

Vascular Plant Survey of UNAVCO's PBO Site at Slope Mountain, Lake Clark National Park and Preserve



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Abstract –

The University of Alaska Anchorage, Alaska Natural Heritage Program agreed to conduct a vascular plant survey of the proposed UNAVCO Plate Boundary Observatory GPS monument site at Slope Mountain in Lake Clark National Park and Preserve. The need for a plant survey was precipitated by the discovery of a number of rare plants found on surrounding peaks during vascular plant inventories in 2003 and 2005 (see Carlson et al. 2005 for details). The survey of the UNAVCO site on the northeast peak of Slope Mountain did not reveal any imperiled or critically imperiled vascular plant species. Here, I briefly outline the background of the project and rare plant concerns in the area, location and habitat of the site, survey methods, and results.

Introduction –

Saddle Mountain, just 12 km to the southwest of Slope Mountain, was found to have a small population of *Arabis* (Brassicaceae) that superficially resembled *Arabis lemmonii* (Fig. 1), a species that is “Critically Imperiled in Alaska” (AKNHP 2007 Rank) and known only from a single site in Alaska in the extreme eastern portion of the Chugach Mountains (Cook and Roland 2002). After collecting numerous new specimens from this site of different developmental stages and locating a new site on a granite nunatak on Double Glacier, it appears that the morphology of this rockcress falls within the broad concept of this species. However, the weakly clasping leaves and presence of other characters, and extreme isolation suggest that greater taxonomic work is required to determine if the Saddle Mountain plants are indeed *A. lemmonii*, a new species or a new subspecies of *A. lemmonii*. Additionally, a number of other rare plants are known from the Chigmit Mountains, these include: *Aphragmus eschscholtziana* (G3-S3), *Carex phaeocephala* (G4-S3), *Papaver alboroseum* (G3G4-S3), *Potentilla drummondii* (G5-S2), and *Thalaspis arcticum* (G3-S3) (Carlson et al. 2005). *Potentilla drummondii* is common globally, but is imperiled in Alaska. The other species have ranges that are primarily restricted to Alaska and are rare within the state. None of these five species are imperiled.

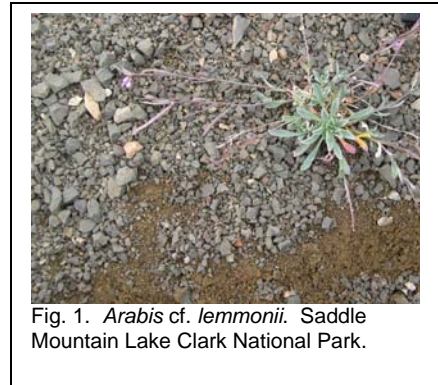


Fig. 1. *Arabis* cf. *lemmonii*. Saddle Mountain Lake Clark National Park.

Methods –

On 24 July 2007, M. L. Carlson, AKNHP Program Botanist, accompanied Ben Pauk of UNAVCO to Homer, Alaska and departed Homer by helicopter to the base of Slope Mountain at the Johnson River estuary. We were unable to access the site due to a low ceiling that persisted throughout the day. We returned to Anchorage in the evening and discussed plans for a second attempt in early August.

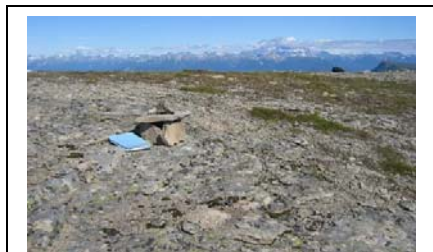


Fig. 2. PBO site, Slope Mountain, Lake Clark National Park and Preserve.

On 8 August 2007, M. L. Carlson accompanied Sara Gasparich of UNAVCO on a helicopter flight from Anchorage to Slope Mountain. The proposed monument site and rock cairn was relocated at 60.08144°N, 152.62404°W, elevation 2,991 ft at the northeast peak of Slope Mountain. I thoroughly surveyed a 30 x 30 m area where the monument was proposed to be located, where the helicopters would likely land, and most foot traffic would be

concentrated (Fig. 2.). I walked slowly, canvassing the area, and identified all individual plants to species, or collected the taxonomically difficult species for later identification. Secondly, I made a broader survey of approximately 400 x 120 m, concentrating on areas that would likely receive foot traffic and that appeared to have the highest likelihood of harboring rare plant species.

Results and Discussion –

At the monument site, highly weathered and fissured metamorphic bedrock underlies the area and is largely exposed. Loose small rocks and fines often form a thin layer over the bedrock. The habitat of the site is barren fellfield, with greater than 50% bare ground, the slope ranges from 0° to 10° and faces southeast (see Fig. 2.). The plant species found at this location were all common alpine species of neutral to more acidic substrates in south-central Alaska. The dwarf shrubs were the following: *Arctostaphylos rubra*, *Diapensia lapponica*, *Empetrum nigrum*, *Harimanilla stellariana*, *Loiseleuria procumbens*, *Luetkea pectinata*, *Salix rotundifolia*, and *Vaccinium uliginosum*. The graminoid species were: *Carex circinata*, *Carex microchaeta*, *Carex micropoda*, *Carex* cf. *nigricans*, *Festuca altaica*, *Hierochloe alpina*, *Luzula arcuata*, *Poa arctica*, and *Poa alpina*. The forbs included: *Antennaria monocephala*, *Artemisia arctica*, *Campanula lasiocarpa*, *Gentiana glauca*, *Geum rossii*, *Huperzia selago*, *Lycopodium alpinum*, *Minuartia macrocarpa*, *Saxifraga bronchialis*, and *Sibbaldia procumbens*.



Fig. 3. PBO site (thick arrow) and the saddle northeast of the site (thin arrow). The rare *Carex phaeocephala* was found at the saddle and where the photo was taken.

At the saddle approximately 200 m to the northeast of the proposed monument site at 60.08228°N, 152.62263°W, small amounts of exposed and eroding mudstone were present (Fig. 3.). This habitat is similar to the *Arabis* site at Saddle Mountain; however, no *Arabis* plants were located after a thorough search. The habitat was small dark mudstone outcrops with small areas of eroded fine rocks surrounded by larger weathered talus of perhaps sand stone. The ground was well drained with about 90% bare ground. The site slopes gently to the southeast and is precipitously steep to the northwest, where a large puffin rookery is located. Snow appears to persist late into the summer at the saddle and a small snowmelt pond was also present. The vascular plant species found in this area was the dwarf shrub species: *Phyllodoce aleutica*; the ferns: *Cryptogramma acrostichoides*, *Polystichium lonchitis*, the graminoid species: *Carex* cf. *lachenalii*, *Carex phaeocephala*, *Draba stenoloba*, *Festuca brachyphylla*, *Juncus drummondii*, *Juncus mertensiana*, *Luzula arcuata*, *Phleum alpinum*, *Trisetum spicatum*; and the forbs: *Anemone narcissiflora*, *Antennaria alpina*, *Cardamine bellidifolia*, *Epilobium anagallidifolium*, *Epilobium latifolium*, *Minuartia obtusiloba*, *Oxyria digyna*, *Polemonium boreale*, *Potentilla villosa*, *Sagina saginoides*, *Saxifraga nelsoniana*, *Saxifraga ferruginea*, *Silene acaulis*, and *Stellaria longipes*. One of these species, *Carex phaeocephala*, is uncommon globally and rare within Alaska (AKNHP Tracking List 2007). This alpine sedge was observed at a few other sites in the Chigmit Mountains during 2005 surveys on barren talus moraines and because its habitat is difficult to access, its rarity may be partially the result of low collection intensity. Additionally,

Carex phaeocephala inhabits loose talus recently deglaciated, suggesting that it tolerates significant ground disturbance and can disperse to new sites.

I hiked to the highest local point, above the monument site at 60.08127°N, 152.62631°W, elevation 3,053 ft. This area was a well vegetated alpine graminoid-shrub tundra site with richer soils and numerous marmot burrows. The species present at this location were the dwarf shrubs: *Empetrum nigrum*, *Luetkea pectinata*, *Salix rotundifolia*, *S. arctica*, and *Vaccinium uliginosum*; graminoid species were: *Agrostis alaskana*, *Festuca altaica*, *Poa alpina*, *Poa arctica*, *Carex microchaeta*, *Carex phaeocephala*, and *Luzula arcuata*. *Artemisia arctica*, *Antennaria alpina*, *Antennaria monocephala*, *Geranium erianthum*, *Solidago multiradiata*, and *Stellaria longipes*, were the forb species present.

Conclusions –

My assessment of the PBO monument site is that no vascular plant species of conservation concern are present and that ground disturbing activities there or around the northeast peak of Slope Mountain will not have an impact on rare plants.

References –

- AKNHP (Alaska Natural Heritage Program). 2004. Vascular Plant Tracking List. http://aknhp.uaa.alaska.edu/botany/Botany_tracking_page.htm. University of Alaska Anchorage.
- Carlson, M. L., R. Lipkin, and J. A. Michaelson. 2005. Southwest Network of National Parks: Vascular Plant Inventory Summary Report. 37 pp. Cooperative Agreement between National Park Service, Southwest Alaska Network and Alaska Natural Heritage Program, UAA.
- Cook, M. B., C. A. Roland. 2002. Notable vascular plants from Alaska in Wrangell-St. Elias National Park and Preserve with comments on the floristics. *Canadian Field-Naturalist* 116:192-304.