Dunlin (*Calidris alpina*)

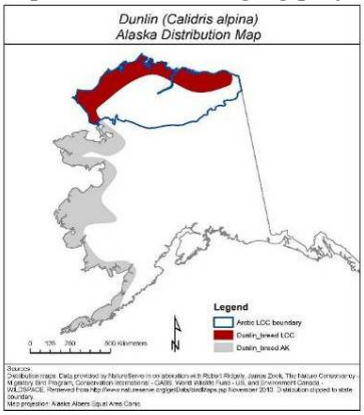
Vulnerability: **Presumed Stable** Confidence: High

The Dunlin (*arcticola* subspecies) is a common breeding bird in Arctic Alaska from the area surrounding Barrow to the east. The *pacifica* subspecies also occurs within the Arctic LCC assessment area in the region around Cape Lisburne and Cape Krusenstern. Dunlin use a wide variety of breeding habitats found in the northern sub-arctic and arctic. On the Arctic Coastal Plain of Alaska, *C. a. arcticola* breed in moist-wet tundra, often in areas with ponds, polygons, and strangmoor landforms (Warnock and Gill 1996). The *arcticola* subspecies winters in Asia while *pacifica* winters along the west coast of North America. Current population estimate is 1.3 million (*arcticola*: 750,000, *pacifica*: 500,000; Morrison et al. 2006) with a declining trend.

Range: We used the extant Nature Serve range map for the assessment as it closely matched that of the Birds of North America (Warnock and Gill 1996) and other sources (Johnson and Herter 1989, Johnson et al. 2007, Bart et al. 2012).

Physiological Hydro Niche: Among the indirect exposure and sensitivity factors in the assessment (see table on next page), Dunlin ranked "neutral", in many categories. Only in the physiological hydrologic niche category was there a clear scoring of increased vulnerability. The range from "slightly increased" to "greatly increased" vulnerability represents uncertainty in the severity of such an impact. If significant tundra drying occurs this species could experience a considerable negative impact as they often utilize wet tundra habitats for nesting and foraging (particularly the *arcticola* subspecies; Warnock and Gill 1996). 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. Dunlin do commonly nest and forage in moist tundra (rather than wet tundra) during the breeding season so it is possible they could adjust to drier habitats. The geospatial component of the assessment picked up Dunlin as being slightly vulnerable to sea-level rise.

Dietary Versatility: Dunlin have a flexible diet and current evidence suggests they take advantage of a wide variety of prey (Warnock and Gill 1996) so they would likely not face any negative impacts from a changing prey base.



Interactions with Other Species: In terms of dependence on interspecific interactions, this species will communally feed and flock with other shorebirds during post-breeding staging (Taylor et al. 2010) but it is unknown if these behaviors increase species persistence. Also, climate change may reduce the amplitude of lemming cycles (Ims and Fuglei 2005) and thus could expose this species to greater nest predation pressure if lemmings become less available as alternative prey.

Genetic Variation: Little is known about Dunlin genetics although, in general, many shorebird species are believed to have low genetic variation (Baker and Stauch 1988) and thus

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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.

potentially more vulnerability to certain climate-mediated events (e.g. disease outbreaks). However, at this time, there is little evidence to support such occurrences in the near future.

Phenological Response: Although there is evidence suggesting that some shorebird species are able to track phenological changes associated with a warming climate at least in terms of nest initiation (J. Liebezeit and S. Zack unpublished data; D. Ward, pers. comm.) there is no such evidence for Dunlin specifically at this time.

In summary, despite potential negative response to changes in tundra conditions, , Dunlin will likely be able to remain "stable" with regard to climate change, at least during the timeframe of this assessment (next 50 years).

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