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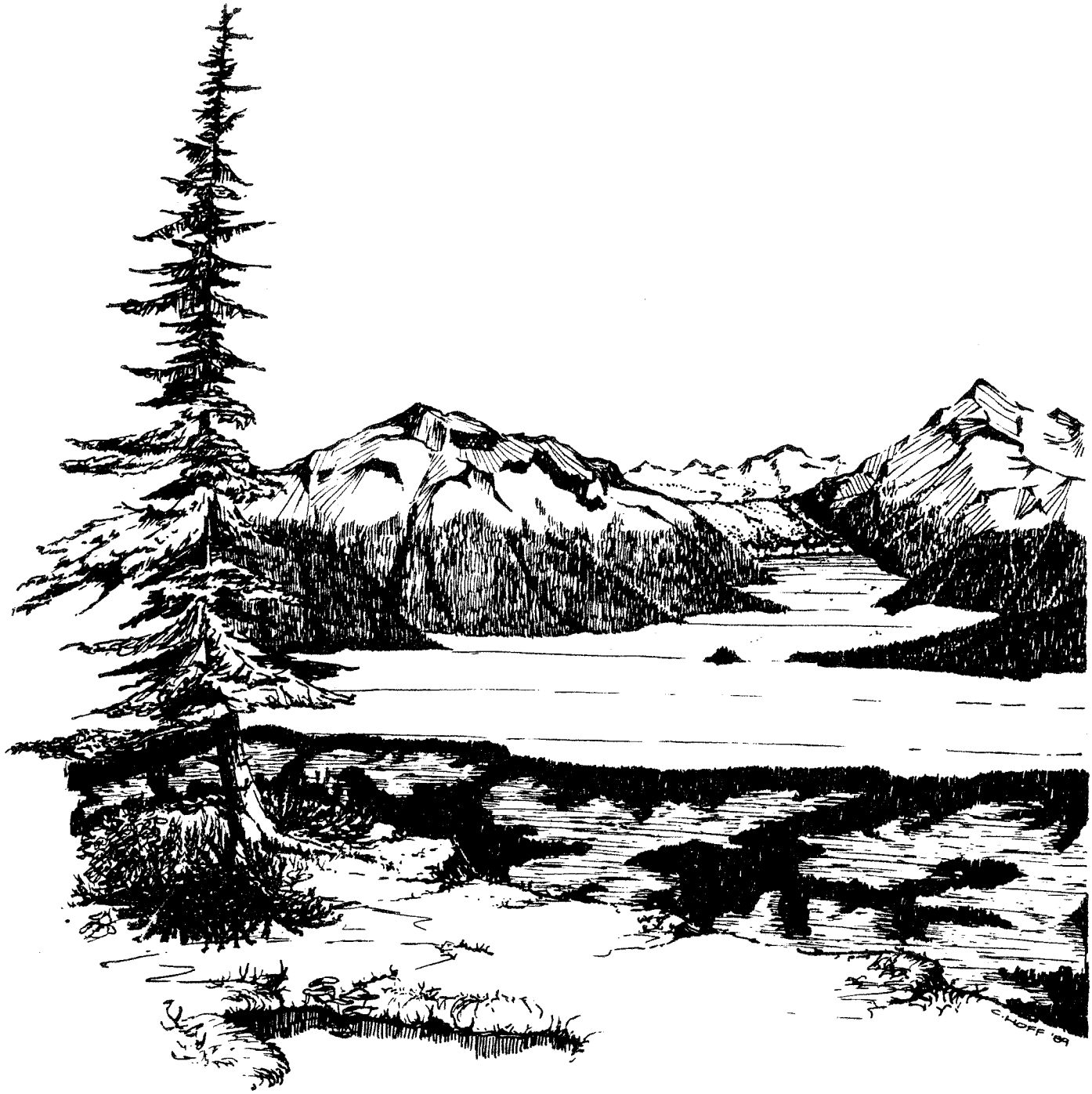
PRELIMINARY FOREST PLANT ASSOCIATIONS

OF THE STIKINE AREA, TONGASS NATIONAL FOREST



INTRODUCTION

Plant communities that have developed over long periods of time are useful indicators that can be used in the management of forest land. Similar climax communities or plant associations form on sites with similar environmental characteristics. Soil and climatic are the major influencing factors. Plant associations can be used to predict site response to changes caused by management practices or to estimate value to wildlife. Emphasis can be placed on management of ecosystems rather than on resources. An understanding and recognition of plant associations provides a common denominator for communication among resource managers. A Western hemlock/Blueberry plant association should mean the same thing to everyone. Whereas, an old-growth western hemlock forest can be interpreted many ways.

The climate in southeast Alaska is characterized by cool moist summers and mild winters. Precipitation is high throughout the year and soil moisture deficits rarely occur. Instead, excessive soil moisture during much of the year is the norm on many sites and it greatly influences the plant associations that develop. Casual observations would suggest that precipitation is more or less uniform throughout the area. Climatological data indicates otherwise. Some areas receive less than 40 inches of precipitation while others may have well over 100 inches.

Although strongly influenced by the maritime climate, temperature differences exist. In general temperatures increase from east to west and decrease from south to north and with increased elevation. Temperatures are modified by local topography. Mainland valleys tend to be warmer in summer and colder in winter than most sites. Glaciers also influence local climates.

These differences in climate are reflected in the vegetation. For example, western redcedar and salal reach the northern limits of their range on the Forest. They are common in some plant associations on the southern part of the Forest but are absent in similar associations further north. Alaska cedar and mountain hemlock become less common, especially at lower elevations, as latitude decrease.

CLASSIFICATION CONCEPTS

The plant community concept used in this guide is the plant association. It is intended for use in the Stikine Area of the Tongass National Forest. However, it does not include the Stikine-LeConte Wilderness. It does not apply to the Ketchikan Area or Chatham Area. Similar publications have been developed for these Areas and they include many of the same plant associations. Plant association concepts used here follow the pattern originally used on the Chatham Area.

Plant associations are usually grouped into plant series. For example, all western hemlock plant associations are grouped into the Western hemlock Series. We recognize seven plant series based on the dominant overstory tree species. They are:

Western hemlock Series
Western hemlock-Alaska cedar Series
Sitka spruce Series
Mixed-Conifer Series
Mountain hemlock Series
Shore pine Series
Western hemlock-Western redcedar Series

Within each series, plant associations are described based on understory vegetation. Indicator plants are used to distinguish associations series and associations.

The plant association classification is built on the concept that climax vegetation will develop on undisturbed sites. The classification does not include seral communities that will develop into plant communities. The old-growth forests in southeast Alaska generally fit this concept. Disturbance from windthrow is usually limited to scattered trees or small groups. Large scale windthrow is uncommon but does occur. Its main effect is to form an even-aged stand that generally has a higher Sitka spruce component than the original stand. Fire is rare and has played an insignificant role in the forests of southeast Alaska. In recent years, timber harvesting has increased greatly, but the acres harvested still account for a small percentage of the forest land.

The Sitka spruce Series is found on sites that receive some site disturbance at regular intervals. The most common sites are flood plains, although the Sitka spruce communities occur on upland slopes. While these communities do not meet the exact requirements of a climax community, the topographic features of the surrounding land insures that moderate disturbance will likely continue and perpetuate the stand characteristics. For the purpose of this guide, the Sitka spruce plant communities will be considered as climax plant associations, recognizing that in the absence of disturbance these communities would develop into other associations.

METHODS

During the summers of 1986-1987, field data were collected. Over 400 temporary plots were established to sample vegetative and soil characteristics. Plots were circular in shape and located in old-growth stands. Stands that appeared to be second growth were not sampled. Plots were located in the stand to sample the vegetation that best represented the stand. Large stand openings, disturbed areas, and breaks in topography were avoided. The center of the plot was marked with flagging ribbon and the plot divided into quadrants with a 42 foot radius (0.127 acre). The edge of the plots were flagged at four points, perpendicular through plot center.

Plants were identified to species when possible. Classification of trees and shrubs conforms to Viereck and Little (1972). With one exception, Anderson's Flora of Alaska and Adjacent Parts of Canada (Welsh 1974) was used to classify forbs, graminoids, and ferns.

When species identification was not possible, plants were identified to genus. Because of the difficulty in differentiating between Vaccinium alaskense and Vaccinium ovalifolium, they were identified only to genus. For each plot the percent coverage for each species of vascular plant was estimated. Although mosses and other non-vascular plants were often present, only data for Sphagnum spp were recorded. For trees, coverage estimates were made for both the overstory and the understory for each species. Total tree coverage for the overstory and understory and total tall shrub coverage was estimated. For low shrubs, forbs, graminoids, and ferns, total coverage was calculated using the sum of all species because of the difficulty in estimating total coverage for low growing plants. This has resulted in total plant coverages in excess of 100 percent for some plots.

Other data recorded included percent coverage by dead and down logs, height of blueberry (nearest 0.5 foot), deer browsing, slope shape in the plot, percent slope, aspect, elevation, location to nearest 1/4 section, and percentage of the plot covered by bare ground, bedrock, and boulders. Finally, the stand was assigned to a preliminary plant association classification.

A variable plot was also established using the fixed plot center. Basal area of the plot was measured using a prism or relaskop using a basal factor of 40. On some plots, a basal area factor of 20 or 10 was needed to get five or six trees in the sample. Trees under five inches in diameter at 4.5 feet (dbh) were not included.

Diameter of each tree was measured to the nearest inch. The height of one tree was measured and the height of each other tree was estimated to the nearest five feet using the measured tree as reference. Tree class, crown ratio, and crown class were determined for each tree. The mean height of the dominate trees in the stand was estimated. Dead trees were included in the sample if they had a stem height of at least 12 feet.

A soil profile description was completed at all of the sample sites. The profile was located to represent the typical edaphic conditions of the site. If two comtrasting soils occurred on the same plot, both were described and classified. Soils were classified to the soil series level using the U.S. system of soil taxanomy (Soil Survey Staff 1975).

DATA ANALYSIS

Region 6 Ecology Programs were used to organize the data, to prepare tables for editing, and for data analysis. Plots were grouped by plant association based on field observations and the data examined. At this time, some plots were assigned to other plant associations and the data re-examined. Our concept of some plant associations did not hold up to data analysis and were eventually eliminated from our list. Others became evident and were added. A few plant associations were observed so infrequently they were not included in the final analysis and written descriptions.

Estimates of board foot volume were calculated for each plant association using the variable plot data. Region 6 Stand Exam Data Processing programs were used to analyze the data.

PLANT ASSOCIATION DESCRIPTIONS

Written descriptions are given for 30 plant associations found on the Stikine Area. The descriptions characterize the typical stand in the association. Tables presenting summarized plot data for the important plants found in the association are presented. They give the minimum, maximum, and mean coverage for these plants and can be used to describe the range of what might actually be seen in the field.

The mean presented with the text was computed over all plots, whether the plant was present or absent. This mean is useful in estimating plant coverage for areas larger than the plot, such as forest stands. Appendix tables present plant coverage for all plants observed for each plant association. Cover percentages in the Appendix tables are means that were computed using only the plots on which they were found. Appendix tables give an estimate of species abundance when the plant is present.

KEY TO PRELIMINARY PLANT ASSOCIATIONS OF TONGASS NATIONAL FOREST STIKINE AREA

1. Use this key for forest stands with at least a mature overstory and which are not severely disturbed by over-browsing, blowdown, timber harvest, etc. If the stand is severely disturbed or in an early successional stage, the site can best be classified by extrapolating from the nearest undisturbed stand occupying a similar site.

2. Select a plot location where the species composition of the understory and overstory is uniform throughout. If half of the plot is dominated by devil's club and the other half is dominated by skunk cabbage; move the plot center into one or the other.

3. Work through the key. Do not skip couplets. Remember the key is just an identification aid. Check the association and site descriptions to ensure you have correctly classified the plot.

4. In stands where the understory is unusually sparse the relative amounts of each species needed to identify the association may have to be adjusted downward.

5. Subjective terms are used to express the relative abundance of species in a community. In this key, the following definitions apply:

   Common: The species usually occurs throughout the community, but represents a relatively small percentage of cover (normally 1 to 5 percent).

   Well represented: The species is prominent in the plant community. It normally represents greater than 5 percent cover even for small forbs and ferns.

   Forest: Plant communities having a minimum of 10% canopy coverage of trees greater than 25 feet tall.

SERIES KEY

1. Sitka spruce canopy cover greater than 15%. (2)

1. Sitka spruce canopy cover less than 15%. (4)

2. Devil's club, alder, or skunk cabbage common in understory.
SITKA SPRUCE SERIES page 9

2. Devil's club, alder, or skunk cabbage uncommon in understory. (3)

3. Sitka spruce more common than western hemlock in overstory.
SITKA SPRUCE SERIES page 9

3. Western hemlock more common than Sitka spruce in overstory.
WESTERN HEMLOCK SERIES page 8

4. Shore pine canopy cover greater than 15%.
SHORE PINE SERIES page 11

4. Shore pine canopy cover less than 15%. (5)

5. Western hemlock in the overstory. (6)

5. Western hemlock not in the overstory. (10)

6. Western hemlock codominant with mountain hemlock, Sitka spruce, Alaska cedar, redcedar, or shore pine in various mixes. No species dominates. Stand height generally under 80 feet. Low elevations.
MIXED CONIFER SERIES page 10

6. Western hemlock an overstory dominant alone or with other species. Stand height generally over 100 feet. (7)

7. Western hemlock dominates the overstory. Other species are uncommon.
WESTERN HEMLOCK SERIES page 8

7. Western hemlock codominant with other species. (8)

8. Mountain hemlock canopy cover greater than 15%. High elevations or cold sites.
MOUNTAIN HEMLOCK SERIES page 11

8. Mountain hemlock canopy cover less than 15%. (9)

page 7

9. Alaska cedar canopy cover greater than 5%.
WESTERN HEMLOCK-ALASKA CEDAR SERIES
page 8

9. Western redcedar canopy cover greater than 5%.
WESTERN HEMLOCK-WESTERN REDCEDAR SERIES
page 10

10. Mountain hemlock canopy cover greater than 15%. High elevations or cold sites.
MOUNTAIN HEMLOCK SERIES page 11

10. Mountain hemlock, western redcedar, Alaska cedar, shore pine, or Sitka spruce present in various mixes. No species dominates. Stand height generally under 80 feet. Low elevations.
MIXED CONIFER SERIES page 10

KEY TO THE PLANT ASSOCIATIONS OF THE STIKINE AREA

WESTERN HEMLOCK SERIES

1. Devil's club is common and well distributed throughout the understory. (2)

1. Devil's club is absent or uncommon. (3)

    2. Blueberry is well represented.
    140 WESTERN HEMLOCK/BLUEBERY-DEVIL'S CLUB (TSHE/VACCI-OPHO)

    2. Blueberry is poorly represented.
    160 WESTERN HEMLOCK/DEVIL'S CLUB (TSHE/OPHO)

    3. Skunk cabbage is common throughout the understory.
    130 WESTERN HEMLOCK/BLUEBERRY/SKUNK CABBAGE (TSHE/VACCI/LYAM)

    3. Skunk cabbage is absent or uncommon. (4)

        4. Spinulose shield-fern is usually common. Soils are deep and well drained. Blueberry is the dominant shrub.
        120 WESTERN HEMLOCK/BLUEBERRY/SPINULOSE SHIELD-FERN (TSHE/VACCI/DRAU)

        4. Spinulose shield-fern is absent or uncommon. Soils are shallow or somewhat poorly to poorly drained. Blueberry is the dominant shrub.
        110 WESTERN HEMLOCK/BLUEBERRY (TSHE/VACCI)

WESTERN HEMLOCK-ALASKA CEDAR SERIES

1. Skunk cabbage is well represented.
220 WESTERN HEMLOCK-ALASKA CEDAR/BLUEBERRY/SKUNK CABBAGE (TSHE-CHNO/VACCI/LYAM)

1. Skunk cabbage is absent or uncommon.
210 WESTERN HEMLOCK-AKASKA CEDAR/BLUEBERRY (TSHE-CHNO/VACCI)

SITKA SPRUCE SERIES

1. Alder is well represented. Typically alder occurs in canopy openings between widely spaced trees.
   350 SITKA SPRUCE/DEVIL'S CLUB-ALDER (PISI/OPHO-ALNUS)
1. Alder is absent or uncommon. (2)

   2. Devil's club is absent or uncommon. (7)

   2. Devil's club is common. (3)

      3. Mountain hemlock is common in the overstory. High elevations or cold sites.
         395 SITKA SPRUCE-MOUNTAIN HEMLOCK/BLUEBERRY-DEVIL'S CLUB (PISI-TSME/VACCI-OPHO)

      3. Mountain hemlock is absent or uncommon. (4)

         4. Skunk cabbage is well represented.
            340 SITKA SPRUCE/DEVIL'S CLUB/SKUNK CABBAGE (PISI/OPHO/LYAM)

         4. Skunk cabbage is absent or uncommon. (5)

            5. Blueberry is well represented.
               320 SITKA SPRUCE/BLUEBERRY-DEVIL'S CLUB (PISI/VACCI-OPHO)

            5. Blueberry is uncommon or restricted to raised microsites. (6)

               6. Enchanter's nightshade is common and well represented in the understory. Occurs on loess soils.
                  355 SITKA SPRUCE/DEVIL'S CLUB/ENCHANTER'S NIGHTSHADE (PISI/OPHO/CIAL)

               6. Enchanter's nightshade may be present. Soils are not loess soils.
                  330 SITKA SPRUCE/DEVIL'S CLUB (PISI/OPHO)

      7. Skunk cabbage is well represented in the understory.
         370 SITKA SPRUCE/BLUEBERRY/SKUNK CABBAGE. (PISI/VACCI/LYAM)

      7. Skunk cabbage is absent or poorly represented.
         310 SITKA SPRUCE/BLUEBERRY (PISI/VACCI)

MIXED CONIFER SERIES

1. Salal is well represented. (2)

1. Salal is absent or poorly represented. (3)

    2. Skunk cabbage is well represented.
    470 MIXED CONIFER/SALAL/SKUNK CABBAGE (MXD-CON/GASH/LYAM)

    2. Skunk cabbage is poorly represented. Blueberry is common and well represented.
    460 MIXED CONIFER/BLUEBERRY-SALAL (MXD-CON/VACCI-GASH)

    3. Deer cabbage and other bog associated plants are common. Blueberry and rusty menziesia dominate the shrub layer.
    430 MIXED CONIFER/BLUEBERRY/DEER CABBAGE (MXD-CON/VACCI/FACR)

    3. Deer cabbage and other bog associated plants are uncommon. (4)

        4. Skunk cabbage is well represented. Blueberry and rusty menziesia are abundant.
        420 MIXED CONIFER/BLUEBERRY/SKUNK CABBAGE (MXD-CON/VACCI/LYAM)

        4. Skunk cabbage is absent or poorly represented. Blueberry and rusty menziesia are abundant.
        410 MIXED CONIFER/BLUEBERRY (MXD-CON/VACCI)

WESTERN HEMLOCK-WESTERN REDCEDAR SERIES

1. Skunk cabbage is common and well represented. Blueberry is the dominant shrub.
730 WESTERN HEMLOCK-WESTERN REDCEDAR/BLUEBERRY/SKUNK CABBAGE (TSHE-THPL/VACCI/LYAM)

1. Skunk cabbage is uncommon or absent.
710 WESTERN HEMLOCK-WESTERN REDCEDAR/BLUEBERRY (TSHE-THPL/VACCI)

MOUNTAIN HEMLOCK SERIES

1. Cassiope, heather, and/or luetkea are common. Blueberry and/or copper bush are the dominant shrubs.
   530 MOUNTAIN HEMLOCK/BLUEBERRY-MERTINS CASSIOPE (TSME/VACCI/CAME)

1. Cassiope, heather, luetkea, or other plants associated with alpine tundra are absent or uncommon. (2)

   2. Copperbush, blueberry, and deer cabbage are well represented.
      540 MOUNTAIN HEMLOCK/BLUEBERRY-COPPERBUSH/DEER CABBAGE (TSME/VACCI-CLPY/FACR)

   2. Copperbush is absent or uncommon. Blueberry is the dominant shrub. (3)

      3. Skunk cabbage is common.
         580 MOUNTAIN HEMLOCK/BLUEBERRY/SKUNK CABBAGE (TSME/VACCI/LYAM)

      3. Skunk cabbage is uncommon or absent. (4)

         4. Marsh marigold is common.
            570 MOUNTAIN HEMLOCK/BLUEBERRY/MARSH MARIGOLD (TSME/VACCI/CABI)

         4. Marsh marigold is absent or uncommon.
            510 MOUNTAIN HEMLOCK/BLUEBERRY (TSME/VACCI)

SHORE PINE SERIES

1. Blueberry is well represented in the understory.
   620 SHORE PINE/BLUEBERRY (PICO/VACCI)

1. Blueberry is poorly represented, restricted to raised microsites. (2)

   2. Sitka sedge is well distributed and exceeds 25% cover.
      630 SHORE PINE/SITKA SEDGE (PICO/CASI)

   2. Sitka sedge is absent or if present does not exceed 25% cover. Crowberry, sedges, and other bog plants abundant.
      610 SHORE PINE/CROWBERRY (PICO/EMNI)

WESTERN HEMLOCK SERIES

Western hemlock dominates the overstory. Sitka spruce is an important component, but rarely approaches western hemlock in abundance. Mountain hemlock, Alaska cedar, shore pine and western redcedar are typically absent, but where present, are a very minor component of the overstory or understory.

The western hemlock series occurs from sea level to about 2000 ft. It is the most common and wide spread series on the Area. Plant associations within the series occur on a wide variety of sites, but are characterized by a dominance of western hemlock in the overstory and understory.

There are five plant associations within the western hemlock series. They represent quite different site conditions and are distinguished by the presence and abundance of key indicator species.

WESTERN HEMLOCK/BLUEBERRY
Distinguished by the general lack of key indicators other the blueberry.

WESTERN HEMLOCK/BLUEBERRY/SHIELD FERN
Distinguished by the relative abundance of shield fern and lack of devil's club

WESTERN HEMLOCK/BLUEBERRY/SKUNK CABBAGE
Distinguished by the abundance of skunk cabbage

WESTERN HEMLOCK/BLUEBERRY-DEVIL'S CLUB
Distinguished by the abundance of both blueberry and devil's club.

WESTERN HEMLOCK/DEVIL'S CLUB
Distinguished by the abundance of devil's club and the lack of blueberry.

Tusga heterophylla/Vaccinium spp
Western hemlock/Blueberry
TSHE/VACCI 110

VEGETATION: Western hemlock dominates the **overstory** which averages about 70 percent coverage. Sitka spruce is often present as a minor species not exceeding 15 percent coverage. Alaska cedar and mountain hemlock may also be present as scattered trees. Other species are rare.

The **understory** tree coverage is dominated by western hemlock. Other species may be present, but always at less than 5 percent coverage.

Blueberry dominates the **tall shrub** layer. Rusty menziesia is usually present but is less abundant. A small amount of red huckleberry is present on many sites. Devil's club is typically absent but does occur as widely scattered plants in some stands. Other tall shrubs are rare and **low shrubs** are absent.

The **forb** layer averages 26 percent coverage. Bunchberry and five-leaf bramble are almost always present. Rosey twisted-stalk, fern-leaf gold thread, and blue-bead are often present. Skunk cabbage is typically absent but may be present as scattered plants on wet microsites.

Grasses and sedges are typically absent or occur as occasional plants.

Fern coverage averages 6 percent. Deer fern and oak fern are common. Other ferns are uncommon or are not abundant.

SITE CHARACTERISTICS: This association is scattered throughout the Forest on mountainslopes and hillslopes. Elevations range from sea level to the subalpine zone where it is replaced by mountain hemlock associations. It typically occurs on very stable forested soils with thick undisturbed organic duff layers. It commonly occurs on two distinctly different soil conditions; shallow well-drained soils, or deep somewhat poorly to poorly drained soils.

MANAGEMENT- This association is moderately productive. Estimated site index of Sitka spruce is about 75. Old growth stand heights average 115 feet. Basal area averages 305 sq ft per acre. The potential productivity of these sites is limited by either shallow soil depth or by excess soil wetness during part of the growing season.

Natural regeneration is prolific. Young second growth stands are primarily western hemlock with some Sitka spruce. Other species are uncommon. Species composition can be altered by planting or by precommercial thinning.

Wildlife habitat characteristics include a well-developed stand structure. Snow intercept capability is high. Blueberry forage production is high. Production of persistent forbs is moderate.

WESTERN HEMLOCK/BLUEBERRY
PLOT DATA (n=21)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	30	90	68.8
W HEMLOCK	100	25	90	63.5
MT HEMLOCK	19	0	20	1.9
SITKA SPRUCE	52	0	15	4.7
ALASKA CEDAR	28	0	8	1.5
W REDCEDAR	--	--	--	----
SHORE PINE	4	0	5	0.2
UNDERSTORY	100	10	45	23.2
W HEMLOCK	100	10	45	22.3
MT HEMLOCK	19	0	5	0.6
SITKA SPRUCE	61	0	4	0.8
ALASKA CEDAR	4	0	4	0.2
W REDCEDAR	--	--	--	----
SHORE PINE	--	--	--	----
TALL SHRUBS	100	16	90	61.3
BLUEBERRY	100	15	90	53.8
RUSTY MENZIESIA	95	0	20	5.9
RED HUCKLEBERRY	57	0	8	2.1
DEVIL'S CLUB	23	0	3	0.3
SALMONBERRY	9	0	1	0.1
COPPERBUSH	--	--	--	----
LOW SHRUBS	--	--	--	----
FORBS	100	5	64	26.2
BUNCHBERRY	95	0	14	6.0
FIVE-LEAF BRAMBLE	95	0	16	7.0
ROSEY TWISTED-STALK	61	0	6	2.0
FERN-LEAF GOLDTHREAD	57	0	10	2.7
CLASPING TWISTED-STALK	38	0	1	0.4
SKUNK CABBAGE	28	0	8	0.8
TRIFOLIATE FOAMFLOWER	19	0	4	0.4
HEART-LEAVED TWAYBLADE	42	0	2	0.5
GRAMINOIDS				
SEDGES	4	0	1	0.0
GRASSES	--	--	--	----
FERNS	81	0	15	4.6
DEER FERN	57	0	7	2.0
OAK FERN	42	0	8	1.4
SHIELD FERN	61	0	3	1.0
LADY FERN	14	0	1	0.1
BEECH FERN	9	0	1	0.1

Tsuga heterophylla/Vaccinium spp/Dryopteris austriaca
Western hemlock/Blueberry/Spinulose shield fern.
TSHE/VACCI/DRAU 120

VEGETATION: **Overstory** coverage is typically about 75 percent and is comprised mostly of western hemlock. Sitka spruce is the only other important tree species and normally comprises less than 15 percent of the overstory. Other species occur infrequently.

The **understory** species composition is similar to the overstory. Western hemlock coverage is normally about 20 percent. Sitka spruce seedlings are usually present, but rarely exceed 5 percent coverage.

The **tall shrub** layer, about 45 percent coverage, is mostly blueberry. Rusty menziesia and red huckleberry are often present but much less abundant. Devil's club and salmonberry are sometimes present but are never abundant. Other species are generally absent. **Low shrub** species do not occur.

Total **forb** coverage is about 30 percent. Important forb species include bunchberry, five-leaf bramble, rosey twisted-stalk, fern-leaf gold thread, and blue-bead. Skunk cabbage is normally absent.

Grasses and sedges typically do not occur.

Ferns are well represented. Total fern coverage is typically about 15 percent. Spinulose shield fern is a key indicator species in the association and is typically about 10 percent coverage. Oak fern and deer fern are common associates. Lady fern and beech fern are uncommon or poorly represented.

SITE CHARACTERISTICS: This plant association occurs throughout the Forest on mountainslopes, hillslopes, stream terraces and outwash plains. Elevation ranges from sea level to the subalpine zone where it is replaced by mountain hemlock associations. It typically occurs on very stable forest soils with thick undisturbed organic duff layers. Soils are deep and well or moderately well drained. Nearly all soils are classified as Humic Cryorthods.

MANAGEMENT: This association is highly productive. Estimated site index for Sitka spruce is about 100. Old growth stand heights are about 135 feet. Basal area is commonly about 305 sq ft per acre.

Natural regeneration is prolific. Young second growth stands are mostly western hemlock with lesser amounts of Sitka spruce. Other species seldom occur. Species composition can be altered by planting or by precommercial thinning.

Wildlife habitat characteristics include a well-developed stand structure. Snow intercept capability is high. Blueberry forage production is moderate. Production of persistent forbs is moderate.

WESTERN HEMLOCK/BLUEBERRY/SHIELD FERN
PLOT DATA (n=33)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	40	95	74.2
W HEMLOCK	100	35	95	68.0
MT HEMLOCK	--	--	--	----
SITKA SPRUCE	57	0	45	8.1
ALASKA CEDAR	--	--	--	----
W REDCEDAR	--	--	--	----
SHORE PINE	--	--	--	----
UNDERSTORY	100	4	51	22.5
W HEMLOCK	100	4	45	21.5
MT HEMLOCK	12	0	3	0.2
SITKA SPRUCE	63	0	5	0.9
ALASKA CEDAR	--	--	--	----
W REDCEDAR	--	--	--	----
SHORE PINE	--	--	--	----
TALL SHRUBS	100	14	86	46.3
BLUEBERRY	100	8	80	41.5
RUSTY MENZIESIA	51	0	10	1.5
RED HUCKLEBERRY	57	0	15	1.9
DEVIL'S CLUB	75	0	7	1.5
SALMONBERRY	30	0	2	0.3
COPPERBUSH	--	--	--	----
LOW SHRUBS	--	--	--	----
FORBS	100	15	71	31.9
BUNCHBERRY	100	1	15	5.8
FIVE-LEAF BRAMBLE	96	0	20	7.8
ROSEY TWISTED-STALK	81	0	15	3.1
FERN-LEAF GOLDTHREAD	81	0	10	3.7
CLASPING TWISTED-STALK	63	0	3	0.8
SKUNK CABBAGE	3	0	2	0.1
TRIFOLIATE FOAMFLOWER	63	0	10	1.5
HEART-LEAVED TWAYBLADE	48	0	2	0.5
GRAMINOIDS				
SEDGES	--	--	--	----
GRASSES	--	--	--	----
FERNS	100	4	51	16.2
DEER FERN	78	0	15	2.9
OAK FERN	84	0	20	3.3
SHIELD FERN	100	1	45	9.3
LADY FERN	39	0	2	0.5
BEECH FERN	12	0	1	0.1

Tsuga heterophylla/Vaccinium spp/Lysichitum americanum
Western hemlock/Blueberry/Skunk cabbage.
TSHE/VACCI/LYAM 130

VEGETATION: **Overstory** coverage is typically about 65 percent and is comprised mostly of western hemlock. Sitka spruce is the only other important tree species and normally comprises less than 15 percent of the overstory. Other species occur infrequently.

The **understory** species composition is similar to the overstory. Western hemlock coverage is normally about 30 percent. Sitka spruce is often present but rarely exceeds 5 percent coverage

The **tall shrub** layer, about 55 percent coverage, is mostly blueberry. Rusty menziesia and red huckleberry are often present in lesser amounts. Devil's club and salmonberry are sometimes present but are never abundant. Other species are generally absent. **Low shrub** species do not occur.

Total **forb** coverage is averages about 50 percent. Important forb species include skunk cabbage, bunchberry, five-leaf bramble, rosey twisted-stalk and fern-leaf gold thread. Skunk cabbage is always well represented and is an important indicator species. It ranges from 5 to 65 percent coverage.

Grasses and sedges typically occur as occasional plants.

Total **fern** coverage is typically about 6 percent. Deer fern, oak fern, shield fern and lady fern are often present but seldom plentiful.

SITE CHARACTERISTICS: This plant association occurs throughout the Forest on mountainslopes, hillslopes, lowlands and valleys. Elevation ranges from sea level to the subalpine zone where it is replaced by the Mountain hemlock/Blueberry/Skunk cabbage associations. It typically occurs on excessively wet forest soils with thick organic surface layers which are saturated with water for part of the growing season. Soils are usually deep and poorly drained. Nearly all soils are classified as Histosols or are mineral soils with a histic epipedon..

MANAGEMENT: This association is moderately productive. Estimated site index for Sitka spruce is about 70. Old growth stand heights are about 115 feet. Basal area is commonly about 230 sq ft per acre. The potential productivity of this association is limited by excessive soil wetness.

Natural regeneration is prolific. Young second growth stands are mostly western hemlock with lesser amounts of Sitka spruce. Other species seldom occur. Species composition can be altered by planting or by precommercial thinning.

Wildlife habitat characteristics include a well-developed stand structure. Snow intercept capability is high. Blueberry forage production is high. Production of persistent forbs is high.

WESTERN HEMLOCK/BLUEBERRY/SKUNK CABBAGE
PLOT DATA (n=18)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	40	85	65.1
W HEMLOCK	100	35	80	60.2
MT HEMLOCK	5	0	10	0.6
SITKA SPRUCE	72	0	15	5.6
ALASKA CEDAR	16	0	4	0.3
W REDCEDAR	--	--	--	----
SHORE PINE	--	--	--	----
UNDERSTORY	100	7	45	30.4
W HEMLOCK	100	5	43	29.5
MT HEMLOCK	11	0	4	0.3
SITKA SPRUCE	66	0	5	1.5
ALASKA CEDAR	5	0	1	0.1
W REDCEDAR	11	0	1	0.1
SHORE PINE	--	--	--	----
TALL SHRUBS	100	25	85	57.1
BLUEBERRY	100	15	75	53.1
RUSTY MENZIESIA	83	0	25	6.8
RED HUCKLEBERRY	55	0	8	1.4
DEVIL'S CLUB	38	0	15	1.7
SALMONBERRY	33	0	2	0.4
COPPERBUSH	--	--	--	----
LOW SHRUBS	--	--	--	----
FORBS	100	16	90	51.2
BUNCHBERRY	100	1	15	6.5
FIVE-LEAF BRAMBLE	94	0	15	8.2
ROSEY TWISTED-STALK	88	0	12	2.7
FERN-LEAF GOLDTHREAD	88	0	13	4.2
CLASPING TWISTED-STALK	55	0	2	0.7
SKUNK CABBAGE	100	5	65	25.7
TRIFOLIATE FOAMFLOWER	44	0	3	0.8
HEART-LEAVED TWAYBLADE	44	0	1	0.4
GRAMINOIDS				
SEDGES	22	0	1	0.2
GRASSES	--	--	--	----
FERNS	94	0	17	5.7
DEER FERN	55	0	7	1.3
OAK FERN	72	0	9	1.9
SHIELD FERN	77	0	7	1.7
LADY FERN	44	0	3	0.6
BEECH FERN	--	--	--	----

Tsuga heterophylla/Vaccinium spp-Oplopanax horridum.
Western hemlock/Blueberry-Devil's club
TSHE/VACCI-OPHO 140

VEGETATION: **Overstory** coverage is typically about 70 percent and is comprised mostly of western hemlock. Sitka spruce is the only other important tree species and normally comprises less than 15 percent of the overstory. Other species seldom occur.

The **understory** species composition is similar to the overstory. Western hemlock coverage is normally about 20 percent. Sitka spruce seedlings are usually present but rarely exceed 5 percent coverage.

The **tall shrub** layer coverage is about 55 percent. Blueberry and devil's club are always well represented. Salmonberry is often present but is typically less abundant than blueberry or devil's club. Rusty menziesia and red huckleberry are often present in small amounts. **Low shrubs** do not occur.

Total **forb** coverage is about 35 percent. Important forb species include bunchberry, five-leaf bramble, rosy and clasping twisted-stalk, fern-leaf gold thread, and foamflower. Skunk cabbage is normally absent.

Grasses and sedges are sometimes present as occasional plants.

Ferns are well represented. Total fern coverage is typically about 20 percent. Shield fern and oak fern are the most abundant but deer fern and lady fern are also usually present. Beech fern is absent or uncommon.

SITE CHARACTERISTICS: This plant association occurs throughout the Forest on mountainslopes, hillslopes, stream terraces and outwash plains. Elevation ranges from sea level to the subalpine zone but it is most common below 800 feet. Soils are typically deep or moderately deep, and are well or moderately well drained. Most soils are classified as Humic, Typic, or less frequently Lithic Cryorthods.

MANAGEMENT: This association is highly productive. Estimated site index for Sitka spruce is about 96. Old growth stand heights are about 135 feet. Basal area is commonly about 260 sq ft per acre.

Natural regeneration is prolific. Young second growth stands are mostly western hemlock with lesser amounts of Sitka spruce. Other species seldom occur. Excessive soil disturbance will favor the establishment of brush such as salmonberry, devil's club and alder.

Wildlife habitat characteristics include a well developed stand structure. Snow intercept capability is high. Blueberry forage production is low. Production of persistent forbs is high.

WESTERN HEMLOCK/BLUEBERRY-DEVIL'S CLUB
PLOT DATA (n=17)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	45	85	68.2
W HEMLOCK	100	30	85	65.6
MT HEMLOCK	--	--	--	----
SITKA SPRUCE	29	0	15	3.5
ALASKA CEDAR	--	--	--	----
W REDCEDAR	5	0	1	0.1
SHORE PINE	--	--	--	----
UNDERSTORY	100	5	45	23.6
W HEMLOCK	100	5	45	22.2
MT HEMLOCK	5	0	2	0.1
SITKA SPRUCE	64	0	5	1.5
ALASKA CEDAR	--	--	--	----
W REDCEDAR	--	--	--	----
SHORE PINE	--	--	--	----
TALL SHRUBS	100	25	83	57.1
BLUEBERRY	100	8	50	28.3
RUSTY MENZIESIA	52	0	10	2.5
RED HUCKLEBERRY	35	0	5	0.6
DEVIL'S CLUB	100	8	40	24.2
SALMONBERRY	70	0	35	5.1
COPPERBUSH	--	--	--	----
LOW SHRUBS	--	--	--	----
FORBS	100	17	67	34.4
BUNCHBERRY	100	1	15	4.8
FIVE-LEAF BRAMBLE	100	3	15	8.5
ROSEY TWISTED-STALK	88	0	6	2.5
FERN-LEAF GOLDTHREAD	94	0	18	6.2
CLASPING TWISTED-STALK	76	0	6	1.5
SKUNK CABBAGE	5	0	1	0.1
TRIFOLIATE FOAMFLOWER	100	1	15	4.7
HEART-LEAVED TWAYBLADE	41	0	2	0.5
GRAMINOIDS				
SEDGES	17	0	2	0.2
GRASSES	5	0	1	0.1
FERNS	100	8	51	22.4
DEER FERN	88	0	10	2.6
OAK FERN	100	2	30	8.4
SHIELD FERN	100	1	27	8.8
LADY FERN	76	0	15	3.2
BEECH FERN	35	0	3	0.5

Tsuga heterophylla/Oplopanax horridum
Western hemlock/Devil's club
TSHE/OPHO 160

VEGETATION: **Overstory** coverage is typically about 75 percent and is comprised mostly of western hemlock. Sitka spruce is the only other important tree species and normally comprises less than 15 percent of the overstory. Other species are typically absent.

The **understory** species composition is similar to the overstory. Western hemlock cover is normally about 10 percent. Sitka spruce seedlings are usually present but rarely exceed 2 percent coverage.

The **tall shrub** layer, normally about 45 percent cover, is dominated by devil's club. Blueberry and rusty menziesia are often present but only in small amounts. Salmonberry is often present and is plentiful in some stands. **Low shrub** species do not occur.

Total **forb** cover is about 25 percent. Foamflower is always present and is well represented. Other important forb species include bunchberry, five-leaf bramble, rosey and clasping twisted-stalk and fern-leaf goldthread. Skunk cabbage is normally absent.

Grasses and sedges are uncommon, generally occurring as occasional plants.

Ferns are plentiful. Total fern cover is typically about 40 percent. Oak fern, shield fern and lady fern are all typically well represented.

SITE CHARACTERISTICS: This plant association is not common, occurring in scattered locations throughout the Forest on mountainslopes, hillslopes and stream terraces. Elevation ranges from near sea level to about 500 feet. Soils are typically deep or moderately deep, and are well or moderately well drained. Most soils are classified as Humic, Typic, or less frequently Lithic, Cryorthods.

MANAGEMENT: This association is highly productive. Estimated site index for Sitka spruce is about 99. Old growth stand heights are about 142 feet. Basal area is commonly about 270 sq ft per acre.

Natural regeneration is prolific. Young second growth stands are mostly western hemlock with lesser amounts of Sitka spruce. Other species seldom occur. Excessive disturbance of soil surface layers will favor the establishment of brush such as salmonberry, devil's club, and alder.

Wildlife habitat characteristics include a well developed stand structure. Snow intercept capability is high. Blueberry forage production is very low. production of persistent forbs is low.

WESTERN HEMLOCK/DEVIL'S CLUB
PLOT DATA (N=4)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	60	90	76.2
W HEMLOCK	100	55	85	73.7
MT HEMLOCK	--	--	--	----
SITKA SPRUCE	75	0	15	5.5
ALASKA CEDAR	--	--	--	----
W REDCEDAR	--	--	--	----
SHORE PINE	--	--	--	----
UNDERSTORY	100	3	15	10.7
W HEMLOCK	100	3	15	10.5
MT HEMLOCK	--	--	--	----
SITKA SPRUCE	100	1	2	1.5
ALASKA CEDAR	--	--	--	----
W REDCEDAR	--	--	--	----
SHORE PINE	--	--	--	----
TALL SHRUBS	100	34	85	49.7
BLUEBERRY	75	0	7	4.3
RUSTY MENZIESIA	75	0	2	1.0
RED HUCKLEBERRY	25	0	1	0.3
DEVIL'S CLUB	100	25	40	31.2
SALMONBERRY	75	0	50	13.0
COPPERBUSH	--	--	--	----
LOW SHRUBS	--	--	--	----
FORBS	100	15	39	26.0
BUNCHBERRY	75	0	3	1.5
FIVE-LEAF BRAMBLE	100	3	4	3.5
ROSEY TWISTED-STALK	75	0	8	3.5
FERN-LEAF GOLDTHREAD	50	0	2	0.8
CLASPING TWISTED-STALK	100	1	8	3.5
SKUNK CABBAGE	--	--	--	----
TRIFOLIATE FOAMFLOWER	100	7	8	7.3
HEART-LEAVED TWAYBLADE	--	--	--	----
GRAMINOIDS				
SEDGES	25	0	2	0.5
GRASSES	--	--	--	----
FERNS	100	27	54	41.5
DEER FERN	75	0	5	2.8
OAK FERN	100	8	25	18.2
SHIELD FERN	100	6	15	9.8
LADY FERN	100	2	10	8.0
BEECH FERN	50	0	2	0.8

WESTERN HEMLOCK-ALASKA CEDAR SERIES

The series is characterized by the presence of both western hemlock and Alaska cedar in the overstory. Western hemlock is normally more abundant but Alaska cedar is always present as a co-dominant species. Other species do not occur or are a minor component of the overstory. Alaska cedar is usually, but not always, present in the understory.

The western hemlock-Alaska cedar series occurs throughout the Forest at elevations ranging from near sea level up to the subalpine zone where it is replaced by the mountain hemlock series. The series is most prevalent at mid to high elevations just below the subalpine zone.

There are only two plant associations recognized in this series. These are:

WESTERN HEMLOCK-ALASKA CEDAR/BLUEBERRY
Distinguished by the general lack of key indicators other than blueberry.

WESTERN HEMLOCK-ALASKA CEDAR/BLUEBERRY/SKUNK CABBAGE
Distinguished by the abundance of skunk cabbage

These two associations are found on sites very similar to those on which Western hemlock/Blueberry or Western hemlock/Blueberry/Skunk cabbage associations are found. The primary difference is the Alaska cedar in the overstory. Although Alaska cedar is distributed throughout the Forest, the reason for its presence or absence on otherwise similar sites is not clearly understood.

Tsuga heterophylla-Chamaecyparis nootkatensis/Vaccinium spp
Western hemlock-Alaska cedar/Blueberry
TSHE-CHNO/VACCI 210

VEGETATION: Western hemlock and Alaska cedar dominate the **overstory** which averages about 60 percent coverageage. Sitka spruce and mountain hemlock are often present as a minor species not exceeding 15 percent coverage. Within its range, western redcedar may be present as a minor species, especially at lower elevations.

The **understory** tree cover is dominated by western hemlock. Alaska cedar, mountain hemlock and Sitka spruce are usually present in smaller amounts. Other species may occur, but always at less than 5 percent coverage.

The **tall shrub** layer, typically about 55 percent coverage, is dominated by blueberry. Rusty menziesia is usually present, but is less abundant. A small amount of red huckleberry is present on many sites. Devil's club and salmonberry are typically absent or occur only as widely scattered plants in some stands. Other tall shrubs are rare and **low shrubs** are absent.

Forbs are plentiful averaging about 35 percent coverage. Bunchberry, fern-leaf goldthread and five-leaf bramble are almost always present. Rosey and clasping twisted-stalk, foamflower and heart-leaf twayblade often occor. Skunk cabbage is typically absent or found as a few scattered plants on wet microsites.

Grasses and sedges occur only as occasional plants.

Fern coverage averages 9 percent. Deer fern and oak fern are the most common.

SITE CHARACTERISTICS: This association is scattered throughout the Forest on mountainslopes and hillslopes. Elevations range from sea level to the subalpine zone where it is replaced by mountain hemlock associations. It is most often found at mid to high elevation just below the subalpine zone. It typically occurs on very stable forested soils with thick undisturbed organic duff layers. It commonly occurs under two distinctly different soil conditions, well drained shallow soils or somewhat poorly to poorly drained deep soils.

MANAGEMENT: This association is moderately productive. Estimated site index of Sitka spruce is about 80. Old growth stand heights average 100 feet. Basal area averages 360 sq ft per acre. The potential productivity of these sites is limited by either shallow soil depth or by excess soil wetness during part of the growing season.

Natural regeneration is prolific. Young second growth stands are primarily western hemlock with some Sitka spruce. Alaska cedar regeneration is uncommon. Planting will normally be required to establish Alaska cedar as a significant component of second growth stands.

Wildlife habitat characteristics include a well developed stand structure. Snow intercept capability is moderate. Blueberry forage production is moderate. Production of persistent forbs is moderate. Because Alaska cedar is highly resistant to decay, dead trees often persist for many years as snags. Dead basal area averages about 100 square feet per acre.

WESTERN HEMLOCK-ALASKA CEDAR/BLUEBERRY
PLOT DATA (n=19)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	45	75	60.8
W HEMLOCK	100	13	60	33.3
MT HEMLOCK	42	0	15	2.4
SITKA SPRUCE	42	0	10	1.9
ALASKA CEDAR	100	7	45	25.7
W REDCEDAR	15	0	15	1.4
SHORE PINE	5	0	5	0.3
UNDERSTORY	100	18	45	33.1
W HEMLOCK	100	6	40	24.6
MT HEMLOCK	42	0	25	3.3
SITKA SPRUCE	73	0	17	2.5
ALASKA CEDAR	52	0	15	3.1
W REDCEDAR	10	0	2	0.2
SHORE PINE	5	0	1	0.1
TALL SHRUBS	100	20	90	54.3
BLUEBERRY	100	15	85	41.8
RUSTY MENZIESIA	100	3	25	9.8
RED HUCKLEBERRY	63	0	10	2.6
DEVIL'S CLUB	73	0	7	1.3
SALMONBERRY	26	0	2	0.3
COPPERBUSH	--	--	--	----
LOW SHRUBS	5	0	1	0.1
FORBS	100	8	52	33.4
BUNCHBERRY	100	2	12	4.9
FIVE-LEAF BRAMBLE	100	2	15	7.2
ROSEY TWISTED-STALK	78	0	6	2.4
FERN-LEAF GOLDTHREAD	100	1	10	4.8
CLASPING TWISTED-STALK	73	0	2	0.8
SKUNK CABBAGE	52	0	6	1.8
TRIFOLIATE FOAMFLOWER	84	0	6	2.6
HEART-LEAVED TWAYBLADE	89	0	2	1.2
GRAMINOIDS				
SEDGES	5	0	1	0.1
GRASSES	5	0	1	0.1
FERNS	95	0	20	9.4
DEER FERN	84	0	15	4.1
OAK FERN	84	0	15	3.7
SHIELD FERN	57	0	4	0.7
LADY FERN	36	0	3	0.5
BEECH FERN	26	0	1	0.3

Tsuga heterophylla-Chamaecyparis nootkatensis/Vaccinium spp/Lysichitum americanum
Western hemlock-Alaska cedar/Blueberry/Skunk cabbage
TSHE-CHNO/VACCI/LYAM 220

VEGETATION: **Overstory** coverage is typically about 65 percent and is comprised of both western hemlock and Alaska cedar. Sitka spruce is often present, but comprises less than 15 percent of the overstory. Western redcedar, within its range, occurs as a minor component of some stands, especially at low elevations. Other species occur infrequently.

The **understory**, about 35 percent coverage, is dominated by western hemlock. Alaska cedar and Sitka spruce are often present but only in small amounts. Western redcedar, within its range, is a significant component of the understory.

The **tall shrub** layer, about 55 percent coverage, is mostly blueberry. Rusty menziesia is present but is less abundant. Red huckleberry is often present in small amounts. Devil's club and salmonberry are typically absent or present only as a few scattered plants. **Low shrub** species do not occur.

Total **forb** coverage averages about 40 percent. Skunk cabbage is an important indicator species of this association, typically at about 15 percent coverage. Other common forb species include bunchberry, five-leaf bramble, heart-leaf twayblade, rosey twisted-stalk and fern-leaf gold thread.

Grasses and sedges typically are present only as occasional plants.

Total **fern** coverage is typically about 8 percent. Deer fern and oak fern are the most common species.

SITE CHARACTERISTICS: This plant association occurs throughout the Forest on mountainslopes, hillslopes, lowlands and valleys. Elevation ranges from sea level to the subalpine zone where it is replaced on similar sites by the Mountain hemlock/Blueberry/Skunk cabbage association. It typically occurs on excessively wet forest soils with thick organic surface layers which are saturated with water for part of the growing season. Soils are usually deep and poorly drained. Nearly all soils are classified as Histosols or are mineral soils with a histic epipedon.

MANAGEMENT: This association is moderately productive. Estimated site index for Sitka spruce is about 75. Old growth stand heights are about 95 feet. Basal area is commonly about 265 sq ft per acre. The potential productivity of this association is limited by excessive soil wetness.

Natural regeneration is prolific. Young second growth stands are mostly western hemlock with lesser amounts of Sitka spruce. Alaska cedar regeneration is uncommon. Planting will normally be required to establish Alaska cedar as a significant component of second growth stands.

Wildlife habitat characteristics include a well developed stand structure. Snow intercept capability is moderate. Blueberry forage production is moderate. Production of persistent forbs is high. Because Alaska cedar is highly resistant to decay, dead trees often persist for many years as snags. Dead basal area averages about 100 sq ft per acre.

WESTERN HEMLOCK-ALASKA CEDAR/BLUEBERRY/SKUNK CABBAGE
PLOT DATA (n=7)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	55	75	62.9
W HEMLOCK	100	30	60	41.7
MT HEMLOCK	14	0	2	0.3
SITKA SPRUCE	57	0	7	3.0
ALASKA CEDAR	100	5	45	23.1
W REDCEDAR	42	0	8	2.1
SHORE PINE	--	--	--	----
UNDERSTORY	100	20	60	37.1
W HEMLOCK	100	15	60	32.9
MT HEMLOCK	42	0	12	2.0
SITKA SPRUCE	85	0	3	1.7
ALASKA CEDAR	85	0	10	3.0
W REDCEDAR	28	0	35	5.4
SHORE PINE	--	--	--	----
TALL SHRUBS	100	35	75	53.9
BLUEBERRY	100	35	65	42.9
RUSTY MENZIESIA	100	4	20	10.4
RED HUCKLEBERRY	85	0	5	1.6
DEVIL'S CLUB	57	0	7	1.7
SALMONBERRY	28	0	4	0.7
COPPERBUSH	--	--	--	----
LOW SHRUBS	14	0	1	0.1
FORBS	100	23	55	40.6
BUNCHBERRY	100	4	8	5.4
FIVE-LEAF BRAMBLE	100	4	12	6.3
ROSEY TWISTED-STALK	85	0	15	4.1
FERN-LEAF GOLDTHREAD	85	0	13	5.7
CLASPING TWISTED-STALK	71	0	1	0.7
SKUNK CABBAGE	100	5	25	13.6
TRIFOLIATE FOAMFLOWER	57	0	2	0.9
HEART-LEAVED TWAYBLADE	100	1	2	1.1
GRAMINOIDS				
SEDGES	14	0	1	0.1
GRASSES	--	--	--	----
FERNS	100	1	16	8.1
DEER FERN	71	0	7	3.1
OAK FERN	85	0	8	3.3
SHIELD FERN	28	0	1	0.3
LADY FERN	42	0	5	1.0
BEECH FERN	28	0	1	0.3

SITKA SPRUCE SERIES

The Sitka spruce series is characterized by mature forest stands dominated by Sitka spruce in the overstory. They typically occur on sites with re-occurring soil disturbance. On more stable sites, western hemlock eventually replaces the less shade-tolerant Sitka spruce following disturbance. The Sitka spruce series is found primarily on flood plains and alluvial fans where soils are periodically flooded. On other sites, disturbance is from windthrow, colluvial deposition, snow movement, or periodic deposition of windblown silt. In the Sitka spruce series, disturbance is sufficiently frequent and naturally occurring that Sitka spruce communities are the climax plant communities.

Sitka spruce is dominate or co-dominate with western hemlock in the overstory. The overstory contains a minimum of 15 percent Sitka spruce. Other tree species are usually absent. Sitka spruce is usually present in the understory,but is typically less abundant than western hemlock.

There are eight plant associations in the Sitka spruce series. They represent differences in the degree of disturbance and differences in soil drainage. They are listed according to the relative degree of disturbance.

SITKA SPRUCE/BLUEBERRY
Distinguished by lack of key indicator species other than blueberry. Occurs on relatively stable sites.

SITKA SPRUCE/BLUEBERRY/SKUNK CABBAGE
Distinguished by the abundance on skunk cabbage. Occurs on relatively stable wet sites.

SITKA SPRUCE/BLUEBERRY-DEVIL'S CLUB
Distinguished by the abundance of both blueberry and devil's club. Occurs on moderately disturbed sites.

SITKA SPRUCE/DEVIL'S CLUB/SKUNK CABBAGE
Distinguished by the presence of both devil's club and skunk cabbage. Occurs on moderately disturbed wet sites.

SITKA SPRUCE-MOUNTAIN HEMLOCK/BLUEBERRY-DEVIL'S CLUB
Distinguished by the presence of mountain hemlock in the overstory. Occurs only on high elevation colluvial mountain slopes.

SITKA SPRUCE/DEVIL'S CLUB
Distinguished by the abundance of devil's club and lack of blueberry and skunk cabbage. Occurs on frequently disturbed sites.

SITKA SPRUCE/DEVIL'S CLUB-ALDER
Distinguished by the presence of Alder in the tall shrub layer. Occurs on frequently and severely disturbed sites.

SITKA SPRUCE/DEVIL'S CLUB/ENCHANTERS NIGHTSHADE
Distinguished by the abundance of enchanters nightshade. Occurs only on hill slopes adjacent to the Stikine river delta that receive periodic deposition of windblown silt.

Picea sitchensis/Vaccinium spp
Sitka spruce/Blueberry
PISI/VACCI 310

VEGETATION: The **overstory** coverage is typically about 65 percent. Sitka spruce and western hemlock are the main components. Sitka spruce is typically about 40 percent coverage but is always greater than 15 percent coverage. Other species are typically absent, however mountain hemlock is present as a minor component in some mainland valleys.

Western hemlock dominates the **understory**. Sitka spruce is usually present in smaller amounts. Other species are typically absent.

The **tall shrub** layer is dominantly blueberry. It averages about 45 percent coverage. Rusty menziesia is often present as a minor component. Other species are typically absent. **Low shrubs** are absent.

The **forb** layer coverage is typically about 30 percent. Bunchberry and five-leaf bramble are the most common and abundant forbs. Rosey and clasping twisted-stalk are usually present. Deerberry, though often absent, is an important component of the forb layer in some stands.

Grasses and sedges are typically absent.

Fern coverage is typically about 10 percent. Shield fern is common. Lady fern and oak fern are usually found. Deer fern and northern beech fern are occasionally found.

This association is quite similar to the Western hemlock/Blueberry/Shield fern association from which it differs primarily in the abundance of Sitka spruce in the overstory.

SITE CHARACTERISTICS: This association is found throughout the Forest on stream terraces, floodplains, alluvial fans, and less frequently on colluvial footslopes. Soils are typically deep, well or moderately well drained, and have a relatively thin organic duff layer. Soil disturbance is less severe or more infrequent than on most other associations in this series. This is indicated by the abundance of blueberry and relatively well developed soil profiles.

MANAGEMENT: This is a highly productive association. Site index of Sitka spruce is estimated to be about 100. Stand heights are typically about 135 feet. Basal area is about 340 sq ft per acre.

Natural regeneration is prolific. Young second growth stands consist of western hemlock and Sitka spruce. Other species rarely occur. Disturbance of soil surface layer during harvest will favor the establishment of brush such as salmonberry, devil's club and alder.

Wildlife habitat characteristics include a well developed stand structure. Snow intercept capability is high. Blueberry forage production is moderate. Production of persistent forbs is high.

SITKA SPRUCE/BLUEBERRY
PLOT DATA (n=9)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	45	85	66.7
W HEMLOCK	77	0	60	26.7
MT HEMLOCK	11	0	15	1.7
SITKA SPRUCE	100	20	70	41.7
ALASKA CEDAR	--	--	--	----
W REDCEDAR	11	0	1	0.1
SHORE PINE	--	--	--	----
RED ALDER	11	0	3	0.3
UNDERSTORY	100	3	40	22.6
W HEMLOCK	100	3	40	20.4
MT HEMLOCK	44	0	2	0.6
SITKA SPRUCE	77	0	6	2.2
ALASKA CEDAR	--	--	--	----
W REDCEDAR	--	--	--	----
SHORE PINE	--	--	--	----
RED ALDER	11	0	3	0.3
TALL SHRUBS	100	7	82	43.9
BLUEBERRY	100	5	80	40.6
RUSTY MENZIESIA	66	0	7	1.8
RED HUCKLEBERRY	22	0	5	0.7
DEVIL'S CLUB	66	0	5	1.1
SALMONBERRY	11	0	1	0.1
SITKA ALDER	--	--	--	----
LOW SHRUBS	--	--	--	----
FORBS	100	8	62	31.7
BUNCHBERRY	88	0	25	8.6
FIVE-LEAF BRAMBLE	100	3	25	10.7
ROSEY TWISTED-STALK	77	0	15	4.0
FERN-LEAF GOLDTHREAD	11	0	4	0.4
CLASPING TWISTED-STALK	77	0	1	0.8
SKUNK CABBAGE	55	0	5	1.1
TRIFOLIATE FOAMFLOWER	33	0	5	0.9
HEART-LEAVED TWAYBLADE	33	0	2	0.4
DEERBERRY	33	0	15	1.9
GRAMINOIDS				
SEDGES	--	--	--	----
GRASSES	--	--	--	----
FERNS	100	2	28	9.8
DEER FERN	22	0	1	0.2
OAK FERN	66	0	20	4.0
SHIELD FERN	100	1	6	3.0
LADY FERN	55	0	5	1.3
BEECH FERN	33	0	10	1.3

Picea sitchensis/Vaccinium spp-Oplopanax horridum
Sitka spruce/Blueberry-Devil's club
PISI/VACCI-OPHO 320

VEGETATION: The **overstory** coverage is typically about 60 percent. Sitka spruce and western hemlock are the main components. Sitka spruce is typically more abundant and taller than western hemlock. Other species are typically absent; however, mountain hemlock is present as a minor component in some mainland valleys. Overstory spruce are typically tall, large diameter, widely spaced, dominant trees.

The **understory**, typically about 25 percent coverage, is composed of Sitka spruce and western hemlock. Western hemlock is usually more abundant than Sitka spruce. Other species are typically absent.

The **tall shrub** layer, typically about 70 percent coverage, consist of both blueberry and devil's club. Salmonberry is often present as a minor component. Rusty menziesia is present in some stands. Other species are uncommon. **Low shrubs** are absent.

The **forb** layer coverage is typically about 35 percent. Bunchberry, five-leaf bramble, rosey and clasping twisted-stalk and trifoliate foamflower are the most abundant. Skunk cabbage, if present, is restricted to wet microsites and never abundant. Enchanter's nightshade and fern-leaf goldthread may be present. Deerberry, though often absent, is an important component of the forb layer in some stands.

Grasses and sedges are typically absent.

Fern cover is typically about 25 percent. Shield fern, oak fern and lady fern are the most abundant.

SITE CHARACTERISTICS: This association is found throughout the Forest on floodplains, alluvial fans, and less frequently on colluvial footslopes. Soils are typically deep, well or moderately well drained, and have thin organic duff layers. Soil disturbance, usually by flooding, is not severe but relatively frequent. This is indicated by the abundance of both devil's club and blueberry and moderately well developed soil profiles.

MANAGEMENT: This association is highly productive. Site index of Sitka spruce is estimated to be about 100. Stand heights are typically about 170 feet. Basal area is about 360 sq ft per acre.

Natural regeneration is prolific. Young second growth stands consist of western hemlock and Sitka spruce. Other species rarely occur. The thin organic soil surface layer are easily disturbed during harvest. Exposure of mineral subsurface layers will favor the establishment of brush such as salmonberry, devil's club and alder.

Wildlife habitat characteristics include a well developed stand structure. Snow intercept capability is moderate. Blueberry forage production is moderate. Production of persistent forbs is high.

SITKA SPRUCE/BLUEBERRY-DEVIL'S CLUB
PLOT DATA (n=12)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	45	90	62.1
W HEMLOCK	91	0	45	27.5
MT HEMLOCK	16	0	7	0.7
SITKA SPRUCE	100	20	85	41.2
ALASKA CEDAR	--	--	--	----
W REDCEDAR	--	--	--	----
SHORE PINE	--	--	--	----
RED ALDER	--	--	--	----
UNDERSTORY	100	5	45	22.8
W HEMLOCK	100	4	40	19.5
MT HEMLOCK	16	0	3	0.3
SITKA SPRUCE	100	1	15	3.3
ALASKA CEDAR	--	--	--	----
W REDCEDAR	--	--	--	----
RED ALDER	--	--	--	----
TALL SHRUBS	100	40	104	69.1
BLUEBERRY	100	25	65	39.6
RUSTY MENZIESIA	50	0	2	0.8
RED HUCKLEBERRY	8	0	1	0.1
DEVIL'S CLUB	100	6	70	28.8
SALMONBERRY	83	0	10	3.4
SITKA ALDER	8	0	2	0.2
RED ELDERBERRY	8	0	1	0.1
LOW SHRUBS	--	--	--	----
FORBS	100	22	45	33.7
BUNCHBERRY	100	1	8	4.6
FIVE-LEAF BRAMBLE	100	4	15	9.4
ROSEY TWISTED-STALK	100	1	9	4.1
FERN-LEAF GOLDTHREAD	58	0	12	3.4
CLASPING TWISTED-STALK	100	1	6	1.8
SKUNK CABBAGE	41	0	8	1.5
TRIFOLIATE FOAMFLOWER	100	2	15	6.1
HEART-LEAVED TWAYBLADE	16	0	1	0.2
ENCHANTER'S NIGHTSHADE	25	0	4	0.7
DEERBERRY	25	0	12	1.3
GRAMINOIDS	--	--	--	----
SEDGES	--	--	--	----
GRASSES	16	0	1	0.2
FERNS	100	10	55	23.7
DEER FERN	50	0	3	0.8
OAK FERN	100	1	30	9.8
SHIELD FERN	100	1	20	7.0
LADY FERN	91	0	25	7.4
BEECH FERN	41	0	3	0.7

Picea sitchensis/Oplopanax horridum
Sitka spruce/Devil's club
PISI/OPHO 330

VEGETATION: The **overstory** coverage is typically about 65 percent. Sitka spruce is the main component. Western hemlock is usually present as a codominant. Dominant Sitka spruce are typically large diameter, widely spaced trees, that are 20 to 40 feet taller than western hemlock. Other species are typically absent, however mountain hemlock is present as a minor component in some mainland valleys.
The **understory**, typically about 15 percent coverage, is composed of western hemlock and Sitka spruce. Sitka spruce may be absent in some stands. Other species are typically absent.
The **tall shrub** layer, typically about 70 percent coverage, consist primarily of devil's club. Salmonberry and blueberry are usually present but are less abundant than devil's club. Rusty menziesia is present in some stands. Other species are uncommon. **Low shrubs** are absent.
This association has a wide variety and abundance of **forbs**. Total coverage is typically about 35 percent. Rosey twisted-stalk, trifoliate foamflower, and enchanter's nightshade are usually present. Any of these species, along with deerberry, may be present at low levels or may be present at 20 to 50 coverage. Five-leaf bramble is usually present. Bunchbeberry, stream violet and wintergreen are often present, but poorly represented. Skunk cabbage is usually absent, but when present is restricted to wet microsites.
Grasses and sedges are present in some stands but are never plentiful.
Ferns are abundant with total fern coverage typically about 35 percent. Shield fern, lady fern and oak fern are typically well represented. Beech fern and deer fern are present in some stands.
Based on vegetation alone, this association is not easily distinguished from the Sitka spruce/Devil's club/Enchanter's nightshade association found on sites that receive regular periodic accumulations of windblown silt. Using vegetation with site characteristics, the two are readily separated

SITE CHARACTERISTICS: This association is found throughout the Forest on floodplains, alluvial fans, and less frequently on colluvial footslopes. Soils are typically deep, well or moderately well drained, and have thin organic duff layers. Soil disturbance, usually by flooding, is not severe but is frequent. This results in an abundance of devil's club and general lack of blueberry in the understory. Flooding also restricts soil profile development.

MANAGEMENT: This association is highly productive. Site index of Sitka spruce is estimated to be about 100. Stand heights are typically about 175 feet. Basal area is about 375 sq ft per acre.

Natural regeneration of conifers is possible if measures are taken to control brush. The thin organic soil surface layers are easily disturbed during harvest. Exposure of mineral subsurface layers will favor the establishment of brush species such as salmonberry, devil's club and alder. When brush competition is not a factor, young second growth stands consist primarily of Sitka spruce with some western hemlock. A minor component of black cottonwood could occur in mainland stands.

Wildlife habitat characteristics include a well developed stand structure. Snow intercept capability is high. Blueberry forage production is very low. Production of persistent forbs is moderate.

SITKA SPRUCE/DEVIL'S CLUB
PLOT DATA (n=17)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	40	90	65.2
W HEMLOCK	76	0	40	13.9
MT HEMLOCK	5	0	2	0.1
SITKA SPRUCE	100	30	80	53.8
ALASKA CEDAR	--	--	--	----
W REDCEDAR	5	0	2	0.1
SHORE PINE	--	--	--	----
RED ALDER	5	0	2	0.1
UNDERSTORY	100	7	35	16.2
W HEMLOCK	100	1	35	13.5
MT HEMLOCK	11	0	6	0.5
SITKA SPRUCE	88	0	15	2.8
ALASKA CEDAR	--	--	--	----
TALL SHRUBS	100	19	96	68.5
BLUEBERRY	94	0	20	6.1
RUSTY MENZIESIA	41	0	5	0.8
RED HUCKLEBERRY	41	0	2	0.5
DEVIL'S CLUB	100	6	95	57.7
SALMONBERRY	64	0	40	7.2
SITKA ALDER	5	0	1	0.1
LOW SHRUBS	--	--	--	----
FORBS	100	15	71	35.8
BUNCHBERRY	70	0	6	1.4
FIVE-LEAF BRAMBLE	82	0	15	4.6
ROSEY TWISTED-STALK	88	0	20	3.8
FERN-LEAF GOLDTHREAD	41	0	3	0.6
CLASPING TWISTED-STALK	88	0	5	1.8
SKUNK CABBAGE	35	0	4	0.6
TRIFOLIATE FOAMFLOWER	100	1	40	8.8
HEART-LEAVED TWAYBLADE	5	0	1	0.1
WINTERGREEN (PRAL)	64	0	3	0.9
ENCHANTER'S NIGHTSHADE	76	0	50	6.3
DEERBERRY	47	0	55	4.7
STREAM VOIOLET	58	0	4	1.1
GRAMINOIDS				
SEDGES	--	--	--	----
GRASSES	29	0	1	0.3
FERNS	100	6	70	33.8
DEER FERN	23	0	1	0.2
OAK FERN	100	2	40	12.5
SHIELD FERN	100	1	20	8.1
LADY FERN	100	1	50	12.2
BEECH FERN	58	0	4	1.1

Picea sitchensis/Oplopanax horridum/Lysichitum americanum
Sitka spruce/Devil's club/Skunk cabbage
PISI/OPHO/LYAM 340

VEGETATION: The **overstory** coverage is typically about 55 percent and is comprised mostly of Sitka spruce with some western hemlock. An occasional red alder may be present but other species are typically absent.

The **understory** coverage is typically about 25 percent. Although Sitka spruce is generally more abundant than western hemlock in the overstory, western hemlock is the more dominate in the understory.

The **tall shrub** layer coverage averages 55 percent. Devil's club is the most common shrub. Blueberry is present and sometimes well represented. Rusty menziesia and salmonberry are often present but usually not well represented. Other shrubs are occasionally found but no **low shrubs** are present.

Skunk cabbage is present and abundant. Other **forbs** such as bunchberry, roseyand clasping twisted-stalk, and fern-leaf goldthread are usually present and may be abundant. Five-leaf bramble and trifoliate foamflower are present and usually well represented. Stream violet and enchanter's nightshade are usually found but may not be well represented.

Grasses and sedges are occasionally found but are poorly represented.

Ferns are usually abundant. Lady fern, spinulose sheild fern, and oak fern are the most common and abundant. Deer fern and beech fern are often present but generally poorly represented. Other ferns may occur.

SITE CHARACTERISTICS: This association is not extensive but is scattered throughout the Forest on floodplains and occasionally on the lower extend of alluvial fans or colluvial footslopes. It is most often found at elevations below 500 feet. Soils are poorly drained and are formed in deep alluvial or colluvial deposits. Microrelief is important on these sites. Most trees are rooted on slightly elevated microsites while skunk cabbage occurs on the low areas between. Flooding on these sites is quite frequent but not severe.

MANAGEMENT: This association is moderately productive. Site index of Sitka spruce is estimated to be about 85. Stand height averages about 155 feet and basal area averages about 305 sq ft per acre. Potential productivity of these sites is limited by excess soil wetness.

Natural regeneration is prolific. Young second growth stands consist of western hemlock and Sitka spruce. Other species rarely occur. Disturbance of soil surface layer during harvest will favor the establishment of brush such as salmonberry, devil's club and alder.

Wildlife habitat characteristics include a well developed stand structure. Snow intercept capability is moderate. Blueberry forage production is low. Production of persistent forbs is high.

SITKA SPRUCE/DEVIL'S CLUB/SKUNK CABBAGE
PLOT DATA (n=12)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	37	75	56.0
W HEMLOCK	100	5	40	17.1
MT HEMLOCK	--	--	--	----
SITKA SPRUCE	100	15	65	42.1
ALASKA CEDAR	8	0	1	0.1
W REDCEDAR	--	--	--	----
SHORE PINE	--	--	--	----
RED ALDER	16	0	5	0.6
UNDERSTORY	100	2	55	27.2
W HEMLOCK	100	1	40	20.4
MT HEMLOCK	--	--	--	----
SITKA SPRUCE	100	1	15	5.0
ALASKA CEDAR	--	--	--	----
RED ALDER	8	0	1	0.1
TALL SHRUBS	100	30	66	53.8
BLUEBERRY	100	3	30	13.2
RUSTY MENZIESIA	75	0	5	1.5
RED HUCKLEBERRY	--	--	--	----
DEVIL'S CLUB	100	6	50	35.9
SALMONBERRY	83	0	10	2.8
SITKA ALDER	8	0	3	0.3
STINK CURRENT	25	0	4	0.5
LOW SHRUBS	--	--	--	----
FORBS	100	40	119	70.6
BUNCHBERRY	91	0	15	4.5
FIVE-LEAF BRAMBLE	100	1	20	8.7
ROSEY TWISTED-STALK	91	0	15	4.6
FERN-LEAF GOLDTHREAD	66	0	8	3.2
CLASPING TWISTED-STALK	83	0	4	1.3
SKUNK CABBAGE	100	10	80	30.0
TRIFOLIATE FOAMFLOWER	100	3	25	11.2
HEART-LEAVED TWAYBLADE	16	0	2	0.3
WINTERGREEN (PRAL)	58	0	2	0.8
ENCHANTER'S NIGHTSHADE	58	0	8	2.1
STREAM VIOLET	66	0	6	1.8
DEERBERRY	16	0	8	0.8
GRAMINOIDS				
GRASSES	25	0	2	0.3
FERNS	100	6	57	20.6
DEER FERN	58	0	2	0.8
OAK FERN	91	0	15	5.1
SHIELD FERN	100	1	15	4.1
LADY FERN	100	1	35	8.8
BEECH FERN	75	0	5	1.3

Picea sitchensis/Oplopanx horridum-Alnus
Sitka spruce/Devil's club-Alder
PISI/OPHO-ALNUS 350

VEGETATION: The **overstory** is composed mostly of Sitka spruce and averages about 50 percent coverage. Western hemlock may be present but is poorly represented. Red alder is often present and well represented.

The **understory**, typically about 15 percent coverage, is primarily Sitka spruce and western hemlock. Red alder may also be present. Other species are typically absent.

The **tall shrub** layer is very dense, with coverage ranging from 80 to 95 percent. Sitka alder is usually present with devil's club. Blueberry, stink current, highbush cranberry and salmonberry are often present and at times very well represented. **Small shrubs** are lacking.

The **forb** layer typically averages 35 percent coverage. Clasping and rosey twisted stalk, trifoliate foamflower, five-leaf bramble, and enchanter's nightshade are the most common forbs. Often, one or more of these species will be abundant while others may be absent or poorly represented. Bunchberry is often present but is never abundant. Skunk cabbage may be found associated with overflow channels but it is never abundant.

Grasses and sedges are absent or rarely encountered.

Fern cover is well developed. Lady fern, oak fern and shield fern are most common. Deer fern and beech fern are absent.

SITE CHARACTERISTICS: This association is not extensive but is scattered throughout the Forest on active floodplains. It most often occurs at elevations below 500 feet along large mainland valleys immediately adjacent to large channels. Soils are typically well or moderately well drained with little or no surface organic layers. Disturbance by flooding on these sites is both frequent and severe.

MANAGEMENT: This association is highly productive though limited somewhat by low stocking. Old growth stand heights average about 145 feet and basal area average about 240 sq ft per acre.

Conifer regeneration on these sites is difficult. Severe brush competition and physical damage to seedlings from flooding can be expected.

Wildlife habitat characteristics include a rather sparse overstory consisting of widely spaced large trees. Understory trees are also not plentiful. Snow intercept capability is moderate. Blueberry forage production is very low. Production of persistent forbs is also low.

SITKA SPRUCE/DEVIL'S CLUB-ALDER
PLOT DATA (n=4)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	45	55	51.2
W HEMLOCK	25	0	5	1.3
MT HEMLOCK	--	--	--	----
SITKA SPRUCE	100	40	50	45.0
ALASKA CEDAR	--	--	--	----
W REDCEDAR	--	--	--	----
RED ALDER	50	0	30	10.0
UNDERSTORY	100	2	20	14.0
W HEMLOCK	100	1	20	7.5
MT HEMLOCK	--	--	--	----
SITKA SPRUCE	100	1	15	5.8
ALASKA CEDAR	--	--	--	----
RED ALDER	25	0	4	1.0
TALL SHRUBS	100	80	95	86.2
BLUEBERRY	75	0	40	14.7
RUSTY MENZIESIA	25	0	1	0.3
RED HUCKLEBERRY	--	--	--	----
DEVIL'S CLUB	100	35	70	48.7
SALMONBERRY	50	0	25	8.0
SITKA ALDER	75	0	30	17.5
RED ELDERBERRY	50	0	15	4.0
STINK CURRENT	50	0	22	8.5
RED OSIER DOGWOOD	25	0	20	5.0
LOW SHRUBS	--	--	--	----
FORBS	100	27	40	34.7
BUNCHBERRY	75	0	2	1.3
FIVE-LEAF BRAMBLE	75	0	10	6.5
ROSEY TWISTED-STALK	75	0	12	5.8
FERN-LEAF GOLDTHREAD	--	--	--	----
CLASPING TWISTED-STALK	100	4	15	6.8
SKUNK CABBAGE	50	0	2	0.8
TRIFOLIATE FOAMFLOWER	100	5	7	6.3
HEART-LEAVED TWAYBLADE	--	--	--	----
WINTERGREEN (PYSE)	25	0	1	0.3
ENCHANTER'S NIGHTSHADE	75	0	18	6.3
GRAMINOIDS				
GRASSES	25	0	1	0.3
FERNS	100	12	31	23.7
DEER FERN	--	--	--	----
OAK FERN	100	6	10	8.3
SHIELD FERN	75	0	8	3.0
LADY FERN	100	2	20	12.7
BEECH FERN	--	--	--	----

Picea sitchesis/Oplopanax horridum/Circaea alpinum
Sitka spruce/Devil's club/Enchanter's nightshade
PISI/OPHO/CIAL 355

VEGETATION: The **overstory**, typically about 60 percent coverage, consists of Sitka spruce and western hemlock with Sitka spruce being more common. Other species so not occur.
Understory tree coverage is typically about 10 percent. Western hemlock and Sitka spruce are found with western hemlock being more common.

Devil's club dominates the **tall shrub** layer which is typically about 60 percent coverage. Blueberry is absent or occurs as a few scattered plants. Salmonberry may be present and at times well represented. Other shrubs including rusty menziezia and red elderberry frequently occur as scattered plants. **Low shrubs** are absent.

The **forb** layer is typically about 25 percent coverage. Enchanter's nightshade, rosey and clasping twisted-stalk, and trifoliate foamflower are the most common forbs. Enchanter's nightshade is well distributed in the understory and occupies both low and raised microsites. Bunchberry and five-leaf bramble are usually not present but may occur sparingly on some sites. Skunk cabbage may occur in wet mircosites but is usually absent.

Grasses and sedges are lacking.
Ferns are very abundant. Total fern cover is typically about 60 percent. Lady fern, oak fern, northern beech fern, licorice fern, and spinulose sheild fern are the most common. Prickley sheild fern is often found but is poorly represented. Deer fern is typically absent.

SITE CHARACTERISTICS: This association is not extensive and is found only on hillslopes adjacent to the Stikine River delta. Windblown silt is deposited on these sites at least annually. Most deposition occurs during the winter months. Elevation is less than 500 feet. Soils are typically deep, well or moderately well drained, and have very thin organic duff layers. Soil surface layers have pH greater than 5.5. Soil profile development is minimal. Soils are classified as typic of lithic cryumbrepts.

MANAGEMENT: This association is moderately productive. Site index of Sitka spruce is estimated to be about 90. Stand heights are typically about 145 feet. Basal area is about 300 sq ft per acre.
Natural regeneration of conifers is possible if measures are taken to control brush. The thin organic soil surface layer are easily disturbed during harvest. Exposure of mineral subsurface layers will favor the establishment of brush such as salmonberry, devil's club and alder. When brush competition is not a factor, young second growth stands consist primarily of Sitka spruce with some western hemlock.

Wildlife habitat characteristics include a well developed canopy but relatively sparse understory. Snow intercept capability is moderate. Blueberry forage production is very low. Production of persistent forbs is very low.

It is not always possible to differentiate this association from the Sitka spruce/Devil's club association based on vegetation alone. This association is restricted, however, to sites adjacent to the Stikine River that receive annual accumulations of windblown silt.

SITKA SPRUCE/DEVIL'S CLUB/ENCHANTER'S NIGHTSHADE
PLOT DATA (n=6)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	50	65	58.3
W HEMLOCK	100	5	31	15.3
MT HEMLOCK	--	--	--	----
SITKA SPRUCE	100	28	60	43.8
ALASKA CEDAR	--	--	--	----
W REDCEDAR	--	--	--	----
SHORE PINE	--	--	--	----
RED ALDER	--	--	--	----
UNDERSTORY	100	5	15	11.2
W HEMLOCK	100	5	15	10.2
MT HEMLOCK	--	--	--	----
SITKA SPRUCE	83	0	5	2.2
ALASKA CEDAR	--	--	--	----
RED ALDER	--	--	--	----
TALL SHRUBS	100	35	90	62.5
BLUEBERRY	50	0	3	1.0
RUSTY MENZIESIA	66	0	2	0.8
RED HUCKLEBERRY	16	0	1	0.2
DEVIL'S CLUB	100	30	90	59.2
SALMONBERRY	33	0	10	1.8
TRAILING BLACK CURRENT	50	0	1	0.5
RED ELDERBERRY	66	0	2	0.8
LOW SHRUBS	--	--	--	----
FORBS	100	10	39	25.5
BUNCHBERRY	16	0	1	0.2
FIVE-LEAF BRAMBLE	16	0	1	0.2
ROSEY TWISTED-STALK	100	1	6	2.0
FERN-LEAF GOLDTHREAD	--	--	--	----
CLASPING TWISTED-STALK	83	0	3	1.2
SKUNK CABBAGE	16	0	1	0.2
TRIFOLIATE FOAMFLOWER	100	3	15	6.3
HEART-LEAVED TWAYBLADE	--	--	--	----
WINTERGREEN (PYSE)	16	0	1	0.2
WINTERGREEN (PYAL)	66	0	2	0.8
ENCHANTER'S NIGHTSHADE	100	1	20	12.0
DEERBERRY	50	0	3	0.8
GRAMINOIDS	--	--	--	----
FERNS	100	32	84	60.3
DEER FERN	--	--	--	----
OAK FERN	100	15	60	30.0
SHIELD FERN	83	0	15	6.2
LADY FERN	100	5	25	13.7
BEECH FERN	100	1	50	14.2
PRICKLY SHIELD FERN	50	0	2	0.7

Picea sitchensis/Vaccinium spp/Lysichitum americanum
Sitka spruce/Blueberry/Skunk cabbage
PISI/VACCI/LYAM 370

VEGETATION: The **overstory** coverage is typically about 65 percent and composed of Sitka spruce and western hemlock. Within a stand, either species may be more prevalent, but Sitka spruce coverage is always at least 15 percent. Occasionally, mountain hemlock and western redcedar are present.

The **understory** coverage is typically about 30 percent. Western hemlock is more common in the understory than Sitka spruce though both species are usually present. Western redcedar or mountain hemlock may occasionally be found.

The **tall shrub** layer coverage is typically about 50 percent and is dominated by blueberry. Devil's club and rusty menziesia are usually present. Blueberry and rusty menziesia are often restricted to raised micosites.

Low shrubs are absent.

Forb coverage is typically about 70 percent with skunk cabbage being the most common species. Bunchberry, five-leaf bramble, and fern-leaf goldthread are common and usually well represented. Rosey and clasping twisted-stalk and trifoliate foamflower are usually present.

Grasses and sedges are uncommon and poorly represented.

Fern coverage is typically about 6 percent. Spinulose shield fern, oak fern or lady fern are usually present but not abundant. Deer fern and beech fern are present in some stands.

SITE CHARACTERISTICS: This association is not extensive but is scattered throughout the Forest on floodplains and less frequently at the lower extend of alluvial fans or colluvial footslopes. It is most often found at elevations below 500 feet. Typically, soils are poorly drained and are formed in deep alluvial or colluvial deposits. Microrelief is common feature of these sites with most trees and blueberry rooted on slightly elevated microsites with somewhat better drainage. Skunk cabbage is occurs in the poorly drained depressions. Flooding on these sites is frequent but not severe.

MANAGEMENT: This association is moderately productive. Site index of Sitka spruce is estimated to be about 80. Stand height averages about 135 feet and basal area averages about 325 sq ft per acre. Potential productivity of these sites is limited by excessive soil wetness.

Natural regeneration is prolific. Young second growth stands consist of western hemlock and Sitka spruce. Other species rarely occur. Disturbance of soil surface layers during harvest will favor the establishment of brush species such as salmonberry, devil's club and alder.

Wildlife habitat characteristics include a well developed stand structure. Snow intercept capability is high. Blueberry forage production is moderate. Production of persistent forbs is high.

SITKA SPRUCE/BLUEBERRY/SKUNK CABBAGE
PLOT DATA (n=7)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	40	85	64.3
W HEMLOCK	100	1	65	38.0
MT HEMLOCK	14	0	5	0.7
SITKA SPRUCE	100	15	55	31.4
ALASKA CEDAR	--	--	--	----
W REDCEDAR	14	0	10	1.4
SHORE PINE	--	--	--	----
RED ALDER	--	--	--	----
UNDERSTORY	100	16	40	28.7
W HEMLOCK	100	7	40	26.0
MT HEMLOCK	14	0	1	0.1
SITKA SPRUCE	85	0	12	3.7
ALASKA CEDAR	--	--	--	----
RED ALDER	--	--	--	----
TALL SHRUBS	100	29	75	51.3
BLUEBERRY	100	25	65	40.0
RUSTY MENZIESIA	85	0	10	4.6
RED HUCKLEBERRY	28	0	10	1.6
DEVIL'S CLUB	71	0	25	6.6
SALMONBERRY	28	0	8	1.3
SITKA ALDER	14	0	1	0.1
LOW SHRUBS	--	--	--	----
FORBS	100	48	100	70.7
BUNCHBERRY	100	2	8	4.0
FIVE-LEAF BRAMBLE	100	4	15	8.9
ROSY TWISTED-STALK	71	0	5	1.6
FERN-LEAF GOLDTHREAD	100	1	12	5.0
CLASPING TWISTED-STALK	57	0	2	0.7
SKUNK CABBAGE	100	30	75	47.1
TRIFOLIATE FOAMFLOWER	71	0	6	2.4
HEART-LEAVED TWAYBLADE	14	0	1	0.1
WINTERGREEN (PYSE)	42	0	1	0.4
ENCHANTER'S NIGHTSHADE	14	0	2	0.3
DEERBERRY	14	0	1	0.1
GRAMINOIDS				
SEDGES	--	--	--	----
GRASSES	14	0	1	0.1
FERNS	100	1	14	5.6
DEER FERN	57	0	6	1.3
OAK FERN	71	0	5	2.0
SHIELD FERN	71	0	3	1.0
LADY FERN	71	0	3	1.0
BEECH FERN	28	0	2	0.4

Picea sitchensis-Tsuga mertensiana/Vaccunuim spp-Oplopanax horridum
Sitka spruce-Mountain hemlock/ Blueberry-Devil's club
PISI-TSME/VACCI-OPHO 395

VEGETATION: The **overstory** coverage is typically about 50 percent and is dominated by Sitka spruce and mountain hemlock. Sitka spruce usually have large diameters, but are shorter and more tapered than Sitka spruce found in the Sitka spruce/Blueberry-devil's club association. Mountain hemlock trees are typically smaller than neighboring Sitka spruce trees. Western hemlock may be present but is usually not well represented. Other species are lacking.

The **understory** coverage is typically about 30 percent. Sitka spruce, mountain hemlock, and western hemlock are found. Any species may be well represented but mountain hemlock is usually the most common. Other species are absent.

The **tall shrub** layer is typically about 50 percent coverage. Blueberry and devil's club are present and well represented. Salmonberry is common but less abundant. Rusty menziesia, stink currant, red elderberry, and Sitka mountain ash may be present in small amounts.

Low shrubs are lacking.

The **forb** coverage is typically about 50 percent. Rosey twisted-stalk is the most abundant forb. Trifoliate foamflower and five-leaf bramble are common and well represented. Clasping twisted-stalk, small twisted-stalk, false hellebore, and stream violet are present but less common.

Grasses and sedges are generally absent or occur as occasional plants.

Fern coverage is typically about 20 percent. Spinulose shield fern, oak fern and lady fern are common and well represented. Deer fern is occasionally found. Other ferns are uncommon or absent.

SITE CHARACTERISTICS: This association is not extensive but occurs on mountainslopes throughout the Forest. Sites are typically high elevation colluvial footslopes. Soils are well drained with a relatively thin organic surface layers. These sites have a moderate degree of disturbance by colluvial action or more commonly by the downslope movement of the snowpack. Brush slopes commonly occur adjacent to these sites where snow avalanche is more frequent or more severe.

MANAGEMENT: Although this association is seldom managed for timber production, productivity is thought to be high. Site index of Sitka spruce is estimated at about 90. Stand heights average about 152 feet and basal area is about 345 sq ft per acre.

Little is known about second growth management on these sites. It is assumed that brush competition, short growing seasons, and the potential physical damage to seedlings by snow movement may be a problem to establishment of conifers.

This association is not used as winter habitat by most species of wildlife due to the high elevation and persistent snow pack.

SITKA SPRUCE-MOUNTAIN HEMLOCK/BLUEBERRY-DEVIL'S CLUB
PLOT DATA (n=3)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	45	65	51.7
W HEMLOCK	33	0	2	0.7
MT HEMLOCK	100	7	35	22.3
SITKA SPRUCE	100	20	40	33.3
ALASKA CEDAR	--	--	--	----
UNDERSTORY	100	20	40	28.3
W HEMLOCK	100	1	20	8.7
MT HEMLOCK	100	10	15	13.3
SITKA SPRUCE	100	1	15	8.7
ALASKA CEDAR	--	--	--	----
TALL SHRUBS	100	35	70	51.7
BLUEBERRY	100	10	30	18.3
RUSTY MENZIESIA	66	0	1	0.7
RED HUCKLEBERRY	--	--	--	----
DEVIL'S CLUB	100	10	45	30.0
SALMONBERRY	100	2	15	9.7
SITKA ALDER	--	--	--	----
RED ELDERBERRY	66	0	1	0.7
STINK CURRENT	66	0	3	1.3
LOW SHRUBS	--	--	--	----
FORBS	100	36	75	50.0
BUNCHBERRY	33	0	4	1.3
FIVE-LEAF BRAMBLE	66	0	10	5.0
ROSEY TWISTED-STALK	100	10	20	15.0
FERN-LEAF GOLDTHREAD	66	0	15	5.3
CLASPING TWISTED-STALK	100	1	2	1.7
SKUNK CABBAGE	--	--	--	----
TRIFOLIATE FOAMFLOWER	100	5	8	6.3
HEART-LEAVED TWAYBLADE	66	0	2	1.0
WINTERGREEN (PRAL)	33	0	2	0.7
ENCHANTER'S NIGHTSHADE	33	0	1	0.3
STREAM VIOLET	100	1	2	1.3
SMALL TWISTED-STALK	100	3	4	3.3
FALSE HELLEBORE	100	1	4	2.0
MARSH MARIGOLD	33	0	10	3.3
GRAMINOIDS				
GRASSES	33	0	1	0.3
FERNS	100	18	26	22.3
DEER FERN	33	0	1	0.3
OAK FERN	100	2	12	6.0
SHIELD FERN	100	10	15	12.0
LADY FERN	100	3	5	4.0
BEECH FERN	--	--	--	----

MIXED CONIFER SERIES

The mixed-conifer series is generally comprised of "scrub" timber stands that contain several conifer species. In concept, these stands are on sites that are so poor, usually very wet, that no tree species has a competitive advantage over the other species.

Mountain hemlock, western hemlock, Sitka spruce, Alaska cedar, western redcedar, and shore pine make up the overstory and understory. The presence of mountain hemlock at low elevations is a relatively good indicator of the mixed-conifer series. It was present on 94 percent of the mixed-conifer plots sampled. With decreasing latitude, mountain hemlock generally becomes less abundant and western redcedar becomes more plentiful. Western redcedar is most abundant south of Sumner Straight.

Blueberry and rusty menziesia make up a typically dense tall shrub layer. Rusty menziesia is more plentiful in the mixed conifer series than in any other.

There are five associations within the mixed conifer series. Their distribution represents rather subtle differences in soil drainage as well as the northern limit of the range of salal.

MIXED CONIFER/BLUEBERRY

Distinguished by the lack of key indicator species other than blueberry. Found on the better drained sites of the series.

MIXED CONIFER/BLUEBERRY/SKUNK CABBAGE

Distinguished by the abundance of skunk cabbage and lack of salal. This is the most common association in the series.

MIXED CONIFER/BLUEBERRY/DEER CABBAGE

Distinguished by the abundance of deer cabbage and other wetland plants. This association is similar to the Mountain hemlock/Blueberry-Copperbush/Deer cabbage association found at higher elevations. These two associations cannot be distinguished by the presence or absence of any one plant. However, red huckleberry, mountain cranberry, and trifoliate goldthread are commonly found in this association but are absent in the mountain hemlock association.

MIXED CONIFER/BLUEBERRY-SALAL

Distinguished by the abundance of blueberry and salal and lacks of other key indicator plants.

MIXED CONIFER/SALAL/SKUNK CABBAGE

Distinguished by the presence of both skunk cabbage and salal.

Mixed-Conifer/Vaccinum spp
Mixed-Conifer/Blueberry
MXD-CON/VACCI 410

VEGETATION: The **overstory** coverage typically is about 45 percent. Mountain hemlock, western hemlock and Alaska cedar are the most common overstory tree species. Sitka spruce is often present. Western redcedar and shore pine are occasionally found .

Species composition and abundance in the **understory** are similar to the overstory although some differences is relative abundance exist.

The **tall shrub** layer is typically quite dense, averaging about 75 percent coverage. Blueberry and rusty menziesia are the most common and best represented species. Rusty menziesia is very plentiful in many stands. Red huckleberry may be present. Other tall shrubs are uncommon.

Low shrubs typical of bog communities are not a major part of this association. Although some are present, they average only 2 percent coverage.

Forb coverage typically is about 35 percent. Bunchberry, five-leaf bramble and fern-leaf goldthread are the most common and best represented species. American skunk cabbage is sometimes present but not well represented. Rosey twisted-stalk, heart-leaf twayblade, and bluebead are often present.

Sedges and grasses sometimes occur. Generally, they are uncommon and occur only on wetter microsites.

Fern coverage averages about 7 percent. Deer fern is the most common and is often well represented. Other ferns are uncommon, but bracken fern may be well represented on some sites.

SITE CHARACTERISTICS: This association occurs throughout the Forest on broken mountainslopes, hillslopes and most frequently on lowlands at elevations from sea level to about 2000 feet. This association occurs on two contrasting site conditions. Most frequently it is on poorly drained soils with thick organic layers, however it is sometimes found on well drained, very shallow and rocky soils. In either situation, this is generally a somewhat better drained site than the other mixed conifer associations.

MANAGEMENT: Productivity of this association is low. Site index of Sitka spruce is estimated to be about 55. Stand height averages 70 feet with live basal areas of 235 sq ft per acre. Although this is the most productive of the mixed conifer associations, it is only marginally capable of producing commercial wood products.

Very little of this association has been harvested, so second growth management characteristics are uncertain. Those few areas that are second growth have adequate natural regeneration of hemlock with some Sitka spruce. Growth rates in young stands appear to be quite slow and some severely stunted stands have been observed. This association provides important wildlife habitat for many species. Blueberry forage production and production of persistent forbs is high. Forage may be unavailable during winter months because of low snow intercept capability.

MIXED CONIFER/BLUEBERRY PLOT DATA (n=13)

		----vegetative cover----		
	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	25	65	45.4
W HEMLOCK	100	5	35	16.2
MT HEMLOCK	100	4	35	18.8
SITKA SPRUCE	46	0	20	3.9
ALASKA CEDAR	61	0	25	9.5
W REDCEDAR	7	0	10	0.8
SHORE PINE	7	0	15	1.2
UNDERSTORY	100	11	60	33.2
W HEMLOCK	100	2	40	16.8
MT HEMLOCK	92	0	25	9.5
SITKA SPRUCE	84	0	7	2.3
ALASKA CEDAR	53	0	35	5.3
W REDCEDAR	7	0	4	0.3
SHORE PINE	7	0	20	1.5
TALL SHRUBS	100	20	95	73.1
BLUEBERRY	100	15	90	55.8
RUSTY MENZIESIA	92	0	55	17.2
RED HUCKLEBERRY	38	0	10	2.1
DEVIL'S CLUB	15	0	3	0.3
SALAL	--	--	--	----
LOW SHRUBS	38	0	13	1.8
MOUNTAIN CRANBERRY	30	0	10	1.1
LABRADOR TEA	23	0	2	0.3
CROWBERRY	23	0	1	0.2
FORBS	100	19	58	36.2
BUNCHBERRY	100	1	30	8.1
FIVE-LEAF BRAMBLE	100	1	25	7.5
ROSEY TWISTED-STALK	76	0	7	2.6
FERN-LEAF GOLDTHREAD	92	0	15	5.8
SKUNK CABBAGE	84	0	10	2.8
TRIFOLIATE FOAMFLOWER	30	0	2	0.5
HEART-LEAVED TWAYBLADE	69	0	2	0.8
DEER CABBAGE	46	0	2	0.8
MARSH MARIGOLD	15	0	6	0.5
BLUEBEAD	61	0	6	1.7
GRAMINOIDS				
SEDGES	23	0	5	0.6
FERNS	92	0	17	6.7
DEER FERN	61	0	15	2.2
OAK FERN	23	0	2	0.4
SHIELD FERN	30	0	2	0.4
LADY FERN	15	0	2	0.2
BRACKEN FERN	30	0	15	2.1

Mixed-conifer/Vaccinium spp/Lysichitum americanum
Mixed-conifer/Blueberry/Skunk cabbage
MXD-CON/VACCI/LYAM 420

VEGETATION: The **overstory** coverage typically is about 45 percent. Mountain hemlock, western hemlock Sitka spruce and Alaska cedar are the most common overstory tree species. Western redcedar and shore pine are also present in some stands.

Species composition and frequency in the **understory** is similar to the overstory, although Alaska cedar is somewhat less abundant relative to the other species.

The **tall shrub** layer is typically quite dense, averaging about 65 percent coverage. Blueberry and rusty menziesia are the most common and best represented species. Rusty menziesia is very plentiful in many stands. Red huckleberry is often present. Other tall shrubs are uncommon.

Low shrubs typical of bog communities are not a major part of this association. Although present in some stands, they average only one percent coverage.

Forb coverage is typically about 55 percent. Skunk cabbage, bunchberry, five-leaf bramble, and fern-leaf goldthread are the most common and well represented species. Skunk cabbage averages about 25 percent and is a key indicator plant in this association. Rosey twisted-stalk and heart-leaf twayblade often occur.

Sedges and grasses are often present as a minor component of some stands.

Ferns average about 4 percent coverage. Deer fern is the most commonly found and is sometimes well represented. Other fern occur infrequently.

SITE CHARACTERISTICS: This association is the most common and wide-spread of the mixed conifer series. It occurs throughout the Forest on broken mountainslopes, hillslopes and most frequently on lowlands at elevations from sea level to about 2000 feet. This association always occurs on excessively wet forest sites. Soils are deep and are poorly or very poorly drained. Most soils are classified as Histosols or have histic epipedons.

MANAGEMENT: Productivity of this association is very low. Site index of Sitka spruce is estimated to be less than 50. Stand height averages 74 feet with live basal areas of 255 sq ft per acre. This association is not considered capable of producing commercial wood products. Potential productivity of this association is limited by excessively wet soil conditions.

Very little of this association has been harvested, so second growth management management characteristics are uncertain. Those few areas that are second growth have adequate natural regeneration of hemlock with some Sitka spruce. Growth rates in young stands appear to be quite slow and some severely stunted stands have been observed.

This association provides important wildlife habitat for many species. Blueberry forage production and the production of persistent forbs is high. Forage may be unavailable during winter months because of moderate snow intercept capability.

MIXED CONIFER/BLUEBERRY/SKUNK CABBAGE PLOT DATA (N=32)

		----vegetative cover----		
	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	25	90	50.4
W HEMLOCK	100	1	60	19.9
MT HEMLOCK	96	0	30	11.2
SITKA SPRUCE	84	0	19	4.8
ALASKA CEDAR	81	0	40	12.8
W REDCEDAR	28	0	60	6.4
SHORE PINE	9	0	15	0.8
UNDERSTORY	100	9	65	37.1
W HEMLOCK	100	2	40	18.4
MT HEMLOCK	84	0	30	9.8
SITKA SPRUCE	96	0	20	3.5
ALASKA CEDAR	75	0	25	5.2
W REDCEDAR	31	0	16	1.9
SHORE PINE	15	0	2	0.2
TALL SHRUBS	100	20	90	64.1
BLUEBERRY	100	10	85	50.6
RUSTY MENZIESIA	96	0	60	11.9
RED HUCKLEBERRY	50	0	10	1.3
SALMONBERRY	37	0	6	0.6
SALAL	3	0	5	0.2
LOW SHRUBS	37	0	10	1.7
MOUNTAIN CRANBERRY	28	0	5	0.8
DWARF BLUEBERRY	18	0	3	0.3
LABRADOR TEA	12	0	2	0.2
FORBS	100	11	98	54.9
BUNCHBERRY	100	1	15	7.5
FIVE-LEAF BRAMBLE	96	0	20	5.6
ROSEY TWISTED-STALK	96	0	15	3.8
FERN-LEAF GOLDTHREAD	100	1	15	6.5
CLASPING TWISTED-STALK	56	0	4	0.9
SKUNK CABBAGE	100	5	60	24.6
TRIFOLIATE FOAMFLOWER	37	0	10	1.0
HEART-LEAVED TWAYBLADE	87	0	2	0.9
DEER CABBAGE	37	0	10	1.6
MARSH MARIGOLD	15	0	20	1.0
GRAMINOIDS				
SEDGES	59	0	13	2.2
GRASSES	21	0	34	1.3
FERNS	81	0	31	3.9
DEER FERN	71	0	8	1.9
OAK FERN	34	0	10	0.8
SHIELD FERN	25	0	4	0.3
LADY FERN	31	0	6	0.5
BRACKEN FERN	3	0	1	0.1

Mixed-conifer/Vaccinium spp/Fauria crista-galli
Mixed-conifer/Blueberry/Deer cabbage
MXD-CON/VACCI/FACR 430

VEGETATION: The **overstory** coverage typically is about 40 percent and characterized by numerous canopy openings. Alaska cedar is typically the most common tree and it along with mountain hemlock and western hemlock account for most of the overstory cover. Sitka spruce and shore pine are often present as is western redcedar within its range.

Alaska cedar is the most common **understory** tree species. It is often present in a prostrate shrub-like form. The other species are present in the understory at about the same level as they were present in the overstory.

The **tall shrub** layer averages about 45 percent coverage. It is dominated by blueberry and rusty menziesia. It is generally interspersed with low shrubs, forbs, grasses and sedges. Red huckleberry is often present. Salmonberry and devil's club may be present but are never common. Copper bush is present on about one third of the sites and is well represented in some stands.
The **low shrub** layer is an important component of this association. Dwarf blueberry, mountain cranberry, and Labrador tea are the most common species. Crowberry and bog laurel are often found.

Forb coverage is typically about 50 percent. Deer cabbage is the most abundant forb, and is a key indicator species in this association. On some sites deer cabbage grows with or is replaced by or marsh marigold. Bunchberry, fern-leaf goldthread and skunk cabbage are usually present and well represented. Other forbs associated with bog communities are usually present.

Grasses and sedges occur in most stands. Carex anthoxanthea is the most common species but several other species include many-flower sedge and Sitka sedge are present. Grasses and sedges are usually found in small patches occupying the wetter microsites.

Fern coverage averages about 4 percent. Deer fern is the most common. Other ferns may be present but generally are poorly represented.

SITE CHARACTERISTICS: This association occurs throughout the Forest on broken mountainslopes, hillslopes and most frequently on lowlands at elevations from sea level to about 2000 feet. This association always occurs on excessively wet forest sites. It is perhaps the wettest association in the mixed conifer series and is often located adjacent to muskegs. Soils are deep and are poorly or very poorly drained. Most soils are classified as Histosols or have histic epipedons.

MANAGEMENT: Productivity of this association is very low. Site index of Sitka spruce is estimated to be less than 50. Stand height averages 58 feet with basal areas of 163 sq ft per acre. This association is not considered capable of producing commercial wood products. Potential productivity of this association is limited by excessively wet soil conditions. Very little of this association has been harvested, so second growth management management characteristics are uncertain. This association provides important wildlife habitat for many species. Blueberry forage production is moderate, and the production of persistent forbs is low. Forage may be unavailable during winter months because of low snow intercept capability.

MIXED CONIFER/BLUEBERRY/DEER CABBAGE PLOT DATA (n=12)

		----vegetaitve cover----		
	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	25	50	38.3
W HEMLOCK	91	0	40	7.9
MT HEMLOCK	100	4	15	9.5
SITKA SPRUCE	50	0	7	2.1
ALASKA CEDAR	100	6	30	18.0
W REDCEDAR	8	0	1	0.1
SHORE PINE	50	0	10	3.4
UNDERSTORY	100	20	65	38.6
W HEMLOCK	100	2	25	12.3
MT HEMLOCK	100	4	25	11.1
SITKA SPRUCE	83	0	5	2.6
ALASKA CEDAR	100	1	40	15.2
W REDCEDAR	16	0	2	0.3
SHORE PINE	50	0	8	1.4
TALL SRUBS	100	12	78	44.6
BLUEBERRY	100	3	70	35.1
RUSTY MENZIESIA	100	3	25	9.8
RED HUCKLEBERRY	58	0	2	0.8
SALAL	--	--	--	----
LOW SHRUBS	83	0	67	15.2
MOUNTAIN CRANBERRY	66	0	8	3.3
DWARF BLUEBERRY	75	0	10	2.9
LABRADOR TEA	66	0	10	2.4
CROWBERRY	50	0	6	1.7
BOG LAUREL	50	0	8	1.3
FORBS	100	25	72	49.4
BUNCHBERRY	100	1	10	5.8
FIVE-LEAF BRAMBLE	66	0	10	2.5
ROSEY TWISTED-STALK	66	0	3	0.8
FERN-LEAF GOLDTHREAD	100	1	12	4.8
SKUNK CABBAGE	83	0	10	4.4
TRIFOLIATE FOAMFLOWER	41	0	3	0.6
HEART-LEAVED TWAYBLADE	58	0	1	0.6
DEER CABBAGE	91	0	45	20.7
MARSH MARIGOLD	41	0	20	7.3
GRAMINOIDS				
SEDGES	91	0	40	9.0
GRASSES	50	0	5	1.1
FERNS	91	0	11	4.2
DEER FERN	91	0	10	2.4
OAK FERN	16	0	7	0.7
LADY FERN	33	0	1	0.3
BEECH FERN	25	0	2	0.3
BRACKEN FERN	16	0	6	0.8

Mixed conifer/Vaccinium spp/Galtheria shallon
Mixed Conifer/Blueberry-Salal
MXD-CON/VACCI-GASH 460

VEGETATION: The **overstory** coverage is typically sparse, averaging about 40 percent. Mountain hemlock, western hemlock, western redcedar and Alaska cedar are the most common overstory trees. Sitka Spruce and shore pine may be present but not well represented.

Mountain hemlock and western redcedar are the most common species in the **understory**. Western hemlock, Alaska cedar, and shore pine are usually present. Sitka spruce may be present.

The **tall shrub** layer is dense, typically about 70 percent coverage. Salal and blueberry are the most common and best represented species. They form most of the tall shrub layer. Rusty Menziesia is common and generally well represented but less so than in other mixed-conifer associations. Red huckleberry is more common than in other plant associations.

Low shrubs are usually present and well represented. Dwarf blueberry is the most commonly found species but averages less than 2 percent coverage. Other species such as Labrador tea, crowberry, and bog laurel are often present and well represented.

Forb coverage averages about 23 percent. Bunchberry is the most commonly found and abundant forb. Fern leaf goldthread and skunk cabbage are present but not well represented. Heart-leaf twayblade, rosey twisted-stalk and twinflower are usually present. Deer cabbage may be present and well represented.

Grasses and sedges are not common.

Ferns are poorly represented. Deer fern is the most common species. Bracken fern may be present.

SITE CHARACTERISTICS: This association occurs on broken mountainslopes, hillslopes and most frequently on lowlands at elevations below 500 feet. It only occurs south of Sumner Strait, within the range of salal, on excessively wet forest sites. Soils are deep and are poorly or very poorly drained. Most soils are classified as Histosols or have histic epipedons.

MANAGEMENT: Productivity of this association is very low. Site index of Sitka spruce is estimated to be less than 50. Stand height averages 55 feet with basal areas of 220 sq ft per acre. This association is not considered capable of producing commercial wood products. Potential productivity is limited by excessively wet soil conditions.

Very little of this association has been harvested, so second growth management management characteristics are uncertain.

This association provides important wildlife habitat for many species. Blueberry forage production is moderate, and the production of persistent forbs is low. Forage may be unavailable during winter months because of low snow intercept capability.

MIXED CONIFER/BLUEBERRY-SALAL PLOT DATA (n=3)

		----vegetative cover----		
	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	15	35	28.3
W HEMLOCK	66	0	10	6.0
MT HEMLOCK	100	2	10	4.7
SITKA SPRUCE	33	0	2	0.7
ALASKA CEDAR	66	0	20	9.3
W REDCEDAR	100	2	20	9.0
SHORE PINE	33	0	6	2.0
UNDERSTORY	100	30	40	36.7
W HEMLOCK	66	0	20	10.7
MT HEMLOCK	100	1	15	8.7
SITKA SPRUCE	33	0	1	0.3
ALASKA CEDAR	66	0	12	4.3
W REDCEDAR	100	1	8	4.0
SHORE PINE	66	0	4	1.7
TALL SRUBS	100	61	74	68.0
BLUEBERRY	100	10	50	28.3
RUSTY MENZIESIA	100	4	7	5.7
RED HUCKLEBERRY	100	2	8	4.0
SALAL	100	15	45	30.0
LOW SHRUBS	100	1	24	9.3
MOUNTAIN CRANBERRY	33	0	4	1.3
DWARF BLUEBERRY	100	1	3	1.7
LABRADOR TEA	33	0	8	2.7
CROWBERRY	33	0	6	2.0
BOG LAUREL	33	0	3	1.0
FORBS	100	11	35	23.0
BUNCHBERRY	100	5	15	10.0
FIVE-LEAF BRAMBLE	33	0	3	1.0
ROSEY TWISTED-STALK	66	0	3	1.7
FERN-LEAF GOLDTHREAD	100	1	4	2.0
CLASPING TWISTED-STALK	33	0	1	0.3
SKUNK CABBAGE	100	1	1	1.0
TRIFOLIATE FOAMFLOWER	--	--	--	----
HEART-LEAVED TWAYBLADE	66	0	1	0.7
DEER CABBAGE	33	0	6	2.0
MARSH MARIGOLD	--	--	--	----
GRAMINOIDS				
SEDGES	--	--	--	----
GRASSES	33	0	1	1.0
FERNS	100	1	5	3.0
DEER FERN	100	1	4	2.0
BRACKEN FERN	66	0	2	1.0

Mixed-Conifer/Galtheria Shallon/Lysichitum americanum
Mixed-Conifer/Salal/Skunk Cabbage
MXD-CON/GASH/LYAM 470

VEGETATION: An open canopy is characteristic of this association. The **overstory** coverage is typically about 35 percent. Western hemlock and western redcedar are most common species. Alaska cedar, mountain hemlock, and Sitka spruce are usually present. Shore pine is present in some stands. This is the only mixed-conifer association where mountain hemlock was not present on all plots.

Western hemlock and western redcedar are the dominant tree species in the **understory**. The other species are often present but not well represented.

The open canopy allows formation of dense **tall shrub** layer with coverage that is typically about 80 percent. Salal, blueberry, and rusty menziesia are well represented. Red Huckleberry is present. Other tall shrubs are typically absent.

Low shrubs typical of bog communities are present, but not abundant, in most stands. Mountain cranberry is the most common species.

Forb coverage is typically about 40 percent. Skunk cabbage is abundant and is a key indicator in this association. Bunchberry is typically well represented. Heart-leaved twayblade is also present. Deerberry, five-leaf bramble, and fern-leaf goldthread are usually present but not well represented.

Sedges and grasses may be present as scattered plants or in small groups.

Fern coverage is typically about 6 percent. Bracken fern and deer fern are the most common.

SITE CHARACTERISTICS: This association occurs on broken mountainslopes, hillslopes and most frequently on lowlands at elevations from sea level to about 500 feet. It only occurs south of Sumner Strait within the range of salal. It is most plentiful on Etolin Island. It is always on excessively wet forest sites. Soils are deep and are poorly or very poorly drained. Most soils are classified as Histosols or have histic epipedons.

MANAGEMENT: Productivity of this association is very low. Site index of Sitka spruce is estimated to be less than 50. Stand height averages 64 feet with live basal areas of 213 sq ft per acre. This association is not considered capable of producing commercial wood products. Potential productivity of this association is limited by excessively wet soil conditions.

Very little of this association has been harvested, so second growth management management characteristics are uncertain.

This association provides important wildlife habitat for many species. Production of blueberry forage and persistent forbs is low. The forage that is produced may be unavailable during winter months due to the low snow intercept capability.

MIXED CONIFER/SALAL/SKUNK CABBAGE PLOT DATA (n=6)

		----vegetative cover----		
	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	30	45	34.2
W HEMLOCK	100	8	20	11.5
MT HEMLOCK	50	0	7	2.2
SITKA SPRUCE	50	0	1	0.5
ALASKA CEDAR	66	0	20	4.8
W REDCEDAR	100	6	30	16.8
SHORE PINE	33	0	15	3.3
UNDERSTORY	100	25	45	35.0
W HEMLOCK	100	25	35	27.5
MT HEMLOCK	50	0	16	3.8
SITKA SPRUCE	83	0	3	0.3
ALASKA CEDAR	50	0	6	2.5
W REDCEDAR	100	1	10	4.5
SHORE PINE	50	0	1	0.5
TALL SHRUBS	100	46	100	81.3
BLUEBERRY	100	1	40	18.5
RUSTY MENZIESIA	100	5	25	13.8
RED HUCKLEBERRY	100	1	8	2.8
SALAL	100	20	85	49.2
LOW SHRUBS	83	0	8	2.8
MOUNTAIN CRANBERRY	83	0	4	1.8
DWARF BLUEBERRY	16	0	1	0.2
LABRADOR TEA	16	0	2	0.3
CROWBERRY	16	0	1	0.2
BOG LAUREL	16	0	1	0.2
FORBS	100	24	53	39.5
BUNCHBERRY	100	4	15	9.2
FIVE-LEAF BRAMBLE	66	0	3	1.2
ROSEY TWISTED-STALK	16	0	1	0.2
FERN-LEAF GOLDTHREAD	66	0	2	1.0
CLASPING TWISTED-STALK	33	0	1	0.3
SKUNK CABBAGE	100	15	40	23.3
TRIFOLIATE FOAMFLOWER	--	--	--	----
HEART-LEAVED TWAYBLADE	100	1	1	1.0
DEER CABBAGE	33	0	2	0.5
MARSH MARIGOLD	16	0	1	0.2
GRAMINOIDS				
SEDGES	66	0	2	0.8
GRASSES	--	--	--	----
FERNS	100	2	15	6.0
DEER FERN	50	0	4	1.3
OAK FERN	--	--	--	----
LADY FERN	--	--	--	----
BRACKEN FERN	66	0	15	4.3

MOUNTAIN HEMLOCK SERIES

This series is comprised of subalpine forest communities. It is characterized by the presence of mountain hemlock in the overstory as a dominant or codominant species. Sitka spruce and Alaska cedar are often present. Western hemlock is a significant component of stands on lower elevation sites but is typically absent near timberline. Other species are typically absent.

Plants indicative of high elevations such as copperbush, Mertens cassiope, starry cassiope, mountain heather and luetkea are common in most associations. These species are increasingly more prevalent as elevation increases or snowpack persists. Conversely, species such as red huckleberry that are common at low elevations rarely occur.

Mountain hemlock series occurs throughout the Forest from 1300 to 3000 feet. Sites are cold with short growing seasons. Snowpack is usually deep and persists for most of the year.

Five plant associations are recognized within the mountain hemlock series. They represent differences in climate severity and to a lesser extent, differences in soil drainage.

MOUNTAIN HEMLOCK/BLUEBERRY

Distinguished by the lack of key indicator species other than blueberry. Represents relatively well-drained sites on a rather wide range of elevation and aspect within the series.

MOUNTAIN HEMLOCK/MERTENS CASSIOPE

Distinguished by the abundance of cassiope, mountain heather and/or leutkea. Represent a rather wide range of soil conditions and the most severe climatic conditions within the series.

MOUNTAIN HEMLOCK/BLUEBERRY-COPPERBUSH/DEER CABBAGE

Distinguished by presence of both copperbush and deer cabbage. Represents somewhat poorly to poorly drained sites at mid to high elevations within the series. This association is similar to the Mixed conifer/Blueberry/ Deer cabbage association. The two are distinguished primarily by elevation. They cannot be distinguished by the presence or absence of any one plant species.

MOUNTAIN HEMLOCK/BLUEBERRY/MARSH MARIGOLD

Distinguished by the abundance of marsh marigold and lack of other key indicator species. Represents moderately well to somewhat poorly drained sites at mid to high elevations within the series.

MOUNTAIN HEMLOCK/BLUEBERRY/SKUNK CABBAGE

Distinguished by the abundance of skunk cabbage. Represents wet, relatively low elevation sites within the series.

Tsuga mertensiana/Vaccinium spp
Mountain hemlock/Blueberry
TSME/VACCI 510

VEGETATION: The **overstory** typically averages about 60 percent coverage. Mountain hemlock is generally the most common overstory tree. Western hemlock is often present, especially at lower elevations, where in some stands it is the most common overstory tree. Sitka spruce is usually present at all elevations. Alaska cedar may be present and is often well represented.

The composition of the **understory** is similar to the overstory. Mountain hemlock, western hemlock and Sitka spruce are common with Sitka spruce less well represented. Alaska cedar is often present. Other species are lacking.

The **tall shrub** layer, typically about 45 percent coverage, is dominated by blueberry. Rusty menziesia is usually present but often not well represented. Salmonberry, copperbush and devil's club and other shrubs may be present. Red huckleberry is rarely found. **Low shrubs** characteristic of bog and alpine communities are absent.

Forbs are plentiful, typically about 60 percent coverage. Five-leaf bramble, rosey twisted-stalk, heart-leaved twayblade, fern-leaf goldthread, trifoliate foam flower, and bunchberry are the most common forbs. With the exception of heart-leaf twayblade, any of these species may be abundant on a given site. False hellebore and clasping twisted-stalk are often present but usually not well represented.

Grasses and sedges may be present but are poorly represented. Carex anthoxanthea is the species most commonly found.

Fern coverage is typically about 6 percent. Spinulose shield fern and deer fern are usually present. Oak fern, and lady fern are often found but not generally not well represented.

SITE CHARACTERISTICS: This association is scattered throughout the Forest on high elevation mountainslopes. Elevation ranges from about 1300 feet to the upper limit of forest stands, about 3000 feet. It typically occurs on shallow very stable forest soils that are well drained to somewhat poorly drained. Snow cover may persist until late spring but not as long as on other mountain hemlock associations.

MANAGEMENT: This moderately productive association is the most productive in the mountain hemlock series. Estimated site index for Sitka spruce is about 70. Stand heights averaged 91 feet with an average basal area of 357 sq ft per acre. The potential productivity of this association is limited by the short growing season.

Limited management activity has occurred on these sites, therefore little is known about second growth management. Owing to severe climatic conditions, it is anticipated that natural regeneration may be somewhat less prolific than at lower elevations. Seedlings may be damaged by deep snow packs and, on steep slopes, by the downslope movement of the snowpack.

This association is important summer range for many wildlife species but is seldom used during the winter months due to deep snow and cold temperatures.

MOUNTAIN HEMLOCK/BLUEBERRY PLOT DATA (n=15)

		----vegetative cover---		
	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	35	80	60.1
W HEMLOCK	66	0	45	10.9
MT HEMLOCK	100	5	67	40.8
SITKA SPRUCE	80	0	25	6.6
ALASKA CEDAR	33	0	20	3.1
W REDCEDAR	--	--	--	----
SHORE PINE	--	--	--	----
UNDERSTORY	100	5	40	20.9
W HEMLOCK	86	0	20	6.9
MT HEMLOCK	100	3	35	12.2
SITKA SPRUCE	86	0	5	1.7
ALASKA CEDAR	40	0	10	2.3
TALL SHRUBS	100	20	75	47.0
BLUEBERRY	100	15	70	42.3
RUSTY MENZIESIA	93	0	6	2.7
RED HUCKLEBERRY	6	0	4	0.3
DEVIL'S CLUB	46	0	10	1.3
SALMONBERRY	46	0	4	0.9
COPPERBUSH	6	0	2	0.1
SITKA MOUNTAIN ASH	13	0	1	0.1
SITKA ALDER	13	0	7	0.7
LOW SHRUBS	--	--	--	----
FORBS	100	9	64	36.5
BUNCHBERRY	66	0	9	2.4
FIVE-LEAF BRAMBLE	100	2	30	8.6
ROSEY TWISTED-STALK	93	0	45	14.0
FERN-LEAF GOLDTHREAD	80	0	10	4.0
CLASPING TWISTED-STALK	60	0	7	1.3
SKUNK CABBAGE	20	0	3	0.3
TRIFOLIATE FOAMFLOWER	73	0	5	1.5
HEART-LEAVED TWAYBLADE	93	0	3	1.3
DEER CABBAGE	26	0	2	0.3
MARSH MARIGOLD	6	0	1	0.1
FALSE HELEBORE	40	0	5	0.7
GRAMINOIDS				
SEDGES	20	0	2	0.3
GRASSES	13	0	1	0.1
FERNS	93	0	21	6.3
DEER FERN	73	0	7	2.1
OAK FERN	40	0	3	0.6
SHIELD FERN	80	0	20	3.0
LADY FERN	26	0	4	0.7
BEECH FERN	6	0	1	0.1

Tsuga mertensiana/Vaccinium ssp-Cassiope mertensiana
Mountain hemlock/Blueberry-Mertens cassiope
TSME/VACCI-CAME 530

VEGETATION: The **overstory** averages about 40 percent coverage. Mountain hemlock is the dominant overstory tree. Alaska cedar is present in most stands. Sitka spruce occurs in some stands. Western hemlock is rare.

Mountain hemlock is most common tree in the **understory**. Western hemlock and Sitka spruce are often present but poorly represented. Alaska cedar is often found and is usually well represented. Other species are typically absent.

The **tall shrub** layer, typically about 40 percent coverage, is dominated by blueberry. Rusty menziesia is usually present and may be well represented. Copperbush is well represented in many stands. Salmonberry, mountain ash and devil's club and other shrubs may be present. Red huckleberry is not found.

Low shrubs characteristic of alpine communities are an important component of this association. Collectively they average about 27 percent coverage. Mertens cassiope and/or mountain heather is present and well represented. Starry cassiope and leutkea usually occur and at times are common and well represented. Dwarf blueberry is often found and crowberry, bog blueberry, and bog laurel may be present.

Forbs are plentiful, typically about 45 percent coverage. Five-leaf bramble, rosey twisted-stalk, bunchberry, and fern-leaf goldthread are present and often well represented. Heart-leaved twayblade and small twisted-stalk usually occur. Clasping twisted-stalk and marsh marigold are present in some stands.

Grasses and sedges are common and well represented. Blackish sedge, cotton grass, and oat grass are the most common species.

Fern coverage averages about 5 percent. Deer fern is the only commonly found fern. Shield fern, oak fern, and lady fern are occasionally are found.

SITE CHARACTERISTICS: This association is scattered throughout the Forest on high elevation mountainslopes and ridgetops. Elevation ranges from about 1300 feet to the upper limit of forest stands, about 3000 feet. Soils conditions are quite variable, ranging from very shallow to deep, and moderately well drained to poorly drained. Distribution of these plant communities appears to be related more to climatic variables such as elevation, slope and aspect than to edaphic conditions. This association represents the coldest environment of any forested plant community.

MANAGEMENT: Productivity is very low. Estimated site index for Sitka spruce is less than 50. These sites are not considered commercial forest land. Stand heights averaged 60 feet with an average basal area of 247 sq ft per acre. The potential productivity of this association is severely limited by the short growing season and cold alpine climate.

No management activity has occurred on these sites, and none is anticipated because of the severe climatic conditions. This association is important summer range for many wildlife species but is seldom used during the winter months due to deep snow and cold temperatures.

MOUNTAIN HEMLOCK/BLUEBERRY-CASSIOPE
PLOT DATA (n=21)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	20	65	38.9
W HEMLOCK	9	0	6	0.4
MT HEMLOCK	100	7	50	25.3
SITKA SPRUCE	38	0	35	4.1
ALASKA CEDAR	61	0	30	10.6
UNDERSTORY	100	10	60	31.1
W HEMLOCK	61	0	15	2.1
MT HEMLOCK	100	1	60	16.5
SITKA SPRUCE	66	0	6	1.4
ALASKA CEDAR	66	0	35	12.6
SHORE PINE	9	0	2	0.1
TALL SHRUBS	100	4	75	39.3
BLUEBERRY	100	3	60	22.6
RUSTY MENZIESIA	90	0	20	3.8
SALMONBERRY	33	0	3	0.6
COPPERBUSH	66	0	40	11.2
SITKA MOUNTAIN ASH	47	0	4	0.9
SITKA ALDER	14	0	9	0.8
LOW SHRUBS	100	4	80	26.9
MERTIN'S CASSIOPE	80	0	65	12.0
STARRY CASSIOPE	66	0	20	2.6
MOUNTAIN HEATHER	61	0	30	5.3
LEUTKEA	57	0	8	2.0
CROWBERRY	38	0	15	1.9
DWARF BLUEBERRY	52	0	20	2.5
BOG LAUREL	28	0	10	1.0
BOG BLUEBERRY	23	0	2	0.3
FORBS	100	5	92	44.2
BUNCHBERRY	57	0	8	2.0
FIVE-LEAF BRAMBLE	95	0	7	3.0
ROSEY TWISTED-STALK	76	0	35	3.7
FERN-LEAF GOLDTHREAD	66	0	6	1.8
CLASPING TWISTED-STALK	33	0	50	2.9
HEART-LEAVED TWAYBLADE	76	0	3	1.0
DEER CABBAGE	85	0	60	22.1
MARSH MARIGOLD	19	0	35	2.0
GRAMINOIDS				
SEDGES	71	0	35	7.1
GRASSES	47	0	5	0.8
FERNS	95	0	18	5.0
DEER FERN	80	0	8	2.7
OAK FERN	19	0	5	0.4
SHIELD FERN	28	0	10	0.7
LADY FERN	28	0	3	0.4

Tsuga mertensiana/Vaccinium spp-Cladothamnus pyrolaeflorus/Fauria crista-galli
Mountain hemlock/Blueberry-Copperbush/Deer cabbage
TSME/VACCI-CLPY/FACR 540

VEGETATION: The **overstory** averages about 45 percent coverage. Mountain hemlock is the most common tree. Western hemlock is present in some stands at mid elevations but becomes less common as elevation increases. Sitka spruce is sometimes present. Alaska cedar is usually present and well represented.

Mountain hemlock and western hemlock are the most commonly found species in the **understory**. Sitka spruce is often present but is usually poorly represented. Alaska cedar is typically present and well represented. Other species are absent.

The **tall shrub** layer, typically about 60 percent coverage, is dominated by blueberry and copperbush. Rusty menziesia is usually present and well represented. Salmonberry, mountain ash and devil's club and other shrubs may be present. Red huckleberry is not found.
Low shrubs characteristic of bog and alpine communities are present in most stands. Mertens cassiope is the most common. Starry cassiope and crowberry are present in some stands.

Forbs are plentiful, typically about 40 percent coverage. Deer cabbage is always present and well represented and is a key indicator species on this association. Five-leaf bramble, rosey twisted-stalk, bunchberry, false hellebore and fern-leaf goldthread are present and well represented. Heart-leaved twayblade is also present. Skunk cabbage, and small twisted-stalk usually occur. Clasping twisted-stalk, marsh marigold and trifoliate foam flower frequently are present.

Grasses and sedges may occur but are generally not well represented. Carex anthoxanthea is the most common species. Many flowered sedge, blackish sedge, woodrush, cotton grass, mountain hairgrass and oat grass may be present.

Fern coverage averages about 8 percent. Deer fern is typically present. Other ferns are much less common but lady fern, spinulose shield fern and oak fern are often present.

SITE CHARACTERISTICS: This association is scattered throughout the Forest on high elevation mountainslopes, broad ridgetops and plateaus. Elevation ranges from about 1300 feet to the upper limit of forest stands, about 3000 feet. Soils are typically very stable, somewhat poorly or poorly drained, and are often shallow. Snow cover is thought to persist well into early summer, longer than on most other forest sites.

MANAGEMENT: Productivity is very low. Estimated site index for Sitka spruce is less than 50. These sites are not considered commercial forest land. Stand heights averaged 60 feet with an average basal area of 275 sq ft per acre. The potential productivity of this association is severely limited by the short growing season and excessively wet soil conditions.

No management activity has occurred on these sites, and none is anticipated due to the severe climatic conditions. This association is important summer range for many wildlife species but is seldom used during the winter months due to deep snow and cold temperatures.

MOUNTAIN HEMLOCK/BLUEBERRY-COPPERBUSH/DEER CABBAGE
PLOT DATA (n=7)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	30	65	45.7
W HEMLOCK	37	0	20	4.0
MT HEMLOCK	100	15	50	27.9
SITKA SPRUCE	37	0	15	2.4
ALASKA CEDAR	62	0	40	14.4
UNDERSTORY	100	8	70	38.7
W HEMLOCK	75	0	20	7.0
MT HEMLOCK	100	3	30	16.1
SITKA SPRUCE	50	0	5	1.4
ALASKA CEDAR	62	0	30	14.1
TALL SHRUBS	100	33	95	63.7
BLUEBERRY	100	20	70	47.1
RUSTY MENZIESIA	100	2	10	5.7
SALMONBERRY	37	0	2	0.4
COPPERBUSH	100	5	15	8.6
SITKA MOUNTAIN ASH	37	0	10	1.7
SITKA ALDER	25	0	4	0.9
LOW SHRUBS	75	0	15	5.3
MERTIN'S CASSIOPE	50	0	3	1.0
STARRY CASSIOPE	37	0	1	0.4
MOUNTAIN HEATHER	--	--	--	----
LEUTKEA	--	--	--	----
CROWBERRY	37	0	15	3.7
FORBS	100	21	58	38.7
BUNCHBERRY	100	1	7	3.7
FIVE-LEAF BRAMBLE	100	3	20	5.1
ROSEY TWISTED-STALK	100	1	25	5.9
FERN-LEAF GOLDTHREAD	75	0	8	4.1
CLASPING TWISTED-STALK	37	0	20	3.1
SKUNK CABBAGE	62	0	2	0.9
TRIFOLIATE FOAMFLOWER	50	0	2	0.7
HEART-LEAVED TWAYBLADE	62	0	4	1.3
DEER CABBAGE	87	0	30	11.0
MARSH MARIGOLD	37	0	10	1.6
FALSE HELLEBORE	87	0	2	1.0
GRAMINOIDS				
SEDGES	37	0	7	1.4
GRASSES	25	0	2	0.4
FERNS	100	1	20	6.7
DEER FERN	100	1	15	5.9
OAK FERN	50	0	5	1.0
SHIELD FERN	25	0	1	0.1
LADY FERN	37	0	1	0.3
BEECH FERN	12	0	1	0.1

Tsuga mertensiana/Vaccinium spp/Caltha biflora
Mountain hemlock/Blueberry/Marsh marigold
TSME/VACCI/CABI 570

VEGETATION: The **overstory** averages about 50 percent coverage. Mountain hemlock is the most common overstory tree. Western hemlock is often present. Sitka spruce is usually present even at high elevations. Alaska cedar may be present and well represented in some stands.

Mountain hemlock and western hemlock form most of the **understory**. Sitka spruce is usually present but poorly represented. Alaska cedar may be present but other species are typically absent.

The **tall shrub** layer, typically about 35 percent coverage, is dominated by blueberry. Rusty menziesia is usually present but usually not well represented. Salmonberry, copperbush and devil's club may be present. Red huckleberry is not found.

Low shrubs characteristic of bog and alpine communities are seldom found.

Forbs are plentiful, typically about 45 percent coverage. Marsh marigold is always present and well represented and is a key indicator for this association. Other common forbs include five-leaf bramble, rosey twisted-stalk, heart-leaved twagblade, fern-leaf goldthread, false hellebore and trifoliate foamflower. Bunchberry, clasping twisted-stalk, and stream violet are often found. Deer cabbage is usually absent.

Grasses and sedges are often present though generally not well represented. No one species is common to the association. Among those found are Carex anthoxathia, many-flowered sedge, blackish sedge, woodrush, Sitka sedge and mountain hairgrass.

Fern coverage is typically about 10 percent. Deer fern is usually present. Oak fern, shield fern, and lady fern are often found but are not usually well represented.

SITE CHARACTERISTICS: This association is scattered throughout the Forest on high elevation mountainslopes. Elevation ranges from about 1300 feet to the upper limit of forest stands, about 3000 feet. It typically occurs on very stable forest soils that are moderately well to somewhat poorly drained. Snow cover may persist until late spring but not as long as on some mountain hemlock associations.

MANAGEMENT: Productivity is low. Estimated site index for Sitka spruce is about 55. Stand heights averaged 92 feet with an average basal area of 302 sq ft per acre. The potential productivity of this association is limited by the short growing season.

Limited management activity has occurred on these sites, therefore little is known about second growth management. Owing to severe climatic conditions, it is anticipated that natural regeneration may be somewhat less prolific than at lower elevations. Seedlings may be damaged by deep snow packs and, on steep slopes, by the downslope movement of the snowpack. This association is important summer range for many wildlife species but is seldom used during the winter months due to deep snow and cold temperatures.

MOUNTAIN HEMLOCK/BLUEBERRY/MARSH MARIGOLD
PLOT DATA (n=11)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	20	75	48.2
W HEMLOCK	63	0	15	4.5
MT HEMLOCK	100	15	50	35.0
SITKA SPRUCE	81	0	15	4.4
ALASKA CEDAR	27	0	45	7.5
W REDCEDAR	--	--	--	----
SHORE PINE	--	--	--	----
UNDERSTORY	100	6	45	21.3
W HEMLOCK	100	1	25	5.9
MT HEMLOCK	100	2	15	11.6
SITKA SPRUCE	90	0	7	1.7
ALASKA CEDAR	36	0	20	3.1
W REDCEDAR	18	0	2	0.4
SHORE PINE	--	--	--	----
TALL SHRUBS	100	14	75	37.1
BLUEBERRY	100	10	70	33.4
RUSTY MENZIESIA	90	0	7	1.8
RED HUCKLEBERRY	--	--	--	----
DEVIL'S CLUB	36	0	12	1.5
SALMONBERRY	45	0	6	0.9
COPPERBUSH	27	0	3	0.5
SITKA MOUNTAIN ASH	--	--	--	----
LOW SHRUBS	9	0	1	0.1
FORBS	100	19	79	45.4
BUNCHBERRY	81	0	6	2.0
FIVE-LEAF BRAMBLE	100	2	20	7.9
ROSEY TWISTED-STALK	90	0	20	7.3
FERN-LEAF GOLDTHREAD	90	0	15	4.5
CLASPING TWISTED-STALK	45	0	3	0.7
SKUNK CABBAGE	45	0	1	0.5
TRIFOLIATE FOAMFLOWER	90	0	20	3.3
HEART-LEAVED TWAYBLADE	90	0	3	1.4
DEER CABBAGE	9	0	15	1.4
MARSH MARIGOLD	100	4	40	11.1
FALSE HELLEBORE	90	0	5	1.7
GRAMINOIDS				
SEDGES	54	0	4	1.0
GRASSES	18	0	1	0.2
FERNS	100	2	55	11.1
DEER FERN	100	1	12	4.0
OAK FERN	63	0	4	1.4
SHIELD FERN	54	0	4	0.9
LADY FERN	63	0	40	4.5
BEECH FERN	9	0	1	0.1

Tsuga mertensiana/Vaccinium spp/Lysichitum americanium
Mountain hemlock/Blueberry/Skunk cabbage
TSME/VACCI/LYAM 580

VEGETATION: The **overstory** averages about 50 percent coverage. Mountain hemlock is generally the most common overstory tree. Western hemlock is typically present and well represented. Sitka spruce is usually present. Alaska cedar may be present and well represented.

Mountain hemlock and western hemlock are the most common **understory** trees, both are usually present and well represented. Sitka spruce and Alaska cedar are often present. Other species are absent.

The **tall shrub** layer, typically about 50 percent coverage, is dominated by blueberry. Rusty menziesia is usually present but often not well represented. Salmonberry, copperbush, and devil's club and other shrubs may be present. Red huckleberry is not found.

Low shrubs characteristic of bog and alpine communities are absent.

Forbs are plentiful, typically about 60 percent coverage. Skunk cabbage is always present and well represented and is a key indicator species for this association. Five-leaf bramble, rosey twisted-stalk and fern-leaf goldthread are present and well represented. Heart-leaved twayblade is also present. False hellebore, bunchberry, deer cabbage, and small twisted-stalk usually occur. Clasping twisted-stalk, marsh marigold and trifoliate foam flower frequently are present.

Grasses and sedges may be present but are poorly represented. Carex anthoxanthea is the species most commonly found.

Fern coverage is typically about 6 percent. Deer fern is usually present and well represented. Oak fern and lady fern are often found but generally are not well represented.

SITE CHARACTERISTICS: This association is scattered throughout the Forest on high elevation mountainslopes, broad ridgetops and plateaus. Elevation ranges from about 1300 feet to about 2500 feet. It typically occurs on very stable organic soils that are poorly or very poorly drained. Snow cover may persist until late spring but not as long as on some mountain hemlock associations.

MANAGEMENT: Productivity is low. Estimated site index for Sitka spruce is about 55. Stand heights average 80 feet with an average basal area of 298 sq ft per acre. The potential productivity of this association is limited by the short growing season and excessively wet soil conditions.

Limited management activity has occurred on these sites, therefore little is known about second growth management. Owing to severe climatic conditions, it is anticipated that natural regeneration may be somewhat less prolific than at lower elevations. Seedlings may be damaged by deep snow packs.

This association is important summer range for many wildlife species but is seldom used during the winter months due to deep snow and cold temperatures.

MOUNTAIN HEMLOCK/BLUEBERRY/SKUNK CABBAGE
PLOT DATA (n=10)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	30	90	51.1
W HEMLOCK	50	0	25	7.8
MT HEMLOCK	100	20	75	35.0
SITKA SPRUCE	60	0	15	3.9
ALASKA CEDAR	50	0	30	8.7
W REDCEDAR	--	--	--	----
SHORE PINE	--	--	--	----
UNDERSTORY	100	10	35	22.7
W HEMLOCK	90	0	20	5.5
MT HEMLOCK	100	5	20	12.2
SITKA SPRUCE	70	0	6	2.2
ALASKA CEDAR	60	0	10	4.0
TALL SHRUBS	100	18	82	51.2
BLUEBERRY	100	10	80	43.5
RUSTY MENZIESIA	90	0	7	3.7
RED HUCKLEBERRY	--	--	--	----
DEVIL'S CLUB	30	0	2	0.5
SALMONBERRY	40	0	15	3.2
COPPERBUSH	40	0	6	1.4
SITKA MOUNTAIN ASH	20	0	1	0.2
SITKA ALDER	20	0	8	0.9
LOW SHRUBS	30	0	4	0.8
FORBS	100	32	100	62.5
BUNCHBERRY	90	0	7	2.8
FIVE-LEAF BRAMBLE	100	2	15	6.9
ROSEY TWISTED-STALK	100	1	25	8.4
FERN-LEAF GOLDTHREAD	100	1	10	6.3
CLASPING TWISTED-STALK	70	0	4	1.1
SKUNK CABBAGE	100	3	25	9.7
TRIFOLIATE FOAMFLOWER	60	0	6	2.8
HEART-LEAVED TWAYBLADE	100	1	3	1.6
DEER CABBAGE	80	0	30	6.5
MARSH MARIGOLD	60	0	65	12.2
FALSE HELLEBORE	90	0	4	1.9
GRAMINOIDS				
SEDGES	60	0	35	9.5
GRASSES	20	0	2	0.3
FERNS	90	0	13	6.0
DEER FERN	90	0	6	2.9
OAK FERN	50	0	3	0.9
SHIELD FERN	30	0	3	0.5
LADY FERN	50	0	6	1.6
BEECH FERN	--	--	--	----

SHORE PINE SERIES

The shore pine series is characterized by sparsely forested stands dominated by shore pine. It is typically found at low to mid elevations on very wet sites. The series occupies a position between the mixed-conifer series and non-forest muskeg. Shore pine is the dominant overstory species although Alaska cedar, western hemlock, mountain hemlock, Sitka spruce and western redcedar may occur in both the overstory and understory.

Typically trees are short, poorly formed and widely spaced. These stands have a characteristic wide diversity of species, especially of the low shrubs, forbs, and sedges.

Three plant associations are recognized within the shore pine series. They represent rather subtle differences in soil drainage.

SHORE PINE/CROWBERRY

Distinguished by relative abundance of crowberry and other low shrubs. This is the most common association within the series.

SHORE PINE/BLUEBERRY

Distinguished by the relative abundance of blueberry and other tall shrubs. This association is similar to the Mixed conifer/Blueberry/Skunk cabbage association but shore pine are taller than other trees and dominate the overstory.

SHORE PINE/SITKA SEDGE

Distinguished by the abundance of Sitka sedge. It is usually associated with a drainageway or some flooding, ponding, or subsurface water flow.

Pinus contorta/Empetrum nigrum
Shore pine/Crowberry
PICO/EMNI 610

VEGETATION: The **overstory** is sparse and dominated by shore pine. Typically, overstory coverage is about 25 percent. Alaska cedar is often present but generally not well represented. Western hemlock, mountain hemlock, Sitka spruce and western redcedar are present in some stands.
The **understory** is usually more dense than the overstory. Shore pine, Alaska cedar, mountain hemlock, and western hemlock are usually present and well represented. Alaska cedar is often present in shrub-like form. Sitka spruce is commonly found but usually not well represented. Within its range, western redcedar is present in some stands.

The **tall shrub** layer, typically about 8 percent coverage, is less dense than in any other forest association. Usually, plants are restricted to raised microsites such as downed logs or the base of standing trees. Rusty menziesia and blueberry are the most common species.
The **low shrub** layer is a prominent component of this association. Typically, coverage is about 50 percent. Mountain cranberry, crowberry, labrador tea, bog laurel and dwarf blueberry are almost always present. Bog blueberry and bog cranberry are often found. Bog rosemary and common juniper may occur. Abundance of any one species may vary widely among sites.

A diverse **forb** component is characteristic of these stands. Total forb coverage is typically about 50 percent. Bunchberry, deer cabbage, burnet, trifoliate goldthread, and skunk cabbage are the most commonly found species. Deer cabbage is usually the most abundant forb, although bunchberry and burnet are often well represented. Other species including fern-leaf goldthread, cloudberry, swamp gentian and artic starflower are often present but usually not well represented. Many other species occur as occasional plants but rarely exceed one percent coverage.

Sedges, grasses and rushes form much of the ground cover. Few-flowered sedge is the most common and best represented species. Many flowered sedge, Carex anthoxanthea, and tufted clubrush are often present and well represented. Sitka sedge may be present and well represented. Oatgrass may be present but is usually not well represented. Other species including blackish sedge and cotton grass occur in some stands.
Ferns are absent in most stands. Where present, they average about 2 percent coverage. Deer fern, bracken fern, and oak fern may occur in some stands.

SITE CHARACTERISTICS: This plant association occurs on broken mountainslopes, hillslopes, and most frequently, on lowlands throughout the Area. It occurs at elevations from sea level to the subalpine zone. Soils are very poorly drained and are typically formed in deep organic material.
MANAGEMENT: Productivity is very low. These sites are incapable of producing commercial wood products. Site index of Sitka spruce is less than 50. Stand heights are typically about 50 feet and basal area averages about 100 sq ft per acre. Trees are widely spaced with small diameters and poor form.
This association provides some important "edge" habitat for some wildlife species. Production of persistent forbs and blueberry forage is very low. This association has little value for winter range because of low forage production and very low snow intercept capability.

SHORE PINE/CROWBERRY PLOT DATA (n=28)

		----vegetative cover----		
	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	10	40	24.1
W HEMLOCK	32	0	6	1.1
MT HEMLOCK	32	0	6	1.0
SITKA SPRUCE	7	0	3	0.1
ALASKA CEDAR	64	0	15	3.1
SHORE PINE	100	8	35	19.4
UNDERSTORY	100	7	86	36.5
W HEMLOCK	78	0	25	5.1
MT HEMLOCK	78	0	15	4.4
SITKA SPRUCE	42	0	4	0.7
ALASKA CEDAR	89	0	75	18.7
SHORE PINE	100	2	30	10.3
TALL SRUBS	82	0	30	7.0
BLUEBERRY	75	0	25	4.4
RUSTY MENZIESIA	82	0	10	2.7
LOW SHRUBS	100	6	137	47.8
MOUNTAIN CRANBERRY	100	1	15	3.7
LABRADOR TEA	96	0	20	7.7
CROWBERRY	96	0	45	16.2
BOG LAUREL	89	0	10	3.5
DWARF BLUEBERRY	89	0	40	5.9
BOG BLUEBERRY	71	0	20	5.0
CRANBERRY	60	0	10	2.6
COMMON JUNIPER	17	0	3	0.3
FORBS	100	14	99	44.4
BUNCHBERRY	100	2	20	5.3
FIVE-LEAF BRAMBLE	21	0	2	0.3
FERN-LEAF GOLDTHREAD	57	0	5	1.2
SKUNK CABBAGE	71	0	15	2.6
DEER CABBAGE	92	0	70	20.7
MENZIESI'S BURNET	85	0	25	8.0
TRIFOLIATE GOLDTHREAD	75	0	8	1.5
CLOUDBERRY	50	0	8	1.5
GRAMINOIDS				
SEDGES	100	4	85	44.7
GRASSES	60	0	10	2.1
FEW-FLOWERED SEDGE	82	0	45	14.4
MANY-FLOWERED SEDGE	57	0	55	7.1
SITKA SEDGE	39	0	30	4.1
TUFTED CLUBRUSH	60	0	40	8.8
CAREX ANTHOXANTHEA	53	0	50	6.8
FERNS	25	0	5	0.4
DEER FERN	17	0	2	0.2
BRACKEN FERN	7	0	5	0.2

Pinus contorta/Vaccunium spp
Shore pine/Blueberry
PICO/VACCI 620

VEGETATION: The **overstory** averages about 50 percent coverage. Shore pine, Alaska cedar, western hemlock, mountain hemlock and western redcedar (within its range) are usually present and well represented in the overstory. Shore pine is dominate in height and diameter to the other species which occupy co-dominate or intermediate positions the stand.

In the **understory**, Alaska cedar, western hemlock, mountain hemlock and western redcedar (within its range) are common and well represented. Shore pine and Sitka spruce are usually present but not well represented.

The **tall shrub** layer typically averages about 40 percent coverage. Blueberry and rusty menziesia are common and well represented. On some sites rusty menziesia may be more abundant than blueberry. Red huckleberry is usually present and is well represented in some stands. Other tall shrubs are uncommon.

Low shrubs are abundant, though less so than in other shore pine associations. No one species dominates. Mountain cranberry and Labrador tea are the two most commonly found species. Crowberry, bog laurel, bog blueberry, and dwarf blueberry are often present.

Forb coverage is typically about 40 percent. Bunchberry, fern-leaved goldthread, skunk cabbage, and deer cabbage are the most common forbs. All of these except fern-leaved goldthread are usually well represented. Other common forbs include burnet, trifoliate goldthread, twin-flower five-leaf bramble and false hellebore.

Sedges or grasses are usually present but no species predominates. Most commonly found are few-flowered sedge, Sitka sedge, and Carex anthoxanthea. Also present are oatgrass, tufted clubrush, and many-flowered sedge. Usually, these species are poorly represented and uncommon over most of the stand.

Ferns are absent in many stands, but deer fern and western bracken fern are sometimes present.

SITE CHARACTERISTICS: This plant association occurs on broken mountainslopes, hillslopes, and most frequently, on lowlands throughout the Forest. It occurs at elevations from sea level to the subalpine zone. Soils are very poorly drained and are typically formed in deep organic material.

MANAGEMENT: Productivity is very low. These sites are incapable of producing commercial wood products. Site index of Sitka spruce is less than 50. Stand heights are typically about 65 feet and basal area averages about 225 sq ft per acre. Trees are widely spaced, with small diameters, and poor form. Potential productivity of these sites is severely limited by excess soil wetness. These stands have not been harvested and second growth management is not anticipated.

This association provides important "edge" habitat for some wildlife species. Production of persistent forbs is low and blueberry forage production is moderate. This association has little value for winter range because of low forage production and low moderate snow intercept capability.

SHORE PINE/BLUEBERRY PLOT DATA (n=8)

		----vegetative cover----		
	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	30	70	50.6
W HEMLOCK	87	0	20	7.9
MOUNTAIN HEMLOCK	100	2	20	7.5
SITKA SPRUCE	12	0	3	0.4
ALASKA CEDAR	100	2	20	11.6
WESTERN REDCEDAR	50	0	20	3.6
SHORE PINE	100	15	40	24.6
UNDERSTORY	100	22	74	49.5
W HEMLOCK	100	4	30	13.1
MT HEMLOCK	100	3	20	12.5
SITKA SPRUCE	62	0	2	0.8
ALASKA CEDAR	100	1	35	15.6
WESTERN REDCEDAR	50	0	20	5.0
SHORE PINE	75	0	6	2.8
TALL SHRUBS	100	15	80	41.0
BLUEBERRY	100	10	70	28.4
RUSTY MENZIESIA	100	2	30	10.6
LOW SHRUBS	100	2	31	14.4
MOUNTAIN CRANBERRY	100	1	8	3.5
LABRADOR TEA	75	0	6	2.5
CROWBERRY	62	0	4	1.5
BOG LAUREL	62	0	5	2.1
DWARF BLUEBERRY	62	0	15	4.9
FORBS	100	15	67	42.0
BUNCHBERRY	100	4	15	8.8
FIVE-LEAF BRAMBLE	50	0	4	1.3
FERN-LEAF GOLDTHREAD	100	1	3	2.3
SKUNK CABBAGE	87	0	20	10.0
HEART-LEAVED TWAYBLADE	37	0	1	0.4
DEER CABBAGE	75	0	35	12.1
MENZIESI'S BURNET	62	0	6	2.1
TRIFOLIATE GOLDTHREAD	62	0	3	1.0
CLOUDBERRY	37	0	3	0.9
GRAMINOIDS				
SEDGES	87	0	25	9.8
GRASSES	37	0	4	0.9
FEW-FLOWERED SEDGE	37	0	3	0.9
SITKA SEDGE	37	0	10	1.6
TUFTED CLUBRUSH	25	0	6	1.0
CAREX ANTHOXANTHEA	37	0	9	2.5
OATGRASS	25	0	4	0.6
FERNS	62	0	3	1.0
DEER FERN	37	0	1	0.4
BRACKEN FERN	12	0	1	0.1

Pinus contorta/Carex sitchensis
Shore pine/Sitka sedge
PICO/CASI 630

VEGETATION: The **overstory** is sparse and dominated by shore pine. Overstory coverage is typically about 30 percent. Alaska cedar, Sitka spruce, western hemlock and western redcedar also occur but generally not well represented.

Shore pine, mountain hemlock and western hemlock are usually present and well represented in the **understory**. Sitka spruce is often present but is poorly represented. Western redcedar is well represented in some stands.

Typically **tall shrub** coverage is about 12 percent. Tall shrubs are usually restricted to raised microsites forming shrub islands on down logs and stumps. Rusty menziesia is common and best represented. Blueberry is usually present but often not well represented.

Low shrubs are are an important component of these stands. Labrador tea, mountain cranberry, and crowberry are the most common and best represented species. Bog laurel, dwarf blueberry, bog blueberry, and bog cranberry are usually present but not well represented.

Forb coverage is typically about 40 percent. Bunchberry and skunk cabbage are the most common and best represented species. Deerberry is usually present but not well represented. Deer cabbage, burnet, fern-leaf goldthread, trifoliate goldthread, five-leaf bramble, and cloudberry are often present. Deer cabbage and burnet are usually well represented.

Sedges are a major component of this association. Total sedge coverage is typically about 65 percent. Sitka sedge is the most abundant and makes up 25 to 75 percent of the cover. Many-flowered sedge is usually present and well represented. Oat grass, Carex anthoxanthea, few-flowered sedge, tufted clubrush, cotton grass, and blackish sedge may be present. When present, oat grass, Carex anthoxanthea and few-flowered sedge may be well represented.

Ferns are absent in most stands. Deer fern and beech fern are occasionally found.

SITE CHARACTERISTICS: This plant association occurs on broken mountainslopes, hillslopes, and most frequently, on lowlands throughout the Forest. It occurs at elevations from sea level to the subalpine zone. Soils are very poorly drained and are typically formed in deep organic material. This association is often in shallow drainageways, in locations that are occasionally flooded or ponded, or in locations subject to subsurface lateral water flow.

MANAGEMENT: Productivity is very low. These sites are not capable of producing commercial wood products. Site index of Sitka spruce is less than 50. Stand heights are typically about 50 feet and basal area averages about 120 sq ft per acre. Trees are widely spaced, with small diameters, and poor form.

This association provides important "edge" habitat for some wildlife species. Production of persistent forbs and blueberry forage is very low. This association has little value for winter range because of low forage production and very low snow intercept capability.

SHORE PINE/SITKA SEDGE PLOT DATA (n=8)

		----vegetative cover----		
	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	21	46	29.2
W HEMLOCK	25	0	3	0.8
MT HEMLOCK	75	0	10	2.8
SITKA SPRUCE	37	0	2	0.5
ALASKA CEDAR	37	0	5	1.4
SHORE PINE	100	20	45	24.4
UNDERSTORY	100	13	30	21.5
W HEMLOCK	87	0	25	6.1
MT HEMLOCK	100	1	10	4.3
SITKA SPRUCE	50	0	3	0.8
ALASKA CEDAR	37	0	10	1.5
SHORE PINE	100	1	20	9.3
TALL SRUBS	100	3	36	11.7
BLUEBERRY	75	0	8	2.4
RUSTY MENZIESIA	100	1	15	6.1
LOW SHRUBS	100	12	72	36.2
MOUNTAIN CRANBERRY	100	2	13	5.5
LABRADOR TEA	100	4	35	15.5
CROWBERRY	75	0	15	7.0
BOG LAUREL	62	0	5	2.1
DWARF BLUEBERRY	62	0	7	1.8
BOG BLUEBERRY	62	0	12	2.3
CRANBERRY	50	0	13	2.8
BOG ROSEMARY	25	0	1	0.3
FORBS	100	15	83	41.6
BUNCHBERRY	100	2	15	6.4
FIVE-LEAF BRAMBLE	50	0	2	0.8
FERN-LEAF GOLDTHREAD	62	0	10	2.5
SKUNK CABBAGE	75	0	20	2.5
DEER CABBAGE	62	0	45	14.4
MENZIESI'S BURNET	62	0	10	3.6
TRIFOLIATE GOLDTHREAD	50	0	2	0.6
CLOUDBERRY	50	0	7	1.5
ARCTIC STARFLOWER	37	0	1	0.4
GRAMINOIDS				
SEDGES	100	30	100	67.0
GRASSES	25	0	5	0.8
FEW-FLOWERED SEDGE	25	0	10	2.5
MANY-FLOWERED SEDGE	75	0	30	14.4
SITKA SEDGE	100	25	75	44.4
OATGRASS	37	0	15	2.5
FERNS	25	0	1	0.3
DEER FERN	12	0	1	0.1
BEECH FERN	12	0	1	0.1

WESTERN HEMLOCK-WESTERN REDCEDAR SERIES

The series is characterized by the presence of both western hemlock and western redcedar in the overstory. These tree species are typically present in similar proportions as a co-dominant species. Other species do not occur or are a minor component of the overstory. Western redcedar is usually, but not always present in the understory.

The western hemlock-western redcedar series is limited in distribution by the range of western redcedar. The series is best represented on south Etolin Island. It occurs only sporadically north of Sumner Strait on south Mitkof and south Kuiu Islands. It is typically found at elevations less than 500 feet, but it occurs as high as 1000 feet on south-facing slopes on south Etolin Island.

There are only two plant associations recognized in this series. They are:

WESTERN HEMLOCK-WESTERN REDCEDAR/BLUEBERRY
Distinguished by the general lack of key indicators other than blueberry.

WESTERN HEMLOCK-WESTERN REDCEDAR/BLUEBERRY/SKUNK CABBAGE
Distinguished by the abundance of skunk cabbage.

The Western hemlock-Western redcedar plant associations are thought to represent somewhat warmer sites than similar associations in the Western hemlock or the Western hemlock-Alaska cedar series.

Tsuga heterophylla-Thuja plicata/Vaccinium spp
Western hemlock-Western redcedar/Blueberry
TSHE-THPL/VACCI 710

VEGETATION: Western hemlock and Western redcedar dominate the **overstory** which averages about 65 percent coverage. Sitka spruce and Alaska cedar are often present as minor species not exceeding 15 percent coverage. Alaska cedar is typically absent at lower elevations.

The **understory** tree cover is dominated by western hemlock. Western redcedar and Sitka spruce are usually present in smaller amounts. Other species are typically absent.

The **tall shrub** layer, typically about 45 percent coverage, is dominated by blueberry. Rusty menziesia and red huckleberry are usually present but less abundant. Devil's club and salmonberry are typically absent or occur only as widely scattered plants in some stands. Other tall shrubs are rare and **low shrubs** are typically absent.

Many different **forbs** are present. Total forb coverage averages about 25 percent. Bunchberry, fern-leaf goldthread and five-leaf bramble, rosey and clasping twisted-stalk, deerberry, blue-bead, and heart-leaf twayblade are usually present. Deerberry and blue-bead are more common in this association than in many others. Skunk cabbage is typically absent, or occurs as an occasional plant restricted to wet microsites.

Grasses and sedges are typically absent.

Fern coverage averages 8 percent. Deer fern and oak fern are the most common. A small amount of shield fern is found in many stands.

SITE CHARACTERISTICS: This association is found only on the most southerly parts of the Forest on mountainslopes and hillslopes. It is most common at elevations below 600 feet but does occur as high as 1000 feet on some south-facing mountain slopes. It typically occurs on very stable forested soils with thick undisturbed organic duff layers. Soils are typically moderately well or well-drained humic cryorthods or humic lithic cryorthods.

MANAGEMENT: This association is moderately productive. Estimated site index of Sitka spruce is about 86. Old growth stand heights average 118 feet. Basal area averages 337 sq ft per acre.

Natural regeneration is prolific. Young second growth stands are primarily western hemlock with some Western redcedar and Sitka spruce. Regeneration of redcedar is somewhat undependable at the northern extent of its range but most second growth stands will have a redcedar component similar to the old growth stand harvested from the site. Planting and precommercial thinning can be used to alter the species composition of second growth stands.

Wildlife habitat characteristics include a well developed stand structure. Snow intercept capability is high. Blueberry forage production is moderate. Production of persistent forbs is moderate.

Because Western redcedar is resistant to decay, dead trees often persist for many years as snags. Spike-top redcedar trees are common.

WESTERN HEMLOCK-WESTERN REDCEDAR/BLUEBERRY
PLOT DATA (n=19)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	40	85	64.7
W HEMLOCK	100	8	50	30.9
MT HEMLOCK	--	--	--	----
SITKA SPRUCE	26	0	20	2.0
ALASKA CEDAR	31	0	30	3.1
W REDCEDAR	100	15	55	34.7
SHORE PINE	--	--	--	----
UNDERSTORY	100	5	80	37.9
W HEMLOCK	100	4	80	34.9
MT HEMLOCK	--	--	--	----
SITKA SPRUCE	78	0	6	1.2
ALASKA CEDAR	5	0	3	0.2
W REDCEDAR	84	0	30	4.5
SHORE PINE	--	--	--	----
TALL SHRUBS	100	6	90	44.3
BLUEBERRY	100	1	70	34.6
RUSTY MENZIESIA	94	0	20	6.7
RED HUCKLEBERRY	94	0	25	4.4
DEVIL'S CLUB	36	0	4	0.6
SALMONBERRY	10	0	2	0.2
COPPERBUSH	5	0	1	0.1
LOW SHRUBS	5	0	1	0.1
MOUNTAIN CRANBERRY	5	0	1	0.1
FORBS	100	5	46	25.1
BUNCHBERRY	100	1	15	6.3
FIVE-LEAF BRAMBLE	89	0	15	4.3
ROSEY TWISTED-STALK	78	0	8	2.0
FERN-LEAF GOLDTHREAD	68	0	15	3.4
CLASPING TWISTED-STALK	78	0	3	0.9
SKUNK CABBAGE	31	0	7	0.9
TRIFOLIATE FOAMFLOWER	42	0	6	1.2
HEART-LEAVED TWAYBLADE	84	0	4	1.3
DEERBERRY	63	0	25	3.2
WESTERN TWAYBLADE	52	0	1	0.5
BLUE-BEAD	52	0	8	1.4
GRAMINOIDS				
SEDGES	5	0	1	0.1
GRASSES	--	--	--	----
FERNS	94	0	27	8.4
DEER FERN	94	0	20	4.5
OAK FERN	78	0	10	2.5
SHIELD FERN	52	0	3	0.6
LADY FERN	21	0	2	0.3
BEECH FERN	26	0	3	0.5

Tsuga heterophylla-Thuja plicata/Vaccinium spp/Lysichitum americanium
Western hemlock-Western redcedar/Blueberry/Skunk cabbage
TSHE-THPL/VACCI/LYAM 730

VEGETATION: **Overstory** coverage is typically about 60 percent and is comprised of western hemlock and western redcedar in approximately equal proportions. Sitka spruce is often present but comprises less than 15 percent of the overstory. Alaska cedar occurs as a minor component in some stands at higher elevations. Other species occur infrequently.

The **understory**, about 38 percent coverage, is dominated by western hemlock. Western redcedar and Sitka spruce are usually present in small amounts. Alaska cedar and mountain hemlock are present in some stands.

The **tall shrub** layer, about 45 percent coverage, is mostly blueberry. Rusty menziesia is present but is less abundant than blueberry. Red huckleberry is often present in small amounts. Devil's club and salmonberry are typically absent, but may occur as occasional plants. **Low shrub** species typically do not occur.

Total **forb** coverage averages about 45 percent. Skunk cabbage is and important indicator species of this association and typically averages about 20 percent coverage. Other forb species include bunchberry, five-leaf bramble, heart-leaf twayblade, rosey and clasping twisted-stalk, and fern-leaf gold thread.

Grasses and sedges typically do not occur.

Total **fern** coverage is typically about 6 percent. Deer fern and oak fern are the most common species.

SITE CHARACTERISTICS: This association is found only on the most southerly parts of the Forest on mountainslopes, hillslopes and lowlands. It is most common at elevations below 600 feet but does occur as high as 1000 feet on some south-facing mountain slopes. It typically occurs on excessively wet forest soils with thick organic surface layers which are saturated with water for part of the growing season. Soils are usually deep and poorly drained. Nearly all soils are classified as Histosols or are mineral soils with a histic epipedon.

MANAGEMENT: This association has low potential productivity. Estimated site index for Sitka spruce is about 65. Old growth stand heights are about 100 feet. Basal area is commonly about 310 sq ft per acre. The potential productivity of this association is limited by excessive soil wetness.

Natural regeneration is prolific. Young second growth stands are primarily western hemlock with some western redcedar and Sitka spruce. Regeneration of redcedar is somewhat undependable at the northern extent of its range but most second growth stands will have a redcedar component similar to the old growth stand harvested from the site. Planting and precommercial thinning can be used to alter the species composition of second growth stands.

Wildlife habitat characteristics include a well developed stand structure. Snow intercept capability is moderate. Blueberry forage production is moderate. Production of persistent forbs is moderate.
Because western redcedar is resistant to decay, dead trees often persist for many years as snags. Spike-top redcedar trees are common.

WESTERN HEMLOCK-WESTERN REDCEDAR/BLUEBERRY/SKUNK CABBAGE
PLOT DATA (n=12)

	CONSTANCY	MIN	MAX	MEAN
OVERSTORY	100	40	80	60.4
W HEMLOCK	100	15	50	30.8
MT HEMLOCK	8	0	1	0.1
SITKA SPRUCE	50	0	10	2.3
ALASKA CEDAR	41	0	30	4.5
W REDCEDAR	100	10	45	27.9
SHORE PINE	--	--	--	----
UNDERSTORY	100	15	55	38.2
W HEMLOCK	100	15	55	30.0
MT HEMLOCK	41	0	10	1.6
SITKA SPRUCE	100	1	4	1.9
ALASKA CEDAR	16	0	5	0.7
W REDCEDAR	91	0	30	6.8
SHORE PINE	--	--	--	----
TALL SHRUBS	100	12	67	43.2
BLUEBERRY	100	3	60	32.3
RUSTY MENZIESIA	100	1	40	9.7
RED HUCKLEBERRY	75	0	6	2.3
DEVIL'S CLUB	50	0	5	0.9
SALMONBERRY	16	0	1	0.2
LOW SHRUBS	8	0	1	0.1
MOUNTAIN CRANBERRY	8	0	1	0.1
DWARF BLUEBERRY	8	0	1	0.1
FORBS	100	19	94	44.6
BUNCHBERRY	100	1	10	5.5
FIVE-LEAF BRAMBLE	100	1	8	4.2
ROSEY TWISTED-STALK	83	0	4	2.2
FERN-LEAF GOLDTHREAD	83	0	15	4.0
CLASPING TWISTED-STALK	58	0	1	0.6
SKUNK CABBAGE	100	4	55	22.2
TRIFOLIATE FOAMFLOWER	50	0	4	1.3
HEART-LEAVED TWAYBLADE	83	0	2	1.0
DEERBERRY	41	0	15	1.8
WESTERN TWAYBLADE	25	0	1	0.3
BLUE-BEAD	16	0	5	0.5
GRAMINOIDS				
SEDGES	33	0	1	0.3
GRASSES	--	--	--	----
FERNS	100	1	18	5.7
DEER FERN	100	1	10	3.3
OAK FERN	66	0	2	1.0
SHIELD FERN	41	0	2	0.5
LADY FERN	41	0	1	0.4
BEECH FERN	16	0	3	0.3

COMPARISONS

Information describing forest communities is useful to resource managers for determining values for timber, wildlife, and other resources. Plant coverage data is useful in developing models that predict responses to management activities. Some of the data collected to develop this plant association guide has been sumarize into tables to assist managers in using the information.

SPECIES DIVERSITY

The number of vascular plants present in a plant communities is often used as a measure of species diversity. Communities with more species are said to be more diverse than communities with fewer species. Differences in the number of species present varied among plant associations (Table 1). This suggests that some plant associations are more diverse than others. However, some of this differences are probably the result of differences in sample size.

In MXD-CON/VACCI/LYAM, 88 species were found on 32 plots while in PISI-TSME/VACCI-OPHO, 32 species were found on 3 plots. When the average number of species per plot was calculated, both associations averaged 23.0 species.

TSHE/VACCI/DRAU had 36 species on 33 plots and an average of 17.0 species per plot. When compared to MXD-CON/VACCI/LYAM, TSHE/VACCI/DRAU appears to be less diverse since the number of plots sampled is nearly identical.

WINTER FORAGE PRODUCTION

Forbs that remain green throughout the winter and are available for wildlife are called persistent forbs. They are an important and nutritious winter food source, especially for Sitka blacktail deer. Four species of persistent forbs that are important for wildlife are found on the Forest. They are: bunchberry (COCA), five-leaf bramble (RUPE), fern-leaf goldthread (COAS), and trifoliate foamflower (TITR).

During winters with heavy snowfall, blueberry is used heavily for browse as persistent forbs may be unavailable or less accessible. Plant associations with an abundance of blueberry and persistent forbs can provide good winter range for deer provided that they also have a canopy cover that is capable of intercepting snow during winters with heavy snowfall.

Table 2 lists the abundance of blueberry and persistent forbs by plant association. These data were collected when deer populations were low and probably represent the upper level of productivity. When deer populations are high, the abundance of these plants may be much lower.

Table 3 lists the relative capability of each plant association to intercept and hold snow in the forest canopy. Along with elevation, slope, aspect and topographic features, intercept capability can be used to estimate the accessibility of forage during winters with heavy snowfall.

Table 1. Species occurrence of vascular plants by plant association.

PLANT ASSOCIATION	CODE	TREES* O--U	SHRUBS TALL	SHRUBS LOW	FORBS	GRASS	FERNS	CLUBS	TOTAL	AVE/ PLOT
		number of species								
TSHE/VACCI	110	5--4	6	0	17	1	7	3	39	16.2
TSHE/VACCI/DRAU	120	2--3	6	0	18	0	6	3	36	17.0
TSHE/VACCI/LYAM	130	4--5	7	0	19	3	5	2	41	17.3
TSHE/VACCI-OPHO	140	3--3	7	0	23	4	8	3	48	20.5
TSHE/OPHO	160	2--2	6	0	11	2	9	2	32	20.0
TSHE-CHNO/VACCI	210	6--6	6	2	27	2	9	3	55	21.5
TSHE-CHNO/VACCI/LYAM	220	5--5	5	2	19	1	6	3	41	20.9
PISI/VACCI	310	4--4	7	0	18	0	7	3	39	15.4
PISI/VACCI-OPHO	320	3--4	8	0	21	3	7	2	45	20.3
PISI/OPHO	330	5--3	11	0	21	5	9	1	52	19.6
PISI/OPHO/LYAM	340	4--3	9	0	22	8	9	2	54	22.3
PISI/OPHO-ALNUS	350	3--3	9	0	15	2	5	0	34	19.5
PISI/OPHO/CIAL	355	2--2	8	0	16	0	7	2	35	20.3
PISI/VACCI/LYAM	370	4--3	7	0	16	4	6	0	37	17.4
PISI-TSME/VACCI-OPHO	395	3--3	7	0	16	2	4	0	32	23.0
MXD-CON/VACCI	410	6--6	7	5	22	5	8	3	56	20.3
MXD-CON/VACCI/LYAM	420	6--6	13	8	38	10	10	3	88	23.0
MXD-CON/VACCI/FACR	430	6--7	8	10	29	9	7	2	72	28.9
MXD-CON/VACCI-GASH	460	6--6	4	6	16	1	2	2	37	22.0
MXD-CON/GASH/LYAM	470	6--6	4	6	17	3	3	3	42	21.8
TSME/VACCI	510	4--4	9	0	26	5	5	3	52	18.2
TSME/CAME	530	4--5	9	10	38	10	8	3	83	23.6
TSME/VACCI-CLPY/FACR	540	4--4	8	6	18	4	5	2	47	21.9
TSME/VACCI/CABI	570	4--5	6	1	28	5	6	2	53	21.7
TSME/VACCI/LYAM	580	4--4	7	6	24	8	5	2	56	23.2
PICO/EMNI	610	6--7	6	12	34	11	3	3	76	26.8
PICO/VACCI	620	6--6	5	6	22	8	3	2	52	24.4
PICO/CASI	630	6--5	6	8	28	9	2	2	61	24.4
TSHE-THPL/VACCI	710	4--4	6	1	20	1	7	3	42	18.3
TSHE-THPL/VACCI/LYAM	730	6--5	7	2	21	3	7	2	48	20.4

* TREE OVERSTORY--UNDERSTORY: The same tree species are present in both the overstory and understory. The higher value is used to compute the total.

Table 2. Vegetative cover of blueberry and persistent forbs by plant association.

PLANT ASSOCIATION	PA CODE	VACCINIUM SPP TALL	VACCINIUM SPP LOW	PERSISTANT FORBS COCA	RUPE	COAS	TITR	TOTAL
		percent coverage						
TSHE/VACCI	110	56	0.0	6.0	7.0	2.7	0.4	16.1
TSHE/VACCI/DRAU	120	44	0.0	5.8	7.8	3.7	1.5	18.8
TSHE/VACCI/LYAM	130	54	0.0	6.5	8.2	4.2	0.8	20.7
TSHE/VACCI-OPHO	140	29	0.0	4.8	7.5	6.2	4.7	24.2
TSHE/OPHO	160	5	0.0	1.5	3.5	0.8	7.3	13.1
TSHE-CHNO/VACCI	210	44	0.1	4.9	7.2	4.8	2.6	19.5
TSHE-CHNO/VACCI/LYAM	220	45	0.1	5.4	6.3	5.7	0.9	18.3
PISI/VACCI	310	41	0.0	8.6	10.7	0.4	0.9	20.6
PISI/VACCI-OPHO	320	40	0.0	4.6	9.4	3.4	6.1	23.5
PISI/OPHO	330	7	0.0	1.4	4.6	0.6	8.8	15.4
PISI/OPHO/LYAM	340	13	0.0	4.5	8.7	3.2	11.2	27.6
PISI/OPHO-ALNUS	350	15	0.0	1.3	6.5	0.0	6.3	14.1
PISI/OPHO/CIAL	355	1	0.0	0.2	0.2	0.0	6.3	6.7
PISI/VACCI/LYAM	370	42	0.0	4.0	8.9	5.0	2.4	20.3
PISI-TSME/VACCI-OPHO	395	18	0.0	1.3	5.0	5.3	6.3	17.9
MXD-CON/VACCI	410	58	1.2	8.1	7.5	5.8	0.5	21.9
MXD-CON/VACCI/LYAM	420	52	1.1	7.5	5.6	6.5	1.0	20.6
MXD-CON/VACCI/FACR	430	36	7.7	5.8	2.5	4.8	0.6	13.7
MXD-CON/VACCI-GASH	460	32	3.0	10.0	1.0	2.0	0.0	13.0
MXD-CON/GASH/LYAM	470	21	2.0	9.2	1.2	1.0	0.0	11.4
TSME/VACCI	510	42	0.0	2.4	8.6	4.0	1.5	16.5
TSME/CAME	530	23	2.8	2.0	3.0	1.8	0.7	7.5
TSME/VACCI-CLPY/FACR	540	47	0.0	3.7	5.1	4.1	0.7	14.6
TSME/VACCI/CABI	570	33	0.0	2.0	7.9	4.5	3.3	17.7
TSME/VACCI/LYAM	580	44	0.1	2.8	6.9	6.3	2.8	18.8
PICO/EMNI	610	5	14.6	5.3	0.3	1.2	0.0	6.8
PICO/VACCI	620	32	8.5	8.5	1.3	2.3	0.0	12.1
PICO/CASI	630	3	9.4	6.4	0.8	2.5	0.0	9.7
TSHE-THPL/VACCI	710	39	0.1	6.3	4.3	3.4	1.2	15.2
TSHE-THPL/VACCI/LYAM	730	34	0.2	5.5	4.2	4.0	1.3	15.0

TABLE 3. Tree cover, stand height, and snow intercept capability of plant associations on the Stikine Area.

PLANT ASSOCIATION	PA CODE	-------TREE-COVER------ OVER	UNDER	TOTAL	STAND HT	* SNOW INTERCEPT
		-----percentage-----			--feet--	
TSHE/VACCI	110	69	23	92	115	HIGH
TSHE/VACCI/DRAU	120	74	22	96	136	HIGH
TSHE/VACCI/LYAM	130	65	30	95	115	HIGH
TSHE/VACCI-OPHO	140	68	24	92	135	HIGH
TSHE/OPHO	160	76	11	87	142	HIGH
TSHE-CHNO/VACCI	210	61	33	94	101	MODERATE
TSHE-CHNO/VACCI/LYAM	220	63	37	98	94	MODERATE
PISI/VACCI	310	67	23	90	133	HIGH
PISI/VACCI-OPHO	320	62	23	85	170	MODERATE
PISI/OPHO	330	65	16	81	178	HIGH
PISI/OPHO/LYAM	340	56	27	83	156	MODERATE
PISI/OPHO-ALNUS	350	51	14	65	146	MODERATE
PISI/OPHO/CIAL	355	58	11	69	146	MODERATE
PISI/VACCI/LYAM	370	64	29	93	135	HIGH
PISI-TSME/VACCI-OPHO	395	52	28	80	152	MODERATE
MXD-CON/VACCI	410	45	33	78	70	LOW
MXD-CON/VACCI/LYAM	420	50	37	87	74	MODERATE
MXD-CON/VACCI/FACR	430	38	39	77	58	LOW
MXD-CON/VACCI-GASH	460	28	37	65	57	LOW
MXD-CON/GASH/LYAM	470	34	35	69	64	LOW
TSME/VACCI	510	60	21	81	91	MODERATE
TSME/CAME	530	39	31	70	61	LOW
TSME/VACCI-CLPY/FACR	540	46	39	85	61	LOW
TSME/VACCI/CABI	570	48	21	69	92	LOW
TSME/VACCI/LYAM	580	51	23	74	80	MODERATE
PICO/EMNI	610	24	36	61	49	LOW
PICO/VACCI	620	51	50	101	64	MODERATE
PICO/CASI	630	29	22	51	49	LOW
TSHE-THPL/VACCI	710	65	38	105	118	HIGH
TSHE-THPL/VACCI/LYAM	730	60	38	98	99	MODERATE

* HIGH = 64-76% OVERSTORY COVER
MODERATE = 50-63% OVERSTORY COVER
LOW = <50% OVERSTORY COVER

ESTIMATION OF SITE INDEX VALUES FOR PLANT ASSOCIATIONS

No data are available that directly measure the productivity of plant associations. However site index data for soil series are available as is soil series data for each plant association. These data are used here as an indirect estimate of the site index of plant associations (Table 4).

The site index values used are from the Regional Common Land Unit (CLU) data base which is located in the GIS info file CLU.SERIES. This table was developed using two sources of data: site index values per soil series determined for Farr's site index plots (Farr 1984) and site index values determined for benchmark soil series in conjunction with the Stikine Area soil survey. Site index in this report refers to the height of Sitka spruce at age 50 in unmanaged second growth stands.

The characterization of plant associations in terms of soil series is from the Stikine Area soil/site data base which incorporates both the standard plant association plot data and traverse and transect data from the soil survey.

Site index values assigned are simply the mean value from all available data points. Calculations for a couple of associations follow as examples.

WESTERN HEMLOCK/BLUEBERRY/SKUNK CABBAGE ASSOCIATION

Soil series	site index	x	frequency	=	
Blashke	105		1	105	
Bradfield	90		2	180	
Fanshaw	100		1	100	
Kaikli	55		2	110	
Maybeso	50		6	300	
Mitkof	80		3	240	1390/20= 69.5
Nakwasina	60		1	60	
St Nicholas	70		1	70	
Wadleigh	75		3	225	
			20	1390	

WESTERN HEMLOCK/BLUEBERRY/ SHIELD FERN ASSOCIATION

Soil series	site index	X	frequency	=	
Blashke	105		1	105	
Fanshaw	100		5	500	
Gunnuk	100		1	100	
Karta	100		3	300	
Kupreanof	105		11	1155	4750/46 = 103.26
Tolstoi	100		5	500	
Tuxekan	105		4	420	
Ulloa	105		2	210	
Vixen	100		2	200	
Kwatahein	105		12	1260	
			46	4750	

Table 4. The relationship of plant association to site productivity.

ASSOCIATION	PA CODE	PRODUCTIVITY CLASS	SITE INDEX	STAND HEIGHT	BASAL AREA
			------feet------		sq ft/ac
TSHE/VACCI	110	MODERATE	80	115	305
TSHE/VACCI/DRAU	120	HIGH	103	136	303
TSHE/VACCI/LYAM	130	MODERATE	70	115	233
TSHE/VACCI-OPHO	140	HIGH	96	135	263
TSHE/OPHO	160	HIGH	99	142	270
TSHE-CHNO/VACCI	210	MODERATE	79	101	362
TSHE-CHNO/VACCI/LYAM	220	MODERATE	74	94	266
PISI/VACCI	310	HIGH	102	133	329
PISI/VACCI-OPHO	320	HIGH	99	170	360
PISI/OPHO	330	HIGH	99	178	374
PISI/OPHO/LYAM	340	MODERATE	86	156	305
PISI/OPHO-ALNUS	350	HIGH	95	146	240
PISI/OPHO/CIAL	355	HIGH	90	146	293
PISI/VACCI/LYAM	370	MODERATE	82	135	326
PISI-TSME/VACCI-OPHO	395	HIGH	90	152	347
MXD-CON/VACCI	410	LOW	55	70	235
MXD-CON/VACCI/LYAM	420	VERY LOW	<50	74	256
MXD-CON/VACCI/FACR	430	VERY LOW	<50	58	163
MXD-CON/VACCI-GASH	460	VERY LOW	<50	57	220
MXD-CON/GASH/LYAM	470	VERY LOW	<50	64	213
TSME/VACCI	510	MODERATE	70	91	357
TSME/VACCI-CAME	530	VERY LOW	<50	61	247
TSME/VACCI-CLPY/FACR	540	VERY LOW	<50	61	275
TSME/VACCI/CABI	570	LOW	55	92	302
TSME/VACCI/LYAM	580	LOW	54	80	298
PICO/EMNI	610	VERY LOW	<50	49	96
PICO/VACCI	620	VERY LOW	<50	64	225
PICO/CASI	630	VERY LOW	<50	49	120
TSHE-THPL/VACCI	710	MODERATE	86	118	337
TSHE-THPL/VACCI/LYAM	730	LOW	65	99	310

Productivity classes are assigned using the following range of values:

Productivity Class	Site Index
Very Low	<50
Low	50 - 70
Moderate	70 - 90
High	90 - 105

TIMBER VOLUME

Estimates of board foot volume were calculated for each plant association using the variable plot data. Region 6 Stand Exam Data Processing programs were used to analyze the data.

Calculated board foot volumes of plant association plots are estimated to be about 40 percent higher than the net volume expected for the entire stand. This is due primarily to the biased, rather than random, method of plot location within the stand, as well as consistantly underestimating tree defect. Plant association plots are located in areas of relative floristic homogenicity. Ecotones or abnormalities such as holes in the canopy are avoided in order to represent the more or less undisturbed "climax" condition.

Mean board foot volumes from the plot data were multiplied by 0.6 to estimate the volume class for a normal stand of the plant association.

Also reported in Table 5 is the species component for each plant association. These data are given as percentages and are estimates of the contribution of each species to the total volume. They can be used to estimate the percentage of total volume contributed by each species for a plant association.

TABLE 5. Percentage board foot volume by species and volume class by plant association.

PLANT ASSOCIATION	PA CODE	SPECIES YC CHNO	SS PISI	LP PICO	RC THPL	WH TSHE	MH TSME	VOLUME CLASS
		percentage						MBF/AC
TSHE/VACCI	110	1	17	--	--	78	4	20-30
TSHE/VACCI/DRAU	120	--	23	--	--	77	--	30-50
TSHE/VACCI/LYAM	130	1	27	--	--	71	1	8-20
TSHE/VACCI-OPHO	140	--	11	--	--	89	--	20-30
TSHE/OPHO	160	--	37	--	--	63	--	20-30
TSHE-CHNO/VACCI	210	56	7	--	3	33	1	20-30
TSHE-CHNO/VACCI/LYAM	220	34	29	--	1	36	--	8-20
PISI/VACCI	310	--	79	--	1	19	1	30-50
PISI/VACCI-OPHO	320	--	84	--	--	14	2	>50
PISI/OPHO	330	--	86	--	1	13	--	>50
PISI/OPHO/LYAM	340	--	79	--	--	21	--	30-50
PISI/OPHO-ALNUS	350	--	95	--	--	5	--	20-30
PISI/OPHO/CIAL	355	--	86	--	--	14	--	30-50
PISI/VACCI/LYAM	370	--	68	--	--	32	--	30-50
PISI-TSME/VACCI-OPHO	395	--	91	--	--	2	7	20-30
MXD-CON/VACCI	410	25	14	--	1	32	28	8-20
MXD-CON/VACCI/LYAM	420	31	11	1	12	28	17	8-20
MXD-CON/VACCI/FACR	430	43	13	14	--	8	22	0-8
MXD-CON/VACCI-GASH	460	50	--	--	31	17	2	0-8
MXD-CON/GASH/LYAM	470	33	--	5	40	16	6	0-8
TSME/VACCI	510	6	18	--	--	13	63	20-30
TSME/CAME	530	25	11	--	--	1	63	0-8
TSME/VACCI-CLPY/FACR	540	40	5	--	--	10	45	8-20
TSME/VACCI/CABI	570	9	30	--	--	6	55	8-20
TSME/VACCI/LYAM	580	9	10	--	--	27	54	8-20
PICO/EMNI	610	8	--	92	--	--	--	0-8
PICO/VACCI	620	10	--	79	3	6	2	0-8
PICO/CASI	630	1	--	89	5	--	5	0-8
TSHE-THPL/VACCI	710	4	7	--	69	20	--	30-50
TSHE-THPL/VACCI/LYAM	730	8	6	--	55	31	--	20-30

WETLAND CLASSIFICATION

Wetlands are important for wildlife habitat and for controlling water movement and soil erosion. They receive special regulations governing their use. To be classified as a wetland, the area must have wetland plants growing on it, have soils classified as hydric soils, and have wetland hydrology. If one of these criteria are missing, the land is classified as a non-wetland. In southeast Alaska, because of the abundance of precipitation, wetlands may occur on moderate slopes where poorly drained or organic soils are present.

In Table 6, wetland designations are listed for each plant association. The following designations are based on the average percent coverage of facultative wetland (FACW) and obligate wetland (OBL) plants compared to facultative upland (FACU) and upland (UPL) plants using the 1986 Fish and Wildlife Service list.

To determine wetland designation, percent coverage for OBL and UPL plants was multiplied by a factor of (2) and percent coverage for FACW and FACU plants was multiplied by a factor of (1). Plants designated FACULTATIVE were considered neutral and were not included in the calculations. Plant associations with FACW + OBL percentages greater than FACU + UPL percentages are designated wetlands. When FACU + UPL percentages are greater than FACW + OBL percentages, plant associations are designated non-wetlands. A wetland ratio was calculated by dividing the FACW + OBL coverage by the FACU + OBL coverage. A ratio of one or greater indicates a wetland. A ratio of less than one indicates a non-wetland.

WETLAND CLASSIFICATION CRITERIA ARE UNDERGOING REVISION BY OTHER AGENCIES. IT IS UNLIKELY THAT THE METHOD USED HERE WILL BE THE ONE ADOPTED. LIKELY, THE FOREST SERVICE WILL ACCEPT THE NEW REVISION. IN ANY EVENT, THIS METHOD HAS NOT YET BEEN OFFICIALLY ADOPTED IN THIS REGION. THE DATA GIVE THE RELATIVE STATUS OF THE DIFFERENT PLANT ASSOCIATIONS AND OFFER A MEANS OF COMPARING THEM WITH RESPECT TO WETLAND PLANTS.

Table 6. Wetland designation of plant associations on the Stikine Area.

PLANT ASSOCIATION	PA CODE	#PLOTS	FACW + OBLx2	FACU + UPLx2	RATIO	WETLAND DESIGNATION
			percent coverage			
TSHE/VACCI	110	21	1.8	36.6	0.05	NON-WETLAND
TSHE/VACCI/DRAU	120	33	0.6	44.0	0.01	NON-WETLAND
TSHE/VACCI/LYAM	130	18	52.8	33.9	1.56	WETLAND
TSHE/VACCI-OPHO	140	17	4.0	72.9	0.05	NON-WETLAND
TSHE/OPHO	160	4	3.7	89.4	0.04	NON-WETLAND
TSHE-CHNO/VACCI	210	19	7.9	50.2	0.16	NON-WETLAND
TSHE-CHNO/VACCI/LYAM	220	7	31.2	48.8	0.64	NON-WETLAND
PISI/VACCI	310	9	3.8	78.0	0.05	NON-WETLAND
PISI/VACCI-OPHO	320	12	5.4	111.5	0.05	NON-WETLAND
PISI/OPHO	330	17	11.3	151.5	0.07	NON-WETLAND
PISI/OPHO/LYAM	340	12	68.6	113.7	0.60	NON-WETLAND
PISI/OPHO-ALNUS	350	4	16.2	135.6	0.12	NON-WETLAND
PISI/OPHO/CIAL	355	6	29.4	149.5	0.04	NON-WETLAND
PISI/VACCI/LYAM	370	7	96.2	70.8	1.36	WETLAND
PISI-TSME/VACCI-OPHO	395	3	10.8	111.7	0.10	NON-WETLAND
MXD-CON/VACCI	410	13	10.9	65.3	0.17	NON-WETLAND
MXD-CON/VACCI/LYAM	420	32	58.6	55.9	1.05	WETLAND
MXD-CON/VACCI/FACR	430	12	69.7	46.3	1.51	WETLAND
MXD-CON/VACCI-GASH	460	3	12.3	34.2	0.36	NON-WETLAND
MXD-CON/GASH/LYAM	470	6	50.9	51.2	0.99	NON-WETLAND
TSME/VACCI	510	15	2.9	34.2	0.08	NON-WETLAND
TSME/VACCI-CAME	530	21	38.5	68.4	0.56	NON-WETLAND
TSME/VACCI-CLPY/FACR	540	7	18.9	32.8	0.58	NON-WETLAND
TSME/VACCI/CABI	570	11	38.3	39.3	0.97	NON-WETLAND
TSME/VACCI/LYAM	580	10	58.0	34.3	1.69	WETLAND
PICO/EMNI	610	27	132.2	25.0	5.29	WETLAND
PICO/VACCI	620	7	61.6	44.5	1.38	WETLAND
PICO/CASI	630	7	196.5	27.4	7.17	WETLAND
TSHE-THPL/VACCI	710	19	2.9	40.2	0.07	NON-WETLAND
TSHE-THPL/VACCI/LYAM	730	12	47.0	43.1	1.10	WETLAND

APPENDIX

Table A1 List of species abbreviations, scientific name, and common name of the plants observed during plant association surveys. Species used in the key are indicated with a *.

TREES

SPECIES		SCIENTIFIC NAME	COMMON NAME
ALRU	*	Alnus rubra	Red alder
CHNO	*	Chamaecyparis nootkatensis	Alaska cedar
PICO	*	Pinus contorta	Shore pine
PISI	*	Picea sitchensis	Sitka spruce
THPL	*	Thuja plicata	Western redcedar
TSHE	*	Tsuga heterophylla	Western hemlock
TSME	*	Tsuga mertensiana	Mountain hemlock

TALL SHRUBS

ALSI	*	Alnus sinuata	Sitka alder
CLPY	*	Cladothamnus pyrolaeflorus	Copperbush
COST		Cornus stolonifera	Red osier dogwood
GASH	*	Gaultheria shallon	Salal
MALUS		Malus diversifolia	Oregon crab apple
MEFE		Menziesia ferruginea	Rusty menziesia
OPHO	*	Oplopanax horridum	Devil's club
RIBES		Ribes spp	Currant/gooseberry
RIBR		Ribes bracteosum	Stink currant
RILA		Ribes lacustre	Swamp gooseberry
RILA2		Ribes laxiflorum	Trailing black currant
RUPA		Rubus parviflorus	Thimble berry
RUSP		Rubus spectabilis	Salmonberry
SARA		Sambucus racemosa	Red elderberry
SOSI		Sorbus sitchensis	Sitka mountain ash
VACCI	*	Vaccinium alask./oval.	Blueberry
VAPA		Vaccinium parvifolium	Red huckleberry
VIED		Virburnum edule	High bush cranberry

LOW SHRUBS

ANPO		Andromeda polifolia	Bog rosemary
CAME	*	Cassiope mertensiana	Mertens cassiope
CAST5	*	Cassiope stelleriana	Starry cassiope
EMNI	*	Empetrum nigrum	Crowberry
JUCO		Juniperus communis	Common juniper
KAPO		Kalmia polifolia	Bog kalmia
LEGR		Ledum groenlandicum	Labrador tea
LUPE	*	Luetkea pectinata	Luetkea
PHGL	*	Phyllodoce glanduliflora	Mountain-heather
VACA		Vaccinium caespitosum	Dwarf blueberry
VAOX		Vaccinium oxycoccos	Bog cranberry
VAUL		Vaccinium uliginosum	Bog blueberry
VAVI		Vaccinium vitis-idaea	Mountain cranberry

Table A1 List of species abbreviations, scientific name, and common name of the plants observed during plant association surveys. Species used in the key are indicated with a *.

FORBS

SPECIES		SCIENTIFIC NAME	COMMON NAME
ACRU		Actaea rubra	Baneberry
ARNIC		Arnica spp	Arnica
ARSY		Aruncus sylvester	Goatsbeard
ASTER		Aster spp	Aster
CABI	*	Caltha biflora	Marsh marigold
CAUM		Cardamine umbellata	Bittercress
CIAL	*	Circaea alpina	Enchanter's nightshade
CLUN		Clintonia uniflora	Blue-bead
COAS		Coptis asplenifolia	Fern-leaf goldthread
COTR2		Coptis trifolia	Trifoliate goldthread
COME		Corallorhiza mertensiana	Coral root
COCA		Cornus canadensis	Bunchberry dogwood
DODEC		Dodecatheon spp	Shooting star
DROSE		Drosera spp	Sundew
EPAL		Epilobium alpinum	Alpine willow-herb
EQUIS		Equisitum spp	Horsetail
ERPE		Erigeron peregrinus	Subalpine daisy
FACR	*	Fauria crista-galli	Deer cabbage
GALIU		Galium spp	Bedstraw
GATR2		Galium trifidum	Small bedstraw
GATR		Galium triflorum	Sweet-scented bedstraw
GEDO		Gentiana douglasiana	Swamp gentian
GEPL		Gentiana platypetala	Blue gentian
GECA4		Geum calthifolium	Caltha-leaf avens
GOOB		Goodyera oblongifolia	Rattlesnake plantain
HABEN		Habenaria spp	Bog-orchid
HADI		Habenaria dilatata	White bog-orchid
HASA		Habenaria saccata	Slender bog-orchid
HAUN		Habenaria unalascensis	Alaska bog-orchid
HELA		Heracleum lanatum	Cow parsnip
HEGL2		Heuchera glabra	Alpine heuchera
LEPY		Leptarrhena pyrolifolia	Leatherleaf saxifrage
LIBO2		Linnaea borealis	Twin-flower
LISTE		Listera spp	Twayblade
LICA3		Listera caurina	Western twayblade
LICO3		Listera cordata	Heart-leaved twayblade
LYAM	*	Lysichitum americanum	Yellow skunk cabbage
MADI2		Maianthemum dilatatum	Deerberry
METR		Menyanthes trifoliata	Buckbean
MITEL		Mitella spp	Mitrewort
MOUN		Moneses uniflora	Single delight
MYSC		Myosotis scorpioides	Forget-me-not
OSMOR		Osmorhiza	Sweet cicely

Table A1 List of species abbreviations, scientific name, and common name of the plants observed during plant association surveys. Species used in the key are indicated with a *.

FORBS

SPECIES	SCIENTIFIC NAME	COMMON NAME
OSPU	Osmorhiza purpurea	Sweet cicely
PAFI	Parnassia fimbriata	Grass of parnassus
PEFR	Petasites frigidus	Arctic sweet coltsfoot
PIVU	Pinguicula vulgaris	Common butterwort
PRAL	Prenanthes alata	Rattlesnake root
PYROL	Pyrola spp	Wintergreen
PYAS	Pyrola asarifolia	Liverleaf wintergreen
PYSE	Pyrola secunda	One-sided wintergreen
RANUN	Ranunculus spp	Buttercup
RAUN2	Ranunculus uncinatus	None
RUCH	Rubus chamaemorus	Cloudberry
RUPE	Rubus pedatus	Five-leaf bramble
SANGU	Sanguisorba	Burnet
SAME4	Sanguisorba menziesii	Menziesia's burnet
SASI	Sanguisorba sitchensis	Sitka burnet
SAXIF	Saxifraga spp	Saxifrage
SAFE	Sxifraga ferruginea	Alaska saxifrage
SAPU	Saxifraga punctata	Brook saxifrage
SETR	Senecio triangularis	None
STELL	Stellaria spp	Chickweed
STAM	Streptopus amplexifolius	Clasping twisted-stalk
STRO	Streptopus roseus	Rosy twisted-stalk
STST	Streptopus spreptopoides	Dwarf twisted-stalk
TITR	Tiarella trifoliata	Trifoliate foamflower
TIUN	Tiarella unifoliata	Unifoliate foamflower
TOGL	Tolfieldia glutinosa	Sticky tolfieldia
TREU	Trientalis europea	Artic starflower
VASI	Valeriana sitchensis	Sitka valerian
VEVI	Veratrum viride	False hellebore
VIOLA	Viola spp	Violet
VIGL	Viola glabella	Stream violet
VILA	Viola langsdorffii	Alaska violet

Table A1 List of species abbreviations, scientific name, and common name of the plants observed during plant association surveys. Species used in the key are indicated with a *.

SEDGES AND RUSHES

SPECIES		SCIENTIFIC NAME	COMMON NAME
CAREX		Carex spp	Sedge
CAAN5		Carex anthoxanthea	None
CAMA		Carex macrochaeta	Long-awn sedge
CAME2		Carex mertensii	Mertens sedge
CANI2		Carex nigricans	Blackish sedge
CAPA1		Carex pauciflora	Few-flowered sedge
CAPH		Carex phyllomanica	Stellate sedge
CAPL		Carex pluriflora	Many-flowered sedge
CAPR		Carex praegracilis	None
CASI3	*	Carex sitchensis	Sitka sedge
ERIOP		Eriophorum spp	Cotton grass
LUZUL		Luzula spp	Woodrush
LUPA		Luzula parviflora	None
SCCA2		Scirpus caespitosus	Tufted clubrush

GRASSES

CACA		Calamagrostis canadensis	Bluejoint
CANU3		Calamagrostis nutkaensis	Pacific reedgrass
DEAT		Deschampsia atropurpurea	Mountain hairgrass
ELYMU		Elymus spp	Ryegrass
ELHI		Elymus hirsutus	Nothern ryegrass
GRAMI		Gramineae spp	Grass species
TRISE		Trisetum spp	Oatgrass
TRCE		Trisetum cernuum	Nodding oatgrass

FERNS

ADPE		Adiantum pedatum	Maiden-hair fern
ATFI		Athyrium filix-femina	Lady fern
BLSP		Blechnum spicant	Deer fern
CYFR		Cystopteris fragilis	Fragil fern
DRAU2	*	Dryopteris austriaca	Spinulose shield fern
GYDR		Gymnocarpium dryopteris	Oak-fern
POGL4		Polypodium glycyrrhiza	Licorice fern
POBR		Polystichum braunii	Prickly shield fern
POMU		Polystichum munitum	Sword-fern
PTAQ		Pteridium aquilinum	Western bracken fern
THLI		Thelypteris limbosperma	Mountain wood-fern
THPH		Thelypteris phegopteris	Northern beech-fern

Table A1 List of species abbreviations, scientific name, and common name of the plants observed during plant association surveys. Species used in the key are indicated with a *.

CLUB MOSSES AND MOSSES

SPECIES	SCIENTIFIC NAME	COMMON NAME
LYCOP	Lycopodium spp	Clubmoss
LYAN	Lycopodium annotinum	Stiff clubmoss
LYCL	Lycopodium clavatum	Running clubmoss
LYSE	Lycopodium selago	Fir clubmoss
SPHAG	Sphagnum spp	Sphagnum moss

Table A2 PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	TSHE/ VACCI 110	TSHE VACCI/ DRAU 120	TSHE/ VACCI/ LYAM 130	TSHE/ VACCI-OPHO 140	TSHE/ OPHO 160	TSHE-CHNO/ VACCI 210	TSHE-CHNO/ VACCI/ LYAM 220
	Cover/Constancy						
OVERSTORY	69/100	74/100	65/100	68/100	76/100	61/100	63/100
ALRU	---	---	---	---	---	---	---
CHNO	5/28	---	2/16	---	---	26/100	23/100
PISI	9/52	14/57	8/72	12/29	7/75	5/42	5/57
PICO	5/4	---	---	---	---	5/5	---
THPL	---	---	---	1/5	---	9/15	5/42
TSHE	64/100	68/100	60/100	66/100	74/100	33/100	42/100
TSME	10/19	---	10/5	---	---	6/42	2/14
UNDERSTORY	23/100	22/100	30/100	24/100	11/100	33/100	37/100
ALRUU	---	---	---	---	---	---	---
CHNOU	4/4	---	1/5	---	---	6/52	4/85
PISIU	1/61	1/63	2/66	2/64	2/100	3/73	2/85
PICOU	---	---	---	---	---	1/5	---
THPLU	---	---	1/11	---	---	2/10	19/28
TSHEU	22/100	22/100	30/100	22/100	10/100	25/100	33/100
TSMEU	3/19	2/12	3/11	2/5	---	8/42	5/42
TALL SHRUBS	61/100	46/100	57/100	50/100	50/100	54/100	54/100
ALSI	---	---	---	---	---	---	---
CLPY	---	---	---	---	---	---	---
COST	---	---	---	---	---	---	---
GASH	---	---	---	---	---	---	---
MALUS	---	---	---	---	---	---	---
MEFE	6/95	3/51	8/83	5/52	1/75	10/100	10/100
OPHO	1/23	2/75	4/38	24/100	31/100	2/73	3/57
RIBES	---	---	---	---	---	---	---
RIBR	---	---	---	1/5	---	---	---
RILA1	---	---	---	---	---	---	---
RILA2	---	---	---	---	---	---	---
RUPA	---	---	---	1/5	---	2/10	---
RUSP	1/9	1/30	1/33	7/70	17/75	1/26	2/28
SARA	---	1/6	1/5	1/29	2/50	---	---
SOSI	1/4	---	---	---	---	---	---
VACCI	54/100	42/100	53/100	28/100	6/75	42/100	43/100
VAPA	4/57	3/57	2/55	2/35	1/25	4/63	2/85
VIED	---	---	1/5	---	---	---	---

Table A2 PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	110	120	130	140	160	210	220
	Cover/Constancy						
LOW SHRUBS	---	---	---	---	---	1/5	1/14
ANPO	---	---	---	---	---	---	---
CAME	---	---	---	---	---	---	---
CAST5	---	---	---	---	---	---	---
EMNI	---	---	---	---	---	---	---
JUCO	---	---	---	---	---	---	---
KAPO	---	---	---	---	---	---	---
LEGR	---	---	---	---	---	---	---
LUPE	---	---	---	---	---	---	---
PHGL	---	---	---	---	---	---	---
VACA	---	---	---	---	---	---	---
VAOX	---	---	---	---	---	---	---
VAUL	---	---	---	---	---	1/5	---
VAVI	---	---	---	---	---	---	1/14
FORBS	26/100	32/100	51/100	34/100	26/100	33/100	41/100
ACRU	---	---	---	---	---	---	---
ARNIC	---	---	---	---	---	---	---
ARSY	---	---	---	---	---	---	---
ASTER	---	---	---	---	---	---	---
CABI	1/4	---	---	1/5	---	8/15	10/14
CAUM	---	---	---	---	---	---	---
CIAL	---	---	1/5	3/35	---	---	---
CLUN	13/28	9/39	3/16	3/29	---	5/42	4/14
COAS	5/61	4/81	5/88	7/94	2/50	5/100	7/85
COTR2	6/4	---	---	---	---	---	1/28
COME	---	---	1/5	---	---	---	---
COCA	6/100	6/100	6/100	5/100	2/75	5/100	5/100
DODEC	---	---	---	---	---	---	---
DROSE	---	---	---	---	---	---	---
EPAL	---	---	---	---	---	---	---
EQUIS	---	---	1/5	---	---	1/5	1/14
ERPE	---	---	---	---	---	---	---
FACR	---	---	1/5	---	---	---	---
GALIU	---	---	---	1/5	---	1/5	---
GATR2	---	---	---	---	---	---	---
GATR	---	---	---	---	---	---	---
GEDO	---	---	---	---	---	---	---
GEPL	---	---	---	---	---	---	---
GECA4	---	---	---	---	---	---	---
GOOB	---	---	---	---	---	---	1/14
HABEN	---	---	---	---	---	1/5	1/14
HADI	---	---	---	---	---	---	---
HASA	---	---	---	---	---	1/5	---

Table A2 PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	110	120	130	140	160	210	220
	Cover/Constancy						
HAUN	---	---	---	---	---	---	---
HELA	---	---	---	---	---	---	---
HEGL2	---	---	---	---	---	---	---
LEPY	---	---	---	---	---	---	---
LIBO2	---	1/6	---	1/5	---	2/10	---
LISTE	---	---	---	---	---	---	---
LICA3	1/4	1/9	---	1/17	---	1/63	---
LICO3	1/42	1/48	1/44	1/41	---	1/89	1/100
LYAM	3/28	2/3	26/100	1/5	---	3/52	14/100
MADI2	6/28	6/45	3/27	3/41	---	3/36	1/14
METR	---	---	---	---	---	---	---
MITEL	---	---	---	---	---	---	---
MOUN	1/52	1/87	1/44	1/52	1/50	1/47	1/42
MYSC	---	---	---	---	---	---	---
OSMOR	---	---	---	---	---	1/10	---
OSPU	---	---	---	---	---	---	---
PAFI	---	---	---	---	---	---	---
PEFR	---	---	---	---	---	---	---
PIVU	---	---	---	---	---	---	---
PRAL	---	---	1/11	2/17	3/50	3/26	---
PYROL	---	1/3	---	1/5	---	1/10	---
PYAS	---	---	---	---	---	1/5	---
PYSE	1/9	1/12	1/5	1/11	---	1/21	1/42
RANUN	---	---	---	---	---	---	---
RAUN2	---	---	---	---	---	---	---
RUCH	---	---	---	---	---	---	---
RUPE	7/100	8/96	9/94	8/100	4/100	7/100	6/100
SANGU	---	---	---	---	---	---	---
SAME4	---	---	---	---	---	---	---
SASI	---	---	---	---	---	---	---
SAXIF	---	---	---	---	---	---	---
SAFE	---	---	---	---	---	---	---
SAPU	---	---	---	---	---	---	---
SETR	---	---	---	---	---	---	---
STELL	---	---	---	---	---	---	---
STAM	1/38	1/63	1/55	2/76	4/100	1/73	1/71
STRO	3/66	4/81	3/88	3/88	5/75	3/78	5/85
STST	2/23	2/60	1/22	3/70	1/50	2/36	1/14
TITR	2/19	2/63	2/44	5/100	7/100	3/84	2/57
TIUN	---	---	---	---	---	---	---

Table A2 PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	110	120	130	140	160	210	220
	Cover/Constancy						
TOGL	---	---	1/5	---	---	---	---
TREU	---	---	---	---	---	---	---
VASI	---	---	---	---	---	---	---
VEVI	1/4	1/6	---	3/5	---	2/15	---
VIOLA	---	---	---	---	---	---	---
VIGL	---	1/9	---	3/29	2/50	2/21	1/14
VILA	---	---	---	---	2/25	---	---
SEDGES-RUSHES	1/4	---	1/22	1/17	2/25	1/5	1/14
CAREX	1/4	---	1/11	1/11	---	---	---
CAAN5	---	---	1/5	---	---	---	---
CAMA	---	---	---	---	---	---	---
CAME2	---	---	1/5	---	---	---	1/14
CANI2	---	---	---	---	---	---	---
CAPA1	---	---	---	---	---	---	---
CAPH	---	---	---	---	---	---	---
EPAL	---	---	---	---	---	---	---
CAPR	---	---	---	---	1/25	---	---
CASI3	---	---	---	---	---	---	---
ERIOP	---	---	---	---	---	---	---
LUZUL	---	---	---	1/5	1/25	1/5	---
LUPA	---	---	---	---	---	---	---
SCCA2	---	---	---	---	---	---	---
GRASSES	---	---	---	1/5	---	1/5	---
CACA	---	---	---	---	---	---	---
CANU3	---	---	---	---	---	---	---
DEAT	---	---	---	---	---	---	---
ELYMU	---	---	---	---	---	---	---
ELHI	---	---	---	---	---	---	---
GRAMI	---	---	---	---	---	1/5	---
TRISE	---	---	---	1/5	---	---	---
TRCE	---	---	---	---	---	---	---

Table A2 PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	110	120	130	140	160	210	220
	Cover/Constancy						
FERNS	5/100	16/100	6/100	22/100	42/100	9/100	8/100
ADPE	---	---	---	---	---	---	---
ATFI	1/14	1/39	1/44	4/76	8/100	1/36	2/42
BLSP	4/57	4/78	2/55	3/88	4/75	5/84	4/71
CYFR	---	---	---	1/17	2/50	1/5	---
DRAU2	2/61	9/100	2/77	9/100	10/100	1/57	1/28
GYDR	3/42	4/84	3/72	8/100	18/100	4/84	4/85
POGL4	1/14	1/15	1/27	1/5	1/25	1/21	1/28
POBR	---	---	---	1/5	3/25	---	---
POMU	---	---	---	---	---	1/5	---
PTAQ	---	---	---	---	---	---	---
THLI	1/4	---	---	---	2/25	1/5	---
THPH	1/9	1/12	---	1/35	2/50	1/26	1/28
CLUB MOSSES	1/23	2/36	1/16	1/35	1/75	2/47	2/100
LYCOP	1/4	---	---	---	---	---	---
LYAN	1/9	1/27	2/5	1/17	1/25	1/26	1/28
LYCL	1/14	2/12	1/16	2/5	---	2/31	1/85
LYSE	---	1/3	---	1/11	1/50	1/15	1/14
SPHAG	11/90	6/84	24/100	9/58	2/50	4/73	9/100

Table A3 PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	PISI/ VACCI 310	PISI/ VACCI-OPHO 320	PISI/ OPHO 330	PISI/ OPHO/ LYAM 340	PISI/ OPHO-ALNUS 350	PISI/ OPHO/ CIAL 355	PISI/ VACCI/ LYAM 370	PISI-TSME/ VACCI-OPHO 395
	Cover/Constancy							
OVERSTORY	67/100	62/100	65/100	56/100	51/100	58/100	64/100	52/100
ALRU	3/11	---	2/5	4/16	20/50	---	---	---
CHNO	---	---	---	1/8	---	---	---	---
PISI	42/100	41/100	54/100	42/100	45/100	44/100	31/100	33/100
PICO	---	---	---	---	---	---	---	---
THPL	1/11	---	2/5	---	---	---	10/14	---
TSHE	34/77	30/91	18/76	17/100	5/25	15/100	38/100	2/33
TSME	15/11	4/16	2/5	---	---	---	5/14	22/100
UNDERSTORY	23/100	23/100	16/100	27/100	14/100	11/100	29/100	28/100
ALRUU	3/11	2/16	---	1/8	4/25	---	---	---
CHNOU	---	---	---	---	---	---	---	---
PISIU	3/77	3/100	3/88	5/100	6/100	3/83	4/85	9/100
PICOU	---	---	---	---	---	---	---	---
THPLU	---	---	---	---	---	---	---	---
TSHEU	20/100	20/100	14/100	20/100	8/100	10/100	26/100	9/100
TSMEU	1/44	2/16	4/11	---	---	---	1/14	13/100
TALL SHRUBS	44/100	69/100	68/100	54/100	86/100	62/100	51/100	52/100
ALSI	---	2/8	1/5	3/8	23/75	---	1/14	---
CLPY	---	---	---	---	---	---	---	---
COST	---	---	8/11	---	20/25	---	---	---
GASH	---	---	---	---	---	---	---	---
MALUS	---	---	---	---	---	---	---	---
MEFE	3/66	2/50	2/41	2/75	1/25	1/66	5/85	1/66
OPHO	2/66	29/100	58/100	36/100	49/100	59/100	9/71	30/100
RIBES	---	---	7/5	---	17/50	2/33	---	---
RIBR	---	---	1/17	2/25	---	---	---	2/66
RILA	---	---	---	---	---	1/16	---	---
RILA2	1/11	---	---	1/8	---	1/33	---	---
RUPA	---	---	---	---	---	---	---	---
RUSP	1/11	4/83	11/64	3/83	16/50	6/33	4/28	10/100
SARA	---	1/8	2/29	2/16	8/50	1/66	1/14	1/66
SOSI	1/11	---	---	---	---	---	---	1/33
VACCI	41/100	40/100	6/94	13/100	20/75	2/50	40/100	18/100
VAPA	3/22	1/8	1/41	---	---	1/16	6/28	---
VIED	---	---	1/11	1/8	4/75	---	---	---

Table A3 PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	310	320	330	340	350	355	370	395
	Cover/Constancy							
LOW SHRUBS	---	---	---	---	---	---	---	---
ANPO	---	---	---	---	---	---	---	---
CAME	---	---	---	---	---	---	---	---
CAST5	---	---	---	---	---	---	---	---
EMNI	---	---	---	---	---	---	---	---
JUCO	---	---	---	---	---	---	---	---
KAPO	---	---	---	---	---	---	---	---
LEGR	---	---	---	---	---	---	---	---
LUPE	---	---	---	---	---	---	---	---
PHGL	---	---	---	---	---	---	---	---
VACA	---	---	---	---	---	---	---	---
VAOX	---	---	---	---	---	---	---	---
VAUL	---	---	---	---	---	---	---	---
VAVI	---	---	---	---	---	---	---	---
FORBS	32/100	34/100	36/100	71/100	35/100	26/100	71/100	50/100
ACRU	1/11	---	---	---	---	1/16	---	---
ARNIC	---	---	1/5	---	---	---	---	---
ARSY	1/11	---	---	1/8	---	1/33	---	---
ASTER	---	---	---	---	---	---	---	---
CABI	---	1/16	---	2/16	1/25	---	---	10/33
CAUM	---	---	---	---	---	---	---	---
CIAL	---	3/25	8/76	4/58	8/75	12/100	2/14	1/33
CLUN	---	2/8	---	---	---	1/33	2/14	---
COAS	2/55	6/64	2/41	5/75	1/25	---	5/100	8/66
COTR2	---	---	---	---	---	---	---	---
COME	---	---	---	---	---	---	---	---
COCA	10/88	5/100	2/70	5/91	2/75	1/16	4/100	4/33
DODEC	---	---	---	---	---	---	---	---
DROSE	---	---	---	---	---	---	---	---
EPAL	---	---	---	---	---	---	---	---
EQUIS	---	---	7/5	1/8	2/50	---	1/14	---
ERPE	---	---	---	---	---	---	---	---
FACR	---	---	---	---	---	---	---	---
GALIU	---	---	1/5	---	---	---	---	---
GATR2	---	---	---	1/8	---	---	---	---
GATR	---	---	1/5	1/8	---	---	---	---
GEDO	---	---	---	---	---	---	---	---
GEPL	---	---	---	---	---	---	---	---
GECA4	---	---	---	---	---	---	---	---
GOOB	---	---	---	---	---	---	---	---
HABEN	---	---	---	---	---	---	---	---
HADA	---	---	---	---	---	---	---	---
HASA	---	---	---	---	---	---	---	---

Table A3 PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	310	320	330	340	350	355	370	395
	Cover/Constancy							
HAUN	---	---	---	---	---	---	---	---
HELA	---	---	---	---	---	---	---	---
HEGL2	---	---	---	---	---	---	---	---
LEPY	---	---	---	---	---	---	---	---
LIBO2	---	---	---	---	---	---	---	---
LISTE	---	---	---	---	---	---	---	---
LICA3	2/22	1/8	---	---	---	1/16	---	1/33
LICO3	1/44	1/32	1/5	2/16	---	---	1/14	2/66
LYAM	2/55	4/41	2/35	30/100	2/50	1/16	47/100	---
MADI2	6/33	5/25	10/47	5/16	---	2/50	1/14	---
METR	---	---	---	---	---	---	---	---
MITEL	---	---	---	---	---	---	---	---
MOUN	1/77	1/33	1/35	1/25	---	1/66	1/28	---
MYSC	---	---	---	---	---	---	---	---
OSMOR	---	---	1/5	---	---	---	---	---
OSPU	---	---	---	---	1/25	---	---	1/66
PAFI	---	---	---	---	---	---	---	---
PEFR	---	---	---	---	---	---	---	---
PIVU	---	---	---	---	---	---	---	---
PRAL	1/22	1/16	1/64	1/58	---	1/66	---	2/33
PYROL	---	---	---	---	---	---	---	---
PYAS	---	---	---	---	---	---	---	---
PYSE	2/22	1/16	---	2/16	1/25	1/16	1/42	---
RANUN	---	---	---	---	---	---	---	---
RAUN2	---	---	---	---	---	---	---	---
RUCH	---	---	---	---	---	---	---	---
RUPE	11/100	9/100	6/82	9/100	9/75	1/16	9/100	8/66
SANGU	---	---	---	---	---	---	---	---
SAME4	---	---	---	---	---	---	---	---
SASI	---	---	---	---	---	---	---	---
SAXIF	---	---	---	---	---	---	---	---
SAFE4	---	---	---	---	---	---	---	---
SAPU	---	---	---	---	---	---	---	---
SETR	---	---	---	---	---	---	---	---
STELL	---	---	---	---	---	---	---	---
STAM	1/77	2/100	2/88	2/83	7/100	1/83	1/57	2/100
STRO	5/77	4/100	4/88	5/91	8/75	2/100	2/71	15/100
STST	2/44	2/33	2/35	1/16	1/25	---	1/28	3/100
TITR	3/33	6/100	9/100	11/100	6/100	6/100	3/71	6/100
TIUN	---	---	---	---	---	---	---	---

Table A3 PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	310	320	330	340	350	355	370	395
	Cover/Constancy							
TOGL	---	---	---	---	---	---	---	---
TREU	---	---	---	---	---	---	---	---
VASI	---	---	---	---	---	---	---	1/33
VEVI	---	1/25	1/5	1/25	1/50	---	---	2/100
VIOLA	---	---	---	---	---	---	---	---
VIGL	---	1/25	2/58	3/66	2/50	1/16	1/14	1/100
VILA	---	---	---	---	---	---	---	---
SEDGES-RUSHES	---	1/16	1/11	1/41	1/25	---	2/42	1/33
CAREX	---	---	---	2/16	---	---	1/28	---
CAAN5	---	---	---	---	---	---	---	---
CAMA	---	---	---	---	---	---	---	---
CAME2	---	---	---	1/8	---	---	---	---
CANI2	---	---	---	---	---	---	---	---
CAPA1	---	---	---	---	---	---	---	---
CAPH	---	---	---	---	---	---	---	---
CAPL	---	---	---	---	---	---	---	---
CAPR	---	---	---	---	---	---	---	---
CASI3	---	---	---	2/16	---	---	1/14	---
ERIOP	---	---	---	---	---	---	---	---
LUZUL	---	1/16	1/11	1/8	---	---	1/28	1/33
LUPA	---	---	---	---	---	---	---	---
SCCA2	---	---	---	---	---	---	---	---
GRASSES	---	1/16	1/29	1/25	1/25	---	1/14	1/33
CACA	---	---	---	---	---	---	---	---
CANU3	---	---	---	---	---	---	---	---
DEAT	---	---	---	---	---	---	---	---
ELYMU	---	---	---	1/8	---	---	---	---
ELHI	---	---	---	1/8	---	---	---	---
GRAMI	---	1/8	1/5	---	---	---	---	---
TRISE	---	1/8	1/11	1/8	---	---	1/14	1/33
TRCE	---	---	1/5	1/8	---	---	---	---

Table A3 PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	310	320	330	340	350	355	370	395
	Cover/Constancy							
FERNS	10/100	24/100	34/100	21/100	24/100	60/100	6/100	22/100
ADPE	---	---	1/5	3/8	---	---	---	---
ATFI	2/55	8/91	12/100	9/100	13/100	14/100	1/71	4/100
BLSP	1/22	2/50	1/23	1/58	---	---	2/57	1/33
CYFR	1/11	1/16	---	1/8	1/25	1/33	1/14	---
DRAU2	3/100	7/100	8/100	4/100	4/75	7/83	1/71	12/100
GYDR	6/66	10/100	12/100	6/91	8/100	30/100	3/71	6/100
POGL4	1/22	1/8	1/23	1/33	1/25	1/100	---	---
POBR	---	---	---	2/8	---	1/50	---	---
POMU	---	---	1/5	---	---	---	---	---
PTAQ	---	---	---	---	---	---	---	---
THLI	---	---	---	---	---	---	---	---
THPH	4/33	2/41	2/58	2/75	---	14/100	2/28	---
CLUB MOSSES	1/33	2/25	1/5	1/25	---	1/100	---	---
LYCOP	---	---	---	---	---	---	---	---
LYAN	1/11	1/25	1/5	1/16	---	2/33	---	---
LYCL	1/11	1/16	---	1/8	---	---	---	---
LYSE	1/11	---	---	---	---	1/66	---	---
SPHAG	10/77	9/66	2/52	11/83	1/50	2/16	31/85	7/66

Table A4. PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	MXD-CON/ VACCI 410	MXD-CON/ VACCI/ LYAM 420	MXD-CON/ VACCI/ FACR 430	MXD-CON/ VACCI-GASH 460	MXD-CON/ GASH/ LYAM 470	TSHE-THPL/ VACCI 710	THSE-THPL/ VACCI/ LYAM 730
	Cover/Constancy						
OVERSTORY	45/100	50/100	38/100	28/100	34/100	65/100	60/100
ALRU	---	---	---	---	---	---	1/8
CHNO	16/61	16/81	18/100	14/66	7/66	10/31	11/41
PISI	8/46	6/84	4/50	2/33	1/50	8/26	5/50
PICO	15/7	8/9	7/50	6/33	10/33	---	---
THPL	10/7	23/28	1/8	9/100	17/100	35/100	28/100
TSHE	16/100	20/100	9/91	9/66	12/100	31/100	31/100
TSME	19/100	12/96	10/100	5/100	4/50	---	1/8
UNDERSTORY	33/100	37/100	39/100	37/100	35/100	38/100	38/100
ALRUU	---	---	10/8	---	---	---	---
CHNOU	10/53	7/75	15/100	6/66	5/50	3/5	4/16
PISIU	3/84	4/96	3/83	1/33	2/83	2/78	2/100
PICOU	20/7	1/15	3/50	2/66	1/50	---	---
THPLU	4/7	6/31	2/16	4/100	4/100	5/84	7/91
TSHEU	17/100	18/100	12/100	16/66	28/100	35/100	30/100
TSMEU	10/92	12/84	11/100	9/100	8/50	---	4/41
TALL SHRUBS	73/100	64/100	45/100	68/100	81/100	44/100	43/100
ALSI	---	1/6	---	---	---	---	---
CLPY	3/7	2/6	5/33	---	---	1/5	---
COST	---	---	---	---	---	---	---
GASH	---	5/3	---	30/100	49/100	---	---
MALUS	---	8/6	---	---	---	---	---
MEFE	19/92	12/96	10/100	6/100	14/100	7/94	10/100
OPHO	2/15	2/31	2/16	---	---	2/36	2/50
RIBES	---	---	---	---	---	---	---
RIBR	---	---	---	---	---	---	---
RILA	---	---	---	---	---	---	---
RILA2	---	1/3	---	---	---	---	---
RUPA	---	6/3	---	---	---	---	---
RUSP	1/7	2/37	1/25	---	---	2/10	1/16
SARA	---	2/3	---	---	---	---	1/8
SOSI	---	1/3	1/16	---	---	---	1/8
VACCI	56/100	51/100	35/100	28/100	19/100	35/100	32/100
VAPA	5/38	3/50	1/58	4/100	3/100	5/94	3/75
VIED	---	---	1/8	---	---	---	---

Table A4. PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	410	420	430	460	470	710	730
	Cover/Constancy						
LOW SHRUBS	2/38	2/34	15/91	9/100	3/83	1/5	1/8
ANPO	---	---	---	---	---	---	---
CAME	---	2/3	10/8	---	---	---	---
CAST5	---	3/3	6/16	---	---	---	---
EMNI	1/23	1/6	3/50	6/33	1/16	---	---
JUCO	---	---	---	---	---	---	---
KAPO	1/7	1/12	3/50	3/33	1/16	---	---
LEGR	1/23	1/12	4/66	8/33	2/16	---	---
LUPE	---	---	---	---	---	---	---
PHGL	---	2/6	3/25	---	---	---	---
VACA	---	2/18	4/75	2/100	1/16	---	1/8
VAOX	---	---	1/16	2/33	1/16	---	---
VAUL	1/7	---	6/25	---	---	---	---
VAVI	4/30	3/28	5/66	4/33	2/83	1/5	1/8
FORBS	36/100	55/100	49/100	23/100	40/100	25/100	45/100
ACRU	---	---	---	---	---	---	---
ARNIC	---	---	---	---	---	---	---
ARSY	---	1/3	---	---	---	---	---
ASTER	---	---	---	---	---	---	---
CABI	4/15	6/15	18/41	---	1/16	---	3/8
CAUM	---	1/3	---	---	---	---	---
CIAL	---	2/3	---	---	---	---	1/8
CLUN	3/61	2/25	1/8	---	---	3/52	3/16
COAS	6/92	6/100	5/100	2/100	2/66	5/68	5/83
COTR2	1/23	1/15	1/58	2/33	1/33	---	---
COME	---	---	---	---	---	---	---
COCA	8/100	8/100	6/100	10/100	9/100	6/100	6/100
DODEC	---	1/3	1/16	---	---	---	---
DROSE	---	---	---	1/33	---	---	---
EPAL	---	---	---	---	---	---	---
EQUIS	---	1/6	1/8	---	---	---	---
ERPE	---	1/3	---	---	---	---	---
FACR	2/46	4/37	22/91	6/33	2/33	---	1/8
GALIU	---	---	---	---	---	---	---
GATR2	---	---	1/8	---	---	---	---
GATR	---	1/9	---	---	---	---	---
GEDO	---	2/3	2/16	---	1/33	---	---
GEPA	---	---	---	---	---	---	---
GECA4	---	---	---	---	---	---	---
GOOB	---	---	---	---	---	---	---
HABEN	---	1/9	1/25	---	---	---	---
HADI	---	---	1/8	---	---	---	---
HASA	---	1/3	1/8	---	---	---	---

Table A4. PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	410	420	430	460	470	710	730
	Cover/Constancy						
HAUN	---	---	---	---	---	---	---
HELA	---	---	---	---	---	---	---
HEGL2	---	---	---	---	---	---	---
LEPY	---	---	---	---	---	---	---
LIBO2	1/30	2/40	1/50	2/66	1/66	1/26	1/25
LISTE	---	1/3	---	---	---	---	---
LICA3	1/23	1/21	1/8	1/33	1/16	1/52	1/25
LICO3	1/69	1/87	1/58	1/66	1/100	2/84	1/83
LYAM	3/84	25/100	5/83	1/100	23/100	3/31	22/100
MADI2	3/46	4/18	2/25	---	1/83	5/63	4/41
METR	---	---	---	---	---	---	---
MITEL	---	---	---	---	---	---	---
MOUN	1/15	2/15	---	---	1/16	1/10	1/16
MYSC	---	1/3	---	---	---	---	---
OSMOR	---	---	---	---	---	---	---
OSPU	---	---	---	---	---	---	---
PAFI	---	---	---	---	---	---	---
PEFR	---	---	---	---	---	---	---
PIVU	---	---	---	---	---	---	---
PRAL	1/7	1/12	1/33	---	---	2/5	---
PYROL	---	1/12	---	1/33	1/16	1/5	1/8
PYAS	---	---	---	---	---	---	---
PYSE	1/38	1/31	1/16	1/33	---	2/10	1/25
RANUN	---	---	---	---	---	---	---
RAUN2	---	1/3	---	---	---	---	---
RUCH	5/30	2/12	1/16	---	---	---	---
RUPE	8/100	6/96	4/66	3/33	2/66	5/89	4/100
SANGU	---	1/3	---	---	---	---	---
SAME4	---	2/6	2/33	---	---	---	---
SASI	---	---	---	---	---	---	---
SAXIF	---	---	---	---	---	---	---
SAFE	---	---	---	---	---	---	---
SAPU	---	---	---	---	---	---	---
SETR	---	---	---	---	---	---	---
STELL	---	---	---	---	---	---	---
STAM	1/46	2/56	1/25	1/33	1/33	1/78	1/58
STRO	3/76	4/96	1/66	2/66	1/16	2/78	3/83
STST	1/23	1/15	---	3/33	1/33	1/26	1/16
TITR	2/30	3/37	1/41	---	---	3/42	3/50
TIUN	---	---	---	---	---	---	---

Table A4. PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	410	420	430	460	470	710	730
	Cover/Constancy						
TOGL	---	4/3	---	---	---	---	---
TREU	1/7	---	1/8	1/33	---	---	---
VASI	---	---	---	---	---	---	---
VEVI	2/15	1/40	1/50	---	---	1/10	1/8
VIOLA	---	---	---	---	---	---	---
VIGL	---	1/18	1/8	---	---	1/5	1/16
VILA	---	---	---	---	---	---	---
SEDGES-RUSHES	3/23	4/59	10/91	---	1/66	1/5	1/33
CAREX	1/15	2/28	4/33	---	1/16	1/5	1/8
CAAN5	1/7	4/31	5/41	---	1/33	---	1/8
CAMA	---	---	---	---	---	---	---
CAME2	1/7	1/6	---	---	---	---	1/16
CANI2	---	---	---	---	---	---	---
CAPA1	---	---	3/16	---	---	---	---
CAPH	---	---	---	---	1/33	---	---
CAPL	4/7	3/3	2/16	---	---	---	---
CAPR	---	---	---	---	---	---	---
CASI3	---	2/6	30/16	---	---	---	---
ERIOP	---	---	1/8	---	---	---	---
LUSPP	---	---	---	---	---	---	---
LUZUL	---	1/6	---	---	---	---	---
LUPA	---	---	---	---	---	---	---
SCCA2	---	---	---	---	---	---	---
GRASSES	2/7	6/21	2/50	1/33	---	---	---
CACA	---	---	1/8	---	---	---	---
CANU3	---	6/3	---	---	---	---	---
DEAT	---	---	---	---	---	---	---
ELYMU	---	---	---	---	---	---	---
ELHI	---	---	---	---	---	---	---
GRAMI	2/7	7/12	2/33	1/33	---	---	---
TRISE	---	3/9	1/8	---	---	---	---
TRCE	---	1/3	---	---	---	---	---

Table A4. PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	410	420	430	460	470	710	730
	Cover/Constancy						
FERNS	7/100	4/100	4/100	3/100	6/100	8/100	6/100
ADPE	---	5/3	---	---	---	---	---
ATFI	2/15	2/31	1/33	---	---	1/21	1/41
BLSP	4/61	3/71	3/91	2/100	3/50	5/94	3/100
CYFR	---	1/3	---	---	---	1/5	---
DRAU2	1/30	1/25	1/8	---	---	1/52	1/41
GYDR	2/23	2/34	4/16	---	---	3/78	2/66
POGL4	1/15	1/15	1/8	---	1/66	1/31	1/58
POBR	---	---	---	---	---	---	---
POMU	---	---	---	---	---	---	---
PTAQ	7/30	1/3	4/16	2/66	6/66	---	---
THLI	1/7	1/3	---	---	---	---	1/8
THPH	1/7	3/9	1/25	---	---	2/26	2/16
CLUB MOSSES	1/53	2/59	2/91	2/66	2/50	2/52	2/58
LYCOP	---	1/3	---	---	---	---	---
LYAN	1/30	1/9	1/41	3/33	2/16	1/5	1/8
LYCL	1/15	2/50	1/83	---	1/50	1/42	2/58
LYSE	1/7	1/6	---	1/33	1/16	1/10	---
SPHAG	14/92	18/96	11/91	16/100	18/100	7/78	15/100

Table A5. PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	TSME/ VACCI 510	TSME/ VACCI/ CAME 530	TSME/ VACCI-CLPY/ FACR 540	TSME/ VACCI/ CABI 570	TSME/ VACCI/ LYAM 580	PICO/ EMNII 610	PICO/ VACCI 620	PICO/ CASI 630
	Cover/Constancy							
OVERSTORY	60/100	39/100	46/100	48/100	51/100	24/100	51/100	29/100
ALRU	---	---	---	---	---	---	---	---
CHNO	9/33	17/61	20/71	27/27	17/50	5/64	12/100	4/37
PISI	8/80	11/38	8/28	5/81	6/60	2/7	3/12	1/37
PICO	---	---	---	---	---	19/100	25/100	24/100
THPL	---	---	---	---	---	4/3	7/50	5/12
TSHE	16/66	4/9	9/42	7/63	16/50	3/32Y	9/87	3/25
TSME	41/100	25/100	28/100	35/100	35/100	3/32	8/100	4/75
UNDERSTORY	21/100	31/100	39/100	21/100	23/100	36/100	50/100	22/100
ALRUU	---	---	---	---	---	1/3	---	---
CHNOU	6/40	19/66	20/71	8/36	7/60	21/89	16/100	4/37
PISIU	2/86	2/66	3/42	2/90	3/70	2/42	1/62	2/50
PICOU	---	2/9	---	---	---	10/100	4/75	9/100
THPLU	---	---	---	2/18	---	9/14	10/50	---
TSHEU	8/86	4/61	10/71	6/100	6/90	6/78	13/100	7/87
TSMEU	12/100	16/100	16/100	12/100	12/100	6/78	12/100	4/100
TALL SHRUBS	47/100	39/100	64/100	37/100	51/100	7/96	41/100	12/100
ALSI	6/13	5/14	3/28	---	5/20	1/3	---	1/12
CLPY	2/6	17/66	9/100	2/27	4/40	2/14	2/12	---
COST	---	---	---	---	---	---	---	---
GASH	---	---	---	---	---	---	---	25/12
MALUS	---	---	---	---	---	---	---	---
MEFE	3/93	4/90	6/100	2/90	4/90	3/82	11/100	6/100
OPHO	3/46	1/9	2/14	4/36	2/30	---	---	---
RIBES	---	---	---	---	---	---	---	---
RIBR	---	6/4	1/14	1/9	---	---	---	---
RILA	---	---	---	---	---	---	---	---
RILA2	7/6	6/4	---	---	---	---	---	---
RUPA	---	---	---	---	---	---	---	---
RUSP	2/46	2/33	2/28	2/45	8/40	---	1/12	---
SARA	---	---	---	---	---	---	---	---
SOSI	1/13	2/47	4/42	---	1/20	---	---	---
VACCI	42/100	23/100	47/100	33/100	43/100	6/75	28/100	3/75
VAPA	4/6	---	---	---	---	1/7	5/75	1/12
VIED	---	---	---	---	---	1/3	---	1/12

Table A5. PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	510	530	540	570	580	610	620	630
	Cover/Constancy							
LOW SHRUBS	---	27/100	5/85	1/9	3/30	48/100	14/100	36/100
ANPO	---	1/4	---	---	---	1/21	---	1/25
CAME	---	15/80	2/57	---	1/10	5/7	---	---
CAST5	---	4/66	1/42	---	1/20	5/7	---	---
EMNI	---	5/38	9/42	---	1/20	17/96	2/62	9/75
JUCO	---	---	---	---	---	2/17	---	---
KAPO	---	4/28	1/14	---	---	4/89	3/62	3/62
LEGR	---	1/4	1/14	---	---	8/96	3/75	16/100
LUPE	---	4/57	---	---	1/10	---	---	---
PHGL	---	9/61	---	1/9	1/10	3/17	---	---
VACA	---	5/52	---	---	1/10	7/89	8/62	3/62
VAOX	---	---	1/14	---	---	4/60	---	6/50
VAUL	---	1/23	---	---	---	7/71	1/12	4/62
VAVI	---	---	---	---	---	4/100	4/100	6/100
FORBS	36/100	44/100	39/100	45/100	62/100	44/100	42/100	42/100
ACRU	1/6	---	---	---	---	---	---	---
ARNIC	---	5/4	---	5/9	1/10	---	---	1/12
ARSY	---	---	---	1/9	---	---	---	---
ASTER	---	---	---	---	---	1/7	---	---
CABI	1/6	10/19	6/28	11/100	20/60	6/10	2/25	4/25
CAUM	---	---	---	---	---	---	---	---
CIAL	---	---	---	---	---	---	---	---
CLUN	---	---	---	---	---	---	---	---
COAS	5/80	3/66	5/85	5/90	6/100	2/57	2/100	4/62
COTR2	---	1/14	---	1/9	6/20	2/78	2/62	1/50
COME	---	---	---	---	---	---	---	---
COCA	4/66	4/61	4/100	2/81	3/90	5/100	9/100	6/100
DODEC	---	---	---	---	---	2/21	1/12	3/37
DROSE	---	1/4	---	---	---	1/39	---	1/12
EPAL	1/6	---	---	---	---	---	---	---
EQUIS	---	---	---	---	---	1/3	---	1/12
ERPE	---	1/9	---	---	---	1/10	1/12	---
FACR	1/26	26/85	11/100	15/9	8/80	22/92	16/75	23/62
GALIU	---	---	---	---	---	---	---	---
GATR2	---	---	---	---	---	---	---	---
GATR	---	---	---	---	---	---	---	---
GEDO	---	1/9	---	---	1/10	1/64	1/12	2/12
GEPL	---	1/4	---	---	---	1/3	---	---
GECA4	---	1/4	---	---	1/20	1/17	---	---
GOOB	---	---	---	---	---	---	---	---
HABEN	1/6	---	---	---	---	1/17	1/12	1/25
HADI	---	---	---	---	---	1/10	---	---
HASA	1/6	1/9	---	1/9	---	1/10	1/12	1/12

Table A5. PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	510	530	540	570	580	610	620	630
	Cover/Constancy							
HAUN	---	---	---	---	---	1/3	---	---
HELA	---	---	---	1/9	---	---	---	1/12
HEGL2	2/13	---	---	---	3/10	---	---	---
LEPY	---	2/9	---	---	---	---	---	---
LIBO2	---	---	1/14	---	---	1/17	2/62	1/25
LISTE	---	---	---	---	---	---	---	---
LICA3	1/13	1/19	1/14	1/18	1/20	---	---	---
LICO3	1/93	1/76	2/71	2/90	2/100	1/10	1/37	1/12
LYAM	2/20	3/9	1/71	1/45	10/100	4/71	11/87	8/75
MADI2	---	1/4	---	1/9	---	2/7	1/12	2/87
METR	---	---	---	---	---	1/10	---	---
MITEL	1/6	1/4	---	---	---	---	---	---
MOUN	---	---	---	1/18	---	---	---	---
MYSC	---	---	---	---	---	---	---	---
OSMOR	---	---	---	1/18	---	---	---	---
OSPU	1/6	---	---	---	---	---	---	3/12
PAFI	1/6	1/4	---	---	---	---	---	---
PEFR	---	1/4	---	---	---	---	---	---
PIVU	---	---	---	---	---	1/7	---	---
PRAL	---	1/4	---	1/9	---	---	---	---
PYROL	---	---	---	---	---	---	---	---
PYAS	---	---	---	---	---	---	---	---
PYSE	1/20	2/28	1/28	2/18	2/30	---	---	---
RANUN	---	---	---	---	---	1/3	---	---
RAUN2	---	---	---	---	---	---	---	---
RUCH	---	---	---	---	---	3/50	2/37	3/50
RUPE	9/100	3/95	5/100	8/100	7/100	1/21	2/50	2/50
SANGU	---	---	---	---	---	1/3	---	---
SAME4	1/6	2/14	---	---	2/20	9/85	3/62	5/74
SASI	---	---	---	---	---	---	---	1/12
SAXIF	---	---	1/14	---	---	---	---	---
SAFE	1/6	1/4	---	---	---	---	---	---
SAPU	---	1/4	---	---	---	---	---	---
SETR	---	---	---	1/9	---	---	---	---
STELL	---	---	---	1/9	---	---	---	---
STAM	2/60	9/33	7/42	2/45	2/70	1/7	1/12	1/12
STRO	15/93	5/76	6/100	8/90	8/100	1/7	2/12	---
STST	2/60	1/23	---	2/36	2/50	---	---	---
TITR	2/73	2/33	2/42	4/90	5/60	---	---	1/12
TIUN	---	---	---	1/9	---	---	---	---

Table A5. PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	510	530	540	570	580	610	620	630
	Cover/Constancy							
TOGL	---	---	---	---	---	1/17	---	1/12
TREU	---	2/9	---	---	1/10	1/35	1/12	1/37
VASI	1/6	2/19	1/14	1/9	3/10	---	---	---
VEVI	2/40	2/80	1/85	2/90	2/90	1/21	2/50	1/25
VIOLA	---	---	---	---	---	1/3	---	---
VIGL	1/20	1/14	1/14	1/45	3/30	---	---	---
VILA	---	2/4	---	---	---	---	1/12	1/12
SEDGE	1/20	10/71	3/42	2/54	16/60	45/100	11/87	67/100
CAREX	1/13	10/19	2/28	2/27	2/10	21/17	5/50	10/25
CAAN5	1/6	10/42	3/14	---	13/50	13/53	7/37	30/12
CAMA	---	---	---	1/9	---	---	---	---
CAME2	---	---	---	---	---	---	---	---
CANI2	---	8/9	---	---	---	2/7	---	1/12
CAPA1	---	---	---	---	---	18/82	2/37	10/25
CAPH	---	---	---	---	---	---	---	---
CAPL	---	3/14	---	2/9	6/20	12/57	10/12	19/75
CAPR	---	---	---	---	15/10	---	---	---
CASI3	---	---	4/14	---	1/10	10/39	4/37	44/100
ERIOP	---	1/14	---	---	1/10	2/25	---	1/12
LUSPP	---	1/4	---	---	---	---	---	---
LUZUL	---	1/4	---	1/18	---	---	---	---
LUPA	1/6	---	---	---	---	---	---	---
SCCA2	---	---	---	---	---	14/60	4/25	2/25
GRASSES	1/13	2/47	2/28	1/18	2/20	4/60	2/37	3/25
CACA	---	---	---	---	---	---	---	---
CANU3	---	---	---	---	---	---	---	---
DEAT	---	2/14	---	---	1/10	2/10	---	---
ELYMU	---	---	---	---	---	---	---	---
ELHI	---	---	---	---	---	---	---	---
GRAMI	1/6	1/4	2/28	1/18	1/10	4/7	2/12	---
TRISE	1/6	1/19	---	---	---	3/39	2/25	7/37
TRCE	---	---	---	---	---	---	---	---

Table A5. PLANT COMPOSITION OF FOREST PLANT ASSOCIATIONS OF THE STIKINE AREA, TONGASS N F. Cover is the average percent coverage on those plots that the species occurred. Constancy is the percentage of plots in which the species occurred.

Association	510	530	540	570	580	610	620	630
	Cover/Constancy							
FERNS	6/100	5/100	7/100	11/100	6/100	2/25	2/62	1/25
ADPE	---	---	---	---	---	---	---	---
ATFI	2/26	2/28	1/28	7/63	3/50	---	---	---
BLSP	3/73	3/80	6/100	4/100	3/90	1/17	1/37	1/12
CYFR	---	1/4	---	---	---	---	---	---
DRAU2	4/80	2/28	1/14	2/54	2/30	---	---	---
GYDR	2/40	2/19	2/42	2/63	2/50	1/3	---	---
POGL4	---	---	---	---	---	---	1/12	---
POBR	---	---	---	---	---	---	---	---
POMU	---	---	---	---	---	---	---	---
PTAQ	---	1/4	---	---	---	3/7	1/12	---
THLI	---	6/9	---	5/9	2/20	---	---	---
THPH	1/6	10/4	1/14	1/9	---	---	---	1/12
CLUB MOSSES	1/40	1/47	1/42	1/36	1/20	2/60	2/75	2/62
LYCOP	---	---	---	---	---	---	---	---
LYAN	1/6	1/14	---	1/27	1/10	1/10	2/25	2/25
LYCL	1/13	1/28	2/28	---	---	1/60	2/75	1/50
LYSE	1/26	1/4	1/14	1/9	1/10	1/3	---	---
SPHAG	6/100	13/66	9/85	6/90	14/100	35/92	37/87	44/100

Table A6. Elevation and slope characteristics of plant associations sampled on the Stikine Area.

PLANT ASSOCIATION	PA CODE	ELEVATION MIN	ELEVATION MAX	ELEVATION AVE	SLOPE MIN	SLOPE MAX	SLOPE AVE
		feet			percent		
TSHE/VACCI	110	100	1700	574	1	85	31
TSHE/VACCI/DRAU	120	100	2100	517	1	70	35
TSHE/VACCI/LYAM	130	100	1200	296	2	43	14
TSHE/VACCI-OPHO	140	100	1500	510	5	65	32
TSHE/OPHO	160	200	500	325	2	80	47
TSHE-CHNO/VACCI	210	100	1700	949	18	75	50
TSHE-CHNO/VACCI/LYAM	220	400	1200	771	17	65	37
PISI/VACCI	310	100	900	304	1	45	11
PISI/VACCI-OPHO	320	100	800	232	1	15	4
PISI/OPHO	330	100	1500	274	1	65	12
PISI/OPHO/LYAM	340	100	1300	286	1	40	7
PISI/OPHO-ALNUS	350	200	400	288	1	5	2
PISI/OPHO/CIAL	355	100	400	200	13	70	49
PISI/VACCI/LYAM	370	100	550	379	1	15	6
PISI-TSME/VACCI-OPHO	395	1300	2300	1733	22	40	29
MXD-CON/VACCI	410	100	2200	623	1	95	23
MXD-CON/VACCI/LYAM	420	100	1800	575	2	60	17
MXD-CON/VACCI/FACR	430	200	1500	700	3	65	25
MXD-CON/VACCI-GASH	460	100	400	267	10	15	12
MXD-CON/GASH/LYAM	470	100	100	100	1	12	5
TSME/VACCI	510	1300	2700	1913	25	85	55
TSME/CAME	530	1500	2900	2195	15	95	48
TSME/VACCI-CLPY/FACR	540	1400	2300	1871	25	90	51
TSME/VACCI/CABI	570	1700	2400	2038	40	82	60
TSME/VACCI/LYAM	580	1500	2400	1890	25	60	45
PICO/EMNI	610	100	2100	552	1	35	10
PICO/VACCI	620	100	800	431	5	30	12
PICO/CASI	630	100	900	219	1	15	5
TSHE-THPL/VACCI	710	100	900	365	7	70	37
TSHE-THPL/VACCI/LYAM	730	100	700	379	4	65	26

GLOSSARY

Abundant---Any species with 25 percent or greater canopy coverage.

Alluvial fan---An alluvial landform whose surface forms a segment of a cone that radiates downslope from the point where the stream emerges from a narrow valley onto a less sloping surface.

Basal area---The cross-sectional area of a tree or trees measured at 4.5 feet above ground or just above butt swell; usually summed for all trees in a given stand and expressed on a per acre basis.

Bench---A platform-type, nearly level to gently inclined erosional surface developed on resistant strata in area where valleys are cut in alternating strong and weak layers with an essentially horizontal attitude.

Biennial---A plant that completes its life cycle in two growing seasons.

Browse---Shrubby forage eaten by large animals. To eat shrubby forage.

Canopy coverage---The area covered when an imaginary polygon is circumscribed about a plant's foliage and projected to a horizontal plane and expressed as a percentage of the sampling unit. The collective coverage of all individuals of a species or combination of species on a plot or stand is used in the key and plant association descriptions.

Climax community---The final stage in plant succession for a given habitat that perpetuates itself in the absence of disturbance.

Climax species---A species that is self-perpetuating in the absence of disturbance and is not replaced by other species.

Common---A plant species with one percent or greater canopy coverage.

Commonly found---Usually present in a stand. A plant that is commonly found may be poorly or well represented.

Constancy---The percentage of stands in a plant association containing a given species.

Cryorthod---A soil of cold climates that have a spodic horizon and are freely drained. (A soil classification in the U.S. system of soil taxonomy.)

dbh (diameter at breast height)---Tree trunk diameter at 4.5 feet above ground. For trees with butt swell, the diameter is measured immediately above the swell.

Edaphic---(i) Of or pertaining to soil. (ii) Resulting from or influenced by factors inherent in the soil or other substrate, rather than by climatic factors.

Epipedon---A soil horizon that has formed on the surface that has been appreciably darkened by organic matter of eluviated or as a minimum, rock structure has been destroyed.

Facultative---For a plant, the ability to grow on a particular site.

Flood plain---The land bordering a stream, built up of sediments from overflow of the stream and subject to inundation when the stream is at flood stage.

Forb---An herbaceous plant that is not a graminoid, fern or clubmoss.

Graminoid---Grasses and grasslike plants including sedges (Carex spp) and rushes (Juncus, Luzula, Scirpus and Eriophorum spp).

Histic epipedon---An organic soil horizon that is saturated with water at some period of the year unless artificially drained and that is at or near the surface of a mineral soil.

Histosols---Organic soils that have organic materials in more than half of the upper 80 cm, or that are of any thickness if overlying rock or fragmental materials that have interstices filled with organic soil materials. (An order in the U.S. system of soil taxonomy.)

Humic---A term used in the U.S system of soil taxomony to denote a higher than typical concentration of organic carbon.

Indicator plant---A plant whose presence is indicative of certain environmental conditions.

Lithic---A term used in the U.S. system of soil taxonomy to denote bedrock contact within the soil profile.

Loess---Soil material transported and deposited by wind and consisting of predominantly silt size particles.

Microsite---Small scale, local differences in topography, including mounds, swales, or pits. It represents a small volume of soil where biological or chemical processes differ from those of the area as a whole.

Oblibate---For a plant, a plant that is restricted or usually found on certain sites.

Occasional---Occurring irregularly or infrequently.

Outwash plain---An extensive lowland area forming the surface of a body of stratified glacial drift deposited by meltwater streams beyond active glaciers.

Overstory---In a forest stand that portion of the trees that form the canopy and are represented by dominant, codominant, and intermediate trees.

Perennial---A plant that lives for more than two years.

Persistent forb---A forb whose leaves remain green and are present on the plant throughout the year.

pH, soil---The negative logarithm of the hydrogen ion activity of a soil. The degree of acidity (or alkalinity) of a soil at a specified moisture content or soil-water ratio, and expressed in terms of the pH scale. Low pH values are acidic.

Plant association---(i) A climax plant community, having stands comprised of the same vegetation layers with limited variability in species composition and abundance, indicating certain climatic and edaphic characteristics of the sites on which it is found. (ii) A potential natural plant community of definite floristic composition and uniform appearance.

Poorly represented---A plant species that is represented at less than 5 percent canopy coverage.

Riparian---Vegetation bordering water courses, lakes swamps, or marshes.

Scarce---A plant that is absent or has less than one percent coverage

Seral---A species or community that is replaced (at least in part) by another species or community as succession occurs.

Shrub (tall)---A woody perennial plant, usually with multiple stems, capable of reaching a height of 3 to 20 feet.

Shrub (low)---A woody perennial plant, usually with multiple stems, capable of reaching a height of less than 3 feet.

Site index---A measure of forest productivity determined by the height attained by a given tree species at a designated age under a specified environment. In this report site index refers to the height of Sitka spruce at age 50 in an even aged unmanaged second growth stand.

Stand---A plant community that is relatively uniform in composition, structure, and habitat conditions.

Stocking---A general term for the number of trees or basal area per acre.

Succession---Changes in the species composition of plant communities on an area relative to a previous state, usually toward some hypothetical equilibrium point, climax.

Terrace---A nearly level, usually narrow, plain bordering a river, lake, or sea.

Toe slope---A constructional geomorphic surface that forms the outermost, gently inclined surface at the base of a hill slope or mountain slope.

Undergrowth---Collectively, those plants shrub-sized and smaller growing under a forest canopy.

Understory---In a forest stand, that portion of the trees below the overstory including seedlings, saplings, and suppressed trees.

Well represented---A species of plant having five percent or greater coverage.