About BRI

Biodiversity Research Institute (BRI), headquartered in Portland, Maine, is a nonprofit ecological research group whose mission is to assess emerging threats to wildlife and ecosystems through collaborative research, and to use scientific findings to advance environmental awareness and inform decision makers.

BRI supports 11 research programs within three research centers including the **Center for Ecology and Conservation Research**, the **Center for Mercury Studies**, and the **Center for Loon Conservation**. Within these centers, BRI manages the following programs:

Taxonomic

- Loon Program
- Mammal Program
- Marine Bird Program
- Raptor Program
- Songbird Program
- Waterfowl Program

Ecosystems

- Arctic Program
- Tropical Program
- Wetlands Program

Environmental Issues

- Wildlife Health Program
- Wildlife and Renewable Energy Program

BRI has been conducting scientific inquiries for private sector and government clients nationwide and globally since 1998. Using both traditional and innovative approaches, our researchers collect, analyze, and interpret scientific results on how ecological stressors impact living systems.

By incorporating regional data and developing strategies for collecting additional data, BRI has effectively modeled such stressors on species and community distributions, phenology, adaptive strategies and population viability across tropical, temperate, and arctic biomes.

BRI's Wildlife Toxicology Lab has the capacity to analyze various tissue samples for mercury concentrations.

For more information on our capabilities and services, visit: **www.briloon.org/services**

BRI's Loon Program

BRI's Loon Program is dedicated toward a greater awareness of loon species worldwide. Since 1989, our biologists have monitored breeding, migratory, and wintering loon poopulations across North America. A basis for this work has been the discovery and widespread use of a replicable and safe capture method that permits regular banding and sampling of adult and juvenile loons.

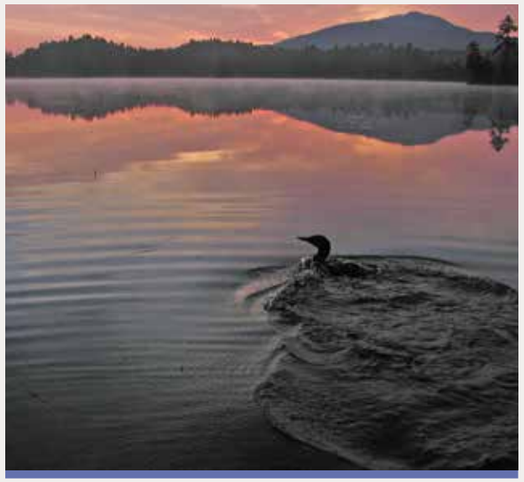
BRI continues to identify threats to loon populations and develop collaborative research projects to help at-risk populations achieve self-sustaining levels.

Research Capabilities

BRI biologists are skilled in numerous diverse aspects of loon research including:

- **Surveys**—Conducting surveys on breeding loons to estimate abundance, reproductive success, feeding habits, and space use.
- **Capture and banding**—BRI researchers are experts in the safe and efficient capture and banding of loons (>5,000 banded to date). Techniques vary by species, season, and geographic region; all methods are approved by required permitting agencies.
- **Tracking device selection and fitting**—Tracking technologies are critical for acquiring important data on loon ecology. BRI staff are skilled in selecting appropriate tracking devices and safely fitting them to individuals.
- **Laboratory analysis**—BRI's Wildlife Toxicology Lab has the capacity to analyze various tissue samples for lead and mercury concentrations. Necropsies are performed by BRI veterinarians in our Wildlife Health and Pathology Lab.
- **Ecological analysis and modeling**—BRI staff have expertise in managing and analyzing large and complex multivariate datasets comprised of animal movement, demographic, contaminant, or other data.


Common Loon



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www.briloon.org/loons

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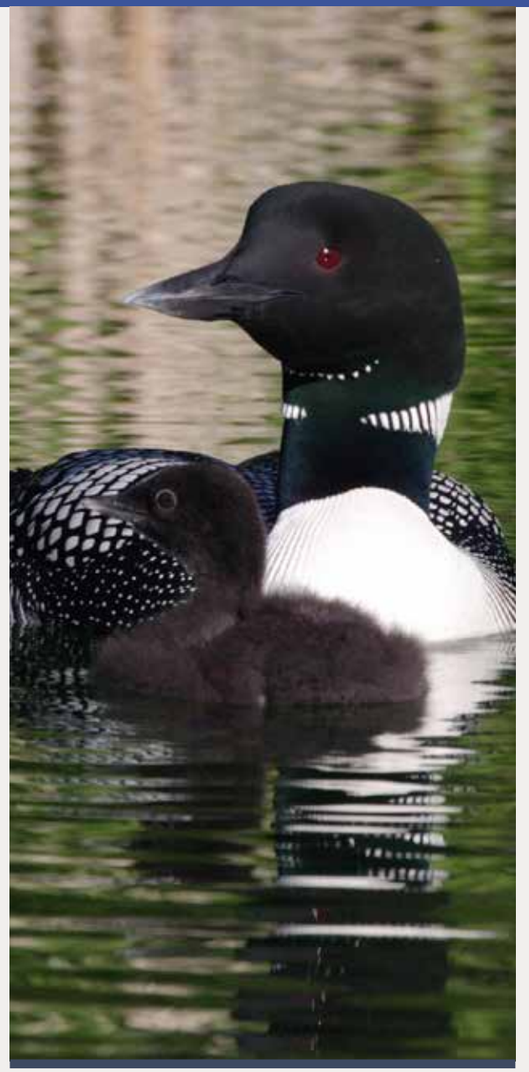
Biodiversity Research Institute

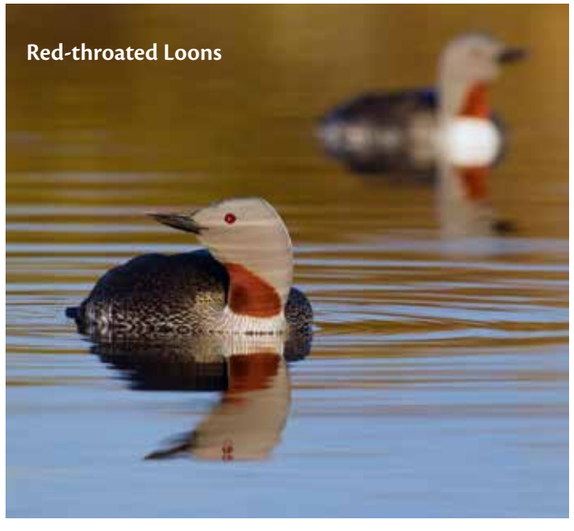
Loon Program



Why Study Loons

Loons are widely recognized symbols of northern wilderness and indicators of aquatic health. Landscape-level alterations, habitat disturbance, fishing practices, and pollution threaten loon populations across their range, but at both individual and population levels, loons are resilient and able to acclimate to many of these threats, often within the same generation.

The sustainability of loon populations over time will ultimately depend on our own awareness and response to minimaize the many threats known across North America and their global range.


Red-throated Loons

BRI's loon research stretches across the globe to include breeding areas, migratory corridors, and wintering regions of several species including the Common Loon, Red-throated Loon, Yellow-billed Loon, and Pacific Loon. Many of our studies investigate significant environmental threats to loon populations, through three primary focus areas: Contaminant Monitoring, Movement Studies, and Populations Dynamics.

Species We Study

Loon species emphasized in BRI's research include:

- Common Loon
- Red-throated Loon
- Yellow-billed Loon
- Pacific Loon

Contaminant Monitoring

BRI began its 30-year history of studying contaminants by documenting the exposure and effects of methylmercury in the Common Loon across North America. Research efforts have expanded to include additional contaminants (including lead, oil, and emerging organic pollutants) and species (including the Red-throated and Yellow-billed Loons). Overall research goals include the identification of biological mercury hotspots, conducting risk and injury assessments, and developing the use of loon species as biosentinels for monitoring contaminants in response to regulatory and policy requirements (e.g., US Federal Energy Regulatory Commission (FERC); Natural Resource Damage Assessment and Restoration (NRDAR); US EPA's Mercury Air Toxics Standards rule; and the global Minamata Convention on Mercury).

Current contaminants monitoring projects include:

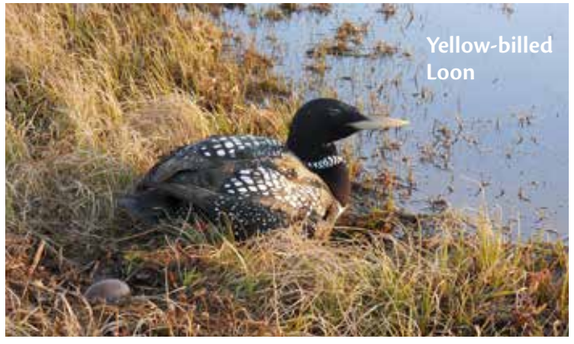
- Mercury – In the USA: AK, MA, ME, MT, NH, NY, WA, WY; Canada, Iceland, and Russia
- PAHs – Gulf of Mexico and Saskatchewan
- Lead – Western and Eastern United States

Movement Studies

Efforts to study and monitor the movements of loons across their life cycle help us learn critical information about their behavior and ecology, such as: breeding and wintering site fidelity (important for managing populations); the connectivity for various breeding populations with their wintering areas (important for pinpointing impacts during a marine oil spill); threats that breeding loon populations may encounter during migration and winter (important for rare species like the Yellow-billed Loon); and how migrant and overwintering Red-throated and Common Loons might respond to marine wind farms that are constructed along the mid-Atlantic Coast and elsewhere. The answers to such questions help policy makers and resource managers make responsible conservation and management decisions.

Locations of BRI projects with a focus on tracking loon movements:

- Western and Eastern United States – Common Loon
- Gulf of Mexico – Common Loon
- Mid-Atlantic United States (marine) – Red-throated Loon and Common Loon
- Arctic Coastal Plain – Yellow-billed Loon


Yellow-billed Loon

Population Dynamics

Monitoring uniquely color-marked or satellite-tagged loons is paramount to continued understanding of population demographics and trends. Over time, BRI's banding efforts have encompassed most of North America for the Common Loon (including 11 US states and 8 Canadian provinces during the breeding season and 8 US states during winter), three sites in the Yellow-billed Loon's breeding range (Alaska, Nunavut, and Northwest Territories), and many sites for the Red-throated (mid-Atlantic nearshore areas) and Pacific Loons (Alaska). As a result of research conducted using banded and tagged loons, various state, regional, and national management and conservation efforts have been employed.

Current population dynamics monitoring projects include:

- Common Loon 25-year tracking study in the Rangeley Lakes and upper Kennebec River region of Maine, USA for FERC-relicensing purposes.
- Common Loon restoration in Maine and Massachusetts in response to NRDAR oil spill assessments for the North Cape, RI, Sanborn, ME, and Buzzards Bay, MA.
- Common Loon injury assessment in Louisiana and Mississippi as related to the BP Deepwater Horizon oil spill
- Common Loon long-term tracking of color-banded individuals in the western US (MT, WA and WY), in the Great Lakes (MI and MN), in the eastern U.S. (MA, ME, NH, NY and VT) and in Canada (ON, NB, NS, and PQ).
- Restore the Call – New England


Common Loon

Current Highlights

Restore the Call: New England

Based on a six-year study to develop safe and replicable techniques for translocating, raising, and releasing Common Loon chicks to new sites (initial funding from the Ricketts Conservation Foundation), BRI continues this important work to establish new breeding populations of Common Loons in southern and western Massachusetts. Other restoration sites are now being investigated. For more information on this study, visit: **www.briloon.org/restorethecall**

IUCN Diver/Loon Working Group

BRI leads an international Species Working Group as part of the International Union for Conservation and Nature's Species Survival Commission—a science-based network of more than 10,000 volunteer experts working together in more than 140 Specialist Groups, Red List Authorities and Task Forces. For more information see: https://www.iucn.org/commissions/ssc-groups/birds/diver-loon

INVITATION TO ATTEND

2020 International Loon/Diver Symposium

In the fall of 2020, BRI will host an International Loon/Diver Symposium in Portland, Maine. We invite loon researchers and conservationists, state and federal employees, wildlife rehabilitators, students, and loon enthusiasts from across the northern hemisphere to share knowledge and expertise.

The Symposium will encompass all five loon species: Arctic Loon; Common Loon; Pacific Loon; Red-throated Loon; and Yellow-billed Loon. The Planning Committee is developing a detailed itinerary. We will post conference updates as information is available. Please spread the word to your colleagues. To learn more, visit: **www.briloon.org/loons2020**