# Long-tailed Duck (*Clangula hyemalis*)

Vulnerability: **Presumed Stable** Confidence: Moderate

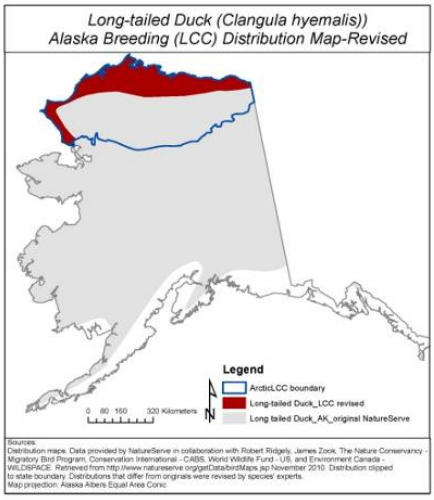
The Long-tailed Duck is one of the most common sea ducks in Arctic Alaska, and has a circumpolar distribution. They are known for their ability to dive to impressive depths (> 60 m) in search of food (Robertson and Savard 2002). In Arctic Alaska, this species typically nests in wet tundra near shallow *Carex* or *Arctophila*-dominated ponds, and braided streams (Robertson and Savard 2002). During the breeding season, their diet consists primarily of aquatic invertebrates although they will also take vegetative matter (Robertson and Savard 2002). During post-breeding molt, this species uses coastal lagoons and deep, open lakes (Robertson and Savard 2002). Long-tailed Ducks winter on both coasts of North America and on the Great Lakes (Robertson and Savard 2002). Current Arctic Coastal Plain population is estimated at approximately 44,000 with a stable trend across recent years (Larned et al. 2012).


***Range:*** We modified the NatureServe range map for this assessment to more accurately reflect this species more coastally-oriented breeding range based on the Birds of North America (Robertson and Savard 2002) and other range descriptions (Bart et al. 2012, Johnson and Herter 1989).

***Physiological Hydro Niche:*** Long-tailed Ducks were ranked as particularly vulnerable to changes in hydrologic niche because of their significant association with wet tundra and shallow pond habitats for nesting and foraging. If substantial tundra drying occurs, this species could experience a negative impact. Current projections of annual potential evapotranspiration suggest negligible atmospheric-driven drying for the foreseeable future (TWS and SNAP), and its interaction with hydrologic processes is very poorly understood (Martin et al. 2009). Thus atmospheric moisture, as an exposure factor (most influential on the "hydrological niche" sensitivity category), was not heavily weighted in the assessment.

***Physical Habitat Restrictions:*** Hardening of the windward side of barrier islands (to prevent erosion on development platforms as off-shore activity increases) could impact this species, although molting Long-tailed Ducks that currently use hardened sites around existing oilfields (e.g. West Dock) show little sign of impact (J. Reed, pers. comm.).

***Disturbance Regimes:*** Climate-mediated disturbance processes, most importantly increasing storms and associated coastal erosion (Jones et al. 2009) could affect barrier island / lagoon systems, thus affecting the availability of molting sites for Long-tailed Ducks. These types of habitat features are relatively uncommon in the Arctic LCC and are particularly susceptible to such disturbances.




***Interactions with Other Species:*** In terms of interactions with other species, it is possible climate changes may disrupt lemming cycles (Post et al. 2009) and thus could expose this species to greater nest predation pressure if lemmings are no longer a periodically superabundant food source for predators.

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| Vulnerability Factors | D | SD | N | SI | I | GI | Unknown or N/A |
|---|---|---|---|---|---|---|---|
| *B1. Sea level rise* | | | * | | | | |
| *B2a. Natural barriers* | | | * | | | | |
| *B2b. Anthropogenic barriers* | | | * | | | | |
| *B3. Human response to CC* | | | * | * | | | |
| *C1. Dispersal/Movement* | | | * | | | | |
| *C2ai. Historical thermal niche (GIS)* | | | * | | | | |
| *C2aii. Physiological thermal niche* | | | * | | | | |
| *C2bi. Historical hydro niche (GIS)* | | | | * | | | |
| *C2bii. Physiological hydro niche* | | | | * | * | * | |
| *C2c. Disturbance regime* | | | * | * | | | |
| *C2d. Ice & Snow habitats* | | | * | | | | |
| *C3. Physical habitat restrictions* | | | * | * | | | |
| *C4a. Biotic habitat dependence* | | | * | | | | |
| *C4b. Dietary versatility* | | * | * | | | | |
| *C4d. Biotic dispersal dependence* | | | * | | | | |
| *C4e. Interactions with other species* | | | * | * | | | |
| *C5a. Genetic variation* | | | | | | | * |
| *C5b. Genetic bottlenecks* | | | * | | | | * |
| *C6. Phenological response* | | * | * | * | | | * |
| *D1. CC-related distribution response* | | | * | | | | |

D=Decrease vulnerability, SD=Somewhat decrease vulnerability, N=Neutral effect, SI=Slightly increase vulnerability, I=Increase vulnerability, GI=Greatly increase vulnerability.

***Phenological Response***: Although long-term data sets exist for this species (e.g. Larned et al. 2012), the relationship between seasonal temperature / precipitation and phenology for this species in the Arctic LCC has not been examined, so it is at best speculative on how they would respond to changing biotic schedules.

In summary, Long-tailed Ducks will likely experience some negative impacts from climate change. In particular, they may be most susceptible to coastal impacts during the molting period. Overall, though, this species appears to have enough versatility in life history traits and behaviors to remain "stable" with regard to climate change at least during the timeframe of this assessment (to 2050).

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From: Liebezeit et al. 2012. Assessing Climate Change Vulnerability of Breeding Birds in Arctic Alaska. A report prepared for the Arctic Landscape Conservation Cooperative. Wildlife Conservation Society, North America Program, Bozeman, MT., 167pp.