nest, and or scat.
3. Water level increase (WLI): increase in lake level causing nest floods. Eggs washed off nests, or eggs still in nest, chilled in standing water.
4. Water level decrease (WLD): decrease in water level causing eggs to be stranded in unreachable nests.
8. Unknown (UNK): cause unknown.

Lake-level data were analyzed and compared with timing of surveyed nest discoveries using the analytical technique from Fair (2006) to help assess the role of water level fluctuations in cases
of unknown causes of nest failure. Loon chicks surviving past six weeks of age were assumed to have survived or fledged (Evers 2007).

4.2 LOON MANAGEMENT EFFORTS

4.2.1 Artificial Nesting Islands (Rafts)

During May, BRI and NextEra Energy biologists floated, vegetated, and anchored 17 rafts with avian guards (Fair 1993) on Aziscohos Lake in 17 loon territories (Figure 2) where established pairs have experienced successive nest failure due to artificial water level fluctuations or shoreline predation and have a suitable flotation site (DeSorbo et al 2008). Rafts were observed during each lakewide survey and monitored periodically for proper placement, buoyancy, and adequate nesting materials throughout the season. After nesting, rafts were stored on site above high water to dry for the winter.

4.2.2 Informational Signs

Informational signs were posted at Bosebuck Camps in 2010.

4.3 COLOR-BANDING AND MONITORING MARKED INDIVIDUALS

Loons were captured using well-established night-lighting and vocalization playback techniques as described by Evers (1993, 2001). Adult and juvenile birds of sufficient tarsus size were banded with USFWS aluminum bands and a unique combination of plastic colored leg bands, enabling identification of individual birds to be made from a distance in future observations. Captured birds were weighed, two second secondary feathers collected by clipping at the base of the quill, and blood samples taken from the metatarsal vein for contaminant analysis.

During surveys, bands were observed opportunistically using binoculars or spotting scopes. Band combinations observed in the field were recorded and later referenced against a color band identification list to confirm the individual(s).
Figure 2: Map of Raft Sites and Status for 2010
4.4 Abandoned Egg Collection

Whole, verifiably abandoned loon eggs were opportunistically collected to determine 1) egg viability as indicated by developmental stage and 2) egg mercury concentration. Collected eggs were placed in a labeled zip-lock plastic bag and frozen for future analysis.

5.0 Results and Discussion

5.1 Loon Population, Nesting, and Productivity on Aziscohos Lake, 2010

Twenty-one territorial pairs of common loons were observed on Aziscohos Lake in 2010 (Figure 3.) Sixteen (76%) of 21 pairs nested, initiating 17 nesting attempts including one renest (Figure 4, Specific locations in Appendix 2). Eight (50%) of nesting pairs successfully hatched a total of 13 chicks, of which eight (62%) survived to fledge. Table 3 summarizes nesting activity by loon territory; more information by territory is recorded in Appendix 3.

Territorial population and nesting frequency in 2010 were similar to the previous five year averages; 2010 productivity appeared significantly improved over 2008-2009 (Table 4), though still below 0.48 chicks surviving / territorial pair necessary over the long term to maintain a loon population (Evers 2007). Average productivity for Aziscohos Lake 1987-2009 was 0.34 chicks / territorial pair; 2010 productivity was 0.38 chicks / territorial pair.

Thirteen common loon chicks were hatched from nests on eight territories [Beaver Brook (1), Buck Mountain (2), Hurricane (2), Meadow Brook (1), Raven (1), South Hammond (2), Tiger Gray (2), and Twin Brook (2)]. Eight chicks from five of these territories [Buck Mountain (2), Meadow Brook (1), South Hammond (2), Tiger Gray (2), and Twin Brook(1)] survived past six weeks of age to fledge, reflecting the average number of chicks fledged here 2005-2009.
Figure 3: Distribution of Common Loon Territories on Aziscohos Lake 2010
Figure 4: General Nest Location and Substrates on Aziscohos Lake 2010
Table 3: 2010 Aziscohos Lake Loon Nesting and Productivity by Territory

<table>
<thead>
<tr>
<th>Territory Name</th>
<th>Territorial Pairs</th>
<th>Nesting Pairs</th>
<th>Chicks Hatched</th>
<th>Chicks Surviving</th>
<th>Nest Fail</th>
<th>Renest</th>
<th># Rafts Floated</th>
<th>Raft Used</th>
<th>Nest Fail Cause</th>
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<tbody>
<tr>
<td>Aldrich Brook</td>
<td>1</td>
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<td>0</td>
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<td>1</td>
<td>1</td>
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<tr>
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<td>Sunday Pond</td>
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<tr>
<td>Twin Brook</td>
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<tr>
<td><strong>2010 Totals</strong></td>
<td><strong>21</strong></td>
<td><strong>16</strong></td>
<td><strong>13</strong></td>
<td><strong>8</strong></td>
<td><strong>9</strong></td>
<td><strong>1</strong></td>
<td><strong>17</strong></td>
<td><strong>12</strong></td>
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</table>

Table 4: Common Loon Population and Productivity on Aziscohos Lake 2005-2010

<table>
<thead>
<tr>
<th>Parameter</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>Average</th>
<th>SD</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Territorial Pairs (TP)</td>
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<td>19</td>
<td>23</td>
<td>19</td>
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<td>2</td>
<td>21</td>
</tr>
<tr>
<td>Nesting Pairs</td>
<td>17</td>
<td>16</td>
<td>18</td>
<td>16</td>
<td>17</td>
<td>17</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>Chicks Hatched</td>
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<td>12</td>
<td>10</td>
<td>13</td>
<td>15</td>
<td>14</td>
<td>4</td>
<td>13</td>
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<td>Chicks Surviving (CS)</td>
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<td>9</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>3</td>
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<td>0.27</td>
<td>0.36</td>
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</tbody>
</table>

5.1.1 Nest Failures

Nine (53%) of 17 attempted nests failed on Aziscohos Lake in 2010. Five (56%) of nine nest failures occurred on rafts. Causes of nest failure included two (22%) mammalian predation, one (11%) water level increase, one (11%) human disturbance, and five (56%) nest abandonment due to unknown causes.

5.1.2 Assessment of the Effects of Lake-level Changes on Common Loon Nesting Success on Aziscohos Lake in 2010.

One (11%) of nine observed common loon nest failures (6% of 17 observed nesting attempts and 25% of four nest failures on natural, nonfloating substrate) was attributed to lake-level increase on Aziscohos Lake in 2010.
Lake-level fluctuations during the common loon nesting season are known to cause nest failure due to nest inundation when water levels increase or nest stranding when water levels decrease. Changes \( \geq 0.5 \) feet vertical increase and \( \geq 1.0 \) feet vertical decrease after nest initiation commonly threaten nesting success (Fair 1979, 2006). Daily lake levels on Aziscohos Lake in 2010 exhibited an increase of \( \geq 0.5 \) feet June 3-8 (Figure 5) subsequent to heavy precipitation and causing the nest inundation noted above.

During prime nest initiation season May 25 - June 20, nests initiated on nonfloating sites on eight (30\%) of 27 days would have suffered \( \geq 0.5 \) vertical foot lake-level increases according to an assessment of daily lake levels using Fair’s (2006) method. During the usual nest initiation season May 15 - July 15, nests initiated on nonfloating sites during 25 (41\%) of 61 days would have suffered \( \geq 0.5 \) vertical foot lake-level increase or a water-level decrease of \( \geq 1.0 \) vertical feet. Specifically, nesting attempts initiated May 15-23 and July 8-15 would have suffered lake-level decline \( \geq 1.0 \) feet, and nesting attempts initiated May 30 – June 6 would have suffered lake-level increases \( \geq 0.5 \) feet. Most loon nests on Aziscohos in 2010 were initiated outside these periods or on artificial floating nesting islands.

### 5.2 Artificial Nesting Islands (Rafts) Use and Effectiveness

Twelve (75\%) of 16 nesting loon pairs used rafts as nest sites on Aziscohos Lake in 2010. Nesting loon pairs on 12 (71\%) of 17 territories with rafts offered used rafts for nesting substrate. Twelve (71\%) of 17 rafts offered were used by loons (Figure 6).

Seven (58\%) of 12 nesting attempts on rafts were successful, compared to one (20\%) of five nesting attempts on natural nonfloating sites (Table 5). Raft-borne nests contributed 92\% of loons fledged on Aziscohos Lake in 2010. Nesting success has generally been higher for nests on rafts since mitigation management was first attempted (Figure 7), and raft-borne nests have produced the preponderance of loon fledglings during most of those years (Figure 8).
Figure 5: Daily Reservoir Water Level for Aziscohos Lake May 1 - August 31, 2010

*Red line denotes full pond=1520.3 feet above sea level

Table 5: Comparative Loon Nesting Summary: Raft vs. Natural Nests, Aziscohos Lake, 2010

<table>
<thead>
<tr>
<th>Raft Nests</th>
<th>2010</th>
<th>Natural Nests</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Nesting Attempts</td>
<td>12</td>
<td>Number of Nesting Attempts</td>
<td>5</td>
</tr>
<tr>
<td>Number of Successful Nest Attempts</td>
<td>7</td>
<td>Number of Successful Nest Attempts</td>
<td>1</td>
</tr>
<tr>
<td>Success Rate</td>
<td>58%</td>
<td>Success Rate</td>
<td>20%</td>
</tr>
<tr>
<td>Chicks Hatched from Rafts</td>
<td>12</td>
<td>Chicks Hatched from Natural Sites</td>
<td>1</td>
</tr>
<tr>
<td>Total Hatches all types</td>
<td>13</td>
<td>Total Hatches all types</td>
<td>13</td>
</tr>
<tr>
<td>Contribution to Productivity</td>
<td>92%</td>
<td>Contribution to Productivity</td>
<td>8%</td>
</tr>
</tbody>
</table>

Figure 6: Numbers of Rafts Floated and Used on Aziscohos Lake, 1987 - 2010
Under the current Aziscohos lake water-level management regime, artificial nesting islands make a significant contribution to loon nesting success and overall loon productivity. Loon
productivity here remains below sustainable levels most years, but is much higher than years prior to initiation of conservation efforts (Fair 1986) and is affected by factors beyond water-level management. Productivity levels for sustainable populations are better measured for larger area populations.

5.2.1 Informational Signs

Informational signs were posted at the Bosebuck Camps in 2010. Signs were not posted in loon territories since human disturbance has not been considered a significant factor in loon nesting success on Aziscohos Lake.

5.3 Color Banding and Monitoring Marked Individuals

Nine loons were captured and sampled (feathers and blood) on Aziscohos Lake in 2010: Five females, one male, and three chicks from five territories (Appendix 4). Four of the adults were recaptured individuals; all first-time captures were banded. Color-marked loons observed on Aziscohos Lake in 2010 are reported in Appendix 3.

5.4 Abandoned Egg Collection

Nine abandoned loon eggs were collected from six territories in 2010: Aldrich (1), Big Brook (1), Dam (2), Meadow Brook (2), Raven (1), and Sunday Pond (2). In addition to the abandoned eggs two hatched loon chick carcasses were collected off nests in 2010, one from each Raven and Hurricane territories.

6.0 RECOMMENDATIONS

6.1 Population Monitoring

Continue annual monitoring of all established pairs and color-marked individuals, transitional pairs, nesting pairs, productivity, and effectiveness of raft management on Aziscohos Lake.

6.2 Raft Management and Placement

Continue raft management program on Aziscohos Lake in the loon territories currently being offered rafts and expand or reduce where indicated according to DeSorbo et al. (2007, 2008).
6.3 Color-Marking Individuals

Continue capture, sampling, and color-marking of individual loons. Color-banding provides a mechanism for understanding impacts by water level management and its influences on their reproductive success (e.g., individual performance and within-season movements).

6.4 Informational Signs

Informational signs should be placed at the two public boat launches on Aziscohos Lake, Black Brook Cove Campground and Twin Brook, as well as at Bosebuck Camps.
7.0 LITERATURE CITED


Appendix 1: Definition of Terms

Artificial nesting island or “rafts” – Artificial floating platforms for use as an alternate nesting site for Common Loons as described by BRI raft protocol and DeSorbo et al. (2008). Artificial nesting islands were first developed and employed as a loon research tool by McIntyre (1977), later improved for management use by BRI.

Avian guard – A camouflage mesh cover that is attached to artificial nesting islands with the intent of minimizing the visibility of the nest and eggs from avian predators and boat traffic.

Between-year territory fidelity – The return of an established territory holder to its previously occupied territory.

Breeding adults – Established and transitional territory holders that attempt to breed.

Buffer population – That portion of the loon population that includes non-breeders.

Chick survival – Number of loon chicks fledged divided by the number of loon chicks hatched; often expressed as a percentage.

Established Territory – Paired adults found on territory for at least three consecutive weeks for three consecutive years.

Estimated minimum survivorship – The known return rate for adult loons during the breeding season.

Fledge rate – Number of chicks fledged divided by either the number of nesting pairs (F/NP) or territorial pairs (F/TP). Also referred to in this report as “fledging success.” F/NP is a representation of the total number of chicks fledged relative to pairs that attempted to nest, F/TP is a representation of the number of chicks fledged relative to all of the territorial pairs within a given subpopulation – including those territorial pairs that did not nest.

Hatch rate – Number of chicks hatched divided by the number of nesting pairs (H/NP) or territorial pairs (H/TP) of a given or study-area population. H/NP is a representation of the total number of chicks hatched relative to pairs that attempted to nest (also referred to as “hatching success”). H/TP is a representation of the number of chicks fledged relative to all of the territorial pairs within a given population – including those territorial pairs that did not nest.

Hatch window – The estimated time frame in which hatching is expected to occur.

Individual performance – Tracking the reproductive success of color marked individuals over time.

Long-term productivity – a measure of productivity taking into consideration the number of years the territory has existed or has been monitored. This value is calculated by dividing the number of chicks hatched by the number of years during which the parameter was measured.

Loon – Common Loon (Gavia immer); no other loon species was observed in the study area during the report period.

Loon return-year – A measure of loon site fidelity that represents the number of years an individual loon returned to the territory from which it was originally banded.
Mate fidelity – The known pairing of an adult with the previous years’ mate

Mate switching – The known change of mates within or between years.

Multiple lake territory – Paired adults using two or more lakes during a breeding cycle to provide the required resources. Multiple-lake territories are only those that require flight to access another lake.

Natal site fidelity – The known return of an individual originally banded as a juvenile

Nest attempt – Presence or evidence of any loon nest constructed or scraped that contained eggs or had evidence of eggs; this excludes copulatory platforms and nests of uncertain origin.

Nest failure – Any nest attempt that fails to completely hatch or at least one egg.

Nest onset – The time, often expressed as a “window” of dates, during which a nesting pair initiates incubation.

Nest success – Any nest attempt in which at least one chick hatches.

Nesting frequency – Number of nesting pairs divided by the number of territorial pairs in a given population or study area; often expressed as a percentage. Nesting frequency is an index of the portion of a population attempting reproduction on a given year or time period.

Nesting season – That part of the year encompassing early reproductive behavior on the breeding grounds through late hatching of chicks. Nest building may begin prior to complete ice-out in Maine and New Hampshire and hatches may occur as late as mid August in western Maine (Fair unpubl. Data). The nesting season varies from year, across latitudes and sometimes between lakes. On Aziscohos Lake during this study period, nesting season is generally defined as May 15 – August 5.

Nesting success – The number of loon pairs hatching at least one chick divided by total number of pairs exhibiting at least one nesting attempt; usually expressed as a percentage.

Non-breeding adults – Territorial and non-territory holders that do not breed in a given year.

Partial lake territory – Paired adults sharing a lake with other established territory holders.

Production – The number of chicks fledged within a given time period by a loon population.

Productivity – The number of fledged chicks divided by the number of territorial pairs in a given population.

Raft – Artificial nesting island for loons.

Raft use by loons – a raft is considered used when one or more nest attempts occur on that raft; may be expressed as the number of raft nest attempts divided by number of rafts deployed that year.

Renest – A second nest attempt in a given year.
Territorial persistence – The tendency for territorial pair to remain present within their territory throughout the season. Measured by the length of time a pair remains on territory throughout the year.

Territory years - The number of years a territory has been surveyed. Used as the denominator of the long-term hatch rate productivity measure.

Total production – The total number of loon chicks fledged lakewide during the breeding season.

Whole lake territory – One established territory on a waterbody. This territory may or may not encompass the entire lake, however, a second pair is not established.
Appendix 2: Loon Nest Site Location on Aziscohos Lake 2010

Appendix 2.1 Nest locations at Beaver Island (natural) and Beaver Brook (raft).
Appendix 2.2 Nest locations at Big Brook (natural) and Buck Mountain (raft).
Appendix 2.3 Nest locations at Dam (raft) and Cold Brook (raft)
Appendix 2.4 Nest locations at Hammel Brook (raft) and Twin Brook (raft).
Appendix 2.5 Nest locations at Tiger Gray (raft) and Meadow Brook (natural).
Appendix 2.6 Nest locations at Raven (raft), Hurricane (raft), Little Magalloway (natural), and Sunday Pond (raft).
Appendix 2.6 Nest location at Aldrich Brook (raft) and South Hammond (raft).
Appendix 3: Qualitative Population and Productivity Summary by Loon Territory, Aziscohos Lake 2010

All loon territories are listed in alphabetical order. Territories displaying an “R” represent those in which a raft was floated; all others display “NR” or no raft.

Aldrich Brook (R): The banded 2006 Aldrich Brook male and an unbanded female returned in 2010. The pair began nesting on the raft by 6/15, but the nest was found abandoned by 7/9. One egg was collected from the water.

Beaver Brook (R): An unbanded pair occupied the Beaver Brook territory and began nesting on the raft by 5/21. One chick hatched between 6/4 and 6/15, but did not survive to fledge. The female from this territory was caught and banded.

Beaver Island (NR): An unbanded pair occupied the Beaver Island territory began and nesting on the small island on the southwest side of Beaver Island. The nest was first found occupied on 6/4, however it was found abandoned by 6/30. From the amount of small eggshell fragments remaining on the nest, a hatch may have occurred but since no chicks were observed, it cannot be confirmed.

Big Brook (R): The Big Brook territory was occupied by the banded 2009 Yukon male and an unbanded female. The pair were nesting by 6/15 on the west side of the cove, south of the grassy point that divides this area. The nest failed due to mammal predation between 6/30 and 7/9 and one egg was collected.

Bosebuck (NR): The banded 1994 Bosebuck male and the banded 1994 Little Magalloway female occupied the Bosebuck territory in 2010, but did not nest. Three ABJs were seen in this territory: the 2006 Buck Mountain ABJ, the 2004 Hurricane ABJ, and the 2005 Hammel Brook ABJ. The banded 2003 Camo Camp female and two unidentified banded loons were also recorded. A new eagle nest was discovered in this territory and the eaglet was banded.

Bosebuck North River (NR): This territory was occupied by the banded 2009 Bosebuck North River female and another loon, believed to be the banded 1997 South Cove male. One loon was observed constructing a nest on the eastern shore of the southernmost cove, but no eggs were confirmed.

Buck Mountain (R): The banded 2000 Buck Mountain female and an unbanded male occupied this territory and were nesting on the raft by 6/15. Two chicks hatched between 6/30 and 7/9. Both chicks survived to fledge.

Camo Camp (R): The banded 1999 Beaver Brook ABJ (female) and the banded 2002 Twin Brook male occupied this territory but no nesting attempts were observed.

Cold Brook (R): A territorial loon pair occupied the Cold Brook territory in 2010; however their band status could not be confirmed. The pair was observed nesting on 6/4 but the nest had failed by 6/22. The cause of the nest failure could not be determined, and one egg was collected from the nest.

Dam (R): The banded 1996 Beaver Brook female and the banded 1999 Dam male occupied this territory in 2010. A failed nest was discovered on 6/15, and two eggs were collected off the raft.

Emery’s Misery (R): The banded 2004 Emery’s Misery female and the banded 2009 male occupied this territory but did not nest.
Grove (NR): A territorial pair occupied the Grove territory in 2010. One loon was banded but could not be fully identified. The pair did not nest.

Hammel Brook (R): A banded loon, believed to be the 2000 ABJ from the Tiger Gray territory, paired with an unbanded loon in Hammel Brook. The pair were incubating two eggs on the raft by 6/4. The nest failed due to mammalian predation between 6/4 and 6/15.

Hurricane (R): A banded loon pair occupied the Hurricane territory in 2010. Three other banded birds were seen in this territory: the 2000 Buck Mountain male, the 1996 Hammel Brook female and partial bands were seen on a third loon believed to be the 2007 Hurricane female. Due to the regularity of all these loons on territory together, we could not confirm the identity of the territorial pair, though it most likely the 2000 Buck Mountain male and the 1996 Hammel female. The pair nested on the raft between 5/26 and 6/4 and hatched two chicks by 7/9. One chick was collected off the raft and the other was reported dead by a reputable observer.

Lincoln Brook (NR): The Lincoln Brook territory was unoccupied by loon pairs in 2010. A banded loon, believed to be the 1998 South Hammond female, was seen here once, but bands could not be confirmed.

Little Magalloway (NR): The banded 2002 Little Magalloway male and the banded 1994 Hurricane ABJ occupied this territory in 2010. The pair was nesting naturally by 6/4 on the east side of the northern-most island. Two eggs were confirmed on the nest, however the nest was found abandoned by 6/30 and no chicks were seen.

Meadow Brook (NR): The banded 2007 Meadow Brook pair returned in 2010 and was nesting naturally by 6/4. A nest with two eggs was located on floating bog mat but failed due to a water level rise that occurred between 6/4 and 6/15. The pair had renested at their historic site by 6/22. Although two eggs were recorded early in this second nest attempt, only one egg was seen on 7/9. One chick hatched between 7/14 and 7/22 and survived to fledge.

North Hammond (R): The North Hammond territory was unoccupied by loon pairs in 2010. The banded 2000 Tiger Gray female was seen in this territory.

Raven (R): The banded 1998 Raven male and an unbanded female occupied this territory and were nesting on the raft by 5/21. One chick hatched, but died on the raft between 6/15 and 6/22.

Schist Cove (NR): The Schist Cove territory was unoccupied by a consistent loon pair in 2010, however several unbanded loons were observed.

South Hammond (R): The banded 2005 South Hammond male and the banded 2002 female occupied this territory and were nesting on the raft by 6/4. Two chicks between 6/22 and 6/30 and both chicks survived to fledge.

Sunday Pond (R): The banded 1998 Sunday Cove female and an unbanded male occupied this territory and were nesting on the raft by 5/26. The nest failed by 6/30 when a Bosebuck camp wildlife tour passed within 35 meters of the raft location.

Tiger Gray (R): An unbanded pair occupied the Tiger Gray territory and began nesting on the raft between 5/12 and 5/21. Two chicks hatched by 6/22 and both survived to fledge.
Twin Brook (R): The banded 2008 Twin Brook male and the banded 2002 female occupied this territory and began nesting on the raft between 5/21 and 5/26. Two chicks hatched by 6/22 and only one survived to fledge.

Yukon (R): The Yukon Territory was unoccupied by loon pairs in 2010. The banded 1995 Big Brook female was seen in this territory.

Appendix 4: Band Information for Common Loons Banded in 2010

<table>
<thead>
<tr>
<th>Band #</th>
<th>Date</th>
<th>Territory</th>
<th>Retrap</th>
<th>Age</th>
<th>Sex</th>
<th>Left Leg Top</th>
<th>Left Leg Bottom</th>
<th>Right Leg Top</th>
<th>Right Leg Bottom</th>
</tr>
</thead>
<tbody>
<tr>
<td>UnME-10001</td>
<td>6/22/10</td>
<td>Twin Brook</td>
<td>No</td>
<td>Chick</td>
<td>Unknown</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UnME-10002</td>
<td>6/22/10</td>
<td>Twin Brook</td>
<td>No</td>
<td>Chick</td>
<td>Unknown</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UnME-10003</td>
<td>6/22/10</td>
<td>Tiger Gray</td>
<td>No</td>
<td>Chick</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0669-20569</td>
<td>6/15/10</td>
<td>Beaver Brook</td>
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<td>blue</td>
<td>yellow</td>
<td>blue dot</td>
<td>silver</td>
</tr>
<tr>
<td>0898-09977</td>
<td>7/14/10</td>
<td>Buck Mountain</td>
<td>Yes</td>
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<td>red</td>
<td>yellow</td>
<td>white</td>
<td>silver</td>
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<tr>
<td>0938-15277</td>
<td>7/9/10</td>
<td>South Hammond</td>
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<td>orange</td>
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<td>green</td>
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<tr>
<td>0669-21953</td>
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<td>Female</td>
<td>red</td>
<td>green</td>
<td>yellow stripe</td>
<td>silver</td>
</tr>
</tbody>
</table>

Retrap=individuals that were previously captured and banded