

## ***Pinus contorta* var. *latifolia*/Cladina species Plant Association**

### Lodgepole Pine/Reindeer Lichen Plant Association

#### Southern Alaska

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**Conservation Status Rank:** S2 (imperiled)

#### ***Introduction***

The *Pinus contorta* var. *latifolia*/Cladina species (lodgepole pine/reindeer lichen) Plant Association occurs on mountain sideslopes and knolls underlain by shallow bedrock. One occurrence has been documented from Klondike Gold Rush National Historical Park but is likely to occur elsewhere in Southeast Alaska (Figure 1; Flagstad and Boucher 2014). This association is considered rare in Southeast Alaska and in neighboring regions of British Columbia, where it is found only on the driest bedrock outcrops with thin soils (Banner et al. 1993, Flagstad and Boucher 2014).



Figure 1. The *Pinus contorta* var. *latifolia*/Cladina species Plant Association in Klondike Gold Rush National Historical Park, Alaska (photo by L. Flagstad).

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#### ***Distribution***

This association has been sampled in Klondike Gold Rush National Historical Park and in British Columbia (Figure 2; Banner et al. 1993, Flagstad and Boucher 2014). The *Pinus contorta* var. *latifolia*/Cladina species Plant Association distribution map was developed from the Lodgepole Pine Open Forest landcover class mapped by Flagstad and Boucher (2014).

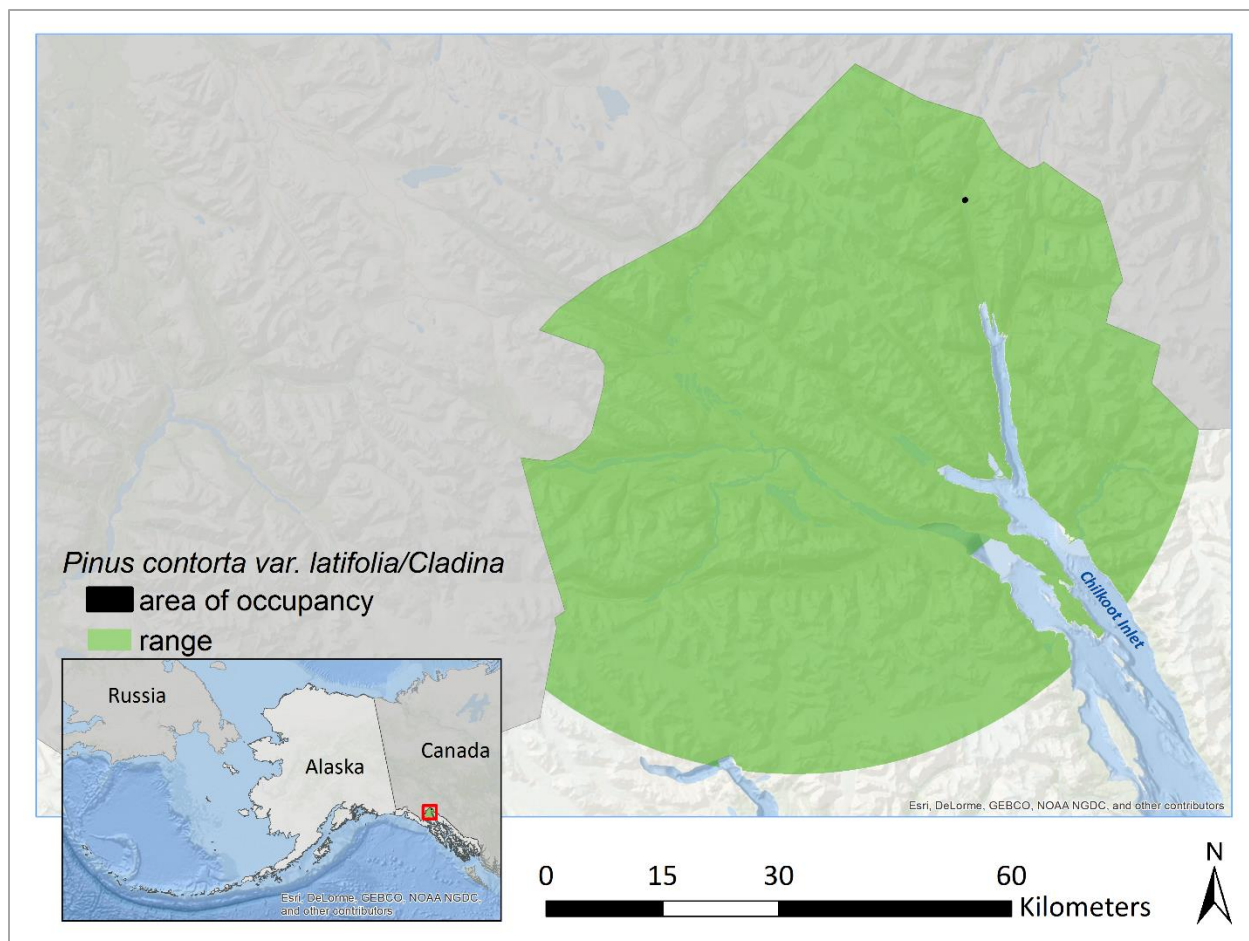


Figure 2. Distribution of the *Pinus contorta* var. *latifolia*/Cladina species Plant Association. Note that the areas of occupancy in this map are buffered for greater visibility.

### Climate

The Klondike region is characterized by a mix of continental and maritime climates that interface from sea level to the high alpine (Nowacki et al. 2000). Similar to much of southeast Alaska, wetness and disturbance are major climatic drivers for the development and maintenance the local ecosystems. However, Klondike's relative remoteness from the open ocean lessens storm effects and its proximity to the continental interior increases inputs of cold and dry air (Davey et al. 2007, Nowacki et al. 2001). As a result, the Klondike region experiences less precipitation and greater fluctuation in annual temperatures relative to much of southeast Alaska. At Chilkoot Pass, mean monthly wind speeds reach 23.5 m/s, while temperatures dip to  $-27.9^{\circ}\text{C}$  and snow reaches depths of over 4 m (for the highly discontinuous period of measurement from 2010 to 2013; RAWs 2014). Average annual precipitation (including water equivalent of snow) is 59.0 cm with 74.9 cm as snowfall. Mean monthly precipitation for September (wettest month) is 101.7 cm received entirely as rain. The mean monthly precipitation for November (driest month) is 15.3 cm, with 14.4 cm received as snow (for the periods of record from 2004 to 2014 [precipitation] and from 2009 to 2014 [snow]; SNOTEL 2014).

### ***Environmental Characteristics***

This association occurs on dry mountain sideslopes and knolls underlain by shallow bedrock. The elevation of the single site sampled in Klondike Gold Rush National Historical Park is 167 m. In British Columbia this association is found only on the driest bedrock outcrops with thin soils (Banner et al. 1993).

### ***Vegetation and Succession***

The *Pinus contorta* var. *latifolia*/*Cladina* species plant association is an upland, mid-elevation, open forest type where *Pinus contorta* var. *latifolia* (12 m tall) is the dominant tree species and *Tsuga heterophylla* (1.2 m) and *Picea sitchensis* (0.9 m) saplings are present at low cover (Figure 1) (Flagstad and Boucher 2014). Lichens blanket the forest floor, primarily *Cladina rangiferina*, *Cladina mitis*, and *Cladonia uncialis*. Shrubs and herbaceous plant species are not well represented. This association represents a late-seral type with no significant disturbance.

### ***Conservation Status***

**Rarity:** *Pinus contorta* var. *latifolia* is considered rare in Southeast Alaska and in neighboring regions of British Columbia (Viereck and Little 2007, Banner et al. 1993). A single occurrence of the species in association with a *Cladina*-dominated understory has been documented for Alaska (Flagstad and Boucher 2014).

**Threats:** The one occurrence in Alaska is located adjacent to a National Park Service work camp and is thus threatened by foot traffic and potentially invasive weeds. More broadly, this association may be susceptible to timber harvest, but is likely protected by its remote, mountainous locations.

**Trend:** Disturbance of these thin soils could result in erosion and thus short- and long-term declines in extent.

### ***Species of Conservation Concern***

No animal or plant species of conservation concern are known or suspected to occur within this plant association. Additional study is required to evaluate whether this association supports species of conservation concern.

### ***Classification Concept Source***

This association was first described by Banner et al. (1993) and subsequently by Flagstad and Boucher (2014).

### ***Literature Cited***

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