Short-eared Owl (*Asio flammeus*)

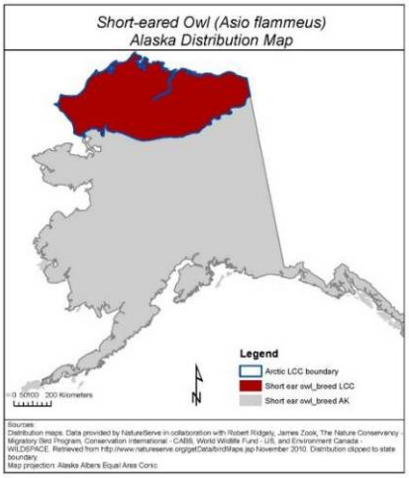
Vulnerability: **Presumed Stable** Confidence: High

The Short-eared Owl occurs widely throughout North America. An owl of open country, they nest on the ground inhabiting marshes, grasslands, and tundra throughout their range. Like Snowy Owls, Short-eared owl population dynamics are linked to cycles in their primary prey - small mammals (Holt and Leasure 1993). In the Alaskan Arctic, they typically nest on drier tundra sites, usually with enough vegetation to conceal incubating females. They often forage in wet tundra habitats, though not exclusively (Holt and Leasure 1993). Short-eared Owls migrate to wintering grounds in the lower 48 and northern Mexico (Holt and Leasure 1993). The current global population is estimated at 2 million (Rich et al. 2004).

Range: We used the extant NatureServe range map for the assessment as it closely matched the Birds of North America and other range descriptions (Johnson and Herter 1989, Holt and Leasure 1993).

Interactions with Other Species: Like the Snowy owl, Short-eared Owl successful reproduction seems to be tied to some degree to lemming population cycles (Holt and Leasure 1993). Climate change has increased the length of lemming population cycles and decreases maximum population densities (Ims and Fuglei 2005, Gilg et al. 2009) which could negatively influence Short-eared Owl nest survivorship, distribution, and abundance. However, their ability to switch to a variety of other prey sources suggest they would, in most cases, be able to compensate for such changes with little negative impact.

Physiological Hydro Niche: Although Short-eared Owls do utilize wet tundra habitats for foraging, sometimes extensively, they exploit drier tundra habitats as well and they typically nest in drier upland tundra. Because of this, they are unlikely to be significantly affected by tundra drying events in the arctic, which could result in a net loss of wet tundra habitats. However, current projections of annual potential evapotranspiration suggest negligible atmospheric-driven drying for the foreseeable future (TWS and SNAP).



Disturbance Regimes: Deeper snow and subsequent flooding in early spring could reduce hunting success. Fires and resulting shrubification (Tape et al. 2006) may reduce available hunting and nesting areas, but it is unlikely this would result in significant impacts, as the percentage of ground affected would be minimal. Thermokarst will likely change upland tundra habitats to new vegetation communities (Martin et al. 2009) but it is unknown how these new communities may or may not be suitable for Short-eared Owls.

Interspecies Interactions: Increased freeze/thaw and icing events could eliminate rodent cycles and keep their populations relatively low (Gilg et al. 2009).

Human Response to CC: Increasing power lines associated with a wider-ranging road network or other human activities in response to climate change could cause direct mortality, but the extent of such infrastructure will likely be minimal in the near future.

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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.

Physiological Thermal Niche: Because Short-eared Owls breed over a wide latitudinal gradient, there is no evidence to suggest that they have any thermal sensitivity during nesting. They could actually benefit from warmer temperatures at the northern terminus of their breeding range via reduction in cold stress.
Phenological Response &Genetic Variation: There currently exists little or no information regarding the genetic or phenological traits that would make this species more or less vulnerable to a warming climate.

In summary, while Short-eared Owls have some life history traits that potentially make them vulnerable to climate change, within the time frame of this assessment this species will likely be able to cope with impacts associated with a changing climate and remain stable.

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