

***Luzula confusa-Poa arctica* Plant Association**

Northern Woodrush-Arctic Bluegrass Plant Association

Northern Alaska

Conservation Status Rank: S4 (apparently secure)

Introduction

The *Luzula confusa-Poa arctica* (northern woodrush-Arctic bluegrass) Plant Association is a graminoid-dominated type that occurs on acidic coastal tundra (Figure 1). It may represent the typical vegetation type in coastal habitats of northern Alaska, but it does not occur widely and is poorly characterized (Webber 1978). This type is distinguished from the *Luzula confusa-Sphaerophorus globosus* plant association by its greater abundance of graminoids, particularly rushes and grasses and its somewhat moister, more organic-rich soils.

Distribution

This plant association is known from Barrow and is estimated to occur within only a small portion of the larger region. Due to its patchiness and small area of occupancy, this distribution of this association is difficult to map at the landscape scale. A preliminary distribution of this association was derived from herbarium records and bioclimatic information. The distribution of the *Luzula confusa-Poa arctica* plant association (Figure 2) was developed from the intersection of locations where both *Luzula confusa* and *Poa arctica* were collected (Consortium of Pacific Northwest Herbaria 2015) within (or near) Subzone C of the Arctic Alaska Tundra Vegetation Map (Raynolds et al. 2006).



Figure 1. The *Luzula confusa-Poa arctica* plant association on a high-centered polygon at Barrow, Alaska (photo by D.A. Walker).

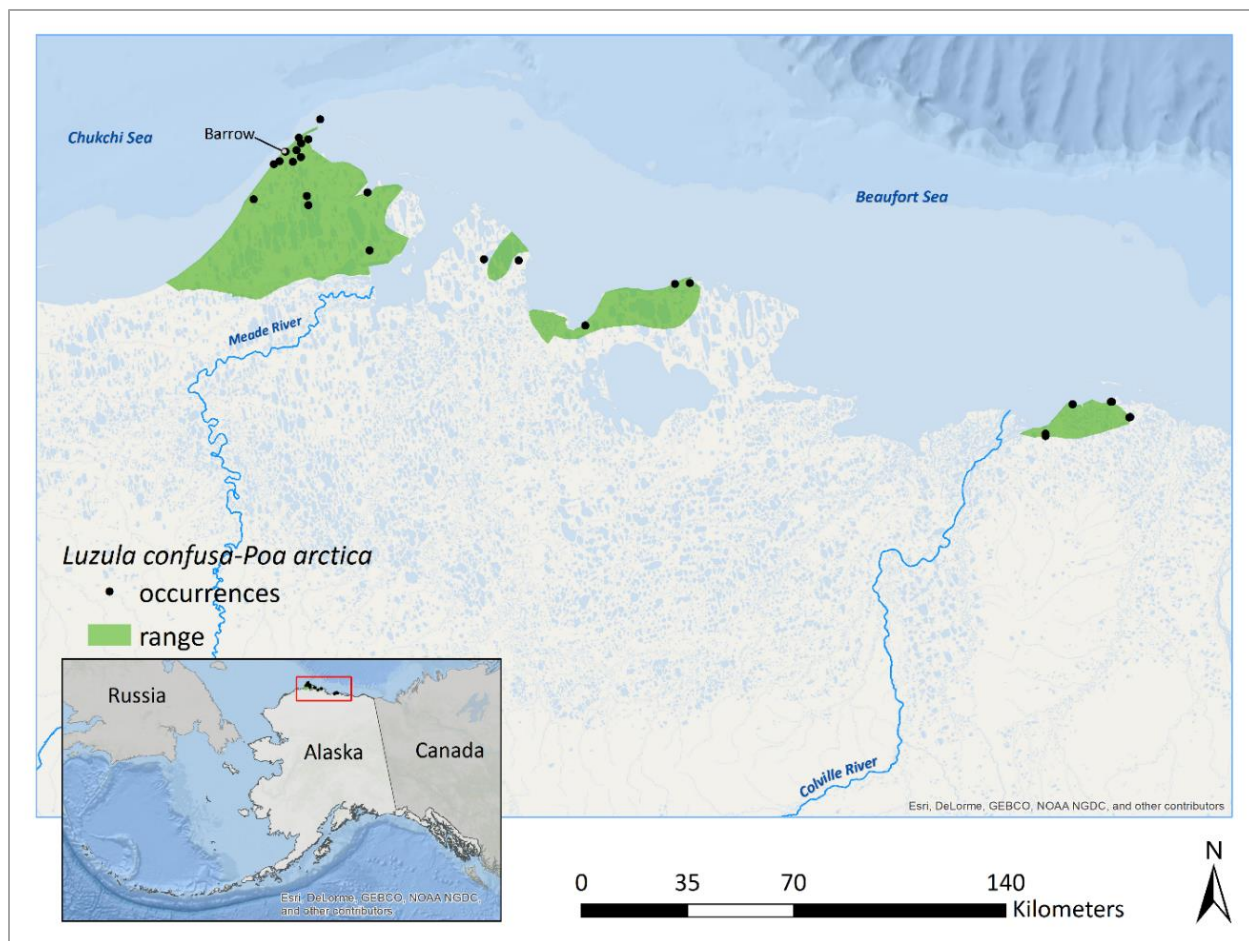


Figure 2. Distribution of *Luzula confusa* -*Poa arctica* Plant Association. Note that point occurrences in this map are buffered for greater visibility.

Climate

In the northern Alaska region, the arctic climate is dry and cold, characterized by very short summers and long winters (Natural Resources Conservation Service, 2006). The mean annual precipitation ranges from about 10 to 26 cm. Annual precipitation mostly falls as snow during the long winter season. The average annual temperature ranges from -13 to -6 °C, and freezing temperatures can occur in any month. Summers are frequently foggy because of close proximity to the Arctic Ocean. June, July and August annually receive the highest average precipitation, with August receiving an average of 3.3 cm precipitation. The average annual temperature ranges from -13 to -6 °C, and freezing temperatures can occur in any month. Summers are frequently foggy because of close proximity to the Arctic Ocean. The northern part of the Arctic Coastal Plain, is classified as bioclimatic Subzone C, which has a mean July temperature of 7°C (Walker et al. 2005).

Environmental Characteristics

This plant association occurs on mesic, organic-rich acidic coastal tundra (Figure 1). Those associations with high cover of the crustose lichen *Ochrolechia frigida*, occur mainly on organic-rich, high-centered polygons, low-centered polygon rims, and other somewhat elevated microsites in ice wedge polygon complexes (Figure 3 and Figure 4). Sites may have a lumpy microtopography due to hummocks of the moss *Dicranum elongatum* covered by *Ochrolechia* species.

Vegetation

This plant association is characterized by an abundance of the rushes *Luzula confusa* and *L. arctica*, the grasses *Poa arctica*, *Dupontia fisheri* and *Anthoxanthum monticola* and lichens. Lichen species include *Sphaerophorus globosus*, *Dactylina arctica*, *Alectoria nigricans*, *Cladonia* species and locally abundant *Ochrolechia frigida* (Figure 3 and Figure 4). Bryophyte species include *Polytrichastrum alpinum*, *Dicranum elongatum*, *Polytrichum strictum* and *Sarmenthyphnum sarmentosum*. At Prudhoe Bay and Barter Island this subtype is replaced by a similar community with abundant *Dryas integrifolia* and *Ochrolechia frigida*.

Conservation Status

Rarity: While multiple occurrences of this association are documented, they appear to be restricted to the high-arctic climate of the Barrow region.

Threats: Threats include climate change in so far that warming could thaw the presumably ice-rich soils that support this association and shift the bioclimate that typifies its range beyond the extent of land. Additional threats include anthropogenic disturbances such as village and oil and gas development as well as snow machine and all-terrain vehicle traffic.

Trend: Short-term declines related to coastal erosion and thermokarst are expected for this association. In the long-term, loss of habitat may be exacerbated by the northward shift of bioclimatic zones.

Species of Conservation Concern

The bird and plant species listed below are designated critically imperiled or vulnerable either globally (G1-G3) or within Alaska (S1-S3) and are known or suspected to occur in this plant association (Table 1, Table 2). More research is needed to better understand which mammals of conservation concern are supported by the *Luzula confusa* – *Poa arctica* plant association. Please visit the Alaska Center for Conservation Science webpage for species descriptions (ACCS 2016).



Figure 3. The *Luzula confusa*-*Poa arctica* Plant Association showing abundant *Ochrolechia frigida* on rims of low centered polygons (photo by D.A. Walker).



Figure 4. The *Luzula confusa*-*Poa arctica* Plant Association showing *Ochrolechia frigida* covering hummocks of the moss *Dicranum elongatum* (photo by D.A. Walker).

Table 1. Bird species of conservation concern within the *Luzula confusa* – *Poa arctica* Plant Association.

Common Name	Scientific Name	Global Rank	State Rank	Habitat Description
Snowy Owl	<i>Bubo scandiacus</i>	G5	S3S4	Suspected to winter in open areas near shorelines. Breeds in tundra from near treeline to the edge of polar seas.
Smith's Longspur	<i>Calcarius pictus</i>	G5	S3S4B	Breeds in dry tundra and is known to nest in the Brooks Range foothills.

Table 2. Plant species of conservation concern within the *Luzula confusa*-*Poa arctica* Plant Association.

Scientific Name	Global Rank	State Rank	Habitat Description
<i>Draba micropetala</i>	GNR	S1S2	Creek and stream banks, beach ridges.
<i>Draba pauciflora</i>	G4	S2	Beach ridges, boulder slopes, high-center polygons, broad troughs, seepage slopes.
<i>Draba subcapitata</i>	G4	S1S2	Occurs in graminoid-herbaceous meadows and ericaceous heath of coastal bluffs, river bars, pingos, and hummocks.
<i>Papaver gorodkovii</i>	G3	S2S3	Associated with sparsely vegetated habitats on river floodplains, gravel bars, rock outcrops, and polygon tundra.
<i>Ranunculus sabinei</i>	G4	S1	Tundra slopes, hummocks, estuary banks; all occurrences near coast.
<i>Saxifraga rivularis</i> ssp. <i>arctolitoralis</i>	G5T2T3	S2	Occurs in wet meadows near arctic seashores.

Classification Concept Source

The classification concept for this plant association is based on the dry *Luzula confusa* heath described by Webber (1978). The similar associations of *Luzula confusa*, *Alectoria nigricans*, *Polytrichum juniperinum* and *Sphaerophorus globosus*-*Luzula confusa*, subtype *Saxifraga foliolosa* are described by Walker (1977) and Elias et al. (1996), respectively.

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