

American Tree Sparrow (*Spizella arborea*)

Vulnerability: **Increase Likely**

Confidence: **Moderate**

The American Tree Sparrow is a common breeding bird of boreal and tundra dominated habitats in northern Canada and Alaska. This species breeds in open scrubby areas; willow, birch, and alder thickets, stunted spruce, open tundra with scattered shrubs, often near lakes or bogs (Naugler 1993). In summer American Tree Sparrows consume a wide variety of animal prey (primarily both larval and adult insects). Alaskan birds are short-distance migrants and winter in temperate North America (Naugler 1993). This species' population is very large (>10 million) although the overall population has undergone a small (statistically insignificant) decrease over the last 40 years in North America (Butcher and Niven 2007).

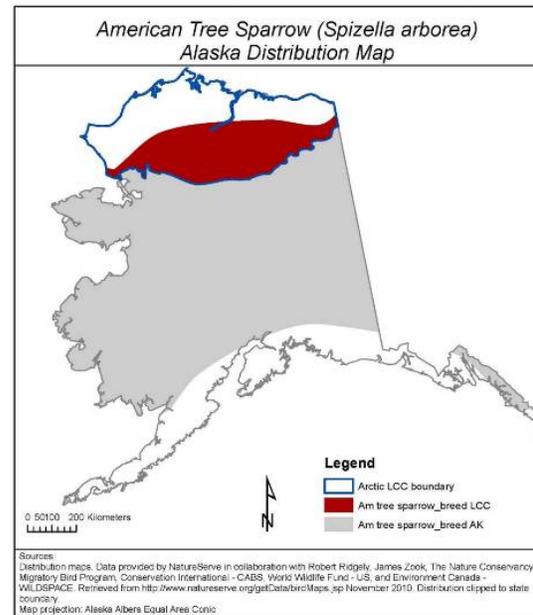


Range: We used the extant NatureServe range map for the assessment as it closely matched the Birds of North America (Naugler 1993) and other range descriptions (Johnson and Herter 1989).

For most of the sensitivity categories in the assessment, American Tree Sparrows were ranked with a neutral response (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), American Tree Sparrows will be able to exploit new areas and potentially expand their breeding range further northward.

Human Response to Climate Change: 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 (Naugler 1993). Because of this, any increase in human presence (e.g. activities associated with climate change mitigation) will likely have no negatively impact on this species.

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 this species' physiological ability to adapt thermally. Warming could actually facilitate northern expansion of their range.



Physiological Hydrologic Niche: American Tree Sparrow breeding territories are generally found near water, such as bogs, lakes or riparian areas, and so it is possible that an arctic drying trend could negatively impact this species. However, a drying trend is more likely to affect shallow ponds and emergent tundra which are less likely to be utilized by this riparian-oriented species. Current projections of annual potential evapotranspiration suggest negligible atmospheric-driven drying for the foreseeable future (TWS and SNAP) and so wet habitats may only be minimally impacted.

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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. During a 20-year period (1992-2011) American Tree Sparrows have shown no significant shift in earlier or later departure dates from the Alaska Bird Observatory's banding station in Fairbanks, Alaska (S. Guers, unpublished data). However, there are apparently no other long-term datasets for this species' breeding or migration activities and so little else is known regarding phenology in this species (S. Guers, pers. comm.).

In general, this vulnerability assessment suggests that American Tree Sparrows will likely increase, potentially expanding their breeding range in Arctic Alaska under the current predictions of climate change.

Literature Cited

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<http://www.snap.uaf.edu/data.php>.