

Loon Nest Monitoring Instructions

Maine Loon Restoration Project (2021-2026)



Thank you for helping the Maine Loon Restoration Project!

This monitoring effort is part of a five-year project (2021-2026) to increase loon survival and nesting success on Maine lakes and ponds. Your observations will help determine how successful we are at improving loon breeding success, as well as identify pairs that are consistently failing to hatch chicks and could benefit from our help. This monitoring is different from the Annual Loon Count, where the goal is to document all loons within an area on a single day. In these surveys, you'll be focusing on one pair of loons over a season and gathering information to tell their story. We want to know the answers to these key questions:

- *Was there a mated pair in your area and did they nest this year?*
- *If they nested, how many eggs hatched? Did the chicks make it through the summer?*
- *Was there any predation or human intrusion that affected the pair's nesting success?*

Here are some guidelines to help you track the nesting success of a loon pair. If you have questions, see p. 5 for contact information to reach out to project staff for support. [For unfamiliar terms, reference the glossary on p. 9. You can find links to any resources mentioned in the text on the summary page \(p. 6\).](#)

- 1. What & Where to Survey:** You can monitor any lake or pond where there is a breeding loon pair present. Your surveys will focus on just **one mated pair or "territorial pair" of loons**. We are especially focused on tracking pairs that haven't hatched chicks in recent years and also finding out how well loons do using artificial loon nests or floating "loon rafts" that we're assisting in putting out on some lakes and ponds. If you are on a larger lake with multiple breeding pairs, focus on a specific section where a pair of loons has been spotted or is known to have nested in past years. On smaller waterbodies that support only a single breeding pair, you'll survey the entire lake or pond. In general, lakes less than 20 acres will not support nesting loons, and lakes of around 200 acres can support multiple pairs. A pair's breeding territory is generally about 100 acres, but can be larger or smaller depending on food availability, competition, or habitat quality.
- 2. Survey Frequency:** For this project, we are looking for volunteers or associations to "adopt" a loon pair to monitor throughout the season. Ideally, monitoring should start at the beginning of May (or as soon after the ice melts as safely possible) and continue once per week until the chicks are at least six weeks old, but preferably until they leave the lake. If you can't cover this schedule yourself, is there someone else you can pair up with or a lake association that might be willing to help? Staff of the Maine Loon Restoration Project will provide training resources and support for those conducting surveys throughout the season.
- 3. What You Can Expect Throughout the Season:** What you observe will vary throughout the season. Early monitoring will focus on defining the pair's breeding area and where they may be nesting, while later monitoring efforts may focus on locating the chicks and documenting their development. Here's an idea of what you might observe at different times of the season:

Early Surveys (*Ice melt through spring*)

- Loons form territories and territorial pairs
- Begin courtship and mating
- Test out sites for nest building

Egg Laying (*Mid-May to Mid-June*)

- Surveys focus on nesting pairs
- Eggs are typically laid from mid-May to mid-June or later if the pair re-nests after their initial nest fails

Hatching & Chick Growth (*Mid-June to late July*)

- Eggs normally hatch from mid-June to late-July, but some chicks will hatch into August
- Observe downy chicks as they grow
- Track loon pairs that have not produced any chicks or are re-nesting after their first attempt failed

Chick Survival & Fledging (*August into fall or early winter when chicks "fledge" or fly off the lake*)

- Surveys focus on growing young and their survival

5. Preparing for the Survey: Before you start:

1. Print out and review the *Survey Form* (maineaudubon.org/loonsurvey), as well as the *Incident Report Form* and *Season Summary*, so you know what information you will be collecting out on the water.
2. Print a map of your lake and bring it with you to mark where loons are observed.
3. Bring a copy of the *Loon Monitoring Reference Sheet* with you on your survey.
4. Review information on loon behavior and signs of distress to learn how to avoid getting too close while you're monitoring—and potentially causing disturbance that can take the pair's attention away from their nest or chicks and affect nesting success.

NOTE: All of these resources can be found on the Maine Loon Restoration Project webpage under **Resources for Loon Nest Monitoring**: <https://maineaudubon.org/projects/loons/loon-restoration-project/#monitoring>.

6. Materials: Getting materials together ahead of time is key to a successful survey! You will need:

Lake map	Survey form	Monitoring Reference Sheet
Season Summary form	Incident forms	Binoculars
Pencil	Rain & wind protection	Hat/Sunglasses/Sunscreen
Water/snacks	Watercraft/Survey vessel	Life jacket/PFD
<i>Optional: Camera</i>	<i>Clipboard</i>	<i>Cellphone in waterproof case</i>

Monitoring can be done from any type of watercraft. The more stable the watercraft, the easier it will be to record data. You will not be able to conduct a thorough survey from shore. A camera with a high powered zoom lens is helpful for documenting loon behavior, and a cell phone is helpful for marking loon locations using Google Maps, but neither is required.

7. **Survey Time & Travel Route:** To do a full and thorough survey you will need to spend anywhere from a half hour to 3 hours traveling around the area you believe to be the loons' territory. Early monitoring may require covering larger areas to locate the pair and get a sense of the extent of their breeding area, while later monitoring efforts may focus on the nesting area or locating the chicks.

You don't need to know the boundaries of the territory to do your surveys—start by focusing on the area where you have seen the pair interacting. Then expand or tighten your survey area over time as you observe the pair and see where they spend their time. It may also help to talk to other people on the lake and record their observations. They may have seen the pair together or observed courtship or territorial behavior that may help us further define the pair's territory. All information is useful.

8. **Safety Guidelines:** When you locate the pair, nest, or chicks, observe them from a distance with binoculars. Watch **only** as long as necessary to collect the survey form data.

Back away if you see any distress behaviors even if you don't have all of the data you are trying to collect. The loons' ability to tend to their nest and chicks is more important than data or photos! Never approach loons too closely or follow them. Don't approach nests to count eggs, even if a loon isn't on the nest or it appears to be abandoned. Loons may sometimes leave the nest for extended periods. For more information about how to observe loons safely, review our brochure: [How Close is Too Close?](#) (Appendix I) and visit loon.org for educational videos of loon behavior.

Reporting Incidents of Disturbance or Predation:

If you see human behaviors or animals cause loons to leave the nest or their young, or evoke a strong reaction from the loon family, please submit an **Incident Report**:

- Online at <https://arcg.is/aHGST>; or
- By printing a form at: maineaudubon.org/loonincidents and emailing a scan or photo of the completed form to the project partner you are working most on closely with (see contact information on page 5) promptly after an incident occurs.

It is especially important to fill out this form if:

1. a human or animal intrusion causes a loon to leave the nest or its chicks
2. the incident causes harm or death to the loons
3. the incident causes nest failure, such as by knocking out the eggs or flooding the nest

Safety!

Your safety and the loons' safety are top priority!

Don't go out on the water when conditions seem questionable or unsafe. Always remember a PFD and be sure to let someone know where you are going and when you'll be back.

Approaching loons can be dangerous; they have powerful, sharp beaks. Please do not approach loons closely, for your sake and theirs!

Do not remove eggs from loon nests, even if they are abandoned. Neither Maine Audubon nor Maine Department of Inland Fisheries and Wildlife will accept abandoned loon eggs. It is illegal to collect eggs without permission from a federal permit holder or sub-permittee.

9. Data Collection:

On the Water:

1. Travel slowly throughout the pair's territory and record your observations on the survey form. Make sure to look along the entire shoreline and around islands within the pair's territory (the area that the pair frequents) with your binoculars.

2. Mark your observations and travel route on your lake map, including where you observed loons, nests, and any noteworthy events. Also record locations of any eagle nests or perch trees, the boundaries of the area where you have seen the loon pair interact, boat launches, areas of heavy boat traffic, fishing and recreation sites, or other information you think could help tell a visual story of this pair's breeding site and breeding challenges.

3. Keep your distance if you see or suspect a loon or nest is present. When looking for nests, pay particular attention to islands, coves, marsh areas, floating mats of vegetation, and mounds of mud. Nests are more likely where there is enough vegetative cover to shade the nest and protect it from avian predators flying overhead; where it is deep enough for a loon to swim to shore all season without touching bottom; and where the shoreline is not too steep or rocky. Loons often prefer to nest on islands and may prefer areas with less development or human intrusion (although loons can nest near boat ramps and houses, so there's no hard rule).

Filling out the Survey Form: Each time you survey your loon pair, record your observations on one column of the survey form. You can record observations from seven surveys on one data sheet. Appendix II: *Filling Out the Survey Form* provides tips on filling out some questions on the survey form. Also see the *Monitoring Reference Sheet* for pictures of loon territorial behaviors and chick development stages.

10. Data Entry & Submission

After each survey, submit your data online at: <https://arcg.is/reHeG>. Instructions are included in Appendix III. Submitting your data online is important and will allow us to keep an eye on your loons' "story" as it unfolds. If you are surveying as part of a team, team members can take turns entering data, or the team may want to designate one person as the lead for data entry. Note that once you hit 'Submit' you will not be able to view or update your data. If you have questions or need to make changes, please email the Lakes Environmental Association at the email below.

Once a hard copy of the survey form is fully completed (after 7 surveys), please mail or email the paper survey form, along with your map and any Incident Reports, to the project partner you are working most closely with:

- 1) Maine Loon Restoration Project, Maine Audubon, 20 Gilsland Farm Rd., Falmouth, ME 04105 or loonrestoration@maineaudubon.org
- 2) Maine Lakes, PO Box 91, Yarmouth, ME 04096 or loon@lakes.me
- 3) Lakes Environmental Association, c/o Loon Restoration, 230 Main Street, Bridgton, ME 04009 or maggie@leamaine.org

You may need to print a new copy of the survey form at maineaudubon.org/loonsurvey if you will be conducting additional surveys.

If you have a good camera, please submit photos with your completed survey form.



Photos should be taken far enough from the nest or loons that you do not cause the loons to change their behavior or exhibit signs of distress.

Be sure to give loons plenty of space and watch for distress signals!

11. Season Summary Form

In addition to the survey forms, we need your help compiling a summary of the loon pair's story over the season. After each survey, review the questions on the printed Season Summary form (maineaudubon.org/loonsummary) and fill in any new information you have collected. This form is where you record major events that you witness or become aware of throughout the survey season, such as the ice-out date on your lake (see glossary), first loon arrival date, start of nesting for the pair, first chick sightings, etc. Don't forget to fill out the background information section of this form, including any knowledge you have on the pair's productivity in the last three years (nesting and hatch dates, known nesting failures, chick and adult survival/deaths, changes in nest locations, disturbance or predation). This information is valuable in determining potential raft locations or protection measures for the future years.

At the end of the season (after chicks have reached at least 6 weeks of age, preferably after they have left the lake), submit your Season Summary Form online at: <https://arcg.is/1Da0me0> and mail/email a copy to one of the addresses listed above (in part 10), along with your survey forms, map, and any incident forms.

THANK YOU!

This project would not be possible without your dedication and passion for loon conservation. Please reach out to any of the project partners should you need assistance with any aspect of this project.

Maine Audubon: loonrestoration@maineaudubon.org, (207) 781-2330

Maine Lakes: loon@lakes.me, (207) 495-2330

Lakes Environmental Association: maggie@leamaine.org, (207) 332-1106

Penobscot Nation Natural Resources: Benjamin.Simpson@penobscotnation.org



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Appendix I. Links to Monitoring Resources

Links to most of the resources listed below can be found here:

<https://maineaudubon.org/projects/loons/loon-restoration-project/#monitoring>

You may also find specific documents using the links below:

- **Maps of your lake:** maineaudubon.org/loonlakemaps
- **Lake Information:** Look up MIDAS #, lake acreage, and other information about your lake at: <https://www.lakesofmaine.org/>
- **Information About Loon Behaviors & Distress Signals:**
 - 'How Close is Too Close?' brochure: maineaudubon.org/loonbehaviors
 - Loon behaviors (images & videos): <https://loon.org/about-the-common-loon/loon-behavior/>
 - Living in Loon Territory: maineaudubon.org/livinginloonterritory
- **Monitoring Resources:**
 - Monitoring Reference Sheet: <https://maineaudubon.org/wp-content/uploads/2022/03/Loon-Placard-Final-WEB.pdf>
 - Printable Forms: maineaudubon.org/loonsurvey

Submit your completed data forms to the partner organization you are working most closely with:

- Maine Audubon: loonrestoration@maineaudubon.org
- Maine Lakes: loon@lakes.me
- Lakes Environmental Association: maggie@leamaine.org

Links for Online Data Entry:

- Survey Form: <https://arcg.is/reHeG>
- Season Summary Form: <https://arcg.is/1Da0me0>
- Incident Report Form: <https://arcg.is/aHGST>
- **Loon Band Sighting Guide:** <https://maineaudubon.org/wp-content/uploads/2022/04/Loon-Band-Sighting-Guide.pdf>
- **Clues & Resources for Determining Causes of Loon Nest Failure**
 - Animal track guide – to help aid in identifying any tracks left by nest predators <https://www.maine.gov/ifw/docs/MDIFW-Animal-Tracking-Card-color.pdf>
 - Clues to the Causes of Nest Failure: <https://maineaudubon.org/wp-content/uploads/2022/04/Clues-to-Nest-Failure.pdf> and there are also some tips on how to determine causes of nest abandonment in the glossary (page 10)

Appendix II. Tips for Filling out the Key Sections of the Survey Form:

Data Field	Entry
MIDAS # and Lake Acres	To find your lake’s MIDAS number, and acreage use the lake search tool at: https://www.lakesofmaine.org/ .
Survey Location	This refers to the unique name you assign to the loon pair you will be observing and a brief description of their location, e.g., Twin Island pair, Broad Cove to Swim Rock.
Is a Territorial Pair Present?	A territorial pair consists of two adult loons that are observed together and interacting over a multi-week period and defend an area from other loons. To be considered a territorial pair, a loon pair must establish and defend a territory for at least 4 weeks.
If yes, list behavior(s) that led you to label them as a territorial pair	List any courtship or territorial behaviors you observe. Examples of courtship behavior include synchronized movement (swimming, diving, and foraging together), exchanging wails or hoots, mutual bill dipping or circling each other. You may observe them copulating or testing out shoreline nest sites. Territorial pairs can also engage in confrontations with challengers, including sudden simultaneous dives, chases, the “penguin dance”, and other aggressive or evasive behaviors. Refer to Monitoring Reference Sheet or go to loon.org for pictures and descriptions of behaviors that help differentiate a territorial pair from other loons that are together.
Leg Bands Observed?	Some loons have been banded with colored markers around their legs, which identify individual loons and are very helpful in tracking loons over time. If you see leg bands, spend some time observing to see if you can tell the color combination, e.g. red over green on left leg. If you see bands on loons that are not part of the pair you are observing, describe these in the comments. Refer to Loon Band Sighting Guide (see the link on page 6) for tips and tricks on how to sight bands on loons.
Known or suspected cause of nest failure	Determining the cause of nest failure can be tricky, so just do your best to capture any clues. Photos of the failed nest can be very helpful. Some information on nest failure is included in the glossary (Appendix IV). If you’d like to dig in a bit more, refer to the Clues to the Causes of Loon Nest Failure and Animal Track Guide (links on pg. 6). Elaborate on any evidence for the cause of the nest failure in the comments.
Survey Form Pg. 2	
Immature Loons	Not this year’s chicks. Same size as adults but without black and white feathers. Will not be with parents and can be alone or within groups.
Chick Development Stage (1-3)	Record what stage of development chicks are in – 1-downy young, 2-small young, or 3-large young. Refer to Monitoring Reference Sheet for photos of chicks throughout development.
Intruders? Y/N	Are there any other loons interacting with the loon pair during the survey time?
Comments	Please provide any additional observations and any information reported by other lake users. If there was a known or suspected nest failure describe how you came to your conclusions here.

Appendix III. Tips for Online Data Entry. The list below only includes fields on the online form that need clarification or additional directions. Other fields that are more obvious (name, email, etc.) or are repeated directly from your survey form are omitted to save space.

Data Field	Entry
Lake Name	Start typing your lake name in the box to filter the list to a few choices. Select your lake from the dropdown list. Check the town and number of acres to verify that you have selected the correct lake or pond, especially for common lake names
Describe survey location	This is the “Survey Location” from your survey sheet.
Mark your survey area	If you have outlined your survey area before when submitting a survey form online, and your survey area hasn’t changed, <u>you can skip this step</u> . Otherwise, type your lake name in the box marked “Find address or place”. Hit enter and the map will Zoom in to the vicinity of your lake or pond. You may need to add the town to your search. Click the “+” button if you need to Zoom in more. If you need a map with more details or labels, click the button with four squares in the upper right-hand corner of the map and select the USGS National Map or a map of your choice. Then click the icon with the “squiggly line” on the right side of the map and draw a shape on the map marking the boundaries of the area you surveyed, which should correspond with the area that the loons frequent. Your drawing will save automatically.
Leg bands	If you click ‘Yes’ a new box appears (‘Please describe location and color of leg bands’). Refer to <i>Loon Band Sighting Guide</i> for tips to sight bands (link on page 6).
Loon pictures	Attach any photos taken during your survey that provide supporting information, such as nest location, leg bands, or chick stage. You do not need to include general photos of the loon pair. Click “Select image file” and the photo you want to submit.
Observation notes	Any additional notes, such as leg bands observed on other loons on the lake, any questions, or events you observed. If you attached photos, describe what the photos are portraying.
Number of boats operating within 100 feet of loons, including your own vessel	Enter the total number of boats within 100’ of loons (including your own vessel) or any vessel that is causing noticeable loon disturbance (at any distance).
Type of vessel within 100 ft. of loons	Select all that apply. If some options are unfamiliar, see glossary for definitions of different types of boats.
Number of intruders observed	Intruders are other loons interacting with and challenging the territorial pair.
Comments	Any additional information about the loons you observed and any information reported by other lake users.
Did you observe a reportable incident?	If you observed a human or animal intrusion that caused a strong reaction from the loon family or caused loons to leave their nest or young, it’s very important to submit an incident report form so that we can track what loons are distressed by.
Info to add to Season Summary?	Review your paper Season Summary Form. Click ‘yes’ if your survey collected some of the information on this form.
Submit	Press the submit data button to submit your data online. Note that you will not be able to retrieve the form or make changes. Email maggie@mainelakes.org .

APPENDIX IV. Glossary of Terms

Chick stashing: A loon parent will sometimes “stash” its chick to join their mate in fending off a threat, such as another loon that is challenging the pair in an attempt to take over the territory. The parent takes the chick into a protected area away from the confrontation and then leaves the chick alone, but often somewhat hidden, while both parents confront the intruder. Confrontations can last for an extended period of time. While this behavior does leave the chick vulnerable for the time it is alone, it is not abandoned. A parent will return for it. If you find a chick alone, do not approach it or try to rescue it.

Clues to Causes of Nest Failure: The reasons that cause a nest to fail are sometimes difficult to determine, but you can help by providing photos of an abandoned nest taken from a distance and gathering clues about the nest’s demise. Is there water in a nest with eggs? This may indicate the nest flooded due to rising water levels or heavy rain. Are there eggs outside the nest, floating, or missing? This may indicate that waves or boat wakes washed the eggs out of the nest or flooding floated the eggs away. Are there visible holes in the eggs that may hint at avian predation? Or crushed eggshells and egg fragments which could be leftover from a land mammal in the nest? Bigger fragments may be leftovers from hatching. Is the waterline far from the nest and/or are there drag marks, signs of something dragging itself to or from the nest? This may mean that water levels fell and left the nest high and dry requiring loons to push themselves along the shore to reach the nest. Did anyone see a chick at some point, which could indicate that the pair successfully hatched a chick and the chick may have been killed or died after hatching? Are there tracks or scat (poop) present, which may indicate that a predator took the eggs or attempted to drag them away.

Eagle perch tree: Large trees on the water’s edge that eagles frequently perch on. Eagles use these trees as outlooks and can sometimes be seen consuming prey on the perch.

Fledge/fledging/fledgling: Once chicks are capable of flight they have ‘fledged’ (around 12 weeks of age). A chick that has fledged is referred to as a fledgling. Signs that a chick is approaching the fledging stage include attaining adult size and shape, lack of fluffy down, exercising their wings by flapping, and attempts at flight. Parents typically migrate first and leave their fledged young to migrate on their own a few weeks later.

Ice out: When the ice melts to the point where you can navigate unimpeded from one end of the water body to the other.

Immature/sub-adult loons: Loons in their 2nd or 3rd summers. They are adult size and shape, but do not have the adult black-and-white breeding plumage. Instead, the feathers on their backs and heads are grayish-brown with white undersides. Sub-adults may be mistaken with older, first year young in late summer and early fall (see ***Monitoring Reference Sheet – Chick Development*** stages for photos). If a loon matching this description is seen early in the season (typically before August) without parents and it doesn’t receive parental care, or is seen in a group of three or more loons, it is likely an immature, sub-adult loon. For additional tips on loon appearance and telling immature loons apart from first year chicks or wintering loons, see <https://loon.org/about-the-common-loon/appearance/>.

Intruding Loons/Intruders: Intruders disrupt loons from tending their nest or protecting and caring for their eggs and chicks and can include humans, predators, and other loons. Intruding loons are loons that are not part of a territorial pair, which enter the pair’s territory and challenge the pair with

displays, aggression, or attacks. These intruders will take over the territory and displace one member of the pair if they win the confrontation. You can distinguish an intruder from members of the pair if you see the aggressive or territorial behaviors listed on the survey form and shown in the Monitoring Reference Sheet. When an intruder is present, the pair will be on alert and will not conduct normal foraging, preening, or courtship behaviors.

Nest Failure: When a loon pair attempts nesting and fails to hatch chicks. This may include eggs that are laid but don't hatch, abandonment of the nest, predation or flooding of the nest, etc. Breeding failure is a more general term which also includes pairs that form but never attempt nesting.

Nesting pair: Pairs are considered nesting pairs from the beginning of copulation up until hatching. Copulation can occur several times over a 7 day period. 1-2 eggs are deposited in the nest 1-2 days after fertilization. The pair will share incubation duties for 27-30 days. Much longer than this and the egg(s) are unlikely to be viable.

Preening: When birds use their beak to move oil from a gland on their back to their feathers to maintain waterproofing. This is also a time when they straighten and organize their feathers.

Re-nesting: Loon pairs can re-nest (often in a different location) if the first nesting attempt fails. Pairs that re-nest as late as the end of August can sometimes successfully fledge young.

Single adult loons: These are likely unmated adult loons, also referred to as "non-territorial", "non-breeders", "residents", "wanderers", "loners" or "floaters". Unmated loons do not establish pair bonds, or are only part of a pair bond *for less than four weeks*. Unmated loons are typically found on low quality territories and are most likely young birds (ages 3-6), or established adults that have been cast out of their former territory.

Territorial pair: Two adult loons that exhibit clear pair behavior, including exchanges of contact wails or hoots and synchronized movement around the territory with relaxed foraging. Territorial pairs will also engage in territorial disputes with loon challengers or "intruders". These disputes often include sudden simultaneous dives, chases, attacks, or other agonistic behavior indicating the two loons may not be a pair. To be considered a territorial pair, loons must establish and defend a territory for at least 4 weeks.

Tour Boat: Any vessel embarking passenger for touristic reasons including site seeing and tours.

Wake Boat: Also known as surfboats or towboats. Designed to create a large wake for watersports.