Spectacled Eider (*Somateria fischeri*)

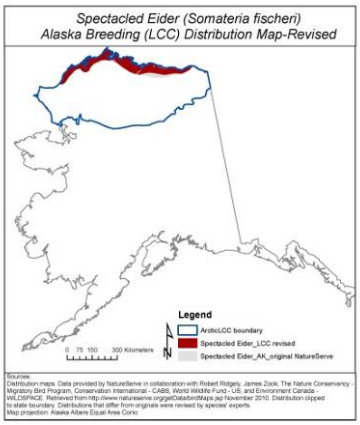
Vulnerability: **Presumed Stable** Confidence: Low

The Spectacled Eider is a medium-sized sea duck with males easily recognized by their striking "clown-like" head plumage. This species was listed as threatened in 1993 under the Endangered Species Act as it has suffered severe population declines in western Alaska. The Arctic Coastal Plain population may also be declining. In Arctic Alaska, breeding Spectacled Eiders use river deltas and wet tundra habitats, including drained-lake basins, flooded wetlands, and islets within a matrix of thaw lakes for both nesting and foraging (Petersen et al. 2000). During the breeding season, their diet consists primarily of both adult and larval aquatic insects (Petersen et al. 2000). Alaskan breeders spend their winters offshore in the Bering Sea, often amassed in small openings in the pack ice (Petersen et al. 2000). Current Arctic Coastal Plain population is estimated at 6-8,000 (http://seaduckjv.org/infoseries/spei_sppfactsheet.pdf).

Range: We adjusted the NatureServe Map to more closely reflect recent satellite telemetry studies indicating that most Spectacled Eiders in Arctic Alaska nest within 20 km of the coast (M. Sexson, pers. comm.). Because of their reliance on nesting habitats near the coast, their ability to shift to new habitats is restricted.

Human Response to CC: All-weather roads (necessitated by a warming climate and shortened ice road season) associated with energy extraction activities could impact this species. At the same time, impounded water created by a road network could provide additional foraging habitat (J. Liebezeit, pers. obs.). Overall, human activity in response to climate change will likely be localized in the near future so would only slightly increase vulnerability.

Physiological Hydro Niche: The greatest potential source of vulnerability for Spectacled Eiders was with respect to "physiological hydrologic niche" category, in which scores ranged from "neutral" to "greatly increased" vulnerability. This range reflects uncertainty both in the direction and intensity of change in Arctic hydrology, as well as in the effect this will have on the eider (less or greater vulnerability). If substantial tundra drying occurs, this species could experience a considerable negative impact as they are highly dependent on wet tundra habitats for nesting and foraging (Petersen et al. 2000). Current projections of annual potential evapo-transpiration suggest negligible atmospheric-driven drying for the foreseeable future (TWS and SNAP). Thus atmospheric moisture, as an exposure factor (most influential on the "hydrological niche" sensitivity category), was not heavily weighted in the assessment.



Disturbance Regime: In terms of disturbance, projected increases in winter precipitation and surface temperatures (ACIA 2005) will likely alter the amount, extent, and duration of flooding, potentially limiting nesting habitat. At the same time thermokarst could create new nesting and foraging habitats (Martin et al. 2009).

Interactions with Other Species: Spectacled eiders are known to sometimes nest in gull

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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.

territories supposedly to gain protection (Petersen et al. 2000). How a changing climate might alter this relationship is not known. It is possible that nest predation by red fox could increase as their population may be expanding in the arctic (Pamperin et al. 2006). Eiders may not be able to defend nests as successfully as against the smaller arctic foxes.

Genetic Variation: Spectacled Eiders are genetically homogenous across their range as a result of male dispersal (Scribner et al. 2001) and thus could be vulnerable to certain climate-mediated events in the near future (e.g. disease outbreaks).

Phenological Response: The relationship between seasonal temperature / precipitation and phenology for this species in the Arctic LCC has not yet been examined.

In summary, this assessment suggests the Spectacled Eider will remain stable in the face of a changing climate. However, it was ranked close to the cut-off for "moderately vulnerable" (see assessment results section) and worth continued attention as Arctic Alaska climatic conditions continue to change.

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