Greater White-fronted Goose (*Anser albifrons*)

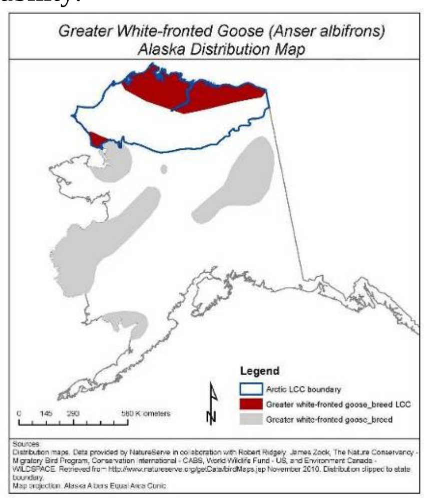
Vulnerability: **Presumed Stable** Confidence: Moderate

The Greater White-fronted Goose, with a nearly circumpolar distribution, has the most expansive range of any species in its genus. In Alaska, this species breeds in large numbers in both the Yukon-Kuskokwim Delta and also on the Arctic Coastal Plain, but they will also nest in the interior. On the coastal plain breeding habitat ranges from lowland wet to upland dry tundra often near ponds or lakes (Ely and Dzubin 1994). The Greater White-fronted Goose diet is dominated by vegetative matter, primarily grass and sedge rhizomes, tubers, and berries (Ely and Dzubin 1994). Arctic Alaskan populations winter on the Gulf Coastal plain in Louisiana and Texas as well as northern Mexico (Ely and Dzubin 1994). The Alaskan Arctic Coastal Plain population is estimated at 200,000 and population growth has been rapid in the past decade but has recently leveled off (Larned et al. 2012).

Range: We used the extant NatureServe map for the assessment as it matched other range map sources and descriptions (Johnson and Herter 1989, Ely and Dzubin1994).

Physiological Hydro Niche: Among the indirect exposure and sensitivity factors in the assessment (see table on next page), Greater White-fronted Goose 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 water bodies for breeding and foraging. A drying trend could have negative impacts by reducing availability of suitable habitats. 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.

Human Response to CC: All-weather roads (necessitated by a warming climate and shortened ice road season) associated with energy extraction activities could impact Greater White-fronted Geese, particularly near Teshekpuk Lake, however other sources of human activity related to climate change mitigation will be much less pervasive in the near future so would likely only slightly increase vulnerability.



Disturbance Regime: Climate-mediated disturbance processes, namely thermokarst, could both create and destroy foraging and nesting habitats through both ice wedge degradation and draining of thaw lakes (Martin et al. 2009). Likewise, predicted increased coastal erosion and resulting salinization (Jones et al. 2009) could both negatively and positively affect post-breeding aggregations of staging birds by destroying and creating foraging / molting habitat.

Greater White-fronted Goose (*Anser albifrons*)

Vulnerability: **Presumed Stable** Confidence: High

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.

Interactions with Other Species: In terms of "interactions with other species", it is possible that red fox nest predation could increase if they become more numerous (Pamperin et al. 2006) and geese would not be able to defend nests as successfully as against the smaller arctic foxes. ***Physiological Thermo Niche:*** Because this species experiences much warmer conditions at interior Alaska breeding sites, they should be able to adapt physiologically to a warmer Arctic environment. ***Phenological Response:*** Timing of nesting has advanced about 10 days since the 1970s likely in response to increasing spring and summer temperatures (D. Ward, pers. comm.) however it is unknown if they can synchronize timing to changing schedules of other species and processes they depend on (e.g. spring green up timing).

In summary, this assessment suggests that Greater White-fronted Geese will likely be adaptable enough to cope with climate changes predicted to occur in Arctic Alaska, at least during the 50 year timeline of this assessment.

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