

BREEDING ECOLOGY OF LONG TAILED DUCKS (*CLANGULA HYEMALIS*) IN CHURCHILL, MANITOBA



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BACKGROUND

The breeding ecology of long-tailed ducks (*Clangula hyemalis*) was studied in Churchill, Manitoba, from 2004-2011 and data are compared with data collected 40 years ago by Dr. Robert Alison. This area is unique in that there are numerous nesting ducks, is readily accessible to researchers, and represents the most southern known breeding population of long-tailed ducks. This study is also providing information on common eiders (*Somateria mollissima*) and arctic terns (*Sterna paradisaea*), which nest simultaneously and in the same habitat. Eiders are believed to be increasing dramatically since the 1960s and also are believed to winter on Hudson Bay. Terns are a good indicator of long-tailed duck nesting sites as they deter herring gulls (*Larus argentatus*). Population biology is considered to be the largest gap in our knowledge in the life history of long-tailed ducks. This study is trying to fill that gap by providing information on a breeding population of long-tailed ducks that will include nesting chronology, productivity, brood survival, and intra-specific interaction.

OBJECTIVES

The goals of this study are to determine components of breeding ecology of the local Churchill group of long-tailed ducks. These data are providing baseline information that might have important value for long-term changes (e.g., climate change) throughout northern North America. Specific objectives include:

1. Determine nesting chronology and productivity of long-tailed ducks at the Churchill study site.
2. Determine intraspecific relationships and habitat conditions that affect nest location and outcome of nesting activity.



Female LTDU captured with net on nest

TECHNIQUES

Long-tailed ducks were studied on three study sites near Churchill, Manitoba, in 2004-11. Ducks were captured during a 2-week period in mid-June with mist nets set over water. In addition, females were captured while nesting with the use of dip nets. Some broods were drive-trapped into mist nets above and below water in early August, 2005.

All captured long-tailed ducks were banded with USGS-issued bands, and were aged, sexed, and weighed before release at capture site. Ducks were aged by use of bursa depth and plumage characteristics (especially scapulars, remiges, and retrices). In 2009 and 2010, nasal disks were attached to long-tailed ducks to monitor movements.

The location and number of nests of long-tailed ducks, common eiders, and arctic terns observed during this study were recorded. Success or failure of all nests was determined by presence of embryo sacs detached from the eggshell. Intraspecific relationships in the study site were determined by recording all other avian species associated with the nesting site of the long-tailed ducks. Distance between nests, clutch size, and any intraspecific activities were recorded.

Each nest site was recorded as being on an island, peninsula, or mainland. The habitat around each site used for nesting was described using biotic and abiotic characteristics, including elevation of nest above water, distance of nest from water, size of island, and distance from human influence (e.g., road). Vegetation surrounding each nest was identified and percent cover for each plant species was estimated in a square meter area around each nest.

RESULTS

During 8 years (2004-11) of nest searching in June and July a total of 107 completed nests were discovered and mean clutch size was 7 eggs. Number of discovered nests declined during the study, although search effort remained the same. Many nest starts (1-2 eggs) were discovered, but eggs disappeared within a few days apparently from herring gull predation. Numbers of gulls have increased in recent years in long-tailed duck nesting areas. Long-tailed duck nests were located an average 2.2 m from the water edge and 31 cm above water surface. Mean bowl depth late in incubation was 5.9 cm. Some females used the same nest bowl for 2 consecutive years as indicated by the presence of embryo sacs among the new un-hatched eggs. Measurements of 50 eggs in 2004 from nine nests were: length 52.2 mm, width 38.8 mm, and weight 37.4 g.

Banding of 143 adult long-tailed ducks caught in mist nets revealed a skewed sex ratio favoring males (1.7M:1F). No second-year (subadults) males were captured in any years, although second-year females were commonly captured on breeding sites. Site fidelity of long-tailed ducks to the Churchill breeding area was documented by the capture of 10 (7.8%) ducks banded the previous years during the 7-year banding study. One banded female captured in the same nest bowl she used in previous year.

Six recaptured long-tailed ducks had been banded the previous year, one was banded two years earlier, and two recaptured ducks were banded three years previous. The longest time between recapture, however, was a female long-tailed duck that was banded in 2005 and re-captured in 2011 with a dip net on the same Island on West Twin Lake where it had been banded.

This study has revealed the close association that long-tailed ducks have with common eiders and arctic terns, which nest simultaneously and in the same habitat. Both duck species seem to benefit from the presence of aggressive arctic terns by reducing predation by herring gulls, whose numbers are increasing in the study area. Special consideration was given in this study to determine the commonality of factors in regard to nesting sites for these three species.

The use of islands or narrow peninsulas as nesting sites for ducks and terns was an important characteristic of nesting sites that has potential benefits from reduced predation. Avian predation was recorded by herring gulls, common ravens (*Corvus corax*), and Pacific loon (*Gavia pacifica*). Mammalian predators included red fox (*Vulpes vulpes*) and American mink (*Neovison vison*).



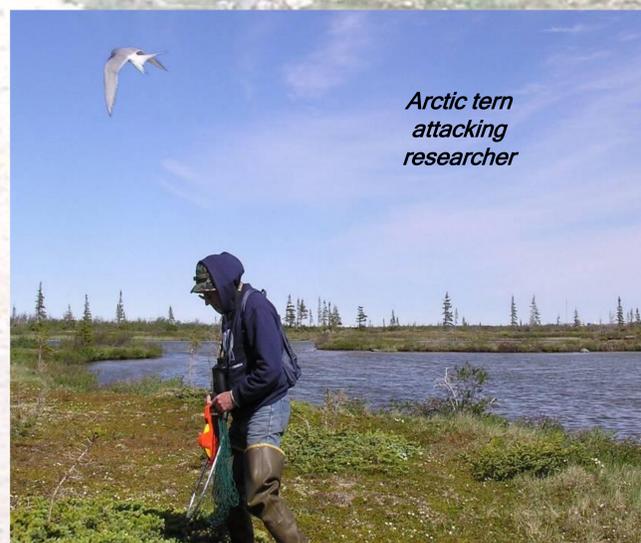
LTDU Embryo Sacs



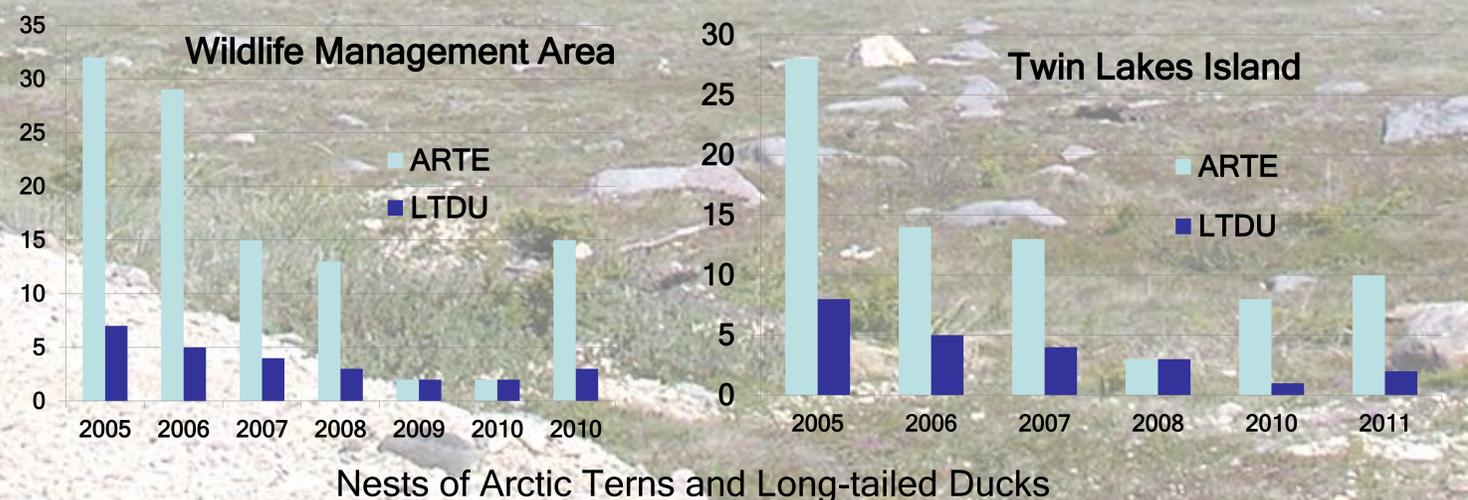
LTDU Pair Caught 2009 and 2010

CONCLUSIONS

This study is an attempt to increase nesting ecology data originally obtained in the early 1970s by R. Alison, and determine long-term changes in the population and habitat of long-tailed ducks that could possibly be related to global climate change. Churchill is a unique area where this species is relatively easy to study. Island nesting seems important to reduce mammalian predation, but does not seem to deter herring gull predation. Arctic terns do deter gull predation, although numbers of each species are probably an important variable. Understanding the Churchill population of long-tailed ducks could have important implications in understanding populations in more remote areas.



Arctic tern attacking researcher



Nests of Arctic Terns and Long-tailed Ducks



Herring gull attacking LTDU brood