# Snow Bunting (*Plectrophenax nivalis*)

Vulnerability: **Presumed Stable** Confidence: Moderate

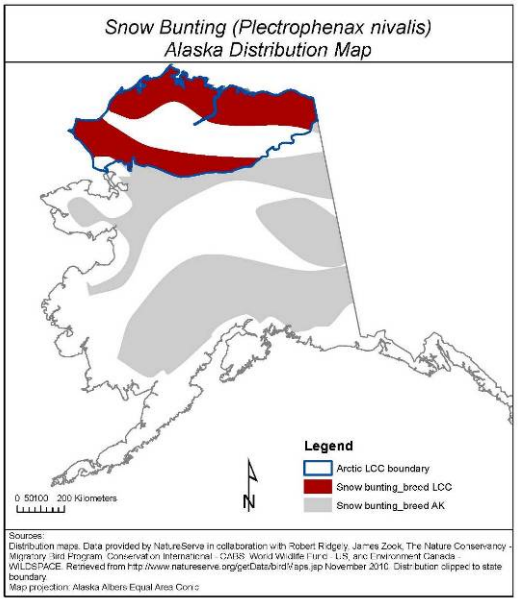
The Snow Bunting is one of the first birds to return to their Arctic breeding grounds, with males arriving in early April. This species occurs throughout the circumpolar arctic and, as a cavity-nester, will use human-made nest sites (e.g. barrels, buildings, pipelines) as readily as natural ones (rock cavities, under boulders, cliff faces; Lyon and Montgomerie 1995). Snow Buntings consume a wide variety of both plant (e.g. seeds, plant buds) and animal prey (invertebrates). Their wintering range is centered in the northern continental US and southern Canada although it extends north into the low arctic in some places (Lyon and Montgomerie 1995). Current global population estimate is 40 million (Rich et al. 2004).


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

***Human Response to CC***: Increased human activity and infrastructure associated with human response to climate change could benefit Snow Buntings by providing increased artificial nesting habitat, as they are known to readily take advantage of human infrastructure (Lyon and Montgomerie 1995, J. Liebezeit, pers. obs.). Because it is unlikely that there will be significant development of this type in Arctic Alaska, the influence on this species would be nominal.

***Physiological Thermal Niche***: Changes in thermal and hydrological niche will likely not offer a significant benefit or disadvantage for this species. Increasing temperatures could make some nesting sites "too hot" while, in others cases provide warmer conditions beneficial for raising altricial young.

***Physiological Hydro Niche***: Snow buntings will utilize wet tundra for foraging but are not tied strongly to water-dominated habitats (Lyon and Montgomerie 1995) and so any tundra drying in Arctic Alaska (see Martin et al. 2009) is not likely to have a strong negative or positive affect on this species. Current projections of annual potential evapotranspiration 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.




***Dietary Versatility***: The Snow Bunting's varied omnivorous diet will likely be beneficial to this species as the climate warms, human activity in the region increases, and the food base changes.

***Physical Habitat Restrictions***: Despite bunting use of human structures for nesting, nesting sites on the coastal plain are still quite limited since they depend on relatively uncommon geologic features (e.g. cliffs, rock outcrops). This paucity of adequate breeding sites on the coastal plain will likely continue to be a limiting factor for this species.

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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.

***Genetic Varitation:*** There are currently no Snow Bunting studies that add insight into how climate change impacts would influence their population genetics.

***Phenological Response***: There are also no long-term data sets to provide sufficient information on how Snow Buntings will respond to changing arctic phenology.

In summary, this vulnerability assessment suggests that Snow Buntings are relatively flexible in most sensitivity factors and have an expansive enough breeding range to adjust to climate changes and remain stable (and potentially even benefit) in the region over the next 50 years.

## Literature Cited


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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.