Common Loon Status Report 2020

WYOMING

A Series Publication of BRI's Center for Waterbird Studies

Status of Western Breeding Loon Populations

In Wyoming, the Common Loon is the rarest breeding bird (Oranan 2019); they are listed as a Species of Greatest Conservation Need, as determined by the Wyoming Game and Fish Department. In 2012, Biodiversity Research Institute (BRI), in partnership with Yellowstone National Park (YNP), initiated a study to monitor and understand the local breeding loon population. In 2013, BRI created a dedicated working group in collaboration with governmental agencies including Yellowstone and Grand Teton National Parks, the Wyoming Game and Fish Department, and Bridger-Teton and Caribou-Targhee National Forests. BRI's goal within the Wyoming Loon Working Group is to ensure that Wyoming's small and isolated breeding population of Common Loons is self-sustaining. A wider understanding of loon ecology and threats will be important to assist governmental agencies with management and outreach efforts.

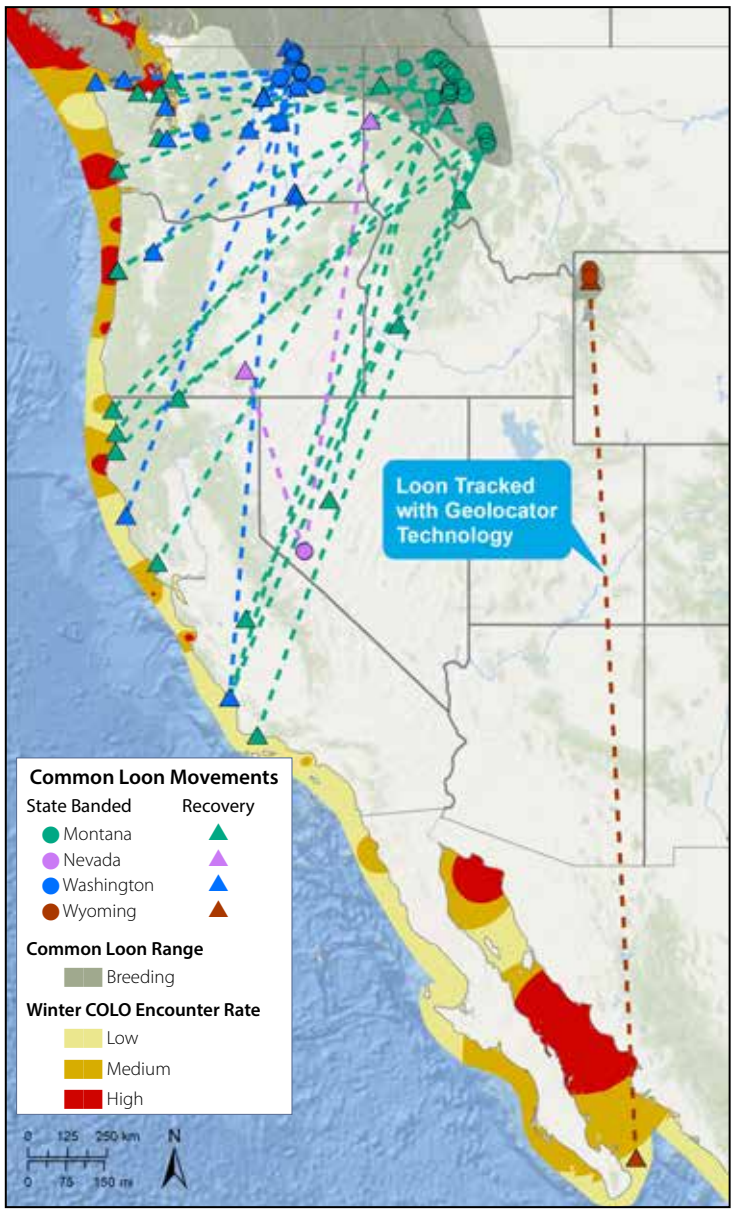


Figure 1. The breeding and wintering range for the Common Loon in the western U.S. Movements of loons are based on recoveries (n=38), recaptures (n=65), and re-observation of individuals banded by BRI researchers. The winter range densities are taken from the National Audubon Society's Christmas Bird Count, 2002-2012, and are categorized in three levels of encounter rates.

Western U.S. Breeding Populations

In the western U.S., Common Loons regularly breed in Montana, Washington, and Wyoming—with breeding pairs in Idaho occasionally found (Figure 1). Today, the western U.S. breeding population is estimated at 124 territorial pairs—combining Montana (80 pairs), Washington (22 pairs), and Wyoming (22 pairs). Based on scattered historical nesting records in California, Oregon, and Idaho, the western breeding population has experienced a contraction of its breeding range in the past century.

To study breeding ecology, migration patterns, and over-wintering fidelity of Common Loons in the West, BRI banded 626 loons at their breeding lakes from 1993 to 2019. During migration, BRI banded 60 spring and 41 fall migrant loons on Walker Lake, Nevada from 1998 to 2004, and in wintering areas, 126 loons were banded in California from 1997 to 2012.

Wyoming Breeding Population

With only 22 observed territorial pairs, the Wyoming loon population is one of the smallest and most isolated in the species range (Figures 1 and 2). This population is not only the most southern loon population in the west, but it is also isolated from contiguous populations to the north by more than 220 miles. This makes immigration, and therefore dispersal and rescue from other populations, unlikely.

The breeding population is distributed across:

- Yellowstone National Park—16 pairs;
- Caribou-Targhee National Forest—5 pairs;
- Bridger-Teton National Forest—1 pair; and
- irregularly in Grand Teton National Park.

Surveys from 2015-2019 identified several lakes with oversummering individuals and occasionally territorial pairs in the Wind River Range.

1,500

Number of miles a Wyoming Common Loon migrated from breeding territory to wintering waters.

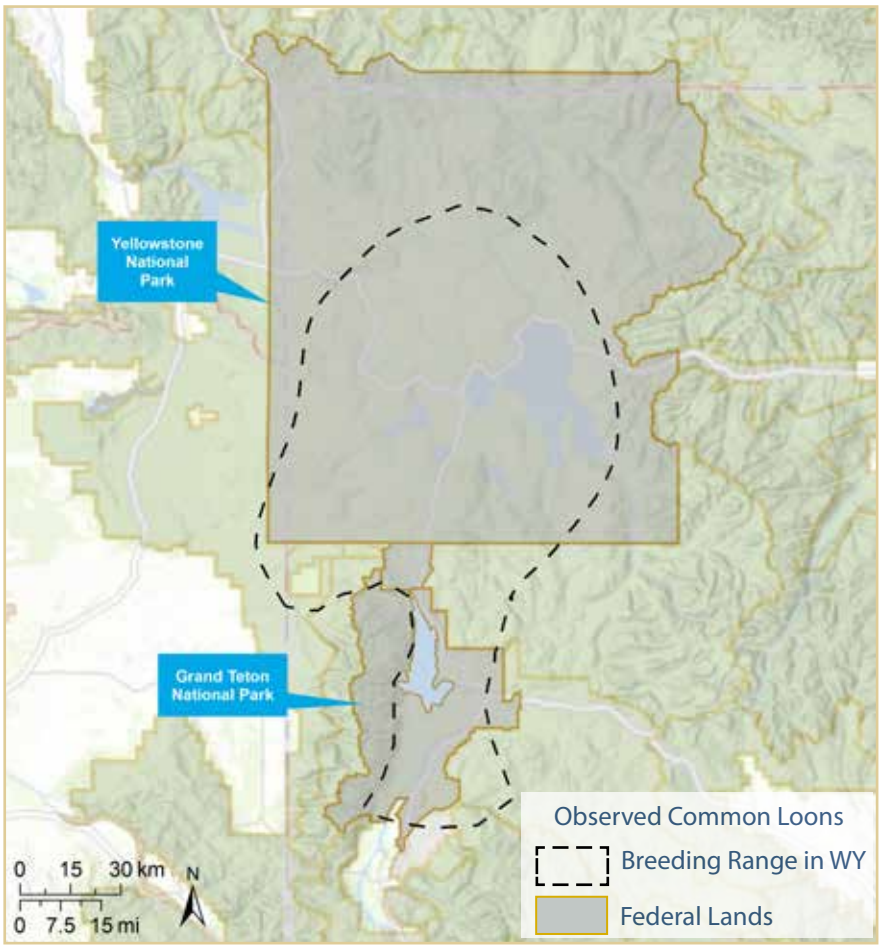
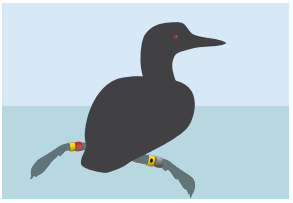


Figure 2. Generalized breeding range of Common Loons in northwestern Wyoming.

Number of BRI Banded Common Loons

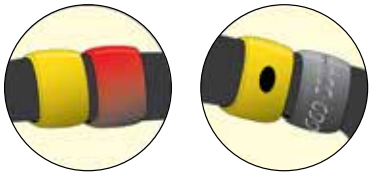


33
Wyoming
(since 2014)

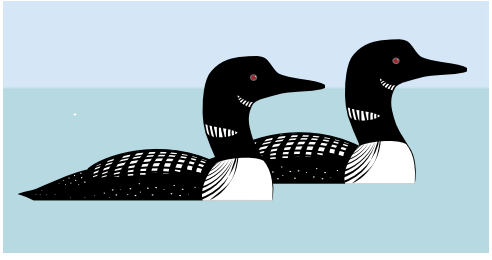
626
Western U.S.
(since 1993)

5,517
North America
(since 1989)

Long-term monitoring of banded loons provides valuable information about reproductive success, habitat utilization, and behavioral ecology.



Plastic color bands are used in unique combinations (left) and metal bands are engraved with a unique I.D. number (right).



Total Number of Territorial Pairs

Wyoming	Western U.S.	North America
22	**124**	**258,000***

*Approximate

Breeding Loons in the Greater Yellowstone Ecosystem

Based on monitoring efforts by the National Park Service and Wyoming Game and Fish Department since 1989, we know the Wyoming breeding loon population (measured as number of territorial pairs; Figure 3).

From 1989 to 2006, the number of known territorial pairs ranged from 16 to 21 (Figure 3). This variation over the 18-year time period is typical and is likely related to adult mortality events and even the accuracy of surveys.

However, there was a perceived decline after 2006. The reasons for this decline are unknown, but human disturbance of nesting pairs and loss of breeding adults are suspected. From 2008 to 2010, surveys were not comprehensive and are incomplete.

Since BRI started conducting standardized surveys in 2013 there has been a recorded increase in the number of territorial pairs. In 2019, there were 22 pairs (Opabona 2019).

Loon productivity is best measured as chicks surviving (i.e., those living at least 6 weeks) per territorial pair. In Wyoming, 20 of the 30 years of measured productivity (66%) since 1989 were above the well-established sustainability threshold of 0.48 CS/TP value (Figure 4). This statistic is encouraging.

For the past nine years, productivity has been above 0.48 CS/TP (90% of the years), which may be related to the increase in territorial pairs now being observed. Exceptionally low productivity years, such as in 1993, 2004, 2008, and 2011, are typical of loon populations over time. Conversely, exceptional years were recorded in 1989, 2014, and 2019.

Typically, for long-lived birds, 20% of the breeding population produces 50% of the young, which is evident in the northwest Wyoming breeding population. Territories with high quality individual loons and/or pairs should be prioritized for long-term management.

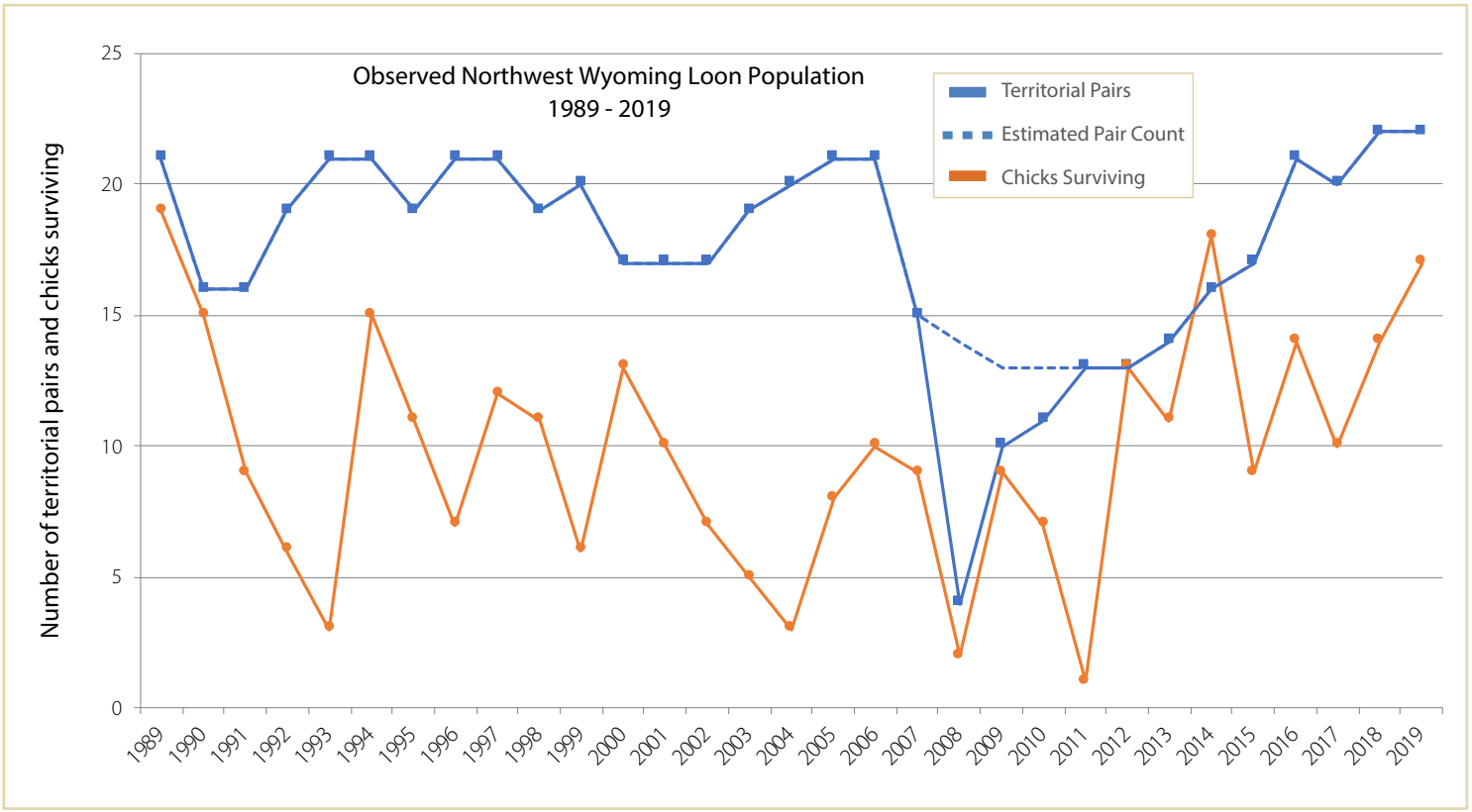


Figure 3. The number of territorial pairs in northwest Wyoming experienced a significant decline in 2007. Recently, it appears the population is rebounding with new pairs forming. Note, surveys from 2008 to 2010 were not comprehensive.

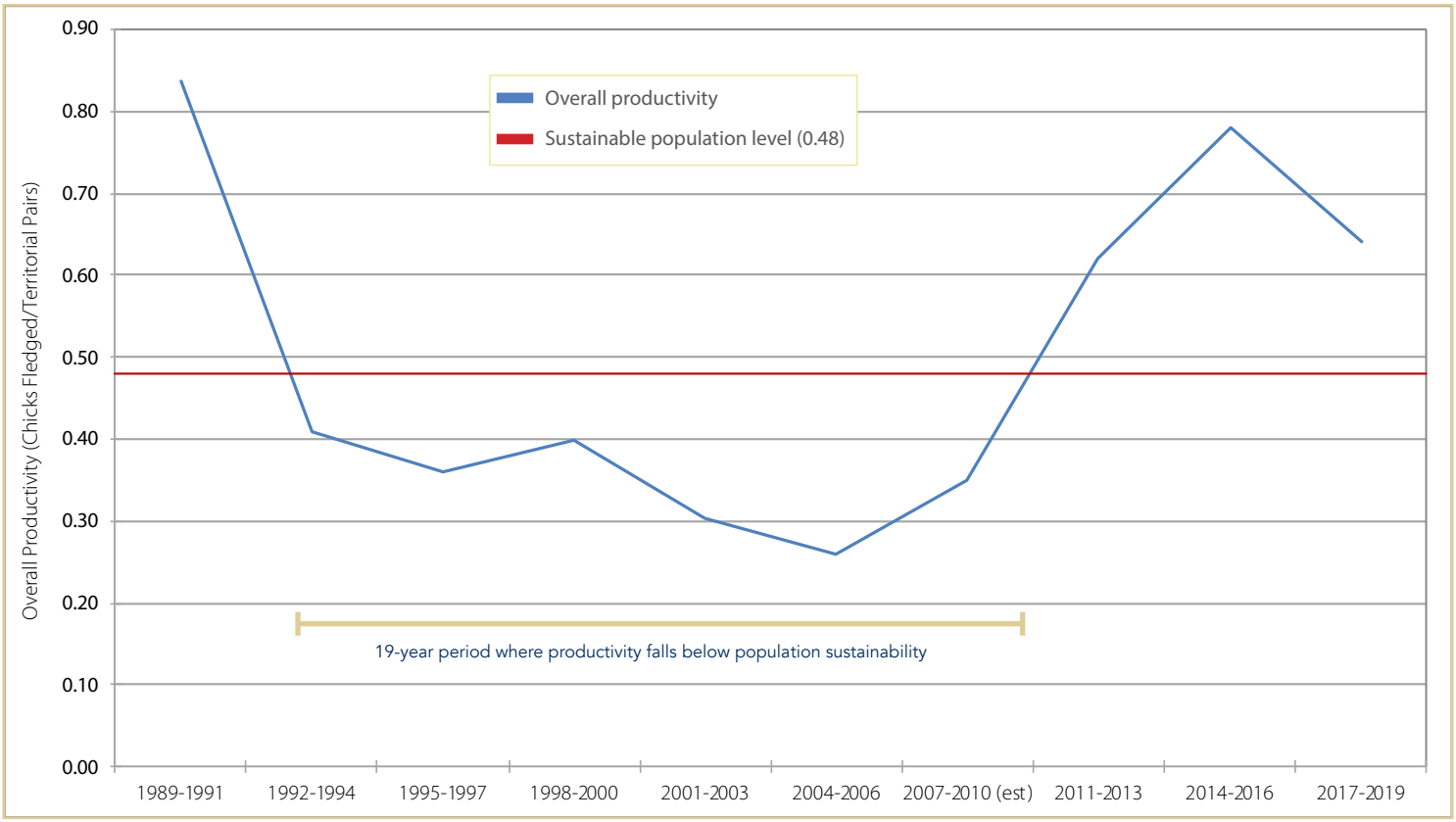


Figure 4. Wyoming loon productivity by three-year periods, compared with a well-established national productivity model that uses chicks surviving per territorial pair as a sustainable population benchmark.

Conservation Concerns for Population Sustainability

Loons are long-lived; they have relatively low annual productivity and a poor ability to colonize new breeding areas. Given its small size and disjunct location, the breeding loon population in Wyoming is at particularly high risk of local extinction and is highly susceptible to coastal threats (for first summering and wintering individuals). During the breeding season, general threats to this population include: (1) direct human disturbance to nests and chicks and take of adults; (2) water level fluctuations (especially related to climate change); (3) changes in prey abundance and composition; and, (4) contaminants (e.g., lead and mercury) and toxins (e.g., cyanobacteria). On the wintering grounds (Figure 1), Wyoming's loon population is susceptible to hazards such as marine oil spills and commercial fishing nets.

Direct Human Disturbance

Canoes and kayaks pose a threat when accessing shallow water areas typical of loon nesting and brood sites. Motorboats may represent a lesser disturbance factor, unless they are within a nesting or nursery area. Excessive angler wading in shallow vegetated areas can disturb nesting and foraging activity, as can hikers. Discarded fishing line poses mortality risks from entanglement.

ACTION: Improve public awareness, especially at boat launches and hiking trails.

In an effort to restore native cutthroat trout populations of Yellowstone Lake, the National Park Service is removing lake trout through gillnetting. Loons are attracted to the fish activity and can become entangled and drown.

ACTION: Monitor location, timing, and depth of nets.

Climate Change/Water Level Fluctuations

Loons nest on the water's edge where changing water levels can pose a serious threat. A rise in water level can flood eggs on a nest; a fall in water level can leave a nest high and dry (Figure 5). Fluctuations on a lake are seasonal and are related to snow melt and storms. Climate change forces may be related to increases in events and magnitude.

ACTION: Place rafts in territories of need.

Contaminants and Toxins

The anthropogenic release of mercury into the environment is a serious problem in North America and around the world. Wyoming ecosystems that are sensitive to the atmospheric deposition of mercury from regional and even global sources include lakes, especially those with abundant shoreline wetlands and frequent water level fluctuations. Lead fishing tackle is poisonous to loons and causes fatalities. Cyanobacteria toxin outbreaks can have lethal effects.

ACTION: Monitor trends of contaminant and toxin levels.

Oil Spills

Marine oil spills can have significant impacts on winter populations of loons, through oil ingestion and oiling of feathers causing hypothermia.

ACTION: Determine where Wyoming breeding loons overwinter.

Changes in Prey Abundance and Composition

Changes in fish species composition and availability on Yellowstone Lake over the last two decades—loss of cutthroat trout to increasing populations of lake trout—may have an adverse effect on piscivorous birds such as Ospreys and Bald Eagles, and possibly the Common Loon.

ACTION: Increase cutthroat trout populations.

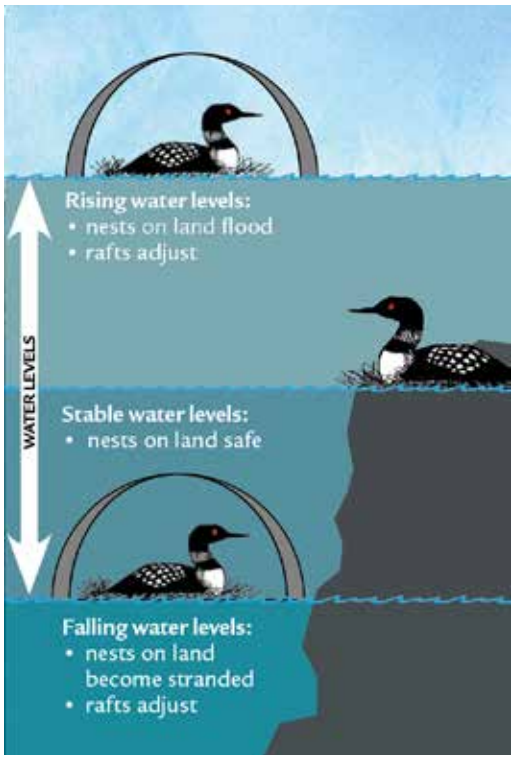


Figure 5. Rafts, or artificial nesting platforms, can significantly improve nesting success.

Recommendations for 2020

Evidence of the loon's ability to acclimate to changing conditions demonstrates that properly designed conservation efforts can often be beneficial. General threats to North America's loon population are well-established (Figure 6). In Wyoming, BRI's research over the past seven years has led to recommendations that prioritize the following actions to help understand and protect loon breeding populations and maintain their long-term sustainability.

Monitoring

- Continue to conduct standardized surveys of the breeding population, including the Wind River Range.

planned BRI activity

Continue to track color-banded adults and returning juveniles to determine site fidelity, local territory movements, age at first breeding, and individual performance.

Research

planned BRI activity

Continue the capture, banding, and sampling of loons to track individuals and determine health including contaminant body burdens (e.g., mercury, lead, and stable isotopes).

planned BRI activity

Determine inter- and intraseasonal movements through the use of geolocators and satellite transmitters.

Management

- Expand the use of artificial nest platforms to mitigate loss of productivity due to water level fluctuations. Use avian guards.
- Continue closures of nest sites vulnerable to human disturbance, using ropes and floating signs, and/or restrict activities on small lakes during the nesting period.
- Continue working with YNP biologists to modify gillnetting locations and timing to reduce loon bycatch.

Outreach

planned BRI activity

Continue to create a greater awareness of the presence and requirements of breeding loons using dioramas, exhibits, communication pieces, and video and slide presentations.

planned BRI activity

Add signs, posters, or other educational materials at boat launches, trailheads, kiosks, and visitor centers.

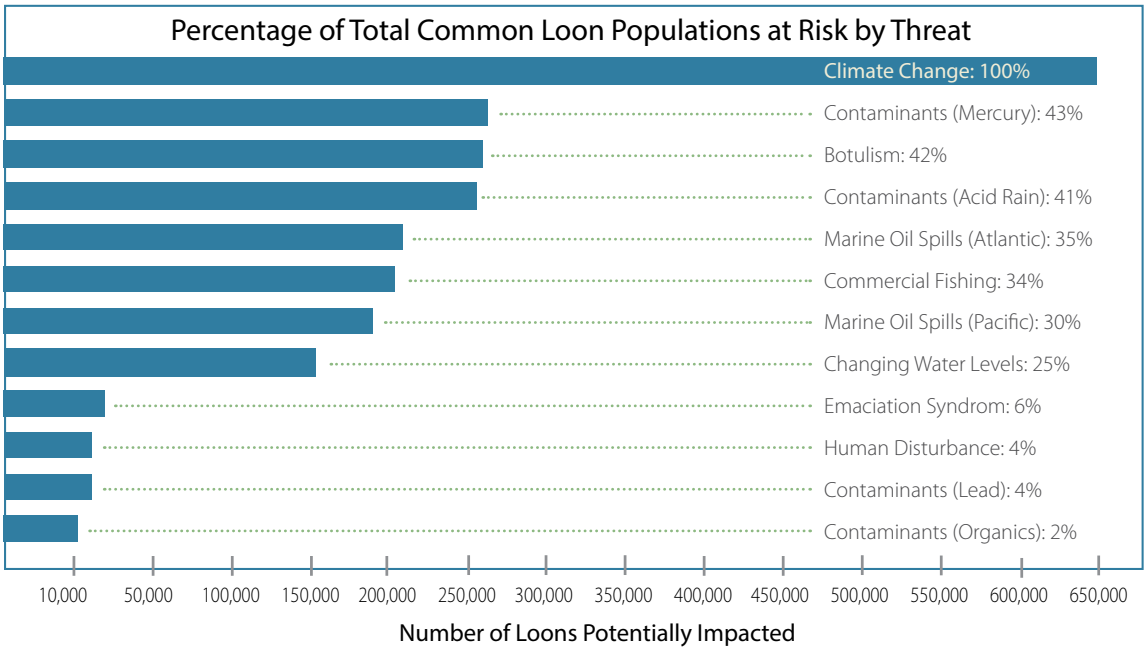


Figure 6. The percentage of the North American Common Loon population potentially adversely impacted by 12 major threat categories. Threats associated with an icon are specifically important for Wyoming's breeding loon population. (Source: Evers 2014).

Biodiversity Research Institute
276 Canco Road | Portland, Maine 04103
www.briloon.org

Bibliography

Baril, L.M., Smith, D.W., Drummer, T. and Koel, T.M., 2013. Implications of cutthroat trout declines for breeding ospreys and bald eagles at Yellowstone Lake. Journal of Raptor Research, 47(3); 234-245.

DeSorbo C.R., Taylor K.M., Kramar D.E., Fair J, Cooley Jr. J.H., Evers D., Hanson W., Vogel H., Atwood J.L. 2007. Reproductive advantages for common loons using rafts. Journal of Wildlife Management 71:1206-1213.

DeSorbo C.R., Fair J., Taylor K., Hanson W., Evers D.C., Vogel H., Cooley J. 2007. Guidelines for constructing and deploying Common Loon nesting rafts. Northeastern Naturalist 15(1):75-86.

Evers, D.C. 2007. Status assessment and conservation plan for the Common Loon in North America. U.S. Fish and Wildlife Service Tech. Rept. Hadley, Massachusetts.

Evers, D.C., L. Savoy, C.R. DeSorbo, D. Yates, W. Hanson, K.M. Taylor, L. Siegel, J.H. Cooley, M. Bank, A. Major, K. Munney, H.S. Vogel, N. Schoch, M. Pokras, W. Goodale, and J. Fair. 2008. Adverse effects from environmental mercury loads on breeding common loons. Ecotoxicology 17:69-81.

Evers, D.C., J.D. Paruk, J.W. McIntyre, and J.F. Barr. 2010. Common Loon (*Gavia immer*). In The Birds of North America, No. 313 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, D.C.

Evers, D.C. 2014. Conserve the Call: Identifying and Managing Environmental Threats to the Common Loon. A series publication of Biodiversity Research Institute's Center for Loon Conservation, Portland, Maine. Science Communications Series BRI 2014-21. 36 pages.

Orabona, A. 2019. Common Loon research and monitoring in Wyoming. Wyoming Game and Fish Department–Nongame Program, Lander, WY. 2 pages.

Suggested Citation for this Report

Evers, D.C., L. Savoy, K. Taylor, and J. Fair. 2020. Wyoming Status Report for the Common Loon. Biodiversity Research Institute. Portland, Maine. Science Communications Series BRI 2020-12. 8 pages.

Project Funding

The National Park Service provided initial funding for this project in 2012 and 2013. Additional funding came from the Wyoming Governor's Big Game License Coalition in 2013. The Ricketts Conservation Foundation generously provided funding from 2013-2018.

Acknowledgments

BRI wishes to acknowledge our summer field staff who helped collect data as well as Doug Smith of Yellowstone National Park, Susan Patla and Zack Walker of the Wyoming Game and Fish Department, Kerry Murphy of Bridger-Teton National Forest, Sabrina Derusseau and Nate Yorgason of Caribou-Targhee National Forest, and John Stephenson of Grand Teton National Park for their field data and insights.

Credits

Maps: Mark Burton
Illustrations: Iain Stenhouse, Linda Mirabile
Photography: All Common Loon images © Daniel Poleschook; pp 4-5: Landscape banner © shutterstock

Biodiversity Research Institute's 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.