Pacific Loon (*Gavia pacifica*)

Vulnerability: **Presumed Stable** Confidence: Moderate

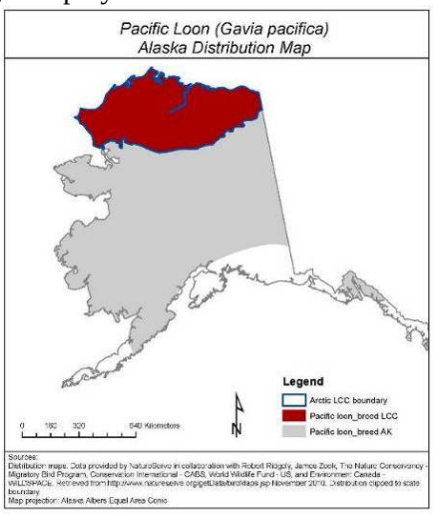
The Pacific Loon is the most common breeding loon in Arctic Alaska, nesting throughout much of the state (Russell 2002). This species typically breeds on lakes that are ≥1 ha in size in both boreal and tundra habitats. They are primarily piscivorous although they are known to commonly feed chicks invertebrates (D. Rizzolo and J. Schmutz, unpublished data). Many Pacific Loons spend their winters in offshore waters of the west coast of Canada and the U.S. (Russell 2002). The most recent Alaska population estimate is 100-125,000 individuals (Ruggles and Tankersley 1992) with ~ 69,500 on the Arctic Coastal Plain specifically (Groves et al. 1996).

Range: We used the extant NatureServe map for the assessment as it matched other range map sources and descriptions (Johnson and Herter 1989, Russell 2002).

Physiological Hydro Niche: Among the indirect exposure and sensitivity factors in the assessment (see table on next page), Pacific Loons ranked neutral in most categories with the exception of physiological hydrologic niche for which they were evaluated to have a "slightly to greatly increased" vulnerability. This response was driven primarily by this species reliance on small water bodies (typically <1ha) for breeding and foraging. Current projections of annual potential evapotranspiration suggest negligible atmospheric-driven drying for the foreseeable future (TWS and SNAP). Thus atmospheric moisture, as an exposure factor, was not heavily weighted in the assessment.

Physical Habitat Restrictions: Pacific Loons occur throughout Alaska in a variety of habitats including warmer boreal environs, so there is little reason to think they could not adapt physiologically to some degree of warming in the Arctic environment in the future. Also their adaptability to varied habitat types would enable them to cope with shrub or boreal zone encroachment (Tape et al. 2006) into tundra habitats.

Although small fish make up a significant part of the Pacific Loon diet, they also eat many invertebrates (e.g., caddis fly larvae, nostracods) and so, unlike some other loon species, exhibit enough flexibility in their diet that they would likely be able to adjust to climate-mediated changes in prey base.



Disturbance Regime: Climate-mediated disturbance, namely thermokarst, could both create and destroy lake habitats through ice wedge degradation and draining of thaw lakes (Martin et al. 2009). No other known climate-mediated disturbance events are likely to affect this species significantly in the timeframe of this assessment.

Pacific Loons do show some evidence of an inverse distribution relative to the much larger Yellow-billed Loon, which is probably driven by competitive exclusion. However, since Pacific Loons are so much more numerous, any population-level influence on abundance is probably insubstantial (J. Schmutz, pers. comm.)

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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: Despite the existence of long-term data sets for loons in northern Alaska (Mallek et al. 2005) there is currently no assessment of phenology-related variables and, thus, it is not known how this species might respond to changing biotic schedules. However, Pacific Loon populations in Alaska have been relatively stable over the history of aerial abundance surveys (> 35 years; Groves et al. 1996).

In summary, the Pacific Loon will likely be able to adjust to climate and associated habitat changes predicted to occur in Arctic Alaska, at least during the 50 year timeline of this assessment.

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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.