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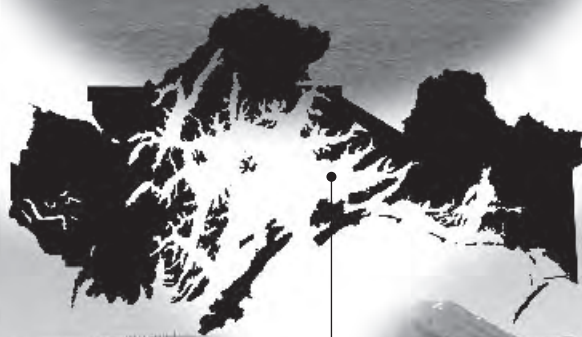
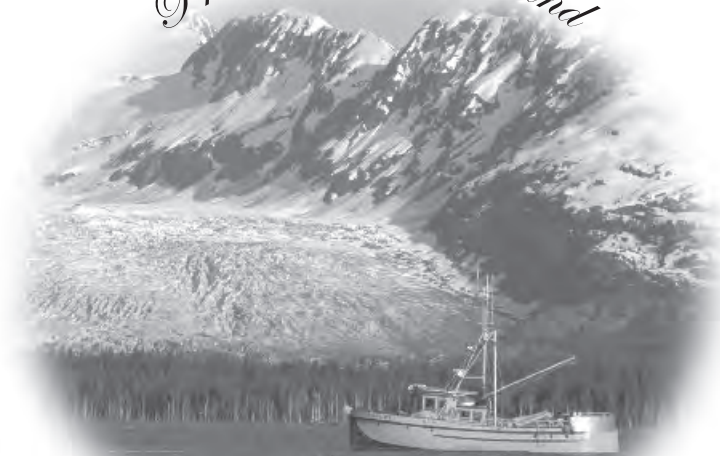
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Plant Community Types of the Chugach National Forest: Southcentral Alaska

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Prince William Sound



Kenai Peninsula



Copper River Delta



**PLANT COMMUNITY TYPES OF THE CHUGACH NATIONAL FOREST:
SOUTHCENTRAL ALASKA**

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SUMMARY

Southcentral Alaska features some of the most pristine habitats in the world, significant biological diversity and natural resources, and a wide array of recreational opportunities. This report portrays a classification of plant community types on USDA Forest Service (Chugach National Forest) lands in the Kenai Peninsula, Prince William Sound, and Copper River Delta areas of Alaska. The study area covers approximately six million acres (2.5 million hectares) and features heavily glaciated mountains, numerous islands, and extensive wetlands. Precipitation varies from around 20 to 200 inches (50 to 500 cm). The environmental diversity, in combination with a wide range of natural disturbances (e.g., fires, snow avalanches, windthrow, landslides, earthquakes), has resulted in substantial diversity of community types.

Multivariate analyses and manual sorting of data tables resulted in the definition of 282 community types among 2293 study plots. Of these types, 152 are forests, 55 are shrublands, and 75 are herblands. The classification includes dichotomous keys for field identification of the community types. Descriptions for each type include summaries of vegetation composition and environmental characteristics.

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PLANT COMMUNITY TYPES OF THE CHUGACH NATIONAL FOREST: SOUTHCENTRAL ALASKA¹

INTRODUCTION

Southcentral Alaska features some of the most pristine habitats in the world, significant biological diversity and natural resources, and a wide array of recreational opportunities. The interaction of a complex geology, varied climate, and periodic disturbance coupled with a diverse spectrum of plant species has resulted in a rich vegetation mosaic. A classification that summarizes this vegetation diversity for applications in inventory, mapping, and description is desirable for effective ecosystem management of these lands.

Plant community classifications, in combination with physical site classifications (e.g., based on soil, topography, climate), aid in delimiting logical units for management (Layser 1974; Pfister 1976). Additionally, biophysical classifications improve the accuracy of predicting such management-relevant characteristics as browse production and tree growth. The work described here provides a classification of plant community types for lands encompassed by the Chugach National Forest in southcentral Alaska. This classification is based on 2293 study plots sampled from 1988 through 1995.

This classification of plant communities is paramount towards achieving ecosystem management goals. For example, linking habitat models to maps of community types and other biophysical features through a geographic information system could facilitate wildlife habitat evaluation. Areas with the highest habitat favorability for the species (or suite of species) could be identified and managed appropriately. Rare assemblages of plant species can also be identified and protected through this classification.

¹ please submit any comments regarding this classification to the Forest Ecologist at the Chugach National Forest, Anchorage, Alaska.

Objectives

The purpose of our study is to provide the USDA Forest Service with information needed to more effectively manage public lands on the Chugach National Forest to conserve ecological values and biological diversity. The main objectives of this study are to:

- 1) develop a comprehensive classification of plant community types for the area of southcentral Alaska bounded by the Chugach National Forest;
- 2) describe the general vegetation features and the physical setting of each type; and
- 3) summarize vegetation diversity on the Chugach National Forest through the use of this classification.

Previous Work

Within the Alaska Region of the USDA Forest Service, classifications of late-successional forest types have been developed on the Tongass National Forest (DeMeo et al. 1992; Martin et al. 1995; Pawuk and Kissinger 1988). In addition, wetland communities of the Yakutat Forelands of the Tongass National Forest have been described by Shephard (1995). On the Chugach National Forest, vegetation classifications of forest types have been developed for portions of the Kenai Peninsula and Prince William Sound by Reynolds (1990) and Borchers et al. (1989), respectively. A classification of the wetland communities of the Copper River Delta has been developed by Boggs (1998). The present classification expands on the pioneering work of Reynolds (1990) and Borchers et al. (1989) to include forest and non-forest vegetation from throughout mountainous portions of the Kenai Peninsula and Prince William Sound. The Copper River Delta wetland community type descriptions are summarized from the work of Boggs (1998). The present work also expands on previous forest classifications in the Alaska Region (listed above) by describing early as well as late-successional forest vegetation.

The above-mentioned studies provide general descriptions of some of the plant communities that occur in the study area. However, prior to this

report, a comprehensive classification of all plant communities across the range of physical site and vegetation compositional and structural variation was not available. Hence, land managers on the Chugach National Forest did not previously have a system to consistently inventory, map, and interpret plant communities. Holistic ecosystem management for this unique area would be more difficult to achieve without this information.

Outline

The INTRODUCTION section provides a general description of the rationale for developing a community type classification, lists the general objectives of the work conducted, and identifies related previous studies in the area.

The ENVIRONMENTAL SETTING section provides a general description of broad ecological delineations (i.e., sections; see ECOMAP 1993), land features, climate, and vegetation within the study area.

The METHODS section documents field and analytic procedures used in developing this classification.

The ECOLOGICAL TERMS AND CONCEPTS section provides definitions of terms and a discussion of the philosophic basis used in this classification.

The FUTURE STUDY section briefly describes relevant future studies that build on this classification.

The DESCRIPTIONS OF COMMUNITY TYPES section provides summary descriptions of the vegetation characteristics and physical setting of each community type represented by three or more study plots.

The OTHER COMMUNITY TYPES section provides a listing of community types represented by fewer than three study plots.

The VEGETATION DIVERSITY section graphically summarizes vascular plant species richness and community type richness within the Chugach National Forest.

The KEY TO THE MAJOR COMMUNITY TYPES section (Appendix A - *green colored paper*) provides a dichotomous key to the lifeforms, cover types, and community types currently described in the study area.

The LIST OF ALL PLANT SPECIES section (Appendix B) provides a list of all plant species identified in this study.

The AVERAGE CONSTANCY AND COVER TABLE (Appendix C) provides a summary listing of plant species cover and frequency of occurrence within each community type.

ENVIRONMENTAL SETTING

The Chugach National Forest in southcentral Alaska (Figure 1) spans a transition zone between boreal forests and the northernmost coastal temperate forests on the North American continent. The National Forest covers a land area of approximately six million acres (2.5 million hectares). Using the National Hierarchy of Ecological Units (i.e., ECOMAP 1993), the study area falls within six ecological sections (Davidson 1996): Alaska Mountains, Kenai Mountain, Northern Gulf Fjordlands, Northern Gulf Forelands, Chugach Mountain, and Saint Elias Mountain. For the purposes of this study (and for management), the Chugach and Saint Elias mountain sections are lumped-together since they are both dominated by snowfields, ice fields, and bare rock.

Most management activities on the Chugach National Forest are currently centered on the eastern portion of the Kenai Peninsula (including the Portage, Placer, and Twentymile river valleys), Prince William Sound, and the Copper River Delta (see cover). These three areas are within the Kenai Mountain, Northern Gulf Fjordlands, and Northern Gulf Forelands ecological sections, respectively. The following discussion is focused on summarizing environmental characteristics of these three areas.

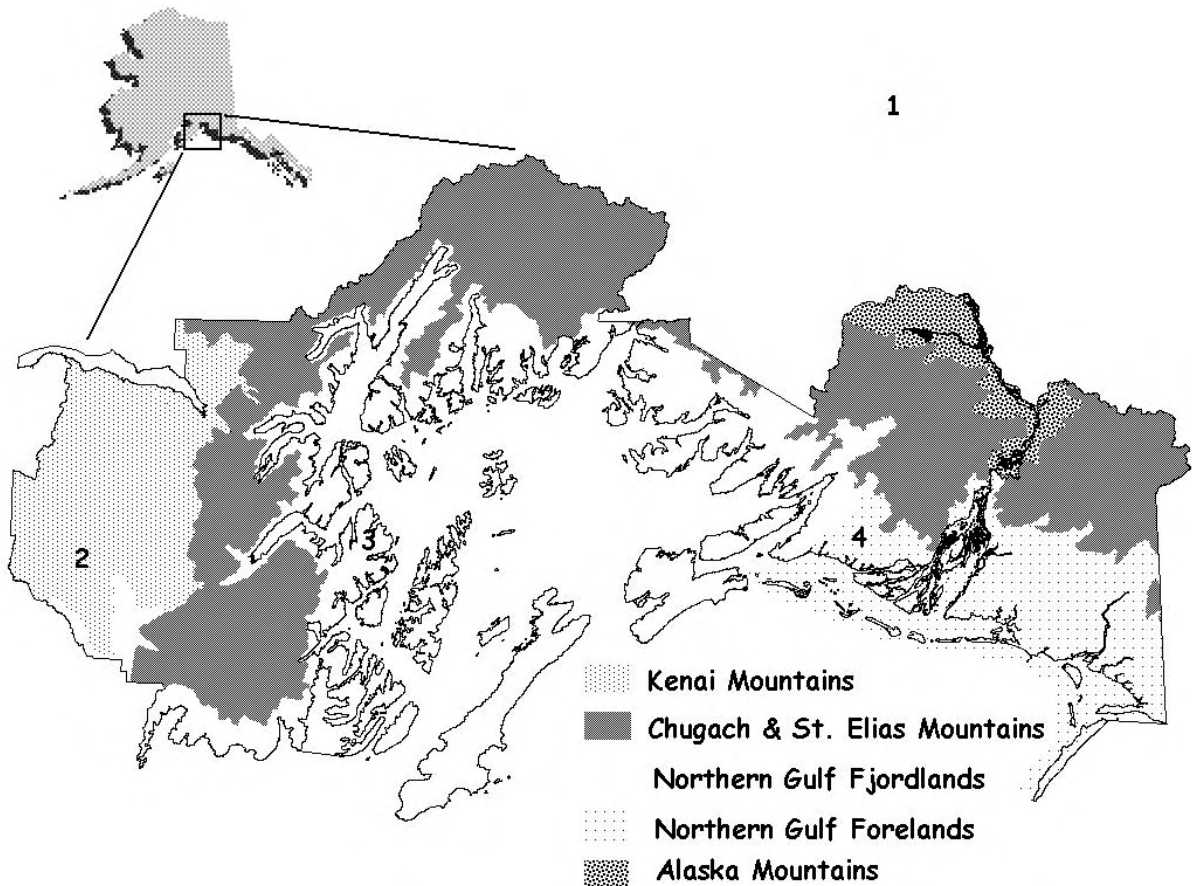


Figure 1. Area covered by this classification in southcentral Alaska. The boundary encompasses the Chugach National Forest. The shaded areas refer to the five ecological sections described in the text. The numbered locations are the weather station used in Figure 2, as follows: 1 = Tonsina; 2 = Cooper Lake Project; 3 = Main Bay; and 4 = Cordova FAA.

The Chugach National Forest study area is dominated by heavily glaciated, often very rugged, mountain ranges. Over 30 percent of the area is covered by permanent ice and snow, and 10 percent rock.

The Kenai Peninsula (Kenai Mountain Ecological Section) portion of the National Forest consists of both rounded and jagged mountains and alpine valleys shaped by glaciers. Many of the valleys in the eastern portion of the Peninsula contain alpine glaciers in their upper portions. Elevations range from sea level to 6200 feet (1900 m). The lithology consists of numerous types of slates and meta-sandstones and minor occurrences of limestone. At higher elevations large areas of exposed rock occur.

Along Turnagain Arm, the topography consists of steep and rocky side slopes surrounding glacially scoured (U-shaped) valley bottoms. The valleys bottom sediments are glacial alluvial outwash. Within the Chugach National Forest, the wetlands in the Portage, Placer, and Twentymile valleys adjacent to Turnagain Arm is second in area only to the wetlands of the Copper River Delta.

Lands in Prince William Sound (Northern Gulf Fjordlands Ecological Section) consist of mainland areas and islands. Elevations range from sea level to about 13000 feet (4000 m). The mainland features glaciated mountains that are steep and rugged, ice-scoured areas, and rolling peat lands over glaciated bedrock. Most of the lithology consists of meta-sandstone, shale, slate, and several granitic intrusions. Fjords with tidewater glaciers are also common.

The island archipelago in Prince William Sound features both rugged and rounded mountain topography. Many of the islands were uplifted significantly by the 1964 Great Alaska Earthquake creating low, flat shorelines (especially on the southern half of Montague Island). There are also rounded or smooth marine terraces that have been smoothed by wave action before they were lifted above the water by tectonic events. The lithology primarily consists of shale and meta-sandstone. Granitic intrusions and basaltic extrusions are present in some locations.

The Copper River Delta area (Northern Gulf Forelands Ecological Section) includes the Copper River and the extensive flatlands surrounding

the river. The area adjacent to the Copper River features islands, sand dunes, and lowlands directly affected by the river. This is a very dynamic landscape with changing river courses and strong winds flowing out of the interior of Alaska (driven by the atmospheric pressure gradient from the interior to the Gulf of Alaska). The landscape features are continuously changing due to water and wind erosion and deposition.

The surficial geology of the flat lands of the Copper River Delta consists of recent, relatively flat, outwash alluvial sediments associated with periodic flooding from outburst lakes and periods of heavy precipitation. Many spits, barrier islands, sand bars, and tidal flats are present and constantly changing due to isostatic rebound, wave action, floods, and tectonic uplift. The seaward portion of the area consists of tidal marshes and uplifted marine tidal sediments and ponds (which were raised above tidal influence by the 1964 Great Alaska Earthquake). The landward portion of the area consists of alluvial outwash deposits. The numerous sand bars and barrier islands seaward protect the mainland.

Climate

The range of climatic conditions among the ecological sections of the study area were compiled from annual precipitation, snowpack, and temperature maps in Blanchet (1983) and from descriptions in Davidson (1996). Walter climate diagrams (Walter 1984) based on data from weather stations (EarthInfo, Inc. 1995) representing the different ecological sections are presented in Figure 2.

Most of the Chugach National Forest lies within the Humid Temperate Domain of ECOMAP (ECOMAP 1993). However, the Tasnuna River area (Alaska Mountains Ecological Section) in the northeastern portion of the National Forest (Figure 1) occurs within the Polar Domain. Data from Tonsina weather station were used to generate a climate diagram representing conditions for the Tasnuna River area (Figure 2). Although Tonsina is not within the Tasnuna River drainage, it is the closest station available with a sufficient data record. The climate at Tonsina approximates that present in the Tasnuna River area. The climate at Tonsina is marked by

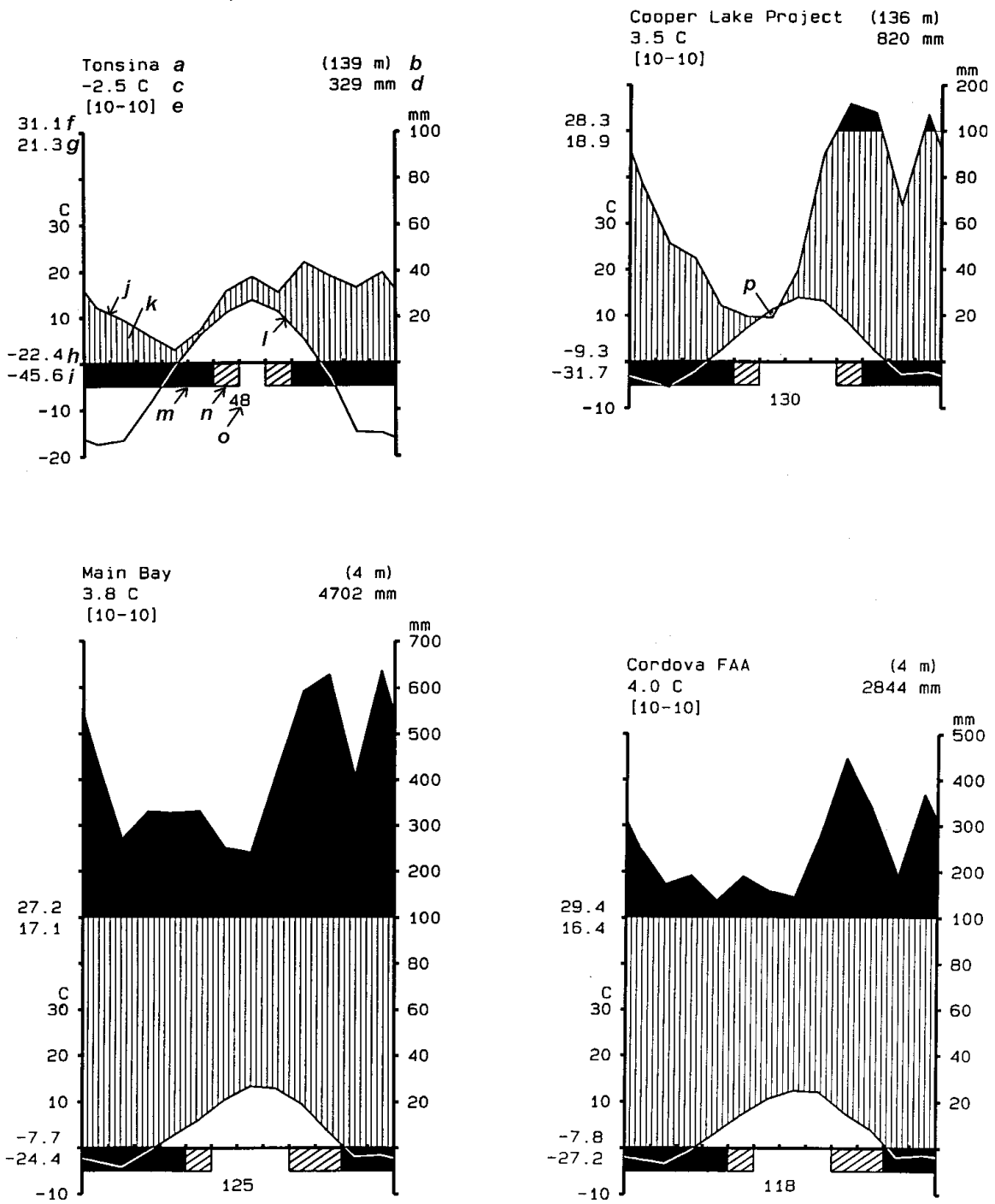


Figure 2. (caption on next page)

Figure 2. Walter climate diagrams based on data collected at weather stations representing a range of climatic conditions on the Chugach National Forest. Abscissa: months, starting in January. Ordinate: one division = 10°C or 20 mm precipitation (note: above 100 mm of monthly precipitation, increments shift from 20 to 100 mm per division); a = station, b = elevation in meters above sea level, c = mean annual temperature, d = mean annual precipitation, e = refers to 10 years of temperature and precipitation records (1985 through 1994 used for all diagrams), f = highest temperature recorded over the 10 year period, g = mean daily maximum temperature of the warmest month, h = mean daily minimum temperature of the coldest month, i = lowest temperature recorded over the 10 year period, j = mean monthly precipitation curve, k = relative humidity season (vertical shading for monthly precipitation less than 100 mm, black shading for monthly precipitation greater than 100 mm), l = mean monthly temperature curve, m = months with mean daily minimum temperature below 0°C (black shading), n = months with absolute minimum temperature below 0°C (diagonal shading), o = mean duration of frost-free period in days, p = relative period of drought (dotted shading).

a very short frost-free period (less than 50 days), mean annual temperatures below freezing, and monthly precipitation between 0.20 and 1.75 inches (5 to 45 mm).

The climates depicted in the diagrams for the Cooper Lake Project (Kenai Peninsula), Main Bay (Prince William Sound), and Cordova FAA (Copper River Delta) weather stations all contrast strongly with that of Tonsina (Figure 2). All three of these locations (not including Tonsina) have frost-free periods in excess of 115 days, mean annual temperatures above 38.5°F (3.5°C), and at least some months with precipitation exceeding 4 inches (100 mm).

In the Kenai Mountains portion of the Kenai Peninsula, the climate is transitional between maritime and continental with mean annual temperatures of 39°F (3.9°C) at low elevations and 20°F (-6.7°C) at upper elevations. The annual precipitation ranges from 20 to 80 inches (50 to 200 cm), with a mean maximum snow pack of 20 to 120 inches (50 to 300 cm), depending on elevation and location. The climate diagram for the Cooper Lake Project weather station (Figure 2) shows a decline in monthly precipitation from January through June followed by an abrupt increase in precipitation over July through September. The diagram indicates a brief period of relative drought in June (Figure 2). This dry period causes low fuel moisture to occur and it is the most favorable time for fires.

The lands in Prince William Sound feature mean annual temperatures ranging from 40°F (4.4°C) at shoreline to 32°F (0°C) at upper elevations. Mean annual precipitation ranges from 80 inches (200 cm) at sea level to over 300 inches (760 cm) at some upper elevation locations. The mean maximum snow pack ranges from 60 to 160 inches (150 to 400 cm) depending on location and elevation. The climate diagram for the Main Bay weather station (Figure 2) shows precipitation in excess of 8 inches (200 mm) for each month of the year.

In the Copper River Delta area, mean annual temperature is 34°F (1.1°C) to 42°F (5.6°C). Average precipitation ranges from 80 inches (200 cm) at the seashore to 200 inches (500 cm) further inland. The mean maximum snowpack ranges from 10 inches to 80 inches (25 to 200 cm) respective to the distance from the seashore. Strong continental winds,

which drain the interior in the winter, flow out the Copper River Canyon, cooling the temperatures in this area. The climate diagram for the Cordova FAA weather station (Figure 2) is similar in overall pattern to that of Main Bay. However, monthly precipitation at Cordova FAA ranges between 5 and 18 inches (125 to 450 mm) while it is between 10 and 25 inches (250 to 650 mm) at Main Bay.

In the high Chugach and Saint Elias mountains, the climate features cold, wet summers and winters. The annual precipitation occurs mainly as snow at elevations above 8000 feet (2500 m). These snow accumulations range up to 320 inches (800 cm) annually.

Soils

Davidson (1998a) describes eight landtype associations (ECOMAP 1993) across the Chugach National Forest. Among the criteria defining these landtype associations, Davidson (1996 and 1998b) has identified characteristic soil types. A summary of this information follows:

Landtype Association	Characteristic Soils
Glaciers	no soil (rocks and ice dominate)
Mountain Summits	shallow coarse textured soil between rock outcrops
Mountain Side Slopes	medium textured soil with moderate amounts of coarse fragments
Depositional Slopes	a. deep, well drained, medium textured soil with variable amounts of coarse fragments b. areas of fine textured soil that pond water and form wetlands
Moraines	poorly to well drained soils with coarse fragments consisting of non-sorted gravel, cobbles, and stones in a moderate to fine textured matrix
Coastal	a. deep, excessively drained sand on beaches and dunes exposed to continuous erosion b. deep, poorly drained silts on tidal flats
Fluvial Valley Bottoms	a. dominated by deep, stratified soils with rounded coarse fragments b. may pond water or form wetlands on fine textured soil c. commonly have high water table
Hills	a. usually coarse to medium textured soil with 15 to 65% coarse fragments b. usually organic soils in basins between hills where the organic material rests on glacial till or bedrock

Vegetation²

On the Kenai Peninsula, characteristic needleleaf forest trees include white spruce (*Picea glauca*), Sitka spruce, Lutz spruce (hybrids between white spruce and Sitka spruce), mountain hemlock, and occasionally black spruce. Mountain hemlock occurs primarily on side slopes at low to mid elevations while the spruces may dominate on both valley bottoms and side slopes. The spruce bark beetle (*Dendroctonus rufipennis*) is currently causing extensive mortality within the white, Lutz, and Sitka spruce forests (Holsten et al. 1995). Paper birch is a dominant broadleaf forest species and a major component of the mixed forests. Broadleaf forests of black cottonwood and willow (especially Barclay and feltleaf) shrublands are commonly found in the valley bottoms. Quaking aspen forests occur sporadically on southern side slopes. Over the last 150 years human-caused fires have been common and have profoundly affected forest vegetation succession in some areas (Potkin 1997). Because of the rarity of lightning strikes in the area, natural fires are rare (Potkin 1997).

Undergrowth species common within the Kenai Peninsula forest zone include: bluejoint reedgrass, rusty menziesia, early blueberry, devil's club, wood fern, lowbush cranberry, crowberry, splendid feathermoss, and Schreber's feathermoss. Non-forested steep mountain sideslopes below the alpine zone are often characterized by alternating stringers of tall shrubs dominated by Sitka alder, and rich herbaceous communities with species such as tall fireweed, bluejoint reedgrass, northern geranium, and lady fern. Alpine vegetation consists of dwarf scrub and herbaceous community types often dominated by such species as: crowberry, Steller's cassiope, bog blueberry, luetkea, white mountain-avens, and rough fescue.

Wetland vegetation in the Portage, Placer, and Twentymile river valleys (east end of Turnagain Arm) is compositionally similar to that summarized below for the Copper River Delta area.

² the scientific names for the species listed in this section are provided in Table 1 (page 33 of this report), except where noted in the text.

On the lands in Prince William Sound, characteristic needleleaf forest species include Sitka spruce, mountain hemlock, and western hemlock. Tall shrubland dominated by Sitka alder and salmonberry characterize avalanche chutes and beach fringe areas. Undergrowth species common beneath tree canopies include: early blueberry, Alaska blueberry (*Vaccinium alaskense*), devil's club, salmonberry, rusty menziesia, copperbush, skunk cabbage, deer cabbage, Pacific reedgrass, wood fern, splendid feathermoss, and gooseneck mosses. Characteristic species of the shrublands and herblands include: salmonberry, crowberry, bog blueberry, Steller's cassiope, Aleutian mountain heath, luetkea, tall cotton grass, tufted bulrush, bluejoint reedgrass, beach rye, Lyngbye's sedge, fewflower sedge, manyflower sedge, and sphagnum mosses.

In the Copper River Delta area needleleaf forest communities feature western hemlock and Sitka spruce. The forest undergrowth is composed of salmonberry, devil's club, early blueberry, Alaska blueberry, and skunk cabbage. Broadleaf forests are dominated by black cottonwoods with undergrowth of Sitka alder and willow. Forests frequently occur as interstitial stringers between adjacent open wetlands. Dominant wetland herbaceous communities include swamp horsetail, marsh fivefinger, buckbean, Lyngbye's sedge, Sitka sedge, burreed, yellow pondlily, dwarf alkaligrass, Pacific silverweed, Nootka lupine, tall fireweed, and beach rye. Characteristic dominants of the shrublands include sweetgale, Sitka alder, Barclay willow, and Sitka willow. Due to uplift from the 1964 Great Alaska Earthquake, the vegetation on tidal deposits are undergoing rapid successional change.

Predominant plants within the rock and ice dominated upper elevations of the Chugach and Saint Elias mountains are lichens and dwarf shrubs (e.g., crowberry, Steller's cassiope, luetkea, bog blueberry).

METHODS

Field Methods

Field sampling took place in the summers of 1988 through 1995 (primarily during July and August). From 1988 through 1991 sampling focused on forest vegetation. Sampling from 1992 through 1995 included

both forest and non-forest vegetation. The following guidelines were used for site and plot selection:

- 1) Sampling was not restricted to any particular vegetation structural type (i.e., forests, shrublands, and herblands were all sampled). Plot selection focused on contemporary vegetation without reference to successional relationships. Plots were established within portions of sites that appeared to be relatively uniform in topography and vegetation structure. Within an area, one to five plots were chosen to represent the contrasting vegetation composition on different geographic settings (Gillison and Brewer 1985; Austin and Heyligers 1989).
- 2) The site was required to be at least large enough to encompass the 500 m² or 50 m² plots used in forests and non-forests, respectively. The plots were primarily circular in shape. Occasionally, rectangular plots were used. Choice between the two plot shapes depended on the size and configuration of the site. For example, a narrow, linear site may have necessitated the use of a rectangular plot.
- 3) To be selected, the vegetation within the sampled portion of the site was required to be relatively homogeneous. This determination was based on a cursory examination of the general structure and composition of the site. In the overstory, important criteria included uniformity in canopy closure, overall vegetation height, and species composition. In the undergrowth, uniformity (or fine-scale repeating pattern) in the composition and distribution of the dominant plants were the primary criteria. For example, if all the blueberry shrubs occurred on one side of the site and all the skunk cabbage plants on the other side, then the site was not considered to be homogeneous. The sample plot in this example would have needed to be located in either the skunk cabbage or the blueberry portion of the site, but not encompassing both.
- 4) To be acceptable for selection, the physical/abiotic characteristics at the site needed to be relatively homogeneous. For example, the slope, aspect, microtopography, and soils needed to be relatively uniform. Since the vegetation is closely tied to site conditions, many of the problems of finding homogeneous vegetation were alleviated if the site being sampled was homogeneous.

- 5) No attempt was made to find the modal or "perfect" site. Such an attempt may have resulted in much of the day being spent searching rather than sampling. Also, it would have resulted in a failure to describe the range of characteristics of the vegetation and environment.
- 6) Visual estimates of percent canopy cover were obtained for all vascular plants (identified to species) within the sample plot (following procedures similar to those outlined on pages 60-61 of Mueller-Dombois and Ellenberg (1974))³. To accurately estimate the percent cover for each species, a thorough search of each plot was conducted. This was true for the smaller (less conspicuous) plants as well as the larger plants. Immature plants that could not be identified to the species level were identified to the genus level. Mature plants that could not be identified in the field were collected and pressed for later identification. Site information such as elevation, slope, aspect, parent material, and landform were also recorded for each plot. A reconnaissance soil pit was excavated at most sites and information was collected to determine soil subgroup and general physical properties (e.g., texture, coarse fragment content).

Office Methods

Analysis focused on using a combination of (1) classification to determine community types, and (2) ordination (gradient analyses) to describe general patterns of communities in relation to environmental factors. Classification was primarily accomplished using two-way indicator species analysis (TWINSPAN; Hill 1979a) in the CEP MS-DOS computer package (Mohler 1987). Ordination was primarily achieved using the detrended correspondence analysis (DCA) algorithm in the CANOCO computer package (ter Braak 1988). The input data were species cover

³ Attempts were made to list and estimate cover of individual moss and lichen species. However, the documentation of these non-vascular plant species was not consistent across all plots. Therefore, the moss and lichen species data were not used in the quantitative analyses.

variables recorded in each plot. Both TWINSpan and DCA are based on the same mathematical strategy (i.e., reciprocal averaging; Hill 1979a,b) and thus offer direct comparisons between the results of ordination and classification.

All default options in the TWINSpan algorithm were used except that pseudospecies cut levels were set at 0, 2, 5, and 25 percent cover. All default options were used in running DCA. Initially, the entire data matrix of 2293 sites and 720 species was analyzed. Subsequently, to reduce the amount of variation being considered (which is substantial in the whole matrix), the species list was thinned to the most characteristic vascular plant species and analyses were conducted on forest, shrubland, and herbland subgroups.

In many instances, a particular TWINSpan class included a plot or plots that, based on field experience and DCA patterns, appeared to be better placed in a different existing TWINSpan class. These plots were repositioned in the classification as appropriate.

In addition to helping refine the TWINSpan classification, DCA ordination assisted in describing and interpreting general patterns of vegetation communities and environment. For example, DCA extracts the dominant compositional gradients from the species data matrix. The environmental controls of these compositional gradients were then qualitatively interpreted based on comparisons with the site data.

The Alaska Vegetation Classification (Viereck et al. 1992) hierarchy was used to guide the development of this classification through level 4 (basically equivalent to "cover type" or vegetation "series"). Level 4 and the community type level (level 5) of the Alaska Vegetation Classification are not comprehensive for the Chugach National Forest (see Table 2). The present classification expands on the Alaska Vegetation Classification relative to southcentral Alaska by providing keys to the community types and descriptions of the vegetation characteristics, geographic distributions, and environmental features for each community type.

Taxonomic Considerations

Taxonomic nomenclature for vascular plants follows Hultén (1968). Exceptions to this include the following revisions to spelling of the scientific names:

<u>Hultén (1968) Spelling</u>	<u>Revised Spelling (NRCS 1997)</u>
<i>Carex lyngbyaei</i>	<i>C. lyngbyei</i>
<i>Deschampsia caespitosa</i>	<i>D. cespitosa</i>
<i>Lysichiton americanum</i>	<i>L. americanus</i>
<i>Myriophyllum spicatum</i>	<i>M. sibiricum</i>
<i>Nuphar polysepalum</i>	<i>N. polysepala</i>

Additionally, the following two species were found within the study area but are not reported in Hultén (1968): *Picea X lutzii*⁴ (Lutz spruce) and *Poa macrantha* (seashore bluegrass; see Pojar and MacKinnon 1994).

Nomenclature for non-vascular plants generally follows Vitt et al. (1988) and Geiser et al. (1994). Scientific names of all species in this study and the number of times they were observed are listed in Appendix B. The scientific and common names of plant species used in the names of community types or in the descriptions are provided in Table 1.

⁴ *Picea X lutzii* is the hybrid between *P. glauca* and *P. sitchensis* as described in Viereck and Little (1972) under the name *Picea X lutzii*.

Table 1. Code, scientific, and common names used in the names of community types or in the text. The common names are those considered to be in most widespread use by workers on the Forest. For a complete list of plant species identified in this study, and the authorities for each taxon, see Appendix B.

Code Name	Scientific Name	Common Name
TREES		
BETPAP	<i>Betula papyrifera</i>	paper birch
CHANOO	<i>Chamaecyparis nootkatensis</i>	Alaska yellow cedar
PICLUT	<i>Picea X lutzii</i>	Lutz spruce
PICMAR	<i>Picea mariana</i>	black spruce
PICSIT	<i>Picea sitchensis</i>	Sitka spruce
POPBAL	<i>Populus balsamifera ssp. trichocarpa</i>	black cottonwood
POPTRE	<i>Populus tremuloides</i>	quaking aspen
SALSCO	<i>Salix scouleriana</i>	Scouler willow
TSUHET	<i>Tsuga heterophylla</i>	western hemlock
TSUMER	<i>Tsuga mertensiana</i>	mountain hemlock
TALL SHRUBS		
ALNCRIS	<i>Alnus crispa ssp. sinuata</i>	Sitka alder
BETNAN	<i>Betula nana</i>	dwarf birch
CLAPYR	<i>Cladanthamnus pyroliflorus</i>	copperbush
ECHHOR	<i>Echinopanax horridum</i>	devil's club
MENFER	<i>Menziesia ferruginea</i>	rusty menziesia
MYRGAL	<i>Myrica gale</i>	sweetgale
ROSACI	<i>Rosa acicularis</i>	prickly rose
RUBSPE	<i>Rubus spectabilis</i>	salmonberry
SALIX	<i>Salix sp.</i>	willow
SALALA	<i>Salix alaxensis</i>	feltleaf willow
SALBAR	<i>Salix barclayi</i>	Barclay willow
SALCOM	<i>Salix commutata</i>	undergreen willow

SALHOO	<i>Salix hookeriana</i>	Hooker willow
SALSIT	<i>Salix sitchensis</i>	Sitka willow
SAMRAC	<i>Sambucus racemosa</i>	red elderberry
SHECAN	<i>Shepherdia canadensis</i>	buffaloberry
SORSIT	<i>Sorbus sitchensis</i>	Sitka mountain-ash
VACOVA	<i>Vaccinium ovalifolium</i>	early blueberry
VIBEDU	<i>Viburnum edule</i>	highbush cranberry

LOW AND DWARF SHRUBS

ANDPOL	<i>Andromeda polifolia</i>	bog rosemary
ARCALP	<i>Arctostaphylos alpina</i>	alpine bearberry
ARCUVA	<i>Arctostaphylos uva-ursi</i>	kinnikinnick
CASSTE	<i>Cassiope stelleriana</i>	Steller's cassiope
CASTET	<i>Cassiope tetragona</i>	white arctic mountain heather
DIALAP	<i>Diapensia lapponica</i>	pincushion plant
DRYOCT	<i>Dryas octopetala</i>	white mountain-avens
EMPNIG	<i>Empetrum nigrum</i>	crowberry
LEDPAL	<i>Ledum palustre</i>	marsh labrador tea
LINBOR	<i>Linnaea borealis</i>	twinflor
LOIPRO	<i>Loiseleuria procumbens</i>	alpine azalea
LUEPEC	<i>Luetkea pectinata</i>	Luetkea
OXYMIC	<i>Oxycoccus microcarpus</i>	bog cranberry
PHYALE	<i>Phyllodoce aleutica</i>	Aleutian mountain heath
SALARC	<i>Salix arctica</i>	arctic willow
SALMYR	<i>Salix myrtilifolia</i>	low blueberry willow
SALRET	<i>Salix reticulata</i>	netleaf willow
SALROT	<i>Salix rotundifolia</i>	least willow
SPIBEA	<i>Spiraea beauverdiana</i>	Beauverd spiraea
VACCAE	<i>Vaccinium caespitosum</i>	dwarf blueberry
VACULI	<i>Vaccinium uliginosum</i>	bog blueberry
VACVIT	<i>Vaccinium vitis-idaea</i>	lowbush cranberry

FORBS

ACHBOR	<i>Achillea borealis</i>	Yarrow
ACODEL	<i>Aconitum delphinifolium</i>	monkshood
ANENAR	<i>Anemone narcissiflora</i>	narcissus anemone
ANGGEN	<i>Angelica genuflexa</i>	bent-leaved angelica
ANGLUC	<i>Angelica lucida</i>	seacoast angelica
ANTMON	<i>Antennaria monocephala</i>	pygmy pussytoes
ARTARC	<i>Artemisia arctica</i>	boreal sagebrush
ARUSYL	<i>Aruncus sylvester</i>	goatsbeard
CALHER	<i>Callitriche hermaphroditica</i>	northern waterstarwort
CALVER	<i>Callitriche verna</i>	spring waterstarwort
CAMLAS	<i>Campanula lasiocarpa</i>	mountain harebell
CASUNA	<i>Castilleja unalaschcensis</i>	Alaska Indian paintbrush
COPASP	<i>Coptis aspleniifolia</i>	fernleaf goldthread
COPTRI	<i>Coptis trifolia</i>	trifoliolate goldthread
CORCAN	<i>Cornus canadensis</i>	bunchberry
DODPUL	<i>Dodecatheon pulchellum</i>	pretty shootingstar
DROROT	<i>Drosera rotundifolia</i>	round-leaf sundew
EPIADE	<i>Epilobium adenocaulon</i>	northern willowherb
EPIANA	<i>Epilobium anagallidifolium</i>	alpine willowherb
EPIANG	<i>Epilobium angustifolium</i>	tall fireweed
EPILAT	<i>Epilobium latifolium</i>	dwarf fireweed
ERIPER	<i>Erigeron peregrinus</i>	subalpine fleabane
FAUCRI	<i>Fauria crista-galli</i>	deer cabbage
FRACHI	<i>Fragaria chiloensis</i>	beach strawberry
FRICAM	<i>Fritillaria camschatcensis</i>	chocolate lily
GALTRI	<i>Galium trifidum</i>	threepetal bedstraw
GALTRIL	<i>Galium triflorum</i>	fragrant bedstraw
GENDOU	<i>Gentiana douglasiana</i>	swamp gentian
GENGLA	<i>Gentiana glauca</i>	pale gentian
GEOLIV	<i>Geocaulon lividum</i>	northern comandra
GERERI	<i>Geranium erianthum</i>	northern geranium
GEUCAL	<i>Geum calthifolium</i>	calthaleaf avens
HEDALP	<i>Hedysarum alpinum</i>	alpine sweetvetch

HERLAN	<i>Heracleum lanatum</i>	cow parsnip
HIPTET	<i>Hippuris tetraphylla</i>	fourleaf marestail
HIPVUL	<i>Hippuris vulgaris</i>	common marestail
HONPEP	<i>Honckenya peploides</i>	seaside sandplant
IRISET	<i>Iris setosa</i>	wild iris
LATMAR	<i>Lathyrus maritimus</i>	beach pea
LATPAL	<i>Lathyrus palustris</i>	vetchling
LISCOR	<i>Listera cordata</i>	heartleaf twayblade
LUPNOO	<i>Lupinus nootkatensis</i>	Nootka lupine
LYSAME	<i>Lysichiton americanus</i>	skunk cabbage
MENTRI	<i>Menyanthes trifoliata</i>	buckbean
MYRSIB	<i>Myriophyllum sibiricum</i>	shortspike watermilfoil
NUPPOL	<i>Nuphar polysepala</i>	yellow pondlily
OXYNIG	<i>Oxytropis nigrescens</i>	blackish oxytrope
PARPAL	<i>Parnassia palustris</i>	northern grass of Parnassus
PEDPAR	<i>Pedicularis parviflora</i>	smallflower lousewort
PLAMAR	<i>Plantago maritima</i>	goosetongue plantain
POLACU	<i>Polemonium acutiflorum</i>	tall jacobsladder
POLVIV	<i>Polygonum viviparum</i>	alpine bistort
POTFIL	<i>Potamogeton filiformis</i>	slender-leaved pondweed
POTNAT	<i>Potamogeton natans</i>	floating pondweed
POTPEC	<i>Potamogeton pectinatus</i>	sago pondweed
POTPER	<i>Potamogeton perfoliatus</i>	claspingleaf pondweed
POTEGE	<i>Potentilla egedii</i>	Pacific silverweed
POTPAL	<i>Potentilla palustris</i>	marsh fivefinger
PYROLA	<i>Pyrola</i> sp.	wintergreen
PYRASA	<i>Pyrola asarifolia</i>	liverleaf wintergreen
PYRSEC	<i>Pyrola secunda</i>	one-sided wintergreen
RANCYM	<i>Ranunculus cymbalaria</i>	seaside buttercup
RANTRI	<i>Ranunculus trichophyllus</i>	white water crowfoot
RHIMIN	<i>Rhinanthus minor</i>	yellow rattle
RUBARC	<i>Rubus arcticus</i>	nagoonberry
RUBPED	<i>Rubus pedatus</i>	fiveleaf bramble
SANSTI	<i>Sanguisorba stipulata</i>	Sitka burnet

SAXBRO	<i>Saxifraga bronchialis</i>	yellowdot saxifrage
SPARGA	<i>Sparganium</i> sp.	burreed
SPAANG	<i>Sparganium angustifolium</i>	floating burreed
SPAHYP	<i>Sparganium hyperboreum</i>	northern burreed
SPAMIN	<i>Sparganium minimum</i>	small burreed
SPIROM	<i>Spiranthes romanzoffiana</i>	hooded ladiestresses
STECAL	<i>Stellaria calycantha</i>	northern starwort
STRAMP	<i>Streptopus amplexifolius</i>	twistedstalk
SUBAQU	<i>Subularia aquatica</i>	awlwort
THASPA	<i>Thalictrum sparsiflorum</i>	fewflower meadowrue
TIATRI	<i>Tiarella trifoliata</i>	foamflower
TRIEUR	<i>Trientalis europaea</i>	starflower
TRIMAR	<i>Triglochin maritimum</i>	seaside arrowgrass
UTRVUL	<i>Utricularia vulgaris</i>	common bladderwort
VALSIT	<i>Valeriana sitchensis</i>	Sitka valerian
VERVIR	<i>Veratrum viride</i>	false hellebore
VIOLA	<i>Viola</i> sp.	violet
VIOGLA	<i>Viola glabella</i>	yellow violet

GRAMINOIDS

AGRALA	<i>Agrostis alascana</i>	Alaska bentgrass
ARCFUL	<i>Arctophila fulva</i>	pendant grass
CALCAN	<i>Calamagrostis canadensis</i>	bluejoint reedgrass
CALNUT	<i>Calamagrostis nutkaensis</i>	Pacific reedgrass
CAREX	<i>Carex</i> sp.	sedge
CARANT	<i>Carex anthoxanthea</i>	arctic sedge
CARAQU	<i>Carex aquatilis</i>	water sedge
CARCHO	<i>Carex chordorrhiza</i>	creeping sedge
CARGLA	<i>Carex glareosa</i>	lesser saltmarsh sedge
CARLIM	<i>Carex limosa</i>	mud sedge
CARLYN	<i>Carex lyngbyei</i>	Lyngbye's sedge
CARMACK	<i>Carex mackenziei</i>	Mackenzie's sedge
CARMACH	<i>Carex macrochaeta</i>	longawned sedge
CARMAG	<i>Carex magellanica</i>	boreal bog sedge

CARMIC	<i>Carex microchaeta</i>	smallawned sedge
CARMICG	<i>Carex microglochin</i>	fewseeded bog sedge
CARPAU	<i>Carex pauciflora</i>	fewflower sedge
CARPLU	<i>Carex pluriflora</i>	manyflower sedge
CARRHY	<i>Carex rhynchosphysa</i>	bladder beaked sedge
CARROS	<i>Carex rostrata</i>	beaked sedge
CARSAX	<i>Carex saxatilis</i>	rock sedge
CARSIT	<i>Carex sitchensis</i>	Sitka sedge
DESCES	<i>Deschampsia cespitosa</i>	tufted hairgrass
ELEACI	<i>Eleocharis acicularis</i>	needle spikerush
ELEPAL	<i>Eleocharis palustris</i>	common spikerush
ELYARE	<i>Elymus arenarius</i>	beach rye
ERIANG	<i>Eriophorum angustifolium</i>	tall cottongrass
ERIRUS	<i>Eriophorum russeolum</i>	red cottongrass
FESALT	<i>Festuca altaica</i>	rough fescue
FESRUB	<i>Festuca rubra</i>	red fescue
GLYPAU	<i>Glyceria pauciflora</i>	false mannagrass
HIEALP	<i>Hierochloe alpina</i>	alpine holy grass
JUNCUS	<i>Juncus</i> sp.	rush
JUNALP	<i>Juncus alpinus</i>	alpine rush
JUNARC	<i>Juncus arcticus</i>	arctic rush
LUZULA	<i>Luzula</i> sp.	woodrush
LUZMUL	<i>Luzula multiflora</i>	common woodrush
LUZWAH	<i>Luzula wahlenbergii</i>	Wahlenberg's woodrush
PHLCOM	<i>Phleum commutatum</i>	mountain timothy
POA	<i>Poa</i> sp.	bluegrass
POAMAC2	<i>Poa macrantha</i>	seashore bluegrass
PUCGIN	<i>Puccinellia</i> sp.	alkaligrass
PUCNUT	<i>Puccinellia nutkaensis</i>	Pacific reedgrass
PUCPUM	<i>Puccinellia pumila</i>	dwarf alkaligrass
TRICAE	<i>Trichophorum caespitosum</i>	tufted bulrush
TRISPI	<i>Trisetum spicatum</i>	spike trisetum

FERNS AND ALLIES

ATHFIL	<i>Athyrium filix-femina</i>	lady fern
BLESPI	<i>Blechnum spicant</i>	deer fern
DRYDIL	<i>Dryopteris dilatata</i>	wood fern
EQUISE	<i>Equisetum</i> sp.	horsetail
EQUARV	<i>Equisetum arvense</i>	common horsetail
EQUFLU	<i>Equisetum fluviatile</i>	swamp horsetail
EQUPAL	<i>Equisetum palustre</i>	marsh horsetail
EQUPRA	<i>Equisetum pratense</i>	meadow horsetail
EQUUSIL	<i>Equisetum silvaticum</i>	woodland horsetail
EQUVAR	<i>Equisetum variegatum</i>	northern horsetail
GYMDRY	<i>Gymnocarpium dryopteris</i>	oak fern
LYCALP	<i>Lycopodium alpinum</i>	alpine clubmoss
LYCANN	<i>Lycopodium annotinum</i>	stiff clubmoss
LYCCLA	<i>Lycopodium clavatum</i>	running clubmoss
LYCCOM	<i>Lycopodium complanatum</i>	groundcedar
LYCOPO	<i>Lycopodium</i> sp.	clubmoss
THELIM	<i>Thelypteris limbosperma</i>	maiden fern
THEPHE	<i>Thelypteris phegopteris</i>	beech fern

MOSSES

HYLSPL	<i>Hylocomium splendens</i>	splendid feathermoss
PLESCH	<i>Pleurozium schreberi</i>	Schreber's feathermoss
RHYTID	<i>Rhytidiadelphus</i> sp.	gooseneck moss
SPHAGN	<i>Sphagnum</i> sp.	sphagnum moss

ALGAE

CHARA	<i>Chara</i> sp.	chara
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Certain species were difficult to distinguish in the field. Because of identification difficulties and similarities in ecology (note: the two *Alnus* species and two *Ledum* subspecies are ecologically distinct), the following species were merged. For example, *Vaccinium ovalifolium* and *V. alaskense* were merged into *V. ovalifolium*:

Taxon 1	Taxon 2	Merged Name
<i>Achillea borealis</i>	<i>Achillea millefolium</i>	<i>Achillea borealis</i>
<i>Alnus crispa</i> ssp. <i>sinuata</i>	<i>Alnus incana</i> ssp. <i>tenuifolia</i>	<i>Alnus crispa</i> ssp. <i>sinuata</i>
<i>Betula nana</i>	<i>Betula glandulosa</i>	<i>Betula nana</i>
<i>Betula papyrifera</i>	<i>Betula kenaica</i>	<i>Betula papyrifera</i>
<i>Carex microchaeta</i>	<i>Carex nesophila</i>	<i>Carex microchaeta</i>
<i>Cornus canadensis</i>	<i>Cornus suecica</i>	<i>Cornus canadensis</i>
<i>Deschampsia cespitosa</i>	<i>Deschampsia beringensis</i>	<i>Deschampsia cespitosa</i>
<i>Ledum palustre</i> ssp. <i>decumbens</i>	<i>Ledum palustre</i> ssp. <i>groenlandicum</i>	<i>Ledum palustre</i>
<i>Picea X lutzii</i>	<i>Picea glauca</i>	<i>Picea X lutzii</i>
<i>Populus balsamifera</i> ssp. <i>trichocarpa</i>	<i>Populus balsamifera</i> ssp. <i>balsamifera</i>	<i>Populus balsamifera</i> ssp. <i>trichocarpa</i>
<i>Vaccinium ovalifolium</i>	<i>Vaccinium alaskense</i>	<i>Vaccinium ovalifolium</i>

ECOLOGICAL TERMS AND CONCEPTS

There is a long-standing debate among vegetation ecologists regarding two contrasting views of plant community organization: 1) a view that distinct community types develop and reappear across the landscape wherever environmental conditions are similar (Daubenmire 1966) and 2) a view that community type classification is artificial since vegetation, like environment, varies continuously across the landscape (Cottam and McIntosh 1966; Vogl 1966). The authors of this classification acknowledge that, while continua exist, natural resource managers and field biologists need ecologically-based classifications for inventory, mapping, and ecosystem interpretations.

Additionally, vegetation classifications provide a common system for improving communication among diverse investigators and aid in improving sampling and experimental design (Pfister et al. 1977). Local conditions that deviate from the classification can still be described in relation to how they differ from the type descriptions (Steele et al. 1983).

Plant communities and the soils supporting them are functional products of the interaction of organisms, climate, geomorphology, parent material, and time (Jenny 1941; Major 1951). In addition, natural and human-caused disturbance can profoundly affect plant community composition. This classification describes vegetation compositional groupings that reflect the combined and interactive influence of these biophysical factors.

Ecological classification is an attempt to divide vegetation and the environment into abstract natural units that are useful for management applications (Boggs 1998). Vegetation classifications generally fall under two broad groups:

- 1) *plant association classifications* - based strictly on potential vegetation (i.e., the end product of vegetation succession)
- 2) *community type classifications* - based on existing vegetation (includes the range of vegetation successional states from early to late)

This document presents a community type classification. Thus, some of the types represent late stages of succession while many represent early and intermediate stages in succession.

In general, the key (Appendix A) and the classification group vegetation samples according to dominant tree, shrub, and herbaceous species, in that order. For example, all samples dominated by *Tsuga mertensiana* are examined as a set, samples within this set where *Vaccinium ovalifolium* is dominant in the shrub layer are extracted as a subset, and samples where *Calamagrostis nutkaensis* characterizes the herbaceous layer are extracted into a third, and final, subset (the resulting type is *Tsuga mertensiana/Vaccinium ovalifolium/Calamagrostis nutkaensis*). This scheme allows for the recognition of more ecologically distinct areas than would be possible if only undergrowth or overstory were considered alone

(Daubenmire and Daubenmire 1968). The same tree canopy can occur over almost wholly different ground covers. In general terms, one might hypothesize that the tree stratum is more closely tied to macroenvironment, whereas the undergrowth is more sensitive to microenvironment (Daubenmire and Daubenmire 1968).

Community type names were chosen for brevity and for appropriateness in conveying a sense of environmental conditions over a given range. The name does not infer that the only species at the site are those given in the name. For example, in forest types, three or more tree species may codominate in the overstory and the occurrence of 20 or more undergrowth species is not uncommon.

FUTURE STUDY

This document provides a classification of community types based on vegetation and physical site data collected from 2293 study plots. The classification is basically a data summary and is based on a minimum of assumptions and interpretations. In its current form, the classification (and the databases from which it was developed) are immediately applicable in ecological inventory, mapping, and sampling/experimental design.

Full realization of the interpretive power of the classification provided here will require additional studies focusing on interpretation, synthesis, and modeling. Among proposals for relevant future studies are the following:

- **Resource Capability Index Development** - Ecologically-based management is constrained by the inherent capability of the land to produce resources. The proposed work would develop a set of resource capability indices (*sensu* Pfister 1976) based on the community type and ecological unit classifications. These indices could include such variables as wood volume yield capability, wildlife browse capability, and aesthetic recovery rate.
- **Description of Successional Sequences** - The community types described occur as discreet vegetation states on one or more successional

sequences. A given community may be an early successional state on one successional sequence and a mid to late-successional state on another successional sequence. The proposed work would identify the successional sequences and the timelines associated with the transitions along these sequences. This information would be invaluable in developing predictions of vegetation compositional changes. Such predictive capability has implications and benefits for silvicultural management, wildlife habitat management, and recreation management (e.g., in relation to aesthetic recovery rates).

- **Indicator Species and Conditions Indicated** - The plant species used in the community type names and key are referred to as "indicator species". Additional analyses (combined with literature review) are needed to identify and summarize the ecological conditions indicated by each indicator species.
- **Floristic/Environmental Relationships** - Knowledge of the environmental distribution and zonation of species and communities contributes to our understanding of the spatial relationships of species and communities and the ability to make predictions about species and community occurrences in unsampled areas. This knowledge may be obtained by qualitative analyses where schematic diagrams are used to depict the direct relationships of species and communities to environmental factors (Whittaker 1967) or by quantitative analyses where generalized linear models are used to statistically relate vegetation and environmental factors (Austin et al. 1984). The proposed work would involve both quantitative and qualitative analyses of floristic/environmental relationships.
- **Terrestrial Ecological Unit Database Development** - The data on which this classification is based are being migrated into the new Forest Service ecological database standard (i.e., the TERRA database; USDA 1998). A major component of the continued development of the TERRA database on the Chugach National Forest is building relevant ecosystem management interpretations. TERRA will facilitate development of interpretations by providing integrated database tools for storing, retrieving, analyzing, summarizing, and displaying ecological data.

- **Ecological Unit Inventory** - *ECOMAP* (1993) provides a regionalization, classification, and mapping system for stratifying the Earth into progressively smaller areas of increasingly uniform ecological potential. *ECOMAP* provides a powerful tool and scientific basis to plan for and accomplish ecosystem management. The proposed work would apply the vegetation classification towards developing ecological unit inventory map products at the landtype and landtype phase levels of the *ECOMAP* hierarchy. In addition, the classification would be used to update (as necessary) *GIS* databases for areas where ecological unit mapping has already occurred.
- **Assess Biological Diversity Patterns** - The classification (and the data on which the classification is based) would be used in the mapping and analysis of biological diversity characteristics (e.g., species, community, and landscape richness, diversity, and pattern) across southcentral Alaska. Areas of biological diversity significance would be highlighted. Management alternatives could be developed towards maintaining or restoring biological diversity.
- **Field Guidebook** - This project would involve developing and publishing a field (vest pocket) guide describing the community types present in southcentral Alaska. The content of the guide would include (1) keys to each community type and (2) condensed descriptions of the floristic, geographic, and physiographic features of each community type. This document would be extracted and built from the large format version provided here.
- **Training** - The hierarchical classification of community types presented here is an invaluable tool for ecological interpretation, inventory, and mapping. To effectively use the classification system and the vegetation databases from which it was developed requires familiarity with the concepts used to develop the classification, with the application of the classification in identifying community types in the field, and in navigating within the computerized databases. This project would generate a training manual for using the classification and vegetation ecology databases. It will also provide training sessions to field crews and resource specialists in the use and application of the classification and databases.

- **Expansion of the Classification** - To be fully comprehensive, this classification of community types will need to receive periodic updates and revisions to document rare and undersampled community types (including the full range of early successional vegetation). This project would continue field survey efforts to identify new locations for rare community types, describe previously unsampled (or undersampled) vegetation expressions, and more fully document non-vascular plant species composition (i.e., lichens, mosses, liverworts). Additionally, each community type currently described would be ranked according to its rarity in the region and globally. This ranking scheme would follow standard Heritage Program methodology established by The Nature Conservancy (1988; 1996). Occurrence information for rare community types would be entered into the Alaska Natural Heritage Program databases.
- **Criteria and Indicators for Sustainability** - In 1995 in Santiago, Chile 10 countries, including the United States, endorsed a list of criteria and indicators for the conservation and sustainable management of temperate and boreal forests (see Canadian Forest Service 1995). Assessments using many of these criteria and indicators require a hierarchical classification of community types (as provided here). For example, the conservation of biological diversity criteria includes community indicators for evaluating ecosystem diversity (e.g., extent of differing successional stages, fragmentation of community types, the amount and kind of community types represented in reserves). A desirable future study would be to demonstrate applications of the classification towards assessing sustainability in southcentral Alaska.

DESCRIPTIONS OF COMMUNITY TYPES

Descriptions are provided for the 197 community types represented by at least 3 study plots. This classification follows the nomenclature and protocol developed in the Alaska Vegetation Classification (AKVC) by Viereck et al. (1992). This is a hierarchical classification scheme with five levels (I-V). Level I is the broadest and has only three options (i.e., forest, scrub, and herbaceous). Levels II through V are progressively more specific. The title section preceding each community type description lists: scientific name (AKVC level V), common name, code name, number of plots used to describe the type, AKVC level III or IV code (level IV listed if available), and the characteristic AKVC level III and IV names.

Nomenclature for landforms follows the landtype legend provided in Davidson (1998c). The samples included in this community type classification occurred across the following landtypes:

rugged mountains, rounded mountains, rounded subalpine mountains, disturbed mountain side slopes, non-disturbed mountain side slopes, broken mountain side slopes, dissected mountain side slopes, non-disturbed foot slopes, disturbed foot slopes, kame moraines, moraines, estuaries, raised beaches, beaches, sea slopes, raised tidal flats, marine terraces, flood plains, outwash plains, valley floor, dunes, stream terraces, flat lowlands, gently sloping hills, high relief hills, and low relief hills

The vegetation descriptions use the terms absent, present, sparse, common, poorly represented, well represented, and abundant in reference to canopy cover of given species. The threshold of canopy cover reflected by each of these terms is:

Present	> 0	Absent	0
Common	≥ 1	Sparse	< 1
Well Represented	≥ 5	Poorly Represented	< 5
Abundant	≥ 25		

The Chugach National Forest is currently using the AKVC classification scheme for vegetation mapping. Vegetation mapping is

occurring at AKVC level III for Forestwide efforts such as land cover classification and landtype association mapping, and at level IV and V for project level needs. This mapping is stored in the Chugach National Forest GIS database.

A listing of the 197 described communities is provided in Table 2. Additionally, Table 2 documents the following for each community type: average species richness, the most common AKVC level IV code, and other studies documenting the same or similar types within Alaska. A listing of photographs depicting selected AKVC level III community types is provided in Table 3.

Table 2. List of the 197 Chugach National Forest community types represented by three or more sample plots. In addition to the community type code name, the following information is presented:

n = the number of sample plots;

rich = average number of species among sample plots within the community type (i.e., species richness);

AKVC level 4 and AKVC page = the class code and page number in Table 2 of Viereck et al. (1992) in which the community type is listed. If no level 4 type is documented in Viereck et al. (1992) for the community type in question, a question mark is appended to the code; and,

CRD, YAC, CHA, STI, KET = if marked, the type (or a closely similar type) is also documented in classifications of the Copper River Delta (Boggs 1998), the Yakutat Forelands (Shephard 1995), the Chatham Area (Tongass National Forest, Martin et al. 1995), the Stikine Area (Tongass NF, Pawuk and Kissinger 1988), or the Ketchikan Area (Tongass NF, DeMeo et al. 1992), respectively. In some cases, the type identified may not be listed for the particular geographic area referenced by the indicated report. Documentation indicating that these additional types are present in the respective area is provided by Boggs (1996).

Community Type	n	rich	AKVC Level 4	AKVC page	CRD	YAC	CHA	STI	KET
Needleleaf Forest									
PICLUT/ALNCRIS	10	23	IA2?	.	.	.	.	.	.
PICLUT/ALNCRIS-MENFER	4	22	IA2?	.	.	.	.	.	.
PICLUT/CALCAN	5	31	IA2?	.	.	.	.	.	.
PICLUT/DRYDIL	11	31	IA2?	.	.	.	.	.	.
PICLUT/ECHHOR	10	26	IA2?	.	.	.	.	.	.
PICLUT/EQUARV	6	33	IA2?	.	.	.	.	.	.
PICLUT/GYMDRY	13	31	IA2?	.	.	.	.	.	.
PICLUT/LINBOR	5	26	IA2?	.	.	.	.	.	.
PICLUT/MENFER	10	25	IA2?	.	.	.	.	.	.
Community Type	n	rich	AKVC	AKVC	CRD	YAC	CHA	STI	KET

Level 4 page

PICLUT/MENFER/sparse	9	28	IA2?	.	.	.	.	.	.
PICLUT/VACVIT	15	28	IA2?	.	.	.	.	.	.
PICMAR/ALNCRIS	3	23	IA2f	.	.	.	.	.	.
PICMAR/VACVIT	16	22	IA2f	19	.	.	.	.	.
PICSIT/ALNCRIS	19	16	IA2a	17	X	X	X	X	.
PICSIT/ALNCRIS-ECHHOR	10	19	IA1a	.	.	.	.	.	.
PICSIT/ECHHOR	14	16	IA1a	15	X	X	X	X	X
PICSIT/EQUARV	4	20	IA1a	.	.	.	.	.	.
PICSIT/HYLSPL	4	14	IA1a	.	X	X	.	.	.
PICSIT/LYSAME	8	22	IA1a	.	.	.	.	.	.
PICSIT/RUBSPE-ECHHOR	31	18	IA1a	15	X	X	X	X	X
PICSIT/SALBAR	5	18	IA3b	.	.	.	.	.	.
PICSIT/VACOVA	5	18	IA1a	.	X	X	X	X	X
PICSIT/VACOVA-ECHHOR	16	17	IA1a	.	X	X	X	X	X
PICSIT/VACOVA/DRYDIL	6	18	IA1a	.	.	X	.	.	.
TSUHET/HYLSPL	3	20	IA1b	.	.	.	.	.	.
TSUHET/VACOVA	31	17	IA1b	15	X	X	X	X	X
TSUHET/VACOVA-ECHHOR	11	23	IA1b	15	X	X	X	X	X
TSUHET/VACOVA/DRYDIL	4	21	IA1b	15	.	X	X	X	X
TSUHET/VACOVA/LYSAME	4	19	IA1b	.	X	.	X	X	X
TSUHET-PICSIT/ECHHOR	6	21	IA1c	.	.	.	.	.	.
TSUHET-PICSIT/RUBSPE-ECHHOR	4	16	IA1c	.	.	.	.	.	.
TSUHET-PICSIT/VACOVA	33	19	IA1c	15	.	.	.	.	.
TSUHET-PICSIT/VACOVA-ECHHOR	17	19	IA1c	15	.	.	X	.	.
TSUHET-PICSIT/VACOVA/LYSAME	7	20	IA1c	15	.	.	.	.	X
TSUMER/ALNCRIS	4	20	IA2c	.	.	.	.	.	.
TSUMER/ALNCRIS-MENFER	4	23	IA2c	.	.	.	.	.	.
TSUMER/CASSTE	12	19	IA2c	.	.	.	X	X	X
TSUMER/DRYDIL	5	22	IA2c	.	.	.	.	.	.
TSUMER/ECHHOR	4	20	IA1f	.	.	.	.	.	.
TSUMER/HYLSPL	6	21	IA1f	.	.	.	.	.	.
TSUMER/MENFER	19	16	IA1f	.	.	.	.	.	.
TSUMER/MENFER-VACVIT	7	18	IA1f	.	.	.	.	.	.
TSUMER/MENFER/sparse	39	20	IA1f	.	.	.	.	.	.
TSUMER/PHYALE	11	18	IA2c	.	.	.	.	.	.
Community Type	n	rich	AKVC	AKVC	CRD	YAC	CHA	STI	KET

Level 4 page

TSUMER/VACOVA	28	20	IA1f	16	.	X	X	X	X
TSUMER/VACOVA-CASSTE	10	21	IA2c	17	.	.	X	.	.
TSUMER/VACOVA-CLAPYR	18	25	IA2c	17	.	.	X	X	X
TSUMER/VACOVA-ECHHOR	15	26	IA2c	.	.	.	.	.	.
TSUMER/VACOVA-MENFER	6	19	IA1f	.	.	.	.	.	.
TSUMER/VACOVA/CALNUT	12	23	IA2c	.	.	.	.	.	.
TSUMER/VACOVA/FAUCRI	8	27	IA2c	.	.	.	X	.	.
TSUMER/VACULI	15	24	IIA2b	.	.	.	.	.	.
TSUMER/VACVIT	31	23	IA2c	.	.	.	.	.	.
TSUMER-CHANOO/VACOVA-CASSTE	3	27	IA2?	.	.	.	.	.	.
TSUMER-PICLUT/ECHHOR	3	20	IA1?	.	.	.	.	.	.
TSUMER-PICLUT/HYLSPL	5	17	IA1?	.	.	.	.	.	.
TSUMER-PICLUT/MENFER	29	14	IA1?	.	.	.	.	.	.
TSUMER-PICLUT/MENFER-VACVIT	7	17	IA1?	.	.	.	.	.	.
TSUMER-PICLUT/MENFER/sparse	19	20	IA1?	.	.	.	.	.	.
TSUMER-PICSIT/ECHHOR	11	21	IA1?	.	.	.	.	.	.
TSUMER-PICSIT/VACOVA	27	19	IA1?	.	.	.	X	.	X
TSUMER-PICSIT/VACOVA-ECHHOR	22	22	IA1?	.	.	.	.	X	.
TSUMER-PICSIT/VACOVA-RUBSPE	7	22	IA1?	.	.	.	.	.	.
TSUMER-PICSIT/VACOVA/DRYDIL	17	18	IA1?	.	.	.	.	.	.
TSUMER-PICSIT/VACOVA/LYSAME	8	22	IA1?	.	.	.	.	.	.
TSUMER-TSUHET/VACOVA	36	22	IA1?	.	.	X	.	.	.
TSUMER-TSUHET/VACOVA-CASSTE	5	22	IA2?	.	.	.	.	.	.
TSUMER-TSUHET/VACOVA-CLAPYR	3	24	IA2?	.	.	.	.	.	.
TSUMER-TSUHET/VACOVA-ECHHOR	11	24	IA1?	.	.	.	.	.	.
TSUMER-TSUHET/VACOVA-MENFER	4	19	IA1?	.	.	.	.	.	.
TSUMER-TSUHET/VACOVA/CALNUT	5	21	IA2?	.	.	.	.	.	.
TSUMER-TSUHET/VACOVA/FAUCRI	7	31	IA2?	.	.	.	.	.	.
TSUMER-TSUHET/VACOVA/LYSAME	5	27	IA1?	.	.	X	.	.	.

Broadleaf Forest

BETPAP/ALNCRIS	7	21	IB2a	.	.	.	.	.	.
BETPAP/CALCAN	7	24	IB1d	.	.	.	.	.	.
BETPAP/ECHHOR	5	22	IB1d	.	.	.	.	.	.
BETPAP/LINBOR	3	24	IB1d	.	.	.	.	.	.
BETPAP/MENFER	10	23	IB1d	.	.	.	.	.	.
Community Type	n	rich	AKVC	AKVC	CRD	YAC	CHA	STI	KET

Level 4 page

BETPAP/MENFER/sparse	9	20	IB1d	.	.	.	.	.	.
BETPAP/VACVIT	3	30	IB1d	.	.	.	.	.	.
POPBALT/ALNCRIS	51	18	IB2c	.	X	.	.	.	.
POPBALT/ECHHOR	4	18	IB2c	.	X	X	.	X	.
POPTRE/SHECAN	5	27	IB1e	.	.	.	.	.	.

Mixed Forest

PICLUT-BETPAP/CALCAN	3	20	IC1?	.	.	.	.	.	.
PICLUT-BETPAP/HYLSPL	6	20	IC1?	.	.	.	.	.	.
PICLUT-BETPAP/LYCANN	6	23	IC1?	.	.	.	.	.	.
PICLUT-BETPAP/MENFER	3	18	IC1?	.	.	.	.	.	.
PICLUT-BETPAP/MENFER/sparse	7	25	IC1?	.	.	.	.	.	.
PICLUT-BETPAP/VACVIT	13	25	IC1?	.	.	.	.	.	.
PICLUT-POPBALT/ALNCRIS	9	23	IC2?	.	.	.	.	.	.
PICLUT-POPBALT/CALCAN	5	23	IC1?	.	.	.	.	.	.
PICLUT-POPBALT/ECHHOR	4	22	IC2?	.	.	.	.	.	.
PICLUT-POPBALT/EQUARV	5	30	IC2?	.	.	.	.	.	.
PICLUT-POPBALT/HYLSPL	5	19	IC1?	.	.	.	.	.	.
PICLUT-POPTRE/VACVIT	11	23	IC1?	.	.	.	.	.	.
PICSIT-POPBALT/ALNCRIS	4	18	IC2?	.	X	X	.	.	.
TSUMER-BETPAP/HYLSPL	7	10	IC1?	.	.	.	.	.	.
TSUMER-BETPAP/LYCANN	3	14	IC1?	.	.	.	.	.	.
TSUMER-BETPAP/MENFER	11	13	IC1?	.	.	.	.	.	.
TSUMER-BETPAP/MENFER/sparse	6	20	IC1?	.	.	.	.	.	.

Tall Scrub

ALNCRIS-ECHHOR	21	11	IIB1b	.	.	.	.	.	.
ALNCRIS-SALCOM	3	16	IIB1d	.	.	.	.	.	.
ALNCRIS/ATHFIL	3	13	IIB1b	.	.	X	.	.	.
ALNCRIS/CALCAN	10	13	IIB1b	26	X	X	.	.	.
ALNCRIS/DRYDIL	21	10	IIB1b	.	.	.	.	.	.
ALNCRIS/EQUARV	9	13	IIB1b	26	X	.	.	.	.
ALNCRIS-RUBSPE	8	13	IIB1b	26	X	X	.	.	.
ALNCRIS-RUBSPE/ATHFIL	8	15	IIB1b	.	.	.	.	.	.
ALNCRIS-SALALA	9	14	IIB1d	.	.	.	.	.	.
ALNCRIS-SALALA/CALCAN	4	19	IIB1d	26	.	.	.	.	.
Community Type	n	rich	AKVC	AKVC	CRD	YAC	CHA	STI	KET

Level 4 page

ALNCRIS-SALBAR	6	16	IIB1d	.	X	.	.	.	.
ALNCRIS-SALSIT	8	14	IIB1d	.	X	X	.	.	.
ALNCRIS-SALSIT/CALCAN	9	17	IIB1d	.	.	.	.	.	.
SALALA	11	14	IIB2a	.	X	.	.	.	.
SALBAR/CALCAN	17	18	IIB1a	.	.	.	.	.	.
SALBAR/CARSIT	4	12	IIB1a	.	X	.	.	.	.
SALBAR/mixed herb	6	17	IIB1a	.	X	X	.	.	.
SALCOM	7	17	IIB2a	.	X	.	.	.	.
SALHOO	5	20	IIB1a	.	X	X	.	.	.
SALSIT	19	16	IIB1a	.	X	X	.	.	.

Low Scrub

BETNAN	5	17	IIC2d	.	.	.	.	.	.
CLAPYR	8	23	IIC2?	.	.	.	.	.	.
MYRGAL-SALBAR	4	16	IIC1?	.	.	.	.	.	.
MYRGAL-SALCOM	7	17	IIC1?	.	.	.	.	.	.
MYRGAL-SALHOO	4	20	IIC1?	.	.	.	.	.	.
MYRGAL/CALCAN	8	13	IIC2j	33	.	.	.	.	.
MYRGAL/CARLYN	7	21	IIC1?	.	X	.	.	.	.
MYRGAL/CARSIT	12	11	IIC1?	.	X	X	.	.	.
MYRGAL/ERIANG	11	15	IIC2j	33	X	.	.	.	.
RUBSPE	23	10	IIC1?	.	X	.	.	.	.
RUBSPE/ATHFIL	8	12	IIC1?	.	.	.	.	.	.
RUBSPE/CALCAN	8	14	IIC1?	.	.	.	.	.	.

Dwarf Scrub

CASSTE-LUEPEC	44	17	IID2e	.	.	.	.	.	.
CASSTE-LUEPEC/FAUCRI	8	12	IID2e	.	.	.	.	.	.
DRYOCT/HIEALP	7	19	IID1b	.	.	.	.	.	.
EMPNIIG	22	20	IID2c	.	.	.	.	.	.
EMPNIIG-ARCALP	20	15	IID2c	36	.	.	.	.	.
EMPNIIG-VACULI	30	17	IID2c	36	X	X	.	.	.
EMPNIIG-VACULI/CARPLU	5	14	IID2c	.	.	.	.	.	.
EMPNIIG-VACULI/FAUCRI	19	17	IID2c	.	.	.	.	.	.
EMPNIIG-VACULI/TRICAE	9	19	IID2c	.	.	.	.	.	.
Community Type	n	rich	AKVC	AKVC	CRD	YAC	CHA	STI	KET

			Level 4 page						
PHYALE-CASSTE	15	15	IID2d	36	.	.	.	.	.
PHYALE/FAUCRI	9	15	IID2d	.	.	.	.	.	.
SALARC-EMPNIIG	10	19	IID3a	.	.	.	.	.	.
SALARC/CARLYN	3	12	IID3a	.	X	.	.	.	.
SALRET/FESALT	3	26	IID3a	.	.	.	.	.	.
SALROT/CARMIC	9	13	IID3a	.	.	.	.	.	.
Graminoid Herbaceous									
ARCFUL	6	3	IIIA3	44	X	.	.	.	.
CALCAN	21	10	IIIA2	40	X	X	.	.	.
CALCAN/SALIX	3	10	IIIA2c	.	.	.	.	.	.
CARAQU	3	7	IIIA3f	45	.	.	.	.	.
CARLYN	17	6	IIIA3i	47	X	X	.	.	.
CARLYN/LATPAL	12	12	IIIA3i	.	X	.	.	.	.
CARLYN/RANCYM	21	10	IIIA3i	.	X	.	.	.	.
CARLYN/mixed herb	19	11	IIIA3i	.	X	.	.	.	.
CARMACH	7	26	IIIA2f	.	.	.	.	.	.
CARMIC	6	15	IIIA1	.	.	.	.	.	.
CARPAU	3	13	IIIA3j	.	.	.	.	.	.
CARPLU	5	12	IIIA3j	47	.	.	.	.	.
CARROS	3	6	IIIA3f	45	X	.	.	.	.
CARSIT	17	8	IIIA3f	45	X	.	.	.	.
DESCES	8	13	IIIA1	39	X	.	.	.	.
ELEPAL	9	3	IIIA3i	47	X	X	.	.	.
ELYARE	15	6	IIIA1	38	X	X	.	.	.
ELYARE/ACHBOR	3	12	IIIA1	.	X	.	.	.	.
ERiang-CARPAU	12	16	IIIA3	.	.	.	.	.	.
ERiang-CARPLU	9	13	IIIA3	.	X	.	.	.	.
ERiang-TRICAE	6	16	IIIA3	42	.	.	.	.	.
FESALT	5	17	IIIA1	38	.	.	.	.	.
FESALT/GERERI	11	26	IIIA1	39	.	.	.	.	.
LUZWAH	3	9	IIIA1?	.	.	.	.	.	.
PUCPUM	6	2	IIIA3	46	X	X	.	.	.
TRICAE	12	15	IIIA3c	44	.	X	.	.	.
Community Type	n	rich	AKVC	AKVC	CRD	YAC	CHA	STI	KET

Level 4 page

Forb Herbaceous

ATHFIL	5	15	IIIB2d	.	X	X	.	.	.
EPIANG	5	15	IIIB2b	50	X	.	.	.	.
EQUARV	7	11	IIIB3b	51	X	.	.	.	.
EQUFLU	20	5	IIIB3a	50	X	X	.	.	.
EQUVAR	7	15	IIIB1a	48	X	.	.	.	.
FAUCRI	11	16	IIIB2a	50	X	.	.	.	.
FAUCRI/TRICAE	3	18	IIIB2a	.	X	.	.	.	.
FRACHI	3	13	IIIB1a	.	X	X	.	.	.
LATMAR	3	8	IIIB1?	.	X	.	.	.	.
LUPNOO	8	13	IIIB2a	.	X	.	.	.	.
MENTRI	13	7	IIIB3c	51	X	X	.	.	.
POTEGE	6	7	IIIB3d	.	X	.	.	.	.
POTPAL	4	9	IIIB3c	.	X	.	.	.	.
VALSIT	6	24	IIIB2a	.	.	.	.	.	.
VERVIR	4	18	IIIB2a	.	.	.	.	.	.

Aquatic Herbaceous

CALHER	4	4	IIID1g	.	X	.	.	.	.
HIPVUL	5	4	IIID1	53	X	.	.	.	.
MYRSIB	3	4	IIID1	53	X	X	.	.	.
POTFIL	12	4	IIID1f	.	X	.	.	.	.
POTPER	18	3	IIID1f	53	X	.	.	.	.
RANTRI	8	3	IIID1c	53	X	.	.	.	.
SPARGA	6	4	IIID1	53	X	.	.	.	.
SUBAQU	3	5	IIID1g	.	X	.	.	.	.
UTRVUL	3	3	IIID1?	.	X	.	.	.	.
			

GRAND TOTAL 1974

Table 3. List of figures, and their respective page numbers, showing representative photographs of selected Alaska Vegetation Classification (AKVC) level 3 community types present on the Chugach National Forest.

AKVC level 3	Description	Figure	Page
IA1	Closed Needleleaf Forest	5	98
IA2	Open Needleleaf Forest	3	81
IB2	Open Broadleaf Forest	6	113
IC2	Open Mixed Forest	7	120
IIA2	Open Dwarf Tree Scrub	4	86
IIB1	Closed Tall Scrub	8	132
IIC1	Closed Low Scrub	10	144
IIC2	Open Low Scrub	9	143
IID2	Ericaceous Dwarf Scrub	11	147
IID3	Willow Dwarf Scrub	12	155
IIIA1	Dry Graminoid Herbaceous	16	171
IIIA2	Mesic Graminoid Herbaceous	13	158
IIIA3	Wet Graminoid Herbaceous	14	160
IIIB1	Dry Forb Herbaceous	17	178
IIIB2	Mesic Forb Herbaceous	15	163
IIIB3	Wet Forb Herbaceous	18	180
IIID1	Freshwater Aquatic Herbaceous	19	185

Needleleaf Forest Type

Lutz Spruce Cover Type

Picea X lutzii/Alnus crispa ssp. sinuata

(Lutz spruce/Sitka alder)

(PICLUT/ALNCRIS; 10 sites)

IA1.-IA2. Closed and open needleleaf forest

Vegetation- Sites are dominated by an open canopy of *Picea X lutzii* (Lutz spruce). *Populus balsamifera ssp. trichocarpa* (black cottonwood) may also be a well represented canopy component in valley bottoms. *Tsuga mertensiana* (mountain hemlock) is also an occasional associate. *Alnus crispa ssp. sinuata* (Sitka alder) is well represented to abundant and dominates the tall shrub layer. Other tall shrubs that might be common include *Viburnum edule* (highbush cranberry), and *Echinopanax horridum* (devil's club). The herbaceous layer is dominated by *Calamagrostis canadensis* (bluejoint reedgrass). Other often well represented species in the undergrowth include *Equisetum* sp. (horsetail), *Gymnocarpium dryopteris* (oak fern), and *Athyrium filix-femina* (lady fern).

Physical setting- The Lutz spruce/Sitka alder type is fairly widespread in the Kenai Mountains, occurring mostly in small patches on dissected mountain side slopes. It also occurs on the flood plains of the Portage, Placer, and Twentymile area. The sites sampled were mostly on northerly aspects, on slopes up to 45 percent (though most were less than 5 percent), and to 1300 feet in elevation.

Picea X lutzii/Alnus crispa ssp. sinuata-Menziesia ferruginea

(Lutz spruce/Sitka alder-rusty menziesia)

(PICLUT/ALNUS-MENFER; 4 sites)

IA1.-IA2. Closed and open needleleaf forest

Vegetation- Sites are dominated by *Picea X lutzii* (Lutz spruce), with *Betula papyrifera* (paper birch) as a consistent minor associate. *Alnus crispa ssp. sinuata* (Sitka alder) and *Menziesia ferruginea* (rusty menziesia) are well

represented and dominate the tall shrub layer. Other shrubs with high constancy but low cover include *Rosa acicularis* (prickly rose), *Vaccinium ovalifolium* (early blueberry), *Viburnum edule* (highbush cranberry), *Linnaea borealis* (twinline), and *Vaccinium vitis-idaea* (lowbush cranberry). Dominant herbaceous species are *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), and *Equisetum* sp. (horsetail). Other species in the undergrowth with high constancy but low cover include *Pyrola* sp. (wintergreen), *Gymnocarpium dryopteris* (oak fern), and *Lycopodium clavatum* (running clubmoss).

Physical setting- Lutz spruce/Sitka alder-rusty menziesia is a minor type in the Kenai Mountains. Sufficient site data are not available at this time.

Picea X lutzii/Calamagrostis canadensis
(Lutz spruce/bluejoint reedgrass)
(PICLUT/CALCAN; 5 sites)
IA2. Open needleleaf forest

Vegetation- *Picea X lutzii* (Lutz spruce) dominates the tree layer. No other tree species appear to be consistent in this type. Tall, low, and dwarf shrubs are generally absent, poorly represented, or inconsistently represented within this type. *Salix barclayi* (Barclay willow) is the most consistently present tall shrub. *Calamagrostis canadensis* (bluejoint reedgrass) is abundant and dominates the undergrowth. Other consistent species that may be common to abundant include *Epilobium angustifolium* (tall fireweed), *Rubus pedatus* (fiveleaf bramble), *Rubus arcticus* (nagoonberry), *Sanguisorba stipulata* (Sitka burnet), *Equisetum arvense* (common horsetail), *Gymnocarpium dryopteris* (oak fern), *Dryopteris dilatata* (wood fern), and *Cornus canadensis* (bunchberry).

Physical setting- Although there were only 5 sites sampled in the Lutz spruce/bluejoint reedgrass type, it is a widespread type on non-disturbed mountain side slopes and flat lowlands of the Kenai Peninsula. This type has gained further dominance in the last 10 years due to the spruce bark beetle infestation. In many areas, the open nature of this type reflects mortality in the canopy. In the absence of fire, the abundance of bluejoint reedgrass will often inhibit swift forest regeneration. Sites sampled are on all

aspects, on slopes less than 15 percent, and at elevations between 700 and 1200 feet.

Picea X lutzii/Dryopteris dilatata
(Lutz spruce/wood fern)
(PICLUT/DRYDIL; 11 sites)
IA2. Open needleleaf forest

Vegetation- *Picea X lutzii* (Lutz spruce) dominates the tree layer. *Tsuga mertensiana* (mountain hemlock) is the most common tree associate. Tall and low shrubs are generally poorly represented. *Echinopanax horridum* (devil's club), *Viburnum edule* (highbush cranberry), *Linnaea borealis* (twinflower), and *Spiraea beauverdiana* (Beauverd spiraea) are the most constant shrubs, but have low cover. The dominant herbaceous species and indicator for this type is *Dryopteris dilatata* (wood fern), which is well represented. *Gymnocarpium dryopteris* (oak fern), *Equisetum arvense* (common horsetail), *Calamagrostis canadensis* (bluejoint reedgrass), *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), *Epilobium angustifolium* (tall fireweed), and *Pyrola secunda* (one-sided wintergreen) may be common to well represented.

Physical setting- The Lutz spruce/wood fern type is a widespread type in the Kenai Mountains. As with the Lutz spruce/bluejoint reedgrass type, in many cases the open canopy reflects mortality due to the spruce bark beetle infestation. As bluejoint reedgrass is well represented in this type, it will commonly increase in cover and retard forest regeneration in the absence of fire. Sites sampled in this type occur mostly on easterly and southeasterly aspects, on slopes of less than 20 percent, and at elevations between 400 and 1400 feet.

Picea X lutzii/Echinopanax horridum
(Lutz spruce/devil's club)
PICLUT/ECHHOR; 10 sites
IA1.-IA2 Closed and open needleleaf forest

Vegetation- *Picea X lutzii* (Lutz spruce) dominates the tree layer, with *Tsuga mertensiana* (mountain hemlock) the most common tree associate. The tall shrub layer is dominated by *Echinopanax horridum* (devil's club) that is well represented to abundant. *Alnus crispa ssp. sinuata* (Sitka alder) and *Menziesia ferruginea* (rusty menziesia) are common tall shrub associates. Ferns are a dominant undergrowth component, with abundant *Gymnocarpium dryopteris* (oak fern) and *Dryopteris dilatata* (wood fern). The dominant forb in this type is *Rubus pedatus* (fiveleaf bramble), with *Cornus canadensis* (bunchberry), *Calamagrostis canadensis* (bluejoint reedgrass), and *Streptopus amplexifolius* (twistedstalk) as minor herbaceous associates.

Physical setting- The Lutz spruce/devil's club type is a widespread but minor type in the Kenai Mountains. It is also an incidental type on the valley bottoms of the Portage, Placer, and Twentymile area. This type usually occurs along wet but well drained seepage sites and along streams, which are preferred habitats for devil's club. This type occurs on broken and dissected mountain side slopes. Sites sampled are on all aspects, on slopes to 35 percent, and at elevations to 1000 feet.

Picea X lutzii/Equisetum arvense
(Lutz spruce/horsetail)
(PICLUT/EQUARV; 6 sites)
IA2. Open needleleaf forest

Vegetation- *Picea X lutzii* (Lutz spruce) dominates the tree layer. *Tsuga mertensiana* (mountain hemlock), *Picea mariana* (black spruce), or *Betula papyrifera* (paper birch) may be common associates. There are no consistent tall shrubs in this type, but *Alnus crispa ssp. sinuata* (alder), *Echinopanax horridum* (devil's club), *Vaccinium ovalifolium* (early blueberry), and *Menziesia ferruginea* (rusty menziesia), may be common. *Linnaea borealis* (twinflor) is often common in the low shrub layer. *Equisetum arvense* (common horsetail) and *Equisetum silvaticum* (woodland horsetail) are

abundant and dominate the undergrowth. Other species in the undergrowth with high constancy include *Sanguisorba stipulata* (Sitka burnet), *Calamagrostis canadensis* (bluejoint reedgrass), *Gymnocarpium dryopteris* (oak fern), *Rubus pedatus* (fiveleaf bramble), and *Cornus canadensis* (bunchberry).

Physical setting- The Lutz spruce/horsetail type occurs in moist to wet forests and seepage areas on flood plains, non-disturbed foot slopes, broken mountain side slopes, and stream terraces on the Kenai Peninsula. Sites sampled were on northerly aspects with slopes less than 10 percent and elevations from 500 to 900 feet. The open canopy of this type is often due to spruce bark beetle mortality.

Picea X lutzii/Gymnocarpium dryopteris

(Lutz spruce/oak fern)

(PICLUT/GYMDRY; 13 sites)

IA1.-IA2. Closed and open needleleaf forest

Vegetation- *Picea X lutzii* (Lutz spruce) dominates the tree layer. *Tsuga mertensiana* (mountain hemlock) is the most consistent tree associate. Other tree species may be common, but without consistency. Tall and low shrubs are generally poorly represented and have low cover. *Salix barclayi* (Barclay willow), *Viburnum edule* (highbush cranberry), *Linnaea borealis* (twinline), and *Spiraea beauverdiana* (Beauverd spiraea) are the most consistent shrubs. Forb cover is also sparse with *Cornus canadensis* (bunchberry), *Epilobium angustifolium* (tall fireweed), *Pyrola secunda* (one-sided wintergreen), *Rubus pedatus* (fiveleaf bramble), and *Trientalis europaea* (starflower) the most consistent species. The undergrowth is dominated by *Gymnocarpium dryopteris* (oak fern), which is the indicator for this type. *Calamagrostis canadensis* (bluejoint reedgrass) is generally a well represented associate. Presence of other species is highly variable.

Physical setting- Lutz spruce/oak fern is a widely occurring type in the Kenai Mountains. The predominant landforms where this type occurs are flat lowlands, flood plains, and gentle hills. It is found on easterly and northerly aspects with less than 20 percent slopes at elevations between 500 and 1300 feet. Open sites in this type are often the result of spruce

bark beetle infestation. Sites with well represented bluejoint reedgrass may have significant competition for spruce regeneration.

Picea X lutzii/Linnaea borealis
(Lutz spruce/twinflower)
(PICLUT/LINBOR; 5 sites)
IA2. Open needleleaf forest

Vegetation- *Picea X lutzii* (Lutz spruce) dominates the tree layer. *Betula papyrifera* (paper birch) is the most common tree associate. Tall shrubs have low representation in this type. *Sambucus racemosa* (red elderberry) is consistent, but cover is low. The dominant low shrub, and indicator species is *Linnaea borealis* (twinflower) which is well represented. Dominant forbs in the undergrowth are *Cornus canadensis* (bunchberry), *Epilobium angustifolium* (tall fireweed), *Pyrola secunda* (one-sided wintergreen), and *Rubus pedatus* (fiveleaf bramble). Other fairly consistent undergrowth components are *Gymnocarpium dryopteris* (oak fern) and *Lycopodium annotinum* (stiff clubmoss).

Physical setting- The Lutz spruce/twinflower type is minor in the Kenai Mountains, occurring on mountain side slopes. This type is indicative of relatively dry sites and occurs on southerly aspects, on slopes less than 15 percent, and at elevations from 900 to 1100 feet. Although spruce bark beetle is a significant factor in tree mortality and has created the open nature of some of these stands, the lack of significant bluejoint reedgrass should allow for adequate forest regeneration.

Picea X lutzii/Menziesia ferruginea
(Lutz spruce/rusty menziesia)
(PICLUT/MENFER; 10 sites)
IA1.-IA2. Closed and open needleleaf forest

Vegetation- *Picea X lutzii* (Lutz spruce) dominates the tree layer. *Betula papyrifera* (paper birch) and *Tsuga mertensiana* (mountain hemlock) are common associated tree species. *Menziesia ferruginea* (rusty menziesia) is abundant and dominates the tall shrub layer, and is the indicator species for

this type. *Alnus crispa* ssp. *sinuata* (Sitka alder), and *Rosa acicularis* (prickly rose) may be common in the tall shrub layer. *Vaccinium vitis-idaea* (lowbush cranberry), *Empetrum nigrum* (crowberry), and *Linnaea borealis* (twinline) are consistent minor components in the dwarf shrub layer. Common undergrowth species are *Pyrola secunda* (one-sided wintergreen), *Rubus pedatus* (fiveleaf bramble), *Cornus canadensis* (bunchberry), *Gymnocarpium dryopteris* (oak fern), and *Lycopodium annotinum* (stiff clubmoss).

Physical setting- Lutz spruce/rusty menziesia is a common type on side slopes in the Kenai Mountains. This type occurs on all aspects, on slopes up to 60 percent, and at elevations from 450 to 1000 feet. Open stand structure reflects spruce bark beetle activity in many cases, however, regeneration problems are not expected.

Picea X lutzii/Menziesia ferruginea/sparse
(Lutz spruce/rusty menziesia/sparse
(PICLUT/MENFER/sparse: 9 sites)
IA1.-IA2. Closed and open needleleaf forest

Vegetation- *Picea X lutzii* (Lutz spruce) is the dominant tree species with *Betula papyrifera* (paper birch) and *Tsuga mertensiana* (mountain hemlock) often occurring as minor associates. The dominant tall shrub is *Menziesia ferruginea* (rusty menziesia), which is well represented. This type differs from PICLUT/MENFER where *Menziesia ferruginea* is abundant. *Linnaea borealis* (twinline) is consistent in the dwarf shrub layer. Common undergrowth species include *Pyrola secunda* (one-sided wintergreen), *Rubus pedatus* (fiveleaf bramble), *Cornus canadensis* (bunchberry), *Gymnocarpium dryopteris* (oak fern), and *Lycopodium annotinum* (stiff clubmoss).

Physical setting- Lutz spruce/rusty menziesia/sparse is a common type in the Kenai Mountains. This type occurs on foot slopes and mountain side slopes. Sites sampled are on easterly aspects, on slopes up to 55 percent, and from 300 to 1500 feet elevation. Open stand structure reflects spruce bark beetle activity in many cases, however, regeneration problems are not expected.

Picea X lutzii/Vaccinium vitis-idaea
(Lutz spruce/lowbush cranberry)
(PICLUT/VACVIT; 15 sites)
IA2. Open needleleaf forest

Vegetation- *Picea X lutzii* (Lutz spruce) dominates the tree layer. *Betula papyrifera* (paper birch) or *Tsuga mertensiana* (mountain hemlock) often occur as minor associates. The tall shrub component is sparse and inconsistent. *Vaccinium vitis-idaea* (lowbush cranberry) and *Empetrum nigrum* (crowberry) and occasionally *Linnaea borealis* (twinflower) dominate the low/dwarf shrub layer and the undergrowth in general. Other species that are consistently present in the undergrowth include *Cornus canadensis* (bunchberry), *Epilobium angustifolium* (tall fireweed), *Geocaulon lividum* (northern comandra), *Pyrola secunda* (one-sided wintergreen), *Calamagrostis canadensis* (bluejoint reedgrass), and *Lycopodium annotinum* (stiff clubmoss).

Physical setting- The Lutz spruce/lowbush cranberry type is a minor, yet widespread type in the Kenai Mountains. It occurs on many types of landforms, including broken and non-disturbed mountain side slopes, non-disturbed foot slopes, high relief hills, flat lowlands, and flood plains. Sites sampled are on all aspects, on slopes to 10 percent (one site at 55 percent), and from 400 to 1300 feet elevation. Open stand structure reflects spruce bark beetle activity in many cases. Some sites in this type have significant bluejoint reedgrass, which may inhibit forest regeneration following spruce mortality.

Black Spruce Cover Type

Picea mariana/Alnus crispa ssp. sinuata
(black spruce/Sitka alder)
(PICMAR/ALNUS; 3 sites)
IA2f. Open needleleaf forest, black spruce

Vegetation- *Picea mariana* (black spruce) dominates the tree layer. *Betula papyrifera* (paper birch) is the most consistent minor tree associate. The tall shrub layer is dominated by *Alnus crispa ssp. sinuata* (Sitka alder). Well

represented low/dwarf shrubs include *Empetrum nigrum* (crowberry), *Linnaea borealis* (twinflower), and *Vaccinium vitis-idaea* (lowbush cranberry). Species dominant in the herbaceous layer are *Calamagrostis canadensis* (bluejoint reedgrass) and *Viola* sp. (violet). Other species that may be well represented in the undergrowth include *Rosa acicularis* (prickly rose), *Cornus canadensis* (bunchberry), *Equisetum arvense* (common horsetail), and *Lycopodium annotinum* (stiff clubmoss).

Physical setting- Black spruce/Sitka alder is a minor type in the Kenai Mountains. Sufficient site data are not available at this time.

Picea mariana/Vaccinium vitis-idaea
(black spruce/lowbush cranberry)
(PICMAR/VACVIT; 16 sites)

IA2f. Open needleleaf forest, black spruce

Vegetation- *Picea mariana* (black spruce) dominates the tree layer. Other tree species that may be present as minor associates include *Betula papyrifera* (Paper birch) and *Picea X lutzii* (Lutz spruce). Tall shrubs are sparse and inconsistent in this type. *Empetrum nigrum* (crowberry) and *Vaccinium vitis-idaea* (lowbush cranberry) are well represented and dominate the low shrub layer, and are indicators for this type. Other common low/dwarf shrubs include *Ledum palustre* (marsh labrador tea), and *Vaccinium uliginosum* (bog blueberry). Species that can be common in the herb layer include *Cornus canadensis* (bunchberry), *Geocaulon lividum* (northern comandra), *Calamagrostis canadensis* (bluejoint reedgrass), and *Equisetum arvense* (common horsetail).

Physical setting- The black spruce/lowbush cranberry type is common on non-disturbed foot slopes in the Kenai Mountains. It is most common on northerly aspects with less than 20 percent slope and at elevations from 300 to 1000 feet.

Sitka Spruce Cover Type

Picea sitchensis/Alnus crispa ssp. sinuata
(Sitka spruce/Sitka alder)
(PICSIT/ALNCRIS; 19 sites)

IA1a.-IA2a. Closed and open needleleaf forest, Sitka spruce

Vegetation- *Picea sitchensis* (Sitka spruce) dominates the tree layer; other tree species are occasionally present. The tall shrub layer is dominated by *Alnus crispa ssp. sinuata* (Sitka alder), though *Rubus spectabilis* (salmonberry) or *Salix* sp. (willow) may also be well represented. Low and dwarf shrubs are essentially absent. Herbaceous cover is variable, with *Pyrola asarifolia* (liverleaf wintergreen), *Calamagrostis canadensis* (bluejoint reedgrass), and *Equisetum* sp. (horsetail) the most consistent species in the undergrowth.

Physical setting- Sitka spruce/Sitka alder is a minor type, yet is found throughout the Chugach National Forest (predominantly Prince William Sound and the Copper River Delta) on flood plains, high and low relief hills, and raised beaches. Sites sampled are on all aspects, on slopes less than 50 percent, and from sea level to 400 feet elevation. This is one of the more productive types on the Chugach National Forest.

Picea sitchensis/Alnus crispa ssp. sinuata-Echinopanax horridum
(Sitka spruce/Sitka alder-devil's club)
(PICSIT/ALNCRIS-ECHHOR; 10 sites)

IA1a.-IA2a. Closed and open needleleaf forest, Sitka spruce

Vegetation- *Picea sitchensis* (Sitka spruce) dominates the tree layer; other tree species are occasionally present. The tall shrub layer is dominated by *Alnus crispa ssp. sinuata* (Sitka alder) and *Echinopanax horridum* (devil's club), though *Rubus spectabilis* (salmonberry) and *Vaccinium ovalifolium* (early blueberry) may also be well represented. Low and dwarf shrubs are absent. Forbs with high constancy but low cover include *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), *Streptopus amplexifolius*

(twistedstalk), and *Tiarella trifoliata* (foamflower). *Dryopteris dilatata* (wood fern) and *Gymnocarpium dryopteris* (oak fern) are common to well represented.

Physical setting- The Sitka spruce/Sitka alder-devil's club type occurs on flood plains, raised beaches, beaches, and dissected mountain side slopes predominantly in Prince William Sound and the Copper River Delta. Sites sampled are on all aspects, on slopes up to 85 percent, and from sea level to 150 feet elevation. This is one of the most productive types on the Chugach National Forest.

Picea sitchensis/Echinopanax horridum

(Sitka spruce/devil's club)

(PICSIT/ECHHOR; 14 sites)

IA1a. Closed needleleaf forest, Sitka spruce

Vegetation- *Picea sitchensis* (Sitka spruce) dominates the tree layer; other tree species are often present. *Echinopanax horridum* (devil's club) is the dominant shrub with *Alnus crispa* ssp. *sinuata* (Sitka alder), *Menziesia ferruginea* (rusty menziesia), *Rubus spectabilis* (salmonberry), and *Vaccinium ovalifolium* (early blueberry) as common minor associates. Low and dwarf shrubs are absent. Herbaceous species with high constancy but low cover include *Rubus pedatus* (fiveleaf bramble), *Streptopus amplexifolius* (twistedstalk), and *Tiarella trifoliata* (foamflower). *Dryopteris dilatata* (wood fern) and *Gymnocarpium dryopteris* (oak fern) may be well represented in the undergrowth.

Physical setting- The Sitka spruce/devil's club type occurs on flood plains, raised beaches, beaches, flat lowlands, non-disturbed foot slopes, and dissected mountain side slopes throughout the Chugach National Forest. Sites sampled are on northerly aspects, on slopes up to 65 percent, and from sea level to 400 feet elevation. This is one of the most productive types on the Chugach National Forest.

Picea sitchensis/Equisetum arvense
(Sitka spruce/common horsetail)
(PICSIT/EQUARV; 4 sites)

IA1a. Closed needleleaf forest, Sitka spruce

Vegetation- *Picea sitchensis* (Sitka spruce) is the dominant conifer with *Populus balsamifera* ssp. *trichocarpa* (black cottonwood) occasionally present as a minor associate. Shrubs are sparse in this type, but *Alnus crispa* ssp. *sinuata* (Sitka alder) and *Vaccinium ovalifolium* (early blueberry) are often present. Low and dwarf shrubs are absent. *Equisetum arvense* (common horsetail) is abundant and is the major indicator for this type. Other herbaceous species which may be present but inconsistently represented include *Rubus pedatus* (fiveleaf bramble), *Streptopus amplexifolius* (twistedstalk), *Gymnocarpium dryopteris* (oak fern), and *Athyrium filix-femina* (lady fern).

Physical setting- Sitka spruce/common horsetail is an incidental type that occurs on flood plains. The few sites sampled are on flat terrain at 50 feet or less elevation.

Picea sitchensis/Hylocomium splendens
(Sitka spruce/splendid feather moss)
(PICSIT/HYLSPL; 4 sites)

IA1a. Closed needleleaf forest, Sitka spruce

Vegetation- *Picea sitchensis* (Sitka spruce) is the dominant conifer with *Populus balsamifera* ssp. *trichocarpa* (black cottonwood) occasionally present as a minor associate. Shrubs are generally poorly represented or absent. The most constant shrub is *Alnus crispa* ssp. *sinuata* (Sitka alder). Low and dwarf shrubs are absent. This type is characterized by an abundant moss layer and poor representation of herbaceous species. The most consistent mosses on these sites are *Hylocomium splendens* (splendid feather moss) and *Rhytidiadelphus* sp. (gooseneck moss).

Physical setting- Sitka spruce/splendid feather moss is a minor type of the Copper River Delta. Sufficient site data are not available at this time.

Picea sitchensis/Lysichiton americanus

(Sitka spruce/skunk cabbage)

(PICSIT/LYSAME; 8 sites)

IA1a. Closed needleleaf forest, Sitka spruce

Vegetation- *Picea sitchensis* (Sitka spruce) is the dominant conifer with *Tsuga heterophylla* (western hemlock) occasionally occurring as a minor associate. There are no tall, low, or dwarf shrub species dominant in this type, but *Alnus crispa* ssp. *sinuata* (Sitka alder), *Echinopanax horridum* (devil's club), *Vaccinium ovalifolium* (early blueberry), and *Rubus spectabilis* (salmonberry) may be present. *Lysichiton americanus* (skunk cabbage) is well represented in the undergrowth, and is the indicator species for this type. Herbaceous species with high constancy but low cover include *Rubus pedatus* (fiveleaf bramble), *Cornus canadensis* (bunchberry), *Tiarella trifoliata* (foamflower), *Streptopus amplexifolius* (twistedstalk), *Dryopteris dilatata* (wood fern), *Gymnocarpium dryopteris* (oak fern), and *Thelypteris phegopteris* (beech fern).

Physical setting- Sitka spruce/skunk cabbage is a minor type that occurs on flood plains and non-disturbed foot slopes. It is generally found on northerly aspects with less than 15 percent slope and at less than 100 feet elevation.

Picea sitchensis/Rubus spectabilis-Echinopanax horridum

(Sitka spruce/salmonberry-devil's club)

(PICSIT/RUBSPE-ECHHOR; 31 sites)

IA1a. Closed needleleaf forest, Sitka spruce

Vegetation- *Picea sitchensis* (Sitka spruce) dominates the tree layer. *Tsuga mertensiana* (mountain hemlock) or *T. heterophylla* (western hemlock) are occasional minor associates. The tall shrub layer is dominated by abundant *Rubus spectabilis* (salmonberry) and *Echinopanax horridum* (devil's club). *Vaccinium ovalifolium* (early blueberry) is also common to well represented in the tall shrub layer. Low and dwarf shrubs are absent. Undergrowth species with fairly high constancy but low cover include *Rubus pedatus* (fiveleaf bramble), *Cornus canadensis* (bunchberry), *Tiarella trifoliata* (foamflower), and *Streptopus amplexifolius* (twistedstalk). Common ferns

include *Dryopteris dilatata* (wood fern), *Athyrium filix-femina* (lady fern), *Gymnocarpium dryopteris* (oak fern), and *Thelypteris phegopteris* (beech fern).

Physical setting- Sitka spruce/salmonberry-devil's club is the most common Sitka spruce type on the Chugach National Forest. It occurs predominantly in Prince William Sound on flood plains, but is also found on low and high relief hills, foot slopes, and dissected mountain side slopes. It is found on all aspects, on slopes up to 100 percent, and is usually found below 500 feet elevation. Sitka spruce/salmonberry-devil's club is one of the most productive types on the Chugach National Forest, and attains highest productivity on flood plains.

Picea sitchensis/Salix barclayi
(Sitka spruce/Barclay willow)
(PICSIT/SALBAR; 5 sites)

IA1a.-IA2a.-IA3b. Closed and open needleleaf forest-Needleleaf woodland,
Sitka spruce

Vegetation- *Picea sitchensis* (Sitka spruce) dominates the tree layer with *Populus balsamifera* ssp. *trichocarpa* (black cottonwood) occasionally present. *Salix barclayi* (Barclay willow) is abundant in the shrub layer. Other willow species reported in this type include *S. commutata* (undergreen willow), *S. hookeriana* (Hooker willow), and *S. sitchensis* (Sitka willow). *Alnus crispa* ssp. *sinuata* (Sitka alder) and *Myrica gale* (sweetgale) may also occur in the tall shrub layer. Low and dwarf shrubs are essentially absent. Herbaceous species with fairly high constancy include *Pyrola asarifolia* (liverleaf wintergreen), *Rubus arcticus* (nagoonberry), *Calamagrostis canadensis* (bluejoint reedgrass), *Carex* sp. (sedge), and *Equisetum* sp. (horsetail). Forb representation is inconsistent throughout the type.

Physical setting- Physical setting information is not available at this time.

Picea sitchensis/Vaccinium ovalifolium

(Sitka spruce/early blueberry)

(PICSIT/VACOVA; 5 sites)

IA1a. Closed needleleaf forest, Sitka spruce

Vegetation- *Picea sitchensis* (Sitka spruce) dominates the tree layer with *Tsuga heterophylla* (western hemlock) often occurring as a minor associate. *Vaccinium ovalifolium* (early blueberry) is the most constant and abundant shrub. *Rubus spectabilis* (salmonberry), *Echinopanax horridum* (devil's club), and *Alnus crispa* ssp. *sinuata* (Sitka alder) may be common associated tall shrubs. Low and dwarf shrubs are absent. Undergrowth species with high constancy but low cover include *Rubus pedatus* (fiveleaf bramble), *Cornus canadensis* (bunchberry), *Tiarella trifoliata* (foamflower), *Lycopodium annotinum* (stiff clubmoss), and *Streptopus amplexifolius* (twistedstalk).

Physical setting- Sitka spruce/early blueberry is a minor type that has been sampled on beaches and flood plains. It occurs on flat to nearly flat surfaces at less than 50 feet elevation.

Picea sitchensis/Vaccinium ovalifolium-Echinopanax horridum

(Sitka spruce/early blueberry-devil's club)

(PICSIT/VACOVA-ECHHOR; 16 sites)

IA1a.-IA2a. Closed and open needleleaf forest, Sitka spruce

Vegetation- *Picea sitchensis* (Sitka spruce) dominates the tree layer with *Tsuga heterophylla* (western hemlock) occasionally occurring as a minor associate. *Vaccinium ovalifolium* (early blueberry) and *Echinopanax horridum* (devil's club) are well represented and dominate the tall shrub layer. *Rubus spectabilis* (salmonberry) and *Menziesia ferruginea* (rusty menziesia) are often common associates. Low and dwarf shrubs are absent. Undergrowth species with high constancy but low cover include *Rubus pedatus* (fiveleaf bramble), *Cornus canadensis* (bunchberry), *Tiarella trifoliata* (foamflower), and *Streptopus amplexifolius* (twistedstalk). Ferns, which are commonly associated with this type, include *Dryopteris dilatata* (wood fern), *Gymnocarpium dryopteris* (oak fern), and *Athyrium filix-femina* (lady fern).

Physical setting- Sitka spruce/early blueberry-devil's club is a fairly common type on the Chugach National Forest, predominantly in Prince William Sound. It occurs on raised beaches, beaches, flood plains, and side slopes. Sites sampled are on northerly aspects with less than 10 percent slope (a few sites sampled have 50-60 percent slopes) and at elevations up to 200 feet.

Picea sitchensis/Vaccinium ovalifolium/Dryopteris dilatata
(Sitka spruce/early blueberry/wood fern)
(PICSIT/VACOVA/DRYDIL; 6 sites)
IA1a. Closed needleleaf forest, Sitka spruce

Vegetation- *Picea sitchensis* (Sitka spruce) dominates the tree layer with *Tsuga heterophylla* (western hemlock) or *T. mertensiana* (mountain hemlock) often occurring as minor associates. *Vaccinium ovalifolium* (early blueberry) is the most constant and abundant tall shrub. *Rubus spectabilis* (salmonberry), *Echinopanax horridum* (devil's club), and *Menziesia ferruginea* (rusty menziesia) are common associated tall shrubs. Low and dwarf shrubs are absent. Undergrowth species with high constancy but low cover include *Rubus pedatus* (fiveleaf bramble), *Cornus canadensis* (bunchberry), *Tiarella trifoliata* (foamflower), and *Streptopus amplexifolius* (twistedstalk). Common ferns associated with this type include *Dryopteris dilatata* (wood fern), *Gymnocarpium dryopteris* (oak fern), and *Thelypteris phegopteris* (beech fern).

Physical setting- The Sitka spruce/early blueberry/wood fern type is a widespread though minor type that is found mostly in Prince William Sound. It occurs on flood plains, high relief hills, and dissected mountain side slopes, on northerly aspects, at slopes up to 85 percent, and at elevations up to 200 feet.

Western Hemlock Cover Type

Tsuga heterophylla/Hylocomium splendens
(western hemlock/splendid feather moss)
(TSUHET/HYLSPL; 3 sites)

IA1b. Closed needleleaf forest, western hemlock

Vegetation- *Tsuga heterophylla* (western hemlock) dominates the closed tree canopy. *Picea sitchensis* (Sitka spruce) is often a minor associate. Few, if any, vascular plant undergrowth species exceed 5 percent cover. The most consistent shrubs are *Vaccinium ovalifolium* (early blueberry) and *Echinopanax horridum* (devil's club). Low and dwarf shrubs are absent. *Dryopteris dilatata* (wood fern) and *Gymnocarpium dryopteris* (oak fern) are consistent species present in this type. The most consistent but sparse forbs include *Rubus pedatus* (fiveleaf bramble), *Cornus canadensis* (bunchberry), and *Tiarella trifoliata* (foamflower). Mosses such as *Hylocomium splendens* (splendid feather moss) or *Sphagnum* sp. (sphagnum moss) may dominate the ground cover.

Physical setting- The western hemlock/splendid feather moss type occurs on broken and non-disturbed mountain side slopes and foot slopes. Sites sampled are on southerly aspects with less than 40 percent slope, and at elevations up to 500 feet.

Tsuga heterophylla/Vaccinium ovalifolium
(western hemlock/early blueberry)
(TSUHET/VACOVA; 31 sites)

IA1b. Closed needleleaf forest, western hemlock

Vegetation- *Tsuga heterophylla* (western hemlock) dominates the tree layer. *Picea sitchensis* (Sitka spruce) is a consistent well represented overstory component, and *Tsuga mertensiana* (mountain hemlock) can occur as a minor associate. *Vaccinium ovalifolium* (early blueberry) is abundant, and clearly the dominant tall shrub. *Menziesia ferruginea* (rusty menziesia), *Rubus spectabilis* (salmonberry), and *Echinopanax horridum* (devil's club), may be common to well represented in the shrub layer. Low and dwarf shrubs are

absent. Other species that can be well represented in the undergrowth are *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), and *Gymnocarpium dryopteris* (oak fern).

Physical setting- The western hemlock/early blueberry is a major type and is widespread in eastern Prince William Sound. This type is found predominantly on low and high relief hills, but has also been sampled on many other landforms including hills with gentle slopes, flood plains, raised beaches, flat lowlands, and non-disturbed mountain side slopes. Sites sampled are found on all aspects, on slopes to 65 percent, and from sea level to 700 feet elevation.

Tsuga heterophylla/Vaccinium ovalifolium-Echinopanax horridum
(western hemlock/early blueberry-devil's club)
(TSUHET/VACOVA-ECHHOR; 11 sites)

IA1b. Closed needleleaf forest, western hemlock

Vegetation- *Tsuga heterophylla* (western hemlock) dominates the tree layer. *Picea sitchensis* (Sitka spruce) is a consistent well represented overstory component, and *Tsuga mertensiana* (mountain hemlock) can occur as a minor associate. *Vaccinium ovalifolium* (early blueberry) is abundant and dominates the tall shrub layer with *Echinopanax horridum* (devil's club) usually the next most dominant species. *Rubus spectabilis* (salmonberry) and *Menziesia ferruginea* (rusty menziesia) are also usually well represented tall shrubs in this type. Low and dwarf shrubs are absent. Other species that are often present or common in the undergrowth include *Rubus pedatus* (fiveleaf bramble), *Cornus canadensis* (bunchberry), *Tiarella trifoliata* (foam flower), *Streptopus amplexifolius* (twistedstalk), *Listera cordata* (heartleaf twayblade), *Gymnocarpium dryopteris* (oak fern), *Dryopteris dilatata* (wood fern), and *Blechnum spicant* (deer fern).

Physical setting- Western hemlock/early blueberry-devil's club is a common type in eastern Prince William Sound. The predominant landforms for this type are high and low relief hills, but it is also found on flood plains, dissected mountain side slopes, and broken mountain side slopes. This type is found on all aspects on slopes up to 70 percent and at elevations up to 800 feet.

Tsuga heterophylla/Vaccinium ovalifolium/Dryopteris dilatata
(western hemlock/early blueberry/wood fern)
(TSUHET/VACOVA/DRYDIL; 4 sites)

IA1b.-IA2b. Closed and open needleleaf forest, western hemlock

Vegetation- *Tsuga heterophylla* (western hemlock) is the dominant tree with *Picea sitchensis* (Sitka spruce) as an occasional minor associate. *Vaccinium ovalifolium* (early blueberry) is the dominant abundant tall shrub. *Echinopanax horridum* (devil's club) is common. Low and dwarf shrubs are absent. *Rubus pedatus* (fiveleaf bramble), *Cornus canadensis* (bunchberry), *Listera cordata* (heartleaf twayblade), *Streptopus amplexifolius* (twistedstalk), and *Tiarella trifoliata* (foamflower) are consistently present, but have low cover. *Dryopteris dilatata* (wood fern) and *Gymnocarpium dryopteris* (oak fern) are well represented.

Physical setting- Western hemlock/early blueberry/wood fern is a minor type in eastern Prince William Sound on low to high relief hills and on flood plains. It has been sampled on northerly and easterly aspects on slopes up to 30 percent and at elevations up to 300 feet.

Tsuga heterophylla/Vaccinium ovalifolium/Lysichiton americanus
(western hemlock/early blueberry/skunk cabbage)
(TSUHET/VACOVA/LYSAME; 4 sites)

IA1b.-IA2b. Closed and open needleleaf forest, western hemlock

Vegetation- *Tsuga heterophylla* (western hemlock) dominates the tree layer with *Picea sitchensis* (Sitka spruce) as a common minor associate. *Tsuga mertensiana* (mountain hemlock) may be common in the understory. The tall shrub layer is dominated by *Vaccinium ovalifolium* (early blueberry). *Menziesia ferruginea* (rusty menziesia), *Rubus spectabilis*, (salmonberry), and *Alnus crispa* ssp. *sinuata* (Sitka alder) are well represented in the tall shrub layer. Low and dwarf shrubs are absent. The strongest indicator in the undergrowth is *Lysichiton americanus* (skunk cabbage), which is well represented. *Gymnocarpium dryopteris* (oak fern), *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), and *Streptopus*

amplexifolius (twistedstalk) are consistently common or well represented in the undergrowth.

Physical setting- Western hemlock/early blueberry/skunk cabbage is found predominantly in eastern Prince William Sound on low relief hills, flat lowlands, and sea slopes. It has been sampled on most aspects on slopes up to 30 percent and at elevations up to 100 feet.

Western Hemlock-Sitka Spruce Cover Type

Tsuga heterophylla-Picea sitchensis/Echinopanax horridum
(western hemlock-Sitka spruce/devil's club)
(TSUHET-PICSIT/ECHHOR; 6 sites)

IA1c. Closed needleleaf forest, Sitka spruce-western hemlock

Vegetation- *Picea sitchensis* (Sitka spruce) dominates the tree layer with *Tsuga heterophylla* (western hemlock) a consistent well represented to abundant associate. *Echinopanax horridum* (devil's club) is well represented and the dominant tall shrub for this type. *Vaccinium ovalifolium* (early blueberry), *Menziesia ferruginea* (rusty menziesia), and *Rubus spectabilis* (salmonberry) are often common in the tall shrub layer. Low and dwarf shrubs are absent. The most consistent common forbs are *Rubus pedatus* (fiveleaf bramble), *Streptopus amplexifolius* (twistedstalk), and *Tiarella trifoliata* (foamflower). Ferns are well represented, the most dominant being *Gymnocarpium dryopteris* (oak fern), followed by *Dryopteris dilatata* (wood fern), *Athyrium filix-femina* (lady fern), and *Thelypteris phegopteris* (beech fern).

Physical setting- The western hemlock-Sitka spruce/devil's club type occurs predominantly in Prince William Sound. It is found on sea slopes, flood plains, non-disturbed foot slopes, and low relief hills. Sampled sites are on all aspects, on slopes up to 80 percent, and at elevations to 200 feet.

Tsuga heterophylla-Picea sitchensis/Rubus spectabilis-Echinopanax horridum
(western hemlock-Sitka spruce/salmonberry-devil's club)
(TSUHET-PICSIT/RUBSPE-ECHHOR; 4 sites)

IA1c. Closed needleleaf forest, Sitka spruce-western hemlock

Vegetation- *Picea sitchensis* (Sitka spruce) and *Tsuga heterophylla* (western hemlock) codominate the tree layer. *Rubus spectabilis* (salmonberry) is the dominant tall shrub, with *Echinopanax horridum* (devil's club) and *Vaccinium ovalifolium* (early blueberry) well represented. Low and dwarf shrubs are absent. The most consistent forbs are *Rubus pedatus* (fiveleaf bramble), *Streptopus amplexifolius* (twistedstalk), and *Tiarella trifoliata* (foamflower). The dominant ferns are *Athyrium filix-femina* (lady fern) and *Gymnocarpium dryopteris* (oak fern).

Physical setting- Western hemlock-Sitka spruce/salmonberry-devil's club is a fairly minor type sampled from the big islands in Prince William Sound. It occurs on flood plains, flat lowlands, and high relief hills. Sites sampled are on all but southerly aspects, on slopes up to 35 percent, and at elevations to 100 feet.

Tsuga heterophylla-Picea sitchensis/Vaccinium ovalifolium
(western hemlock-Sitka spruce/early blueberry)
(TSUHET-PICSIT/VACOVA; 33 sites)

IA1c. Closed needleleaf forest, Sitka spruce-western hemlock

Vegetation- *Picea sitchensis* (Sitka spruce) and *Tsuga heterophylla* (western hemlock) codominate the tree layer. *T. mertensiana* (mountain hemlock) is occasionally also present in this type. *Vaccinium ovalifolium* (early blueberry) is abundant and clearly the dominant tall shrub. Other common shrubs are *Menziesia ferruginea* (rusty menziesia), *Rubus spectabilis* (salmonberry), and *Echinopanax horridum* (devil's club). Low and dwarf shrubs are absent. No forbs show dominance and occurrence in this type is variable, but the most consistent herbaceous species are *Rubus pedatus* (fiveleaf bramble), *Cornus canadensis* (bunchberry), *Streptopus amplexifolius* (twistedstalk), and *Gymnocarpium dryopteris* (oak fern).

Physical setting- Western hemlock-Sitka spruce/early blueberry is one of the most common types in Prince William Sound. It occurs predominantly on low relief hills. Other landforms for this type include non-disturbed and dissected mountain side slopes, foot slopes, flood plains, high relief hills, marine terraces, and gently sloping hills. Sites sampled are on all aspects, on slopes up to 85 percent, and at elevations generally below 600 feet.

Tsuga heterophylla-Picea sitchensis/Vaccinium ovalifolium-Echinopanax horridum

(western hemlock-Sitka spruce/early blueberry-devil's club)
(TSUHET-PICSIT/VACOVA-ECHHOR; 17 sites)

IA1c. Closed needleleaf forest, Sitka spruce-western hemlock

Vegetation- This type is quite similar to TSUHET-PICSIT/VACOVA, except that *Echinopanax horridum* (devil's club) is well represented in this type.

Tsuga heterophylla (western hemlock) and *Picea sitchensis* (Sitka spruce) codominate the tree layer. The dominant tall shrub is *Vaccinium ovalifolium* (early blueberry), with *Echinopanax horridum* (devil's club) well represented. *Rubus spectabilis* (salmonberry) and *Menziesia ferruginea* (rusty menziesia) are common. Low and dwarf shrubs are absent. No forbs show dominance, the most consistent being *Tiarella trifoliata* (foamflower), *Rubus pedatus* (fiveleaf bramble), *Streptopus amplexifolius* (twistedstalk), and *Cornus canadensis* (bunchberry). The most common ferns are *Gymnocarpium dryopteris* (oak fern), *Dryopteris dilatata* (wood fern), and *Athyrium filix-femina* (lady fern).

Physical setting- The western hemlock-Sitka Spruce/early blueberry-devil's club type is fairly common in Prince William Sound. It occurs on flood plains, flat lowlands, low and high relief hills, and non-disturbed and broken mountain side slopes. Sites sampled are on all aspects, on slopes up to 70 percent, and up to 700 feet elevation.

Tsuga heterophylla-*Picea sitchensis*/*Vaccinium ovalifolium*/*Lysichiton americanus*

(western hemlock-Sitka spruce/early blueberry/skunk cabbage)
(TSUHET-PICSIT/VACOVA/LYSAME; 7 sites)

IA1c. Closed needleleaf forest, Sitka spruce-western hemlock

Vegetation- *Tsuga heterophylla* (mountain hemlock), and *Picea sitchensis* (Sitka spruce) are codominants, with *T. heterophylla* generally having greater cover. *T. mertensiana* (mountain hemlock) is common in about half of the sites. *Vaccinium ovalifolium* (early blueberry) is the dominant tall shrub, with *Menziesia ferruginea* (rusty menziesia), *Rubus spectabilis* (salmonberry), and *Echinopanax horridum* (devil's club) often being well represented. Low and dwarf shrubs are absent. The dominant forb and indicator species is *Lysichiton americanus* (skunk cabbage), which is well represented. Other common forbs are *Cornus canadensis* (bunchberry), *Streptopus amplexifolius* (twistedstalk), and *Rubus pedatus* (fiveleaf bramble). *Gymnocarpium dryopteris* (oak fern) and *Lycopodium clavatum* (running clubmoss) are common.

Physical setting- The western hemlock-Sitka spruce/early blueberry/skunk cabbage type is a widespread but fairly minor type in Prince William Sound. It is usually found in small patches or stringers along seepage areas. Landforms where this type occurs include sea slopes, gently sloping hills, flood plains, and low relief hills. Sites sampled are on all aspects, on less than 35 percent slopes, and at elevations up to 100 feet.

Mountain Hemlock Cover Type

Tsuga mertensiana/*Alnus crispa* ssp. *sinuata*
(mountain hemlock/Sitka alder)
(TSUMER/ALNCRIS; 4 sites)

IA1f.-1A2c. Closed and open needleleaf forest, mountain hemlock

Vegetation- *Tsuga mertensiana* (mountain hemlock) is the dominant and often only tree species in this type. *T. heterophylla* (western hemlock) or *Picea sitchensis* (Sitka spruce) may be well represented on some sites. *Alnus*

crispa ssp. *sinuata* (Sitka alder) is abundant and the indicator species for this type. Other tall shrubs that may be common include *Menziesia ferruginea* (rusty menziesia), *Rubus spectabilis* (salmonberry), *Echinopanax horridum* (devil's club), and *Cladothamnus pyroliflorus* (copperbush), although consistency and cover varies greatly for these species on individual sites. Although occasionally present, low and dwarf shrubs do not provide any indicator value in this type. *Calamagrostis canadensis* (bluejoint reedgrass) is the most consistent graminoid, and *Gymnocarpium dryopteris* (oak fern) the most consistent fern. There is little other consistency or dominance in undergrowth composition within this type.

Physical setting- Mountain hemlock/Sitka alder is a minor type on the Chugach National Forest. It occurs on low relief hills and dissected mountain side slopes. Sites sampled are on all aspects, on slopes from 25 to 80 percent, and at elevations to 1450 feet.

Tsuga mertensiana/*Alnus crispa* ssp. *sinuata*-*Menziesia ferruginea*
(mountain hemlock/Sitka alder-rusty menziesia)
(TSUMER/ALNCRIS-MENFER; 4 sites)
IA1f.-1A2c. Closed and open needleleaf forest, mountain hemlock

Vegetation- *Tsuga mertensiana* (mountain hemlock) is the dominant tree species in this type. *Picea sitchensis* (Sitka spruce), *P. X lutzii* (Lutz spruce), or *Betula papyrifera* (paper birch) may also be well represented on some sites. *Menziesia ferruginea* (rusty menziesia) is abundant and an indicator species. *Alnus crispa* ssp. *sinuata* (Sitka alder) is well represented, and also an indicator species. *Vaccinium ovalifolium* (early blueberry) varies from present to well represented. Although occasionally present, low and dwarf shrubs do not provide any indicator value in this type. *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), and *Gymnocarpium dryopteris* (oak fern) are usually well represented.

Physical setting- Mountain hemlock/Sitka alder-rusty menziesia is a minor type that is found on low relief hills and dissected mountain side slopes throughout the Chugach National Forest. Sites sampled are on easterly and northwesterly aspects, on slopes from 20 to 80 percent, and at elevations up to 1250 feet.

Tsuga mertensiana/Cassiope stelleriana
(mountain hemlock/Steller's cassiope)
(TSUMER/CASSTE; 12 sites)

IA1f.-1A2c. Closed and open needleleaf forest, mountain hemlock

Vegetation- *Tsuga mertensiana* (mountain hemlock) dominates the tree layer. *Picea sitchensis* (Sitka spruce) is occasionally present (Figure 3). There is little consistency or cover in tall shrub composition within this type, *Vaccinium ovalifolium* (early blueberry) being the most consistent. *Cassiope stelleriana* (Steller's cassiope) is the dominant dwarf shrub and the indicator species for this type. *Luetkea pectinata* (luetkea) and *Empetrum nigrum* (crowberry) are often well represented in the dwarf shrub layer. *Fauria crista-galli* (deer cabbage) is not consistent in this type, but is abundant on more than half the sites sampled. There is little other consistency within vascular species composition.

Physical setting- Mountain hemlock/Steller's cassiope is a common type found in the Kenai Mountains and Prince William Sound. It occurs on low relief hills, rounded mountains, dissected and non-disturbed mountain side slopes, and rounded subalpine mountains. Sites sampled are on all aspects, on slopes to 65 percent, and at elevations to 2750 feet.

Tsuga mertensiana/Dryopteris dilatata
(mountain hemlock/wood fern)
(TSUMER/DRYDIL; 5 sites)

IA1f.-1A2c. Closed and open needleleaf forest, mountain hemlock

Vegetation- *Tsuga mertensiana* (mountain hemlock) dominates the tree layer. *Picea X lutzii* (Lutz spruce) may occasionally be present or well represented. *Dryopteris dilatata* (wood fern) is the most consistent and well represented vascular species, and the indicator for this type. The only other species showing consistency are *Vaccinium ovalifolium* (early blueberry), *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf



Figure 3. Open needleleaf forest (bordering to needleleaf woodland) of the *Tsuga mertensiana*/*Cassiope stelleriana* type in Bear Trap Bay, Prince William Sound.

bramble), *Spiraea beauverdiana* (Beauverd spiraea), *Epilobium angustifolium* (tall fireweed), *Dryopteris dilatata* (wood fern), and *Gymnocarpium dryopteris* (oak fern).

Physical setting- Mountain hemlock/wood fern is a minor type in the Kenai Mountains and Prince William Sound. It occurs on dissected and broken mountain side slopes and gently sloping hills. Sites sampled are primarily on easterly aspects, on slopes up to 60 percent, and at elevations from 1300 to 2000 feet.

Tsuga mertensiana/*Echinopanax horridum*
(mountain hemlock/devil's club)
(TSUMER/ECHHOR; 4 sites)

IA1f.-IA2c. Closed and open needleleaf forest, mountain hemlock

Vegetation- *Tsuga mertensiana* (mountain hemlock) is the dominant tree species. *Picea X lutzii* (Lutz spruce) or *Populus balsamifera* ssp. *trichocarpa* (black cottonwood) may be present on sites in the Kenai Mountains. *Picea sitchensis* (Sitka spruce) may be present on sites in Prince William Sound. *Echinopanax horridum* (devil's club) is well represented and the indicator species for this type. The next most consistent shrub is *Vaccinium ovalifolium* (early blueberry). *Rubus pedatus* (fiveleaf bramble), *Dryopteris dilatata* (wood fern), and *Gymnocarpium dryopteris* (oak fern) are usually common.

Physical setting- Mountain hemlock/devil's club is a minor type in the Kenai Mountains and Prince William Sound. It occurs on broken and non-disturbed mountain side slopes. Sites sampled are on southerly aspects, on slopes to 50 percent, and at elevations from 800 to 1800 feet.

Tsuga mertensiana/Hylocomium splendens
(mountain hemlock/splendid feather moss)
(TSUMER/HYLSPL; 6 sites)

IA1f. Closed needleleaf forest, mountain hemlock

Vegetation- *Tsuga mertensiana* (mountain hemlock) dominates the tree layer. *Picea X lutzii* (Lutz spruce) is often an important associated species on sites in the Kenai Mountains. *Picea sitchensis* (Sitka spruce) is often an important associated species on sites in Prince William Sound. Understory species composition is relatively sparse and very inconsistent. Few if any vascular plant species exceed 10 percent cover. This type is characterized by the moss layer, which is dominated by *Hylocomium splendens* (splendid feather moss) and *Pleurozium schreberi* (Schreber's big red stem moss).

Physical setting- Mountain hemlock/splendid feather moss is a minor type on the Chugach National Forest. It occurs on non-disturbed mountain side slopes and foot slopes, broken mountain side slopes, and low relief hills. Sites sampled are on all aspects, on slopes up to 70 percent, and at elevations to 1300 feet.

Tsuga mertensiana/Menziesia ferruginea
(mountain hemlock/rusty menziesia)
(TSUMER/MENFER; 19 sites)

IA1f. Closed needleleaf forest, mountain hemlock

Vegetation- *Tsuga mertensiana* (mountain hemlock) dominates the tree layer. *Picea X lutzii* (Lutz spruce) is an important associated canopy species, which is often codominant. *Menziesia ferruginea* (rusty menziesia) is abundant in the tall shrub layer. *Vaccinium vitis-idaea* (lowbush cranberry) is usually present or common, but rarely exceeds 5 percent cover. Other shrubs are generally poorly represented or absent. *Rubus pedatus* (fiveleaf bramble) is usually well represented.

Physical setting- Mountain hemlock/rusty menziesia is a common type in the Kenai Mountains. It occurs on non-disturbed, dissected, and broken mountain side slopes, non-disturbed foot slopes, and high relief hills. Sites

sampled are on all aspects, on slopes up to 75 percent, and at elevations from 600 to 1900 feet.

Tsuga mertensiana/Menziesia ferruginea-Vaccinium vitis-idaea
(mountain hemlock/rusty menziesia-lowbush cranberry)
(TSUMER/MENFER-VACVIT; 7 sites)

IA1f.-IA2c. Closed and open needleleaf forest, mountain hemlock

Vegetation- *Tsuga mertensiana* (mountain hemlock) dominates the tree layer. *Picea X lutzii* (Lutz spruce) is often an important associated canopy species. *Menziesia ferruginea* (rusty menziesia) is abundant and dominates the tall shrub layer; *Vaccinium ovalifolium* (early blueberry) is often present. *Vaccinium vitis-idaea* (lowbush cranberry) and *Empetrum nigrum* (crowberry) are well represented dwarf shrubs and are indicator species in the undergrowth. *Cornus canadensis* (bunchberry) and *Rubus pedatus* (fiveleaf bramble) are consistently present.

Physical setting- Mountain hemlock/rusty menziesia-lowbush cranberry is a minor type on non-disturbed and dissected side slopes in the Kenai Mountains. Sites sampled are on northerly aspects, on slopes to 65 percent, and at elevations from 700 to 1600 feet.

Tsuga mertensiana/Menziesia ferruginea/sparse
(mountain hemlock/rusty menziesia/sparse)
(TSUMER/MENFER/sparse; 39 sites)

IA1f.-IA2c. Closed and open needleleaf forest, mountain hemlock

Vegetation- *Tsuga mertensiana* (mountain hemlock) dominates the tree layer. *Picea X lutzii* (Lutz spruce) is often a common or well represented canopy associate. *Menziesia ferruginea* (rusty menziesia) is well represented, but usually less than 25 percent cover. *Vaccinium ovalifolium* (early blueberry) is often present. The undergrowth is characteristically sparse. Other species that are somewhat consistent, but low in cover are *Vaccinium vitis-idaea* (lowbush cranberry), *Cornus canadensis* (bunchberry), and *Rubus pedatus* (fiveleaf bramble).

Physical setting- Mountain hemlock/rusty menziesia/sparse is a common type in the Kenai Mountains. This type is found predominantly on broken and non-disturbed mountain side slopes, but may also be found on gently sloping hills, dissected mountain side slopes, and non-disturbed foot slopes. Sites sampled are on all aspects, on slopes up to 55 percent, and at elevations to 1800 feet.

Tsuga mertensiana/Phyllodoce aleutica
(mountain hemlock/Aleutian mountain heath)
(TSUMER/PHYALE; 11 sites)

IA2c.-IA3. Open and woodland needleleaf forest, mountain hemlock

IIA2b. Open dwarf tree scrub, mountain hemlock

Vegetation- *Tsuga mertensiana* (mountain hemlock) dominates the tree layer. Dwarf shrubs dominate the undergrowth (Figure 4). *Vaccinium ovalifolium* (early blueberry) is the only fairly consistent tall shrub, and it has low cover. *Phyllodoce aleutica* (Aleutian mountain heath) is abundant and the dominant indicator species for this type. *Cassiope stelleriana* (Steller's cassiope), *Empetrum nigrum* (crowberry), *Luetkea pectinata* (luetkea), and *Vaccinium caespitosum* (dwarf blueberry) are usually well represented. *Fauria cristagalli* (deer cabbage) is the dominant forb in the undergrowth. *Geum calthifolium* (calthaleaf avens) is often present.

Physical setting- Mountain hemlock/Aleutian mountain heath is a minor though widespread type in Prince William Sound. It occurs primarily on rounded mountain summits, rounded subalpine summits, and low and high relief hills. Sites sampled are on northerly aspects, on slopes to 45 percent, and at elevations to 1600 feet.



Figure 4. Open dwarf tree scrub of the *Tsuga mertensiana*/*Phyllodoce aleutica* type in Harriman Fiord, Prince William Sound.

Tsuga mertensiana/Vaccinium ovalifolium
(mountain hemlock/early blueberry)
(TSUMER/VACOVA; 28 sites)

IA1f. Closed needleleaf forest, mountain hemlock

Vegetation- *Tsuga mertensiana* (mountain hemlock) dominates the tree layer. In Prince William Sound, *Picea sitchensis* (Sitka spruce) is an important overstory tree species and *Tsuga heterophylla* (western hemlock) may occur in minor amounts. In the Kenai Mountains, *Picea X lutzii* (Lutz spruce) can be an important associated canopy species. The tall shrub layer is dominated by abundant *Vaccinium ovalifolium* (early blueberry). *Menziesia ferruginea* (rusty menziesia), *Echinopanax horridum* (devil's club), and *Rubus spectabilis* (salmonberry) can be common associated tall shrubs. Low and dwarf shrub composition is sparse and variable. The most common herbaceous species in the undergrowth include *Rubus pedatus* (fiveleaf bramble), *Cornus canadensis* (bunchberry), *Listera cordata* (heartleaf twayblade), and *Gymnocarpium dryopteris* (oak fern).

Physical setting- Mountain hemlock/early blueberry is a major type at mid to high elevations in the Kenai Mountains and in Prince William Sound. Predominant landforms are non-disturbed, broken, and dissected mountain side slopes, low and high relief hills, and non-disturbed foot slopes. Sites sampled are on all aspects, on slopes to 90 percent, and at elevations to 1400 feet.

Tsuga mertensiana/Vaccinium ovalifolium-Cassiope stelleriana
(mountain hemlock/early blueberry-Steller's cassiope)
(TSUMER/VACOVA-CASSTE; 10 sites)

IA2c. Open needleleaf forest, mountain hemlock

Vegetation- *Tsuga mertensiana* (mountain hemlock) dominates the tree layer. *Picea sitchensis* (Sitka spruce) is a common associated tree species. *Vaccinium ovalifolium* (early blueberry) is abundant and dominates the tall shrub layer. *Cladothamnus pyroliflorus* (copperbush) and *Menziesia ferruginea* (rusty menziesia) may also be well represented in the tall shrub layer. *Cassiope stelleriana* (Steller's cassiope) is a well represented indicator species in the dwarf shrub layer. Other well represented dwarf

shrubs may include *Empetrum nigrum* (crowberry), *Luetkea pectinata* (luetkea), *Phyllodoce aleutica* (Aleutian mountain heath), and *Vaccinium caespitosum* (dwarf blueberry). Well represented forbs include *Rubus pedatus* (bunchberry), *Cornus canadensis* (bunchberry), and *Fauria crista-galli* (deer cabbage).

Physical setting- Mountain hemlock/early blueberry-Steller's cassiope is a minor type in Prince William Sound. It occurs on high and low relief hills, broken mountain side slopes, and rounded mountains. Sites sampled are on most aspects, on slopes from 20 to 50 percent, and at elevations to 1150 feet.

Tsuga mertensiana/Vaccinium ovalifolium-Cladothamnus pyroliflorus
(mountain hemlock/early blueberry-copperbush)

(TSUMER/VACOVA-CLAPYR; 18 sites)

IA2c. Open needleleaf forest, mountain hemlock

Vegetation- *Tsuga mertensiana* (mountain hemlock) dominates the tree layer. *Picea sitchensis* (Sitka spruce) is a common associate, and *T. heterophylla* (mountain hemlock) is occasionally common. *Vaccinium ovalifolium* (early blueberry) is abundant and *Cladothamnus pyroliflorus* (copperbush) is well represented; both are indicator species for this type. *Menziesia ferruginea* (rusty menziesia) and *Alnus crispa* ssp. *sinuata* (Sitka alder) are usually common. Low and dwarf shrub composition is variable. The dominant and abundant forb in this type is *Fauria crista-galli* (deer cabbage). Other well represented undergrowth species include *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), *Coptis aspleniifolia* (fernleaf goldthread), and *Blechnum spicant* (deer fern).

Physical setting- Mountain hemlock/early blueberry-copperbush is a widespread though minor type on low and high relief hills, gently sloping hills, and dissected mountain side slopes in Prince William Sound. Sites sampled are mostly on southerly and westerly aspects, on slopes up to 85 percent, and at elevations to 500 feet.

Tsuga mertensiana/Vaccinium ovalifolium-Echinopanax horridum
(mountain hemlock/early blueberry-devil's club)
(TSUMER/VACOVA-ECHHOR; 15 sites)

IA1f.-1A2c. Closed and open needleleaf forest, mountain hemlock

Vegetation- *Tsuga mertensiana* (mountain hemlock) dominates the tree layer. *Picea sitchensis* (Sitka spruce) is an important associate, and *T. heterophylla* (western hemlock) occurs occasionally. The dominant tall shrub is *Vaccinium ovalifolium* (early blueberry), which is abundant. *Echinopanax horridum* (devil's club) and *Rubus spectabilis* (salmonberry) are well represented, and *Menziesia ferruginea* (rusty menziesia) is often common. Low and dwarf shrubs are usually sparse or absent. Other common species in the undergrowth include *Rubus pedatus* (fiveleaf bramble), *Tiarella trifoliata* (foamflower), *Listera cordata* (heartleaf twayblade), *Gymnocarpium dryopteris* (oak fern), and *Blechnum spicant* (deer fern).

Physical setting- Mountain hemlock/early blueberry-devil's club is a common type in Prince William Sound. Predominant landforms are low and high relief hills, and broken and non-disturbed mountain side slopes. This type occurs on all aspects, but more frequently on southerly and easterly aspects. Sites sampled are on slopes up to 80 percent and elevations to 1200 feet.

Tsuga mertensiana/Vaccinium ovalifolium-Menziesia ferruginea
(mountain hemlock/early blueberry-rusty menziesia)
(TSUMER/VACOVA-MENFER; 6 sites)

IA1f. Closed needleleaf forest, mountain hemlock

Vegetation- *Tsuga mertensiana* (mountain hemlock) dominates the tree layer. *Picea X lutzii* (Lutz spruce) is an important associated species in the Kenai Mountains. *Vaccinium ovalifolium* (early blueberry) and *Menziesia ferruginea* (rusty menziesia) are abundant and indicator species in the tall shrub layer. Low and dwarf shrub composition is variable. Other species occurring frequently in the undergrowth include *Cornus canadensis* (bunchberry) and *Rubus pedatus* (fiveleaf bramble).

Physical setting- Mountain hemlock/early blueberry-rusty menziesia is a minor type in the Kenai Mountains. This type occurs on dissected and non-

disturbed mountain side slopes, non-disturbed foot slopes, and low relief hills. Sites sampled are on all but southerly aspects, on slopes from 30 to 70 percent, and at elevations to 1600 feet.

Tsuga mertensiana/Vaccinium ovalifolium/Calamagrostis nutkaensis
(mountain hemlock/early blueberry/Pacific reedgrass)
(TSUMER/VACOVA/CALNUT; 12 sites)
IA2c. Open needleleaf forest, mountain hemlock

Vegetation- *Tsuga mertensiana* (mountain hemlock) dominates this type. *Picea sitchensis* (Sitka spruce) is a consistent minor canopy component. *Tsuga heterophylla* (western hemlock) is occasionally present. The dominant shrub is *Vaccinium ovalifolium* (early blueberry), which is abundant, and an indicator species for this type. *Cladothamnus pyroliflorus* (copperbush) is usually well represented, and *Menziesia ferruginea* (rusty menziesia) is usually common. Low and dwarf shrub composition is variable. The dominant herbaceous species and indicator characterizing this type is *Calamagrostis nutkaensis* (Pacific reedgrass). Other well represented undergrowth species include *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), *Fauria crista-galli* (deer cabbage), and *Blechnum spicant* (deer fern).

Physical setting- Mountain hemlock/early blueberry/Pacific reedgrass is a fairly widespread though minor type on low and high relief hills in Prince William Sound. It occurs on all aspects, on slopes up to 90 percent, and at elevations to 420 feet.

Tsuga mertensiana/Vaccinium ovalifolium/Fauria crista-galli
(mountain hemlock/early blueberry/deer cabbage)
(TSUMER/VACOVA/FAUCRI; 8 sites)
IA2c.-IA1f Open and closed needleleaf forest, mountain hemlock

Vegetation- *Tsuga mertensiana* (mountain hemlock) dominates the tree layer. *Picea sitchensis* (Sitka spruce) is an important associated tree species. The dominant and abundant tall shrub is *Vaccinium ovalifolium* (early blueberry). *Menziesia ferruginea* (rusty menziesia), *Cladothamnus pyroliflorus* (copperbush), *Rubus spectabilis* (salmonberry), *Empetrum nigrum*

(crowberry), and *Phyllodoce aleutica* (Aleutian mountain heath) can be common to abundant on various sites. The dominant herbaceous species in the undergrowth is *Fauria crista-galli* (deer cabbage), which is well represented and an indicator species. Other common species in the undergrowth are *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), *Listera cordata* (heartleaf twayblade), *Veratrum viride* (false hellebore), and *Blechnum spicant* (deer fern).

Physical setting- Mountain hemlock/early blueberry/deer cabbage is a minor though widespread type in Prince William Sound. It occurs predominantly on low and high relief hills, but also on broken and non-disturbed mountain side slopes. Sites sampled are on most aspects, on slopes up to 35 percent, and at elevations to 1300 feet.

Tsuga mertensiana/Vaccinium uliginosum

(mountain hemlock/bog blueberry)

(TSUMER/VACULI; 15 sites)

IIA2b. Open dwarf tree scrub, mountain hemlock

Vegetation- *Tsuga mertensiana* (mountain hemlock) dominates the open tree canopy characterizing this type and is generally of a dwarf stature. *Picea sitchensis* (Sitka spruce) can be common. The most consistent tall shrubs are *Cladothamnus pyroliflorus* (copperbush) and *Vaccinium ovalifolium* (early blueberry), which are common to well represented, but not always present. This type is characterized by the dwarf shrub layer, which is dominated by *Vaccinium uliginosum* (bog blueberry), *V. caespitosum* (dwarf blueberry), and *Empetrum nigrum* (crowberry), which are well represented to abundant. *Fauria crista-galli* (deer cabbage) is the dominant forb in the undergrowth. Other species that have high constancy in the undergrowth include *Coptis trifolia* (trifoliolate goldthread), *Cornus canadensis* (bunchberry), and *Geum calthifolium* (calthaleaf avens). *Calamagrostis nutkaensis* (Pacific reedgrass) may be common.

Physical setting- Mountain hemlock/bog blueberry is a common type on low relief hills in Prince William Sound. It occurs on all but southerly aspects, on slopes to 30 percent (exception: one site at 65 percent slope), and at elevations to 1300 feet.

Tsuga mertensiana/Vaccinium vitis-idaea
(mountain hemlock/lowbush cranberry)
(TSUMER/VACVIT; 31 sites)

IA1f.-IA2c. Closed and open needleleaf forest, mountain hemlock

Vegetation- *Tsuga mertensiana* (mountain hemlock) dominates the tree layer. *Picea X lutzii* (Lutz spruce) is often an associated canopy species for sites in the Kenai Mountains. *Menziesia ferruginea* (rusty menziesia) is often well represented in the shrub layer. *Empetrum nigrum* (crowberry) and *Vaccinium vitis-idaea* (lowbush cranberry) are well represented and indicators for this type. The most common forbs are *Cornus canadensis* (bunchberry) and *Rubus pedatus* (fiveleaf bramble).

Physical setting- Mountain hemlock/lowbush cranberry is a common type in Prince William Sound and in the Kenai Mountains. It occurs predominantly on gentle and low relief hills, and non-disturbed mountain side slopes, and occasionally on non-disturbed foot slopes, broken mountain side slopes, and flat lowlands. Sites sampled are on all aspects, on slopes to 60 percent, and at elevations to 1400 feet.

Mountain Hemlock-Alaska Cedar Cover Type

Tsuga mertensiana-Chamaecyparis nootkatensis/Vaccinium ovalifolium-
Cassiope stelleriana

(mountain hemlock-Alaska yellow cedar/early blueberry-Steller's cassiope)
(TSUMER-CHANOO/VACOVA-CASSTE; 3 sites)

IA2. Open needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock) and *Chamaecyparis nootkatensis* (Alaska yellow cedar) dominate the tree layer. *Picea sitchensis* (Sitka spruce) or *Tsuga heterophylla* (western hemlock) may be present as minor associates. The dominant tall shrub indicator species is *Vaccinium ovalifolium* (early blueberry), with *Cladothamnus pyroliflorus* (copperbush), *Menziesia ferruginea* (rusty menziesia), and often *Alnus crispa* ssp. *sinuata* (Sitka alder) as well represented associates. The dominant low shrub indicator is *Cassiope stelleriana* (Steller's cassiope), with *Empetrum nigrum*

(crowberry) and *Phyllodoce aleutica* (Aleutian mountain heath) as well represented associates. The dominant forb is *Fauria crista-galli* (deer cabbage). Other common species in the undergrowth are *Coptis trifolia* (trifoliolate goldthread), *Cornus canadensis* (bunchberry), and *Blechnum spicant* (deer fern).

Physical setting- There are only two sites with site information. These sites are in northern Prince William Sound on rounded hills on northerly aspects, on slopes from 65 to 80 percent, and elevations to 200 feet.

Mountain Hemlock-Lutz Spruce Cover Type

Tsuga mertensiana-*Picea X lutzii*/*Echinopanax horridum*
(mountain hemlock-Lutz spruce/devil's club)
(TSUMER-PICLUT/ECHHOR; 3 sites)
IA1-IA2. Closed and open needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock) and *Picea X lutzii* (Lutz spruce) are codominants in the tree layer. *Echinopanax horridum* (devil's club) is the dominant tall shrub and indicator for this type. *Vaccinium ovalifolium* (early blueberry) and *Menziesia ferruginea* (rusty menziesia) are often associated shrubs. No other undergrowth species stands out for this type, but *Cornus canadensis* (bunchberry) and *Rubus pedatus* (fiveleaf bramble) are common.

Physical setting- Mountain hemlock-Lutz spruce/devil's club is a minor type in the Kenai Mountains. This type usually occurs along wet, but well drained, seepage sites and along streams. These are preferred habitats for devil's club. The few sites sampled are on dissected mountain side slopes, on westerly aspects, on slopes up to 40 percent, and at 700 to 1200 feet elevation.

Tsuga mertensiana-*Picea X lutzii*/*Hylocomium splendens*
(mountain hemlock-Lutz spruce/splendid feather moss)
(TSUMER-PICLUT/HYLSPL; 5 sites)

IA1. Closed needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock) and *Picea X lutzii* (Lutz spruce) are codominants in the tree layer. The undergrowth is depauperate, without other vascular species showing dominance. *Vaccinium ovalifolium* (early blueberry), *Menziesia ferruginea* (rusty menziesia), *Linnaea borealis* (twinline), and *Vaccinium vitis-idaea* (lowbush cranberry) are the most consistent shrubs. *Cornus canadensis* (bunchberry) and *Geocaulon lividum* (northern comandra) are usually present. *Hylocomium splendens* (splendid feather moss) is abundant on the forest floor and the indicator for this type.

Physical setting- Mountain hemlock-Lutz spruce/splendid feather moss is a widespread but minor type in the Kenai Mountains. Sites sampled are on broken and non-disturbed mountain side slopes, and non-disturbed foot slopes. The type occurs on all but westerly aspects, on slopes up to 45 percent, and at elevations from 600 to 900 feet.

Tsuga mertensiana-*Picea X lutzii*/*Menziesia ferruginea*
(mountain hemlock-Lutz spruce/rusty menziesia)
(TSUMER-PICLUT/MENFER; 29 sites)

IA1. Closed needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock) and *Picea X lutzii* (Lutz spruce) are codominants in the tree layer. *Betula papyrifera* (paper birch) is present in about half the sites sampled. The main indicator and dominant shrub for this type is *Menziesia ferruginea* (rusty menziesia). *Vaccinium ovalifolium* (early blueberry) and *Echinopanax horridum* (devil's club) are common shrubs in half the sites. Low and dwarf shrubs are sparse. The only consistent forbs are *Rubus pedatus* (fiveleaf bramble) and *Cornus canadensis* (bunchberry), but cover can vary greatly for these species.

Physical setting- Mountain hemlock-Lutz spruce/rusty menziesia is common and widespread in the Kenai Mountains. It is also an incidental type on flood

plains of the Portage, Placer, and Twentymile area. This type occurs on high relief hills, broken mountain side slopes, as well as non-disturbed mountain side slopes and foot slopes. It occurs on all aspects, on slopes up to 50 percent, and at elevations to 1300 feet.

Tsuga mertensiana-Picea X lutzii/Menziesia ferruginea-Vaccinium vitis-idaea
(mountain hemlock-Lutz spruce/rusty menziesia-lowbush cranberry)

(TSUMER-PICLUT/MENFER-VACVIT; 7 sites)

IA1. Closed needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock) and *Picea X lutzii* (Lutz spruce) are codominants in the tree layer. *Betula papyrifera* (paper birch) is present in about half the sites sampled. *Menziesia ferruginea* (rusty menziesia) is the dominant and abundant tall shrub, with *Vaccinium ovalifolium* (early blueberry) common. *Vaccinium vitis-idaea* (lowbush cranberry) is a well represented dwarf shrub and an indicator species. *Linnaea borealis* (twinline) is common. Other undergrowth species that are consistently common are *Geocaulon lividum* (northern comandra), *Cornus canadensis* (bunchberry), and *Rubus pedatus* (fiveleaf bramble).

Physical setting- Mountain hemlock-Lutz spruce/rusty menziesia-lowbush cranberry is a minor type on high relief hills and dissected side slopes in the Kenai Mountains. It occurs on northerly aspects, on slopes up to 50 percent, and at elevations from 450 to 1000 feet.

Tsuga mertensiana-Picea X lutzii/Menziesia ferruginea/sparse
(mountain hemlock-Lutz spruce/rusty menziesia/sparse)

(TSUMER-PICLUT/MENFER/sparse; 19 sites)

IA1. Closed needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock) and *Picea X lutzii* (Lutz spruce) are codominants in the tree layer. *Betula papyrifera* (paper birch) is an occasional associate. *Menziesia ferruginea* is the dominant and well represented tall shrub, though it has less cover than in the mountain hemlock-Lutz spruce/rusty menziesia type. *Vaccinium ovalifolium* (early blueberry) is often present. No other vascular species stand out as

indicators. The undergrowth is generally sparse. The most consistent forbs are the ubiquitous *Cornus canadensis* (bunchberry) and *Rubus pedatus* (fiveleaf bramble).

Physical setting- Mountain hemlock-Lutz spruce/rusty menziesia/sparse is common on dissected and broken mountain side slopes and high relief hills in the Kenai Mountains. It is also an incidental type on flood plains of the Portage, Placer, and Twentymile area. Sites sampled are on easterly or westerly aspects, on slopes up to 70 percent, and at elevations from 500 to 1900 feet.

Mountain Hemlock-Sitka Spruce Cover Type

Tsuga mertensiana-Picea sitchensis/Echinopanax horridum
(mountain hemlock-Sitka spruce/devil's club)
(TSUMER-PICSIT/ECHHOR; 11 sites)
IA1. Closed needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock) and *Picea sitchensis* (Sitka spruce) are codominants in this type. The dominant shrub is *Echinopanax horridum* (devil's club). Other fairly consistent well represented shrubs are *Menziesia ferruginea* (rusty menziesia) and *Vaccinium ovalifolium* (early blueberry). *Rubus spectabilis* (salmonberry) and *Alnus crispa* ssp. *sinuata* (Sitka alder) are also well represented in about half of the sites sampled. Low and dwarf shrubs are absent or sparse. *Rubus pedatus* (fiveleaf bramble), *Cornus canadensis* (bunchberry), *Streptopus amplexifolius* (twistedstalk), and *Tiarella trifoliata* (foamflower) are well represented forbs. *Gymnocarpium dryopteris* (oak fern) and *Dryopteris dilatata* (wood fern) are abundant ferns, and stand out as undergrowth dominants in this type.

Physical setting- Mountain hemlock-Sitka spruce/devil's club is a fairly common type in both Prince William Sound and the Kenai Mountains. It occurs on dissected mountain side slopes, non-disturbed foot slopes, and low relief hills. Sites sampled are on all aspects, on slopes up to 90 percent, and at elevations to 1000 feet.

Tsuga mertensiana-Picea sitchensis/Vaccinium ovalifolium
(mountain hemlock-Sitka spruce/early blueberry)
(TSUMER-PICSIT/VACOVA; 27 sites)
IA1. Closed needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock) and *Picea sitchensis* (Sitka spruce) are codominants in this type. *Vaccinium ovalifolium* (early blueberry) is abundant and the indicator for this type. Other common shrubs are *Echinopanax horridum* (devil's club), *Menziesia ferruginea* (rusty menziesia), and *Rubus spectabilis* (salmonberry). Low and dwarf shrubs are essentially absent. The most consistent common forbs are *Rubus pedatus* (fiveleaf bramble), *Cornus canadensis* (bunchberry), and *Listera cordata* (heartleaf twayblade). *Gymnocarpium dryopteris* (oak fern) is the most common fern.

Physical setting- Mountain hemlock-Sitka spruce/early blueberry is one of the most common types in Prince William Sound. It occurs on low and high relief hills, gently sloping hills, broken, dissected, and non-disturbed mountain side slopes, and sea slopes. Sites sampled are on all aspects, on slopes up to 85 percent, and at elevations to 1200 feet.

Tsuga mertensiana-Picea sitchensis/Vaccinium ovalifolium-Echinopanax horridum
(mountain hemlock-Sitka spruce/early blueberry-devil's club)
(TSUMER-PICSIT/VACOVA-ECHHOR; 22 sites)
IA1. Closed needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock) and *Picea sitchensis* (Sitka spruce) are codominants in this type (Figure 5). *Vaccinium ovalifolium* (early blueberry) is abundant and an indicator for this type. *Echinopanax horridum* (devil's club) is also a well represented indicator species. Other common to well represented shrubs are *Menziesia ferruginea* (rusty menziesia), and *Rubus spectabilis* (salmonberry). Low and dwarf shrubs are essentially absent. The most consistent common forbs are *Rubus pedatus* (fiveleaf bramble), *Cornus canadensis* (bunchberry), *Tiarella trifoliata* (foamflower), and *Streptopus amplexifolius* (twistedstalk). *Dryopteris*



Figure 5. Closed needleleaf forest of the *Tsuga mertensiana*-*Picea sitchensis*/ *Vaccinium ovalifolium*-*Echinopanax horridum* type in Pigot Bay, Prince William Sound.

dilatata (wood fern) and *Gymnocarpium dryopteris* (oak fern) are the most common ferns.

Physical setting- Mountain hemlock-Sitka spruce/early blueberry-devil's club is one of the most common types in Prince William Sound, and is occasionally found in the Kenai Mountains. Predominant landforms include low relief, high relief, and gentle hills, non-disturbed, broken, and dissected mountain side slopes, and raised beaches. Sites sampled are on all aspects, on slopes up to 80 percent, and at elevations up to 1000 feet.

Tsuga mertensiana-Picea sitchensis/Vaccinium ovalifolium-Rubus spectabilis
(mountain hemlock-Sitka spruce/early blueberry-salmonberry)
(TSUMER-PICSIT/VACOVA-RUBSPE; 7 sites)
IA1. Closed needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock) and *Picea sitchensis* (Sitka spruce) are codominants in this type. *Vaccinium ovalifolium* (early blueberry) is abundant and an indicator for this type. *Rubus spectabilis* (salmonberry) is also a well represented indicator species. Other well represented shrubs are *Echinopanax horridum* (devil's club) and *Menziesia ferruginea* (rusty menziesia). Low and dwarf shrubs are absent or sparse. The most consistent common forbs are *Rubus pedatus* (fiveleaf bramble), *Tiarella trifoliata* (foamflower), and *Streptopus amplexifolius* (twistedstalk). *Gymnocarpium dryopteris* (oak fern) and *Dryopteris dilatata* (wood fern) are well represented ferns.

Physical setting- Mountain hemlock-Sitka spruce/early blueberry-salmonberry is fairly common on low and high relief hills in Prince William Sound. It occurs on most aspects, on slopes up to 80 percent, and at elevations up to 300 feet.

Tsuga mertensiana-Picea sitchensis/Vaccinium ovalifolium/Dryopteris dilatata

(mountain hemlock-Sitka spruce/early blueberry/wood fern)
(TSUMER-PICSIT/VACOVA/DRYDIL; 17 sites)

IA1. Closed needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock) and *Picea sitchensis* (Sitka spruce) are codominants in this type. *Vaccinium ovalifolium* (early blueberry) is abundant and the shrub indicator for this type. Other common tall shrubs are *Echinopanax horridum* (devil's club), *Menziesia ferruginea* (rusty menziesia), and *Rubus spectabilis* (salmonberry). Low and dwarf shrubs are absent. *Dryopteris dilatata* (wood fern) is well represented, and an indicator species. *Gymnocarpium dryopteris* (oak fern) is usually common or well represented. The most consistent common forbs are *Rubus pedatus* (fiveleaf bramble), *Listera cordata* (heartleaf twayblade), and *Tiarella trifoliata* (foamflower).

Physical setting- Mountain hemlock-Sitka spruce/early blueberry/wood fern is a minor though widespread type in Prince William Sound. It occurs on high and low relief hills, non-disturbed and dissected mountain side slopes, and foot slopes. Sites sampled are on all aspects, on slopes from 30 to 90 percent, and at elevations to 900 feet.

Tsuga mertensiana-Picea sitchensis/Vaccinium ovalifolium/Lysichiton americanus

(mountain hemlock-Sitka spruce/early blueberry/skunk cabbage)
(TSUMER-PICSIT/VACOVA/LYSAME; 8 sites)

IA1. Closed needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock) and *Picea sitchensis* (Sitka spruce) are codominants in this type. *Vaccinium ovalifolium* (early blueberry) is abundant and the shrub indicator for this type. Other common shrubs are *Echinopanax horridum* (devil's club), *Menziesia ferruginea* (rusty menziesia), and *Rubus spectabilis* (salmonberry). Low and dwarf shrubs are absent. *Lysichiton americanus* (skunk cabbage) is well represented and the forb indicator for this type. Other common forbs include *Cornus canadensis*

(bunchberry), *Rubus pedatus* (fiveleaf bramble), and *Tiarella trifoliata* (foamflower).

Physical setting- Mountain hemlock-Sitka spruce/early blueberry/skunk cabbage is a minor but widespread type on low relief, high relief, and gentle hills in Prince William Sound. Sites sampled are on all but westerly aspects, on slopes up to 80 percent, and at elevations to 300 feet.

Mountain Hemlock-Western Hemlock Cover Type

Tsuga mertensiana-*T. heterophylla*/*Vaccinium ovalifolium*
(mountain hemlock-western hemlock/early blueberry)
(TSUMER-TSUHET/VACOVA; 36 sites)
IA1. Closed needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock) and *T. heterophylla* (western hemlock) are codominants in this type. *Picea sitchensis* (Sitka spruce) is often a well represented associate. *Vaccinium ovalifolium* (early blueberry) is abundant and the tall shrub and indicator for this type. Other well represented or common shrubs are *Rubus spectabilis* (salmonberry), *Menziesia ferruginea* (rusty menziesia), and *Echinopanax horridum* (devil's club). Low and dwarf shrubs are absent or sparse. No other undergrowth species stand out as indicators, but the most common are *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), *Blechnum spicant* (deer fern), and *Gymnocarpium dryopteris* (oak fern).

Physical setting- Mountain hemlock-western hemlock/early blueberry is one of the most common types in Prince William Sound. The predominant landforms are low and high relief hills. Other common landforms include raised beaches, sea slopes, non-disturbed and broken mountain side slopes. Sites sampled are on all aspects, on slopes up to 70 percent, and at elevations to 700 feet.

Tsuga mertensiana-T. heterophylla/Vaccinium ovalifolium-Cassiope stelleriana

(mountain hemlock-western hemlock/early blueberry-Steller's cassiope)
(TSUMER-TSUHET/VACOVA-CASSTE; 5 sites)

IA2. Open needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock) and *T. heterophylla* (western hemlock) are codominants in the generally open canopy. *Picea sitchensis* (Sitka spruce) is occasionally a common associate. *Vaccinium ovalifolium* (early blueberry) is abundant and the tall shrub indicator for this type. Other common to well represented tall shrubs usually found in this type are *Menziesia ferruginea* (rusty menziesia), *Cladothamnus pyroliflorus* (copperbush), and *Rubus spectabilis* (salmonberry). *Cassiope stelleriana* (Steller's cassiope) is a well represented dwarf shrub and also an indicator species for this type. *Phyllodoce aleutica* (Aleutian mountain heath) and *Empetrum nigrum* (crowberry) can also be well represented dwarf shrubs. The most consistent well represented forb is *Fauria crista-galli* (deer cabbage), though it may not always be present. Other common or well represented forbs are *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), and *Streptopus amplexifolius* (twistedstalk). *Blechnum spicant* (deer fern) can be well represented.

Physical setting- Mountain hemlock-western hemlock/early blueberry-Steller's cassiope is a minor but widespread type on low relief hills and rounded subalpine mountains in Prince William Sound. Sites sampled occur on all aspects, on slopes from 25 to 70 percent, and at elevations up to 550 feet.

Tsuga mertensiana-T. heterophylla/Vaccinium ovalifolium-Cladothamnus pyroliflorus

(mountain hemlock-western hemlock/early blueberry-copperbush)
(TSUMER-TSUHET/VACOVA-CLAPYR; 3 sites)

IA1-IA2. Closed and open needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock) and *T. heterophylla* (western hemlock) are codominants in the generally open canopy. *Picea sitchensis* (Sitka spruce) is a consistent common associate. *Vaccinium*

ovalifolium (early blueberry) is abundant and a tall shrub indicator for this type. *Cladothamnus pyroliflorus* (copperbush) is well represented and another indicator species. Other common to well represented shrubs usually found in this type are *Menziesia ferruginea* (rusty menziesia) and *Rubus spectabilis* (salmonberry). Low and dwarf shrubs are sparse. Other consistent well represented undergrowth species are *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), and *Blechnum spicant* (deer fern).

Physical setting- Mountain hemlock-western hemlock/early blueberry-copperbush is a widespread though minor type in Prince William Sound. Sites sampled are on non-disturbed mountain side slopes and high relief hills, on all but northerly aspects, on slopes from 40 to 65 percent, and at elevations to 335 feet.

Tsuga mertensiana-*T. heterophylla*/*Vaccinium ovalifolium*-*Echinopanax horridum*

(mountain hemlock-western hemlock/early blueberry-devil's club)
(TSUMER-TSUHET/VACOVA-ECHHOR; 11 sites)

IA1. Closed needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock), *T. heterophylla* (western hemlock), and *Picea sitchensis* (Sitka spruce) are codominants. *Vaccinium ovalifolium* (early blueberry) is abundant and an indicator for this type. *Echinopanax horridum* (devil's club) is well represented and also an indicator. *Rubus spectabilis* (salmonberry) and *Menziesia ferruginea* (rusty menziesia) are also usually well represented. Low and dwarf shrubs are absent. Common or well represented undergrowth species usually found in this type include *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), *Listera cordata* (heartleaf twayblade), *Tiarella trifoliata* (foamflower), *Coptis asplenifolia* (fernleaf goldthread), and *Streptopus amplexifolius* (twistedstalk). *Blechnum spicant* (deer fern), *Dryopteris dilatata* (wood fern), and *Gymnocarpium dryopteris* (oak fern) are the dominant ferns.

Physical setting- Mountain hemlock-western hemlock/early blueberry-devil's club is a widespread major type in Prince William Sound. Predominant

landforms for this type are high and low relief hills. Minor landforms include raised beaches, and non-disturbed foot slopes, and dissected and non-disturbed mountain side slopes. Sites sampled occur on all but southerly aspects, on slopes up to 75 percent, and at elevations to 700 feet.

Tsuga mertensiana-T. heterophylla/Vaccinium ovalifolium-Menziesia ferruginea

(mountain hemlock-western hemlock/early blueberry-rusty menziesia)

(TSUMER-TSUHET/VACOVA-MENFER; 4 sites)

IA1. Closed needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock) and *T. heterophylla* (western hemlock) are codominants. *Picea sitchensis* (Sitka spruce) is usually a common associate. *Vaccinium ovalifolium* (early blueberry) and *Menziesia ferruginea* (rusty menziesia) are abundant and indicator species for this type. Low and dwarf shrubs are sparse. The most consistent forbs are *Cornus canadensis* (bunchberry) and *Rubus pedatus* (fiveleaf bramble). *Gymnocarpium dryopteris* (oak fern) and *Blechnum spicant* (deer fern) are the most consistent common to well represented ferns.

Physical setting- Mountain hemlock-western hemlock/early blueberry-rusty menziesia is a minor type in Prince William Sound. This type occurs on low relief hills, flat lowlands, and sea slopes. Sites sampled are on southerly aspects, on slopes up to 90 percent, and at elevations to 120 feet.

Tsuga mertensiana-T. heterophylla/Vaccinium ovalifolium/Calamagrostis nutkaensis

(mountain hemlock-western hemlock/early blueberry/Pacific reedgrass)

(TSUMER-TSUHET/VACOVA/CALNUT; 5 sites)

IA1.-IA2. Closed and open needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock) and *T. heterophylla* (western hemlock) are codominants. *Picea sitchensis* (Sitka spruce) is a consistent minor associate. *Vaccinium ovalifolium* (early blueberry) is abundant and an indicator species for this type. Other shrubs that are often found in this type as common to well represented are *Menziesia*

ferruginea (rusty menziesia), *Rubus spectabilis* (salmonberry), and *Alnus crispa* ssp. *sinuata* (Sitka alder). Low and dwarf shrubs are sparse. *Calamagrostis nutkaensis* (Pacific reedgrass) is well represented to abundant and an important indicator for this type. The most consistent forbs are *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), and *Fauria crista-galli* (deer cabbage). *Blechnum spicant* (deer fern) is the most consistent fern.

Physical setting- Mountain hemlock-western hemlock/early blueberry/Pacific reedgrass is a minor type in Prince William Sound. This type is found predominantly on low relief hills, but was also sampled on a raised beach, high relief hills, and gentle hills. Sites sampled are on all but westerly aspects, on slopes to 50 percent, and at elevations to 300 feet.

Tsuga mertensiana-*T. heterophylla*/*Vaccinium ovalifolium*/*Fauria crista-galli*
(mountain hemlock-western hemlock/early blueberry/deer cabbage)
(TSUMER-TSUHET/VACOVA/FAUCRI; 7 sites)
IA1.-Ia2. Closed and open needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock) and *T. heterophylla* (western hemlock) are codominants. *Picea sitchensis* (Sitka spruce) is a common associate. *Vaccinium ovalifolium* (early blueberry) is abundant and an indicator species for this type. Other shrubs that are often found in this type as common to well represented are *Menziesia ferruginea* (rusty menziesia), *Rubus spectabilis* (salmonberry), and *Echinopanax horridum* (devil's club). Not as consistent, but often found are *Alnus crispa* sp. *sinuata* (Sitka alder) and *Cladothamnus pyroliflorus* (copperbush). Low and dwarf shrubs are sparse. The distinguishing well represented forb for this type is *Fauria crista-galli* (deer cabbage). Other common to well represented undergrowth species are *Cornus canadensis* (bunchberry), *Coptis aspleniifolia* (fernleaf goldthread), *Listera cordata* (heartleaf twayblade), *Rubus pedatus* (fiveleaf bramble), and *Blechnum spicant* (deer fern).

Physical setting- Mountain hemlock-western hemlock/early blueberry/deer cabbage is a minor but widespread type on low relief hills in Prince William Sound. It is also occasionally found on high relief and gentle hill slopes. It

occurs on all aspects, on slopes from 30 to 60 percent, and at elevations up to 300 feet.

Tsuga mertensiana-*T. heterophylla*/*Vaccinium ovalifolium*/*Lysichiton americanus*

(mountain hemlock-western hemlock/early blueberry/skunk cabbage)

(TSUMER-TSUHET/VACOVA/LYSAME; 5 sites)

IA1.-IA2. Closed and open needleleaf forest

Vegetation- *Tsuga mertensiana* (mountain hemlock) and *T. heterophylla* (western hemlock) are codominants. *Picea sitchensis* (Sitka spruce) is a common associate. *Vaccinium ovalifolium* (early blueberry) is abundant and the indicator species for this type. Other shrubs that are often found in this type as common to well represented are *Menziesia ferruginea* (rusty menziesia), *Rubus spectabilis* (salmonberry), and *Echinopanax horridum* (devil's club). Low and dwarf shrubs are absent. *Lysichiton americanus* (skunk cabbage) is well represented and an indicator for this type. Other well represented undergrowth species include *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), and *Gymnocarpium dryopteris* (oak fern).

Physical setting- Mountain hemlock-western hemlock/early blueberry/skunk cabbage is a minor yet widespread type in Prince William Sound. It occurs on high and low relief hills, flat lowlands, and non-disturbed foot slopes. Sites sampled are on most aspects, on slopes to 45 percent, and at elevations to 800 feet.

Broadleaf Forest Type

Paper Birch Cover Type

Betula papyrifera/Alnus crispa ssp. sinuata

(paper birch/Sitka alder)

(BETPAP/ALNCRIS; 7 sites)

IB2a. Open broadleaf forest, paper birch

Vegetation- *Betula papyrifera* (paper birch) is the dominant tree species, with *Picea X lutzii* (Lutz spruce), or *Picea sitchensis* (Sitka spruce), occasionally common. Abundant *Alnus crispa ssp. sinuata* (Sitka alder) dominates the tall shrub layer. *Viburnum edule* (highbush cranberry) is often a well represented tall shrub. Low and dwarf shrubs are sparse. The herbaceous component of the undergrowth is often dominated by abundant *Calamagrostis canadensis* (bluejoint reedgrass). *Equisetum arvense* (common horsetail) can be well represented. *Trientalis europaea* (starflower) and *Rubus arcticus* (nagoonberry) are the most common forbs. Forb composition is quite variable and has little indicator value for this type.

Physical setting- Paper birch/Sitka alder is an incidental type on flood plains in the upper Twentymile wetlands area, and dissected and non-disturbed side slopes in the Kenai Mountains. In the upper Twentymile area this type occurs on level ground below 100 feet elevation. In the Kenai Mountains this type occurs on easterly aspects with slopes to 45 percent and elevations to 600 feet.

Betula papyrifera/Calamagrostis canadensis

(paper birch/bluejoint reedgrass)

(BETPAP/CALCAN; 7 sites)

IB1d. Closed broadleaf forest, paper birch

Vegetation- *Betula papyrifera* (paper birch) dominates the tree layer, with *Picea X lutzii* (Lutz spruce) often present in the understory. Tall, low, and dwarf shrubs are inconsistent and have low indicator value. The most

consistent tall shrubs are *Menziesia ferruginea* (rusty menziesia) and *Sambucus racemosa* (red elderberry). *Calamagrostis canadensis* (bluejoint reedgrass) is the most abundant species in the undergrowth and the indicator for this type. Other species that may be well represented in the undergrowth include *Cornus canadensis* (bunchberry), *Epilobium angustifolium* (tall fireweed), *Equisetum* sp. (horsetail), *Linnaea borealis* (twinflower), and *Pyrola* sp. (wintergreen).

Physical setting- Paper birch/bluejoint reedgrass is an incidental type on flood plains in the upper Twentymile valley area, and broken mountain side slopes and non-disturbed foot slopes in the Kenai Mountains. In the upper Twentymile wetlands area this type occurs on level ground below 100 feet elevation. In the Kenai Mountains this type occurs on variable aspects with slopes to 40 percent and elevations to 1400 feet.

Betula papyrifera/Echinopanax horridum

(paper birch/devil's club)

(BETPAP/ECHHOR; 5 sites)

IB1d. Closed broadleaf forest, paper birch

Vegetation- *Betula papyrifera* (paper birch) dominates the closed canopy tree layer. Other varied tree species are likely present. *Echinopanax horridum* (devil's club) is abundant and dominates the tall shrub layer. *Sambucus racemosa* (red elderberry) and *Menziesia ferruginea* (rusty menziesia) can be well represented tall shrub components. Low and dwarf shrubs are sparse. Other species, which may be well represented in the undergrowth, include *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), *Dryopteris dilatata* (wood fern), *Gymnocarpium dryopteris* (oak fern), and *Calamagrostis canadensis* (bluejoint reedgrass).

Physical setting- Paper birch/devil's club is a minor type in the Kenai Mountains. Limited site data show this type occurring on non-disturbed foot slopes, on westerly aspects, on slopes less than 12 percent, and at elevations from 300 to 600 feet.

Betula papyrifera/Linnaea borealis
(paper birch/twinflower)

(BETPAP/LINBOR; 3 sites)

IB1d. Closed broadleaf forest, paper birch

Vegetation- The tree layer is dominated by *Betula papyrifera* (paper birch), but often includes an understory component of *Picea X lutzii* (Lutz spruce). *Linnaea borealis* (twinflower) dominates the dwarf shrub layer and is the main indicator for this type. Tall shrubs do not provide any indicator value, though *Menziesia ferruginea* (rusty menziesia) is consistent and common. *Cornus canadensis* (bunchberry), *Calamagrostis canadensis* (bluejoint reedgrass), and *Gymnocarpium dryopteris* (oak fern) are consistent in the undergrowth.

Physical setting- Paper birch/twinflower is a minor type in the Kenai Mountains. Sufficient site data are not available at this time.

Betula papyrifera/Menziesia ferruginea
(paper birch/rusty menziesia)

(BETPAP/MENFER; 10 sites)

IB1d. Closed Broadleaf forest, paper birch

Vegetation- *Betula papyrifera* (paper birch) dominates the tree layer. *Picea X lutzii* (Lutz spruce) and *Tsuga mertensiana* (mountain hemlock) often occur as minor understory components. *Menziesia ferruginea* (rusty menziesia) is abundant and dominates the shrub layer. *Echinopanax horridum* (devil's club) and *Sambucus racemosa* (red elderberry) may be common to well represented. Other species with high constancy in the undergrowth include *Linnaea borealis* (twinflower), *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), *Epilobium angustifolium* (tall fireweed), *Calamagrostis canadensis* (bluejoint reedgrass), *Dryopteris dilatata* (wood fern), and *Lycopodium annotinum* (stiff clubmoss).

Physical setting- Paper birch/rusty menziesia is a minor type in the Kenai Mountains. It occurs on low and high relief hills, and non-disturbed, broken, and dissected mountain side slopes. Sites sampled are on all but southerly aspects, on slopes up to 45 percent, and at elevations from 400 to 700 feet.

Betula papyrifera/Menziesia ferruginea/sparse
(paper birch/rusty menziesia/sparse)
(BETPAP/MENFER/sparse; 9 sites)
IB1d. Closed broadleaf forest, paper birch

Vegetation- *Betula papyrifera* (paper birch) and *Salix scouleriana* (Scouler willow) are generally codominant in the tree layer, although *S. scouleriana* is not always present. *Picea X lutzii* (Lutz spruce) and *Tsuga mertensiana* (mountain hemlock) often occur as minor understory components. *Menziesia ferruginea* (rusty menziesia) is abundant and dominates the shrub layer, but has less cover than in the paper birch/rusty menziesia type. *Linnaea borealis* (twinflor) is a fairly consistent dwarf shrub with low cover. Other species with high constancy in the undergrowth include *Cornus canadensis* (bunchberry), *Pyrola secunda* (one-sided wintergreen), and *Calamagrostis canadensis* (bluejoint reedgrass).

Physical setting- Paper birch/rusty menziesia/sparse is a minor type in the Kenai Mountains. It occurs primarily on non-disturbed mountain side slopes, but also on high relief hills and non-disturbed foot slopes. Sites sampled are on all but southerly aspects, on slopes to 50 percent, and at elevations from 300 to 600 feet.

Betula papyrifera/Vaccinium vitis-idaea
(paper birch/lowbush cranberry)
(BETPAP/VACVIT; 3 sites)
IB1d. Closed broadleaf forest, paper birch

Vegetation- *Betula papyrifera* (paper birch) dominates the tree layer. *Picea X lutzii* (Lutz spruce) is a common consistent associated tree species. *Menziesia ferruginea* (rusty menziesia) is often present in the shrub layer, but has low cover. *Empetrum nigrum* (crowberry) and *Vaccinium vitis-idaea* (lowbush cranberry) are well represented in the dwarf shrub layer and are indicators for this type. Other species with high constancy in the undergrowth include *Linnaea borealis* (twinflor), *Cornus canadensis* (bunchberry), *Epilobium angustifolium* (tall fireweed), and *Pyrola secunda* (one-sided wintergreen).

Physical setting- Paper birch/lowbush cranberry is a minor type on non-disturbed foot slopes and broken mountain side slopes. Sites sampled are on all but westerly aspects, on slopes from 20 to 75 percent, and at elevations from 500 to 1000 feet.

Black Cottonwood Cover Type

Populus balsamifera ssp. *trichocarpa*/*Alnus crispa* ssp. *sinuata*
(black cottonwood/Sitka alder)
(POPBALT/ALNCRIS; 51 sites)

IB1c.-IB2c. Closed and open broadleaf forest, black cottonwood

Vegetation- *Populus balsamifera* ssp. *trichocarpa* (black cottonwood) is the dominant tree. The tree canopy can consist of large mature trees or smaller immature trees. Species composition is fairly consistent between the mature and immature forests. The main differences between these forests is that *Echinopanax horridum* (devil's club) only occurs within the more mature forests and *Salix* sp. (willow) are more common in immature forests. *Alnus crispa* ssp. *sinuata* (Sitka alder) is abundant and the dominant tall shrub in this type. *Echinopanax horridum* is the next most consistent and dominant tall shrub species. *Viburnum edule* (highbush cranberry) occurs in about half of the sites. *Salix* sp. (willow) is inconsistent in this type, but can comprise significant cover on some sites. Low and dwarf shrubs are sparse. Understory herbaceous species composition can be quite variable, with the following being the most consistent: *Epilobium angustifolium* (tall fireweed), *Pyrola asarifolia* (liverleaf wintergreen), *Pyrola secunda* (one-sided wintergreen), *Streptopus amplexifolius* (twistedstalk), *Trientalis europaea* (starflower), *Calamagrostis canadensis* (bluejoint reedgrass), *Athyrium filix-femina* (lady fern), *Dryopteris dilatata* (wood fern), and *Equisetum arvense* (common horsetail).

Physical setting- Black cottonwood/Sitka alder is a major type in the Portage, Placer, and Twentymile wetland area, as well as the Copper River Delta. Sites sampled are on flood plains, dunes, beaches, and raised tidal flats. This type occurs on level ground, and on elevations under 100 feet (although it is occasionally found at elevations up to 200 feet).

Populus balsamifera ssp. *trichocarpa*/*Echinopanax horridum*
(black cottonwood/devil's club)
(POPBALT/ECHHOR; 4 sites)

IB1c-1B2c. Closed and open broadleaf forest, black cottonwood

Vegetation- *Populus balsamifera* ssp. *trichocarpa* (black cottonwood) dominates the tree layer. *Echinopanax horridum* (devil's club) is well represented to abundant in the tall shrub layer, and the indicator for this type. *Alnus crispa* ssp. *sinuata* (Sitka alder) and *Rubus spectabilis* (salmonberry) may be well represented to abundant. *Sambucus racemosa* (red elderberry) and *Viburnum edule* (highbush cranberry) are usually present. Low and dwarf shrubs are absent. *Aruncus sylvestris* (goatsbeard) and *Calamagrostis canadensis* (bluejoint reedgrass) may be well represented to abundant herbaceous species. *Equisetum arvense* (common horsetail) is always common to abundant. This type is probably a later successional stage of the black cottonwood/Sitka alder type.

Physical setting- Black cottonwood/devil's club is a minor type on the Kenai and Copper River Delta. Sufficient site data are not available at this time.

Quaking Aspen Cover Type

Populus tremuloides/*Shepherdia canadensis*
(quaking aspen/buffaloberry)
(POPTRE/SHECAN; 5 sites)

IB1e. Closed broadleaf forest, quaking aspen

Vegetation- *Populus tremuloides* (quaking aspen) dominates the tree layer. *Picea X lutzii* (Lutz spruce) is a consistent minor component of the overstory and understory (see Figure 6 for photograph of related type). *Shepherdia canadensis* (buffaloberry) is well represented and the indicator for the tall shrub layer. Other common or well represented tall shrubs include *Rosa acicularis* (prickly rose), and *Viburnum edule* (highbush cranberry). Common to well represented dwarf shrubs include *Arctostaphylos uva-ursi* (kinnikinnick), and *Linnaea borealis* (twinflor).



Figure 6. Open broadleaf forest of the *Populus tremuloides/ Calamagrostis canadensis* type (listed in Table 4) in the Juneau Creek drainage, Kenai Peninsula.

Epilobium angustifolium (tall fireweed) is the most consistent species in the forb layer, although the forb species composition is quite variable.

Physical setting- Quaking aspen/buffaloberry is a minor type on non-disturbed foot slopes in the Kenai Mountains. Sites sampled are on southerly aspects, on slopes from 55 to 70 percent, and at elevations from 700 to 900 feet.

Mixed Forest Type

Lutz Spruce-Paper Birch Cover Type

Picea X lutzii-*Betula papyrifera*/*Calamagrostis canadensis*
(Lutz spruce-paper birch/bluejoint reedgrass)
(PICLUT-BETPAP/CALCAN; 3 sites)
IC1.-IC2. Closed and open mixed forest

Vegetation- *Picea X lutzii* (Lutz spruce) and *Betula papyrifera* (paper birch) dominate the tree layer. No shrub species exceeds 10 percent cover, although *Menziesia ferruginea* (rusty menziesia), *Viburnum edule* (highbush cranberry), *Linnaea borealis* (twinflower), and *Vaccinium vitis-idaea* (lowbush cranberry) are often present. *Calamagrostis canadensis* (bluejoint reedgrass) is abundant and the indicator species for this type. Other species with high constancy in the undergrowth include *Cornus canadensis* (bunchberry) and *Pyrola secunda* (one-sided wintergreen).

Physical setting- Lutz spruce-paper birch/bluejoint reedgrass is a minor type on non-disturbed foot slopes and side slopes in the Kenai Mountains. Sites sampled are on northerly aspects, on slopes less than 10 percent, and at elevations from 400 to 600 feet.

Picea X lutzii-Betula papyrifera/Hylocomium splendens
(Lutz spruce-paper birch/splendid feather moss)
(PICLUT-BETPAP/HYLSPL; 6 sites)
IC1. Closed mixed forest

Vegetation- *Picea X lutzii* (Lutz spruce) and *Betula papyrifera* (paper birch) dominate the tree layer. It is common to see *Salix scouleriana* (Scouler willow) and *Tsuga mertensiana* (mountain hemlock) as minor associates. The undergrowth has low species diversity and has sparse cover with no vascular plant species exceeding 10 percent cover. *Hylocomium splendens* (splendid feather moss) and *Pleurozium schreberi* (Schreber's big red stem moss) are the dominant mosses.

Physical setting- Lutz spruce-paper birch/splendid feather moss is a minor type on non-disturbed foot slopes and ravines in the Kenai Mountains. Sites sampled are on easterly and southerly aspects, on slopes to 85 percent, and at elevations from 700 to 1000 feet.

Picea X lutzii-Betula papyrifera/Lycopodium annotinum
(Lutz spruce-paper birch/stiff clubmoss)
(PICLUT-BETPAP/LYCANN; 6 sites)
IC1. Closed mixed forest

Vegetation- *Picea X lutzii* (Lutz spruce) and *Betula papyrifera* (paper birch) dominate the tree layer. *Lycopodium annotinum* (stiff clubmoss) is abundant in the undergrowth, and is the main indicator species for this type. The most consistent shrubs, though low in cover, are *Menziesia ferruginea* (rusty menziesia), *Linnaea borealis* (twinline), and *Vaccinium vitis-idaea* (lowbush cranberry). The most common herbaceous species are *Cornus canadensis* (bunchberry), *Pyrola secunda* (one-sided wintergreen), *Epilobium angustifolium* (tall fireweed), and *Calamagrostis canadensis* (bluejoint reedgrass).

Physical setting- Lutz spruce-paper birch/stiff clubmoss is a minor type in the Kenai Mountains. It occurs on non-disturbed and broken mountain side slopes, non-disturbed foot slopes, and flood plains. Sites sampled are on all

but westerly aspects, on slopes up to 30 percent, and at elevations from 400 to 1100 feet.

Picea X lutzii-Betula papyrifera/Menziesia ferruginea
(Lutz spruce-paper birch/rusty menziesia)
(PICLUT-BETPAP/MENFER; 3 sites)
IC1.-IC2. Closed and open mixed forest

Vegetation- *Picea X lutzii* (Lutz spruce) and *Betula papyrifera* (paper birch) dominate the tree layer. *Menziesia ferruginea* (rusty menziesia) dominates the tall shrub layer, is abundant, and the indicator species for this type. *Vaccinium ovalifolium* (early blueberry) is often present. The dwarf shrub *Linnaea borealis* (twinflor) is often present. The most common associated species in the undergrowth are *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), *Calamagrostis canadensis* (bluejoint reedgrass), *Gymnocarpium dryopteris* (wood fern), and *Lycopodium annotinum* (stiff clubmoss).

Physical setting- Lutz spruce-paper birch/rusty menziesia is a minor type in the Kenai Mountains. Sufficient site data are not available at this time.

Picea X lutzii-Betula papyrifera/Menziesia ferruginea/sparse
(Lutz spruce-paper birch/rusty menziesia/sparse)
(PICLUT-BETPAP/MENFER/sparse; 7 sites)
IC1. Closed mixed forest

Vegetation- *Picea X lutzii* (Lutz spruce) and *Betula papyrifera* (paper birch) dominate these closed sites. The undergrowth is sparse with few vascular plant species exceeding 10 percent cover. The dominant tall shrub is *Menziesia ferruginea* (rusty menziesia). Cover of *Menziesia ferruginea* averages 10 percent. This differs from the PICLUT-BETPAP/MENFER type where its cover averages 45 percent. The most common dwarf shrubs, though low in cover, are *Linnaea borealis* (twinflor) and *Vaccinium vitis-idaea* (lowbush cranberry). The most consistent herbaceous species in this type are *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), and *Lycopodium annotinum* (stiff clubmoss).

Physical setting- Lutz spruce-paper birch/rusty menziesia/sparse is a minor type in the Kenai Mountains. It occurs on non-disturbed, broken, and dissected mountain side slopes, and non-disturbed foot slopes. Sites sampled are on all but southerly aspects, on slopes to 85 percent, and at elevations from 300 to 800 feet.

Picea X lutzii-Betula papyrifera/Vaccinium vitis-idaea
(Lutz spruce-paper birch/lowbush cranberry)
(PICLUT-BETPAP/VACVIT; 13 sites)
IC1.-IC2. Closed and open mixed forest

Vegetation- *Picea X lutzii* (Lutz spruce) and *Betula papyrifera* (paper birch) dominate the tree layer. Tall shrubs do not comprise a significant component in this type. *Vaccinium vitis-idaea* (lowbush cranberry) is well represented and the main indicator species for this type, which is characterized by dwarf shrubs. Other common dwarf and low shrubs are *Empetrum nigrum* (crowberry), *Linnaea borealis* (twinflor), and *Ledum palustre* (marsh labrador tea). Other species common in the undergrowth include *Cornus canadensis* (bunchberry), *Geocaulon lividum* (northern comandra), and *Lycopodium annotinum* (stiff clubmoss).

Physical setting- Lutz spruce-paper birch/lowbush cranberry is a fairly common type in the Kenai Mountains. It occurs primarily on non-disturbed foot slopes, but also occurs on non-disturbed, broken, and dissected mountain side slopes, and high relief hills. Sites sampled are on all aspects, on slopes to 80 percent, and at elevations from 400 to 1400 feet.

Lutz Spruce-Black Cottonwood Cover Type

Picea X lutzii-*Populus balsamifera* ssp. *trichocarpa*/*Alnus crispa* sp. *sinuata*
(Lutz spruce-black cottonwood/Sitka alder)
(PICLUT-POPBALT/ALNCRIS; 9 sites)
IC1.-IC2. Closed and open mixed forest

Vegetation- *Picea X lutzii* (Lutz spruce) and *Populus balsamifera* ssp. *trichocarpa* (black cottonwood) codominate the tree layer. *Alnus crispa* ssp. *sinuata* (Sitka alder) dominates the tall shrub layer. *Echinopanax horridum* (devil's club) and *Viburnum edule* (highbush cranberry) are often present. Low and dwarf shrubs are sparse. *Calamagrostis canadensis* (bluejoint reedgrass) is the most consistent and dominant herbaceous species. Other fairly consistent undergrowth species that are present include *Epilobium angustifolium* (tall fireweed), *Pyrola secunda* (one-sided wintergreen), *P. asarifolia* (liverleaf wintergreen), *Streptopus amplexifolius* (twistedstalk), and *Dryopteris dilatata* (wood fern).

Physical setting- Lutz spruce-black cottonwood/Sitka alder is a common type on flood plains in the Portage, Placer, and Twentymile wetland area. It also occurs occasionally on non-disturbed foot slopes in the Kenai Mountains. Sites sampled are on level ground at elevations below 300 feet.

Picea X lutzii-*Populus balsamifera* ssp. *trichocarpa*/*Calamagrostis canadensis*
(Lutz spruce-black cottonwood/bluejoint reedgrass)
(PICLUT-POPBALT/CALCAN; 5 sites)
IC1. Closed mixed forest

Vegetation- *Picea X lutzii* (Lutz spruce) and *Populus balsamifera* ssp. *trichocarpa* (black cottonwood) codominate the tree layer. *Calamagrostis canadensis* (bluejoint reedgrass) is well represented or abundant, and is the main indicator species for this type. *Alnus crispa* ssp. *sinuata* (Sitka alder) may be present, but has cover of less than 15 percent. *Viburnum edule* (highbush cranberry) is a consistent tall shrub, but has low cover. Low and dwarf shrubs are sparse. Herbaceous species that are often found in this type include *Equisetum arvense* (common horsetail), *Trientalis europaea*

(starflower), *Cornus canadensis* (bunchberry), *Epilobium angustifolium* (tall fireweed), *Pyrola secunda* (one-sided wintergreen), *Pyrola asarifolia* (liverleaf wintergreen), *Rubus arcticus* (nagoonberry), and *Gymnocarpium dryopteris* (oak fern).

Physical setting- Lutz spruce-black cottonwood/bluejoint reedgrass is a minor type in the Kenai Mountains. It occurs on flood plains, stream terraces, and non-disturbed foot slopes. Sites sampled are on northerly aspects, on slopes less than 5 percent, and at elevations from 400 to 750 feet.

Picea X lutzii-*Populus balsamifera* ssp. *trichocarpa*/*Echinopanax horridum*
(Lutz spruce-black cottonwood/devil's club)
(PICLUT-POPBALT/ECHHOR; 4 sites)

IC2.-IC1. Open and closed mixed forest, Lutz spruce-black cottonwood

Vegetation- *Picea X lutzii* (Lutz spruce) and *Populus balsamifera* ssp. *trichocarpa* (black cottonwood) are codominants in the usually open overstory (Figure 7). The tall shrub layer is dominated by well represented *Echinopanax horridum* (devil's club). *Viburnum edule* (highbush cranberry) is also a common shrub component. Low and dwarf shrubs are absent. Ferns are well represented in this type by *Athyrium filix-femina* (lady fern), *Dryopteris dilatata* (wood fern), and *Gymnocarpium dryopteris* (oak fern). Common herbaceous species include *Pyrola secunda* (one-sided wintergreen), *Streptopus amplexifolius* (twistedstalk), and *Equisetum arvense* (common horsetail).

Physical setting- Lutz spruce-black cottonwood/devil's club is a minor type in the Portage, Placer, Twentymile wetland area, and incidental in the Kenai Mountains. Sites sampled in the wetlands area are on northerly aspects with slopes up to 5 percent and elevations under 400 feet.



Figure 7. Open mixed forest of the *Picea X lutzii*-*Populus balsamifera* ssp. *Trichocarpa*/*Echinopanax horridum* type in the vicinity of Carmen Lake, Twentymile River drainage.

Picea X lutzii-*Populus balsamifera* ssp. *trichocarpa*/*Equisetum arvense*
(Lutz spruce-black cottonwood/common horsetail)
(PICLUT-POPBALT/EQUARV; 5 sites)
IC2.-IC1. Open and closed mixed forest

Vegetation- *Picea X lutzii* (Lutz spruce) and *Populus balsamifera* ssp. *trichocarpa* (black cottonwood) share overstory dominance in this type. *Equisetum arvense* (common horsetail) is abundant and the indicator species for this type. *Calamagrostis canadensis* (bluejoint reedgrass) is abundant and shares dominance in the undergrowth. Fairly consistent tall shrub components are *Viburnum edule* (highbush cranberry), *Salix barclayi* (Barclay willow), and *Rosa acicularis* (prickly rose). Low and dwarf shrubs are sparse. Remaining herbaceous species composition is quite variable, the most common species including *Sanguisorba stipulata* (Sitka burnet), *Epilobium angustifolium* (tall fireweed), *Pyrola secunda* (one-sided wintergreen), and *Cornus canadensis* (bunchberry).

Physical setting- Lutz spruce-black cottonwood/common horsetail is a minor type in the Kenai Mountains. It occurs on flood plains, flat lowlands, and non-disturbed foot slopes. Sites sampled are on northerly aspects on slopes up to 5 percent and at elevations from 400 to 1200 feet.

Picea X lutzii-*Populus balsamifera* ssp. *trichocarpa*/*Hylocomium splendens*
(Lutz spruce-black cottonwood/splendid feather moss)
(PICLUT-POPBALT/HYLSPL; 5 sites)
IC1.-IC2. Closed and open mixed forest

Vegetation- *Picea X lutzii* (Lutz spruce) and *Populus balsamifera* ssp. *trichocarpa* (black cottonwood) codominate the tree layer. *Betula papyrifera* (paper birch) is an occasional tree associate. No undergrowth vascular plant species exceeds 5 percent cover in this type. The ground cover is dominated by mosses, with *Hylocomium splendens* (splendid feather moss) dominant. The most common vascular species, though low in cover, is *Alnus crispa* ssp. *sinuata* (Sitka alder).

Physical setting- Lutz spruce-black cottonwood/splendid feather moss is a minor type in the Portage, Placer, and Twentymile wetland area, and

incidental in the Kenai Mountains. Sites sampled in the wetland area are on northerly and easterly aspects with slopes up to 10 percent and elevations to 300 feet.

Lutz Spruce-Quaking Aspen Cover Type

Picea X lutzii-*Populus tremuloides*/*Vaccinium vitis-idaea*
(Lutz spruce-quaking aspen/lowbush cranberry)
(PICLUT-POPTRE/VACVIT; 11 sites)
IC1.-IC2. Closed and open mixed forest

Vegetation- *Picea X lutzii* (Lutz spruce) and *Populus tremuloides* (quaking aspen) codominate the tree layer. *Betula papyrifera* (paper birch) is often a common to well represented associate. Tall shrubs are sparse, with *Viburnum edule* (highbush cranberry) being the most consistent, though it is low in cover. Low and dwarf shrubs characterize this type, with *Vaccinium vitis-idaea* (lowbush cranberry) being abundant and dominant, and *Linnaea borealis* (twinline) often common or well represented. The most common forbs are *Cornus canadensis* (bunchberry), and *Geocaulon lividum* (northern comandra). *Epilobium angustifolium* (tall fireweed), *Lupinus nootkatensis* (Nootka lupine), and *Pyrola secunda* (one-sided wintergreen) are consistently present to common associates.

Physical setting- Lutz spruce-quaking aspen/lowbush cranberry is fairly common on non-disturbed foot slopes in the Kenai Mountains. Sites sampled are on flat and southerly aspects, on slopes to 45 percent (most are less than 5 percent), and at elevations from 400 to 1000 feet.

Sitka Spruce-Black Cottonwood Cover Type

Picea sitchensis-*Populus balsamifera* ssp. *trichocarpa*/*Alnus crispa* ssp.
sinuata

(Sitka spruce-black cottonwood/Sitka alder)

(PICSIT-POPBALT/ALNCRIS; 4 sites)

IC2.-IC1. Open and closed mixed forest

Vegetation- *Picea sitchensis* (Sitka spruce) and *Populus balsamifera* ssp. *trichocarpa* (black cottonwood) codominate the generally open tree layer. *Alnus crispa* ssp. *sinuata* (Sitka alder) is abundant and dominates the tall shrub layer. *Echinopanax horridum* (devil's club) can be present to abundant. *Salix sitchensis* (Sitka willow) or other *Salix* sp. (willow) are also common to abundant in the tall shrub layer. Low and dwarf shrubs are absent. Herbaceous species within this type are quite variable. *Pyrola asarifolia* (liverleaf wintergreen), *Pyrola secunda* (one-sided wintergreen), and *Streptopus amplexifolius* (twistedstalk) are the most consistent forbs, though they have low cover. *Calamagrostis canadensis* (bluejoint reedgrass) and *Athyrium filix-femina* (lady fern) are undergrowth dominants in about half the sites sampled.

Physical setting- Sitka spruce-black cottonwood/Sitka alder is a minor type on the Copper River Delta. Sufficient site data are not available at this time.

Mountain Hemlock-Paper Birch Cover Type

Tsuga mertensiana-*Betula papyrifera*/*Hylocomium splendens*

(mountain hemlock-paper birch/splendid feather moss)

(TSUMER-BETPAP/HYLSPL; 7 sites)

IC1. Closed mixed forest

Vegetation- *Betula papyrifera* (paper birch) and *Picea X lutzii* (Lutz spruce) codominate the overstory, and *Tsuga mertensiana* (mountain hemlock) dominates the tree understory. On some sites *Tsuga mertensiana* is a

codominant overstory component. This type has low species diversity. Shrub and herbaceous layers have very few species and very little cover. The forest floor may be dominated by mosses, *Hylocomium splendens* (splendid feather moss) in particular.

Physical setting- Mountain hemlock-paper birch/splendid feather moss is a minor type in the Kenai Mountains. Sufficient site data are not available at this time.

Tsuga mertensiana-*Betula papyrifera*/*Lycopodium annotinum*
(mountain hemlock-paper birch/stiff clubmoss)
(TSUMER-BETPAP/LYCANN; 3 sites)
IC1.-IC2. Closed and open mixed forest

Vegetation- *Betula papyrifera* (paper birch) is the dominant tree in this type. *Picea X lutzii* (Lutz spruce) and *Tsuga mertensiana* (mountain hemlock) can be overstory or understory codominants. *Lycopodium annotinum* (stiff clubmoss) is common to abundant, and is the undergrowth indicator species for this type. *Lycopodium complanatum* (groundcedar) may also be common. No shrub species is well represented. Shrub species diversity is low. The most consistent shrub species are *Vaccinium ovalifolium* (early blueberry) and *Linnaea borealis* (twinflower), which are common. Herbaceous species diversity as well as cover is also low. The most consistent forbs are *Pyrola secunda* (one-sided wintergreen), *Cornus canadensis* (bunchberry), and *Rubus pedatus* (fiveleaf bramble).

Physical setting- Mountain hemlock-paper birch/stiff clubmoss is a minor type in the Kenai Mountains. Sufficient site data are not available at this time.

Tsuga mertensiana-Betula papyrifera/Menziesia ferruginea
(mountain hemlock-paper birch/rusty menziesia)
(TSUMER-BETPAP/MENFER; 11 sites)

IC1. Closed mixed forest

Vegetation- *Betula papyrifera* (paper birch) is the dominant tree in this type. *Picea X lutzii* (Lutz spruce) and *Tsuga mertensiana* (mountain hemlock) can be overstory or understory codominants. *Menziesia ferruginea* (rusty menziesia) is abundant and dominates the tall shrub layer. *Echinopanax horridum* (devil's club) can be common. The most consistent dwarf shrub is *Linnaea borealis* (twinline). *Cornus canadensis* (bluejoint reedgrass) and *Rubus pedatus* (fiveleaf bramble) are often abundant and dominate the herbaceous layer. *Pyrola secunda* (one-sided wintergreen), *Dryopteris dilatata* (wood fern), and *Lycopodium sp.* (clubmoss) are often found in this type.

Physical setting- Mountain hemlock-paper birch/rusty menziesia is a minor type in the Kenai Mountains. Sufficient site data are not available at this time.

Tsuga mertensiana-Betula papyrifera/Menziesia ferruginea/sparse
(mountain hemlock-paper birch/rusty menziesia/sparse)
(TSUMER-BETPAP/MENFER/sparse; 6 sites)

IC1.-IC2. Closed and open mixed forest

Vegetation- *Betula papyrifera* (paper birch) is the dominant tree in this type. *Picea X lutzii* (Lutz spruce) and *Tsuga mertensiana* (mountain hemlock) can be overstory or understory codominants. *Menziesia ferruginea* (rusty menziesia) is common to well represented. Note that this is less than the *M. ferruginea* cover in the mountain hemlock-paper birch/rusty menziesia type previously described. *Echinopanax horridum* (devil's club) may be well represented. In general, other undergrowth species are sparse. The most consistent undergrowth species are *Cornus canadensis* (bunchberry), *Rubus pedatus* (fiveleaf bramble), *Dryopteris dilatata* (wood fern), and *Lycopodium annotinum* (stiff clubmoss). Cover of these species varies from merely present to occasionally abundant.

Physical setting- Mountain hemlock-paper birch/rusty menziesia/sparse is a minor type on non-disturbed foot slopes and ravines in the Kenai Mountains. Sites sampled are on northerly aspects with slopes up to 65 percent and elevations from 500 to 1200 feet.

Tall Scrub Type

Alnus crispa ssp. *sinuata*-*Echinopanax horridum*
(Sitka alder-devil's club)
(ALNCRIS-ECHHOR; 21 sites)
IIB1b. Closed tall scrub, alder

Vegetation- *Alnus crispa* ssp. *sinuata* (Sitka alder) is abundant and dominates this tall shrub type. *Echinopanax horridum* (devil's club) is a codominant that is well represented to abundant. *Sambucus racemosa* (red elderberry) is often well represented. Low and dwarf shrubs are absent. *Dryopteris dilatata* (wood fern) is common to abundant. Other species often in this type are *Streptopus amplexifolius* (twistedstalk), *Athyrium filix-femina* (lady fern), and *Gymnocarpium dryopteris* (oak fern).

Physical setting- Sitka alder-devil's club is a major tall shrub type in the Portage, Placer, and Twentymile wetland area and in the Kenai Mountains. In the wetland area this type is usually found on flood plains. Sites sampled in the wetland area are mostly on northerly aspects with slopes to 45 percent (but most sites are level) and elevations to 400 feet. In the Kenai Mountains this type occurs on dissected and non-disturbed side slopes. Sites sampled in the Kenai Mountains are on all aspects, on slopes up to 80 percent, and at elevations to 1950 feet.

Alnus crispa ssp. *sinuata*-*Salix commutata*
(Sitka alder-undergreen willow)
(ALNCRIS-SALCOM; 3 sites)
IIB1d. Closed tall scrub, alder-willow

Vegetation- Sites are dominated by *Alnus crispa* ssp. *sinuata* (Sitka alder) and *Salix commutata* (undergreen willow), which are well represented to abundant. Other tall willow species are often present. Low and dwarf shrubs are absent. The herb layer is variable and cover is generally low. The most consistent herbaceous species are *Parnassia palustris* (northern grass of Parnassus) and *Calamagrostis canadensis* (bluejoint reedgrass).

Physical setting- Sitka alder-undergreen willow is a minor type on the Chugach National Forest. Sufficient site data are not available at this time.

Alnus crispa ssp. *sinuata*/*Athyrium filix-femina*
(Sitka alder/lady fern)
(ALNCRIS/ATHFIL; 3 sites)
IIB1b.-IIB2b. Closed and open tall scrub, alder

Vegetation- Sites are dominated by *Alnus crispa* ssp. *sinuata* (Sitka alder), which is abundant. *Echinopanax horridum* (devil's club) is common. Low and dwarf shrubs are absent. *Athyrium filix-femina* (lady fern) is abundant, dominates the herbaceous layer, and is an indicator species for this type. *Gymnocarpium dryopteris* (wood fern) is common to abundant. Other common herbaceous species include *Trientalis europaea* (starflower) and *Equisetum arvense* (common horsetail).

Physical setting- Sitka alder/lady fern is a minor type sampled from the disturbed foot slopes and on flood plains in the Kenai Mountains. Sites sampled are on northerly and southwesterly aspects, on slopes to 15 percent, and at elevations from 200 to 1600 feet.

Alnus crispa ssp. *sinuata*/*Calamagrostis canadensis*
(Sitka alder/bluejoint reedgrass)
(ALNCRIS/CALCAN; 10 sites)
IIB1b.-IIB2b. Closed and open tall scrub, alder

Vegetation- Sites are dominated by *Alnus crispa* ssp. *sinuata* (Sitka alder), which is well represented to abundant. Low and dwarf shrubs are absent. *Calamagrostis canadensis* (bluejoint reedgrass) is well represented to abundant, dominates the herbaceous layer, and is an indicator species for this type. *Athyrium filix-femina* (lady fern) is common to well represented in many sites. Various other herbaceous species may be present.

Physical setting- Sitka alder/bluejoint reedgrass is a common type on the Chugach National Forest. It occurs on flood plains, outwash plains, low relief hills, and non-disturbed foot slopes. Sites sampled are on all aspects, on slopes to 60 percent, and at elevations to 1550 feet.

Alnus crispa ssp. *sinuata*/*Dryopteris dilatata*
(Sitka alder/wood fern)
(ALNCRIS/DRYDIL; 21 sites)
IIB1b. Closed tall scrub, alder

Vegetation- Sites are dominated by *Alnus crispa* ssp. *sinuata* (Sitka alder), which is abundant. Low and dwarf shrubs are sparse. *Dryopteris dilatata* (wood fern) is well represented to abundant, dominates the herbaceous layer, and is an indicator for this type. *Gymnocarpium dryopteris* (oak fern) and *Athyrium filix-femina* (lady fern) may be common to well represented. Other species that may be found frequently, but are low in cover include *Trientalis europaea* (starflower) and *Streptopus amplexifolius* (twistedstalk). *Calamagrostis canadensis* (bluejoint reedgrass) is found in about half the sites and may be common to abundant.

Physical setting- Sitka alder/wood fern is a major tall shrub type in the Kenai Mountains. It occurs on flood plains, disturbed and non-disturbed foot slopes, dissected and non-disturbed mountain side slopes, and high relief hills. Sites sampled are on all aspects, on slopes to 80 percent, and at elevations to 2000 feet.

Alnus crispa ssp. *sinuata*/*Equisetum arvense*
(Sitka alder/common horsetail)
(ALNCRIS/EQUARV; 9 sites)
IIB1b. Closed tall scrub, alder

Vegetation- Sites are dominated by *Alnus crispa* ssp. *sinuata* (Sitka alder), which is abundant. Although species vary, *Salix* sp. (willow) is often a well represented component. Low and dwarf shrubs are sparse. The dominant undergrowth species and indicator is *Equisetum arvense* (common horsetail), which is abundant. Occasionally *E. arvense* is absent or low in cover, in which case *E. variegatum* (northern horsetail) or *E. pratense* (meadow horsetail) are abundant. *Calamagrostis canadensis* (bluejoint reedgrass) is often well represented.

Physical setting- Sitka alder/common horsetail is a common type on beaches and estuaries of the Copper River Delta. The few sites sampled with site data are on flat surfaces with elevations less than 10 feet.

Alnus crispa ssp. *sinuata*-*Rubus spectabilis*
(Sitka alder-salmonberry)
(ALNCRIS-RUBSPE; 8 sites)
IIB1b. Closed tall scrub, alder

Vegetation- *Alnus crispa* ssp. *sinuata* (Sitka alder) is abundant and dominates this tall shrub type. *Rubus spectabilis* (salmonberry) is well represented to abundant and can be a codominant. *Sambucus racemosa* (red elderberry) will often be common to well represented. Low and dwarf shrubs are absent. *Calamagrostis canadensis* (bluejoint reedgrass) is the most consistent herbaceous species and may be common to well represented.

Physical setting- Sitka alder-salmonberry is a minor yet widespread type on the Chugach National Forest. It occurs on broken and dissected mountain side slopes, low relief hills, and dunes. Sites sampled are on all aspects, on slopes to 65 percent, and at elevations to 800 feet.

Alnus crispa ssp. *sinuata*-*Rubus spectabilis*/*Athyrium filix-femina*
(Sitka alder-salmonberry/lady fern)
(ALNCRIS-RUBSPE/ATHFIL; 8 sites)
IIB1b. Closed tall scrub, alder

Vegetation- This type is quite similar to ALNCRIS/RUBSPE, with the addition of *Athyrium filix-femina* (lady fern). *Alnus crispa* ssp. *sinuata* (Sitka alder) is abundant and dominates this tall shrub type. *Rubus spectabilis* (salmonberry) is well represented to abundant and may be a codominant tall shrub. Low and dwarf shrubs are sparse. *A. filix-femina* (lady fern) is well represented to abundant and also an indicator for this type. *Streptopus amplexifolius* (twistedstalk) and *Calamagrostis canadensis* (bluejoint reedgrass) are the next most consistent herbaceous species and may be common to well represented.

Physical setting- Sitka alder-salmonberry/lady fern is a minor though widespread type on the Chugach National Forest. It occurs on broken mountain side slopes, high relief hills, non-disturbed foot slopes, flood plains, and sea slopes. Sites sampled are on all but easterly aspects, on slopes to 120 percent, and at elevations to 1200 feet.

Alnus crispa ssp. *sinuata*-*Salix alaxensis*
(Sitka alder-feltleaf willow)
(ALNCRIS-SALALA; 9 sites)
IIB1d. Closed tall scrub, alder-willow

Vegetation- Sites are dominated by *Alnus crispa* ssp. *sinuata* (Sitka alder) and *Salix alaxensis* (feltleaf willow), which are well represented to abundant. Other tall willow species are often present. *Populus balsamifera* ssp. *trichocarpa* (black cottonwood) understory is common in about half the sites sampled. Low and dwarf shrubs are absent. Understory composition is quite variable and cover is low. The herbaceous species most often found are *Epilobium latifolium* (dwarf fireweed), *Pyrola secunda* (one-sided wintergreen), *Calamagrostis canadensis* (bluejoint reedgrass), and *Equisetum arvense* (common horsetail).

Physical setting- Sitka alder-feltleaf willow is a common type in the Portage, Placer, and Twentymile river valleys on flood plains. It also occurs in other areas in the Kenai Mountains and the Copper River Delta. Sites sampled are on all aspects, on slopes under 5 percent, and at elevations to 500 feet (though one plot had 50 percent slope, and another was at 1600 feet elevation).

Alnus crispa ssp. *sinuata*-*Salix alaxensis*/*Calamagrostis canadensis*
(Sitka alder-feltleaf willow/bluejoint reedgrass)
(ALNCRIS-SALALA/CALCAN; 4 sites)
IIB1d. Closed tall scrub, alder-willow

Vegetation- Sites are dominated by *Alnus crispa* ssp. *sinuata* (Sitka alder) and *Salix alaxensis* (feltleaf willow), which are well represented to abundant. Other tall willow species are often present. Low and dwarf shrubs are absent. *Calamagrostis canadensis* (bluejoint reedgrass) is well represented to abundant and the dominant herbaceous species and indicator for this type. Other common to well represented species that are fairly consistent include *Equisetum arvense* (common horsetail), *Athyrium filix-femina* (lady fern), *Viola glabella* (yellow violet), *Thalictrum sparsiflorum* (fewflower meadowrue), and *Aconitum delphinifolium* (monkshood).

Physical setting- Sitka alder-feltleaf willow/bluejoint reedgrass is a widespread though minor type on flood plains in the Kenai Mountains. Sites sampled are on most aspects with slopes up to 10 percent and elevations to 1550 feet.

Alnus crispa ssp. *sinuata*-*Salix barclayi*
(Sitka alder-Barclay willow)
(ALNCRIS-SALBAR; 6 sites)
IIB1d. Closed tall scrub, alder-willow

Vegetation- Sites are dominated by *Alnus crispa* ssp. *sinuata* (Sitka alder) and *Salix barclayi* (Barclay willow), which are well represented to abundant (Figure 8). Other tall willow species are often present. Low and dwarf shrubs are sparse. The most consistent herbaceous species in this type are



Figure 8. Closed tall scrub of the *Alnus crispa* ssp. *sinuata*-*Salix barclayi* type on Kanak Island, Copper River Delta.

Rubus arcticus (nagoonberry), *Calamagrostis canadensis* (bluejoint reedgrass), *Equisetum arvense* (common horsetail), and *E. palustre* (marsh horsetail).

Physical setting- Sitka alder-Barclay willow is a common type on the Copper River Delta, and a minor type in the Kenai Mountains. It occurs on flood plains and raised beaches. Sites sampled are on flat surfaces at elevations below 100 feet.

Alnus crispa ssp. *sinuata*-*Salix sitchensis*

(Sitka alder-Sitka willow)

(ALNCRIS-SALSIT; 8 sites)

IIB1d.-IIB2d Closed and open tall scrub, alder-willow

Vegetation- Sites are dominated by *Alnus crispa* ssp. *sinuata* (Sitka alder) and *Salix sitchensis* (Sitka willow), which are well represented to abundant. Other willow species are often present. Over half of the sites have minor cover of understory *Picea X lutzii* (Lutz spruce), *Populus balsamifera* ssp. *trichocarpa* (black cottonwood), or *Tsuga mertensiana* (mountain hemlock). Low and dwarf shrubs are absent. The herb layer is usually sparse with variable composition.

Physical setting- Sitka alder-Sitka willow is a common tall shrub type on the Chugach National Forest. It occurs on flood plains, raised beaches, and broken mountain side slopes. Sites sampled are on northerly and westerly aspects, slopes to 70 percent, and elevations to 600 feet.

Alnus crispa ssp. *sinuata*-*Salix sitchensis*/*Calamagrostis canadensis*

(Sitka alder-Sitka willow/bluejoint reedgrass)

(ALNCRIS-SALSIT/CALCAN; 9 sites)

IIB1d.-IIB2d Closed and open tall scrub, alder-willow

Vegetation- Sites are dominated by *Alnus crispa* ssp. *sinuata* (Sitka alder) and *Salix sitchensis* (Sitka willow), which are well represented to abundant. Other willow species are often present. Low and dwarf shrubs are absent. *Calamagrostis canadensis* (bluejoint reedgrass) is well represented to

abundant and the characteristic indicator for this type. *Athyrium filix-femina* (lady fern) and *Equisetum arvense* (common horsetail) are often on these sites and have cover varying from common to abundant.

Physical setting- Sitka alder-Sitka willow/bluejoint reedgrass is a common tall shrub type on the Chugach National Forest. It occurs on flood plains, outwash plains, and gently sloping hills. Sites sampled are on both northerly and southerly aspects, on slopes to 15 percent, and at elevations to 300 feet.

Salix alaxensis
(fettleaf willow)
(SALALA, 11 sites)

IIB2a.-IIB1a. Open and closed tall scrub, willow

Vegetation- *Salix alaxensis* (fettleaf willow) dominates these sites and is usually abundant. Where *S. alaxensis* is not abundant, *S. sitchensis* (Sitka willow), *S. barclayi* (Barclay willow), and *S. commutata* (undergreen willow) are well represented. Even when *S. alaxensis* is abundant, these other willow species may be well represented. Low and dwarf shrubs are sparse. The only herbaceous species that shows up in at least half of the sites is *Calamagrostis canadensis* (bluejoint reedgrass).

Physical setting- Fettleaf willow is a common tall shrub type on flood plains and beaches on the Chugach National Forest. Sites sampled are on all aspects, on slopes to 25 percent (most under 10 percent), and at elevations to 1950 feet.

Salix barclayi/Calamagrostis canadensis
(Barclay willow/bluejoint reedgrass)
(SALBAR/CALCAN, 17 sites)

IIB1a.-IIB2a Closed and open tall scrub, willow

Vegetation- *Salix barclayi* (Barclay willow) is usually abundant and dominates the sites. When cover of *S. barclayi* is lower, *S. sitchensis* (Sitka sedge) or *S. commutata* (undergreen willow) are codominants that are well represented

to abundant. Low and dwarf shrubs are sparse. *Calamagrostis canadensis* (bluejoint reedgrass) is the dominant herbaceous species and is well represented to abundant. *Equisetum arvense* (common horsetail) is often well represented. Other herbaceous species may be well represented, but not with consistency.

Physical setting- Barclay willow/bluejoint reedgrass is a common tall shrub type on the Chugach National Forest. It occurs on flood plains, valley floors, non-disturbed foot slopes, and rounded mountains. Sites sampled are on all aspects, on slopes to 10 percent, and at elevations to 1600 feet (one site occupies a 50 percent slope and is at 3050 feet elevation).

Salix barclayi/*Carex sitchensis*
(Barclay willow/Sitka sedge)
(SALBAR/CARSIT, 4 sites)

IIB1a.-IIB2a. Closed and open tall scrub, willow

Vegetation- *Salix barclayi* (Barclay willow) is abundant and dominates the site. In half the sites *Myrica gale* (sweetgale) is an abundant codominant. Low and dwarf shrubs are usually sparse. *Carex sitchensis* (Sitka sedge) is usually well represented to abundant and an indicator for this type. *C. sitchensis* is occasionally absent, in which case *Potentilla palustris* (marsh fivefinger) is abundant. Other species that are common to abundant include *Rubus arcticus* (nagoonberry) and *Equisetum arvense* (common horsetail). Other herbaceous species may be well represented, but not with consistency.

Physical setting- Barclay willow/Sitka sedge is a minor type on the Chugach National Forest. Sufficient site data are not available at this time.

Salix barclayi/mixed herb
(Barclay willow/mixed herb)
(SALBAR-mixed herb, 6 sites)
IIB1a.- IIB2a. Closed and open tall scrub, willow

Vegetation- *Salix barclayi* (Barclay willow) is abundant and dominates the site. Other willows may also be abundant. Low and dwarf shrubs are sparse. The dominant herbaceous species is *Equisetum arvense* (common horsetail), which is well represented to abundant. Where *E. arvense* is absent or low in cover *Athyrium filix-femina* (lady fern) is abundant. A consistent herbaceous species, though low in cover, is *Calamagrostis canadensis* (bluejoint reedgrass). Other variable herbaceous species are common.

Physical setting- Barclay willow/mixed herb is a minor type in the Kenai Mountains. It occurs on flood plains, stream terraces, and disturbed mountain side slopes. Sites sampled are mostly on northerly aspects, with flat slopes below 100 feet elevation. A few sites are on easterly and westerly aspects, on slopes to 25 percent, and at elevations to 2375 feet.

Salix commutata
(undergreen willow)
(SALCOM, 7 sites)
IIB2a. Open tall scrub, willow

Vegetation- *Salix commutata* (undergreen willow) is well represented to abundant and usually dominates the site. *S. myrtilifolia* (low blueberry willow) is usually a common to well represented low shrub that is often codominant. *Calamagrostis canadensis* (bluejoint reedgrass) is common to abundant. *Equisetum arvense* (common horsetail) and *Potentilla palustris* (marsh fivefinger) are often common to abundant. *Rubus arcticus* (nagoonberry), *Trientalis europaea* (starflower), and *Viola* sp. (violet) are usually common.

Physical setting- Undergreen willow is common on flood plains in the Portage, Placer, and Twentymile river valleys. It occurs on flat surfaces at elevations to 100 feet. It was also sampled in the Kenai Mountains on a low relief hill with 15 percent slope and 2325 feet elevation.

Salix hookeriana
(Hooker willow)
(SALHOO, 5 sites)
IIB1a. Closed tall scrub, willow

Vegetation- *Salix hookeriana* (Hooker willow) is abundant and dominates the site. Other willow species are often present. Dwarf and low shrubs are sparse. Herbaceous species composition is variable. The most consistent species are *Calamagrostis canadensis* (bluejoint reedgrass) and *Equisetum arvense* (common horsetail), which are well represented to abundant.

Physical setting- Hooker willow is a minor type on the Copper River Delta. Sufficient site data are not available at this time.

Salix sitchensis
(Sitka willow)
(SALSIT, 19 sites)
IIB1a.-IIB2a Closed and open tall scrub, willow

Vegetation- *Salix sitchensis* (Sitka willow) is the dominant tall shrub and is well represented to abundant. Other willows are usually present and common to abundant, with *S. barclayi* (Barclay willow) being the most consistent. *Alnus crispa* ssp. *sinuata* (Sitka alder) is common to well represented in over half the sites sampled. Low and dwarf shrubs are sparse. The most consistent herbaceous species are *Sanguisorba stipulata* (Sitka burnet), *Calamagrostis canadensis* (bluejoint reedgrass), and *Equisetum arvense* (common horsetail).

Physical setting- Sitka willow is a common type on the Chugach National Forest. It occurs on flood plains, flat lowlands, outwash plains, and high relief hills. Sites sampled are on all aspects, on slopes to 35 percent, and at elevations to 200 feet (one site at 825 feet elevation).

Low Scrub Type

Betula nana

(dwarf birch)

(BETNAN; 5 sites)

IIC2d. Open low scrub, shrub birch-ericaceous shrub bog

Vegetation- *Betula nana* (dwarf birch) is the dominant low shrub. Dwarf shrubs that may be common to abundant include *Empetrum nigrum* (crowberry), *Vaccinium uliginosum* (bog blueberry), and *Andromeda polifolia* (bog rosemary). Herbaceous species composition is highly variable.

Physical setting- This is a minor yet widespread type in the Kenai Mountains. It occurs on rounded mountains, stream terraces, and disturbed foot slopes. Sites sampled are on all aspects, on slopes to 65 percent, and at elevations to 2350 feet.

Cladothamnus pyroliflorus

(copperbush)

(CLAPYR; 8 sites)

IIC2. Open low scrub

Vegetation- *Cladothamnus pyroliflorus* (copperbush) is well represented to abundant and dominates the shrub layer. The next most consistent tall shrub is *Vaccinium ovalifolium* (early blueberry). *Luetkea pectinata* (luetkea) may be common to abundant. *Fauria crista-galli* (deer cabbage) is usually well represented to abundant and the dominant forb. Other species that are found in over half the sites are *Geum calthifolium* (calthaleaf avens), *Sanguisorba stipulata* (Sitka burnet), and *Thelypteris limbosperma* (maiden fern).

Physical setting- Copperbush is a minor yet widespread type on the Chugach National Forest. It occurs on high and low relief hills, and non-disturbed and broken mountain side slopes. Sites sampled are on all but westerly aspects, on slopes from 40 to 65 percent, and at elevations to 1200 feet.

Myrica gale-Salix barclayi
(sweetgale-Barclay willow)
(MYRGAL-SALBAR; 4 sites)
IIC1. Closed low scrub

Vegetation- *Myrica gale* (sweetgale) and *Salix barclayi* (Barclay willow) are abundant and dominate this type. Other species of *Salix* (willow) may also be well represented to abundant. The most consistent herbaceous species are *Potentilla palustris* (marsh fivefinger), *Calamagrostis canadensis* (bluejoint reedgrass), and *Equisetum arvense* (common horsetail). These species may be common to abundant.

Physical setting- Sweetgale-Barclay willow is a minor though widespread type in the wetlands of the Chugach National Forest. Sufficient site data are not available at this time.

Myrica gale-Salix commutata
(sweetgale-undergreen willow)
(MYRGAL-SALCOM; 7 sites)
IIC1.-IIC2. Closed and open low scrub

Vegetation- *Myrica gale* (sweetgale) and *Salix commutata* (undergreen willow) are well represented to abundant and dominate this type. *Salix myrtillofolia* (low blueberry willow) is usually well represented. *Rubus arcticus* (nagoonberry), *Equisetum arvense* (common horsetail), *Potentilla palustris* (marsh fivefinger), *Trientalis europaea* (starflower), and *Calamagrostis canadensis* (bluejoint reedgrass) are often common to abundant in this type.

Physical setting- Sweetgale-undergreen willow is a common type in the Portage, Placer, and Twentymile river valleys. It occurs on flood plains, on northerly aspects, and on level ground at elevations to 200 feet.

Myrica gale-Salix hookeriana
(sweetgale-Hooker willow)
(MYRGAL-SALHOO; 4 sites)
IIC1.-IIC2. Closed and open low shrub

Vegetation- *Myrica gale* (sweetgale) and *Salix hookeriana* (Hooker willow) are well represented to abundant and dominate this type. No forbs are consistently characteristic of this type. *Carex lyngbyei* (Lyngbye's sedge), and *Equisetum arvense* (common horsetail) are usually common to well represented in this type.

Physical setting- Sweetgale-Hooker willow is a minor type on the Copper River Delta. Sufficient site data are not available at this time.

Myrica gale/Calamagrostis canadensis
(sweetgale/bluejoint reedgrass)
(MYRGAL/CALCAN; 8 sites)
IIC2j. Open low scrub, sweetgale-graminoid bog

Vegetation- *Myrica gale* (sweetgale) is abundant and dominates the shrub layer. *Calamagrostis canadensis* (bluejoint reedgrass) is common to abundant and is the dominant herbaceous species. *Potentilla palustris* (marsh fivefinger) and *Equisetum arvense* (common horsetail) are the next most consistent species, which can be common to abundant. Further species composition varies.

Physical setting- Sweetgale/bluejoint reedgrass is a minor yet widespread type in the Portage, Placer, and Twentymile river valleys, and on the Copper River Delta. Sufficient site data are not available at this time.

Myrica gale/Carex lyngbyei
(sweetgale/Lyngbye's sedge)
(MYRGAL-CARLYN; 7 sites)

IIC1.-IIC2j. Closed and open low scrub, sweetgale-graminoid bog

Vegetation- *Myrica gale* (sweetgale) is abundant and dominates the shrub layer. Other shrubs that are common to well represented include *Salix barclayi* (Barclay willow), *S. commutata* (undergreen willow), and *S. hookeriana* (Hooker willow). The dominant herbaceous species is *Carex lyngbyei* (Lyngbye's sedge), which is abundant. Other species that are common to well represented include *Potentilla palustris* (marsh fivefinger), *Calamagrostis canadensis* (bluejoint reedgrass), and *Equisetum arvense* (common horsetail).

Physical setting- Sweetgale/Lyngbye's sedge is a common type in the wetlands of the Copper River Delta. Sufficient site data are not available at this time.

Myrica gale/Carex sitchensis
(sweetgale/Sitka sedge)
(MYRGAL/CARSIT; 12 sites)

IIC1.-IIC2. Closed and open low scrub

Vegetation- *Myrica gale* (sweetgale) is abundant and dominates these sites. *Potentilla palustris* (marsh fivefinger) is usually well represented to abundant. *Menyanthes trifoliata* (buckbean) is well represented to abundant on some sites. On some sites, these forbs are replaced by abundant *Carex sitchensis* (Sitka sedge). Other common to abundant species often found in this type are *Calamagrostis canadensis* (bluejoint reedgrass) and *Equisetum fluviatile* (swamp horsetail).

Physical setting- Sweetgale/Sitka sedge is a minor though widespread type in the Portage, Placer, and Twentymile river valleys, and on the Copper River Delta. Sufficient site data are not available at this time.

Myrica gale/Eriophorum angustifolium
(sweetgale/tall cottongrass)
(MYRGAL/ERIANG; 11 sites)

IIC2j. Open low scrub, sweetgale-graminoid bog

Vegetation- *Myrica gale* (sweetgale) is abundant and the dominant shrub (Figure 9). Other consistent common to well represented low shrubs include *Andromeda polifolia* (bog rosemary) and *Oxycoccus microcarpus* (bog cranberry). *Eriophorum angustifolium* (tall cottongrass) is usually abundant and is the dominant herbaceous species and indicator species for this type. Where *E. angustifolium* is absent or has low cover, *Trichophorum caespitosum* (tufted bulrush) is well represented to abundant. *Drosera rotundifolia* (round-leaf sundew) and *Fauria crista-galli* (deer cabbage) may be common to abundant.

Physical setting- Sweetgale/tall cottongrass is a minor though widespread type on the Copper River Delta and Prince William Sound. It occurs on flood plains, and low and high relief hills. Sites sampled are on northerly aspects, on slopes to 30 percent, and at elevations to 180 feet.

Rubus spectabilis
(salmonberry)

(RUBSPE; 23 sites)

IIC1. Closed low scrub

Vegetation- *Rubus spectabilis* (salmonberry) is abundant and dominates this type (Figure 10). *Alnus crispa* ssp. *sinuata* (Sitka alder) and *Echinopanax horridum* (devil's club) may be well represented to abundant associates on some sites. The most consistent herbaceous species are *Streptopus amplexifolius* (twistedstalk), *Veratrum viride* (false hellebore), *Athyrium filix-femina* (lady fern), and *Dryopteris dilatata* (wood fern). These species may be common to abundant.

Physical setting- Salmonberry is a major type throughout the Chugach National Forest. It occurs on high and low relief hills, gently sloping hills, non-disturbed foot slopes, dissected and broken mountain side slopes, and



Figure 9. Open low scrub of the *Myrica gale/Eriophorum angustifolium* type in Growler Bay on Glacier Island, Prince William Sound.



Figure 10. Closed low scrub of the *Rubus spectabilis* type in Squirrel Bay on Evans Island, Prince William Sound.

estuaries. Sites sampled are on all aspects, on slopes to 85 percent, and at elevations to 900 feet.

Rubus spectabilis/Athyrium filix-femina
(salmonberry/lady fern)
(RUBSPE/ATHFIL; 8 sites)
IIC1. Closed low scrub

Vegetation- *Rubus spectabilis* (salmonberry) is abundant and dominates these sites. *Alnus crispa ssp. sinuata* (Sitka alder) is often present and abundant. *Echinopanax horridum* (devil's club) may be common to abundant on some sites. *Athyrium filix-femina* (lady fern) is well represented to abundant and an indicator species for this type. *Streptopus amplexifolius* (twistedstalk), *Veratrum viride* (false hellebore), *Dryopteris dilatata* (wood fern), and *Gymnocarpium dryopteris* (oak fern) are the most consistent common to well represented herbaceous species.

Physical setting- Salmonberry/lady fern is a fairly common type on the Chugach National Forest. It occurs on non-disturbed and broken mountain side slopes, high relief hills, and raised tidal flats. Sites sampled are generally on northern aspects, on slopes to 80 percent, and at elevations to 900 feet.

Rubus spectabilis/Calamagrostis canadensis
(salmonberry/bluejoint reedgrass)
(RUBSPE/CALCAN; 8 sites)
IIC1.-IIC2. Closed and open low scrub

Vegetation- *Rubus spectabilis* (salmonberry) is well represented to abundant and dominates these sites. *Alnus crispa ssp. sinuata* (Sitka alder) and *Echinopanax horridum* (devil's club) may be common to abundant associates on some sites. *Calamagrostis canadensis* (bluejoint reedgrass) is well represented and an indicator for this type. *Veratrum viride* (false hellebore) and *Heracleum lanatum* (cow parsnip) are often common and are the most consistent forbs. *Athyrium filix-femina* (lady fern), *Dryopteris*

dilatata (wood fern), and *Gymnocarpium dryopteris* (oak fern) may be common to abundant.

Physical setting- Salmonberry/bluejoint reedgrass is a fairly common type on the Chugach National Forest. It occurs on broken and non-disturbed mountain side slopes, and high relief hills. Sites sampled are on southerly aspects, on slopes from 35 to 100 percent, and at elevations to 1500 feet.

Dwarf Scrub Type

Cassiope stelleriana-*Luetkea pectinata*

(Steller's cassiope-luetkea)

(CASSTE-LUEPEC; 44 sites)

IID2e. Ericaceous dwarf scrub; cassiope tundra

Vegetation- This type is characterized by dwarf ericaceous shrubs (Figure 11). *Cassiope stelleriana* (Steller's cassiope) and *Luetkea pectinata* (luetkea) are abundant on these sites (either species might occasionally be absent). *Cassiope tetragona* (white arctic mountain heather) may occur in addition to or in place of *C. stelleriana*. *Empetrum nigrum* (crowberry) is also often well represented in this type. Herbaceous species composition varies widely from site to site. *Artemisia arctica* (boreal sagebrush) is the only species showing fairly high constancy

Physical setting- Steller's cassiope-luetkea is a major alpine type in the mountains of the Chugach National Forest. It occurs on rugged and rounded mountains, low and high relief hills, non-disturbed foot slopes, broken, disturbed, and non-disturbed mountain side slopes, and kame moraines. The type is especially characteristic of concave areas where snow accumulates within the alpine tundra zone. Sites sampled are on all aspects, on slopes to 90 percent, and at elevations to 3950 feet (most between 1500 and 3950 feet).



Figure 11. Ericaceous dwarf scrub of the *Cassiope stelleriana*-*Luetkea pectinata* type on the saddle between Mount Adair and Sleeping Sister Mountain, Kenai Peninsula.

Cassiope stelleriana-Luetkea pectinata/Fauria crista-galli
(Steller's cassiope-luetkea/deer cabbage)
(CASSTE-LUEPEC/FAUCRI; 8 sites)

IID2e. Ericaceous dwarf scrub; cassiope tundra

Vegetation- This type is characterized by dwarf ericaceous shrubs. *Cassiope stelleriana* (Steller's cassiope) and *Luetkea pectinata* (luetkea) are abundant on these sites. *Phyllodoce aleutica* (Aleutian mountain heath) is often common to well represented. This type differs from the Stellar's cassiope-luetkea type in that *Fauria crista-galli* (deer cabbage) is abundant on all sites. *Erigeron peregrinus* (subalpine fleabane) is the next most consistent forb in this type.

Physical setting- Steller's cassiope-luetkea/deer cabbage is a minor though widespread type on the Chugach National Forest. It occurs on rounded subalpine mountains, non-disturbed and dissected mountain side slopes, and high and low relief hills. Sites sampled are on northerly and westerly aspects, on slopes from 20 to 55 percent, and at elevations from 300 to 1500 feet.

Dryas octopetala/Hierochloe alpina
(white mountain-avens/alpine holy grass)
(DRYOCT/HIEALP; 7 sites)

IID1b. Dryas dwarf scrub; dryas-sedge tundra

Vegetation- This type is characterized by *Dryas octopetala* (white mountain-avens) as the dominant dwarf shrub. Other common and fairly consistent dwarf shrubs are *Vaccinium vitis-idaea* (lowbush cranberry), *Salix arctica* (arctic willow), *Empetrum nigrum* (crowberry), and *Diapensia lapponica* (pincushion plant). *Hierochloe alpina* (alpine holy grass) is common and an indicator species for this type. *Carex microchaeta* (smallawned sedge) is often common to well represented. Forb composition varies. The most consistent forbs are *Anemone narcissiflora* (narcissus anemone), *Oxytropis nigrescens* (blackish oxytrope), *Artemisia arctica* (boreal sagebrush), *Campanula lasiocarpa* (mountain harebell), *Polygonum viviparum* (alpine bistort), and *Saxifraga bronchialis* (yellowdot saxifrage).

Physical setting- White mountain-avens/alpine holy grass is a minor alpine type in the Kenai Mountains. It occurs on dissected mountain side slopes, and rounded mountains. Sites sampled are on all aspects, on slopes from 25 to 70 percent, and at elevations from 2625 to 3925 feet.

Empetrum nigrum

(crowberry)

(EMPNIG; 22 sites)

IID2c. Ericaceous dwarf scrub; crowberry tundra

Vegetation- This type is characterized by dwarf ericaceous shrubs.

Empetrum nigrum (crowberry) is abundant and dominates the dwarf shrub layer. *Vaccinium vitis-idaea* (lowbush cranberry) is common. *Loiseleuria procumbens* (alpine azalea), *Diapensia lapponica* (pincushion plant), and *Salix arctica* (nagoonberry) are other dwarf shrubs common in this type. The most consistent and common to well represented herbaceous species in this type are *Artemisia arctica* (boreal sagebrush), *Anemone narcissiflora* (narcissus anemone), *Carex microchaeta* (smallawned sedge), *Festuca altaica* (rough rescue), and *Hierochloe alpina* (alpine holy grass).

Physical setting- Crowberry is a major alpine type in the Kenai Mountains. It occurs primarily on rounded mountains, but also on dissected, disturbed, and non-disturbed mountain side slopes, kame moraines, and moraines. Sites sampled are on all aspects, on slopes to 70 percent, and at elevations from 900 to 3650 feet.

Empetrum nigrum-Arctostaphylos alpina

(crowberry-alpine bearberry)

(EMPNIG-ARCALP; 20 sites)

IID2c. Ericaceous dwarf scrub; crowberry tundra

Vegetation- This type is characterized by dwarf ericaceous shrubs.

Empetrum nigrum (crowberry) and *Arctostaphylos alpina* (alpine bearberry) are dominant and may be common to abundant. *Vaccinium uliginosum* (bog blueberry) and *Vaccinium vitis-idaea* (lowbush cranberry) are usually common to well represented. Herbaceous species are fairly sparse. *Anemone*

narcissiflora (narcissus anemone) and *Artemisia arctica* (boreal sagebrush) are the most consistent forbs. *Hierochloe alpina* (alpine holy grass) is common to well represented. *Carex microchaeta* (smallawned sedge) and *Festuca altaica* (rough fescue) are also often in this type.

Physical setting- Crowberry-alpine bearberry is a major alpine type in the Kenai Mountains. It occurs primarily on rounded mountains, but also on dissected and non-disturbed mountain side slopes. Sites sampled are on all but northerly aspects, on slopes from 30 to 80 percent, and at elevations from 2180 to 3700 feet.

Empetrum nigrum-Vaccinium uliginosum
(crowberry-bog blueberry))
(EMPNIG-VACULI; 30 sites)

IID2c. Ericaceous dwarf scrub; crowberry tundra

Vegetation- This type is characterized by dwarf ericaceous shrubs. *Empetrum nigrum* (crowberry) and *Vaccinium uliginosum* (bog blueberry) are well represented to abundant and dominate these sites. *Vaccinium vitis-idaea* (lowbush cranberry) and *Loiseleuria procumbens* (alpine azalea) are present in about half the sites sampled. There are no herbaceous species that are consistently represented in this type. The most consistent is *Hierochloe alpina* (alpine holy grass), which is common on half the sites sampled.

Physical setting- Crowberry-bog blueberry is a major alpine type in the Kenai Mountains, but it also occurs at lower elevations in Prince William Sound. It occurs primarily on rounded subalpine mountains, flat lowlands, and kame moraines. Sites sampled are on all aspects, on slopes to 80 percent, and at elevations to 3800 feet.

Empetrum nigrum-Vaccinium uliginosum/Carex pluriflora
(crowberry-bog blueberry/manyflower sedge)
(EMPNIG-VACULI/CARPLU; 5 sites)

IID2c. Ericaceous dwarf scrub; crowberry tundra

Vegetation- *Picea sitchensis* (Sitka spruce) is often present, but with very low cover. Dwarf ericaceous shrubs characterize this type. *Empetrum nigrum* (crowberry) and *Vaccinium uliginosum* (bog blueberry) are well represented to abundant and are indicator species. *Oxycoccus microcarpus* (bog cranberry) and *Andromeda polifolia* (bog rosemary) are usually common. *Carex pluriflora* (manyflower sedge) is abundant and is the dominant herbaceous species and indicator. *Eriophorum angustifolium* (tall cottongrass) and *Carex sitchensis* (Sitka sedge) are often well represented.

Physical setting- Crowberry-bog blueberry/manyflower sedge is a minor type on the Copper River Delta and in Prince William Sound. It occurs on flood plains and high relief hills. Sites sampled are on northerly and westerly aspects, on slopes less than 5 percent, and at elevations up to 100 feet.

Empetrum nigrum-Vaccinium uliginosum/Fauria crista-galli
(crowberry-bog blueberry/deer cabbage)
(EMPNIG-VACULI/FAUCRI; 19 sites)

IID2c. Ericaceous dwarf scrub; crowberry tundra

Vegetation- Dwarf ericaceous shrubs characterize this type. *Empetrum nigrum* (crowberry) and *Vaccinium uliginosum* (bog blueberry) are well represented to abundant and dominate these sites. *Oxycoccus microcarpus* (bog cranberry) and *Andromeda polifolia* (bog rosemary) are major species in about half the sites sampled. *Fauria crista-galli* (deer cabbage) is well represented to abundant and is an indicator for this type. *Geum calthifolium* (calthaleaf avens) and *Cornus canadensis* (bunchberry) are the next most consistently well represented undergrowth species.

Physical setting- Crowberry-bog blueberry/deer cabbage is a major type on low relief hills in Prince William Sound. It also occasionally occurs on

rounded mountains and dissected mountain side slopes. Sites sampled are on all aspects, on slopes to 40 percent, and at elevations to 1130 feet.

Empetrum nigrum-Vaccinium uliginosum/Trichophorum caespitosum
(crowberry-bog blueberry/tufted bulrush)
(EMPNIG-VACULI/TRICAE; 9 sites)

IID2c. Ericaceous dwarf scrub; crowberry tundra

Vegetation- *Tsuga mertensiana* (mountain hemlock) is often present, but with very low cover. Dwarf ericaceous shrubs characterize this type. *Empetrum nigrum* (crowberry) and *Vaccinium uliginosum* (bog blueberry) are well represented to abundant. *Andromeda polifolia* (bog rosemary) and *Loiseleuria procumbens* (alpine azalea) are other dwarf shrubs that commonly occur. *Cladothamnus pyroliflorus* (copperbush) is well represented in over half the sites sampled. The indicator species in the herbaceous layer is *Trichophorum caespitosum* (tufted bulrush), which is generally abundant. Other herbaceous species with high constancy are *Fauria crista-galli* (deer cabbage), which is abundant, and *Geum calthifolium* (calthaleaf avens), which is common.

Physical setting- Crowberry-bog blueberry/tufted bulrush is a common type in Prince William Sound. It occurs on low relief hills, gently sloping hills, and rounded mountains. Sites sampled are on all aspects, on slopes to 40 percent, and at elevations to 900 feet.

Phyllodoce aleutica-Cassiope stelleriana
(Aleutian mountain heath-Steller's cassiope)
(PHYALE-CASSTE; 15 sites)

IID2d. Ericaceous dwarf scrub; mountain heath tundra

Vegetation- This type is dominated by dwarf ericaceous shrubs. *Phyllodoce aleutica* (Aleutian mountain heath) and *Cassiope stelleriana* (Steller's cassiope) dominate the dwarf shrub layer. *Luetkea pectinata* (luetkea) and *Empetrum nigrum* (crowberry) are also usually present and can be common to abundant. No other species are consistent components of this type.

Physical setting- Aleutian mountain heath/Steller's cassiope is a common type in the Kenai Mountains and in Prince William Sound. It occurs on rounded mountains and non-disturbed, disturbed, and dissected mountain side slopes. Sites sampled are on all aspects, on slopes to 70 percent, and at elevations from 1300 to 2900 feet (one site is at 200 feet).

Phyllodoce aleutica/Fauria crista-galli
(Aleutian mountain heath/deer cabbage)
(PHYALE/CASSTE; 9 sites)

IID2d. Ericaceous dwarf scrub; mountain heath tundra

Vegetation- This type is dominated by dwarf ericaceous shrubs. *Phyllodoce aleutica* (Aleutian mountain heath) is abundant and an indicator species for this type. *Empetrum nigrum* (crowberry), *Cassiope stelleriana* (Steller's cassiope), *Vaccinium caespitosum* (dwarf blueberry), and *Luetkea pectinata* (luetkea) are also usually present and common to abundant. *Fauria crista-galli* (deer cabbage) is the dominant forb and an indicator species for this type. Other forbs that may be common are *Geum calthifolium* (calthaleaf avens) and *Erigeron peregrinus* (subalpine fleabane).

Physical setting- Aleutian mountain heath/deer cabbage is a minor type in Prince William Sound. It occurs on low and high relief hills, rounded mountains, rounded subalpine mountains, and non-disturbed mountain side slopes. Sites sampled are on all but easterly aspects, on slopes to 60 percent, and at elevations to 1600 feet.

Salix arctica-Empetrum nigrum
(arctic willow-crowberry)
(SALARC-EMPNIG; 10 sites)

IID3a. Willow dwarf scrub; willow tundra

Vegetation- This type is dominated by dwarf shrubs. *Salix arctica* (arctic willow) and *Empetrum nigrum* (crowberry) are abundant. They are the dominant dwarf shrubs and indicators for this type. *Vaccinium vitis-idaea* (lowbush cranberry) and *Diapensia lapponica* (pincushion plant) can be common to well represented. The most consistent and common forbs are

Anemone narcissiflora (narcissus anemone), *Campanula lasiocarpa* (mountain harebell), *Artemisia arctica* (boreal sagebrush), *Antennaria monocephala* (pygmy pussytoes), and *Gentiana glauca* (pale gentian).

Physical setting- Arctic willow-crowberry is a common type in the alpine in the Kenai Mountains. It occurs primarily on rounded mountains, but also on disturbed mountain side slopes. Sites sampled are on southerly and southeasterly aspects, on slopes to 85 percent, and at elevations from 3000 to 4350 feet.

Salix arctica/*Carex lyngbyei*
(arctic willow/Lyngbye's sedge)
(SALARC/CARLYN; 3 sites)
IID3a. Willow dwarf scrub; willow tundra

Vegetation- *Salix arctica* (arctic willow) is abundant, an indicator, and the dominant dwarf shrub. *Carex lyngbyei* (Lyngbye's sedge) is also abundant, an indicator, and the dominant herbaceous species. Other species that are often in this type include *Iris setosa* (wild iris), *Hedysarum alpinum* (alpine sweetvetch), *Parnassia palustris* (northern grass of Parnassus), and *Potentilla palustris* (marsh fivefinger).

Physical setting- Arctic willow-Lyngbye's sedge is a minor type on the Copper River Delta. Site data are not available at this time.

Salix reticulata/*Festuca altaica*
(netleaf willow/rough fescue)
(SALRET/FESALT; 3 sites)
IID3a. Willow dwarf scrub; willow tundra

Vegetation- *Salix reticulata* (netleaf willow) is common to abundant, an indicator, and the dominant dwarf shrub (Figure 12). The most consistent and abundant herbaceous species is *Festuca altaica* (rough fescue). Other

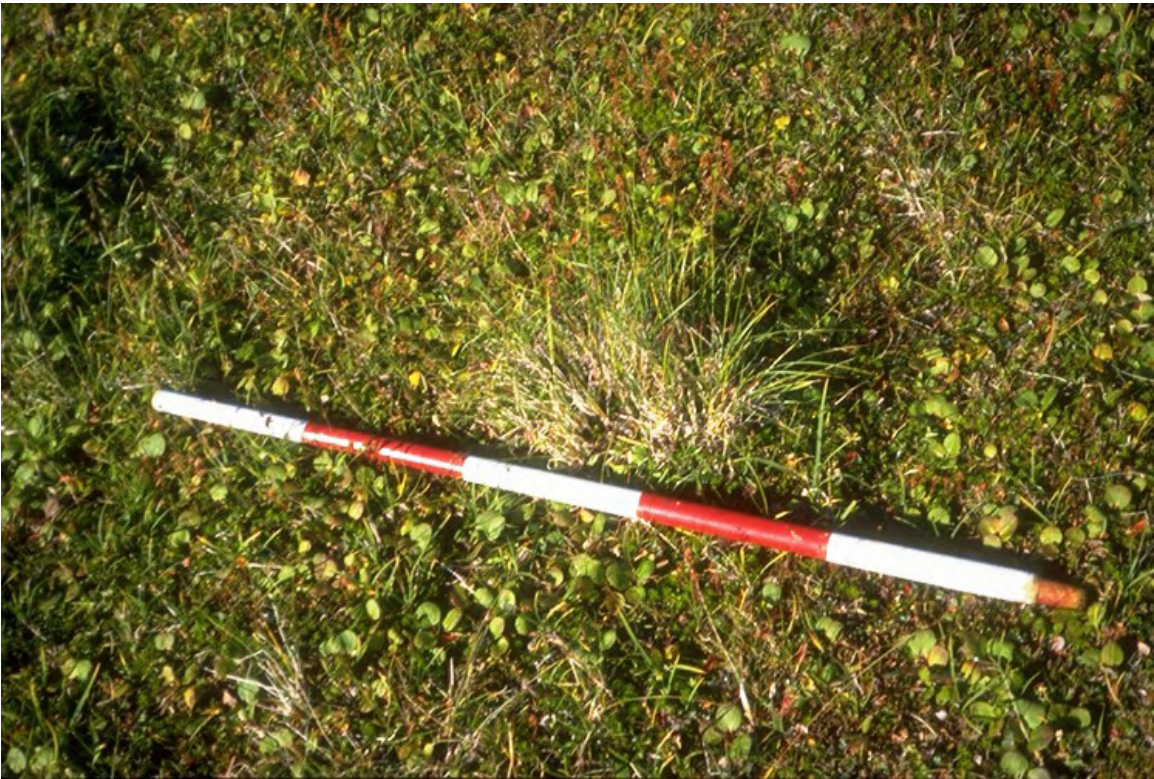


Figure 12. Willow dwarf scrub of the *Salix reticulata*/*Festuca altaica* type on Mount Adair, Kenai Peninsula.

species that are often in this type include *Empetrum nigrum* (crowberry), *Artemisia arctica* (boreal sagebrush), *Achillea borealis* (yarrow), *Anemone narcissiflora* (narcissus anemone), *Antennaria monocephala* (pygmy pussytoes), *Sanguisorba stipulata* (Sitka burnet), *Carex macrochaeta* (longawned sedge), *Luzula multiflora* (common woodrush), *L. Wahlenbergii* (Wahlenberg's woodrush), and *Trisetum spicatum* (spike trisetum).

Physical setting- Netleaf willow/rough fescue is a minor type in the alpine in the Kenai Mountains. It occurs on rounded and rugged mountains. Sites sampled are on northeasterly and southwesterly aspects, on slopes to 10 percent, and at elevations to 3900 feet.

Salix rotundifolia/*Carex microchaeta*
(least willow/smallawned sedge)
(SALROT/CARMIC; 9 sites)

IID3a. Willow dwarf scrub; willow tundra

Vegetation- *Salix rotundifolia* (least willow) is the dominant dwarf shrub and indicator. *Diapensia lapponica* (pincushion plant) and *Vaccinium vitis-idaea* (lowbush cranberry) are other commonly occurring dwarf shrubs. *Carex microchaeta* (smallawned sedge) is the dominant herbaceous species and indicator. *Hierochloe alpina* (alpine holy grass) is often well represented. *Artemisia arctica* (boreal sagebrush), *Gentiana glauca* (pale gentian), and *Anemone narcissiflora* (narcissus anemone) are often common.

Physical setting- Least willow/smallawned sedge is a common type on rounded mountains in the alpine of the Kenai Mountains. Sites sampled are on all aspects, on slopes to 45 percent, and at elevations from 3475 to 4600 feet.

Graminoid Herbaceous Types

Arctophila fulva
(pendant grass)
(ARCFUL, 6 sites)

IIIA3e. Wet graminoid herbaceous, fresh grass marsh

Vegetation- *Arctophila fulva* (pendant grass) is abundant and dominates this type, although *Eleocharis acicularis* (needle spikerush) or *Equisetum fluviatile* (swamp horsetail) may codominate. Species richness is very low.

Physical setting- Pendant grass is a minor type on the raised tidal flats and outwash plains of the Copper River Delta. Sites sampled are on indistinct aspects, on slopes less than 5 percent, and at elevations less than 50 feet.

Calamagrostis canadensis
(bluejoint reedgrass)
(CALCAN, 21 sites)

IIIA2a. Mesic graminoid herbaceous, fresh grass marsh

Vegetation- *Calamagrostis canadensis* (bluejoint reedgrass) is generally abundant and the dominant herbaceous species (Figure 13). Some sites sampled have few other species besides *Calamagrostis canadensis*, while others may have variable, but well represented associate species. Occasional well represented associates include *Sanguisorba stipulata* (Sitka burnet), *Rubus arcticus* (nagoonberry), *Equisetum arvense* (common horsetail), *Gymnocarpium dryopteris* (oak fern), *Epilobium angustifolium* (tall fireweed), *Dryopteris dilatata* (wood fern), and *Veratrum viride* (false hellebore).

Physical setting- Bluejoint reedgrass is a major graminoid type on the Chugach National Forest. It occurs on estuaries, raised tidal flats, disturbed and non-disturbed foot slopes, low relief hills, and non-disturbed, disturbed, and dissected mountain side slopes. Sites sampled are on all aspects, on slopes to 65 percent, and at elevations to 2100 feet.



Figure 13. Mesic graminoid herbaceous vegetation of the *Calamagrostis canadensis* type below Cowan Peak, Palmer Creek drainage, Kenai Peninsula.

Calamagrostis canadensis/*Salix* sp.
(bluejoint reedgrass/willow)
(CALCAN/SALIX, 3 sites)

IIIA2c. Mesic graminoid herbaceous, bluejoint-shrub

Vegetation- *Calamagrostis canadensis* (bluejoint reedgrass) is well represented to abundant and is the dominant herbaceous species in the type. *Salix alaxensis* (feltleaf willow), *Salix barclayi* (Barclay willow), or *Salix sitchensis* (Sitka willow) is well represented. Remaining species composition is variable. Species that may be well represented include *Potentilla palustris* (marsh fivefinger) and *Equisetum* sp. (horsetail).

Physical setting- Bluejoint reedgrass/willow is a minor type in the Portage, Placer, and Twentymile river valleys. Sites sampled are on flood plains with slopes less than 5 percent and elevations less than 100 feet.

Carex aquatilis
(water sedge)
(CARAQU, 3 sites)

IIIA3f. Wet graminoid herbaceous, subarctic lowland sedge wet meadow

Vegetation- Communities are dominated by abundant *Carex aquatilis* (water sedge). Some sites have other graminoids that are well represented, but not with consistency (Figure 14).

Physical setting- Water sedge is a minor but widely distributed type on the Chugach National Forest. Sufficient site data are not available at this time.

Carex lyngbyei
(Lyngbye's sedge)
(CARLYN, 17 sites)

IIIA3i. Wet graminoid herbaceous, halophytic sedge wet meadow

Vegetation- *Carex lyngbyei* (Lyngbye's sedge) is abundant and dominates this type. Other species may be well represented, but not with consistency. Species richness is low.



Figure 14. Wet graminoid herbaceous vegetation of the *Carex aquatilis* type on the East Fork of Meadow Creek, Kenai Peninsula.

Physical setting- Lyngbye's sedge is a major type on the Copper River Delta and the Portage, Placer, and Twentymile river valley wetlands. It occurs on raised tidal flats and flood plains. Sites sampled are essentially flat and range in elevation from sea level to 20 feet.

Carex lyngbyei/Lathyrus palustris
(Lyngbye's sedge/vetchling)
(CARLYN/LATPAL, 12 sites)

IIIA3i. Wet graminoid herbaceous, halophytic sedge wet meadow

Vegetation- *Carex lyngbyei* (Lyngbye's sedge) and *Lathyrus palustris* (vetchling) are abundant and dominate the type. *Calamagrostis canadensis* (bluejoint reedgrass) is often common to abundant. Other herbaceous species that appear common to well represented in half of the communities sampled are *Iris setosa* (wild iris), *Agrostis alascana* (Alaska bentgrass), and *Deschampsia cespitosa* (tufted hairgrass).

Physical setting- Lyngbye's sedge/vetchling is a common type on the uplifted tidal flats of the Copper River Delta. Sites sampled are essentially flat and range in elevation from at sea level to 20 feet.

Carex lyngbyei/Ranunculus cymbalaria
(Lyngbye's sedge/seaside buttercup)
(CARLYN/RANCYM, 21 sites)

IIIA3i. Wet graminoid herbaceous, halophytic sedge wet meadow

Vegetation- *Carex lyngbyei* (Lyngbye's sedge) is abundant and dominates this type. At least one of the diagnostic salt tolerant species, *Puccinellia* sp. (alkaligrass), *Carex mackenziei* (Mackenzie's sedge), *Plantago maritima* (goosetongue plantain), *Triglochin maritimum* (seaside arrowgrass), or *Ranunculus cymbalaria* (seaside buttercup) are present, though with low cover. *Potentilla egedii* (Pacific silverweed) and *Deschampsia cespitosa* (tufted hairgrass) are generally found in this type and are common to well represented.

Physical setting- Lyngbye's sedge/seaside buttercup is a common type in the estuaries (tidal flats) and raised beaches of the Copper River Delta. Sites sampled are essentially flat and are at elevations of 10 feet or less.

Carex lyngbyei/mixed herb
(Lyngbye's sedge/mixed herb)
(CARLYN/mixed herb, 19 sites)

IIIA3i. Wet graminoid herbaceous, halophytic sedge wet meadow

Vegetation- *Carex lyngbyei* (Lyngbye's sedge) is abundant and dominates this type. Species richness is high, though variable, and the combined cover of herbaceous species other than *C. lyngbyei* is at least 25 percent. No individual species other than *C. lyngbyei* is consistent in occurrence. *Deschampsia cespitosa* (tufted hairgrass) is common in half the plots.

Physical setting- Lyngbye's sedge/mixed herb is a minor type on the raised tidal flats of the Copper River Delta, and the flood plains of the Portage, Placer, and Twentymile river valleys. Sites sampled are essentially flat and are at elevations to 15 feet.

Carex macrochaeta
(longawned sedge)
(CARMACH, 7 sites)

IIIA2f. Mesic graminoid herbaceous, mesic sedge-herb meadow tundra

Vegetation- *Carex macrochaeta* (longawned sedge) and *C. magellanica* (boreal bog sedge) is usually abundant and dominates this type (Figure 15). *Sanguisorba stipulata* (Sitka burnet), and *Geranium erianthum* (northern geranium) are common to abundant. Other herbaceous species that are usually present, but variable in cover, are *Artemisia arctica* (boreal sagebrush), *Aconitum delphinifolium* (monkshood), *Anemone narcissiflora* (narcissus anemone), *Polemonium acutiflorum* (tall Jacobs ladder), *Castilleja unalaschcensis* (Alaska Indian paintbrush), *Valeriana sitchensis* (Sitka valerian), *Epilobium angustifolium* (tall fireweed), and *Phleum commutatum* (mountain timothy). Species richness is high.



Figure 15. Mesic forb herbaceous (bordering to mesic graminoid herbaceous) vegetation of the *Carex macrochaeta* type on a mountain side slope above Granite Creek, Kenai Peninsula.

Physical setting- Longawned sedge is a minor alpine type in the Kenai Mountains. It occurs on rugged mountains, dissected mountain side slopes, and ravines. Sites sampled are on all aspects, on slopes from 45 to 55 percent, and at elevations from 1950 to 2950 feet.

Carex microchaeta
(smallawned sedge)
(CARMIC, 6 sites)

IIIA1d. Dry graminoid herbaceous, midgrass herb

Vegetation- *Carex microchaeta* (smallawned sedge) is abundant and dominates this type. *Cassiope stelleriana* (Steller's cassiope), *Empetrum nigrum* (crowberry), and *Salix rotundifolia* (least willow) are often common to well represented dwarf shrubs. Other herbaceous species that are usually common to well represented are *Anemone narcissiflora* (narcissus anemone), *Artemisia arctica* (boreal sagebrush), *Antennaria monocephala* (pygmy pussytoes), *Gentiana glauca* (pale gentian), *Luzula multiflora* (common woodrush, and *Hierochloe alpina* (alpine holy grass).

Physical setting- Smallawned sedge is a minor type in the alpine zone of the Kenai Mountains. It occurs on rugged and rounded mountains. Sites sampled are on northerly and northeasterly aspects, on slopes to 65 percent, and at elevations from 3100 to 4250 feet.

Carex pauciflora
(fewflower sedge)
(CARPAU, 3 sites)

IIIA3j. Wet graminoid herbaceous, subarctic lowland sedge bog

Vegetation- *Carex pauciflora* (fewflower sedge) is abundant and dominates this type. *Eriophorum angustifolium* (tall cottongrass) is common to well represented. A consistent dwarf shrub is *Vaccinium uliginosum* (bog blueberry), although others, *Andromeda polifolia* (bog rosemary), *Empetrum nigrum* (crowberry), and *Oxycoccus microcarpus* (bog cranberry) may be common to well represented. *Fauria crista-galli* (deer cabbage) and *Geum calthifolium* (calthaleaf avens) are common to well represented. *Cornus*

canadensis (bunchberry), *Drosera rotundifolia* (roundleaf sundew), *Gentiana douglasiana* (swamp gentian), *Pedicularis parviflora* (smallflower lousewort), and *Trichophorum caespitosum* (tufted bulrush) may also be common to well represented.

Physical setting- Fewflower sedge is a minor type in Prince William Sound. It occurs on low relief hills and non-disturbed mountain side slopes. Sites sampled are on all but southerly aspects, on slopes less than 5 percent, and at elevations to 520 feet.

Carex pluriflora
(manyflower sedge)
(CARPLU, 5 sites)

IIIA3j. Wet graminoid herbaceous, subarctic lowland sedge bog

Vegetation- *Carex pluriflora* (manyflower sedge) is abundant and dominates the type. *Eriophorum angustifolium* (tall cottongrass) may also be common to well represented. Remaining species composition within this type is variable.

Physical setting- Manyflower sedge is a minor type in Prince William Sound and on the Copper River Delta. It occurs on low relief hills, estuaries, and flood plains. Sites sampled are on all but easterly aspects, have slopes less than 10 percent, and are at elevations to 170 feet.

Carex rostrata
(beaked sedge)
(CARROS, 3 sites)

IIIA3f. Wet graminoid herbaceous, subarctic lowland sedge wet meadow

Vegetation- *Carex rostrata* (beaked sedge) is abundant and dominates the type. A few other species, such as *Potentilla palustris* (marsh fivefinger) or *Epilobium adenocaulon* (northern willowherb), may be well represented, but not with consistency. Species richness is low.

Physical setting- Beaked sedge is a minor type on the Copper River Delta and the Portage, Placer, and Twentymile river valleys. Sufficient site data are not available at this time.

Carex sitchensis
(Sitka sedge)
(CARSIT, 17 sites)

IIIA3f. Wet graminoid herbaceous, subarctic lowland sedge wet meadow

Vegetation- *Carex sitchensis* (Sitka sedge) is well represented to abundant and dominates this type. *Equisetum fluviatile* (swamp horsetail), *Potentilla palustris* (marsh fivefinger), and *Calamagrostis canadensis* (bluejoint reedgrass) may be well represented to abundant and strong codominants on some sites. Further species composition is variable.

Physical setting- Sitka sedge is a major wetland type on the Copper River Delta. It is incidental on the rest of the Chugach National Forest. It occurs on flood plains, outwash plains, and raised tidal flats. Sites sampled are flat surfaces at elevations to 100 feet.

Deschampsia cespitosa
(tufted hairgrass)
(DESCES, 8 sites)

IIIA1e. Dry graminoid herbaceous, hairgrass

Vegetation- *Deschampsia cespitosa* (tufted hairgrass) is well represented to abundant and dominates this type. *Potentilla egedii* (Pacific silverweed) is well represented in over half the sites sampled. Further species composition is variable.

Physical setting- Tufted hairgrass is a minor though widespread type on the Copper River Delta and the Kenai Mountains. It occurs on estuaries, beaches, high and low relief hills, and broken mountain side slopes. Sites sampled are on flat surfaces at elevations to 900 feet.

Eleocharis palustris
(common spike rush)
(ELEPAL, 9 sites)

IIIA3d.-IIIA3i. Wet graminoid herbaceous, freshwater sedge marsh and halophytic sedge wet meadow

Vegetation- *Eleocharis palustris* (common spikerush) is well represented and dominates this type. Species composition is highly variable due to the large ecological amplitude of *E. palustris*, ranging from tidal marshes to outwash plains. Species richness is low.

Physical setting- Common spike rush is a minor yet widespread type on the Copper River Delta. It occurs on flood plains, raised beaches, estuaries, and outwash plains. Sites sampled are essentially flat and are at elevations to 10 feet.

Elymus arenarius
(beach rye)
(ELYARE, 15 sites)

IIIA1a. Dry graminoid herbaceous, elymus

Vegetation- *Elymus arenarius* (beach rye) is usually abundant and dominates this type. Although other species may be well represented to abundant, no other species occur with constancy. *Lathyrus maritimus* (beach pea) is the most consistent associated species, occurring in 40% of the sites sampled.

Physical setting- Beach rye is a minor though widespread type on the Copper River Delta and in Prince William Sound. It occurs on dunes, flood plains, beaches, gently sloping hills, and estuaries. It often forms linear communities along beach fronts that were uplifted by the 1964 earthquake. Sites sampled are on all aspects, on slopes up to 20 percent, and at elevations to 10 feet (one site at 100 feet elevation).

Elymus arenarius/Achillea borealis
(beach rye/yarrow)

(ELYARE/ACHBOR, 3 sites)

IIIA1a. Dry graminoid herbaceous, elymus

Vegetation- *Elymus arenarius* (beach rye) is abundant and dominates this type. *Achillea borealis* (yarrow) is well represented to abundant. Other species often present are *Poa macrantha* (seashore bluegrass), *Luzula multiflora* (common woodrush), *Stellaria calycantha* (northern starwort), and *Fragaria chiloensis* (beach strawberry). Species richness and community structure are far higher than in the beach rye type.

Physical setting- Beach rye/yarrow is a minor type on the beaches of the Copper River Delta. Sites sampled are on northerly or southerly aspects, on slopes to 35 percent, and are at sea level.

Eriophorum angustifolium-Carex pauciflora
(tall cottongrass-fewflower sedge)

(ERIANG-CARPAU, 12 sites)

IIIA3a. Wet graminoid herbaceous, wet sedge meadow tundra

Vegetation- *Eriophorum angustifolium* (tall cottongrass), *Carex pauciflora* (fewflower sedge), and usually *Trichophorum caespitosum* (tufted bulrush) are well represented to abundant and codominate this type. Other species often common to well represented are *Gentiana douglasiana* (swamp gentian), *Geum calthifolium* (calthaleaf avens), *Drosera rotundifolia* (roundleaf sundew), *Dodecatheon pulchellum* (pretty shootingstar), *Andromeda polifolia* (bog rosemary), and *Oxycoccus microcarpus* (bog cranberry).

Physical setting- Tall cottongrass-fewflower sedge is a minor though widespread type in Prince William Sound. It occurs primarily on low relief hills, but also occasionally on high relief hills and flood plains. Sites sampled are on all but southerly aspects, on slopes to 20 percent, and at elevations to 300 feet.

Eriophorum angustifolium-Carex pluriflora
(tall cottongrass-manyflower sedge)
(ERIANG-CARPLU, 9 sites)

IIIA3a. Wet graminoid herbaceous, wet sedge meadow tundra

Vegetation- *Eriophorum angustifolium* (tall cottongrass), and *Carex pluriflora* (manyflower sedge) are well represented to abundant and codominate this type. Species that are often present include *Andromeda polifolia* (bog rosemary), *Empetrum nigrum* (crowberry), *Drosera rotundifolia* (roundleaf sundew), *Fauria crista-galli* (deer cabbage), and *Geum calthifolium* (calthaleaf avens).

Physical setting- Tall cottongrass-manyflower sedge is a minor though widespread type in Prince William Sound. It occurs on low and high relief hills, gently sloping hills, flood plains, valley floors, and broken mountain side slopes. Sites sampled are on all aspects, have slopes to 20 percent, and are at elevations to 1100 feet.

Eriophorum angustifolium-Trichophorum caespitosum
(tall cottongrass-tufted bulrush)
(ERIANG-TRICAE, 6 sites)

IIIA3a. Wet graminoid herbaceous, wet sedge meadow tundra

Vegetation- *Eriophorum angustifolium* (tall cottongrass) and *Trichophorum caespitosum* (tufted bulrush) are abundant and codominate this type. Other species with high constancy include *Andromeda polifolia* (bog rosemary), *Empetrum nigrum* (crowberry), *Vaccinium uliginosum* (bog blueberry), and *Drosera rotundifolia* (roundleaf sundew), although cover values vary. Also, *Gentiana douglasiana* (swamp gentian) and *Geum calthifolium* (calthaleaf avens) are often present in this type.

Physical setting- Tall cottongrass-tufted bulrush is a minor type in Prince William Sound and in the Kenai Mountains. It occurs on low relief hills and flood plains. Sites sampled are on all aspects, on slopes to 10 percent, and are at elevations to 200 feet (one site is at 1000 feet elevation).

Festuca altaica
(rough fescue)
(FESALT, 5 sites)

IIIA1b. Dry graminoid herbaceous, dry fescue

Vegetation- *Festuca altaica* (rough fescue) is abundant and dominates this type. *Artemisia arctica* (boreal sagebrush) and *Lycopodium alpinum* (alpine clubmoss) are usually common to well represented. Scattered dwarf shrubs, such as *Vaccinium vitis-idaea* (lowbush cranberry), and various *Carex* sp. (sedge) are often present.

Physical setting- Rough fescue is a minor alpine type in the Kenai Mountains. It occurs on rounded and rugged mountains, and broken and dissected mountain side slopes. Sites sampled are on southerly, southeasterly, and easterly aspects, on slopes from 20 to 80 percent, and at elevations from 1100 to 4600 feet.

Festuca altaica/*Geranium erianthum*
(rough fescue/northern geranium)
(FESALT/GERERI, 11 sites)

IIIA1d. Dry graminoid herbaceous, midgrass herb

Vegetation- *Festuca altaica* (rough fescue) is abundant and dominates this type (Figure 16). *Geranium erianthum* (northern geranium) and *Epilobium angustifolium* (tall fireweed) are well represented and are diagnostic species for this type. Other species with high constancy, but variable cover, include *Achillea borealis* (yarrow), *Artemisia arctica* (boreal sagebrush), *Castilleja unalaschcensis* (Alaska Indian paintbrush), and *Fritillaria camschatcensis* (chocolate lily). Additional species often encountered are *Calamagrostis canadensis* (bluejoint reedgrass), *Trisetum spicatum* (spike trisetum), and *Gymnocarpium dryopteris* (oak fern). Species richness is high.

Physical setting- Rough fescue/northern geranium is a minor type in the Kenai Mountains. It occurs on broken, dissected, disturbed, and non-disturbed mountain side slopes. Sites sampled are on southerly and easterly aspects, on slopes from 45 to 70 percent, and at elevations from 1520 to 2825 feet.



Figure 16. Dry graminoid herbaceous vegetation of the *Festuca altaica*/
Geranium erianthum type on Sleeping Sister Mountain, Kenai Peninsula.

Luzula wahlenbergii
(Wahlenberg's woodrush)
(LUZWAH, 3 sites)
IIIA1. Dry graminoid herbaceous

Vegetation- *Luzula wahlenbergii* (Wahlenberg's woodrush) is well represented to abundant and dominates this type. *Artemisia arctica* (boreal sagebrush) is often present. Total cover is low.

Physical setting- Wahlenberg's woodrush is a minor type in the Kenai Mountains. Sufficient site data are not available at this time.

Puccinellia pumila
(dwarf alkaligrass)
(PUCPUM, 6 sites)
IIIA3h. Wet graminoid herbaceous, halophytic grass wet meadow

Vegetation- *Puccinellia pumila* (dwarf alkaligrass) is well represented to abundant and dominates this type. Species richness is very low.

Physical setting- Dwarf alkaligrass is a minor type on the Copper River Delta. It is found only on the tidal marsh landscape adjacent to the fore-shore levee and the sound side of the barrier islands and spits. Sufficient site data are not available at this time.

Trichophorum caespitosum
(tufted bulrush)
(TRICAE, 12 sites)
IIIA3c. Wet graminoid herbaceous, wet sedge-herb meadow tundra

Vegetation- *Trichophorum caespitosum* (tufted bulrush) is abundant and dominates this type. Other species that are often common to abundant in this type include *Andromeda polifolia* (bog rosemary), *Drosera rotundifolia* (roundleaf sundew), *Geum calthifolium* (calthaleaf avens), *Carex pauciflora* (fewflower sedge), and *Eriophorum angustifolium* (tall cottongrass).

Physical setting- Tufted bulrush is a minor though widespread type in the Kenai Mountains and Prince William Sound. It occurs on broken mountain side slopes, rounded subalpine mountains, low relief hills, and flood plains. Sites sampled are on all aspects, on slopes to 80 percent, and at elevations to 1600 feet.

Forb Herbaceous Type

Athyrium filix-femina

(lady fern)

(ATHFIL, 5 sites)

IIIB2d. Mesic forb herbaceous, ferns

Vegetation- *Athyrium filix-femina* (lady fern) is abundant and dominates this type. Sites may occasionally have well represented shrubs such as *Myrica gale* (sweetgale) or *Rubus spectabilis* (salmonberry). Other herbaceous species are well represented, the most common including *Epilobium angustifolium* (tall fireweed), *Calamagrostis canadensis* (bluejoint reedgrass), *Heracleum lanatum* (cow parsnip), and *Veratrum viride* (false hellebore).

Physical setting- Lady fern is a minor, though widespread, type on the Chugach National Forest. It occurs on low and high relief hills, estuaries, and dissected mountain side slopes. Sites sampled are on all but easterly aspects, on slopes to 65 percent, and at elevations to 1200 feet.

Epilobium angustifolium

(tall fireweed)

(EPIANG, 5 sites)

IIIB2b. Mesic forb herbaceous, fireweed

Vegetation- *Epilobium angustifolium* (tall fireweed) is abundant and the dominant herbaceous species in this type. *Calamagrostis canadensis* (bluejoint reedgrass), *Athyrium filix-femina* (lady fern), and *Angelica lucida*

(seacoast angelica) may be well represented. Other herbaceous species may also be well represented to abundant, but are not consistent associates.

Physical setting- Tall fireweed is a common type in the Kenai Mountains and on the Copper River Delta. The two plots with available site data are on disturbed mountain side slopes, north and southwest aspects, slopes to 23 percent, and elevations to 1750 feet.

Equisetum arvense
(common horsetail)
(EQUARV, 7 sites)

IIIB3b. Wet forb herbaceous, subarctic lowland wet meadow

Vegetation- *Equisetum arvense* (common horsetail) is well represented to abundant and is the dominant herbaceous species in this type. Other herbaceous species such as *Epilobium latifolium* (dwarf fireweed), *Lathyrus palustris* (vetchling), *Calamagrostis canadensis* (bluejoint reedgrass), and *Elymus arenarius* (beach rye), may be common to well represented.

Physical setting- Common horsetail is a minor though widespread type on the Copper River Delta and the Portage, Placer, and Twentymile river valleys. It occurs on primarily on flood plains. Sites sampled are generally flat and are at elevations to 35 feet.

Equisetum fluviatile
(swamp horsetail)
(EQUFLU, 20 sites)

IIIB3a. Wet forb herbaceous, fresh herb marsh

Vegetation- *Equisetum fluviatile* (swamp horsetail) is well represented to abundant and dominates this type. Although occurrence is sporadic, *Potentilla palustris* (marsh fivefinger) and *Menyanthes trifoliata* (buckbean) are the most common associates. Species richness is low.

Physical setting- Swamp horsetail is an emergent species that grows on sites with permanent to semi-permanent standing water (lakes and ponds).

The type is common on the Copper River Delta and the Portage, Placer, and Twentymile river valley wetlands. It occurs on flood plains, estuaries, beaches, and raised tidal flats. Sites sampled are on flat surfaces at elevations to 100 feet.

Equisetum variegatum
(northern horsetail)
(EQUVAR, 7 sites)

IIIB1a. Dry forb herbaceous, seral herbs

Vegetation- *Equisetum variegatum* (northern horsetail) is abundant and dominates this type. Tall shrubs *Alnus crispa* ssp *sinuata* (Sitka alder) and various *Salix* sp. (willows) are often present. *Equisetum arvense* (common horsetail), *Deschampsia cespitosa* (tufted hairgrass), *Spiranthes romanzoffiana* (hooded lady's-tresses), and *Parnassia palustris* (northern grass of Parnassus) are the most common herbaceous associates.

Physical setting- Northern horsetail is a minor type on the Copper River Delta. It occurs on flood plains and dunes. Sufficient site data are not available at this time.

Fauria crista-galli
(deer cabbage)
(FAUCRI, 11 sites)

IIIB2a. Mesic forb herbaceous, mixed herbs

Vegetation- *Fauria crista-galli* (deer cabbage) is abundant and the dominant forb in this type. Low shrubs such as *Empetrum nigrum* (crowberry), and *Luetkea pectinata* (luetkea) can be common. *Carex* sp. (sedge) are well represented to abundant. *Geum calthifolium* (calthaleaf avens) is often a common associate.

Physical setting- Deer cabbage is a common type throughout Prince William Sound. It occurs on rounded and rugged mountains, low relief hills, and flood plains. Sites sampled are on all aspects, on slopes to 80 percent, and at elevations to 2000 feet.

Fauria crista-galli/*Trichophorum caespitosum*
(deer cabbage/tufted bulrush)
(FAUCRI/TRICAE, 3 sites)
IIIB2a. Mesic forb herbaceous, mixed herbs

Vegetation- *Fauria crista-galli* (deer cabbage) is abundant and dominates the type. *Trichophorum caespitosum* (tufted bulrush) is also abundant and an indicator species. *Tsuga mertensiana* (mountain hemlock), *Alnus crispa* ssp. *sinuata* (Sitka alder), and *Cladothamnus pyroliflorus* (copperbush) may be present. A variety of dwarf shrubs such as *Vaccinium uliginosum* (bog blueberry) and *Empetrum nigrum* (crowberry) are present. Other herbaceous species present include *Dodecatheon pulchellum* (pretty shootingstar), *Gentiana douglasiana* (swamp gentian), *Geum calthifolium* (calthaleaf avens), and *Carex anthoxanthea* (arctic sedge).

Physical setting- Deer cabbage/tufted bulrush is a minor though widespread type in Prince William Sound. It occurs on low relief hills. Sites sampled are on northerly aspects, on slopes to 55 percent, and at elevations to 425 feet.

Fragaria chiloensis
(beach strawberry)
(FRACHI, 3 sites)
IIIB1a. Dry forb herbaceous, seral herbs

Vegetation- *Fragaria chiloensis* (beach strawberry) is abundant and dominates this type. *Achillea borealis* (yarrow) is common to abundant and can be codominant. *Rhinanthus minor* (yellow rattle), *Elymus arenarius* (beach rye), and *Festuca rubra* (red fescue) are usually present to well represented.

Physical setting- Beach strawberry is found on the barrier islands and dunes of the Copper River Delta. Sufficient site data are not available at this time.

Lathyrus maritimus
(beach pea)
(LATMAR, 3 sites)
IIIB1. Dry forb herbaceous

Vegetation- *Lathyrus maritimus* (beach pea) is abundant and dominates this type (see Figure 17 for a photograph of a dry forb herbaceous type). *Elymus arenarius* (beach rye) is well represented to abundant and often codominant. Other species often present in this type include *Achillea borealis* (yarrow), *Fragaria chiloensis* (beach strawberry), *Honckenya peploides* (seaside sandplant), *Rhinanthus minor* (yellow rattle), *Festuca rubra* (red fescue), and *Poa macrantha* (seashore bluegrass).

Physical setting- Beach pea is a minor yet widespread type on dunes, beaches, and estuaries throughout the Chugach National Forest. Sites sampled are flat surfaces at elevations to 30 feet.

Lupinus nootkatensis
(Nootka lupine)
(LUPNOO, 8 sites)
IIIB2a. Mesic forb herbaceous, mixed herbs

Vegetation- *Lupinus nootkatensis* (Nootka lupine) is abundant and dominates this type. Common associates are *Achillea borealis* (yarrow), *Elymus arenarius* (beach rye), *Deschampsia cespitosa* (tufted hairgrass), *Potentilla egedii* (Pacific silverweed), and *Lathyrus palustris* (vetchling), any of which may be common to abundant.

Physical setting- Nootka lupine is a common type on the Copper River Delta and the Portage, Placer, Twentymile river valleys. It occurs on beaches, raised beaches, flat lowlands, and flood plains. Sites sampled are generally on indistinct aspects, with slopes up to only 3 percent, and at elevations to 15 feet (one site is at 200 feet).



Figure 17. Dry forb herbaceous vegetation of the *Epilobium latifolium* type (listed in Table 4) near the terminus of the Spencer Glacier, Placer Valley, Kenai Peninsula.

Menyanthes trifoliata

(buckbean)

(MENTRI, 13 sites)

IIIB3c. Wet forb herbaceous, subarctic lowland herb bog meadow

Vegetation- *Menyanthes trifoliata* (buckbean) is abundant and dominates this type (Figure 18). *Potentilla palustris* (marsh fivefinger) and *Equisetum fluviatile* (swamp horsetail) are often common to well represented. Various *Carex* sp. (sedges) are common to abundant.

Physical setting- Buckbean is an emergent species that grows on sites with permanent to semi-permanent standing water (lakes and ponds). It is a major type in the Copper River Delta and is common in the Portage, Placer, and Twentymile river valleys. It occurs on estuaries, outwash plains, and flood plains. Sites sampled are on flat surfaces at elevations to 100 feet.

Potentilla egedii

(Pacific silverweed)

(POTEGE, 6 sites)

IIIB3d. Wet forb herbaceous, halophytic herb wet meadow

Vegetation- *Potentilla egedii* (Pacific silverweed) is usually abundant and dominates this type. The most consistent associates are *Ranunculus cymbalaria* (seaside buttercup), *Deschampsia cespitosa* (tufted hairgrass), and *Puccinellia pumila* (dwarf alkaligrass), which may be common. Other species such as *Achillea borealis* (yarrow) and *Honckenya peploides* (seaside sandplant) are inconsistent, but may be abundant on individual sites.

Physical setting- Pacific silverweed is a major type in the Copper River Delta. It occurs on beaches and estuaries. Sites sampled are on essentially flat surfaces at elevations to 25 feet.



Figure 18. Wet forb herbaceous vegetation of the *Menyanthes trifoliata* type in Placer Valley, Kenai Peninsula.

Potentilla palustris
(marsh fivefinger)
(POTPAL, 4 sites)

IIIB3c. Wet forb herbaceous, subarctic lowland herb bog meadow

Vegetation- *Potentilla palustris* (marsh fivefinger) is abundant and dominates this type. *Equisetum fluviatile* (swamp horsetail) or *Calamagrostis canadensis* (bluejoint reedgrass) is common to well represented.

Physical setting- Marsh fivefinger is an emergent species that grows on sites with permanent to semi-permanent standing water (lakes and ponds). This is a major type on the Copper River Delta and the Portage, Placer, and Twentymile river valleys. It occurs on raised tidal flats, and outwash plains. Sites sampled are on flat surfaces at elevations under 50 feet.

Valeriana sitchensis
(Sitka valerian)
(VALSIT, 6 sites)

IIIB2a. Mesic forb herbaceous, mixed herbs

Vegetation- *Valeriana sitchensis* (Sitka valerian) is abundant and is the dominant herbaceous species. The most common associated species are *Geranium erianthum* (northern geranium), *Sanguisorba stipulata* (Sitka burnet), *Lupinus nootkatensis* (Nootka lupine), and *Epilobium angustifolium* (tall fireweed), which may be common to well represented. Species richness is high.

Physical setting- Sitka valerian is a minor type in the Kenai Mountains. It occurs on rounded mountains, and disturbed mountain slopes. Sites sampled are on all but northerly aspects. Slopes vary from 35 to 70 percent. Elevations range from 2200 to 3400 feet.

Veratrum viride
(false hellebore)
(VERVIR, 4 sites)

IIIB2a. Mesic forb herbaceous, mixed herbs

Vegetation- *Veratrum viride* (false hellebore) is abundant and the dominant herbaceous species. The most common associated species are *Calamagrostis canadensis* (bluejoint reedgrass), *Geranium erianthum* (northern geranium), *Epilobium angustifolium* (tall fireweed), and *Sanguisorba stipulata* (Sitka burnet), which may be common to well, represented. Species richness is high.

Physical setting- False hellebore is a minor though widespread type in the Kenai Mountains. It occurs on high relief hills, disturbed and non-disturbed mountain side slopes, and non-disturbed foot slopes. Sites sampled are on all but northerly aspects, on slopes to 50 percent, and at elevations to 2150 feet.

Aquatic Herbaceous Types

Callitriche hermaphroditica
(northern waterstarwort)
(CALHER, 4 sites)

IIID1g. Freshwater aquatic herbaceous; water starwort

Vegetation- *Callitriche hermaphroditica* (northern waterstarwort) dominates this aquatic type. *Callitriche verna* (spring waterstarwort), *Myriophyllum sibiricum* (shortspike watermilfoil), *Potamogeton perfoliatus* (clasping leaf pondweed), and *Subularia aquatica* (awlwort) are common well represented associates, but are inconsistent in occurrence. Species richness is low.

Physical setting- Northern water starwort is a minor aquatic type on the Copper River Delta. Sites sampled are ponds that have permanent standing water. Water depth varies seasonally and yearly, depending on flooding and precipitation.

Hippuris vulgaris
(common maretail)
(HIPVUL, 5 sites)

IIID1b. Freshwater aquatic herbaceous, common maretail

Vegetation- *Hippuris vulgaris* (common maretail) is well represented to abundant and dominates this type. Other species may also be well represented to abundant, but not with consistency. Species richness is very low.

Physical setting- Common maretail is an emergent species that grows on sites with permanent to semi-permanent standing water. This type occurs on the Copper River Delta and the Portage, Placer, and Twentymile river valley wetlands on raised tidal flats and outwash plains. Sufficient site data are not available at this time.

Myriophyllum sibiricum
(spike watermilfoil)
(MYRSIB, 3 sites)

IIID1e. Freshwater aquatic herbaceous; watermilfoil

Vegetation- *Myriophyllum sibiricum* (spike watermilfoil) is well represented to abundant and dominates this aquatic type. *Potamogeton perfoliatus* (claspingleaf pondweed) or *P. natans* (floating pondweed) is a well represented to abundant associate. *Nuphar polysepala* (pond lily) is well represented in one site sampled. Species richness is low.

Physical setting- Spike watermilfoil is a minor though widely distributed aquatic type on the Copper River Delta. It occurs in clear water ponds on the raised tidal flats and outwash plains.

Potamogeton filiformis
(slender-leaved pondweed)
(POTFIL, 12 sites)

IIID1f. Freshwater aquatic herbaceous; fresh pondweed

Vegetation- *Potamogeton filiformis* (slender-leaved pondweed) is well represented to abundant and dominates this aquatic type (see Figure 19 for a photograph of an aerial view of freshwater aquatic herbaceous habitat). *Potamogeton perfoliatus* (claspingleaf pondweed) is a common to abundant associate. *Ranunculus trichophyllus* (white water crowfoot) and *Myriophyllum sibiricum* (spike watermilfoil) are common to well represented in half the sites sampled. Species richness is low.

Physical setting- Slender-leaved pondweed is a common aquatic type on the Copper River Delta. It occurs in clear water ponds on raised tidal flats.

Potamogeton perfoliatus
(claspingleaf pondweed)
(POTPER, 18 sites)

IIID1f. Freshwater aquatic herbaceous; fresh pondweed

Vegetation- *Potamogeton perfoliatus* (claspingleaf pondweed) is well represented to abundant and dominates this type. *Ranunculus trichophyllus* (white water crowfoot) and either *Callitriche hermaphroditica* (northern waterstarwort) or *C. verna* (spring waterstarwort) are often associates that can be common to well represented. Species richness is low.

Physical setting- Claspingleaf pondweed is a common aquatic type on the Copper River Delta. It occurs in clear water ponds on raised tidal flats.



Figure 19. Freshwater aquatic herbaceous communities occupy portions of the ponds in this aerial view of a portion of the Scott River area, Copper River Delta.

Ranunculus trichophyllus
(white water crowfoot)
(RANTRI, 8 sites)

IIID1c. Freshwater aquatic herbaceous; aquatic buttercup

Vegetation- *Ranunculus trichophyllus* (white water crowfoot) is well represented to abundant and dominates this type. *Potamogeton perfoliatus* (claspingleaf pondweed) is well represented in half the sites sampled. Species richness is low.

Physical setting- White water crowfoot is a minor aquatic type on the Copper River Delta. It occurs in clear water ponds on raised tidal flats.

Sparganium sp.
(burreed)
(SPARGA, 6 sites)

IIID1d. Aquatic herbaceous, burreed

Vegetation- Either *Sparganium angustifolium* (floating burreed), *S. hyperboreum* (northern burreed), or *S. minimum* (small burreed) dominate this type. These three species are grouped into one type because of similarities in habitat. *Potamogeton perfoliatus* (claspingleaf pondweed) or *P. pectinatus* (sago pondweed) are present to well represented in over half the sites sampled.

Physical setting- Burreed species are aquatics known to grow in clear water ponds with permanent standing water. The burreed type is limited in extent though widely distributed on the Copper River Delta. It occurs on raised tidal flats and outwash plains that are essentially flat. Elevations are less than 100 feet.

Subularia aquatica

(awlwort)

(SUBAQU, 3 sites)

IIID1g. Freshwater aquatic herbaceous; water starwort

Vegetation- *Subularia aquatica* (awlwort) is abundant and dominates this type. *Potamogeton filiformis* (slender-leaved pondweed) is an abundant codominant. *Potamogeton perfoliatus* (clasping leaf pondweed) and *Ranunculus trichophyllus* (white water crowfoot) are common to well represented. Species richness is low.

Physical setting- Awlwort is a minor aquatic type on the Copper River Delta. It occurs in clear water ponds on raised tidal flats.

Utricularia vulgaris

(common bladderwort)

(UTRVUL, 3 sites)

IIID1. Freshwater aquatic herbaceous

Vegetation- *Utricularia vulgaris* (common bladderwort) is abundant and dominates this type. *Sparganium angustifolium* (floating burreed) is a common to well represented associate. *Potentilla palustris* (marsh fivefinger) may be common to abundant. Species richness is low.

Physical setting- Common bladderwort is a minor aquatic type on the Copper River Delta. It occurs in clear water ponds on raised tidal flats. Sufficient site data are not available at this time.

OTHER COMMUNITY TYPES

In addition to the 197 community types represented by three or more plots that are listed in Table 2 and described in the text, 85 community types have been identified that are represented by fewer than three sample plots (Table 4). Many of the types presented in Table 4 may be scarce, but valid, community types on the Chugach National Forest while some may be widespread but undersampled.

Also, of the 2293 sample plots used in developing this classification, 199 fell into undefined or incomplete categories. These categories are listed at the end of Table 4. They represent sites not fitting into community types defined in the classification.

Future sampling and analysis may expand the sample size of some of the community types listed in Table 4 and define additional types.

Table 4. List of Chugach National Forest community types represented by fewer than three sample plots and undefined types (see text for details).

Community Type	n
Needleleaf Forest	
<i>Picea X lutzii/Salix barclayi</i>	2
<i>Picea X lutzii/Vaccinium ovalifolium</i>	1
<i>Picea mariana/Equisetum arvense</i>	1
<i>Picea sitchensis/Athyrium filix-femina</i>	2
<i>Picea sitchensis/Vaccinium ovalifolium/Calamagrostis nutkaensis</i>	2
<i>Picea sitchensis/Vaccinium ovalifolium/Lysichiton americanus</i>	1
<i>Tsuga heterophylla-Chamaecyparis nootkatensis/Vaccinium oval.-Menziesia ferruginea</i>	2
<i>Tsuga heterophylla-Picea sitchensis/Athyrium filix-femina</i>	1
<i>Tsuga heterophylla-Picea sitchensis/Calamagrostis canadensis</i>	1
<i>Tsuga heterophylla-Picea sitchensis/Dryopteris dilatata</i>	1
<i>Tsuga heterophylla/Echinopanax horridum</i>	1
<i>Tsuga heterophylla/Vaccinium ovalifolium/Calamagrostis nutkaensis</i>	2
<i>Tsuga mertensiana-Chamaecyparis nootkatensis/Vaccinium oval.-Cladothamnus pyroliflorus</i>	2
<i>Tsuga mertensiana-Picea X lutzii/Vaccinium ovalifolium</i>	2
<i>Tsuga mertensiana-Picea X lutzii/Vaccinium ovalifolium-Menziesia ferruginea</i>	1
<i>Tsuga mertensiana-Picea X lutzii/Vaccinium vitis-idaea</i>	2
<i>Tsuga mertensiana-Picea sitchensis/Menziesia ferruginea</i>	2
<i>Tsuga mertensiana-Picea sitchensis/Vaccinium ovalifolium-Cladothamnus pyroliflorus</i>	2
<i>Tsuga mertensiana-Picea sitchensis/Vaccinium ovalifolium/Calamagrostis nutkaensis</i>	2
Broadleaf Forest	
<i>Betula papyrifera/Equisetum arvense</i>	2
<i>Betula papyrifera/Hylocomium splendens</i>	1
<i>Betula papyrifera/Myrica gale</i>	2
<i>Populus balsamifera ssp. trichocarpa/Equisetum arvense</i>	2
<i>Populus balsamifera ssp. trichocarpa/Menziesia ferruginea/sparse</i>	1
<i>Populus balsamifera ssp. trichocarpa/Salix sitchensis</i>	2
<i>Populus tremuloides/Calamagrostis canadensis</i>	1
<i>Populus tremuloides/Linnaea borealis</i>	2
<i>Populus tremuloides/Vaccinium ovalifolium</i>	1
<i>Populus tremuloides/Vaccinium vitis-idaea</i>	2

Mixed Forest

<i>Picea X lutzii-Betula papyrifera/Alnus crispa ssp. sinuata</i>	2
<i>Picea X lutzii-Betula papyrifera/Cornus canadensis</i>	1
<i>Picea X lutzii-Betula papyrifera/Dryopteris dilatata</i>	2
<i>Picea X lutzii-Betula papyrifera/Echinopanax horridum</i>	1
<i>Picea X lutzii-Betula papyrifera/Equisetum arvense</i>	1
<i>Picea X lutzii-Betula papyrifera/Linnaea borealis</i>	1
<i>Picea X lutzii-Populus tremuloides/Equisetum arvense</i>	2
<i>Picea X lutzii-Populus tremuloides/Linnaea borealis</i>	2
<i>Picea X lutzii-Populus tremuloides/Lycopodium annotinum</i>	1
<i>Picea X lutzii-Populus tremuloides/Viburnum edule</i>	1
<i>Picea mariana-Betula papyrifera/Alnus crispa ssp. sinuata</i>	1
<i>Picea mariana-Betula papyrifera/Menziesia ferruginea</i>	1
<i>Picea mariana-Betula papyrifera/Menziesia ferruginea-Vaccinium vitis-idaea</i>	1
<i>Picea sitchensis-Populus balsamifera ssp. trichocarpa/Hylocomium splendens</i>	1
<i>Tsuga mertensiana-Betula papyrifera/Alnus crispa ssp. sinuata</i>	2
<i>Tsuga mertensiana-Betula papyrifera/Calamagrostis canadensis</i>	1
<i>Tsuga mertensiana-Betula papyrifera/Echinopanax horridum</i>	1
<i>Tsuga mertensiana-Betula papyrifera/Linnaea borealis</i>	2
<i>Tsuga mertensiana-Betula papyrifera/Menziesia ferruginea-Vaccinium vitis-idaea</i>	2
<i>Tsuga mertensiana-Betula papyrifera/Vaccinium vitis-idaea</i>	2
<i>Tsuga mertensiana-Populus balsamifera ssp. trichocarpa/Alnus crispa ssp. sinuata</i>	1
<i>Tsuga mert.-Populus bals. ssp. tric./Alnus crispa ssp. sinuata-Echinopanax horridum</i>	1
<i>Tsuga mertensiana-Populus tremuloides/Linnaea borealis</i>	1

Tall Scrub

<i>Alnus crispa ssp. sinuata-Salix barclayi/Calamagrostis canadensis</i>	1
<i>Alnus crispa ssp. sinuata/Hylocomium splendens</i>	2
<i>Salix barclayi/Equisetum variegatum</i>	1

Low Scrub

<i>Myrica gale-Empetrum nigrum</i>	1
<i>Myrica gale-Salix alaxensis</i>	2
<i>Myrica gale/Epilobium angustifolium</i>	2
<i>Myrica gale/Equisetum variegatum</i>	1

Dwarf Scrub

<i>Salix rotundifolia/Geum rossii</i>	1
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Graminoid Herbaceous

<i>Calamagrostis canadensis/Epilobium angustifolium</i>	2
<i>Carex chordorrhiza</i>	1
<i>Carex glareosa</i>	1
<i>Carex limosa</i>	1
<i>Carex microglochin</i>	1
<i>Carex rhynchosphysa</i>	1
<i>Carex saxatilis</i>	1
<i>Carex sitchensis/Sphagnum sp.</i>	2
<i>Elymus arenarius-Calamagrostis canadensis</i>	1
<i>Eriophorum russeolum</i>	1
<i>Festuca altaica-Calamagrostis canadensis</i>	1
<i>Glyceria pauciflora</i>	1
<i>Juncus alpinus</i>	1
<i>Juncus arcticus</i>	1
<i>Luzula multiflora</i>	1

Forb Herbaceous

<i>Epilobium adenocaulon</i>	1
<i>Epilobium anagallidifolium</i>	1
<i>Epilobium latifolium</i>	1
<i>Equisetum palustre</i>	2
<i>Fauria crista-galli/Carex anthoxanthea</i>	2
<i>Hippuris tetraphylla</i>	2
<i>Honckenya peploides</i>	2

Aquatic Herbaceous

<i>Chara sp.</i>	2
<i>Nuphar polysepala</i>	1
<i>Potamogeton pectinatus</i>	1

Undefined Types

<i>Picea X lutzii/undefined</i>	4
<i>Picea sitchensis/undefined</i>	4
<i>Tsuga heterophylla-Picea sitchensis/undefined</i>	1
<i>Tsuga mertensiana-Picea mariana/undefined</i>	2
<i>Tsuga mertensiana-Picea sitchensis/undefined</i>	4
<i>Tsuga mertensiana-Tsuga heterophylla/undefined</i>	11
<i>Tsuga mertensiana/undefined</i>	17
<i>Betula papyrifera/undefined</i>	1

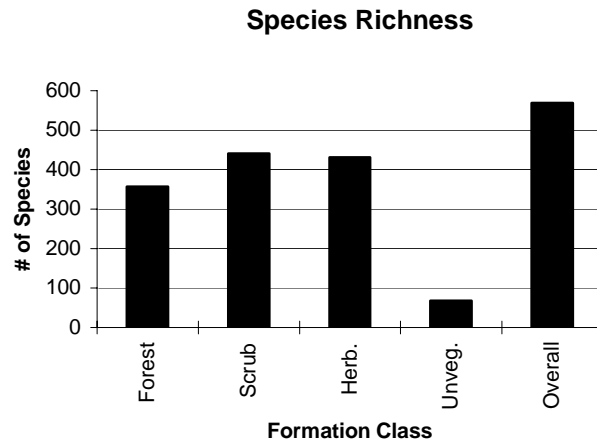
<i>Populus balsamifera</i> ssp. <i>trichocarpa</i> /undefined	3
<i>Picea X lutzii</i> - <i>Betula papyrifera</i> /undefined	3
<i>Picea X lutzii</i> - <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> /undefined	10
<i>Picea X lutzii</i> - <i>Populus tremuloides</i> /undefined	1
<i>Picea mariana</i> - <i>Betula papyrifera</i> /undefined	1
<i>Picea sitchensis</i> - <i>Betula papyrifera</i> /undefined	2
<i>Tsuga mertensiana</i> - <i>Betula papyrifera</i> /undefined	7
<i>Alnus crispa</i> ssp. <i>sinuata</i> - <i>Rubus spectabilis</i> /undefined	1
<i>Alnus crispa</i> ssp. <i>sinuata</i> - <i>Salix barclayi</i> /undefined	1
<i>Alnus crispa</i> ssp. <i>sinuata</i> /undefined	5
<i>Salix barclayi</i> /undefined	8
<i>Salix</i> sp./undefined	1
undefined tall scrub	2
<i>Myrica gale</i> - <i>Salix</i> sp./undefined	1
<i>Myrica gale</i> /undefined	9
undefined low scrub	9
<i>Empetrum nigrum</i> /undefined	1
<i>Salix arctica</i> /undefined	4
<i>Salix rotundifolia</i> /undefined	2
undefined dwarf scrub	6
<i>Carex</i> sp./undefined	11
<i>Eriophorum angustifolium</i> /undefined	1
<i>Eriophorum</i> sp./undefined	4
undefined graminoid herbaceous	5
undefined forb herbaceous	5
undefined non-vegetated	46
<i>Picea mariana</i> /undefined	0
<i>Tsuga heterophylla</i> - <i>Chamaecyparis nootkatensis</i> /undefined	0
<i>Tsuga heterophylla</i> /undefined	0
<i>Tsuga mertensiana</i> - <i>Picea X lutzii</i> /undefined	0
<i>Tsuga mertensiana</i> - <i>Picea mariana</i> /undefined	0
<i>Picea sitchensis</i> - <i>Betula papyrifera</i> /undefined	0
<i>Picea sitchensis</i> - <i>Populus balsamifera</i> ssp. <i>trichocarpa</i> /undefined	0
<i>Tsuga mertensiana</i> - <i>Populus tremuloides</i> /undefined	0
<i>Phyllodoce aleutica</i> /undefined	0
undefined aquatic herbaceous	0
Incomplete Data	5
undefined and incomplete total	199
GRAND TOTAL	319

VEGETATION DIVERSITY

The Chugach National Forest features a wide array of vegetation diversity that includes both species poor areas and species rich areas. Data used in developing this classification were used to summarize this vegetation diversity. The range of vascular plant species richness (total number of species) across the national forest varies from 68 in sparsely vegetated areas to 441 in shrublands (Figure 20A). Additionally, Table 2 documents the range of species richness among community types represented by three or more plots. The range of richness varies from two species in *Puccinellia pumila* graminoid herbaceous communities to 33 in *Picea X lutzii*/*Equisetum arvense* open needleleaf forests.

This study recorded 36% (569 species) of the total flora of Alaska (as documented in Hultén 1968). Additionally, a total of 282 community types were documented (Figure 20B; tables 2 and 4). The greatest community richness occurred within forest types (152) while the richness of scrub types (55) was lower than herbaceous types (75). Geographically, the number of community types varies from 122 in the Copper River Delta area to 158 in the Kenai Peninsula area of the national forest (Figure 20C).

A)



B)

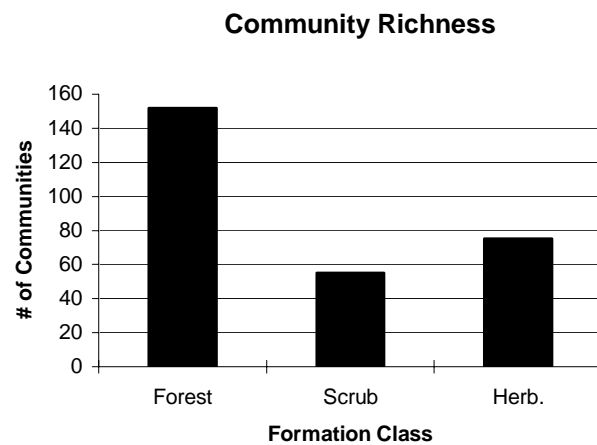
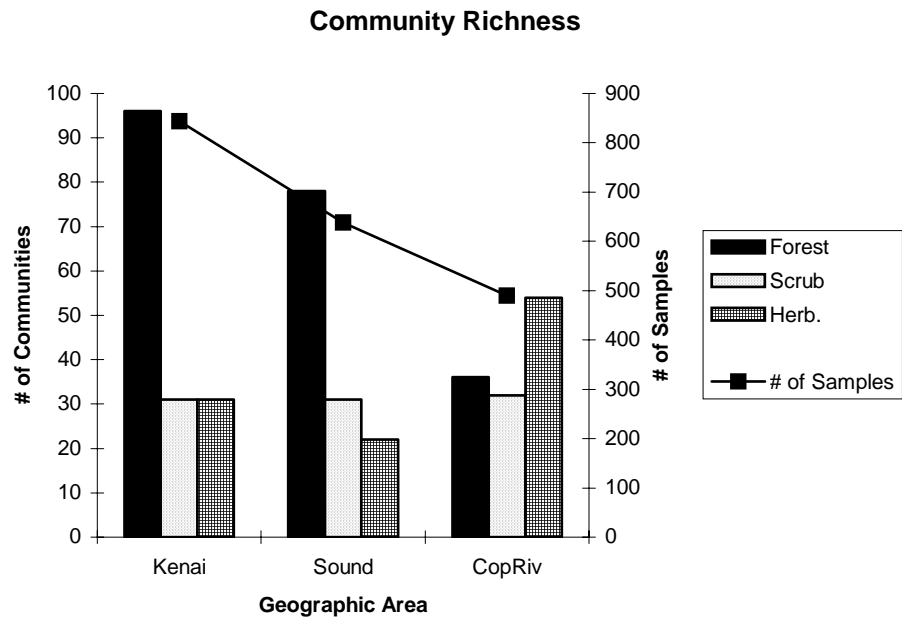


Figure 20. Vascular plant species richness (A) and community richness (B) by formation class (i.e., level 1 of Viereck et al. (1992)), and community richness (C) by formation class and geographic area (i.e., Kenai Peninsula, Prince William Sound, and Copper River Delta).

c)



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APPENDIX A

KEY TO COMMUNITY TYPES

Instructions

1. Use the key to identify community types of the Humid Temperate Domain of Southcentral Alaska. Only those types represented by three or more sample plots are included within the body of the keys. Types represented by fewer than three plots are simply listed at the end of each key.
2. Locate a representative portion of the vegetation site in question (i.e., the vegetation and environment should be relatively homogeneous within the portion of the site to which this key is applied).
3. Estimate canopy cover for all indicator species present in the representative portion of the site. Indicator species are those species used in the key (see Table 1 for a list of these species including their scientific, common, and code names). The common names used are those that are considered to be in most widespread use by workers on the Forest. Prior to using the key, refer to the "Merged Species" table, as a few common species have been combined.
4. Compare the vegetation characteristics of the site to the written description of the type provided in the text. **Please notify the Forest Ecologist at the Chugach National Forest (address on page 1) of the location of vegetation occurrences that do not fit the key and descriptions** (please provide canopy cover estimates for all dominant vascular plant species present at these sites).

Lifeform Key

1. Tree species are present and have a canopy cover of 10 percent or more.
2. Over 75 percent of tree cover is contributed by needleleaf (conifer) species.
NEEDLELEAF FOREST
2. Less than 75 percent of tree cover is contributed by needleleaf (conifer) species.

3. Over 75 percent of tree cover is contributed by broadleaf species.

BROADLEAF FOREST

3. Broadleaf or needleleaf species contribute 25 to 75 percent of the tree cover.

MIXED FOREST

1. Tree species are absent or nearly so (less than 10 percent cover).

4. Vegetation with at least 25 percent cover of erect to decumbent shrubs.

5. Shrubs taller than 1.5 m (5 ft) dominate.

TALL SCRUB

5. Shrubs taller than 1.5 m are absent or not dominant.

6. Shrubs 20 cm (8 in) to 1.5 m in height dominate.

LOW SCRUB

6. Shrubs under 20 cm in height dominate.

DWARF SCRUB

4. Vegetation herbaceous (may have up to 25 percent shrub cover).

HERBACEOUS

7. Herbaceous species with a combined cover of at least 15%.

8. Emergent or terrestrial herbaceous vegetation cover is at least 15%.

9. Graminoid species dominate cover.

GRAMINOID COMMUNITY TYPES

9. Graminoid species not dominant.

FORB COMMUNITY TYPES

8. Emergent or terrestrial herbaceous vegetation cover is less than 15%.

AQUATIC COMMUNITY TYPES

7. Herbaceous species with a combined cover of less than 15%.
SPARSE OR UNVEGETATED AREAS (e.g., mud flats; sand dunes; beaches; rock outcrops; scree/talus slopes)
(Chugach National Forest database contains 46 plots in the "undefined Non-Vegetated" category)

Needleleaf Forest Cover Type Key

1. Mountain hemlock (*Tsuga mertensiana*) cover is at least 15%.
 2. Alaska yellow cedar (*Chamaecyparis nootkatensis*) cover is at least 15%.
MOUNTAIN HEMLOCK-ALASKA YELLOW CEDAR COVER TYPE
 2. Alaska yellow cedar cover is less than 15%.
 3. Western hemlock (*Tsuga heterophylla*) cover is at least 15%.
MOUNTAIN HEMLOCK-WESTERN HEMLOCK COVER TYPE
 3. Western hemlock cover is less than 15%.
 4. Spruce (*Picea* sp.) cover is at least 15%.
 5. White spruce or Lutz spruce (*P. glauca* or *P. X lutzii*) is the dominant spruce species.
MOUNTAIN HEMLOCK-LUTZ SPRUCE COVER TYPE
 5. Sitka spruce (*P. sitchensis*) is the dominant spruce species.
MOUNTAIN HEMLOCK-SITKA SPRUCE COVER TYPE
 4. Spruce cover is less than 15%.
MOUNTAIN HEMLOCK COVER TYPE
1. Mountain hemlock cover is less than 15%.

- 6. Alaska yellow cedar cover is at least 15%.
WESTERN HEMLOCK-ALASKA YELLOW CEDAR COVER TYPE
- 6. Alaska yellow cedar cover is less than 15%.
 - 7. Spruce cover is at least 15%.
 - 8. Western hemlock cover is at least 15%.
WESTERN HEMLOCK-SITKA SPRUCE COVER TYPE
 - 8. Western hemlock cover is less than 15%.
 - 9a. Black spruce (*Picea mariana*) cover is at least 15%.
BLACK SPRUCE COVER TYPE
 - 9b. White spruce or Lutz spruce cover is at least 15%.
LUTZ SPRUCE COVER TYPE
 - 9c. Sitka spruce cover is at least 15%.
SITKA SPRUCE COVER TYPE
 - 7. Spruce cover is less than 15%.
WESTERN HEMLOCK COVER TYPE

Listed below are undersampled needleleaf forest cover types and associated undersampled community types:

MOUNTAIN HEMLOCK-BLACK SPRUCE
MOUNTAIN HEMLOCK-BLACK SPRUCE/undefined

Broadleaf Forest Cover Type Key

1. Quaking aspen (*Populus tremuloides*) cover is at least 5%.
QUAKING ASPEN COVER TYPE

1. Quaking aspen cover is less than 5%.
 2. Black cottonwood (*Populus balsamifera* ssp. *trichocarpa*) cover is at least 5%.
BLACK COTTONWOOD COVER TYPE

 2. Black cottonwood cover is less than 5%.
PAPER BIRCH (*Betula papyrifera*) COVER TYPE

Mixed Forest Cover Type Key

1. Mountain hemlock (*Tsuga mertensiana*) cover is at least 5%.
MOUNTAIN HEMLOCK-PAPER BIRCH (*Betula papyrifera*) COVER TYPE

1. Mountain hemlock cover is less than 5%.
 2. Black spruce (*Picea mariana*) cover is at least 15% combined with paper birch cover of at least 5%.
BLACK SPRUCE-PAPER BIRCH COVER TYPE

 2. Black spruce cover is less than 15% or is not combined with paper birch cover of at least 5%.
 3. Quaking aspen (*Populus tremuloides*) cover is at least 5%.
LUTZ SPRUCE-QUAKING ASPEN COVER TYPE

 3. Quaking aspen cover is less than 5%.

4. Black cottonwood (*Populus balsamifera* ssp. *trichocarpa*) cover is at least 5%.
 5. White spruce (*Picea glauca*) or Lutz spruce (*P. X lutzii*) cover is at least 15%.
LUTZ SPRUCE-BLACK COTTONWOOD COVER TYPE
 5. White spruce or Lutz spruce cover is less than 15%.
SITKA SPRUCE-BLACK COTTONWOOD COVER TYPE
4. Black cottonwood cover is less than 5%.
LUTZ SPRUCE-PAPER BIRCH COVER TYPE

Listed below are undersampled mixed forest cover types and associated undersampled community types:

MOUNTAIN HEMLOCK-BLACK COTTONWOOD
 MOUNTAIN HEMLOCK-BLACK COTTONWOOD/SITKA ALDER
 MOUNTAIN HEMLOCK-BLACK COTTONWOOD/SITKA ALDER-DEVIL'S CLUB
 MOUNTAIN HEMLOCK-QUAKING ASPEN
 MOUNTAIN HEMLOCK-QUAKING ASPEN/TWINFLOWER
 SITKA SPRUCE-PAPER BIRCH
 SITKA SPRUCE-PAPER BIRCH/undefined

Needleleaf Forest Keys

Key to the Black Spruce Types

- 1a. Sitka alder (*Alnus crispa* ssp. *sinuata*) cover is at least 15%.
BLACK SPRUCE/SITKA ALDER
- 1b. Lowbush cranberry (*Vaccinium vitis-idaea*) and/or crowberry (*Empetrum nigrum*) cover is at least 5%.
BLACK SPRUCE/LOWBUSH CRANBERRY
- 1c. Lowbush cranberry and/or crowberry cover is less than 5%.
BLACK SPRUCE/undefined
(Compare against listing and descriptions of undersampled black spruce community types.)

Listed below are undersampled black spruce community types:

BLACK SPRUCE/COMMON HORSETAIL

Key to the Lutz Spruce Types

1. Sitka alder (*Alnus crispa* ssp. *sinuata*) cover is at least 15%.
 2. Rusty menziesia (*Menziesia ferruginea*) cover is at least 25%.
LUTZ SPRUCE/SITKA ALDER-RUSTY MENZIESIA
 2. Rusty menziesia cover is less than 25%.
LUTZ SPRUCE/SITKA ALDER
1. Sitka alder cover is less than 15%.
 - 3a. Rusty menziesia cover is at least 25%.
LUTZ SPRUCE/RUSTY MENZIESIA

- 3b. Lowbush cranberry (*Vaccinium vitis-idaea*) and/or crowberry (*Empetrum nigrum*) cover is at least 5%.
LUTZ SPRUCE/LOWBUSH CRANBERRY
- 3c. Devil's club (*Echinopanax horridum*) cover is at least 5%.
LUTZ SPRUCE/DEVIL'S CLUB
- 3d. Wood fern (*Dryopteris dilatata*) cover is at least 5%.
LUTZ SPRUCE/WOOD FERN
- 3e. Common horsetail (*Equisetum arvense*) and/or woodland horsetail (*E. silvaticum*) cover is at least 25%.
LUTZ SPRUCE/COMMON HORSETAIL
- 3f. Bluejoint reedgrass (*Calamagrostis canadensis*) cover is at least 25%.
LUTZ SPRUCE/BLEUJOINT REEDGRASS
- 3g. Rusty menziesia cover is at least 5%.
LUTZ SPRUCE/RUSTY MENZIESIA/sparse
- 3h. Twinflower (*Linnaea borealis*) cover is at least 5%.
LUTZ SPRUCE/TWINFLOWER
- 3i. Oak fern (*Gymnocarpium dryopteris*) cover is at least 5%.
LUTZ SPRUCE/OAK FERN
- 3j. Oak fern cover is less than 5%.
LUTZ SPRUCE/undefined
(Compare against listing and descriptions of undersampled Lutz spruce community types.)

Listed below are undersampled Lutz spruce community types:

LUTZ SPRUCE/BARCLAY WILLOW
LUTZ SPRUCE/EARLY BLUEBERRY

Key to the Sitka Spruce Types

1. Sitka alder (*Alnus crispa* ssp. *sinuata*) cover is at least 15%.
 2. Devil's club (*Echinopanax horridum*) cover is at least 5%.
SITKA SPRUCE/SITKA ALDER-DEVIL'S CLUB
 2. Devil's club cover is less than 5%.
SITKA SPRUCE/SITKA ALDER
1. Sitka alder cover is less than 15%.
 3. Salmonberry (*Rubus spectabilis*) cover is at least 15%.
SITKA SPRUCE/SALMONBERRY-DEVIL'S CLUB
 3. Salmonberry cover is less than 15%.
 4. Early blueberry (*Vaccinium ovalifolium*) cover is at least 15%.
 - 5a. Devil's club cover is at least 5%.
SITKA SPRUCE/EARLY BLUEBERRY-DEVIL'S CLUB
 - 5b. Wood fern (*Dryopteris dilatata*) cover is at least 5%.
SITKA SPRUCE/EARLY BLUEBERRY/WOOD FERN
 - 5c. Wood fern cover is less than 5%.
SITKA SPRUCE/EARLY BLUEBERRY
 4. Early blueberry cover is less than 15%.
 - 6a. Skunk cabbage (*Lysichiton americanus*) cover is at least 5%.
SITKA SPRUCE/SKUNK CABBAGE
 - 6b. Devil's club cover is at least 5%.
SITKA SPRUCE/DEVIL'S CLUB

- 6c. Barclay willow (*Salix barclayi*) cover is at least 25%.
SITKA SPRUCE/BARCLAY WILLOW
- 6d. Common horsetail (*Equisetum arvense*) cover is at least 25%.
SITKA SPRUCE/COMMON HORSETAIL
- 6e. No undergrowth vascular plant species exceeds 5% cover.
SITKA SPRUCE/SPLENDID FEATHER MOSS
- 6f. Other undergrowth vascular plant species exceed 5% cover.
SITKA SPRUCE/undefined
(Compare against listing and descriptions of undersampled Sitka spruce community types.)

Listed below are undersampled Sitka spruce community types:

SITKA SPRUCE/LADY FERN
SITKA SPRUCE/EARLY BLUEBERRY/PACIFIC REEDGRASS
SITKA SPRUCE/EARLY BLUEBERRY/SKUNK CABBAGE

Key to the Mountain Hemlock Types

- 1. Sitka alder (*Alnus crispa* ssp. *sinuata*) cover is at least 15%.
 - 2. Rusty menziesia (*Menziesia ferruginea*) cover is at least 25%.
MOUNTAIN HEMLOCK/SITKA ALDER-RUSTY MENZIESIA
 - 2. Rusty menziesia cover is less than 25%.
MOUNTAIN HEMLOCK/SITKA ALDER
- 1. Sitka alder cover is less than 15%.
 - 3. Early blueberry (*Vaccinium ovalifolium*) cover is at least 15%.

- 4a. Rusty menziesia cover is at least 25%.
MOUNTAIN HEMLOCK/EARLY BLUEBERRY-RUSTY MENZIESIA
- 4b. Devil's club (*Echinopanax horridum*) cover is at least 5%.
MOUNTAIN HEMLOCK/EARLY BLUEBERRY-DEVIL'S CLUB
- 4c. Steller's cassiope (*Cassiope stelleriana*) cover is at least 5%.
MOUNTAIN HEMLOCK/EARLY BLUEBERRY-STELLER'S CASSIOPE
- 4d. Pacific reedgrass (*Calamagrostis nutkaensis*) cover is at least 15%.
MOUNTAIN HEMLOCK/EARLY BLUEBERRY/PACIFIC REEDGRASS
- 4e. Copperbush (*Cladothamnus pyrolaeiflorus*) cover is at least 5%.
MOUNTAIN HEMLOCK/EARLY BLUEBERRY-COPPERBUSH
- 4f. Deer cabbage (*Fauria crista-galli*) cover is at least 5%.
MOUNTAIN HEMLOCK/EARLY BLUEBERRY/DEER CABBAGE
- 4g. Deer cabbage cover is less than 5%.
MOUNTAIN HEMLOCK/EARLY BLUEBERRY
- 3. Early blueberry cover is less than 15%.
 - 5. Rusty menziesia cover is at least 25%.
 - 6. Lowbush cranberry (*Vaccinium vitis-idaea*) and/or crowberry (*Empetrum nigrum*) cover is at least 5%.
MOUNTAIN HEMLOCK/RUSTY MENZIESIA-LOWBUSH CRANBERRY
 - 6. Lowbush cranberry and/or crowberry cover is less than 5%.
MOUNTAIN HEMLOCK/RUSTY MENZIESIA
 - 5. Rusty menziesia cover is less than 25%.
 - 7. Steller's cassiope, lowbush cranberry, crowberry, Aleutian mountain heath (*Phyllodoce aleutica*), **OR** bog blueberry

(*Vaccinium uliginosum*) cover is at least 5%.

8a. Aleutian mountain heath cover is at least 25%.
MOUNTAIN HEMLOCK/ALEUTIAN MOUNTAIN HEATH

8b. Steller's cassiope cover is at least 5%.
MOUNTAIN HEMLOCK/STELLER'S CASSIOPE

8c. Bog blueberry cover is at least 5%.
MOUNTAIN HEMLOCK/BOG BLUEBERRY

8d. Bog blueberry cover is less than 5%.
MOUNTAIN HEMLOCK/LOWBUSH CRANBERRY

7. Steller's cassiope, lowbush cranberry, crowberry, Aleutian mountain heath, or bog blueberry cover is less than 5%.

9a. Devil's club cover is at least 5%.
MOUNTAIN HEMLOCK/DEVIL'S CLUB

9b. Wood fern (*Dryopteris dilatata*) cover is at least 5%.
MOUNTAIN HEMLOCK/WOOD FERN

9c. Rusty menziesia cover is at least 5%.
MOUNTAIN HEMLOCK/RUSTY MENZIESIA/sparse

9d. No undergrowth vascular plant species exceeds 5% cover.
MOUNTAIN HEMLOCK/SPLENDID FEATHER MOSS

9e. Other undergrowth vascular plant species exceed 5% cover.
MOUNTAIN HEMLOCK/undefined

Key to the Mountain Hemlock-Alaska Yellow Cedar Types

MOUNTAIN HEMLOCK-ALASKA YELLOW CEDAR/EARLY BLUEBERRY-STELLER'S CASSIOPE

(Compare against listing and descriptions of undersampled mountain hemlock-Alaska yellow cedar community types.)

Listed below are undersampled mountain hemlock-Alaska yellow cedar community types:

MOUNTAIN HEMLOCK-ALASKA YELLOW CEDAR/EARLY BLUEBERRY-COPPERBUSH

Key to the Mountain Hemlock-Lutz Spruce Types

1. Rusty menziesia (*Menziesia ferruginea*) cover is at least 25%.
 2. Lowbush cranberry (*Vaccinium vitis-idaea*) and/or crowberry (*Empetrum nigrum*) cover is at least 5%.
MOUNTAIN HEMLOCK-LUTZ SPRUCE/RUSTY MENZIESIA-LOWBUSH CRANBERRY
 2. Lowbush cranberry and/or crowberry cover is less than 5%.
MOUNTAIN HEMLOCK-LUTZ SPRUCE/RUSTY MENZIESIA
1. Rusty menziesia cover is less than 25%.
 - 3a. Devil's club (*Echinopanax horridum*) cover is at least 5%.
MOUNTAIN HEMLOCK-LUTZ SPRUCE/DEVIL'S CLUB
 - 3b. Rusty menziesia cover is at least 5%.
MOUNTAIN HEMLOCK-LUTZ SPRUCE/RUSTY MENZIESIA/sparse
 - 3c. No undergrowth vascular plant species exceeds 5% cover.
MOUNTAIN HEMLOCK-LUTZ SPRUCE/SPLENDID FEATHER MOSS
 - 3d. Other vascular plant species exceed 5% cover.
MOUNTAIN HEMLOCK-LUTZ SPRUCE/undefined
(Compare against listing and descriptions of undersampled mountain hemlock-Lutz spruce community types.)

Listed below are undersampled mountain hemlock-Lutz spruce community types:

MOUNTAIN HEMLOCK-LUTZ SPRUCE/LOWBUSH CRANBERRY
MOUNTAIN HEMLOCK-LUTZ SPRUCE/EARLY BLUEBERRY
MOUNTAIN HEMLOCK-LUTZ SPRUCE/EARLY BLUEBERRY-RUSTY MENZIESIA

Key to the Mountain Hemlock-Sitka Spruce Types

1. Early blueberry (*Vaccinium ovalifolium*) cover is at least 15%.
 - 2a. Salmonberry (*Rubus spectabilis*) cover is at least 15%.
MOUNTAIN HEMLOCK-SITKA SPRUCE/EARLY BLUEBERRY-SALMONBERRY
 - 2b. Skunk cabbage (*Lysichiton americanus*) cover is at least 5%.
MOUNTAIN HEMLOCK-SITKA SPRUCE/EARLY BLUEBERRY/SKUNK CABBAGE
 - 2c. Devil's club (*Echinopanax horridum*) cover is at least 5%.
MOUNTAIN HEMLOCK-SITKA SPRUCE/EARLY BLUEBERRY-DEVIL'S CLUB
 - 2d. Wood fern (*Dryopteris dilatata*) cover is at least 5%.
MOUNTAIN HEMLOCK-SITKA SPRUCE/EARLY BLUEBERRY/WOOD FERN
 - 2e. Wood fern cover is less than 5%.
MOUNTAIN HEMLOCK-SITKA SPRUCE/EARLY BLUEBERRY
1. Early blueberry cover is less than 15%.
 3. Devil's club cover is at least 5%.
MOUNTAIN HEMLOCK-SITKA SPRUCE/DEVIL'S CLUB
 3. Devil's club cover is less than 5%.
MOUNTAIN HEMLOCK-SITKA SPRUCE/undefined

(Compare against listing and descriptions of undersampled mountain hemlock-Sitka spruce community types.)

Listed below are undersampled mountain hemlock-Sitka spruce community types:

MOUNTAIN HEMLOCK-SITKA SPRUCE/RUSTY MENZIESIA
MOUNTAIN HEMLOCK-SITKA SPRUCE/EARLY BLUEBERRY-COPPERBUSH
MOUNTAIN HEMLOCK-SITKA SPRUCE/EARLY BLUEBERRY/PACIFIC REEDGRASS

Key to the Mountain Hemlock-Western Hemlock Types

1. Early blueberry (*Vaccinium ovalifolium*) cover is at least 15%.
 - 2a. Rusty menziesia (*Menziesia ferruginea*) cover is at least 25%.
MOUNTAIN HEMLOCK-WESTERN HEMLOCK/EARLY BLUEBERRY-RUSTY MENZIESIA
 - 2b. Skunk cabbage (*Lysichiton americanus*) cover is at least 5%.
MOUNTAIN HEMLOCK-WESTERN HEMLOCK/EARLY BLUEBERRY/SKUNK CABBAGE
 - 2c. Devil's club (*Echinopanax horridum*) cover is at least 5%.
MOUNTAIN HEMLOCK-WESTERN HEMLOCK/EARLY BLUEBERRY-DEVIL'S CLUB
 - 2d. Steller's cassiope (*Cassiope stelleriana*) cover is at least 5%.
MOUNTAIN HEMLOCK-WESTERN HEMLOCK/EARLY BLUEBERRY-STELLER'S CASSIOPE
 - 2e. Pacific reedgrass (*Calamagrostis nutkaensis*) cover is at least 15%.
MOUNTAIN HEMLOCK-WESTERN HEMLOCK/EARLY BLUEBERRY/PACIFIC REEDGRASS
 - 2f. Copperbush (*Cladothamnus pyrolaeiflorus*) cover is at least 5%.
MOUNTAIN HEMLOCK-WESTERN HEMLOCK/EARLY BLUEBERRY-COPPERBUSH
 - 2g. Deer cabbage (*Fauria crista-galli*) cover is at least 5%.
MOUNTAIN HEMLOCK-WESTERN HEMLOCK/EARLY BLUEBERRY/DEER CABBAGE

2h. Deer cabbage cover is less than 5%.
MOUNTAIN HEMLOCK-WESTERN HEMLOCK/EARLY BLUEBERRY

1. Early blueberry cover is less than 15%.
MOUNTAIN HEMLOCK-WESTERN HEMLOCK/undefined

Key to the Western Hemlock Types

1. Early blueberry (*Vaccinium ovalifolium*) cover is at least 15%.

2a. Skunk cabbage (*Lysichiton americanus*) cover is at least 5%.
WESTERN HEMLOCK/EARLY BLUEBERRY/SKUNK CABBAGE

2b. Devil's club (*Echinopanax horridum*) cover is at least 5%.
WESTERN HEMLOCK/EARLY BLUEBERRY-DEVIL'S CLUB

2c. Wood fern (*Dryopteris dilatata*) cover is at least 5%.
WESTERN HEMLOCK/EARLY BLUEBERRY/WOOD FERN

2d. Wood fern cover is less than 5%.
WESTERN HEMLOCK/EARLY BLUEBERRY

1. Early blueberry cover is less than 15%.

3. No undergrowth vascular plant species exceeds 5% cover.
WESTERN HEMLOCK/SPLENDID FEATHER MOSS

3. Other vascular plant species exceed 5% cover.
WESTERN HEMLOCK/undefined

(Compare against listing and descriptions of undersampled western hemlock community types.)

Listed below are undersampled western hemlock community types:

WESTERN HEMLOCK/DEVIL'S CLUB
WESTERN HEMLOCK/EARLY BLUEBERRY/PACIFIC REEDGRASS

Key to the Western Hemlock-Alaska Yellow Cedar Types

WESTERN HEMLOCK-ALASKA YELLOW CEDAR/undefined
(Compare against listing and descriptions of undersampled western hemlock-Alaska yellow cedar community types.)

Listed below are undersampled western hemlock-Alaska yellow cedar community types:

WESTERN HEMLOCK-ALASKA YELLOW CEDAR/EARLY BLUEBERRY-RUSTY MENZIESIA

Key to the Western Hemlock-Sitka Spruce Types

1. Salmonberry (*Rubus spectabilis*) cover is at least 15%.
WESTERN HEMLOCK-SITKA SPRUCE/SALMONBERRY-DEVIL'S CLUB
1. Salmonberry cover is less than 15%.
 2. Early blueberry (*Vaccinium ovalifolium*) cover is at least 15%.
 - 3a. Skunk cabbage (*Lysichiton americanus*) cover is at least 5%.
WESTERN HEMLOCK-SITKA SPRUCE/EARLY BLUEBERRY/SKUNK CABBAGE
 - 3b. Devil's club (*Echinopanax horridum*) cover is at least 5%.
WESTERN HEMLOCK-SITKA SPRUCE/EARLY BLUEBERRY-DEVIL'S CLUB
 - 3c. Devil's club cover is less than 5%.
WESTERN HEMLOCK-SITKA SPRUCE/EARLY BLUEBERRY

2. Early blueberry cover is less than 15%.
 4. Devil's club cover is at least 5%.
WESTERN HEMLOCK-SITKA SPRUCE/DEVIL'S CLUB
 4. Devil's club cover is less than 5%.
WESTERN HEMLOCK-SITKA SPRUCE/undefined
(Compare against listing and descriptions of undersampled western hemlock-Sitka spruce community types.)

Listed below are undersampled western hemlock-Sitka spruce community types:

WESTERN HEMLOCK-SITKA SPRUCE/BLEUJOINT REEDGRASS
WESTERN HEMLOCK-SITKA SPRUCE/LADY FERN
WESTERN HEMLOCK-SITKA SPRUCE/WOOD FERN

Broadleaf Forest Keys

Key to the Black Cottonwood Types

- 1a. Sitka alder (*Alnus crispa* ssp. *sinuata*) cover is at least 15%.
BLACK COTTONWOOD/SITKA ALDER
- 1b. Devil's club (*Echinopanax horridum*) cover is at least 5%.
BLACK COTTONWOOD/DEVIL'S CLUB
- 1c. Devil's club cover is less than 5%.
BLACK COTTONWOOD/undefined
(Compare against listing and descriptions of undersampled black cottonwood community types.)

Listed below are undersampled black cottonwood community types:

BLACK COTTONWOOD/COMMON HORSETAIL
BLACK COTTONWOOD/RUSTY MENZIESIA/sparse
BLACK COTTONWOOD/SITKA WILLOW

Key to the Paper Birch Types

1. Sitka alder (*Alnus crispa* ssp. *sinuata*) cover is at least 15%.
PAPER BIRCH/SITKA ALDER
1. Sitka alder cover is less than 15%.
 2. Rusty menziesia (*Menziesia ferruginea*) cover is at least 25%.
PAPER BIRCH/RUSTY MENZIESIA
 2. Rusty menziesia cover is less than 25%.

- 3a. Lowbush cranberry (*Vaccinium vitis-idaea*) and/or crowberry (*Empetrum nigrum*) cover is at least 5%.
PAPER BIRCH/LOWBUSH CRANBERRY
- 3b. Devil's club (*Echinopanax horridum*) cover is at least 5%.
PAPER BIRCH/DEVIL'S CLUB
- 3c. Bluejoint reedgrass (*Calamagrostis canadensis*) cover is at least 25%.
PAPER BIRCH/BLUEJOINT REEDGRASS
- 3d. Rusty menziesia cover is at least 5%.
PAPER BIRCH/RUSTY MENZIESIA/sparse
- 3e. Twinflower (*Linnaea borealis*) cover is at least 5%.
PAPER BIRCH/TWINFLOWER
- 3f. Twinflower cover is less than 5%.
PAPER BIRCH/undefined
(Compare against listing and descriptions of undersampled paper birch community types.)

Listed below are undersampled paper birch community types:

PAPER BIRCH/COMMON HORSETAIL
 PAPER BIRCH/SPLENDID FEATHER MOSS
 PAPER BIRCH/SWEETGALE

Key to the Quaking Aspen Types

QUAKING ASPEN/BUFFALOBERRY
 (Compare against listing and descriptions of undersampled quaking aspen community types.)

Listed below are undersampled quaking aspen community types:

QUAKING ASPEN/BLUEJOINT REEDGRASS
 QUAKING ASPEN/LOWBUSH CRANBERRY
 QUAKING ASPEN/EARLY BLUEBERRY

QUAKING ASPEN/TWINFLOWER

Mixed Forest Keys

Key to the Black Spruce-Paper Birch Types

BLACK SPRUCE-PAPER BIRCH/undefined

Listed below are undersampled black spruce-paper birch community types:

BLACK SPRUCE-PAPER BIRCH/RUSTY MENZIESIA

BLACK SPRUCE-PAPER BIRCH/RUSTY MENZIESIA-LOWBUSH CRANBERRY

BLACK SPRUCE-PAPER BIRCH/SITKA ALDER

Key to the Lutz Spruce-Black Cottonwood Types

- 1a. Sitka alder (*Alnus crispa* ssp. *sinuata*) cover is at least 15%.
LUTZ SPRUCE-BLACK COTTONWOOD/SITKA ALDER
- 1b. Devil's club (*Echinopanax horridum*) cover is at least 5%.
LUTZ SPRUCE-BLACK COTTONWOOD/DEVIL'S CLUB
- 1c. Common horsetail (*Equisetum arvense*) and/or woodland horsetail (*E. silvaticum*) cover is at least 25%.
LUTZ SPRUCE-BLACK COTTONWOOD/COMMON HORSETAIL
- 1d. Bluejoint reedgrass (*Calamagrostis canadensis*) cover is at least 25%.
LUTZ SPRUCE-BLACK COTTONWOOD/BLEUJOINT REEDGRASS
- 1e. No undergrowth vascular plant species exceeds 5% cover.
LUTZ SPRUCE-BLACK COTTONWOOD/SPLENDID FEATHER MOSS
- 1f. Other undergrowth vascular plant species exceed 5% cover.
LUTZ SPRUCE-BLACK COTTONWOOD/undefined

Key to the Lutz Spruce-Paper Birch Types

- 1a. Rusty menziesia (*Menziesia ferruginea*) cover is at least 25%.
LUTZ SPRUCE-PAPER BIRCH/RUSTY MENZIESIA
- 1b. Lowbush cranberry (*Vaccinium vitis-idaea*) and/or crowberry (*Empetrum nigrum*) cover is at least 5%.
LUTZ SPRUCE-PAPER BIRCH/LOWBUSH CRANBERRY
- 1c. Bluejoint reedgrass (*Calamagrostis canadensis*) cover is at least 25%.
LUTZ SPRUCE-PAPER BIRCH/BLUEJOINT REEDGRASS
- 1d. Rusty menziesia cover is at least 5%.
LUTZ SPRUCE-PAPER BIRCH/RUSTY MENZIESIA/sparse
- 1e. Clubmoss (*Lycopodium* sp.) cover is at least 5%.
LUTZ SPRUCE-PAPER BIRCH/STIFF CLUBMOSS
- 1f. No undergrowth vascular plant species exceeds 5% cover.
LUTZ SPRUCE-PAPER BIRCH/SPLENDID FEATHER MOSS
- 1g. Other undergrowth vascular plant species exceed 5% cover.
LUTZ SPRUCE-PAPER BIRCH/undefined
(Compare against listing and descriptions of undersampled Lutz spruce-paper birch types)

Listed below are undersampled Lutz spruce-paper birch community types:

LUTZ SPRUCE-PAPER BIRCH/BUNCHBERRY
LUTZ SPRUCE-PAPER BIRCH/COMMON HORSETAIL
LUTZ SPRUCE-PAPER BIRCH/DEVIL'S CLUB
LUTZ SPRUCE-PAPER BIRCH/WOOD FERN
LUTZ SPRUCE-PAPER BIRCH/SITKA ALDER
LUTZ SPRUCE-PAPER BIRCH/TWINFLOWER

Key to the Lutz Spruce-Quaking Aspen Types

1. Lowbush cranberry (*Vaccinium vitis-idaea*) and/or crowberry (*Empetrum nigrum*) cover is at least 5%.
LUTZ SPRUCE-QUAKING ASPEN/LOWBUSH CRANBERRY
1. Lowbush cranberry and/or crowberry cover is less than 5%.
LUTZ SPRUCE-QUAKING ASPEN/undefined
(Compare against listing and descriptions of Lutz spruce-quaking aspen community types.)

Listed below are undersampled Lutz spruce-quaking aspen community types:

LUTZ SPRUCE-QUAKING ASPEN/COMMON HORSETAIL
LUTZ SPRUCE-QUAKING ASPEN/STIFF CLUBMOSS
LUTZ SPRUCE-QUAKING ASPEN/TALLBUSH CRANBERRY
LUTZ SPRUCE-QUAKING ASPEN/TWINFLOWER

Key to the Mountain Hemlock-Paper Birch Types

1. Rusty menziesia (*Menziesia ferruginea*) cover is at least 25%.
MOUNTAIN HEMLOCK-PAPER BIRCH/RUSTY MENZIESIA
1. Rusty menziesia cover is less than 25%.
 - 2a. Rusty menziesia (*Menziesia ferruginea*) cover is at least 5%.
MOUNTAIN HEMLOCK-PAPER BIRCH/RUSTY MENZIESIA/sparse
 - 2b. Clubmoss (*Lycopodium* sp.) cover is at least 5%.
MOUNTAIN HEMLOCK-PAPER BIRCH/STIFF CLUBMOSS
 - 2c. No undergrowth vascular plant species exceeds 5% cover.
MOUNTAIN HEMLOCK-PAPER BIRCH/SPLENDID FEATHER MOSS

- 2d. Other undergrowth vascular plant species exceed 5% cover.
MOUNTAIN HEMLOCK-PAPER BIRCH/undefined
(Compare against listing and descriptions of mountain hemlock-paper birch community types.)

Listed below are undersampled mountain hemlock-paper birch community types:

MOUNTAIN HEMLOCK-PAPER BIRCH/BLUEJOINT REEDGRASS
MOUNTAIN HEMLOCK-PAPER BIRCH/DEVIL'S CLUB
MOUNTAIN HEMLOCK-PAPER BIRCH/LOWBUSH CRANBERRY
MOUNTAIN HEMLOCK-PAPER BIRCH/SITKA ALDER
MOUNTAIN HEMLOCK-PAPER BIRCH/TWINFLOWER
MOUNTAIN HEMLOCK-PAPER BIRCH/RUSTY MENZIESIA-LOWBUSH CRANBERRY

Key to the Sitka Spruce-Black Cottonwood Types

1. Sitka alder (*Alnus crispa* ssp. *sinuata*) cover is at least 15%.
SITKA SPRUCE-BLACK COTTONWOOD/SITKA ALDER
1. Sitka alder cover is less than 15%.
SITKA SPRUCE-BLACK COTTONWOOD/undefined
(Compare against listing and descriptions of undersampled Sitka spruce-black cottonwood types)

Listed below are undersampled Sitka spruce-black cottonwood community types:

SITKA SPRUCE-BLACK COTTONWOOD/SPLENDID FEATHER MOSS

Key to the Tall Scrub Types

1. Sitka alder (*Alnus crispa* ssp. *sinuata*) cover is at least 15%.
 2. Salmonberry (*Rubus spectabilis*) cover is at least 5%.
 3. Lady fern (*Athyrium filix-femina*) cover is at least 5%.
SITKA ALDER-SALMONBERRY/LADY FERN
 3. Lady fern cover is less than 5%.
SITKA ALDER-SALMONBERRY
 2. Salmonberry cover is less than 5%.
 4. Feltleaf willow (*Salix alaxensis*) cover is at least 5% and greater than or equal to any other individual willow species.
 5. Bluejoint reedgrass (*Calamagrostis canadensis*) cover is at least 5%.
SITKA ALDER-FELTLEAF WILLOW/BLUEJOINT REEDGRASS
 5. Bluejoint reedgrass cover is less than 5%.
SITKA ALDER-FELTLEAF WILLOW
 4. Feltleaf willow cover is less than 5%.
 6. Sitka willow (*S. sitchensis*) cover is at least 5% and greater than or equal to any other individual willow species.
 7. Bluejoint reedgrass cover is at least 5%.
SITKA ALDER-SITKA WILLOW/BLUEJOINT REEDGRASS
 7. Bluejoint reedgrass cover is less than 5%.
SITKA ALDER-SITKA WILLOW
 6. Sitka willow cover is less than 5%.

- 8a. Barclay willow (*S. barclayi*) cover is at least 15%.
SITKA ALDER-BARCLAY WILLOW
- 8b. Undergreen willow (*S. commutata*) and/or low blueberry willow (*S. myrtillifolia*) cover greater than or equal to any other individual willow species.
SITKA ALDER-UNDERGREEN WILLOW
- 8c. Devil's club (*Echinopanax horridum*) cover is at least 5%.
SITKA ALDER-DEVILS CLUB
- 8d. Wood fern (*Dryopteris dilatata*) cover is at least 5%.
SITKA ALDER/WOOD FERN
- 8e. Common horsetail (*Equisetum arvense*), meadow horsetail (*E. pratense*) and/or northern horsetail (*E. variegatum*) cover is at least 25%.
SITKA ALDER/COMMON HORSETAIL
- 8f. Bluejoint reedgrass cover is at least 5%.
SITKA ALDER/BLEUEJOINT REEDGRASS
- 8g. Lady fern cover is at least 5%.
SITKA ALDER/LADY FERN
- 8h. Lady fern cover is less than 5%.
SITKA ALDER/undefined
(Compare against listing and descriptions of undersampled Tall Scrub types)

1. Sitka alder cover is less than 15%.

9. Tall willow species (*Salix* sp.), individually or combined, with at least 25% cover.

10a. Feltleaf willow cover greater than or equal to any other individual willow species.

FELTLEAF WILLOW

10b. Hooker willow (*S. hookeriana*) cover greater than or equal to any other individual willow species.

HOOKEE WILLOW

- 10c. Barclay willow and/or Sitka willow cover greater than any other individual willow species.
- 11a. Sitka sedge (*C. sitchensis*), marsh fivefinger (*Potentilla palustris*), and/or buckbean (*Menyanthes trifoliata*), individually or combined, with at least 25% cover.
BARCLAY WILLOW/SITKA SEDGE
- 11b. Bluejoint reedgrass cover is at least 5%.
BARCLAY WILLOW/BLUEJOINT REEDGRASS
- 11c. Sitka willow cover greater than any other individual willow species.
SITKA WILLOW
- 11d. Common horsetail, lady fern, and/or bent-leaved angelica (*Angelica genuflexa*), individually or combined, with greater than 25% cover.
BARCLAY WILLOW/mixed herb
- 11e. Common horsetail, lady fern, and bent-leaved angelica, individually or combined, with less than 25% cover.
BARCLAY WILLOW/undefined
(Compare against listing and descriptions of undersampled Tall Scrub types)
- 10d. Undergreen willow and/or low blueberry willow (*S. myrtillofolia*) cover greater than or equal to any other individual willow species.
UNDERGREEN WILLOW
- 10e. Undergreen willow and/or low blueberry willow cover not greater any other individual willow species.
WILLOW/undefined
(Compare against listing and descriptions of undersampled Tall Scrub types)
9. Tall willow species, individually or combined, with less than 25% cover.
undefined Tall Scrub types
(Compare against listing and descriptions of undersampled Tall Scrub types)

Listed below are undersampled Tall Scrub community types:

BARCLAY WILLOW/NORTHERN HORSETAIL
SITKA ALDER/SPLENDID FEATHER MOSS

SITKA ALDER-BARCLAY WILLOW/BLUEJOINT REEDGRASS
SITKA ALDER-BARCLAY WILLOW/undefined
SITKA ALDER-SALMONBERRY/undefined

Key to the Low Scrub Types

1. Salmonberry (*Rubus spectabilis*) cover is at least 15%.
 - 2a. Bluejoint reedgrass (*Calamagrostis canadensis*) cover at least 5%.
SALMONBERRY/BLUEJOINT REEDGRASS
 - 2b. Lady fern (*Athyrium filix-femina*) cover at least 15%.
SALMONBERRY/LADY FERN
 - 2c. Lady fern cover is less than 15%.
SALMONBERRY
1. Salmonberry cover is less than 15%.
 3. Sweetgale (*Myrica gale*) cover is at least 15%.
 4. Tall willow species (*Salix* sp.), individually or combined, with at least 25% cover.
 - 5a. Hooker willow (*S. hookeriana*) cover greater than or equal to any other individual willow species.
SWEETGALE-HOOKER WILLOW
 - 5b. Barclay willow (*S. barclayi*) cover greater than or equal to any other individual willow species.
SWEETGALE-BARCLAY WILLOW
 - 5c. Undergreen willow (*S. commutata*) or low blueberry willow (*S. myrtilifolia*) cover greater than or equal to any other individual willow species.
SWEETGALE-UNDERGREEN WILLOW

5d. Undergreen willow and/or low blueberry willow cover not greater than any other individual willow species.

SWEETGALE-WILLOW/undefined

(Compare against listing and descriptions of undersampled Low Scrub types)

4. Tall willow species, individually or combined, with less than 25% cover.

6a. Lyngbye's sedge (*Carex lyngbyei*) with at least 25% cover.

SWEETGALE/LYNGBYE'S SEDGE

6b. Tufted bulrush (*Trichophorum caespitosum*) or tall cottongrass (*Eriophorum angustifolium*) cover is at least 15%.

SWEETGALE/TALL COTTONGRASS

6c. Sitka sedge (*C. sitchensis*), marsh fivefinger (*Potentilla palustris*), and buckbean (*Menyanthes trifoliata*), individually or combined, with at least 25% cover.

SWEETGALE/SITKA SEDGE

6d. Bluejoint reedgrass cover is at least 5%.

SWEETGALE/BLUEJOINT REEDGRASS

6e. Bluejoint reedgrass cover is less than 5%.

SWEETGALE/undefined

(Compare against listing and descriptions of undersampled Low Scrub types)

3. Sweetgale cover is less than 15%.

7a. Dwarf birch (*Betula nana* or *B. glandulosa*) cover is at least 5%.

DWARF BIRCH

7b. Copperbush (*Cladothamnus pyroliflorus*) cover is at least 15%.

COPPERBUSH

7c. Copperbush cover is less than 15%.

undefined Low Scrub types

(Compare against listing and descriptions of undersampled Low Scrub types)

Listed below are undersampled Low Scrub community types:

SWEETGALE-CROWBERRY
SWEETGALE-FELTLEAF WILLOW
SWEETGALE/NORTHERN HORSETAIL
SWEETGALE/TALL FIREWEED

Key to the Dwarf Scrub Types

1. Arctic willow (*Salix arctica*) cover is at least 5%.
 - 2a. Crowberry (*Empetrum nigrum*) and/or lowbush cranberry (*Vaccinium vitis-idaea*) cover is at least 5%.
ARCTIC WILLOW-CROWBERRY
 - 2b. Lyngbye's sedge (*Carex lyngbyei*) cover is at least 5%.
ARCTIC WILLOW/LYNGBYE'S SEDGE
 - 2c. Lyngbye's sedge (*Carex lyngbyei*) cover is less than 5%.
ARCTIC WILLOW/undefined
(Compare against listing and descriptions of undersampled Dwarf Scrub types)
1. Arctic willow is less than 5%.
 3. Aleutian mountain heath (*Phyllodoce aleutica*) cover is at least 15%.
 - 4a. Deer cabbage (*Fauria crista-galli*) cover is at least 5%.
ALEUTIAN MOUNTAIN HEATH/DEER CABBAGE
 - 4b. Steller's cassiope (*Cassiope stelleriana*), white arctic mountain heather (*C. tetragona*), and/or luetkea (*Luetkea pectinata*) cover is at least 15%.
ALEUTIAN MOUNTAIN HEATH-STELLER'S CASSIOPE

- 4c. Steller's cassiope, white arctic mountain heather, and/or luetkea cover is less than 15%.
ALEUTIAN MOUNTAIN HEATH/undefined
 (Compare against listing and descriptions of undersampled Dwarf Scrub types)
3. Aleutian mountain heath cover is less than 15%.
5. Steller's cassiope, white arctic mountain heather, and/or luetkea cover is at least 15%.
6. Deer cabbage cover is at least 5%.
STELLER'S CASSIOPE-LUETKEA/DEER CABBAGE
6. Deer cabbage cover is less than 5%.
STELLER'S CASSIOPE-LUETKEA
5. Steller's cassiope, white arctic mountain heather, and/or luetkea cover is less than 15%.
7. Crowberry (*Empetrum nigrum*) cover is at least 5%.
8. Bog blueberry (*Vaccinium uliginosum*) cover is at least 5%.
- 9a. Tufted bulrush (*Trichophorum caespitosum*) cover is at least 5%.
CROWBERRY-BOG BLUEBERRY/TUFTED BULRUSH
- 9b. Deer cabbage cover is at least 5%.
CROWBERRY-BOG BLUEBERRY/DEER CABBAGE
- 9c. Manyflower sedge (*Carex pluriflora*) cover is at least 5%.
CROWBERRY-BOG BLUEBERRY/MANYFLOWER SEDGE
- 9d. Alpine bearberry (*Arctostaphylos alpina*) cover is at least 5%.
CROWBERRY-ALPINE BEARBERRY
- 9e. Alpine bearberry cover is less than 5%.
CROWBERRY-BOG BLUEBERRY

- 8. Bog blueberry cover is less than 5%.
CROWBERRY
- 7. Crowberry cover is less than 5%.
- 10. Least willow (*Salix rotundifolia*) cover is at least 5%.
 - 11. Smallawned sedge (*Carex microchaeta*) cover is at least 5%.
LEAST WILLOW/SMALLAWNED SEDGE
 - 11. Smallawned sedge cover is less than 5%.
LEAST WILLOW/undefined
(Compare against listing and descriptions of undersampled Dwarf Scrub types)
- 10. Least willow cover is less than 5%.
 - 12a. Netleaf willow (*Salix reticulata*) cover is at least 5%.
NETLEAF WILLOW/ROUGH FESCUE
 - 12b. White mountain-avens (*Dryas octopetala*) cover is at least 5%.
WHITE MOUNTAIN AVENS/ALPINE HOLY GRASS
 - 12c. White mountain-avens cover is less than 5%.
undefined Dwarf Scrub types
(Compare against listing and descriptions of undersampled Dwarf Scrub types)

Listed below are undersampled Dwarf Scrub community types:

ALEUTIAN MOUNTAIN HEATH/undefined
 ARCTIC WILLOW/undefined
 LEAST WILLOW/ALPINE AVENS
 LEAST WILLOW/undefined
 CROWBERRY/undefined

Key to the Graminoid Herbaceous Types

1. Tall cottongrass (*Eriophorum angustifolium*) cover is at least 15%.
 - 2a. Fewflower sedge (*Carex pauciflora*) cover is at least 5%.
TALL COTTONGRASS-FEWFLOWER SEDGE
 - 2b. Manyflower sedge (*Carex pluriflora*) cover is at least 5%.
TALL COTTONGRASS-MANYFLOWER SEDGE
 - 2c. Tufted bulrush (*Trichophorum caespitosum*) cover is at least 5%.
TALL COTTONGRASS-TUFTED BULRUSH
 - 2d. Tufted bulrush cover is less than 5%.
TALL COTTONGRASS/undefined
(Compare against listing and descriptions of undersampled Graminoid Herbaceous types)
1. Tall cottongrass cover is less than 15%.
 3. Individual sedge (*Carex* sp.) species with the greatest canopy cover or sedge species and vetchling (*Lathyrus palustris*) codominate the site.
 - 4a. Beaked sedge (*C. rostrata*) with the greatest cover.
BEAKED SEDGE
 - 4b. Manyflower sedge cover is at least 25%.
MANYFLOWER SEDGE
 - 4c. Sitka sedge (*C. sitchensis*) with the greatest cover.
SITKA SEDGE
 - 4d. Lyngbye's sedge (*C. lyngbyei*) with the greatest cover, or codominating the community with vetchling.

- 5a. Tidally influenced, or one of the following salt-tolerant species present: alkaligrass (*Puccinellia* sp.) species, Mackenzie's sedge (*C. mackenziei*), goosetongue plantain (*Plantago maritima*), seaside arrowgrass (*Triglochin maritimum*), and seaside buttercup (*Ranunculus cymbalaria*).
LYNGBYE'S SEDGE/SEASIDE BUTTERCUP
- 5b. Vetchling cover is at least 25%.
LYNGBYE'S SEDGE/VETCHLING
- 5c. Herbaceous cover, other than Lyngbye's sedge with at least 25% cover.
LYNGBYE'S SEDGE/MIXED HERB
- 5d. Herbaceous cover other than Lyngbye's sedge with less than 25% cover.
LYNGBYE'S SEDGE
- 4e. Water sedge (*C. aquatilis*) cover is at least 25%.
WATER SEDGE
- 4f. Fewflower sedge (*C. pauciflora*) cover is at least 25%.
FEWFLOWER SEDGE
- 4g. Smallawned sedge (*C. microchaeta*) cover is at least 25%.
SMALLAWNED SEDGE
- 4h. Boreal bog sedge (*C. magellanica*) and/or longawned sedge (*C. macrochaeta*) cover is at least 25%.
LONGAWNED SEDGE
- 4i. Boreal bog sedge cover is less than 25%.
CAREX/undefined
(Compare against listing and descriptions of undersampled Graminoid Herbaceous types)
- 3. Individual sedge species without the greatest canopy cover or sedge species and vetchling do not codominate the site.
 - 6a. Common spikerush (*Eleocharis palustris*) with the greatest cover.
COMMON SPIKERUSH

- 6b. Pendent grass (*Arctophila fulva*) with the greatest cover.
PENDENT GRASS
- 6c. Tufted bulrush (*Trichophorum caespitosum*) and/or *Sphagnum* sp. cover is at least 15%.
TUFTED BULRUSH
- 6d. Dwarf alkaligrass (*Puccinellia pumila*) or Pacific alkaligrass (*P. nutkaensis*), individually or combined, with the greatest cover.
DWARF ALKALIGRASS
- 6e. Rough fescue (*Festuca altaica*) cover is at least 15%.
7. Northern geranium (*Geranium erianthum*) and/or tall fireweed (*Epilobium angustifolium*) cover is at least 5%.
ROUGH FESCUE/NORTHERN GERANIUM
7. Northern geranium (*Geranium erianthum*) and/or tall fireweed (*Epilobium angustifolium*) cover is less than 5%.
ROUGH FESCUE
- 6f. Tufted hairgrass (*Deschampsia cespitosa*) with the greatest cover.
TUFTED HAIRGRASS
- 6g. Beach rye (*Elymus arenarius*) cover is at least 15%.
8. Bryophytes (mosses or liverworts) with at least 15% cover, or beach strawberry (*Fragaria chiloensis*) and yarrow (*Achillea borealis*), individually or combined, with at least 5% canopy cover.
BEACH RYE/YARROW
8. Bryophytes (mosses or liverworts) with less than 15% cover, or strawberry and yarrow, individually or combined, with less than 5% canopy cover.
BEACH RYE
- 6h. Bluejoint reedgrass (*Calamagrostis canadensis*) cover is at least 15%.
9. Willow sp. (*Salix* sp.) cover is at least 15%.
BLUEJOINT REEDGRASS/WILLOW

9. Willow sp. cover is less than 15%
BLUEJOINT REEDGRASS
- 6i. Wahlenberg's woodrush (*Luzula wahlenbergii*) cover is at least 5%.
WAHLENBERG'S WOODRUSH
- 6j. Wahlenberg's woodrush cover is less than 5%.
undefined Graminoid Herbaceous types
 (Compare against listing and descriptions of undersampled Graminoid Herbaceous types)

Listed below are undersampled Graminoid Herbaceous community types:

ALPINE RUSH (*Juncus alpinus*)
 ARCTIC RUSH (*J. arcticus*)
 BEACH RYE/BLEUJOINT REEDGRASS
 BLEUJOINT REEDGRASS/TALL FIREWEED
 CREEPING SEDGE (*Carex chordorrhiza*)
 BLADDER BEAKED SEDGE (*Carex rhynchosphysa*)
 COMMON WOODRUSH (*Luzula multiflora*)
 COTTONGRASS/undefined
 FALSE MANNAGRASS (*Glyceria pauciflora*)
 FEWSEEDED BOG SEDGE (*C. microglochin*)
 LESSER SALTMARSH SEDGE (*C. glareosa*)
 MUD SEDGE (*C. limosa*)
 RED COTTONGRASS (*Eriophorum russeolum*)
 ROCK SEDGE (*C. saxatilis*)
 ROUGH FESCUE/BLEUJOINT REEDGRASS
 SITKA SEDGE/SPHAGNUM

Key to the Forb Herbaceous Types

- 1a. Swamp horsetail (*Equisetum fluviatile*) with the greatest cover of any vascular plant.
SWAMP HORSETAIL
- 1b. Marsh fivefinger (*Potentilla palustris*) with the greatest cover of any vascular plant.
MARSH FIVEFINGER
- 1c. Buckbean (*Menyanthes trifoliata*) with the greatest cover of any vascular plant.
BUCKBEAN
- 1d. Pacific silverweed (*Potentilla egedii*) with the greatest cover of any vascular plant.
PACIFIC SILVERWEED
- 1e. Northern horsetail (*Equisetum variegatum*) with the greatest cover of any vascular plant.
NORTHERN HORSETAIL
- 1f. Beach pea (*Lathyrus maritimus*) with the greatest cover of any vascular plant.
BEACH PEA
- 1g. Beach strawberry (*Fragaria chiloensis*) with the greatest cover of any vascular plant.
BEACH STRAWBERRY
- 1h. Deer cabbage (*Fauria crista-galli*) cover is at least 15%.
 - 2. Tufted bulrush (*Trichophorum caespitosum*) cover is at least 15%.
DEER CABBAGE/TUFTED BULRUSH
 - 2. Tufted bulrush cover is less than 15%.
DEER CABBAGE
- 1i. Tall fireweed (*Epilobium angustifolium*) with the greatest cover of any vascular plant.
TALL FIREWEED

- 1j. Sitka valerian (*Valeriana sitchensis*) cover is at least 25%.
SITKA VALERIAN
- 1k. False hellebore (*Veratrum viride*) cover is at least 25%.
FALSE HELLEBORE
- 1l. Boreal bog sedge (*Carex magellanica*) and/or longawned sedge (*C. macrochaeta*) cover is at least 25%.
LONGAWNED SEDGE
- 1m. Nootka lupine (*Lupinus nootkatensis*) with the greatest cover of any vascular plant.
NOOTKA LUPINE
- 1n. Common horsetail (*Equisetum arvense*) with the greatest cover of any vascular plant.
COMMON HORSETAIL
- 1o. Lady fern (*Athyrium filix-femina*) cover is at least 25%.
LADY FERN
- 1p. Lady fern cover is less than 25%.
undefined Forb Herbaceous types

Listed below are undersampled forb herbaceous community types:

ALPINE WILLOWHERB (*Epilobium anagallidifolium*)
 DEER CABBAGE/ARCTIC SEDGE (*Carex anthoxantha*)
 DWARF FIREWEED (*E. latifolium*)
 ALPINE WILLOWHERB (*Epilobium adenocaulon*)
 FOURLEAF MARESTAIL (*Hippuris tetraphylla*)
 MARSH HORSETAIL (*Equisetum palustre*)
 SEASIDE SANDPLANT (*Honckenya peploides*)

Key to the Aquatic Herbaceous Types

- 1a. Slender-leaved pondweed (*Potamogeton filiformis*) with the greatest cover.
SLENDER LEAVED PONDWEED
- 1b. Shortspike watermilfoil (*Myriophyllum sibiricum*) with the greatest cover.
SHORTSPIKE WATERMILFOIL
- 1c. Northern waterstarwort (*Callitriche hermaphroditica*) with the greatest cover.
NORTHERN WATERSTARWORT
- 1d. Whitewater crowfoot (*Ranunculus trichophyllus*) with the greatest cover.
WHITEWATER CROWFOOT
- 1e. Claspingleaf pondweed (*Potamogeton perfoliatus*) with the greatest cover.
CLASPINGLEAF PONDWEED
- 1f. Awlwort (*Subularia aquatica*) with the greatest cover.
AWLWORT
- 1g. Burreed (*Sparganium* sp.) species with the greatest cover of any vascular plant.
SPARGANIUM sp.
- 1h. Common marestalk (*Hippuris vulgaris*) with the greatest cover of any vascular plant.
COMMON MARESTAIL
- 1i. Common bladderwort (*Utricularia vulgaris*) with the greatest cover.
COMMON BLADDERWORT
- 1j. Common bladderwort without the greatest cover.
undefined Aquatic Herbaceous types
(Compare against listing and descriptions of undersampled aquatic herbaceous types)

Listed below are undersampled aquatic herbaceous community types:

Chara sp. (an alga)

SAGO PONDWEED (*Potamogeton pectinatus*)

YELLOW POND LILY (*Nuphar polysepala*)

APPENDIX B

List of all plant species identified in this study including their Chugach National Forest code name, their NRCS (1997) code name, their scientific name, and the number of sample plots on which the species was observed (out of a total of 2293 plots).

Chugach Code	NRCS Code	Scientific Name	Count
TREES			
BETPAPU		<i>Betula papyrifera</i> - understory	146
BETPAP	BEPA	<i>Betula papyrifera</i> Marsh.	262
CHANO	CHNO	<i>Chamaecyparis nootkatensis</i> (D. Don) Spach	10
CHANOOU		<i>Chamaecyparis nootkatensis</i> - understory	2
PICLUT	PILU	<i>Picea X lutzii</i> Little	454
PICLUTU		<i>Picea X lutzii</i> - understory	354
PICMAR	PIMA	<i>Picea mariana</i> (P. Mill.) B.S.P.	36
PICMARU		<i>Picea mariana</i> - understory	29
PICSIT	PISI	<i>Picea sitchensis</i> (Bong.) Carr.	587
PICSITU		<i>Picea sitchensis</i> - understory	298
POPBALU		<i>Populus balsamifera</i> ssp. <i>trichocarpa</i> - understory	82
POPBAL	POBAT	<i>Populus balsamifera</i> ssp. <i>trichocarpa</i> (Torr. & Gray ex Hook.) Brayshaw	143
POPTREU		<i>Populus tremuloides</i> - understory	44
POPTRE	POTR5	<i>Populus tremuloides</i> Michx.	41
SALDEPRU		<i>Salix depressa rostrata</i> - understory	16
SALDEPR	SADER	<i>Salix depressa</i> ssp. <i>rostrata</i> (Richards.) Hiitonen	14
SALSCOU		<i>Salix scouleriana</i> - understory	52
SALSCO	SASC	<i>Salix scouleriana</i> Barratt ex Hook.	69
TSUHET	TSHE	<i>Tsuga heterophylla</i> (Raf.) Sarg.	279
TSUHETU		<i>Tsuga heterophylla</i> - understory	211
TSUMER	TSME	<i>Tsuga mertensiana</i> (Bong.) Carr.	703
TSUMERU		<i>Tsuga mertensiana</i> - understory	524
TALL SHRUBS			
ALNCRIS	ALCRS	<i>Alnus crispa</i> ssp. <i>sinuata</i> (Regel) Hultén	682
AMELAN	AMELA	<i>Amelanchier</i> Medik.	7
BETULA	BETUL	<i>Betula</i> L.	20
BETNAN	BENA	<i>Betula nana</i> L.	43

CLAPYR	CLPY3	<i>Cladothamnus pyroliflorus</i> Bong.	188
ECHHOR	ECHO2	<i>Echinopanax horridum</i> (Sm.) Dcne. & Planch.	741
LONINV	LOIN5	<i>Lonicera involucrata</i> Banks ex Spreng.	1
MALFUS	MAFU	<i>Malus fusca</i> (Raf.) Schneid.	15
MENFER	MEFE	<i>Menziesia ferruginea</i> Sm.	795
MYRGAL	MYGA	<i>Myrica gale</i> L.	139
PHYCAP	PHCA11	<i>Physocarpus capitatus</i> (Pursh) Kuntze	1
POTFRU	POFR4	<i>Potentilla fruticosa</i> auct. non L.	20
RIBES	RIBES	<i>Ribes</i> L.	89
RIBBRA	RIBR	<i>Ribes bracteosum</i> Dougl. ex Hook.	37
RIBGLA	RIGL	<i>Ribes glandulosum</i> Grauer	8
RIBHUD	RIHU	<i>Ribes hudsonianum</i> Richards.	33
RIBLAC	RILA	<i>Ribes lacustre</i> (Pers.) Poir.	7
RIBLAX	RILA3	<i>Ribes laxiflorum</i> Pursh	82
RIBTRI	RITR	<i>Ribes triste</i> Pallas	106
ROSACI	ROAC	<i>Rosa acicularis</i> Lindl.	131
RUBIDA	RUID	<i>Rubus idaeus</i> L.	45
RUBSPE	RUSP	<i>Rubus spectabilis</i> Pursh	536
SALIX	SALIX	<i>Salix</i> L.	52
SALALA	SAAL	<i>Salix alaxensis</i> (Anderss.) Coville	96
SALBAR	SABA3	<i>Salix barclayi</i> Anderss.	247
SALBRAN	SABRN	<i>Salix brachycarpa</i> ssp. <i>niphoclada</i> (Rydb.) Argus	1
SALCOM	SACO2	<i>Salix commutata</i> Bebb	120
SALGLA	SAGL	<i>Salix glauca</i> L.	1
SALHOO	SAHO	<i>Salix hookeriana</i> Barratt ex Hook.	52
SALLAS	SALA5	<i>Salix lasiandra</i> Benth.	2
SALPUL	SAPU15	<i>Salix pulchra</i> Cham.	12
SALSIT	SASI2	<i>Salix sitchensis</i> Sanson ex Bong.	137
SAMRAC	SARA2	<i>Sambucus racemosa</i> L.	221
SHECAN	SHCA	<i>Shepherdia canadensis</i> (L.) Nutt.	12
SORBUS	SORBU	<i>Sorbus</i> L.	5
SORSO	SOSC2	<i>Sorbus scopulina</i> Greene	72
SORSIT	SOSI2	<i>Sorbus sitchensis</i> M. Roemer	214
VACOVA	VAOV	<i>Vaccinium ovalifolium</i> Sm.	805
VIBEDU	VIDE	<i>Viburnum edule</i> (Michx.) Raf.	258
LOW AND DWARF SHRUBS			
ANDPOL	ANPO	<i>Andromeda polifolia</i> L.	118
ARCALP	ARAL2	<i>Arctostaphylos alpina</i> (L.) Spreng.	43
ARCRUB	ARRU	<i>Arctostaphylos rubra</i> (Rehd. & Wilson) Fern.	4

ARCUVA	ARUV	<i>Arctostaphylos uva-ursi</i> (L.) Spreng.	34
CASLYC	CALY4	<i>Cassiope lycopodioides</i> (Pallas) D. Don	1
CASMER	CAME7	<i>Cassiope mertensiana</i> (Bong.) D. Don	5
CASSTE	CAST33	<i>Cassiope stelleriana</i> (Pallas) DC.	223
CASTET	CATE11	<i>Cassiope tetragona</i> (L.) D. Don	11
CHACAL	CHCA2	<i>Chamaedaphne calyculata</i> (L.) Moench	2
DIALAP	DILA	<i>Diapensia lapponica</i> L.	72
DRYOCT	DROC	<i>Dryas octopetala</i> L.	40
EMPNIG	EMNI	<i>Empetrum nigrum</i> L.	558
JUNCOM	JUCO6	<i>Juniperus communis</i> L.	10
KALPOL	KAPO	<i>Kalmia polifolia</i> Wangerh.	3
LEDPAL	LEPA11	<i>Ledum palustre</i> L.	134
LINBOR	LIBO3	<i>Linnaea borealis</i> L.	347
LOIPRO	LOPR	<i>Loiseleuria procumbens</i> (L.) Desv.	105
LUEPEC	LUPE	<i>Luetkea pectinata</i> (Pursh) Kuntze	169
OXYMIC	OXMI3	<i>Oxycoccus microcarpus</i> Turcz. ex Rupr	89
PHYALE	PHAL4	<i>Phylodoce aleutica</i> (Spreng.) Heller	122
SALARC	SAAR4	<i>Salix arctica</i> Liebm., non Pallas	75
SALFUS	SAFU	<i>Salix fuscescens</i> Anderss.	4
SALMYR	SAMY	<i>Salix myrtilifolia</i> Anderss.	37
SALOVA	SAOV	<i>Salix ovalifolia</i> Trautv.	3
SALPHL	SAPH	<i>Salix phlebophylla</i> Anderss.	3
SALRET	SARE2	<i>Salix reticulata</i> L.	24
SALROT	SARO2	<i>Salix rotundifolia</i> Trautv.	44
SALSET	SASE4	<i>Salix setchelliana</i> Ball	1
SALSTO	SAST2	<i>Salix stolonifera</i> Coville	1
SPIBEA	SPBE	<i>Spiraea beauverdiana</i> auct. non Schneid.	176
VACCAE	VACE	<i>Vaccinium caespitosum</i> Michx.	201
VACULI	VAUL	<i>Vaccinium uliginosum</i> L.	259
VACVIT	VAVI	<i>Vaccinium vitis-idaea</i> L.	478

FORBS

ACHBOR	ACBO	<i>Achillea borealis</i> Bong.	126
ACODEL	ACDE2	<i>Aconitum delphinifolium</i> DC.	116
ACTRUB	ACRU2	<i>Actaea rubra</i> (Ait.) Willd.	61
ADOMOS	ADMO	<i>Adoxa moschatellina</i> L.	1
ALLSCH	ALSC	<i>Allium schoenoprasum</i> L.	1
ANAMAR	ANMA	<i>Anaphalis margaritacea</i> (L.) Benth. & Hook. f.	3
ANEMON	ANEMO	<i>Anemone</i> L.	14
ANENAR	ANNA	<i>Anemone narcissiflora</i> L.	143

ANEPAR	ANPA	<i>Anemone parviflora</i> Michx.	6
ANERIC	ANRI	<i>Anemone richardsonii</i> Hook.	28
ANGELI	ANGEL	<i>Angelica</i> L.	3
ANGGEN	ANGE2	<i>Angelica genuflexa</i> Nutt.	31
ANGLUC	ANLU	<i>Angelica lucida</i> L.	57
ANTTEN	ANTEN	<i>Antennaria</i> Gaertn.	4
ANTMON	ANMO9	<i>Antennaria monocephala</i> DC.	29
APABOR	APBO	<i>Apargidium boreale</i> (Bong.) Torr. & Gray	22
AQUFOR	AQFO	<i>Aquilegia formosa</i> Fisch. ex DC.	25
ARABIS	ARABI2	<i>Arabis</i> L.	3
ARADIV	ARDI2	<i>Arabis</i> X <i>divaricarpa</i> A. Nels. (pro sp.)	4
ARADRU	ARDR	<i>Arabis drummondii</i> Gray	7
ARAHIR	ARHI	<i>Arabis hirsuta</i> (L.) Scop.	4
ARALYR	ARLY2	<i>Arabis lyrata</i> L.	10
ARNICA	ARNIC	<i>Arnica</i> L.	24
ARNLAT	ARLA8	<i>Arnica latifolia</i> Bong.	16
ARNLES	ARLE2	<i>Arnica lessingii</i> (Torr. & Gray) Greene	4
ARTEME	ARTEM	<i>Artemisia</i> L.	9
ARTARC	ARAR9	<i>Artemisia arctica</i> Less.	160
ARTTIL	ARTI	<i>Artemisia tilesii</i> Ledeb.	21
ARUSYL	ARSY2	<i>Aruncus sylvester</i> Kostel.	71
ASTER	ASTER	<i>Aster</i> L.	9
ASTJUN	ASJU	<i>Aster junciformis</i> Rydb.	1
ASTSUB	ASSU4	<i>Aster subspicatus</i> Nees	7
ASTRAG	ASTRA	<i>Astragalus</i> L.	1
ASTALP	ASAL7	<i>Astragalus alpinus</i> L.	2
ATRALA	ATAL	<i>Atriplex alaskensis</i> S. Wats.	1
BOSROS	BORO	<i>Boschniakia rossica</i> (Cham. & Schlecht.) Fedtsch.	29
BRACAM	BRCA2	<i>Brassica campestris</i> L.	1
CALHER	CAHE2	<i>Callitriche hermaphroditica</i> L.	13
CALVER	CAVE2	<i>Callitriche verna</i> L.	15
CALTHA	CALTH	<i>Caltha</i> L.	2
CALBIF	CABI2	<i>Caltha biflora</i> DC.	2
CALLEP	CALE4	<i>Caltha leptosepala</i> DC.	5
CALPAL	CAPA5	<i>Caltha palustris</i> L.	36
CAMLAS	CALA7	<i>Campanula lasiocarpa</i> Cham.	55
CAMROT	CARO2	<i>Campanula rotundifolia</i> L.	22
CAMUNI	CAUN2	<i>Campanula uniflora</i> L.	1
CARDAM	CARDA	<i>Cardamine</i> L.	8
CARBEL	CABE	<i>Cardamine bellidifolia</i> L.	1

CARMICP	CAMI3	Cardamine microphylla M.F. Adams	2
CARPRA	CAPRA	Cardamine pratensis var. angustifolia Hook.	2
CARUMB	CAUM3	Cardamine umbellata Greene	13
CASUNA	CAUN4	Castilleja unalaschcensis (Cham. & Schlecht.) Malte	62
CERAST	CERAS	Cerastium L.	4
CERARV	CEAR4	Cerastium arvense L.	4
CERBEE	CEBE2	Cerastium beeringianum Cham. & Schlecht.	2
CERFON	CEFO2	Cerastium fontanum Baumg.	2
CHRARC	CHAR13	Chrysanthemum arcticum auct. non L.	8
CHRLEU	CHLE80	Chrysanthemum leucanthemum L.	1
CHRTET	CHTE3	Chrysosplenium tetrandrum (Lund ex Malmgr.) Th. Fries	1
CICDOU	CIDO	Cicuta douglasii (DC.) Coult. & Rose	35
CICMAC	CIMA	Cicuta mackenzieana Raup	19
CIRALP	CIAL	Circaea alpina L.	59
CLASIB	CLSI2	Claytonia sibirica L.	3
COEVIR	COVI6	Coeloglossum viride (L.) Hartman	11
CONCHI	COCH2	Conioselinum chinense (L.) BSP.	15
COPASP	COAS	Coptis aspleniifolia Salisb.	202
COPTRI	COTR2	Coptis trifolia (L.) Salisb.	149
CORTRI	COTR3	Corallorrhiza trifida Chatelain	6
CORCAN	COCA13	Cornus canadensis L.	1059
DACARI	DAAR	Dactylorhiza aristata (Fisch. ex Lindl.) Soo	1
DELGLA	DEGL3	Delphinium glaucum S. Wats.	23
DODECA	DODEC	Dodecatheon L.	17
DODJEF	DOJE	Dodecatheon jeffreyi Van Houtte	8
DODPUL	DOPU	Dodecatheon pulchellum (Raf.) Merr.	59
DRABAX	DRABA	Draba L.	5
DRAAUR	DRAU	Draba aurea Vahl ex Hornem.	4
DRASTE	DRST2	Draba stenoloba Ledeb.	1
DROSER	DROSE	Drosera L.	2
DROANG	DRAN	Drosera anglica Huds.	6
DROROT	DRRO	Drosera rotundifolia L.	96
EPILOB	EPILO	Epilobium L.	83
EPIADE	EPAD	Epilobium adenocaulon Hausskn.	29
EPIANA	EPAN4	Epilobium anagallidifolium Lam.	11
EPIANG	EPAN2	Epilobium angustifolium L.	451
EPIBEH	EPBE3	Epilobium behringianum Hausskn.	3
EPIGLA	EPGL4	Epilobium glandulosum Lehm.	15
EPIHOR	EPHO	Epilobium hornemannii Reichenb.	16
EPIILAC	EPLA3	Epilobium lactiflorum Hausskn.	2

EPILAT	EPLA	<i>Epilobium latifolium</i> L.	63
EPILEP	EPLE	<i>Epilobium leptocarpum</i> Hausskn.	10
EIPAL	EPPA	<i>Epilobium palustre</i> L.	34
EPISER	EPSE4	<i>Epilobium sertulatum</i> Hausskn.	5
ERIGER	ERIGE2	<i>Erigeron</i> L.	2
ERIACRP	ERACP2	<i>Erigeron acris</i> ssp. <i>politus</i> (Fries) Schinz & R. Keller	4
ERIPER	ERPE3	<i>Erigeron peregrinus</i> (Banks ex Pursh) Greene	118
EUPMOL	EUMO3	<i>Euphrasia mollis</i> (Ledeb.) Wettst.	2
FAUCRI	FACR	<i>Fauria crista-galli</i> (Menzies ex Hook.) Makino	324
FRACHI	FRCH	<i>Fragaria chiloensis</i> (L.) P. Mill.	14
FRICAM	FRCA5	<i>Fritillaria camschatcensis</i> (L.) Ker-Gawl.	58
GALIUM	GALIU	<i>Galium</i> L.	35
GALAPA	GAAP2	<i>Galium aparine</i> L.	3
GALBOR	GABO2	<i>Galium boreale</i> L.	14
GALKAM	GAKA	<i>Galium kamschatcicum</i> Steller ex J.A. & J.H. Schultes	5
GALTRI	GATR2	<i>Galium trifidum</i> L.	104
GALTRIL	GATR3	<i>Galium triflorum</i> Michx.	118
GENTIA	GENTI	<i>Gentiana</i> L.	8
GENAMA	GEAM4	<i>Gentiana amarella</i> L. auct. p.p.	4
GENDOU	GEDO	<i>Gentiana douglasiana</i> Bong.	79
GENGLA	GEGL	<i>Gentiana glauca</i> Pallas	70
GENPLA	GEPL	<i>Gentiana platypetala</i> Griseb.	21
GENPRO	GEPR7	<i>Gentiana propinqua</i> Richards.	2
GEOLIV	GELI2	<i>Geocaulon lividum</i> (Richards.) Fern.	182
GERERI	GEER2	<i>Geranium erianthum</i> DC.	120
GEUM	GEUM	<i>Geum</i> L.	6
GEUCAL	GECA6	<i>Geum calthifolium</i> Menzies ex Sm.	173
GEUMAC	GEMA4	<i>Geum macrophyllum</i> Willd.	25
GEUROS	GERO2	<i>Geum rossii</i> (R. Br.) Ser.	9
GLAMAR	GLMA	<i>Glaux maritima</i> L.	2
GLELIT	GLLI	<i>Glehnia littoralis</i> F. Schmidt ex Miq.	1
GOOREP	GORE2	<i>Goodyera repens</i> (L.) R. Br. ex Ait. f.	3
HEDALP	HEAL	<i>Hedysarum alpinum</i> L.	7
HERLAN	HELA4	<i>Heracleum lanatum</i> Michx.	131
HEUGLA	HEGL5	<i>Heuchera glabra</i> Willd. ex Roemer & J.A. Schultes	68
HIERAC	HIERA	<i>Hieracium</i> L.	6
HIEGRA	HIGR	<i>Hieracium gracile</i> Hook.	5
HIETRI	HITR2	<i>Hieracium triste</i> Willd. ex Spreng.	19
HIPMON	HIMO2	<i>Hippuris montana</i> Ledeb.	7
HIPTET	HITE	<i>Hippuris tetraphylla</i> L. f.	2

HIPVUL	HIVU2	<i>Hippuris vulgaris</i> L.	22
HONPEP	HOPE	<i>Honckenya peploides</i> (L.) Ehrh.	14
IMPNOL	IMNO	<i>Impatiens noli-tangere</i> L.	1
IRISET	IRSE	<i>Iris setosa</i> Pallas ex Link	44
LAPPUL	LAPPU	<i>Lappula</i> Moench	1
LATMAR	LAMA3	<i>Lathyrus maritimus</i> Bigelow	14
LATPAL	LAPA4	<i>Lathyrus palustris</i> L.	63
LEPPYR	LEPY	<i>Leptarrhena pyrolifolia</i> (D. Don) R. Br. ex Ser.	5
LIGSCO	LISC3	<i>Ligusticum scoticum</i> L.	19
LISTER	LISTE	<i>Listera</i> R. Br. ex Ait. f.	28
LISBOR	LIBO4	<i>Listera borealis</i> Morong	10
LISCAU	LICA10	<i>Listera caurina</i> Piper	25
LISCOR	LICO6	<i>Listera cordata</i> (L.) R. Br. ex Ait. f.	381
LLOSER	LLSE	<i>Lloydia serotina</i> (L.) Reichenb.	11
LUPNOO	LUNO	<i>Lupinus nootkatensis</i> Donn ex Sims	206
LUPPOL	LUPO2	<i>Lupinus polyphyllus</i> Lindl.	2
LYSAME	LYAM3	<i>Lysichiton americanus</i> Hultén & St. John	170
LYSTHY	LYTH2	<i>Lysimachia thyrsoflora</i> L.	18
MAIDIL	MADI	<i>Maianthemum dilatatum</i> (Wood) A. Nels. & J.F. Macbr.	64
MALMON	MAMO6	<i>Malaxis monophylla</i> (L.) Sw.	1
MENTRI	METR3	<i>Menyanthes trifoliata</i> L.	55
MERPAN	MEPA	<i>Mertensia paniculata</i> (Ait.) G. Don	15
MIMGUT	MIGU	<i>Mimulus guttatus</i> DC.	3
MINARC	MIAR3	<i>Minuartia arctica</i> (Stev. ex Ser.) Graebn.	12
MINMAC	MIMA4	<i>Minuartia macrocarpa</i> (Pursh) Ostenf.	3
MINRUB	MIRU3	<i>Minuartia rubella</i> (Wahlenb.) Hiern	1
MITELL	MITEL	<i>Mitella</i> L.	2
MITPEN	MIPE	<i>Mitella pentandra</i> Hook.	4
MOELAT	MOLA6	<i>Moehringia lateriflora</i> (L.) Fenzl	21
MONUNI	MOUN2	<i>Moneses uniflora</i> (L.) Gray	267
MONHYP	MOHY3	<i>Monotropa hypopithys</i> L.	1
MYOALP	MYAL	<i>Myosotis alpestris</i> F.W. Schmidt	16
MYRSIB	MYSI	<i>Myriophyllum sibiricum</i> Komarov	19
NUPPOL	NUPO2	<i>Nuphar polysepala</i> Engelm.	4
OSMORH	OSMOR	<i>Osmorhiza</i> Raf.	26
OSMCHI	OSCH	<i>Osmorhiza chilensis</i> Hook. & Arn.	4
OSMDEP	OSDE	<i>Osmorhiza depauperata</i> Phil.	14
OSMPUR	OSPU	<i>Osmorhiza purpurea</i> (Coul. & Rose) Suksdorf	25
OXYDIG	OXDI3	<i>Oxyria digyna</i> (L.) Hill	5
OXYTRO	OXYTR	<i>Oxytropis</i> DC.	1

OXYCAM	OXCA4	<i>Oxytropis campestris</i> (L.) DC.	7
OXYNIG	OXNI	<i>Oxytropis nigrescens</i> (Pallas) Fisch. ex DC.	28
PARNAS	PARNA	<i>Parnassia</i> L.	1
PARPAL	PAPA8	<i>Parnassia palustris</i> L.	67
PEDICU	PEDIC	<i>Pedicularis</i> L.	38
PEDCAP	PECA2	<i>Pedicularis capitata</i> M.F. Adams	13
PEDKAN	PEKA7	<i>Pedicularis kanei</i> Dur.	21
PEDLAB	PELA	<i>Pedicularis labradorica</i> Wirsing	16
PEDLAN	PELA3	<i>Pedicularis langsдорфii</i> Fisch. ex Stev.	10
PEDPAR	PEPA4	<i>Pedicularis parviflora</i> Sm. ex Rees	50
PEDVER	PEVE	<i>Pedicularis verticillata</i> L.	10
PETASI	PETAS	<i>Petasites</i> P. Mill.	8
PETFRI	PEFR5	<i>Petasites frigidus</i> (L.) Fries	5
PETHYP	PEHY5	<i>Petasites hyperboreus</i> Rydb.	18
PETSAG	PESA5	<i>Petasites sagittatus</i> (Banks ex Pursh) Gray	2
PINGUI	PINGU	<i>Pinguicula</i> L.	4
PINVUL	PIVU	<i>Pinguicula vulgaris</i> L.	26
PLAMAC	PLMA	<i>Plantago macrocarpa</i> Cham. & Schlecht.	2
PLAMAR	PLMA3	<i>Plantago maritima</i> L.	9
PLATAN	PLATA2	<i>Platanthera</i> L.C. Rich.	69
PLACHO	PLCH3	<i>Platanthera chorisiana</i> (Cham.) Reichenb.	2
PLADIL	PLDI3	<i>Platanthera dilatata</i> (Pursh) Lindl. ex Beck	60
PLAHYP	PLHY2	<i>Platanthera hyperborea</i> (L.) Lindl.	9
PLAObT	PLOB	<i>Platanthera obtusata</i> (Banks ex Pursh) Lindl.	3
PLASAC	PLSA6	<i>Platanthera saccata</i> (Greene) Hultén	37
POLEMO	POLEM	<i>Polemonium</i> L.	2
POLACU	POAC	<i>Polemonium acutiflorum</i> Willd. ex Roemer & J.A. Schultes	36
POLPUL	POPU3	<i>Polemonium pulcherrimum</i> Hook.	3
POLYGO	POLYG4	<i>Polygonum</i> L.	1
POLAVI	POAV	<i>Polygonum aviculare</i> L.	2
POLVIV	POVI3	<i>Polygonum viviparum</i> L.	46
POTFIL	POFI2	<i>Potamogeton filiformis</i> Pers.	27
POTFRI	POFR3	<i>Potamogeton friesii</i> Rupr.	1
POTGRA	POGR8	<i>Potamogeton gramineus</i> L.	1
POTNAT	PONA4	<i>Potamogeton natans</i> L.	1
POTPEC	POPE6	<i>Potamogeton pectinatus</i> L.	2
POTPER	POPE7	<i>Potamogeton perfoliatus</i> L.	75
POTENT	POTEN	<i>Potentilla</i> L.	9
POTEGE	POEG	<i>Potentilla egedii</i> Wormsk.	97
POTNIV	PONI2	<i>Potentilla nivea</i> L.	1

POTPAL	POPA14	Potentilla palustris (L.) Scop.	170
POTVIL	POVI4	Potentilla villosa Pallas ex Pursh	8
PREALA	PRAL	Prenanthes alata (Hook.) D. Dietr.	77
PRIMUL	PRIMU	Primula L.	1
PRICUN	PRCU	Primula cuneifolia Ledeb.	11
PRIEGA	PREG	Primula egaliksensis Wormsk. ex Hornem.	3
PRISIB	PRSI	Primula sibirica Jacq.	1
PYROLA	PYROL	Pyrola L.	26
PYRASA	PYAS	Pyrola asarifolia Michx.	207
PYRCHL	PYCH	Pyrola chlorantha Sw.	59
PYRGRA	PYGR	Pyrola grandiflora Radius	45
PYRMIN	PYMI	Pyrola minor L.	13
PYRSEC	PYSE	Pyrola secunda L.	433
RANUNC	RANUN	Ranunculus L.	31
RANBON	RABO2	Ranunculus bongardii Greene	3
RANCON	RACO9	Ranunculus confervoides (Fries) Fries	4
RANCOO	RACO2	Ranunculus cooleyae Vasey & Rose	4
RANCYM	RACY	Ranunculus cymbalaria Pursh	20
RANESC	RAES	Ranunculus eschscholtzii Schlecht.	4
RANNIV	RANI	Ranunculus nivalis L.	1
RANOCC	RAOC	Ranunculus occidentalis Nutt.	10
RANPAC	RAPA	Ranunculus pacificus (Hultén) L. Benson	1
RANREP	RARE80	Ranunculus reptans L.	7
RANTRI	RATR	Ranunculus trichophyllus Chaix	37
RHIMIN	RHMI13	Rhinanthus minor L.	46
RORISL	ROIS2	Rorippa islandica (Oeder) Borb.	1
RUBUS	RUBUS	Rubus L.	3
RUBARC	RUAR	Rubus arcticus L.	245
RUBCHA	RUCH	Rubus chamaemorus L.	32
RUBPED	RUPE	Rubus pedatus Sm.	917
RUMEX	RUMEX	Rumex L.	5
RUMFEN	RUFE3	Rumex fenestratus Greene	16
RUMLON	RULO2	Rumex longifolius DC.	4
SANGUI	SANGU2	Sanguisorba L.	4
SANOFF	SAOF3	Sanguisorba officinalis L.	1
SANSTI	SAST11	Sanguisorba stipulata Raf.	250
SAXIFR	SAXIF	Saxifraga L.	15
SAXBRO	SABR6	Saxifraga bronchialis L.	29
SAXFER	SAFE	Saxifraga ferruginea Graham	2
SAXLYA	SALY3	Saxifraga lyallii Engl.	9

SAXPUN	SAPU6	<i>Saxifraga punctata</i> L. p.p.	27
SAXRIV	SARI8	<i>Saxifraga rivularis</i> L.	1
SAXSER	SASE7	<i>Saxifraga serpyllifolia</i> Pursh	1
SAXTRI	SATR5	<i>Saxifraga tricuspida</i> Rottb.	10
SEDROS	SERO2	<i>Sedum rosea</i> (L.) Scop.	13
SENECI	SENEC	<i>Senecio</i> L.	2
SENPAU	SEPA4	<i>Senecio pauciflorus</i> Pursh	4
SENPSE	SEPS	<i>Senecio pseudoarnica</i> Less.	2
SENTRI	SETR	<i>Senecio triangularis</i> Hook.	20
SIBPRO	SIPR	<i>Sibbaldia procumbens</i> L.	14
SILENE	SILEN	<i>Silene</i> L.	1
SILACA	SIAC	<i>Silene acaulis</i> (L.) Jacq.	6
SMIRAC	SMRA	<i>Smilacina racemosa</i> (L.) Desf.	1
SOLIDA	SOLID	<i>Solidago</i> L.	1
SOLLEP	SOLE8	<i>Solidago lepida</i> DC.	8
SOLMUL	SOMU	<i>Solidago multiradiata</i> Ait.	13
SPARGA	SPARG	<i>Sparganium</i> L.	1
SPAANG	SPAN2	<i>Sparganium angustifolium</i> Michx.	9
SPAHYP	SPHY	<i>Sparganium hyperboreum</i> Laestad.	2
SPAMIN	SPMI	<i>Sparganium minimum</i> (Hartman) Wallr.	6
SPECAN	SPCA3	<i>Spergularia canadensis</i> (Pers.) G. Don	1
SPIROM	SPRO	<i>Spiranthes romanzoffiana</i> Cham.	24
STACHY	STACH	<i>Stachys</i> L.	1
STELLA	STELL	<i>Stellaria</i> L.	13
STECAL	STCA	<i>Stellaria calycantha</i> (Ledeb.) Bong.	49
STECRA	STCR	<i>Stellaria crassifolia</i> Ehrh.	36
STECRI	STCR2	<i>Stellaria crispa</i> Cham. & Schlecht.	16
STEMON	STMO2	<i>Stellaria monantha</i> Hultén	4
STESIT	STSI3	<i>Stellaria sitchana</i> Steud.	10
STEUMB	STUM	<i>Stellaria umbellata</i> Turcz. ex Kar. & Kir.	1
STRAMP	STAM2	<i>Streptopus amplexifolius</i> (L.) DC.	692
STRROS	STRO4	<i>Streptopus roseus</i> Michx.	2
STRSTR	STST3	<i>Streptopus streptopoides</i> (Ledeb.) Frye & Rigg	1
SUBAQU	SUAQ	<i>Subularia aquatica</i> L.	6
SWEPER	SWPE	<i>Swertia perennis</i> L.	16
TARAXA	TARAX	<i>Taraxacum</i> G.H. Weber ex Wiggers	9
TELGRA	TEGR2	<i>Tellima grandiflora</i> (Pursh) Dougl. ex Lindl.	7
THAALP	THAL	<i>Thalictrum alpinum</i> L.	1
THASPA	THSP	<i>Thalictrum sparsiflorum</i> Turcz. ex Fisch. & C.A. Mey.	36
TIATRI	TITR	<i>Tiarella trifoliata</i> L.	416

TOFIEL	TOFIE	Tofieldia Huds.	4
TOFCOC	TOCO	Tofieldia coccinea Richards.	13
TOFGLU	TOGL2	Tofieldia glutinosa (Michx.) Pers.	18
TRIEUR	TREU	Trientalis europaea L.	424
TRIMAR	TRMA4	Triglochin maritimum L.	18
TRIPAL	TRPA6	Triglochin palustre L.	9
URTYLA	URLY2	Urtica lyallii S. Wats.	4
UTRVUL	UTVU	Utricularia vulgaris L. p.p.	15
VALCAP	VACA3	Valeriana capitata Pallas ex Link	2
VALSIT	VASI	Valeriana sitchensis Bong.	81
VERVIR	VEVI	Veratrum viride Ait.	265
VERONI	VERON	Veronica L.	1
VERAME	VEAM2	Veronica americana Schwein. ex Benth.	3
VERSER	VESE	Veronica serpyllifolia L.	3
VERSTE	VEST2	Veronica stelleri Pallas ex Link	2
VERWOR	VEWO2	Veronica wormskjoldii Roemer & J.A. Schultes	7
VIOLA	VIOLA	Viola L.	119
VIOEPI	VIEP	Viola epipsila Ledeb.	37
VIOGLA	VIGL	Viola glabella Nutt.	133
VIOLAN	VILA6	Viola langsдорffii Fisch. ex Gingins	53
ZANPAL	ZAPA	Zannichellia palustris L.	1
ZYGELE	ZIEL2	Zigadenus elegans Pursh	3

GRAMINOIDS

AGROPY	AGROP2	Agropyron Gaertn.	1
AGRSUB	AGSU	Agropyron subsecundum (Link) A.S. Hitchc.	1
AGRVIO	AGVI3	Agropyron violaceum (Hornem.) Lange	15
AGROST	AGROS2	Agrostis L.	38
AGRAEQ	AGAE	Agrostis aequivalvis (Trin.) Trin.	37
AGRALA	AGAL2	Agrostis alascana Hultén	56
AGRBOR	AGBO2	Agrostis borealis Hartman	11
AGREXA	AGEX	Agrostis exarata Trin.	7
AGRGEM	AGGE2	Agrostis geminata Trin.	1
AGRGIG	AGGI2	Agrostis gigantea Roth	8
AGRSCA	AGSC5	Agrostis scabra Willd.	10
PODTHU	AGTH2	Agrostis thurberiana A.S. Hitchc.	2
ARCLAT	ARLA2	Arctagrostis latifolia (R. Br.) Griseb.	21
ARCFUL	ARFU2	Arctophila fulva (Trin.) Rupr. ex Anderss.	15
BROCIL	BRCI2	Bromus ciliatus L.	1
BROPUM	BRPU3	Bromus pumpellianus Scribn.	1

CALAMA	CALAM	Calamagrostis Adans.	28
CALCAN	CACA4	Calamagrostis canadensis (Michx.) Beauv.	682
CALDES	CADE3	Calamagrostis deschampsoides Trin.	3
CALINE	CAIN	Calamagrostis inexpansa Gray	3
CALLAP	CALA6	Calamagrostis lapponica (Wahlenb.) Hartman	1
CALNEG	CANE	Calamagrostis neglecta (Ehrh.) P.G. Gaertn., B. Mey. & Scherb.	7
CALNUT	CANU	Calamagrostis nutkaensis (J. Presl) J. Presl ex Steud.	114
CAREX	CAREX	Carex L.	248
CARAEN	CAAE	Carex aenea Fern.	2
CARANT	CAAN10	Carex anthoxanthea J.& K. Presl	77
CARAQU	CAAQ	Carex aquatilis Wahlenb.	29
CARATR	CAAT5	Carex atrata L. p.p.	1
CARAUR	CAAU3	Carex aurea Nutt.	1
CARBIC	CABI4	Carex bicolor Bellardi ex All.	1
CARBRU	CABR15	Carex brunnescens (Pers.) Poir.	8
CARBUX	CABU6	Carex buxbaumii Wahlenb.	1
CARCAN	CACA11	Carex canescens L.	18
CARCHO	CACH5	Carex chordorrhiza Ehrh. ex L. f.	3
CARCIR	CACI5	Carex circinata C.A. Mey.	3
CARDEW	CADE9	Carex deweyana Schwein.	3
CARDIO	CADIG	Carex dioica ssp. gynocrates (Wormsk. ex Drej.) Hultén	9
CARDIS	CADI6	Carex disperma Dewey	1
CARFLA	CAFL4	Carex flava L.	3
CARGAR	CAGA3	Carex garberi Fern.	4
CARGLA	CAGL4	Carex glareosa Schkuhr ex Wahlenb.	2
CARGME	CAGM	Carex gmelinii Hook. & Arn.	3
CARINT	CAIN11	Carex interior Bailey	3
CARKEL	CAKE2	Carex kelloggii W. Boott	17
CARLAC	CALA10	Carex lachenalii Schkuhr	2
CARLAE	CALA13	Carex laeviculmis Meinsh.	6
CARLEP	CALE10	Carex leptalea Wahlenb.	2
CARLIM	CALI7	Carex limosa L.	7
CARLIV	CALI	Carex livida (Wahlenb.) Willd.	4
CARLYN	CALY3	Carex lyngbyei Hornem.	138
CARMACK	CAMA8	Carex mackenziei Krecz.	5
CARMACL	CAMA9	Carex macloviana d'Urv.	7
CARMACH	CAMA11	Carex macrochaeta C.A. Mey.	85
CARMAG	CAMA12	Carex magellanica Lam.	23
CARMAR	CAMA14	Carex maritima Gunn.	3
CARMER	CAME6	Carex mertensii Prescott ex Bong.	15

CARMIC	CAMI4	<i>Carex microchaeta</i> Holm	103
CARMICG	CAMI6	<i>Carex microglochin</i> Wahlenb.	16
CARMICT	CAMI7	<i>Carex microptera</i> Mack.	1
CARNIG	CANI2	<i>Carex nigricans</i> C.A. Mey.	12
CAROED	CAOE	<i>Carex oederi</i> auct. non Retz.	1
CARPAU	CAPA19	<i>Carex pauciflora</i> Lightf.	51
CARPHY	CAPH6	<i>Carex phyllomanica</i> W. Boott	7
CARPLU	CAPL6	<i>Carex pluriflora</i> Hultén	58
CARPOD	CAPO	<i>Carex podocarpa</i> R. Br.	1
CARPRE	CAPR8	<i>Carex preslii</i> Steud.	1
CARPYR	CAPY3	<i>Carex pyrenaica</i> Wahlenb.	12
CARRHY	CARH3	<i>Carex rhynchosphysa</i> Fisch., C.A. Mey. & Ave-Lall.	1
CARROS	CARO6	<i>Carex rostrata</i> Stokes	13
CARSAX	CASA10	<i>Carex saxatilis</i> L.	16
CARSCI	CASC10	<i>Carex scirpoidea</i> Michx.	3
CARSIT	CASI3	<i>Carex sitchensis</i> Prescott ex Bong.	74
CARSPE	CASP5	<i>Carex spectabilis</i> Dewey	3
CARSTY	CAST10	<i>Carex stylosa</i> C.A. Mey.	5
CARWIL	CAWI3	<i>Carex williamsii</i> Britt.	1
CINLAT	CILA2	<i>Cinna latifolia</i> (Trev. ex Goepp.) Griseb.	2
DANINT	DAIN	<i>Danthonia intermedia</i> Vasey	4
DESCES	DECE	<i>Deschampsia cespitosa</i> (L.) Beauv.	141
ELEOCH	ELEOC	<i>Eleocharis</i> R. Br.	17
ELEACI	ELAC	<i>Eleocharis acicularis</i> (L.) Roemer & J.A. Schultes	7
ELEKAM	ELKA	<i>Eleocharis kamtschatica</i> (C.A. Mey.) Komarov	8
ELEPAL	ELPA3	<i>Eleocharis palustris</i> (L.) Roemer & J.A. Schultes	35
ELEUNI	ELUN	<i>Eleocharis uniglumis</i> (Link) J.A. Schultes	4
ELYMUS	ELYMU	<i>Elymus</i> L.	2
ELYARE	ELAR	<i>Elymus arenarius</i> L.	49
ERIOPH	ERIOP	<i>Eriophorum</i> L.	25
ERIAN6	ERAN6	<i>Eriophorum angustifolium</i> Honckeney	100
ERIRUS	ERRU2	<i>Eriophorum russeolum</i> Fries ex Hartman	16
ERISCH	ERSC2	<i>Eriophorum scheuchzeri</i> Hoppe	1
FESTUC	FESTU	<i>Festuca</i> L.	13
FESALT	FEAL	<i>Festuca altaica</i> Trin.	111
FESBRA	FEBR	<i>Festuca brachyphylla</i> J.A. Schultes ex J.A. & J.H. Schultes	15
FESRUB	FERU2	<i>Festuca rubra</i> L.	57
FESSAX	FESA	<i>Festuca saximontana</i> Rydb.	1
FESVIV	FEVI3	<i>Festuca vivipara</i> (L.) Sm.	1
PUCPAU	GLPA6	<i>Glyceria pauciflora</i> J. Presl	11

HIEALP	HIAL3	<i>Hierochloe alpina</i> (Sw. ex Willd.) Roemer & J.A. Schultes	110
HIEODO	HIOD	<i>Hierochloe odorata</i> (L.) Beauv.	4
HORDEU	HORDE	<i>Hordeum</i> L.	3
HORBRA	HOBR2	<i>Hordeum brachyantherum</i> Nevski	21
JUNCUS	JUNCU	<i>Juncus</i> L.	10
JUNALP	JUAL	<i>Juncus alpinus</i> Vill.	12
JUNARC	JUAR2	<i>Juncus arcticus</i> Willd.	27
JUNBUF	JUBU	<i>Juncus bufonius</i> L.	3
JUNCAS	JUCA6	<i>Juncus castaneus</i> Sm.	2
JUNDRU	JUDR	<i>Juncus drummondii</i> E. Mey.	7
JUNEFF	JUEF	<i>Juncus effusus</i> L.	1
JUNFAL	JUFA	<i>Juncus falcatus</i> E. Mey.	8
JUNFIL	JUFI	<i>Juncus filiformis</i> L.	2
JUNMER	JUME3	<i>Juncus mertensianus</i> Bong.	8
LUZULA	LUZUL	<i>Luzula</i> DC.	20
LUZARCU	LUARU	<i>Luzula arcuata</i> ssp. <i>unalaschcensis</i> (Buch.) Hultén	1
LUZMUL	LUMU2	<i>Luzula multiflora</i> (Ehrh.) Lej.	27
LUZPAR	LUPA4	<i>Luzula parviflora</i> (Ehrh.) Desv.	56
LUZSPI	LUSP4	<i>Luzula spicata</i> (L.) DC.	1
LUZWAH	LUWA	<i>Luzula wahlenbergii</i> Rupr.	56
PHLEUM	PHLEU	<i>Phleum</i> L.	2
PHLCOM	PHCO9	<i>Phleum commutatum</i> Gaudin	55
PHLPRA	PHPR3	<i>Phleum pratense</i> L.	4
POA	POA	<i>Poa</i> L.	42
POAALP	POAL2	<i>Poa alpina</i> L.	3
POAARC	POAR2	<i>Poa arctica</i> R. Br.	9
POAEMI	POEM	<i>Poa eminens</i> J. Presl	6
POAGLA	POGL	<i>Poa glauca</i> Vahl	6
POALAN	POLA	<i>Poa lanata</i> Scribn. & Merr.	25
POALEP	POLE2	<i>Poa leptocoma</i> Trin.	2
POAMAC2	POMA26	<i>Poa macrantha</i> Vasey	9
POAMAC	POMA2	<i>Poa macrocalyx</i> Trautv. & C.A. Mey.	2
POANEM	PONE	<i>Poa nemoralis</i> L.	6
POAPAL	POPA2	<i>Poa palustris</i> L.	7
POAPAU	POPA26	<i>Poa paucispicula</i> Scribn. & Merr.	1
POAPRA	POPR	<i>Poa pratensis</i> L.	4
PUCCIN	PUCCI	<i>Puccinellia</i> Parl.	1
PUCNUT	PUNU	<i>Puccinellia nutkaensis</i> (J. Presl) Fern. & Weatherby	5
PUCPUM	PUPU	<i>Puccinellia pumila</i> (Vasey) A.S. Hitchc.	12
SCIRPU	SCIRP	<i>Scirpus</i> L.	3

SCIMIC	SCMI2	Scirpus microcarpus J.& K. Presl	1
TRIALP	TRAL7	Trichophorum alpinum (L.) Pers.	2
TRICAE	TRCE3	Trichophorum caespitosum (L.) Hartman	86
TRISET	TRISE	Trisetum Pers.	5
TRICER	TRCE2	Trisetum cernuum Trin.	8
TRISPI	TRSP2	Trisetum spicatum (L.) Richter	64
VAHATR	VAAT2	Vahlodea atropurpurea (Wahlenb.) Fries ex Hartman	73

FERNS AND ALLIES

ATHFIL	ATFI	Athyrium filix-femina (L.) Roth	510
BLESPI	BLSP	Blechnum spicant (L.) Roth	317
BOTRYC	BOTRY	Botrychium Sw.	1
BOTBOR	BOBOO3	Botrychium boreale ssp. obtusilobum auct. non (Rupr.) Clausen	3
BOTLUN	BOLU	Botrychium lunaria (L.) Sw.	5
BOTMULR	BOMUR	Botrychium multifidum var. robustum (Rupr.) C. Christens.	1
CRYCRI	CRCR10	Cryptogramma crispa (L.) R. Br.	7
CYSTOP	CYSTO	Cystopteris Bernh.	9
CYSFRA	CYFR2	Cystopteris fragilis (L.) Bernh.	13
DRYDIL	DRDI2	Dryopteris dilatata auct. non (Hoffmann) Gray	687
EQUISE	EQUIS	Equisetum L.	37
EQUARV	EQAR	Equisetum arvense L.	438
EQUFLU	EQFL	Equisetum fluviatile L.	124
EQUPAL	EQPA	Equisetum palustre L.	40
EQUpra	EQPR	Equisetum pratense Ehrh.	32
EQUsci	EQSC	Equisetum scirpoides Michx.	2
EQUsil	EQSY	Equisetum silvaticum L.	70
EQUvar	EQVA	Equisetum variegatum Schleich. ex F. Weber & D.M.H. Mohr	49
GYMDRY	GYDR	Gymnocarpium dryopteris (L.) Newman	824
LYCOPO	LYCOP2	Lycopodium L.	74
LYCALP	LYAL3	Lycopodium alpinum L.	60
LYCANN	LYAN2	Lycopodium annotinum L.	425
LYCCLA	LYCL	Lycopodium clavatum L.	152
LYCCOM	LYCO3	Lycopodium complanatum L.	48
LYCSAB	LYSA	Lycopodium sabinifolium Willd.	23
LYCSEL	LYSE	Lycopodium selago L.	222
POLVUL	POVU3	Polypodium vulgare L.	8
POLBRA	POBR4	Polystichum braunii (Spenner) Fee	11
SELSEL	SESE	Selaginella selaginoides (L.) Beauv. ex Mart. & Schrank	14
THELIM	THLI9	Thelypteris limbosperma auct. non (All.) Fuchs	93
THEPHE	THPH	Thelypteris phegopteris (L.) Slosson	211

WOOILV WOIL Woodsia ilvensis (L.) R. Br. 5

MOSSES AND LIVERWORTS

AMBPOL	AMPO7	Amblystegium polygamum BSG	1
AMBRIP	AMRI4	Amblystegium riparium (Hedw.) BSG	6
AMBSER	AMSE3	Amblystegium serpens (Hedw.) BSG	1
ANTCUR	ANCU3	Antitrichia curtipendula (Hedw.) Brid.	4
AULACO	AULAC2	Aulacomnium Schwaegr.	1
AULPAL	AUPA70	Aulacomnium palustre (Hedw.) Schwaegr.	5
BARBIL	BARBI2	Barbilophozia Loeske	1
BARCON	BACO8	Barbula convoluta Hedw.	1
BRACHY	BRACH10	Brachythecium Schimp. in B.S.G.	4
BRAASP	BRAS2	Brachythecium asperrimum (C. Muell.) Sull.	3
BRARIV	BRII5	Brachythecium rivulare Schimp. in B.S.G.	1
BRAVEL	BRVE7	Brachythecium velutinum (Hedw.) BSG	1
BRYUM	BRYUM2	Bryum Hedw.	3
BRYCAE	BRCA71	Bryum caespiticium Hedw.	1
CALLIE	CALLI10	Calliargon (Sull.) Kindb.	2
CALGIG	CAGI70	Calliargon giganteum (Schimp.) Kindb.	3
CALLIEA	CALLI11	Calliargonella Loeske	1
CAMPYL	CAMPY3	Campylium (Sull.) Mitt.	1
CAMNIS	CAHI70	Campylium hispidulum (Brid.) Mitt.	1
CAMSTE	CAST51	Campylium stellatum (Hedw.) C. Jens.	6
CINCLI	CINCL2	Cinclidium Sw. in Schrad.	1
CINSTY	CIST70	Cinclidium stygium Sw. in Schrad.	1
CLIDEN	CLDE70	Climacium dendroides (Hedw.) Web. & Mohr	2
CONCON	CONOC3	Conocephalum conicum (L.) Lindb.	2
DICSUB	DISU70	Dicranella subulata (Hedw.) Schimp.	1
DICRAN	DICRA8	Dicranum Hedw.	325
DICFUS	DIFU5	Dicranum fuscescens Turn.	1
DICMAJ	DIMA18	Dicranum majus Sm.	1
DICPOL	DIPO70	Dicranum polysetum Sw.	1
DICSCO	DISC71	Dicranum scoparium Hedw.	51
DREADU	DRAD2	Drepanocladus aduncus (Hedw.) Warnst.	1
DREREV	DRRE70	Drepanocladus revolvens (Sw.) Warnst.	1
DREUNC	DRUN70	Drepanocladus uncinatus (Hedw.) Warnst.	1
ENCALY	ENCAL2	Encalypta Hedw.	1
FISSID	FISSI2	Fissidens Hedw.	1
HELBLA	HEBL2	Helodium blandowii (Web. & Mohr) Warnst.	10
HYLOCO	HYLOC2	Hylocomium Schimp. in B.S.G.	1

HYLSPL	HYSP70	Hylocomium splendens (Hedw.) Schimp. in B.S.G.	447
HYPNUM	HYPNU2	Hypnum Hedw.	18
HYPICAL	HYCA70	Hypnum callichroum Brid.	2
HYPICUP	HYCU4	Hypnum cupressiforme Hedw.	2
HYPLIN	HYLI70	Hypnum lindbergii Mitt.	2
MARCHA	MARCH	Marchantia L.	7
MEETRI	METR70	Meesia triquetra (Richt.) Jngstr.	12
MNIUM	MNIUM2	Mnium Hedw.	18
MYUJUL	MYJU70	Myurella julacea (Schwaegr.) Schimp. in B.S.G.	2
ONCWAH	ONWA7	Oncophorus wahlenbergii Brid.	1
ORTCON	ORCO10	Orthotrichum consimile Mitt.	1
PALSQU	PASQ70	Paludella squarrosa (Hedw.) Brid.	1
PHIFON	PHFO6	Philonotis fontana (Hedw.) Brid.	11
PLAGIO	PLAGI7	Plagiomnium T. Kop.	3
PLAINS	PLIN11	Plagiomnium insigne (Mitt.) T. Kop.	4
PLARUG	PLRU5	Plagiomnium rugicum (Laur.) Kop.	3
PLEURO	PLEUR10	Pleurozium Mitt.	4
PLESCH	PLSC70	Pleurozium schreberi (Brid.) Mitt.	340
POGALP	POAL19	Pogonatum alpinum (Hedw.) Rhl.	1
POHLIA	POHLI2	Pohlia Hedw.	7
POHNUT	PONU70	Pohlia nutans (Hedw.) Lindb.	1
POLYTR	POLYT5	Polytrichum Hedw.	187
POLCOM	POCO38	Polytrichum commune Hedw.	9
POLSTR	POST70	Polytrichum strictum Brid.	2
PTILID	PTILI3	Ptilium De Not.	5
PTICRI	PTCR70	Ptilium crista-castrensis (Hedw.) De Not.	157
RACOMI	RACOM	Racomitrium Brid.	11
RACHET	RAHE8	Racomitrium heterostichum (Hedw.) Brid.	1
RACLAN	RALA70	Racomitrium lanuginosum (Hedw.) Brid.	4
RACVAR	RAVA3	Racomitrium varium (Mitt.) A. Jaeger	1
RHIZOM	RHIZO2	Rhizomnium (Broth.) T. Kop.	8
RHIAND	RHAN70	Rhizomnium andrewsianum (Steere) T.J. Kop.	3
RHIGLA	RHGL70	Rhizomnium glabrescens (Kindb.) T. Kop.	132
RHINUD	RHNU4	Rhizomnium nudum (E. Britton & R.S. Williams) T.J. Kop.	6
RHIPER	RHPE11	Rhizomnium perssonii T.J. Kop.	1
RHIPSE	RHPS70	Rhizomnium pseudopunctatum (Bruch & Schimp.) T.J. Kop.	1
RHYTID	RHYTI2	Rhytidiadelphus (Lindb. ex Limpr.) Warnst.	5
RHYLOR	RHLO70	Rhytidiadelphus loreus (Hedw.) Warnst.	126
RHYSQU	RHSQ70	Rhytidiadelphus squarrosus (Hedw.) Warnst.	33
RHYTRI	RHTR70	Rhytidiadelphus triquetrus (Hedw.) Warnst.	66

SPHAGN	SPHAG2	Sphagnum L.	443
SPHANG	SPAN11	Sphagnum angustifolium (C. Jens. ex Russ.) C. Jens. in Tolf	1
SPHCAP	SPCA70	Sphagnum capillifolium (Ehrh.) Hedw.	4
SPHFUS	SPFU70	Sphagnum fuscum (Schimp.) Klinggr.	14
SPHGIR	SPGI70	Sphagnum gingensohnii Russ.	93
SPHLIN	SPLI70	Sphagnum lindbergii Schimp. in Lindb.	2
SPHMAG	SPMA70	Sphagnum magellanicum Brid.	1
SPHPAC	SPPA11	Sphagnum pacificum Flatberg	6
SPHPAP	SPPA71	Sphagnum papillosum Lindb.	6
SPHRIP	SPRI70	Sphagnum riparium Ångström	3
SPHSQU	SPSQ70	Sphagnum squarrosum Crome in Hoppe	15
SPHSUB	SPSU3	Sphagnum subnitens Russow & Warnst.	2
SPHTER	SPTE71	Sphagnum teres (Schimp.) Ångström in Hartm.	1
SPHWAR	SPWA70	Sphagnum warnstorffii Russ.	4
TORTUL	TORTU	Tortula Hedw.	1
ULOCRI	ULCR2	Ulota crispa (Hedw.) Brid	1

LICHENS AND ALGAE

ALECTO	ALECT3	Alectoria Ach.	1
BRYORI	BRYOR2	Bryoria Brodo & D. Hawksw.	1
BRYBIC	BRBI60	Bryoria bicolor (Ehrh.) Brodo & D. Hawksw.	1
CETRAR	CETRA2	Cetraria Ach.	25
CETCUC	CECU60	Cetraria cucullata (Bell.) Ach.	10
CETISL	CEIS60	Cetraria islandica (L.) Ach.	14
CETNIV	CENI62	Cetraria nivalis (L.) Ach.	15
CLADIN	CLADI3	Cladina (Nyl.) Nyl.	100
CLARAN	CLRAG	Cladina rangiferina (L.) Nyl.	82
CLASTE	CLST60	Cladina stellaris (Opiz) Brodo	63
CLADON	CLADO3	Cladonia P. Browne	212
CLABEL	CLBE4	Cladonia bellidiflora (Ach.) Schaerer	3
CLACAR	CLCA10	Cladonia carneola (Fr.) Fr.	1
CLACOR	CLCO19	Cladonia cornuta (L.) Hoffm.	2
CLAGRA	CLGR13	Cladonia gracilis (L.) Willd.	1
CLASCA	CLSC60	Cladonia scabriuscula (Delise) Nyl.	2
CLASQU	CLSQ60	Cladonia squamosa Hoffm.	5
CLAUNC	CLUN60	Cladonia uncialis (L.) F. H. Wigg.	1
COELOC	COELO5	Coelocaulon Link	3
CORNIC	CORNI	Cornicularia (Schreber) Hoffm.	1
CORDIV	CODI15	Cornicularia divergens Ach.	1
DACTYL	DACTY4	Dactylina Nyl.	2

DACARC	DAAR60	<i>Dactylina arctica</i> (Richardson) Nyl.	2
HYPOGY	HYPOG2	<i>Hypogymnia</i> (Nyl.) Nyl.	2
LOBARI	LOBAR2	<i>Lobaria</i> Schreber	10
LOBLIN	LOLI60	<i>Lobaria linita</i> (Ach.) Rabenh.	7
LOBORE	LOOR60	<i>Lobaria oregana</i> (Tuck.) Mull. Arg.	1
NEPHRO	NEPHR3	<i>Nephroma</i> Ach.	8
NEPARC	NEAR60	<i>Nephroma arcticum</i> (L.) Torss.	103
PELTIG	PELTI2	<i>Peltigera</i> Willd.	40
PELAPH	PEAP60	<i>Peltigera aphthosa</i> (L.) Willd.	256
PELCAN	PECA60	<i>Peltigera canina</i> (L.) Willd.	1
PELMEM	PEME60	<i>Peltigera membranacea</i> (Ach.) Nyl.	4
PELNEO	PENE12	<i>Peltigera neopolydactyla</i> (Gyeln.) Gyeln.	2
PELSCA	PESC60	<i>Peltigera scabrosa</i> Th. Fr.	2
SPHGLO	SPGL60	<i>Sphaerophorus globosus</i> (Hudson) Vainio	1
STEREO	STERE2	<i>Stereocaulon</i> Hoffm.	27
STEALP	STAL60	<i>Stereocaulon alpinum</i> Laurer ex Funck	27
STETOM	STTO60	<i>Stereocaulon tomentosum</i> Fr.	2
THAMNO	THAMN3	<i>Thamnia</i> Ach. ex Schaerer	2
THASUB	THSU60	<i>Thamnia subuliformis</i> (Ehrh.) Culb.	34
THAVER	THVE60	<i>Thamnia vermicularis</i> (Sw.) Ach. ex Schaerer	14
UMBILI	UMBIL2	<i>Umbilicaria</i> Hoffm.	4
ALGAE		Alga unknown	17
CHARA		<i>Chara</i> sp. (this is an alga)	14

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APPENDIX C

Average constancy (CON) and cover (COV) of plant species used in the key and in the descriptions for community types. Average constancy is the percentage of sample plots on which the species occurs across all plots sampled for the community type. Average cover is calculated based on the sample plots on which the species occurs. For example, if a plant occurs on two out of ten sample plots within a community type and the cover of that species is 50 percent and 70 percent on the plots, COV equals 60 percent (i.e., $50+70/2 = 60$ NOT $50+70/10 = 12$) and CON equals 20 percent (i.e., $100 \times 2/10 = 20$).

Needleaf Forest

Species	PICLUT/ALNCRIS-MENFER				PICLUT/DRYDIL				PICLUT/EQUARV			
	PICLUT/ALNCRIS		PICLUT/CALCAN		PICLUT/ECHHOR		PICLUT/ECHHOR		PICLUT/ECHHOR		PICLUT/ECHHOR	
	10 Plots CON	COV	4 Plots CON	COV	5 Plots CON	COV	11 Plots CON	COV	10 Plots CON	COV	6 Plots CON	COV
TREES												
Betula papyrifera	10	10	75	5	40	1	27	3	40	6	50	8
Chamaecyparis nootkatensis	.	.	.	.	.	.	.	.	.	.	.	.
Picea X lutzii	100	40	100	58	100	24	100	37	100	53	100	40
Picea mariana	.	.	25	1	.	.	.	.	.	.	33	6
Picea sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Populus balsamifera ssp. trichocarpa	40	11	.	.	20	3	9	10	30	7	.	.
Populus tremuloides	.	.	.	.	.	.	.	.	.	.	.	.
Salix scouleriana	.	.	.	.	.	.	.	.	.	.	.	.
Tsuga heterophylla	.	.	.	.	.	.	.	.	.	.	.	.
Tsuga mertensiana	40	6	25	3	40	1	73	5	70	6	50	5
TALL SHRUBS												
Alnus crispa ssp. sinuata	100	35	100	20	.	.	45	4	90	5	67	3
Betula nana	.	.	.	.	.	.	.	.	.	.	.	.
Cladothamnus pyroliflorus	.	.	.	.	.	.	.	.	.	.	.	.
Echinopanax horridum	50	15	50	1	20	1	82	2	100	29	67	1
Menziesia ferruginea	20	7	100	45	40	1	55	8	70	4	50	14
Myrica gale	.	.	.	.	.	.	.	.	.	.	.	.
Rosa acicularis	40	2	75	7	20	1	18	1	20	1	50	2
Rubus spectabilis	.	.	.	.	.	.	9	30	10	1	.	.
Salix alaxensis	.	.	.	.	.	.	.	.	.	.	.	.
Salix barclayi	30	2	.	.	80	2	36	2	.	.	17	1
Salix commutata	20	10	.	.	.	.	9	10	.	.	.	.
Salix hookeriana	.	.	.	.	.	.	.	.	.	.	.	.
Salix sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Salix sp.	10	1	.	.	.	.	9	1	.	.	17	1
Sambucus racemosa	30	5	25	1	.	.	27	4	60	5	50	1
Vaccinium ovalifolium	20	1	75	5	40	1	55	1	50	4	67	2
Viburnum edule	70	2	75	1	40	6	73	3	50	1	33	2
LOW AND DWARF SHRUBS												
Andromeda polifolia	.	.	.	.	.	.	.	.	.	.	.	.
Arctostaphylos uva-ursi	.	.	.	.	.	.	.	.	.	.	.	.
Cassiope stelleriana	.	.	.	.	.	.	9	1	.	.	.	.
Empetrum nigrum	30	1	.	.	20	1	.	.	.	.	33	1
Ledum palustre	.	.	.	.	.	.	.	.	.	.	50	1
Linnaea borealis	40	4	100	4	60	2	73	1	40	4	83	5
Loiseleuria procumbens	.	.	.	.	.	.	.	.	.	.	.	.
Luetkea pectinata	.	.	.	.	.	.	.	.	.	.	.	.
Oxycoccus microcarpus	.	.	.	.	.	.	.	.	.	.	.	.
Phyllodoce aleutica	.	.	.	.	.	.	.	.	.	.	.	.
Salix reticulata	.	.	.	.	.	.	.	.	.	.	.	.
Spiraea beauverdiana	30	2	25	1	80	2	64	2	.	.	50	1
Vaccinium caespitosum	30	1	.	.	.	.	9	1	10	1	.	.
Vaccinium uliginosum	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium vitis-idaea	20	1	100	3	60	1	27	1	10	1	67	1

FORBS

Achillea borealis	.	.	.	.	.	.	.	.	.	.	.	.
Aconitum delphinifolium	20	1	50	1	40	1	27	1	10	1	.	.
Anemone narcissiflora	.	.	.	.	.	.	.	.	.	.	.	.
Artemisia arctica	.	.	.	.	.	.	.	.	.	.	.	.
Aruncus sylvester	.	.	.	.	.	.	.	.	10	1	.	.
Castilleja unalaschcensis	.	.	.	.	.	.	.	.	.	.	.	.
Coptis aspleniifolia	.	.	.	.	.	.	.	.	.	.	.	.
Coptis trifolia	.	.	.	.	.	.	.	.	.	.	.	.
Cornus canadensis	50	7	100	23	100	7	100	4	80	2	100	8
Dodecatheon pulchellum	.	.	.	.	.	.	.	.	.	.	.	.
Drosera rotundifolia	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium adenocaulon	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium angustifolium	60	3	25	1	100	11	82	2	40	3	50	2
Epilobium latifolium	10	1	.	.	.	.	.	.	.	.	.	.
Erigeron peregrinus	.	.	.	.	.	.	.	.	.	.	.	.
Fauria crista-galli	.	.	.	.	.	.	.	.	.	.	.	.
Fragaria chiloensis	.	.	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	.	.	.	.	.	.	.	.	.	.
Galium trifidum	.	.	25	1	.	.	18	1	.	.	.	.
Gentiana douglasiana	.	.	.	.	.	.	.	.	.	.	.	.
Geocaulon lividum	10	1	75	1	.	.	9	1	10	1	50	1
Geranium erianthum	20	1	.	.	80	2	55	2	.	.	17	3
Geum calthifolium	.	.	.	.	.	.	.	.	.	.	.	.
Heracleum lanatum	10	1	25	1	.	.	36	1	10	1	.	.
Iris setosa	.	.	.	.	.	.	.	.	.	.	.	.
Listera cordata	.	.	.	.	40	1	18	1	30	1	50	1
Lupinus nootkatensis	60	2	.	.	40	2	36	1	.	.	17	1
Lysichiton americanus	.	.	.	.	.	.	.	.	.	.	.	.
Parnassia palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pedicularis parviflora	.	.	.	.	.	.	.	.	.	.	.	.
Polemonium acutiflorum	10	1	.	.	20	1	.	.	.	.	17	1
Polygonum viviparum	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla egedii	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pyrola asarifolia	50	2	100	6	40	1	18	1	20	2	17	1
Pyrola secunda	70	2	100	3	80	3	91	2	60	1	50	2
Pyrola sp.	.	.	.	.	.	.	9	3	.	.	.	.
Rubus arcticus	60	1	.	.	80	6	45	1	.	.	50	1
Rubus pedatus	40	2	75	13	100	10	91	4	100	13	83	8
Sanguisorba stipulata	20	2	75	2	80	10	73	3	.	.	100	1
Spiranthes romanzoffiana	.	.	.	.	.	.	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	.	.	9	1	.	.	.	.
Streptopus amplexifolius	50	1	.	.	60	2	82	1	90	2	67	2
Thalictrum sparsiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Tiarella trifoliata	.	.	.	.	.	.	18	3	40	11	.	.
Trientalis europaea	50	1	.	.	80	2	45	1	50	5	50	1
Valeriana sitchensis	.	.	.	.	40	1	9	1	.	.	.	.
Veratrum viride	10	1	.	.	40	6	55	1	.	.	.	.
Viola glabella	.	.	.	.	.	.	.	.	.	.	.	.
Viola sp.	.	.	50	1	40	2	.	.	.	.	17	1

GRAMINOIDS

Agrostis alascana	.	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	90	13	50	1	100	50	82	10	70	5	83	12
Calamagrostis nutkaensis	.	.	.	.	.	.	.	.	.	.	.	.
Carex anthoxantha	.	.	.	.	.	.	.	.	.	.	.	.
Carex lyngbyei	.	.	.	.	.	.	.	.	.	.	.	.
Carex macrochaeta	.	.	.	.	.	.	.	.	.	.	.	.
Carex microglochin	.	.	.	.	.	.	.	.	.	.	.	.
Carex pauciflora	.	.	.	.	.	.	.	.	.	.	.	.
Carex pluriflora	.	.	.	.	.	.	.	.	.	.	.	.
Carex rostrata	.	.	.	.	.	.	.	.	.	.	.	.
Carex sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Carex sp.	.	.	.	.	.	.	9	1	.	.	.	.
Deschampsia cespitosa	.	.	.	.	.	.	.	.	.	.	.	.
Eriophorum angustifolium	.	.	.	.	.	.	.	.	.	.	.	.
Festuca altaica	.	.	.	.	.	.	.	.	.	.	.	.
Festuca rubra	.	.	.	.	.	.	.	.	.	.	.	.
Hierochloe alpina	.	.	.	.	.	.	.	.	.	.	.	.
Juncus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Luzula sp.	.	.	.	.	20	1	.	.	.	.	.	.
Phleum commutatum	10	1	.	.	20	1	.	.	.	.	.	.
Poa sp.	.	.	.	.	.	.	.	.	.	.	.	.
Trichophorum caespitosum	.	.	.	.	.	.	.	.	.	.	.	.
Trisetum spicatum	10	1	.	.	.	.	.	.	.	.	.	.
FERNS AND ALLIES												
Athyrium filix-femina	40	28	.	.	20	1	55	5	20	1	50	4
Blechnum spicant	.	.	.	.	.	.	.	.	.	.	.	.
Dryopteris dilatata	40	11	50	1	100	3	100	17	80	28	33	2
Equisetum arvense	40	36	50	45	100	6	82	11	50	5	83	43
Equisetum fluviatile	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum palustre	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum pratense	.	.	50	3	20	50	9	1	.	.	.	.
Equisetum sp.	10	1	.	.	.	.	.	.	.	.	.	.
Equisetum silvaticum	10	10	.	.	.	.	18	12	20	1	67	38
Equisetum variegatum	.	.	.	.	.	.	.	.	.	.	.	.
Gymnocarpium dryopteris	60	27	100	4	100	34	91	17	100	29	67	11
Lycopodium alpinum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium annotinum	40	11	.	.	40	3	36	4	70	3	67	2
Lycopodium clavatum	.	.	100	9	.	.	.	.	.	.	.	.
Lycopodium complanatum	10	1	.	.	.	.	.	.	.	.	.	.
Thelypteris limbosperma	.	.	.	.	.	.	.	.	.	.	.	.
Thelypteris phegopteris	.	.	.	.	.	.	.	.	10	1	.	.
MOSSES												
Hylocomium splendens	50	22	.	.	80	9	82	14	100	35	83	18
Pleurozium schreberi	40	15	.	.	80	2	64	12	60	10	83	14
Rhytidiadelphus sp.	.	.	.	.	.	.	.	.	30	5	.	.
Sphagnum sp.	10	20	.	.	20	1	36	3	.	.	.	.

Species	PICLUT/LINBOR				PICLUT/MENFER/sparse				PICMAR/ALNCRIS				
	PICLUT/GYMDRY		5 Plots		PICLUT/MENFER		9 Plots		PICLUT/VACVIT		3 Plots		
	13 Plots	CON	COV	CON	COV	10 Plots	CON	COV	CON	COV	15 Plots	CON	COV
TREES													
Betula papyrifera	31	4	100	3	90	4	44	4	80	2	67	1	
Chamaecyparis nootkatensis	.	.	.	.	.	.	.	.	.	.	.	.
Picea X lutzii	100	32	100	32	100	44	100	39	100	37	33	1	
Picea mariana	.	.	.	.	.	.	.	.	13	6	100	37
Picea sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Populus balsamifera ssp. trichocarpa	23	7	.	.	.	.	.	.	.	.	.	.
Populus tremuloides	.	.	20	3	.	.	.	.	13	7	.	.
Salix scouleriana	.	.	.	.	.	.	.	.	33	2	33	1
Tsuga heterophylla	.	.	.	.	.	.	.	.	.	.	.	.
Tsuga mertensiana	62	2	40	1	70	6	56	8	80	5	33	3	
TALL SHRUBS													
Alnus crispa ssp. sinuata	8	3	.	.	50	5	56	4	27	2	100	37	
Betula nana	23	2	20	30	.	.	11	1	20	10	.	.	
Cladothamnus pyroliflorus	.	.	.	.	.	.	.	.	.	.	.	.
Echinopanax horridum	31	2	40	1	30	1	33	3	7	1	33	1	
Menziesia ferruginea	38	1	20	3	100	51	100	16	60	3	33	1	
Myrica gale	.	.	20	20	.	.	.	.	.	.	.	.
Rosa acicularis	23	2	40	1	60	2	33	2	40	2	67	10	
Rubus spectabilis	.	.	.	.	.	.	.	.	.	.	33	1
Salix alaxensis	.	.	.	.	.	.	.	.	.	.	.	.
Salix barclayi	69	5	.	.	10	1	11	10	27	2	.	.	
Salix commutata	.	.	.	.	.	.	.	.	.	.	.	.
Salix hookeriana	.	.	.	.	.	.	.	.	.	.	.	.
Salix sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Salix sp.	.	.	20	3	.	.	.	.	7	1	33	3
Sambucus racemosa	15	6	80	4	10	1	33	5	27	1	33	1	
Vaccinium ovalifolium	46	2	.	.	40	2	56	1	33	1	33	1	
Viburnum edule	62	4	60	2	20	1	56	1	27	1	67	1	
LOW AND DWARF SHRUBS													
Andromeda polifolia	.	.	20	1	.	.	.	.	.	.	.	.
Arctostaphylos uva-ursi	8	1	.	.	.	.	11	1	13	10	.	.
Cassiope stelleriana	.	.	.	.	.	.	.	.	.	.	.	.
Empetrum nigrum	38	2	20	1	80	7	22	1	93	14	100	14	
Ledum palustre	.	.	20	3	20	1	.	.	40	8	33	10	
Linnaea borealis	77	2	100	12	100	11	100	7	73	8	100	9	
Loiseleuria procumbens	.	.	.	.	.	.	.	.	.	.	.	.
Luetkea pectinata	.	.	.	.	.	.	.	.	.	.	.	.
Oxycoccus microcarpus	.	.	20	3	.	.	.	.	7	1	33	1
Phyllodoce aleutica	.	.	.	.	.	.	.	.	.	.	.	.
Salix reticulata	.	.	.	.	.	.	.	.	.	.	33	1
Spiraea beauverdiana	62	4	.	.	20	1	22	2	53	2	33	1	
Vaccinium caespitosum	15	1	.	.	20	2	.	.	33	5	33	1	
Vaccinium uliginosum	8	1	20	1	.	.	.	.	40	10	33	1
Vaccinium vitis-idaea	38	1	20	1	90	5	67	1	100	13	100	7	

FORBS

Achillea borealis	15	1	.	.	.	.	.	.	.	.	.	.
Aconitum delphinifolium	23	1	.	.	10	1	33	1	.	.	67	1
Anemone narcissiflora	.	.	.	.	.	.	.	.	.	.	.	.
Artemisia arctica	.	.	.	.	.	.	.	.	7	1	.	.
Aruncus sylvester	.	.	.	.	.	.	.	.	.	.	.	.
Castilleja unalaschcensis	.	.	.	.	.	.	.	.	.	.	.	.
Coptis aspleniifolia	.	.	.	.	.	.	.	.	.	.	.	.
Coptis trifolia	.	.	.	.	.	.	.	.	.	.	.	.
Cornus canadensis	100	9	100	9	90	13	100	6	100	6	67	12
Dodecatheon pulchellum	.	.	.	.	.	.	.	.	.	.	.	.
Drosera rotundifolia	.	.	20	1	.	.	.	.	.	.	.	.
Epilobium adenocaulon	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium angustifolium	85	2	80	11	40	3	56	5	87	3	.	.
Epilobium latifolium	8	1	.	.	.	.	.	.	.	.	.	.
Erigeron peregrinus	.	.	.	.	.	.	.	.	.	.	.	.
Fauria crista-galli	.	.	.	.	.	.	.	.	.	.	.	.
Fragaria chiloensis	.	.	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	.	.	.	.	.	.	.	.	.	.
Galium trifidum	.	.	.	.	.	.	.	.	.	.	.	.
Gentiana douglasiana	.	.	.	.	.	.	.	.	.	.	.	.
Geocaulon lividum	15	1	40	1	60	2	44	2	73	4	67	2
Geranium erianthum	31	2	.	.	.	.	11	1	7	1	.	.
Geum calthifolium	.	.	.	.	.	.	.	.	.	.	.	.
Heracleum lanatum	.	.	.	.	.	.	.	.	.	.	.	.
Iris setosa	.	.	20	1	.	.	.	.	.	.	.	.
Listera cordata	46	1	20	1	20	1	44	1	40	1	.	.
Lupinus nootkatensis	46	2	.	.	.	.	.	.	47	3	.	.
Lysichiton americanus	.	.	.	.	.	.	.	.	.	.	.	.
Parnassia palustris	.	.	.	.	.	.	.	.	.	.	33	3
Pedicularis parviflora	.	.	.	.	.	.	.	.	.	.	.	.
Polemonium acutiflorum	8	1	.	.	.	.	.	.	.	.	.	.
Polygonum viviparum	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla egedii	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pyrola asarifolia	15	1	.	.	20	1	11	1	7	1	33	1
Pyrola secunda	92	3	80	8	80	4	100	3	73	4	33	1
Pyrola sp.	15	1	.	.	10	1	.	.	.	.	.	.
Rubus arcticus	69	2	20	1	10	1	11	1	20	2	33	3
Rubus pedatus	85	7	80	8	100	17	100	8	67	8	33	20
Sanguisorba stipulata	69	6	20	1	30	4	33	2	27	3	67	1
Spiranthes romanzoffiana	.	.	.	.	.	.	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	69	1	40	1	30	2	33	1	33	1	.	.
Thalictrum sparsiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Tiarella trifoliata	8	1	.	.	.	.	.	.	.	.	.	.
Trientalis europaea	85	2	40	1	30	1	33	2	47	3	.	.
Valeriana sitchensis	.	.	.	.	.	.	.	.	7	1	.	.
Veratrum viride	23	1	.	.	10	1	.	.	7	1	.	.
Viola glabella	.	.	.	.	.	.	.	.	.	.	.	.
Viola sp.	.	.	.	.	20	1	.	.	.	.	100	12

GRAMINOIDS												
Agrostis alascana	.	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	85	8	40	1	50	1	22	2	73	9	100	30
Calamagrostis nutkaensis	.	.	.	.	.	.	.	.	.	.	.	.
Carex anthoxanthea	.	.	.	.	.	.	.	.	.	.	.	.
Carex lyngbyei	.	.	.	.	.	.	.	.	.	.	.	.
Carex macrochaeta	.	.	.	.	.	.	.	.	.	.	.	.
Carex microglochin	.	.	.	.	.	.	.	.	.	.	.	.
Carex pauciflora	.	.	.	.	.	.	.	.	.	.	.	.
Carex pluriflora	.	.	.	.	.	.	.	.	.	.	.	.
Carex rostrata	.	.	.	.	.	.	.	.	.	.	.	.
Carex sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Carex sp.	8	1	.	.	.	.	.	.	20	1	33	20
Deschampsia cespitosa	.	.	.	.	.	.	.	.	.	.	.	.
Eriophorum angustifolium	.	.	.	.	.	.	.	.	.	.	.	.
Festuca altaica	.	.	.	.	.	.	.	.	7	1	.	.
Festuca rubra	.	.	.	.	.	.	11	1	.	.	.	.
Hierochloe alpina	.	.	.	.	.	.	.	.	.	.	.	.
Juncus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Luzula sp.	8	1	.	.	.	.	.	.	13	1	.	.
Phleum commutatum	.	.	.	.	.	.	.	.	.	.	.	.
Poa sp.	.	.	.	.	.	.	.	.	.	.	33	50
Trichophorum caespitosum	.	.	.	.	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	.	.	.	.	.	.	7	1	.	.
FERNS AND ALLIES												
Athyrium filix-femina	15	15	20	1	10	1	33	2	13	1	33	1
Blechnum spicant	.	.	.	.	.	.	.	.	.	.	.	.
Dryopteris dilatata	46	2	40	1	20	3	67	1	20	1	33	1
Equisetum arvense	46	3	40	1	50	27	33	1	13	1	67	40
Equisetum fluviatile	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum palustre	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum pratense	.	.	.	.	10	1	.	.	.	.	.	.
Equisetum sp.	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum silvaticum	15	2	20	1	20	1	22	7	.	.	33	1
Equisetum variegatum	.	.	.	.	.	.	.	.	.	.	.	.
Gymnocarpium dryopteris	100	29	80	18	80	10	89	11	53	17	.	.
Lycopodium alpinum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium annotinum	46	8	80	22	90	7	56	10	73	6	67	11
Lycopodium clavatum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium complanatum	8	1	.	.	.	.	.	.	13	1	.	.
Thelypteris limbosperma	.	.	.	.	.	.	.	.	.	.	.	.
Thelypteris phegopteris	.	.	.	.	10	1	11	1	.	.	.	.
MOSESSES												
Hylocomium splendens	77	16	80	13	60	27	100	40	73	28	.	.
Pleurozium schreberi	69	22	80	45	50	16	100	18	73	30	.	.
Rhytidiadelphus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum sp.	38	6	.	.	20	31	33	25	13	2	.	.

Species	PICSIT/ALNCRIS				PICSIT/ECHHOR				PICSIT/HYLSPL			
	PICMAR/VACVIT		PICSIT/ALNCRIS		PICSIT/ALNCRIS-ECHHOR		PICSIT/EQUARV		PICSIT/HYLSPL		PICSIT/HYLSPL	
	16 Plots CON	COV	19 Plots CON	COV	10 Plots CON	COV	14 Plots CON	COV	4 Plots CON	COV	4 Plots CON	COV
TREES												
Betula papyrifera	63	3	.	.	10	3	14	2	.	.	.	.
Chamaecyparis nootkatensis	.	.	.	.	.	.	.	.	.	.	.	.
Picea X lutzii	63	17	.	.	.	.	.	.	.	.	.	.
Picea mariana	100	34	.	.	.	.	.	.	.	.	.	.
Picea sitchensis	.	.	100	45	100	46	100	71	100	73	100	73
Populus balsamifera ssp. trichocarpa	.	.	11	3	.	.	14	7	25	10	50	10
Populus tremuloides	19	5	.	.	.	.	.	.	.	.	.	.
Salix scouleriana	13	2	.	.	.	.	.	.	.	.	.	.
Tsuga heterophylla	.	.	16	2	20	6	29	6	25	1	25	1
Tsuga mertensiana	38	3	16	4	40	6	7	10	.	.	.	.
TALL SHRUBS												
Alnus crispa ssp. sinuata	25	4	100	48	100	29	43	5	75	2	75	2
Betula nana	44	9	.	.	.	.	.	.	.	.	.	.
Cladothamnus pyroliflorus	.	.	5	1	.	.	.	.	.	.	.	.
Echinopanax horridum	6	1	26	2	100	25	100	39	50	1	25	1
Menziesia ferruginea	13	31	5	1	40	20	43	4	.	.	.	.
Myrica gale	6	20	.	.	.	.	.	.	.	.	.	.
Rosa acicularis	25	2	.	.	.	.	.	.	.	.	.	.
Rubus spectabilis	6	1	42	20	70	21	57	2	25	1	25	1
Salix alaxensis	.	.	16	8	.	.	.	.	.	.	.	.
Salix barclayi	13	1	37	21	10	10	.	.	.	.	.	.
Salix commutata	.	.	11	7	.	.	.	.	.	.	.	.
Salix hookeriana	.	.	16	13	.	.	.	.	.	.	.	.
Salix sitchensis	.	.	42	21	10	30	.	.	25	1	.	.
Salix sp.	31	1	.	.	.	.	.	.	25	1	.	.
Sambucus racemosa	.	.	16	2	20	3	36	3	.	.	25	10
Vaccinium ovalifolium	19	1	21	11	80	21	64	5	50	11	50	1
Viburnum edule	6	1	16	1	.	.	.	.	50	1	25	1
LOW AND DWARF SHRUBS												
Andromeda polifolia	6	3	.	.	.	.	.	.	.	.	.	.
Arctostaphylos uva-ursi	19	2	.	.	.	.	.	.	.	.	.	.
Cassiope stelleriana	.	.	.	.	.	.	.	.	.	.	.	.
Empetrum nigrum	94	28	.	.	.	.	.	.	.	.	.	.
Ledum palustre	63	15	.	.	.	.	.	.	.	.	.	.
Linnaea borealis	19	4	.	.	.	.	.	.	.	.	.	.
Loiseleuria procumbens	.	.	.	.	.	.	.	.	.	.	.	.
Luetkea pectinata	.	.	.	.	.	.	.	.	.	.	.	.
Oxycoccus microcarpus	25	6	.	.	.	.	.	.	.	.	.	.
Phyllodoce aleutica	.	.	.	.	.	.	.	.	.	.	.	.
Salix reticulata	.	.	.	.	.	.	.	.	.	.	.	.
Spiraea beauverdiana	13	2	5	1	.	.	.	.	.	.	.	.
Vaccinium caespitosum	13	6	.	.	.	.	.	.	.	.	.	.
Vaccinium uliginosum	44	11	.	.	.	.	7	3	.	.	.	.
Vaccinium vitis-idaea	100	20	.	.	.	.	.	.	.	.	.	.

FORBS

Achillea borealis	.	.	16	2	.	.	.	.	.	.	.	.
Aconitum delphinifolium	13	1	.	.	.	.	.	.	.	.	.	.
Anemone narcissiflora	.	.	.	.	.	.	.	.	.	.	.	.
Artemisia arctica	.	.	.	.	.	.	.	.	.	.	.	.
Aruncus sylvester	6	1	11	2	10	1	.	.	25	1	.	.
Castilleja unalaschcensis	.	.	5	1	.	.	.	.	.	.	.	.
Coptis aspleniifolia	.	.	.	.	.	.	7	1	.	.	.	.
Coptis trifolia	.	.	.	.	10	10	.	.	.	.	.	.
Cornus canadensis	81	4	21	11	80	3	57	3	25	10	50	1
Dodecatheon pulchellum	.	.	.	.	.	.	.	.	.	.	.	.
Drosera rotundifolia	6	1	.	.	.	.	.	.	.	.	.	.
Epilobium adenocaulon	.	.	5	3	.	.	.	.	.	.	.	.
Epilobium angustifolium	50	1	16	2	10	1	.	.	50	1	25	1
Epilobium latifolium	.	.	.	.	.	.	.	.	.	.	.	.
Erigeron peregrinus	.	.	.	.	.	.	.	.	.	.	.	.
Fauria crista-galli	.	.	.	.	.	.	.	.	.	.	.	.
Fragaria chiloensis	.	.	5	3	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	.	.	.	.	.	.	.	.	.	.
Galium trifidum	6	1	5	1	10	1	7	1	.	.	.	.
Gentiana douglasiana	.	.	.	.	.	.	.	.	.	.	.	.
Geocaulon lividum	88	2	.	.	.	.	.	.	.	.	.	.
Geranium erianthum	.	.	.	.	.	.	.	.	25	1	.	.
Geum calthifolium	.	.	.	.	.	.	.	.	.	.	.	.
Heracleum lanatum	.	.	21	2	20	1	.	.	.	.	.	.
Iris setosa	13	1	.	.	.	.	.	.	.	.	.	.
Listera cordata	.	.	5	1	20	2	21	2	.	.	25	1
Lupinus nootkatensis	31	1	11	2	.	.	.	.	.	.	25	1
Lysichiton americanus	.	.	16	4	10	3	7	1	.	.	.	.
Parnassia palustris	6	1	.	.	.	.	.	.	.	.	.	.
Pedicularis parviflora	.	.	.	.	.	.	.	.	.	.	.	.
Polemonium acutiflorum	.	.	.	.	.	.	.	.	25	1	.	.
Polygonum viviparum	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla egedii	.	.	16	2	.	.	.	.	.	.	.	.
Potentilla palustris	6	3	16	1	.	.	.	.	25	1	.	.
Pyrola asarifolia	13	2	53	9	.	.	14	1	25	1	25	1
Pyrola secunda	31	3	37	6	10	10	21	1	25	3	75	1
Pyrola sp.	.	.	.	.	10	3	7	1	.	.	.	.
Rubus arcticus	.	.	32	2	.	.	.	.	75	1	25	1
Rubus pedatus	19	5	26	1	70	7	86	7	25	20	50	1
Sanguisorba stipulata	13	1	11	1	.	.	.	.	25	1	.	.
Spiranthes romanzoffiana	.	.	.	.	.	.	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	.	.	26	1	90	1	86	1	75	1	50	1
Thalictrum sparsiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Tiarella trifoliata	.	.	11	2	80	7	86	7	.	.	.	.
Trientalis europaea	.	.	16	1	10	1	.	.	25	3	.	.
Valeriana sitchensis	.	.	.	.	.	.	14	6	.	.	.	.
Veratrum viride	.	.	11	2	20	1	.	.	.	.	.	.
Viola glabella	.	.	.	.	30	4	7	1	.	.	.	.
Viola sp.	6	3	.	.	.	.	.	.	.	.	.	.

GRAMINOIDS

Agrostis alascana	.	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	44	4	58	12	10	50	.	.	50	2	.
Calamagrostis nutkaensis	.	.	.	.	20	6	14	6	.	.	.
Carex anthoxanthea	.	.	.	.	.	.	.	.	.	.	.
Carex lyngbyei	.	.	5	1	.	.	.	.	.	.	.
Carex macrochaeta	.	.	11	2	.	.	.	.	25	1	.
Carex microglochin	.	.	.	.	.	.	.	.	.	.	.
Carex pauciflora	.	.	.	.	.	.	.	.	.	.	.
Carex pluriflora	.	.	.	.	.	.	.	.	.	.	.
Carex rostrata	.	.	.	.	.	.	.	.	.	.	.
Carex sitchensis	.	.	5	30	.	.	.	.	.	.	.
Carex sp.	31	7	11	1	10	10	.	.	.	.	.
Deschampsia cespitosa	.	.	.	.	.	.	.	.	.	.	.
Eriophorum angustifolium	.	.	.	.	.	.	.	.	.	.	.
Festuca altaica	6	1	.	.	.	.	.	.	.	.	.
Festuca rubra	.	.	.	.	.	.	.	.	.	.	.
Hierochloe alpina	.	.	.	.	.	.	.	.	.	.	.
Juncus sp.	.	.	.	.	.	.	.	.	.	.	.
Luzula sp.	13	6	.	.	.	.	.	.	.	.	.
Phleum commutatum	.	.	.	.	.	.	.	.	25	1	.
Poa sp.	6	50	.	.	.	.	.	.	.	.	.
Trichophorum caespitosum	.	.	.	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	5	1	.	.	.	.	.	.	.

FERNS AND ALLIES

Athyrium filix-femina	.	.	58	5	50	9	43	7	75	2	.
Blechnum spicant	.	.	.	.	.	.	.	.	.	.	.
Dryopteris dilatata	6	1	42	5	80	15	79	24	50	1	75
Equisetum arvense	50	9	53	40	.	.	.	.	100	68	.
Equisetum fluviatile	6	1	.	.	.	.	.	.	.	.	.
Equisetum palustre	.	.	.	.	.	.	.	.	25	1	25
Equisetum pratense	.	.	.	.	.	.	.	.	.	.	.
Equisetum sp.	.	.	.	.	20	6	14	6	.	.	.
Equisetum silvaticum	6	3	.	.	.	.	.	.	.	.	.
Equisetum variegatum	.	.	11	20	.	.	.	.	.	.	.
Gymnocarpium dryopteris	.	.	16	2	80	13	93	14	75	7	25
Lycopodium alpinum	.	.	.	.	.	.	.	.	.	.	.
Lycopodium annotinum	13	26	16	1	30	1	14	1	25	3	75
Lycopodium clavatum	6	10	.	.	.	.	7	20	.	.	.
Lycopodium complanatum	19	1	.	.	.	.	.	.	.	.	.
Thelypteris limbosperma	.	.	5	1	10	1	.	.	.	.	.
Thelypteris phegopteris	.	.	16	2	20	6	29	3	.	.	.

MOSESSES

Hylocomium splendens	44	29	32	19	30	13	14	6	75	37	100
Pleurozium schreberi	56	42	.	.	.	.	.	.	.	.	.
Rhytidiadelphus sp.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum sp.	6	1	16	11	10	30	7	20	.	.	.

Species	PICSIT/RUBSPE-ECHHOR				PICSIT/VACOVA				PICSIT/VACOVA-DRYDIL			
	PICSIT/LYSAME		PICSIT/SALBAR		PICSIT/VACOVA-ECHHOR		PICSIT/VACOVA-ECHHOR		PICSIT/VACOVA-ECHHOR		PICSIT/VACOVA-ECHHOR	
	8 Plots CON	COV	31 Plots CON	COV	5 Plots CON	COV	5 Plots CON	COV	16 Plots CON	COV	6 Plots CON	COV
TREES												
Betula papyrifera	.	.	.	.	.	.	.	.	.	.	.	.
Chamaecyparis nootkatensis	.	.	.	.	.	.	.	.	.	.	.	.
Picea X lutzii	.	.	.	.	.	.	.	.	.	.	.	.
Picea mariana	.	.	.	.	.	.	.	.	.	.	.	.
Picea sitchensis	100	46	100	54	100	30	100	70	100	61	100	63
Populus balsamifera ssp. trichocarpa	.	.	.	.	40	1	.	.	13	7	.	.
Populus tremuloides	.	.	.	.	.	.	.	.	.	.	.	.
Salix scouleriana	.	.	.	.	.	.	.	.	.	.	.	.
Tsuga heterophylla	25	6	26	6	20	1	80	4	31	8	17	10
Tsuga mertensiana	25	2	23	7	.	.	.	.	13	6	67	7
TALL SHRUBS												
Alnus crispa ssp. sinuata	50	3	35	4	100	3	60	2	38	4	33	2
Betula nana	.	.	.	.	.	.	.	.	.	.	.	.
Cladothamnus pyroliflorus	25	2	.	.	.	.	.	.	.	.	.	.
Echinopanax horridum	75	3	100	19	.	.	80	3	100	17	83	3
Menziesia ferruginea	38	2	23	1	.	.	40	7	56	5	100	5
Myrica gale	.	.	.	.	40	30	.	.	.	.	.	.
Rosa acicularis	.	.	.	.	.	.	.	.	.	.	.	.
Rubus spectabilis	75	2	100	38	.	.	60	4	69	4	83	4
Salix alaxensis	.	.	.	.	.	.	.	.	.	.	.	.
Salix barclayi	.	.	.	.	100	38	.	.	.	.	.	.
Salix commutata	.	.	.	.	80	23	.	.	.	.	.	.
Salix hookeriana	.	.	.	.	60	10	.	.	.	.	.	.
Salix sitchensis	.	.	.	.	60	14	.	.	.	.	.	.
Salix sp.	.	.	.	.	.	.	.	.	.	.	.	.
Sambucus racemosa	.	.	29	1	.	.	.	.	.	.	.	.
Vaccinium ovalifolium	100	7	97	12	.	.	100	40	100	35	100	43
Viburnum edule	25	1	3	1	.	.	20	1	.	.	.	.
LOW AND DWARF SHRUBS												
Andromeda polifolia	.	.	.	.	.	.	.	.	.	.	.	.
Arctostaphylos uva-ursi	.	.	.	.	.	.	.	.	.	.	.	.
Cassiope stelleriana	.	.	.	.	.	.	.	.	.	.	.	.
Empetrum nigrum	13	3	.	.	20	1	.	.	.	.	.	.
Ledum palustre	.	.	.	.	.	.	.	.	.	.	.	.
Linnaea borealis	.	.	.	.	.	.	.	.	.	.	.	.
Loiseleuria procumbens	.	.	.	.	.	.	.	.	.	.	.	.
Luetkea pectinata	.	.	.	.	.	.	.	.	.	.	.	.
Oxycoccus microcarpus	.	.	.	.	.	.	.	.	.	.	.	.
Phyllodoce aleutica	.	.	.	.	.	.	.	.	.	.	.	.
Salix reticulata	.	.	.	.	.	.	.	.	.	.	.	.
Spiraea beauverdiana	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium caespitosum	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium uliginosum	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium vitis-idaea	.	.	.	.	.	.	.	.	.	.	.	.

FORBS

Achillea borealis	.	.	.	.	.	.	.	.	.	.	.	.
Aconitum delphinifolium	.	.	.	.	.	.	.	.	.	.	.	.
Anemone narcissiflora	.	.	.	.	.	.	.	.	.	.	.	.
Artemisia arctica	.	.	.	.	.	.	.	.	.	.	.	.
Aruncus sylvester	13	1	13	1	.	.	.	6	3	.	.	.
Castilleja unalaschcensis	.	.	.	.	.	.	.	.	.	.	.	.
Coptis aspleniifolia	25	15	10	5	.	.	.	19	4	33	2	.
Coptis trifolia	25	1	6	1	.	.	20	1	25	6	.	.
Cornus canadensis	100	6	68	2	.	.	100	2	75	4	83	4
Dodecatheon pulchellum	.	.	.	.	.	.	.	.	.	.	.	.
Drosera rotundifolia	.	.	.	.	20	1	.	.	.	.	.	.
Epilobium adenocaulon	.	.	.	.	20	1	.	.	.	.	.	.
Epilobium angustifolium	.	.	.	.	20	1	.	.	.	.	.	.
Epilobium latifolium	.	.	.	.	20	1	.	.	.	.	.	.
Erigeron peregrinus	.	.	.	.	.	.	.	.	.	.	.	.
Fauria crista-galli	63	3	.	.	.	.	.	.	.	.	.	.
Fragaria chiloensis	.	.	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	.	.	.	.	.	.	.	.	.	.
Galium trifidum	.	.	.	.	.	.	.	.	.	.	.	.
Gentiana douglasiana	.	.	.	.	.	.	.	.	.	.	.	.
Geocaulon lividum	.	.	.	.	.	.	.	.	.	.	.	.
Geranium erianthum	.	.	.	.	.	.	.	.	.	.	.	.
Geum calthifolium	.	.	3	1	.	.	.	.	.	17	1	.
Heracleum lanatum	13	1	.	.	.	.	.	13	2	.	.	.
Iris setosa	.	.	.	.	.	.	.	.	.	.	.	.
Listera cordata	13	1	19	1	.	.	60	2	44	1	33	2
Lupinus nootkatensis	.	.	.	.	20	10	.	.	.	.	.	.
Lysichiton americanus	100	28	16	17	.	.	20	1	6	3	33	2
Parnassia palustris	.	.	.	.	20	1	.	.	.	.	.	.
Pedicularis parviflora	.	.	.	.	.	.	.	.	.	.	.	.
Polemonium acutiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Polygonum viviparum	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla egedii	.	.	.	.	20	3	.	.	.	.	.	.
Potentilla palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pyrola asarifolia	13	1	.	.	60	5	20	1	13	7	.	.
Pyrola secunda	13	3	3	1	.	.	20	1	19	2	.	.
Pyrola sp.	.	.	.	.	.	.	.	.	.	.	17	1
Rubus arcticus	.	.	.	.	60	3	.	.	.	.	.	.
Rubus pedatus	88	3	94	7	.	.	100	8	100	10	100	19
Sanguisorba stipulata	13	1	.	.	.	.	.	.	.	.	.	.
Spiranthes romanzoffiana	.	.	.	.	20	1	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	75	1	87	2	.	.	80	1	100	2	100	1
Thalictrum sparsiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Tiarella trifoliata	75	4	100	5	.	.	60	8	75	8	83	4
Trientalis europaea	.	.	.	.	40	1	.	.	6	1	.	.
Valeriana sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Veratrum viride	13	1	19	1	.	.	.	.	.	.	.	.
Viola glabella	38	2	19	3	.	.	.	.	6	3	17	3
Viola sp.	.	.	.	.	.	.	.	.	.	.	.	.

GRAMINOIDS

Agrostis alascana	.	.	.	.	40	11	.	.	.	.	.	.
Calamagrostis canadensis	.	.	6	2	60	5	20	3	6	3	.	.
Calamagrostis nutkaensis	13	1	3	10	.	.	.	.	6	50	33	2
Carex anthoxantha	13	40	.	.	.	.	.	.	.	.	.	.
Carex lyngbyei	.	.	.	.	.	.	.	.	.	.	.	.
Carex macrochaeta	13	10	10	2	.	.	.	.	.	.	17	3
Carex microglochin	.	.	.	.	.	.	.	.	.	.	.	.
Carex pauciflora	.	.	.	.	.	.	.	.	.	.	.	.
Carex pluriflora	13	30	.	.	.	.	.	.	.	.	.	.
Carex rostrata	.	.	.	.	20	3	.	.	.	.	.	.
Carex sitchensis	.	.	.	.	60	17	.	.	.	.	.	.
Carex sp.	.	.	.	.	.	.	.	.	6	1	.	.
Deschampsia cespitosa	.	.	.	.	20	3	.	.	.	.	.	.
Eriophorum angustifolium	.	.	.	.	.	.	.	.	.	.	.	.
Festuca altaica	.	.	.	.	.	.	.	.	.	.	.	.
Festuca rubra	.	.	.	.	20	1	.	.	.	.	.	.
Hierochloe alpina	.	.	.	.	.	.	.	.	.	.	.	.
Juncus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Luzula sp.	.	.	.	.	.	.	.	.	.	.	.	.
Phleum commutatum	.	.	.	.	.	.	.	.	.	.	.	.
Poa sp.	.	.	.	.	.	.	.	.	6	1	.	.
Trichophorum caespitosum	.	.	.	.	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	.	.	.	.	.	.	.	.	.	.

FERNS AND ALLIES

Athyrium filix-femina	50	28	68	3	20	1	20	3	75	6	.	.
Blechnum spicant	25	12	16	1	.	.	.	.	19	1	33	1
Dryopteris dilatata	75	3	97	10	.	.	60	2	69	7	100	10
Equisetum arvense	13	1	3	3	20	1	40	7	.	.	.	.
Equisetum fluviatile	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum palustre	13	1	.	.	20	3	.	.	.	.	.	.
Equisetum pratense	.	.	.	.	60	27	.	.	.	.	.	.
Equisetum sp.	38	1	3	1	.	.	20	1	13	2	.	.
Equisetum silvaticum	.	.	.	.	.	.	.	.	6	10	.	.
Equisetum variegatum	.	.	.	.	.	.	.	.	.	.	.	.
Gymnocarpium dryopteris	88	6	94	8	.	.	40	20	94	6	100	11
Lycopodium alpinum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium annotinum	25	1	19	2	20	1	80	2	25	1	.	.
Lycopodium clavatum	.	.	10	1	.	.	.	.	13	1	17	1
Lycopodium complanatum	.	.	.	.	.	.	.	.	.	.	.	.
Thelypteris limbosperma	.	.	3	3	.	.	.	.	.	.	.	.
Thelypteris phegopteris	63	7	65	5	.	.	.	.	38	4	67	4

MOSSES

Hylocomium splendens	25	15	29	15	20	20	60	27	.	.	17	30
Pleurozium schreberi	.	.	.	.	40	25	20	10	.	.	.	.
Rhytidiadelphus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum sp.	75	13	26	11	40	12	20	1	13	10	17	30

Species	TSUHET/HYLSPL		TSUHET/VACOVA		TSUHET/VACOVA-ECHHOR		TSUHET/VACOVA/DRYDIL		TSUHET/VACOVA/LYSAME		TSUHET-PICSIT/ECHHOR	
	3 Plots		31 Plots		11 Plots		4 Plots		4 Plots		6 Plots	
	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV
TREES												
Betula papyrifera
Chamaecyparis nootkatensis
Picea X lutzii
Picea mariana
Picea sitchensis	67	7	87	8	100	8	50	10	100	7	100	47
Populus balsamifera ssp. trichocarpa
Populus tremuloides
Salix scouleriana
Tsuga heterophylla	100	86	100	72	100	72	100	63	100	68	100	38
Tsuga mertensiana	.	.	45	7	27	8	.	.	25	3	.	.
TALL SHRUBS												
Alnus crispa ssp. sinuata	.	.	3	3	.	.	.	.	75	19	33	1
Betula nana
Cladothamnus pyroliflorus	25	1	.	.
Echinopanax horridum	100	2	74	2	100	15	100	3	75	1	100	22
Menziesia ferruginea	67	1	84	8	91	6	50	1	100	18	83	3
Myrica gale
Rosa acicularis
Rubus spectabilis	.	.	71	4	91	9	50	2	100	9	83	3
Salix alaxensis
Salix barclayi
Salix commutata
Salix hookeriana
Salix sitchensis
Salix sp.
Sambucus racemosa	.	.	3	1	36	2	.	.	.	.	.	.
Vaccinium ovalifolium	100	3	100	47	100	41	100	38	100	43	100	4
Viburnum edule
LOW AND DWARF SHRUBS												
Andromeda polifolia
Arctostaphylos uva-ursi
Cassiope stelleriana
Empetrum nigrum
Ledum palustre
Linnaea borealis
Loiseleuria procumbens
Luetkea pectinata
Oxycoccus microcarpus
Phyllodoce aleutica
Salix reticulata
Spiraea beauverdiana
Vaccinium caespitosum	.	.	3	1	.	.	.	.	.	.	.	.
Vaccinium uliginosum
Vaccinium vitis-idaea

FORBS

Achillea borealis	.	.	.	.	.	.	.	.	.	.	.	.
Aconitum delphinifolium	.	.	.	.	.	.	.	.	.	.	.	.
Anemone narcissiflora	.	.	.	.	.	.	.	.	.	.	.	.
Artemisia arctica	.	.	.	.	.	.	.	.	.	.	.	.
Aruncus sylvester	.	.	.	.	.	.	.	.	.	.	.	.
Castilleja unalaschcensis	.	.	.	.	.	.	.	.	.	.	.	.
Coptis aspleniifolia	33	3	39	4	55	3	.	.	.	.	.	.
Coptis trifolia	.	.	3	1	9	3	.	.	.	.	.	.
Cornus canadensis	67	1	97	6	100	3	100	1	100	9	50	5
Dodecatheon pulchellum	.	.	.	.	.	.	.	.	.	.	.	.
Drosera rotundifolia	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium adenocaulon	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium angustifolium	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium latifolium	.	.	.	.	.	.	.	.	.	.	.	.
Erigeron peregrinus	.	.	.	.	.	.	.	.	.	.	.	.
Fauria crista-galli	.	.	13	5	.	.	.	.	50	11	.	.
Fragaria chiloensis	.	.	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	.	.	.	.	.	.	.	.	.	.
Galium trifidum	.	.	.	.	.	.	.	.	.	.	.	.
Gentiana douglasiana	.	.	.	.	.	.	.	.	.	.	.	.
Geocaulon lividum	.	.	.	.	.	.	.	.	.	.	.	.
Geranium erianthum	.	.	.	.	.	.	.	.	.	.	.	.
Geum calthifolium	.	.	.	.	.	.	.	.	.	.	.	.
Heracleum lanatum	.	.	.	.	.	.	.	.	.	.	.	.
Iris setosa	.	.	.	.	.	.	.	.	.	.	.	.
Listera cordata	67	1	55	2	91	1	100	2	50	6	50	1
Lupinus nootkatensis	.	.	.	.	.	.	.	.	.	.	.	.
Lysichiton americanus	.	.	32	2	27	1	.	.	100	13	33	11
Parnassia palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pedicularis parviflora	.	.	.	.	.	.	.	.	.	.	.	.
Polemonium acutiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Polygonum viviparum	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla egedii	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pyrola asarifolia	.	.	.	.	.	.	.	.	.	.	.	.
Pyrola secunda	.	.	.	.	.	.	.	.	.	.	.	.
Pyrola sp.	.	.	.	.	.	.	.	.	.	.	.	.
Rubus arcticus	.	.	.	.	.	.	.	.	.	.	.	.
Rubus pedatus	67	7	97	8	100	11	100	10	100	7	83	6
Sanguisorba stipulata	.	.	.	.	.	.	.	.	.	.	.	.
Spiranthes romanzoffiana	.	.	.	.	.	.	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	67	1	52	1	82	1	100	1	100	1	100	1
Thalictrum sparsiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Tiarella trifoliata	100	3	45	1	91	2	100	1	.	.	83	2
Trientalis europaea	.	.	3	1	.	.	.	.	.	.	.	.
Valeriana sitchensis	33	1	.	.	.	.	.	.	.	.	.	.
Veratrum viride	.	.	6	2	9	1	.	.	.	.	.	.
Viola glabella	33	3	6	1	55	1	.	.	.	.	33	3
Viola sp.	.	.	.	.	9	1	.	.	.	.	.	.

GRAMINOIDS

Agrostis alascana	.	.	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	.	.	3	10	.	.	.	.	.	.	.	.
Calamagrostis nutkaensis	.	.	6	7	.	.	.	50	2	.	.	.
Carex anthoxanthea	.	.	3	1	.	.	.	.	.	.	.	.
Carex lyngbyei	.	.	.	.	.	.	.	.	.	.	.	.
Carex macrochaeta	.	.	.	.	.	.	.	.	.	.	.	.
Carex microglochin	.	.	.	.	.	.	.	.	.	.	.	.
Carex pauciflora	.	.	.	.	.	.	.	.	.	.	.	.
Carex pluriflora	.	.	.	.	.	.	.	.	.	.	.	.
Carex rostrata	.	.	.	.	.	.	.	.	.	.	.	.
Carex sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Carex sp.	.	.	6	1	.	.	.	.	.	.	.	.
Deschampsia cespitosa	.	.	.	.	.	.	.	.	.	.	.	.
Eriophorum angustifolium	.	.	.	.	.	.	.	.	.	.	.	.
Festuca altaica	.	.	.	.	.	.	.	.	.	.	.	.
Festuca rubra	.	.	.	.	.	.	.	.	.	.	.	.
Hierochloe alpina	.	.	.	.	.	.	.	.	.	.	.	.
Juncus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Luzula sp.	.	.	.	.	9	1	.	.	.	.	.	.
Phleum commutatum	.	.	.	.	.	.	.	.	.	.	.	.
Poa sp.	.	.	.	.	.	.	.	.	.	.	.	.
Trichophorum caespitosum	.	.	.	.	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	.	.	.	.	.	.	.	.	.	.

FERNS AND ALLIES

Athyrium filix-femina	67	3	10	3	55	2	25	1	.	.	83	5
Blechnum spicant	67	2	48	4	82	9	50	10	25	1	17	3
Dryopteris dilatata	100	5	35	3	100	6	100	10	50	16	83	7
Equisetum arvense	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum fluviatile	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum palustre	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum pratense	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum sp.	.	.	3	1	.	.	.	.	.	.	17	1
Equisetum silvaticum	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum variegatum	.	.	.	.	.	.	.	.	.	.	.	.
Gymnocarpium dryopteris	100	4	71	5	100	9	100	7	75	11	100	10
Lycopodium alpinum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium annotinum	.	.	29	2	45	1	75	1	50	2	50	2
Lycopodium clavatum	67	1	16	1	18	1	25	1	25	1	17	1
Lycopodium complanatum	.	.	.	.	.	.	.	.	.	.	.	.
Thelypteris limbosperma	.	.	.	.	.	.	.	.	.	.	.	.
Thelypteris phegopteris	33	1	10	2	27	1	.	.	.	.	83	3

MOSESSES

Hylocomium splendens	33	20	26	39	55	17	100	18	25	30	50	23
Pleurozium schreberi	.	.	.	.	.	.	.	.	.	.	.	.
Rhytidiadelphus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum sp.	100	4	74	11	73	17	100	45	50	15	67	11

Species	TSUHET-PICSIT/VACOVA				TSUHET-PICSIT/VACOVA/LYSAME				TSUMER/ALNCRIS-MENFER			
	TSUHET-PICSIT/RUBSPE		ECHHOR		TSUHET-PICSIT/VACOVA		ECHHOR		TSUMER/ALNCRIS		4 Plots	
	4 Plots	33 Plots	17 Plots	7 Plots	4 Plots	4 Plots	CON	COV	CON	COV	CON	COV
TREES												
Betula papyrifera	25	10
Chamaecyparis nootkatensis
Picea X lutzii	50	10
Picea mariana
Picea sitchensis	100	35	100	35	100	38	100	27	25	10	50	6
Populus balsamifera ssp. trichocarpa
Populus tremuloides
Salix scouleriana
Tsuga heterophylla	100	48	100	57	100	55	100	53	25	10	.	.
Tsuga mertensiana	.	.	18	7	18	2	71	6	100	35	100	45
TALL SHRUBS												
Alnus crispa ssp. sinuata	25	1	12	2	6	1	14	1	100	28	100	20
Betula nana
Cladothamnus pyroliflorus	.	.	6	2	.	.	.	.	50	40	.	.
Echinopanax horridum	100	16	91	2	100	14	71	4	75	4	50	6
Menziesia ferruginea	25	1	85	8	76	3	100	12	100	6	100	38
Myrica gale
Rosa acicularis
Rubus spectabilis	100	28	73	3	88	4	86	4	75	9	50	17
Salix alaxensis
Salix barclayi	25	1	.	.
Salix commutata
Salix hookeriana
Salix sitchensis
Salix sp.
Sambucus racemosa	.	.	3	1	.	.	.	.	25	3	.	.
Vaccinium ovalifolium	100	14	100	35	100	34	100	49	25	30	100	31
Viburnum edule
LOW AND DWARF SHRUBS												
Andromeda polifolia
Arctostaphylos uva-ursi
Cassiope stelleriana	25	1	25	1
Empetrum nigrum	50	1
Ledum palustre
Linnaea borealis	.	.	3	1	.	.	.	.	.	.	25	3
Loiseleuria procumbens
Luetkea pectinata	50	11	.	.
Oxycoccus microcarpus
Phyllodoce aleutica
Salix reticulata
Spiraea beauverdiana
Vaccinium caespitosum	.	.	3	3	.	.	.	.	.	.	.	.
Vaccinium uliginosum	25	1	.	.
Vaccinium vitis-idaea	75	1

FORBS

Achillea borealis	.	.	.	.	.	.	.	.	.	.	.	.
Aconitum delphinifolium	.	.	.	.	.	.	.	25	1	25	1	
Anemone narcissiflora	.	.	.	.	.	.	.	25	1	.	.	
Artemisia arctica	.	.	.	.	.	.	.	.	.	.	.
Aruncus sylvester	.	.	.	.	.	.	.	25	1	.	.	
Castilleja unalaschcensis	.	.	.	.	.	.	.	.	.	.	.
Coptis aspleniifolia	25	10	36	3	24	3	29	2	.	25	10	
Coptis trifolia	.	.	9	4	.	.	29	6	.	25	3	
Cornus canadensis	50	1	79	4	82	2	100	9	25	3	100	25
Dodecatheon pulchellum	.	.	.	.	.	.	.	.	25	1	25	1
Drosera rotundifolia	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium adenocaulon	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium angustifolium	.	.	.	.	.	.	.	.	50	1	.	.
Epilobium latifolium	.	.	.	.	.	.	.	.	.	.	.	.
Erigeron peregrinus	.	.	.	.	.	.	.	.	25	10	25	1
Fauria crista-galli	.	.	3	1	.	.	14	1	50	15	50	30
Fragaria chiloensis	.	.	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	.	.	.	.	.	.	.	.	.	.
Galium trifidum	.	.	.	.	.	.	.	.	.	.	25	1
Gentiana douglasiana	.	.	.	.	.	.	.	.	.	.	.	.
Geocaulon lividum	.	.	.	.	.	.	.	.	.	.	.	.
Geranium erianthum	.	.	.	.	.	.	.	.	.	.	.	.
Geum calthifolium	.	.	.	.	.	.	.	.	25	1	.	.
Heracleum lanatum	.	.	.	.	.	.	.	.	25	1	25	1
Iris setosa	.	.	.	.	.	.	.	.	.	.	.	.
Listera cordata	25	1	64	2	47	2	71	2	25	1	.	.
Lupinus nootkatensis	.	.	.	.	.	.	.	.	.	.	.	.
Lysichiton americanus	25	1	21	1	6	1	100	13	25	20	50	6
Parnassia palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pedicularis parviflora	.	.	.	.	.	.	.	.	.	.	.	.
Polemonium acutiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Polygonum viviparum	.	.	.	.	.	.	.	.	.	.	25	1
Potentilla egedii	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pyrola asarifolia	.	.	.	.	.	.	.	.	.	.	25	3
Pyrola secunda	.	.	.	.	.	.	.	.	.	.	50	3
Pyrola sp.	.	.	.	.	6	1	.	.	.	.	.	.
Rubus arcticus	.	.	.	.	.	.	.	.	.	.	.	.
Rubus pedatus	100	8	97	6	94	8	100	9	50	12	100	18
Sanguisorba stipulata	.	.	.	.	.	.	.	.	.	.	25	3
Spiranthes romanzoffiana	.	.	.	.	.	.	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	100	2	79	1	88	1	100	1	75	1	75	2
Thalictrum sparsiflorum	.	.	.	.	.	.	.	.	.	.	25	1
Tiarella trifoliata	100	2	67	2	100	2	43	3	25	3	25	1
Trientalis europaea	.	.	.	.	.	.	.	.	50	1	25	1
Valeriana sitchensis	.	.	.	.	6	1	.	.	25	3	.	.
Veratrum viride	.	.	9	1	6	1	.	.	50	7	25	10
Viola glabella	.	.	12	2	29	3	.	.	.	.	25	1
Viola sp.	.	.	.	.	.	.	.	.	.	.	25	1

GRAMINOIDS

Agrostis alascana	.	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	.	.	3	1	.	.	.	75	11	25	1
Calamagrostis nutkaensis	.	.	6	11	.	.	14	1	.	50	26
Carex anthoxanthea	.	.	.	.	.	.	.	.	.	.	.
Carex lyngbyei	.	.	.	.	.	.	.	.	.	.	.
Carex macrochaeta	.	.	.	.	.	.	.	25	20	25	3
Carex microglochin	.	.	.	.	.	.	.	.	.	.	.
Carex pauciflora	.	.	.	.	.	.	.	.	.	.	.
Carex pluriflora	.	.	.	.	.	.	.	.	.	.	.
Carex rostrata	.	.	.	.	.	.	.	.	.	.	.
Carex sitchensis	.	.	.	.	.	.	.	.	.	.	.
Carex sp.	.	.	.	.	.	.	14	1	25	3	.
Deschampsia cespitosa	.	.	.	.	.	.	.	.	.	.	.
Eriophorum angustifolium	.	.	.	.	.	.	.	.	.	.	.
Festuca altaica	.	.	.	.	.	.	.	.	.	.	.
Festuca rubra	.	.	.	.	.	.	.	.	.	.	.
Hierochloe alpina	.	.	.	.	.	.	.	.	.	.	.
Juncus sp.	.	.	.	.	.	.	.	.	.	.	.
Luzula sp.	.	.	.	.	.	.	.	.	.	.	.
Phleum commutatum	.	.	.	.	.	.	.	.	.	.	.
Poa sp.	.	.	.	.	.	.	.	.	.	.	.
Trichophorum caespitosum	.	.	.	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	.	.	.	.	.	.	.	.	.

FERNS AND ALLIES

Athyrium filix-femina	75	11	36	4	71	3	14	1	50	12	.	.
Blechnum spicant	.	.	45	3	41	5	43	2	.	.	50	15
Dryopteris dilatata	50	10	64	4	82	8	57	4	50	32	.	.
Equisetum arvense	.	.	.	.	.	.	.	.	25	1	50	16
Equisetum fluviatile	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum palustre	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum pratense	.	.	.	.	.	.	.	.	.	.	25	10
Equisetum sp.	.	.	3	1	.	.	.	.	.	.	.	.
Equisetum silvaticum	.	.	.	.	.	.	.	.	.	.	25	1
Equisetum variegatum	.	.	.	.	.	.	.	.	.	.	.	.
Gymnocarpium dryopteris	100	5	97	6	100	8	100	6	100	5	75	20
Lycopodium alpinum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium annotinum	25	1	45	1	18	2	.	.	25	1	25	10
Lycopodium clavatum	.	.	18	1	.	.	71	2	.	.	.	.
Lycopodium complanatum	.	.	.	.	.	.	.	.	.	.	.	.
Thelypteris limbosperma	.	.	9	4	.	.	.	.	.	.	25	10
Thelypteris phegopteris	.	.	30	2	41	2	.	.	25	20	25	1

MOSESSES

Hylocomium splendens	25	40	33	25	41	12	14	20	.	.	.	.
Pleurozium schreberi	.	.	.	.	.	.	.	.	.	.	.	.
Rhytidiadelphus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum sp.	25	20	42	12	71	16	71	20	.	.	25	10

Species	TSUMER/CASSTE		TSUMER/DRYDIL		TSUMER/ECHHOR		TSUMER/HYLSPL		TSUMER/MENFER		TSUMER/MENFER-VACVIT	
	12 Plots		5 Plots		4 Plots		6 Plots		19 Plots		7 Plots	
	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV
TREES												
Betula papyrifera	.	.	.	.	.	.	50	2	21	6	43	2
Chamaecyparis nootkatensis	.	.	.	.	.	.	.	.	.	.	.	.
Picea X lutzii	.	.	40	10	50	7	67	8	89	7	71	9
Picea mariana	.	.	.	.	.	.	.	.	.	.	14	3
Picea sitchensis	25	1	.	.	50	10	33	10	.	.	.	.
Populus balsamifera ssp. trichocarpa	.	.	.	.	25	3	.	.	.	.	.	.
Populus tremuloides	.	.	.	.	.	.	.	.	.	.	.	.
Salix scouleriana	.	.	.	.	.	.	.	.	.	.	29	2
Tsuga heterophylla	.	.	.	.	25	10	17	10	.	.	.	.
Tsuga mertensiana	100	41	100	52	100	65	100	70	100	71	100	60
TALL SHRUBS												
Alnus crispa ssp. sinuata	17	3	60	3	50	1	17	10	21	4	14	3
Betula nana	.	.	.	.	.	.	.	.	5	1	.	.
Cladothamnus pyroliflorus	58	9	20	3	.	.	.	.	.	.	.	.
Echinopanax horridum	.	.	20	1	100	10	17	1	21	3	14	1
Menziesia ferruginea	58	5	60	17	50	11	67	2	100	43	100	44
Myrica gale	8	30	.	.	.	.	.	.	.	.	.	.
Rosa acicularis	.	.	.	.	.	.	.	.	5	1	.	.
Rubus spectabilis	.	.	20	1	50	1	.	.	.	.	.	.
Salix alaxensis	.	.	.	.	.	.	.	.	.	.	.	.
Salix barclayi	.	.	.	.	.	.	.	.	.	.	.	.
Salix commutata	.	.	.	.	.	.	.	.	.	.	.	.
Salix hookeriana	.	.	.	.	.	.	.	.	.	.	.	.
Salix sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Salix sp.	.	.	.	.	.	.	.	.	5	3	.	.
Sambucus racemosa	.	.	.	.	25	3	33	1	5	1	.	.
Vaccinium ovalifolium	83	4	100	5	75	8	67	2	53	4	71	3
Viburnum edule	.	.	.	.	25	1	.	.	11	2	.	.
LOW AND DWARF SHRUBS												
Andromeda polifolia	8	1	.	.	.	.	.	.	.	.	.	.
Arctostaphylos uva-ursi	.	.	.	.	.	.	.	.	.	.	.	.
Cassiope stelleriana	100	20	20	1	.	.	.	.	11	12	14	30
Empetrum nigrum	75	29	.	.	.	.	17	1	47	2	86	15
Ledum palustre	8	1	.	.	.	.	.	.	21	1	57	9
Linnaea borealis	.	.	60	1	.	.	67	3	53	1	29	1
Loiseleuria procumbens	17	6	.	.	.	.	.	.	.	.	.	.
Luetkea pectinata	83	16	40	2	25	1	.	.	.	.	.	.
Oxycoccus microcarpus	.	.	.	.	.	.	.	.	.	.	.	.
Phyllodoce aleutica	50	14	.	.	.	.	.	.	.	.	.	.
Salix reticulata	.	.	.	.	.	.	.	.	.	.	.	.
Spiraea beauverdiana	8	1	80	3	.	.	17	1	.	.	14	1
Vaccinium caespitosum	42	17	.	.	25	1	17	1	16	1	.	.
Vaccinium uliginosum	33	6	.	.	.	.	.	.	5	3	14	1
Vaccinium vitis-idaea	.	.	20	1	.	.	67	1	84	2	86	12

FORBS

Achillea borealis	.	.	.	.	.	.	.	.	.	.	.
Aconitum delphinifolium	.	.	.	.	.	.	.	.	.	.	.
Anemone narcissiflora	25	2	.	.	.	.	.	.	.	.	.
Artemisia arctica	8	3	.	.	.	.	.	.	.	.	.
Aruncus sylvester	.	.	.	.	.	.	.	.	.	.	.
Castilleja unalaschcensis	.	.	.	.	.	.	.	.	.	.	.
Coptis aspleniifolia	.	.	.	.	50	10	.	.	.	.	.
Coptis trifolia	25	5	.	.	.	.	.	.	.	.	.
Cornus canadensis	58	6	100	4	25	1	67	2	63	7	100	1
Dodecatheon pulchellum	8	1	.	.	.	.	.	.	.	.	.	.
Drosera rotundifolia	8	3	.	.	.	.	.	.	.	.	.	.
Epilobium adenocaulon	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium angustifolium	17	1	80	2	25	1	33	2	11	1	14	1
Epilobium latifolium	.	.	.	.	.	.	.	.	.	.	.	.
Erigeron peregrinus	33	4	.	.	.	.	.	.	.	.	.	.
Fauria crista-galli	58	57	.	.	.	.	.	.	.	.	.	.
Fragaria chiloensis	.	.	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	.	.	.	.	.	.	.	.	.	.
Galium trifidum	.	.	.	.	.	.	.	.	.	.	.	.
Gentiana douglasiana	.	.	.	.	.	.	.	.	.	.	.	.
Geocaulon lividum	.	.	.	.	.	.	17	3	42	2	71	2
Geranium erianthum	17	1	.	.	.	.	.	.	.	.	.	.
Geum calthifolium	50	5	.	.	.	.	.	.	.	.	.	.
Heracleum lanatum	.	.	.	.	.	.	.	.	.	.	.	.
Iris setosa	.	.	.	.	.	.	.	.	.	.	.	.
Listera cordata	.	.	.	.	50	2	50	1	16	1	.	.
Lupinus nootkatensis	17	1	20	1	.	.	.	.	.	.	.	.
Lysichiton americanus	.	.	.	.	.	.	.	.	.	.	.	.
Parnassia palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pedicularis parviflora	.	.	.	.	.	.	.	.	.	.	.	.
Polemonium acutiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Polygonum viviparum	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla egedii	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pyrola asarifolia	.	.	.	.	.	.	17	1	.	.	14	1
Pyrola secunda	8	1	20	3	25	3	50	2	21	2	29	1
Pyrola sp.	.	.	.	.	.	.	.	.	.	.	.	.
Rubus arcticus	8	1	20	1	.	.	.	.	.	.	.	.
Rubus pedatus	50	3	100	10	75	2	83	11	84	9	71	7
Sanguisorba stipulata	17	2	20	3	.	.	17	1	.	.	.	.
Spiranthes romanzoffiana	.	.	.	.	.	.	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	.	.	60	1	50	1	33	1	5	1	.	.
Thalictrum sparsiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Tiarella trifoliata	.	.	.	.	50	7	17	3	.	.	.	.
Trientalis europaea	17	1	20	1	.	.	17	1	11	1	.	.
Valeriana sitchensis	8	3	40	1	.	.	.	.	.	.	.	.
Veratrum viride	33	2	60	4	25	1	17	1	.	.	.	.
Viola glabella	.	.	.	.	.	.	.	.	.	.	.	.
Viola sp.	17	2	20	1	.	.	.	.	.	.	.	.

GRAMINOIDS

Agrostis alascana	.	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	8	10	40	2	25	1	17	1	5	1	14	1
Calamagrostis nutkaensis	.	.	.	.	.	.	.	.	.	.	.	.
Carex anthoxanthea	25	5	.	.	.	.	.	.	.	.	.	.
Carex lyngbyei	.	.	.	.	.	.	.	.	.	.	.	.
Carex macrochaeta	.	.	.	.	.	.	.	.	.	.	.	.
Carex microglochin	8	20	.	.	.	.	.	.	.	.	.	.
Carex pauciflora	.	.	.	.	.	.	.	.	.	.	.	.
Carex pluriflora	.	.	.	.	.	.	.	.	.	.	.	.
Carex rostrata	.	.	.	.	.	.	.	.	.	.	.	.
Carex sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Carex sp.	25	5	.	.	.	.	.	.	.	.	.	.
Deschampsia cespitosa	.	.	.	.	.	.	.	.	.	.	.	.
Eriophorum angustifolium	17	15	.	.	.	.	.	.	.	.	.	.
Festuca altaica	.	.	.	.	.	.	.	.	.	.	.	.
Festuca rubra	.	.	.	.	.	.	.	.	.	.	.	.
Hierochloe alpina	.	.	.	.	.	.	.	.	.	.	.	.
Juncus sp.	8	1	.	.	.	.	.	.	.	.	.	.
Luzula sp.	.	.	.	.	.	.	.	.	.	.	.	.
Phleum commutatum	.	.	.	.	.	.	.	.	.	.	.	.
Poa sp.	8	1	.	.	.	.	.	.	.	.	.	.
Trichophorum caespitosum	17	35	.	.	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	.	.	.	.	.	.	.	.	.	.

FERNS AND ALLIES

Athyrium filix-femina	.	.	20	3	50	10	33	11	5	1	.	.
Blechnum spicant	25	4	.	.	50	7	17	10	.	.	.	.
Dryopteris dilatata	8	1	100	12	75	5	33	1	21	6	14	1
Equisetum arvense	.	.	20	3	25	1	.	.	11	7	.	.
Equisetum fluviatile	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum palustre	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum pratense	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum sp.	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum silvaticum	.	.	.	.	.	.	17	1	5	1	.	.
Equisetum variegatum	.	.	.	.	.	.	.	.	.	.	.	.
Gymnocarpium dryopteris	17	2	100	4	75	2	50	4	26	1	.	.
Lycopodium alpinum	8	1	.	.	.	.	.	.	.	.	.	.
Lycopodium annotinum	17	2	20	1	.	.	83	1	26	2	57	1
Lycopodium clavatum	17	3	.	.	25	1	.	.	.	.	.	.
Lycopodium complanatum	.	.	.	.	.	.	.	.	.	.	.	.
Thelypteris limbosperma	17	7	.	.	50	6	17	3	.	.	.	.
Thelypteris phegopteris	.	.	.	.	25	3	17	1	.	.	.	.

MOSSES

Hylocomium splendens	8	10	20	10	.	.	67	43	58	36	43	37
Pleurozium schreberi	17	35	60	37	25	40	50	30	58	24	57	43
Rhytidiadelphus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum sp.	8	10	60	7	50	3	17	40	16	10	14	20

Species	TSUMER/MENFER/sparse		TSUMER/PHYALE		TSUMER/VACOVA		TSUMER/VACOVA-CASSTE		TSUMER/VACOVA-CLAPYR		TSUMER/VACOVA-ECHHOR	
	39 Plots		11 Plots		28 Plots		10 Plots		18 Plots		15 Plots	
	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV
TREES												
Betula papyrifera	21	2	.	.	.	.	.	.	.	.	.	.
Chamaecyparis nootkatensis	.	.	.	.	.	.	.	.	.	.	.	.
Picea X lutzii	85	7	.	.	21	7	.	.	.	.	.	.
Picea mariana	3	1	.	.	.	.	.	.	.	.	.	.
Picea sitchensis	.	.	27	2	64	6	50	9	78	6	100	8
Populus balsamifera ssp. trichocarpa	.	.	.	.	.	.	.	.	.	.	.	.
Populus tremuloides	.	.	.	.	.	.	.	.	.	.	.	.
Salix scouleriana	3	1	.	.	.	.	.	.	.	.	.	.
Tsuga heterophylla	.	.	.	.	18	6	10	10	39	5	53	5
Tsuga mertensiana	100	64	100	31	100	62	100	42	100	37	100	51
TALL SHRUBS												
Alnus crispa ssp. sinuata	18	2	18	2	7	1	20	3	78	4	13	1
Betula nana	.	.	.	.	.	.	.	.	.	.	.	.
Cladothamnus pyroliflorus	.	.	55	9	21	1	70	10	100	15	40	4
Echinopanax horridum	18	1	.	.	64	1	.	.	39	1	100	14
Menziesia ferruginea	100	14	18	2	82	7	80	5	100	6	80	4
Myrica gale	.	.	.	.	.	.	.	.	.	.	.	.
Rosa acicularis	3	1	.	.	.	.	.	.	.	.	.	.
Rubus spectabilis	.	.	9	1	61	4	30	2	67	2	100	6
Salix alaxensis	.	.	.	.	.	.	.	.	.	.	.	.
Salix barclayi	3	1	.	.	.	.	.	.	.	.	.	.
Salix commutata	.	.	.	.	.	.	.	.	.	.	.	.
Salix hookeriana	.	.	.	.	.	.	.	.	.	.	.	.
Salix sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Salix sp.	.	.	.	.	4	1	.	.	.	.	.	.
Sambucus racemosa	5	1	.	.	.	.	20	2	.	.	7	1
Vaccinium ovalifolium	87	2	73	2	100	56	100	36	100	34	100	47
Viburnum edule	5	1	.	.	.	.	.	.	.	.	.	.
LOW AND DWARF SHRUBS												
Andromeda polifolia	.	.	18	1	.	.	.	.	.	.	.	.
Arctostaphylos uva-ursi	10	2	.	.	.	.	.	.	.	.	.	.
Cassiope stelleriana	.	.	100	18	18	2	100	24	39	2	20	1
Empetrum nigrum	64	3	100	21	18	3	80	24	50	14	.	.
Ledum palustre	18	1	.	.	4	1	.	.	.	.	.	.
Linnaea borealis	54	2	.	.	7	1	.	.	.	.	.	.
Loiseleuria procumbens	.	.	55	13	.	.	.	.	.	.	.	.
Luetkea pectinata	.	.	91	11	7	2	80	23	28	2	7	1
Oxycoccus microcarpus	3	1	.	.	.	.	.	.	.	.	.	.
Phyllodoce aleutica	.	.	100	29	7	3	80	11	22	3	.	.
Salix reticulata	.	.	.	.	.	.	.	.	.	.	.	.
Spiraea beauverdiana	13	1	.	.	.	.	.	.	.	.	.	.
Vaccinium caespitosum	15	1	82	13	18	1	70	8	39	5	.	.
Vaccinium uliginosum	3	1	55	6	.	.	10	1	28	6	.	.
Vaccinium vitis-idaea	82	2	.	.	11	2	10	1	17	2	.	.

FORBS

Achillea borealis	.	.	.	.	.	.	.	.	.	.	.
Aconitum delphinifolium	.	.	.	7	1	.	.	.	.	20	1	
Anemone narcissiflora	.	.	27	1	4	1	20	2	.	7	1	
Artemisia arctica	.	.	.	.	.	.	.	.	.	.	.
Aruncus sylvester	.	.	.	.	.	.	.	.	.	7	1	
Castilleja unalaschcensis	.	.	.	.	.	.	.	.	.	.	.
Coptis aspleniifolia	.	.	9	10	25	6	.	.	72	8	53	6
Coptis trifolia	.	.	45	3	14	1	30	4	50	2	13	1
Cornus canadensis	79	4	45	2	79	3	90	7	100	12	67	6
Dodecatheon pulchellum	.	.	.	.	.	.	10	3	.	.	.	.
Drosera rotundifolia	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium adenocaulon	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium angustifolium	21	1	.	.	4	1	.	.	.	.	.	.
Epilobium latifolium	.	.	.	.	.	.	.	.	.	.	.	.
Erigeron peregrinus	.	.	55	1	4	1	10	1	33	2	7	1
Fauria crista-galli	.	.	91	32	25	2	70	20	100	30	47	3
Fragaria chiloensis	.	.	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	.	.	.	.	.	.	6	1	.	.
Galium trifidum	.	.	.	.	.	.	.	.	.	.	.	.
Gentiana douglasiana	.	.	.	.	.	.	.	.	6	1	.	.
Geocaulon lividum	28	4	.	.	.	.	.	.	.	.	.	.
Geranium erianthum	.	.	.	.	.	.	.	.	.	.	.	.
Geum calthifolium	.	.	82	3	.	.	40	4	22	4	.	.
Heracleum lanatum	.	.	.	.	4	1	.	.	.	.	7	1
Iris setosa	.	.	.	.	.	.	.	.	.	.	.	.
Listera cordata	10	1	27	2	71	3	30	1	28	1	87	3
Lupinus nootkatensis	3	1	.	.	.	.	.	.	.	.	.	.
Lysichiton americanus	.	.	.	.	4	1	.	.	50	1	20	4
Parnassia palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pedicularis parviflora	.	.	.	.	.	.	.	.	.	.	.	.
Polemonium acutiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Polygonum viviparum	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla egedii	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pyrola asarifolia	8	1	.	.	4	1	.	.	.	.	.	.
Pyrola secunda	36	2	.	.	4	1	.	.	.	.	7	1
Pyrola sp.	.	.	.	.	7	2	.	.	.	.	.	.
Rubus arcticus	3	1	.	.	.	.	.	.	.	.	.	.
Rubus pedatus	92	5	64	3	100	7	100	7	89	8	100	8
Sanguisorba stipulata	3	1	.	.	.	.	.	.	.	.	7	1
Spiranthes romanzoffiana	.	.	.	.	.	.	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	3	1	.	.	46	1	50	1	67	1	80	1
Thalictrum sparsiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Tiarella trifoliata	.	.	9	1	46	3	20	1	17	4	93	5
Trientalis europaea	8	1	.	.	4	10	10	3	39	1	.	.
Valeriana sitchensis	.	.	.	.	14	2	.	.	6	1	20	1
Veratrum viride	.	.	27	2	32	2	40	4	61	2	60	2
Viola glabella	.	.	.	.	18	5	.	.	17	1	53	2
Viola sp.	.	.	.	.	.	.	.	.	.	.	.	.

GRAMINOIDS

Agrostis alascana	.	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	5	1	.	.	.	.	.	6	3	7	1	
Calamagrostis nutkaensis	.	.	.	.	7	1	20	16	39	7	13	7
Carex anthoxanthea	.	.	55	4	4	3	30	4	17	14	13	2
Carex lyngbyei	.	.	.	.	.	.	.	.	.	.	.	.
Carex macrochaeta	.	.	9	1	4	1	20	2	.	.	.	.
Carex microglochin	.	.	.	.	.	.	.	.	.	.	.	.
Carex pauciflora	.	.	.	.	.	.	.	.	.	.	.	.
Carex pluriflora	.	.	.	.	.	.	.	.	.	.	.	.
Carex rostrata	.	.	.	.	.	.	.	.	.	.	.	.
Carex sitchensis	.	.	.	.	.	.	.	.	6	10	.	.
Carex sp.	.	.	45	11	4	1	20	7	44	9	20	2
Deschampsia cespitosa	.	.	9	3	.	.	.	.	.	.	.	.
Eriophorum angustifolium	.	.	9	40	.	.	.	.	.	.	.	.
Festuca altaica	.	.	.	.	.	.	.	.	.	.	.	.
Festuca rubra	.	.	.	.	.	.	.	.	.	.	.	.
Hierochloe alpina	.	.	.	.	.	.	.	.	.	.	.	.
Juncus sp.	.	.	.	.	.	.	.	.	.	.	7	1
Luzula sp.	.	.	.	.	.	.	.	.	.	.	.	.
Phleum commutatum	.	.	.	.	.	.	.	.	.	.	.	.
Poa sp.	.	.	.	.	.	.	10	3	.	.	.	.
Trichophorum caespitosum	.	.	36	1	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	.	.	.	.	.	.	.	.	.	.

FERNS AND ALLIES

Athyrium filix-femina	8	1	.	.	46	4	.	.	22	6	60	5
Blechnum spicant	.	.	.	.	57	4	50	1	89	11	93	5
Dryopteris dilatata	26	1	.	.	57	2	20	1	6	3	67	4
Equisetum arvense	13	1	.	.	.	.	.	.	.	.	7	3
Equisetum fluviatile	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum palustre	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum pratense	5	1	.	.	.	.	.	.	.	.	.	.
Equisetum sp.	.	.	.	.	.	.	.	.	.	.	7	1
Equisetum silvaticum	5	1	.	.	.	.	.	.	.	.	.	.
Equisetum variegatum	.	.	.	.	.	.	.	.	.	.	.	.
Gymnocarpium dryopteris	23	1	9	1	82	3	40	2	39	3	93	4
Lycopodium alpinum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium annotinum	28	1	9	3	14	1	.	.	11	1	13	1
Lycopodium clavatum	5	3	27	2	11	2	.	.	6	3	13	1
Lycopodium complanatum	.	.	.	.	.	.	.	.	.	.	.	.
Thelypteris limbosperma	.	.	9	1	21	4	20	1	17	5	47	6
Thelypteris phegopteris	.	.	9	1	25	1	10	1	11	7	47	3

MOSESSES

Hylocomium splendens	72	33	9	20	43	20	20	20	11	40	40	6
Pleurozium schreberi	69	37	.	.	18	30	30	20	.	.	.	.
Rhytidiadelphus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum sp.	44	17	18	35	50	29	50	18	56	4	73	10

Species	TSUMER/VACOVA/CALNUT				TSUMER/VACULI				TSUMER-CHANOO/VACOVA-CASSTE			
	TSUMER/VACOVA-MENFER		TSUMER/VACOVA/FAUCRI		TSUMER/VACULI		TSUMER/VACVIT		TSUMER/VACVIT		3 Plots	
	6 Plots CON	COV	12 Plots CON	COV	8 Plots CON	COV	15 Plots CON	COV	31 Plots CON	COV	CON	COV
TREES												
Betula papyrifera	.	.	.	.	.	.	.	.	16	5	.	.
Chamaecyparis nootkatensis	.	.	.	.	.	.	.	.	3	3	100	30
Picea X lutzii	67	8	.	.	.	.	.	.	55	7	.	.
Picea mariana	.	.	.	.	.	.	.	.	3	1	.	.
Picea sitchensis	17	1	92	8	100	4	47	4	29	2	67	3
Populus balsamifera ssp. trichocarpa	.	.	.	.	.	.	.	.	.	.	.	.
Populus tremuloides	.	.	.	.	.	.	.	.	.	.	.	.
Salix scouleriana	.	.	.	.	.	.	.	.	6	2	.	.
Tsuga heterophylla	.	.	25	10	13	10	7	10	6	1	67	7
Tsuga mertensiana	100	63	100	41	100	46	100	25	100	44	100	33
TALL SHRUBS												
Alnus crispa ssp. sinuata	67	2	25	3	38	5	47	2	32	3	67	7
Betula nana	.	.	.	.	.	.	.	.	13	1	.	.
Cladothamnus pyroliflorus	17	1	92	17	63	3	73	14	26	16	100	10
Echinopanax horridum	33	1	50	1	25	2	.	.	.	.	.	.
Menziesia ferruginea	100	35	92	4	88	7	47	3	84	7	100	17
Myrica gale	.	.	.	.	.	.	.	.	.	.	.	.
Rosa acicularis	.	.	.	.	.	.	.	.	.	.	.	.
Rubus spectabilis	50	1	58	5	63	7	7	1	10	4	.	.
Salix alaxensis	.	.	.	.	.	.	.	.	.	.	.	.
Salix barclayi	.	.	.	.	.	.	.	.	13	3	.	.
Salix commutata	.	.	.	.	.	.	.	.	.	.	.	.
Salix hookeriana	.	.	.	.	.	.	.	.	.	.	.	.
Salix sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Salix sp.	.	.	.	.	.	.	.	.	10	1	.	.
Sambucus racemosa	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium ovalifolium	100	52	100	33	100	41	67	5	68	4	100	50
Viburnum edule	17	1	8	3	.	.	.	.	.	.	.	.
LOW AND DWARF SHRUBS												
Andromeda polifolia	.	.	.	.	13	1	60	2	13	1	.	.
Arctostaphylos uva-ursi	.	.	.	.	.	.	.	.	6	2	.	.
Cassiope stelleriana	67	3	25	2	63	2	53	1	16	2	100	20
Empetrum nigrum	50	2	33	11	63	29	100	38	90	29	100	13
Ledum palustre	.	.	.	.	.	.	.	.	39	2	.	.
Linnaea borealis	33	2	.	.	.	.	.	.	39	2	.	.
Loiseleuria procumbens	.	.	8	1	.	.	47	3	.	.	.	.
Luetkea pectinata	33	2	.	.	50	4	40	2	6	10	33	1
Oxycoccus microcarpus	.	.	.	.	.	.	13	1	23	1	.	.
Phyllodoce aleutica	17	3	25	17	63	17	53	3	16	14	100	13
Salix reticulata	.	.	.	.	.	.	.	.	.	.	.	.
Spiraea beauverdigiana	.	.	.	.	.	.	.	.	29	1	.	.
Vaccinium caespitosum	17	1	42	14	63	6	93	13	39	13	67	6
Vaccinium uliginosum	.	.	17	2	13	3	100	24	35	4	67	2
Vaccinium vitis-idaea	50	4	17	2	25	1	27	4	74	5	67	3

FORBS

Achillea borealis	.	.	.	.	.	.	.	.	.	.	.	.
Aconitum delphinifolium	.	.	.	.	.	.	.	.	.	.	.	.
Anemone narcissiflora	.	.	.	.	.	13	1	6	2	.	.	.
Artemisia arctica	.	.	.	.	.	.	.	.	.	.	.	.
Aruncus sylvester	17	1	.	.	13	1	.	3	1	.	.	.
Castilleja unalaschcensis	.	.	.	.	.	.	.	.	.	.	.	.
Coptis aspleniifolia	.	.	67	3	38	5	27	4	13	4	33	10
Coptis trifolia	17	1	50	1	63	1	100	2	32	1	100	2
Cornus canadensis	100	5	100	13	88	16	93	8	90	6	100	11
Dodecatheon pulchellum	.	.	8	1	13	1	13	1	3	3	.	.
Drosera rotundifolia	.	.	.	.	.	.	7	1	6	1	.	.
Epilobium adenocaulon	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium angustifolium	17	1	.	.	.	.	.	.	26	1	.	.
Epilobium latifolium	.	.	.	.	.	.	.	.	.	.	.	.
Erigeron peregrinus	.	.	25	2	.	.	40	1	16	2	.	.
Fauria crista-galli	17	3	83	25	100	19	100	34	39	41	100	22
Fragaria chiloensis	.	.	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	8	1	.	.	.	.	6	1	.	.
Galium trifidum	17	1	.	.	.	.	.	.	.	.	.	.
Gentiana douglasiana	.	.	8	1	.	.	33	1	13	1	.	.
Geocaulon lividum	17	1	.	.	.	.	.	.	23	2	.	.
Geranium erianthum	.	.	.	.	.	.	7	1	3	1	.	.
Geum calthifolium	17	1	17	6	50	2	80	3	19	4	33	3
Heracleum lanatum	.	.	.	.	.	.	.	.	.	.	.	.
Iris setosa	.	.	.	.	.	.	.	.	.	.	.	.
Listera cordata	50	1	25	1	75	2	7	1	10	1	33	1
Lupinus nootkatensis	.	.	.	.	.	.	.	.	13	1	.	.
Lysichiton americanus	.	.	67	2	.	.	7	1	.	.	.	.
Parnassia palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pedicularis parviflora	.	.	.	.	.	.	.	.	6	2	.	.
Polemonium acutiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Polygonum viviparum	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla egedii	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pyrola asarifolia	17	1	.	.	.	.	.	.	3	1	.	.
Pyrola secunda	33	1	.	.	.	.	.	.	26	3	.	.
Pyrola sp.	.	.	.	.	.	.	.	.	.	.	.	.
Rubus arcticus	.	.	.	.	.	.	.	.	3	1	.	.
Rubus pedatus	100	5	100	6	100	7	27	3	77	3	67	6
Sanguisorba stipulata	17	1	.	.	.	.	.	.	3	1	.	.
Spiranthes romanzoffiana	.	.	.	.	.	.	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	33	1	50	1	38	1	7	1	19	1	.	.
Thalictrum sparsiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Tiarella trifoliata	.	.	58	2	25	2	7	1	6	2	.	.
Trientalis europaea	.	.	33	1	25	1	33	1	32	1	33	1
Valeriana sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Veratrum viride	50	1	75	2	75	4	13	1	10	2	67	1
Viola glabella	.	.	17	2	25	2	.	.	.	.	.	.
Viola sp.	17	1	.	.	.	.	.	.	.	.	.	.

GRAMINOIDS

Agrostis alascana	.	.	.	.	13	1	.	.	.	.	.	.
Calamagrostis canadensis	17	1	.	.	.	.	7	20	23	2	.	.
Calamagrostis nutkaensis	17	1	100	28	.	.	60	6	10	17	33	3
Carex anthoxantha	.	.	42	11	38	8	40	2	16	9	33	20
Carex lyngbyei	.	.	.	.	.	.	.	.	.	.	.	.
Carex macrochaeta	.	.	33	4	13	3	.	.	6	1	.	.
Carex microglochin	.	.	.	.	.	.	.	.	.	.	.	.
Carex pauciflora	.	.	.	.	.	.	.	.	6	25	.	.
Carex pluriflora	.	.	.	.	13	1	.	.	.	.	.	.
Carex rostrata	.	.	.	.	.	.	.	.	.	.	.	.
Carex sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Carex sp.	17	1	8	10	50	3	33	10	6	2	.	.
Deschampsia cespitosa	.	.	8	1	.	.	13	6	3	1	.	.
Eriophorum angustifolium	.	.	.	.	13	3	.	.	6	10	.	.
Festuca altaica	.	.	.	.	.	.	.	.	.	.	.	.
Festuca rubra	.	.	.	.	.	.	.	.	.	.	.	.
Hierochloe alpina	.	.	.	.	.	.	7	1	.	.	.	.
Juncus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Luzula sp.	.	.	.	.	.	.	.	.	.	.	.	.
Phleum commutatum	.	.	.	.	.	.	.	.	.	.	.	.
Poa sp.	.	.	.	.	.	.	.	.	.	.	.	.
Trichophorum caespitosum	.	.	.	.	.	.	27	7	10	34	33	1
Trisetum spicatum	.	.	.	.	.	.	.	.	.	.	.	.

FERNS AND ALLIES

Athyrium filix-femina	.	.	17	2	38	7	7	1	6	11	.	.
Blechnum spicant	17	1	92	5	88	4	40	4	19	5	100	5
Dryopteris dilatata	.	.	25	2	38	2	.	.	3	1	.	.
Equisetum arvense	17	20	8	1	.	.	.	.	6	1	.	.
Equisetum fluviatile	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum palustre	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum pratense	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum sp.	.	.	.	.	.	.	7	1	3	1	.	.
Equisetum silvaticum	.	.	.	.	.	.	.	.	16	1	.	.
Equisetum variegatum	.	.	.	.	.	.	.	.	.	.	.	.
Gymnocarpium dryopteris	67	4	17	1	25	3	7	1	23	3	.	.
Lycopodium alpinum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium annotinum	.	.	8	1	38	1	13	1	16	2	33	1
Lycopodium clavatum	17	3	.	.	.	.	33	1	.	.	33	1
Lycopodium complanatum	.	.	.	.	.	.	.	.	.	.	.	.
Thelypteris limbosperma	.	.	17	3	38	5	.	.	10	1	33	1
Thelypteris phegopteris	.	.	8	3	.	.	7	10	3	1	33	1

MOSSES

Hylocomium splendens	33	10	.	.	50	35	13	25	52	22	67	20
Pleurozium schreberi	33	10	.	.	25	15	7	20	45	33	33	10
Rhytidiadelphus sp.	.	.	.	.	.	.	.	.	.	.	33	20
Sphagnum sp.	17	1	50	34	63	6	33	5	35	39	67	35

Species	TSUMER-PICLUT/HYLSPL				TSUMER-PICLUT/MENFER-VACVIT				TSUMER-PICLUT/MENFER/sparse			
	TSUMER-PICLUT/ECHHOR		TSUMER-PICLUT/MENFER		TSUMER-PICLUT/MENFER		TSUMER-PICLUT/MENFER/sparse		TSUMER-PICLUT/MENFER/sparse		TSUMER-PICLUT/MENFER/sparse	
	3 Plots	5 Plots	29 Plots	7 Plots	19 Plots	11 Plots	CON	COV	CON	COV	CON	COV
CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	
TREES												
Betula papyrifera	.	.	40	7	48	7	57	6	26	9	.	.
Chamaecyparis nootkatensis
Picea X lutzii	100	37	100	28	100	36	100	27	100	34	.	.
Picea mariana	14	20	.	.	.	.
Picea sitchensis	100	45
Populus balsamifera ssp. trichocarpa
Populus tremuloides	.	.	40	2	.	.	.	.	.	.	.	.
Salix scouleriana	.	.	40	1	3	1	14	1	11	1	.	.
Tsuga heterophylla
Tsuga mertensiana	100	43	100	56	100	52	100	46	100	46	100	34
TALL SHRUBS												
Alnus crispa ssp. sinuata	21	4	14	30	26	3	64	8
Betula nana
Cladothamnus pyroliflorus	9	3
Echinopanax horridum	100	20	.	.	55	8	14	1	47	1	100	24
Menziesia ferruginea	67	2	60	3	100	45	100	50	100	14	91	16
Myrica gale
Rosa acicularis	29	2	11	1	.	.
Rubus spectabilis	64	10
Salix alaxensis
Salix barclayi
Salix commutata
Salix hookeriana
Salix sitchensis
Salix sp.
Sambucus racemosa	33	1	20	1	3	3	14	3	21	2	27	2
Vaccinium ovalifolium	67	7	60	1	55	2	86	3	74	3	91	6
Viburnum edule	.	.	20	1	17	1	14	1	21	1	.	.
LOW AND DWARF SHRUBS												
Andromeda polifolia
Arctostaphylos uva-ursi
Cassiope stelleriana
Empetrum nigrum	.	.	40	1	14	1	43	18	37	1	.	.
Ledum palustre	29	2	5	1	.	.
Linnaea borealis	33	1	60	2	38	2	86	2	63	2	.	.
Loiseleuria procumbens
Luetkea pectinata	9	1
Oxycoccus microcarpus	14	1	.	.	.	.
Phyllodoce aleutica	9	1
Salix reticulata
Spiraea beauverdiana
Vaccinium caespitosum	9	1
Vaccinium uliginosum	5	1	.	.
Vaccinium vitis-idaea	.	.	60	1	59	2	100	10	63	1	.	.

FORBS

Achillea borealis	.	.	.	.	.	.	.	.	.	.	.	.
Aconitum delphinifolium	33	1	.	.	.	.	.	.	.	.	.	.
Anemone narcissiflora	.	.	.	.	.	.	.	.	.	.	.	.
Artemisia arctica	.	.	.	.	.	.	.	.	.	.	.	.
Aruncus sylvester	.	.	.	.	.	.	.	.	.	45	2	.
Castilleja unalaschcensis	.	.	.	.	.	.	.	.	.	.	.	.
Coptis aspleniifolia	.	.	.	.	.	.	.	.	.	.	.	.
Coptis trifolia	.	.	.	.	.	.	.	.	.	9	10	.
Cornus canadensis	100	2	80	1	79	5	71	5	79	3	82	4
Dodecatheon pulchellum	.	.	.	.	.	.	.	.	.	.	.	.
Drosera rotundifolia	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium adenocaulon	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium angustifolium	33	1	20	3	3	1	.	.	16	1	9	1
Epilobium latifolium	.	.	.	.	.	.	.	.	.	.	.	.
Erigeron peregrinus	.	.	.	.	.	.	.	.	.	.	9	1
Fauria crista-galli	.	.	.	.	.	.	.	.	.	.	9	10
Fragaria chiloensis	.	.	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	.	.	.	.	.	.	.	.	.	.
Galium trifidum	.	.	.	.	.	.	.	.	.	.	9	1
Gentiana douglasiana	.	.	.	.	.	.	.	.	.	.	.	.
Geocaulon lividum	.	.	80	2	17	1	86	1	26	1	.	.
Geranium erianthum	.	.	.	.	.	.	.	.	.	.	.	.
Geum calthifolium	.	.	.	.	.	.	.	.	.	.	.	.
Heracleum lanatum	.	.	.	.	.	.	.	.	.	.	27	5
Iris setosa	.	.	.	.	.	.	.	.	.	.	.	.
Listera cordata	67	1	20	1	.	.	14	1	11	1	27	1
Lupinus nootkatensis	.	.	.	.	.	.	.	.	.	.	.	.
Lysichiton americanus	.	.	.	.	.	.	.	.	.	.	9	1
Parnassia palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pedicularis parviflora	.	.	.	.	.	.	.	.	.	.	.	.
Polemonium acutiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Polygonum viviparum	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla egedii	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pyrola asarifolia	.	.	.	.	3	1	14	1	.	.	.	.
Pyrola secunda	33	1	40	1	34	2	43	2	58	1	27	1
Pyrola sp.	.	.	.	.	.	.	.	.	.	.	.	.
Rubus arcticus	.	.	.	.	.	.	.	.	.	.	.	.
Rubus pedatus	100	8	60	5	97	20	86	6	95	9	100	10
Sanguisorba stipulata	.	.	.	.	3	1	.	.	5	1	.	.
Spiranthes romanzoffiana	.	.	.	.	.	.	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	67	1	.	.	3	1	14	1	26	5	91	1
Thalictrum sparsiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Tiarella trifoliata	67	1	.	.	.	.	.	.	5	1	73	10
Trientalis europaea	33	1	.	.	.	.	.	.	.	.	9	1
Valeriana sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Veratrum viride	.	.	.	.	.	.	.	.	5	1	9	3
Viola glabella	.	.	.	.	.	.	.	.	.	.	18	6
Viola sp.	.	.	.	.	.	.	.	.	.	.	9	3

GRAMINOIDS

Agrostis alascana	.	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	33	3	.	.	7	6	.	.	.	9	1
Calamagrostis nutkaensis	.	.	.	.	.	.	.	.	.	9	1
Carex anthoxanthea	.	.	.	.	.	.	.	.	.	.	.
Carex lyngbyei	.	.	.	.	.	.	.	.	.	.	.
Carex macrochaeta	.	.	.	.	.	.	.	.	.	.	.
Carex microglochin	.	.	.	.	.	.	.	.	.	.	.
Carex pauciflora	.	.	.	.	.	.	.	.	.	.	.
Carex pluriflora	.	.	.	.	.	.	.	.	.	.	.
Carex rostrata	.	.	.	.	.	.	.	.	.	.	.
Carex sitchensis	.	.	.	.	.	.	.	.	.	.	.
Carex sp.	.	.	.	.	.	.	.	.	.	27	1
Deschampsia cespitosa	.	.	.	.	.	.	.	.	.	.	.
Eriophorum angustifolium	.	.	.	.	.	.	.	.	.	.	.
Festuca altaica	.	.	.	.	.	.	.	.	.	.	.
Festuca rubra	.	.	.	.	.	.	.	.	.	.	.
Hierochloe alpina	.	.	.	.	.	.	.	.	.	.	.
Juncus sp.	.	.	.	.	.	.	.	.	.	.	.
Luzula sp.	.	.	.	.	.	.	.	.	.	.	.
Phleum commutatum	.	.	.	.	.	.	.	.	.	.	.
Poa sp.	.	.	.	.	.	.	.	.	.	.	.
Trichophorum caespitosum	.	.	.	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	.	.	.	.	.	.	.	9	1

FERNS AND ALLIES

Athyrium filix-femina	67	3	.	.	10	1	.	.	26	2	55	10
Blechnum spicant	.	.	.	.	.	.	.	.	.	.	18	2
Dryopteris dilatata	67	30	.	.	52	7	14	1	42	4	91	30
Equisetum arvense	.	.	.	.	7	11	43	11	16	1	18	6
Equisetum fluviatile	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum palustre	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum pratense	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum sp.	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum silvaticum	.	.	.	.	10	2	14	1	.	.	9	1
Equisetum variegatum	.	.	.	.	.	.	.	.	.	.	.	.
Gymnocarpium dryopteris	67	7	.	.	38	4	.	.	42	3	100	36
Lycopodium alpinum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium annotinum	67	1	20	1	48	3	43	5	63	3	36	6
Lycopodium clavatum	.	.	.	.	3	1	14	1	.	.	18	2
Lycopodium complanatum	.	.	.	.	.	.	.	.	5	1	.	.
Thelypteris limbosperma	.	.	.	.	.	.	.	.	.	.	9	1
Thelypteris phegopteris	33	3	.	.	.	.	.	.	.	.	18	7

MOSESSES

Hylocomium splendens	33	40	80	55	28	53	43	23	63	46	36	40
Pleurozium schreberi	67	55	80	25	28	20	43	43	58	29	.	.
Rhytidiadelphus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum sp.	33	1	.	.	3	60	14	50	16	24	9	1

Species	TSUMER-PICSIT/VACOVA-ECHHOR				TSUMER-PICSIT/VACOVA-DRYDIL				TSUMER-TSUHET/VACOVA			
	TSUMER-PICSIT/VACOVA		TSUMER-PICSIT/VACOVA-RUBSPE		TSUMER-PICSIT/VACOVA-LYSAME							
	27 Plots	22 Plots	7 Plots	17 Plots	8 Plots	36 Plots	CON	COV	CON	COV	CON	COV
TREES												
Betula papyrifera	.	.	.	.	.	.	.	.	.	.	.	.
Chamaecyparis nootkatensis	.	.	.	.	.	.	.	.	.	.	.	.
Picea X lutzii	.	.	.	.	.	.	.	.	.	.	.	.
Picea mariana	.	.	.	.	.	.	.	.	.	.	.	.
Picea sitchensis	100	35	100	40	100	47	100	39	100	40	83	16
Populus balsamifera ssp. trichocarpa	.	.	.	.	.	.	.	.	.	.	.	.
Populus tremuloides	.	.	.	.	.	.	.	.	.	.	.	.
Salix scouleriana	.	.	.	.	.	.	.	.	.	.	.	.
Tsuga heterophylla	15	8	14	1	14	10	6	1	.	.	100	44
Tsuga mertensiana	100	46	100	39	100	31	100	39	100	41	100	38
TALL SHRUBS												
Alnus crispa ssp. sinuata	19	1	18	1	14	1	12	7	.	.	22	3
Betula nana	.	.	.	.	.	.	.	.	.	.	.	.
Cladothamnus pyroliflorus	15	2	9	2	.	.	12	3	25	2	19	2
Echinopanax horridum	93	1	100	14	100	11	100	3	88	1	86	2
Menziesia ferruginea	85	3	91	7	86	14	71	4	88	7	89	9
Myrica gale	.	.	.	.	.	.	.	.	.	.	.	.
Rosa acicularis	.	.	.	.	.	.	.	.	.	.	.	.
Rubus spectabilis	89	4	95	5	100	30	88	4	100	3	97	6
Salix alaxensis	.	.	.	.	.	.	.	.	.	.	.	.
Salix barclayi	.	.	.	.	.	.	.	.	.	.	.	.
Salix commutata	.	.	.	.	.	.	.	.	.	.	.	.
Salix hookeriana	.	.	.	.	.	.	.	.	.	.	.	.
Salix sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Salix sp.	.	.	.	.	.	.	.	.	.	.	.	.
Sambucus racemosa	.	.	.	.	14	1	.	.	.	.	.	.
Vaccinium ovalifolium	100	56	100	43	100	44	100	54	100	50	100	49
Viburnum edule	.	.	.	.	.	.	.	.	13	1	.	.
LOW AND DWARF SHRUBS												
Andromeda polifolia	.	.	.	.	.	.	.	.	.	.	.	.
Arctostaphylos uva-ursi	.	.	.	.	.	.	.	.	.	.	.	.
Cassiope stelleriana	4	10	.	.	14	1	.	.	.	.	.	.
Empetrum nigrum	.	.	.	.	.	.	.	.	.	.	.	.
Ledum palustre	.	.	.	.	.	.	.	.	.	.	.	.
Linnaea borealis	.	.	.	.	.	.	.	.	.	.	.	.
Loiseleuria procumbens	.	.	.	.	.	.	.	.	.	.	.	.
Luetkea pectinata	7	3	.	.	.	.	.	.	.	.	.	.
Oxycoccus microcarpus	.	.	.	.	.	.	.	.	.	.	.	.
Phyllodoce aleutica	.	.	.	.	.	.	.	.	.	.	.	.
Salix reticulata	.	.	.	.	.	.	.	.	.	.	.	.
Spiraea beauverdiana	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium caespitosum	.	.	5	1	14	3	6	1	.	.	3	1
Vaccinium uliginosum	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium vitis-idaea	.	.	.	.	.	.	.	.	.	.	.	.

FORBS

Achillea borealis	.	.	.	.	.	.	.	.	.	.	.	.
Aconitum delphinifolium	.	.	.	.	.	.	.	.	.	3	1	.
Anemone narcissiflora	.	.	.	.	.	.	.	.	.	.	.	.
Artemisia arctica	.	.	.	.	.	.	.	.	.	.	.	.
Aruncus sylvester	.	.	9	1	.	.	6	1	.	.	3	1
Castilleja unalaschcensis	.	.	.	.	.	.	.	.	.	.	.	.
Coptis aspleniifolia	44	5	36	8	14	1	12	3	63	11	75	5
Coptis trifolia	4	3	9	1	29	1	6	1	25	1	.	.
Cornus canadensis	93	5	91	4	71	4	59	6	100	8	97	6
Dodecatheon pulchellum	.	.	.	.	.	.	.	.	.	.	.	.
Drosera rotundifolia	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium adenocaulon	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium angustifolium	4	1	.	.	.	.	.	.	.	.	.	.
Epilobium latifolium	.	.	.	.	.	.	.	.	.	.	.	.
Erigeron peregrinus	.	.	.	.	.	.	.	.	.	.	3	1
Fauria crista-galli	19	4	14	1	14	1	.	.	50	4	25	2
Fragaria chiloensis	.	.	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	.	.	.	.	.	.	.	.	.	.
Galium trifidum	.	.	.	.	.	.	.	.	.	.	.	.
Gentiana douglasiana	.	.	.	.	.	.	.	.	.	.	.	.
Geocaulon lividum	.	.	.	.	.	.	.	.	.	.	.	.
Geranium erianthum	.	.	.	.	.	.	.	.	.	.	.	.
Geum calthifolium	.	.	.	.	.	.	.	.	.	.	.	.
Heracleum lanatum	.	.	.	.	.	.	.	.	.	.	.	.
Iris setosa	.	.	.	.	.	.	.	.	.	.	.	.
Listera cordata	93	2	77	4	71	1	82	6	88	2	78	1
Lupinus nootkatensis	.	.	.	.	.	.	.	.	.	.	.	.
Lysichiton americanus	56	2	14	1	29	2	6	1	100	14	36	2
Parnassia palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pedicularis parviflora	.	.	.	.	.	.	.	.	.	.	.	.
Polemonium acutiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Polygonum viviparum	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla egedii	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pyrola asarifolia	.	.	.	.	.	.	.	.	.	.	.	.
Pyrola secunda	.	.	5	1	.	.	.	.	.	.	.	.
Pyrola sp.	.	.	.	.	.	.	.	.	.	.	.	.
Rubus arcticus	.	.	.	.	.	.	6	1	.	.	.	.
Rubus pedatus	96	6	100	10	100	21	100	11	100	7	97	7
Sanguisorba stipulata	4	1	.	.	.	.	.	.	.	.	3	1
Spiranthes romanzoffiana	.	.	.	.	.	.	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	63	1	91	2	100	1	76	1	75	1	72	1
Thalictrum sparsiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Tiarella trifoliata	74	2	95	4	100	8	82	5	100	2	72	2
Trientalis europaea	4	1	5	1	29	1	.	.	13	1	.	.
Valeriana sitchensis	.	.	5	1	.	.	18	1	.	.	.	.
Veratrum viride	15	1	36	1	29	2	47	2	13	3	17	1
Viola glabella	19	1	45	3	29	7	41	3	13	3	11	1
Viola sp.	.	.	.	.	.	.	6	1	.	.	.	.

GRAMINOIDS

Agrostis alascana	.	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	4	20	.	.	.	6	1	.	.	.	.
Calamagrostis nutkaensis	7	1	23	3	14	1	12	2	38	5	17	6
Carex anthoxantha	4	10	.	.	14	1	.	.	13	20	6	2
Carex lyngbyei	.	.	.	.	.	.	.	.	.	.	.	.
Carex macrochaeta	4	10	.	.	14	10	18	3	13	3	.	.
Carex microglochin	.	.	.	.	.	.	.	.	.	.	.	.
Carex pauciflora	.	.	.	.	.	.	.	.	.	.	.	.
Carex pluriflora	.	.	.	.	.	.	.	.	.	.	.	.
Carex rostrata	.	.	.	.	.	.	.	.	.	.	.	.
Carex sitchensis	.	.	.	.	.	.	.	.	13	20	.	.
Carex sp.	.	.	5	1	.	.	6	1	.	.	3	1
Deschampsia cespitosa	.	.	5	1	.	.	6	1	.	.	.	.
Eriophorum angustifolium	.	.	.	.	.	.	.	.	13	1	.	.
Festuca altaica	.	.	.	.	.	.	.	.	.	.	.	.
Festuca rubra	.	.	.	.	.	.	.	.	.	.	.	.
Hierochloe alpina	.	.	.	.	.	.	.	.	.	.	.	.
Juncus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Luzula sp.	.	.	.	.	.	.	.	.	.	.	.	.
Phleum commutatum	.	.	.	.	.	.	.	.	.	.	.	.
Poa sp.	.	.	.	.	.	.	.	.	.	.	.	.
Trichophorum caespitosum	.	.	.	.	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	.	.	14	3	.	.	.	.	.	.

FERNS AND ALLIES

Athyrium filix-femina	33	3	59	4	43	2	35	7	38	1	36	4
Blechnum spicant	74	3	68	4	43	2	47	3	75	1	86	8
Dryopteris dilatata	70	2	91	8	100	11	100	13	63	1	64	2
Equisetum arvense	4	1	.	.	.	.	.	.	.	.	.	.
Equisetum fluviatile	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum palustre	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum pratense	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum sp.	.	.	.	.	14	3	.	.	.	.	3	3
Equisetum silvaticum	.	.	5	1	.	.	.	.	.	.	.	.
Equisetum variegatum	.	.	.	.	.	.	.	.	.	.	.	.
Gymnocarpium dryopteris	96	4	91	10	100	17	88	13	100	3	86	4
Lycopodium alpinum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium annotinum	22	1	32	2	43	4	12	2	25	2	22	1
Lycopodium clavatum	15	2	9	2	.	.	12	1	13	1	19	1
Lycopodium complanatum	.	.	.	.	.	.	.	.	.	.	.	.
Thelypteris limbosperma	7	1	18	3	.	.	18	11	.	.	19	5
Thelypteris phegopteris	30	2	50	6	57	3	53	2	38	2	17	2

MOSSES

Hylocomium splendens	.	.	18	4	29	30	6	60	.	.	25	18
Pleurozium schreberi	.	.	5	3	14	10	.	.	.	.	3	3
Rhytidiadelphus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum sp.	48	9	45	10	71	34	24	18	63	28	72	10

Species	TSUMER-TSUHET/VACOVA-CLAPYR				TSUMER-TSUHET/VACOVA-MENFER				TSUMER-TSUHET/VACOVA/FAUCRI			
	TSUMER-TSUHET/VACOVA-CASSTE		TSUMER-TSUHET/VACOVA-ECHHOR		TSUMER-TSUHET/VACOVA/CALNUT							
	5 Plots	3 Plots	11 Plots	4 Plots	5 Plots	7 Plots	CON	COV	CON	COV	CON	COV
TREES												
Betula papyrifera	.	.	.	.	.	.	.	.	.	.	.	.
Chamaecyparis nootkatensis	.	.	.	.	.	.	.	.	.	.	.	.
Picea X lutzii	.	.	.	.	.	.	.	.	.	.	.	.
Picea mariana	.	.	.	.	.	.	.	.	.	.	.	.
Picea sitchensis	40	7	100	5	100	28	75	8	100	9	100	7
Populus balsamifera ssp. trichocarpa	.	.	.	.	.	.	.	.	.	.	.	.
Populus tremuloides	.	.	.	.	.	.	.	.	.	.	.	.
Salix scouleriana	.	.	.	.	.	.	.	.	.	.	.	.
Tsuga heterophylla	100	22	100	27	100	31	100	48	100	30	100	30
Tsuga mertensiana	100	32	100	43	100	35	100	35	100	24	100	36
TALL SHRUBS												
Alnus crispa ssp. sinuata	40	20	33	10	18	2	50	12	80	4	86	6
Betula nana	.	.	.	.	.	.	.	.	.	.	.	.
Cladothamnus pyroliflorus	80	13	100	17	27	4	.	.	40	10	71	2
Echinopanax horridum	20	3	67	1	100	13	50	2	60	1	100	2
Menziesia ferruginea	100	11	100	13	73	7	100	30	80	13	100	11
Myrica gale	20	1	.	.	.	.	.	.	.	.	.	.
Rosa acicularis	.	.	.	.	.	.	.	.	.	.	.	.
Rubus spectabilis	80	7	67	6	100	10	50	6	100	4	100	4
Salix alaxensis	.	.	.	.	.	.	.	.	.	.	.	.
Salix barclayi	.	.	.	.	.	.	.	.	.	.	.	.
Salix commutata	.	.	.	.	.	.	.	.	.	.	.	.
Salix hookeriana	.	.	.	.	.	.	.	.	.	.	.	.
Salix sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Salix sp.	.	.	.	.	.	.	.	.	.	.	.	.
Sambucus racemosa	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium ovalifolium	100	32	100	37	100	49	100	50	100	40	100	49
Viburnum edule	.	.	.	.	.	.	.	.	.	.	14	1
LOW AND DWARF SHRUBS												
Andromeda polifolia	.	.	33	1	.	.	.	.	.	.	.	.
Arctostaphylos uva-ursi	.	.	.	.	.	.	.	.	.	.	.	.
Cassiope stelleriana	100	16	33	1	.	.	.	.	20	3	.	.
Empetrum nigrum	60	21	33	3	.	.	25	3	.	.	14	1
Ledum palustre	.	.	.	.	.	.	.	.	.	.	.	.
Linnaea borealis	.	.	.	.	.	.	.	.	.	.	.	.
Loiseleuria procumbens	.	.	.	.	.	.	.	.	.	.	.	.
Luetkea pectinata	20	3	.	.	.	.	.	.	.	.	.	.
Oxycoccus microcarpus	.	.	.	.	.	.	.	.	.	.	.	.
Phyllodoce aleutica	100	22	67	2	.	.	.	.	20	1	.	.
Salix reticulata	.	.	.	.	.	.	.	.	.	.	.	.
Spiraea beauverdiana	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium caespitosum	60	2	33	3	.	.	.	.	.	.	.	.
Vaccinium uliginosum	20	20	.	.	.	.	.	.	.	.	.	.
Vaccinium vitis-idaea	.	.	.	.	.	.	25	3	20	1	14	1

FORBS

Achillea borealis	.	.	.	.	.	.	.	.	.	.	.	.
Aconitum delphinifolium	.	.	.	.	.	.	.	.	.	.	.	.
Anemone narcissiflora	20	3	.	.	.	.	.	.	.	.	.	.
Artemisia arctica	.	.	.	.	.	.	.	.	.	.	.	.
Aruncus sylvester	.	.	.	.	.	.	.	.	.	14	1	.
Castilleja unalaschcensis	.	.	.	.	.	.	.	.	.	14	1	.
Coptis aspleniifolia	40	12	67	2	82	8	50	1	60	7	100	6
Coptis trifolia	20	1	33	3	9	1	.	.	40	2	14	1
Cornus canadensis	100	9	100	14	100	4	100	15	100	18	100	13
Dodecatheon pulchellum	.	.	.	.	.	.	.	.	.	.	.	.
Drosera rotundifolia	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium adenocaulon	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium angustifolium	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium latifolium	.	.	.	.	.	.	.	.	.	.	.	.
Erigeron peregrinus	.	.	33	1	.	.	.	.	.	.	14	1
Fauria crista-galli	80	18	67	45	27	1	50	6	80	15	100	11
Fragaria chiloensis	.	.	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	.	.	.	.	.	.	.	.	14	1
Galium trifidum	.	.	.	.	.	.	.	.	.	.	.	.
Gentiana douglasiana	.	.	33	1	.	.	.	.	.	.	.	.
Geocaulon lividum	.	.	.	.	.	.	.	.	.	.	.	.
Geranium erianthum	.	.	.	.	.	.	.	.	.	.	.	.
Geum calthifolium	40	2	33	1	.	.	.	.	.	.	.	.
Heracleum lanatum	.	.	.	.	.	.	25	1	.	.	.	.
Iris setosa	.	.	.	.	.	.	.	.	.	.	.	.
Listera cordata	40	1	33	1	91	3	25	3	40	2	100	1
Lupinus nootkatensis	.	.	.	.	.	.	.	.	.	.	.	.
Lysichiton americanus	20	1	.	.	27	2	50	10	60	2	71	1
Parnassia palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pedicularis parviflora	.	.	.	.	.	.	.	.	.	.	.	.
Polemonium acutiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Polygonum viviparum	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla egedii	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pyrola asarifolia	.	.	.	.	.	.	.	.	.	.	.	.
Pyrola secunda	.	.	.	.	.	.	.	.	.	.	.	.
Pyrola sp.	.	.	33	1	.	.	.	.	.	.	.	.
Rubus arcticus	.	.	.	.	.	.	.	.	.	.	.	.
Rubus pedatus	80	5	100	7	100	11	100	8	100	7	100	8
Sanguisorba stipulata	.	.	.	.	.	.	.	.	.	.	.	.
Spiranthes romanzoffiana	.	.	.	.	.	.	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	80	1	33	1	91	1	50	1	60	2	57	1
Thalictrum sparsiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Tiarella trifoliata	20	1	67	1	91	4	.	.	20	1	57	2
Trientalis europaea	.	.	33	1	.	.	.	.	.	.	.	.
Valeriana sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Veratrum viride	40	1	33	3	27	1	25	1	40	1	57	6
Viola glabella	.	.	.	.	27	3	.	.	.	.	29	1
Viola sp.	.	.	.	.	.	.	.	.	.	.	.	.

GRAMINOIDS

Agrostis alascana	.	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	.	.	.	.	.	.	.	.	.	.	.
Calamagrostis nutkaensis	20	20	.	.	.	25	20	100	28	29	10
Carex anthoxanthea	20	10	.	.	.	.	.	.	.	.	.
Carex lyngbyei	.	.	.	.	.	.	.	.	.	.	.
Carex macrochaeta	.	.	.	.	.	.	.	20	10	.	.
Carex microglochin	.	.	.	.	.	.	.	.	.	.	.
Carex pauciflora	.	.	.	.	.	.	.	.	.	.	.
Carex pluriflora	.	.	.	.	.	.	.	.	.	.	.
Carex rostrata	.	.	.	.	.	.	.	.	.	.	.
Carex sitchensis	.	.	.	.	.	.	.	.	.	.	.
Carex sp.	20	3	.	.	.	.	.	.	.	43	4
Deschampsia cespitosa	.	.	.	.	.	.	.	.	.	.	.
Eriophorum angustifolium	.	.	.	.	.	.	.	.	.	.	.
Festuca altaica	.	.	.	.	.	.	.	.	.	.	.
Festuca rubra	.	.	.	.	.	.	.	.	.	.	.
Hierochloe alpina	.	.	.	.	.	.	.	.	.	.	.
Juncus sp.	.	.	.	.	.	.	.	.	.	.	.
Luzula sp.	.	.	.	.	.	.	.	.	.	.	.
Phleum commutatum	.	.	.	.	.	.	.	.	.	.	.
Poa sp.	.	.	.	.	.	.	.	.	.	.	.
Trichophorum caespitosum	.	.	.	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	.	.	.	.	.	.	.	.	.

FERNS AND ALLIES

Athyrium filix-femina	20	1	.	.	73	5	25	3	.	.	43	5
Blechnum spicant	100	10	100	17	82	7	75	11	100	7	100	10
Dryopteris dilatata	.	.	33	1	82	7	.	.	.	.	29	2
Equisetum arvense	.	.	.	.	.	.	.	.	.	.	14	1
Equisetum fluviatile	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum palustre	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum pratense	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum sp.	.	.	.	.	.	.	.	.	20	10	.	.
Equisetum silvaticum	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum variegatum	.	.	.	.	.	.	.	.	.	.	.	.
Gymnocarpium dryopteris	40	3	33	1	82	5	100	12	40	12	43	1
Lycopodium alpinum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium annotinum	.	.	33	1	27	1	50	1	.	.	29	1
Lycopodium clavatum	20	1	33	3	18	1	.	.	.	.	14	1
Lycopodium complanatum	.	.	.	.	.	.	.	.	.	.	.	.
Thelypteris limbosperma	60	2	33	20	9	3	.	.	.	.	14	1
Thelypteris phegopteris	20	3	.	.	36	4	.	.	.	.	29	1

MOSESSES

Hylocomium splendens	20	10	33	20	18	15	25	20	.	.	57	28
Pleurozium schreberi	.	.	33	20	.	.	.	.	.	.	.	.
Rhytidiadelphus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum sp.	20	50	.	.	45	12	25	10	20	1	71	6

TSUMER-TSUHET/VACOVA/LYSAME

Species	5 Plots	
	CON	COV
TREES		
Betula papyrifera	.	.
Chamaecyparis nootkatensis	.	.
Picea X lutzii	.	.
Picea mariana	.	.
Picea sitchensis	80	15
Populus balsamifera ssp. trichocarpa	.	.
Populus tremuloides	.	.
Salix scouleriana	.	.
Tsuga heterophylla	100	42
Tsuga mertensiana	100	30
TALL SHRUBS		
Alnus crispa ssp. sinuata	40	1
Betula nana	.	.
Cladothamnus pyroliflorus	20	10
Echinopanax horridum	80	3
Menziesia ferruginea	100	11
Myrica gale	.	.
Rosa acicularis	.	.
Rubus spectabilis	100	4
Salix alaxensis	.	.
Salix barclayi	.	.
Salix commutata	.	.
Salix hookeriana	.	.
Salix sitchensis	.	.
Salix sp.	.	.
Sambucus racemosa	.	.
Vaccinium ovalifolium	100	42
Viburnum edule	.	.
LOW AND DWARF SHRUBS		
Andromeda polifolia	.	.
Arctostaphylos uva-ursi	.	.
Cassiope stelleriana	.	.
Empetrum nigrum	.	.
Ledum palustre	.	.
Linnaea borealis	.	.
Loiseleuria procumbens	.	.
Luetkea pectinata	.	.
Oxycoccus microcarpus	.	.
Phyllodoce aleutica	.	.
Salix reticulata	.	.
Spiraea beauverdiana	.	.
Vaccinium caespitosum	.	.
Vaccinium uliginosum	.	.
Vaccinium vitis-idaea	.	.

FORBS

Achillea borealis	.	.
Aconitum delphinifolium	.	.
Anemone narcissiflora	.	.
Artemisia arctica	.	.
Aruncus sylvester	.	.
Castilleja unalaschcensis	.	.
Coptis aspleniifolia	80	6
Coptis trifolia	.	.
Cornus canadensis	100	9
Dodecatheon pulchellum	.	.
Drosera rotundifolia	.	.
Epilobium adenocaulon	.	.
Epilobium angustifolium	.	.
Epilobium latifolium	.	.
Erigeron peregrinus	.	.
Fauria crista-galli	80	2
Fragaria chiloensis	.	.
Fritillaria camschatcensis	.	.
Galium trifidum	.	.
Gentiana douglasiana	.	.
Geocaulon lividum	.	.
Geranium erianthum	.	.
Geum calthifolium	.	.
Heracleum lanatum	.	.
Iris setosa	.	.
Listera cordata	100	2
Lupinus nootkatensis	.	.
Lysichiton americanus	100	18
Parnassia palustris	.	.
Pedicularis parviflora	.	.
Polemonium acutiflorum	.	.
Polygonum viviparum	.	.
Potentilla egedii	.	.
Potentilla palustris	.	.
Pyrola asarifolia	.	.
Pyrola secunda	20	1
Pyrola sp.	.	.
Rubus arcticus	.	.
Rubus pedatus	100	8
Sanguisorba stipulata	.	.
Spiranthes romanzoffiana	.	.
Stellaria calycantha	.	.
Streptopus amplexifolius	80	2
Thalictrum sparsiflorum	.	.
Tiarella trifoliata	80	2
Trientalis europaea	.	.
Valeriana sitchensis	.	.
Veratrum viride	20	1
Viola glabella	20	1
Viola sp.	.	.

GRAMINOIDS

Agrostis alascana	.	.
Calamagrostis canadensis	20	1
Calamagrostis nutkaensis	.	.
Carex anthoxanthea	.	.
Carex lyngbyei	.	.
Carex macrochaeta	.	.
Carex microglochin	.	.
Carex pauciflora	.	.
Carex pluriflora	.	.
Carex rostrata	.	.
Carex sitchensis	.	.
Carex sp.	40	1
Deschampsia cespitosa	.	.
Eriophorum angustifolium	.	.
Festuca altaica	.	.
Festuca rubra	.	.
Hierochloe alpina	.	.
Juncus sp.	.	.
Luzula sp.	.	.
Phleum commutatum	.	.
Poa sp.	.	.
Trichophorum caespitosum	.	.
Trisetum spicatum	.	.

FERNS AND ALLIES

Athyrium filix-femina	40	7
Blechnum spicant	60	5
Dryopteris dilatata	20	1
Equisetum arvense	20	1
Equisetum fluviatile	.	.
Equisetum palustre	.	.
Equisetum pratense	.	.
Equisetum sp.	.	.
Equisetum silvaticum	.	.
Equisetum variegatum	.	.
Gymnocarpium dryopteris	100	5
Lycopodium alpinum	.	.
Lycopodium annotinum	80	2
Lycopodium clavatum	.	.
Lycopodium complanatum	.	.
Thelypteris limbosperma	.	.
Thelypteris phegopteris	40	2

MOSESSES

Hylacomium splendens	40	35
Pleurozium schreberi	.	.
Rhytidiadelphus sp.	.	.
Sphagnum sp.	80	30

Broadleaf Forest

Species	BETPAP/ALNCRIS		BETPAP/CALCAN		BETPAP/ECHHOR		BETPAP/LINBOR		BETPAP/MENFER		BETPAP/MENFER/sparse	
	7 Plots		7 Plots		5 Plots		3 Plots		10 Plots		9 Plots	
	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV
TREES												
Betula papyrifera	100	40	100	66	100	72	100	67	100	68	100	53
Picea X lutzii	29	10	71	5	60	4	100	13	80	7	22	3
Picea mariana	.	.	14	1	.	.	.	.	.	.	.	.
Picea sitchensis	14	10	.	.	40	6	.	.	.	.	78	12
Populus balsamifera ssp. trichocarpa	14	3	.	.	.	.	.	.	10	1	.	.
Populus tremuloides	.	.	.	.	.	.	.	.	.	.	.	.
Salix scouleriana	14	10	14	1	40	17	67	1	30	12	89	30
Tsuga heterophylla	.	.	.	.	.	.	.	.	.	.	.	.
Tsuga mertensiana	29	2	29	1	60	2	67	1	90	8	67	6
TALL SHRUBS												
Alnus crispa ssp. sinuata	100	40	43	5	40	7	67	1	20	2	67	2
Echinopanax horridum	14	1	43	1	100	34	67	1	70	11	67	1
Menziesia ferruginea	29	2	71	2	80	11	100	2	100	46	100	14
Myrica gale	.	.	14	40	.	.	.	.	.	.	.	.
Rosa acicularis	14	1	57	1	.	.	33	1	20	6	22	1
Rubus spectabilis	.	.	.	.	.	.	.	.	.	.	.	.
Salix alaxensis	.	.	.	.	.	.	.	.	.	.	.	.
Salix barclayi	.	.	14	1	.	.	.	.	.	.	.	.
Salix commutata	14	3	14	10	.	.	.	.	.	.	.	.
Salix sitchensis	14	3	.	.	.	.	.	.	.	.	.	.
Salix sp.	14	1	.	.	.	.	.	.	10	3	.	.
Sambucus racemosa	14	1	71	1	100	23	67	1	70	3	22	12
Shepherdia canadensis	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium ovalifolium	.	.	.	.	.	.	.	.	.	.	11	1
Viburnum edule	71	13	43	4	40	1	67	1	30	1	33	1
LOW AND DWARF SHRUBS												
Arctostaphylos uva-ursi	.	.	.	.	.	.	.	.	.	.	.	.
Empetrum nigrum	.	.	14	1	.	.	33	1	10	1	11	1
Ledum palustre	.	.	29	1	.	.	33	10	10	1	.	.
Linnaea borealis	29	2	71	3	20	1	100	17	90	3	89	2
Spiraea beauverdana	14	1	43	1	.	.	67	1	60	1	22	1
Vaccinium caespitosum	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium uliginosum	.	.	14	1	.	.	.	.	.	.	.	.
Vaccinium vitis-idaea	14	1	29	1	.	.	67	2	50	1	22	2
FORBS												
Achillea borealis	.	.	.	.	20	1	33	1	10	1	11	1
Aconitum delphinifolium	.	.	29	1	20	1	33	1	.	.	.	.
Angelica lucida	43	5	.	.	.	.	.	.	.	.	.	.
Aruncus sylvestris	.	.	.	.	.	.	33	3	.	.	.	.
Castilleja unalaschcensis	.	.	14	1	.	.	.	.	.	.	.	.
Cornus canadensis	43	3	86	8	80	20	100	13	100	17	100	4
Epilobium adenocaulon	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium angustifolium	29	2	71	3	20	1	67	2	80	2	56	1

Epilobium latifolium	.	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	14	1	.	.	.	.	.	.	.
Galium trifidum	14	1	14	1	60	1	33	1	10	1	22	1
Gentiana douglasiana	.	.	.	.	.	.	.	.	.	.	.	.
Geocaulon lividum	.	.	.	.	.	.	.	.	20	1	.	.
Geranium erianthum	.	.	14	1	.	.	.	.	.	.	.	.
Heracleum lanatum	14	3	43	10	40	2	33	1	.	.	.	.
Listera cordata	14	1	.	.	.	.	.	.	.	.	.	.
Lupinus nootkatensis	.	.	.	.	.	.	.	.	.	.	.	.
Menyanthes trifoliata	14	10	.	.	.	.	.	.	.	.	.	.
Potentilla palustris	43	7	14	30	.	.	.	.	.	.	.	.
Pyrola asarifolia	14	10	43	5	20	10	33	3	10	1	22	6
Pyrola secunda	29	3	71	2	100	2	33	1	60	2	78	2
Pyrola sp.	.	.	14	3	.	.	.	.	10	10	11	3
Rubus arcticus	71	6	.	.	.	.	.	.	.	.	.	.
Rubus pedatus	14	1	43	2	80	18	33	1	80	12	22	1
Sanguisorba stipulata	57	5	29	1	.	.	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	29	3	.	.	20	1	33	1	20	1	11	1
Thalictrum sparsiflorum	43	1	14	1	.	.	.	.	.	.	.	.
Tiarella trifoliata	.	.	.	.	.	.	.	.	.	.	.	.
Trientalis europaea	86	4	43	2	60	1	.	.	30	1	11	1
Valeriana sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Veratrum viride	.	.	.	.	.	.	.	.	.	.	.	.
Viola glabella	.	.	.	.	.	.	.	.	.	.	.	.
Viola sp.	43	2	29	2	.	.	.	.	.	.	.	.
GRAMINOIDS												
Agrostis alascana	.	.	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	86	35	100	46	100	11	100	8	80	8	89	4
Carex aquatilis	14	10	.	.	.	.	.	.	.	.	.	.
Carex lyngbyei	.	.	14	10	.	.	.	.	.	.	.	.
Carex microglochin	.	.	.	.	.	.	.	.	.	.	.	.
Carex rostrata	14	1	.	.	.	.	.	.	.	.	.	.
Carex sp.	.	.	.	.	.	.	.	.	.	.	.	.
Elymus arenarius	.	.	.	.	.	.	.	.	.	.	.	.
Festuca rubra	.	.	.	.	.	.	.	.	.	.	.	.
Luzula multiflora	.	.	.	.	.	.	.	.	.	.	.	.
Phleum commutatum	.	.	14	1	.	.	.	.	.	.	.	.
Poa sp.	14	3	.	.	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	.	.	20	1	.	.	.	.	.	.
FERNS AND ALLIES												
Athyrium filix-femina	29	3	57	1	40	3	67	1	20	2	.	.
Dryopteris dilatata	14	1	57	2	80	23	33	1	80	5	33	5
Equisetum arvense	86	20	57	13	40	7	33	20	30	1	11	10
Equisetum fluviatile	14	10	14	20	.	.	.	.	.	.	.	.
Equisetum silvaticum	14	1	14	10	40	7	.	.	40	1	11	3
Equisetum sp.	.	.	.	.	.	.	.	.	.	.	.	.
Gymnocarpium dryopteris	14	3	43	24	60	53	100	1	50	4	56	15
Lycopodium annotinum	.	.	43	17	40	21	.	.	70	12	67	12
Lycopodium clavatum	.	.	14	10	20	30	33	30	.	.	22	25
Lycopodium complanatum	14	3	.	.	.	.	.	.	.	.	44	6
Thelypteris phegopteris	.	.	.	.	.	.	.	.	.	.	.	.

MOSSES

Hylocomium splendens
 Pleurozium schreberi

29	7	14	1	20	10	.	.	50	22	56	11
43	20	29	1	20	1	33	10	60	24	56	8

Species	POPBALT/ALNCRIS				POPTRE/SHECAN					
	BETPAP/VACVIT		POPBALT/ECHHOR		POPBALT/ECHHOR		POPTRE/SHECAN			
	3 Plots	51 Plots	4 Plots	5 Plots	4 Plots	5 Plots	4 Plots	5 Plots		
CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	
TREES										
Betula papyrifera	100	73	6	11	25	60	20	1		
Picea X lutzii	100	10	39	5	.	.	100	13		
Picea mariana	33	3	.	.	.	.	.	.
Picea sitchensis	.	.	6	8	.	.	.	.
Populus balsamifera ssp. trichocarpa	.	.	100	35	100	38	40	2		
Populus tremuloides	.	.	.	.	.	.	100	64		
Salix scouleriana	.	.	2	1	25	3	20	3		
Tsuga heterophylla	.	.	2	1	.	.	.	.
Tsuga mertensiana	67	1	16	1	.	.	.	.
TALL SHRUBS										
Alnus crispa ssp. sinuata	33	3	100	55	75	10	20	3		
Echinopanax horridum	.	.	63	21	100	40	.	.		
Menziesia ferruginea	100	5	.	.	.	.	.	.
Myrica gale	.	.	2	1	.	.	.	.
Rosa acicularis	67	1	2	1	25	10	100	7		
Rubus spectabilis	.	.	16	30	50	25	.	.		
Salix alaxensis	.	.	22	10	25	10	.	.		
Salix barclayi	67	1	16	8	.	.	40	2		
Salix commutata	.	.	.	.	.	.	.	.
Salix sitchensis	.	.	24	13	.	.	.	.
Salix sp.	.	.	6	1	.	.	.	.
Sambucus racemosa	.	.	29	7	75	5	.	.		
Shepherdia canadensis	.	.	.	.	.	.	100	14		
Vaccinium ovalifolium	.	.	6	1	.	.	.	.
Viburnum edule	67	1	57	6	100	4	100	4		
LOW AND DWARF SHRUBS										
Arctostaphylos uva-ursi	.	.	.	.	.	.	80	11		
Empetrum nigrum	100	8	.	.	.	.	20	3		
Ledum palustre	67	2	.	.	.	.	.	.
Linnaea borealis	100	10	.	.	.	.	100	9		
Spiraea beauverdiana	67	1	2	1	.	.	.	.
Vaccinium caespitosum	.	.	4	1	.	.	.	.
Vaccinium uliginosum	.	.	.	.	.	.	.	.
Vaccinium vitis-idaea	100	8	.	.	.	.	.	.
FORBS										
Achillea borealis	.	.	4	1	.	.	60	1		
Aconitum delphinifolium	.	.	4	1	.	.	.	.
Angelica lucida	.	.	10	1	.	.	.	.
Aruncus sylvester	.	.	22	10	50	45	.	.		
Castilleja unalaschcensis	.	.	.	.	.	.	60	2		
Cornus canadensis	100	8	27	4	25	10	60	2		
Epilobium adenocaulon	.	.	2	1	.	.	.	.

Epilobium angustifolium	100	2	49	4	25	1	100	2
Epilobium latifolium	.	.	12	3	.	.	.	.
Fritillaria camschatcensis	.	.	.	.	.	.	.	.
Galium trifidum	.	.	18	1	.	.	.	.
Gentiana douglasiana	.	.	.	.	.	.	20	3
Geocaulon lividum	67	2	.	.	.	.	20	10
Geranium erianthum	33	1	.	.	.	.	.	.
Heracleum lanatum	.	.	27	4	25	20	.	.
Listera cordata	.	.	2	1	.	.	.	.
Lupinus nootkatensis	.	.	2	1	.	.	60	2
Menyanthes trifoliata	.	.	2	3	.	.	.	.
Potentilla palustris	.	.	2	10	.	.	.	.
Pyrola asarifolia	.	.	69	7	.	.	40	2
Pyrola secunda	100	2	76	6	.	.	80	2
Pyrola sp.	33	1	2	1	.	.	.	.
Rubus arcticus	.	.	41	9	.	.	.	.
Rubus pedatus	33	3	8	7	.	.	.	.
Sanguisorba stipulata	.	.	8	2	.	.	.	.
Stellaria calycantha	.	.	24	1	.	.	.	.
Streptopus amplexifolius	33	1	65	4	50	1	.	.
Thalictrum sparsiflorum	.	.	8	2	.	.	20	1
Tiarella trifoliata	.	.	12	5	.	.	.	.
Trientalis europaea	67	1	51	3	.	.	.	.
Valeriana sitchensis	.	.	2	1	.	.	.	.
Veratrum viride	.	.	.	.	25	1	.	.
Viola glabella	.	.	.	.	25	1	.	.
Viola sp.	.	.	6	3	25	1	20	1
GRAMINOIDS								
Agrostis alascana	.	.	4	1	.	.	.	.
Calamagrostis canadensis	67	1	67	23	75	20	40	7
Carex aquatilis	.	.	.	.	.	.	.	.
Carex lyngbyei	.	.	.	.	.	.	.	.
Carex microglochin	.	.	2	1	.	.	.	.
Carex rostrata	.	.	.	.	.	.	.	.
Carex sp.	.	.	16	5	.	.	.	.
Elymus arenarius	.	.	2	1	.	.	.	.
Festuca rubra	.	.	2	1	.	.	.	.
Luzula multiflora	.	.	2	1	.	.	.	.
Phleum commutatum	.	.	2	1	.	.	.	.
Poa sp.	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	.	.	.	.	.	.
FERNS AND ALLIES								
Athyrium filix-femina	33	1	63	12	25	1	.	.
Dryopteris dilatata	33	1	57	7	.	.	.	.
Equisetum arvense	.	.	39	10	100	21	.	.
Equisetum fluviatile	.	.	2	10	.	.	.	.
Equisetum silvaticum	.	.	.	.	.	.	.	.
Equisetum sp.	.	.	12	2	.	.	.	.
Gymnocarpium dryopteris	67	2	33	12	50	7	.	.
Lycopodium annotinum	67	1	10	1	25	1	.	.
Lycopodium clavatum	.	.	.	.	.	.	.	.
Lycopodium complanatum	33	3	.	.	.	.	.	.

<i>Thelypteris phegopteris</i>	.	.	8	1	.	.	.	.
MOSES								
<i>Hylocomium splendens</i>	33	60	10	2	.	.	20	1
<i>Pleurozium schreberi</i>	100	30	16	19	25	1	40	1

Mixed Forest

Species	PICLUT-BETPAP/HYLSPL				PICLUT-BETPAP/MENFER				PICLUT-BETPAP/VACVIT			
	PICLUT-BETPAP/CALCAN		PICLUT-BETPAP/LYCANN		PICLUT-BETPAP/MENFER		PICLUT-BETPAP/MENFER/sparse		PICLUT-BETPAP/VACVIT		PICLUT-BETPAP/VACVIT	
	3 Plots	6 Plots	6 Plots	6 Plots	3 Plots	7 Plots	7 Plots	13 Plots	13 Plots	13 Plots	13 Plots	
CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	
TREES												
Betula papyrifera	100	30	100	50	100	37	100	27	100	54	100	28
Picea X lutzii	100	27	100	43	100	40	100	23	100	36	100	28
Picea mariana	.	.	17	1	.	.	.	.	.	.	15	2
Picea sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Populus balsamifera ssp. trichocarpa	.	.	17	1	.	.	.	.	.	.	.	.
Populus tremuloides	.	.	.	.	.	.	.	.	.	.	38	1
Salix scouleriana	.	.	50	11	17	10	67	2	29	3	31	6
Tsuga mertensiana	33	1	67	3	50	2	67	2	71	2	38	2
TALL SHRUBS												
Alnus crispa ssp. sinuata	33	3	33	1	.	.	33	3	29	7	8	1
Betula nana	.	.	.	.	.	.	.	.	.	.	.	.
Echinopanax horridum	33	3	17	1	33	1	33	10	57	2	.	.
Menziesia ferruginea	67	6	50	2	67	3	100	47	100	11	31	2
Rosa acicularis	33	3	17	3	50	5	.	.	71	1	46	1
Rubus spectabilis	.	.	.	.	.	.	.	.	.	.	.	.
Salix barclayi	.	.	.	.	17	1	.	.	.	.	23	1
Salix commutata	.	.	.	.	.	.	.	.	.	.	.	.
Salix hookeriana	.	.	.	.	.	.	.	.	.	.	.	.
Salix sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Salix sp.	.	.	.	.	.	.	.	.	.	.	.	.
Sambucus racemosa	33	1	17	1	33	2	33	1	57	1	8	1
Shepherdia canadensis	.	.	.	.	.	.	.	.	.	.	8	1
Vaccinium ovalifolium	.	.	17	1	.	.	67	6	.	.	15	2
Viburnum edule	67	1	17	1	17	1	.	.	29	1	23	2
LOW AND DWARF SHRUBS												
Arctostaphylos uva-ursi	.	.	.	.	.	.	.	.	.	.	.	.
Empetrum nigrum	.	.	33	1	17	3	33	10	.	.	77	10
Ledum palustre	.	.	33	1	33	1	.	.	.	.	69	4
Linnaea borealis	100	3	67	1	67	3	67	12	71	2	92	9
Spiraea beauverdiana	.	.	17	3	50	2	33	40	14	1	23	2
Vaccinium caespitosum	.	.	.	.	.	.	.	.	.	.	15	2
Vaccinium uliginosum	.	.	.	.	.	.	.	.	.	.	23	2
Vaccinium vitis-idaea	100	2	67	1	67	2	33	10	57	2	100	15
FORBS												
Achillea borealis	.	.	17	1	.	.	.	.	.	.	.	.
Aconitum delphinifolium	33	1	.	.	.	.	.	.	.	.	.	.
Angelica lucida	.	.	.	.	.	.	.	.	.	.	.	.
Aruncus sylvestris	.	.	.	.	.	.	.	.	.	.	.	.
Cornus canadensis	100	8	67	2	83	5	100	33	86	2	100	11
Epilobium angustifolium	67	3	67	2	83	1	33	1	71	1	69	2
Epilobium latifolium	.	.	.	.	.	.	.	.	.	.	.	.
Galium trifidum	.	.	.	.	.	.	33	1	.	.	.	.
Geocaulon lividum	33	1	67	1	33	1	33	1	29	1	92	3

Geranium erianthum	.	.	.	.	.	.	.	.	.	.	.	.
Heracleum lanatum	.	.	.	.	.	.	.	.	.	.	.	.
Listera cordata	.	.	.	.	17	1	.	.	.	.	23	1
Lupinus nootkatensis	.	.	.	.	.	.	.	.	.	.	31	2
Polemonium acutiflorum	33	1	.	.	.	.	33	1	.	.	.	.
Pyrola asarifolia	.	.	.	.	.	.	33	1	.	.	.	.
Pyrola secunda	100	2	83	1	83	3	67	1	71	1	54	1
Pyrola sp.	.	.	.	.	.	.	.	.	.	.	.	.
Rubus arcticus	.	.	.	.	.	.	.	.	.	.	.	.
Rubus pedatus	33	3	17	1	67	13	100	8	71	11	38	8
Sanguisorba stipulata	.	.	.	.	17	1	33	1	.	.	8	1
Stellaria calycantha	.	.	.	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	33	1	17	1	17	1	.	.	57	1	23	1
Thalictrum sparsiflorum	33	1	.	.	.	.	33	1	.	.	.	.
Tiarella trifoliata	.	.	.	.	.	.	.	.	.	.	.	.
Trientalis europaea	33	1	.	.	67	1	.	.	29	2	38	2
Utricularia vulgaris	.	.	.	.	.	.	.	.	.	.	.	.
Valeriana sitchensis	.	.	.	.	17	1	.	.	.	.	.	.
Veratrum viride	.	.	.	.	.	.	.	.	.	.	.	.
Viola sp.	.	.	.	.	.	.	.	.	.	.	.	.
GRAMINOIDS												
Agrostis alascana	.	.	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	100	60	67	1	83	8	67	15	43	7	62	6
Carex limosa	.	.	.	.	.	.	.	.	.	.	.	.
Carex lyngbyei	.	.	.	.	.	.	.	.	.	.	.	.
Carex magellanica	.	.	.	.	.	.	.	.	.	.	.	.
Carex rostrata	.	.	.	.	.	.	.	.	.	.	.	.
Carex sp.	.	.	.	.	.	.	.	.	.	.	15	1
Festuca altaica	.	.	.	.	.	.	.	.	.	.	.	.
Phleum commutatum	.	.	.	.	.	.	.	.	.	.	8	1
Poa sp.	.	.	.	.	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	17	1	.	.	.	.	.	.	.	.
FERNS AND ALLIES												
Athyrium filix-femina	.	.	.	.	17	1	33	3	.	.	.	.
Dryopteris dilatata	.	.	17	1	33	3	67	1	57	2	23	4
Equisetum arvense	33	20	17	1	33	1	33	50	29	2	8	1
Equisetum fluviatile	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum pratense	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum silvaticum	67	6	17	1	33	11	.	.	43	1	8	3
Gymnocarpium dryopteris	33	3	.	.	50	4	67	6	29	6	31	8
Lycopodium annotinum	67	7	50	1	83	20	67	15	71	6	85	5
Lycopodium clavatum	.	.	.	.	.	.	33	1	.	.	.	.
Lycopodium complanatum	.	.	33	1	17	10	.	.	.	.	23	1
Thelypteris phegopteris	.	.	.	.	.	.	.	.	.	.	.	.
MOSESSES												
Hylocomium splendens	33	10	33	6	83	18	.	.	71	17	85	52
Pleurozium schreberi	67	6	50	40	67	50	.	.	71	42	92	28
Sphagnum sp.	.	.	.	.	17	1	.	.	.	.	.	.

Species	PICLUT-POPBALT/CALCAN				PICLUT-POPBALT/EQUARV				PICLUT-POPTRE/VACVIT			
	PICLUT-POPBALT/ALNCRIS		PICLUT-POPBALT/ECHHOR		PICLUT-POPBALT/HYLSPL							
	9 Plots	5 Plots	4 Plots	5 Plots	5 Plots	11 Plots	CON	COV	CON	COV	CON	COV
	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV
TREES												
Betula papyrifera	11	10	40	20	.	.	20	1	40	20	64	8
Picea X lutzii	100	22	100	28	100	28	100	28	100	34	91	27
Picea mariana	.	.	.	.	.	.	.	.	.	.	18	25
Picea sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Populus balsamifera ssp. trichocarpa	100	33	100	34	100	20	100	26	100	22	18	2
Populus tremuloides	.	.	.	.	.	.	.	.	.	.	100	24
Salix scouleriana	.	.	.	.	.	.	.	.	20	3	27	3
Tsuga mertensiana	22	2	20	1	25	3	.	.	40	2	27	2
TALL SHRUBS												
Alnus crispa ssp. sinuata	100	37	60	7	50	3	60	5	80	2	9	1
Betula nana	.	.	.	.	.	.	.	.	.	.	9	1
Echinopanax horridum	89	17	40	2	100	40	40	2	20	1	.	.
Menziesia ferruginea	.	.	.	.	.	.	.	.	.	.	9	1
Rosa acicularis	22	1	60	3	.	.	80	3	20	1	36	2
Rubus spectabilis	.	.	20	3	.	.	.	.	.	.	.	.
Salix barclayi	.	.	.	.	.	.	80	11	40	1	9	1
Salix commutata	56	3	.	.	.	.	20	1	40	1	.	.
Salix hookeriana	.	.	.	.	.	.	.	.	.	.	.	.
Salix sitchensis	.	.	.	.	.	.	20	1	.	.	.	.
Salix sp.	.	.	.	.	.	.	.	.	.	.	9	1
Sambucus racemosa	22	6	.	.	25	3	.	.	20	1	.	.
Shepherdia canadensis	.	.	.	.	.	.	.	.	.	.	18	2
Vaccinium ovalifolium	11	1	20	3	25	1	.	.	20	1	.	.
Viburnum edule	89	2	100	5	100	7	100	5	40	1	64	2
LOW AND DWARF SHRUBS												
Arctostaphylos uva-ursi	.	.	.	.	.	.	.	.	.	.	27	3
Empetrum nigrum	11	1	.	.	.	.	20	1	.	.	55	12
Ledum palustre	.	.	.	.	.	.	.	.	.	.	9	10
Linnaea borealis	.	.	20	1	.	.	.	.	20	1	91	7
Spiraea beauverdiana	.	.	20	1	.	.	40	1	.	.	.	.
Vaccinium caespitosum	22	1	.	.	.	.	.	.	.	.	27	2
Vaccinium uliginosum	.	.	.	.	.	.	20	1	.	.	9	10
Vaccinium vitis-idaea	11	3	40	1	.	.	40	1	.	.	100	22
FORBS												
Achillea borealis	11	1	.	.	.	.	.	.	.	.	9	1
Aconitum delphinifolium	.	.	40	1	50	2	60	1	20	1	.	.
Angelica lucida	22	1	.	.	.	.	20	1	20	1	.	.
Aruncus sylvester	.	.	.	.	25	1	20	3	.	.	.	.
Cornus canadensis	67	4	80	7	.	.	80	2	20	1	100	7
Epilobium angustifolium	78	3	60	9	50	2	80	6	.	.	82	2
Epilobium latifolium	22	2	.	.	.	.	.	.	40	3	.	.
Galium trifidum	33	5	.	.	.	.	.	.	.	.	.	.

Geocaulon lividum	11	3	.	.	.	.	.	.	.	91	8
Geranium erianthum	.	.	.	.	25	1	60	2	.	.	.
Heracleum lanatum	11	1	40	1	25	10	20	1	20	1	.
Listera cordata	.	.	.	.	.	.	.	.	20	1	18
Lupinus nootkatensis	22	1	.	.	.	.	.	.	60	2	73
Polemonium acutiflorum	.	.	.	.	.	.	20	1	.	.	.
Pyrola asarifolia	78	5	60	4	50	10	40	1	40	1	9
Pyrola secunda	89	7	60	5	75	5	80	2	60	2	73
Pyrola sp.	.	.	.	.	25	1	40	1	.	.	.
Rubus arcticus	67	6	60	5	.	.	40	3	40	1	.
Rubus pedatus	22	6	20	1	25	1	20	1	.	.	9
Sanguisorba stipulata	11	1	60	1	.	.	80	11	.	.	9
Stellaria calycantha	56	1	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	78	4	20	1	100	7	40	1	40	1	.
Thalictrum sparsiflorum	.	.	.	.	25	1	60	1	.	.	.
Tiarella trifoliata	11	3	.	.	50	11	.	.	.	.	.
Trientalis europaea	56	2	80	1	50	2	60	1	.	.	27
Utricularia vulgaris	.	.	.	.	.	.	.	.	.	.	.
Valeriana sitchensis	.	.	.	.	.	.	.	.	.	.	.
Veratrum viride	.	.	.	.	.	.	20	1	.	.	.
Viola sp.	.	.	20	1	.	.	20	1	.	.	.
GRAMINOIDS											
Agrostis alascana	.	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	78	31	100	40	50	2	100	68	40	1	36
Carex limosa	.	.	.	.	.	.	.	.	.	.	.
Carex lyngbyei	.	.	.	.	.	.	.	.	.	.	.
Carex magellanica	.	.	.	.	.	.	40	1	.	.	.
Carex rostrata	.	.	.	.	.	.	.	.	.	.	.
Carex sp.	33	1	40	1	25	1	20	1	20	1	9
Festuca altaica	.	.	.	.	.	.	.	.	.	.	18
Phleum commutatum	22	1	.	.	.	.	.	.	20	1	.
Poa sp.	11	3	.	.	.	.	.	.	.	.	.
Trisetum spicatum	11	1	.	.	.	.	.	.	40	1	9
FERNS AND ALLIES											
Athyrium filix-femina	56	13	40	1	75	8	40	1	.	.	.
Dryopteris dilatata	78	8	40	6	100	11	20	10	40	1	.
Equisetum arvense	22	12	100	6	75	8	100	46	20	1	.
Equisetum fluviatile	.	.	.	.	25	1	.	.	.	.	.
Equisetum pratense	.	.	.	.	.	.	20	3	.	.	.
Equisetum silvaticum	.	.	.	.	.	.	20	3	.	.	.
Gymnocarpium dryopteris	22	26	100	7	100	35	60	14	20	3	9
Lycopodium annotinum	22	3	.	.	.	.	20	1	20	1	55
Lycopodium clavatum	.	.	.	.	.	.	.	.	20	1	.
Lycopodium complanatum	.	.	.	.	.	.	.	.	20	1	45
Thelypteris phegopteris	11	1	.	.	.	.	.	.	.	.	.
MOSESSES											
Hylocomium splendens	22	25	20	10	75	17	40	6	.	.	73
Pleurozium schreberi	11	10	20	1	25	1	40	15	20	10	82
Sphagnum sp.	.	.	.	.	.	.	.	.	.	.	.

Species	TSUMER-BETPAP/HYL SPL				TSUMER-BETPAP/MENFER					
	PICSIT-POPBALT/ALNCRIS		TSUMER-BETPAP/LYCANN		TSUMER-BETPAP/LYCANN		TSUMER-BETPAP/MENFER/sparse			
	4 Plots		7 Plots		3 Plots		11 Plots		6 Plots	
	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV
TREES										
Betula papyrifera	.	.	100	49	100	40	100	48	100	38
Picea X lutzii	.	.	100	40	100	20	64	25	100	22
Picea mariana	.	.	14	1	.	.	.	.	.	.
Picea sitchensis	100	20	.	.	.	.	36	17	.	.
Populus balsamifera ssp. trichocarpa	100	25	.	.	33	10	18	10	17	1
Populus tremuloides	.	.	.	.	.	.	.	.	.	.
Salix scouleriana	.	.	.	.	33	1	36	4	33	3
Tsuga mertensiana	.	.	100	20	100	17	100	28	100	20
TALL SHRUBS										
Alnus crispa ssp. sinuata	100	65	.	.	33	1	27	5	33	2
Betula nana	.	.	.	.	.	.	.	.	.	.
Echinopanax horridum	75	7	43	3	33	1	64	2	67	11
Menziesia ferruginea	.	.	57	2	33	3	100	48	100	13
Rosa acicularis	.	.	.	.	.	.	9	1	17	1
Rubus spectabilis	25	60	.	.	.	.	.	.	.	.
Salix barclayi	25	10	.	.	.	.	.	.	17	1
Salix commutata	.	.	.	.	.	.	.	.	.	.
Salix hookeriana	25	10	.	.	.	.	.	.	.	.
Salix sitchensis	100	16	.	.	.	.	.	.	.	.
Salix sp.	.	.	.	.	.	.	.	.	.	.
Sambucus racemosa	50	7	14	1	33	3	27	1	33	15
Shepherdia canadensis	.	.	.	.	.	.	.	.	.	.
Vaccinium ovalifolium	25	1	.	.	67	1	.	.	17	1
Viburnum edule	.	.	29	1	.	.	27	1	17	1
LOW AND DWARF SHRUBS										
Arctostaphylos uva-ursi	.	.	.	.	.	.	.	.	.	.
Empetrum nigrum	.	.	14	1	.	.	.	.	17	1
Ledum palustre	.	.	29	1	33	1	.	.	.	.
Linnaea borealis	.	.	14	1	67	2	73	2	50	4
Spiraea beauverdiana	.	.	.	.	33	3	9	1	.	.
Vaccinium caespitosum	.	.	.	.	.	.	.	.	.	.
Vaccinium uliginosum	.	.	.	.	.	.	.	.	.	.
Vaccinium vitis-idaea	.	.	.	.	33	1	18	2	50	2
FORBS										
Achillea borealis	.	.	.	.	.	.	.	.	.	.
Aconitum delphinifolium	.	.	.	.	.	.	.	.	.	.
Angelica lucida	.	.	.	.	.	.	.	.	.	.
Aruncus sylvestris	.	.	.	.	.	.	.	.	.	.
Cornus canadensis	.	.	57	1	67	2	82	18	100	9
Epilobium angustifolium	.	.	14	1	33	1	27	1	33	1
Epilobium latifolium	.	.	.	.	.	.	.	.	.	.
Galium trifidum	.	.	.	.	.	.	.	.	.	.

Geocaulon lividum	.	.	14	1	33	10	27	1	17	1
Geranium erianthum	.	.	.	.	.	.	.	.	.	.
Heracleum lanatum	.	.	.	.	.	.	.	.	.	.
Listera cordata	.	.	.	.	.	.	.	.	17	1
Lupinus nootkatensis	.	.	.	.	.	.	.	.	.	.
Polemonium acutiflorum	.	.	.	.	.	.	.	.	.	.
Pyrola asarifolia	75	4	.	.	.	.	18	1	.	.
Pyrola secunda	75	7	43	2	100	3	64	1	67	1
Pyrola sp.	.	.	.	.	.	.	.	.	.	.
Rubus arcticus	25	3	.	.	.	.	.	.	.	.
Rubus pedatus	25	1	43	2	67	2	82	22	67	6
Sanguisorba stipulata	.	.	.	.	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	75	1	14	1	.	.	.	.	17	1
Thalictrum sparsiflorum	.	.	.	.	.	.	.	.	.	.
Tiarella trifoliata	25	1	.	.	.	.	.	.	.	.
Trientalis europaea	25	1	.	.	33	1	.	.	17	1
Utricularia vulgaris	25	1	.	.	.	.	.	.	.	.
Valeriana sitchensis	.	.	.	.	.	.	.	.	.	.
Veratrum viride	25	1	.	.	.	.	.	.	.	.
Viola sp.	.	.	.	.	.	.	.	.	.	.
GRAMINOIDS										
Agrostis alascana	25	3	.	.	.	.	.	.	.	.
Calamagrostis canadensis	50	15	29	1	33	1	36	1	33	1
Carex limosa	25	1	.	.	.	.	.	.	.	.
Carex lyngbyei	25	1	.	.	.	.	.	.	.	.
Carex magellanica	.	.	.	.	.	.	.	.	.	.
Carex rostrata	25	1	.	.	.	.	.	.	.	.
Carex sp.	25	10	.	.	.	.	.	.	.	.
Festuca altaica	.	.	.	.	.	.	.	.	.	.
Phleum commutatum	.	.	.	.	.	.	.	.	.	.
Poa sp.	.	.	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	.	.	.	.	.	.	.	.
FERNS AND ALLIES										
Athyrium filix-femina	50	46	.	.	.	.	.	.	.	.
Dryopteris dilatata	50	6	43	3	33	1	64	3	83	1
Equisetum arvense	25	1	.	.	.	.	18	2	17	1
Equisetum fluviatile	.	.	.	.	.	.	.	.	.	.
Equisetum pratense	.	.	.	.	.	.	.	.	.	.
Equisetum silvaticum	25	3	.	.	.	.	.	.	33	2
Gymnocarpium dryopteris	25	1	29	2	.	.	27	1	50	11
Lycopodium annotinum	.	.	57	2	100	14	55	14	83	2
Lycopodium clavatum	.	.	.	.	.	.	36	9	.	.
Lycopodium complanatum	.	.	14	1	67	7	.	.	.	.
Thelypteris phegopteris	.	.	.	.	.	.	.	.	.	.
MOSESSES										
Hylocomium splendens	.	.	14	30	.	.	.	.	50	30
Pleurozium schreberi	.	.	14	30	33	70	.	.	33	31
Sphagnum sp.	25	10	.	.	.	.	.	.	.	.

Tall Scrub

Species	ALNCRIS-SALCOM				ALNCRIS/CALCAN				ALNCRIS/EQUARV			
	ALNCRIS-ECHHOR		ALNCRIS/ATHFIL		ALNCRIS/DRYDIL							
	21 Plots CON	COV	3 Plots CON	COV	3 Plots CON	COV	10 Plots CON	COV	21 Plots CON	COV	9 Plots CON	COV
TREES												
Betula papyrifera	.	.	.	.	.	.	.	.	5	3	.	.
Picea X lutzii	.	.	.	.	.	.	.	.	.	.	.	.
Picea sitchensis	.	.	.	.	.	.	10	1	14	2	11	3
Populus balsamifera ssp. trichocarpa	5	3	.	.	.	.	10	1	.	.	11	1
Tsuga mertensiana	.	.	.	.	.	.	.	.	5	1	.	.
TALL SHRUBS												
Alnus crispa ssp. sinuata	100	85	100	33	100	73	100	58	100	82	100	92
Betula nana	.	.	.	.	.	.	.	.	.	.	.	.
Cladothamnus pyroliflorus	.	.	.	.	.	.	.	.	.	.	.	.
Echinopanax horridum	100	31	33	3	100	3	10	1	38	2	.	.
Menziesia ferruginea	.	.	.	.	.	.	.	.	5	3	.	.
Myrica gale	.	.	.	.	.	.	.	.	.	.	22	11
Rubus spectabilis	10	2	.	.	.	.	.	.	5	3	11	1
Salix alaxensis	10	7	33	3	.	.	.	.	.	.	33	7
Salix barclayi	5	1	33	1	33	1	30	2	.	.	56	5
Salix commutata	.	.	100	40	.	.	10	1	.	.	22	7
Salix hookeriana	.	.	33	10	.	.	.	.	.	.	11	1
Salix sitchensis	.	.	33	3	.	.	10	3	.	.	33	5
Salix sp.	5	3	.	.	.	.	20	6	.	.	.	.
Sambucus racemosa	76	6	.	.	33	3	40	3	48	6	11	10
Vaccinium ovalifolium	5	3	.	.	.	.	.	.	10	2	.	.
Viburnum edule	10	2	.	.	33	1	30	11	5	1	.	.
LOW AND DWARF SHRUBS												
Arctostaphylos uva-ursi	.	.	.	.	.	.	.	.	.	.	.	.
Cassiope stelleriana	.	.	.	.	.	.	.	.	.	.	.	.
Empetrum nigrum	.	.	.	.	.	.	.	.	.	.	.	.
Linnaea borealis	.	.	.	.	.	.	.	.	.	.	.	.
Luetkea pectinata	.	.	.	.	.	.	.	.	5	1	.	.
Oxycoccus microcarpus	.	.	.	.	.	.	.	.	.	.	.	.
Phyllodoce aleutica	.	.	.	.	.	.	.	.	.	.	.	.
Salix arctica	.	.	.	.	.	.	.	.	.	.	11	10
Salix reticulata	.	.	.	.	.	.	.	.	.	.	.	.
Spiraea beauverdiana	.	.	.	.	.	.	.	.	10	2	.	.
Vaccinium caespitosum	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium uliginosum	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium vitis-idaea	.	.	.	.	.	.	.	.	.	.	.	.
FORBS												
Achillea borealis	.	.	33	1	33	1	.	.	.	.	.	.
Aconitum delphinifolium	.	.	.	.	33	1	.	.	.	.	.	.
Anemone narcissiflora	.	.	.	.	.	.	.	.	.	.	.	.
Angelica lucida	.	.	.	.	.	.	10	10	.	.	11	10
Artemisia arctica	.	.	.	.	.	.	.	.	.	.	.	.
Aruncus sylvester	29	4	.	.	.	.	.	.	5	10	.	.

Castilleja unalaschcensis	.	.	.	.	.	.	.	.	.	.	.
Coptis trifolia	.	.	.	.	.	.	.	.	.	.	.
Cornus canadensis	.	.	.	.	.	10	1	.	.	.	.
Drosera rotundifolia	.	.	.	.	.	.	.	.	.	.	.
Epilobium adenocaulon	.	.	.	.	.	10	1	.	.	11	1
Epilobium anagallidifolium	.	.	.	.	.	.	.	5	1	.	.
Epilobium angustifolium	24	3	.	.	.	50	10	10	2	11	3	
Epilobium latifolium	.	.	.	.	.	10	3	.	.	11	1
Erigeron peregrinus	.	.	.	.	.	.	.	.	.	.	.
Fauria crista-galli	.	.	.	.	.	.	.	5	20	.	.
Fragaria chiloensis	.	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	.	.	.	.	.	.	.	.	.
Galium trifidum	.	.	.	.	33	1	10	1	.	11	1
Geocaulon lividum	.	.	.	.	.	.	.	.	.	.	.
Geranium erianthum	.	.	.	.	.	.	.	.	.	.	.
Geum calthifolium	.	.	.	.	.	.	.	.	.	11	1
Heracleum lanatum	14	1	.	.	33	1	10	3	5	1	11	20
Iris setosa	.	.	.	.	.	.	.	.	.	22	11
Lathyrus palustris	5	1	.	.	.	.	.	.	.	11	1
Listera cordata	.	.	.	.	.	.	.	.	.	.	.
Lupinus nootkatensis	.	.	33	10	.	.	10	1	.	.	.	
Lysichiton americanus	.	.	.	.	.	.	10	3	.	.	.
Menyanthes trifoliata	.	.	.	.	.	.	.	.	.	.	.
Parnassia palustris	.	.	67	1	.	.	.	.	.	.	.
Polemonium acutiflorum	.	.	.	.	.	.	20	1	.	.	.
Polygonum viviparum	.	.	.	.	.	.	.	.	.	.	.
Potentilla egedii	.	.	.	.	.	.	.	.	.	11	30
Potentilla palustris	.	.	33	3	.	.	20	1	.	22	1	
Pyrola asarifolia	10	7	.	.	.	.	10	10	.	33	14
Pyrola secunda	5	1	33	10	.	.	10	1	.	.	.	
Rhinanthus minor	.	.	.	.	.	.	.	.	.	.	.
Rubus arcticus	5	3	33	3	.	.	30	24	.	11	3	
Rubus pedatus	.	.	.	.	.	.	.	24	2	.	.
Sanguisorba stipulata	33	1	20	6	10	2	22	2
Spiranthes romanzoffiana	.	.	33	1	.	.	.	.	.	.	.
Stellaria calycantha	10	1	10	1	5	10	.	.
Streptopus amplexifolius	81	2	.	.	67	2	20	2	71	2	.	.
Thalictrum sparsiflorum	33	1	10	10	.	.	11	1
Tiarella trifoliata	5	10	5	1	.	.
Trientalis europaea	33	3	33	1	100	1	40	2	90	3	11	1
Valeriana sitchensis	5	1
Veratrum viride	29	2	10	1	24	7	.	.
Viola glabella	5	1	.	.	33	1	11	3
Viola sp.	30	5
GRAMINOIDS												
Agrostis alascana	.	.	33	20
Arctophila fulva
Calamagrostis canadensis	38	6	67	3	33	3	100	47	57	25	78	8
Calamagrostis nutkaensis	5	1	.	.
Carex anthoxantha
Carex aquatilis	10	1
Carex lyngbyei	33	2
Carex macrochaeta	5	10	.	.

Carex magellanica	.	.	.	.	.	.	.	.	.	.	.	.
Carex saxatilis	.	.	.	.	.	.	.	.	.	.	.	.
Carex sitchensis	.	.	.	.	.	10	70	.	.	.	.	.
Carex sp.	.	.	33	1	.	.	.	5	1	11	1	.
Deschampsia cespitosa	.	.	33	1	.	.	.	.	.	.	.	.
Elymus arenarius	.	.	.	.	.	.	.	.	.	.	.	.
Eriophorum angustifolium	.	.	.	.	.	.	.	.	.	.	.	.
Eriophorum russeolum	.	.	.	.	.	.	.	.	.	.	.	.
Festuca altaica	.	.	.	.	.	.	.	.	.	.	.	.
Festuca rubra	.	.	33	1	.	.	.	.	.	.	.	.
Juncus alpinus	.	.	.	.	.	.	.	.	.	.	.	.
Juncus arcticus	.	.	33	10	.	.	.	.	.	.	.	.
Juncus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Luzula multiflora	.	.	33	1	.	.	.	.	.	.	.	.
Luzula sp.	.	.	.	.	.	.	.	.	.	.	.	.
Luzula wahlenbergii	.	.	.	.	.	.	.	.	.	.	.	.
Phleum commutatum	.	.	.	.	.	.	.	.	.	.	.	.
Poa sp.	.	.	.	.	.	.	.	.	.	.	.	.
Puccinellia nutkaensis	.	.	.	.	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	.	.	.	.	.	.	.	.	.	.
FERNS AND ALLIES												
Athyrium filix-femina	62	11	.	.	100	60	70	7	52	22	44	9
Dryopteris dilatata	100	29	33	20	33	1	30	2	100	39	.	.
Equisetum arvense	10	1	33	3	100	7	30	5	14	11	89	59
Equisetum fluviatile	.	.	33	3	.	.	.	.	.	.	22	1
Equisetum palustre	.	.	.	.	.	.	10	1	.	.	11	1
Equisetum pratense	.	.	.	.	.	.	10	1	.	.	11	90
Equisetum silvaticum	.	.	.	.	.	.	.	.	5	1	.	.
Equisetum sp.	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum variegatum	.	.	.	.	.	.	.	.	.	.	44	19
Gymnocarpium dryopteris	62	13	.	.	100	18	20	40	67	11	.	.
Lycopodium annotinum	.	.	33	50	.	.	.	.	.	.	.	.
Thelypteris limbosperma	.	.	.	.	.	.	.	.	.	.	.	.
Thelypteris phegopteris	10	2	.	.	.	.	.	.	10	6	.	.
MOSESSES												
Hylocomium splendens	.	.	33	30	.	.	.	.	.	.	.	.
Pleurozium schreberi	5	20	.	.	.	.	.	.	10	20	.	.
Sphagnum sp.	.	.	.	.	.	.	10	1	.	.	.	.

Species	ALNCRIS-RUBSPE/ATHFIL				ALNCRIS-SALALA/CALCAN				ALNCRIS-SALSIT			
	ALNCRIS-RUBSPE		ALNCRIS-SALALA		ALNCRIS-SALBAR		ALNCRIS-SALBAR		ALNCRIS-SALBAR		ALNCRIS-SALBAR	
	8 Plots CON	8 Plots COV	8 Plots CON	8 Plots COV	9 Plots CON	9 Plots COV	4 Plots CON	4 Plots COV	6 Plots CON	6 Plots COV	8 Plots CON	8 Plots COV
TREES												
Betula papyrifera	.	.	.	.	.	.	.	.	.	.	.	.
Picea X lutzii	.	.	.	.	22	1	.	.	.	.	38	1
Picea sitchensis	.	.	13	1	.	.	.	.	33	2	25	1
Populus balsamifera ssp. trichocarpa	.	.	.	.	67	2	25	3	17	3	38	3
Tsuga mertensiana	13	1	13	1	.	.	.	.	.	.	25	2
TALL SHRUBS												
Alnus crispa ssp. sinuata	100	73	100	69	100	55	100	35	100	47	100	44
Betula nana	.	.	.	.	.	.	.	.	.	.	.	.
Cladothamnus pyroliflorus	.	.	13	3	.	.	.	.	.	.	.	.
Echinopanax horridum	25	12	50	4	11	1	25	3	.	.	13	3
Menziesia ferruginea	13	3	13	1	.	.	.	.	.	.	.	.
Myrica gale	.	.	.	.	.	.	.	.	17	40	.	.
Rubus spectabilis	100	39	100	28	11	1	.	.	17	1	.	.
Salix alaxensis	25	7	.	.	100	21	100	48	50	5	50	8
Salix barclayi	25	2	.	.	44	7	50	12	100	32	50	6
Salix commutata	.	.	.	.	.	.	.	.	33	15	25	10
Salix hookeriana	.	.	.	.	.	.	.	.	17	20	.	.
Salix sitchensis	.	.	25	35	56	7	50	17	33	12	100	24
Salix sp.	.	.	.	.	.	.	.	.	.	.	13	20
Sambucus racemosa	75	12	50	16	.	.	.	.	.	.	.	.
Vaccinium ovalifolium	.	.	13	3	.	.	.	.	.	.	13	1
Viburnum edule	13	10	.	.	11	1	25	10	17	3	.	.
LOW AND DWARF SHRUBS												
Arctostaphylos uva-ursi	.	.	.	.	.	.	.	.	.	.	.	.
Cassiope stelleriana	.	.	.	.	.	.	.	.	.	.	.	.
Empetrum nigrum	.	.	.	.	.	.	.	.	.	.	13	1
Linnaea borealis	.	.	.	.	.	.	.	.	.	.	.	.
Luetkea pectinata	.	.	.	.	.	.	.	.	.	.	.	.
Oxycoccus microcarpus	.	.	.	.	.	.	.	.	.	.	.	.
Phyllodoce aleutica	.	.	.	.	.	.	.	.	.	.	.	.
Salix arctica	.	.	.	.	.	.	.	.	.	.	.	.
Salix reticulata	.	.	.	.	.	.	.	.	.	.	.	.
Spiraea beauverdiana	.	.	13	1	.	.	.	.	.	.	.	.
Vaccinium caespitosum	.	.	13	1	.	.	.	.	17	20	.	.
Vaccinium uliginosum	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium vitis-idaea	.	.	.	.	.	.	.	.	.	.	.	.
FORBS												
Achillea borealis	.	.	13	3	.	.	.	.	33	3	13	1
Aconitum delphinifolium	.	.	.	.	11	1	75	2	.	.	.	.
Anemone narcissiflora	.	.	.	.	.	.	.	.	.	.	.	.
Angelica lucida	.	.	13	1	.	.	.	.	17	1	.	.
Artemisia arctica	.	.	.	.	11	3	.	.	.	.	.	.

Aruncus sylvester	25	25	25	16	11	1	25	3	.	.	.	.
Castilleja unalaschcensis	.	.	.	.	11	1	.	.	.	.	13	1
Coptis trifolia	.	.	.	.	.	.	.	.	.	.	.	.
Cornus canadensis	.	.	.	.	.	.	.	.	33	1	.	.
Drosera rotundifolia	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium adenocaulon	13	1	13	1	.	.	.	.	33	1	25	3
Epilobium anagallidifolium	.	.	.	.	.	.	.	.	.	.	13	1
Epilobium angustifolium	50	2	13	3	.	.	25	10	17	1	25	1
Epilobium latifolium	.	.	13	3	56	12	25	10	.	.	38	1
Erigeron peregrinus	.	.	.	.	.	.	.	.	.	.	.	.
Fauria crista-galli	.	.	13	1	.	.	.	.	.	.	.	.
Fragaria chiloensis	.	.	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	13	1	.	.	.	.	.	.	.	.
Galium trifidum	13	1	13	1	11	1	25	3	17	1	13	1
Geocaulon lividum	.	.	.	.	.	.	.	.	.	.	.	.
Geranium erianthum	.	.	13	1	.	.	25	1	.	.	.	.
Geum calthifolium	.	.	.	.	.	.	.	.	.	.	13	3
Heracleum lanatum	25	6	50	4	11	1	50	7	.	.	.	.
Iris setosa	.	.	.	.	.	.	.	.	.	.	.	.
Lathyrus palustris	.	.	.	.	.	.	25	3	17	1	13	3
Listera cordata	13	30	13	1	.	.	.	.	.	.	.	.
Lupinus nootkatensis	.	.	.	.	.	.	.	.	.	.	13	60
Lysichiton americanus	.	.	13	30	.	.	.	.	.	.	.	.
Menyanthes trifoliata	.	.	.	.	.	.	.	.	.	.	.	.
Parnassia palustris	.	.	.	.	11	1	.	.	.	.	.	.
Polemonium acutiflorum	.	.	.	.	.	.	25	3	.	.	.	.
Polygonum viviparum	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla egedii	.	.	.	.	.	.	.	.	.	.	13	3
Potentilla palustris	.	.	.	.	.	.	.	.	17	10	.	.
Pyrola asarifolia	.	.	.	.	44	3	25	10	33	1	25	1
Pyrola secunda	.	.	13	1	56	3	25	10	33	6	38	2
Rhinanthus minor	.	.	.	.	.	.	.	.	.	.	.	.
Rubus arcticus	25	11	.	.	.	.	25	20	50	18	13	1
Rubus pedatus	13	10	.	.	.	.	.	.	.	.	.	.
Sanguisorba stipulata	13	3	13	1	22	2	50	3	33	2	13	1
Spiranthes romanzoffiana	.	.	.	.	.	.	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	44	2	.	.	17	3	50	2
Streptopus amplexifolius	38	2	63	4	11	1	25	1	.	.	13	10
Thalictrum sparsiflorum	.	.	.	.	.	.	75	2	.	.	.	.
Tiarella trifoliata	13	10	25	2	.	.	.	.	17	3	.	.
Trientalis europaea	.	.	13	1	11	1	25	3	17	1	.	.
Valeriana sitchensis	.	.	13	1	11	1	.	.	.	.	.	.
Veratrum viride	13	1	13	20	11	3	25	1	.	.	.	.
Viola glabella	13	30	13	3	.	.	25	1	.	.	.	.
Viola sp.	13	1	13	1	.	.	75	7	17	3	.	.
GRAMINOIDS												
Agrostis alascana	.	.	.	.	.	.	.	.	.	.	.	.
Arctophila fulva	13	1	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	75	6	63	7	56	3	100	35	67	4	25	2
Calamagrostis nutkaensis	.	.	.	.	.	.	.	.	.	.	.	.
Carex anthoxantha	.	.	.	.	.	.	.	.	.	.	.	.
Carex aquatilis	.	.	.	.	.	.	.	.	.	.	.	.
Carex lyngbyei	.	.	.	.	.	.	.	.	.	.	.	.

Carex macrochaeta	13	1	13	3	.	.	.	.	.	.	13	10
Carex magellanica	.	.	.	.	11	20	.	.	.	.	.	.
Carex saxatilis	.	.	.	.	.	.	.	.	.	.	.	.
Carex sitchensis	.	.	.	.	.	.	.	17	3	.	.	.
Carex sp.	.	.	.	.	11	1	50	1	17	1	13	1
Deschampsia cespitosa	13	3	13	1	11	3	.	.	17	3	13	3
Elymus arenarius	.	.	.	.	.	.	.	.	.	.	.	.
Eriophorum angustifolium	.	.	.	.	.	.	.	.	.	.	.	.
Eriophorum russeolum	.	.	.	.	.	.	.	.	.	.	.	.
Festuca altaica	.	.	.	.	.	.	.	.	17	10	.	.
Festuca rubra	13	1	.	.	.	.	.	.	.	.	13	3
Juncus alpinus	.	.	.	.	.	.	.	.	.	.	.	.
Juncus arcticus	.	.	.	.	.	.	.	.	.	.	.	.
Juncus sp.	.	.	.	.	.	.	.	.	17	3	.	.
Luzula multiflora	.	.	.	.	.	.	.	.	17	1	.	.
Luzula sp.	.	.	.	.	.	.	.	.	.	.	.	.
Luzula wahlenbergii	.	.	.	.	.	.	.	.	.	.	.	.
Phleum commutatum	.	.	13	1	11	1	25	1	.	.	.	.
Poa sp.	.	.	.	.	11	3	25	1	.	.	25	1
Puccinellia nutkaensis	.	.	.	.	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	.	.	33	1	.	.	.	.	25	1
FERNS AND ALLIES												
Athyrium filix-femina	63	2	100	21	.	.	75	5	33	2	13	3
Dryopteris dilatata	38	24	38	11	.	.	.	.	.	.	.	.
Equisetum arvense	38	7	50	2	67	3	100	13	50	30	38	10
Equisetum fluviatile	.	.	.	.	11	3	25	3	17	1	.	.
Equisetum palustre	.	.	.	.	.	.	.	.	50	2	.	.
Equisetum pratense	.	.	.	.	.	.	25	20	.	.	.	.
Equisetum silvaticum	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum sp.	.	.	.	.	11	10	.	.	.	.	.	.
Equisetum variegatum	13	10	.	.	11	1	.	.	33	25	.	.
Gymnocarpium dryopteris	50	8	38	11	.	.	50	11	.	.	.	.
Lycopodium annotinum	.	.	.	.	.	.	.	.	.	.	.	.
Thelypteris limbosperma	.	.	13	50	.	.	.	.	.	.	.	.
Thelypteris phegopteris	38	2	38	1	.	.	.	.	.	.	.	.
MOSSES												
Hylocomium splendens	.	.	.	.	.	.	.	.	17	30	.	.
Pleurozium schreberi	.	.	.	.	.	.	.	.	.	.	13	20
Sphagnum sp.	.	.	.	.	.	.	.	.	17	1	.	.

Species	SALALA				SALBAR/CALCAN				SALBAR/CARSIT				SALCOM	
	ALNCRIS-SALSIT/CALCAN		11 Plots		17 Plots		4 Plots		SALBAR/mixed herb		7 Plots			
	9 Plots	CON	COV	CON	COV	CON	COV	CON	COV	6 Plots	CON	COV	CON	COV
TREES														
Betula papyrifera	.	.	.	.	6	3	.	.	.	.	14	3		
Picea X lutzii	.	.	.	.	6	10	.	.	.	.	14	3		
Picea sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Populus balsamifera ssp. trichocarpa	.	.	27	1	6	3	.	.	17	1	.	.		
Tsuga mertensiana	.	.	.	.	.	.	.	.	.	.	.	.
TALL SHRUBS														
Alnus crispa ssp. sinuata	100	51	36	2	24	8	25	10	17	3	.	.		
Betula nana	.	.	.	.	.	.	.	.	17	1	.	.		
Cladothamnus pyroliflorus	.	.	.	.	.	.	.	.	.	.	.	.
Echinopanax horridum	11	1	9	10	6	1	.	.	.	.	.	.
Menziesia ferruginea	.	.	.	.	.	.	.	.	.	.	.	.
Myrica gale	.	.	9	10	18	20	50	50	50	10	.	.		
Rubus spectabilis	33	2	9	10	6	1	.	.	.	.	.	.
Salix alaxensis	22	7	100	35	12	7	.	.	17	3	.	.		
Salix barclayi	33	17	45	11	100	53	100	43	100	51	.	.		
Salix commutata	11	10	45	7	35	14	50	20	33	40	100	31		
Salix hookeriana	.	.	.	.	.	.	.	.	.	.	.	.
Salix sitchensis	100	24	55	12	35	20	.	.	33	17	14	1		
Salix sp.	.	.	.	.	6	1	.	.	.	.	14	1		
Sambucus racemosa	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium ovalifolium	.	.	.	.	.	.	.	.	17	1	.	.		
Viburnum edule	.	.	9	3	12	6	.	.	.	.	29	2		
LOW AND DWARF SHRUBS														
Arctostaphylos uva-ursi	.	.	9	1	.	.	25	1	.	.	.	.
Cassiope stelleriana	.	.	.	.	.	.	.	.	.	.	14	10		
Empetrum nigrum	.	.	9	3	6	10	.	.	17	1	14	3		
Linnaea borealis	.	.	.	.	12	1	.	.	17	1	14	1		
Luetkea pectinata	.	.	.	.	.	.	.	.	.	.	14	10		
Oxycoccus microcarpus	.	.	.	.	.	.	.	.	.	.	14	3		
Phyllodoce aleutica	.	.	.	.	.	.	.	.	.	.	.	.
Salix arctica	.	.	.	.	.	.	.	.	.	.	.	.
Salix reticulata	.	.	.	.	.	.	.	.	.	.	14	1		
Spiraea beauverdiana	11	1	.	.	18	1	.	.	17	3	14	1		
Vaccinium caespitosum	.	.	.	.	12	1	.	.	.	.	.	.
Vaccinium uliginosum	.	.	.	.	.	.	25	3	.	.	.	.
Vaccinium vitis-idaea	.	.	9	1	6	1	25	30	17	1	14	1		
FORBS														
Achillea borealis	22	2	9	1	12	2	.	.	17	20	14	1		
Aconitum delphinifolium	.	.	.	.	47	1	.	.	50	1	14	1		
Anemone narcissiflora	.	.	9	1	6	1	.	.	.	.	14	1		
Angelica lucida	11	1	.	.	6	1	.	.	.	.	.	.
Artemisia arctica	.	.	18	16	12	2	.	.	.	.	14	10		

Aruncus sylvester	11	30	.	.	6	1	.	.	.	.	.	.
Castilleja unalaschcensis	.	.	9	3	12	1	.	.	.	.	.	.
Coptis trifolia	.	.	.	.	.	.	.	.	17	1	.	.
Cornus canadensis	11	3	.	.	24	9	.	.	17	1	14	20
Drosera rotundifolia	.	.	.	.	.	.	.	.	.	.	14	1
Epilobium adenocaulon	11	1	.	.	6	3	.	.	.	.	.	.
Epilobium anagallidifolium	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium angustifolium	11	3	45	8	47	14	.	.	50	2	43	1
Epilobium latifolium	33	2	18	2	.	.	.	.	.	.	.	.
Erigeron peregrinus	.	.	.	.	6	3	.	.	.	.	.	.
Fauria crista-galli	.	.	.	.	.	.	.	.	.	.	.	.
Fragaria chiloensis	.	.	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	.	.	6	1	.	.	.	.	.	.
Galium trifidum	11	1	.	.	18	2	.	.	17	1	.	.
Geocaulon lividum	.	.	.	.	.	.	.	.	17	1	.	.
Geranium erianthum	11	3	9	3	35	3	.	.	33	2	14	1
Geum calthifolium	11	10	.	.	.	.	.	.	.	.	.	.
Heracleum lanatum	33	2	.	.	35	2	.	.	17	3	.	.
Iris setosa	.	.	.	.	6	1	.	.	17	1	.	.
Lathyrus palustris	.	.	9	10	6	10	.	.	17	10	14	1
Listera cordata	.	.	.	.	.	.	.	.	17	1	14	1
Lupinus nootkatensis	.	.	27	5	12	2	.	.	17	20	14	1
Lysichiton americanus	11	1	.	.	.	.	.	.	.	.	.	.
Menyanthes trifoliata	.	.	.	.	.	.	.	.	.	.	14	1
Parnassia palustris	22	2	18	3	12	6	25	3	17	3	29	7
Polemonium acutiflorum	.	.	9	1	29	1	.	.	17	1	14	1
Polygonum viviparum	.	.	.	.	.	.	.	.	.	.	14	1
Potentilla egedii	.	.	.	.	.	.	.	.	33	11	.	.
Potentilla palustris	.	.	18	1	47	11	75	23	33	12	86	8
Pyrola asarifolia	44	9	36	3	41	8	.	.	17	1	14	1
Pyrola secunda	11	10	36	4	24	4	.	.	17	1	.	.
Rhinanthus minor	.	.	.	.	.	.	.	.	17	1	.	.
Rubus arcticus	44	11	9	10	59	5	75	5	33	1	71	4
Rubus pedatus	.	.	.	.	12	3	25	1	17	1	14	3
Sanguisorba stipulata	22	2	18	16	65	6	.	.	50	8	29	3
Spiranthes romanzoffiana	.	.	.	.	.	.	.	.	.	.	.	.
Stellaria calycantha	11	3	18	2	.	.	.	.	.	.	14	1
Streptopus amplexifolius	22	2	27	2	12	2	.	.	33	1	.	.
Thalictrum sparsiflorum	.	.	9	3	6	1	.	.	.	.	.	.
Tiarella trifoliata	.	.	.	.	.	.	.	.	.	.	.	.
Trientalis europaea	33	2	9	10	53	1	50	2	17	1	71	2
Valeriana sitchensis	.	.	9	1	12	6	.	.	33	3	14	10
Veratrum viride	.	.	.	.	24	6	.	.	17	10	14	10
Viola glabella	11	3	.	.	.	.	.	.	.	.	.	.
Viola sp.	22	2	18	1	41	2	25	1	33	1	71	2
GRAMINOIDS												
Agrostis alascana	.	.	.	.	6	3	.	.	.	.	.	.
Arctophila fulva	11	10	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	100	18	64	7	100	25	50	2	83	2	100	9
Calamagrostis nutkaensis	.	.	.	.	.	.	.	.	.	.	.	.
Carex anthoxantha	.	.	9	3	.	.	.	.	.	.	.	.
Carex aquatilis	11	20	.	.	6	3	.	.	.	.	43	5
Carex lyngbyei	.	.	9	70	.	.	.	.	33	11	14	3

Carex macrochaeta	11	3	9	10	18	8	.	.	.	.	.	.
Carex magellanica	.	.	9	70	.	.	.	.	17	70	14	10
Carex saxatilis	.	.	.	.	12	35	.	.	17	1	.	.
Carex sitchensis	.	.	.	.	12	3	75	37	.	.	.	.
Carex sp.	11	10	9	1	18	11	25	3	17	1	29	7
Deschampsia cespitosa	11	10	9	1	18	5	.	.	.	.	.	.
Elymus arenarius	.	.	9	1	.	.	.	.	17	1	.	.
Eriophorum angustifolium	.	.	.	.	6	1	.	.	.	.	.	.
Eriophorum russeolum	.	.	.	.	.	.	.	.	.	.	.	.
Festuca altaica	.	.	9	50	6	40	.	.	.	.	14	3
Festuca rubra	.	.	9	1	.	.	.	.	.	.	.	.
Juncus alpinus	.	.	.	.	.	.	.	.	.	.	.	.
Juncus arcticus	.	.	.	.	.	.	.	.	.	.	.	.
Juncus sp.	.	.	.	.	6	3	.	.	.	.	.	.
Luzula multiflora	.	.	.	.	.	.	.	.	.	.	.	.
Luzula sp.	.	.	9	1	.	.	.	.	.	.	.	.
Luzula wahlenbergii	.	.	.	.	.	.	.	.	.	.	.	.
Phleum commutatum	11	10	9	1	.	.	.	.	.	.	14	1
Poa sp.	11	1	18	7	6	1	.	.	.	.	.	.
Puccinellia nutkaensis	.	.	.	.	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	18	6	6	1	.	.	.	.	14	1
FERNS AND ALLIES												
Athyrium filix-femina	56	4	9	3	24	8	.	.	33	22	.	.
Dryopteris dilatata	11	1	.	.	6	3	.	.	.	.	.	.
Equisetum arvense	67	37	45	6	82	10	75	2	83	42	86	13
Equisetum fluviatile	.	.	9	3	35	9	25	3	17	3	43	10
Equisetum palustre	.	.	.	.	.	.	50	16	.	.	.	.
Equisetum pratense	.	.	.	.	18	38	.	.	.	.	.	.
Equisetum silvaticum	.	.	.	.	12	12	.	.	.	.	.	.
Equisetum sp.	11	3	.	.	.	.	.	.	.	.	.	.
Equisetum variegatum	11	3	9	1	6	3	.	.	.	.	.	.
Gymnocarpium dryopteris	22	2	9	1	41	29	.	.	.	.	14	50
Lycopodium annotinum	11	1	9	1	18	2	.	.	.	.	14	1
Thelypteris limbosperma	.	.	.	.	.	.	.	.	.	.	.	.
Thelypteris phegopteris	.	.	.	.	.	.	.	.	.	.	.	.
MOSESSES												
Hylocomium splendens	11	10	.	.	6	1	50	10	.	.	.	.
Pleurozium schreberi	11	30	9	20	6	1	.	.	17	20	.	.
Sphagnum sp.	22	40	.	.	6	40	25	98	17	50	29	85

Species	SALHOO		SALSIT	
	5 Plots		19 Plots	
	CON	COV	CON	COV
TREES				
Betula papyrifera	.	.	.	.
Picea X lutzii	.	.	.	.
Picea sitchensis	20	3	21	2
Populus balsamifera ssp. trichocarpa	.	.	.	.
Tsuga mertensiana	.	.	5	1
TALL SHRUBS				
Alnus crispa ssp. sinuata	40	7	63	4
Betula nana	.	.	.	.
Cladothamnus pyroliflorus	.	.	.	.
Echinopanax horridum	.	.	.	.
Menziesia ferruginea	.	.	5	1
Myrica gale	20	10	11	20
Rubus spectabilis	20	20	5	1
Salix alaxensis	.	.	32	8
Salix barclayi	40	17	74	21
Salix commutata	40	17	16	17
Salix hookeriana	100	54	16	8
Salix sitchensis	60	14	100	50
Salix sp.	.	.	.	.
Sambucus racemosa	.	.	5	3
Vaccinium ovalifolium	.	.	5	3
Viburnum edule	.	.	5	10
LOW AND DWARF SHRUBS				
Arctostaphylos uva-ursi	.	.	.	.
Cassiope stelleriana	.	.	5	1
Empetrum nigrum	20	1	.	.
Linnaea borealis	.	.	.	.
Luetkea pectinata	.	.	11	11
Oxycoccus microcarpus	.	.	.	.
Phyllodoce aleutica	.	.	5	1
Salix arctica	.	.	.	.
Salix reticulata	.	.	.	.
Spiraea beauverdiana	.	.	.	.
Vaccinium caespitosum	.	.	.	.
Vaccinium uliginosum	20	3	.	.
Vaccinium vitis-idaea	20	3	.	.
FORBS				
Achillea borealis	20	20	11	10
Aconitum delphinifolium	.	.	5	1
Anemone narcissiflora	.	.	.	.
Angelica lucida	40	6	11	2
Artemisia arctica	.	.	.	.

Aruncus sylvester	.	.	5	1
Castilleja unalaschcensis	.	.	.	.
Coptis trifolia	.	.	.	.
Cornus canadensis	.	.	.	.
Drosera rotundifolia	.	.	.	.
Epilobium adenocaulon	.	.	16	2
Epilobium anagallidifolium	.	.	.	.
Epilobium angustifolium	20	1	21	4
Epilobium latifolium	.	.	16	4
Erigeron peregrinus	.	.	.	.
Fauria crista-galli	20	30	.	.
Fragaria chiloensis	.	.	5	1
Fritillaria camschatcensis	.	.	5	3
Galium trifidum	20	3	26	3
Geocaulon lividum	.	.	.	.
Geranium erianthum	.	.	11	6
Geum calthifolium	20	10	.	.
Heracleum lanatum	.	.	11	2
Iris setosa	40	2	.	.
Lathyrus palustris	40	31	5	3
Listera cordata	.	.	.	.
Lupinus nootkatensis	.	.	26	28
Lysichiton americanus	20	10	.	.
Menyanthes trifoliata	.	.	.	.
Parnassia palustris	.	.	11	1
Polemonium acutiflorum	.	.	.	.
Polygonum viviparum	.	.	.	.
Potentilla egedii	20	3	5	20
Potentilla palustris	60	10	11	15
Pyrola asarifolia	40	20	26	11
Pyrola secunda	.	.	16	2
Rhinanthus minor	20	1	.	.
Rubus arcticus	40	7	37	15
Rubus pedatus	.	.	.	.
Sanguisorba stipulata	40	2	53	10
Spiranthes romanzoffiana	20	1	5	1
Stellaria calycantha	.	.	5	3
Streptopus amplexifolius	20	3	16	1
Thalictrum sparsiflorum	.	.	11	2
Tiarella trifoliata	.	.	21	2
Trientalis europaea	40	1	21	2
Valeriana sitchensis	.	.	.	.
Veratrum viride	.	.	.	.
Viola glabella	.	.	11	36
Viola sp.	.	.	21	9
GRAMINOIDS				
Agrostis alascana	20	3	16	14
Arctophila fulva	.	.	5	1
Calamagrostis canadensis	80	33	68	21
Calamagrostis nutkaensis	.	.	.	.
Carex anthoxanthea	.	.	.	.
Carex aquatilis	.	.	.	.
Carex lyngbyei	40	6	5	90

Carex macrochaeta	.	.	11	7
Carex magellanica	.	.	5	1
Carex saxatilis	.	.	.	.
Carex sitchensis	40	20	5	40
Carex sp.	.	.	11	11
Deschampsia cespitosa	40	1	21	9
Elymus arenarius	.	.	.	.
Eriophorum angustifolium	.	.	.	.
Eriophorum russeolum	.	.	5	1
Festuca altaica	.	.	.	.
Festuca rubra	20	1	5	3
Juncus alpinus	.	.	5	1
Juncus arcticus	20	1	11	2
Juncus sp.	.	.	5	1
Luzula multiflora	.	.	5	1
Luzula sp.	.	.	5	1
Luzula wahlenbergii	20	1	.	.
Phleum commutatum	.	.	.	.
Poa sp.	.	.	5	1
Puccinellia nutkaensis	.	.	5	10
Trisetum spicatum	.	.	.	.
FERNS AND ALLIES				
Athyrium filix-femina	40	25	32	8
Dryopteris dilatata	.	.	.	.
Equisetum arvense	80	45	63	14
Equisetum fluviatile	20	3	5	1
Equisetum palustre	20	30	5	20
Equisetum pratense	.	.	11	50
Equisetum silvaticum	.	.	.	.
Equisetum sp.	.	.	.	.
Equisetum variegatum	.	.	11	2
Gymnocarpium dryopteris	.	.	21	17
Lycopodium annotinum	20	3	.	.
Thelypteris limbosperma	.	.	.	.
Thelypteris phegopteris	.	.	.	.
MOSESSES				
Hylocomium splendens	20	30	.	.
Pleurozium schreberi	.	.	.	.
Sphagnum sp.	20	10	5	50

Low Scrub

Species	BETNAN		CLAPYR		MYRGAL-SALCOM				MYRGAL/CALCAN				MYRGAL/CARLYN	
	5 Plots		8 Plots		4 Plots		7 Plots		4 Plots		8 Plots		7 Plots	
	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV
TREES														
Betula papyrifera	.	.	.	.	.	.	14	1	.	.	.	.	.	.
Picea X lutzii	40	1	.	.	.	.	.	.	.	.	13	1	.	.
Picea mariana	.	.	.	.	.	.	.	.	.	.	13	1	.	.
Picea sitchensis	20	1	50	1	25	1	14	3	.	.	.	.	14	3
Tsuga heterophylla	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Tsuga mertensiana	20	3	75	2	.	.	.	.	.	.	.	.	.	.
TALL SHRUBS														
Alnus crispa ssp. sinuata	.	.	25	12	50	1	14	10	.	.	13	1	57	4
Betula nana	100	32	.	.	.	.	.	.	.	.	25	7	.	.
Cladothamnus pyroliflorus	.	.	100	35	.	.	.	.	.	.	.	.	.	.
Echinopanax horridum	.	.	13	1	.	.	.	.	.	.	.	.	.	.
Menziesia ferruginea	.	.	38	1	.	.	.	.	.	.	.	.	.	.
Myrica gale	20	3	.	.	100	58	100	39	100	53	100	61	100	59
Rubus spectabilis	.	.	38	7	.	.	.	.	.	.	.	.	.	.
Salix alaxensis	.	.	.	.	25	3	14	1	25	3	.	.	.	.
Salix barclayi	.	.	.	.	100	40	14	10	25	10	13	1	86	6
Salix commutata	.	.	.	.	50	20	86	28	75	10	.	.	71	2
Salix hookeriana	.	.	.	.	25	10	14	10	100	28	13	3	71	5
Salix sitchensis	.	.	.	.	25	10	14	1	50	7	.	.	57	3
Salix sp.	20	1	.	.	.	.	.	.	.	.	13	3	.	.
Sambucus racemosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium ovalifolium	.	.	63	3	.	.	.	.	.	.	.	.	.	.
Viburnum edule	.	.	13	1	.	.	.	.	25	1	.	.	.	.
LOW AND DWARF SHRUBS														
Andromeda polifolia	60	4	.	.	.	.	.	.	.	.	13	1	14	1
Arctostaphylos alpina	20	1	.	.	.	.	.	.	.	.	.	.	.	.
Cassiope stelleriana	.	.	50	14	.	.	.	.	.	.	.	.	.	.
Diapensia lapponica	20	1	.	.	.	.	.	.	.	.	.	.	.	.
Dryas octopetala	20	1	.	.	.	.	.	.	.	.	.	.	.	.
Empetrum nigrum	60	27	25	6	.	.	.	.	.	.	.	.	.	.
Ledum palustre	40	6	.	.	.	.	.	.	.	.	13	10	.	.
Linnaea borealis	20	1	.	.	.	.	.	.	.	.	.	.	.	.
Loiseleuria procumbens	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Luetkea pectinata	.	.	75	23	.	.	.	.	.	.	.	.	.	.
Oxycoccus microcarpus	40	1	.	.	.	.	14	1	.	.	13	3	.	.
Phyllodoce aleutica	.	.	38	14	.	.	.	.	.	.	.	.	.	.
Salix arctica	.	.	.	.	.	.	.	.	25	1	.	.	14	40
Salix myrtillofolia	.	.	.	.	.	.	.	.	.	.	13	10	.	.
Spiraea beauverdiana	40	1	.	.	.	.	14	1	.	.	13	1	.	.
Vaccinium caespitosum	.	.	38	5	.	.	.	.	.	.	.	.	.	.
Vaccinium uliginosum	60	11	13	20	.	.	14	1	.	.	13	1	.	.
Vaccinium vitis-idaea	40	6	.	.	.	.	.	.	.	.	13	3	.	.

FORBS

Achillea borealis	.	.	.	.	.	29	3	.	.	13	1	43	2	
Aconitum delphinifolium	.	.	.	.	.	.	.	.	.	.	.	.	.
Anemone narcissiflora	40	1	25	6	.	.	.	.	.	.	.	.	.
Angelica lucida	.	.	13	3	.	.	14	1	.	25	1	.	.	
Artemisia arctica	40	6	38	4	.	.	.	.	.	.	.	.	.
Aruncus sylvester	.	.	13	1	.	.	.	.	.	.	.	.	.
Campanula lasiocarpa	20	1	.	.	.	.	.	.	.	.	.	.	.
Castilleja unalaschcensis	.	.	25	1	.	.	.	.	.	.	.	.	.
Coptis aspleniifolia	.	.	.	.	.	.	.	.	.	.	.	.	.
Coptis trifolia	.	.	25	1	.	.	.	.	.	.	.	.	.
Cornus canadensis	20	20	38	1	.	.	.	.	.	13	3	.	.	
Dodecatheon pulchellum	.	.	25	1	.	.	.	.	.	.	.	14	1	
Drosera rotundifolia	.	.	13	1	.	.	.	.	.	.	.	14	1	
Epilobium adenocaulon	.	.	.	.	25	1	14	3	25	1	.	14	1	
Epilobium angustifolium	20	3	13	10	.	.	14	1	.	.	38	17	.	
Erigeron peregrinus	.	.	38	5	.	.	.	.	.	.	.	.	.
Fauria crista-galli	.	.	100	38	.	.	.	.	.	.	.	.	.
Fragaria chiloensis	.	.	.	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	.	.	25	1	.	.	.	.	.	.	.
Galium trifidum	.	.	.	.	50	2	14	1	.	.	25	1	14	1
Gentiana douglasiana	.	.	13	1	.	.	.	.	.	.	.	.	.
Geranium erianthum	.	.	38	1	.	.	.	.	.	.	.	.	.
Geum calthifolium	.	.	63	5	.	.	.	.	.	.	.	.	.
Heracleum lanatum	.	.	13	3	.	.	.	.	.	.	.	.	.
Iris setosa	.	.	.	.	25	1	14	3	25	3	50	2	57	4
Lathyrus palustris	.	.	.	.	.	.	43	2	.	.	25	6	43	2
Listera cordata	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lupinus nootkatensis	.	.	13	3	.	.	.	.	50	6	.	.	14	1
Lysichiton americanus	.	.	.	.	25	3	.	.	.	.	.	.	.	.
Menyanthes trifoliata	.	.	.	.	25	20	.	.	.	.	13	3	.	.
Parnassia palustris	.	.	.	.	.	.	14	1	50	1	.	.	14	1
Pedicularis parviflora	.	.	.	.	.	.	.	.	.	.	.	.	14	1
Polygonum viviparum	.	.	.	.	.	.	.	.	50	1	.	.	.	.
Potentilla egedii	.	.	.	.	50	1	14	1	50	20	13	1	57	9
Potentilla palustris	20	1	.	.	75	9	71	13	50	6	75	10	100	7
Pyrola asarifolia	.	.	.	.	25	1	14	20	.	.	.	.	29	17
Ranunculus cymbalaria	.	.	.	.	.	.	.	.	25	1	.	.	.	.
Rhinanthus minor	.	.	.	.	.	.	.	.	.	.	.	.	14	1
Rubus arcticus	20	1	.	.	50	7	100	10	25	3	25	7	.	.
Rubus pedatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sanguisorba stipulata	20	1	75	2	25	1	29	2	50	2	25	10	29	2
Saxifraga bronchialis	20	1	.	.	.	.	.	.	.	.	.	.	.	.
Spiranthes romanzoffiana	.	.	.	.	.	.	.	.	.	.	.	.	29	1
Stellaria calycantha	.	.	.	.	.	.	14	1	.	.	.	.	.	.
Streptopus amplexifolius	.	.	13	1	.	.	.	.	.	.	.	.	.	.
Thalictrum sparsiflorum	.	.	.	.	.	.	14	3	.	.	25	7	.	.
Tiarella trifoliata	.	.	38	1	.	.	.	.	.	.	.	.	14	1
Trientalis europaea	20	3	13	1	50	2	71	3	25	1	50	4	.	.
Valeriana sitchensis	.	.	13	3	.	.	.	.	.	.	.	.	.	.
Veratrum viride	.	.	25	6	.	.	.	.	.	.	.	.	.	.
Viola glabella	.	.	13	1	.	.	.	.	.	.	.	.	.	.
Viola sp.	.	.	25	1	25	3	14	3	.	.	.	.	.	.

GRAMINOIDS

Agrostis alascana	.	.	.	.	50	2	14	10	25	50	13	30	57	11
Calamagrostis canadensis	40	2	38	2	75	10	86	10	50	7	100	30	86	5
Calamagrostis nutkaensis	.	.	13	1	.	.	.	.	.	.	.	.	.	.
Carex anthoxantha	.	.	13	3	.	.	.	.	.	.	.	.	.	.
Carex aquatilis	20	3	.	.	.	.	29	12	25	20	.	.	.	.
Carex glareosa	.	.	.	.	.	.	.	.	25	3	.	.	.	.
Carex lyngbyei	.	.	.	.	.	.	.	.	75	11	13	3	100	50
Carex mackenziei	.	.	.	.	.	.	.	.	.	.	.	.	14	1
Carex macrochaeta	.	.	50	13	.	.	.	.	.	.	.	.	.	.
Carex microchaeta	20	1	.	.	.	.	.	.	.	.	.	.	.	.
Carex pauciflora	40	20	.	.	.	.	.	.	.	.	.	.	.	.
Carex pluriflora	40	2	.	.	.	.	.	.	25	30	25	35	.	.
Carex rostrata	.	.	.	.	25	3	.	.	.	.	.	.	.	.
Carex sitchensis	.	.	.	.	25	3	.	.	25	70	13	20	.	.
Carex sp.	.	.	38	2	.	.	57	5	.	.	13	3	.	.
Deschampsia cespitosa	20	1	13	1	25	1	29	2	50	1	13	3	43	2
Eleocharis palustris	.	.	.	.	.	.	.	.	.	.	.	.	14	1
Eriophorum angustifolium	60	2	13	1	.	.	.	.	.	.	.	.	.	.
Eriophorum russeolum	.	.	.	.	.	.	.	.	25	30	.	.	14	1
Festuca altaica	40	11	.	.	.	.	.	.	.	.	.	.	.	.
Festuca rubra	.	.	.	.	25	1	14	1	50	6	.	.	57	1
Hierochloa alpina	40	25	.	.	.	.	.	.	.	.	.	.	.	.
Juncus alpinus	.	.	.	.	.	.	.	.	.	.	.	.	14	1
Juncus arcticus	.	.	.	.	.	.	14	10	25	3	.	.	14	1
Luzula multiflora	.	.	.	.	.	.	14	1	.	.	.	.	.	.
Luzula wahlenbergii	20	1	.	.	.	.	.	.	.	.	.	.	.	.
Poa sp.	.	.	13	1	.	.	.	.	.	.	.	.	.	.
Trichophorum caespitosum	40	40	13	80	.	.	.	.	.	.	.	.	.	.
FERNS AND ALLIES														
Athyrium filix-femina	.	.	.	.	25	3	14	1	.	.	25	16	.	.
Blechnum spicant	.	.	25	2	.	.	.	.	.	.	.	.	.	.
Dryopteris dilatata	.	.	38	8	.	.	.	.	.	.	13	1	.	.
Equisetum arvense	40	1	.	.	75	30	100	15	75	5	63	26	86	7
Equisetum fluviatile	20	1	.	.	50	7	29	7	.	.	50	9	14	1
Equisetum palustre	.	.	.	.	.	.	.	.	25	3	.	.	.	.
Equisetum pratense	.	.	.	.	.	.	.	.	.	.	.	.	14	30
Equisetum variegatum	.	.	.	.	.	.	29	6	50	1	.	.	43	4
Gymnocarpium dryopteris	.	.	13	10	.	.	.	.	.	.	.	.	.	.
Lycopodium annotinum	40	2	.	.	25	10	.	.	.	.	.	.	.	.
Lycopodium clavatum	20	1	38	2	.	.	.	.	.	.	.	.	.	.
Lycopodium complanatum	20	1	.	.	.	.	.	.	.	.	.	.	.	.
Thelypteris limbosperma	.	.	63	11	.	.	.	.	.	.	.	.	.	.
Thelypteris phegopteris	.	.	38	2	.	.	.	.	.	.	.	.	.	.
MOSESSES														
Hylocomium splendens	.	.	.	.	25	10	.	.	.	.	.	.	.	.
Pleurozium schreberi	.	.	.	.	25	30	14	3	.	.	.	.	.	.
Sphagnum sp.	60	73	25	25	25	1	29	42	50	2	25	30	.	.

Species	MYRGAL/CARSIT		MYRGAL/ERLANG		RUBSPE		RUBSPE/ATHFIL		RUBSPE/CALCAN	
	12 Plots		11 Plots		23 Plots		8 Plots		8 Plots	
	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV
TREES										
Betula papyrifera	.	.	.	.	.	.	.	.	.	.
Picea X lutzii	8	1	.	.	.	.	.	.	.	.
Picea mariana	.	.	.	.	.	.	.	.	.	.
Picea sitchensis	.	.	36	1	.	.	13	1	13	3
Tsuga heterophylla	.	.	9	1	.	.	13	3	.	.
Tsuga mertensiana	.	.	18	1	4	1	13	1	13	3
TALL SHRUBS										
Alnus crispa ssp. sinuata	.	.	.	.	65	40	88	34	50	26
Betula nana	.	.	.	.	.	.	.	.	.	.
Cladothamnus pyroliflorus	.	.	.	.	4	30	.	.	.	.
Echinopanax horridum	.	.	.	.	61	11	63	12	63	4
Menziesia ferruginea	.	.	.	.	4	1	.	.	.	.
Myrica gale	100	56	100	39	.	.	.	.	.	.
Rubus spectabilis	.	.	.	.	100	74	100	58	100	49
Salix alaxensis	.	.	.	.	.	.	.	.	.	.
Salix barclayi	67	6	.	.	.	.	.	.	.	.
Salix commutata	50	7	.	.	.	.	.	.	.	.
Salix hookeriana	25	8	.	.	.	.	.	.	.	.
Salix sitchensis	8	1	.	.	.	.	.	.	.	.
Salix sp.	8	10	.	.	.	.	.	.	.	.
Sambucus racemosa	.	.	.	.	35	6	38	10	38	8
Vaccinium ovalifolium	.	.	.	.	9	2	13	10	25	6
Viburnum edule	.	.	.	.	.	.	.	.	.	.
LOW AND DWARF SHRUBS										
Andromeda polifolia	8	10	100	5	.	.	.	.	.	.
Arctostaphylos alpina	.	.	.	.	.	.	.	.	.	.
Cassiope stelleriana	.	.	9	1	.	.	.	.	.	.
Diapensia lapponica	.	.	.	.	.	.	.	.	.	.
Dryas octopetala	.	.	.	.	.	.	.	.	.	.
Empetrum nigrum	8	3	45	17	.	.	.	.	.	.
Ledum palustre	.	.	9	1	.	.	.	.	.	.
Linnaea borealis	.	.	.	.	.	.	.	.	.	.
Loiseleuria procumbens	.	.	9	1	.	.	.	.	.	.
Luetkea pectinata	.	.	.	.	4	1	.	.	.	.
Oxycoccus microcarpus	8	20	73	4	.	.	.	.	.	.
Phyllodoce aleutica	.	.	.	.	.	.	.	.	.	.
Salix arctica	.	.	.	.	.	.	.	.	.	.
Salix myrtillofolia	.	.	.	.	.	.	.	.	.	.
Spiraea beauverdiana	.	.	.	.	.	.	.	.	.	.
Vaccinium caespitosum	.	.	9	1	.	.	.	.	.	.
Vaccinium uliginosum	8	10	36	4	.	.	.	.	.	.
Vaccinium vitis-idaea	.	.	9	1	.	.	.	.	.	.

FORBS

Achillea borealis	.	.	.	.	.	.	.	.	.
Aconitum delphinifolium	.	.	.	.	.	.	.	13	3
Anemone narcissiflora	.	.	.	.	.	.	.	.	.
Angelica lucida	.	.	.	.	.	.	.	13	10
Artemisia arctica	.	.	.	.	.	.	.	.	.
Aruncus sylvester	.	.	.	13	21	25	6	25	22
Campanula lasiocarpa	.	.	.	.	.	.	.	.	.
Castilleja unalascensis	.	.	.	.	.	.	.	.	.
Coptis aspleniifolia	.	.	.	4	1	.	.	.	.
Coptis trifolia	8	1	27	1	.	.	.	.	.
Cornus canadensis	8	10	27	2	.	.	.	13	3
Dodecatheon pulchellum	.	.	18	2	.	.	.	.	.
Drosera rotundifolia	8	1	82	8	.	.	.	.	.
Epilobium adenocaulon	.	.	.	.	.	.	.	.	.
Epilobium angustifolium	8	3	.	.	4	30	.	50	9
Erigeron peregrinus	.	.	27	1	4	1	.	.	.
Fauria crista-galli	.	.	73	12	4	20	.	.	.
Fragaria chiloensis	8	1	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	9	1	4	1	.	.	.
Galium trifidum	17	1	.	.	.	.	13	1	.
Gentiana douglasiana	.	.	55	3	.	.	.	.	.
Geranium erianthum	.	.	.	.	.	.	.	38	2
Geum calthifolium	.	.	55	11	13	5	.	.	.
Heracleum lanatum	.	.	.	.	13	2	38	2	75
Iris setosa	8	10	.	.	.	.	.	.	.
Lathyrus palustris	17	2	.	.	.	.	.	.	.
Listera cordata	.	.	.	.	4	1	.	.	.
Lupinus nootkatensis	.	.	.	.	.	.	.	.	.
Lysichiton americanus	.	.	.	.	.	.	.	.	.
Menyanthes trifoliata	42	24	.	.	.	.	.	.	.
Parnassia palustris	.	.	.	.	.	.	.	.	.
Pedicularis parviflora	.	.	18	2	.	.	.	.	.
Polygonum viviparum	.	.	.	.	.	.	.	.	.
Potentilla egedii	.	.	.	.	.	.	.	.	.
Potentilla palustris	92	36	.	.	.	.	.	.	.
Pyrola asarifolia	.	.	.	.	.	.	.	.	.
Ranunculus cymbalaria	.	.	.	.	.	.	.	.	.
Rhinanthus minor	.	.	.	.	.	.	.	.	.
Rubus arcticus	50	7	9	1	.	.	.	.	.
Rubus pedatus	.	.	.	.	4	1	.	13	10
Sanguisorba stipulata	.	.	.	.	.	.	.	38	5
Saxifraga bronchialis	.	.	.	.	.	.	.	.	.
Spiranthes romanzoffiana	.	.	.	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	.	.	.	13	1
Streptopus amplexifolius	.	.	.	.	52	2	88	3	25
Thalictrum sparsiflorum	17	2	.	.	.	.	.	.	.
Tiarella trifoliata	.	.	.	.	17	3	38	10	13
Trientalis europaea	17	1	55	1	4	1	13	1	25
Valeriana sitchensis	.	.	.	.	9	1	.	25	25
Veratrum viride	.	.	.	.	57	4	75	5	75
Viola glabella	.	.	.	.	22	3	50	7	13
Viola sp.	8	3	.	.	13	2	13	10	50

GRAMINOIDS										
Agrostis alascana	8	1	.	.	.	.	.	.	.
Calamagrostis canadensis	83	17	.	.	39	2	25	3	100	13
Calamagrostis nutkaensis	8	1	.	.	.	.	.	.	.	.
Carex anthoxanthea	.	.	.	.	4	1	.	.	.	.
Carex aquatilis	8	10	.	.	.	.	.	.	.	.
Carex glareosa	.	.	.	.	.	.	.	.	.	.
Carex lyngbyei	17	15	.	.	.	.	.	.	.	.
Carex mackenziei	.	.	.	.	.	.	.	.	.	.
Carex macrochaeta	.	.	.	.	4	1	.	.	38	5
Carex microchaeta	.	.	.	.	.	.	.	.	.	.
Carex pauciflora	8	50	27	5	.	.	.	.	.	.
Carex pluriflora	8	10	45	12	.	.	.	.	.	.
Carex rostrata	.	.	.	.	.	.	.	.	.	.
Carex sitchensis	33	58	27	21	.	.	.	.	.	.
Carex sp.	17	10	27	18	4	1	13	1	13	3
Deschampsia cespitosa	8	1	27	4	4	1	.	.	.	.
Eleocharis palustris	.	.	18	40	.	.	.	.	.	.
Eriophorum angustifolium	.	.	91	35	.	.	.	.	.	.
Eriophorum russeolum	8	3	.	.	.	.	.	.	.	.
Festuca altaica	.	.	.	.	.	.	.	.	.	.
Festuca rubra	.	.	.	.	.	.	.	.	.	.
Hierochloe alpina	.	.	.	.	.	.	.	.	.	.
Juncus alpinus	.	.	.	.	.	.	.	.	.	.
Juncus arcticus	.	.	.	.	.	.	.	.	.	.
Luzula multiflora	.	.	.	.	.	.	.	.	.	.
Luzula wahlenbergii	.	.	.	.	.	.	.	.	.	.
Poa sp.	.	.	.	.	.	.	.	.	.	.
Trichophorum caespitosum	.	.	55	35	.	.	.	.	.	.
FERNS AND ALLIES										
Athyrium filix-femina	.	.	.	.	65	5	100	23	88	23
Blechnum spicant	.	.	.	.	.	.	13	1	.	.
Dryopteris dilatata	.	.	.	.	78	10	63	6	63	6
Equisetum arvense	42	19	.	.	.	.	13	1	.	.
Equisetum fluviatile	75	9	.	.	.	.	.	.	.	.
Equisetum palustre	25	2	.	.	.	.	.	.	.	.
Equisetum pratense	8	3	.	.	.	.	.	.	.	.
Equisetum variegatum	.	.	.	.	.	.	.	.	.	.
Gymnocarpium dryopteris	.	.	.	.	35	4	63	4	38	7
Lycopodium annotinum	.	.	.	.	.	.	.	.	.	.
Lycopodium clavatum	.	.	.	.	.	.	.	.	.	.
Lycopodium complanatum	.	.	.	.	.	.	.	.	.	.
Thelypteris limbosperma	.	.	.	.	9	12	13	1	13	10
Thelypteris phegopteris	.	.	.	.	22	4	50	2	38	2
MOSSES										
Hylocomium splendens	.	.	.	.	.	.	.	.	.	.
Pleurozium schreberi	.	.	.	.	.	.	.	.	.	.
Sphagnum sp.	25	30	55	58	4	1	.	.	.	.

Dwarf Scrub

Species	CASSTE-LUEPEC/FAUCRI						EMPNIQ		EMPNIQ-VACULI					
	CASSTE-LUEPEC		8 Plots		DRYOCT/HIEALP		22 Plots		EMPNIQ-ARCALP		30 Plots		EMPNIQ-VACULI/CARPLU	
	44 Plots	CON	COV	CON	COV	7 Plots	CON	COV	CON	COV	CON	COV	CON	COV
TREES														
Chamaecyparis nootkatensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Picea X lutzii	2	1	.	.	.	.	.	.	5	1	7	1	.	.
Picea sitchensis	5	1	13	1	.	.	.	.	.	.	20	1	80	2
Tsuga heterophylla	.	.	.	.	.	.	.	.	.	.	.	.	20	3
Tsuga mertensiana	9	1	.	.	.	.	.	.	5	1	17	2	20	1
TALL SHRUBS														
Alnus crispa ssp. sinuata	7	2	25	6	.	.	.	.	.	.	7	7	.	.
Betula nana	2	1	.	.	.	.	.	.	.	.	.	.	.	.
Cladothamnus pyroliflorus	9	2	63	2	.	.	.	.	.	.	3	1	.	.
Menziesia ferruginea	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Salix alaxensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Salix barclayi	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Salix commutata	.	.	.	.	.	.	.	.	.	.	3	1	.	.
Salix sitchensis	2	1	.	.	.	.	.	.	.	.	.	.	.	.
Salix sp.	.	.	.	.	14	3	5	20	5	3	3	1	.	.
Vaccinium ovalifolium	5	1	13	1	.	.	.	.	.	.	3	1	.	.
LOW AND DWARF SHRUBS														
Andromeda polifolia	.	.	.	.	.	.	.	.	.	.	13	2	80	2
Arctostaphylos alpina	5	1	.	.	43	10	27	1	100	24	23	2	.	.
Arctostaphylos uva-ursi	.	.	.	.	14	20	5	1	5	1	3	1	.	.
Cassiope stelleriana	77	39	100	43	.	.	27	2	10	1	33	3	.	.
Cassiope tetragona	9	15	.	.	14	1	.	.	.	.	13	4	.	.
Diapensia lapponica	20	2	.	.	57	9	50	3	45	4	40	4	.	.
Dryas octopetala	7	7	.	.	100	26	18	14	35	15	27	5	.	.
Empetrum nigrum	61	16	25	2	71	2	100	42	95	26	100	28	100	35
Ledum palustre	7	2	.	.	14	1	9	6	45	3	23	1	20	1
Linnaea borealis	5	1	.	.	.	.	5	3	25	6	17	1	.	.
Loiseleuria procumbens	27	4	25	16	29	3	59	8	35	7	50	7	.	.
Luetkea pectinata	80	26	100	28	.	.	9	6	.	.	17	2	.	.
Oxycoccus microcarpus	.	.	.	.	.	.	.	.	.	.	17	5	100	3
Phyllodoce aleutica	14	6	63	7	.	.	.	.	.	.	3	1	.	.
Salix arctica	9	2	.	.	71	2	50	3	50	1	33	1	.	.
Salix reticulata	11	3	.	.	.	.	14	11	10	2	13	2	.	.
Salix rotundifolia	23	3	.	.	.	.	23	6	.	.	20	1	.	.
Spiraea beauverdiana	16	3	.	.	.	.	36	4	20	6	13	1	.	.
Vaccinium caespitosum	5	6	13	1	.	.	14	2	.	.	3	10	.	.
Vaccinium uliginosum	14	14	25	16	14	1	41	1	85	14	100	29	100	25
Vaccinium vitis-idaea	34	2	.	.	86	3	91	3	95	4	63	7	20	10
FORBS														
Achillea borealis	.	.	.	.	.	.	5	1	.	.	7	1	.	.
Aconitum delphinifolium	5	1	.	.	14	1	5	1	5	1	3	1	.	.
Anemone narcissiflora	39	1	13	1	86	1	82	3	60	1	40	1	.	.
Angelica lucida	.	.	.	.	.	.	9	1	.	.	.	.	.	.

Antennaria monocephala	.	.	.	.	29	1	27	2	.	.	3	1	.	.
Artemisia arctica	66	4	13	1	57	3	91	4	55	2	37	3	.	.
Campanula lasiocarpa	14	1	.	.	71	1	45	1	10	1	23	1	.	.
Castilleja unalaschcensis	7	1	.	.	14	1	5	1	5	1	7	1	.	.
Coptis trifolia	.	.	.	.	.	.	.	.	.	.	10	2	.	.
Cornus canadensis	2	3	.	.	.	.	18	3	15	2	27	5	40	3
Dodecatheon pulchellum	.	.	25	2	.	.	.	.	.	.	3	1	.	.
Drosera rotundifolia	.	.	.	.	.	.	.	.	.	.	13	6	40	2
Epilobium anagallidifolium	.	.	13	3	.	.	.	.	.	.	.	.	.	.
Epilobium angustifolium	11	12	.	.	14	1	23	5	10	2	13	1	.	.
Epilobium latifolium	5	6	.	.	.	.	14	2	10	1	7	1	.	.
Erigeron peregrinus	14	11	75	5	.	.	5	1	.	.	3	1	.	.
Fauria crista-galli	9	2	100	54	.	.	.	.	.	.	23	2	40	1
Fritillaria camschatcensis	.	.	.	.	14	1	14	1	10	1	3	1	.	.
Gentiana douglasiana	.	.	.	.	.	.	.	.	.	.	3	3	20	1
Gentiana glauca	41	1	.	.	14	1	45	1	20	1	20	1	.	.
Geranium erianthum	11	9	13	1	14	3	5	1	5	3	7	17	.	.
Geum calthifolium	7	8	50	2	.	.	.	.	.	.	20	2	.	.
Hedysarum alpinum	.	.	.	.	.	.	.	.	5	20	.	.	.	.
Heracleum lanatum	.	.	.	.	.	.	.	.	.	.	3	1	.	.
Iris setosa	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Lupinus nootkatensis	23	12	38	1	14	3	23	5	5	1	17	1	.	.
Lysichiton americanus	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Oxytropis nigrescens	2	1	.	.	86	1	9	2	30	1	17	1	.	.
Parnassia palustris	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pedicularis parviflora	2	3	.	.	.	.	.	.	.	.	3	3	40	1
Polemonium acutiflorum	2	1	.	.	.	.	5	1	.	.	.	.	.	.
Polygonum viviparum	9	2	.	.	57	1	27	1	15	1	10	1	.	.
Potentilla egedii	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla palustris	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pyrola asarifolia	2	1	.	.	.	.	5	1	.	.	.	.	.	.
Rhinanthus minor	.	.	.	.	.	.	5	1	.	.	.	.	20	1
Rubus arcticus	7	2	.	.	.	.	23	1	.	.	3	1	20	10
Rubus pedatus	2	1	.	.	.	.	.	.	.	.	7	6	.	.
Sanguisorba stipulata	11	13	13	1	.	.	14	2	.	.	3	3	.	.
Saxifraga bronchialis	5	1	.	.	57	1	9	1	10	1	7	1	.	.
Spiranthes romanzoffiana	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Stellaria calycantha	2	1	.	.	.	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	2	1	.	.	.	.	.	.	.	.	.	.	.	.
Trientalis europaea	14	2	.	.	.	.	18	1	10	1	13	2	20	1
Valeriana sitchensis	14	14	.	.	.	.	.	.	.	.	.	.	.	.
Veratrum viride	11	1	13	3	.	.	.	.	.	.	.	.	.	.
Viola sp.	7	1	.	.	.	.	5	1	.	.	3	10	.	.
GRAMINOIDS														
Agrostis alascana	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	9	9	.	.	.	.	18	4	.	.	7	6	.	.
Calamagrostis nutkaensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carex anthoxantha	.	.	13	3	.	.	.	.	.	.	.	.	20	10
Carex aquatilis	.	.	.	.	.	.	.	.	.	.	3	1	.	.
Carex lyngbyei	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carex macrochaeta	16	13	38	8	.	.	9	1	.	.	3	10	.	.
Carex magellanica	5	15	.	.	.	.	.	.	.	.	3	3	.	.
Carex microchaeta	43	6	.	.	86	4	59	9	65	3	37	6	.	.

Carex microglochin	11	3	25	7	.	.	.	.	5	1	.	.	.	.
Carex pauciflora	.	.	.	.	.	.	.	.	.	.	10	20	20	1
Carex pluriflora	.	.	.	.	.	.	.	.	.	.	3	1	100	30
Carex sitchensis	.	.	.	.	.	.	.	.	.	.	7	30	60	20
Carex sp.	18	4	25	2	14	3	27	3	5	1	30	10	.	.
Deschampsia cespitosa	7	2	25	1	.	.	5	1	.	.	.	.	.	.
Eriophorum angustifolium	.	.	.	.	.	.	.	.	.	.	10	7	80	25
Eriophorum russeolum	.	.	.	.	.	.	.	.	.	.	3	1	.	.
Festuca altaica	32	3	.	.	43	24	86	12	55	6	13	3	.	.
Hierochloe alpina	23	4	.	.	100	3	77	5	85	6	53	4	.	.
Juncus sp.	2	1	.	.	.	.	.	.	.	.	.	.	.	.
Luzula multiflora	5	2	.	.	.	.	9	1	.	.	.	.	.	.
Luzula sp.	2	3	.	.	.	.	5	1	.	.	.	.	.	.
Luzula wahlenbergii	41	2	.	.	29	1	27	1	5	1	17	1	.	.
Phleum commutatum	14	2	.	.	.	.	5	1	.	.	.	.	.	.
Poa sp.	9	1	.	.	14	1	5	10	.	.	3	1	.	.
Trichophorum caespitosum	.	.	.	.	.	.	.	.	.	.	10	2	.	.
Trisetum spicatum	11	1	.	.	29	1	9	3	15	1	7	1	.	.
FERNS AND ALLIES														
Athyrium filix-femina	2	1	.	.	.	.	.	.	.	.	.	.	.	.
Blechnum spicant	.	.	.	.	.	.	.	.	.	.	3	1	.	.
Dryopteris dilatata	7	1	.	.	.	.	.	.	.	.	3	1	.	.
Equisetum arvense	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum fluviatile	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum palustre	.	.	.	.	.	.	.	.	.	.	.	.	20	3
Equisetum variegatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gymnocarpium dryopteris	11	19	.	.	.	.	.	.	5	1	7	2	.	.
Lycopodium alpinum	50	7	.	.	.	.	50	3	10	2	10	4	.	.
Lycopodium annotinum	7	1	13	10	.	.	14	1	10	1	17	1	.	.
Lycopodium clavatum	16	11	25	2	.	.	5	1	5	1	10	1	.	.
Lycopodium complanatum	.	.	13	30	.	.	.	.	.	.	.	.	.	.
Thelypteris limbosperma	.	.	25	1	.	.	.	.	.	.	.	.	.	.
MOSESSES														
Hylacomium splendens	.	.	.	.	.	.	5	10	.	.	.	.	20	20
Pleurozium schreberi	.	.	13	10	.	.	9	25	.	.	10	24	20	20
Sphagnum sp.	.	.	.	.	.	.	.	.	.	.	10	72	40	75

Species	EMPNIIG-VACULI/FAUCRI				PHYALE-CASSTE				SALARC-EMPNIIG				SALRET/FESALT			
	EMPNIIG-VACULI/TRICAE								PHYALE/FAUCRI				SALARC/CARLYN			
	19 Plots		9 Plots		15 Plots		9 Plots		10 Plots		3 Plots		3 Plots			
	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV		
TREES																
Chamaecyparis nootkatensis	11	2	.	.	.	.	.	.	.	.	.	.	.	.
Picea X lutzii	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Picea sitchensis	11	3	33	1	.	.	11	1	10	1	.	.	.	.
Tsuga heterophylla	.	.	11	1	.	.	11	3	.	.	.	.	.	.
Tsuga mertensiana	47	2	67	2	7	3	56	1	20	1	.	.	.	.
TALL SHRUBS																
Alnus crispa ssp. sinuata	.	.	11	1	.	.	.	.	.	.	33	1	.	.
Betula nana	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cladothamnus pyroliflorus	11	2	67	7	13	7	33	4	.	.	.	.	.	.
Menziesia ferruginea	.	.	.	.	.	.	11	3	.	.	.	.	.	.
Salix alaxensis	.	.	.	.	.	.	.	.	.	.	33	1	.	.
Salix barclayi	.	.	.	.	.	.	.	.	.	.	33	3	.	.
Salix commutata	.	.	.	.	.	.	.	.	.	.	33	3	.	.
Salix sitchensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Salix sp.	.	.	.	.	.	.	.	.	.	.	.	.	33	10
Vaccinium ovalifolium	5	3	.	.	7	1	11	1	.	.	.	.	.	.
LOW AND DWARF SHRUBS																
Andromeda polifolia	53	3	78	2	.	.	11	3	.	.	.	.	.	.
Arctostaphylos alpina	.	.	.	.	.	.	.	.	20	6	.	.	.	.
Arctostaphylos uva-ursi	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cassiope stelleriana	32	4	56	3	93	35	89	21	30	2	.	.	33	3		
Cassiope tetragona	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Diapensia lapponica	.	.	11	3	.	.	.	.	80	11	.	.	33	3
Dryas octopetala	.	.	.	.	.	.	.	.	50	9	.	.	.	.
Empetrum nigrum	100	28	100	24	60	15	100	22	100	24	.	.	67	2		
Ledum palustre	.	.	11	1	.	.	.	.	20	1	.	.	.	.
Linnaea borealis	.	.	.	.	.	.	.	.	10	1	.	.	.	.
Loiseleuria procumbens	42	12	67	4	.	.	56	10	40	5	.	.	.	.
Luetkea pectinata	21	4	44	1	100	24	89	11	10	1	.	.	33	10		
Oxycoccus microcarpus	58	3	22	2	.	.	.	.	.	.	.	.	.	.
Phyllodoce aleutica	42	3	44	2	100	45	100	29	.	.	.	.	.	.
Salix arctica	.	.	.	.	.	.	.	.	100	15	100	33	33	3
Salix reticulata	.	.	.	.	.	.	.	.	20	2	.	.	100	38
Salix rotundifolia	.	.	.	.	.	.	.	.	30	2	.	.	33	3
Spiraea beauverdiana	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium caespitosum	63	9	44	1	20	17	100	12	.	.	.	.	.	.
Vaccinium uliginosum	100	28	100	24	7	3	33	33	50	5	.	.	33	3		
Vaccinium vitis-idaea	16	5	.	.	13	2	.	.	100	5	.	.	33	10		
FORBS																
Achillea borealis	.	.	.	.	.	.	.	.	.	.	33	3	67	2
Aconitum delphinifolium	.	.	.	.	.	.	.	.	.	.	.	.	33	1
Anemone narcissiflora	5	1	.	.	13	2	22	1	80	4	.	.	67	1		

Angelica lucida	.	.	.	.	7	1	.	.	.	.	.	.	.	.
Antennaria monocephala	.	.	.	.	.	.	.	.	60	2	.	.	67	1
Artemisia arctica	.	.	.	.	7	1	.	.	60	4	.	.	100	2
Campanula lasiocarpa	.	.	.	.	.	.	.	.	80	1	.	.	33	1
Castilleja unalaschcensis	.	.	.	.	.	.	.	.	.	.	.	.	33	1
Coptis trifolia	47	2	67	1	7	1	33	2	.	.	.	.	.	.
Cornus canadensis	74	6	56	5	20	4	44	6	.	.	.	.	.	.
Dodecatheon pulchellum	16	1	22	2	.	.	11	3	.	.	.	.	.	.
Drosera rotundifolia	42	4	56	5	.	.	.	.	.	.	.	.	.	.
Epilobium anagallidifolium	.	.	.	.	.	.	.	.	.	.	.	.	33	1
Epilobium angustifolium	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium latifolium	.	.	.	.	.	.	.	.	.	.	.	.	33	3
Erigeron peregrinus	26	1	67	3	33	4	67	3	.	.	.	.	.	.
Fauria crista-galli	100	26	100	41	13	2	100	25	.	.	.	.	.	.
Fritillaria camschatcensis	5	1	.	.	7	3	.	.	.	.	.	.	.	.
Gentiana douglasiana	37	3	33	2	.	.	11	3	.	.	.	.	.	.
Gentiana glauca	.	.	.	.	27	1	.	.	60	1	.	.	33	3
Geranium erianthum	.	.	.	.	7	3	11	1	.	.	.	.	.	.
Geum calthifolium	79	7	89	4	7	1	78	5	.	.	.	.	.	.
Hedysarum alpinum	.	.	.	.	.	.	.	.	.	.	67	6	.	.
Heracleum lanatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Iris setosa	.	.	.	.	.	.	.	.	.	.	67	11	.	.
Lupinus nootkatensis	.	.	11	1	40	3	22	2	.	.	.	.	.	.
Lysichiton americanus	.	.	.	.	7	1	.	.	.	.	.	.	.	.
Oxytropis nigrescens	.	.	.	.	.	.	.	.	30	2	.	.	33	1
Parnassia palustris	.	.	.	.	.	.	.	.	.	.	67	2	33	1
Pedicularis parviflora	5	3	11	1	.	.	.	.	.	.	.	.	.	.
Polemonium acutiflorum	.	.	.	.	.	.	.	.	.	.	.	.	33	3
Polygonum viviparum	.	.	.	.	7	1	11	1	30	1	33	1	33	1
Potentilla egedii	.	.	.	.	.	.	.	.	.	.	33	10	.	.
Potentilla palustris	.	.	.	.	.	.	.	.	.	.	67	1	.	.
Pyrola asarifolia	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Rhinanthus minor	.	.	.	.	.	.	.	.	.	.	33	3	.	.
Rubus arcticus	.	.	.	.	13	1	.	.	.	.	.	.	.	.
Rubus pedatus	11	1	.	.	7	1	.	.	.	.	.	.	.	.
Sanguisorba stipulata	.	.	.	.	.	.	.	.	.	.	.	.	67	2
Saxifraga bronchialis	.	.	.	.	.	.	.	.	20	1	.	.	.	.
Spiranthes romanzoffiana	11	1	11	1	.	.	.	.	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	.	.	.	.	.	.	11	1	.	.	.	.	.	.
Trientalis europaea	32	1	11	1	33	1	.	.	.	.	.	.	.	.
Valeriana sitchensis	.	.	.	.	20	4	.	.	.	.	.	.	.	.
Veratrum viride	.	.	.	.	7	1	.	.	.	.	.	.	.	.
Viola sp.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
GRAMINOIDS														
Agrostis alascana	5	1	.	.	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	.	.	11	1	7	3	.	.	.	.	.	.	.	.
Calamagrostis nutkaensis	11	6	11	1	.	.	.	.	.	.	.	.	.	.
Carex anthoxanthea	47	6	11	1	.	.	44	6	.	.	.	.	.	.
Carex aquatilis	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carex lyngbyei	5	1	.	.	.	.	.	.	.	.	100	60	.	.
Carex macrochaeta	.	.	.	.	13	2	11	10	.	.	.	.	.	.
Carex magellanica	.	.	.	.	.	.	.	.	.	.	.	.	33	50

Carex microchaeta	.	.	.	.	13	2	.	.	90	9	.	.	67	12
Carex microglochin	.	.	.	.	7	1	.	.	.	.	.	.	33	1
Carex pauciflora	21	19	33	13	.	.	.	.	.	.	.	.	.	.
Carex pluriflora	16	23	.	.	.	.	.	.	.	.	33	10	.	.
Carex sitchensis	11	10	11	20	.	.	.	.	.	.	.	.	.	.
Carex sp.	32	8	44	9	53	4	33	11	10	3	.	.	.	.
Deschampsia cespitosa	5	1	11	3	.	.	11	1	.	.	.	.	.	.
Eriophorum angustifolium	37	21	44	6	.	.	.	.	.	.	.	.	.	.
Eriophorum russeolum	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Festuca altaica	.	.	.	.	.	.	.	.	40	18	.	.	100	33
Hierochloe alpina	.	.	.	.	33	3	.	.	100	8	.	.	33	20
Juncus sp.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Luzula multiflora	.	.	.	.	.	.	.	.	10	1	.	.	67	1
Luzula sp.	.	.	.	.	13	3	.	.	.	.	.	.	.	.
Luzula wahlenbergii	.	.	.	.	7	1	.	.	30	1	.	.	67	2
Phleum commutatum	.	.	.	.	.	.	.	.	.	.	.	.	33	1
Poa sp.	.	.	.	.	13	2	.	.	.	.	.	.	33	3
Trichophorum caespitosum	21	2	100	34	.	.	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	.	.	.	.	.	.	.	.	.	.	67	1
FERNS AND ALLIES														
Athyrium filix-femina	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Blechnum spicant	5	1	11	1	.	.	22	2	.	.	.	.	.	.
Dryopteris dilatata	.	.	.	.	7	1	.	.	.	.	.	.	.	.
Equisetum arvense	11	1	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum fluviatile	.	.	.	.	.	.	.	.	.	.	33	1	.	.
Equisetum palustre	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum variegatum	.	.	.	.	.	.	.	.	.	.	33	1	.	.
Gymnocarpium dryopteris	.	.	.	.	7	3	.	.	.	.	.	.	.	.
Lycopodium alpinum	.	.	.	.	33	6	.	.	30	5	.	.	.	.
Lycopodium annotinum	11	2	11	1	20	1	.	.	10	1	.	.	.	.
Lycopodium clavatum	32	1	56	3	40	3	33	2	.	.	.	.	.	.
Lycopodium complanatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thelypteris limbosperma	.	.	11	1	.	.	11	3	.	.	.	.	.	.
MOSESSES														
Hylacomium splendens	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Pleurozium schreberi	5	10	.	.	20	10	.	.	.	.	.	.	.	.
Sphagnum sp.	32	68	.	.	7	10	.	.	.	.	.	.	.	.

Species	SALROT/CARMIC	
	9 Plots	
	CON	COV
TREES		
<i>Chamaecyparis nootkatensis</i>	.	.
<i>Picea X lutzii</i>	.	.
<i>Picea sitchensis</i>	.	.
<i>Tsuga heterophylla</i>	.	.
<i>Tsuga mertensiana</i>	.	.
TALL SHRUBS		
<i>Alnus crispa</i> ssp. <i>sinuata</i>	.	.
<i>Betula nana</i>	.	.
<i>Cladothamnus pyroliflorus</i>	.	.
<i>Menziesia ferruginea</i>	.	.
<i>Salix alaxensis</i>	.	.
<i>Salix barclayi</i>	.	.
<i>Salix commutata</i>	.	.
<i>Salix sitchensis</i>	.	.
<i>Salix</i> sp.	.	.
<i>Vaccinium ovalifolium</i>	.	.
LOW AND DWARF SHRUBS		
<i>Andromeda polifolia</i>	.	.
<i>Arctostaphylos alpina</i>	.	.
<i>Arctostaphylos uva-ursi</i>	.	.
<i>Cassiope stelleriana</i>	33	2
<i>Cassiope tetragona</i>	.	.
<i>Diapensia lapponica</i>	67	5
<i>Dryas octopetala</i>	11	3
<i>Empetrum nigrum</i>	44	3
<i>Ledum palustre</i>	.	.
<i>Linnaea borealis</i>	.	.
<i>Loiseleuria procumbens</i>	.	.
<i>Luetkea pectinata</i>	.	.
<i>Oxycoccus microcarpus</i>	.	.
<i>Phyllodoce aleutica</i>	.	.
<i>Salix arctica</i>	22	2
<i>Salix reticulata</i>	.	.
<i>Salix rotundifolia</i>	100	21
<i>Spiraea beauverdiana</i>	.	.
<i>Vaccinium caespitosum</i>	.	.
<i>Vaccinium uliginosum</i>	.	.
<i>Vaccinium vitis-idaea</i>	56	1
FORBS		
<i>Achillea borealis</i>	.	.
<i>Aconitum delphinifolium</i>	.	.
<i>Anemone narcissiflora</i>	56	1

Angelica lucida	.	.
Antennaria monocephala	33	2
Artemisia arctica	89	3
Campanula lasiocarpa	33	2
Castilleja unalaschcensis	.	.
Coptis trifolia	.	.
Cornus canadensis	.	.
Dodecatheon pulchellum	.	.
Drosera rotundifolia	.	.
Epilobium anagallidifolium	.	.
Epilobium angustifolium	.	.
Epilobium latifolium	.	.
Erigeron peregrinus	.	.
Fauria crista-galli	.	.
Fritillaria camschatcensis	.	.
Gentiana douglasiana	.	.
Gentiana glauca	56	1
Geranium erianthum	.	.
Geum calthifolium	.	.
Hedysarum alpinum	.	.
Heracleum lanatum	.	.
Iris setosa	.	.
Lupinus nootkatensis	.	.
Lysichiton americanus	.	.
Oxytropis nigrescens	.	.
Parnassia palustris	.	.
Pedicularis parviflora	.	.
Polemonium acutiflorum	.	.
Polygonum viviparum	33	1
Potentilla egedii	.	.
Potentilla palustris	.	.
Pyrola asarifolia	.	.
Rhinanthus minor	.	.
Rubus arcticus	.	.
Rubus pedatus	.	.
Sanguisorba stipulata	.	.
Saxifraga bronchialis	11	1
Spiranthes romanzoffiana	.	.
Stellaria calycantha	.	.
Streptopus amplexifolius	.	.
Trientalis europaea	.	.
Valeriana sitchensis	.	.
Veratrum viride	.	.
Viola sp.	.	.
GRAMINOIDS		
Agrostis alascana	.	.
Calamagrostis canadensis	.	.
Calamagrostis nutkaensis	.	.
Carex anthoxanthea	.	.
Carex aquatilis	.	.
Carex lyngbyei	.	.
Carex macrochaeta	.	.
Carex magellanica	.	.

Carex microchaeta	100	21
Carex microglochin	.	.
Carex pauciflora	.	.
Carex pluriflora	.	.
Carex sitchensis	.	.
Carex sp.	11	1
Deschampsia cespitosa	.	.
Eriophorum angustifolium	.	.
Eriophorum russeolum	.	.
Festuca altaica	22	1
Hierochloe alpina	67	12
Juncus sp.	.	.
Luzula multiflora	22	7
Luzula sp.	.	.
Luzula wahlenbergii	33	2
Phleum commutatum	.	.
Poa sp.	.	.
Trichophorum caespitosum	.	.
Trisetum spicatum	.	.
FERNS AND ALLIES		
Athyrium filix-femina	.	.
Blechnum spicant	.	.
Dryopteris dilatata	.	.
Equisetum arvense	11	1
Equisetum fluviatile	.	.
Equisetum palustre	.	.
Equisetum variegatum	.	.
Gymnocarpium dryopteris	.	.
Lycopodium alpinum	11	30
Lycopodium annotinum	.	.
Lycopodium clavatum	.	.
Lycopodium complanatum	.	.
Thelypteris limbosperma	.	.
MOSESSES		
Hylacomium splendens	.	.
Pleurozium schreberi	.	.
Sphagnum sp.	.	.

Graminoid Herbaceous

Species	ARCFUL		CALCAN		CALCAN/SALIX		CARAQU		CARLYN		CARLYN/LATPAL	
	6 Plots		21 Plots		3 Plots		3 Plots		17 Plots		12 Plots	
	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV
TREES												
Betula papyrifera	.	.	5	1	.	.	33	1	.	.	.	.
Picea X lutzii	.	.	10	6	.	.	33	1	6	1	.	.
Picea sitchensis
Populus balsamifera ssp. trichocarpa	33	1	.	.	6	1	.	.
Salix scouleriana
Tsuga heterophylla
Tsuga mertensiana	33	1	.	.	.	.
TALL SHRUBS												
Alnus crispa ssp. sinuata	.	.	14	2	.	.	33	1	24	4	.	.
Betula nana
Cladothamnus pyroliflorus
Echinopanax horridum	.	.	5	1	.	.	.	.	.	.	.	.
Menziesia ferruginea	.	.	5	3	.	.	.	.	.	.	.	.
Myrica gale	.	.	5	3	33	20	.	.	18	5	17	11
Rosa acicularis
Rubus spectabilis
Salix alaxensis	33	10	.	.	18	2	.	.
Salix barclayi	.	.	14	10	.	.	33	10	6	10	.	.
Salix commutata	33	3	.	.	6	1	.	.
Salix hookeriana
Salix sitchensis	33	10	.	.	6	1	.	.
Salix sp.	.	.	5	1	.	.	.	.	.	.	.	.
Sambucus racemosa	.	.	14	2	.	.	.	.	.	.	.	.
Vaccinium ovalifolium
Viburnum edule	.	.	5	3	.	.	.	.	.	.	.	.
LOW AND DWARF SHRUBS												
Andromeda polifolia
Arctostaphylos uva-ursi
Cassiope stelleriana	33	1	.	.	.	.
Diapensia lapponica
Empetrum nigrum	33	1	.	.	.	.
Ledum palustre
Linnaea borealis
Loiseleuria procumbens
Luetkea pectinata
Oxycoccus microcarpus
Salix arctica	6	3	.	.
Salix myrtillofolia	.	.	5	1	.	.	.	.	.	.	.	.
Salix reticulata
Salix rotundifolia
Spiraea beauverdana	.	.	33	5	.	.	.	.	.	.	.	.
Vaccinium caespitosum	.	.	5	3	.	.	.	.	.	.	.	.
Vaccinium uliginosum

Vaccinium vitis-idaea	.	.	.	.	.	.	.	.	.	.	.
FORBS												
Achillea borealis	.	.	10	6	33	3	.	.	6	1	25	2
Aconitum delphinifolium	.	.	5	10	.	.	.	.	.	.	.	.
Anemone narcissiflora	.	.	.	.	.	.	.	.	.	.	.	.
Angelica lucida	.	.	.	.	.	.	.	.	.	.	8	3
Antennaria monocephala	.	.	.	.	.	.	.	.	.	.	.	.
Artemisia arctica	.	.	.	.	.	.	.	.	.	.	.	.
Campanula lasiocarpa	.	.	.	.	.	.	.	.	.	.	.	.
Castilleja unalaschcensis	.	.	.	.	.	.	.	.	.	.	.	.
Coptis trifolia	.	.	.	.	.	.	.	.	.	.	.	.
Cornus canadensis	.	.	5	1	.	.	.	.	.	.	.	.
Dodecatheon pulchellum	.	.	.	.	.	.	33	1	.	.	.	.
Drosera rotundifolia	.	.	5	10	.	.	.	.	6	1	.	.
Epilobium adenocaulon	.	.	5	1	.	.	.	.	.	.	8	1
Epilobium anagallidifolium	.	.	5	1	.	.	.	.	.	.	.	.
Epilobium angustifolium	.	.	52	6	33	10	.	.	.	.	.	.
Epilobium latifolium	.	.	5	1	33	3	.	.	.	.	.	.
Erigeron peregrinus	.	.	.	.	.	.	.	.	.	.	.	.
Fauria crista-galli	.	.	.	.	.	.	33	3	.	.	.	.
Fragaria chiloensis	.	.	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	14	1	.	.	.	.	.	.	8	1
Galium trifidum	.	.	14	4	33	1	.	.	6	1	33	3
Gentiana douglasiana	.	.	.	.	.	.	.	.	.	.	.	.
Gentiana glauca	.	.	.	.	.	.	.	.	.	.	.	.
Geranium erianthum	.	.	10	3	.	.	.	.	.	.	.	.
Geum calthifolium	.	.	.	.	.	.	33	1	.	.	.	.
Hedysarum alpinum	.	.	.	.	.	.	.	.	6	30	.	.
Heracleum lanatum	.	.	19	4	.	.	.	.	.	.	.	.
Hippuris vulgaris	17	1	.	.	.	.	.	.	.	.	.	.
Honckenya peploides	.	.	.	.	.	.	.	.	.	.	.	.
Iris setosa	.	.	.	.	.	.	.	.	6	1	50	15
Lathyrus maritimus	.	.	.	.	.	.	.	.	.	.	.	.
Lathyrus palustris	.	.	10	6	.	.	.	.	6	3	100	70
Lupinus nootkatensis	.	.	5	60	33	3	.	.	6	1	.	.
Lysichiton americanus	.	.	.	.	.	.	.	.	.	.	.	.
Menyanthes trifoliata	.	.	.	.	.	.	.	.	.	.	.	.
Myriophyllum sibiricum	.	.	.	.	.	.	.	.	.	.	8	1
Nuphar polysepala	.	.	.	.	.	.	.	.	.	.	.	.
Parnassia palustris	.	.	5	1	.	.	.	.	12	1	8	1
Pedicularis parviflora	.	.	.	.	.	.	.	.	6	1	.	.
Plantago maritima	.	.	.	.	.	.	.	.	.	.	.	.
Polemonium acutiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Polygonum viviparum	.	.	.	.	.	.	.	.	6	3	.	.
Potentilla egedii	.	.	5	1	.	.	.	.	29	2	42	5
Potentilla palustris	17	1	19	2	67	30	33	3	12	6	33	11
Pyrola asarifolia	.	.	10	6	33	10	.	.	6	3	.	.
Pyrola secunda	.	.	5	10	33	3	.	.	.	.	.	.
Ranunculus cymbalaria	.	.	.	.	.	.	.	.	.	.	.	.
Rhinanthus minor	.	.	5	1	.	.	.	.	12	3	.	.
Rubus arcticus	.	.	10	12	33	10	.	.	.	.	8	3
Rubus pedatus	.	.	14	2	.	.	.	.	.	.	.	.
Sanguisorba stipulata	.	.	19	13	.	.	.	.	6	1	17	2

Saxifraga bronchialis	.	.	.	.	.	.	.	.	.	.	.	.
Sparganium angustifolium	17	10	.	.	.	.	.	.	.	.	.	.
Sparganium minimum	.	.	.	.	.	.	.	.	.	.	.	.
Sparganium sp.	.	.	.	.	.	.	.	.	.	.	.	.
Spiranthes romanzoffiana	.	.	.	.	.	.	.	6	1	.	.	.
Stellaria calycantha	.	.	.	.	.	.	.	12	1	.	.	.
Streptopus amplexifolius	.	.	33	2	.	.	.	.	.	.	.	.
Thalictrum sparsiflorum	.	.	5	1	.	.	.	.	.	.	.	.
Trientalis europaea	.	.	57	4	33	10	.	.	.	33	2	.
Utricularia vulgaris	.	.	5	3	.	.	.	.	.	.	.	.
Valeriana sitchensis	.	.	14	8	.	.	.	.	.	.	.	.
Veratrum viride	.	.	38	17	.	.	.	.	.	.	.	.
Viola glabella	.	.	5	10	.	.	.	.	.	.	.	.
Viola sp.	.	.	14	4	.	.	.	.	.	8	10	.
GRAMINOIDS												
Agrostis alascana	.	.	.	.	.	.	.	12	7	58	4	.
Arctophila fulva	100	63	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	.	.	100	69	100	56	33	20	6	1	75	36
Calamagrostis nutkaensis	.	.	.	.	.	.	.	.	.	.	.	.
Carex anthoxanthea	.	.	.	.	.	.	.	.	.	.	.	.
Carex aquatilis	.	.	5	3	.	.	100	73	.	.	.	.
Carex limosa	.	.	.	.	.	.	.	.	.	.	.	.
Carex lyngbyei	.	.	.	.	.	.	.	.	100	73	100	74
Carex mackenziei	.	.	.	.	.	.	.	.	.	.	.	.
Carex macrochaeta	.	.	.	.	.	.	.	.	.	.	.	.
Carex magellanica	.	.	.	.	.	.	.	.	.	.	.	.
Carex microchaeta	.	.	.	.	.	.	.	.	.	.	.	.
Carex microglochin	.	.	.	.	.	.	.	.	.	.	.	.
Carex pauciflora	.	.	.	.	.	.	.	.	.	.	.	.
Carex pluriflora	.	.	.	.	.	.	.	.	.	.	17	7
Carex rostrata	.	.	.	.	.	.	.	.	.	.	.	.
Carex saxatilis	.	.	.	.	.	.	.	.	.	.	.	.
Carex sitchensis	.	.	5	1	33	10	.	.	.	.	.	.
Carex sp.	.	.	10	10	.	.	33	20	.	.	.	.
Deschampsia cespitosa	.	.	.	.	.	.	.	.	12	1	50	6
Eleocharis acicularis	33	27	.	.	.	.	.	.	.	.	.	.
Eleocharis palustris	.	.	.	.	.	.	.	.	12	1	.	.
Elymus arenarius	.	.	10	2	.	.	.	.	6	1	.	.
Eriophorum angustifolium	.	.	5	1	.	.	.	.	.	.	.	.
Eriophorum russeolum	.	.	.	.	.	.	.	.	6	1	.	.
Festuca altaica	.	.	.	.	.	.	.	.	.	.	.	.
Festuca rubra	.	.	10	6	.	.	.	.	12	2	33	1
Glyceria pauciflora	17	3	.	.	.	.	.	.	.	.	.	.
Hierochloe alpina	.	.	.	.	.	.	.	.	.	.	.	.
Juncus alpinus	.	.	.	.	.	.	.	.	.	.	.	.
Juncus arcticus	.	.	5	30	.	.	.	.	.	.	.	.
Juncus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Luzula multiflora	.	.	.	.	.	.	.	.	.	.	.	.
Luzula sp.	.	.	.	.	.	.	.	.	.	.	.	.
Luzula wahlenbergii	.	.	.	.	.	.	.	.	.	.	.	.
Phleum commutatum	.	.	.	.	.	.	.	.	.	.	.	.
Poa macrantha	.	.	.	.	.	.	.	.	.	.	.	.
Poa sp.	.	.	.	.	.	.	.	.	6	1	.	.

Puccinellia nutkaensis	.	.	.	.	.	.	.	.	.	.	.	.
Puccinellia pumila	.	.	.	.	.	.	.	.	.	.	.	.
Puccinellia sp.	.	.	.	.	.	.	.	.	.	.	.	.
Trichophorum caespitosum	.	.	.	.	.	33	10	.	.	.	.	.
Trisetum spicatum	.	.	.	.	.	.	.	.	.	.	.	.
FERNS AND ALLIES												
Athyrium filix-femina	.	.	19	4	.	.	.	.	.	.	8	1
Dryopteris dilatata	.	.	43	13	.	.	.	.	.	.	.	.
Equisetum arvense	.	.	29	14	67	10	33	1	12	16	33	14
Equisetum fluviatile	50	12	5	10	33	30	.	.	18	11	8	80
Equisetum palustre	.	.	.	.	.	.	.	.	6	3	.	.
Equisetum pratense	.	.	5	10	.	.	.	.	.	.	.	.
Equisetum silvaticum	.	.	5	1	.	.	.	.	.	.	.	.
Equisetum sp.	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum variegatum	.	.	.	.	.	.	.	.	6	1	.	.
Gymnocarpium dryopteris	.	.	52	19	.	.	.	.	.	.	.	.
Lycopodium alpinum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium annotinum	.	.	5	1	.	.	.	.	.	.	.	.
Lycopodium clavatum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium complanatum	.	.	.	.	.	.	.	.	.	.	.	.
MOSESSES												
Pleurozium schreberi	.	.	.	.	.	.	.	.	.	.	.	.
Rhytidiadelphus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum sp.	.	.	5	40	.	.	.	.	.	.	58	34

Species	CARLYN/mixed herb				CARMACH		CARMIC		CARPAU		CARPLU		
	CARLYN/RANCYM		19 Plots		7 Plots		6 Plots		3 Plots		5 Plots		
	21 Plots	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV
TREES													
Betula papyrifera
Picea X lutzii
Picea sitchensis	.	.	11	1	.	.	.	.	.	.	20	1
Populus balsamifera ssp. trichocarpa	
Salix scouleriana	
Tsuga heterophylla	
Tsuga mertensiana	
TALL SHRUBS													
Alnus crispa ssp. sinuata	5	3	5	1	.	.	.	.	.	.	20	1
Betula nana	
Cladothamnus pyroliflorus	
Echinopanax horridum	
Menziesia ferruginea	
Myrica gale	19	4	21	4	.	.	.	.	.	.	.	.
Rosa acicularis	14	1	.	.	.	.	.	.
Rubus spectabilis	
Salix alaxensis	5	3	5	1	.	.	.	.	.	.	20	1
Salix barclayi	14	1	11	2	.	.	.	.	.	.	.	.
Salix commutata	24	3	.	.	.	.	.	.	.	.	.	.
Salix hookeriana	14	2	5	1	.	.	.	.	.	.	20	1
Salix sitchensis	.	.	5	3	.	.	.	.	.	.	.	.
Salix sp.	
Sambucus racemosa	
Vaccinium ovalifolium	.	.	5	1	.	.	.	.	.	.	.	.
Viburnum edule	
LOW AND DWARF SHRUBS													
Andromeda polifolia	67	10	40	3	
Arctostaphylos uva-ursi	14	1	.	.	.	.	.	.
Cassiope stelleriana	83	3	.	.	.	.
Diapensia lapponica	33	2	.	.	.	.
Empetrum nigrum	14	3	67	4	67	2	40	2	
Ledum palustre	
Linnaea borealis	17	1	.	.	.	.
Loiseleuria procumbens	17	1	.	.	.	.
Luetkea pectinata	
Oxycoccus microcarpus	67	2	20	1	
Salix arctica	5	3	5	10	14	1	.	.	.	.	20	10
Salix myrtillofolia	
Salix reticulata	14	20	.	.	.	.	.	.
Salix rotundifolia	50	8	.	.	.	.
Spiraea beauverdiana	
Vaccinium caespitosum	

Vaccinium uliginosum	.	.	.	.	.	.	17	1	100	4	40	2
Vaccinium vitis-idaea	.	.	.	.	.	.	50	5	.	.	.	.
FORBS												
Achillea borealis	.	.	5	3	57	2	.	.	.	.	20	3
Aconitum delphinifolium	.	.	.	.	71	8	.	.	.	.	.	.
Anemone narcissiflora	.	.	.	.	86	3	83	3	.	.	20	3
Angelica lucida	.	.	5	1	.	.	.	.	.	.	.	.
Antennaria monocephala	.	.	.	.	14	1	50	2	.	.	.	.
Artemisia arctica	.	.	.	.	100	5	100	7	.	.	.	.
Campanula lasiocarpa	.	.	.	.	14	1	50	2	.	.	.	.
Castilleja unalaschcensis	.	.	.	.	86	2	.	.	.	.	.	.
Coptis trifolia	.	.	.	.	.	.	.	.	.	.	20	1
Cornus canadensis	.	.	.	.	.	.	.	.	67	6	20	1
Dodecatheon pulchellum	.	.	5	1	.	.	.	.	.	.	20	3
Drosera rotundifolia	.	.	.	.	.	.	.	.	67	12	40	2
Epilobium adenocaulon	.	.	5	1	.	.	.	.	.	.	.	.
Epilobium anagallidifolium	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium angustifolium	.	.	.	.	57	13	.	.	.	.	.	.
Epilobium latifolium	.	.	.	.	29	11	.	.	.	.	.	.
Erigeron peregrinus	.	.	.	.	43	2	.	.	.	.	.	.
Fauria crista-galli	.	.	.	.	.	.	.	.	100	2	20	3
Fragaria chiloensis	5	1	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	5	1	43	1	.	.	33	1	.	.
Galium trifidum	5	3	32	5	.	.	.	.	.	.	.	.
Gentiana douglasiana	.	.	.	.	.	.	.	.	67	2	20	3
Gentiana glauca	.	.	.	.	.	.	83	2	.	.	.	.
Geranium erianthum	.	.	.	.	100	16	.	.	.	.	.	.
Geum calthifolium	.	.	.	.	.	.	.	.	100	5	20	3
Hedysarum alpinum	.	.	.	.	.	.	.	.	.	.	.	.
Heracleum lanatum	.	.	.	.	43	2	.	.	.	.	.	.
Hippuris vulgaris	.	.	11	2	.	.	.	.	.	.	.	.
Honckenya peploides	.	.	.	.	.	.	.	.	.	.	.	.
Iris setosa	5	1	16	8	.	.	.	.	.	.	20	1
Lathyrus maritimus	.	.	.	.	.	.	.	.	.	.	.	.
Lathyrus palustris	5	1	16	3	.	.	.	.	.	.	.	.
Lupinus nootkatensis	5	1	.	.	57	6	.	.	.	.	.	.
Lysichiton americanus	.	.	.	.	.	.	.	.	.	.	.	.
Menyanthes trifoliata	.	.	11	1	.	.	.	.	.	.	.	.
Myriophyllum sibiricum	.	.	5	1	.	.	.	.	.	.	.	.
Nuphar polysepala	.	.	.	.	.	.	.	.	.	.	.	.
Parnassia palustris	29	1	11	1	.	.	.	.	.	.	20	1
Pedicularis parviflora	14	2	21	1	.	.	.	.	67	6	40	1
Plantago maritima	14	2	.	.	.	.	.	.	.	.	.	.
Polemonium acutiflorum	.	.	.	.	71	2	.	.	.	.	.	.
Polygonum viviparum	.	.	.	.	29	1	.	.	.	.	.	.
Potentilla egedii	86	18	26	10	.	.	.	.	.	.	20	1
Potentilla palustris	14	1	37	19	.	.	.	.	.	.	20	1
Pyrola asarifolia	.	.	.	.	.	.	.	.	.	.	.	.
Pyrola secunda	.	.	.	.	.	.	.	.	.	.	.	.
Ranunculus cymbalaria	38	6	.	.	.	.	.	.	.	.	.	.
Rhinanthus minor	10	1	11	2	29	1	.	.	.	.	20	1
Rubus arcticus	.	.	5	3	14	1	.	.	.	.	.	.
Rubus pedatus	.	.	.	.	.	.	.	.	.	.	.	.

Sanguisorba stipulata	.	.	.	.	100	22	.	.	.	.	20	20
Saxifraga bronchialis	.	.	.	.	.	.	.	.	.	.	.	.
Sparganium angustifolium	.	.	.	.	.	.	.	.	.	.	.	.
Sparganium minimum	.	.	.	.	.	.	.	.	.	.	.	.
Sparganium sp.	.	.	.	.	.	.	.	.	.	.	.	.
Spiranthes romanzoffiana	10	1	.	.	.	.	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	.	.	.	.	43	2	.	.	.	.	.	.
Thalictrum sparsiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Trientalis europaea	.	.	5	20	57	6	.	.	33	1	.	.
Utricularia vulgaris	.	.	.	.	.	.	.	.	.	.	.	.
Valeriana sitchensis	.	.	.	.	71	17	.	.	.	.	.	.
Veratrum viride	.	.	.	.	29	30	.	.	.	.	.	.
Viola glabella	.	.	.	.	.	.	.	.	.	.	.	.
Viola sp.	.	.	11	2	57	3	.	.	.	.	20	1
GRAMINOIDS												
Agrostis alascana	19	4	26	14	.	.	.	.	.	.	.	.
Arctophila fulva	.	.	5	1	.	.	.	.	.	.	.	.
Calamagrostis canadensis	5	1	37	21	57	19	.	.	.	.	40	11
Calamagrostis nutkaensis	.	.	.	.	.	.	.	.	.	.	.	.
Carex anthoxantha	.	.	.	.	.	.	.	.	.	.	.	.
Carex aquatilis	.	.	.	.	.	.	.	.	.	.	.	.
Carex limosa	.	.	5	3	.	.	.	.	.	.	.	.
Carex lyngbyei	100	68	100	66	.	.	.	.	.	.	20	10
Carex mackenziei	14	11	.	.	.	.	.	.	.	.	.	.
Carex macrochaeta	.	.	.	.	29	30	.	.	.	.	.	.
Carex magellanica	.	.	.	.	71	62	.	.	.	.	.	.
Carex microchaeta	.	.	.	.	.	.	100	38	.	.	.	.
Carex microglochin	.	.	.	.	.	.	.	.	.	.	.	.
Carex pauciflora	.	.	.	.	.	.	.	.	100	40	40	11
Carex pluriflora	5	1	11	3	.	.	.	.	33	10	100	48
Carex rostrata	.	.	.	.	.	.	.	.	.	.	.	.
Carex saxatilis	.	.	16	4	.	.	.	.	.	.	.	.
Carex sitchensis	.	.	21	18	.	.	.	.	.	.	20	20
Carex sp.	10	6	11	11	14	1	.	.	.	.	.	.
Deschampsia cespitosa	71	11	53	12	.	.	.	.	.	.	20	1
Eleocharis acicularis	10	12	5	10	.	.	.	.	.	.	.	.
Eleocharis palustris	29	3	16	2	.	.	.	.	.	.	.	.
Elymus arenarius	.	.	5	10	.	.	.	.	.	.	.	.
Eriophorum angustifolium	.	.	5	1	.	.	.	.	100	5	60	8
Eriophorum russeolum	.	.	5	10	.	.	.	.	.	.	.	.
Festuca altaica	.	.	.	.	43	2	17	3	.	.	.	.
Festuca rubra	24	1	11	7	.	.	.	.	.	.	20	1
Glyceria pauciflora	.	.	.	.	.	.	.	.	.	.	.	.
Hierochloe alpina	.	.	.	.	14	1	67	5	.	.	.	.
Juncus alpinus	19	2	5	1	.	.	.	.	.	.	.	.
Juncus arcticus	33	5	5	3	.	.	.	.	.	.	.	.
Juncus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Luzula multiflora	.	.	5	3	14	1	50	3	.	.	.	.
Luzula sp.	.	.	.	.	.	.	17	10	.	.	.	.
Luzula wahlenbergii	.	.	.	.	14	1	.	.	.	.	.	.
Phleum commutatum	.	.	.	.	86	1	.	.	.	.	.	.
Poa macrantha	.	.	.	.	.	.	.	.	.	.	.	.

Poa sp.	5	1	.	.	14	1	.	.	.	.	.	.
Puccinellia nutkaensis	5	3	.	.	.	.	.	.	.	.	.	.
Puccinellia pumila	10	6	.	.	.	.	.	.	.	.	.	.
Puccinellia sp.	.	.	.	.	.	.	.	.	.	.	.	.
Trichophorum caespitosum	.	.	.	.	.	.	.	67	30	20	30	.
Trisetum spicatum	.	.	.	.	57	2	.	.	.	.	.	.
FERNS AND ALLIES												
Athyrium filix-femina	.	.	.	.	14	20	.	.	.	.	.	.
Dryopteris dilatata	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum arvense	24	4	32	9	14	1	.	.	.	.	.	.
Equisetum fluviatile	.	.	11	2	.	.	.	.	.	.	.	.
Equisetum palustre	.	.	5	1	.	.	.	.	.	.	.	.
Equisetum pratense	.	.	5	60	.	.	.	.	.	.	.	.
Equisetum silvaticum	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum sp.	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum variegatum	10	6	11	1	.	.	.	.	.	.	.	.
Gymnocarpium dryopteris	.	.	.	.	29	30	.	.	.	.	.	.
Lycopodium alpinum	.	.	.	.	14	30	17	10	.	.	.	.
Lycopodium annotinum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium clavatum	.	.	.	.	.	.	17	1	.	.	.	.
Lycopodium complanatum	.	.	.	.	.	.	.	.	.	.	.	.
MOSESSES												
Pleurozium schreberi	.	.	.	.	.	.	.	.	.	.	.	.
Rhytidiadelphus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum sp.	.	.	16	60	.	.	.	.	67	60	20	70

Species	CARROS		CARSIT		DESCES		ELEPAL		ELYARE		ELYARE/ACHBOR	
	3 Plots		17 Plots		8 Plots		9 Plots		15 Plots		3 Plots	
	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV
TREES												
Betula papyrifera
Picea X lutzii
Picea sitchensis	33	3
Populus balsamifera ssp. trichocarpa	7	1	.	.
Salix scouleriana
Tsuga heterophylla
Tsuga mertensiana
TALL SHRUBS												
Alnus crispa ssp. sinuata	33	1	.	.	.	.	.	.	.	.	33	1
Betula nana
Cladothamnus pyroliflorus
Echinopanax horridum
Menziesia ferruginea
Myrica gale	.	.	12	3	.	.	.	.	.	.	.	.
Rosa acicularis
Rubus spectabilis
Salix alaxensis	13	3	.	.	.	.	.	.
Salix barclayi	.	.	12	6	13	10	.	.	.	.	.	.
Salix commutata	25	6	.	.	.	.	.	.
Salix hookeriana	.	.	6	1	13	3	.	.	.	.	.	.
Salix sitchensis	33	1	6	1	.	.	.	.	.	.	.	.
Salix sp.
Sambucus racemosa
Vaccinium ovalifolium
Viburnum edule
LOW AND DWARF SHRUBS												
Andromeda polifolia
Arctostaphylos uva-ursi
Cassiope stelleriana
Diapensia lapponica
Empetrum nigrum	13	10	.	.	.	.	.	.
Ledum palustre
Linnaea borealis
Loiseleuria procumbens
Luetkea pectinata
Oxycoccus microcarpus
Salix arctica
Salix myrtillofolia
Salix reticulata
Salix rotundifolia
Spiraea beauverdiana	13	1	.	.	.	.	.	.
Vaccinium caespitosum	13	3	.	.	.	.	.	.

Vaccinium uliginosum	.	.	.	.	13	1	.	.	.	.	.	.
Vaccinium vitis-idaea	.	.	.	.	.	.	.	.	.	.	.	.
FORBS												
Achillea borealis	.	.	.	.	38	1	.	.	40	4	100	20
Aconitum delphinifolium	.	.	.	.	.	.	.	.	.	.	.	.
Anemone narcissiflora	.	.	.	.	.	.	.	.	.	.	.	.
Angelica lucida	.	.	.	.	13	3	.	.	13	6	.	.
Antennaria monocephala	.	.	.	.	.	.	.	.	.	.	.	.
Artemisia arctica	.	.	.	.	25	7	.	.	.	.	.	.
Campanula lasiocarpa	.	.	.	.	.	.	.	.	.	.	.	.
Castilleja unalaschcensis	.	.	.	.	13	1	.	.	.	.	33	10
Coptis trifolia	.	.	.	.	.	.	.	.	.	.	.	.
Cornus canadensis	.	.	.	.	.	.	.	.	.	.	.	.
Dodecatheon pulchellum	.	.	.	.	.	.	.	7	1	.	.	.
Drosera rotundifolia	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium adenocaulon	33	10	.	.	.	.	.	.	.	.	33	1
Epilobium anagallidifolium	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium angustifolium	.	.	6	3	13	10	.	.	.	.	.	.
Epilobium latifolium	.	.	.	.	.	.	.	7	10	.	.	.
Erigeron peregrinus	.	.	.	.	13	1	.	.	.	.	.	.
Fauria crista-galli	.	.	12	6	.	.	.	.	.	.	.	.
Fragaria chiloensis	.	.	.	.	.	.	.	.	.	.	67	1
Fritillaria camschatcensis	.	.	.	.	13	1	.	.	13	2	.	.
Galium trifidum	.	.	6	1	.	.	.	.	27	2	.	.
Gentiana douglasiana	.	.	.	.	.	.	.	.	.	.	.	.
Gentiana glauca	.	.	.	.	.	.	.	.	.	.	.	.
Geranium erianthum	.	.	.	.	25	1	.	.	.	.	.	.
Geum calthifolium	.	.	.	.	.	.	.	.	.	.	.	.
Hedysarum alpinum	.	.	.	.	.	.	.	.	.	.	.	.
Heracleum lanatum	.	.	.	.	.	.	.	.	.	.	.	.
Hippuris vulgaris	.	.	6	10	.	.	11	1	.	.	.	.
Honckenya peplodes	.	.	.	.	13	30	.	.	33	2	33	10
Iris setosa	.	.	.	.	.	.	.	.	7	1	.	.
Lathyrus maritimus	.	.	.	.	.	.	.	.	40	3	33	20
Lathyrus palustris	.	.	.	.	25	1	.	.	20	8	.	.
Lupinus nootkatensis	.	.	6	30	38	4	.	.	27	7	33	30
Lysichiton americanus	.	.	.	.	.	.	.	.	.	.	.	.
Menyanthes trifoliata	33	1	29	13	.	.	.	.	.	.	.	.
Myriophyllum sibiricum	.	.	.	.	.	.	11	10	.	.	.	.
Nuphar polysepala	.	.	.	.	.	.	11	1	.	.	.	.
Parnassia palustris	.	.	.	.	25	2	.	.	13	2	.	.
Pedicularis parviflora	.	.	.	.	.	.	.	.	.	.	.	.
Plantago maritima	.	.	.	.	38	4	.	.	.	.	.	.
Polemonium acutiflorum	.	.	.	.	25	2	.	.	.	.	.	.
Polygonum viviparum	.	.	.	.	.	.	.	.	7	1	.	.
Potentilla egedii	.	.	.	.	63	19	11	1	13	10	.	.
Potentilla palustris	33	20	59	16	.	.	.	.	.	.	.	.
Pyrola asarifolia	.	.	.	.	.	.	.	.	.	.	.	.
Pyrola secunda	.	.	.	.	.	.	.	.	.	.	.	.
Ranunculus cymbalaria	.	.	.	.	38	5	11	1	.	.	.	.
Rhinanthus minor	.	.	.	.	25	1	.	.	.	.	33	1
Rubus arcticus	.	.	.	.	25	1	.	.	7	1	.	.
Rubus pedatus	.	.	.	.	.	.	.	.	.	.	.	.

Sanguisorba stipulata	.	.	6	3	25	2	.	.	.	.	.	.
Saxifraga bronchialis	.	.	.	.	.	.	.	.	.	.	.	.
Sparganium angustifolium	.	.	.	.	.	.	22	7	.	.	.	.
Sparganium minimum	.	.	.	.	.	.	11	3	.	.	.	.
Sparganium sp.	.	.	.	.	.	.	.	.	.	.	.	.
Spiranthes romanzoffiana	.	.	.	.	.	.	.	.	.	.	.	.
Stellaria calycantha	33	1	.	.	.	.	.	.	.	.	67	2
Streptopus amplexifolius	.	.	.	.	.	.	.	.	.	.	.	.
Thalictrum sparsiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Trientalis europaea	.	.	12	1	25	1	.	.	13	1	.	.
Utricularia vulgaris	.	.	.	.	.	.	11	1	.	.	.	.
Valeriana sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Veratrum viride	.	.	.	.	.	.	.	.	.	.	.	.
Viola glabella	.	.	6	3	.	.	.	.	.	.	.	.
Viola sp.	.	.	.	.	.	.	.	.	.	.	.	.
GRAMINOIDS												
Agrostis alascana	.	.	18	2	.	.	.	.	.	.	.	.
Arctophila fulva	.	.	6	3	.	.	.	.	.	.	.	.
Calamagrostis canadensis	.	.	53	25	25	7	.	.	20	2	.	.
Calamagrostis nutkaensis	.	.	.	.	.	.	.	.	.	.	.	.
Carex anthoxantha	.	.	.	.	.	.	.	.	.	.	.	.
Carex aquatilis	33	3	12	2	.	.	.	.	.	.	.	.
Carex limosa	.	.	.	.	.	.	.	.	.	.	.	.
Carex lyngbyei	.	.	18	18	38	9	33	4	.	.	.	.
Carex mackenziei	.	.	.	.	.	.	.	.	.	.	.	.
Carex macrochaeta	.	.	.	.	13	20	.	.	.	.	.	.
Carex magellanica	.	.	.	.	.	.	.	.	.	.	.	.
Carex microchaeta	.	.	.	.	.	.	.	.	.	.	.	.
Carex microglochin	.	.	.	.	.	.	.	.	.	.	.	.
Carex pauciflora	.	.	.	.	.	.	.	.	.	.	.	.
Carex pluriflora	.	.	6	1	.	.	.	.	.	.	.	.
Carex rostrata	100	67	6	10	.	.	.	.	.	.	.	.
Carex saxatilis	.	.	.	.	.	.	.	.	.	.	.	.
Carex sitchensis	.	.	100	66	.	.	.	.	.	.	.	.
Carex sp.	.	.	.	.	.	.	.	.	13	1	.	.
Deschampsia cespitosa	.	.	6	1	100	30	.	.	20	11	33	20
Eleocharis acicularis	.	.	.	.	13	20	.	.	.	.	.	.
Eleocharis palustris	.	.	.	.	13	10	100	48	.	.	.	.
Elymus arenarius	.	.	.	.	25	2	.	.	100	55	100	50
Eriophorum angustifolium	.	.	6	1	.	.	.	.	.	.	.	.
Eriophorum russeolum	.	.	12	6	.	.	.	.	.	.	.	.
Festuca altaica	.	.	.	.	.	.	.	.	13	10	.	.
Festuca rubra	.	.	.	.	38	2	.	.	.	.	33	40
Glyceria pauciflora	.	.	.	.	.	.	.	.	.	.	.	.
Hierochloa alpina	.	.	.	.	.	.	.	.	.	.	.	.
Juncus alpinus	.	.	.	.	.	.	.	.	.	.	.	.
Juncus arcticus	.	.	.	.	38	2	.	.	.	.	.	.
Juncus sp.	33	10	.	.	.	.	.	.	.	.	.	.
Luzula multiflora	.	.	.	.	.	.	.	.	.	.	67	1
Luzula sp.	.	.	.	.	.	.	.	.	.	.	.	.
Luzula wahlenbergii	.	.	.	.	.	.	.	.	.	.	.	.
Phleum commutatum	.	.	.	.	25	2	.	.	.	.	.	.
Poa macrantha	.	.	.	.	13	30	.	.	13	1	67	6

Poa sp.	.	.	.	.	.	.	.	.	.	.	.
Puccinellia nutkaensis	.	.	.	.	13	10	.	.	7	1	.	.
Puccinellia pumila	.	.	.	.	13	1	.	.	.	.	.	.
Puccinellia sp.	.	.	.	.	13	10	.	.	.	.	.	.
Trichophorum caespitosum	.	.	.	.	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	.	.	.	.	.	.	.	.	.	.
FERNS AND ALLIES												
Athyrium filix-femina	.	.	.	.	.	.	.	.	.	.	.	.
Dryopteris dilatata	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum arvense	.	.	6	1	13	1	.	.	27	18	.	.
Equisetum fluviatile	33	1	65	6	.	.	.	.	.	.	.	.
Equisetum palustre	33	3	47	9	.	.	.	.	.	.	.	.
Equisetum pratense	.	.	12	6	.	.	.	.	.	.	.	.
Equisetum silvaticum	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum sp.	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum variegatum	33	3	6	1	.	.	.	.	7	20	33	1
Gymnocarpium dryopteris	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium alpinum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium annotinum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium clavatum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium complanatum	.	.	.	.	.	.	.	.	.	.	.	.
MOSESSES												
Pleurozium schreberi	.	.	.	.	13	20	.	.	.	.	.	.
Rhytidiadelphus sp.	.	.	.	.	13	10	.	.	.	.	.	.
Sphagnum sp.	.	.	18	2	.	.	.	.	.	.	.	.

Species	ERIANGL-CARPLU				ERIANGL-TRICAE		FESALT		FESALT/GERERI		LUZWAH	
	ERIANGL-CARPAU		9 Plots		6 Plots		5 Plots		11 Plots		3 Plots	
	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV
TREES												
Betula papyrifera
Picea X lutzii
Picea sitchensis	8	1	22	1	.	.	.	.	.	.	.	.
Populus balsamifera ssp. trichocarpa
Salix scouleriana	9	1	.	.
Tsuga heterophylla	.	.	11	1	.	.	.	.	.	.	.	.
Tsuga mertensiana	.	.	11	3	17	1	.	.	.	.	.	.
TALL SHRUBS												
Alnus crispa ssp. sinuata
Betula nana
Cladothamnus pyroliflorus
Echinopanax horridum
Menziesia ferruginea
Myrica gale
Rosa acicularis	27	17	.	.
Rubus spectabilis
Salix alaxensis
Salix barclayi
Salix commutata
Salix hookeriana
Salix sitchensis
Salix sp.	17	1	.	.	.	.	.	.
Sambucus racemosa
Vaccinium ovalifolium
Viburnum edule	9	1	.	.
LOW AND DWARF SHRUBS												
Andromeda polifolia	92	4	56	8	83	6	.	.	.	.	.	.
Arctostaphylos uva-ursi	18	6	.	.
Cassiope stelleriana	.	.	11	1	.	.	20	1	.	.	33	1
Diapensia lapponica	20	3	.	.	.	.
Empetrum nigrum	50	3	56	7	83	3	20	1	18	7	33	1
Ledum palustre	9	1	.	.
Linnaea borealis	18	1	.	.
Loiseleuria procumbens	8	1	.	.	17	1	.	.	.	.	.	.
Luetkea pectinata	.	.	11	1	.	.	20	1	.	.	.	.
Oxycoccus microcarpus	75	1	33	2	50	1	.	.	.	.	.	.
Salix arctica
Salix myrtillofolia
Salix reticulata
Salix rotundifolia	20	3	.	.	33	1
Spiraea beauverdiana	20	10	36	7	.	.
Vaccinium caespitosum	.	.	33	1	.	.	.	.	9	10	.	.

Vaccinium uliginosum	58	1	44	4	83	1	.	.	.	.	.	.
Vaccinium vitis-idaea	.	.	.	.	.	.	60	7	27	1	.	.
FORBS												
Achillea borealis	.	.	.	.	.	.	40	1	82	4	.	.
Aconitum delphinifolium	.	.	.	.	.	.	.	.	55	4	.	.
Anemone narcissiflora	.	.	.	.	.	.	.	.	27	2	.	.
Angelica lucida	.	.	.	.	.	.	20	1	36	2	.	.
Antennaria monocephala	.	.	.	.	.	.	40	2	.	.	.	.
Artemisia arctica	.	.	.	.	.	.	80	9	82	13	67	2
Campanula lasiocarpa	.	.	.	.	.	.	20	3	.	.	.	.
Castilleja unalaschcensis	.	.	.	.	.	.	20	3	91	4	.	.
Coptis trifolia	25	1	11	3	.	.	.	.	.	.	.	.
Cornus canadensis	67	3	33	4	50	4	.	.	55	21	.	.
Dodecatheon pulchellum	75	3	44	2	33	2	.	.	.	.	.	.
Drosera rotundifolia	83	3	56	1	83	9	.	.	.	.	.	.
Epilobium adenocaulon	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium anagallidifolium	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium angustifolium	.	.	.	.	.	.	40	15	100	10	.	.
Epilobium latifolium	.	.	.	.	.	.	.	.	.	.	33	3
Erigeron peregrinus	25	1	.	.	17	1	.	.	27	10	.	.
Fauria crista-galli	67	5	56	9	50	8	.	.	.	.	.	.
Fragaria chiloensis	.	.	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	.	.	.	.	.	.	73	1	.	.
Galium trifidum	.	.	.	.	.	.	.	.	.	.	.	.
Gentiana douglasiana	100	2	44	2	67	3	.	.	.	.	.	.
Gentiana glauca	.	.	.	.	.	.	40	3	.	.	.	.
Geranium erianthum	.	.	.	.	.	.	40	3	91	12	.	.
Geum calthifolium	83	5	56	7	67	11	.	.	.	.	.	.
Hedysarum alpinum	.	.	.	.	.	.	.	.	9	1	.	.
Heracleum lanatum	.	.	.	.	.	.	.	.	18	2	.	.
Hippuris vulgaris	.	.	.	.	.	.	.	.	.	.	.	.
Honckenya peploides	.	.	.	.	.	.	.	.	.	.	.	.
Iris setosa	.	.	.	.	.	.	.	.	.	.	.	.
Lathyrus maritimus	.	.	.	.	.	.	.	.	.	.	.	.
Lathyrus palustris	.	.	.	.	.	.	.	.	.	.	.	.
Lupinus nootkatensis	.	.	.	.	.	.	20	3	55	3	.	.
Lysichiton americanus	8	1	.	.	.	.	.	.	.	.	.	.
Menyanthes trifoliata	.	.	.	.	17	3	.	.	.	.	.	.
Myriophyllum sibiricum	.	.	.	.	.	.	.	.	.	.	.	.
Nuphar polysepala	.	.	.	.	.	.	.	.	.	.	.	.
Parnassia palustris	.	.	.	.	.	.	.	.	.	.	.	.
Pedicularis parviflora	67	2	33	1	50	3	.	.	.	.	.	.
Plantago maritima	.	.	.	.	.	.	.	.	.	.	.	.
Polemonium acutiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Polygonum viviparum	.	.	.	.	.	.	.	.	9	1	.	.
Potentilla egedii	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla palustris	.	.	11	3	17	1	.	.	.	.	.	.
Pyrola asarifolia	.	.	.	.	.	.	.	.	9	1	.	.
Pyrola secunda	.	.	.	.	.	.	.	.	.	.	.	.
Ranunculus cymbalaria	.	.	.	.	.	.	.	.	.	.	.	.
Rhinanthus minor	.	.	.	.	.	.	.	.	55	1	.	.
Rubus arcticus	.	.	11	1	.	.	.	.	55	2	.	.
Rubus pedatus	.	.	.	.	.	.	.	.	.	.	.	.

Sanguisorba stipulata	.	.	11	1	.	.	.	.	36	8	.	.
Saxifraga bronchialis	.	.	.	.	.	.	20	1	9	1	33	1
Sparganium angustifolium	.	.	.	.	.	.	.	.	.	.	.	.
Sparganium minimum	.	.	.	.	.	.	.	.	.	.	.	.
Sparganium sp.	8	1	.	.	.	.	.	.	.	.	.	.
Spiranthes romanzoffiana	8	1	.	.	33	1	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	.	.	.	.	.	.	.	.	9	1	.	.
Thalictrum sparsiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Trientalis europaea	33	1	33	1	17	3	.	.	45	1	.	.
Utricularia vulgaris	.	.	.	.	.	.	.	.	.	.	.	.
Valeriana sitchensis	.	.	.	.	.	.	.	.	18	2	.	.
Veratrum viride	.	.	.	.	.	.	.	.	27	7	.	.
Viola glabella	.	.	.	.	.	.	.	.	.	.	.	.
Viola sp.	.	.	.	.	.	.	.	.	27	4	.	.
GRAMINOIDS												
Agrostis alascana	.	.	.	.	.	.	.	.	.	.	.	.
Arctophila fulva	.	.	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	.	.	.	.	.	.	20	1	64	11	.	.
Calamagrostis nutkaensis	8	1	.	.	.	.	.	.	.	.	.	.
Carex anthoxantha	.	.	11	10	.	.	.	.	.	.	.	.
Carex aquatilis	.	.	.	.	.	.	.	.	.	.	.	.
Carex limosa	.	.	.	.	.	.	.	.	.	.	.	.
Carex lyngbyei	.	.	.	.	.	.	.	.	.	.	.	.
Carex mackenziei	.	.	.	.	.	.	.	.	.	.	.	.
Carex macrochaeta	.	.	.	.	.	.	.	.	9	10	.	.
Carex magellanica	.	.	.	.	.	.	.	.	27	11	.	.
Carex microchaeta	.	.	.	.	.	.	40	20	9	1	33	1
Carex microglochin	.	.	.	.	.	.	.	.	.	.	33	1
Carex pauciflora	100	24	22	1	50	3	.	.	.	.	.	.
Carex pluriflora	25	8	100	19	17	3	.	.	.	.	.	.
Carex rostrata	.	.	.	.	.	.	20	1	9	10	.	.
Carex saxatilis	.	.	.	.	.	.	.	.	.	.	.	.
Carex sitchensis	8	1	22	6	.	.	.	.	.	.	.	.
Carex sp.	.	.	.	.	50	11	40	3	.	.	.	.
Deschampsia cespitosa	8	1	11	1	33	3	.	.	.	.	.	.
Eleocharis acicularis	.	.	.	.	.	.	.	.	.	.	.	.
Eleocharis palustris	.	.	.	.	.	.	.	.	.	.	.	.
Elymus arenarius	.	.	.	.	.	.	.	.	.	.	.	.
Eriophorum angustifolium	100	28	100	37	100	37	.	.	.	.	.	.
Eriophorum russeolum	.	.	.	.	.	.	.	.	.	.	.	.
Festuca altaica	.	.	.	.	.	.	100	54	100	61	.	.
Festuca rubra	.	.	.	.	.	.	.	.	.	.	.	.
Glyceria pauciflora	.	.	.	.	.	.	.	.	.	.	.	.
Hierochloe alpina	.	.	.	.	.	.	40	2	9	1	.	.
Juncus alpinus	.	.	.	.	.	.	.	.	.	.	.	.
Juncus arcticus	.	.	.	.	.	.	.	.	.	.	.	.
Juncus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Luzula multiflora	.	.	.	.	.	.	.	.	18	1	.	.
Luzula sp.	.	.	.	.	.	.	20	3	.	.	.	.
Luzula wahlenbergii	.	.	.	.	.	.	.	.	.	.	100	23
Phleum commutatum	.	.	.	.	.	.	20	1	36	3	.	.
Poa macrantha	.	.	.	.	.	.	.	.	.	.	.	.

Poa sp.	.	.	.	.	.	.	.	18	12	33	1
Puccinellia nutkaensis	.	.	.	.	.	.	.	.	.	.	.
Puccinellia pumila	.	.	.	.	.	.	.	.	.	.	.
Puccinellia sp.	.	.	.	.	.	.	.	.	.	.	.
Trichophorum caespitosum	92	22	44	25	100	28	.	.	.	.	.
Trisetum spicatum	.	.	.	.	.	.	40	2	64	1	33
FERNS AND ALLIES											
Athyrium filix-femina	.	.	.	.	.	.	.	.	.	.	.
Dryopteris dilatata	.	.	.	.	.	.	.	.	18	1	.
Equisetum arvense	.	.	22	1	17	1	.	.	18	1	.
Equisetum fluviatile	.	.	.	.	.	.	.	.	.	.	.
Equisetum palustre	.	.	.	.	.	.	.	.	.	.	.
Equisetum pratense	.	.	.	.	.	.	.	.	.	.	.
Equisetum silvaticum	.	.	.	.	.	.	.	.	.	.	.
Equisetum sp.	8	1	.	.	.	.	.	.	.	.	.
Equisetum variegatum	.	.	.	.	.	.	.	.	.	.	.
Gymnocarpium dryopteris	.	.	.	.	.	.	.	.	64	9	.
Lycopodium alpinum	.	.	.	.	.	.	80	6	.	.	.
Lycopodium annotinum	8	1	.	.	.	.	.	.	.	.	.
Lycopodium clavatum	17	1	.	.	.	.	.	.	.	.	.
Lycopodium complanatum	.	.	.	.	.	.	20	1	9	3	.
MOSESSES											
Pleurozium schreberi	.	.	.	.	17	10	.	.	9	70	.
Rhytidiadelphus sp.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum sp.	33	72	78	62	50	63	.	.	.	.	.

Species	PUCPUM		TRICAE	
	6 Plots		12 Plots	
	CON	COV	CON	COV
TREES				
Betula papyrifera
Picea X lutzii
Picea sitchensis
Populus balsamifera ssp. trichocarpa
Salix scouleriana
Tsuga heterophylla
Tsuga mertensiana	.	.	33	1
TALL SHRUBS				
Alnus crispa ssp. sinuata	.	.	8	1
Betula nana	.	.	25	2
Cladothamnus pyroliflorus	.	.	8	3
Echinopanax horridum
Menziesia ferruginea
Myrica gale	.	.	8	10
Rosa acicularis
Rubus spectabilis	.	.	8	1
Salix alaxensis
Salix barclayi
Salix commutata
Salix hookeriana
Salix sitchensis
Salix sp.	.	.	8	1
Sambucus racemosa
Vaccinium ovalifolium
Viburnum edule
LOW AND DWARF SHRUBS				
Andromeda polifolia	.	.	92	3
Arctostaphylos uva-ursi
Cassiope stelleriana
Diapensia lapponica
Empetrum nigrum	.	.	33	3
Ledum palustre
Linnaea borealis
Loiseleuria procumbens	.	.	8	1
Luetkea pectinata
Oxycoccus microcarpus	.	.	25	1
Salix arctica
Salix myrtillofolia
Salix reticulata
Salix rotundifolia
Spiraea beauverdiana
Vaccinium caespitosum

Vaccinium uliginosum	.	.	50	3
Vaccinium vitis-idaea	.	.	.	.
FORBS				
Achillea borealis	.	.	.	.
Aconitum delphinifolium	.	.	.	.
Anemone narcissiflora	.	.	.	.
Angelica lucida	.	.	.	.
Antennaria monocephala	.	.	.	.
Artemisia arctica	.	.	.	.
Campanula lasiocarpa	.	.	.	.
Castilleja unalaschcensis	.	.	.	.
Coptis trifolia	.	.	.	.
Cornus canadensis	.	.	25	2
Dodecatheon pulchellum	.	.	42	1
Drosera rotundifolia	.	.	67	6
Epilobium adenocaulon	.	.	.	.
Epilobium anagallidifolium	.	.	.	.
Epilobium angustifolium	.	.	8	3
Epilobium latifolium	.	.	.	.
Erigeron peregrinus	.	.	33	4
Fauria crista-galli	.	.	50	10
Fragaria chiloensis	.	.	.	.
Fritillaria camschatcensis	.	.	.	.
Galium trifidum	.	.	.	.
Gentiana douglasiana	.	.	50	2
Gentiana glauca	.	.	.	.
Geranium erianthum	.	.	.	.
Geum calthifolium	.	.	67	5
Hedysarum alpinum	.	.	.	.
Heracleum lanatum	.	.	.	.
Hippuris vulgaris	.	.	.	.
Honckenya peploides	.	.	.	.
Iris setosa	.	.	8	3
Lathyrus maritimus	.	.	.	.
Lathyrus palustris	.	.	.	.
Lupinus nootkatensis	.	.	.	.
Lysichiton americanus	.	.	.	.
Menyanthes trifoliata	.	.	17	15
Myriophyllum sibiricum	.	.	.	.
Nuphar polysepala	.	.	.	.
Parnassia palustris	.	.	.	.
Pedicularis parviflora	.	.	25	1
Plantago maritima	.	.	.	.
Polemonium acutiflorum	.	.	.	.
Polygonum viviparum	.	.	.	.
Potentilla egedii	.	.	.	.
Potentilla palustris	.	.	8	1
Pyrola asarifolia	.	.	.	.
Pyrola secunda	.	.	.	.
Ranunculus cymbalaria	17	3	.	.
Rhinanthus minor	.	.	.	.
Rubus arcticus	.	.	8	1
Rubus pedatus	.	.	.	.

Sanguisorba stipulata	.	.	33	2
Saxifraga bronchialis	.	.	.	.
Sparganium angustifolium	.	.	.	.
Sparganium minimum	.	.	.	.
Sparganium sp.	.	.	.	.
Spiranthes romanzoffiana	.	.	8	1
Stellaria calycantha	.	.	.	.
Streptopus amplexifolius	.	.	.	.
Thalictrum sparsiflorum	.	.	.	.
Trientalis europaea	.	.	17	2
Utricularia vulgaris	.	.	.	.
Valeriana sitchensis	.	.	.	.
Veratrum viride	.	.	.	.
Viola glabella	.	.	.	.
Viola sp.	.	.	8	1
GRAMINOIDS				
Agrostis alascana	.	.	.	.
Arctophila fulva	.	.	.	.
Calamagrostis canadensis	.	.	17	1
Calamagrostis nutkaensis	.	.	.	.
Carex anthoxantha	.	.	.	.
Carex aquatilis	.	.	.	.
Carex limosa	.	.	.	.
Carex lyngbyei	33	1	.	.
Carex mackenziei	.	.	.	.
Carex macrochaeta	.	.	.	.
Carex magellanica	.	.	.	.
Carex microchaeta	.	.	.	.
Carex microglochin	.	.	.	.
Carex pauciflora	.	.	58	16
Carex pluriflora	.	.	25	4
Carex rostrata	.	.	.	.
Carex saxatilis	.	.	.	.
Carex sitchensis	.	.	8	3
Carex sp.	.	.	33	4
Deschampsia cespitosa	.	.	8	20
Eleocharis acicularis	.	.	.	.
Eleocharis palustris	.	.	.	.
Elymus arenarius	.	.	.	.
Eriophorum angustifolium	.	.	67	7
Eriophorum russeolum	.	.	.	.
Festuca altaica	.	.	.	.
Festuca rubra	.	.	.	.
Glyceria pauciflora	.	.	.	.
Hierochloe alpina	.	.	.	.
Juncus alpinus	.	.	.	.
Juncus arcticus	.	.	.	.
Juncus sp.	.	.	.	.
Luzula multiflora	.	.	.	.
Luzula sp.	.	.	.	.
Luzula wahlenbergii	.	.	.	.
Phleum commutatum	.	.	.	.
Poa macrantha	.	.	.	.

Poa sp.	.	.	.	.
Puccinellia nutkaensis	.	.	.	.
Puccinellia pumila	100	35	.	.
Puccinellia sp.	.	.	.	.
Trichophorum caespitosum	.	.	100	61
Trisetum spicatum	.	.	.	.
FERNS AND ALLIES				
Athyrium filix-femina	.	.	.	.
Dryopteris dilatata	.	.	.	.
Equisetum arvense	.	.	8	1
Equisetum fluviatile	.	.	17	1
Equisetum palustre	.	.	.	.
Equisetum pratense	.	.	.	.
Equisetum silvaticum	.	.	.	.
Equisetum sp.	.	.	.	.
Equisetum variegatum	.	.	.	.
Gymnocarpium dryopteris	.	.	.	.
Lycopodium alpinum	.	.	.	.
Lycopodium annotinum	.	.	.	.
Lycopodium clavatum	.	.	.	.
Lycopodium complanatum	.	.	.	.
MOSESSES				
Pleurozium schreberi	.	.	.	.
Rhytidiadelphus sp.	.	.	.	.
Sphagnum sp.	.	.	42	37

Forb Herbaceous

Species	ATHFIL 5 Plots		EPIANG 5 Plots		EQUARV 7 Plots		EQUFLU 20 Plots		EQUVAR 7 Plots		FAUCRI 11 Plots		FAUCRI/TRICAE 3 Plots	
	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV
TREES														
Populus balsamifera ssp. trichocarpa
Tsuga heterophylla	14	1	.	.	.	.
Tsuga mertensiana	9	1	67	3
TALL SHRUBS														
Alnus crispa ssp. sinuata	14	3	.	.	57	1	.	.	67	2
Cladothamnus pyroliflorus	18	1	67	2
Myrica gale	40	12	.	.	.	.	5	1	29	1	.	.	.	.
Rubus spectabilis	40	11	.	.	.	.	.	.	.	.	9	1	.	.
Salix alaxensis	29	1	.	.	.	.
Salix barclayi	15	2	29	3	.	.	.	.
Salix commutata	10	3	43	5	.	.	.	.
Salix hookeriana	29	6	5	3	43	2	.	.	.	.
Salix sitchensis	57	1	.	.	.	.
Salix sp.	14	1	.	.	.	.	.	.	.	.
Sambucus racemosa	20	1	.	.	.	.	.	.	.	.	.	.	.	.
Vaccinium ovalifolium	20	1	20	1	.	.	.	.	.	.	.	.	.	.
LOW AND DWARF SHRUBS														
Andromeda polifolia	18	2	67	1
Cassiope stelleriana	18	2	33	1
Empetrum nigrum	55	3	67	2
Ledum palustre	9	3	.	.
Loiseleuria procumbens	9	1	33	1
Luetkea pectinata	27	10	33	1
Oxycoccus microcarpus	27	2	.	.
Phyllodoce aleutica	9	1	.	.
Salix arctica	29	6	.	.	.	.
Spiraea beauverdiana
Vaccinium caespitosum	18	1	67	1
Vaccinium uliginosum	18	3	67	3
Vaccinium vitis-idaea	9	1	.	.
FORBS														
Achillea borealis	20	1	40	6	43	1	.	.	14	1	.	.	.	.
Aconitum delphinifolium	.	.	20	3	.	.	.	.	.	.	9	3	.	.
Anemone narcissiflora	18	6	67	1
Angelica lucida	.	.	40	25	.	.	.	.	.	.	.	.	.	.
Artemisia arctica	.	.	20	3	.	.	.	.	.	.	9	3	.	.
Aruncus sylvestris	20	20	.	.	.	.	.	.	.	.	.	.	.	.
Callitriche hermaphroditica
Callitriche verna
Castilleja unalaschcensis	.	.	20	1	.	.	.	.	.	.	.	.	.	.
Coptis trifolia	9	1	67	1
Cornus canadensis	.	.	20	3	.	.	.	.	.	.	36	3	33	1
Dodecatheon pulchellum	36	2	100	2

Drosera rotundifolia	.	.	.	.	.	.	.	.	.	27	2	67	2
Epilobium adenocaulon	.	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium anagallidifolium	20	1	.	.	.	.	.	.	.	9	3	.	.
Epilobium angustifolium	100	7	100	52	.	.	.	.	.	9	3	.	.
Epilobium latifolium	.	.	.	.	43	10	.	.	.	.	.	.	.
Erigeron peregrinus	.	.	.	.	.	.	.	.	.	27	2	33	3
Fauria crista-galli	.	.	20	10	.	.	.	.	.	100	60	100	63
Fragaria chiloensis	.	.	.	.	.	.	.	.	.	.	.	.	.
Fritillaria camschatcensis	20	3	20	1	.	.	.	.	.	9	1	.	.
Galium trifidum	40	1	60	2	.	.	15	4	.	18	2	.	.
Gentiana douglasiana	.	.	.	.	.	.	.	.	.	45	2	100	2
Gentiana glauca	.	.	.	.	.	.	.	.	.	.	.	.	.
Geocaulon lividum	.	.	.	.	.	.	.	.	.	.	.	.	.
Geranium erianthum	20	1	20	20	.	.	.	.	.	9	3	.	.
Geum calthifolium	.	.	.	.	.	.	.	.	.	64	4	100	2
Heracleum lanatum	60	11	40	2	.	.	.	.	.	.	.	.	.
Hippuris vulgaris	.	.	.	.	.	.	20	2	.	.	.	.	.
Honckenya peploides	.	.	.	.	.	.	.	.	.	.	.	.	.
Iris setosa	20	3	.	.	14	3	.	.	.	.	.	.	.
Lathyrus maritimus	.	.	.	.	.	.	.	.	.	.	.	.	.
Lathyrus palustris	40	7	.	.	57	9	.	.	14	1	.	.	.
Lupinus nootkatensis	20	3	40	20	14	10	.	.	.	18	6	.	.
Lysichiton americanus	.	.	.	.	.	.	.	.	.	.	.	.	.
Menyanthes trifoliata	.	.	.	.	.	.	30	2	.	.	.	.	.
Myriophyllum sibiricum	.	.	.	.	.	.	5	1	.	.	.	.	.
Nuphar polysepala	.	.	.	.	.	.	.	.	.	.	.	.	.
Parnassia palustris	.	.	.	.	43	2	.	.	71	1	.	.	.
Pedicularis parviflora	.	.	.	.	.	.	10	1	.	.	.	.	.
Plantago maritima	.	.	.	.	.	.	.	.	.	.	.	.	.
Polemonium acutiflorum	.	.	.	.	.	.	.	.	.	.	.	.	.
Polygonum viviparum	.	.	.	.	.	.	.	.	.	.	.	.	.
Potamogeton filiformis	.	.	.	.	.	.	5	1	.	.	.	.	.
Potamogeton pectinatus	.	.	.	.	.	.	.	.	.	.	.	.	.
Potamogeton perfoliatus	.	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla egedii	.	.	20	1	29	20	.	.	29	2	.	.	.
Potentilla palustris	.	.	20	10	14	1	35	10	14	1	.	.	.
Ranunculus cymbalaria	.	.	.	.	.	.	.	.	.	.	.	.	.
Ranunculus trichophyllus	.	.	.	.	.	.	.	.	.	.	.	.	.
Rhinanthus minor	.	.	.	.	29	16	.	.	14	3	.	.	.
Rubus arcticus	20	1	.	.	.	.	.	.	14	1	18	1	.
Rubus pedatus	.	.	.	.	.	.	.	.	.	.	.	.	.
Sanguisorba stipulata	20	3	40	10	.	.	.	.	.	27	2	.	.
Sparganium angustifolium	.	.	.	.	.	.	.	.	.	.	.	.	.
Sparganium hyperboreum	.	.	.	.	.	.	.	.	.	.	.	.	.
Sparganium minimum	.	.	.	.	.	.	5	1	.	.	.	.	.
Spiranthes romanzoffiana	.	.	.	.	.	.	.	.	71	1	.	.	.
Stellaria calycantha	.	.	.	.	29	1	.	.	.	.	.	.	.
Streptopus amplexifolius	20	10	20	3	.	.	.	.	.	9	3	.	.
Tiarella trifoliata	.	.	.	.	.	.	.	.	.	18	1	.	.
Trientalis europaea	40	1	60	5	.	.	5	1	.	36	2	.	.
Utricularia vulgaris	.	.	.	.	.	.	10	2	.	.	.	.	.
Valeriana sitchensis	20	20	40	25	.	.	.	.	.	27	5	.	.
Veratrum viride	60	33	20	20	.	.	.	.	.	9	20	.	.
Viola glabella	40	3	.	.	.	.	5	3	.	9	3	.	.

Viola sp.	20	1	.	.	.	.	5	1	.	.	9	10	.	.
GRAMINOIDS														
Agrostis alascana	.	.	.	.	.	.	5	3	.	.	27	4	.	.
Arctophila fulva	.	.	.	.	.	.	5	1	14	1	.	.	.	.
Calamagrostis canadensis	80	17	80	14	71	6	15	17	.	.	9	1	.	.
Calamagrostis nutkaensis	.	.	.	.	.	.	.	.	.	.	9	3	.	.
Carex anthoxantha	.	.	.	.	.	.	.	.	.	.	9	10	100	4
Carex aquatilis	.	.	.	.	.	.	5	1	14	10	.	.	.	.
Carex limosa	.	.	.	.	.	.	.	.	14	1	.	.	.	.
Carex lyngbyei	.	.	.	.	29	15	15	10	57	2	.	.	.	.
Carex mackenziei	.	.	.	.	.	.	5	1	.	.	.	.	.	.
Carex macrochaeta	20	1	20	30	.	.	.	.	.	.	18	22	33	3
Carex microchaeta	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Carex microglochin	.	.	.	.	.	.	.	.	.	.	9	10	.	.
Carex pauciflora	.	.	.	.	.	.	.	.	.	.	18	15	.	.
Carex pluriflora	.	.	.	.	.	.	.	.	.	.	9	20	.	.
Carex rostrata	.	.	.	.	.	.	10	2	.	.	.	.	.	.
Carex saxatilis	.	.	.	.	.	.	10	10	14	10	.	.	.	.
Carex sitchensis	.	.	20	20	.	.	5	1	.	.	18	7	.	.
Carex sp.	.	.	.	.	29	10	5	10	.	.	45	13	.	.
Deschampsia cespitosa	.	.	20	1	29	2	.	.	71	1	9	1	33	1
Eleocharis palustris	.	.	.	.	.	.	10	7	29	1	.	.	.	.
Elymus arenarius	.	.	20	1	57	13	.	.	.	.	.	.	.	.
Eriophorum angustifolium	.	.	.	.	.	.	10	7	.	.	18	15	.	.
Eriophorum russeolum	.	.	.	.	.	.	.	.	29	1	.	.	.	.
Festuca altaica	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Festuca rubra	.	.	20	80	14	10	.	.	43	1	.	.	.	.
Glyceria pauciflora	.	.	.	.	.	.	5	20	.	.	.	.	.	.
Juncus alpinus	.	.	.	.	.	.	.	.	29	1	.	.	.	.
Juncus arcticus	.	.	.	.	14	1	.	.	29	1	.	.	.	.
Juncus sp.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Luzula multiflora	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phleum commutatum	.	.	40	1	.	.	.	.	.	.	.	.	.	.
Poa macrantha	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Puccinellia pumila	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trichophorum caespitosum	.	.	.	.	.	.	.	.	.	.	9	1	100	33
Trisetum spicatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.
FERNS AND ALLIES														
Athyrium filix-femina	100	72	60	18	14	3	.	.	.	.	27	11	.	.
Blechnum spicant	.	.	.	.	.	.	.	.	.	.	9	1	.	.
Dryopteris dilatata	40	2	20	3	14	1	.	.	.	.	9	10	.	.
Equisetum arvense	40	25	40	20	100	37	20	11	71	9	18	11	.	.
Equisetum fluviatile	.	.	.	.	.	.	100	49	14	1	.	.	.	.
Equisetum palustre	.	.	.	.	.	.	15	2	.	.	.	.	.	.
Equisetum pratense	.	.	.	.	.	.	5	1	.	.	.	.	.	.
Equisetum variegatum	.	.	.	.	14	1	5	3	100	60	.	.	.	.
Gymnocarpium dryopteris	20	3	20	20	.	.	.	.	.	.	.	.	.	.
Lycopodium alpinum	.	.	20	1	.	.	.	.	.	.	.	.	.	.
Lycopodium annotinum	.	.	.	.	.	.	.	.	.	.	9	1	.	.
Lycopodium clavatum	.	.	.	.	.	.	.	.	.	.	9	3	33	1
Lycopodium complanatum	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Thelypteris limbosperma	.	.	.	.	.	.	.	.	.	.	9	10	33	1

Thelypteris phegopteris	.	.	.	.	.	.	.	.	.	.	.	.
MOSES												
Pleurozium schreberi	.	.	.	.	.	.	.	.	.	.	.	.
Sphagnum sp.	.	.	.	.	.	5	90	.	.	36	67	.

Species	FRACHI		LATMAR		LUPNOO		MENTRI		POTEGE		POTPAL	
	3 Plots		3 Plots		8 Plots		13 Plots		6 Plots		4 Plots	
	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV
TREES												
Populus balsamifera ssp. trichocarpa	8	1	.	.	.	.
Tsuga heterophylla
Tsuga mertensiana
TALL SHRUBS												
Alnus crispa ssp. sinuata	13	1	.	.	17	1	.	.
Cladothamnus pyroliflorus
Myrica gale	33	1	.	.	25	3	23	2	.	.	25	1
Rubus spectabilis	13	1	.	.	.	.	.	.
Salix alaxensis	25	1	.	.	.	.	.	.
Salix barclayi	25	7	8	3	.	.	25	1
Salix commutata	25	1
Salix hookeriana
Salix sitchensis
Salix sp.	13	10	.	.	.	.	.	.
Sambucus racemosa
Vaccinium ovalifolium
LOW AND DWARF SHRUBS												
Andromeda polifolia
Cassiope stelleriana
Empetrum nigrum
Ledum palustre
Loiseleuria procumbens
Luetkea pectinata	13	1	.	.	.	.	.	.
Oxycoccus microcarpus
Phyllodoce aleutica
Salix arctica	17	10	.	.
Spiraea beauverdiana
Vaccinium caespitosum
Vaccinium uliginosum
Vaccinium vitis-idaea
FORBS												
Achillea borealis	100	34	67	27	75	15	.	.	17	30	.	.
Aconitum delphinifolium
Anemone narcissiflora
Angelica lucida	33	1	.	.	25	12	.	.	.	.	25	3
Artemisia arctica
Aruncus sylvester
Callitriche hermaphroditica
Callitriche verna
Castilleja unalaschensis	33	20	33	1	.	.	.	.	.	.	.	.
Coptis trifolia
Cornus canadensis

Dodecatheon pulchellum	.	.	.	.	.	.	.	.	.	.	.	.
Drosera rotundifolia	.	.	.	.	.	8	1	.	.	.	.	.
Epilobium adenocaulon	.	.	.	.	25	1	.	.	.	.	.	.
Epilobium anagallidifolium	.	.	.	.	.	.	.	.	.	.	.	.
Epilobium angustifolium	33	10	.	.	38	1	.	.	.	.	.	.
Epilobium latifolium	.	.	.	.	.	.	.	.	.	.	25	1
Erigeron peregrinus	.	.	.	.	13	10	.	.	.	.	.	.
Fauria crista-galli	.	.	.	.	.	.	.	.	.	.	.	.
Fragaria chiloensis	100	60	67	2	25	17	.	.	.	.	.	.
Fritillaria camschatcensis	.	.	.	.	.	.	.	.	.	.	.	.
Galium trifidum	.	.	.	.	13	1	8	3	.	.	.	.
Gentiana douglasiana	.	.	.	.	.	.	.	.	.	.	.	.
Gentiana glauca	.	.	.	.	.	.	.	.	.	.	.	.
Geocaulon lividum	.	.	.	.	.	.	.	.	.	.	.	.
Geranium erianthum	.	.	.	.	.	.	.	.	.	.	.	.
Geum calthifolium	.	.	.	.	.	.	.	.	.	.	.	.
Heracleum lanatum	.	.	.	.	13	10	.	.	.	.	.	.
Hippuris vulgaris	.	.	.	.	.	.	8	1	.	.	25	1
Honckenya peploides	.	.	67	1	.	.	.	.	17	60	.	.
Iris setosa	.	.	.	.	13	3	.	.	33	6	.	.
Lathyrus maritimus	33	1	100	53	25	1	.	.	.	.	.	.
Lathyrus palustris	.	.	.	.	50	7	.	.	17	20	25	3
Lupinus nootkatensis	33	1	.	.	100	64	.	.	.	.	.	.
Lysichiton americanus	.	.	.	.	.	.	.	.	.	.	.	.
Menyanthes trifoliata	.	.	.	.	.	.	100	48	.	.	25	3
Myriophyllum sibiricum	.	.	.	.	.	.	.	.	.	.	25	1
Nuphar polysepala	.	.	.	.	.	.	.	.	.	.	.	.
Parnassia palustris	.	.	.	.	38	1	.	.	17	3	50	1
Pedicularis parviflora	.	.	.	.	.	.	8	1	17	1	.	.
Plantago maritima	.	.	.	.	.	.	.	.	17	1	.	.
Polemonium acutiflorum	.	.	.	.	.	.	.	.	.	.	.	.
Polygonum viviparum	.	.	.	.	13	3	.	.	.	.	25	1
Potamogeton filiformis	.	.	.	.	.	.	.	.	.	.	.	.
Potamogeton pectinatus	.	.	.	.	.	.	.	.	.	.	.	.
Potamogeton perfoliatus	.	.	.	.	.	.	.	.	.	.	.	.
Potentilla egedii	33	20	.	.	63	2	.	.	100	32	.	.
Potentilla palustris	.	.	.	.	.	.	69	11	.	.	100	60
Ranunculus cymbalaria	.	.	.	.	.	.	.	.	50	2	.	.
Ranunculus trichophyllus	.	.	.	.	.	.	.	.	.	.	.	.
Rhinanthus minor	100	1	67	1	25	1	.	.	33	1	.	.
Rubus arcticus	33	3	.	.	25	6	.	.	.	.	25	3
Rubus pedatus	.	.	.	.	.	.	.	.	.	.	.	.
Sanguisorba stipulata	.	.	.	.	13	10	.	.	.	.	.	.
Sparganium angustifolium	.	.	.	.	.	.	.	.	.	.	.	.
Sparganium hyperboreum	.	.	.	.	.	.	.	.	.	.	.	.
Sparganium minimum	.	.	.	.	.	.	.	.	.	.	.	.
Spiranthes romanzoffiana	33	1	.	.	.	.	.	.	.	.	.	.
Stellaria calycantha	.	.	.	.	.	.	.	.	.	.	.	.
Streptopus amplexifolius	.	.	.	.	.	.	.	.	.	.	.	.
Tiarella trifoliata	.	.	.	.	.	.	.	.	.	.	.	.
Trientalis europaea	33	1	.	.	.	.	.	.	.	.	.	.
Utricularia vulgaris	.	.	.	.	.	.	23	7	.	.	.	.
Valeriana sitchensis	.	.	.	.	.	.	.	.	.	.	.	.
Veratrum viride	.	.	.	.	13	1	.	.	.	.	.	.

Viola glabella	.	.	.	.	13	10	.	.	.	.	.	.
Viola sp.	.	.	.	.	.	.	.	.	.	.	25	3
GRAMINOIDS												
Agrostis alascana	.	.	.	.	.	.	8	1	.	.	25	1
Arctophila fulva	.	.	.	.	.	.	.	.	.	.	.	.
Calamagrostis canadensis	.	.	.	.	25	16	15	1	.	.	50	7
Calamagrostis nutkaensis	.	.	.	.	.	.	.	.	.	.	.	.
Carex anthoxanthea	.	.	.	.	.	.	.	.	.	.	.	.
Carex aquatilis	.	.	.	.	.	.	.	.	.	.	.	.
Carex limosa	.	.	.	.	.	.	8	10	.	.	.	.
Carex lyngbyei	.	.	.	.	.	.	8	1	33	6	25	1
Carex mackenziei	.	.	.	.	.	.	.	.	.	.	.	.
Carex macrochaeta	.	.	.	.	.	.	.	.	.	.	.	.
Carex microchaeta	.	.	.	.	.	.	.	.	.	.	.	.
Carex microglochin	.	.	.	.	.	.	.	.	.	.	.	.
Carex pauciflora	.	.	.	.	.	.	.	.	.	.	.	.
Carex pluriflora	.	.	.	.	.	.	.	.	.	.	25	10
Carex rostrata	.	.	.	.	.	.	.	.	.	.	.	.
Carex saxatilis	.	.	.	.	.	.	23	17	.	.	.	.
Carex sitchensis	.	.	.	.	.	.	8	1	.	.	.	.
Carex sp.	.	.	.	.	.	.	31	10	.	.	25	3
Deschampsia cespitosa	33	1	.	.	50	16	.	.	50	1	25	30
Eleocharis palustris	.	.	.	.	.	.	15	2	.	.	25	1
Elymus arenarius	100	10	100	30	75	13	.	.	.	.	.	.
Eriophorum angustifolium	.	.	.	.	.	.	8	10	.	.	.	.
Eriophorum russeolum	.	.	.	.	.	.	15	1	.	.	25	1
Festuca altaica	.	.	.	.	13	30	.	.	.	.	.	.
Festuca rubra	67	6	67	1	38	15	.	.	17	1	.	.
Glyceria pauciflora	.	.	.	.	.	.	.	.	.	.	.	.
Juncus alpinus	.	.	.	.	.	.	.	.	.	.	.	.
Juncus arcticus	.	.	.	.	.	.	.	.	33	1	.	.
Juncus sp.	.	.	.	.	.	.	.	.	.	.	.	.
Luzula multiflora	33	1	.	.	.	.	.	.	.	.	.	.
Phleum commutatum	.	.	.	.	.	.	.	.	.	.	.	.
Poa macrantha	.	.	100	1	.	.	.	.	.	.	.	.
Puccinellia pumila	.	.	.	.	.	.	.	.	50	2	.	.
Trichophorum caespitosum	.	.	.	.	.	.	.	.	.	.	.	.
Trisetum spicatum	.	.	.	.	.	.	.	.	.	.	.	.
FERNS AND ALLIES												
Athyrium filix-femina	.	.	.	.	.	.	.	.	17	3	.	.
Blechnum spicant	.	.	.	.	.	.	.	.	.	.	.	.
Dryopteris dilatata	.	.	.	.	.	.	.	.	.	.	.	.
Equisetum arvense	33	1	.	.	38	5	8	10	.	.	25	10
Equisetum fluviatile	.	.	.	.	.	.	69	14	.	.	50	40
Equisetum palustre	.	.	.	.	.	.	8	1	.	.	.	.
Equisetum pratense	.	.	.	.	.	.	8	1	.	.	25	10
Equisetum variegatum	.	.	.	.	.	.	.	.	.	.	.	.
Gymnocarpium dryopteris	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium alpinum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium annotinum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium clavatum	.	.	.	.	.	.	.	.	.	.	.	.
Lycopodium complanatum	.	.	.	.	.	.	.	.	.	.	.	.

Thelypteris limbosperma	.	.	.	.	13	1	.	.	.	.	.	.
Thelypteris phegopteris	.	.	.	.	.	.	.	.	.	.	.	.
MOSESSES												
Pleurozium schreberi	.	.	.	.	.	.	.	.	.	.	25	80
Sphagnum sp.	.	.	.	.	.	.	23	17	.	.	25	1

Species	VALSIT		VERVIR	
	6 Plots		4 Plots	
	CON	COV	CON	COV
TREES				
Populus balsamifera ssp. trichocarpa	.	.	.	.
Tsuga heterophylla	.	.	.	.
Tsuga mertensiana	.	.	.	.
TALL SHRUBS				
Alnus crispa ssp. sinuata	.	.	25	3
Cladothamnus pyroliflorus	.	.	.	.
Myrica gale	.	.	.	.
Rubus spectabilis	.	.	25	3
Salix alaxensis	.	.	.	.
Salix barclayi	.	.	.	.
Salix commutata	.	.	.	.
Salix hookeriana	.	.	.	.
Salix sitchensis	.	.	.	.
Salix sp.	.	.	25	3
Sambucus racemosa	.	.	.	.
Vaccinium ovalifolium	.	.	.	.
LOW AND DWARF SHRUBS				
Andromeda polifolia	.	.	.	.
Cassiope stelleriana	.	.	.	.
Empetrum nigrum	17	3	.	.
Ledum palustre	.	.	.	.
Loiseleuria procumbens	.	.	.	.
Luetkea pectinata	33	3	25	10
Oxycoccus microcarpus	.	.	.	.
Phyllodoce aleutica	.	.	.	.
Salix arctica	.	.	.	.
Spiraea beauverdiana	33	1	.	.
Vaccinium caespitosum	17	3	25	3
Vaccinium uliginosum	.	.	.	.
Vaccinium vitis-idaea	17	1	.	.
FORBS				
Achillea borealis	50	2	.	.
Aconitum delphinifolium	50	2	25	1
Anemone narcissiflora	50	2	25	3
Angelica lucida	.	.	25	1
Artemisia arctica	50	18	.	.
Aruncus sylvester	.	.	.	.
Callitriche hermaphroditica	.	.	.	.
Callitriche verna	.	.	.	.
Castilleja unalaschensis	67	2	25	1
Coptis trifolia	.	.	.	.
Cornus canadensis	17	1	.	.

Dodecatheon pulchellum	.	.	25	1
Drosera rotundifolia	.	.	.	.
Epilobium adenocaulon	.	.	.	.
Epilobium anagallidifolium	.	.	25	3
Epilobium angustifolium	83	6	75	11
Epilobium latifolium	17	10	.	.
Erigeron peregrinus	67	6	.	.
Fauria crista-galli	.	.	.	.
Fragaria chiloensis	.	.	.	.
Fritillaria camschatcensis	67	1	25	3
Galium trifidum	.	.	.	.
Gentiana douglasiana	.	.	.	.
Gentiana glauca	17	3	.	.
Geocaulon lividum	17	1	.	.
Geranium erianthum	100	17	100	6
Geum calthifolium	.	.	.	.
Heracleum lanatum	17	1	50	2
Hippuris vulgaris	.	.	.	.
Honckenya peploides	.	.	.	.
Iris setosa	.	.	.	.
Lathyrus maritimus	.	.	.	.
Lathyrus palustris	.	.	.	.
Lupinus nootkatensis	83	5	50	11
Lysichiton americanus	17	20	.	.
Menyanthes trifoliata	.	.	.	.
Myriophyllum sibiricum	.	.	.	.
Nuphar polysepala	.	.	.	.
Parnassia palustris	.	.	.	.
Pedicularis parviflora	.	.	.	.
Plantago maritima	.	.	.	.
Polemonium acutiflorum	17	1	.	.
Polygonum viviparum	.	.	.	.
Potamogeton filiformis	.	.	.	.
Potamogeton pectinatus	.	.	.	.
Potamogeton perfoliatus	.	.	.	.
Potentilla egedii	.	.	.	.
Potentilla palustris	.	.	.	.
Ranunculus cymbalaria	.	.	.	.
Ranunculus trichophyllus	.	.	.	.
Rhinanthus minor	.	.	25	1
Rubus arcticus	50	2	25	1
Rubus pedatus	17	1	.	.
Sanguisorba stipulata	83	7	75	5
Sparganium angustifolium	.	.	.	.
Sparganium hyperboreum	.	.	.	.
Sparganium minimum	.	.	.	.
Spiranthes romanzoffiana	.	.	.	.
Stellaria calycantha	.	.	.	.
Streptopus amplexifolius	17	1	25	3
Tiarella trifoliata	.	.	.	.
Trientalis europaea	50	2	25	1
Utricularia vulgaris	.	.	.	.
Valeriana sitchensis	100	33	50	7
Veratrum viride	50	10	100	35

Viola glabella	17	10	50	15
Viola sp.	.	.	.	.

GRAMINOIDS

Agrostis alascana	.	.	.	.
Arctophila fulva	.	.	.	.
Calamagrostis canadensis	33	2	100	11
Calamagrostis nutkaensis	.	.	.	.
Carex anthoxanthea	.	.	.	.
Carex aquatilis	.	.	.	.
Carex limosa	.	.	.	.
Carex lyngbyei	.	.	.	.
Carex mackenziei	.	.	.	.
Carex macrochaeta	33	7	25	1
Carex microchaeta	17	10	.	.
Carex microglochin	.	.	.	.
Carex pauciflora	.	.	.	.
Carex pluriflora	.	.	.	.
Carex rostrata	.	.	.	.
Carex saxatilis	.	.	.	.
Carex sitchensis	.	.	.	.
Carex sp.	33	6	50	6
Deschampsia cespitosa	.	.	.	.
Eleocharis palustris	.	.	.	.
Elymus arenarius	.	.	.	.
Eriophorum angustifolium	.	.	.	.
Eriophorum russeolum	.	.	.	.
Festuca altaica	17	1	.	.
Festuca rubra	.	.	.	.
Glyceria pauciflora	.	.	.	.
Juncus alpinus	.	.	.	.
Juncus arcticus	.	.	.	.
Juncus sp.	17	1	.	.
Luzula multiflora	17	1	.	.
Phleum commutatum	67	2	25	20
Poa macrantha	.	.	.	.
Puccinellia pumila	.	.	.	.
Trichophorum caespitosum	.	.	.	.
Trisetum spicatum	17	1	.	.

FERNS AND ALLIES

Athyrium filix-femina	67	2	50	11
Blechnum spicant	.	.	.	.
Dryopteris dilatata	.	.	.	.
Equisetum arvense	.	.	25	1
Equisetum fluviatile	.	.	.	.
Equisetum palustre	.	.	.	.
Equisetum pratense	.	.	.	.
Equisetum variegatum	.	.	.	.
Gymnocarpium dryopteris	67	7	25	30
Lycopodium alpinum	17	20	.	.
Lycopodium annotinum	.	.	.	.
Lycopodium clavatum	.	.	.	.
Lycopodium complanatum	17	1	.	.

Thelypteris limbosperma	.	.	25	1
Thelypteris phegopteris	17	30	.	.
MOSESSES				
Pleurozium schreberi	.	.	.	.
Sphagnum sp.	.	.	.	.

Aquatic Herbaceous

Species	CALHER 4 Plots		MYRSIB 3 Plots		POTFIL 12 Plots		POTPER 18 Plots		RANTRI 8 Plots		SUBAQU 3 Plots		UTRVUL 3 Plots		
	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	CON	COV	
FORBS															
Callitriche hermaphroditica	100	40	33	1	17	6	22	11	13	1	.	.	.	.
Callitriche verna	50	10	33	1	17	6	22	6	25	10	.	.	.	.
Hippuris vulgaris	.	.	.	.	.	.	6	50	.	.	.	.	33	60
Myriophyllum sibiricum	25	20	100	57	42	9	.	.	.	.	.	.	.	.
Nuphar polysepala	.	.	33	10	.	.	.	.	.	.	.	.	.	.
Potamogeton filiformis	50	1	33	1	100	56	11	10	13	30	100	30	.	.	
Potamogeton natans	.	.	33	40	.	.	.	.	.	.	.	.	.	.
Potamogeton pectinatus	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Potamogeton perfoliatus	50	15	67	15	67	24	100	44	50	10	100	7	.	.	
Potentilla palustris	67	26
Ranunculus trichophyllus	50	1	33	1	50	6	39	10	100	30	100	1	.	.	
Sparganium angustifolium	100	20
Sparganium hyperboreum
Sparganium minimum
Subularia aquatica	25	10	.	.	8	10	.	.	13	50	100	43	.	.	
Utricularia vulgaris	100	93
GRAMINOIDS															
Calamagrostis canadensis
Carex lyngbyei
Glyceria pauciflora	25	1	.	.	.	.	11	15	13	1	33	1	.	.
FERNS AND ALLIES															
Equisetum fluviatile	.	.	.	.	.	.	.	.	13	10	.	.	.	.

Species	HIPVUL		SPARGA	
	5 Plots		6 Plots	
	CON	COV	CON	COV
FORBS				
Callitriche hermaphroditica	20	90	.	.
Callitriche verna	.	.	17	1
Hippuris vulgaris	100	50	33	30
Myriophyllum sibiricum	20	1	33	7
Nuphar polysepala	20	1	.	.
Potamogeton filiformis	20	1	17	1
Potamogeton natans	.	.	.	.
Potamogeton pectinatus	.	.	17	3
Potamogeton perfoliatus	20	30	50	8
Potentilla palustris	.	.	17	1
Ranunculus trichophyllus	20	10	17	20
Sparganium angustifolium	20	1	33	84
Sparganium hyperboreum	20	10	17	60
Sparganium minimum	20	3	50	50
Subularia aquatica	.	.	.	.
Utricularia vulgaris	40	2	17	3
GRAMINOIDS				
Calamagrostis canadensis	20	1	.	.
Carex lyngbyei	20	1	.	.
Glyceria pauciflora	20	10	17	10
FERNS AND ALLIES				
Equisetum fluviatile	20	10	17	20

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