

ECOLOGICAL RESERVE #68 - GLADYS LAKE
Permanent plots, established August 17 - 21, 1988,
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Nov. 1988

A) P L O T D E S C R I P T I O N S

NOTE:

Each plot consists of a vegetation plot and a trail plot. All vegetation plots are circular with a radius of 2 meters and are marked by an aluminum pin protected by a small rock cairn. All trail plots are lines perpendicular to the trail direction. Measurements are to the trail center. Vegetation plots were selected to be representative of the plant cover and soils that occurred originally in the trail location. Vegetation cover/abundance estimates are according to the Braun-Blanquet scale.

Photographic documentation includes a trail- and a vegetation photo for each plot. To be repeatable for comparative purposes, photographs were taken using the same focal length (58 mm), in each case. Distances and directions were recorded. The distance is 3.5 m where not otherwise indicated in the plot description.

Descriptions of plot locations are by landmarks on the ground, but additional use of the stereo air photographs are recommended for plot relocation, as some land forms and topographic features referred to in the descriptions may be better visible on the air photos than on the ground. All plot locations are marked by orange dots and numbers on air photos B.C.5428: 283 and B.C.5429: 58.

Plot 1

To locate plot: Field-locate by air photo the largest of the small lakes that occur on the height of Danihue Pass, then locate top of esker to the N of lake that parallels the trail and is marked by a rock covered with orange (Xanthoria) lichens.

Trail Plot: short distance 7 degrees from rock, at intersection with trail.

Vegetation Plot: N of and adjacent to trail.

5 Festuca altaica
3 Salix reticulata
2 Salix barrattiana
2 Artemisia arctica
2 Carex microchaeta
1 Potentilla diversifolia trail photo 1/18
+ Senecio pauciflorus veget.photo 1/17
+ Aconitum delphinifolium (directions not recorded)
r Salix glauca
r Erigeron humilis
r Veronica wormskjoldii



Plot 1 (Photo 1/17). Altai fescue community
on moderately well-drained soil.



Plot 1 (Photo 1/18). Trail in good condition. Trail profile
19 cm deep.

r *Ranunculus nivalis*
2 *Cladina alpestris*
2 *Aulacomnium palustre*
1 *Hylocomium splendens*
r *Polytrichum juniperinum*
r all other mosses and lichens

Plot 2

To locate plot: Follow trail NE from where it fords the upper Eaglenest Cr. appr. 150 m (uphill) to a stand of trees, then measure 70 m along trail from NE edge of timber to a pointed rock (2 m diam.) located 4 m S of centreline of trail.

Trail Plot: as described

Vegetation Plot: 7 m 307 degrees from point of described rock

5 *Betula glandulosa*
3 *Calamagrostis canadensis*
2 *Epilobium angustifolium*
2 *Polemonium acutiflorum*
1 *Rubus arcticus*
1 *Artemisia arctica*
+ *Festuca altaica*
4 *Ptilium crista-castrensis*
3 *Pleurozium schreberi*
2 *Hylocomium splendens*
+ *Cladina mitis*
+ *Peltigera aphthosa*
r *Cladina rangiferina*

Trail photo: from 3 m distance
Veget. photo: from 4 m, looking E

Plot 3

To locate plot: Proceed ca. 550 m NE (uphill) from stand of timber mentioned for plot 2 to a prominent grassy draw that is crossed at a right angle by the trail. The trail splits into two in this draw.

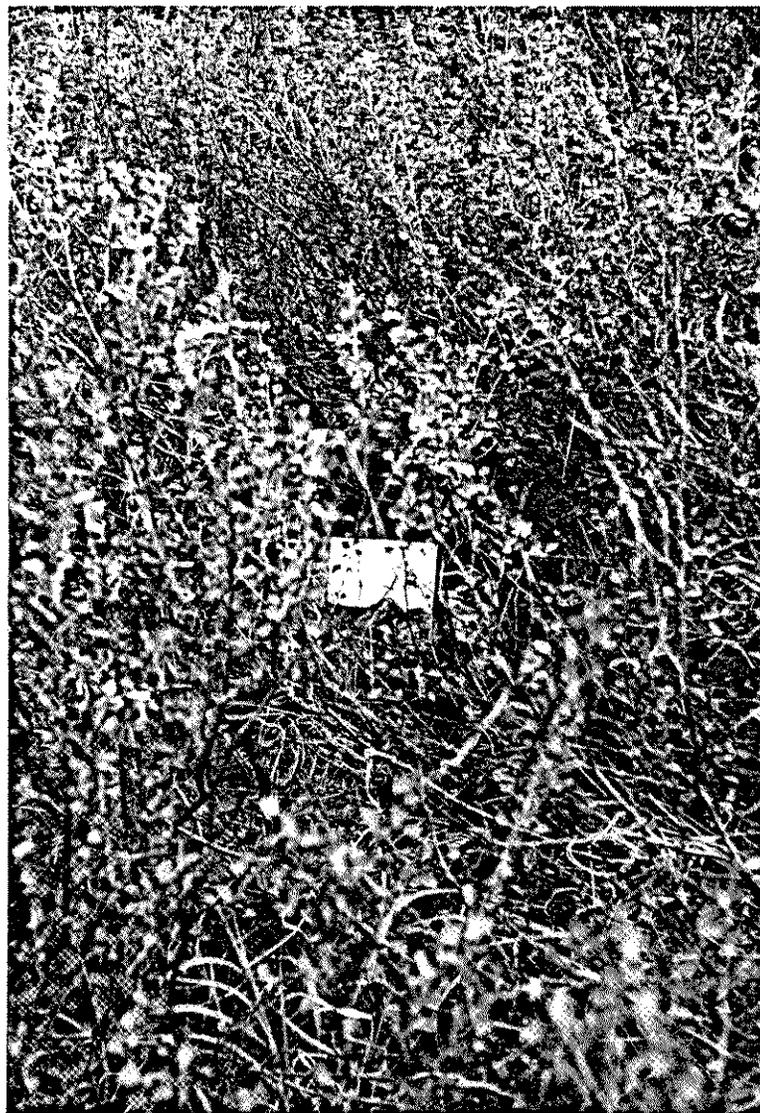
Trail Plot: 7.8 m from the SW margin of the draw, as marked by edge of shrub vegetation, and 11.5 m from the NE margin of the draw.

Vegetation Plot: plot centre is 3.5 m 7 degrees from trail plot.

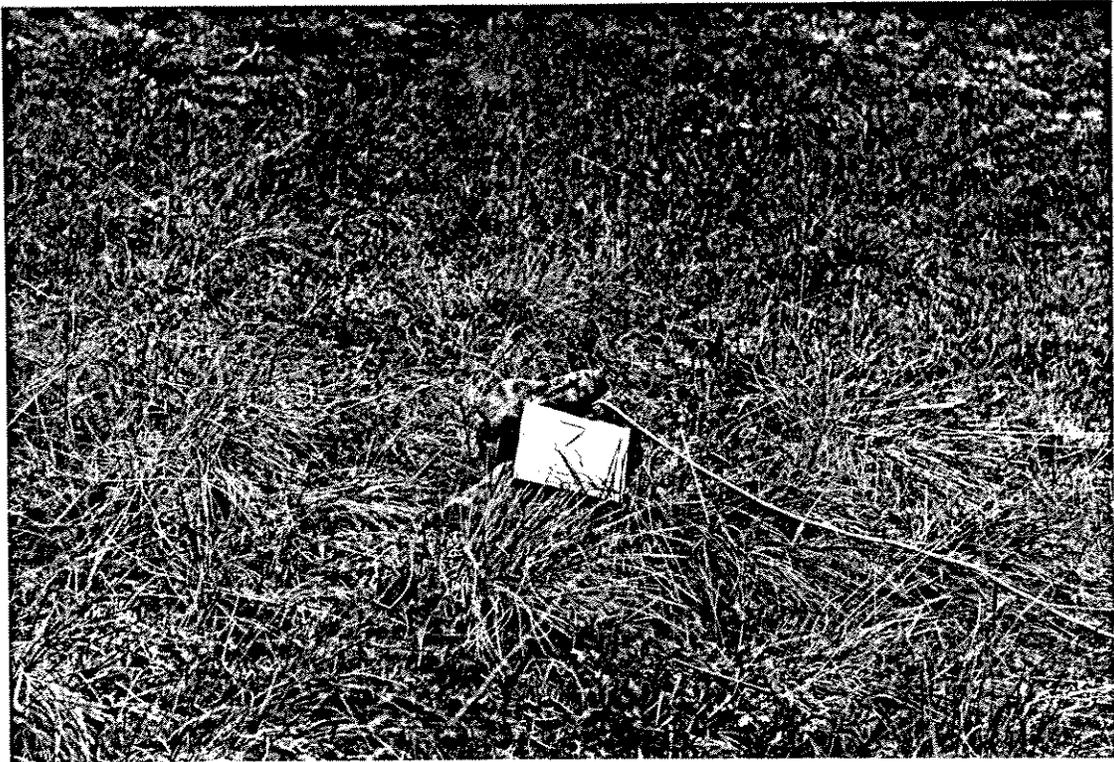
3 *Festuca altaica*
3 *Artemisia arctica*
3 *Carex microchaeta*
2 *Luzula parviflora*
2 *Sibbaldia procumbens*
2 *Calamagrostis canadensis*
2 *Polemonium acutiflorum*
1 *Phleum alpinum*
+ *Veronica wormskjoldii*
+ *Poa alpina*
+ *Betula glandulosa*



Plot 2 (Photo 1/19). Trail on moderately well-drained, but bouldery soil. Trail profile 11 cm deep.



Plot 2 (Photo 1/20). Scrub birch - Canada reedgrass community.



Plot 3 (Photo 1/21). Mixed Altai fescue community.



Plot 3 (Photo 1/22). Good trail on moderately well-drained soil.
Trail profile 20 cm deep.

r *Stellaria monantha*
 r *Salix polaris*
 r *Potentilla diversifolia*
 r *Ranunculus nivalis*
 r *Polygonum viviparum*
 r *Antennaria monocephala*
 r *Erigeron humilis*
 r *Aconitum delphinifolium*
 2 *Barbilophozia hatcheri*
 2 *Cetraria islandica*
 2 *Brachythecium* sp.
 2 *Stereocaulon* sp.
 2 *Lobaria oregana*
 1 *Pleurozium schreberi*
 1 *Hylocomium splendens*
 + *Peltigera apthosa*
 + *Drepanocladus uncinatus*

Trail photo: from 3 m, looking W
 Veget. photo: from 3.5 m, looking SW

Plot 4

To locate plot: Proceed along trail about 700 m to the NE from timber stand of plot 2 to an untreed fan originating in a long runnel coming down from the mountain. At the western edge of this open area the trail is located between two 1.5 m diam. rocks. From this point backtrack along trail ca. 58 m to small rocky streambed.

Trail plot: 6.5 m NE along trail from above streambed
 Vegetation plot: 2.7 m 307 degrees from trail centreline

4 *Salix barrattiana*
 4 *Festuca altaica*
 2 *Betula glandulosa*
 2 *Mertensia paniculata*
 2 *Salix reticulata*
 2 *Carex microchaeta*
 1 *Aconitum delphinifolium*
 1 *Rubus arcticus*
 1 *Artemisia arctica*
 1 *Polemonium acutiflorum*
 + *Anemone richardsonii*
 + *Delphinium glaucum*
 r *Epilobium angustifolium*
 4 *Hylocomium splendens*
 2 *Brachythecium* sp.
 2 *Aulacomnium palustre*
 + *Dicranum* cf. *acutifolium*
 + *Dactylina arctica*
 r *Peltigera apthosa*
 r *Peltigera canina*
 r *Cladonia chlorophaea*
 r *Cladina mitis*

Trail photo: from 3.5 m, looking E
 Veget. photo: from 3.5 m, looking SE



Plot 4 (Photo 1/23). Trail through moderately moist soil with part-organic surface. Trail profile 25 cm deep.



Plot 4 (Photo 1/24). Barratt's willow - Altai fescue community

Plot 5

Plot location: On the NE edge of the same untreed fan described in plot 4, at the intersection of trail and creek that comes down from Danihue Pass.

Trail plot: 19 m SW along trail from edge of creek crossing

Vegetation plot: 3.5 m 125 degrees from trail plot

5 *Salix barrattiana*
4 *Festuca altaica*
2 *Mertensia paniculata*
2 *Artemisia arctica*
1 *Salix glauca*
1 *Polemonium acutiflorum*
1 *Anemone richardsonii*
1 *Carex microchaeta*
1 *Delphinium glaucum*
r *Stellaria monantha*
r *Artemisia tilesii*
r *Pedicularis langsдорфii*
r *Equisetum scirpoides*
3 *Hylocomium splendens*
2 *Barbilophozia hatcheri*
2 *Aulacomnium palustre*
1 *Peltigera apthosa*
1 *Brachythecium sp.*
+ *Lobaria oregana*
+ *Cetraria islandica*

Trail photo: from 3.5 m, looking NE
Veget. photo: from 3.5 m, looking NE

Plot 6

Location: W of pass, where creek originating in largest pass lake breaks through moraine

Trail plot: From centreline of creek at narrowest point in moraine 51 m 312 degrees to point on trail. This point is also 13 m E along trail from a 1 m diam. rock on the southern edge of the trail.

Vegetation plot: 5.1 m 132 degrees from trail plot

NOTE: occasional grazing seems evident

3 *Deschampsia atropurpurea*
3 *Carex microchaeta*
3 *Luzula parviflora*
2 *Juncus drummondii*
2 *Trisetum spicatum*
2 *Sibbaldia procumbens*
2 *Artemisia arctica*
2 *Phleum alpinum*
1 *Festuca altaica*
1 *Senecio triangularis*
1 *Calamagrostis canadensis*
+ *Senecio pauciflorus*
+ *Veronica wormskjoldii*
+ *Salix glauca*
+ *Gentiana glauca*



Plot 5 (Photo 1/26). Trail in good condition. Trail profile 15 cm deep.



Plot 5 (Photo 1/27). Barratt's willow - Altai fescue community on soil with part-organic surface.



Plot 6 (Photo 1/30). Trail in good condition on moderately well-drained soil. Trail profile 18 cm deep.



Plot 6 (Photo 1/31). Mixed sedge - grass community.

+ Carex nigricans
 + Salix polaris
 r Ranunculus nivalis
 r Antennaria monocephala
 3 Barbilophozia hatcheri
 2 Campylium stellatum
 1 Drepanocladus uncinatus
 1 Peltigera apthosa
 1 Stereocaulon sp.
 + Brachythecium sp.
 + Aulacomnium palustre
 + Pleurozium schreberi
 + Peltigera canina
 + Lobaria oregana
 + Cetraria islandica
 + Polytrichum juniperinum
 r Cladonia cornuta
 r Cladonia cf. pyxidata

Trail photo: from 3.5 m, looking SW
 Veget.photo: from 3.5 m, looking SE

Plot 7

To locate plot: Follow trail E from the largest of the small lakes on the pass to just past second lake. In this area the trail passes between two lone subalpine fir bushes. A big rock is located on the left at the W entrance to the bushes.

Trail plot: 24 m (straight line) from big rock
 Vegetation plot: 3.5 m 97 degrees from trail plot

4 Festuca altaica
 3 Salix barrattiana
 2 Salix alaxensis
 2 Betula glandulosa
 2 Salix reticulata
 2 Carex microchaeta
 1 Mertensia paniculata
 1 Aconitum delphinifolium
 1 Artemisia arctica
 1 Solidago multiradiata
 1 Polemonium acutiflorum
 + Senecio lugens
 + Anemone richardsonii
 + Antennaria microphylla
 + Luzula parviflora
 + Trisetum spicatum
 + Potentilla diversifolia
 + Potentilla fruticosa
 + Polygonum viviparum
 r Antennaria monocephala
 r Poa alpina
 r Stellaria monantha
 r Rubus arcticus
 r Gentianella amarella
 4 Cetraria islandica

Trail photo: from 3.5 m, looking NE
 Veget.photo: from 3.5 m, looking W



Plot 7 (Photo 1/32). Trail on slightly moist soil with part-organic surface. Trail profile 11 cm deep (note little used old track on left).



Plot 7 (Photo 1/33). Altai fescue - Barratt's willow - scrub birch community.

3 Cetraria cucullata
 3 Hylocomium splendens
 2 Cladonia mitis
 2 Aulacomnium palustre
 + Cladonia coccinea
 + Cladonia chlorophaea
 r Dactylina arctica

Plot 8

To locate plot: Coming from pass and going E, follow trail across upper large outwash terrace, then across lower one. This is the middle one of the three large terraces at different levels that are crossed by the trail (compare air photo). From edge of terrace, where trail starts to descend steeply, follow trail for 122 m. This plot is located on or near the NE boundary of the ecological reserve.

Trail plot: From distinctive circular Abies clump above trail measure 9 m 87 degrees to find trail plot.

Vegetation plot: 3.8 m 87 degrees (further downhill) from trail plot.

3 Heracleum lanatum
 3 Epilobium angustifolium
 3 Artemisia arctica
 2 Festuca altaica
 2 Aconitum delphinifolium
 2 Vaccinium caespitosum
 2 Mertensia paniculata
 2 Abies lasiocarpa
 2 Lupinus arcticus
 1 Arnica cordifolia
 1 Arnica mollis
 1 Potentilla diversifolia
 1 Senecio triangularis
 1 Aquilegia formosa
 1 Castilleja unalascensis
 + Gentianella amarella
 + Agoseris aurantiaca
 + Rubus arcticus
 r Salix reticulata
 r Orthilia secunda
 r Achillea millefolium
 r Cornus canadensis
 3 Barbilophozia hatcheri
 2 Drepanocladus uncinatus
 + Pleurozium schreberi
 + Stereocaulon sp.
 r Cladonia impexa
 + (total) other undet. bryophytes

Trail photo from 3.5 m, looking W
 Veget. photo from 3.5 m, looking S



Plot 8 (Photo 1/36). Lush mixed herb-grass community near tree line.



Plot 8 (Photo 1/37). This trail on a colluvial soil and a steep slope shows erosion damage. Trail profile 43 cm deep.

Plot 9

To locate plot, start from eastern edge of largest outwash terrace as in plot 8 (just inside NE boundary of reserve). Follow trail SW (towards pass) 27 m to a distinctive rock (75 cm diam.) on the left edge of the trail.

Trail Plot: 62 m along trail towards pass

Vegetation Plot: In an area of frost humps 3.8 m 347 degrees from trail plot.

4 Festuca altaica
3 Artemisia arctica
2 Salix glauca
2 Potentilla diversifolia
2 Salix polaris
2 Luzula parviflora
2 Sibbaldia procumbens
1 Betula glandulosa
1 Polygonum viviparum
1 Salix arctica
1 Veronica wormskjoldii
1 Carex microchaeta
+ Polemonium acutiflorum
+ Pedicularis langsдорфii
+ Gentiana glauca
r Vaccinium vitis-idaea
r Luzula spicata
3 Stereocaulon sp.
3 Cladina mitis
2 Polytrichum juniperinum
2 Lobaria oregana
2 Barbilophozia hatcheri
1 Polytrichum norvegicum
1 Cetraria islandica
1 Cladina uncinata
+ Cladonia cornuta
+ Aulacomnium palustre
+ Dicranum acutifolium
r Dactylina arctica

Trail photo: from 3.5 m, looking SW
Veget. photo: " " " "

Plot 10

To locate plot: Start on same terrace as in # 9, follow trail toward pass to near upper end of terrace to a point where trail goes through a narrow gap between subalpine firs, then 83 m to the crossing of a small creek bed.

Trail Plot: 10 m SW from creek bed

Vegetation Plot: 3.7 m 164 degrees from trail plot

5 Salix barrattiana
4 Heracleum lanatum
3 Equisetum arvense
3 Mertensia paniculata



Plot 9 (Photo 1/38). Altai fescue community on large outwash terrace (compare 1/35). Note frost hummocks.



Plot 9 (Photo 1/39). Trail on loamy soil over well-drained, gravelly sub-soil. Trail profile 22 cm.



Plot 10 (Photo 1/40). Barratt's willow community on alluvial fan with subsurface seepage.



Plot 10 (Photo 2/1). Trail in good condition, probably due to gravelly subsoil. Trail profile 12 cm deep.

2 Delphinium glaucum
 2 Festuca altaica
 2 Artemisia tilesii
 2 Calamagrostis canadensis
 1 Polemonium acutiflorum
 1 Epilobium angustifolium
 1 Artemisia arctica
 + Arenaria lateriflora
 + Luzula parviflora
 + Arnica cordifolia
 + Astragalus alpinus
 + Rubus arcticus
 + Lycopodium annotinum
 r Botrychium lunaria
 r Stellaria monantha
 2 Brachythecium sp.

Trail photo: no note
 Veget.photo: looking approx. S

Plot 11

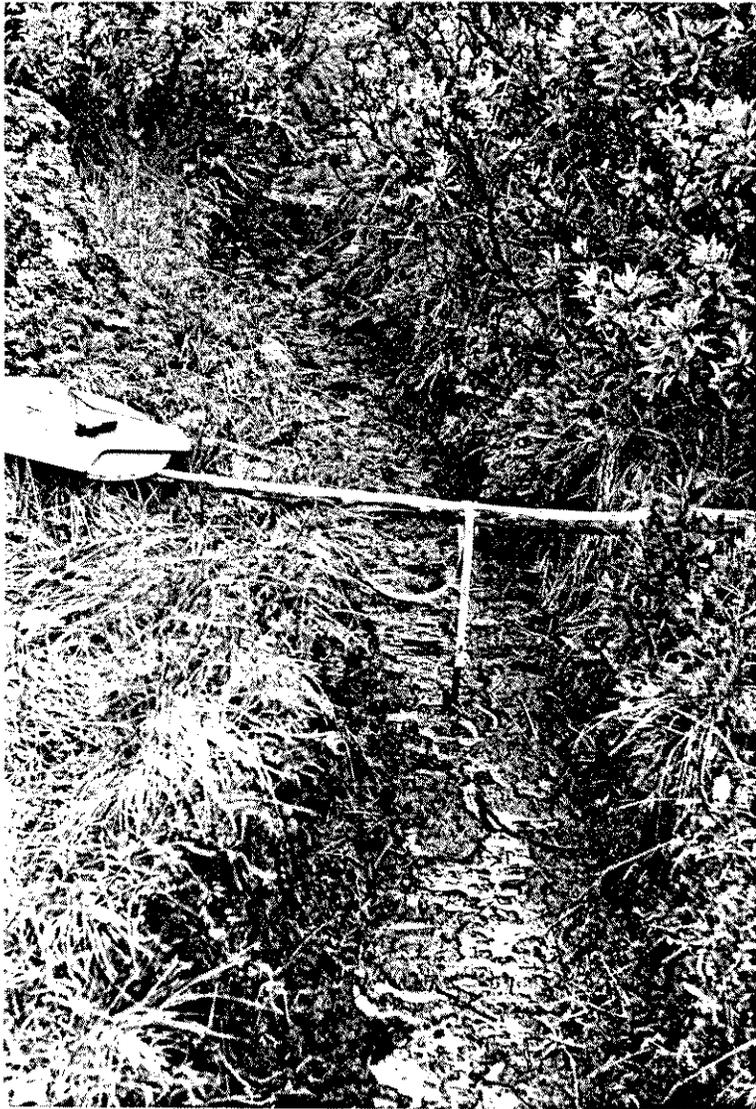
Location: On upper large terrace where trail from pass comes down and meets terrace elevation. A 1 x 1.5 m rock is located immediately on SE edge of trail.

Trail Plot: on trail next to rock (NOTE, trail consists of two tracks here)

Vegetation Plot: 6.2 m 335 degrees from centre of rock

3 Salix barrattiana
 3 Festuca altaica
 3 Artemisia arctica
 2 Senecio triangularis
 1 Arnica latifolia
 1 Aconitum delphinifolium
 1 Agoseris aurantiaca
 1 Potentilla diversifolia
 1 Gentianella amarella
 1 Vaccinium caespitosum
 + Rubus arcticus
 + Pyrola minor
 + Ranunculus nivalis
 + Polemonium acutiflorum
 + Botrychium lunaria
 + Salix reticulata
 + Achillea millefolium
 + Rumex acetosa
 r Polygonum viviparum
 r Luzula parviflora
 r Sibbaldia procumbens
 4 Hylocomium splendens
 3 Pleurozium schreberi
 2 Lobaria oregana
 2 Aulacomnium palustre
 2 Stereocaulon sp.
 1 Cladina mitis
 + Brachythecium sp.

Trail photo: looking W
 Veget.photo: looking S



Plot 11 (Photo 2/2). Slight downcutting and puddling is observed in this trail section due to moderately moist, part-organic surface soils. Trail profile 32 cm deep.



Plot 11 (Photo 2/3). Barratt's willow - Altai fescue community.

- + *Peltigera apthosa*
- + *Cladonia chlorophaea* (& others)
- r *Cladonia cornuta*

Plot 12

Location: Where trail (coming from pass and going NE) leaves irregular kames and ascends to a small terrace remnant (above upper large terrace) that overlooks the valley and is covered with very low scrub birch and lichens.

Trail Plot: 9 m E from where trail becomes level

Vegetation Plot: 2.75 m 313 degrees from trail plot

- 5 *Betula glandulosa*
- 2 *Festuca altaica*
- 2 *Vaccinium vitis-idaea*
- 1 *Polemonium acutiflorum*
- + *Stellaria monantha*
- 4 *Cladina mitis*
- 4 *Hylocomium splendens*
- 3 *Cladina alpestris*
- 3 *Cladina rangiferina*
- 3 *Cetraria cucullata*
- 3 *Polytrichum strictum*
- 2 *Pleurozium schreberi*
- + *Peltigera apthosa*
- + *Dactylina arctica*
- + *Cladonia cornuta*
- r *Ptilium crista-castrensis*

Trail photo: looking E
Veget. photo: looking SE

Plot 13

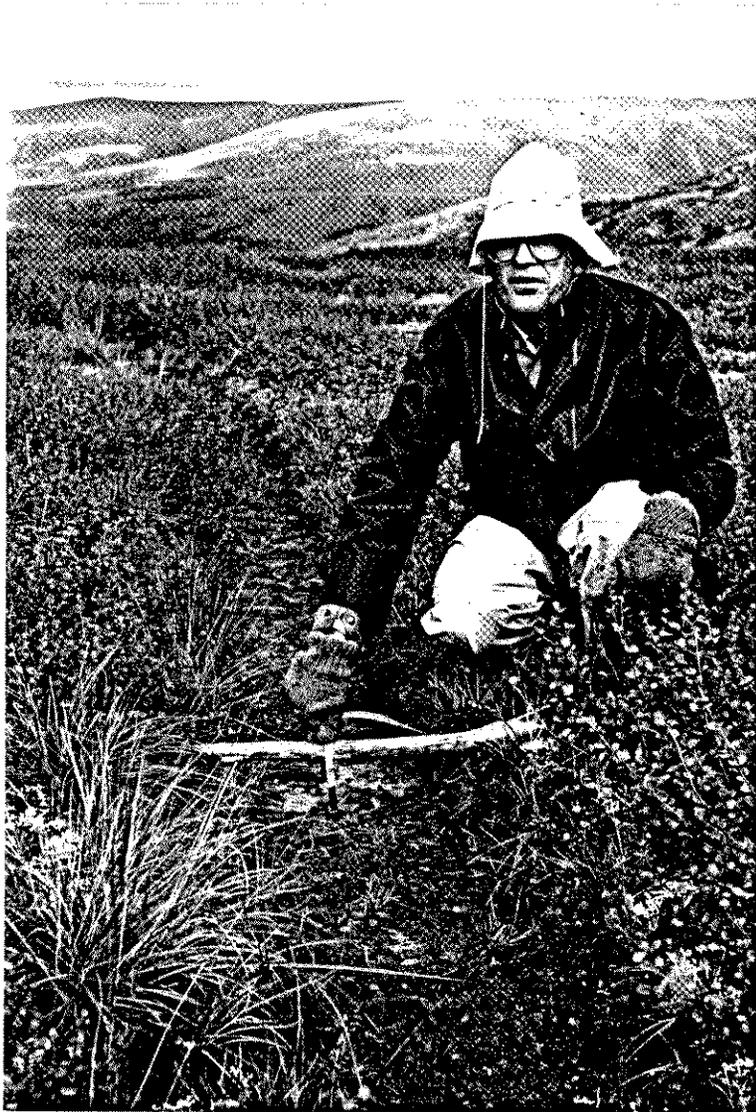
Location: Several small kettle lakes are located about 1/2 km NE of the pass. About 200 m NE of the last kettle lake the trail descends to lush willow flats along the main creek flowing to Black Fox Lake.

Trail Plot: 19 m downhill along trail from start of descent. (NOTE, there are two trails, one of them weak.)

Vegetation Plot: 3 m 91 degrees (down-slope) from trail plot

- 5 *Cassiope mertensiana*
- 2 *Artemisia arctica*
- 1 *Phyllodoce empetrifomis*
- 1 *Betula glandulosa*
- 1 *Arnica latifolia*
- 1 *Senecio triangularis*
- 1 *Lycopodium alpinum*
- 1 *Festuca altaica*
- 1 *Salix glauca*
- 1 *Empetrum nigrum*
- 1 *Salix arctica*
- + *Pleum alpinum*
- + *Sibbaldia procumbens*

Trail photo: looking SW
Veget. photo: looking NE



Plot 12 (Photo 2/5). Trail in good condition on well-drained soil over outwash gravels. Trail profile 14 cm.



Plot 12 (Photo 2/6). A very low scrub birch - lichen community occurs on this poor and dry site.



Plot 13 (Photo 2/8). The trail is in good condition despite the steep grade on this well-drained, stony soil. Trail profile 14 cm deep.



Plot 13 (Photo 2/9). White mountain heather community indicative of long-lasting snow cover.

+ Hieracium gracile
 + Vaccinium caespitosum
 + Carex cf. albonigra
 + Lycopodium annotinum
 r Polemonium acutiflorum
 r Luzula parviflora
 r Epilobium alpinum
 r Campanula lasiocarpa
 3 Barbilophozia hatcheri
 1 Cetraria islandica
 1 Cladonia ecmocyna
 1 Polytrichum juniperinum
 1 Polytrichum norvegicum
 + Cladina mitis
 r Dicranum sp.

Plot 14

Location: Plot located between # 12 and # 13. From start of descent described in plot 13 follow trail NE 182 m to a ca. 1 m diam. rock on right (SE) side of trail, then 93 m to where creek comes closest to the SE-facing wooded slope. Locate scattered boulders (50-100 cm diam.) on creek side of trail (creek visible from this area through grassy gap in bushes).

Reference point is the centre between the four largest (flattish) boulders.

Trail Plot: 18 m 57 degrees from reference point. NOTE, that the trail is braided and that the veg.plot is traversed by an old overgrown trail.

Vegetation Plot: 4 m 14 degrees from trail plot

5 Salix barrattiana
 3 Artemisia arctica
 3 Epilobium arcticum
 2 Carex microchaeta
 2 Aconitum delphinifolium
 2 Epilobium angustifolium
 2 Festuca altaica
 1 Senecio triangularis
 1 Polygonum viviparum
 1 Salix reticulata
 1 Mertensia paniculata
 + Achillea millefolium
 + Polemonium acutiflorum
 + Petasites frigidus
 + Veronica wormskjoldii
 + Caltha leptosepala
 + Pedicularis langsдорфii
 + Potentilla diversifolia
 + Anemone richardsonii
 + Delphinium glaucum
 r Stellaria monantha
 r Oxyria digyna

Trail photo: looking SW
 Veget.photo: looking E



Plot 14 (Photo 2/13). Barratt's willow community.



Plot 14 (Photo 2/14). Moist to wet soils with part-organic surface have resulted in muddy and incised trail sections that are abandoned, while new tracks are forming. Trail profile 35 cm deep.

r *Rubus arcticus*
2 *Aulacomnium palustre*
2 *Hylocomium splendens*
1 *Drepanocladus revolvens*
1 *Barbilophozia hatcheri*
+ *Brachythecium* sp.

Plot 15

Location: In lush green floodplain of a tributary stream coming off mountain slope and joining the main creek from the NW. This area is located between the two largest of the kettle lakes mentioned in the description of plot 13 (SW of stream crossing). The stream rounds the SE promontory of a kame near the trail in a sharp bend.

Trail Plot: 15.3 m 190 degrees from the tallest willow bush on the S end of the promontory. NOTE, that a secondary trail is just forming here.

Vegetation plot: 2.6 m 339 degrees from trail plot

5 *Salix barrattiana*
3 *Calamagrostis canadensis*
3 *Epilobium angustifolium*
3 *Mertensia paniculata*
3 *Artemisia tilesii*
2 *Delphinium glaucum*
2 *Polemonium acutiflorum*
1 *Oxyria digyna*
+ *Rubus arcticus*
+ *Aconitum delphinifolium*
r *Stellaria monantha*
r *Ranunculus nivalis*
r *Stellaria longipes*
r *Arabis hirsuta*
r *Carex* sp.
3 *Brachythecium* sp.

Trail photo: looking W
Veget. photo: looking W

Plot 16

Location: E of highest point on Danihue Pass. Proceeding SW from the largest of the kettle lakes, trail passes narrow neck between two lakes (lakes connected by stream, but connection may be flooded at high water). After about another 80 m and a small rise, a further, smaller pond is located on the left (to the S) of the trail (this may be only a collection of round rocks under drought conditions).

Trail Plot: 8.5 m 318 degrees from 1 m boulder on pond's SW shore
Vegetation Plot: 14.5 m 318 degrees from said boulder

4 *Carex microchaeta*
3 *Carex scirpoidea*



Plot 15 (Photo 2/16). Barratt's willow community on periodically wet alluvial fan.



Plot 15 (Photo 2/17). Despite firm ground a secondary trail has formed here, probably due to flooding at snowmelt. Trail profile 15 cm deep.



Plot 16 (Photo 2/18). Mixed sedge community in a seepy area.



Plot 16 (Photo 1/19). Due to soft, part-organic and wet surface soils and large stones, considerable trampling has taken place here and the trail is poorly defined. Trail "profile" 10 cm deep.

3 *Epilobium latifolium*
 2 *Arnica lessingii*
 2 *Festuca altaica*
 2 *Salix reticulata*
 2 *Potentilla diversifolia*
 1 *Juncus mertensianus*
 1 *Polygonum viviparum*
 1 *Salix polaris*
 1 *Anemone richardsonii*
 + *Solidago multiradiata*
 + *Artemisia arctica*
 + *Pedicularis langsдорфii*
 + *Petasites frigidus*
 + *Parnassia fimbriata*
 + *Anemone parviflora*
 r *Aconitum delphinifolium*
 r *Veronica wormsjoldii*
 r *Trisetum alpinum*
 r *Equisetum variegatum*
 r *Poa alpina*
 r *Agrostis scabra*
 + *Cladonia* spp. and indet. bryophytes (vegetative)

Trail photo: looking NE
 Veget. photo: looking SE

Plot 17

To locate plot: identify largest of the lakes occurring on Danihue Pass (air photo). From third lake counting toward the NE, 317 degrees to trail that is located in a small valley.

Trail Plot: 36 m 52 degrees from a pointed 0.75 m diam. rock located on NW edge of trail. NOTE multiple trail formation (compare photo).

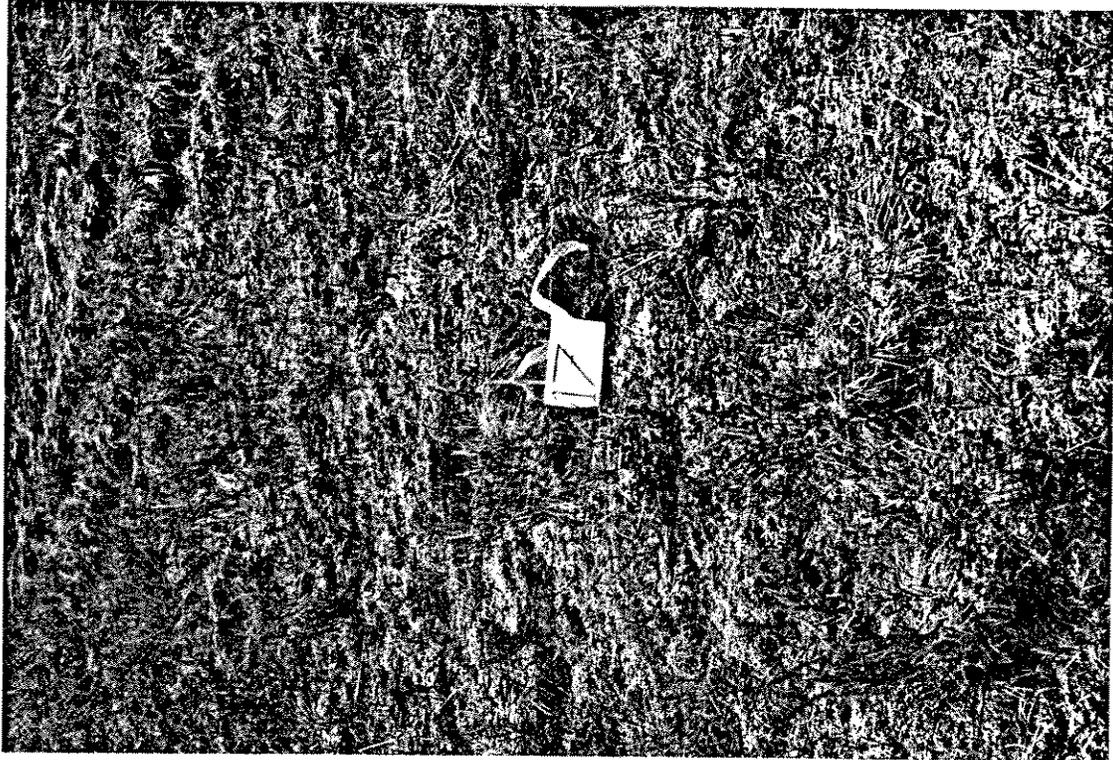
Vegetation Plot: 3.6 m 137 degrees from trail plot on main trail
 NOTE, this plot shows considerable trampling impact, especially to the lichen flora.

4 *Sibbaldia procumbens*
 3 *Festuca altaica* (grazed)
 3 *Luzula* cf. *spicata*
 3 *Carex microchaeta*
 2 *Calamagrostis canadensis*
 2 *Carex scirpoidea*
 2 *Carex lachenalii*
 1 *Petasites frigidus*
 1 *Potentilla diversifolia*
 1 *Antennaria alpina*
 1 *Salix polaris*
 1 *Viola palustris*
 + *Rubus arcticus*
 + *Juncus drummondii*
 + *Veronica wormskjoldii*
 + *Polygonum viviparum*
 r *Salix barrattiana*

Trail photo: looking SW
 Veget. photo: looking W



Plot 17 (Photo 2/21). Strongest form of trail braiding observed in the entire area in a flat trail section (compare photo 1/9). Multiple trails form here despite favourable soils, probably because this small basin has long-lasting snow cover and very wet conditions at snow melt. Trail profile 20 cm deep.



Plot 17 (Photo 2/20). Mixed grass-herb-lichen community with slight grazing and trampling impact.

r Artemisia arctica
3 Stereocaulon sp.
2 Cladina mitis
1 Pleurozium schreberi
1 Cladina rangiferina
+ Polytrichum juniperinum
+ Dicranum acutifolium
+ Hylocomium splendens
+ Lobaria oregana

Plot 18

Location as in plot 1, i.e. find high point on esker N of largest lake (air photo !) on the pass, marked by distinctive rock with orange lichens. From here due N to trail (plot 1).

Trail Plot: 86 m (straight line) 209 degrees from plot 1. NOTE that there are two unused trails paralleling the active trail, one eroded to gravelly base and another one growing back to the native vegetation.

Vegetation Plot: 7.2 m 297 degrees from active trail

4 Salix barrattiana
4 Epilobium angustifolium
3 Artemisia arctica
3 Festuca altaica
3 Delphinium glaucum
2 Mertensia paniculata
1 Valeriana sitchensis
1 Luzula parviflora
+ Carex microchaeta
+ Rubus arcticus
+ Petasites frigidus
+ Senecio lugens
+ Polemonium acutiflorum
+ Pyrola minor
+ Anemone richardsonii
r Saxifraga tricuspadata
r Stellaria monantha
r Arabis hirsuta
r Senecio pauciflorus
1 Peltigera aphthosa
+ Hylocomium splendens

Trail photo: looking SW
Veget. photo: looking W

Plot 19

Location: About 1 km SW of Danihue Pass and about 250 m uphill from creek crossing. Wet trampled trail section with a clump of trees to the N and a 1.75 m diam. rock to the S of trail.

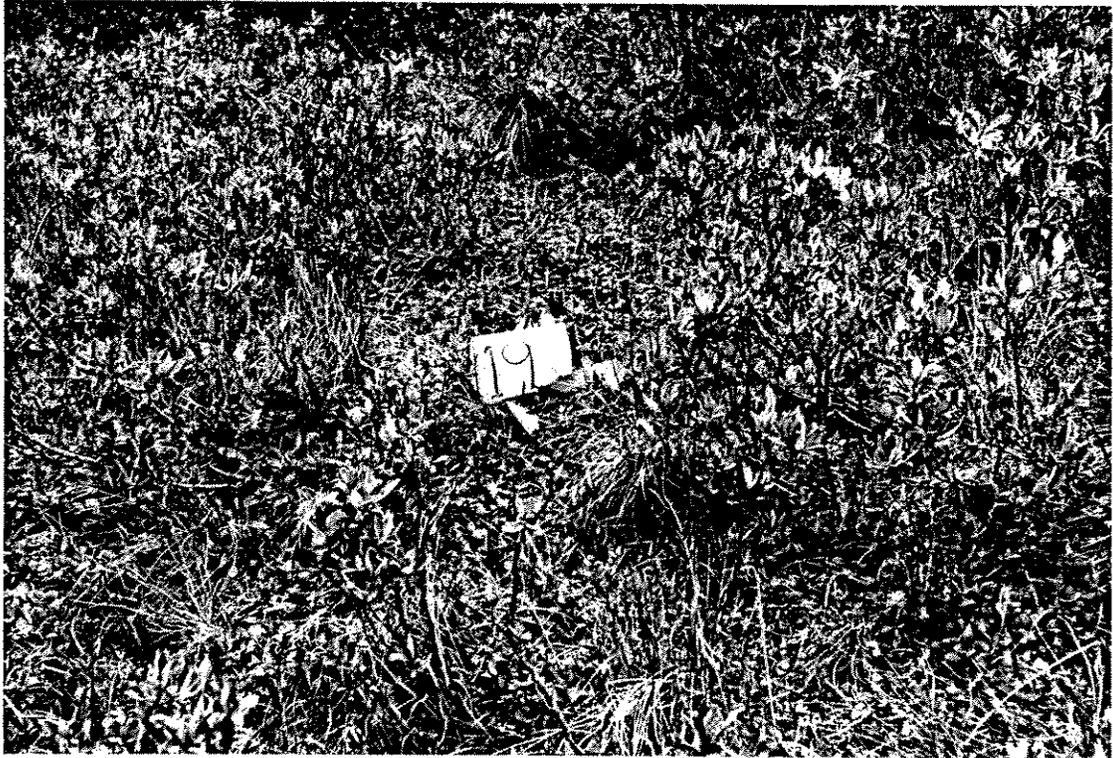
Trail Plot: 13.8 m 31 degrees from peak of said rock
Vegetation Plot: 4.8 m 312 degrees from trail plot



Plot 18 (Photo 2/22). Mixed Barratt's willow-herb-grass community.



Plot 18 (Photo 2/23). Active trail on moderately well-drained till material. Two abandoned and regenerating parallel trails indicate that there must be at least periodic poor trail condition, probably at snow melt. Trail profile 19 cm deep.



Plot 19 (Photo 2/24). Barratt's and netted willow community on a sloping seepage site.



Plot 19 (Photo 2/25). Seepage throughout the used season has made this trail section one of the worst, with severe trampling impact showing in the mud and the beginning of water erosion. Trail profile 22 cm deep.

4 Salix reticulata
3 Salix barrattiana
3 Festuca altaica
3 Carex microchaeta
2 Petasites frigidus
2 Equisetum arvense
1 Pedicularis langsдорffii
1 Senecio triangularis
1 Polygonum viviparum
+ Salix alaxensis
+ Cerastium arvense
+ Polemonium acutiflorum
+ Stellaria monantha
+ Mertensia paniculata
+ Aconitum delphinifolium
+ Artemisia arctica
+ Veronica wormskjoldii
3 Aulacomnium palustre
1 Hylocomium splendens
r Thuidium abietinum

Trail photo: looking SW

Veget. photo: looking SW

Plot 20

To locate plot: ascend from upper Eaglenest Creek crossing ca. 0.6 km toward pass. When passing through last row of scattered trees, a very large boulder (ca. 8 m diam.) is seen about 50 m SE of trail. Proceeding another 40 m another boulder is seen on the same side.

Trail Plot: 24 m 305 degrees from NW face of said second boulder.

NOTE, there are several old parallel trails now growing over

Vegetation Plot: 9.2 m 305 degrees from same

5 Betula glandulosa
3 Festuca altaica
2 Linnaea borealis
1 Epilobium angustifolium
1 Empetrum nigrum
+ Salix alaxensis
r Vaccinium vitis-idaea
r Stellaria monantha
4 Cladina alpestris
4 Pleurozium schreberi
3 Cladina rangiferina
1 Peltigera malacea
1 Cladonia cornuta
1 Dicranum acutifolium
1 Cladonia sylvatica
+ Cetraria cucullata
r Dactylina arctica
r Cladonia fimbriata

Trail photo: looking NE

Veget. photo: looking S



Plot 20 (Photo 2/26). Trail on a steep, well-drained section, without problems. Several overgrown old trails are present, probably due to horses trying to avoid steep pitches. Trail profile 12 cm deep.



Plot 20 (Photo 2/27). Dense scrub birch vegetation is typical for such dry sites.

Plot 21

Location: Directly E of where upper Eaglenest Creek is forded by horse trail before ascending to Danihue Pass. When coming down from talus slope toward creek, note large rock (ca. 2 m diam.) in the scrub birches to the N of the trail.

Trail Plot: 26 m 239 degrees from rock (muddy trail section)

Vegetation Plot: 7.5 m 207 degrees from trail plot

4 Carex aquatilis
3 Salix alaxensis
3 Salix reticulata
2 Salix barrattiana
2 Salix glauca
2 Sanguisorba stipulata
1 Polemonium acutiflorum
1 Polygonum viviparum
1 Potentilla diversifolia
+ Betula glandulosa
+ Aster subspicatus
+ Anemone richardsonii
+ Epilobium alpinum
+ Veronica wormskjoldii
+ Agrostis scabra
+ Luzula parviflora
+ Rubus arcticus
+ Caltha leptosepala
r Phleum alpinum
r senecio pauciflorus
4 Aulacomnium palustre
3 Sphagnum cf. warnstorffii
2 Tomenthypnum nitens
1 Drepanocladus exannulatus
1 Dicranum acutifolium

Trail photo: looking W
Veget. photo: looking N

Plot 22

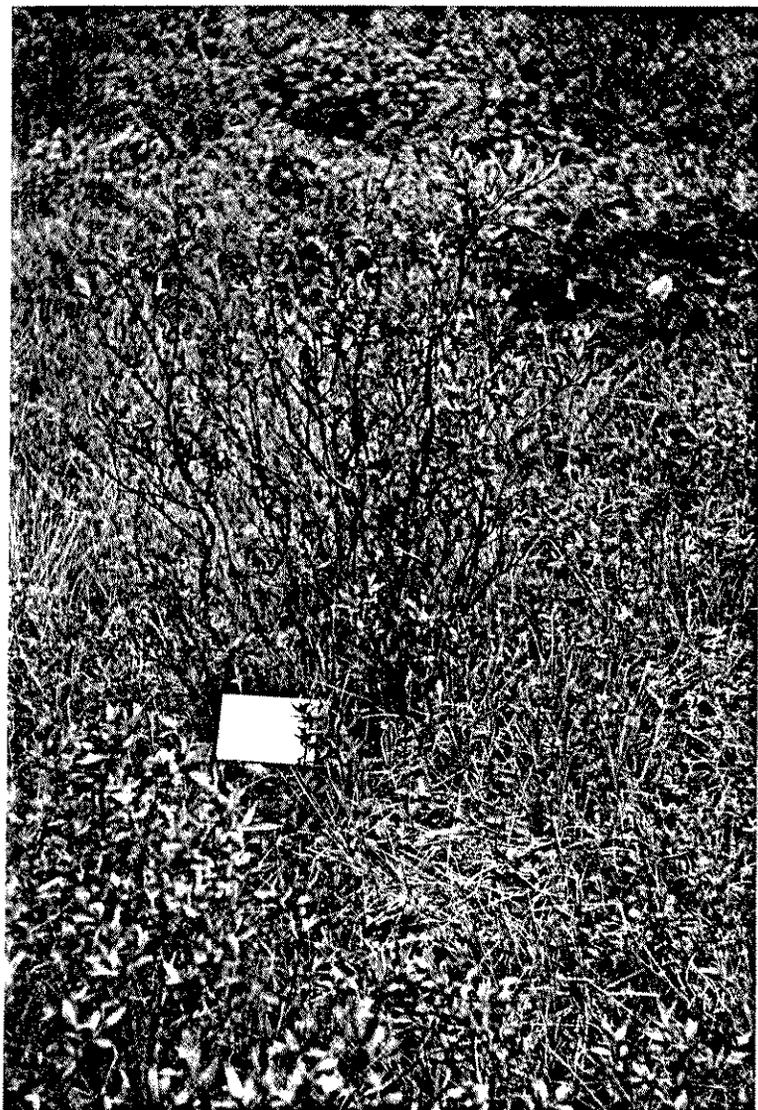
Location: SW of Nation Peak, where trail coming from Danihue/Icebox direction crosses main creek before ascending towards Bates Camp.

Trail Plot: 10.2 m up (S) along trail from edge of creek. NOTE: trail is faint despite wet ground due to low use and vigorous growth of sedges.

Vegetation Plot: 4.3 m 72 degrees from trail plot.

4 Salix barrattiana
4 Carex aquatilis
1 Salix alaxensis
1 Senecio triangularis
1 Arnica alpina
1 Calamagrostis canadensis
1 Sanguisorba stipulata
1 Valeriana sitchensis
+ Artemisia arctica

Trail photo: looking NW
Veget. photo: looking SE



Plot 21 (Photo 2/28). Wet water sedge - willow community along Eaglenest Creek.



Plot 21 (Photo 2/29). Short, muddy trail section through sedge meadow where trail crosses the creek. Trail profile 20 cm deep.



Plot 22 (Photo 2/32). Trail barely visible in tall sedges, despite wet ground. Trail profile 15 cm deep.



Plot 22 (Photo 2/33). Water sedge - Barratt's willow community. Much of the trail that goes to Bates Camp along the slope foot below Nation Peak leads through similar wet meadows.

- + Petasites frigidus
- + Polemonium acutiflorum
- + Rubus arcticus
- + Salix reticulata
- r Polygonum viviparum
- r Potentilla diversifolia
- 4 Tomenthypnum nitens
- 4 Aulacomnium palustre
- 3 Drepanocladus revolvens
- 2 Calliergon sp.
- 2 Hylocomium splendens
- 1 Philonotis sp.
- + Mnium sp.

Plot 23

Location: about 250 m N of plot 22, where trail crosses a prominent, gravelly creek bed descending from the slopes of Nation Peak (air photo). Plot is on steep bank S of creek.

Trail Plot: 17.3 m from creek bank (low to middle water). NOTE, that three trails have formed in succession due to downcutting of previous trail(s), but they begin to overgrow now.

Vegetation Plot: 8.4 m 15 degrees from trail plot

- 4 Artemisia arctica
- 3 Festuca altaica
- 2 Phleum alpinum
- 2 Arnica latifolia
- 2 Valeriana sitchensis
- 2 Vaccinium caespitosum
- 2 Deschampsia atropurpurea
- 1 Betula glandulosa
- 1 Luzula parviflora
- 1 Sanguisorba stipulata
- 1 Epilobium angustifolium
- 1 Achillea millefolium
- 1 Senecio triangularis
- 1 Sibbaldia procumbens
- 1 Aconitum delphinifolium
- + Rumex acetosa
- + Polygonum viviparum
- + Polemonium acutiflorum
- + Potentilla diversifolia
- + Rubus arcticus
- + Veronica wormskjoldii
- + Agoseris aurantiaca
- + Equisetum arvense
- r Hieracium gracile
- r Castilleja unalascensis
- r Stellaria monantha
- r Pyrola minor
- r Trientalis arctica
- 4 Aulacomnium palustre

Trail photo: looking E

Veget.photo: looking N

ECOLOGICAL RESERVE #68 - GLADYS LAKE
Permanent plots, established August 17 - 21, 1988,
H. Roemer and J. Pinder-Moss

Nov. 1988

A) P L O T D E S C R I P T I O N S

NOTE:

Each plot consists of a vegetation plot and a trail plot. All vegetation plots are circular with a radius of 2 meters and are marked by an aluminum pin protected by a small rock cairn. All trail plots are lines perpendicular to the trail direction. Measurements are to the trail center. Vegetation plots were selected to be representative of the plant cover and soils that occurred originally in the trail location. Vegetation cover/abundance estimates are according to the Braun-Blanquet scale.

Photographic documentation includes a trail- and a vegetation photo for each plot. To be repeatable for comparative purposes, photographs were taken using the same focal length (58 mm), in each case. Distances and directions were recorded. The distance is 3.5 m where not otherwise indicated in the plot description.

Descriptions of plot locations are by landmarks on the ground, but additional use of the stereo air photographs are recommended for plot relocation, as some land forms and topographic features referred to in the descriptions may be better visible on the air photos than on the ground. All plot locations are marked by orange dots and numbers on air photos B.C.5428: 283 and B.C.5429: 58.

Plot 1

To locate plot: Field-locate by air photo the largest of the small lakes that occur on the height of Danihue Pass, then locate top of esker to the N of lake that parallels the trail and is marked by a rock covered with orange (Xanthoria) lichens.

Trail Plot: short distance 7 degrees from rock, at intersection with trail.

Vegetation Plot: N of and adjacent to trail.

5 Festuca altaica
3 Salix reticulata
2 Salix barrattiana
2 Artemisia arctica
2 Carex microchaeta
1 Potentilla diversifolia trail photo 1/18
+ Senecio pauciflorus veget. photo 1/17
+ Aconitum delphinifolium (directions not recorded)
r Salix glauca
r Erigeron humilis
r Veronica wormskjoldii



Plot 1 (Photo 1/17). Altai fescue community
on moderately well-drained soil.



Plot 1 (Photo 1/18). Trail in good condition. Trail profile
19 cm deep.

r *Ranunculus nivalis*
2 *Cladina alpestris*
2 *Aulacomnium palustre*
1 *Hylocomium splendens*
r *Polytrichum juniperinum*
r all other mosses and lichens

Plot 2

To locate plot: Follow trail NE from where it fords the upper Eaglenest Cr. appr. 150 m (uphill) to a stand of trees, then measure 70 m along trail from NE edge of timber to a pointed rock (2 m diam.) located 4 m S of centreline of trail.

Trail Plot: as described

Vegetation Plot: 7 m 307 degrees from point of described rock

5 *Betula glandulosa*
3 *Calamagrostis canadensis*
2 *Epilobium angustifolium*
2 *Polemonium acutiflorum*
1 *Rubus arcticus*
1 *Artemisia arctica*
+ *Festuca altaica*
4 *Ptilium crista-castrensis*
3 *Pleurozium schreberi*
2 *Hylocomium splendens*
+ *Cladina mitis*
+ *Peltigera aphthosa*
r *Cladina rangiferina*

Trail photo: from 3 m distance
Veget. photo: from 4 m, looking E

Plot 3

To locate plot: Proceed ca. 550 m NE (uphill) from stand of timber mentioned for plot 2 to a prominent grassy draw that is crossed at a right angle by the trail. The trail splits into two in this draw.

Trail Plot: 7.8 m from the SW margin of the draw, as marked by edge of shrub vegetation, and 11.5 m from the NE margin of the draw.

Vegetation Plot: plot centre is 3.5 m 7 degrees from trail plot.

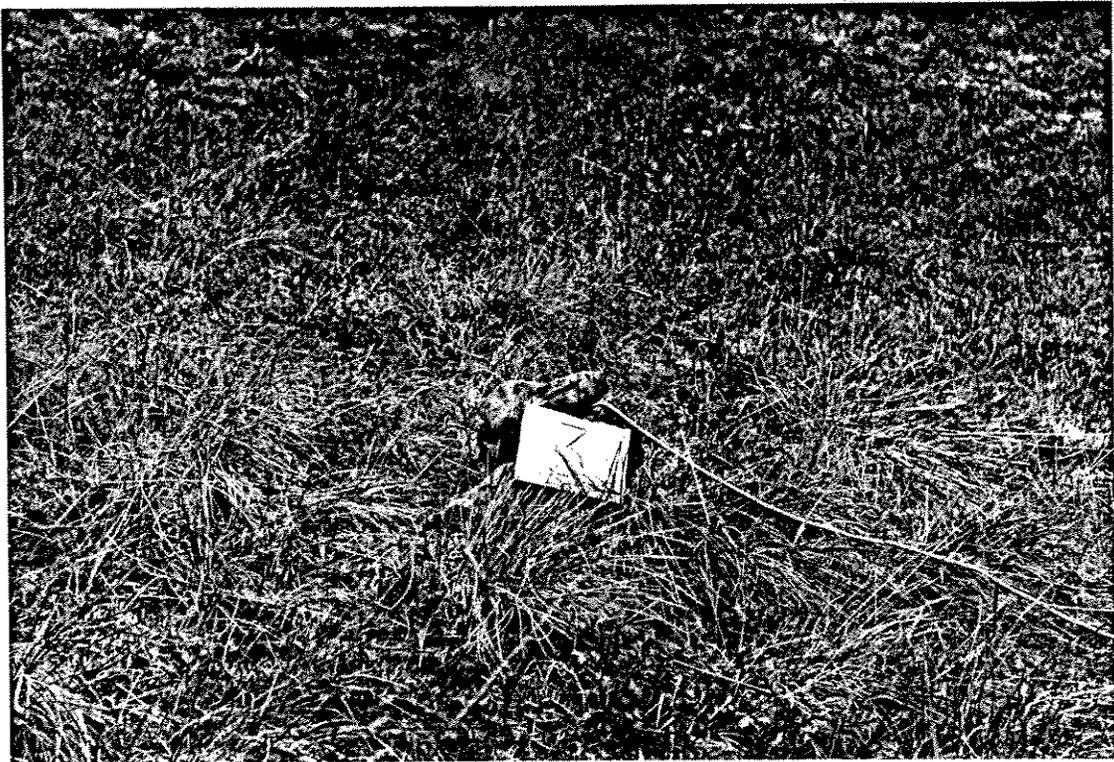
3 *Festuca altaica*
3 *Artemisia arctica*
3 *Carex microchaeta*
2 *Luzula parviflora*
2 *Sibbaldia procumbens*
2 *Calamagrostis canadensis*
2 *Polemonium acutiflorum*
1 *Phleum alpinum*
+ *Veronica wormskjoldii*
+ *Poa alpina*
+ *Betula glandulosa*



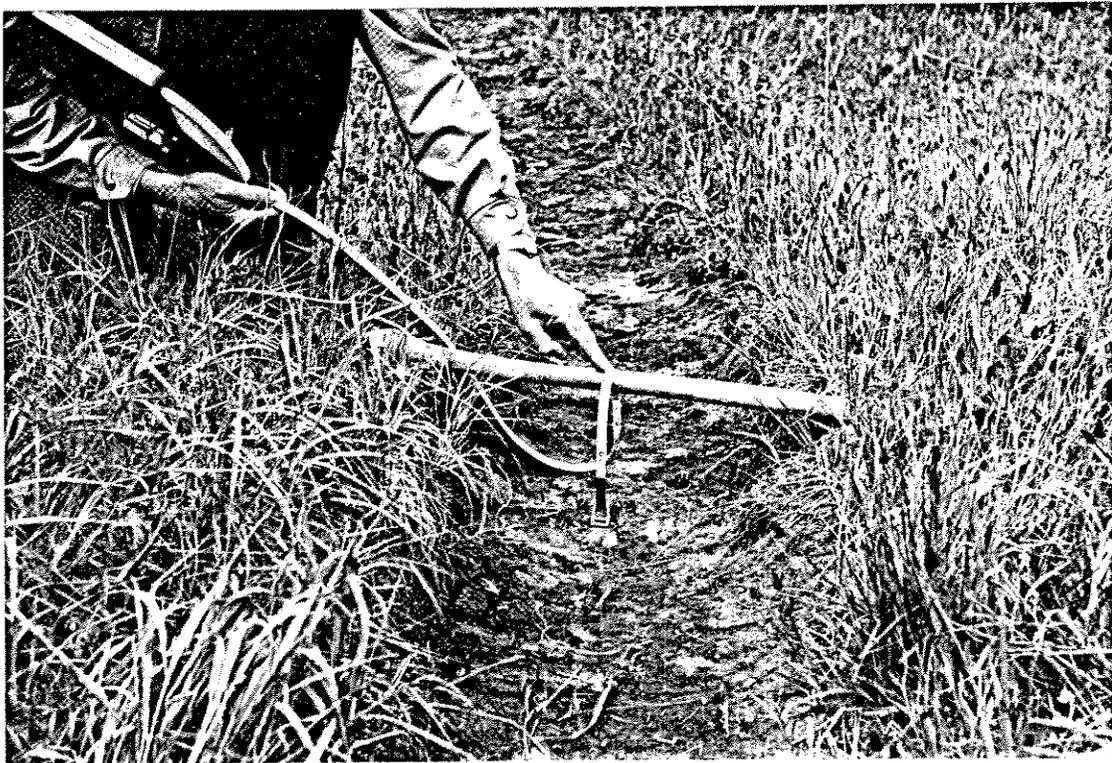
Plot 2 (Photo 1/19). Trail on moderately well-drained, but bouldery soil. Trail profile 11 cm deep.



Plot 2 (Photo 1/20). Scrub birch - Canada reedgrass community.



Plot 3 (Photo 1/21). Mixed Altai fescue community.



Plot 3 (Photo 1/22). Good trail on moderately well-drained soil.
Trail profile 20 cm deep.

r *Stellaria monantha*
 r *Salix polaris*
 r *Potentilla diversifolia*
 r *Ranunculus nivalis*
 r *Polygonum viviparum*
 r *Antennaria monocephala*
 r *Erigeron humilis*
 r *Aconitum delphinifolium*
 2 *Barbilophozia hatcheri*
 2 *Cetraria islandica*
 2 *Brachythecium* sp.
 2 *Stereocaulon* sp.
 2 *Lobaria oregana*
 1 *Pleurozium schreberi*
 1 *Hylocomium splendens*
 + *Peltigera aphthosa*
 + *Drepanocladus uncinatus*

Trail photo: from 3 m, looking W
 Veget. photo: from 3.5 m, looking SW

Plot 4

To locate plot: Proceed along trail about 700 m to the NE from timber stand of plot 2 to an untreed fan originating in a long runnel coming down from the mountain. At the western edge of this open area the trail is located between two 1.5 m diam. rocks. From this point backtrack along trail ca. 58 m to small rocky streambed.

Trail plot: 6.5 m NE along trail from above streambed
 Vegetation plot: 2.7 m 307 degrees from trail centreline

4 *Salix barrattiana*
 4 *Festuca altaica*
 2 *Betula glandulosa*
 2 *Mertensia paniculata*
 2 *Salix reticulata*
 2 *Carex microchaeta*
 1 *Aconitum delphinifolium*
 1 *Rubus arcticus*
 1 *Artemisia arctica*
 1 *Polemonium acutiflorum*
 + *Anemone richardsonii*
 + *Delphinium glaucum*
 r *Epilobium angustifolium*
 4 *Hylocomium splendens*
 2 *Brachythecium* sp.
 2 *Aulacomnium palustre*
 + *Dicranum* cf. *acutifolium*
 + *Dactylina arctica*
 r *Peltigera aphthosa*
 r *Peltigera canina*
 r *Cladonia chlorophaea*
 r *Cladina mitis*

Trail photo: from 3.5 m, looking E
 Veget. photo: from 3.5 m, looking SE



Plot 4 (Photo 1/23). Trail through moderately moist soil with part-organic surface. Trail profile 25 cm deep.



Plot 4 (Photo 1/24). Barratt's willow - Altai fescue community

Plot 5

Plot location: On the NE edge of the same untreed fan described in plot 4, at the intersection of trail and creek that comes down from Danihue Pass.

Trail plot: 19 m SW along trail from edge of creek crossing

Vegetation plot: 3.5 m 125 degrees from trail plot

5 *Salix barrattiana*
4 *Festuca altaica*
2 *Mertensia paniculata*
2 *Artemisia arctica*
1 *Salix glauca*
1 *Polemonium acutiflorum*
1 *Anemone richardsonii*
1 *Carex microchaeta*
1 *Delphinium glaucum*
r *Stellaria monantha*
r *Artemisia tilesii*
r *Pedicularis langsдорфii*
r *Equisetum scirpoides*
3 *Hylocomium splendens*
2 *Barbilophozia hatcheri*
2 *Aulacomnium palustre*
1 *Peltigera apthosa*
1 *Brachythecium sp.*
+ *Lobaria oregana*
+ *Cetraria islandica*

Trail photo: from 3.5 m, looking NE
Veget. photo: from 3.5 m, looking NE

Plot 6

Location: W of pass, where creek originating in largest pass lake breaks through moraine

Trail plot: From centreline of creek at narrowest point in moraine 51 m 312 degrees to point on trail. This point is also 13 m E along trail from a 1 m diam. rock on the southern edge of the trail.

Vegetation plot: 5.1 m 132 degrees from trail plot

NOTE: occasional grazing seems evident

3 *Deschampsia atropurpurea*
3 *Carex microchaeta*
3 *Luzula parviflora*
2 *Juncus drummondii*
2 *Trisetum spicatum*
2 *Sibbaldia procumbens*
2 *Artemisia arctica*
2 *Phleum alpinum*
1 *Festuca altaica*
1 *Senecio triangularis*
1 *Calamagrostis canadensis*
+ *Senecio pauciflorus*
+ *Veronica wormskjoldii*
+ *Salix glauca*
+ *Gentiana glauca*



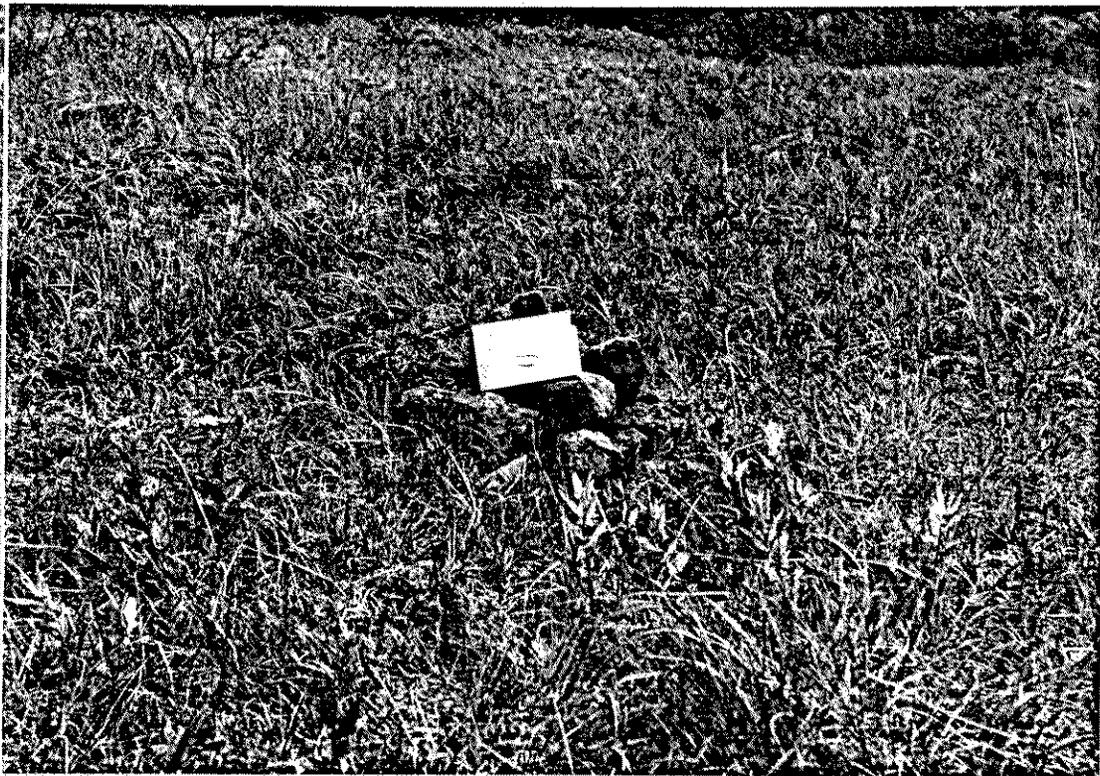
Plot 5 (Photo 1/26). Trail in good condition. Trail profile 15 cm deep.



Plot 5 (Photo 1/27). Barratt's willow - Altai fescue community on soil with part-organic surface.



Plot 6 (Photo 1/30). Trail in good condition on moderately well-drained soil. Trail profile 18 cm deep.



Plot 6 (Photo 1/31). Mixed sedge - grass community.

+ Carex nigricans
 + Salix polaris
 r Ranunculus nivalis
 r Antennaria monocephala
 3 Barbilophozia hatcheri
 2 Campylium stellatum
 1 Drepanocladus uncinatus
 1 Peltigera apthosa
 1 Stereocaulon sp.
 + Brachythecium sp.
 + Aulacomnium palustre
 + Pleurozium schreberi
 + Peltigera canina
 + Lobaria oregana
 + Cetraria islandica
 + Polytrichum juniperinum
 r Cladonia cornuta
 r Cladonia cf. pyxidata

Trail photo: from 3.5 m, looking SW
 Veget. photo: from 3.5 m, looking SE

Plot 7

To locate plot: Follow trail E from the largest of the small lakes on the pass to just past second lake. In this area the trail passes between two lone subalpine fir bushes. A big rock is located on the left at the W entrance to the bushes.

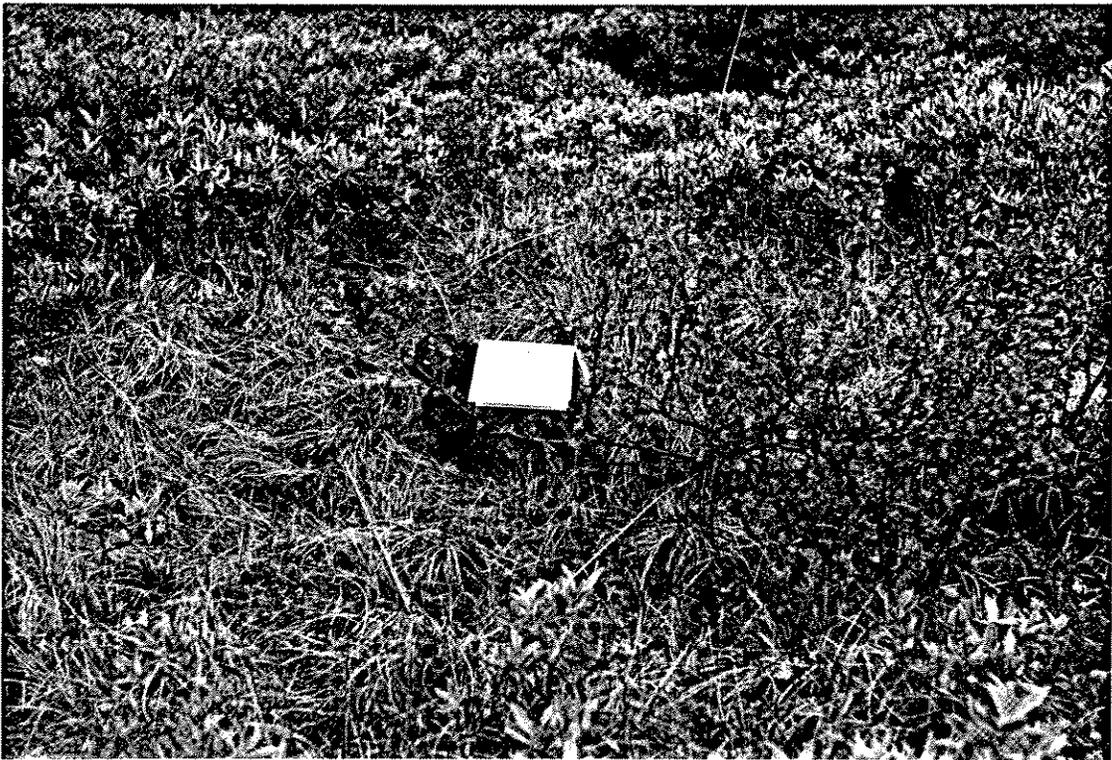
Trail plot: 24 m (straight line) from big rock
 Vegetation plot: 3.5 m 97 degrees from trail plot

4 Festuca altaica
 3 Salix barrattiana
 2 Salix alaxensis
 2 Betula glandulosa
 2 Salix reticulata
 2 Carex microchaeta
 1 Mertensia paniculata
 1 Aconitum delphinifolium
 1 Artemisia arctica
 1 Solidago multiradiata
 1 Polemonium acutiflorum
 + Senecio lugens
 + Anemone richardsonii
 + Antennaria microphylla
 + Luzula parviflora
 + Trisetum spicatum
 + Potentilla diversifolia
 + Potentilla fruticosa
 + Polygonum viviparum
 r Antennaria monocephala
 r Poa alpina
 r Stellaria monantha
 r Rubus arcticus
 r Gentianella amarella
 4 Cetraria islandica

Trail photo: from 3.5 m, looking NE
 Veget. photo: from 3.5 m, looking W



Plot 7 (Photo 1/32). Trail on slightly moist soil with part-organic surface. Trail profile 11 cm deep (note little used old track on left).



Plot 7 (Photo 1/33). Altai fescue - Barratt's willow - scrub birch community.

3 Cetraria cucullata
 3 Hylocomium splendens
 2 Cladonia mitis
 2 Aulacomnium palustre
 + Cladonia coccinea
 + Cladonia chlorophaea
 r Dactylina arctica

Plot 8

To locate plot: Coming from pass and going E, follow trail across upper large outwash terrace, then across lower one. This is the middle one of the three large terraces at different levels that are crossed by the trail (compare air photo). From edge of terrace, where trail starts to descend steeply, follow trail for 122 m. This plot is located on or near the NE boundary of the ecological reserve.

Trail plot: From distinctive circular Abies clump above trail measure 9 m 87 degrees to find trail plot.

Vegetation plot: 3.8 m 87 degrees (further downhill) from trail plot.

3 Heracleum lanatum
 3 Epilobium angustifolium
 3 Artemisia arctica
 2 Festuca altaica
 2 Aconitum delphinifolium
 2 Vaccinium caespitosum
 2 Mertensia paniculata
 2 Abies lasiocarpa
 2 Lupinus arcticus
 1 Arnica cordifolia
 1 Arnica mollis
 1 Potentilla diversifolia
 1 Senecio triangularis
 1 Aquilegia formosa
 1 Castilleja unalascensis
 + Gentianella amarella
 + Agoseris aurantiaca
 + Rubus arcticus
 r Salix reticulata
 r Orthilia secunda
 r Achillea millefolium
 r Cornus canadensis
 3 Barbilophozia hatcheri
 2 Drepanocladus uncinatus
 + Pleurozium schreberi
 + Stereocaulon sp.
 r Cladonia impexa
 + (total) other undet. bryophytes

Trail photo from 3.5 m, looking W
 Veget. photo from 3.5 m, looking S



Plot 8 (Photo 1/36). Lush mixed herb-grass community near tree line.



Plot 8 (Photo 1/37). This trail on a colluvial soil and a steep slope shows erosion damage. Trail profile 43 cm deep.

Plot 9

To locate plot, start from eastern edge of largest outwash terrace as in plot 8 (just inside NE boundary of reserve). Follow trail SW (towards pass) 27 m to a distinctive rock (75 cm diam.) on the left edge of the trail.

Trail Plot: 62 m along trail towards pass.

Vegetation Plot: In an area of frost humps 3.8 m 347 degrees from trail plot.

4 Festuca altaica
3 Artemisia arctica
2 Salix glauca
2 Potentilla diversifolia
2 Salix polaris
2 Luzula parviflora
2 Sibbaldia procumbens
1 Betula glandulosa
1 Polygonum viviparum
1 Salix arctica
1 Veronica wormskjoldii
1 Carex microchaeta
+ Polemonium acutiflorum
+ Pedicularis langsдорфii
+ Gentiana glauca
r Vaccinium vitis-idaea
r Luzula spicata
3 Stereocaulon sp.
3 Cladina mitis
2 Polytrichum juniperinum
2 Lobaria oregana
2 Barbilophozia hatcheri
1 Polytrichum norvegicum
1 Cetraria islandica
1 Cladina uncinata
+ Cladonia cornuta
+ Aulacomnium palustre
+ Dicranum acutifolium
r Dactylina arctica

Trail photo: from 3.5 m, looking SW
Veget. photo: " " " "

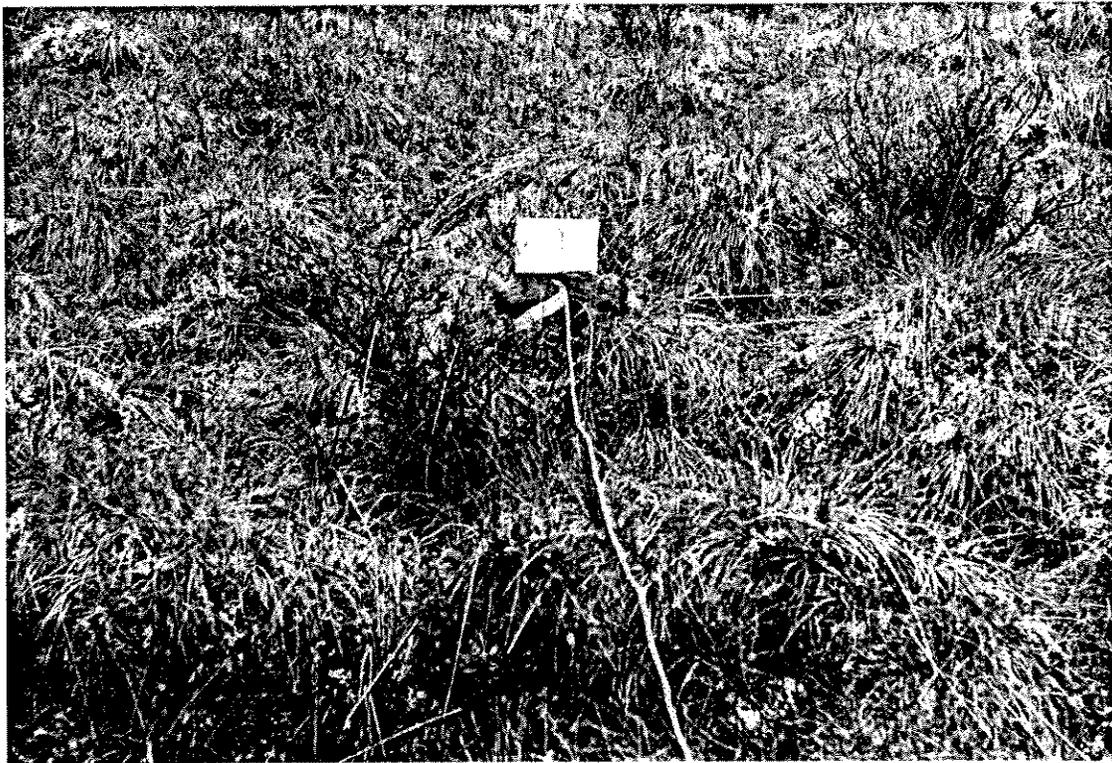
Plot 10

To locate plot: Start on same terrace as in # 9, follow trail toward pass to near upper end of terrace to a point where trail goes through a narrow gap between subalpine firs, then 83 m to the crossing of a small creek bed.

Trail Plot: 10 m SW from creek bed

Vegetation Plot: 3.7 m 164 degrees from trail plot

5 Salix barrattiana
4 Heracleum lanatum
3 Equisetum arvense
3 Mertensia paniculata



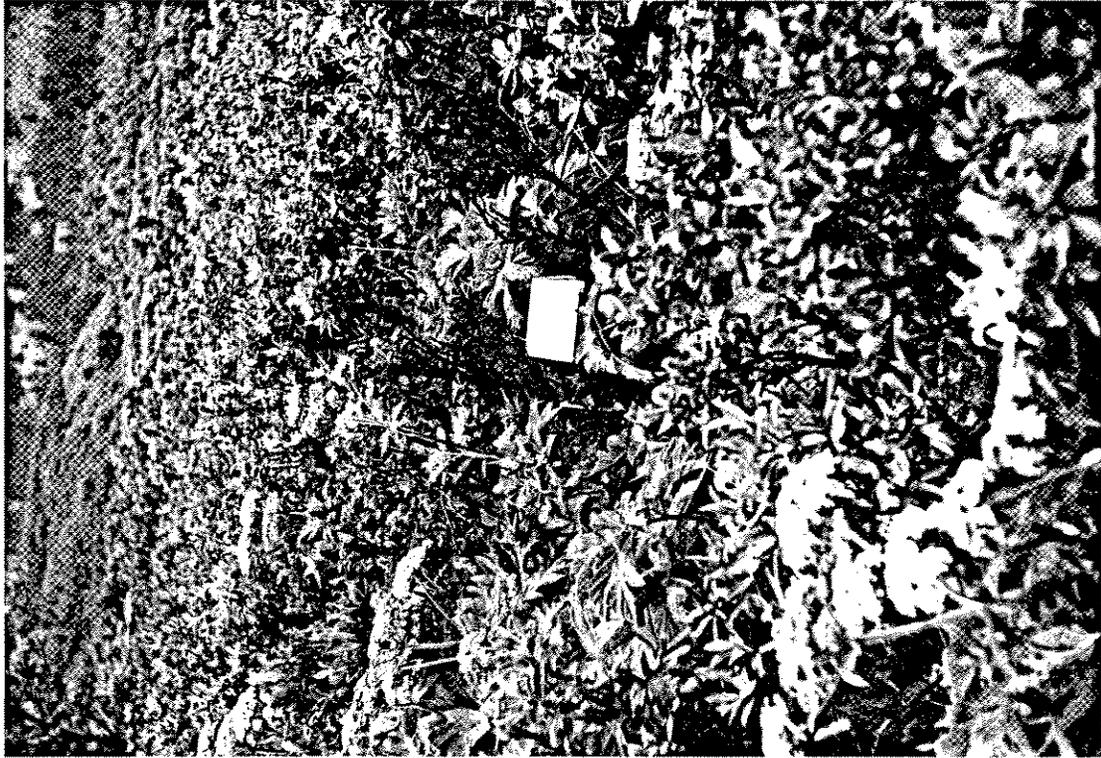
Plot 9 (Photo 1/38). Altai fescue community on large outwash terrace (compare 1/35). Note frost hummocks.



Plot 9 (Photo 1/39). Trail on loamy soil over well-drained, gravelly sub-soil. Trail profile 22 cm.



Plot 10 (Photo 2/1). Trail in good condition, probably due to gravelly subsoil. Trail profile 12 cm deep.



Plot 10 (Photo 1/40). Barratt's willow community on alluvial fan with subsurface seepage.

2 Delphinium glaucum
2 Festuca altaica
2 Artemisia tilesii
2 Calamagrostis canadensis
1 Polemonium acutiflorum
1 Epilobium angustifolium
1 Artemisia arctica
+ Arenaria lateriflora
+ Luzula parviflora
+ Arnica cordifolia
+ Astragalus alpinus
+ Rubus arcticus
+ Lycopodium annotinum
r Botrychium lunaria
r Stellaria monantha
2 Brachythecium sp.

Trail photo: no note
Veget.photo: looking approx. S

Plot 11

Location: On upper large terrace where trail from pass comes down and meets terrace elevation. A 1 x 1.5 m rock is located immediately on SE edge of trail.

Trail Plot: on trail next to rock (NOTE, trail consists of two tracks here)

Vegetation Plot: 6.2 m 335 degrees from centre of rock

3 Salix barrattiana
3 Festuca altaica
3 Artemisia arctica
2 Senecio triangularis
1 Arnica latifolia
1 Aconitum delphinifolium
1 Agoseris aurantiaca
1 Potentilla diversifolia
1 Gentianella amarella
1 Vaccinium caespitosum
+ Rubus arcticus
+ Pyrola minor
+ Ranunculus nivalis
+ Polemonium acutiflorum
+ Botrychium lunaria
+ Salix reticulata
+ Achillea millefolium
+ Rumex acetosa
r Polygonum viviparum
r Luzula parviflora
r Sibbaldia procumbens
4 Hylocomium splendens
3 Pleurozium schreberi
2 Lobaria oregana
2 Aulacomnium palustre
2 Stereocaulon sp.
1 Cladina mitis
+ Brachythecium sp.

Trail photo: looking W
Veget.photo: looking S



Plot 11 (Photo 2/3). Barratt's willow - Altai fescue community.



Plot 11 (Photo 2/2). Slight downcutting and puddling is observed in this trail section due to moderately moist, part-organic surface soils. Trail profile 32 cm deep.

- + *Peltigera apthosa*
- + *Cladonia chlorophaea* (& others)
- r *Cladonia cornuta*

Plot 12

Location: Where trail (coming from pass and going NE) leaves irregular kames and ascends to a small terrace remnant (above upper large terrace) that overlooks the valley and is covered with very low scrub birch and lichens.

Trail Plot: 9 m E from where trail becomes level

Vegetation Plot: 2.75 m 313 degrees from trail plot

- 5 *Betula glandulosa*
- 2 *Festuca altaica*
- 2 *Vaccinium vitis-idaea*
- 1 *Polemonium acutiflorum*
- + *Stellaria monantha*
- 4 *Cladina mitis*
- 4 *Hylocomium splendens*
- 3 *Cladina alpestris*
- 3 *Cladina rangiferina*
- 3 *Cetraria cucullata*
- 3 *Polytrichum strictum*
- 2 *Pleurozium schreberi*
- + *Peltigera apthosa*
- + *Dactylina arctica*
- + *Cladonia cornuta*
- r *Ptilium crista-castrensis*

Trail photo: looking E
Veget. photo: looking SE

Plot 13

Location: Several small kettle lakes are located about 1/2 km NE of the pass. About 200 m NE of the last kettle lake the trail descends to lush willow flats along the main creek flowing to Black Fox Lake.

Trail Plot: 19 m downhill along trail from start of descent. (NOTE, there are two trails, one of them weak.)

Vegetation Plot: 3 m 91 degrees (down-slope) from trail plot

- 5 *Cassiope mertensiana*
- 2 *Artemisia arctica*
- 1 *Phyllodoce empetrifomis*
- 1 *Betula glandulosa*
- 1 *Arnica latifolia*
- 1 *Senecio triangularis*
- 1 *Lycopodium alpinum*
- 1 *Festuca altaica*
- 1 *Salix glauca*
- 1 *Empetrum nigrum*
- 1 *Salix arctica*
- + *Pleum alpinum*
- + *Sibbaldia procumbens*

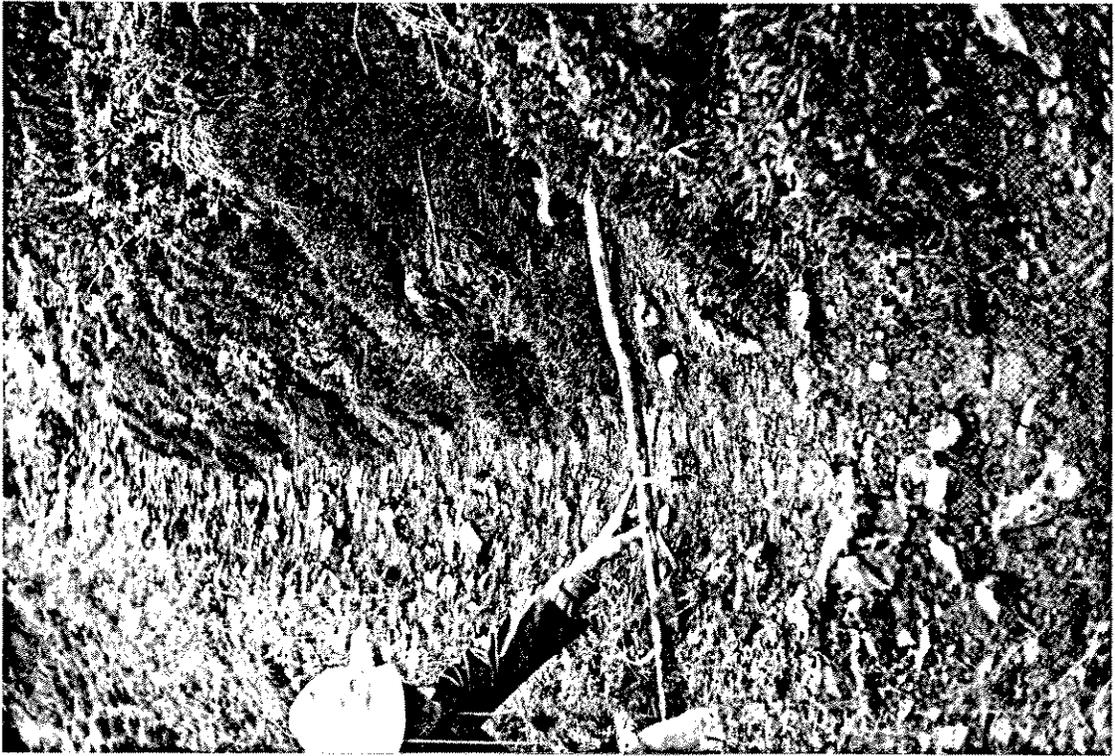
Trail photo: looking SW
Veget. photo: looking NE



Plot 12 (Photo 2/6). A very low scrub birch - lichen community occurs on this poor and dry site.



Plot 12 (Photo 2/5). Trail in good condition on well-drained soil over outwash gravels. Trail profile 14 cm.



Plot 13 (Photo 2/8). The trail is in good condition despite the steep grade on this well-drained, stony soil. Trail profile 14 cm deep.



Plot 13 (Photo 2/9). White mountain heather community indicative of long-lasting snow cover.

- + Hieracium gracile
- + Vaccinium caespitosum
- + Carex cf. albonigra
- + Lycopodium annotinum
- r Polemonium acutiflorum
- r Luzula parviflora
- r Epilobium alpinum
- r Campanula lasiocarpa
- 3 Barbilophozia hatcheri
- 1 Cetraria islandica
- 1 Cladonia ecmocyna
- 1 Polytrichum juniperinum
- 1 Polytrichum norvegicum
- + Cladina mitis
- r Dicranum sp.

Plot 14

Location: Plot located between # 12 and # 13. From start of descent described in plot 13 follow trail NE 182 m to a ca. 1 m diam. rock on right (SE) side of trail, then 93 m to where creek comes closest to the SE-facing wooded slope. Locate scattered boulders (50-100 cm diam.) on creek side of trail (creek visible from this area through grassy gap in bushes).

Reference point is the centre between the four largest (flattish) boulders.

Trail Plot: 18 m 57 degrees from reference point. NOTE, that the trail is braided and that the veg.plot is traversed by an old overgrown trail.

Vegetation Plot: 4 m 14 degrees from trail plot

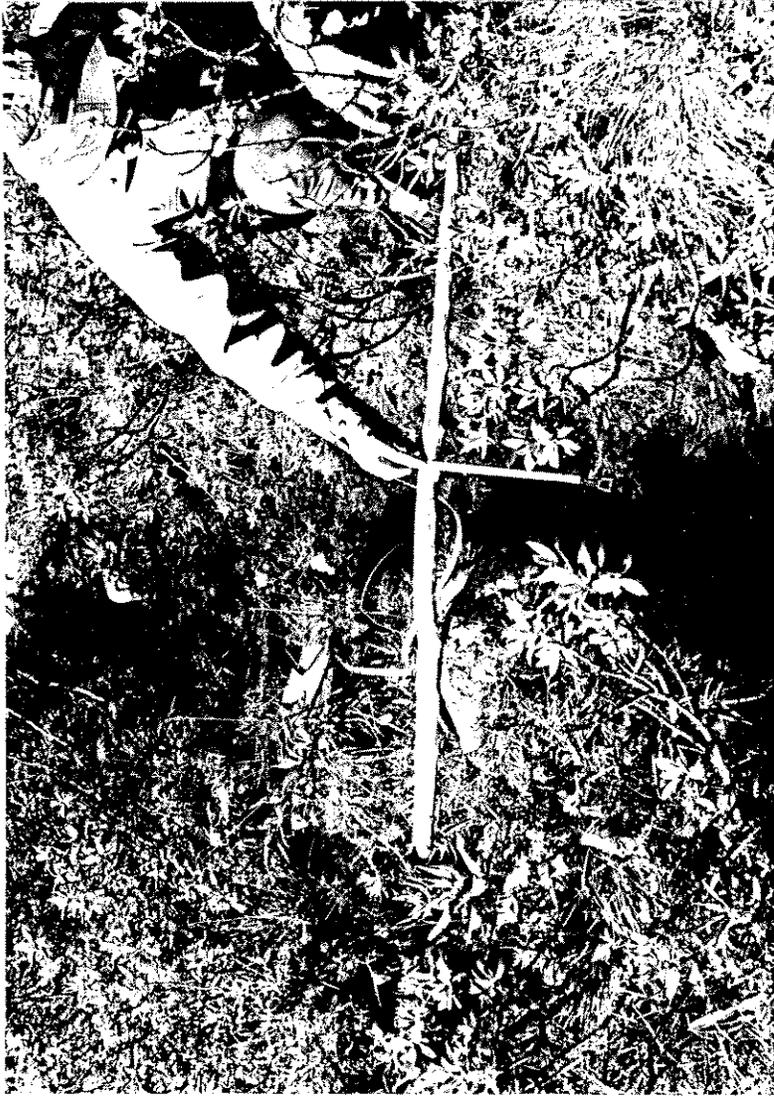
- 5 Salix barrattiana
- 3 Artemisia arctica
- 3 Epilobium arcticum
- 2 Carex microchaeta
- 2 Aconitum delphinifolium
- 2 Epilobium angustifolium
- 2 Festuca altaica
- 1 Senecio triangularis
- 1 Polygonum viviparum
- 1 Salix reticulata
- 1 Mertensia paniculata
- + Achillea millefolium
- + Polemonium acutiflorum
- + Petasites frigidus
- + Veronica wormskjoldii
- + Caltha leptosepala
- + Pedicularis langsдорфii
- + Potentilla diversifolia
- + Anemone richardsonii
- + Delphinium glaucum
- r Stellaria monantha
- r Oxyria digyna

Trail photo: looking SW

Veget. photo: looking E



Plot 14 (Photo 2/13). Barratt's willow community.



Plot 14 (Photo 2/14). Moist to wet soils with part-organic surface have resulted in muddy and incised trail sections that are abandoned, while new tracks are forming. Trail profile 35 cm deep.

r *Rubus arcticus*
2 *Aulacomnium palustre*
2 *Hylocomium splendens*
1 *Drepanocladus revolvens*
1 *Barbilophozia hatcheri*
+ *Brachythecium* sp.

Plot 15

Location: In lush green floodplain of a tributary stream coming off mountain slope and joining the main creek from the NW. This area is located between the two largest of the kettle lakes mentioned in the description of plot 13 (SW of stream crossing). The stream rounds the SE promontory of a kame near the trail in a sharp bend.

Trail Plot: 15.3 m 190 degrees from the tallest willow bush on the S end of the promontory. NOTE, that a secondary trail is just forming here.

Vegetation plot: 2.6 m 339 degrees from trail plot

5 *Salix barrattiana*
3 *Calamagrostis canadensis*
3 *Epilobium angustifolium*
3 *Mertensia paniculata*
3 *Artemisia tilesii*
2 *Delphinium glaucum*
2 *Polemonium acutiflorum*
1 *Oxyria digyna*
+ *Rubus arcticus*
+ *Aconitum delphinifolium*
r *Stellaria monantha*
r *Ranunculus nivalis*
r *Stellaria longipes*
r *Arabis hirsuta*
r *Carex* sp.
3 *Brachythecium* sp.

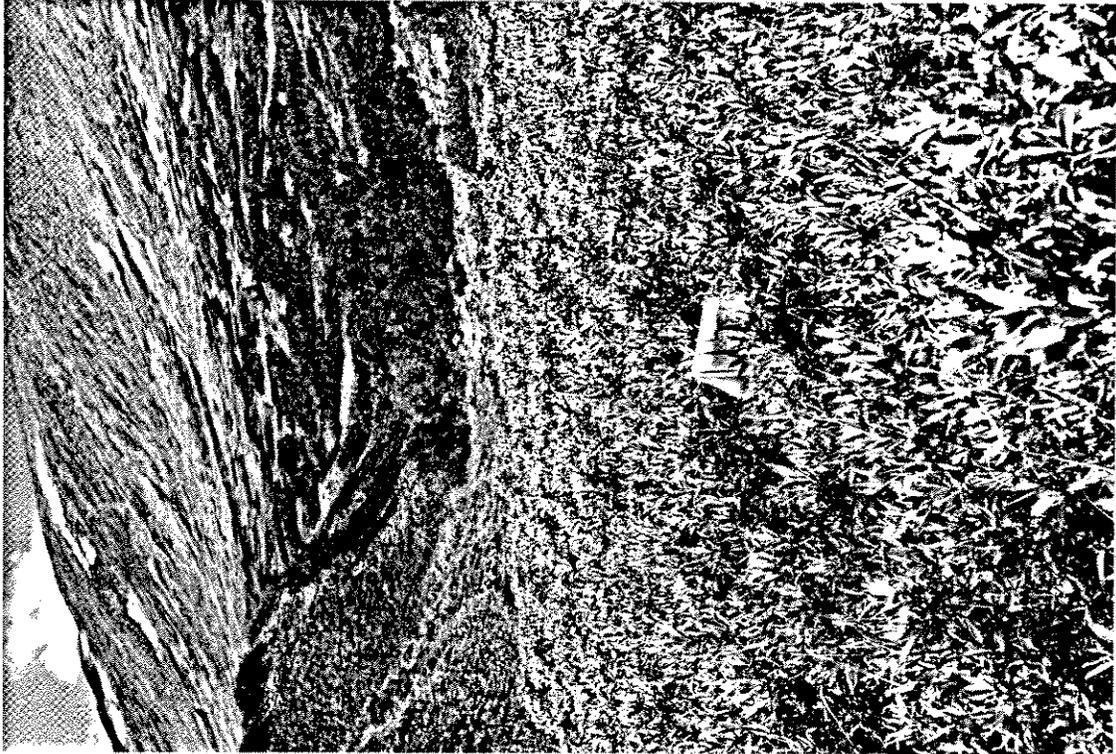
Trail photo: looking W
Veget. photo: looking W

Plot 16

Location: E of highest point on Danihue Pass. Proceeding SW from the largest of the kettle lakes, trail passes narrow neck between two lakes (lakes connected by stream, but connection may be flooded at high water). After about another 80 m and a small rise, a further, smaller pond is located on the left (to the S) of the trail (this may be only a collection of round rocks under drought conditions).

Trail Plot: 8.5 m 318 degrees from 1 m boulder on pond's SW shore
Vegetation Plot: 14.5 m 318 degrees from said boulder

4 *Carex microchaeta*
3 *Carex scirpoidea*



Plot 15 (Photo 2/16). Barratt's willow community on periodically wet alluvial fan.



Plot 15 (Photo 2/17). Despite firm ground a secondary trail has formed here, probably due to flooding at snowmelt. Trail profile 15 cm deep.



Plot 16 (Photo 2/18). Mixed sedge community in a seepy area.



Plot 16 (Photo 1/19). Due to soft, part-organic and wet surface soils and large stones, considerable trampling has taken place here and the trail is poorly defined. Trail "profile" 10 cm deep.

3 *Epilobium latifolium*
 2 *Arnica lessingii*
 2 *Festuca altaica*
 2 *Salix reticulata*
 2 *Potentilla diversifolia*
 1 *Juncus mertensianus*
 1 *Polygonum viviparum*
 1 *Salix polaris*
 1 *Anemone richardsonii*
 + *Solidago multiradiata*
 + *Artemisia arctica*
 + *Pedicularis langsдорфii*
 + *Petasites frigidus*
 + *Parnassia fimbriata*
 + *Anemone parviflora*
 r *Aconitum delphinifolium*
 r *Veronica wormsjoldii*
 r *Trisetum alpinum*
 r *Equisetum variegatum*
 r *Poa alpina*
 r *Agrostis scabra*
 + *Cladonia* spp. and indet. bryophytes (vegetative)

Trail photo: looking NE
 Veget. photo: looking SE

Plot 17

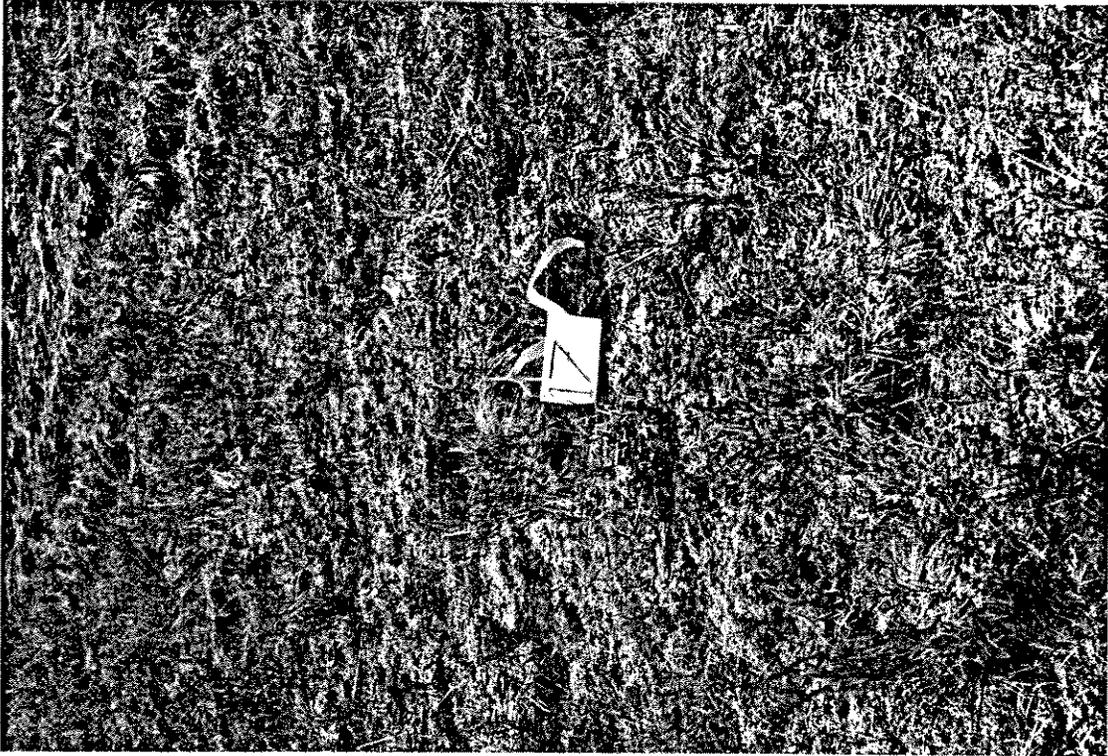
To locate plot: identify largest of the lakes occurring on Danihue Pass (air photo). From third lake counting toward the NE, 317 degrees to trail that is located in a small valley.

Trail Plot: 36 m 52 degrees from a pointed 0.75 m diam. rock located on NW edge of trail. NOTE multiple trail formation (compare photo).

Vegetation Plot: 3.6 m 137 degrees from trail plot on main trail
 NOTE, this plot shows considerable trampling impact, especially to the lichen flora.

4 *Sibbaldia procumbens*
 3 *Festuca altaica* (grazed)
 3 *Luzula* cf. *spicata*
 3 *Carex microchaeta*
 2 *Calamagrostis canadensis*
 2 *Carex scirpoidea*
 2 *Carex lachenalii*
 1 *Petasites frigidus*
 1 *Potentilla diversifolia*
 1 *Antennaria alpina*
 1 *Salix polaris*
 1 *Viola palustris*
 + *Rubus arcticus*
 + *Juncus drummondii*
 + *Veronica wormskjoldii*
 + *Polygonum viviparum*
 r *Salix barrattiana*

Trail photo: looking SW
 Veget. photo: looking W



Plot 17 (Photo 2/20). Mixed grass-herb-lichen community with slight grazing and trampling impact.



Plot 17 (Photo 2/21). Strongest form of trail braiding observed in the entire area in a flat trail section (compare photo 1/9). Multiple trails form here despite favourable soils, probably because this small basin has long-lasting snow cover and very wet conditions at snow melt. Trail profile 20 cm deep.

r *Artemisia arctica*
3 *Stereocaulon* sp.
2 *Cladina mitis*
1 *Pleurozium schreberi*
1 *Cladina rangiferina*
+ *Polytrichum juniperinum*
+ *Dicranum acutifolium*
+ *Hylocomium splendens*
+ *Lobaria oregana*

Plot 18

Location as in plot 1, i.e. find high point on esker N of largest lake (air photo !) on the pass, marked by distinctive rock with orange lichens. From here due N to trail (plot 1).

Trail Plot: 86 m (straight line) 209 degrees from plot 1. NOTE that there are two unused trails paralleling the active trail, one eroded to gravelly base and another one growing back to the native vegetation.

Vegetation Plot: 7.2 m 297 degrees from active trail

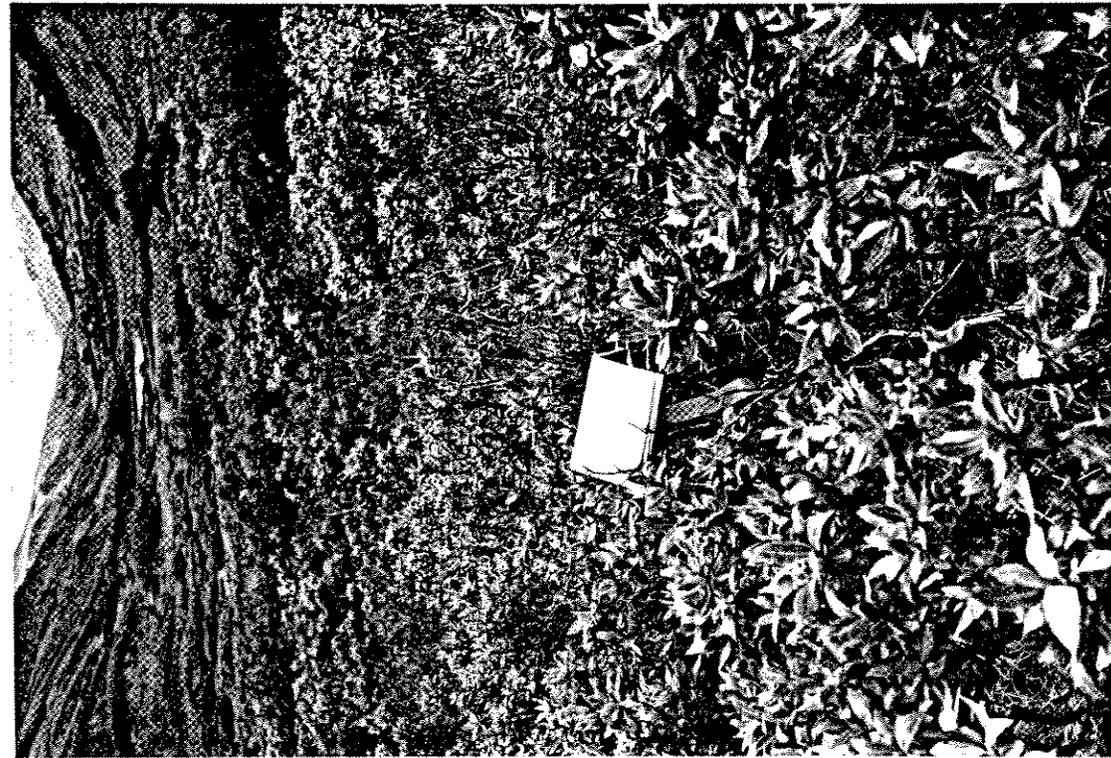
4 *Salix barrattiana*
4 *Epilobium angustifolium*
3 *Artemisia arctica*
3 *Festuca altaica*
3 *Delphinium glaucum*
2 *Mertensia paniculata*
1 *Valeriana sitchensis*
1 *Luzula parviflora*
+ *Carex microchaeta*
+ *Rubus arcticus*
+ *Petasites frigidus*
+ *Senecio lugens*
+ *Polemonium acutiflorum*
+ *Pyrola minor*
+ *Anemone richardsonii*
r *Saxifraga tricuspidata*
r *Stellaria monantha*
r *Arabis hirsuta*
r *Senecio pauciflorus*
1 *Peltigera aphthosa*
+ *Hylocomium splendens*

Trail photo: looking SW
Veget. photo: looking W

Plot 19

Location: About 1 km SW of Danihue Pass and about 250 m uphill from creek crossing. Wet trampled trail section with a clump of trees to the N and a 1.75 m diam. rock to the S of trail.

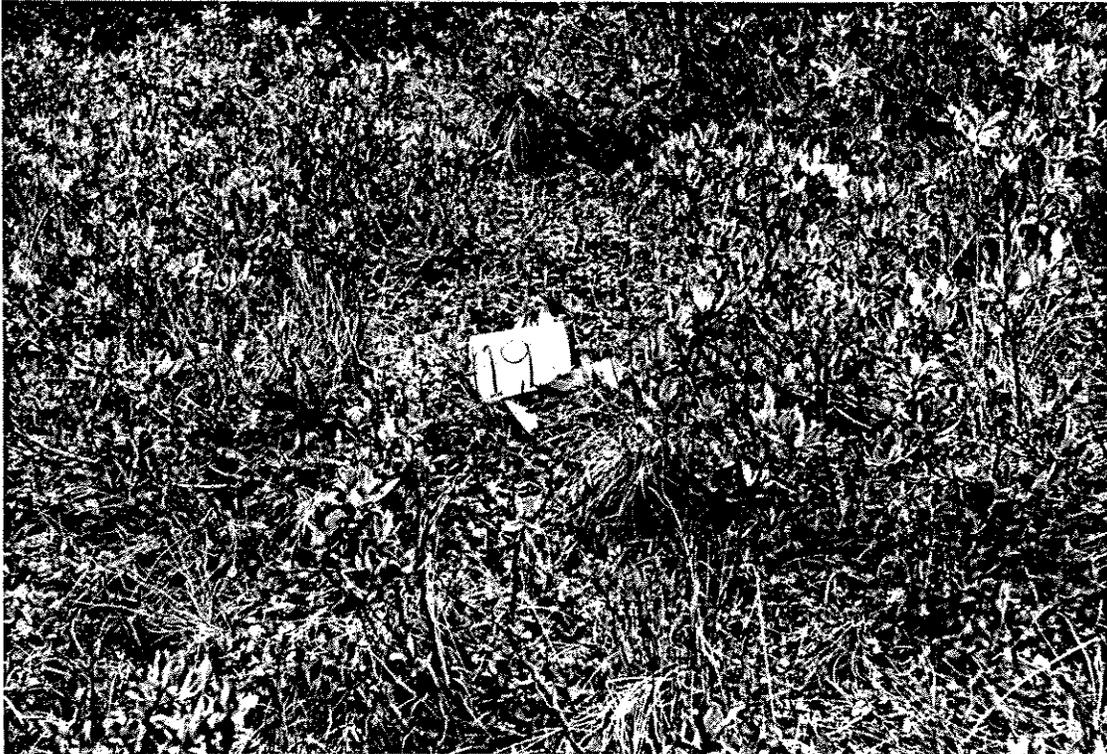
Trail Plot: 13.8 m 31 degrees from peak of said rock
Vegetation Plot: 4.8 m 312 degrees from trail plot



Plot 18 (Photo 2/22). Mixed Barratt's willow-herb-grass community.



Plot 18 (Photo 2/23). Active trail on moderately well-drained till material. Two abandoned and regenerating parallel trails indicate that there must be at least periodic poor trail condition, probably at snow melt. Trail profile 19 cm deep.



Plot 19 (Photo 2/24). Barratt's and netted willow community on a sloping seepage site.



Plot 19 (Photo 2/25). Seepage throughout the used season has made this trail section one of the worst, with severe trampling impact showing in the mud and the beginning of water erosion. Trail profile 22 cm deep.

4 Salix reticulata
 3 Salix barrattiana
 3 Festuca altaica
 3 Carex microchaeta
 2 Petasites frigidus
 2 Equisetum arvense
 1 Pedicularis langsдорфii
 1 Senecio triangularis
 1 Polygonum viviparum
 + Salix alaxensis
 + Cerastium arvense
 + Polemonium acutiflorum
 + Stellaria monantha
 + Mertensia paniculata
 + Aconitum delphinifolium
 + Artemisia arctica
 + Veronica wormskjoldii
 3 Aulacomnium palustre
 1 Hylocomium splendens
 r Thuidium abietinum

Trail photo: looking SW
 Veget. photo: looking SW

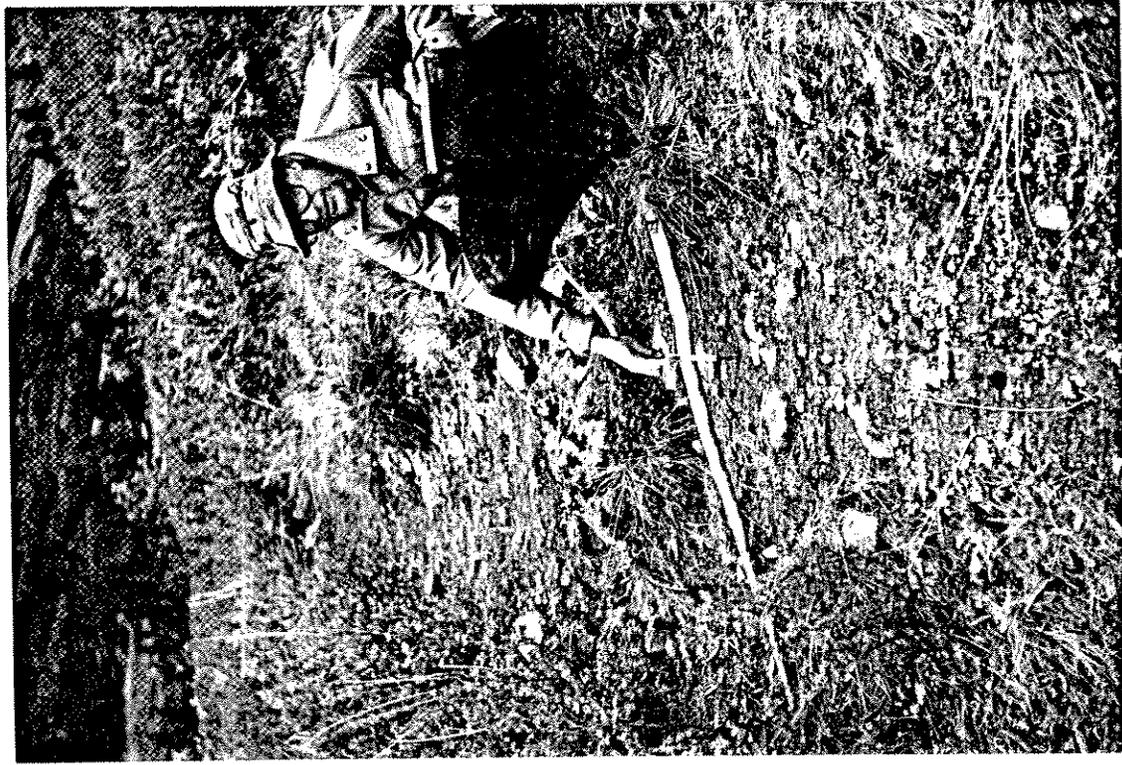
Plot 20

To locate plot: ascend from upper Eaglenest Creek crossing ca. 0.6 km toward pass. When passing through last row of scattered trees, a very large boulder (ca. 8 m diam.) is seen about 50 m SE of trail. Proceeding another 40 m another boulder is seen on the same side.

Trail Plot: 24 m 305 degrees from NW face of said second boulder.
 NOTE, there are several old parallel trails now growing over
 Vegetation Plot: 9.2 m 305 degrees from same

5 Betula glandulosa
 3 Festuca altaica
 2 Linnaea borealis
 1 Epilobium angustifolium
 1 Empetrum nigrum
 + Salix alaxensis
 r Vaccinium vitis-idaea
 r Stellaria monantha
 4 Cladina alpestris
 4 Pleurozium schreberi
 3 Cladina rangiferina
 1 Peltigera malacea
 1 Cladonia cornuta
 1 Dicranum acutifolium
 1 Cladonia sylvatica
 + Cetraria cucullata
 r Dactylina arctica
 r Cladonia fimbriata

Trail photo: looking NE
 Veget. photo: looking S



Plot 20 (Photo 2/26). Trail on a steep, well-drained section, without problems. Several overgrown old trails are present, probably due to horses trying to avoid steep pitches. Trail profile 12 cm deep.



Plot 20 (Photo 2/27). Dense scrub birch vegetation is typical for such dry sites.

Plot 21

Location: Directly E of where upper Eaglenest Creek is forded by horse trail before ascending to Danihue Pass. When coming down from talus slope toward creek, note large rock (ca. 2 m diam.) in the scrub birches to the N of the trail.

Trail Plot: 26 m 239 degrees from rock (muddy trail section)

Vegetation Plot: 7.5 m 207 degrees from trail plot

- 4 Carex aquatilis
 - 3 Salix alaxensis
 - 3 Salix reticulata
 - 2 Salix barrattiana
 - 2 Salix glauca
 - 2 Sanguisorba stipulata
 - 1 Polemonium acutiflorum
 - 1 Polygonum viviparum
 - 1 Potentilla diversifolia
 - + Betula glandulosa
 - + Aster subspicatus
 - + Anemone richardsonii
 - + Epilobium alpinum
 - + Veronica wormskjoldii
 - + Agrostis scabra
 - + Luzula parviflora
 - + Rubus arcticus
 - + Caltha leptosepala
 - r Phleum alpinum
 - r senecio pauciflorus
 - 4 Aulacomnium palustre
 - 3 Sphagnum cf. warnstorffii
 - 2 Tomenthypnum nitens
 - 1 Drepanocladus exannulatus
 - 1 Dicranum acutifolium
- Trail photo: looking W
Veget. photo: looking N

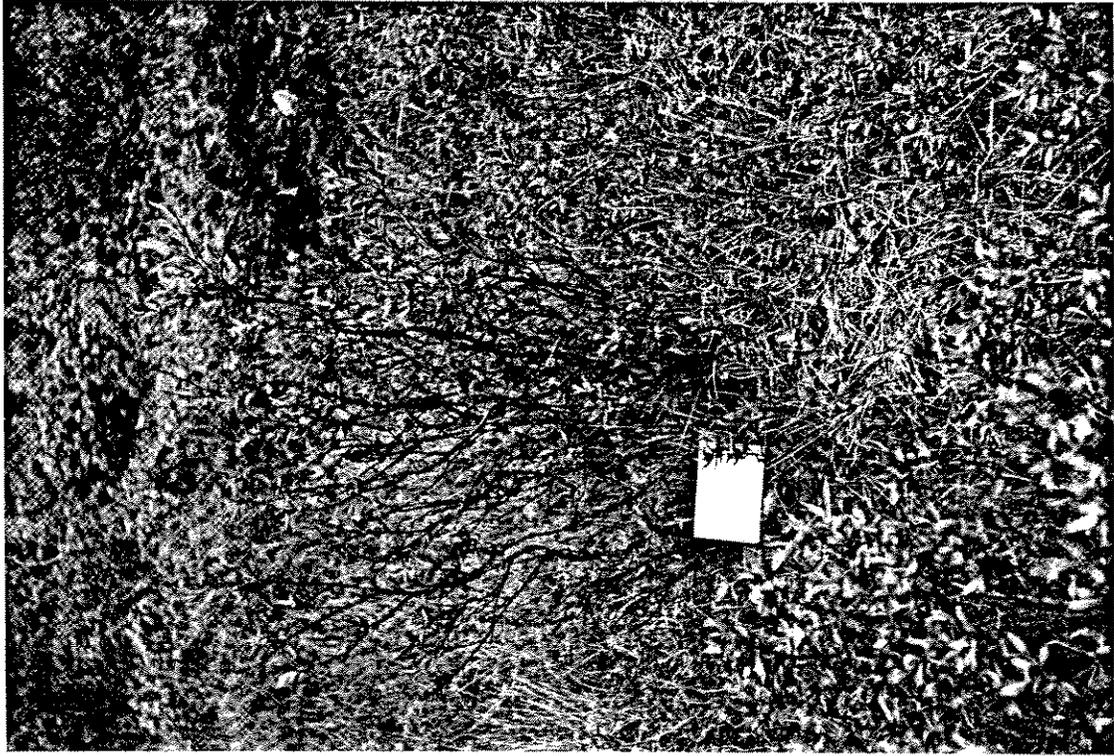
Plot 22

Location: SW of Nation Peak, where trail coming from Danihue/Icebox direction crosses main creek before ascending towards Bates Camp.

Trail Plot: 10.2 m up (S) along trail from edge of creek. NOTE: trail is faint despite wet ground due to low use and vigorous growth of sedges.

Vegetation Plot: 4.3 m 72 degrees from trail plot.

- 4 Salix barrattiana
 - 4 Carex aquatilis
 - 1 Salix alaxensis
 - 1 Senecio triangularis
 - 1 Arnica alpina
 - 1 Calamagrostis canadensis
 - 1 Sanguisorba stipulata
 - 1 Valeriana sitchensis
 - + Artemisia arctica
- Trail photo: looking NW
Veget. photo: looking SE



Plot 21 (Photo 2/28). Wet water sedge - willow community along Eaglenest Creek.



Plot 21 (Photo 2/29). Short, muddy trail section through sedge meadow where trail crosses the creek. Trail profile 20 cm deep.



Plot 22 (Photo 2/33). Water sedge - Barratt's willow community. Much of the trail that goes to Bates Camp along the slope foot below Nation Peak leads through similar wet meadows.



Plot 22 (Photo 2/32). Trail barely visible in tall sedges, despite wet ground. Trail profile 15 cm deep.

- + Petasites frigidus
- + Polemonium acutiflorum
- + Rubus arcticus
- + Salix reticulata
- r Polygonum viviparum
- r Potentilla diversifolia
- 4 Tomenthypnum nitens
- 4 Aulacomnium palustre
- 3 Drepanocladus revolvens
- 2 Calliergon sp.
- 2 Hylocomium splendens
- 1 Philonotis sp.
- + Mnium sp.

Plot 23

Location: about 250 m N of plot 22, where trail crosses a prominent, gravelly creek bed descending from the slopes of Nation Peak (air photo). Plot is on steep bank S of creek.

Trail Plot: 17.3 m from creek bank (low to middle water). NOTE, that three trails have formed in succession due to downcutting of previous trail(s), but they begin to overgrow now.

Vegetation Plot: 8.4 m 15 degrees from trail plot

- 4 Artemisia arctica
- 3 Festuca altaica
- 2 Phleum alpinum
- 2 Arnica latifolia
- 2 Valeriana sitchensis
- 2 Vaccinium caespitosum
- 2 Deschampsia atropurpurea
- 1 Betula glandulosa
- 1 Luzula parviflora
- 1 Sanguisorba stipulata
- 1 Epilobium angustifolium
- 1 Achillea millefolium
- 1 Senecio triangularis
- 1 Sibbaldia procumbens
- 1 Aconitum delphinifolium
- + Rumex acetosa
- + Polygonum viviparum
- + Polemonium acutiflorum
- + Potentilla diversifolia
- + Rubus arcticus
- + Veronica wormskjoldii
- + Agoseris aurantiaca
- + Equisetum arvense
- r Hieracium gracile
- r Castilleja unalascensis
- r Stellaria monantha
- r Pyrola minor
- r Trientalis arctica
- 4 Aulacomnium palustre

Trail photo: looking E

Veget. photo: looking N



Photos 3/26 (left) and 3/27 Spatsizi Wilderness Park,
portion near Klappan Coal Camp.

