



Loon Preservation Committee

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Fireworks and Loons in New Hampshire-DRAFT

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Introduction

Do fireworks harm loons? Loon Preservation Committee staff have heard this question from lake residents frequently, and perhaps more often in the last 5-10 years, with the perceived increase in the use of fireworks on some New Hampshire lakes during that time. In fact, consumer spending on private fireworks has increased nationally over the last fifteen years, with a record level of consumption in 2015 (261 million pounds), according to the American Pyrotechnics Association (APA, 2016).

Concerns about fireworks displays near loon nesting sites include behavioral impacts (disturbing loons so that they abandon a nest or chicks, or abandon the territory in the longer term) and potential contamination of the lake ecosystem with fireworks-derived heavy metals and other compounds like perchlorate. In contrast to public displays (e.g. town-sponsored July 4th festivities), private fireworks use is more likely to be repeated, and at different locations around a lake, including near loon nest sites.

This summary reviews the evidence for fireworks impacts on loons in New Hampshire, and the information available for other wildlife species.

Evidence in New Hampshire

Behavioral impact:

Reports and observations find that loons respond to fireworks displays with calls (tremolos, wails, territorial yodels) that demonstrate some stress, in some cases. As with other disturbances, the response of individual loons varies. LPC observations and volunteer reports have not found a consistent, predictable pattern of loon response, or intensity of response, to fireworks.

Because nighttime observation of nesting and brooding loons is rarely feasible there is, as far as we know, no data from visual observations of incubating or brooding loons during nearby fireworks displays. We encourage volunteer observers, where possible, to closely document the responses of incubating and brooding loons to fireworks, including video or still photo images. All such observations must be made from a safe distance, to avoid disturbing the loon(s).

In New Hampshire loon nests hatch, on average, around the 4th of July. In several specific cases where an expected hatch has coincided closely with a planned fireworks display and the nest has been closely observed, LPC has not documented any nest failure from fireworks displays. Statewide monitoring data from approximately 150-200 nests annually in the last decade also does not suggest any clear negative association between hatching success and fireworks use. This is in contrast to other documented nest failure causes that are apparent in the data as local concerns, like water level fluctuations on a specific lake, or as trends over time, such as the occasional severe black fly season. There is currently not evidence for a similar effect from fireworks use.

As described above, limited data and anecdotal information show that although loons do sometimes respond vocally to fireworks, no dramatic effect on nest outcomes has been found. Further observation will be needed to establish or discount the possibility of more subtle behavioral impacts from fireworks, and to distinguish any impacts from a fireworks display or repeated fireworks use from the influence of other stressors.

Contamination:

Contaminant sampling of loon eggs, blood, and other tissue in New Hampshire has not been directed at known fireworks locations or timing. LPC's data on contaminants in loon eggs include six of the trace elements used in fireworks that have potentially toxic effects on wildlife. Some of the levels found in loon eggs exceed levels known to cause negative health or reproductive impacts in other bird species. However, the data do not suggest that these are linked to fireworks, as we do not see a uniform pattern of these high contaminant levels from a single lake.

Other studies

Research suggests that fireworks can have some lasting impacts on bird populations. For example, piping plover nest losses were observed near fireworks displays in New Jersey (USFWS, 1997), and negative (e.g. avoidance) behaviors and/or nest losses were documented in tern, seal, and seabirds in California (Weigand and McChesney, 2008, and Stephensen, 2012).

Contaminants research suggests that pollution from frequent, commercial fireworks displays (e.g. at theme parks) may be considerable (Wilkin et al., 2007). For occasional public or private firework displays, pilot studies in Washington state (SCPW, 2009) and Lake George, New York (LGA, 2010) did not find lake pollution above human health thresholds within a single year. Cumulative effects were not studied. However, perchlorate concentrations were measurably higher after annual fireworks displays in the Washington study, and warranted further investigation as a potential hazard.

Conclusion:

Fireworks use on New Hampshire lakes has not been observed to cause loon nest failure or abandonment. There are also no indications to date that toxins from fireworks have substantially impaired loon health or survival at individual lakes or for the loon population as a whole. Based on findings to date, fireworks do not appear to warrant the same level of concern as other population-level threats addressed by LPC's monitoring, research, and management (for example mortality from lead fishing tackle and monofilament entanglement, human-caused water level fluctuations, shoreline habitat loss, and environmental mercury contamination). However, given that fireworks are a plausible behavioral stressor, the limited observational data collected to date, and that fireworks use may be increasing on New Hampshire lakes, we recommend:

- As a precaution, avoid the use of fireworks near active loon nests, and schedule their use to avoid active incubation periods, where possible. Public and private fireworks displays should always follow state law, local ordinances, and lake community rules or etiquette. On some New Hampshire lakes, local communities have established fireworks guidelines that effectively address diverse concerns in the community.
- Continued observation of loon response when fireworks are in use near nesting and brooding areas, both through LPC's field work and through volunteer observations and video or camera documentation of loon response. Current levels of private and organized fireworks displays may stress breeding and nesting loons without causing nest failure, and the relative impact of any stress from fireworks, among many stressors, is not known.

- LPC will continue contaminants analyses that screen for fireworks as a possible source. Fireworks do introduce pollutants to New Hampshire lakes, but the quantity and impact of those toxins on the ecosystem, and any subtle or non-lethal impact to loons has not been studied directly.

The Loon Preservation Committee is eager to work cooperatively with other organizations and agencies in New Hampshire and with lake communities to gather more information on fireworks use and potential impacts to loons, and to apply relevant findings on the environmental impacts of fireworks to loons. Please contact the Loon Preservation Committee (603.476.5666, www.loon.org, info@loon.org) for more information or with questions.

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