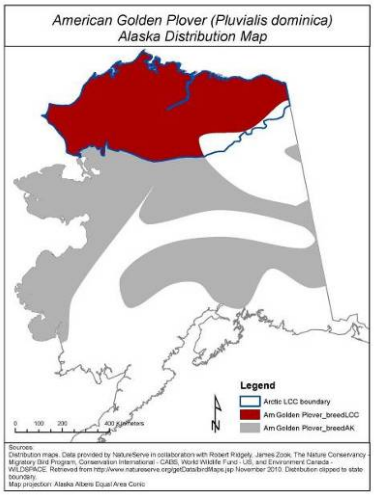
American Golden-plover (*Pluvialis dominica*)

Vulnerability: **Presumed Stable** Confidence: Moderate

The American Golden-plover is a conspicuous breeding bird in Arctic Alaska with slightly higher density in the Brooks Range foothills compared to the coastal plain (Johnson et al. 2007). In general, this species tends to nest in upland dry habitats, quite often near wetland areas (Johnson and Connors 1996). Like other plovers, American Golden-plovers search for invertebrate prey visually and forage in a mix of wet to dry tundra during the breeding season. This species winters primarily in the southern portion of South America (Johnson and Connors 1996). Current North American population estimate is 200,000 with a declining trend (Morrison et al. 2006).

Range: We used the extant NatureServe range map for the assessment as it closely matched that of the Birds of North America (Johnson and Connors 1996) and other range descriptions (Johnson and Herter 1989, Johnson et al. 2007).
Physiological Thermal Niche: Among the indirect exposure and sensitivity factors in the assessment (see table on next page), American Golden-plover ranked "neutral", in many categories. In the physiological hydrologic niche category there was broad range of scores from neutral to increased vulnerability. This range represents uncertainty both in the direction and intensity of change in Arctic hydrology, as well as in the effect this will have on the plover. If significant tundra drying occurs, this species could experience loss of wet foraging habitat, although they commonly utilize a mix of both dry and wet foraging habitats (Johnson and Connors 1996). Because they typically nest in drier tundra, they may actually benefit from large-scale tundra drying. Current projections of annual potential evavapotranspiration 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.

Disturbance Regime: Disturbance processes, such as climate-mediated thermokarst could both create and destroy nesting and foraging habitats. Fire frequency in the foothills is likely to increase (Racine and Jandt 2008), reducing soil moisture and potentially diminishing availability of invertebrate prey. Fires could also reduce nesting site availability (Martin et al. 2009). In the foreseeable future, fire will likely only affect a small portion of the landscape and thus not significantly impact plover habitat.



Interactions with Other Species: Climate changes may reduce the amplitude of lemming cycles making them less available as alternative prey (Ims and Fuglei 2005) and thus could expose this species to greater nest predation.
Dietary versatility: Plovers have a flexible diet and current evidence suggests they take advantage of a wide variety of prey (Johnson and Connors 1996) so they would likely not face any negative impacts from a changing prey base.
Phenological Response: Although not demonstrated in American Golden-plovers, there is evidence suggesting shorebirds are able to

American Golden-plover (*Pluvialis dominica*)

Vulnerability: **Presumed Stable** Confidence: Moderate

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.

shift their nest initiation dates in response to climate warming (J. Liebezeit and S. Zack, unpublished comm.). However, it is unknown if they can synchronize timing to match potentially changing schedules of invertebrate prey.

Genetic Variation: Shorebird species are believed to have low genetic variation (Baker and Stauch 1988) and thus potentially would be more vulnerable to certain climate-mediated events in the near future (e.g. disease outbreaks).

In summary, American Golden-plovers have enough versatility in their life history traits and behaviors on the breeding grounds that will likely enable them to cope and remain "stable" with regard to climate change at least during the timeframe of this assessment (to 2050).

Literature Cited

Baker, A.J. and Strauch, J.G. 1988. Genetic variation and differentiation in shorebirds. – Acta XX Congressus Internationalis Ornithologicus 2: 1639–1645.

Ims, R.A., and E. Fuglei. 2005. Trophic interaction cycles in tundra ecosystems and the impact of climate change. BioScience 55: 311-322.

Johnson, J.A., R.B. Lanctot, B.A. Andres, J.R. Bart, S.C. Brown, S.J. Kendall, and D.C. Payer. 2007. Distribution of breeding shorebirds on the Arctic Coastal Plain of Alaska. Arctic 60(3): 277-293.

Johnson, O.W and P.G. Connors. 1996. American Golden-plover (*Pluvialis dominica*). In The Birds of North America, No. 201 (A. Poole and F. Gill, eds.). The Birds of North America, Inc. Philadelphia, PA.

Johnson, S.R. and D.R. Herter. 1989. The birds of the Beaufort Sea, Anchorage: British Petroleum Exploration (Alaska), Inc.

Martin, P., J. Jenkins, F.J. Adams, M.T. Jorgenson, A.C. Matz, D.C. Payer, P.E. Reynolds, A.C. Tidwell, and J.R. Zelenak. 2009. Wildlife response to environmental Arctic change: Predicting future habitats of Arctic Alaska. Report of the Wildlife Response to Environmental Arctic Change (WildREACH), Predicting Future Habitats of Arctic Alaska Workshop, 17-18 November 2008. Fairbanks, Alaska, USFWS, 148 pages.

Morrison, R.I.G., B.J. McCaffery, R.E. Gill, S.K. Skagen, S.L. Jones, G.W. Page, C.L. Gratto-Trevor, and B.A. Andres. 2006. Population estimates of North American shorebirds, 2006. Wader Study Group Bulletin 111:67-85.

Racine, C. and R. Jandt. 2008. The 2007"Anaktuvuk River" tundra fire on the Arctic Slope of Alaska: a new phenomenon? In D.L. Kane and K.M. Hinkel (Eds.), Ninth International Conference on Permafrost, Extended Abstracts (p. 247-248). Institute of Northern Engineering, University of Alaska Fairbanks.

The Wilderness Society (TWS) and Scenarios Network for Alaska Planning (SNAP), Projected (2001-2099: A1B scenario) monthly total potential evapotranspiration from 5 AR4 GCMs that perform best across Alaska and the Arctic, utilizing 2km downscaled temperature as model inputs. http://www.snap.uaf.edu/data.php.

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.