

White-crowned Sparrow (*Zonotrichia leucophrys*)

Vulnerability: **Increase Likely**

Confidence: High

The White-crowned Sparrow is a common breeding bird from the Pacific Coast in the Lower 48 to the northern extent of its range in Arctic Alaska (Chilton et al. 1995). The Gambel's subspecies, the breeder in Alaska, is most commonly associated with shrubby riparian habitats that run through both boreal and tundra environs. White-crowned Sparrows consume a wide variety of plant and animal prey and during the breeding season feed their young a strict diet of insect and other animal prey. Alaskan birds are short-distance migrants and winter in temperate North America (Chilton et al. 1995). Overall White-crowned Sparrow populations appear to be stable (Chilton et al. 1995).

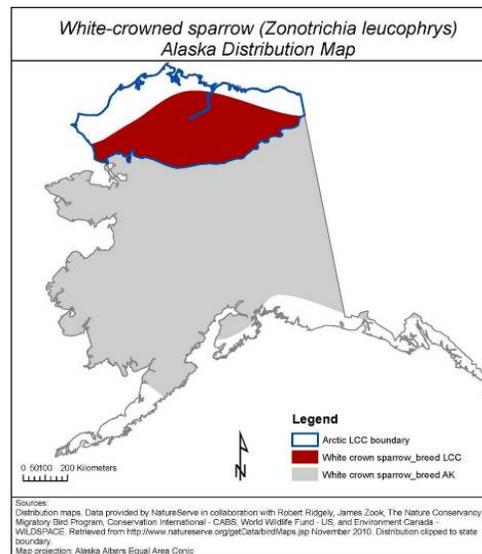


Range: We used the extant NatureServe range map for the assessment as it closely matched the Birds of North America (Chilton et al. 1995) and other range descriptions (Johnson and Herter 1989).

For most of the indirect exposure and sensitivity categories in the assessment, White-crowned Sparrows were scored as neutral (see table on next page), and for five categories, they ranked as potentially having decreased vulnerability. As shrubby and boreal habitats increase on the North Slope (Tape et al. 2006), White-crowned Sparrows will be able to exploit new areas and potentially expand their breeding range further northward (Martin et al. 2009).

Human Response to CC: In their Lower 48 wintering range, this species is known to adapt well to human-dominated environments and are a frequent bird in suburban settings. Because of this, any increase in human presence (e.g. activities in response to climate change) will likely have no negative impact on this species, and could, in fact, be beneficial through increasing habitat patchiness and heterogeneity.

Physiological Thermal Niche: Because this species tolerates warm temperatures at breeding sites in the Alaskan interior and further south, it is unlikely that a warming climate will compromise its physiological ability to adapt thermally. Warming could actually facilitate northern expansion of their range by reducing cold stress, particularly during the nesting period.



Physiological Hydro Niche: White-crowned Sparrow breeding territories are generally found near a source of water (standing or running), and so it is possible that a drying trend could negatively impact this species. However, a drying trend would more likely affect shallow ponds and emergent tundra which are less likely to be utilized by this riparian-oriented species. Also, it is important to point out that current projections of annual potential evapotranspiration suggest negligible atmospheric-driven drying for the foreseeable future (TWS and SNAP).

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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.

Phenological Response:

One common breeding passerine, the Lapland Longspur, appears to have adjusted nest initiation in response to climate warming over the last 10 years (J. Liebezeit and S. Zack, unpublished data), but it is unknown whether this result can be generalized. For White-crowned Sparrows, there are long-term data sets available from bird banding stations in Fairbanks (Alaska Bird Observatory), Tok (Tetlin National Wildlife Refuge), and near Denali National Park (Alaska Bird Observatory) that include spring arrival dates and fall departure dates. Unfortunately, these data have not been examined or the year-to-year variation makes it difficult to see trends (S. Sharbaugh, pers. comm.).

In general, this assessment suggests that White-crowned Sparrows will likely increase and expand their breeding range in Arctic Alaska under the current projections of climate change.

Literature Cited

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