

***Picea sitchensis*/*Calamagrostis nutkaensis* Plant Association**

Sitka Spruce/Pacific Reedgrass Plant Association

Southern Alaska

Conservation Status Rank: S4 (apparently secure)

Introduction

The *Picea sitchensis*/*Calamagrostis nutkaensis* (Sitka spruce-Pacific reedgrass) Plant Association is characterized by open coastal forests, dominated by the coniferous tree *Picea sitchensis* in the overstory and the grass *Calamagrostis nutkaensis* in the understory (Figure 1). This association occurs as a narrow, discontinuous band along exposed portions of the Gulf of Alaska coastline that are subject to salt spray. This unique habitat occupies a small total area, yet supports several taxa of conservation concern. Impacts are generally low, but some villages, towns and cities occur adjacent to, and often within, this association.



Figure 1. *Picea sitchensis*/*Calamagrostis nutkaensis* Plant Association near Sitka, Alaska.

Distribution

The *Picea sitchensis/Calamagrostis nutkaensis* association forms a discontinuous fringe along the coastline of Southeast Alaska (DeMeo et al. 1992, Martin et al. 1995). It appears in limited areas on the outer shores of Glacier Bay National Park and Preserve (Boggs et al. 2008a), in a few rocky areas of the Copper River basin, likely occurs in Prince William Sound and is most common in Kenai Fjords National Park (Figure 2; Boggs et al. 2008b). The distribution of this plant association was developed from *Picea sitchensis* landcover classes of the Alaska Landcover Map (Boggs et al. 2015) occurring within 1,000 m of a rocky shoreline delineated by the National Oceanic and Atmospheric Association's Shorezone project (NOAA 2015). Occurrence data is derived from herbarium records of *Calamagrostis nutkaensis* occurring in coastal, Sitka spruce forests (CPNWH 2016).

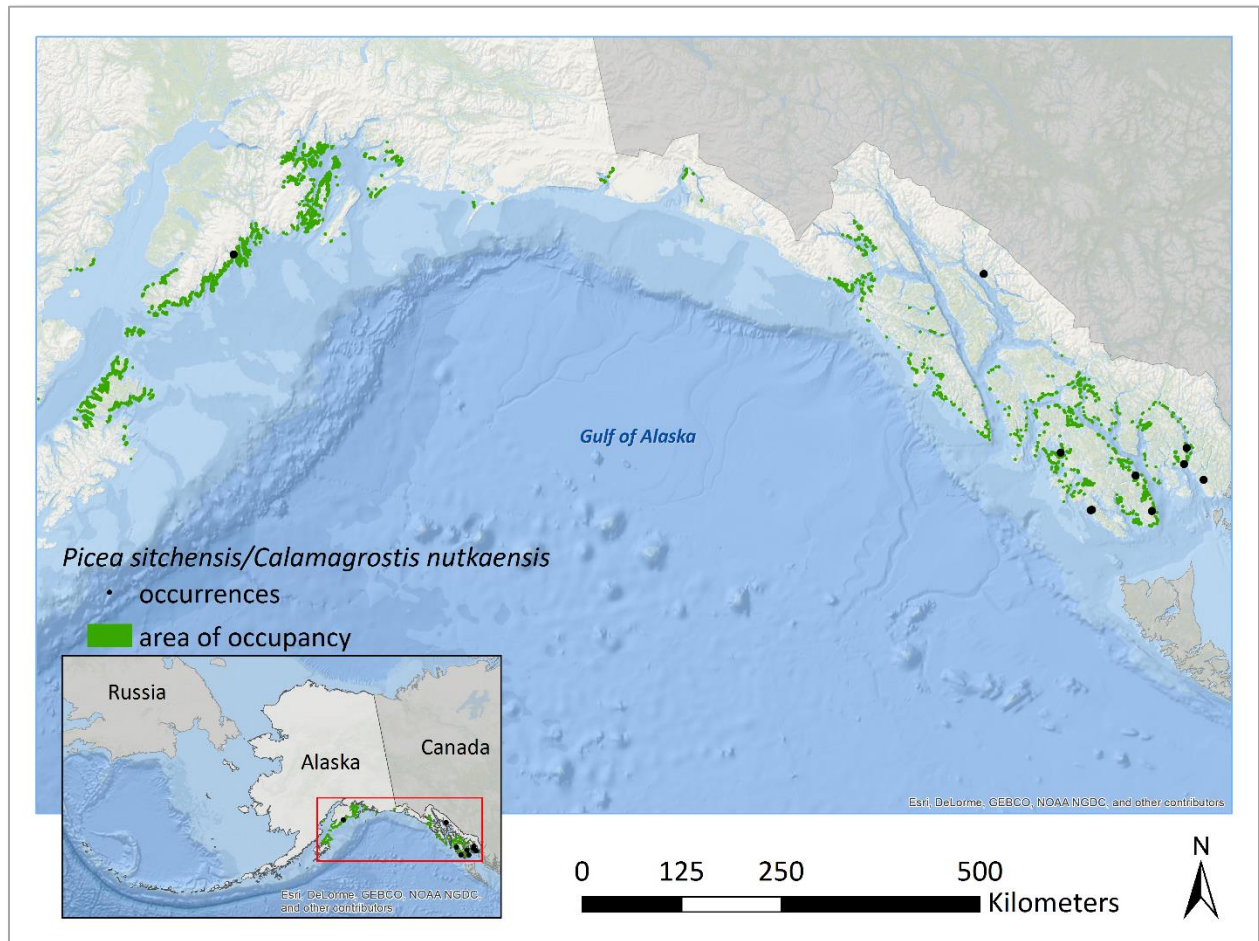


Figure 2. Distribution of the *Picea sitchensis/Calamagrostis nutkaensis* Plant Association in southern Alaska. Note that areas of occupancy in this map are buffered for greater visibility.

Climate

Southeast Alaska has a cool, wet maritime climate (Gallant et al. 1995, Nowacki et al. 2001). The mean annual precipitation in coastal rainforests ranges from 135 to 390 cm, with 80 to 600 cm falling as snow. Average summer temperatures range from 7 to 18 °C; average winter temperatures range from -3 to 3 °C. Consequently, this forest association has developed under relatively short, cool and extremely wet growing

seasons. Rainfall and temperature show highly variable patterns dependent upon proximity to mainland ice fields, the Pacific Ocean, topography and regional weather patterns.

Environmental Characteristics

This association is a beach fringe habitat most common on exposed, rocky headlands, uplifted beach ridges, and rocky platforms that are subject to salt spray (DeMeo et al. 1992, Martin et al. 1995). It sometimes occurs on floodplains and alluvial fans adjacent to saltwater. Soils are well drained but often skeletal (DeMeo et al. 1992, Martin et al. 1995). Rock outcrops are common. Soils are typically derived from the local bedrock, but may develop from beach gravels imported from remote parent materials.

Vegetation and Succession

This forested association is dominated by the coniferous tree, *Picea sitchensis* and by the salt-tolerant grass *Calamagrostis nutkaensis* the understory (DeMeo et al. 1992, Martin et al. 1995). Stands are open with an average canopy cover of 44% and an average tree height of 39 m. The most common herbaceous species found in this association are *Maianthemum dilatatum* (24%) and *Calamagrostis nutkaensis* (10%; DeMeo et al. 1992). Total shrub cover is about 1% and may include *Gaultheria shallon*, *Menziesia ferruginea* or *Vaccinium* species such as *V. alaskaense*, *V. ovalifolium*, or *V. parvifolium*. Both *Tsuga heterophylla* (western hemlock) and *Picea sitchensis* seedling and saplings occur in the understory.

Moving inland from the shore, *Picea sitchensis* and *Calamagrostis nutkaensis* cover decrease and *Tsuga heterophylla* and *Vaccinium* spp. increase, a transition that presumably relates to decreased disturbance and exposure to salt spray. The dominance of grass in the understory and a greatly reduced shrub cover differentiate this association from all other spruce-dominated associations in the region.

Small-scale windthrow is common, usually to within 30 m of the beach. Although succession studies have not been explicitly conducted within this type, the broad trends of forest gap succession likely apply.

Conservation Status

Rarity: Although this plant association is widely distributed along the coastline of Southeast Alaska, its potential range is small (324 km²) and only 10 occurrences have been identified.

Threats: The mature *Picea sitchensis* present at these sites, and their accessibility, makes them susceptible to timber harvest. Spruce bark beetle (*Dendroctonus rufipennis*) infestation is an additional threat.

Trend: The extent and condition of this association is not expected to change in the short- or long-term.

Species of Conservation Concern

The mammal, 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). Please visit the Alaska Center for Conservation Science website for species descriptions (ACCS 2016).

Table 1. Mammal and bird species of conservation concern within the *Picea sitchensis/Calamagrostis nutkaensis* Plant Association.

Common Name	Scientific Name	Global Rank	State Rank	Habitat Description
Birds				
Queen Charlotte Goshawk	<i>Accipiter gentilis laingi</i>	G5T2	S2	Nest in either Sitka spruce or western hemlock. Typically hunt in continuous forests.

Common Name	Scientific Name	Global Rank	State Rank	Habitat Description
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	G3G4	S2S3	Nest in old-growth hemlock and Sitka spruce on moss-covered trunks, or on ground near sea-facing talus slopes or cliffs.
Mammals				
Alexander Archipelago wolf	<i>Canis lupus ligoni</i>	G4T2T3	S3	Primarily found in rugged coastal spruce-hemlock forests supporting prey such as deer, small mammals, and spawning salmon.
California myotis	<i>Myotis californicus</i>	G3G4	S2	In SE Alaska, occur primarily in closed forests with snags and fallen logs.
Keen's myotis	<i>Myotis keenii</i>	G2G3	S1S2	In SE Alaska, occur primarily in coniferous forests with females preferring old-growth forests and cedar trees in riparian areas for day roosts.
Prince of Wales flying squirrel	<i>Glaucomys sabrinus griseifrons</i>	G5T2?	S2	Old growth western hemlock-Sitka spruce forests, and peatland scrub-mixed-conifer forests. Dens in tree cavities and woodpecker holes
Admiralty Island ermine	<i>Mustela erminea salva</i>	G5T3T4	S2S3	Occurs in forests, shrublands and alpine. May favor forest-wetland ecotones.
Prince Of Wales Island ermine	<i>Mustela erminea celenda</i>	G5T3	S3	See Admiralty Island Ermine description.
Baranof Island ermine	<i>Mustela erminea initis</i>	G5T3T4	S3	See Admiralty Island Ermine description.
Suemez Island ermine	<i>Mustela erminea seclusa</i>	G5T2T3	S3	See Admiralty Island Ermine description.
Kupreanof red squirrel	<i>Tamiasciurus hudsonicus picatus</i>	G5T3?	S3	Variety of coniferous and mixed habitats. Nests in holes in tree trunks or in a mass of twigs, leaves, mosses, and lichens in densest foliage of a tree.
Warren Island dusky shrew	<i>Sorex monticolus malitiosus</i>	G5T3	S3	Occurs in meadows, peatlands, coniferous forest, and alpine. Rarely found more than a few meters from water in summer. Requires moist soil and dense understory.

Table 2. Plant species of conservation concern within the *Picea sitchensis/Calamagrostis nutkaensis* Plant Association.

Scientific Name	Global Rank	State Rank	Habitat Description
<i>Ligusticum calderi</i>	G3G4	S2	Known principally from the Queen Charlotte Islands and northern Vancouver Island in British Columbia. In Alaska occurs on moist, rocky, limestone at high elevations on Kodiak Island, Dall Island and southern Prince of Wales Island.
<i>Ranunculus orthorhyncus</i>	G5T5	S2S3	Wetland plant found uncommonly in variable habitat of southern Alaska. Prefers moist meadows, streambanks and shores, including sea beaches and upper tidal marshes (Pojar and MacKinnon 1994).

Classification Concept Source

The classification concept for this plant association is based on DeMeo and others (1992) as well as Martin and others (1995).

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