

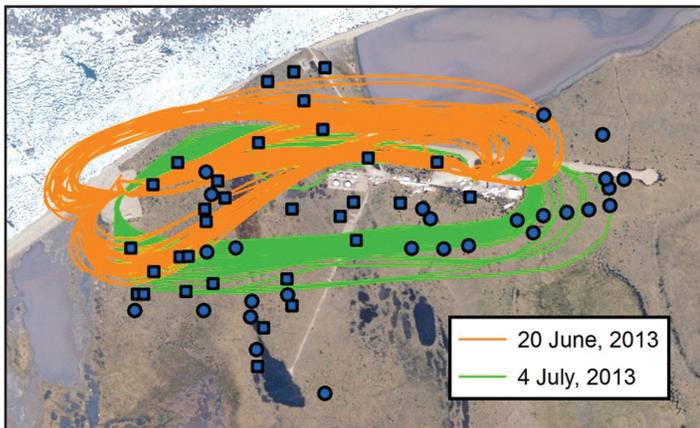
Effects of Industrial and Investigator Disturbance on Arctic-Nesting Geese

Direct encounters with humans can increase the likelihood that nesting geese will lose their eggs to predators, according to a U.S. Geological Survey (USGS) study. As part of a study to understand reasons for the rapid increase of geese across northern Alaska and to understand potential impacts to nesting-geese from oil and gas development on the Arctic Coastal Plain of Alaska, USGS researchers used remote cameras to assess the behavioral response of Greater White-fronted geese to disturbance.

The cameras, placed at goose nests in areas with and without industrial activity, revealed that undisturbed geese took breaks from incubating eggs less than once per day, and only for about nine minutes at a time. Geese exposed to industrial disturbance took more breaks, but they were only absent from nests for about three additional minutes per day. When researchers visited the nests, incubation breaks averaged 30 minutes longer. This longer break time increased the chance that the eggs would be eaten by a predator.

Observer visits were responsible for reductions of 7–35% in nest survival probability, highlighting the importance of minimizing, and controlling for, observer effects in studies of avian productivity. Indirect vehicular and aircraft disturbance posed less risk to nest survival than direct encroachment by observers at nest sites.

Results of the study indicate that effects of both industrial and research activity can be minimized through practices that limit direct encounters with nests, such as minimizing travel on the tundra during the nesting season, using established travel routes during the summer, and minimizing the research study area to reduce impact.



Tracks of helicopter traffic over Greater White-fronted goose nests (blue squares and circles) in northern Alaska, July 2013. Helicopter activity did not increase the time geese spent away from their nests. USGS graphic (public domain).



Greater White-fronted geese nesting near industrial activity in northern Alaska. USGS photo (public domain).

MANAGEMENT IMPLICATIONS

- The risk of depredation to eggs of Arctic-nesting geese increases substantially when nests are unattended. Thus, the primary threats of human activity to productivity are actions that cause incubating females to be absent from their nests.
- Indirect vehicular and aircraft disturbance posed less risk to nest survival than direct encroachment by observers at nest sites. Therefore, effects of industrial activities on avian productivity in the Arctic can be minimized through practices that limit direct encounters with nests.
- If a goal is to minimize impacts of industrial activities on avian productivity in the Arctic, our findings support avoidance of pedestrian and vehicular travel on the tundra to the extent possible during the nesting period, and restriction of travel to established routes.

THIS BRIEF REFERS TO:

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