Limber Pine, Whitebark Pine, Alpine Heath,

and Terricolous Alpine Lichen Vegetation Alliances in Alberta

(Compilation of Information on Selected Alberta Plant Communities, 1998-1999)

by

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Abstract

This study provides a provincial-level classification of plant associations within the Alberta limber pine, whitebark pine, and alpine heath vegetation alliances, and further characterizes other high elevation treeless vegetation types. Both qualitative and quantitative approaches were used to identify vegetation associations. Qualitative information was used from published and unpublished reports. The quantitative approach used Alberta Ecological Site Information System (ESIS) data (14 limber pine plots, 66 whitebark pine plots, and 447 treeless plots with elevation >/=2000 m) which were analyzed by via classification, ordination, and statistics. Qualitative and quantitative types were merged where they overlapped.

Within the Limber Pine alliance, two types are identified: *Pseudotsuga menziesii - Pinus flexilis / Juniperis communis / Festuca scabrella* and *Pinus flexilis / Arctostaphylos uva-ursi - Juniperis horizontalis*.

Within the Whitebark Pine alliance, seven types are identified: *Abies lasiocarpa - Pinus albicaulis / Xerophyllum tenax; Pinus albicaulis - Abies lasiocarpa / Luzula hitchcockii - Vaccinium myrtillus; Pinus albicaulis - Picea engelmannii / Dryas octopetala*; *Abies lasiocarpa - Pinus albicaulis - Picea engelmannii / Vaccinium scoparium; Abies lasiocarpa - Pinus albicaulis - Picea engelmannii / Empetrum nigrum; Pinus albicaulis / Juniperis communis - Arctostaphylos uva-ursi;* and *Pinus albicaulis - Pinus contorta / Juniperis communis - Elymus innovatus - Linnaea borealis*.

Within the Alpine Heath alliance, four types are identified: *Phyllodoce glanduliflora*; *Phyllodoce empetriformis; Cassiope tetragona*; and *Cassiope mertensiana*.

No terricolous alpine communities were found in which lichen cover exceeded non-lichen cover. Five associations were identified in which lichens may form a significant part of the vegetation cover. These were: *Salix reticulata* [non-bryoid : bryoid cover ratio 7:1]; *Dryas octopetala* [ratio 9.5:1]; *Carex nardina* / lichen [ratio 1.5:1]; *Dryas integrifolia - Silene acaulis* [ratio 4:1]*; Kobresia myosuroides* [ratio 10:1]. The five groups are better viewed as part of pre-existing vascular plant alliances.

Eleven other associations were identified in the process of analyzing the high elevation dataset. These types may prove useful to conservation as they provide a quantitative overview of Alberta high elevation vegetation types. The types were: *Salix glauca; Elymus innovatus; Arctostaphylos uva-ursi; Salix arctica*; *Antennaria lanata*; *Carex nigricans*; *Aulacomnium palustre*; *Trollius albiflorus*; *Selaginella densa*; *Salix barrattiana;* and *Salix arctica - S. reticulata.*

Within the 447 treeless high elevation plots, the three most abundant types were *Dryas octopetala* (n=99); *Phyllodoce glanduliflora* (n=47); and *Cassiope mertensiana* (n=42). All three types should be analyzed for potential subtypes.

Community characterization abstracts are provided for the limber pine, whitebark pine, and alpine heath associations.

Introduction

A first step in the protection of biodiversity is the identification of conservation units or elements, be they species, communities, landscapes, or ecosystems (e.g., Grossman et al. 1994). Once elements have been identified, their distribution and abundance, status, and ecological relationships with other elements may be described and plans made for their management.

The Alberta Natural Heritage Information Centre (ANHIC) plays a critical role in the collection, evaluation, and dissemination of information on elements of Alberta's biodiversity. Tracking lists are developed for high priority elements that are rare or deemed special. Currently, the centre tracks element occurrences for plant and many animal species, and continues to build its database on plant communities and landscape elements. While an initial tracking list of natural plant communities is currently being prepared, much work remains to be done.

A number of high priority alliances or major vegetation types have been identified by ANHIC for which information is needed. The ultimate goal is to develop a complete list plant community elements (associations) within each alliance, and to identify associations that need protection.

This study addresses four such alliances: whitebark pine (*Pinus albicaulis*), limber pine (*Pinus flexilis*), alpine heath, and alpine terricolous lichen. The purpose of the study is to synthesize information from previous studies and from raw data into a provincial classification. A review and compilation of information from published papers, unpublished reports, and consultation with experts was completed. A qualitative classification was developed and cross-referenced to previous studies both within and outside Alberta. Vegetation and site information was then extracted from the Alberta Ecological Site Information System (ESIS), and multivariate ordination, classification, and statistical analyses were conducted, from which quantitative classifications were developed for the four alliances. The qualitative and quantitative classifications were compared. ANHIC community characterization abstracts, based on a Nature Conservancy model, were prepared for each association.

Methods

Qualitative Methods

A literature review was first conducted, from which a preliminary classification was developed. The classification was presented in the form of crosswalk tables that provided correlations between the preliminary types and types identified in various studies.

Quantitative Methods

Plot/species cover data were derived from the Alberta Ecological Site Inventory System (ESIS) ascii data file *exss.dat.* Based on an examination of the literature, dominant or common species characteristic of limber pine, whitebark pine, alpine heath, and terricolous alpine lichen communities were identified. *Exss.dat* was imported into Paradox and the data were filtered to only those plots that contained at least one of the following species: *Pinus flexilis, P. albicaulis, Phyllodoce empetriformis, P. glanduliflora, Cassiope mertensiana, C. tetragona, Salix arcticus, S. reticulata, Dryas octopetala, D. integrifolia, Carex rupestris, Cetraria nivalis, C. cucullata, C. islandica, Stereocaulon alpinum, Alectoria ochroleuca*, and *Thamnolia subuliformis*.

Out of an initial plot total of >10,000, the coarse species filter created an intermediate file of 1,953 plots, 1413 species, and 61,116 records. This file was then queried to contain only records of species that occurred in >/=20 plots, creating a file (timony20.db) limited to 411 species and 56,493 records.

Whitebark pine communities were the queried by selecting only those plots in which whitebark pine cover was >/=5%, creating a database file of 66 plots, 265 species, and 1658 records. In order to create a plot by species cover matrix, the number of species had to be

reduced. The database was thus queried to only those species that occurred >/=5 times, reducing the table to 104 species and 1345 records, from which a plot by species cover table was produced (via Form/Data Model/Design Layout, Edit/Save Crosstab in Paradox).

Similarly, limber pine communities were queried by selecting only those plots in which limber pine cover was >/=5%, creating a database file of 14 plots, 305 records, and 114 species, 52 of which occurred only once in the 14 plots. The data file was then queried to only those species that occurred >/= 2 times (255 records, 62 species), from which a Paradox plot by species cover table was produced).

Alpine heath and alpine lichen communities required a more complex query. Rather than make an *a priori* division between heath and alpine plots, *timony20.db* was filtered by a series of queries linked to the ESIS site data file (*exsias.db*), and other intermediate files, to contain only plots in which all tree species were absent (12,620 records), from which a further subset was limited to plots with elevations >/= 2000 m (11,266 records, 447 plots). From this file, a subset was created limited to species that occurred >20 times in the 447 plots (9856 records, 159 species).

The above filtering was necessary for four reasons: (1) subsets of the ESIS database were needed to limit the analyses to plots relevant to the various alliances; (2) the number of species had to be limited to allow construction of plot by species matrices; (3) extremely large datasets make data manipulation and analyses difficult (e.g., graphical and tabular output can be rendered unreadable or unusable); (4) uncommon species, since they seldom occur with other species, tend to distort multivariate community analyses. The fourth reason is the most powerful as the prime objective of the multivariate analyses is to derive meaningful plant associations.

What information was lost through filtering? Species were omitted in the final filtering as follows: limber pine if <2 occurrences in 14 plots; whitebark pine if <5 occurrences in 66 plots; and treeless high elevation plots if <21 occurrences in 447 plots. The most serious possible data loss is of species that occur seldom, but when present are important or have high fidelity to a particular association. For example, *Betula glandulosa*, a common shrub of mesic to subhydric, imperfectly-drained situations, commonly occurring with *Salix glauca*, was omitted. Similarly, *Xerophyllum tenax* and *Luzula hitchcockii* were not part of the analyses, but these species are important in two of the qualitatively defined whitebark pine associations. To determine if this might have resulted in problems in the whitebark pine classification, the database (version prior to filtering of uncommon species) was queried for *Xerophyllum* and *Luzula hitchcockii* plots. *Xerophyllum* occurred in only two of the 1,953 plots, one of which was from a whitebark pine association (Group 6). *Luzula hitchcockii* occurred in seven plots, none of which were in any of the plots used in this study. The quantitatve associations identified would likely be unaffected by omission of such species. The most likely effect is that species descriptions for quantitative vegetation types may exclude rare or uncommon species.

Plot/site assessment data were derived from the Alberta Ecological Site Inventory System (ESIS) ascii data file *exsias.dat* and imported into Paradox as *exsias.db*. *Exsias.db* contains a unique study_area and plot_ number combination, site aspect, slope, elevation, surface shape, moisture regime, etc. In both the site information and species cover files, the unique study_area and plot_number combinations were concatenated into a new variable used to link various queries. Site assessment data for each of the plots contained in the three plot by species cover files were queried from the *exsias.db* file to create three site information files. In the case of the high elevation treeless communities, most of the environmental variables proved to have large blocks of missing data, or some data codes proved to be outside of valid ranges. In both cases, these variables were dropped. The result was that high elevation treeless community site variables were limited to five useful parameters: aspect, elevation, slope %, ecological moisture regime, and soil drainage.

Plot by species cover tables (primary matrices) and site information tables (secondary

matrices) were imported into Quattro Pro, formatted for PCORD, saved as Lotus *.wk1 files, and imported into PCORD for analysis. The high elevation treeless community plot by species matrix proved too large for PCORD version 2. Version 3 was purchased after the pine analyses and used for the subsequent analyses.

Classification. Two standard methods of classifying plant communities were explored: cluster analysis and two-way-indicator-species-analysis (TWINSPAN). The latter performs poorly if there is more than one important environmental gradient. The multi-gradient nature of the plant community data meant that TWINSPAN was inappropriate for classification. Cluster analysis, in contrast, has no inherent reduction in dimensionality and can thus portray like groups that are correlated with multiple environmental gradients (McCune and Mefford 1995). In all cases, cluster analyses were used to classify plant associations. A variety of cluster analysis methods was used for each alliance and the most statistically robust classification is reported (that with minimum percent chaining and thus maximum information).

Ordination was used to further explore the plant community relationships. Because ordination does not explicitly classify communities it cannot provide the information required for this study. It can, however, be used to complement or test a classification. Two methods were used: detrended correspondence analysis (DCA) and non-metric multi-dimensional scaling (NMS). DCA is a common technique used with ecological data. While it has been widely-used, DCA has some faults-- lack of robustness and erratic performance (McCune and Mefford 1995). NMS has been less-used than DCA, but is well-suited to non-normal data and to data on scales that are arbitrary, discontinuous, or otherwise questionable. NMS can be used as either an ordination technique or to assess the dimensionality of a dataset.

NMS ordinations were run repeatedly on the limber pine and whitebark pine datasets, but the ordination results proved to be unstable and were omitted. DCA ordinations of limber pine and whitebark pine plots were run, and cluster analysis plot groups were overlain for comparison. Due to the large number of plots in the treeless high elevation dataset, no ordinations were run (output would have been unusable).

Versions of the primary and secondary matrices were reformatted and imported into Systat version 5 (Wilkinson et al. 1992) for statistical analyses. Species cover data were overwhelmingly non-normal (strongly + kurtotic and + skewed) since, for any species, zero cover typically outnumbers plots in which the species cover is >zero. Thus descriptive summary statistics relied upon median, minimum, and maximum cover. Tests for differences in site variables among plot cluster groups employed the non-parametric Kruskal-Wallis test.

Integration of Qualitative and Quantitative Associations

In general, there was good agreement between the qualitative types identified previously in the literature and the quantitative types identified from the ESIS plot data. In a few instances, the plot data allowed finer associations to be identified than did the qualitative descriptions (e.g., alpine heath types). Comparison of qualitative and quantitative types was based on dominant species in the association, and secondarily upon environmental and site factors. There is no wholly objective means to compare the types and different workers might have arrived at somewhat different final types. Association names, where synonymous qualitative and quantitative types existed, favored the quantitative type names as these were, arguably, more objective. The degree of concordance between qualitative and quantitative association dominants indicates that the final types are defensible. See Discussion for the merging of the qualitative and quantitative types.

Literature Review

The following literature review focuses on limber pine, whitebark pine, alpine heath, and alpine lichen vegetation alliances.

Limber Pine Alliance, Within Alberta

Willoughby et al. (1997) described range plant community types and carrying capacities for the montane ecoregion of Alberta. Type E1 (n= 1 plot), *Pinus flexilis / Festuca scabrella*, was described from a steep, subxeric, west-facing slope (40%). The community was believed to have deeper soils and is more protected from desiccating winds normally associated with limber pine communities. Dominant plants were *Pinus flexilis* (25%), *Festuca scabrella* (95%), *Potentilla fruticosa* (5%), *Pseudotsuga menziesii* (4%), and *Thermopsis rhombifolia* (4%). Type E2 (n=5 plots) was *Pinus flexilis - Pseudotsuga menziesii / Juniperis communis / Arctostaphylos uva-ursi,* of subxeric, steep, rapidly-drained, southerly, erosional, exposed ridges and upper slopes. Dominant plants were *Pinus flexilis* (18%), *Pseudotsuga menziesii* (11%), *Arctostaphylos uva-ursi* (20%), and *Juniperis communis* (5%).

Archibald et al. (1996, southwestern Alberta) defined a *Pinus flexilis / Juniperis communis* ecosite, with the additional indicators *Pseudotsuga menziesii* and *Festuca scabrella*. The ecosite is nutrient-poor, subxeric to xeric, and exposure to westerly winds is characteristic. Exposure and drought limit the establishment of trees on its ridgetops and upper slopes; the ecosite is considered an edaphic climax. Drainage is rapid to well; textures are sandy loam to loam; soils are Orthic Eutric Brunisols and Orthic Gray Luvisols derived from colluvium, residuum, and bedrock (Archibald et al. 1996).

Achuff et al. (1997, Waterton Lakes National Park) described a *Pseudotsuga menziesii - Pinus flexilis - Pinus contorta / Arctostaphylos uva-ursi - Juniperis communis* vegetation type (O25) from subxeric montane and lower subalpine (elevation 1580-1950 m) on steep to very steep southerly and westerly slopes. Soils were Orthic Regosols, typically on colluvial landforms. When present, limber pine cover ranges from 3-15%. White pine blister rust (*Cronartium ribicola*) has reduced limber pine cover and more decline is likely. Their related *Pinus flexilis / Arctostaphylos uva-ursi* type (O27) lacks lodgepole pine and Douglas fir. *Festuca scabrella* and *Hedysarum sulphurescens* are prominent. It is found on montane to lower subalpine (elevation 1400-1650 m), moderate to very steep, southerly and westerly slopes. Soils are typically rapidly-drained Orthic Regosols on colluvium.

Corns and Achuff (1982) described a *Pinus flexilis - Pseudotsuga menziesii / Juniperis / Arctostaphylos uva-ursi* type (O2). It occupies xeric to subxeric montane sites (1340-1420 m) on moderate to steep, southerly erosional scarps along the lower Bow and North Saskatchewan Rivers in Banff NP. Distinguishing species are *Pinus flexilis* and *Juniperis scopulorum.* Soils are rapidly-drained Orthic Regosols on eroded glacial deposits. Limber pine cover is characteristically 5-40%.

A type similar to O27 and O2 is defined by Kuchar (1973), also for Waterton Lakes National Park as *Pinus flexilis / Juniperis / Arctostaphylos uva-ursi*.

Limber Pine Alliance, Outside Alberta

A *Pinus flexilis / Arctostaphylos uva-ursi* type is described for warm, dry sites in New Mexico and southern Colorado by DeVelice (1983), DeVelice and Ludwig (1983), and DeVelice et al. (1986). A principal associate in the understory is *Juniperis communis*. Larson and Moir (1987) describe the same type for New Mexico and northern Arizona.

A *Pinus flexilis / Juniperis communis* type has been described frequently (e.g., by Hess 1981; Johnston 1987). Hess (warm, dry sites in the Front Range, Colorado) notes that *Arctostaphylos uva-ursi, Calamagrostis rubescens, Carex rossii, Arenaria fendleri*, and *Erigeron*

compositus are prominent understory species. A *Pinus flexilis - Pinus longaeva* type has been described by Alexander (1985, citing Youngblood, unpub. ms) for the mountains of central and southern Utah.

Pfister et al. (1977) defined three habitat types within the *Pinus flexilis* series of Montana: (1) *Pinus flexilis / Festuca idahoensis*, subdivided into *Festuca scabrella* and *F. idahoensis* phases; (2) *Pinus flexilis / Agropyron spicatum*; and (3) *Pinus flexilis / Juniperis communis*. Sites in the series are generally rocky with intermittent shallow duff layers; soils are shallow gravelly loams to gravelly silts, nearly neutral, and generally derived from limestone or other calcareous parent materials. The *Agropyron spicatum* phase dominates the undergrowth at lower elevation on dry, rocky sites. With increasing moisture, *Pseudotsuga menziesii* becomes co-dominant with limber pine, and fescue grasses replace the wheatgrass. At the highest elevation of this series, *Juniperis communis, J. horizontalis*, and forbs replace the fescues. For further references, see Achuff et al. (1997:62).

For the western United States, Bourgeron and Engelking (1994; see also Hess 1981; Mauk and Henderson 1984; Steele et al. 1983), classified vegetation according to the UNESCO format of a six-tiered hierarchy (class, subclass, group, formation, alliance, association). Within the "Evergreen needle-leaved woodland with rounded crowns" (II.A.2.a) formation, Bourgeron and Engelking (1994) list 14 associations within the limber pine alliance. They are *Pinus flexilis / Arctostaphylos uva-ursi; Pinus flexilis / Calamagrostis purpurascens; Pinus flexilis / Cercocarpus ledifolius; Pinus flexilis / Festuca idahoensis; Pinus flexilis / Festuca scabrella; Pinus flexilis / Juniperis communis; Pinus flexilis / Juniperis osteosperma; Pinus flexilis / Juniperis scopulorum; Pinus flexilis / Leucopoa kingii* (= *Hesperochloa kingii*)*; Pinus flexilis / Mahonia repens; Pinus flexilis / Potentilla fruticosa / Distichlis stricta; Pinus flexilis / Pseudoroegneria spicata; Pinus flexilis / Purshia tridentata*; and *Pinus flexilis* / scree. The *Pinus flexilis / Purshia tridentata* woodland association is known only from Craters of the Moon National Monument and is globally rare (G1 conservation rank) (Reid et al. 1994). A *Pinus flexilis / Trifolium dasyphyllum* type for cool dry sites in the mountains of north-central Colorado has been defined by Hess (1981), with understory associates *Calamagrostis purpurascens* and *Carex foenea*; it is likely equivalent to the *Pinus flexilis / Calamagrostis purpurascens* type of Bourgeron and Engelking (1994).

Whitebark Pine Alliance, Within Alberta

Whitebark pine in southwestern Alberta occupies elevations from 1650-2250 m and its submesic to mesic sites typically have submesotrophic to mesotrophic conditions (Archibald et al. 1996). Whitebark pine competes successfully in heavy shade, root competition, and litter fall (Day 1967). Its distribution in the Rockies may be limited by repeated fires that favor lodgepole pine regeneration (Day 1967).

Achuff et al. (1997, Waterton Lakes National Park) defined a *Picea engelmannii - Abies lasiocarpa - Pinus albicaulis / Shepherdia canadensis* type (O28) on mesic to subxeric lower subalpine (1850-1950 m), moderate to steep, southerly and westerly slopes. *Xerophyllum tenax* is diagnostic and *Hedysarum sulphurescens* and *Thalictrum occidentale* are prominent. *Festuca idahoensis* is present. Soils are usually rapidly to well-drained Orthic and Cumulic Regosols and Orthic Eutric Brunisols on colluvium. A *Pinus albicaulis - Abies lasiocarpa / Luzula hitchcockii - Vaccinium myrtillus* type (O30) is found on subxeric to mesic upper subalpine (2000-2250 m), moderate to steep, southerly and westerly slopes. Soils are rapidly to well-drained Orthic Regosols and Eluviated Eutric Brunisols on colluvium. A *Pinus albicaulis - Picea engelmannii / Dryas octopetala type* (O31) is found on exposed, subxeric upper subalpine (2050-2300 m), moderate to steep slopes. Soils are rapidly-drained Orthic Regosols on colluvium and residuum.

Corns and Achuff (1982) described a *Picea engelmannii - Pinus albicaulis /*

Menziesia glabella type (C12) on mesic, lower subalpine, steep slopes of various aspects. *Vaccinium scoparium* and *Rhododendron albiflorum* are characteristic. Soils are Eutric and Dystric Brunisols on morainal and colluvial materials. Whitebark pine cover ranges from 5-30%. They described a similar type (O4) of *Picea engelmannii - Abies lasiocarpa - Pinus albicaulis - Pinus contorta* found on subxeric, lower to upper subalpine, steep, southerly slopes. Prominent understory plants are *Juniperis communis, Shepherdia, Arctostaphylos uva-ursi*, and *Elymus innovatus*. Soils are Eutric and Dystric Brunisols and Regosols on colluvial and morainal materials. Whitebark pine cover is <20%.

Kuchar (1973, Waterton) described a "fir / whitebark pine" type which resembled his "fir / spruce / menziesia" type (and the C12 type of Corns and Achuff (1982), but occupied relatively drier locations; had poorly-developed soils with rock usually at the surface; had a higher percentage of *Xerophyllum* and little *Menziesia*; and whitebark pine was present and sometimes dominant.

Willoughby and Smith (1997, southern Rocky Mountains) described a *Pinus albicaulis* timberline community type (1 plot) of a steep south-facing slope with a subxeric moisture regime (elevation 2300 m). Canopy cover of whitebark pine was 25%. Codominants are: *Salix glauca* (8%), *Shepherdia canadensis* (8%), *Juniperis communis* (3%), *Arctostaphylos uva-ursi* (2%), *Solidago spathulata* (2%), and *Fragaria virginiana* (2%).

Whitebark Pine Alliance, Outside Alberta

Pinus albicaulis / Luzula hitchcockii and *Pinus albicaulis / Carex geyeri* types are described for Montana, Wyoming, Idaho, Washington, and Oregon by Cooper (1975), Hall (1973), Johnston (1987), Steele et al. (1983), and Williams and Smith (1990). For a tabular summary of types and sources, see Alexander (1985).

Pfister et al. (1977) defined timberline whitebark pine habitat types within their *Abies lasiocarpa* series: (1) *Pinus albicaulis - Abies lasiocarpa* and (2) *Pinus albicaulis*. The former type (1) includes "most timberline sites in Montana and the Northern Rockies." *Picea engelmannii* is also present. Undergrowth is variable, but *Vaccinium scoparium, Arnica latifolia*, and *Hieracium gracile* are usually present. *Luzula hitchcockii* and *Xerophyllum* are prevalent west of the Continental Divide. *Phyllodoce* and *Cassiope* are present on moist sites while dry sites may support *Juncus parryi, Carex rossii, Festuca idahoensis*, and *Arenaria congesta*. Soils are typically acidic gravelly loams and silts derived from sandstone and argillite. The *Pinus albicaulis* type (2), occupies the drier mountain ranges east of the Continental Divide that appear to be too dry for *Abies lasiocarpa* and too cold for *Pseudotsuga* and *Pinus flexilis*. Undergrowth is variable, ranging from *Vaccinium scoparium* on the highest, least droughty sites, to *Carex geyeri*, or *Juncus parryi*, on drier sites, and *Festuca idahoensis* and forbs on the most arid sites capable of supporting trees. Drier sites support subalpine grasslands and more northerly, wind-protected sites support the *Pinus albicaulis - Abies lasiocarpa* or the *Abies lasiocarpa - Pinus albicaulis / Vaccinium scoparium* habitat types. Parent materials are variable; textures are gravelly silt loams and silts; and reactions are slightly basic to slightly acidic.

Steele et al. (1983) described a *Pinus albicaulis / Juniperis communis* type for cool, dry sites in the mountains of SE Idaho and NW Wyoming. Other predominant understory species *Astragalus miser* and *Solidago canadensis*. Those authors also defined three types for the mountains of NW Wyoming related to those defined by Pfister et al. (1977, above): *Pinus albicaulis / Vaccinium scoparium; Pinus albicaulis / Carex geyeri; Pinus albicaulis / Carex rossii*.

Within the "Evergreen (nongiant) forest with rounded crowns (5-50 m tall)" (I.A.9.b) formation, Bourgeron and Engelking (1994) list five associations within the whitebark pine alliance. They are *Pinus albicaulis* and *Pinus albicaulis - Abies lasiocarpa* (in Montana); *Pinus albicaulis / Carex rossii* in Idaho, Montana, and Wyoming; *Pinus albicaulis - Pinus*

contorta / Penstemon laetus in Oregon; and *Pinus albicaulis / Vaccinium scoparium* in Idaho, Montana, Oregon, and Wyoming. The latter is similar to *Abies lasiocarpa - Pinus albicaulis / Vaccinium scoparium* and *Pinus albicaulis / Luzula hitchcockii* in Oregon.

Within the "Evergreen needle-leaved woodland with rounded crowns" (II.A.2.a) formation, Bourgeron and Engelking (1994) list eight associations within the whitebark pine alliance. They are *Abies lasiocarpa - Pinus albicaulis / Arctostaphylos uva-ursi; Abies lasiocarpa - Pinus albicaulis / Vaccinium scoparium; Pinus albicaulis / Calamagrostis rubescens; Pinus albicaulis / Carex geyeri; Pinus albicaulis / Festuca idahoensis; Pinus albicaulis / Juniperis communis; Pinus albicaulis / Ligusticum grayi*; and *Pinus albicaulis / Luzula hitchcockii.*

Alpine Heath, Within Alberta

Johnson and Billings (1962) found that depth of winter snowpack and time of snowmelt were important in the local distribution of alpine plant species in Wyoming and Montana. They noted that snow cover influences vegetation by providing a moderated winter environment, by shortening the growing season, and by providing a summer water supply. Kuchar (1975) found that variation in alpine communities was best explained in terms of snow depth, time of snowmelt, and available soil moisture, with secondary factors of slope, aspect, and soil temperature.

Alpine heaths in Alberta are usually chionophilous; they typically occupy wind-protected, sheltered sites where deep snow accumulations create moist, cold, soliflucted soils (Johnson 1975). Among the four dominant heath species, *Phyllodoce empetriformis* and *Cassiope mertensiana* typify regions of higher precipitation and more maritime conditions of the Main Ranges, while *P. glanduliflora* and *C. tetragona* typify the drier, more continental Front Ranges (Johnson 1975; Crack 1977).

Moss (1955) noted that the chief species of alpine heath were *Cassiope tetragona, C. mertensiana, Phyllodoce empetriformis, P. glanduliflora, Pedicularis bracteosa*, and *Saxifraga* spp.

Ogilvie (1969) reported a *Phyllodoce* association at treeline on lee slopes with snow accumulation (> 3 m) on "Alpine Iron Humus Podzol" and "Alpine Sod Podzol" soils with solifluction. Some of its characteristic plants were *P. glanduliflora, P. empetriformis, Vaccinium scoparium, Erigeron peregrinus, Pedicularis bracteosa*, and *Valeriana sitchensis*. At higher elevations, a *Cassiope* association was reported, characteristic of north-facing slopes with deep snowpacks on "Alpine semipodzol" soils with seepage and solifluction. Some characteristic dominants were *Cassiope tetragona, C. mertensiana, S. arctica, Dryas octopetala*, and *Polygonum viviparum.*

In their heath tundra group, Hrapko and La Roi (1978, Signal Mountain Jasper National Park) identified *Cassiope tetragona - Dryas octopetala*, *Dryas octopetala - Empetrum nigrum*, *Dryas octopetala - Salix arctica*, and *Cassiope mertensiana - Phyllodoce glanduliflora* types. Unlike most of the Rocky Mountains of Alberta, which are predominantly calcareous Paleozoic rocks, Signal Mountain is composed of Precambrian sandstones, conglomerates, siltstones, and shales overlain by acidic soils. Acidic soils may help to explain the existence of the *Dryas octopetala - Empetrum nigrum* association. The *Dryas octopetala - Salix arctica* type is not really a heath, as it contains only a small amount of *Cassiope tetragona* and no other ericads. While on a heath site type, the association occupied only 27 m^2 and occurred on the risers of larger solifluction terraces; it contains elements of rock, heath, and meadow tundra.

Kuchar (1975), working in the Bald Hills of Jasper National Park, identified a heath group composed of three types. (1) A *Cassiope tetragona - Dryas octopetala* type, with an associated *Cassiope tetragona - Phyllodoce glanduliflora* subtype. Another subtype, dominated by a crust of *Lepraria neglecta* (cover 25-100%), and growing with *Cetraria ericetorum,*

Cladonia, Solorina crocea, Stereocaulon alpinum, and other lichens and bryophytes, may be ascribable to an alpine lichen alliance (see below). (2) A *Phyllodoce glanduliflora - Cassiope mertensiana* type, with *Phyllodoce glanduliflora* and *Cassiope mertensiana* subtypes. (3) A *Luetkea pectinata* type occupies sites with the deepest snowpacks in the heath group.

Kondla (1978) defined a broad "alpine meadow-heath" type of 13 stands classified into 12 associations, many of which contained little or no *Cassiope* or *Phyllodoce* species. His *Cassiope* heath association was dominated by *Cassiope tetragona*, *Dryas octopetala,* and *Salix reticulata*.

Timoney (1991a) noted a hygric *Cassiope tetragona - Phyllodoce glanduliflora* type with *Dryas octopetala* in the alpine zone of Mt. Livingstone Natural Area.

In Banff and Jasper National Parks, Corns and Achuff (1982) defined two alpine heath types. *Cassiope tetragona - Dryas octopetala - Salix nivalis (= S. reticulata)* (L4) occupies mesic to subhygric, gentle to steep alpine (2040-2460 m) slopes of northerly aspect. Soils are Brunisols and Regosols on morainal and colluvial materials. *Cassiope tetragona* cover is typically 10-50%, and *Phyllodoce glanduliflora* is <15%. The *Phyllodoce glanduliflora - Cassiope mertensiana - Antennaria lanata* type (L5) occupies mesic alpine sites (2000-2530 m) of various slopes and aspects. Soils are Brunisols and Humo-Ferric Podzols on morainal and residual materials.

Griffiths (1982, Plateau Mountain) defined an alpine heath of well-drained, mesic, rolling, mildly cryoturbated residuum in which the clear dominant was *Phyllodoce glanduliflora*, accompanied by lesser *Salix reticulata, Antennaria lanata*, and *Cetraria*. The absence of *Cassiope mertensiana* was viewed by Griffiths as sufficient to place his community in a different association than Corns and Achuff (1982) L5 type, as was the presence of *Vaccinium scoparium* as a dominant in Trottier's (1972) *Phyllodoce* association.

Lee et al. (1982, Whitegoat and Siffleur Wildernesses) defined three heath-dominated associations: (1) *Cassiope tetragona - Dryas octopetala (D. integrifolia) - Salix nivalis* (= *S. reticulata*); (2) *Phyllodoce glanduliflora / Salix* spp. - *Antennaria lanata*; and (3) *Phyllodoce glanduliflora - Cassiope mertensiana / Trollius albiflorus*. (1) was uncommon in north-facing alpine slopes; (2) was common and abundant on north-facing alpine slopes; (3) was observed only once on a mesic, gentle slope. (1) is equivalent to the L4 type, and (2) and (3) are similar to the L5 type of Corns and Achuff (1982).

Crack (1977, Wilcox Pass) defined two heath associations. (1) The *Cassiope* association was found in mesic sites with moderate to deep snowpacks. *Cassiope tetragona* was dominant and widespread in well-drained sites in hollows or below ridges; *C. mertensiana* was restricted to moister, deeper snowpack areas. Characteristic species were *Dryas octopetala, Salix reticulata, Phyllodoce glanduliflora*, and *Carex albo-nigra*. (2) The Phyllodoce association was found in alpine sites with moderate to deep snowpacks. *P. glanduliflora* was dominant, with lesser *Salix reticulata* and *Carex nigricans*.

Trottier (1972, Highwood Pass) defined two alpine heath types which shared a 45% floristic similarity. The *Phyllodoce* association was dominated by *P. glanduliflora, Vaccinium scoparium*, and *Antennaria lanata*, with lesser *Salix arctica*; *Cassiope mertensiana* was evidently absent. His *Cassiope* type was dominated by *C. tetragona*, with lesser *Dryas octopetala* and *Salix reticulata*, making it equivalent to the L4 type of Corns and Achuff (1982).

Willoughby and Smith (1997) defined a *Cassiope - Phyllodoce* community type (n=58 plots) of north-facing slopes with deep snowpacks (1940-2410 m). Dominants include *Cassiope mertensiana* (27%), *Phyllodoce glanduliflora* (20%), *Phyllodoce empetriformis* (5%), *Salix* spp. (4%), and *Antennaria lanata* (3%). Mean site values were submesic moisture regime, mesotrophic nutrients, slope 24%, and drainage well. The type includes both the *Cassiope tetragona - Dryas octopetala - Salix nivalis* (= *S. reticulata*) (L4) and *Phyllodoce glanduliflora - Cassiope mertensiana - Antennaria lanata* (L5) community types of Corns and Achuff (1982).

Downslope of the alpine heaths, treeline / heath types are widespread. They are found over a wide geographic region and occupy a range of elevations, slopes, soils, and aspects. For example, [1] Baig (1972, timberline vegetation of the Rocky Mountains) defined *Abies - Picea / Phyllodoce* and *Abies - Pinus albicaulis - Picea / Phyllodoce* types. [2] Corns and Achuff (1982) identified a *Picea engelmannii - Abies lasiocarpa / Salix vestita / Cassiope tetragona* type (C24). It occupies mesic to subhygric sites in the upper subalpine zone (1850-2200 m) on moderate to steep northerly slopes. Soils are Static Cryosols and Eutric Brunisols on morainal and colluvial materials. Soils are well to moderately well-drained Eutric Brunisols and Regosols on colluvial, fluvial and morainal deposits. Timoney (1991b, Moose Mountain) reported [3] a cold, hygric, turfy *Picea engelmannii - Abies lasiocarpa / Phyllodoce glanduliflora - Cassiope tetragona* type. Johnson (1975, Ram Mountain) reported [4] a *Picea glauca / Phyllodoce glanduliflora* type.

Alpine Heath, Outside Alberta

Cooper et al. (1997, Beaverhead National Forest, Montana) described two heath community types: (1) *Phyllodoce empetriformis / Antennaria lanata* (4 plots) was locally common on gentle to moderate protected slopes, associated with snow accumulation and granite and quartzite rocks in the wetter ranges of their study area. *Phyllodoce empetriformis* and *Vaccinium scoparium* were common in all 4 plots, while *P. glanduliflora* and *Cassiope mertensiana* were common in 2; mean dwarf shrub cover was 55%; forb cover was 35%, dominated by *Antennaria lanata, Polygonum bistortoides*, and *Sibbaldia procumbens* (2) *Cassiope mertensiana / Carex paysonis* was uncommon and probably experienced earlier snow release than (1). Mean canopy cover of shrubs, dominated by *C. mertensiana* and *Salix arctica*, was 60%. Mean graminoid cover was 23%, dominated by *Carex paysonis*, with *Poa alpina* and *Carex scirpoidea*. *Antennaria lanata* and *Juncus drummondii* were notable for their absence or low cover.

Within the "Evergreen cushion dwarf-shrubland" (IV.A.2.a) formation, Bourgeron and Engelking (1994) list five alpine heath alliances for the western United States. They are: (1) the *Cassiope mertensiana* alliance, composed of the *Cassiope mertensiana; Cassiope mertensiana / Carex paysonis; Cassiope mertensiana / Luetkea pectinata*; and the *Cassiope mertensiana / Phyllodoce empetriformis* associations. (2) *the Empetrum nigrum* alliance, composed of the *Empetrum nigrum;* and *Empetrum nigrum / Lupinus lepidus* associations. (3) the *Kalmia microphylla alliance*, composed of *Kalmia microphylla / Aster alpigenus*; and the *Kalmia microphylla / Carex scopulorum* associations. (4) the *Phyllodoce empetriformis* alliance, composed of *Phyllodoce empetriformis* parkland; *Phyllodoce empetriformis* / *Antennaria lanata; Phyllodoce empetriformis / Lupinus latifolius*; and the *Phyllodoce empetriformis* / *Vaccinium deliciosum* associations. (5) the *Phyllodoce glanduliflora* alliance, composed of the *Phyllodoce glanduliflora / Aster alpigenus* association.

Alpine Lichen, Within Alberta

Few studies were found that reported terricolous alpine lichen tundra in Alberta. Alpine plant communities in Alberta that may support significant lichen cover occupy windswept, exposed sites where little or no snow accumulates, which may be drought-prone in summer, and on which coarse-textured parent materials and soils or bedrock predominate (Baig 1972; Johnson 1975).

In general, most accounts of alpine communities with significant lichen cover are ascribable to (1) those dominated by *Dryas octopetala, D. integrifolia*, and other shrubs in which terricolous lichens may form a significant portion of the vegetation cover and (2) lichen communities on thin soil veneers, or on rockland, that are typically classified as saxicolous. *Dryas* associations are probably the most widespread alpine tundra type in Alberta (Johnson

1975). Cooper et al. (1997) concluded that *Dryas* communities are a common, often dominant vegetation throughout the western Cordillera. The correlation of significant alpine lichen cover with *Dryas* communities, is probably not a strong one, however. For example, Cooper et al. (1997, Montana) described a *Dryas octopetala / Carex rupestris* community type in which cover of mosses and lichen was <1%.

Ogilvie (1969, 1976) and Kirby and Ogilvie (1969) described a "stonefield-lichen association". It occupies high elevation, wind-exposed summits near the altitudinal limit of closed communities (~2700 m) with little or no snow accumulation. There was an extensive surface cover of stones; soils were shallow Regosols. *Cetraria, Cladonia, Thamnolia*, and *Coelocaulon aculeatum (= Cornicularia aculeata)* are reportedly the dominant terricolous forms, while *Lecanora, Rhizocarpon*, and *Umbilicaria* were the dominant saxicolous forms. *Oxytropis podocarpa, Salix reticulata, Smelowskia, Silene acaulis, Papaver kluanensis*, and *Taraxacum ceratophorum* were characteristic vascular plants. Ogilvie (1969) differentiated that association from "plants of talus and rock" in which vascular plants occupy crevices and soil pockets at high elevations, with characteristic plants *Taraxacum lyratum, Crepis nana, Eriogonum androsaceum, Saussurea densa, Campanula uniflora, C. lasiocarpa, Saxifraga oppositifolia*, and *Papaver kluanensis.* Ogilvie (1969) reported a *Dryas octopetala - Oxytropis podocarpa - Cetraria* association of wind-exposed, snowfree ridges and moraines on shallow Regosols ("Ranker" and "Randzina" soils). Other characteristic plants were *Myosotis alpestris, Hedysarum mackenzii, Salix reticulata*, and the lichens *Cetraria islandica, C. cucullata, C. nivalis*, and *Thamnolia subuliformis.*

Bryant and Scheinberg (1970, Plateau Mountain) described a fellfield tundra of active patterned ground (polygons, nets, stripes) divided into five microenvironmental and temporal stages. Stage 1 is the stony, cryoturbated patterned ground boundaries and stage 5 is the +/- stable, central portion of the patterns. Stage 1 is characterized (species listed from higher to lower cover) by *Omphalodiscus* (*= Umbilicaria*) *krascheninnikovii, Dryas octopetala*, and *Umbilicaria hyperborea*; Stage 2 is dominated by the same species, along with *Salix reticulata* and *Rhizocarpon geographicum*; Stage 3 is dominated by *Rhizocarpon geographicum, Carex nardina, Cetraria ericetorum* and *C. cucullata*; Stage 4 is dominated by *Carex nardina, Selaginella* sp., *Cetraria cucullata*, and *C. ericetorum*; Stage 5 is dominated by *Carex nardina, Cetraria cucullata*, and *Selaginella*.

Griffiths (1982, Plateau Mountain) noted (1) lichen-rock barren (no plots)of limestone rock outcrops and cliffs (the only plant specified was *Saxifraga bronchialis*), and stated that areas of limestone pavement with partial vegetation cover are a transitional type between lichen-rock barren and *Dryas* tundra. (2) Talus barren (1 plot) was predominantly bare rock rubble; 38 vascular plant species, including the rare *Agropyron scribneri*, but no lichens were noted. (3) *Dryas* tundra (2 plots) was noted on an alpine xeric residuum ridge and on subalpine limestone pavement. The more typical alpine plot was dominated by *Dryas octopetala* and *Oxytropis podocarpa;* lichens included saxicols and *Cladonia*. (4) Talus tundra (well-drained, mesic, Orthic Regosol) on stabilized scree (2 plots) was dominated by *Dryas octopetala, Hedysarum sulphurescens*, and *Potentilla fruticosa* in the more typical plot. (5) *Kobresia* tundra (well-drained, mesic, Orthic Regosol) was noted on hummocky moraine, dominated by *K. myosuroides*, mosses (*Thuidium, Hypnum, Rhytidium, Tortula, Orthotrichum*, and *Pseudoleskeela*), *Bromus pumpellianus, Hedysarum sulphurescens*, and *Selaginella densa*; lichens were *Cetraria* cf. *laevigata, Cladonia,* and *Stereocaulon* on soil and trace saxicols.

Moss (1955), drawing upon the work of Lewis (1917), noted an alpine boulder-field vegetation of old moraines and rock slides dominated by saxicolous lichens with a low cover of vascular plants. His fell-field vegetation was found on gravelly soils in the alpine zone and dominated by *Dryas octopetala, Silene acaulis*, and other vascular plants.

Jeffrey et al. (1968, Pasque Mountain) noted two alpine tundra types of non-

calcareous parent materials: (1) Hummocky mound tundra dominated by *Dryas octopetala*; and (2) Erosion surface tundra. On calcareous parent materials (Mt. Lyall), the authors noted three tundra types: (1) Sheltered moist hollow with *Arenaria obtusiloba, Dryas octopetala*, and *Phyllodoce glanduliflora.* (2) Dry, exposed slope with dominants *Dryas octopetala, Polygonum viviparum, Arenaria obtusiloba, Potentilla fruticosa, Astragalus,* and *Hedysarum sulphurescens*. The authors then stated that "More than 50 per cent of the ground cover was a dense mat of *Dryas integrifolia*" so it is uncertain which species of *Dryas* was dominant. (3) Hummocky turf on moderately exposed slope dominated by *Festuca brachyphylla, Poa alpina*, and *Carex* sp. In none of their tundra types did the authors detail the lichen cover.

Kuchar (1975, Bald Hills) defined a stony tundra group containing (1) a *Dryas octopetala* / lichen type in which *Salix reticulata* and *Vaccinium vitis-idaea* were prominent. The type included a *Dryas octopetala - Arctostaphylos uva-ursi* subtype. Altitudinal range was 2125-2600 m, with winter snow accumulations of </=1 m, occupying all aspects, on well to excessively-drained sites, and early snowmelt. Prominent terricolous lichens in the group were *Cetraria cucullata/nivalis, C. ericetorum/islandica, C. tilesii, Cornicularia aculeata, Cladonia coccifera/pocillum/pyxidata, C. mitis, Peltigera* spp., *Pseudephebe pubescens*, *Stereocaulon alpinum*, and *Thamnolia subuliformis*. (2) A related *Dryas octopetala / Polytrichum piliferum* type was restricted to the forest-tundra zone in which lichens (principally *Cetraria nivalis, Cladonia mitis,* and *Thamnolia subuliformis*) were common in *Dryas* mats and in micro-depressions. He also defined a lichen tundra type growing on conglomerates and shales on a wide range of elevations, aspects, slopes, and microtopography. Within his boulder field subtype, saxicolous communities occupy bare rock while cryptogram microcommunities occupied crevices and flat, sheltered rocks. Three bryophytes were important: *Ptilidium ciliare, Chandonanthus setiformis*, and *Rhacomitrium lanuginosum*, the latter of which formed small cushions that acted as colonization sites for lichens, principally *Cetraria nivalis*. An analogous situation has been observed by Griggs (1956, Rocky Mountain National Park) in which pioneer cushion plants (e.g., *Silene acaulis, Arenaria obtusiloba, Paronychia pulvinata, Trifolium nanum*, and *T. dasyphyllum*) act to facilitate the invasion of other plants into their cushions,. Debris islands in Bald Hills boulder fields supported *Salix reticulata*, other vasculars, and a variety of lichens and bryophytes (Kuchar 1975). Like Signal Mountain, the Bald Hills are atypical from the bulk of the Rocky Mountains in their acidic parent materials.

Trottier (1972, Highwood Pass) defined a widespread *Dryas octopetala* type dominated by *D. octopetala* and *Salix reticulata*; *Hedysarum sulphurescens* and *Salix arctica* were prominent. *Cetraria ericetorum, C. islandica, C. cucullata* and *C. nivalis* were characteristic lichens. His *Dryas* type shared a 65% floristic similarity to his *Kobresia* type, dominated by *K. myosuroides*, along with *Carex albo-nigra, Bromus pumpellianus, Dryas octopetala, Androsace chamaejasme, Polygonum viviparum, Potentilla diversifolia, P. nivea, Selaginalla densa*, and *Smelowskia*. Characteristic lichens were as in the *Dryas* type, along with *Cladonia pocillum*.

Hrapko and La Roi (1978) defined a Dryas octopetala - *S. nivalis (= Salix reticulata*) type with 26% lichen cover (20% terricolous, 6% saxicolous) that occupied flat alpine areas with early snow release dates, lying at about 2260 m elevation. The predominant lichens were *Cetraria* species and *Thamnolia subuliformis*. A similar type was defined by Kuchar (1975) as *Dryas octopetala / Pseudephebe pubescens (=Alectoria pubescens).* Botanically, the *Dryas octopetala - Salix reticulata* type was most closely related to their *Dryas octopetala - Kobresia bellardii* (= *K. myosuroides*) type. Within their meadow tundra group, they defined a *Salix arctica - Antennaria lanata* type that had the highest lichen cover of any of their communities (34%, all terricolous), including species of *Peltigera, Cetraria, Cladonia*, and *Stereocaulon alpinum*. Other important vasculars were *Polygonum viviparum, Campanula lasiocarpa, Artemisia norvegica, Erigeron peregrinus*, and *Sibbaldia procumbens*.

Kondla (1978) reported a community of saxicolous and crevice lichens on the Mt. Indefatigable landslide (elevation 1754 m) in which *Saxifraga bronchialis* was the only "reasonably abundant" vascular plant." *Cladonia, Cetraria, Dactylina, Rhizocarpon, Xanthoria, Lecidea, Lecanora,* and *Caloplaca* lichens were abundant.

Lee et al. (1982) defined two Dryas types: (1) *Dryas octopetala - Kobresia myosuroides*; and (2) *Dryas octopetala - Salix nivalis* (= *S. reticulata*) / *S. arctica*. (1) was occasional on gradual slopes, and is similar to the H4 type of Corns and Achuff (1982); (2) was abundant and widespread, and is similar to the H1 type of Corns and Achuff (1982).

Williams (1990) noted that lichen communities in Kananaskis Country are generally found on rock slides and outcrops. Terricolous forms were restricted to rock crevices and areas with soil veneers. "*Thamnolia*- and *Cetraria*-type" lichens were seen in "alpine meadow-heath". Subalpine lichen-dominated earth hummocks in the Smith-Dorrien valley were noted, dominated by *Cladonia, Cetraria, Peltigera, Solorina*, and *Lepraria*.

Timoney (1991a) noted a xeric, exposed *Dryas octopetala - Carex rupestris* / lichen type with *Cetraria tilesii, Lecanora epibryon*, and *Xanthoria elegans*; and a xeric to mesic *Potentilla fruticosa - Dryas octopetala* type with *Lecanora epibryon* and *Toninia caeruleonigricans* at Mt. Livingstone Natural Area. The former type is related to the *Dryas octopetala - Carex rupestris* type (H15) of Corns and Achuff (1982), who found lichens (primarily *Cetraria* spp. and *C. tilesii*) to be of low cover.

Dryas integrifolia community types in Alberta appear to have low lichen cover. Johnson (1975, Ram Mountain) defined an *Arctostaphylos uva-ursi - Dryas integrifolia* type with 1% cryptogam cover; a *Dryas integrifolia - Kobresia myosuroides (= K. bellardii) - Potentilla fruticosa* type with 1-2% cryptogam cover; a *Kobresia myosuroides- Dryas integrifolia - Poa* alpine type with 2-3% cryptogam cover; a *Dryas integrifolia - Selaginella densa - Kobresia myosuroides* type (cryptogam cover ?). Similarly, at Moose Mountain Natural Area, Timoney (1991b) reported a *Dryas integrifolia* - legumes / *Carex* alpine tundra complex in which lichen cover was trace.

Achuff et al. (1997, Waterton Lakes National Park) defined a saxicolous lichen tundra type (H12) that occurs on subxeric to xeric alpine sites (2400-2650 m), often on ridgetops and upper slopes. Soils are non-soil rockland or rapidly-drained Orthic Regosols on residuum and colluvium. Common vascular plants include *Silene acaulis* and *Erigeron compositus* and the lichens *Lecidea* sp. and *Rhizocarpon geographicum*. The H12 saxicolous lichen tundra type has been described by Corns and Achuff (1982) for Banff and Jasper National Parks. It occupies subxeric to xeric alpine sites (2400-2800 m) of various slopes and aspects. Soils are Orthic Regosols or rockland on bedrock or colluvial rubble. Characteristic lichens are *Rhizocarpon, Xanthoria, Sporastatia, Cetraria, Acarospora, Cladonia, Dactylina, Lecanora, Umbilicaria*, and *Thamnolia.* Their *Dryas octopetala - Salix nivalis (S. reticulata) - Silene acaulis* type (H1) occupies mesic to subxeric alpine morainal and colluvial materials of south and west aspects and various slopes. Soils are Regosols and Brunisols. Common lichens are *Cetraria nivalis, C. cucullata, C. ericetorum, C. islandica, C. tilesii,* and *Cladonia* spp.

Crack (1977, Wilcox Pass, Jasper NP) defined a *Dryas octopetala* association of dry, windswept, snowfree sites, with associated *Salix reticulata, Astragalus alpinus, Kobresia myosuroides,* and *Potentilla diversifolia;* no lichens were prominent. He noted that the same association (with minor variations) existed at Snow Creek (Beder 1967), Signal Mountain (Hrapko 1970), Highwood Pass (Trottier 1972), and Bow Summit (Broad 1973).

In Jasper NP, similar saxicolous types have been described by Hettinger (1975) as rock and lichen; by Kuchar (1975) as cushion-rosette and lichen tundra; and by La Roi (1975) as *Silene acaulis / Alectoria* (= *Pseudephebe*). A tentative community type was identified by Hrapko and La Roi (1978) as *Potentilla nivea - Silene acaulis* on a sandstone rock face. Prominent saxicolous lichens were *Rhizocarpon geographicum, Omphalodiscus*

krascheninnikovii, and *Pseudephebe pubescens*. In Banff NP, Beder (1967) described a ridge summit stonefield-lichen type. At the Cardinal Divide, Achuff (1984) described a saxicolous lichen type. For the Livingstone-Porcupine area, Strong (1979) described an *Omphalodiscus-Rhizocarpon-Parmelia* type. For the Kananaskis region, Jaques and Legge (1974) described a bare rock-lichen type.

Willoughby and Smith (1997) described a subalpine *Dryas octopetala* community type (n=6 plots) of very xeric to subxeric, submesotrophic, rapidly-drained, wind-exposed, snowfree ridges on shallow, stony, colluvial Regosols (1948-2220 m). Typical cover values of dominants are: *Dryas octopetala* (38%), *Oxytropis sericea* (5%), *Saxifraga bronchialis* (3%), and *Potentilla fruticosa* (3%). At lower elevations, or where snow accumulates, this community is replaced by a fescue - sedge / sandwort community. At higher elevations and similar sites, a widespread *Dryas octopetala, D. integrifolia* type is found (n=43 plots). Typical cover values of dominants are: *Dryas octopetala* and *Dryas integrifolia* (33%), *Kobresia myosuroides* (3%), *Salix reticulata* (2%), *Cassiope tetragona* (2%), and *Carex* spp. (2%).

Alpine Lichen, Outside Alberta

Johnson and Billings (1962) found that lichens in alpine tundra were prominent in desiccation cracks (e.g., *Cetraria islandica*).

Kuchar (1978) and Achuff et al. (1993) identified saxicolous lichen tundra and boulder and rock tundra in Yoho National Park. Achuff and Dudynsky (1984) described a similar saxicolous type from Mt. Revelstoke and Glacier National Parks.

"Mountain avens" (= *Dryas octopetala*), "dryad" (= *Dryas integrifolia*), and other alpine cover types are noted for the Cordillera of western Canada (Ecoregions Working Group 1989), but the discussion is too general and qualitative for assignment to associations.

Within the "Alpine and subalpine meadows of higher latitudes" (V.C.6.b) formation, Bourgeron and Engelking (1994) list two alpine *Dryas* alliances for the western United States. They are (1) the *Dryas integrifolia* alliance, composed of the *Dryas integrifolia - Carex* spp. association; and (2) the *Dryas octopetala* alliance, composed of *Dryas octopetala*; *Dryas octopetala - Carex rupestris; Dryas octopetala - Carex* spp.; and the *Dryas octopetala - Polygonum viviparum* associations. Alpine *Dryas integrifolia - Carex* spp. dwarf shrubland is classified as globally rare (G2); the characteristic and diagnostic species are *Carex rupestris, Carex pseudoscirpoidea* (= *Carex scirpoidea*)*, Bistorta vivipara* (=*Polygonum viviparum*), and *Aquilegia jonesii* (Reid et al. 1994).

Results

Qualitative Classification

Crosswalk tables summarize the qualitative types in relation to their literature sources (Tables 1-4). In order to save space, tree abbreviations are used for common names as follows: limber pine = Pf; whitebark pine = Pa; lodgepole pine = Pl; Douglas fir = Fd; subalpine fir = Fl; engelmann spruce = Se.

Limber Pine

Table 1a. Limber Pine Alliance in Alberta: crosswalk.

Association	Synonymy and Sources	Comments
L1 Pf / Rough Fescue (*Pinus flexilis / Festuca scabrella*) *	Pf / *Festuca scabrella* (Willoughby et al. 1997); Pf / *Arctostaphylos uva-ursi* (Achuff et al. (1997)	differentiated by dominance of *Festuca*, absence of *Juniperis communis*
L2 Pf / Ground Juniper (*Pinus flexilis / Juniperis communis*) *	Pf - Fd / *Juniperis communis* / *Arctostaphylos uva-ursi* (Willoughby et al. 1997); Fd - Pf - Pl / *Arctostaphylos uva-ursi* - *Juniperis communis* (Achuff et al. 1997); Pf - Fd / *Juniperis* / *Arctostaphylos uva-ursi* (Corns and Achuff 1982); Pf / *Juniperis* / *Arctostaphylos uva-ursi* (Kuchar 1973)	differentiated by absence of *Festuca*, dominance of *Juniperis communis*

* A *Pf - Juniperis communis* ecosite described by Archibald et al. (1996) is transitional to types L1 and L2 in that both *Juniperis communis* and *Festuca scabrella* are dominants.

Table 1b. Limber Pine Alliance outside Alberta: crosswalk.

Association	Synonymy and Sources	Comments
L1 Pf / Rough Fescue (*Pinus flexilis / Festuca scabrella*)	Pf / *Festuca idahoensis, Festuca scabrella* phase (Pfister et al. 1977); Pf / *Festuca scabrella* (Bourgeron and Engelking 1994)	
L2 Pf / Ground Juniper (*Pinus flexilis / Juniperis communis*)	Pf / *Arctostaphylos uva-ursi* (DeVelice 1983; DeVelice and Ludwig 1983; DeVelice et al. 1986; Larson and Moir 1987; Bourgeron and Engelking 1994); Pf / *Juniperis communis* (Pfister et al. 1977; Hess 1981; Johnston 1987; Bourgeron and Engelking 1994; [Pf / scree ? (Bourgeron and Engelking	

	1994)]	

Whitebark Pine

Table 2a. Whitebark Pine Alliance in Alberta: crosswalk.

Association	Synonymy and Sources	Comments
W1 Fl - Pa / Beargrass (*Abies lasiocarpa - Pinus albicaulis / Xerophyllum*)	Se - Fl - Pa / *Shepherdia* (Achuff et al. 1997); Fl - Pa (Kuchar 1973)	differentiated by prominence of *Shepherdia, Thalictrum occidentale*, *Xerophyllum*;
W2 Pa - Fl / Smooth Wood-Rush / Low Bilberry (*Pinus albicaulis - Abies lasiocarpa / Luzula hitchcockii - Vaccinium myrtillus*)	Pa - Fl */ Luzula hitchcockii - Vaccinium myrtillus* (Achuff et al. 1997)	more mesic than W3
W3 Pa - Se / White Mountain Avens (*Pinus albicaulis - Picea engelmannii / Dryas octopetala*)	Pa - Se */ Dryas octopetala* (Achuff et al. 1997)	more xeric than W2
W4 Se - Pa / False Azalea (*Picea engelmannii - Pinus albicaulis / Menziesia ferruginea*)	Se - Pa / *Menziesia glabella* (Corns and Achuff 1982);	differentiated from W5 by presence of *Vaccinium scoparium, Rhododendron albiflorum, Ledum groenlandicum* and absence or low cover of *Shepherdia, Juniperis, Arctostaphylos*
W5 Pa / Ground Juniper (*Pinus albicaulis / Juniperis communis*)	Se - Fl - Pa - Pl (Corns and Achuff 1982); Pa timberline type (Willoughby and Smith 1997)	differentiated by presence or high cover of *Shepherdia, Juniperis, Arctostaphylos*, and *Elymus innovatus*

Table 2b. Whitebark Pine Alliance outside Alberta: crosswalk

Association	Synonymy and Sources	Comments
W1 Fl - Pa / Beargrass (*Abies lasiocarpa - Pinus albicaulis / Xerophyllum*)	*; similar to Pa / *Festuca idahoensis* (Bourgeron and Engelking (1994);	
W2 Pa - Fl / Smooth Wood-Rush / Low Bilberry (*Pinus albicaulis - Abies lasiocarpa / Luzula hitchcockii - Vaccinium myrtillus*)	Pa / *Luzula hitchcockii* (and ~ Pa / *Carex geyeri*) (Cooper 1975; Hall 1973; Johnston 1987; Steele et al. 1983; Williams and Smith 1990; Bourgeron and Engelking 1994);*	
W3 Pa - Se / White Mountain Avens (*Pinus albicaulis - Picea engelmannii / Dryas octopetala*)	no synonyms were found	
W4 Se - Pa / False Azalea (*Picea engelmannii - Pinus albicaulis / Menziesia ferruginea*)	Pa (Pfister et al. 1977; Bourgeron and Engelking 1994); Pa / *Vaccinium scoparium* (Steele et al. 1983; Bourgeron and Engelking 1994); Fl - Pa / *Vaccinium scoparium* (Bourgeron and Engelking 1994)	
W5 Pa / Ground Juniper (*Pinus albicaulis / Juniperis communis*)	Pa / Juniperis communis (Steele et al. 1983); Fl - Pa / Arctostaphylos uva-ursi (Bourgeron Engelking 1994)	

* the *Pinus albicaulis - Abies lasiocarpa* habitat types of Pfister et al. (1977) and Bourgeron and Engelking (1994) have elements of both W1 and W2.

Alpine Heath

Table 3a. Alpine Heath Alliance in Alberta: crosswalk.

Association*^	Synonymy and Sources	Comments
E1 White Mountain-Heather - White Mountain Avens (*Cassiope tetragona - Dryas octopetala*)	*Cassiope tetragona - Dryas octopetala* (Hrapko and La Roi 1978); *Cassiope tetragona - Dryas octopetala* (Kuchar 1975; contains a *Cassiope tetragona - Phyllodoce glanduliflora* subtype)#; *Cassiope* heath association (Kondla 1978); *Cassiope tetragona* association (Beder 1967); *Cassiope tetragona - Phyllodoce glanduliflora* type with *Dryas octopetala* (Timoney 1991a); *Cassiope tetragona - Dryas octopetala - Salix nivalis* (Corns and Achuff 1982); *Cassiope tetragona - Dryas octopetala (D. integrifolia) - Salix nivalis* (Lee et al. 1982); *Cassiope* association (Trottier 1972; Crack 1977)	*Phyllodoce empetriformis* and *Cassiope mertensiana* typify regions of higher precipitation and more maritime conditions of the Main Ranges, while *P. glanduliflora* and *C. tetragona* typify the drier, more continental Front Ranges (Johnson 1975; Crack 1977)
E2 Western Mountain-Heather - Yellow Heather (*Cassiope mertensiana - Phyllodoce glanduliflora*)	*Cassiope mertensiana - Phyllodoce glanduliflora* (Hrapko and La Roi 1978); *Phyllodoce glanduliflora - Cassiope mertensiana* (Kuchar 1975, with *Phyllodoce* and *Cassiope* subtypes); *Phyllodoce glanduliflora - Cassiope mertensiana - Antennaria lanata* (Corns and Achuff 1982); alpine heath (Griffiths 1982); *Phyllodoce glanduliflora* / *Salix* spp. - *Antennaria lanata* and *Phyllodoce glanduliflora - Cassiope mertensiana* / *Trollius albiflorus* associations (Lee et al. 1982); *Phyllodoce* association (Trottier 1972; Crack 1977);	Kuchar (1975) described a *Luetkea pectinata* type, perhaps better seen as a facies or phase;
E3 White Mountain Avens - Crowberry (*Dryas octopetala - Empetrum nigrum*)	*Dryas octopetala - Empetrum nigrum* (Hrapko and La Roi 1978)	known only from Signal Mountain, JNP

* some sources defined types that were too broad (e.g., Moss 1955, Ogilvie 1969; Willoughby and Smith 1997) to apply at the association level and have been ignored in the table.
^ only alpine types have been included; subalpine associations with trees have been ignored.
# another subtype of Kuchar (1975) *Cassiope tetragona - Dryas octopetala*, dominated by a crust of the lichen *Lepraria neglecta*, may be ascribable to an alpine lichen alliance.

Table 3b. Alpine Heath Alliance outside Alberta: crosswalk.

Association	Synonymy and Sources	Comments
E1 White Mountain-Heather - White Mountain Avens (*Cassiope tetragona - Dryas octopetala*)	none found	this is a north Cordilleran association that may not occur in the conterminous U.S.; probably occurs in Alaska
E2 Western Mountain-Heather - Yellow Heather (*Cassiope mertensiana - Phyllodoce glanduliflora*)	~ *Phyllodoce empetriformis / Antennaria lanata* (Cooper et al. 1997); the *Cassiope mertensiana / Luetkea pectinata* assoc. (Bourgeron and Engelking 1994) is probably equivalent to Kuchar's (1975) *Luetkea pectinata* type, considered here as a facies of E2	
E3 White Mountain Avens - Crowberry (*Dryas octopetala - Empetrum nigrum*)	~ *Empetrum nigrum* association ? known from Washington State (Bourgeron and Engelking 1994)	

Alpine Lichen

The following classification of alpine lichen associations is the most tentative of the four qualitative classifications presented. Terricolous alpine lichen communities in Alberta are either rare or inadequately studied. As vascular plants cover may be low, and bedrock close to the surface, these site types may be overlooked during the course of typical inventories. In other cases, the small scale of these communities, when associated with patterned ground features, may result in their being subsumed within larger scale communities. For the present purposes, saxicolous lichen communities are ignored. Only alpine communities in which terricolous lichens compose a "significant" part of the vegetation cover are included. For that reason, various *Dryas integrifolia* (e.g., Johnson 1975, Ram Mountain; Timoney 1991b, Moose Mountain) are excluded. The definition of "significant" is fairly arbitrary and depends upon the absolute and relative cover of the dominant species in the community in this qualitative classification.

Table 4a. Alpine Lichen Alliance in Alberta: crosswalk.

Association	Synonymy and Sources	Comments
N1 White Mountain Avens / Lichen (*Dryas octopetala* / lichen)	*Dryas octopetala - Oxytropis podocarpa - Cetraria* (Ogilvie 1969); *Dryas* tundra (Griffiths 1982); fell-field (Moss 1955); *Dryas octopetala* / lichen (Kuchar 1975); *Dryas octopetala* (Trottier 1972, Crack 1977; Willoughby and Smith 1997); *Dryas octopetala - Salix nivalis* (Hrapko and La Roi 1978); *Dryas octopetala - Salix nivalis* / *S. arctica* (Lee et al. 1982); *Dryas octopetala - Carex rupestris* / lichen (Timoney 1991a); *Dryas octopetala - Salix nivalis - Silene acaulis* (Corns and Achuff 1982); *Dryas octopetala / Polytrichum piliferum* (Kuchar 1975) *; *Dryas hookeriana - Oxytropis podocarpa - Cetraria cucullata - C. nivalis* (Beder 1967)	lichen cover variable; typical lichens include *Cetraria islandica, C. ericetorum, C. cucullata, C. nivalis, C. tilesii, Coelocaulon aculeatum, Cladonia coccifera / pocillum / pyxidata, Stereocaulon alpinum, Thamnolia subuliformis, Lecanora epibryon*; char. vasculars include *Dryas integrifolia, Astragalus alpinus, Carex rupestris, Kobresia myosuroides, Polygonum viviparum, Potentilla diversifolia, P. fruticosa*, *Oxytropis podocarpa, O. sericea, Silene acaulis, Salix reticulata, S. arctica, Saxifraga bronchialis, Hedysarum sulphurescens*
N2 Fragrant Sedge / Cetraria (*Carex nardina / Cetraria*)	Stages 3, 4, and 5 of fellfield tundra on active polygons, nets, and stripes (Bryant and Scheinberg 1970); some plots in H1 *Dryas octopetala - Salix nivalis - Silene acaulis* of Corns and Achuff (1982) are similar	from active patterned ground of Plateau Mountain; other char. plants are *Cetraria ericetorum, C. cucullata, Selaginella* cf. *rupestris*, and *Rhizocarpon geographicum*

N3 Bog Sedge Tundra (*Kobresia myosuroides*)	*Kobresia* tundra (Trottier 1972; Griffiths 1982); *Kobresia* association (Beder 1967); *Dryas octopetala - Kobresia bellardii* (= *K. myosuroides*) types of Hrapko and La Roi (1978) and Lee et al. (1982) ascribable here or under N1;	char. lichens *Cetraria islandica, C. ericetorum, C. cucullata, C. nivalis, C.* cf. *laevigata, Cladonia sp., Cladonia pocillum, Stereocaulon, Thamnolia, Ochrolechia, Coelocaulon aculeatum, Peltigera, Physcia muscigena*
N4 Arctic Willow - Woolly Everlasting Meadow (*Salix arctica - Antennaria lanata*)	*Salix arctica - Antennaria lanata* meadow tundra (Hrapko and La Roi 1978); *Phyllodoce glanduliflora - Cassiope mertensiana - Antennaria lanata*) (Corns and Achuff 1982)	this community had the highest terricolous lichen cover (34%) of any type on Signal Mountain; characteristic lichens were *Cladonia, Cetraria, Peltigera*, and *Stereocaulon alpinum*
N5 Stonefield Lichen	stonefield-lichen (Ogilvie 1969, 1976; Kirby and Ogilvie 1969)	apparent absence of *Dryas octopetala*; char. lichens include *Cetraria, Cladonia, Thamnolia, Coelocaulon aculeatum*; vasculars incl. *Oxytropis podocarpa, Salix reticulata, Smelowskia, Silene acaulis, Papaver kluanensis*, and *Taraxacum ceratophorum*

* differs from the typical *Dryas octopetala* / lichen association in the predominance of *Polytrichum piliferum*, better soil development, and lack of many typical saxicolous lichens; predominance of *D. octopetala* and *Salix reticulata*, and presence of the characteristic *Cetraria nivalis, C. cucullata*, and *Thamnolia subuliformis*, however, allies with the broad *Dryas* / lichen type (Kuchar 1975)

Table 4b. Alpine Lichen Alliance outside Alberta: crosswalk.

Association	Synonymy and Sources	Comments
N1 White Mountain Avens / Lichen (*Dryas octopetala* / lichen)	The N1 "association" is broad and may include some or all of the following: *Dryas octopetala, D. octopetala / Carex rupestris; D. octopetala / Carex spp.; D. octopetala - Polygonum viviparum* types of Bourgeron and Engelking (1994)	
N2 Fragrant Sedge / Cetraria (*Carex nardina / Cetraria*)	a *Carex nardina* alpine talus and scree association in Colorado and Washington (Bourgeron and Engelking 1994) may be similar	
N3 Bog Sedge Tundra (*Kobresia myosuroides*)	a *Kobresia myosuroides - Carex rupestris* var. *drummondiana* association in Colorado (Bourgeron and Engelking 1994) may be similar	
N4 Arctic Willow - Woolly Everlasting Meadow (*Salix arctica - Antennaria lanata*)	*Salix arctica / Polygonum bistortoides* (from Montana) and *Antennaria lanata* (from Washington) associations may be similar (Bourgeron and Engelking 1994)	
N5 Stonefield Lichen	none found; this might be a variant of N1 or N2 in which the typical dominant, *Dryas octopetala*, is absent	

Quantitative Analyses
Cluster Analyses and Site Variable Statistics (also see Appendices)

Limber Pine

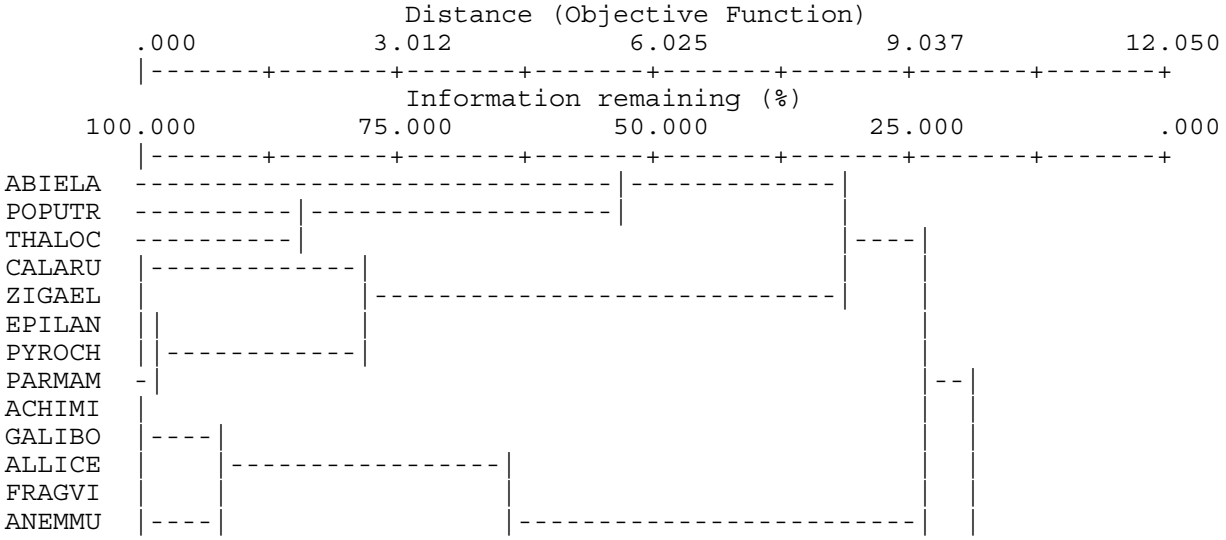
Cluster analyses of species (Figure 1) and plots (Figure 2) provide a classification of limber pine-dominated plots in Alberta. In Figure 3, a DCA plot ordination is overlain with the three cluster groups. Table 5 provides a key to the PCORD plot number, ESIS plot numbers, and cluster groups. Table 6 summarizes environmental variables for the three plot groups. Summary statistics of species cover by plot group are provided in Appendix 1a-d.

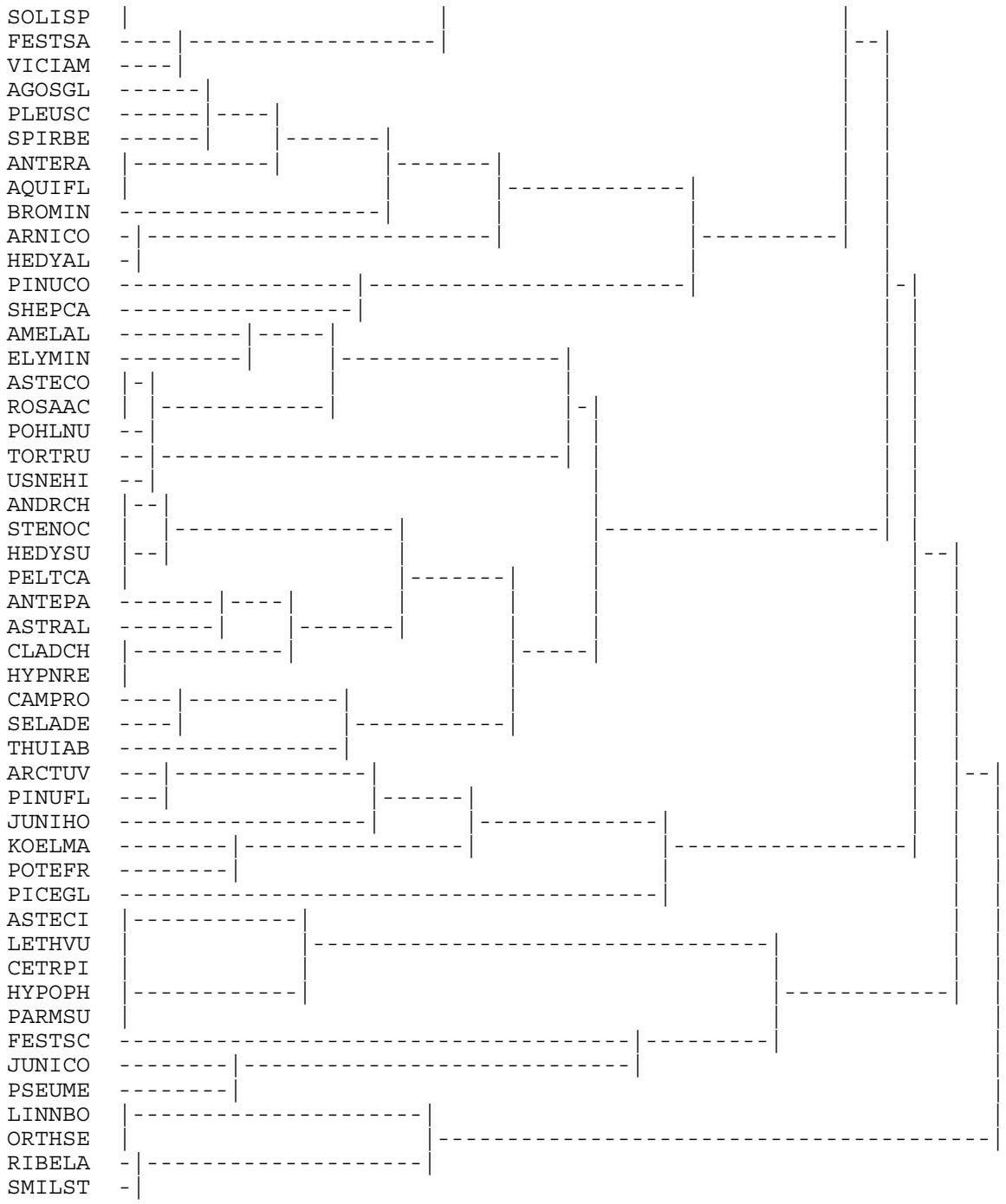
Three groups were identified. Group 1: *Pseudotsuga menziesii - Pinus flexilis / Juniperis communis / Festuca scabrella*; Group 5: *Pinus flexilis / Arctostaphylos uva-ursi - Juniperis horizontalis*; Group 12*: Abies lasiocarpa - Pinus flexilis - Populus tremuloides / Thalictrum occidentale*.

Table 5. Limber Pine PCORD plot, ESIS plot number, and cluster analysis group equivalents.

PCORD	ESIS	Cluster Group
1	17SW224	1
2	17SW233	1
3	17SW316	1
4	17SW60	1
5	32CC71	5
6	34KP2	5
7	34KP21	5
8	34KP41	5
9	34KP42	5
10	34PC20	5
11	34PC8	1
12	34PS490	12
13	94BJC8001	5
14	94BJD6022	12

Figure 1. Cluster analysis of *Pinus flexilis* Alliance species. 2W/(A+B) DISTANCE, FARTHEST NEIGHBOR. Percent chaining = 6.76. Dendrogram scaled normally.

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AMELAL
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ASTECO
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POHLNU
TORTRU
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ANDRCH
STENOC
HEDYSU
PELTCA
ANTEPA
ASTRAL
CLADCH
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CAMPRO
SELADE
THUIAB
ARCTUV
PINUFL
JUNIHO
KOELMA
POTEFR
PICEGL
ASTECI
LETHVU
CETRPI
HYPOPH
PARMSU
FESTSC
JUNICO
PSEUME
LINNBO
ORTHSE
RIBELA
SMILST

Figure 2. Cluster analysis of *Pinus flexilis* Alliance plots. 2W/(A+B) DISTANCE, FARTHEST NEIGHBOR. Percent chaining = 12.00. Abscissa is log of sociological distance.

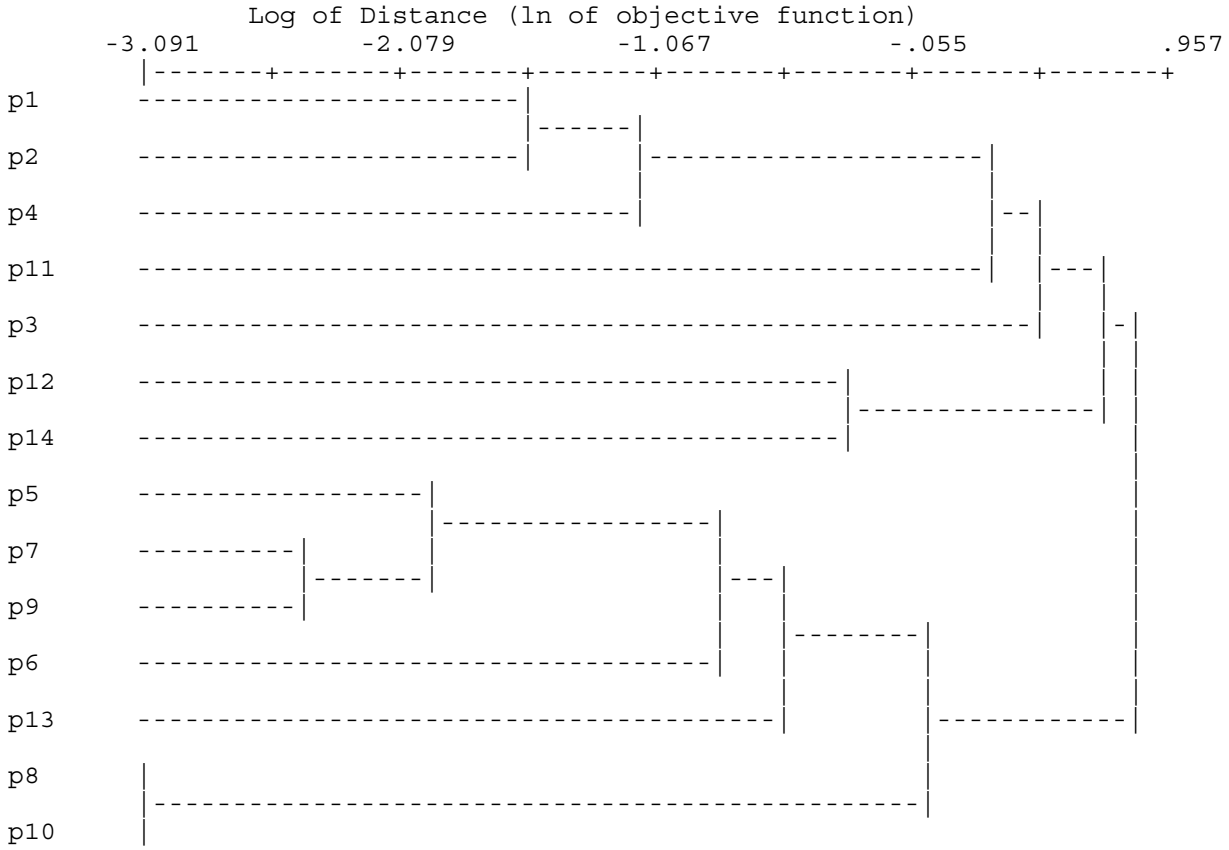


Table 6. *Pinus flexilis* site variables by cluster group. **Bolded** variables are statistically different among the groups at alpha=0.05 (Kruskal-Wallis test). "-" = no minimum and maximum since n=1; x = no data.

Variable	Group 1 (Median, Min, Max)	Group 5 (Median, Min, Max)	Group 12 (Median, Min, Max)	Kruskal-Wallis p
Aspect	280,200,280	221,149,274	305,295,315	p=0.06
Elevation	1670,1475, 1845	1405,1372, 1450	1870,-,-	p=0.01
Site Macro	upper slope, apex, mid-slope	mid/lower slope, upper slope, lower slope	upper slope, -, -	p=0.20
Site Meso	crest/upper slope, crest, upper slope	mid-slope, mid-slope, lower slope	upper slope, -, -	p=0.04
Moisture	subxeric, subxeric, submesic	subxeric, xeric, mesic	submesic, -, -	p=0.36
Nutrients	submeso, submeso, meso	meso, submeso, meso	permeso, -, -	p=0.09
% Bedrock	0,0,2	2.5,0,5	5,-,-	p=0.29
% Cobbles, Stones	0,0,5	15,5,30	x	p=0.02 *
% Decaying Wood	2,0,10	5,1,15	3,1,5	p=0.53
% Mineral	0,0,1	17.5,10,35	4,-,-	p=0.01
% Organic Matter	95,85,99	64,20,90	94.5,94,95	p=0.04
% Water	0,0,0	2,0,4	6,-,-	p=0.06
Perviousness	moderate, rapid, moderate	moderate, moderate, moderate	rapid, -, -	p=0.14
Slope %	38,0,51	17,0,60	49,37,60	p=0.49
Soil Drainage	rapid-well, rapidly, well	rapid-well, rapidly, well	rapidly, -, -	p=0.66
Surface Shape	straight, straight, convex	straight, straight, concave	convex, -, -	p=0.29

* data for groups 1 and 5 only

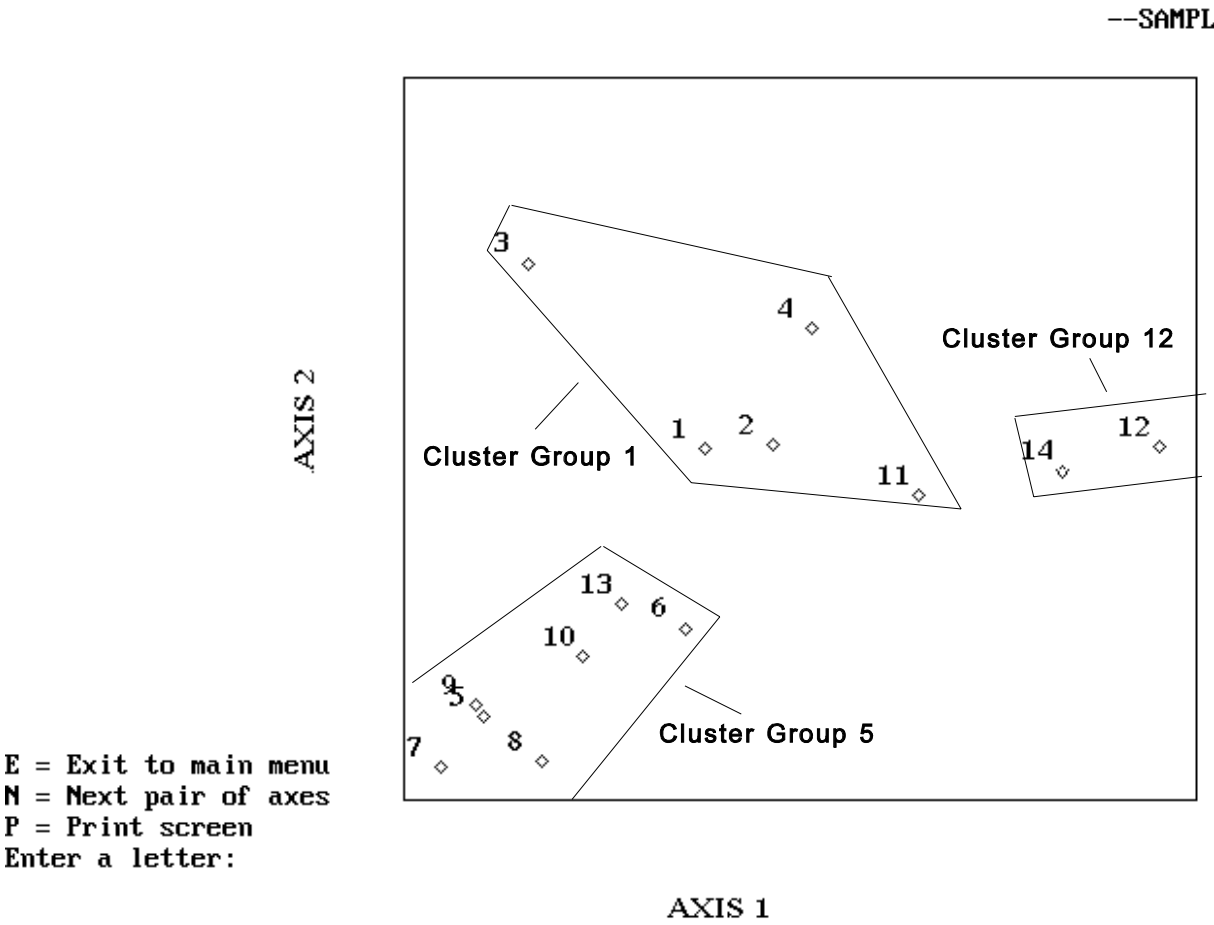


Figure 3. Limber Pine DCA plot analysis, with corresponding cluster analysis groups indicated.. Number of non-zero data items: 255. Downweighting of less common species selected. Axes are rescaled. Number of segments: 30. Threshold: .00. Axis eigenvalues: 1=0.64, 2=0.27.

Whitebark Pine

Cluster analyses of species (Figure 4) and plots (Figure 5) provide a classification of whitebark pine-dominated plots in Alberta. In Figure 6, a DCA plot ordination is overlain with the five cluster groups. Table 7 provides a key to the PCORD plot number, ESIS plot numbers, and cluster groups. Table 8 summarizes environmental variables for the five plot groups. Summary statistics of species cover by plot group are provided in Appendix 2a-f.

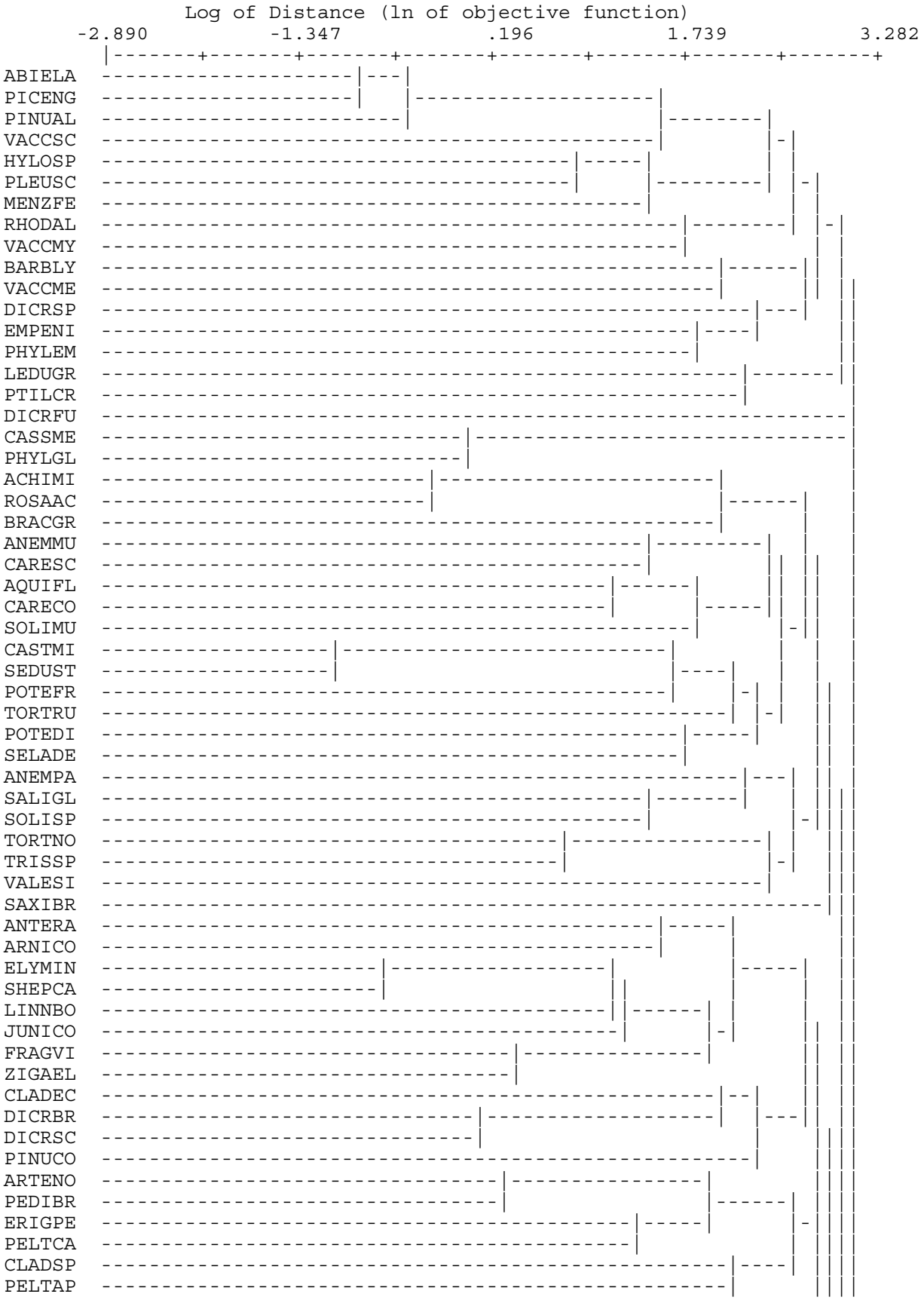
Five groups were identified. Group 1: *Abies lasiocarpa* - *Pinus albicaulis* - *Picea engelmannii / Vaccinium scoparium;*Group 6: *Abies lasiocarpa* - *Pinus albicaulis* - *Picea engelmannii / Empetrum nigrum*; Group 9: *Pinus albicaulis / Juniperis communis* - *Arctostaphylos uva-ursi*; Group 26: *Pinus albicaulis* - *Pinus contorta / Juniperis communis* - *Elymus innovatus* - *Linnaea borealis;* and Group 51: *Picea glauca* x *P. engelmannii* - *Pinus albicaulis* - *Abies lasiocarpa* / feather moss.

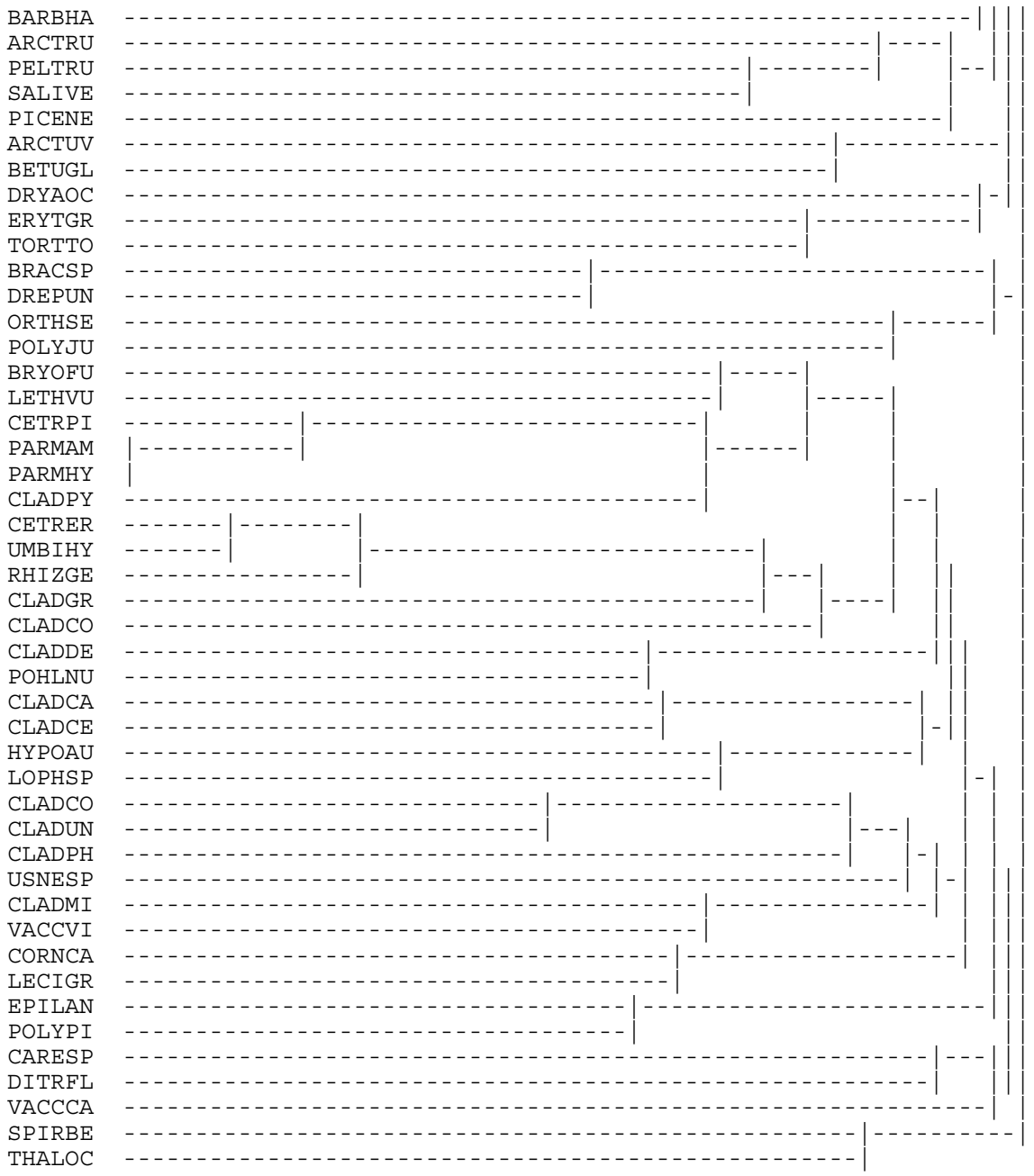
Table 7. Whitebark Pine PCORD plot, ESIS plot number, and cluster analysis group equivalents.

PCORD	ESIS	Cluster Group
1	17SR33	1
2	17SR48	1
3	17SR50	1
4	17SW188	1
5	17SW84	1
6	24SD197	6
7	32NA29	6
8	32NA36	6
9	32NA40	9
10	32NA41	9
11	67LR8	9
12	94BAW5025	1
13	94BAW5119	9
14	94BAW6020	1
15	94BAW6056	9
16	94BAW6103	9
17	94BAW7031	9
18	94BAW7034	9
19	94BAW7046	1
20	94BAW7059	1
21	94BAW7068	6
22	94BAW7071	1
23	94BAW7084	1
24	94BAW7088	1
25	94BIC6023	9
26	94BIC6041	26
27	94BJC6024	9
28	94BJC8090	1
29	94BJD5030	1
30	94BJD5094	9
31	94BJD7017	1
32	94BJD7038	9
33	94BPA7055	9
34	94BPA7071	9
35	94BPA7072	1
36	94JIC5073	1
37	94JIC6068	1
38	94JIC7063	6
39	94JIC9038	9
40	94JIC9086	9

41	94JJC6083	1
42	94JJC7067	6
43	94JJC7075	1
44	94JJD9043	9
45	94JJE9038	6
46	94JJE9067	9
47	94JJE9126	9
48	94JJE9131	26
49	94JJE9134	26
50	94JLC9050	26
51	94JLC9054	51
52	94JLC9062	1
53	94JLC9063	1
54	94JLC9065	26
55	94JLC9068	1
56	94JLC9078	26
57	94JLC9080	26
58	94JLC9108	9
59	94JLC9129	51
60	94JLC9181	9
61	94JPA9096	9
62	94JSJ7054	1
63	94JSJ7084	6
64	94JSJ9046	6
65	94JSJ9063	6
66	94JSJ9077	26

Figure 4. Cluster analysis of *Pinus albicaulis* Alliance species. 2W/(A+B) DISTANCE, GROUP AVERAGE. Percent chaining = 6.46. Abscissa is log of sociological distance.

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ORTHSE
POLYJU
BRYOFU
LETHVU
CETRPI
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PARMHY
CLADPY
CETRER
UMBIHY
RHIZGE
CLADGR
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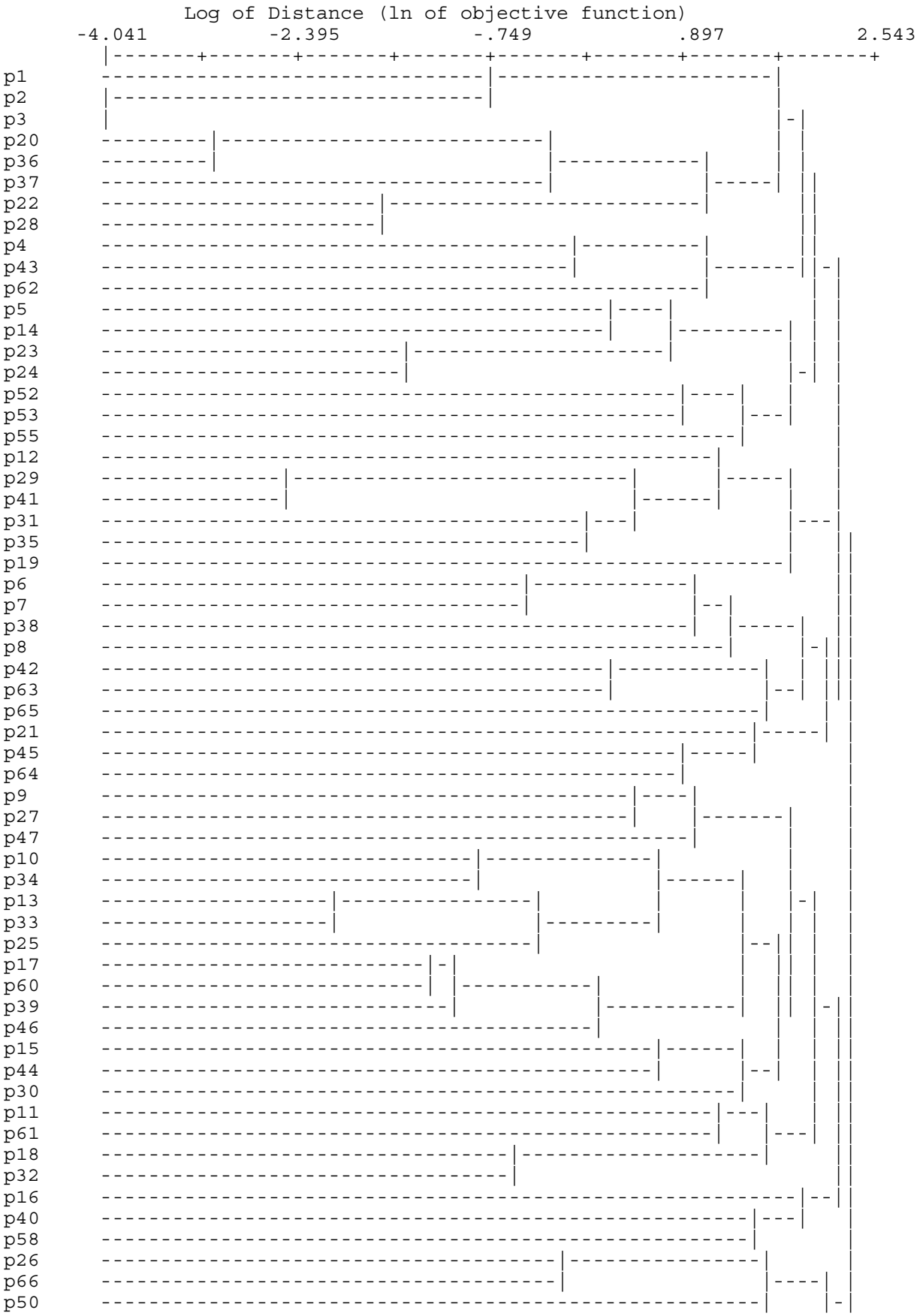
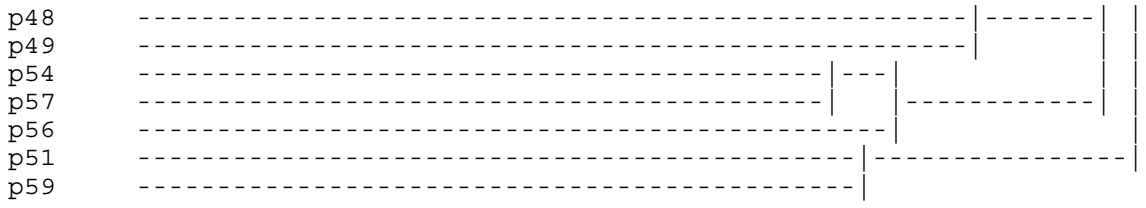
CLADUN
CLADPH
USNESP
CLADMI
VACCVI
CORNCA
LECIGR
EPILAN
POLYPI
CARESP
DITRFL
VACCCA
SPIRBE
THALOC

Figure 5. Cluster analysis of *Pinus albicaulis* Alliance plots. 2W/(A+B) DISTANCE, FARTHEST NEIGHBOR. Percent chaining = 3.76. Abscissa is log of sociological distance.

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p56
p51
p59

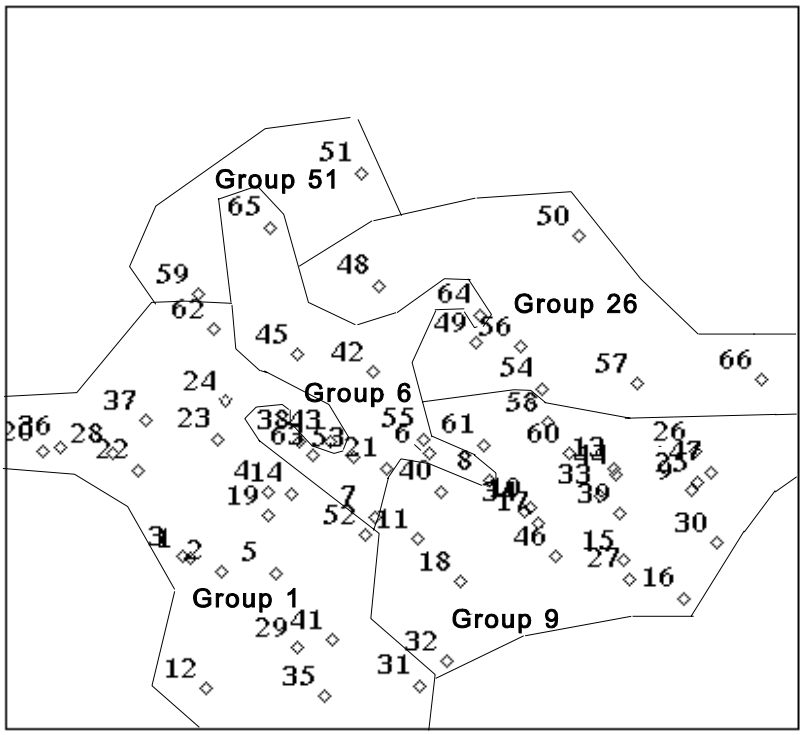
Table 8. *Pinus albicaulis* site variables by cluster group. **Bolded** variables are statistically different among the groups at alpha=0.05 (Kruskal-Wallis test). "-" = no minimum and maximum since n=1; x = no data.

Variable	Group 1 (Median, Min, Max)	Group 6 (Median, Min, Max)	Group 9 (Median, Min, Max)	Group 26 (Median, Min, Max)	Group 51 (Median, Min, Max)	Kruskal-Wallis p
Aspect *	203,0,348	135,45,360	225,90,330	225,45,225	158,135,180	p=0.74
Elevation	1940,1700, 2180	1980,1800, 2200	2065,1690, 2310	1780,1650, 2040	1895,1820, 1970	p=0.02
Site Macro	upper slope,upper slope,lower slope	x	x	x	x	x
Site Meso	mid-slope,crest, mid-slope	mistake in original data	mid-slope, -, -	x	x	x
Moisture	mesic, subxeric, subhygric	mesic, xeric, subhygric	subxeric, xeric, mesic	subxeric, xeric, mesic	mesic, mesic, mesic	p<0.001
Nutrients	meso, submeso, meso	mistake in original data	submeso, -, -	x	x	x
% Bedrock #	1,0,15	6,0,50	20,0,70	15,5,50	x	p=0.001
% Cobbles, Stones #	4,0,94	35,0,70	0,0,80	x	4, -, -	p=0.934
% Decaying Wood	5,1,25	1,0,14	1,0,10	2,1,15	10,10,10	p=0.02
% Mineral	2.5,0,94	1,0,30	15,0,60	10.5,1,30	55,15,94	p=0.13
% Organic Matter	? mistakes in original data	? mistakes in original data	? mistakes in original data	? mistakes in original data	? mistakes in original data	x
% Water	4,0,82	4,0,4	4,0,4	4,4,9	mistakes in original data	x
Perviousness	moderate,moderate, moderate	mistake in original data	x	x	x	x
Slope %	50,0,70	48,6,65	63,5,80	50,45,75	38,17,58	p=0.04
Soil Drainage	well, rapid, imperfect	mistake in original data	rapid, very rapid, mod-well	well, rapid, well	well, well, well	x
Surface Shape	straight,straight, convex	x	x	x	x	x

* aspect difficult to evaluate as true north is given as 0, or 360; with sufficient plots, the median is a reliable indicator of central tendency

\# groups 1,6,9,26 only

--SAMPLES



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Treeless high elevation communities

PCORD, ESIS, and cluster group number equivalents are provided in Appendix 3a. Summary statistics of species cover by plot group are provided in Appendix 3b-v. Species and plots were classified via cluster analyses (Appendices 4 and 5), from which 20 plot groups (+/- associations) were identified. Cluster group eponymous species are bolded in Appendix 4. Site variables for the 20 plot groups are summarized in Table 9.

The species cluster analysis (Appendix 4) groups species with similar ecological requirements as indicated by similar distributions among plots. The species groups differ from the plot groups in that the species may be responding to microhabitats, many of which may exist in each plot. Information relevant to plant ecology and conservation is presented in the cluster analysis. Some examples (underlined in Appendix 4) are:

1. *Pseudephebe pubescens, Umbilicaria proboscidea, U. hyperborea*, and *Rhizocarpon geographicum* (saxicols of acidic subalpine rock outcrops and acidic rocky tundra);

2. *Lecanora epibryon* and *Physconia muscigena* (alpine tundra on soil, humus, or mosses);

3. *Distichium capillaceum* and *Ditrichum flexicaule*, in turn, associated with *Tortella fragilis* and *T. tortuosa* (calcareous rocks and streambanks);

4. *Dryas octopetala* and *Salix reticulata* (widespread mesic alpine tundra), in turn, associated with *Cassiope tetragona*;

5. *Cassiope mertensiana* and *Phyllodoce glanduliflora* (moist, turfy snow catchment sites), in turn associated with *Pyllodoce empetriformis*;

6. *Carex nardina* and *C. rupestris* (xeric, exposed, calcareous tundra);

7. *Cetraria cucullata, C. ericetorum, C. nivalis, C. tilesii, Coelocaulon aculeatum*, and *Thamnolia subuliformis* (open, xeric, exposed tundra soils);

8. *Cladonia mitis, Gentiana glauca, Paraleucobryum enerve*, and *Solorina crocea* (hygric to mesic alpine tundra, typically acidic).

In particular 4. and 5. are noteworthy for two reasons: (a) *Cassiope tetragona* is apparently more similar ecologically to *Dryas octopetala* and *Salix reticulata* than to other *Cassiope* and *Phyllodoce* species; (b) while *Cassiope mertensiana* and *Phyllodoce empetriformis* are reportedly more characteristic of the "maritime" Main Ranges and *C. tetragona* and *P. glanduliflora* more characteristic of the drier Front Ranges (Johnson 1975; Crack 1977), in the ESIS data, *C. mertensiana* and *P. glanduliflora* are most closely allied, followed by a broader group with *P. empetriformis.*

An unfortunate aspect of the ESIS site information data is that important correlates of alpine plant communities such as snow depth and timing of snowmelt (Johnson and Billings 1962; Johnson 1975; Kuchar 1975) are absent from the data. Similarly, surface shape and degree of protection provided by local topography are unspecified. Conversely, slope, aspect, and soil moisture data are present, but most of the communities showed a wide range of variation in these variables. For example, only plant communities typical of drier or warmer sites (*Elymus innovatus, Selaginella densa, Kobresia myosuroides,* and *Arctostaphylos uva-ursi* groups) showed a clear aspect preference (Figure 7).

While the focus of this portion of the report is alpine heath and lichen communities, the analysis was conducted at a more general level so that *a priori* definitions did not obscure valid community types. The twenty types identified in the cluster analysis are briefly described below in their order of appearance in Appendix 5 (see also Appendix 3b). For cross-referencing, the community type equivalents of Corns and Achuff (1982) are provided, in which the "Other Studies" sections provide more synonyms.

Group 1. The *Salix glauca* group (Table 9, Appendix 3c) occupies a wide range of moisture and soil drainage regimes on moderate slopes between 2020 and 2370 m. The Corns

and Achuff (1982) S4 (*Salix* spp. - *Betula glandulosa / Erigeron peregrinus*) community type is similar, found on fluvial and morainal, nearly level to moderate slopes that mesic to hygric on all aspects in the upper subalpine; the wide range of moisture regimes suggests a fluctuating water table. *Erigeron peregrinus* is present in the type (Appendix 3b), and *Betula glandulosa* may be present, but it was excluded from the analysis since it occurred in <20 plots.

Group 5. The *Elymus innovatus* group is a subalpine grassland type (Appendix 3f) that typically occupies moderate to extreme SE to west-facing well-drained mesic slopes. It is similar to the S12 (*Salix glauca / Elymus innovatus*) and H5 (*Elymus innovatus - Fragaria virginiana - Epilobium angustifolium*) types of Corns and Achuff (1982).

Group 55. The *Arctostaphylos uva-ursi* group is a subalpine dwarf shrubland to grassland type (Appendix 3t) that occupies very strong to extreme, subxeric to mesic, south-facing slopes that are rapidly to well-drained. It is related to Type 5, and is similar to the L1 (*Potentilla fruticosa / Arctostaphylos uva-ursi*) and H14 (*Elymus innovatus - Koeleria cristata - Arctostaphylos uva-ursi*) types of Corns and Achuff (1982).

Group 2. The *Salix reticulata* group (Appendix 3d) occupies a wide range of alpine sites. *Dryas octopetala, Polygonum viviparum*, and *Salix arctica* may be subdominant. *Cetraria, Cladonia*, and *Thamnolia* may be present. It is similar to the L4 (*Cassiope tetragona - Dryas octopetala - Salix nivalis*) and H1 (*Dryas octopetala - Salix nivalis - Silene acaulis*) types of Corns and Achuff (1982).

Group 35. The *Cassiope tetragona* group (Appendix 3p) also occupies of wide range of alpine sites, but typically the sites are well-drained, mesic, moderate slopes. *Dryas octopetala* and *Salix reticulata* may be codominant. It is equivalent to the L4 (*Cassiope tetragona - Dryas octopetala - Salix nivalis*) type of Corns and Achuff (1982).

Group 3. The *Dryas octopetala* group (Appendix 3e) was the largest of any of the groups (n=99 plots), and occurred on virtually all site types. Much variation is contained within the group, and inspection of Appendix 5 indicates that at least five sub-groups exist. Only *Dryas octopetala* is present in all plots Of the nine characteristic species, four are lichens (*Cetraria cucullata, C. ericetorum, C. nivalis*, and *Thamnolia subuliformis*), indicating an affinity with alpine lichen communities. The type is similar to the H1 (*Dryas octopetala - Salix nivalis - Silene acaulis*) type of Corns and Achuff (1982).

Group 6. The *Antennaria lanata* group (Appendix 3g) typically occupies moderate slopes that are moderately well-drained, hygric to subhydric, with an elevation range of 2120 to 2510.Typical subdominants are *Phyllodoce glanduliflora* and *Salix arctica*. It is similar to the L5 (*Phyllodoce glanduliflora - Cassiope mertensiana - Antennaria lanata*) type of Corns and Achuff (1982). While *Cassiope mertensiana* may be present in Group 6 (Appendix 3b), it is of low cover.

Group 20. The *Carex nigricans* group (Appendix 3k) is typical of poorly-drained, subhygric, moderately sloping snow catchment sites. *Antennaria lanata, Salix arctica*, and *Luzula piperi* are characteristic. It is similar to the H2 (*Carex nigricans - Antennaria lanata*) type of Corns and Achuff (1982).

Group 9. The *Aulacomnium palustre* group (Appendix 3h) is found on poorly-drained, subhygric to hydric sites on level to strong slopes. High *Aulacomnium* cover (median 60%, n=11 plots) differentiates this group from group 40. Subdominants are *Salix barrattiana, Trollius albiflorus*, and *Erigeron peregrinus*. It is allied to the H9 (*Caltha leptosepala - Trollius albiflorus*) type of Corns and Achuff (1982), but *Caltha* median cover in Group 9 is only 1%. It may be similar to the H10 (*Eriophorum angustifolium - Drepanocladus*) and perhaps to H16 (*Erigeron peregrinus - Valeriana sitchensis*) types of Corns and Achuff (1982), but deletion of infrequent species in the data analyses prevent further comparison.

Group 40. The *Trollius albiflorus* group (Appendix 3q) is found on well to poorly-drained, mesic to subhydric sites with very gentle to very strong slopes. Characteristic species are

Erigeron peregrinus, Salix arctica, Senecio triangularis, and *Caltha leptosepala*. It is similar to the H9 (*Caltha leptosepala - Trollius albiflorus*) type of Corns and Achuff (1982) who concluded that H9 communities were usually depressional, late snowmelt sites that receive seepage throughout summer.

Group 19. *Salix arctica* is a dwarf shrub tundra group (n=22 plots, Appendix 3j) typically found on moderately well-drained sites (range well to poorly) between 2250- and 2610 m elevation. Moisture regime (median mesic, subxeric to hydric range), and slope (median 17%, 0-60%) vary widely. *Salix arctica* is the clear dominant (median cover 30%), and is the only constant species (range 20-55% cover). *Castilleja occidentalis, Polygonum viviparum*, and *Potentilla diversifolia* are subdominant.

Group 12. *Phyllodoce glanduliflora* is a large heath group (n=67 plots, Appendix 3i) found on a wide range of sites (rapidly to imperfectly-drained, 0-70% slope, subxeric to subhygric, 2050-2620 m, 0-315 degrees aspect). *Phyllodoce glanduliflora* is the only constant species; characteristic species are *Salix arctica, Antennaria lanata*, and *Cassiope mertensiana*. It is similar to the L5 (*Phyllodoce glanduliflora - Cassiope mertensiana - Antennaria lanata*) type of Corns and Achuff (1982).

Group 21. *Selaginella densa* is the smallest and most tentative group (n=3, Appendix 3l). It is found on subxeric, south-facing, gentle to extreme slopes. No species exceed 1% median cover; vegetation cover is evidently sparse. *Selaginella densa* is the only constant species. Characteristic species are *Carex scirpoidea, Dryas octopetala, Potentilla diversifolia*, and *Salix arctica*. It is probably a facies of either the H1 (*Dryas octopetala - Salix nivalis - Silene acaulis*) and H4 (*Dryas octopetala - Kobresia myosuroides - Arctostaphylos uva-ursi*) types of Corns and Achuff (1982).

Group 97. The *Salix barrattiana* group (Appendix 3v) is found on well to poorly-drained, mesic to subhydric, very gentle to extreme slopes. *Salix barrattiana* is clearly dominant. Characteristic species are *Pedicularis bracteosa, Phyllodoce glanduliflora, Polygonum viviparum,* and *Potentilla diversifolia*. It is similar to the S8 (*Salix barrattiana / Potentilla diversifolia*) type of Corns and Achuff (1982).

Group 22. The *Phyllodoce empetriformis* heath group (Appendix 3m) is found on well-drained, mesic to subhygric, strong to extreme slopes. Its maximum elevation is only 2360 m. Subdominant species are *Anemone occidentalis, Salix arctica, Cassiope mertensiana*, and *Artemisia norvegica*. The closest type in Corns and Achuff (1982) is L5 (*Phyllodoce glanduliflora - Cassiope mertensiana - Antennaria lanata*), but both *P. glanduliflora* and *Antennaria lanata* are of low cover in Group 22.

Group 25. The *Salix arctica - S. reticulata* group (Appendix 3n) is found on rapid to moderately well-drained, mesic to subhygric, level to extreme slopes. Vegetation cover is low: the two dominants have median covers of 2%. Other characteristic species are *Antennaria lanata, Cetraria islandica*, and *Sibbaldia procumbens*. The most similar type in Corns and Achuff (1982) is L5 (*Phyllodoce glanduliflora - Cassiope mertensiana - Antennaria lanata*), but both *Phyllodoce* and *Cassiope* species are absent or of low cover.

Group 34. The *Carex nardina /* lichen group (Appendix 3o) may be found on any aspect, typically on exposed, well-drained, submesic, moderate slopes, ranging in elevation from 2270 to 2700 m. Vegetation cover is sparse: none of the dominant species exceed 1% median cover. Four of ten characteristic species are lichens: *Cetraria nivalis, C. tilesii, Coelocaulon aculeatum*, and *Thamnolia subuliformis*. Other characteristic species include *Oxytropis podocarpa, Saxifraga oppositifolia*, *Salix reticulata*, and *Silene acaulis*. It is similar to the H1 (*Dryas octopetala - Salix nivalis - Silene acaulis*) type of Corns and Achuff (1982) with the obvious difference the typical low cover of *Dryas octopetala* in Group 34.

Group 50. The *Dryas integrifolia - Silene acaulis group* (Appendix 3r) is found on any aspect, typically on well-drained, mesic, moderate to extreme slopes, ranging widely in elevation

from 2040-2750 m, and reaches the highest elevation of any of the vegetation groups. Subdominants are *Cetraria cucullata, C. tilesii, Dryas octopetala, Oxytropis podocarpa, Polygonum viviparum*, and *Salix reticulata*. It is allied with the H1 (*Dryas octopetala - Salix nivalis - Silene acaulis*) type of Corns and Achuff (1982), but differs in the dominance of *Dryas integrifolia.*

Group 52. The *Kobresia myosuroides* group (Appendix 3s) is found on exposed, rapidly to well-drained, subxeric to mesic, very gentle to extreme south-facing slopes. *Kobresia* dominates over *Dryas octopetala* (ranging in cover from 15-60%). Four lichens (*Cetraria cucullata, C. ericetorum, C. nivalis, Coelocaulon aculeatum*) are among the 14 characteristic species, which include *Dryas octopetala, Oxytropis podocarpa*, and *Silene acaulis*. It is allied with the H4 (*Dryas octopetala - Kobresia myosuroides - Arctostaphylos uva-ursi*) type of Corns and Achuff (1982), but differs in that *Arctostaphylos uva-ursi* is usually absent.

Group 70. The *Cassiope mertensiana* group (Appendix 3u) is typically found on well-drained, mesic to subhygric, very gentle to extreme slopes. Its maximum elevation is only 2340 m. *C. mertensiana* is the only constant. Characteristic species include *Phyllodoce empetriformis, P. glanduliflora, Dicranum scoparium, Salix arctica*, and *Antennaria lanata*. The most similar type in Corns and Achuff (1982) is L5 (*Phyllodoce glanduliflora - Cassiope mertensiana - Antennaria lanata*).

Cluster positions for the group eponyms in the species cluster analysis (Appendix 4) indicates that *Cassiope tetragona* is related closely to *Dryas octopetala*, which is in turn closely related to *Salix reticulata; Aulacomnium palustre* is related to *Salix barrattiana*; *Antennaria lanata* is related to *Salix arctica*; *Arctostaphylos uva-ursi* is related to *Elymus innovatus*; *Cassiope mertensiana* is related to *Phyllodoce glanduliflora*, which is, in turn, related to *Phyllodoce empetriformis*; *Dryas integrifolia* is related to *Kobresia myosuroides*. *Trollius albiflorus, Carex nigricans, Selaginella densa, Salix glauca, Carex nardina*, and *Silene acaulis* are distinct from the other eponyms.

Of the 20 foregoing groups, the heath types are groups 12, 22, 35, and 70. Types that might be considered terricolous “alpine lichen” communities (in a broad sense) are groups 2, 3, 34, 50, and 52.

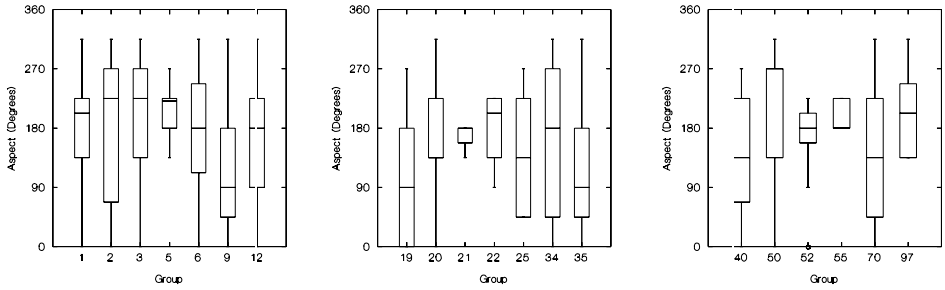

Figure 7. “Treeless high elevation” group site aspects. Only Types 5, 21, 52, and 55 show aspect preferences. The truncation at aspect 315 is an artifact from changing aspect 360 values to 0. Horizontal line in box is the median; bottom and top of box are the 25th and 75th percentiles; whiskers are equivalent to range in these data. If medians and whiskers do not show, they are contained within the 25th and 75th tiles.

Table 9. "Treeless high elevation" site variables (median, minimum, maximum, n) by cluster group. **Bolded** species are always present (100% frequency).

Group	Aspect	Elevation	Moisture	Slope %	Soil Drainage
1 ***Salix glauca***	202,0, 315,16	2205,2020, 2370,16	mesic, xeric, hydric,15	16,3,42, 16	mod-well, rapid,poorly,16
2 ***Salix reticulata***	225,0, 315,15	2375,2000, 2540,16	mesic, xeric, hydric,14	19,0,52, 16	well,rapid, v. poorly,13
3 ***Dryas octopetala***	225,0, 315,99	2320,2000, 2610,99	mesic, xeric, subhydric,76	18,0,75, 96	well,rapid, poorly,66
5 ***Elymus innovatus***	221,135 , 270,7	2180,2020, 2440,7	mesic, subxeric, subhygric,7	30,13,56 ,7	well,rapid, imperf,7
6 ***Antennaria lanata***	180,0, 315,20	2350,2120, 2510,21	hygric-subhydric, mesic, hydric,12	13,4,47, 21	mod-well, xeric, hydric,13
9 ***Aulacomnium palustre***	90,0, 315,11	2160,2050, 2300,11	hygric,subhygric , hydric,10	10,0,21, 11	poorly,poorly, poorly,2
12 ***Phyllodoce glanduliflora***	180,0, 315,64	2310,2050, 2620,67	mesic,subxeric, subhygric,54	18,0,70, 67	well,rapid, imperf,31
19 ***Salix arctica***	90,0, 270,21	2250,2050, 2610,22	mesic, subxeric, hydric,18	17,0,60, 22	mod-well,well, poorly,12
20 **Carex nigricans**	135,0, 315,9	2220,2150, 2440,10	subhygric,mesic, subhydric,9	10,2,37, 9	poorly,well, v. poorly,3
21 ***Selaginella densa***	180,135 , 180,3	2330,2300, 2390,3	subxeric, subxeric, subxeric,2	21,8,55, 3	well,-,-,1
22 ***Phyllodoce empetriformis***	202,90, 225,6	2220,2080, 2360,6	mesic,mesic, subhygric,4	25,17,60 ,6	well,well, well,3
25 *Salix arctica - S. reticulata*	135,45, 270,13	2265,2050, 2470,14	mesic,subxeric, subhygric,13	10,0,60, 13	well,rapid, mod-well,8
34 *Carex nardina / lichen*	180,0, 315,14	2380,2270, 2700,15	submesic, subxeric,mesic,1 0	12.5,4, 60,14	well,rapid, imperf,10
35 ***Cassiope tetragona***	90,0, 315,15	2290,2130, 2490,16	mesic,subxeric, subhygric,14	15,3,50, 16	well,well, imperf,8
40 *Trollius albiflorus*	135,0, 270,19	2145,2020, 2380,20	subhygric,mesic, subhydric,20	18.5,3, 38,20	imperf,well, poorly,12
50 *Dryas integrifolia* - **Silene acaulis**	270,0, 315,17	2195,2040, 2750,20	mesic,subxeric, subhygric,20	15.5,5, 50,20	well,rapid, mod-well,18
52 ***Kobresia myosuroides***	180,0, 225,19	2385,2010, 2580,22	mesic,subxeric, mesic,20	30,5,65, 21	well,rapid, well,20
55 ***Arctostaphylos uva-ursi***	180,180 , 225,8	2145,2070, 2470,8	subxeric, subxeric,mesic,8	39.5,33, 56,8	rapid-well, rapid,well,8
70 ***Cassiope mertensiana***	135,0, 315,42	2150,2000, 2340,42	mesic,mesic, subhygric,38	20,4,58, 42	well,rapid, imperf,27
97 ***Salix barrattiana***	202,135 , 315,12	2220,2080, 2380,12	subhygric,mesic, subhydric,11	25,5,48, 10	mod-well, well,poorly,8

K-W p, stat	0.025 32.8	0.000 112.4	0.000 168.2	0.000 47.7	0.000 85.3

Discussion

Concordance tables (Tables 10-13) merge the qualitative and quantitative associations. Those groups considered sufficiently distinct and part of the limber pine, whitebark pine, and alpine heath alliances, are bolded in the tables. Community characterization abstracts (Appendix 6) were prepared for these associations. As none of the identified groups in the tentative "alpine lichen" proved to be dominated by lichens, those groups are summarized under the discussion and are not dealt with further.

Limber Pine Alliance

Limber pine in Alberta is characteristic of exposed, dry rocky ridges and outcrops of the foothills rather than the Rocky Mountains proper (Ogilvie 1969). Limber pine in southwestern Alberta occupies elevations from ~980-1900 m and its subxeric sites typically have submesotrophic to mesotrophic conditions (Archibald et al. 1996; Willoughby et al. 1997). In Alberta, limber pine communities usually occupy the zone between coniferous forest and prairie (Willoughby et al. 1997).

Within the limber pine alliance, important site variables were (in decreasing order of importance): elevation and % mineral soil; % cobbles and stones; site meso and % organic matter. Group 1: *Pseudotsuga menziesii - Pinus flexilis / Juniperis communis / Festuca scabrella* occupied middle elevations with deeper soils; Group 5: *Pinus flexilis / Arctostaphylos uva-ursi - Juniperis horizontalis* occupied the lowest elevation sites with shallow bedrock and exposed mineral and cobbles and stones; Group 12*: Abies lasiocarpa - Pinus flexilis - Populus tremuloides / Thalictrum occidentale* occupied the highest elevations.

Group 1: The *Pseudotsuga menziesii - Pinus flexilis / Juniperis communis / Festuca scabrella* woodland (savannah) type is characteristic of montane sites in southwestern Alberta. It is found on moderate elevation crests and upper slopes that are rapidly to well-drained and subxeric in which bedrock is not close to the surface. Outside Alberta, similar communities are Pf / *Festuca idahoensis, Festuca scabrella* phase (Pfister et al. 1977); and Pf / *Festuca scabrella* (Bourgeron and Engelking 1994) outside Alberta. In Alberta, other names for the association are Pf / *Festuca scabrella* (Willoughby et al. 1997); Pf / *Arctostaphylos uva-ursi* (Achuff et al. (1997).

Group 5: The *Pinus flexilis / Arctostaphylos uva-ursi - Juniperis horizontalis* woodland type is characteristic of montane sites in southwestern Alberta. It is found on lower elevation middle and lower slopes that are rapidly to well-drained and subxeric in which bedrock is close to the surface. Outside Alberta, similar communities are Pf / *Arctostaphylos uva-ursi* (DeVelice 1983; DeVelice and Ludwig 1983; DeVelice et al. 1986; Larson and Moir 1987; Bourgeron and Engelking 1994); Pf / *Juniperis communis* (Pfister et al. 1977; Hess 1981; Johnston 1987; Bourgeron and Engelking 1994; [Pf / scree (Bourgeron and Engelking 1994)]; Pf / *Juniperis* / *Arctostaphylos uva-ursi* (Kuchar 1973) outside Alberta. In Alberta, synonyms or similar types are Pf - Fd / *Juniperis communis* / *Arctostaphylos uva-ursi* (Willoughby et al. 1997); Fd - Pf - Pl / *Arctostaphylos uva-ursi - Juniperis communis* (Achuff et al. 1997); Pf - Fd / *Juniperis* / *Arctostaphylos uva-ursi* (Corns and Achuff 1982).

The L1/Group 1 and L2/Group 5 concordances (Table 10) are tentative in that L1 and L2 are differentiated, in part, by the absence of *Juniperis communis* in L1 and its dominance in L2. In contrast, in Group 1, *Juniperis communis* is codominant, but is absent in Group 5, and is replaced by *Juniperis horizontalis*. Other Group 1 characteristic species are *Pseudotsuga menziesii, Festuca scabrella, Achillea millefolium, Allium cernuun,* and *Fragaria virginiana*. In Group 5, *Arctostaphylos uva-ursi, Juniperis horizontalis, Koeleria cmacrantha, and Potentilla fruticosa.*. Group 1 is characteristic of sites where bedrock is not close to the surface, whereas Group 5 is a bedrock type. It is probably safe to conclude that the associations identified previously in the literature, and the quantitative types identified here, are all abstractions on a

continuum along which soil depth, available moisture, grass cover, bearberry cover, relative cover of Douglas fir vs. limber pine, and that of *Juniperis communis* vs. *J. horizontalis* all vary. Boundaries defined on that continuum through the naming of associations are probably artificial.

Group 12 (n=2 plots) appears to lie at a transition to other alliances. Three of its characteristic species (*Abies lasiocarpa, Populus tremuloides* and *Thalictrum occidentale* lie together at the top end of the species cluster diagram (Figure 1), indicating a weak relationship with the species. As the group appears to belong to something other than the limber pine alliance, a summary follows, and it will not be discussed further.

This tentative association occupies sites near the upper elevational limit of limber pine. Sites are upper slope, submesic, rapidly-drained. More study is needed.

Range Comments: southwestern Alberta; only 2 plots in this type. Distribution Comments: only 2 plots in this type; may be more characteristic of lower subalpine than montane.

Environmental Factors. Minimum Elevation: 1800 m. Maximum Elevation: 1900 m. Landform: colluvial or morainal slopes. Topographic Position: upper slope. Slope: 37-60%. Aspect: NW. Soil Type: Brunisols? Soil Moisture: submesic.

Vegetation. 1. Strata: trees, shrubs, grasses, herbs. Percent Cover of Each Stratum: trees >55%; shrubs >5%; grasses 1.5%; herbs ~9%. Most Abundant Species in Each Stratum: *Abies lasiocarpa, Pinus flexilis, Populus tremuloides; Linnaea borealis, Shepherdia canadensis, Elymus innovatus, Thalictrum occidentale*. Unvegetated Surface Description: bedrock and mineral soil. Percent Unvegetated: ~10%. Constant Species: *Abies lasiocarpa, Arnica cordifolia, Epilobium angustifolium, Orthilia secunda, Pinus flexilis*. Characteristic Species: *Abies lasiocarpa, Pinus flexilis*.

Common Animals Associated with the Type: perhaps blue grouse, mountain chickadee, Hammond's flycatcher, Clark's nutcracker, mule deer, elk, Columbian ground squirrel (Achuff 1994) . Other Noteworthy Species: *Cronartium ribicola* (white pine blister rust). If decline of whitebark pine continues, decline of Clark's nutcracker would likely follow. Since Clark's nutcracker is the prime dispersal agent for whitebark pine, there may be a positive-feedback, downward spiral of both species, and of the communities in which these species live.

Type and Duration of Natural Disturbances: fire and disease.

Adjacent Communities: likely adjacent to subalpine fir - engelmann spruce (upslope), other limber pine types (downslope) and hairy wild rye (nearby). Included Communities (inclusions): likely hairy wild rye.

Status. Provincial Rank: S1 tentative (may be a transitional type). Justification of Rank: only two plots. Exemplary Site: ESIS plots 34PS490, 94BJD6022.

Table 10. Concordance of the qualitative limber pine types (Table 1a) in Alberta with the quantitative types. **Bolded** types are considered valid associations, for which community characterization have been prepared (see Appendix).

Alberta Limber Pine Types

Qualitative	Quantitative
L1 *Pinus flexilis / Festuca scabrella*	**Group 1** *Pseudotsuga menziesii - Pinus flexilis / Juniperis communis * / Festuca scabrella*
L2 *Pinus flexilis / Juniperis communis*	**Group 5** *Pinus flexilis /Arctostaphylos uva-ursi - Juniperis horizontalis*
none found	Group 12 *Abies lasiocarpa - Pinus flexilis - Populus tremuloides / Thalictrum occidentale* ^

^ Appears to belong to an alliance other than limber pine.

Whitebark Pine Alliance

Within the whitebark pine alliance, important site variables were: moisture regime; % bedrock; elevation and % decaying wood; and slope. Group 1: *Abies lasiocarpa - Pinus albicaulis - Picea engelmannii / Vaccinium scoparium* had a minimal exposure of bedrock and was generally found at middle elevations. Group 6: *Abies lasiocarpa - Pinus albicaulis - Picea engelmannii / Empetrum nigrum* had a high proportion of cobbles and stones and minimal exposure of decaying wood and mineral soil; elevations were generally high. Group 9: *Pinus albicaulis / Juniperis communis - Arctostaphylos uva-ursi* occupied a wide elevational range and had the highest median elevation; these were also the steepest and driest sites with the highest proportion of exposed bedrock. Group 26: *Pinus albicaulis - Pinus contorta / Juniperis communis - Elymus innovatus - Linnaea borealis* occupied the lowest elevations and its sites were as dry as the *Pinus albicaulis* / *Juniperis communis - Arctostaphylos uva-ursi* association. Group 51: *Picea glauca* x *P. engelmannii - Pinus albicaulis - Abies lasiocarpa* / feather moss (n=2 plots) occupied the gentlest slopes and had the highest proportion of decaying wood and perhaps exposed mineral soil.

With merging of the qualitative and quantitative types, there were seven valid associations.

W1: The *Abies lasiocarpa - Pinus albicaulis / Xerophyllum tenax* association is known only from Waterton Lakes National Park. It is found on mesic to subxeric, rapidly- to well-drained, lower subalpine sites with moderate to steep, southerly and westerly aspects. Outside Alberta, similar communities are the *Pinus albicaulis / Festuca idahoensis* (Bourgeron and Engelking 1994) and *Pinus albicaulis - Abies lasiocarpa* types of Pfister et al. (1977) and Bourgeron and Engelking (1994) are similar. In Alberta, the association is based on type O28 *Picea engelmannii - Abies lasiocarpa - Pinus albicaulis* / *Shepherdia* (Achuff et al. 1997); *Abies lasiocarpa - Pinus albicaulis* (Kuchar 1973) is similar.

W2: The *Pinus albicaulis - Abies lasiocarpa / Luzula hitchcockii - Vaccinium myrtillus* association is known from seven plots in Waterton Lakes National Park. It is found on mesic to subxeric, rapidly- to well-drained, upper subalpine sites with moderate to steep southerly and westerly aspects on colluvial landforms. Outside Alberta, probable synonyms are *Pinus albicaulis* / *Luzula hitchcockii* (and similar to *Pinus albicaulis* / *Carex geyeri*) (Cooper 1975; Hall 1973; Johnston 1987; Steele et al. 1983; Williams and Smith 1990; Bourgeron and

Engelking 1994). Outside Alberta, similar communities are *Pinus albicaulis - Abies lasiocarpa* habitat types of Pfister et al. (1977) and Bourgeron and Engelking (1994). In Alberta, the association is based on type O30 *Pinus albicaulis - Abies lasiocarpa / Luzula hitchcockii - Vaccinium myrtillus* of Achuff et al. (1997).

W3: The *Pinus albicaulis - Picea engelmannii / Dryas octopetala* association is found on exposed, subxeric upper subalpine sites with moderate to steep slopes on colluvial and residual landforms of various aspects. Elevation range is 2050-2300 m and soils are Orthic Regosols. It is known from three plots in Waterton Lakes National Park. In Alberta, it is similar to *Pinus albicaulis / Juniperis communis - Arctostaphylos uva-ursi* (Group 9) of this study Timoney. The type is based on type O31 of Achuff et al. (1997).

Group 1: The *Abies lasiocarpa - Pinus albicaulis - Picea engelmannii / Vaccinium scoparium* association has relatively few dominant plant species, and appears to be characteristic of mesic subalpine sites over a wide elevational range. Slope is variable and bedrock is not near the surface. Within the whitebark pine alliance, this is the most abundant group in the Alberta ESIS data. The most similar type is *Abies lasiocarpa - Pinus albicaulis - Picea engelmannii / Empetrum nigrum* (Timoney 1999); see also Se - Pa / *Menziesia glabella* (Corns and Achuff 1982) in Alberta. The association may be synonymous with the Pa (Pfister et al. 1977; Bourgeron and Engelking 1994); Pa / *Vaccinium scoparium* (Steele et al. 1983; Bourgeron and Engelking 1994); and Fl - Pa / *Vaccinium scoparium* (Bourgeron and Engelking 1994) types outside Alberta.

Group 6: *Abies lasiocarpa - Pinus albicaulis - Picea engelmannii / Empetrum nigrum* is an unusual association of high subalpine, mesic, stony sites, probably restricted to acidic parent materials north of the Bow River. It is perhaps allied to the Se - Fl / heather / feathermoss (C34) and Pl - Se / crowberry / *Cladonia mitis* (C35) types of Corns and Achuff (1982). Query of ESIS plot/species database prior to filtering found that one of the plots (24SD197) in this association contained *Xerophyllym tenax* at 20% cover, thus this assocation may also be allied with the Fl - Pa / *Xerophyllum tenax* association of Timoney (1999), the equivalent of the Se - Fl - Pa / *Shepherdia* of Achuff et al. (1997) and Fl - Pa of Kuchar (1973). No similar communities outside Alberta were found, nor were any synonyms found.

Group 9: The *Pinus albicaulis / Juniperis communis - Arctostaphylos uva-ursi* association appears to be a widespread type of high elevation high subalpine subxeric sites with significant exposure of bedrock and bare mineral soil. It has a probable preference for south or SW facing steep slopes over a wide elevational range (1690-2310 m). The Fl - Pa / *Arctostaphylos uva-ursi* type of Bourgeron and Engelking (1994) may be synonymous (outside Alberta). Similar communities are Se - Fl - Pa / *Shepherdia* (Achuff et al. 1997); Fl - Pa (Kuchar 1973); Se - Fl - Pa - Pl (Corns and Achuff 1982); Pa timberline type (Willoughby and Smith 1997) in Alberta, and Pa / *Juniperis communis* (Steele et al. 1983) outside Alberta.

Group 26: The *Pinus albicaulis - Pinus contorta / Juniperis communis - Elymus innovatus - Linnaea borealis* association is characteristic of low to high subalpine elevations transitional to lodgepole pine types. Sites tend to be subxeric, well-drained, of SW aspect, and with significant exposure of bedrock and mineral soil. The Pa / *Juniperis communis* type of Steele et al. (1983) may be the same type. Similar communities are Se - Fl - Pa / *Shepherdia* (Achuff et al. 1997); Fl - Pa (Kuchar 1973); Se - Fl - Pa - Pl (O4 type of Corns and Achuff 1982); Pa timberline type (Willoughby and Smith 1997) in Alberta.; and Fl - Pa / *Arctostaphylos uva-ursi* (Bourgeron and Engelking 1994) outside Alberta.

Group 51 appears to belong a *Picea - Abies* alliance rather than to a *Pinus albicaulis* alliance. As such, a summary of this group is provided below, and will not be dealt with further.

Picea glauca x *P. engelmannii - Pinus albicaulis - Abies lasiocarpa* / feather moss (Group 51) is a subalpine association transitional to *Picea engelmannii - Abies lasiocarpa* types

Similar Communities: Allied to the Se - Fl / heather / feathermoss (C34) and Se - Fl /

rock willow / alpine bearberry (O12) community types of Corns and Achuff (1982).

Range Comments: subalpine (only 2 plots).

Environmental Factors. Minimum Elevation: 1820 m. Maximum Elevation: 1970 m. Landform: colluvial, morainal. Slope: 38% median (17-58%). Aspect: SE? Soil Type: Brunisols and Regosols. Soil Moisture: mesic. Hydrologic Influences: moist soils.

Vegetation. Strata: tree, shrub, herb, bryoids. Percent Cover of Each Stratum: >46% tree; >45% shrub; >6% herb; >44% bryoids. Most Abundant Species in Each Stratum: hybrid spruce; *Empetrum nigrum, Betula glandulosa, Juniperis communis, Rhododendron albiflorum; Arctostaphylos rubra; Hylocomium splendens, Pleurozium schreberi*. Unvegetated Surface Description: mineral soil prominent ? Percent Unvegetated: ~~55% mineral soil. Constant Species: hybrid spruce, *Pinus albicaulis, Empetrum nigrum, Pleurozium schreberi, Barbilophozia lycopodioides, Ptilium crista-castrensis, Cladina mitis, Dicranum scoparium*. Characteristic Species: hybrid spruce, *Pinus albicaulis, Empetrum nigrum, Pleurozium schreberi, Ptilium crista-castrensis*.

Common Animals Associated with the Type: hermit thrush, white-crowned sparrow, fox sparrow, Brewer's sparrow, golden-crowned sparrow, American robin, American dipper, harlequin duck, grizzly bear, elk, mule deer, woodland caribou, golden-mantled ground squirrel are characteristic of high subalpine (forest-tundra) sites in Alberta (Gadd 1995; Achuff 1994).

Other Noteworthy Species: *Cronartium ribicola* (white pine blister rust).

Type and Duration of Natural Disturbances: disease (white pine blister rust); low fire frequency. Successional Status: mature.

Adjacent Communities: *Picea engelmannii - Abies lasiocarpa* types.

Provincial Rank: ?S2? Justification of Rank: only 2 ESIS plots; declining due to white pine blister rust. Exemplary Site: ESIS plots 94JLC9054, 94JLC9129.

Table 11. Concordance of the qualitative whitebark pine types (Table 2a) in Alberta with the quantitative types. **Bolded** types are considered valid associations, for which community characterization have been prepared (see Appendix).

Alberta Whitebark Pine Types

Qualitative	Quantitative
W1 *Abies lasiocarpa - Pinus albicaulis / Xerophyllum*	none found
W2 *Pinus albicaulis - Abies lasiocarpa / Luzula hitchcockii - Vaccinium myrtillus*	none found
W3 *Pinus albicaulis - Picea engelmannii / Dryas octopetala*	distinct from, but allied to, Group 9 *Pinus albicaulis / Juniperis communis - Arctostaphylos uva-ursi* *
W4 *Picea engelmannii - Pinus albicaulis / Menziesia ferruginea*	**Group 1** *Abies lasiocarpa - Pinus albicaulis - Picea engelmannii / Vaccinium scoparium*
W5 *Pinus albicaulis / Juniperis communis*	**Groups 26** *Pinus albicaulis - Pinus contorta / Juniperis communis - Elymus innovatus - Linnaea borealis* and **Group 9** *Pinus albicaulis / Juniperis communis - Arctostaphylos uva-ursi*
none found	**Group 6** *Abies lasiocarpa - Pinus albicaulis - Picea engelmannii / Empetrum nigrum* #
none found	Group 51 *Picea glauca x P. engelmannii - Pinus albicaulis - Abies lasiocarpa* / feather moss ^

* *Dryas octopetala* is sometimes present in Group 9 (2.8% mean cover, median 0, minimum 0, maximum cover 43%); other characteristic spp. in common include *Arctostaphylos uva-ursi, Shepherdia canadensis, Juniperis communis.* For the present, qualitative group W3(based on Achuff et al. 1997, type O31) is considered sufficiently distinct to merit association status.

While no qualitative analogues were found, the group occupies a central position in both the cluster analysis (Figure 5) and DCA plot ordination (Figure 6); thus it appears to be a valid member of the whitebark pine alliance.

^ Group 51 appears to belong a *Picea - Abies* alliance rather than to a *Pinus albicaulis* alliance.

Alpine Heath "Alliance" (Super-Group)

Within the high elevation treeless plots, including both heath, lichen, and other high elevation communities, aspect, elevation, moisture, slope %, and soil drainage all were significant variables in explaining community composition. Such a result is doubtless due in part to the large number of plots.

Within the alpine heath "alliance", the *Phyllodoce glanduliflora* (Group 12) association

was found over the widest range of elevation, moisture, and soil drainage regimes. *Phyllodoce empetriformis* (Group 22) was found on the steepest slopes, and showed a narrow range in soil moisture and soil drainage (due in part to low plot number). *Cassiope tetragona* (Group 35) was found on the most gradual slopes, and like *P. glanduliflora*, ranged widely in soil moisture. *Cassiope mertensiana* (Group 70) was found at the lowest elevations, and showed a narrow range for soil moisture and a wide range in soil drainage.

The four associations are summarized below.

Group 12: The *Phyllodoce glanduliflora* association is a large heath group found on a wide range of sites (rapid to imperfectly-drained, 0-70% slope, subxeric to subhygric, 2050-2620 m elevation, 0-315 degrees aspect). *Phyllodoce glanduliflora* is the only constant species; characteristic species are *Salix arctica, Antennaria lanata*, and *Cassiope mertensiana*. In whole or in part, synonyms are: *Cassiope mertensiana - Phyllodoce glanduliflora* (Hrapko and La Roi 1978); *Phyllodoce glanduliflora - Cassiope mertensiana* (Kuchar 1975, with *Phyllodoce* and *Cassiope* subtypes); *Phyllodoce glanduliflora - Cassiope mertensiana - Antennaria lanata* (Corns and Achuff 1982); alpine heath (Griffiths 1982); *Phyllodoce glanduliflora* / *Salix* spp. - *Antennaria lanata* and *Phyllodoce glanduliflora - Cassiope mertensiana* / *Trollius albiflorus* associations (Lee et al. 1982); *Phyllodoce* association (Trottier 1972; Crack 1977). This association is differentiated from the *Cassiope mertensiana* association of this study by the dominance of *P. glanduliflora*, and the characteristic *Sibbaldia procumbens* and *Potentilla diversifolia* in this type vs. the dominance of *C. mertensiana*, with the characteristic *Luzula piperi* and *Dicranum scoparium* in the *Cassiope mertensiana* association. Outside Alberta, similar communties are *Phyllodoce empetriformis / Antennaria lanata* (Cooper et al. 1997); the *Cassiope mertensiana / Luetkea pectinata* association (Bourgeron and Engelking 1994) is probably equivalent to Kuchar's (1975) *Luetkea pectinata* type. Within their *Phyllodoce glanduliflora* alliance, Bourgeron and Engelking (1994) list the *P. glanduliflora / Aster alpigenus* (G? rank) association.

Group 22: The *Phyllodoce empetriformis* association is found on well-drained, mesic to subhygric, morainal and residual, strong to extreme, middle and upper slopes. Its maximum elevation is only 2360 m (range 2080-2360 m). Subdominant species are *Anemone occidentalis, Salix arctica, Cassiope mertensiana*, and *Artemisia norvegica*. No synonyms were found. In Alberta, the closest type in Corns and Achuff (1982) is L5 (*Phyllodoce glanduliflora - Cassiope mertensiana - Antennaria lanata*), but both *P. glanduliflora* and *Antennaria lanata* are of low cover in Group 22. Outside Alberta, within their *Phyllodoce empetriformis* alliance, Bourgeron and Engelking (1994) list *P. empetriformis* parkland (G5), *P. empetriformis / Antennaria lanata* (G3), *P. empetriformis - Lupinus latifolius* (G?), and *P. empetriformis / Vaccinium deliciosum* (G4) associations.

Group 35: The *Cassiope tetragona* association occupies of wide range of alpine sites. Typically the sites are well-drained, mesic, morainal and colluvial, moderate, middle and upper slopes. Elevational range is 2130- 2490 m. *Dryas octopetala* and *Salix reticulata* may be codominant. Synonyms, in whole or in part are *Cassiope tetragona - Dryas octopetala* (Hrapko and La Roi 1978); *Cassiope tetragona - Dryas octopetala* (Kuchar 1975; contains a *Cassiope tetragona - Phyllodoce glanduliflora* subtype); *Cassiope* heath association (Kondla 1978); *Cassiope tetragona* association (Beder 1967); *Cassiope tetragona - Phyllodoce glanduliflora* type with *Dryas octopetala* (Timoney 1991a); *Cassiope tetragona - Dryas octopetala - Salix nivalis* (Corns and Achuff 1982); *Cassiope tetragona - Dryas octopetala (D. integrifolia) - Salix nivalis* (Lee et al. 1982); *Cassiope* association (Trottier 1972; Crack 1977). Similar communities: Another subtype of Kuchar (1975), *Cassiope tetragona - Dryas octopetala*, dominated by a crust of the lichen *Lepraria neglecta*, may be ascribable to an alpine lichen alliance. In the High Subarctic of northwestern Canada, *Cassiope tetragona* sometimes occurs as a subdominant with *Dryas integrifolia, Betula glandulosa,* and *Salix glauca* in basic, mesic tundras, and also in basic,

hygric to mesic tussock tundras with *Eriophorum vaginatum, Carex lugens, C. scirpoidea, C. vaginata,* and *Betula glandulosa* (Timoney et al. 1993). In the above cases, the associations are distinct from the present *Cassiope tetragona* association.

Group 70: The *Cassiope mertensiana* association is typically found on well-drained, mesic to subhygric, very gentle to extreme, middle and upper slopes. Its maximum elevation is only 2340 m. *C. mertensiana* is the only constant. Characteristic species include *Phyllodoce empetriformis, P. glanduliflora, Dicranum scoparium, Salix arctica*, and *Antennaria lanata*. Synonyms in whole or in part, in Alberta: *Cassiope mertensiana - Phyllodoce glanduliflora* (Hrapko and La Roi 1978); *Phyllodoce glanduliflora - Cassiope mertensiana* (Kuchar 1975, with *Phyllodoce* and *Cassiope* subtypes); *Phyllodoce glanduliflora - Cassiope mertensiana - Antennaria lanata* (Corns and Achuff 1982); alpine heath (Griffiths 1982); *Phyllodoce glanduliflora* / *Salix* spp. - *Antennaria lanata* and *Phyllodoce glanduliflora - Cassiope mertensiana* / *Trollius albiflorus* associations (Lee et al. 1982); *Phyllodoce* association (Trottier 1972; Crack 1977). Similar communities: This type is differentiated from the related *Phyllodoce glanduliflora* association of this study by the dominance of *P. glanduliflora*, and the characteristic *Sibbaldia procumbens* and *Potentilla diversifolia* in the *Phyllodoce glanduliflora* type vs. the dominance of *C. mertensiana*, with the characteristic *Luzula piperi* and *Dicranum scoparium* in the *Cassiope mertensiana* association. Outside Alberta, this type is similar to *Phyllodoce empetriformis / Antennaria lanata* (Cooper et al. 1997); also similar to Kuchar's (1975) *Luetkea pectinata* type. Within their *Cassiope mertensiana* alliance, Bourgeron and Engelking (1994) list the *Cassiope mertensiana* (G? rank), *C. mertensiana / Carex paysonis* (G2), *C. mertensiana / Luetkea pectinata* (G?), and *C. mertensiana - Phyllodoce empetriformis* (G5) associations.

Table 12. Concordance of the qualitative alpine heath types (Table 3a) in Alberta with the quantitative types. **Bolded** types are considered valid associations, for which community characterization have been prepared (see Appendix).

Alberta Heath Types

Qualitative	Quantitative
E1 *Cassiope tetragona - Dryas octopetala*	**Group 35** *Cassiope tetragona*
E2 *Cassiope mertensiana - Phyllodoce glanduliflora*	**Group 12** *Phyllodoce glanduliflora*, and **Group 70** *Cassiope mertensiana*
E3 *Dryas octopetala - Empetrum nigrum*	*
none found	**Group 22** *Phyllodoce empetriformis*

* *Empetrum nigrum* occurred in 14 of the 447 high elevation treeless plots, and was thus excluded from the analyses. Later query of the database (*tino2000.db,* viz. before filtering the less common species) showed that *Empetrum* occurred with *Dryas octopetala* five times; three of those times, the plot was classified as group 3 (*Dryas octopetala*), and twice as group 25 (*Salix arctica - S. reticulata*). *Dryas octopetala - Empetrum nigrum* does not appear to be a true alpine heath type but rather a facies of the broad *Dryas octopetala* group 3.

Table 13. Concordance of the qualitative alpine lichen types (Table 4a) in Alberta with the quantitative types.

Alberta "Alpine Lichen" Types

Qualitative	Quantitative
N1 *Dryas octopetala* / lichen	Group 3 *Dryas octopetala* (Group 2 *Salix reticulata* when *S. reticulata* dominates *Dryas*)
N2 *Carex nardina / Cetraria*	Group 34 *Carex nardina* / lichen
N3 *Kobresia myosuroides*	Group 52 *Kobresia myosuroides*
N4 *Salix arctica - Antennaria lanata*	*
N5 Stonefield lichen	?Group 34 *Carex nardina* / lichen?
none found	Group 50 *Dryas integrifolia - Silene acaulis*

* not a lichen type. It was listed in Table 4a on the strength of its high lichen cover. It is ascribable to Group 6 (*Antennaria lanata*).

"Alpine Lichen Alliance" (Super-Group)

Five quantitative associations were identified from the tentative alpine lichen super-group. (1) *Salix reticulata* [non-bryoid : bryoid cover ratio 7:1]; (2) *Dryas octopetala* [ratio 9.5:1]; (3) *Carex nardina* / lichen [ratio 1.5:1]; (4) *Dryas integrifolia - Silene acaulis* [ratio 4:1]*;* (5) *Kobresia myosuroides* [ratio 10:1]. As the foregoing non-bryoid : bryoid cover ratios indicate, none of the "alpine lichen" alliance groups are typically dominated by terricolous lichens. The five groups are better viewed as part of pre-existing vascular plant alliances, as defined by Bourgeron and Engelking (1994): *(1) Salix reticulata* group under the *Salix nivalis* (= *S. reticulata*) alliance; (2) *Dryas octopetala* group under a *Dryas octopetala* alliance; (3) *Carex nardina* / lichen under a *Carex nardina* alliance; (4) *Dryas integrifolia - Silene acaulis* under a *Dryas integrifolia* alliance; and (5) *Kobresia myosuroides* under a *K. myosuroides* alliance.

In some plots, however, terricolous lichen cover might rival vascular plant cover (see Appendix 3d,e,o,r,s). Whether such situations merit placement within distinct alpine lichen alliances remains unanswered. The best candidates for true terricolous alpine lichen associations may be found in those situations where continual natural disturbance result in an arrested or cyclic succession. Bryant and Scheinberg (1970) describe sites on the summit of Plateau Mountain on which diurnal frost churning creates conditions conducive to lichen dominance.

Since lichen cover is less than vascular plant cover in all the quantitative associations identified, it is more reasonable to include these associations under the appropriate vascular plant alliances. As such, a summary of each of these associations is provided below and will not be dealt with further in the body of the report. Additional information is available in the appendices.

(1) The *Salix reticulata* [Group 2, n=16 plots] association was found over the widest range of soil moisture and soil drainage, indicative of a variable, perched water table, perhaps influenced by snowmelt. It occupies a wide range of alpine sites with no clear site preferences. *Dryas octopetala, Polygonum viviparum*, and *Salix arctica* may be subdominant. *Cetraria, Cladonia*, and *Thamnolia* may be present.

Similar Communities: In Alberta. The "stonefield lichen" vegetation of Ogilvie (1969, 1976) and Kirby and Ogilvie (1969) appears to fit under *Salix reticulata* (Group 2) . It is similar to the L4 (*Cassiope tetragona - Dryas octopetala - Salix nivalis*) and H1 (*Dryas octopetala - Salix nivalis - Silene acaulis*) types of Corns and Achuff (1982). Outside Alberta. *Salix nivalis /*

Festuca ovina (= *Salix reticulata /* cf. *Festuca brachyphylla*) of Bourgeron and Engelking (1994) may be similar and occurs in Washington (S? rank, and G? globally). *Festuca brachyphylla* is sometimes present in Group 2. They also list a *S. reticulata / Caltha leptosepala* (G2 rank) which would be a wetter tundra type than Group 2. Nomenclature is a problem here: it is difficult to determine what is meant by *S. reticulata* vs. *S. nivalis* in Bourgeron and Engelking (1994). Moss (1983) subsumes ssp. *nivalis* (common in Alberta) and ssp. *reticulata* (rare in Alberta) under *S. reticulata*. Hitchcock and Cronquist (1964) view *S. nivalis* as a cordilleran plant and *S. reticulata* as "more strictly northern, circumboreal." Scoggan (1979) views *S. nivalis* as a Rocky Mountain variety of *S. reticulata* and *S. reticulata* var. *reticulata* is viewed as a northern transcontinental variant. Group 25 (*Salix arctica - S. reticulata*) is noted by Bourgeron and Engelking (1994) under a *Salix arctica* alliance as a *Salix arctica - S. reticulata* ssp. *nivalis* association. The association is noted from New Mexico and given a global rank of G2Q. Group 25 is not considered under the "alpine lichen" alliance as its lichen cover is low.

Range Comments:The association is probably uncommon in cordilleran Alberta. The related *Salix nivalis / Festuca ovina* of Bourgeron and Engelking (1994) occurs in Washington.

Environment summary: Minimum Elevation: 2000 m (probably extends below 2000 m); Maximum Elevation: 2540 m. Landform: morainal and colluvial. Topographic Position: macrosite: mid and upper slopes and summits. Slope: 19% median (0-52%). Aspect: various. Geology: sedimentary rocks, typically calcareous. Soil Type: probably Eutric Brunisols and Regosols. Soil Moisture: mesic median (xeric to hydric). Soil Comments: widely variable moisture conditions. Hydrologic Influences: well-drained median (rapidly to very poorly). Seasonal Influences: perhaps associated with slope bases or near snow catchment areas.

Vegetation. Strata: shrubs, herbs, bryoids. Percent Cover of Each Stratum: ~25% shrubs; >3.5% herbs; >4% bryoids. Most Abundant Species in Each Stratum: *Salix reticulata* (shrubs); *Polygonum viviparum* (herbs); *Cetraria nivalis* (bryoids). Constant Species: *Salix reticulata*. Characteristic Species: *Salix reticulata*, *Dryas octopetala, Silene acaulis, Polygonum viviparum, Cetraria nivalis, Cladonia pyxidata* (some *C. pyxidata* may be *C. pocillum*?*), Thamnolia subuliformis, Tortula ruralis*.

Type and Duration of Natural Disturbances: solifluction; nivation? Successional Status: mature. Adjacent Communities: heath types and *Dryas octopetala*.

Provincial Rank: S3? Justification of Rank: 16 ESIS plots. Exemplary Site: plot 386 (94JLC9173).

(2) *Dryas octopetala* [Group 3, n=99 plots] was found over a wide elevational range (610 m in the dataset >/=2000 m), and showed a wide tolerance for soil moisture, slope, and soil drainage. The largest of any of the groups, it occurs on virtually all site types. Much variation is contained within the group; at least five sub-groups may exist in Alberta. Only *Dryas octopetala* is present in all plots Of the nine characteristic species, four are lichens (*Cetraria cucullata, C. ericetorum, C. nivalis*, and *Thamnolia subuliformis*).

Similar Communities: In Alberta. The type is similar to the H1 (*Dryas octopetala - Salix nivalis - Silene acaulis*) type of Corns and Achuff (1982). Outside Alberta. *Dryas octopetala* alliance, composed of *Dryas octopetala* (G3?); *Dryas octopetala - Carex rupestris* (G4)*; Dryas octopetala - Carex* spp. (G5); and the *Dryas octopetala - Polygonum viviparum* (G2) associations (Bourgeron and Engelking 1994).

Range Comments: Probably the most common alpine tundra type in Alberta. Corns and Achuff (1982) note a large number of studies of this community under their H1 type. *Dryas octopetala - Carex rupestris*, *Dryas octopetala - Carex* spp., and *Dryas octopetala - Polygonum viviparum* associations occur in Montana (Bourgeron and Engelking 1994).

Environmental Factors. Minimum Elevation: 2000 m (probably extends below 2000 m); Maximum Elevation: 2610 m. Landform: morainal and colluvial. Topographic Position: various.

Slope: 18% median (0-75%). Aspect: various. Geology: sedimentary rocks, typically calcareous. Soil Type: Orthic Regosols, Orthic Humic Regosols; Melanic, Sombric, and Eutric Brunisols (H1 type of Corns and Achuff 1982). Soil Moisture: mesic median (xeric to subhydric). Soil Comments: solifluction and cryoturbation common; stony phases (H1 type of Corns and Achuff 1982). Hydrologic Influences: well-drained median (rapidly to very poorly).

Vegetation. Strata: shrubs; herbs; bryoids. Percent Cover of Each Stratum: >36% shrubs; >2% herbs; >4% bryoids. Most Abundant Species in Each Stratum: *Dryas octopetala* (shrubs); *Silene acaulis, Polygonum viviparum* (herbs); *Cetraria cucullata, C. ericetorum, C. nivalis, Thamnolia subuliformis* (bryoids). Unvegetated Surface Description: probably mineral soil and stones. Constant Species: *Dryas octopetala*. Characteristic Species: *Dryas octopetala*, *Salix reticulata, Silene acaulis, Cetraria cucullata, C. ericetorum, C. nivalis, Thamnolia subuliformis*. Subtypes: may be at least five subtypes; requires more study.

Type and Duration of Natural Disturbances: cryoturbation; exposure due to low snow cover on some sites. Successional Status: mosaic of mature and seral patches in relation to cryoturbation.

Adjacent Communities: various. Included Communities (inclusions): various.

Provincial Rank: S4-S5. Justification of Rank: 99 ESIS plots; widespread and common. Exemplary Site: plot 228 (94BPA8129).

Analysis and Data Comments: should be analysed further to identify sub-groups (associations).

(3) *Carex nardina* / lichen [Group 34, n=15 plots] was found on the driest sites, had the highest minimum elevation (2270 m), and reached 2700 m maximum elevation. It may be found on any aspect, typically on exposed, well-drained, submesic, moderate slopes, ranging in elevation from 2270 to 2700 m. Vegetation cover is sparse: none of the dominant species exceed 1% median cover. Four of ten characteristic species are lichens: *Cetraria nivalis, C. tilesii, Coelocaulon aculeatum*, and *Thamnolia subuliformis*. Other characteristic species include *Oxytropis podocarpa, Saxifraga oppositifolia*, *Salix reticulata*, and *Silene acaulis*.

Similar Communities: In Alberta. The vegetation of active patterned ground on Plateau Mountain (Bryant and Scheinberg (1970) seems to fit well under *Carex nardina* / lichen. It is similar to the H1 (*Dryas octopetala - Salix nivalis - Silene acaulis*) type of Corns and Achuff (1982) with the obvious difference the typical low cover of *Dryas octopetala* in Group 34. Outside Alberta. Within their *Carex nardina* alliance, Bourgeron and Engelking (1994) list the *Carex nardina* association (G? rank), from Colorado (SU) and Washington (S?) alpine talus; scree communities from Colorado were assigned to *C. nardina* var. *hepburnii*. The type deserves more study.

Range Comments: May be sporadic in cordilleran Alberta if viewed as sufficiently distinct from Group 3. A similar type occurs in Colorado and Washington. *Carex nardina* communities are known from sandy and gravelly, xeric, basic tundras of the Arctic and Subarctic (Porsild and Cody 1980; Timoney et al. 1993).

Environmental Factors. Minimum Elevation: 2270 m. Maximum Elevation: 2700 m. Landform: colluvial and morainal (H1 type of Corns and Achuff 1982). Topographic Position: upper slopes and crests. Slope: 12.5% median (4-60% median). Aspect: various. Geology: calcareous sedimentary. Soil Type: probably Orthic Regosols. Soil Moisture: submesic median (subxeric to mesic). Soil Comments: stony soil phases; some cryoturbation. Hydrologic Influences: well-drained median (rapidly to imperfectly). Key Environmental Factors: stony, exposed, windswept, droughty sites with little snow cover.

Vegetation. Strata: shrubs, herbs, “grasses”, bryoids. Percent Cover of Each Stratum: >1% shrubs; >4% herbs; “grasses” >1%; >4% bryoids. Most Abundant Species in Each Stratum: *Salix reticulata* (shrubs); *Silene acaulis* (herbs); *Carex nardina* (“grasses”); *Cetraria nivalis, C.*

tilesii, Coelocaulon aculeatum, Thamnolia subuliformis (bryoids). Unvegetated Surface Description: cobbles and stones, sand. Percent Unvegetated: high (>50%?). Constant Species: none. Characteristic Species: *Oxytropis podocarpa*, *Carex nardina*; *Cetraria nivalis, C. tilesii, Coelocaulon aculeatum, Thamnolia subuliformis.* Subtypes: none.

Type and Duration of Natural Disturbances: exposure to wind and sun, year-round; cryoturbation. Successional Status: edaphic climax?

Adjacent Communities: possibly *Dryas octopetala* (Group 3) and *Kobresia myosuroides* (Group 52).

Status: Provincial Rank: S3? Justification of Rank: 15 ESIS plots. Exemplary Site: plot 162 (94BPA7021).

(4) *Dryas integrifolia - Silene acaulis* [Group 50, n=20 plots] was found over the widest elevational range (710 m), and reached the highest elevation (2750 m). It is found on any aspect, typically on well-drained, mesic, moderate to extreme slopes, ranging widely in elevation from 2040-2750 m, and reaches the highest elevation of any of the vegetation groups. Subdominants are *Cetraria cucullata, C. tilesii, Dryas octopetala, Oxytropis podocarpa, Polygonum viviparum*, and *Salix reticulata*.

Similar Communities: In Alberta. It is allied with the H1 (*Dryas octopetala - Salix nivalis - Silene acaulis*) type of Corns and Achuff (1982), but differs in the dominance of *Dryas integrifolia.* Outside Alberta. Within the *Dryas integrifolia* alliance, Bourgeron and Engelking (1994) list the *Dryas integrifolia - Carex* spp. association. It is classified as globally rare (G2); the characteristic and diagnostic species are *Carex rupestris, Carex pseudoscirpoidea* (= *Carex scirpoidea*), *Bistorta vivipara* (=*Polygonum viviparum*), and *Aquilegia jonesii* (Reid et al. 1994).

Range Comments: Rare in SW Alberta; becomes more common northward in cordilleran Alberta. May be common in the cordillera north of Alberta. *Dryas integrifolia* is a dominant in many basic tundras of the High Subarctic and Arctic (Timoney et al. 1993; Porsild and Cody 1980), but these communities likely represent different associations, with *Carex rupestris, Cetraria tilesii*, and *Thamnolia subuliformis* characteristic in xeric situations and *Betula glandulosa, Salix glauca, S. lanata, Arctostaphylos rubra, Hedysarum alpinum*, and *Lupinus arcticus* characteristic in mesic situations.

Environmental Factors. Minimum Elevation: 2040 m. Maximum Elevation: 2750 m. Landform: morainal and colluvial. Topographic Position: upper slopes and summits. Slope: 15.5% median (5-50%). Aspect: various. Geology: typically calcareous sedimentary rocks. Soil Type: probably primarily Orthic Regosols. Soil Moisture: mesic median (subxeric to subhygric). Soil Comments: cryoturbation; stony soil phases.

Vegetation. Strata: shrubs, herbs, bryoids. Percent Cover of Each Stratum: >19% shrubs; >3.5% herbs; >6% bryoids. Most Abundant Species in Each Stratum: *Dryas integrifolia* (shrubs); *Oxytropis podocarpa* (herbs); *Cetraria cucullata, C. tilesii* (bryoids). Unvegetated Surface Description: probably mineral soil and stones. Constant Species: *Silene acaulis*. Characteristic Species: *Dryas integrifolia, D. octopetala, Salix reticulata, Polygonum viviparum, Oxytropis podocarpa, Cetraria cucullata, C. tilesii*.

Type and Duration of Natural Disturbances: cryoturbation; exposure due to low snow cover on some sites.

Adjacent Communities: probably *Dryas octopetala*.

Status. Provincial Rank: S3. Justification of Rank: 20 ESIS plots. Exemplary Site: plot 330 (94JJD9037).

(5) *Kobresia myosuroides* [Group 52, n=22 plots] showed a preference for south-facing slopes, was found on the steepest slopes (median 30%) and was on the drier end of the soil drainage gradient (range rapid to well). It is found on exposed, rapidly to well-drained, subxeric

to mesic, very gentle to extreme south-facing slopes. *Kobresia* is dominant over *Dryas octopetala* (ranging in cover from 15-60%). Four lichens (*Cetraria cucullata, C. ericetorum, C. nivalis, Coelocaulon aculeatum*) are among the 14 characteristic species, which include *Dryas octopetala,Oxytropis podocarpa*, and *Silene acaulis*.

Similar Communities: In Alberta. It is allied with the H4 (*Dryas octopetala - Kobresia myosuroides - Arctostaphylos uva-ursi*) type of Corns and Achuff (1982), but differs in that *Arctostaphylos uva-ursi* is usually absent. This type may be a higher elevation facies of Corns and Achuff (1982) H4 type. Outside Alberta. Within the *Kobresia myosuroides* alliance, Bourgeron and Engelking (1994) list the *Kobresia myosuroides - Carex rupestris* var. *drummondiana* (G3 rank), *K. myosuroides - Geum rossii* (G5), and *K. myosuroides - Trifolium dasyphyllum* (GU) associations.

Range Comments: May be fairly common in Alberta on appropriate sites. In the United States, it is most similar to the *Kobresia myosuroides - Carex rupestris* type of Colorado (S3,G3).

Environmental Factors. Minimum Elevation: 2010 m. Maximum Elevation: 2580 m. Landform: morainal and colluvial (H4 type of Corns and Achuff 1982). Topographic Position: upper slopes. Slope: 30% median (5-65%). Aspect: southerly. Geology: typically calcareous sedimentary rocks. Soil Type: Melanic and Eutric Brunisols; Orthic Humic Regosols (H4 type of Corns and Achuff 1982). Soil Moisture: mesic median (subxeric to mesic). Soil Comments: calcareous sands preferred. Hydrologic Influences: well-drained median (rapidly to well-drained). Seasonal Influences: seasonal drought; little snow accumulation. Key Environmental Factors: xeric, calcareous sands and windswept ridges.

Vegetation. Strata: shrubs, herbs, "grasses", bryoids. Percent Cover of Each Stratum: >16% shrubs; >6% herbs; >27.5 "grasses"; >5% bryoids. Most Abundant Species in Each Stratum: *Dryas octopetala* (shrubs); *Oxytropis podocarpa, Silene acaulis* (herbs); *Kobresia myosuroides* ("grasses"); *Cetraria nivalis, C. ericetorum* (bryoids). Unvegetated Surface Description: probably sand and stones. Constant Species: *Kobresia myosuroides.* Characteristic Species: *Kobresia myosuroides, Dryas octopetala*, *Oxytropis podocarpa, Silene acaulis*, *Cetraria nivalis, C. ericetorum, C. cucullata, Coelocaulon aculeatum, Tortula ruralis, Androsace chamaejasme, Selaginella densa, Solidago multiradiata*.

Type and Duration of Natural Disturbances: exposure to sun and wind, year-round; erosion? Successional Status: edaphic climax?

Adjacent Communities: possibly *Dryas octopetala* (Group 3) and *Carex nardina* / lichen (Group 34).

Status. Provincial Rank: S3. Justification of Rank: 22 ESIS plots. Exemplary Site: plot 130 (94BJE8083).

Conservation Status

The conservation status of each of the plant community groups is difficult to determine without areal estimates of each occurrence, distribution maps, and data on trends in abundance. Lacking such detailed information, the best course of action might be to continue to consult with knowledgeable individuals. At the least, visiting of rare community plots (via low-level flights, or on the ground) should be done periodically. This could be accomplished most efficiently by linking a community type/ESIS plot number table from this study (e.g., Tables 5,7) with the ESIS plot location data table (exloc.dat). The query answer table would provide a list of locations for the rare communities in question, which could be plotted in a GIS to facilitate planning of field visits.

Some community types may be declining: e.g., limber and whitebark pine due to white pine blister rust (Achuff et al. 1997). Some communities appear unusual or rare in the dataset examined: e.g., *Selaginella densa* and *Arctostaphylos uva-ursi* communities above 2000 m.

Other may be rare extremes or facies of other types: e.g., *Phyllodoce empetriformis* type in relation to *Cassiope mertensiana*.

Rare Plant Species and the Associations

The distribution of rare plant species among the community groups cannot be addressed presently due to the necessity of eliminating species of low plot frequency prior to classification. To assess rare plant distributions, ESIS plot and cluster group numbers (limber pine: Table 5; whitebark pine: Table 7; treeless, high elevation communities, Appendix 3a) should be used in linked queries within an unfiltered ESIS plot by species database table (e.g, ESIS *exss.dat*). The answer tables would provide complete species lists for plots in each community type. A list of rare species could then be used in linked queries with the answer tables. The queries would provide tables of rare plant species and their plots within each community group.

Conclusions

Through quantitative and qualitative approaches this study characterized two limber pine associations, seven whitebark pine associations, and twenty treeless high elevation groups, four of which were alpine heath associations.

Limber Pine

The *Pseudotsuga menziesii - Pinus flexilis / Juniperis communis / Festuca scabrella* woodland (savannah) type is characteristic of montane sites in southwestern Alberta. It is found on moderate elevation crests and upper slopes that are rapidly to well-drained and subxeric in which bedrock is not close to the surface.

The *Pinus flexilis / Arctostaphylos uva-ursi - Juniperis horizontalis* woodland type is characteristic of montane sites in southwestern Alberta. It is found on lower elevation middle and lower slopes that are rapidly to well-drained and subxeric in which bedrock is close to the surface.

Whitebark Pine

The *Abies lasiocarpa - Pinus albicaulis / Xerophyllum tenax* association is known only from Waterton Lakes National Park. It is found on mesic to subxeric, rapidly- to well-drained, lower subalpine sites with moderate to steep, southerly and westerly aspects.

The *Pinus albicaulis - Abies lasiocarpa / Luzula hitchcockii - Vaccinium myrtillus* association is known from seven plots in Waterton Lakes National Park. It is found on mesic to subxeric, rapidly- to well-drained, upper subalpine sites with moderate to steep southerly and westerly aspects on colluvial landforms.

The *Pinus albicaulis - Picea engelmannii / Dryas octopetala* association is found on exposed, subxeric upper subalpine sites with moderate to steep slopes on colluvial and residual landforms of various aspects. Elevation range is 2050-2300 m and soils are Orthic Regosols. It is known from three plots in Waterton Lakes National Park.

The *Abies lasiocarpa - Pinus albicaulis - Picea engelmannii / Vaccinium scoparium* association has relatively few dominant plant species, and appears to be characteristic of mesic subalpine sites over a wide elevational range. Slope is variable and bedrock is not near the surface. Within the whitebark pine alliance, this is the most abundant group in the Alberta ESIS data.

Abies lasiocarpa - Pinus albicaulis - Picea engelmannii / Empetrum nigrum is an unusual association of high subalpine, mesic, stony sites, probably restricted to acidic parent materials north of the Bow River.

The *Pinus albicaulis / Juniperis communis - Arctostaphylos uva-ursi* association appears

to be a widespread type of high elevation high subalpine subxeric sites with significant exposure of bedrock and bare mineral soil. Probable preference for south or SW facing steep slopes over a wide elevational range (1690-2310 m).

The *Pinus albicaulis - Pinus contorta / Juniperis communis - Elymus innovatus - Linnaea borealis* association is characteristic of low to high subalpine elevations transitional to lodgepole pine types. Sites tend to be subxeric, well-drained, of SW aspect, and with significant exposure of bedrock and mineral soil.

Alpine Heath

The *Phyllodoce glanduliflora* association is a large heath group found on a wide range of sites (rapid to imperfectly-drained, 0-70% slope, subxeric to subhygric, 2050-2620 m elevation, 0-315 degrees aspect). *Phyllodoce glanduliflora* is the only constant species; characteristic species are *Salix arctica, Antennaria lanata*, and *Cassiope mertensiana*.

The *Phyllodoce empetriformis* association is found on well-drained, mesic to subhygric, morainal and residual, strong to extreme, middle and upper slopes. Its maximum elevation is only 2360 m (range 2080-2360 m). Subdominant species are *Anemone occidentalis, Salix arctica, Cassiope mertensiana*, and *Artemisia norvegica*.

The *Cassiope tetragona* association occupies of wide range of alpine sites. Typically the sites are well-drained, mesic, morainal and colluvial, moderate, middle and upper slopes. Elevational range is 2130- 2490 m. *Dryas octopetala* and *Salix reticulata* may be codominant. This association lies between the typical alpine heaths dominated by *Phyllodoce glanduliflora, P. empetriformis,* and *C. mertensiana*, and the non-heath upland association(s) dominated by *Dryas octopetala*.

The *Cassiope mertensiana* association is typically found on well-drained, mesic to subhygric, very gentle to extreme, middle and upper slopes. Its maximum elevation is only 2340 m. *C. mertensiana* is the only constant. Characteristic species include *Phyllodoce empetriformis, P. glanduliflora, Dicranum scoparium, Salix arctica*, and *Antennaria lanata*.

"Alpine Lichen"

Five quantitative associations were identified in which lichens may form a significant part of the vegetation cover. These were: *Salix reticulata*; *Dryas octopetala*; *Carex nardina* / lichen; *Dryas integrifolia - Silene acaulis; Kobresia myosuroides.* The five groups are better viewed as part of pre-existing vascular plant alliances.

Other High Elevation Treeless Types

Eleven other associations were identified in the process of analyzing the high elevation dataset. These types may prove useful to conservation as they provide a quantitative overview of Alberta high elevation vegetation. The types were: *Salix glauca; Elymus innovatus; Arctostaphylos uva-ursi; Salix arctica*; *Antennaria lanata*; *Carex nigricans*; *Aulacomnium palustre*; *Trollius albiflorus*; *Selaginella densa*; *Salix barrattiana;* and *Salix arctica - S. reticulata.*

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Appendices to Accompany

Limber Pine, Whitebark Pine, Alpine Heath,

and Terricolous Alpine Lichen Vegetation Alliances in Alberta

(Compilation of Information on selected Alberta Plant Communities,

1998-1999)

by

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for

Alberta Environmental Protection
Resource Data Division
Edmonton, AB

15 January 1999

List of Appendices

Appendix 1a. Summary statistics of *Pinus flexilis* species cover by plot cluster groups.

Group 1

MON 11/09/98 8:27:06 PM C:\SYSTATW5\PIFLCRTP.SYS

TOTAL OBSERVATIONS: 5

	ABIELA	ACHIMI	AGOSGL	ALLICE	AMELAL
N OF CASES	5	5	5	5	5
MINIMUM	0.000	1.000	0.000	1.000	0.000
MAXIMUM	1.000	1.000	1.000	2.000	3.000
RANGE	1.000	0.000	1.000	1.000	3.000
MEAN	0.200	1.000	0.400	1.200	0.800
VARIANCE	0.200	0.000	0.300	0.200	1.700
STANDARD DEV	0.447	0.000	0.548	0.447	1.304
STD. ERROR	0.200	0.000	0.245	0.200	0.583
SKEWNESS(G1)	1.500	0.000	0.408	1.500	1.150
KURTOSIS(G2)	0.250	0.000	-1.833	0.250	-0.334
SUM	1.000	5.000	2.000	6.000	4.000
C.V.	2.236	0.000	1.369	0.373	1.630
MEDIAN	0.000	1.000	0.000	1.000	0.000

	ANDRCH	ANEMMU	ANTEPA	ANTERA	AQUIFL
N OF CASES	5	5	5	5	5
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	1.000	1.000
RANGE	1.000	1.000	1.000	1.000	1.000
MEAN	0.400	0.600	0.200	0.200	0.200
VARIANCE	0.300	0.300	0.200	0.200	0.200
STANDARD DEV	0.548	0.548	0.447	0.447	0.447
STD. ERROR	0.245	0.245	0.200	0.200	0.200
SKEWNESS(G1)	0.408	-0.408	1.500	1.500	1.500
KURTOSIS(G2)	-1.833	-1.833	0.250	0.250	0.250
SUM	2.000	3.000	1.000	1.000	1.000
C.V.	1.369	0.913	2.236	2.236	2.236
MEDIAN	0.000	1.000	0.000	0.000	0.000

	ARCTUV	ARNICO	ASTECI	ASTECO	ASTRAL
N OF CASES	5	5	5	5	5
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	20.000	4.000	1.000	2.000	1.000
RANGE	20.000	4.000	1.000	2.000	1.000
MEAN	5.600	0.800	0.400	1.200	0.200
VARIANCE	69.300	3.200	0.300	0.700	0.200
STANDARD DEV	8.325	1.789	0.548	0.837	0.447
STD. ERROR	3.723	0.800	0.245	0.374	0.200
SKEWNESS(G1)	1.268	1.500	0.408	-0.344	1.500
KURTOSIS(G2)	-0.071	0.250	-1.833	-1.153	0.250
SUM	28.000	4.000	2.000	6.000	1.000
C.V.	1.487	2.236	1.369	0.697	2.236
MEDIAN	3.000	0.000	0.000	1.000	0.000

	BROMIN	CALARU	CAMPRO	CETRPI	CLADCH
N OF CASES	5	5	5	5	5
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	1.000	1.000

RANGE	1.000	1.000	1.000	1.000	1.000
MEAN	0.200	0.200	0.600	0.400	0.400
VARIANCE	0.200	0.200	0.300	0.300	0.300
STANDARD DEV	0.447	0.447	0.548	0.548	0.548
STD. ERROR	0.200	0.200	0.245	0.245	0.245
SKEWNESS(G1)	1.500	1.500	-0.408	0.408	0.408
KURTOSIS(G2)	0.250	0.250	-1.833	-1.833	-1.833
SUM	1.000	1.000	3.000	2.000	2.000
C.V.	2.236	2.236	0.913	1.369	1.369
MEDIAN	0.000	0.000	1.000	0.000	0.000

	ELYMIN	EPILAN	FESTSA	FESTSC	FRAGVI
N OF CASES	5	5	5	5	5
MINIMUM	0.000	0.000	0.000	0.000	1.000
MAXIMUM	4.000	1.000	1.000	95.000	1.000
RANGE	4.000	1.000	1.000	95.000	0.000
MEAN	2.200	0.400	0.200	20.000	1.000
VARIANCE	4.200	0.300	0.200	1758.500	0.000
STANDARD DEV	2.049	0.548	0.447	41.934	0.000
STD. ERROR	0.917	0.245	0.200	18.754	0.000
SKEWNESS(G1)	-0.296	0.408	1.500	1.499	0.000
KURTOSIS(G2)	-1.791	-1.833	0.250	0.248	0.000
SUM	11.000	2.000	1.000	100.000	5.000
C.V.	0.932	1.369	2.236	2.097	0.000
MEDIAN	3.000	0.000	0.000	2.000	1.000

	GALIBO	HEDYAL	HEDYSU	HYPNRE	HYPOPH
N OF CASES	5	5	5	5	5
MINIMUM	1.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	5.000	2.000	1.000	1.000
RANGE	0.000	5.000	2.000	1.000	1.000
MEAN	1.000	1.200	0.600	0.600	0.400
VARIANCE	0.000	4.700	0.800	0.300	0.300
STANDARD DEV	0.000	2.168	0.894	0.548	0.548
STD. ERROR	0.000	0.970	0.400	0.245	0.245
SKEWNESS(G1)	0.000	1.363	0.844	-0.408	0.408
KURTOSIS(G2)	0.000	0.038	-0.922	-1.833	-1.833
SUM	5.000	6.000	3.000	3.000	2.000
C.V.	0.000	1.807	1.491	0.913	1.369
MEDIAN	1.000	0.000	0.000	1.000	0.000

	JUNICO	JUNIHO	KOELMA	LETHVU	LINNBO
N OF CASES	5	5	5	5	5
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	15.000	2.000	1.000	2.000	0.000
RANGE	15.000	2.000	1.000	2.000	0.000
MEAN	8.000	0.800	0.400	0.800	0.000
VARIANCE	45.000	0.700	0.300	0.700	0.000
STANDARD DEV	6.708	0.837	0.548	0.837	0.000
STD. ERROR	3.000	0.374	0.245	0.374	0.000
SKEWNESS(G1)	0.111	0.344	0.408	0.344	0.000
KURTOSIS(G2)	-1.602	-1.153	-1.833	-1.153	0.000
SUM	40.000	4.000	2.000	4.000	0.000
C.V.	0.839	1.046	1.369	1.046	.
MEDIAN	5.000	1.000	0.000	1.000	0.000

	ORTHSE	PARMAM	PARMSU	PELTCA	PICEGL
N OF CASES	5	5	5	5	5

MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	2.000	2.000	0.000
RANGE	0.000	1.000	2.000	2.000	0.000
MEAN	0.000	0.400	0.800	0.600	0.000
VARIANCE	0.000	0.300	0.700	0.800	0.000
STANDARD DEV	0.000	0.548	0.837	0.894	0.000
STD. ERROR	0.000	0.245	0.374	0.400	0.000
SKEWNESS(G1)	0.000	0.408	0.344	0.844	0.000
KURTOSIS(G2)	0.000	-1.833	-1.153	-0.922	0.000
SUM	0.000	2.000	4.000	3.000	0.000
C.V.	.	1.369	1.046	1.491	.
MEDIAN	0.000	0.000	1.000	0.000	0.000

	PINUCO	PINUFL	PLEUSC	POHLNU	POPUTR
N OF CASES	5	5	5	5	5
MINIMUM	0.000	5.000	0.000	0.000	0.000
MAXIMUM	43.000	30.000	1.000	2.000	3.000
RANGE	43.000	25.000	1.000	2.000	3.000
MEAN	8.600	17.000	0.200	0.800	1.200
VARIANCE	369.800	110.500	0.200	0.700	2.700
STANDARD DEV	19.230	10.512	0.447	0.837	1.643
STD. ERROR	8.600	4.701	0.200	0.374	0.735
SKEWNESS(G1)	1.500	0.113	1.500	0.344	0.408
KURTOSIS(G2)	0.250	-1.529	0.250	-1.153	-1.833
SUM	43.000	85.000	1.000	4.000	6.000
C.V.	2.236	0.618	2.236	1.046	1.369
MEDIAN	0.000	16.000	0.000	1.000	0.000

	POTEFR	PSEUME	PYROCH	RIBELA	ROSAAC
N OF CASES	5	5	5	5	5
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	50.000	1.000	1.000	2.000
RANGE	5.000	50.000	1.000	1.000	2.000
MEAN	1.800	20.200	0.400	0.200	1.200
VARIANCE	3.700	416.200	0.300	0.200	0.700
STANDARD DEV	1.924	20.401	0.548	0.447	0.837
STD. ERROR	0.860	9.124	0.245	0.200	0.374
SKEWNESS(G1)	1.018	0.490	0.408	1.500	-0.344
KURTOSIS(G2)	-0.348	-1.136	-1.833	0.250	-1.153
SUM	9.000	101.000	2.000	1.000	6.000
C.V.	1.069	1.010	1.369	2.236	0.697
MEDIAN	1.000	17.000	0.000	0.000	1.000

	SELADE	SHEPCA	SMILST	SOLISP	SPIRBE
N OF CASES	5	5	5	5	5
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	5.000	1.000	1.000	1.000
RANGE	1.000	5.000	1.000	1.000	1.000
MEAN	0.400	1.600	0.600	0.400	0.400
VARIANCE	0.300	4.300	0.300	0.300	0.300
STANDARD DEV	0.548	2.074	0.548	0.548	0.548
STD. ERROR	0.245	0.927	0.245	0.245	0.245
SKEWNESS(G1)	0.408	0.970	-0.408	0.408	0.408
KURTOSIS(G2)	-1.833	-0.517	-1.833	-1.833	-1.833
SUM	2.000	8.000	3.000	2.000	2.000
C.V.	1.369	1.296	0.913	1.369	1.369
MEDIAN	0.000	1.000	1.000	0.000	0.000

	STENOC	THALOC	THUIAB	TORTRU	USNEHI

N OF CASES	5	5	5	5	5
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	5.000	4.000	4.000
RANGE	1.000	1.000	5.000	4.000	4.000
MEAN	0.400	0.200	1.200	2.200	0.800
VARIANCE	0.300	0.200	4.700	2.700	3.200
STANDARD DEV	0.548	0.447	2.168	1.643	1.789
STD. ERROR	0.245	0.200	0.970	0.735	0.800
SKEWNESS(G1)	0.408	1.500	1.363	-0.348	1.500
KURTOSIS(G2)	-1.833	0.250	0.038	-1.422	0.250
SUM	2.000	1.000	6.000	11.000	4.000
C.V.	1.369	2.236	1.807	0.747	2.236
MEDIAN	0.000	0.000	0.000	3.000	0.000

	VICIAM	ZIGAEL
N OF CASES	5	5
MINIMUM	0.000	0.000
MAXIMUM	1.000	1.000
RANGE	1.000	1.000
MEAN	0.200	0.400
VARIANCE	0.200	0.300
STANDARD DEV	0.447	0.548
STD. ERROR	0.200	0.245
SKEWNESS(G1)	1.500	0.408
KURTOSIS(G2)	0.250	-1.833
SUM	1.000	2.000
C.V.	2.236	1.369
MEDIAN	0.000	0.000

Summary statistics of *Pinus flexilis* species cover by plot group.
Group 5

TOTAL OBSERVATIONS: 7

	ABIELA	ACHIMI	AGOSGL	ALLICE	AMELAL
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	0.000	1.000	1.000
RANGE	2.000	1.000	0.000	1.000	1.000
MEAN	0.286	0.429	0.000	0.429	0.143
VARIANCE	0.571	0.286	0.000	0.286	0.143
STANDARD DEV	0.756	0.535	0.000	0.535	0.378
STD. ERROR	0.286	0.202	0.000	0.202	0.143
SKEWNESS(G1)	2.041	0.289	0.000	0.289	2.041
KURTOSIS(G2)	2.167	-1.917	0.000	-1.917	2.167
SUM	2.000	3.000	0.000	3.000	1.000
C.V.	2.646	1.247	.	1.247	2.646
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ANDRCH	ANEMMU	ANTEPA	ANTERA	AQUIFL
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	0.000	0.000
RANGE	0.000	1.000	1.000	0.000	0.000
MEAN	0.000	0.714	0.143	0.000	0.000
VARIANCE	0.000	0.238	0.143	0.000	0.000

STANDARD DEV	0.000	0.488	0.378	0.000	0.000
STD. ERROR	0.000	0.184	0.143	0.000	0.000
SKEWNESS(G1)	0.000	-0.949	2.041	0.000	0.000
KURTOSIS(G2)	0.000	-1.100	2.167	0.000	0.000
SUM	0.000	5.000	1.000	0.000	0.000
C.V.	.	0.683	2.646	.	.
MEDIAN	0.000	1.000	0.000	0.000	0.000

	ARCTUV	ARNICO	ASTECI	ASTECO	ASTRAL
N OF CASES	7	7	7	7	7
MINIMUM	5.000	0.000	0.000	0.000	0.000
MAXIMUM	30.000	0.000	1.000	1.000	1.000
RANGE	25.000	0.000	1.000	1.000	1.000
MEAN	18.000	0.000	0.143	0.143	0.143
VARIANCE	70.333	0.000	0.143	0.143	0.143
STANDARD DEV	8.386	0.000	0.378	0.378	0.378
STD. ERROR	3.170	0.000	0.143	0.143	0.143
SKEWNESS(G1)	-0.119	0.000	2.041	2.041	2.041
KURTOSIS(G2)	-0.906	0.000	2.167	2.167	2.167
SUM	126.000	0.000	1.000	1.000	1.000
C.V.	0.466	.	2.646	2.646	2.646
MEDIAN	20.000	0.000	0.000	0.000	0.000

	BROMIN	CALARU	CAMPRO	CETRPI	CLADCH
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	0.000	0.000
RANGE	1.000	0.000	1.000	0.000	0.000
MEAN	0.286	0.000	0.286	0.000	0.000
VARIANCE	0.238	0.000	0.238	0.000	0.000
STANDARD DEV	0.488	0.000	0.488	0.000	0.000
STD. ERROR	0.184	0.000	0.184	0.000	0.000
SKEWNESS(G1)	0.949	0.000	0.949	0.000	0.000
KURTOSIS(G2)	-1.100	0.000	-1.100	0.000	0.000
SUM	2.000	0.000	2.000	0.000	0.000
C.V.	1.708	.	1.708	.	.
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ELYMIN	EPILAN	FESTSA	FESTSC	FRAGVI
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	0.000	3.000	1.000	1.000
RANGE	3.000	0.000	3.000	1.000	1.000
MEAN	0.571	0.000	0.429	0.143	0.143
VARIANCE	1.286	0.000	1.286	0.143	0.143
STANDARD DEV	1.134	0.000	1.134	0.378	0.378
STD. ERROR	0.429	0.000	0.429	0.143	0.143
SKEWNESS(G1)	1.663	0.000	2.041	2.041	2.041
KURTOSIS(G2)	1.158	0.000	2.167	2.167	2.167
SUM	4.000	0.000	3.000	1.000	1.000
C.V.	1.984	.	2.646	2.646	2.646
MEDIAN	0.000	0.000	0.000	0.000	0.000

	GALIBO	HEDYAL	HEDYSU	HYPNRE	HYPOPH
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	1.000	0.000	0.000	0.000
RANGE	3.000	1.000	0.000	0.000	0.000

MEAN	0.857	0.143	0.000	0.000	0.000
VARIANCE	1.143	0.143	0.000	0.000	0.000
STANDARD DEV	1.069	0.378	0.000	0.000	0.000
STD. ERROR	0.404	0.143	0.000	0.000	0.000
SKEWNESS(G1)	1.173	2.041	0.000	0.000	0.000
KURTOSIS(G2)	0.380	2.167	0.000	0.000	0.000
SUM	6.000	1.000	0.000	0.000	0.000
C.V.	1.247	2.646	.	.	.
MEDIAN	1.000	0.000	0.000	0.000	0.000

	JUNICO	JUNIHO	KOELMA	LETHVU	LINNBO
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	18.000	13.000	1.000	0.000
RANGE	3.000	18.000	13.000	1.000	0.000
MEAN	1.000	9.000	4.000	0.143	0.000
VARIANCE	2.000	75.000	21.333	0.143	0.000
STANDARD DEV	1.414	8.660	4.619	0.378	0.000
STD. ERROR	0.535	3.273	1.746	0.143	0.000
SKEWNESS(G1)	0.764	-0.135	1.063	2.041	0.000
KURTOSIS(G2)	-1.250	-1.818	0.064	2.167	0.000
SUM	7.000	63.000	28.000	1.000	0.000
C.V.	1.414	0.962	1.155	2.646	.
MEDIAN	0.000	12.000	3.000	0.000	0.000

	ORTHSE	PARMAM	PARMSU	PELTCA	PICEGL
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	6.000
RANGE	0.000	0.000	0.000	0.000	6.000
MEAN	0.000	0.000	0.000	0.000	1.143
VARIANCE	0.000	0.000	0.000	0.000	5.143
STANDARD DEV	0.000	0.000	0.000	0.000	2.268
STD. ERROR	0.000	0.000	0.000	0.000	0.857
SKEWNESS(G1)	0.000	0.000	0.000	0.000	1.663
KURTOSIS(G2)	0.000	0.000	0.000	0.000	1.158
SUM	0.000	0.000	0.000	0.000	8.000
C.V.	.	.	.	.	1.984
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PINUCO	PINUFL	PLEUSC	POHLNU	POPUTR
N OF CASES	7	7	7	7	7
MINIMUM	0.000	5.000	0.000	0.000	0.000
MAXIMUM	15.000	19.000	0.000	0.000	0.000
RANGE	15.000	14.000	0.000	0.000	0.000
MEAN	2.143	11.571	0.000	0.000	0.000
VARIANCE	32.143	28.286	0.000	0.000	0.000
STANDARD DEV	5.669	5.318	0.000	0.000	0.000
STD. ERROR	2.143	2.010	0.000	0.000	0.000
SKEWNESS(G1)	2.041	-0.072	0.000	0.000	0.000
KURTOSIS(G2)	2.167	-1.250	0.000	0.000	0.000
SUM	15.000	81.000	0.000	0.000	0.000
C.V.	2.646	0.460	.	.	.
MEDIAN	0.000	12.000	0.000	0.000	0.000

	POTEFR	PSEUME	PYROCH	RIBELA	ROSAAC
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000

MAXIMUM	6.000	3.000	0.000	0.000	1.000
RANGE	6.000	3.000	0.000	0.000	1.000
MEAN	2.429	0.429	0.000	0.000	0.143
VARIANCE	3.286	1.286	0.000	0.000	0.143
STANDARD DEV	1.813	1.134	0.000	0.000	0.378
STD. ERROR	0.685	0.429	0.000	0.000	0.143
SKEWNESS(G1)	0.940	2.041	0.000	0.000	2.041
KURTOSIS(G2)	0.561	2.167	0.000	0.000	2.167
SUM	17.000	3.000	0.000	0.000	1.000
C.V.	0.746	2.646	.	.	2.646
MEDIAN	2.000	0.000	0.000	0.000	0.000

	SELADE	SHEPCA	SMILST	SOLISP	SPIRBE
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	10.000	0.000	1.000	0.000
RANGE	0.000	10.000	0.000	1.000	0.000
MEAN	0.000	2.000	0.000	0.286	0.000
VARIANCE	0.000	13.667	0.000	0.238	0.000
STANDARD DEV	0.000	3.697	0.000	0.488	0.000
STD. ERROR	0.000	1.397	0.000	0.184	0.000
SKEWNESS(G1)	0.000	1.710	0.000	0.949	0.000
KURTOSIS(G2)	0.000	1.333	0.000	-1.100	0.000
SUM	0.000	14.000	0.000	2.000	0.000
C.V.	.	1.848	.	1.708	.
MEDIAN	0.000	0.000	0.000	0.000	0.000

	STENOC	THALOC	THUIAB	TORTRU	USNEHI
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	1.000
RANGE	0.000	0.000	0.000	1.000	1.000
MEAN	0.000	0.000	0.000	0.143	0.143
VARIANCE	0.000	0.000	0.000	0.143	0.143
STANDARD DEV	0.000	0.000	0.000	0.378	0.378
STD. ERROR	0.000	0.000	0.000	0.143	0.143
SKEWNESS(G1)	0.000	0.000	0.000	2.041	2.041
KURTOSIS(G2)	0.000	0.000	0.000	2.167	2.167
SUM	0.000	0.000	0.000	1.000	1.000
C.V.	.	.	.	2.646	2.646
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VICIAM	ZIGAEL
N OF CASES	7	7
MINIMUM	0.000	0.000
MAXIMUM	2.000	0.000
RANGE	2.000	0.000
MEAN	0.286	0.000
VARIANCE	0.571	0.000
STANDARD DEV	0.756	0.000
STD. ERROR	0.286	0.000
SKEWNESS(G1)	2.041	0.000
KURTOSIS(G2)	2.167	0.000
SUM	2.000	0.000
C.V.	2.646	.
MEDIAN	0.000	0.000

Summary statistics of *Pinus flexilis* species cover by plot group.
Group 12

TOTAL OBSERVATIONS: 2

	ABIELA	ACHIMI	AGOSGL	ALLICE	AMELAL
N OF CASES	2	2	2	2	2
MINIMUM	17.000	0.000	0.000	0.000	0.000
MAXIMUM	60.000	0.000	0.000	1.000	2.000
RANGE	43.000	0.000	0.000	1.000	2.000
MEAN	38.500	0.000	0.000	0.500	1.000
VARIANCE	924.500	0.000	0.000	0.500	2.000
STANDARD DEV	30.406	0.000	0.000	0.707	1.414
STD. ERROR	21.500	0.000	0.000	0.500	1.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	-2.000	0.000	0.000	-2.000	-2.000
SUM	77.000	0.000	0.000	1.000	2.000
C.V.	0.790	.	.	1.414	1.414
MEDIAN	38.500	0.000	0.000	0.500	1.000

	ANDRCH	ANEMMU	ANTEPA	ANTERA	AQUIFL
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	2.000
RANGE	0.000	0.000	0.000	1.000	2.000
MEAN	0.000	0.000	0.000	0.500	1.000
VARIANCE	0.000	0.000	0.000	0.500	2.000
STANDARD DEV	0.000	0.000	0.000	0.707	1.414
STD. ERROR	0.000	0.000	0.000	0.500	1.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	0.000	0.000	-2.000	-2.000
SUM	0.000	0.000	0.000	1.000	2.000
C.V.	.	.	.	1.414	1.414
MEDIAN	0.000	0.000	0.000	0.500	1.000

	ARCTUV	ARNICO	ASTECI	ASTECO	ASTRAL
N OF CASES	2	2	2	2	2
MINIMUM	0.000	1.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	2.000	0.000
RANGE	0.000	0.000	0.000	2.000	0.000
MEAN	0.000	1.000	0.000	1.000	0.000
VARIANCE	0.000	0.000	0.000	2.000	0.000
STANDARD DEV	0.000	0.000	0.000	1.414	0.000
STD. ERROR	0.000	0.000	0.000	1.000	0.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	0.000	0.000	-2.000	0.000
SUM	0.000	2.000	0.000	2.000	0.000
C.V.	.	0.000	.	1.414	.
MEDIAN	0.000	1.000	0.000	1.000	0.000

	BROMIN	CALARU	CAMPRO	CETRPI	CLADCH
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	0.000	0.000
RANGE	0.000	1.000	0.000	0.000	0.000
MEAN	0.000	0.500	0.000	0.000	0.000

VARIANCE	0.000	0.500	0.000	0.000	0.000
STANDARD DEV	0.000	0.707	0.000	0.000	0.000
STD. ERROR	0.000	0.500	0.000	0.000	0.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	-2.000	0.000	0.000	0.000
SUM	0.000	1.000	0.000	0.000	0.000
C.V.	.	1.414	.	.	.
MEDIAN	0.000	0.500	0.000	0.000	0.000

	ELYMIN	EPILAN	FESTSA	FESTSC	FRAGVI
N OF CASES	2	2	2	2	2
MINIMUM	1.000	1.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	0.000	0.000	1.000
RANGE	1.000	0.000	0.000	0.000	1.000
MEAN	1.500	1.000	0.000	0.000	0.500
VARIANCE	0.500	0.000	0.000	0.000	0.500
STANDARD DEV	0.707	0.000	0.000	0.000	0.707
STD. ERROR	0.500	0.000	0.000	0.000	0.500
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	-2.000	0.000	0.000	0.000	-2.000
SUM	3.000	2.000	0.000	0.000	1.000
C.V.	0.471	0.000	.	.	1.414
MEDIAN	1.500	1.000	0.000	0.000	0.500

	GALIBO	HEDYAL	HEDYSU	HYPNRE	HYPOPH
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	0.000	0.000
RANGE	1.000	0.000	1.000	0.000	0.000
MEAN	0.500	0.000	0.500	0.000	0.000
VARIANCE	0.500	0.000	0.500	0.000	0.000
STANDARD DEV	0.707	0.000	0.707	0.000	0.000
STD. ERROR	0.500	0.000	0.500	0.000	0.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	-2.000	0.000	-2.000	0.000	0.000
SUM	1.000	0.000	1.000	0.000	0.000
C.V.	1.414	.	1.414	.	.
MEDIAN	0.500	0.000	0.500	0.000	0.000

	JUNICO	JUNIHO	KOELMA	LETHVU	LINNBO
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	1.000
MAXIMUM	2.000	0.000	0.000	0.000	2.000
RANGE	2.000	0.000	0.000	0.000	1.000
MEAN	1.000	0.000	0.000	0.000	1.500
VARIANCE	2.000	0.000	0.000	0.000	0.500
STANDARD DEV	1.414	0.000	0.000	0.000	0.707
STD. ERROR	1.000	0.000	0.000	0.000	0.500
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	-2.000	0.000	0.000	0.000	-2.000
SUM	2.000	0.000	0.000	0.000	3.000
C.V.	1.414	.	.	.	0.471
MEDIAN	1.000	0.000	0.000	0.000	1.500

	ORTHSE	PARMAM	PARMSU	PELTCA	PICEGL
N OF CASES	2	2	2	2	2
MINIMUM	1.000	0.000	0.000	0.000	0.000

MAXIMUM	1.000	0.000	0.000	0.000	0.000
RANGE	0.000	0.000	0.000	0.000	0.000
MEAN	1.000	0.000	0.000	0.000	0.000
VARIANCE	0.000	0.000	0.000	0.000	0.000
STANDARD DEV	0.000	0.000	0.000	0.000	0.000
STD. ERROR	0.000	0.000	0.000	0.000	0.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	0.000	0.000	0.000	0.000
SUM	2.000	0.000	0.000	0.000	0.000
C.V.	0.000	.	.	.	.
MEDIAN	1.000	0.000	0.000	0.000	0.000

	PINUCO	PINUFL	PLEUSC	POHLNU	POPUTR
N OF CASES	2	2	2	2	2
MINIMUM	0.000	7.000	0.000	0.000	0.000
MAXIMUM	0.000	10.000	1.000	0.000	20.000
RANGE	0.000	3.000	1.000	0.000	20.000
MEAN	0.000	8.500	0.500	0.000	10.000
VARIANCE	0.000	4.500	0.500	0.000	200.000
STANDARD DEV	0.000	2.121	0.707	0.000	14.142
STD. ERROR	0.000	1.500	0.500	0.000	10.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	-2.000	-2.000	0.000	-2.000
SUM	0.000	17.000	1.000	0.000	20.000
C.V.	.	0.250	1.414	.	1.414
MEDIAN	0.000	8.500	0.500	0.000	10.000

	POTEFR	PSEUME	PYROCH	RIBELA	ROSAAC
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	1.000	1.000
RANGE	1.000	0.000	1.000	1.000	1.000
MEAN	0.500	0.000	0.500	0.500	0.500
VARIANCE	0.500	0.000	0.500	0.500	0.500
STANDARD DEV	0.707	0.000	0.707	0.707	0.707
STD. ERROR	0.500	0.000	0.500	0.500	0.500
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	-2.000	0.000	-2.000	-2.000	-2.000
SUM	1.000	0.000	1.000	1.000	1.000
C.V.	1.414	.	1.414	1.414	1.414
MEDIAN	0.500	0.000	0.500	0.500	0.500

	SELADE	SHEPCA	SMILST	SOLISP	SPIRBE
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	3.000	1.000	0.000	0.000
RANGE	0.000	3.000	1.000	0.000	0.000
MEAN	0.000	1.500	0.500	0.000	0.000
VARIANCE	0.000	4.500	0.500	0.000	0.000
STANDARD DEV	0.000	2.121	0.707	0.000	0.000
STD. ERROR	0.000	1.500	0.500	0.000	0.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	-2.000	-2.000	0.000	0.000
SUM	0.000	3.000	1.000	0.000	0.000
C.V.	.	1.414	1.414	.	.
MEDIAN	0.000	1.500	0.500	0.000	0.000

	STENOC	THALOC	THUIAB	TORTRU	USNEHI

N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	8.000	0.000	0.000	0.000
RANGE	1.000	8.000	0.000	0.000	0.000
MEAN	0.500	4.000	0.000	0.000	0.000
VARIANCE	0.500	32.000	0.000	0.000	0.000
STANDARD DEV	0.707	5.657	0.000	0.000	0.000
STD. ERROR	0.500	4.000	0.000	0.000	0.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	-2.000	-2.000	0.000	0.000	0.000
SUM	1.000	8.000	0.000	0.000	0.000
C.V.	1.414	1.414	.	.	.
MEDIAN	0.500	4.000	0.000	0.000	0.000

	VICIAM	ZIGAEL
N OF CASES	2	2
MINIMUM	0.000	0.000
MAXIMUM	0.000	1.000
RANGE	0.000	1.000
MEAN	0.000	0.500
VARIANCE	0.000	0.500
STANDARD DEV	0.000	0.707
STD. ERROR	0.000	0.500
SKEWNESS(G1)	0.000	0.000
KURTOSIS(G2)	0.000	-2.000
SUM	0.000	1.000
C.V.	.	1.414
MEDIAN	0.000	0.500

Appendix 1b. *Pinus flexilis* associations and cover values of dominant species (those with median cover values >/=1%)**. Bolded** species in the association name are always present. **Group 1**, n=5. Association Name: *Pseudotsuga menziesii* - ***Pinus flexilis*** */ Juniperis communis / Festuca scabrella*.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Achimil	1	1	1
Allicer	1	1	2
Anemmul	1	0	1
Astecon	1	0	2
Arctuva	3	0	20
Camprot	1	0	1
Elyminn	3	0	4
Festsca	2	0	95
Fragvir	1	1	1
Galibor	1	1	1
Hypnrev	1	0	1
Junicom	5	0	15
Junihor	1	0	2
Lethvul	1	0	2
Parmsul	1	0	2
Pinufle	16	5	30
Pohlnut	1	0	2
Potefru	1	0	5
Pseumen	17	0	50
Rosaaci	1	0	2
Shepcan	1	0	5
Smilste	1	0	1
Tortrur	3	0	4

Appendix 1c. *Pinus flexilis* associations and cover values of dominant species (those with median cover values >/=1%)**. Bolded** species in the association name are always present. **Group 5,** n=7. Association Name: ***Pinus flexilis*** */* ***Arctostaphylos uva-ursi*** *- Juniperis horizontalis*.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Anemmul	1	0	1
Arctuva	20	5	30

Junihor	12	0	18
Galibor	1	0	3
Koelmac	3	0	13
Pinufle	12	5	19
Potefru	2	0	6

Appendix 1d. *Pinus flexilis* associations and cover values of dominant species (those with median cover values >/=1%)**. Bolded** species in the association name are always present. **Group 12,** n=2. Association Name: ***Abies lasiocarpa - Pinus flexilis*** - *Populus tremuloides / Thalictrum occidentale*.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Abielas	38.5	17	60
Amelaln	1	0	2
Aquifla	1	0	2
Arnicor	1	1	1
Astecon	1	0	2
Elyminn	1.5	1	2
Epilang	1	1	1
Junicom	1	0	2
Linnbor	1.5	1	2
Orthsec	1	1	1
Pinufle	8.5	7	10
Poputre	10	0	20
Shepcan	1.5	0	3
Thalocc	4	0	8

Appendix 2a. Summary statistics of *Pinus albicaulis* species cover by plot cluster groups.

Group=1
TOTAL OBSERVATIONS: 24

	ABIELA	ACHIMI	ANEMMU	ANEMPA	ANTERA
N OF CASES	24	24	24	24	24
MINIMUM	2.000	0.000	0.000	0.000	0.000
MAXIMUM	60.000	1.000	1.000	1.000	3.000
RANGE	58.000	1.000	1.000	1.000	3.000
MEAN	29.208	0.042	0.083	0.042	0.417
VARIANCE	268.433	0.042	0.080	0.042	0.775
STANDARD DEV	16.384	0.204	0.282	0.204	0.881
STD. ERROR	3.344	0.042	0.058	0.042	0.180
SKEWNESS(G1)	0.400	4.587	3.015	4.587	2.210
KURTOSIS(G2)	-0.621	19.043	7.091	19.043	3.798
SUM	701.000	1.000	2.000	1.000	10.000
C.V.	0.561	4.899	3.388	4.899	2.113
MEDIAN	26.000	0.000	0.000	0.000	0.000

	AQUIFL	ARCTRU	ARCTUV	ARNICO	ARTENO
N OF CASES	24	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	1.000	25.000	8.000
RANGE	2.000	1.000	1.000	25.000	8.000
MEAN	0.125	0.042	0.042	1.875	0.875
VARIANCE	0.201	0.042	0.042	26.897	4.549
STANDARD DEV	0.448	0.204	0.204	5.186	2.133
STD. ERROR	0.092	0.042	0.042	1.059	0.435
SKEWNESS(G1)	3.555	4.587	4.587	3.985	2.281
KURTOSIS(G2)	11.531	19.043	19.043	15.031	3.990
SUM	3.000	1.000	1.000	45.000	21.000
C.V.	3.587	4.899	4.899	2.766	2.438
MEDIAN	0.000	0.000	0.000	1.000	0.000

	BARBHA	BARBLY	BETUGL	BRACGR	BRACSP
N OF CASES	24	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	30.000	55.000	1.000	2.000	30.000
RANGE	30.000	55.000	1.000	2.000	30.000
MEAN	1.667	2.917	0.042	0.083	1.750
VARIANCE	37.623	124.341	0.042	0.167	37.587
STANDARD DEV	6.134	11.151	0.204	0.408	6.131
STD. ERROR	1.252	2.276	0.042	0.083	1.251
SKEWNESS(G1)	4.368	4.514	4.587	4.587	4.334
KURTOSIS(G2)	17.664	18.597	19.043	19.043	17.462
SUM	40.000	70.000	1.000	2.000	42.000
C.V.	3.680	3.823	4.899	4.899	3.503
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRYOFU	CARECO	CARESC	CARESP	CASSME
N OF CASES	24	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	1.000	0.000	2.000
RANGE	2.000	1.000	1.000	0.000	2.000
MEAN	0.167	0.042	0.042	0.000	0.208

VARIANCE	0.232	0.042	0.042	0.000	0.346
STANDARD DEV	0.482	0.204	0.204	0.000	0.588
STD. ERROR	0.098	0.042	0.042	0.000	0.120
SKEWNESS(G1)	2.873	4.587	4.587	0.000	2.577
KURTOSIS(G2)	7.359	19.043	19.043	0.000	4.973
SUM	4.000	1.000	1.000	0.000	5.000
C.V.	2.889	4.899	4.899	.	2.824
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CASTMI	CETRER	CETRPI	CLADCA	CLADCE
N OF CASES	24	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	2.000	1.000	2.000	1.000
RANGE	1.000	2.000	1.000	2.000	1.000
MEAN	0.042	0.083	0.167	0.208	0.083
VARIANCE	0.042	0.167	0.145	0.259	0.080
STANDARD DEV	0.204	0.408	0.381	0.509	0.282
STD. ERROR	0.042	0.083	0.078	0.104	0.058
SKEWNESS(G1)	4.587	4.587	1.789	2.378	3.015
KURTOSIS(G2)	19.043	19.043	1.200	4.788	7.091
SUM	1.000	2.000	4.000	5.000	2.000
C.V.	4.899	4.899	2.284	2.443	3.388
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLADCOC	CLADCOR	CLADDE	CLADEC	CLADGR
N OF CASES	24	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	4.000	7.000	3.000
RANGE	1.000	1.000	4.000	7.000	3.000
MEAN	0.042	0.125	0.250	0.500	0.250
VARIANCE	0.042	0.114	0.717	2.087	0.457
STANDARD DEV	0.204	0.338	0.847	1.445	0.676
STD. ERROR	0.042	0.069	0.173	0.295	0.138
SKEWNESS(G1)	4.587	2.268	3.892	4.022	3.132
KURTOSIS(G2)	19.043	3.143	14.496	15.609	9.673
SUM	1.000	3.000	6.000	12.000	6.000
C.V.	4.899	2.703	3.388	2.889	2.703
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLADMI	CLADPH	CLADPY	CLADSP	CLADUN
N OF CASES	24	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	7.000	1.000	1.000	25.000	1.000
RANGE	7.000	1.000	1.000	25.000	1.000
MEAN	0.583	0.083	0.042	1.708	0.042
VARIANCE	2.254	0.080	0.042	26.563	0.042
STANDARD DEV	1.501	0.282	0.204	5.154	0.204
STD. ERROR	0.306	0.058	0.042	1.052	0.042
SKEWNESS(G1)	3.499	3.015	4.587	4.088	4.587
KURTOSIS(G2)	12.235	7.091	19.043	15.942	19.043
SUM	14.000	2.000	1.000	41.000	1.000
C.V.	2.573	3.388	4.899	3.017	4.899
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CORNCA	DICRBR	DICRFU	DICRSC	DICRSP
N OF CASES	24	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000	0.000

MAXIMUM	1.000	20.000	45.000	40.000	10.000
RANGE	1.000	20.000	45.000	40.000	10.000
MEAN	0.167	1.417	2.583	3.375	1.542
VARIANCE	0.145	19.993	86.080	74.853	7.998
STANDARD DEV	0.381	4.471	9.278	8.652	2.828
STD. ERROR	0.078	0.913	1.894	1.766	0.577
SKEWNESS(G1)	1.789	3.475	4.249	3.458	1.799
KURTOSIS(G2)	1.200	11.162	16.843	11.751	2.160
SUM	4.000	34.000	62.000	81.000	37.000
C.V.	2.284	3.156	3.591	2.563	1.834
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DITRFL	DREPUN	DRYAOC	ELYMIN	EMPENI
N OF CASES	24	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	20.000	1.000	3.000	20.000
RANGE	1.000	20.000	1.000	3.000	20.000
MEAN	0.042	1.667	0.083	0.375	3.083
VARIANCE	0.042	16.841	0.080	0.592	35.558
STANDARD DEV	0.204	4.104	0.282	0.770	5.963
STD. ERROR	0.042	0.838	0.058	0.157	1.217
SKEWNESS(G1)	4.587	3.950	3.015	2.183	2.033
KURTOSIS(G2)	19.043	15.108	7.091	4.165	3.038
SUM	1.000	40.000	2.000	9.000	74.000
C.V.	4.899	2.462	3.388	2.052	1.934
MEDIAN	0.000	0.500	0.000	0.000	0.000

	EPILAN	ERIGPE	ERYTGR	FRAGVI	HYLOSP
N OF CASES	24	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	5.000	15.000	4.000	70.000
RANGE	2.000	5.000	15.000	4.000	70.000
MEAN	0.167	0.500	1.083	0.375	14.167
VARIANCE	0.232	1.652	11.558	0.766	541.971
STANDARD DEV	0.482	1.285	3.400	0.875	23.280
STD. ERROR	0.098	0.262	0.694	0.179	4.752
SKEWNESS(G1)	2.873	2.761	3.393	3.172	1.425
KURTOSIS(G2)	7.359	6.332	10.526	10.427	0.633
SUM	4.000	12.000	26.000	9.000	340.000
C.V.	2.889	2.571	3.138	2.334	1.643
MEDIAN	0.000	0.000	0.000	0.000	0.500

	HYPOAU	JUNICO	LECIGR	LEDUGR	LETHVU
N OF CASES	24	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	10.000	1.000	15.000	2.000
RANGE	1.000	10.000	1.000	15.000	2.000
MEAN	0.083	1.292	0.042	1.417	0.417
VARIANCE	0.080	6.563	0.042	12.601	0.428
STANDARD DEV	0.282	2.562	0.204	3.550	0.654
STD. ERROR	0.058	0.523	0.042	0.725	0.133
SKEWNESS(G1)	3.015	2.204	4.587	2.919	1.267
KURTOSIS(G2)	7.091	4.017	19.043	7.738	0.412
SUM	2.000	31.000	1.000	34.000	10.000
C.V.	3.388	1.983	4.899	2.506	1.569
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LINNBO	LOPHSP	MENZFE	ORTHSE	PARMAM

N OF CASES	24	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	8.000	1.000	75.000	1.000	2.000
RANGE	8.000	1.000	75.000	1.000	2.000
MEAN	0.375	0.125	14.667	0.333	0.250
VARIANCE	2.679	0.114	557.362	0.232	0.283
STANDARD DEV	1.637	0.338	23.609	0.482	0.532
STD. ERROR	0.334	0.069	4.819	0.098	0.109
SKEWNESS(G1)	4.480	2.268	1.659	0.707	1.995
KURTOSIS(G2)	18.366	3.143	1.468	-1.500	3.089
SUM	9.000	3.000	352.000	8.000	6.000
C.V.	4.365	2.703	1.610	1.445	2.126
MEDIAN	0.000	0.000	1.000	0.000	0.000

	PARMHY	PEDIBR	PELTAP	PELTCA	PELTRU
N OF CASES	24	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	15.000	12.000	5.000	2.000
RANGE	1.000	15.000	12.000	5.000	2.000
MEAN	0.167	1.083	2.625	0.250	0.083
VARIANCE	0.145	9.645	9.810	1.065	0.167
STANDARD DEV	0.381	3.106	3.132	1.032	0.408
STD. ERROR	0.078	0.634	0.639	0.211	0.083
SKEWNESS(G1)	1.789	3.986	1.535	4.333	4.587
KURTOSIS(G2)	1.200	15.319	1.650	17.370	19.043
SUM	4.000	26.000	63.000	6.000	2.000
C.V.	2.284	2.867	1.193	4.128	4.899
MEDIAN	0.000	0.000	1.000	0.000	0.000

	PHYLEM	PHYLGL	PICENE	PICENG	PINUAL
N OF CASES	24	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000	5.000
MAXIMUM	10.000	5.000	4.000	35.000	32.000
RANGE	10.000	5.000	4.000	35.000	27.000
MEAN	1.083	0.458	0.167	13.500	14.292
VARIANCE	6.688	1.998	0.667	96.000	88.563
STANDARD DEV	2.586	1.414	0.816	9.798	9.411
STD. ERROR	0.528	0.289	0.167	2.000	1.921
SKEWNESS(G1)	2.633	2.917	4.587	0.445	0.934
KURTOSIS(G2)	5.772	6.680	19.043	-0.781	-0.453
SUM	26.000	11.000	4.000	324.000	343.000
C.V.	2.387	3.084	4.899	0.726	0.658
MEDIAN	0.000	0.000	0.000	11.500	11.500

	PINUCO	PLEUSC	POHLNU	POLYJU	POLYPI
N OF CASES	24	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	6.000	35.000	3.000	2.000	0.000
RANGE	6.000	35.000	3.000	2.000	0.000
MEAN	1.042	7.208	0.458	0.125	0.000
VARIANCE	2.998	115.216	0.520	0.201	0.000
STANDARD DEV	1.732	10.734	0.721	0.448	0.000
STD. ERROR	0.353	2.191	0.147	0.092	0.000
SKEWNESS(G1)	1.731	1.354	1.925	3.555	0.000
KURTOSIS(G2)	1.838	0.545	4.231	11.531	0.000
SUM	25.000	173.000	11.000	3.000	0.000
C.V.	1.662	1.489	1.573	3.587	.
MEDIAN	0.000	1.000	0.000	0.000	0.000

	POTEDI	POTEFR	PTILCR	RHIZGE	RHODAL
N OF CASES	24	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	10.000	1.000	30.000
RANGE	0.000	0.000	10.000	1.000	30.000
MEAN	0.000	0.000	0.833	0.083	5.625
VARIANCE	0.000	0.000	5.188	0.080	91.462
STANDARD DEV	0.000	0.000	2.278	0.282	9.564
STD. ERROR	0.000	0.000	0.465	0.058	1.952
SKEWNESS(G1)	0.000	0.000	3.163	3.015	1.538
KURTOSIS(G2)	0.000	0.000	9.460	7.091	0.792
SUM	0.000	0.000	20.000	2.000	135.000
C.V.	.	.	2.733	3.388	1.700
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ROSAAC	SALIGL	SALIVE	SAXIBR	SEDUST
N OF CASES	24	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	2.000	6.000	0.000	0.000
RANGE	0.000	2.000	6.000	0.000	0.000
MEAN	0.000	0.125	0.792	0.000	0.000
VARIANCE	0.000	0.201	3.303	0.000	0.000
STANDARD DEV	0.000	0.448	1.817	0.000	0.000
STD. ERROR	0.000	0.092	0.371	0.000	0.000
SKEWNESS(G1)	0.000	3.555	2.092	0.000	0.000
KURTOSIS(G2)	0.000	11.531	2.710	0.000	0.000
SUM	0.000	3.000	19.000	0.000	0.000
C.V.	.	3.587	2.296	.	.
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SELADE	SHEPCA	SOLIMU	SOLISP	SPIRBE
N OF CASES	24	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	15.000	1.000	0.000	5.000
RANGE	1.000	15.000	1.000	0.000	5.000
MEAN	0.042	0.750	0.042	0.000	0.208
VARIANCE	0.042	9.413	0.042	0.000	1.042
STANDARD DEV	0.204	3.068	0.204	0.000	1.021
STD. ERROR	0.042	0.626	0.042	0.000	0.208
SKEWNESS(G1)	4.587	4.439	4.587	0.000	4.587
KURTOSIS(G2)	19.043	18.118	19.043	0.000	19.043
SUM	1.000	18.000	1.000	0.000	5.000
C.V.	4.899	4.091	4.899	.	4.899
MEDIAN	0.000	0.000	0.000	0.000	0.000

	THALOC	TORTNO	TORTRU	TORTTO	TRISSP
N OF CASES	24	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	20.000	0.000
RANGE	1.000	1.000	0.000	20.000	0.000
MEAN	0.042	0.125	0.000	1.042	0.000
VARIANCE	0.042	0.114	0.000	17.346	0.000
STANDARD DEV	0.204	0.338	0.000	4.165	0.000
STD. ERROR	0.042	0.069	0.000	0.850	0.000
SKEWNESS(G1)	4.587	2.268	0.000	4.212	0.000
KURTOSIS(G2)	19.043	3.143	0.000	16.519	0.000

SUM	1.000	3.000	0.000	25.000	0.000
C.V.	4.899	2.703	.	3.998	.
MEDIAN	0.000	0.000	0.000	0.000	0.000

	UMBIHY	USNESP	VACCCA	VACCME	VACCMY
N OF CASES	24	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	35.000	40.000
RANGE	1.000	1.000	1.000	35.000	40.000
MEAN	0.042	0.083	0.042	3.833	3.667
VARIANCE	0.042	0.080	0.042	73.623	88.580
STANDARD DEV	0.204	0.282	0.204	8.580	9.412
STD. ERROR	0.042	0.058	0.042	1.751	1.921
SKEWNESS(G1)	4.587	3.015	4.587	2.568	3.032
KURTOSIS(G2)	19.043	7.091	19.043	5.836	8.294
SUM	1.000	2.000	1.000	92.000	88.000
C.V.	4.899	3.388	4.899	2.238	2.567
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VACCSC	VACCVI	VALESI	ZIGAEL
N OF CASES	24	24	24	24
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	65.000	4.000	1.000	1.000
RANGE	65.000	4.000	1.000	1.000
MEAN	18.583	0.458	0.083	0.167
VARIANCE	546.341	1.389	0.080	0.145
STANDARD DEV	23.374	1.179	0.282	0.381
STD. ERROR	4.771	0.241	0.058	0.078
SKEWNESS(G1)	1.172	2.461	3.015	1.789
KURTOSIS(G2)	-0.284	4.550	7.091	1.200
SUM	446.000	11.000	2.000	4.000
C.V.	1.258	2.572	3.388	2.284
MEDIAN	7.500	0.000	0.000	0.000

Group=6
TOTAL OBSERVATIONS: 10

	ABIELA	ACHIMI	ANEMMU	ANEMPA	ANTERA
N OF CASES	10	10	10	10	10
MINIMUM	1.000	0.000	0.000	0.000	0.000
MAXIMUM	23.000	0.000	0.000	1.000	1.000
RANGE	22.000	0.000	0.000	1.000	1.000
MEAN	12.000	0.000	0.000	0.100	0.100
VARIANCE	61.111	0.000	0.000	0.100	0.100
STANDARD DEV	7.817	0.000	0.000	0.316	0.316
STD. ERROR	2.472	0.000	0.000	0.100	0.100
SKEWNESS(G1)	0.103	0.000	0.000	2.667	2.667
KURTOSIS(G2)	-1.267	0.000	0.000	5.111	5.111
SUM	120.000	0.000	0.000	1.000	1.000
C.V.	0.651	.	.	3.162	3.162
MEDIAN	11.500	0.000	0.000	0.000	0.000

	AQUIFL	ARCTRU	ARCTUV	ARNICO	ARTENO
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	2.000	10.000	1.000

RANGE	0.000	0.000	2.000	10.000	1.000
MEAN	0.000	0.000	0.300	1.300	0.100
VARIANCE	0.000	0.000	0.456	9.567	0.100
STANDARD DEV	0.000	0.000	0.675	3.093	0.316
STD. ERROR	0.000	0.000	0.213	0.978	0.100
SKEWNESS(G1)	0.000	0.000	1.920	2.554	2.667
KURTOSIS(G2)	0.000	0.000	2.150	4.751	5.111
SUM	0.000	0.000	3.000	13.000	1.000
C.V.	.	.	2.250	2.379	3.162
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BARBHA	BARBLY	BETUGL	BRACGR	BRACSP
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	2.000	1.000	0.000	1.000
RANGE	2.000	2.000	1.000	0.000	1.000
MEAN	0.600	0.600	0.200	0.000	0.100
VARIANCE	0.711	0.711	0.178	0.000	0.100
STANDARD DEV	0.843	0.843	0.422	0.000	0.316
STD. ERROR	0.267	0.267	0.133	0.000	0.100
SKEWNESS(G1)	0.844	0.844	1.500	0.000	2.667
KURTOSIS(G2)	-0.922	-0.922	0.250	0.000	5.111
SUM	6.000	6.000	2.000	0.000	1.000
C.V.	1.405	1.405	2.108	.	3.162
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRYOFU	CARECO	CARESC	CARESP	CASSME
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	17.000
RANGE	1.000	0.000	0.000	0.000	17.000
MEAN	0.100	0.000	0.000	0.000	2.900
VARIANCE	0.100	0.000	0.000	0.000	32.322
STANDARD DEV	0.316	0.000	0.000	0.000	5.685
STD. ERROR	0.100	0.000	0.000	0.000	1.798
SKEWNESS(G1)	2.667	0.000	0.000	0.000	1.833
KURTOSIS(G2)	5.111	0.000	0.000	0.000	1.886
SUM	1.000	0.000	0.000	0.000	29.000
C.V.	3.162	.	.	.	1.960
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CASTMI	CETRER	CETRPI	CLADCA	CLADCE
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	1.000	1.000
RANGE	1.000	1.000	1.000	1.000	1.000
MEAN	0.100	0.200	0.100	0.200	0.200
VARIANCE	0.100	0.178	0.100	0.178	0.178
STANDARD DEV	0.316	0.422	0.316	0.422	0.422
STD. ERROR	0.100	0.133	0.100	0.133	0.133
SKEWNESS(G1)	2.667	1.500	2.667	1.500	1.500
KURTOSIS(G2)	5.111	0.250	5.111	0.250	0.250
SUM	1.000	2.000	1.000	2.000	2.000
C.V.	3.162	2.108	3.162	2.108	2.108
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLADCOC	CLADCOR	CLADDE	CLADEC	CLADGR

N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	7.000	1.000	13.000	1.000
RANGE	1.000	7.000	1.000	13.000	1.000
MEAN	0.100	1.000	0.100	1.600	0.300
VARIANCE	0.100	4.667	0.100	16.267	0.233
STANDARD DEV	0.316	2.160	0.316	4.033	0.483
STD. ERROR	0.100	0.683	0.100	1.275	0.153
SKEWNESS(G1)	2.667	2.440	2.667	2.600	0.873
KURTOSIS(G2)	5.111	4.381	5.111	4.899	-1.238
SUM	1.000	10.000	1.000	16.000	3.000
C.V.	3.162	2.160	3.162	2.521	1.610
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLADMI	CLADPH	CLADPY	CLADSP	CLADUN
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	0.000	1.000	1.000	1.000
RANGE	5.000	0.000	1.000	1.000	1.000
MEAN	0.700	0.000	0.300	0.100	0.200
VARIANCE	2.456	0.000	0.233	0.100	0.178
STANDARD DEV	1.567	0.000	0.483	0.316	0.422
STD. ERROR	0.496	0.000	0.153	0.100	0.133
SKEWNESS(G1)	2.349	0.000	0.873	2.667	1.500
KURTOSIS(G2)	4.035	0.000	-1.238	5.111	0.250
SUM	7.000	0.000	3.000	1.000	2.000
C.V.	2.239	.	1.610	3.162	2.108
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CORNCA	DICRBR	DICRFU	DICRSC	DICRSP
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	5.000	0.000	5.000	45.000
RANGE	1.000	5.000	0.000	5.000	45.000
MEAN	0.200	1.000	0.000	1.000	4.500
VARIANCE	0.178	2.889	0.000	3.556	202.500
STANDARD DEV	0.422	1.700	0.000	1.886	14.230
STD. ERROR	0.133	0.537	0.000	0.596	4.500
SKEWNESS(G1)	1.500	1.574	0.000	1.467	2.667
KURTOSIS(G2)	0.250	1.112	0.000	0.359	5.111
SUM	2.000	10.000	0.000	10.000	45.000
C.V.	2.108	1.700	.	1.886	3.162
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DITRFL	DREPUN	DRYAOC	ELYMIN	EMPENI
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	5.000	2.000	25.000
RANGE	0.000	0.000	5.000	2.000	25.000
MEAN	0.000	0.000	0.500	0.300	6.300
VARIANCE	0.000	0.000	2.500	0.456	67.567
STANDARD DEV	0.000	0.000	1.581	0.675	8.220
STD. ERROR	0.000	0.000	0.500	0.213	2.599
SKEWNESS(G1)	0.000	0.000	2.667	1.920	1.176
KURTOSIS(G2)	0.000	0.000	5.111	2.150	0.559
SUM	0.000	0.000	5.000	3.000	63.000
C.V.	.	.	3.162	2.250	1.305
MEDIAN	0.000	0.000	0.000	0.000	3.000

	EPILAN	ERIGPE	ERYTGR	FRAGVI	HYLOSP
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	1.000	20.000
RANGE	1.000	1.000	0.000	1.000	20.000
MEAN	0.100	0.200	0.000	0.100	2.100
VARIANCE	0.100	0.178	0.000	0.100	39.656
STANDARD DEV	0.316	0.422	0.000	0.316	6.297
STD. ERROR	0.100	0.133	0.000	0.100	1.991
SKEWNESS(G1)	2.667	1.500	0.000	2.667	2.655
KURTOSIS(G2)	5.111	0.250	0.000	5.111	5.072
SUM	1.000	2.000	0.000	1.000	21.000
C.V.	3.162	2.108	.	3.162	2.999
MEDIAN	0.000	0.000	0.000	0.000	0.000

	HYPOAU	JUNICO	LECIGR	LEDUGR	LETHVU
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	20.000	1.000	0.000	1.000
RANGE	1.000	20.000	1.000	0.000	1.000
MEAN	0.100	2.500	0.200	0.000	0.200
VARIANCE	0.100	38.056	0.178	0.000	0.178
STANDARD DEV	0.316	6.169	0.422	0.000	0.422
STD. ERROR	0.100	1.951	0.133	0.000	0.133
SKEWNESS(G1)	2.667	2.634	1.500	0.000	1.500
KURTOSIS(G2)	5.111	5.011	0.250	0.000	0.250
SUM	1.000	25.000	2.000	0.000	2.000
C.V.	3.162	2.468	2.108	.	2.108
MEDIAN	0.000	1.000	0.000	0.000	0.000

	LINNBO	LOPHSP	MENZFE	ORTHSE	PARMAM
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	1.000	0.000	1.000	1.000
RANGE	3.000	1.000	0.000	1.000	1.000
MEAN	0.300	0.200	0.000	0.400	0.300
VARIANCE	0.900	0.178	0.000	0.267	0.233
STANDARD DEV	0.949	0.422	0.000	0.516	0.483
STD. ERROR	0.300	0.133	0.000	0.163	0.153
SKEWNESS(G1)	2.667	1.500	0.000	0.408	0.873
KURTOSIS(G2)	5.111	0.250	0.000	-1.833	-1.238
SUM	3.000	2.000	0.000	4.000	3.000
C.V.	3.162	2.108	.	1.291	1.610
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PARMHY	PEDIBR	PELTAP	PELTCA	PELTRU
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	0.000	1.000
RANGE	1.000	1.000	1.000	0.000	1.000
MEAN	0.200	0.100	0.500	0.000	0.300
VARIANCE	0.178	0.100	0.278	0.000	0.233
STANDARD DEV	0.422	0.316	0.527	0.000	0.483
STD. ERROR	0.133	0.100	0.167	0.000	0.153
SKEWNESS(G1)	1.500	2.667	-0.000	0.000	0.873
KURTOSIS(G2)	0.250	5.111	-2.000	0.000	-1.238
SUM	2.000	1.000	5.000	0.000	3.000

C.V.	2.108	3.162	1.054	.	1.610
MEDIAN	0.000	0.000	0.500	0.000	0.000

	PHYLEM	PHYLGL	PICENE	PICENG	PINUAL
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	2.000	5.000
MAXIMUM	15.000	40.000	0.000	15.000	40.000
RANGE	15.000	40.000	0.000	13.000	35.000
MEAN	2.100	7.700	0.000	6.700	14.500
VARIANCE	24.100	179.122	0.000	12.900	106.500
STANDARD DEV	4.909	13.384	0.000	3.592	10.320
STD. ERROR	1.552	4.232	0.000	1.136	3.263
SKEWNESS(G1)	2.110	1.611	0.000	1.228	1.578
KURTOSIS(G2)	2.969	1.365	0.000	0.998	1.792
SUM	21.000	77.000	0.000	67.000	145.000
C.V.	2.338	1.738	.	0.536	0.712
MEDIAN	0.000	0.000	0.000	5.500	11.000

	PINUCO	PLEUSC	POHLNU	POLYJU	POLYPI
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	15.000	1.000	1.000	1.000	1.000
RANGE	15.000	1.000	1.000	1.000	1.000
MEAN	4.700	0.300	0.100	0.200	0.200
VARIANCE	44.233	0.233	0.100	0.178	0.178
STANDARD DEV	6.651	0.483	0.316	0.422	0.422
STD. ERROR	2.103	0.153	0.100	0.133	0.133
SKEWNESS(G1)	0.777	0.873	2.667	1.500	1.500
KURTOSIS(G2)	-1.216	-1.238	5.111	0.250	0.250
SUM	47.000	3.000	1.000	2.000	2.000
C.V.	1.415	1.610	3.162	2.108	2.108
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POTEDI	POTEFR	PTILCR	RHIZGE	RHODAL
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	3.000	1.000	3.000
RANGE	1.000	0.000	3.000	1.000	3.000
MEAN	0.100	0.000	0.300	0.500	0.500
VARIANCE	0.100	0.000	0.900	0.278	1.167
STANDARD DEV	0.316	0.000	0.949	0.527	1.080
STD. ERROR	0.100	0.000	0.300	0.167	0.342
SKEWNESS(G1)	2.667	0.000	2.667	0.000	1.673
KURTOSIS(G2)	5.111	0.000	5.111	-2.000	1.048
SUM	1.000	0.000	3.000	5.000	5.000
C.V.	3.162	.	3.162	1.054	2.160
MEDIAN	0.000	0.000	0.000	0.500	0.000

	ROSAAC	SALIGL	SALIVE	SAXIBR	SEDUST
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	2.000	1.000	1.000
RANGE	0.000	0.000	2.000	1.000	1.000
MEAN	0.000	0.000	0.200	0.300	0.100
VARIANCE	0.000	0.000	0.400	0.233	0.100
STANDARD DEV	0.000	0.000	0.632	0.483	0.316
STD. ERROR	0.000	0.000	0.200	0.153	0.100

SKEWNESS(G1)	0.000	0.000	2.667	0.873	2.667
KURTOSIS(G2)	0.000	0.000	5.111	-1.238	5.111
SUM	0.000	0.000	2.000	3.000	1.000
C.V.	.	.	3.162	1.610	3.162
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SELADE	SHEPCA	SOLIMU	SOLISP	SPIRBE
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	0.000	5.000
RANGE	1.000	0.000	1.000	0.000	5.000
MEAN	0.200	0.000	0.100	0.000	0.600
VARIANCE	0.178	0.000	0.100	0.000	2.489
STANDARD DEV	0.422	0.000	0.316	0.000	1.578
STD. ERROR	0.133	0.000	0.100	0.000	0.499
SKEWNESS(G1)	1.500	0.000	2.667	0.000	2.491
KURTOSIS(G2)	0.250	0.000	5.111	0.000	4.491
SUM	2.000	0.000	1.000	0.000	6.000
C.V.	2.108	.	3.162	.	2.629
MEDIAN	0.000	0.000	0.000	0.000	0.000

	THALOC	TORTNO	TORTRU	TORTTO	TRISSP
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	1.000	0.000	1.000	1.000
RANGE	10.000	1.000	0.000	1.000	1.000
MEAN	1.000	0.200	0.000	0.200	0.200
VARIANCE	10.000	0.178	0.000	0.178	0.178
STANDARD DEV	3.162	0.422	0.000	0.422	0.422
STD. ERROR	1.000	0.133	0.000	0.133	0.133
SKEWNESS(G1)	2.667	1.500	0.000	1.500	1.500
KURTOSIS(G2)	5.111	0.250	0.000	0.250	0.250
SUM	10.000	2.000	0.000	2.000	2.000
C.V.	3.162	2.108	.	2.108	2.108
MEDIAN	0.000	0.000	0.000	0.000	0.000

	UMBIHY	USNESP	VACCCA	VACCME	VACCMY
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	30.000	25.000	0.000
RANGE	1.000	0.000	30.000	25.000	0.000
MEAN	0.200	0.000	3.100	5.800	0.000
VARIANCE	0.178	0.000	89.433	65.956	0.000
STANDARD DEV	0.422	0.000	9.457	8.121	0.000
STD. ERROR	0.133	0.000	2.991	2.568	0.000
SKEWNESS(G1)	1.500	0.000	2.661	1.389	0.000
KURTOSIS(G2)	0.250	0.000	5.094	1.033	0.000
SUM	2.000	0.000	31.000	58.000	0.000
C.V.	2.108	.	3.051	1.400	.
MEDIAN	0.000	0.000	0.000	1.500	0.000

	VACCSC	VACCVI	VALESI	ZIGAEL
N OF CASES	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	15.000	2.000	1.000	0.000
RANGE	15.000	2.000	1.000	0.000
MEAN	2.500	0.300	0.100	0.000

VARIANCE	25.611	0.456	0.100	0.000
STANDARD DEV	5.061	0.675	0.316	0.000
STD. ERROR	1.600	0.213	0.100	0.000
SKEWNESS(G1)	1.816	1.920	2.667	0.000
KURTOSIS(G2)	1.819	2.150	5.111	0.000
SUM	25.000	3.000	1.000	0.000
C.V.	2.024	2.250	3.162	.
MEDIAN	0.000	0.000	0.000	0.000

Group=9

TOTAL OBSERVATIONS: 22

	ABIELA	ACHIMI	ANEMMU	ANEMPA	ANTERA
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	23.000	3.000	2.000	1.000	15.000
RANGE	23.000	3.000	2.000	1.000	15.000
MEAN	5.091	0.682	0.318	0.227	1.818
VARIANCE	39.325	0.608	0.323	0.184	10.727
STANDARD DEV	6.271	0.780	0.568	0.429	3.275
STD. ERROR	1.337	0.166	0.121	0.091	0.698
SKEWNESS(G1)	1.235	1.223	1.550	1.302	3.162
KURTOSIS(G2)	0.871	1.607	1.434	-0.306	10.189
SUM	112.000	15.000	7.000	5.000	40.000
C.V.	1.232	1.144	1.785	1.887	1.801
MEDIAN	2.000	1.000	0.000	0.000	1.000

	AQUIFL	ARCTRU	ARCTUV	ARNICO	ARTENO
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	10.000	20.000	20.000	3.000
RANGE	2.000	10.000	20.000	20.000	3.000
MEAN	0.500	0.636	4.091	1.318	0.182
VARIANCE	0.452	4.623	28.848	18.132	0.442
STANDARD DEV	0.673	2.150	5.371	4.258	0.664
STD. ERROR	0.143	0.458	1.145	0.908	0.142
SKEWNESS(G1)	0.961	4.015	1.417	4.096	3.789
KURTOSIS(G2)	-0.227	14.956	1.484	15.491	13.260
SUM	11.000	14.000	90.000	29.000	4.000
C.V.	1.345	3.379	1.313	3.230	3.655
MEDIAN	0.000	0.000	1.500	0.000	0.000

	BARBHA	BARBLY	BETUGL	BRACGR	BRACSP
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	4.000	4.000	0.000	1.000	0.000
RANGE	4.000	4.000	0.000	1.000	0.000
MEAN	0.273	0.273	0.000	0.136	0.000
VARIANCE	0.779	0.779	0.000	0.123	0.000
STANDARD DEV	0.883	0.883	0.000	0.351	0.000
STD. ERROR	0.188	0.188	0.000	0.075	0.000
SKEWNESS(G1)	3.696	3.696	0.000	2.119	0.000
KURTOSIS(G2)	12.912	12.912	0.000	2.491	0.000
SUM	6.000	6.000	0.000	3.000	0.000
C.V.	3.237	3.237	.	2.576	.
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRYOFU	CARECO	CARESC	CARESP	CASSME

N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	2.000	2.000	2.000	0.000
RANGE	1.000	2.000	2.000	2.000	0.000
MEAN	0.182	0.409	0.227	0.227	0.000
VARIANCE	0.156	0.444	0.279	0.279	0.000
STANDARD DEV	0.395	0.666	0.528	0.528	0.000
STD. ERROR	0.084	0.142	0.113	0.113	0.000
SKEWNESS(G1)	1.650	1.329	2.228	2.228	0.000
KURTOSIS(G2)	0.722	0.507	4.034	4.034	0.000
SUM	4.000	9.000	5.000	5.000	0.000
C.V.	2.171	1.628	2.325	2.325	.
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CASTMI	CETRER	CETRPI	CLADCA	CLADCE
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	1.000	1.000	0.000	1.000
RANGE	3.000	1.000	1.000	0.000	1.000
MEAN	0.455	0.045	0.091	0.000	0.045
VARIANCE	0.545	0.045	0.087	0.000	0.045
STANDARD DEV	0.739	0.213	0.294	0.000	0.213
STD. ERROR	0.157	0.045	0.063	0.000	0.045
SKEWNESS(G1)	1.974	4.364	2.846	0.000	4.364
KURTOSIS(G2)	4.243	17.048	6.100	0.000	17.048
SUM	10.000	1.000	2.000	0.000	1.000
C.V.	1.625	4.690	3.237	.	4.690
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLADCOC	CLADCOR	CLADDE	CLADEC	CLADGR
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
RANGE	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
VARIANCE	0.000	0.000	0.000	0.000	0.000
STANDARD DEV	0.000	0.000	0.000	0.000	0.000
STD. ERROR	0.000	0.000	0.000	0.000	0.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	0.000	0.000	0.000	0.000
SUM	0.000	0.000	0.000	0.000	0.000
C.V.	.	.	.	.	.
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLADMI	CLADPH	CLADPY	CLADSP	CLADUN
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	1.000	0.000
RANGE	0.000	0.000	1.000	1.000	0.000
MEAN	0.000	0.000	0.091	0.182	0.000
VARIANCE	0.000	0.000	0.087	0.156	0.000
STANDARD DEV	0.000	0.000	0.294	0.395	0.000
STD. ERROR	0.000	0.000	0.063	0.084	0.000
SKEWNESS(G1)	0.000	0.000	2.846	1.650	0.000
KURTOSIS(G2)	0.000	0.000	6.100	0.722	0.000
SUM	0.000	0.000	2.000	4.000	0.000
C.V.	.	.	3.237	2.171	.
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CORNCA	DICRBR	DICRFU	DICRSC	DICRSP
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	5.000	10.000
RANGE	0.000	0.000	1.000	5.000	10.000
MEAN	0.000	0.000	0.045	0.227	0.500
VARIANCE	0.000	0.000	0.045	1.136	4.548
STANDARD DEV	0.000	0.000	0.213	1.066	2.133
STD. ERROR	0.000	0.000	0.045	0.227	0.455
SKEWNESS(G1)	0.000	0.000	4.364	4.364	4.297
KURTOSIS(G2)	0.000	0.000	17.048	17.048	16.651
SUM	0.000	0.000	1.000	5.000	11.000
C.V.	.	.	4.690	4.690	4.265
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DITRFL	DREPUN	DRYAOC	ELYMIN	EMPENI
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	7.000	43.000	50.000	0.000
RANGE	1.000	7.000	43.000	50.000	0.000
MEAN	0.136	0.636	2.818	5.364	0.000
VARIANCE	0.123	2.814	87.013	115.290	0.000
STANDARD DEV	0.351	1.677	9.328	10.737	0.000
STD. ERROR	0.075	0.358	1.989	2.289	0.000
SKEWNESS(G1)	2.119	3.010	3.922	3.482	0.000
KURTOSIS(G2)	2.491	8.157	14.229	11.962	0.000
SUM	3.000	14.000	62.000	118.000	0.000
C.V.	2.576	2.636	3.310	2.002	.
MEDIAN	0.000	0.000	0.000	1.000	0.000

	EPILAN	ERIGPE	ERYTGR	FRAGVI	HYLOSP
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	4.000	15.000	10.000	5.000
RANGE	5.000	4.000	15.000	10.000	5.000
MEAN	0.682	0.864	1.318	1.455	0.227
VARIANCE	1.465	1.266	16.989	4.641	1.136
STANDARD DEV	1.211	1.125	4.122	2.154	1.066
STD. ERROR	0.258	0.240	0.879	0.459	0.227
SKEWNESS(G1)	2.448	1.298	2.862	2.960	4.364
KURTOSIS(G2)	5.816	1.005	6.285	9.464	17.048
SUM	15.000	19.000	29.000	32.000	5.000
C.V.	1.775	1.303	3.127	1.481	4.690
MEDIAN	0.000	0.500	0.000	1.000	0.000

	HYPOAU	JUNICO	LECIGR	LEDUGR	LETHVU
N OF CASES	22	22	22	22	22
MINIMUM	0.000	1.000	0.000	0.000	0.000
MAXIMUM	1.000	30.000	0.000	0.000	1.000
RANGE	1.000	29.000	0.000	0.000	1.000
MEAN	0.091	6.136	0.000	0.000	0.318
VARIANCE	0.087	42.314	0.000	0.000	0.227
STANDARD DEV	0.294	6.505	0.000	0.000	0.477
STD. ERROR	0.063	1.387	0.000	0.000	0.102
SKEWNESS(G1)	2.846	2.326	0.000	0.000	0.781
KURTOSIS(G2)	6.100	6.224	0.000	0.000	-1.390

SUM	2.000	135.000	0.000	0.000	7.000
C.V.	3.237	1.060	.	.	1.498
MEDIAN	0.000	4.000	0.000	0.000	0.000

	LINNBO	LOPHSP	MENZFE	ORTHSE	PARMAM
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	11.000	0.000	0.000	1.000	1.000
RANGE	11.000	0.000	0.000	1.000	1.000
MEAN	2.136	0.000	0.000	0.091	0.091
VARIANCE	11.742	0.000	0.000	0.087	0.087
STANDARD DEV	3.427	0.000	0.000	0.294	0.294
STD. ERROR	0.731	0.000	0.000	0.063	0.063
SKEWNESS(G1)	1.567	0.000	0.000	2.846	2.846
KURTOSIS(G2)	1.166	0.000	0.000	6.100	6.100
SUM	47.000	0.000	0.000	2.000	2.000
C.V.	1.604	.	.	3.237	3.237
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PARMHY	PEDIBR	PELTAP	PELTCA	PELTRU
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	3.000	8.000	1.000	1.000
RANGE	1.000	3.000	8.000	1.000	1.000
MEAN	0.091	0.636	0.636	0.227	0.227
VARIANCE	0.087	0.909	3.004	0.184	0.184
STANDARD DEV	0.294	0.953	1.733	0.429	0.429
STD. ERROR	0.063	0.203	0.370	0.091	0.091
SKEWNESS(G1)	2.846	1.455	3.724	1.302	1.302
KURTOSIS(G2)	6.100	1.112	13.284	-0.306	-0.306
SUM	2.000	14.000	14.000	5.000	5.000
C.V.	3.237	1.498	2.724	1.887	1.887
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PHYLEM	PHYLGL	PICENE	PICENG	PINUAL
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	5.000
MAXIMUM	0.000	0.000	6.000	63.000	32.000
RANGE	0.000	0.000	6.000	63.000	27.000
MEAN	0.000	0.000	0.364	7.591	19.500
VARIANCE	0.000	0.000	1.766	184.348	64.262
STANDARD DEV	0.000	0.000	1.329	13.577	8.016
STD. ERROR	0.000	0.000	0.283	2.895	1.709
SKEWNESS(G1)	0.000	0.000	3.789	3.284	-0.269
KURTOSIS(G2)	0.000	0.000	13.260	10.929	-0.958
SUM	0.000	0.000	8.000	167.000	429.000
C.V.	.	.	3.655	1.789	0.411
MEDIAN	0.000	0.000	0.000	3.500	20.000

	PINUCO	PLEUSC	POHLNU	POLYJU	POLYPI
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	4.000	20.000	1.000	0.000	0.000
RANGE	4.000	20.000	1.000	0.000	0.000
MEAN	0.682	1.182	0.045	0.000	0.000
VARIANCE	1.751	18.823	0.045	0.000	0.000
STANDARD DEV	1.323	4.338	0.213	0.000	0.000

STD. ERROR	0.282	0.925	0.045	0.000	0.000
SKEWNESS(G1)	1.742	3.992	4.364	0.000	0.000
KURTOSIS(G2)	1.520	14.693	17.048	0.000	0.000
SUM	15.000	26.000	1.000	0.000	0.000
C.V.	1.941	3.671	4.690	.	.
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POTEDI	POTEFR	PTILCR	RHIZGE	RHODAL
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	5.000	1.000	1.000	0.000
RANGE	1.000	5.000	1.000	1.000	0.000
MEAN	0.182	0.955	0.045	0.045	0.000
VARIANCE	0.156	1.855	0.045	0.045	0.000
STANDARD DEV	0.395	1.362	0.213	0.213	0.000
STD. ERROR	0.084	0.290	0.045	0.045	0.000
SKEWNESS(G1)	1.650	1.819	4.364	4.364	0.000
KURTOSIS(G2)	0.722	2.504	17.048	17.048	0.000
SUM	4.000	21.000	1.000	1.000	0.000
C.V.	2.171	1.427	4.690	4.690	.
MEDIAN	0.000	1.000	0.000	0.000	0.000

	ROSAAC	SALIGL	SALIVE	SAXIBR	SEDUST
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	8.000	3.000	5.000	1.000
RANGE	1.000	8.000	3.000	5.000	1.000
MEAN	0.227	0.727	0.409	0.318	0.318
VARIANCE	0.184	2.970	0.729	1.180	0.227
STANDARD DEV	0.429	1.723	0.854	1.086	0.477
STD. ERROR	0.091	0.367	0.182	0.232	0.102
SKEWNESS(G1)	1.302	3.633	1.932	3.905	0.781
KURTOSIS(G2)	-0.306	12.862	2.494	14.246	-1.390
SUM	5.000	16.000	9.000	7.000	7.000
C.V.	1.887	2.370	2.088	3.414	1.498
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SELADE	SHEPCA	SOLIMU	SOLISP	SPIRBE
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	6.000	20.000	2.000	2.000	2.000
RANGE	6.000	20.000	2.000	2.000	2.000
MEAN	0.409	3.364	0.545	0.273	0.182
VARIANCE	1.682	25.576	0.450	0.303	0.251
STANDARD DEV	1.297	5.057	0.671	0.550	0.501
STD. ERROR	0.276	1.078	0.143	0.117	0.107
SKEWNESS(G1)	3.892	2.262	0.800	1.855	2.709
KURTOSIS(G2)	14.248	4.342	-0.451	2.495	6.373
SUM	9.000	74.000	12.000	6.000	4.000
C.V.	3.170	1.504	1.230	2.018	2.756
MEDIAN	0.000	1.000	0.000	0.000	0.000

	THALOC	TORTNO	TORTRU	TORTTO	TRISSP
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	6.000	2.000	1.000
RANGE	2.000	1.000	6.000	2.000	1.000

MEAN	0.136	0.136	0.545	0.318	0.136
VARIANCE	0.219	0.123	1.784	0.323	0.123
STANDARD DEV	0.468	0.351	1.335	0.568	0.351
STD. ERROR	0.100	0.075	0.285	0.121	0.075
SKEWNESS(G1)	3.369	2.119	3.338	1.550	2.119
KURTOSIS(G2)	10.179	2.491	10.977	1.434	2.491
SUM	3.000	3.000	12.000	7.000	3.000
C.V.	3.429	2.576	2.448	1.785	2.576
MEDIAN	0.000	0.000	0.000	0.000	0.000

	UMBIHY	USNESP	VACCCA	VACCME	VACCMY
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	0.000	0.000
RANGE	0.000	1.000	1.000	0.000	0.000
MEAN	0.000	0.045	0.045	0.000	0.000
VARIANCE	0.000	0.045	0.045	0.000	0.000
STANDARD DEV	0.000	0.213	0.213	0.000	0.000
STD. ERROR	0.000	0.045	0.045	0.000	0.000
SKEWNESS(G1)	0.000	4.364	4.364	0.000	0.000
KURTOSIS(G2)	0.000	17.048	17.048	0.000	0.000
SUM	0.000	1.000	1.000	0.000	0.000
C.V.	.	4.690	4.690	.	.
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VACCSC	VACCVI	VALESI	ZIGAEL
N OF CASES	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	20.000	0.000	2.000	3.000
RANGE	20.000	0.000	2.000	3.000
MEAN	1.091	0.000	0.136	1.045
VARIANCE	18.087	0.000	0.219	1.188
STANDARD DEV	4.253	0.000	0.468	1.090
STD. ERROR	0.907	0.000	0.100	0.232
SKEWNESS(G1)	4.270	0.000	3.369	0.813
KURTOSIS(G2)	16.500	0.000	10.179	-0.571
SUM	24.000	0.000	3.000	23.000
C.V.	3.898	.	3.429	1.043
MEDIAN	0.000	0.000	0.000	1.000

Group=26
TOTAL OBSERVATIONS: 8

	ABIELA	ACHIMI	ANEMMU	ANEMPA	ANTERA
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	2.000	1.000	0.000	5.000
RANGE	5.000	2.000	1.000	0.000	5.000
MEAN	2.125	0.250	0.125	0.000	0.750
VARIANCE	4.696	0.500	0.125	0.000	3.071
STANDARD DEV	2.167	0.707	0.354	0.000	1.753
STD. ERROR	0.766	0.250	0.125	0.000	0.620
SKEWNESS(G1)	0.460	2.268	2.268	0.000	2.107
KURTOSIS(G2)	-1.560	3.143	3.143	0.000	2.679
SUM	17.000	2.000	1.000	0.000	6.000
C.V.	1.020	2.828	2.828	.	2.337
MEDIAN	1.000	0.000	0.000	0.000	0.000

	AQUIFL	ARCTRU	ARCTUV	ARNICO	ARTENO
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	20.000	15.000	5.000
RANGE	1.000	0.000	20.000	15.000	5.000
MEAN	0.125	0.000	5.625	2.125	1.000
VARIANCE	0.125	0.000	81.696	27.268	2.857
STANDARD DEV	0.354	0.000	9.039	5.222	1.690
STD. ERROR	0.125	0.000	3.196	1.846	0.598
SKEWNESS(G1)	2.268	0.000	1.045	2.235	1.897
KURTOSIS(G2)	3.143	0.000	-0.788	3.057	2.200
SUM	1.000	0.000	45.000	17.000	8.000
C.V.	2.828	.	1.607	2.457	1.690
MEDIAN	0.000	0.000	0.000	0.000	0.500

	BARBHA	BARBLY	BETUGL	BRACGR	BRACSP
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	35.000	1.000	0.000
RANGE	0.000	0.000	35.000	1.000	0.000
MEAN	0.000	0.000	11.250	0.125	0.000
VARIANCE	0.000	0.000	241.071	0.125	0.000
STANDARD DEV	0.000	0.000	15.526	0.354	0.000
STD. ERROR	0.000	0.000	5.489	0.125	0.000
SKEWNESS(G1)	0.000	0.000	0.853	2.268	0.000
KURTOSIS(G2)	0.000	0.000	-1.027	3.143	0.000
SUM	0.000	0.000	90.000	1.000	0.000
C.V.	.	.	1.380	2.828	.
MEDIAN	0.000	0.000	2.500	0.000	0.000

	BRYOFU	CARECO	CARESC	CARESP	CASSME
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	2.000	0.000
RANGE	1.000	1.000	0.000	2.000	0.000
MEAN	0.125	0.125	0.000	0.375	0.000
VARIANCE	0.125	0.125	0.000	0.554	0.000
STANDARD DEV	0.354	0.354	0.000	0.744	0.000
STD. ERROR	0.125	0.125	0.000	0.263	0.000
SKEWNESS(G1)	2.268	2.268	0.000	1.564	0.000
KURTOSIS(G2)	3.143	3.143	0.000	0.860	0.000
SUM	1.000	1.000	0.000	3.000	0.000
C.V.	2.828	2.828	.	1.984	.
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CASTMI	CETRER	CETRPI	CLADCA	CLADCE
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	1.000	1.000
RANGE	0.000	1.000	1.000	1.000	1.000
MEAN	0.000	0.250	0.125	0.125	0.125
VARIANCE	0.000	0.214	0.125	0.125	0.125
STANDARD DEV	0.000	0.463	0.354	0.354	0.354
STD. ERROR	0.000	0.164	0.125	0.125	0.125
SKEWNESS(G1)	0.000	1.155	2.268	2.268	2.268
KURTOSIS(G2)	0.000	-0.667	3.143	3.143	3.143
SUM	0.000	2.000	1.000	1.000	1.000

C.V.	.	1.852	2.828	2.828	2.828
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLADCOC	CLADCOR	CLADDE	CLADEC	CLADGR
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	1.000	1.000	10.000	5.000
RANGE	3.000	1.000	1.000	10.000	5.000
MEAN	0.500	0.125	0.250	2.875	0.625
VARIANCE	1.143	0.125	0.214	19.554	3.125
STANDARD DEV	1.069	0.354	0.463	4.422	1.768
STD. ERROR	0.378	0.125	0.164	1.563	0.625
SKEWNESS(G1)	1.875	2.268	1.155	1.117	2.268
KURTOSIS(G2)	1.938	3.143	-0.667	-0.696	3.143
SUM	4.000	1.000	2.000	23.000	5.000
C.V.	2.138	2.828	1.852	1.538	2.828
MEDIAN	0.000	0.000	0.000	1.000	0.000

	CLADMI	CLADPH	CLADPY	CLADSP	CLADUN
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	1.000	0.000	5.000	1.000
RANGE	10.000	1.000	0.000	5.000	1.000
MEAN	1.750	0.125	0.000	0.625	0.125
VARIANCE	13.071	0.125	0.000	3.125	0.125
STANDARD DEV	3.615	0.354	0.000	1.768	0.354
STD. ERROR	1.278	0.125	0.000	0.625	0.125
SKEWNESS(G1)	1.747	2.268	0.000	2.268	2.268
KURTOSIS(G2)	1.505	3.143	0.000	3.143	3.143
SUM	14.000	1.000	0.000	5.000	1.000
C.V.	2.066	2.828	.	2.828	2.828
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CORNCA	DICRBR	DICRFU	DICRSC	DICRSP
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	35.000	0.000	10.000	0.000
RANGE	1.000	35.000	0.000	10.000	0.000
MEAN	0.250	5.750	0.000	1.375	0.000
VARIANCE	0.214	151.643	0.000	12.268	0.000
STANDARD DEV	0.463	12.314	0.000	3.503	0.000
STD. ERROR	0.164	4.354	0.000	1.238	0.000
SKEWNESS(G1)	1.155	1.966	0.000	2.225	0.000
KURTOSIS(G2)	-0.667	2.242	0.000	3.027	0.000
SUM	2.000	46.000	0.000	11.000	0.000
C.V.	1.852	2.142	.	2.547	.
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DITRFL	DREPUN	DRYAOC	ELYMIN	EMPENI
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	0.000	0.000	10.000	1.000
RANGE	5.000	0.000	0.000	10.000	1.000
MEAN	0.750	0.000	0.000	4.000	0.125
VARIANCE	3.071	0.000	0.000	14.000	0.125
STANDARD DEV	1.753	0.000	0.000	3.742	0.354
STD. ERROR	0.620	0.000	0.000	1.323	0.125

SKEWNESS(G1)	2.107	0.000	0.000	0.385	2.268
KURTOSIS(G2)	2.679	0.000	0.000	-1.199	3.143
SUM	6.000	0.000	0.000	32.000	1.000
C.V.	2.337	.	.	0.935	2.828
MEDIAN	0.000	0.000	0.000	3.500	0.000

	EPILAN	ERIGPE	ERYTGR	FRAGVI	HYLOSP
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	8.000	0.000	0.000	8.000	0.000
RANGE	8.000	0.000	0.000	8.000	0.000
MEAN	1.500	0.000	0.000	2.375	0.000
VARIANCE	7.429	0.000	0.000	8.839	0.000
STANDARD DEV	2.726	0.000	0.000	2.973	0.000
STD. ERROR	0.964	0.000	0.000	1.051	0.000
SKEWNESS(G1)	1.969	0.000	0.000	0.831	0.000
KURTOSIS(G2)	2.342	0.000	0.000	-0.542	0.000
SUM	12.000	0.000	0.000	19.000	0.000
C.V.	1.817	.	.	1.252	.
MEDIAN	0.500	0.000	0.000	1.500	0.000

	HYPOAU	JUNICO	LECIGR	LEDUGR	LETHVU
N OF CASES	8	8	8	8	8
MINIMUM	0.000	5.000	0.000	0.000	0.000
MAXIMUM	0.000	20.000	1.000	0.000	0.000
RANGE	0.000	15.000	1.000	0.000	0.000
MEAN	0.000	10.000	0.250	0.000	0.000
VARIANCE	0.000	28.571	0.214	0.000	0.000
STANDARD DEV	0.000	5.345	0.463	0.000	0.000
STD. ERROR	0.000	1.890	0.164	0.000	0.000
SKEWNESS(G1)	0.000	0.750	1.155	0.000	0.000
KURTOSIS(G2)	0.000	-0.500	-0.667	0.000	0.000
SUM	0.000	80.000	2.000	0.000	0.000
C.V.	.	0.535	1.852	.	.
MEDIAN	0.000	10.000	0.000	0.000	0.000

	LINNBO	LOPHSP	MENZFE	ORTHSE	PARMAM
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	15.000	0.000	10.000	0.000	1.000
RANGE	15.000	0.000	10.000	0.000	1.000
MEAN	5.375	0.000	1.375	0.000	0.250
VARIANCE	36.839	0.000	12.268	0.000	0.214
STANDARD DEV	6.070	0.000	3.503	0.000	0.463
STD. ERROR	2.146	0.000	1.238	0.000	0.164
SKEWNESS(G1)	0.529	0.000	2.225	0.000	1.155
KURTOSIS(G2)	-1.363	0.000	3.027	0.000	-0.667
SUM	43.000	0.000	11.000	0.000	2.000
C.V.	1.129	.	2.547	.	1.852
MEDIAN	3.000	0.000	0.000	0.000	0.000

	PARMHY	PEDIBR	PELTAP	PELTCA	PELTRU
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	2.000	1.000	1.000	1.000
RANGE	0.000	2.000	1.000	1.000	1.000
MEAN	0.000	0.250	0.125	0.125	0.250

VARIANCE	0.000	0.500	0.125	0.125	0.214
STANDARD DEV	0.000	0.707	0.354	0.354	0.463
STD. ERROR	0.000	0.250	0.125	0.125	0.164
SKEWNESS(G1)	0.000	2.268	2.268	2.268	1.155
KURTOSIS(G2)	0.000	3.143	3.143	3.143	-0.667
SUM	0.000	2.000	1.000	1.000	2.000
C.V.	.	2.828	2.828	2.828	1.852
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PHYLEM	PHYLGL	PICENE	PICENG	PINUAL
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	5.000
MAXIMUM	20.000	0.000	10.000	10.000	11.000
RANGE	20.000	0.000	10.000	10.000	6.000
MEAN	2.500	0.000	1.625	2.125	7.375
VARIANCE	50.000	0.000	12.554	13.268	5.696
STANDARD DEV	7.071	0.000	3.543	3.643	2.387
STD. ERROR	2.500	0.000	1.253	1.288	0.844
SKEWNESS(G1)	2.268	0.000	1.938	1.467	0.334
KURTOSIS(G2)	3.143	0.000	2.144	0.725	-1.377
SUM	20.000	0.000	13.000	17.000	59.000
C.V.	2.828	.	2.180	1.714	0.324
MEDIAN	0.000	0.000	0.000	0.000	7.000

	PINUCO	PLEUSC	POHLNU	POLYJU	POLYPI
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	40.000	20.000	1.000	3.000	9.000
RANGE	40.000	20.000	1.000	3.000	9.000
MEAN	12.250	2.625	0.125	0.375	2.375
VARIANCE	224.214	49.411	0.125	1.125	12.268
STANDARD DEV	14.974	7.029	0.354	1.061	3.503
STD. ERROR	5.294	2.485	0.125	0.375	1.238
SKEWNESS(G1)	0.865	2.257	2.268	2.268	0.924
KURTOSIS(G2)	-0.630	3.114	3.143	3.143	-0.635
SUM	98.000	21.000	1.000	3.000	19.000
C.V.	1.222	2.678	2.828	2.828	1.475
MEDIAN	7.000	0.000	0.000	0.000	0.000

	POTEDI	POTEFR	PTILCR	RHIZGE	RHODAL
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	5.000	0.000	5.000	5.000
RANGE	0.000	5.000	0.000	5.000	5.000
MEAN	0.000	0.875	0.000	0.750	0.875
VARIANCE	0.000	3.268	0.000	3.071	2.982
STANDARD DEV	0.000	1.808	0.000	1.753	1.727
STD. ERROR	0.000	0.639	0.000	0.620	0.611
SKEWNESS(G1)	0.000	1.747	0.000	2.107	1.982
KURTOSIS(G2)	0.000	1.505	0.000	2.679	2.369
SUM	0.000	7.000	0.000	6.000	7.000
C.V.	.	2.066	.	2.337	1.974
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ROSAAC	SALIGL	SALIVE	SAXIBR	SEDUST
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000

MAXIMUM	2.000	5.000	0.000	0.000	1.000
RANGE	2.000	5.000	0.000	0.000	1.000
MEAN	0.375	0.750	0.000	0.000	0.250
VARIANCE	0.554	3.071	0.000	0.000	0.214
STANDARD DEV	0.744	1.753	0.000	0.000	0.463
STD. ERROR	0.263	0.620	0.000	0.000	0.164
SKEWNESS(G1)	1.564	2.107	0.000	0.000	1.155
KURTOSIS(G2)	0.860	2.679	0.000	0.000	-0.667
SUM	3.000	6.000	0.000	0.000	2.000
C.V.	1.984	2.337	.	.	1.852
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SELADE	SHEPCA	SOLIMU	SOLISP	SPIRBE
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	8.000	0.000	1.000	0.000
RANGE	0.000	8.000	0.000	1.000	0.000
MEAN	0.000	2.875	0.000	0.125	0.000
VARIANCE	0.000	11.554	0.000	0.125	0.000
STANDARD DEV	0.000	3.399	0.000	0.354	0.000
STD. ERROR	0.000	1.202	0.000	0.125	0.000
SKEWNESS(G1)	0.000	0.464	0.000	2.268	0.000
KURTOSIS(G2)	0.000	-1.443	0.000	3.143	0.000
SUM	0.000	23.000	0.000	1.000	0.000
C.V.	.	1.182	.	2.828	.
MEDIAN	0.000	1.500	0.000	0.000	0.000

	THALOC	TORTNO	TORTRU	TORTTO	TRISSP
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	1.000	0.000	1.000	0.000
RANGE	3.000	1.000	0.000	1.000	0.000
MEAN	0.375	0.125	0.000	0.125	0.000
VARIANCE	1.125	0.125	0.000	0.125	0.000
STANDARD DEV	1.061	0.354	0.000	0.354	0.000
STD. ERROR	0.375	0.125	0.000	0.125	0.000
SKEWNESS(G1)	2.268	2.268	0.000	2.268	0.000
KURTOSIS(G2)	3.143	3.143	0.000	3.143	0.000
SUM	3.000	1.000	0.000	1.000	0.000
C.V.	2.828	2.828	.	2.828	.
MEDIAN	0.000	0.000	0.000	0.000	0.000

	UMBIHY	USNESP	VACCCA	VACCME	VACCMY
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	5.000	30.000	0.000
RANGE	2.000	1.000	5.000	30.000	0.000
MEAN	0.375	0.125	1.125	5.750	0.000
VARIANCE	0.554	0.125	4.411	108.786	0.000
STANDARD DEV	0.744	0.354	2.100	10.430	0.000
STD. ERROR	0.263	0.125	0.743	3.688	0.000
SKEWNESS(G1)	1.564	2.268	1.210	1.813	0.000
KURTOSIS(G2)	0.860	3.143	-0.454	1.843	0.000
SUM	3.000	1.000	9.000	46.000	0.000
C.V.	1.984	2.828	1.867	1.814	.
MEDIAN	0.000	0.000	0.000	0.500	0.000

	VACCSC	VACCVI	VALESI	ZIGAEL

N OF CASES	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	5.000
RANGE	1.000	0.000	0.000	5.000
MEAN	0.125	0.000	0.000	1.250
VARIANCE	0.125	0.000	0.000	3.071
STANDARD DEV	0.354	0.000	0.000	1.753
STD. ERROR	0.125	0.000	0.000	0.620
SKEWNESS(G1)	2.268	0.000	0.000	1.298
KURTOSIS(G2)	3.143	0.000	0.000	0.602
SUM	1.000	0.000	0.000	10.000
C.V.	2.828	.	.	1.402
MEDIAN	0.000	0.000	0.000	0.500

Group=51

TOTAL OBSERVATIONS: 2

	ABIELA	ACHIMI	ANEMMU	ANEMPA	ANTERA
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	13.000	0.000	0.000	0.000	1.000
RANGE	13.000	0.000	0.000	0.000	1.000
MEAN	6.500	0.000	0.000	0.000	0.500
VARIANCE	84.500	0.000	0.000	0.000	0.500
STANDARD DEV	9.192	0.000	0.000	0.000	0.707
STD. ERROR	6.500	0.000	0.000	0.000	0.500
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	-2.000	0.000	0.000	0.000	-2.000
SUM	13.000	0.000	0.000	0.000	1.000
C.V.	1.414	.	.	.	1.414
MEDIAN	6.500	0.000	0.000	0.000	0.500

	AQUIFL	ARCTRU	ARCTUV	ARNICO	ARTENO
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	8.000	0.000	0.000	3.000
RANGE	0.000	8.000	0.000	0.000	3.000
MEAN	0.000	4.000	0.000	0.000	1.500
VARIANCE	0.000	32.000	0.000	0.000	4.500
STANDARD DEV	0.000	5.657	0.000	0.000	2.121
STD. ERROR	0.000	4.000	0.000	0.000	1.500
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	-2.000	0.000	0.000	-2.000
SUM	0.000	8.000	0.000	0.000	3.000
C.V.	.	1.414	.	.	1.414
MEDIAN	0.000	4.000	0.000	0.000	1.500

	BARBHA	BARBLY	BETUGL	BRACGR	BRACSP
N OF CASES	2	2	2	2	2
MINIMUM	0.000	1.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	12.000	0.000	0.000
RANGE	1.000	0.000	12.000	0.000	0.000
MEAN	0.500	1.000	6.000	0.000	0.000
VARIANCE	0.500	0.000	72.000	0.000	0.000
STANDARD DEV	0.707	0.000	8.485	0.000	0.000
STD. ERROR	0.500	0.000	6.000	0.000	0.000

SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	-2.000	0.000	-2.000	0.000	0.000
SUM	1.000	2.000	12.000	0.000	0.000
C.V.	1.414	0.000	1.414	.	.
MEDIAN	0.500	1.000	6.000	0.000	0.000

	BRYOFU	CARECO	CARESC	CARESP	CASSME
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
RANGE	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
VARIANCE	0.000	0.000	0.000	0.000	0.000
STANDARD DEV	0.000	0.000	0.000	0.000	0.000
STD. ERROR	0.000	0.000	0.000	0.000	0.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	0.000	0.000	0.000	0.000
SUM	0.000	0.000	0.000	0.000	0.000
C.V.	.	.	.	.	.
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CASTMI	CETRER	CETRPI	CLADCA	CLADCE
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
RANGE	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
VARIANCE	0.000	0.000	0.000	0.000	0.000
STANDARD DEV	0.000	0.000	0.000	0.000	0.000
STD. ERROR	0.000	0.000	0.000	0.000	0.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	0.000	0.000	0.000	0.000
SUM	0.000	0.000	0.000	0.000	0.000
C.V.	.	.	.	.	.
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLADCOC	CLADCOR	CLADDE	CLADEC	CLADGR
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	1.000	0.000
RANGE	1.000	0.000	0.000	1.000	0.000
MEAN	0.500	0.000	0.000	0.500	0.000
VARIANCE	0.500	0.000	0.000	0.500	0.000
STANDARD DEV	0.707	0.000	0.000	0.707	0.000
STD. ERROR	0.500	0.000	0.000	0.500	0.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	-2.000	0.000	0.000	-2.000	0.000
SUM	1.000	0.000	0.000	1.000	0.000
C.V.	1.414	.	.	1.414	.
MEDIAN	0.500	0.000	0.000	0.500	0.000

	CLADMI	CLADPH	CLADPY	CLADSP	CLADUN
N OF CASES	2	2	2	2	2
MINIMUM	2.000	1.000	0.000	0.000	0.000
MAXIMUM	3.000	5.000	0.000	0.000	2.000
RANGE	1.000	4.000	0.000	0.000	2.000
MEAN	2.500	3.000	0.000	0.000	1.000

VARIANCE	0.500	8.000	0.000	0.000	2.000
STANDARD DEV	0.707	2.828	0.000	0.000	1.414
STD. ERROR	0.500	2.000	0.000	0.000	1.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	-2.000	-2.000	0.000	0.000	-2.000
SUM	5.000	6.000	0.000	0.000	2.000
C.V.	0.283	0.943	.	.	1.414
MEDIAN	2.500	3.000	0.000	0.000	1.000

	CORNCA	DICRBR	DICRFU	DICRSC	DICRSP
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	1.000	0.000
MAXIMUM	1.000	2.000	0.000	2.000	0.000
RANGE	1.000	2.000	0.000	1.000	0.000
MEAN	0.500	1.000	0.000	1.500	0.000
VARIANCE	0.500	2.000	0.000	0.500	0.000
STANDARD DEV	0.707	1.414	0.000	0.707	0.000
STD. ERROR	0.500	1.000	0.000	0.500	0.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	-2.000	-2.000	0.000	-2.000	0.000
SUM	1.000	2.000	0.000	3.000	0.000
C.V.	1.414	1.414	.	0.471	.
MEDIAN	0.500	1.000	0.000	1.500	0.000

	DITRFL	DREPUN	DRYAOC	ELYMIN	EMPENI
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	15.000
MAXIMUM	0.000	0.000	0.000	0.000	25.000
RANGE	0.000	0.000	0.000	0.000	10.000
MEAN	0.000	0.000	0.000	0.000	20.000
VARIANCE	0.000	0.000	0.000	0.000	50.000
STANDARD DEV	0.000	0.000	0.000	0.000	7.071
STD. ERROR	0.000	0.000	0.000	0.000	5.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	0.000	0.000	0.000	-2.000
SUM	0.000	0.000	0.000	0.000	40.000
C.V.	.	.	.	.	0.354
MEDIAN	0.000	0.000	0.000	0.000	20.000

	EPILAN	ERIGPE	ERYTGR	FRAGVI	HYLOSP
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	25.000
RANGE	1.000	0.000	0.000	0.000	25.000
MEAN	0.500	0.000	0.000	0.000	12.500
VARIANCE	0.500	0.000	0.000	0.000	312.500
STANDARD DEV	0.707	0.000	0.000	0.000	17.678
STD. ERROR	0.500	0.000	0.000	0.000	12.500
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	-2.000	0.000	0.000	0.000	-2.000
SUM	1.000	0.000	0.000	0.000	25.000
C.V.	1.414	.	.	.	1.414
MEDIAN	0.500	0.000	0.000	0.000	12.500

	HYPOAU	JUNICO	LECIGR	LEDUGR	LETHVU
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	0.000

MAXIMUM	0.000	15.000	0.000	0.000	0.000
RANGE	0.000	15.000	0.000	0.000	0.000
MEAN	0.000	7.500	0.000	0.000	0.000
VARIANCE	0.000	112.500	0.000	0.000	0.000
STANDARD DEV	0.000	10.607	0.000	0.000	0.000
STD. ERROR	0.000	7.500	0.000	0.000	0.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	-2.000	0.000	0.000	0.000
SUM	0.000	15.000	0.000	0.000	0.000
C.V.	.	1.414	.	.	.
MEDIAN	0.000	7.500	0.000	0.000	0.000

	LINNBO	LOPHSP	MENZFE	ORTHSE	PARMAM
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	0.000	0.000	0.000	0.000
RANGE	2.000	0.000	0.000	0.000	0.000
MEAN	1.000	0.000	0.000	0.000	0.000
VARIANCE	2.000	0.000	0.000	0.000	0.000
STANDARD DEV	1.414	0.000	0.000	0.000	0.000
STD. ERROR	1.000	0.000	0.000	0.000	0.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	-2.000	0.000	0.000	0.000	0.000
SUM	2.000	0.000	0.000	0.000	0.000
C.V.	1.414	.	.	.	.
MEDIAN	1.000	0.000	0.000	0.000	0.000

	PARMHY	PEDIBR	PELTAP	PELTCA	PELTRU
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	2.000	5.000
RANGE	0.000	0.000	0.000	2.000	5.000
MEAN	0.000	0.000	0.000	1.000	2.500
VARIANCE	0.000	0.000	0.000	2.000	12.500
STANDARD DEV	0.000	0.000	0.000	1.414	3.536
STD. ERROR	0.000	0.000	0.000	1.000	2.500
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	0.000	0.000	-2.000	-2.000
SUM	0.000	0.000	0.000	2.000	5.000
C.V.	.	.	.	1.414	1.414
MEDIAN	0.000	0.000	0.000	1.000	2.500

	PHYLEM	PHYLGL	PICENE	PICENG	PINUAL
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	27.000	0.000	8.000
MAXIMUM	0.000	0.000	33.000	0.000	10.000
RANGE	0.000	0.000	6.000	0.000	2.000
MEAN	0.000	0.000	30.000	0.000	9.000
VARIANCE	0.000	0.000	18.000	0.000	2.000
STANDARD DEV	0.000	0.000	4.243	0.000	1.414
STD. ERROR	0.000	0.000	3.000	0.000	1.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	0.000	-2.000	0.000	-2.000
SUM	0.000	0.000	60.000	0.000	18.000
C.V.	.	.	0.141	.	0.157
MEDIAN	0.000	0.000	30.000	0.000	9.000

	PINUCO	PLEUSC	POHLNU	POLYJU	POLYPI

N OF CASES	2	2	2	2	2
MINIMUM	0.000	15.000	0.000	0.000	0.000
MAXIMUM	2.000	20.000	0.000	0.000	0.000
RANGE	2.000	5.000	0.000	0.000	0.000
MEAN	1.000	17.500	0.000	0.000	0.000
VARIANCE	2.000	12.500	0.000	0.000	0.000
STANDARD DEV	1.414	3.536	0.000	0.000	0.000
STD. ERROR	1.000	2.500	0.000	0.000	0.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	-2.000	-2.000	0.000	0.000	0.000
SUM	2.000	35.000	0.000	0.000	0.000
C.V.	1.414	0.202	.	.	.
MEDIAN	1.000	17.500	0.000	0.000	0.000

	POTEDI	POTEFR	PTILCR	RHIZGE	RHODAL
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	5.000	0.000	0.000
MAXIMUM	0.000	0.000	10.000	0.000	15.000
RANGE	0.000	0.000	5.000	0.000	15.000
MEAN	0.000	0.000	7.500	0.000	7.500
VARIANCE	0.000	0.000	12.500	0.000	112.500
STANDARD DEV	0.000	0.000	3.536	0.000	10.607
STD. ERROR	0.000	0.000	2.500	0.000	7.500
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	0.000	-2.000	0.000	-2.000
SUM	0.000	0.000	15.000	0.000	15.000
C.V.	.	.	0.471	.	1.414
MEDIAN	0.000	0.000	7.500	0.000	7.500

	ROSAAC	SALIGL	SALIVE	SAXIBR	SEDUST
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	5.000	0.000	0.000
RANGE	0.000	0.000	5.000	0.000	0.000
MEAN	0.000	0.000	2.500	0.000	0.000
VARIANCE	0.000	0.000	12.500	0.000	0.000
STANDARD DEV	0.000	0.000	3.536	0.000	0.000
STD. ERROR	0.000	0.000	2.500	0.000	0.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	0.000	-2.000	0.000	0.000
SUM	0.000	0.000	5.000	0.000	0.000
C.V.	.	.	1.414	.	.
MEDIAN	0.000	0.000	2.500	0.000	0.000

	SELADE	SHEPCA	SOLIMU	SOLISP	SPIRBE
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
RANGE	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
VARIANCE	0.000	0.000	0.000	0.000	0.000
STANDARD DEV	0.000	0.000	0.000	0.000	0.000
STD. ERROR	0.000	0.000	0.000	0.000	0.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	0.000	0.000	0.000	0.000
SUM	0.000	0.000	0.000	0.000	0.000
C.V.	.	.	.	.	.
MEDIAN	0.000	0.000	0.000	0.000	0.000

	THALOC	TORTNO	TORTRU	TORTTO	TRISSP
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
RANGE	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
VARIANCE	0.000	0.000	0.000	0.000	0.000
STANDARD DEV	0.000	0.000	0.000	0.000	0.000
STD. ERROR	0.000	0.000	0.000	0.000	0.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	0.000	0.000	0.000	0.000
SUM	0.000	0.000	0.000	0.000	0.000
C.V.	.	.	.	.	.
MEDIAN	0.000	0.000	0.000	0.000	0.000

	UMBIHY	USNESP	VACCCA	VACCME	VACCMY
N OF CASES	2	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	5.000	0.000
RANGE	0.000	1.000	0.000	5.000	0.000
MEAN	0.000	0.500	0.000	2.500	0.000
VARIANCE	0.000	0.500	0.000	12.500	0.000
STANDARD DEV	0.000	0.707	0.000	3.536	0.000
STD. ERROR	0.000	0.500	0.000	2.500	0.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	-2.000	0.000	-2.000	0.000
SUM	0.000	1.000	0.000	5.000	0.000
C.V.	.	1.414	.	1.414	.
MEDIAN	0.000	0.500	0.000	2.500	0.000

	VACCSC	VACCVI	VALESI	ZIGAEL
N OF CASES	2	2	2	2
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	0.000	3.000	0.000	0.000
RANGE	0.000	3.000	0.000	0.000
MEAN	0.000	1.500	0.000	0.000
VARIANCE	0.000	4.500	0.000	0.000
STANDARD DEV	0.000	2.121	0.000	0.000
STD. ERROR	0.000	1.500	0.000	0.000
SKEWNESS(G1)	0.000	0.000	0.000	0.000
KURTOSIS(G2)	0.000	-2.000	0.000	0.000
SUM	0.000	3.000	0.000	0.000
C.V.	.	1.414	.	.
MEDIAN	0.000	1.500	0.000	0.000

Appendix 2b. *Pinus albicaulis* associations and cover values of dominant species (those with median cover values >1%)**. Bolded** species in the association name are always present. **Group 1,** n=24. Association Name: ***Abies lasiocarpa - Pinus albicaulis*** - *Picea engelmannii / Vaccinium scoparium*.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Arnicor	1	0	25
Abielas	26	2	60
Menzfer	1	0	75
Peltaph	1	0	12
Piceeng	11.5	0	35
Pinualb	11.5	5	32
Pleusch	1	0	35
Vaccsco	7.5	0	65

Appendix 2c. *Pinus albicaulis* associations and cover values of dominant species (those with median cover values >1%)**. Bolded** species in the association name are always present. **Group 6,** n=10. Association Name: ***Abies lasiocarpa - Pinus albicaulis*** - ***Picea engelmannii*** / *Empetrum nigrum*.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Abielas	11.5	1	23
Empenig	3	0	25
Junicom	1	0	20
Piceeng	5.5	2	15
Pinualb	11	5	40
Vaccmem	1.5	0	25

Appendix 2d. *Pinus albicaulis* associations and cover values of dominant species (those with median cover values >1%)**. Bolded** species in the association name are always present. **Group 9,** n=22. Association Name: ***Pinus albicaulis*** / ***Juniperis communis*** - *Arctostaphylos uva-ursi*.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Abielas	2	0	23
Achimil	1	0	3
Anterac	1	0	15
Arctuva	1.5	0	20
Elyminn	1	0	50

Fragvir	1	0	10
Junicom	4	1	30
Piceeng	3.5	0	63
Pinualb	20	5	32
Potefru	1	0	5
Shepcan	1	0	20
Zigaele	1	0	3

Appendix 2e. *Pinus albicaulis* associations and cover values of dominant species (those with median cover values >1%)**. Bolded** species in the association name are always present. **Group 26,** n=8. Association Name: ***Pinus albicaulis*** - *Pinus contorta* / ***Juniperis communis*** - *Elymus innovatus - Linnaea borealis.*

Species Code	Median Cover	Minimum Cover	Maximum Cover
Abielas	1	0	5
Betugla	2.5	0	35
Cladecm	1	0	10
Elyminn	3.5	0	10
Fragvir	1.5	0	8
Junicom	10	5	20
Linnbor	3	0	15
Pinualb	7	5	11
Pinucon	7	0	40
Shepcan	1.5	0	8

Appendix 2f. *Pinus albicaulis* associations and cover values of dominant species (those with median cover values >1%)**. Bolded** species in the association name are always present. **Group 51,** n=2. Association Name: ***Picea glauca x P. engelmannii - Pinus albicaulis*** - *Abies lasiocarpa* / **feather moss**.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Abielas	6.5	0	13
Arctrub	4	0	8
Artenor	1.5	0	3
Barblyc	1	1	1
Betugla	6	0	12
Cladmit	2.5	2	3

Cladunc	1	0	2
Dicrbre	1	0	2
Dicrsco	1.5	1	2
Empenig	20	15	25
Hylospl	12.5	0	25
Junicom	7.5	0	15
Linnbor	1	0	2
Peltcan	1	0	2
Peltruf	2.5	0	5
Piceene	30	27	33
Pinualb	9	8	10
Pinucon	1	0	2
Pleusch	17.5	15	20
Ptilcri	7.5	5	10
Rhodalb	7.5	0	15
Salives	2.5	0	5
Vaccmem	2.5	0	5
Vaccvit	1.5	0	3

Appendix 3a. Treeless high elevation PCORD, ESIS, and cluster analysis number equivalents.

PCORD	ESIS	Cluster
1	31GP128	1
2	31GP39	2
3	32RC104	3
4	32RC37	3
5	34CB65	5
6	94BAW5070	6
7	94BAW5072	6
8	94BAW5073	6
9	94BAW5074	9
10	94BAW5076	6
11	94BAW5077	6
12	94BAW5078	12
13	94BAW5079	12
14	94BAW5086	6
15	94BAW5087	3
16	94BAW5088	3
17	94BAW5089	6
18	94BAW5091	6
19	94BAW5092	19
20	94BAW5095	20
21	94BAW5129	21
22	94BAW5130	22
23	94BAW5131	12
24	94BAW6080	6
25	94BAW7001	25
26	94BAW7003	25
27	94BAW7032	2
28	94BAW7037	3
29	94BAW7044	19
30	94BAW7045	3
31	94BAW7055	22
32	94BAW7062	12
33	94BAW7081	3
34	94BAW7093	34
35	94BAW7100	35
36	94BIC6038	35
37	94BIC6101	21
38	94BIC6102	20
39	94BIC6103	12
40	94BIC6104	40
41	94BIC6105	19
42	94BIC6106	19
43	94BIC6107	12
44	94BIC8084	12
45	94BIC8090	3
46	94BJC6067	12
47	94BJC6068	3
48	94BJC6069	3
49	94BJC6070	35
50	94BJC8010	50
51	94BJC8011	34
52	94BJC8012	52

53	94BJC8016	3
54	94BJC8017	50
55	94BJC8023	55
56	94BJC8031	52
57	94BJC8033	3
58	94BJC8034	12
59	94BJC8039	12
60	94BJC8062	52
61	94BJC8068	5
62	94BJC8071	3
63	94BJC8072	3
64	94BJC8073	1
65	94BJC8077	52
66	94BJC8079	3
67	94BJC8092	3
68	94BJC8093	12
69	94BJC8094	12
70	94BJD5037	70
71	94BJD5042	6
72	94BJD5043	3
73	94BJD5052	1
74	94BJD5060	12
75	94BJD5061	3
76	94BJD5063	6
77	94BJD5064	6
78	94BJD5065	6
79	94BJD5066	12
80	94BJD5097	3
81	94BJD5098	35
82	94BJD5099	52
83	94BJD5100	19
84	94BJD6035	6
85	94BJD6042	12
86	94BJD6050	3
87	94BJD6052	9
88	94BJD6053	9
89	94BJD7014	12
90	94BJD7029	34
91	94BJD7031	12
92	94BJD7040	12
93	94BJD7044	70
94	94BJD7052	34
95	94BJD7080	3
96	94BJD7101	52
97	94BJD7140	97
98	94BJD8012	3
99	94BJD8013	34
100	94BJD8014	3
101	94BJD8044	2
102	94BJD8058	3
103	94BJD8059	35
104	94BJD8060	6
105	94BJD8061	12
106	94BJD8062	12
107	94BJD8063	1
108	94BJD8064	12
109	94BJD8065	3

110	94BJD8071	34
111	94BJD8093	3
112	94BJD8110	3
113	94BJD8117	3
114	94BJD9075	55
115	94BJD9078	1
116	94BJD9081	3
117	94BJD9083	3
118	94BJD9089	97
119	94BJE8006	52
120	94BJE8024	3
121	94BJE8025	52
122	94BJE8029	55
123	94BJE8030	1
124	94BJE8031	1
125	94BJE8032	50
126	94BJE8034	3
127	94BJE8035	19
128	94BJE8047	2
129	94BJE8071	52
130	94BJE8083	52
131	94BJE8090	3
132	94BJE8091	97
133	94BJE8098	3
134	94BJE8100	3
135	94BJE8110	3
136	94BJE8118	2
137	94BJE8121	52
138	94BJE8124	2
139	94BJE8125	1
140	94BJE8139	35
141	94BJE8140	97
142	94BJE8141	3
143	94BJE8142	3
144	94BJE8143	2
145	94BJE8144	1
146	94BJE8148	1
147	94BJE8158	12
148	94BJE8162	3
149	94BKS6052	3
150	94BKS6070	3
151	94BKS6071	52
152	94BKS6072	12
153	94BKS6074	19
154	94BKS6075	19
155	94BKS6076	12
156	94BKS6077	6
157	94BKS6078	40
158	94BKS6084	3
159	94BKS6102	3
160	94BKS6105	9
161	94BKS6106	9
162	94BPA7021	34
163	94BPA7022	3
164	94BPA7024	97
165	94BPA7036	50
166	94BPA7065	12

167	94BPA7070	12
168	94BPA7078	3
169	94BPA7081	40
170	94BPA7082	70
171	94BPA7088	70
172	94BPA7096	12
173	94BPA7099	70
174	94BPA7116	3
175	94BPA7117	40
176	94BPA7119	35
177	94BPA7121	12
178	94BPA7122	19
179	94BPA7123	12
180	94BPA7125	12
181	94BPA7129	97
182	94BPA7130	3
183	94BPA7131	3
184	94BPA7134	2
185	94BPA7135	12
186	94BPA7136	52
187	94BPA7139	70
188	94BPA7141	40
189	94BPA7142	12
190	94BPA7143	12
191	94BPA7145	21
192	94BPA7149	12
193	94BPA7150	40
194	94BPA7156	12
195	94BPA7166	20
196	94BPA7168	40
197	94BPA7172	1
198	94BPA7176	12
199	94BPA7177	1
200	94BPA7188	12
201	94BPA8003	5
202	94BPA8004	19
203	94BPA8009	3
204	94BPA8016	52
205	94BPA8017	12
206	94BPA8025	3
207	94BPA8046	3
208	94BPA8047	3
209	94BPA8048	55
210	94BPA8067	50
211	94BPA8068	52
212	94BPA8070	1
213	94BPA8071	19
214	94BPA8072	52
215	94BPA8075	5
216	94BPA8079	50
217	94BPA8083	3
218	94BPA8084	35
219	94BPA8085	55
220	94BPA8092	3
221	94BPA8096	2
222	94BPA8104	5
223	94BPA8108	55

224	94BPA8111	2
225	94BPA8112	52
226	94BPA8119	3
227	94BPA8125	52
228	94BPA8129	3
229	94BPA8130	1
230	94BPA8136	6
231	94BPA8162	12
232	94BPA8163	40
233	94BPA8166	12
234	94BPA8167	3
235	94JIC5021	3
236	94JIC5029	19
237	94JIC5048	22
238	94JIC5049	3
239	94JIC5058	34
240	94JIC5059	3
241	94JIC5068	19
242	94JIC6032	34
243	94JIC6037	12
244	94JIC6047	12
245	94JIC6051	97
246	94JIC6054	35
247	94JIC6059	12
248	94JIC6061	3
249	94JIC6066	12
250	94JIC6073	70
251	94JIC6093	70
252	94JIC6108	12
253	94JIC6121	25
254	94JIC6130	3
255	94JIC6131	12
256	94JIC6135	12
257	94JIC7058	50
258	94JIC7059	35
259	94JIC7060	40
260	94JIC7064	20
261	94JIC7065	12
262	94JIC7081	3
263	94JIC7082	34
264	94JIC7095	12
265	94JIC8005	52
266	94JIC8017	52
267	94JIC8020	34
268	94JIC8021	50
269	94JIC8022	3
270	94JIC8032	52
271	94JIC8042	97
272	94JIC8062	3
273	94JIC8066	3
274	94JIC9019	5
275	94JIC9020	50
276	94JIC9037	50
277	94JIC9053	34
278	94JIC9054	3
279	94JIC9059	70
280	94JIC9065	5

281	94JIC9078	70
282	94JIC9090	70
283	94JIC9100	3
284	94JIC9101	70
285	94JIC9128	70
286	94JIC9133	3
287	94JIC9134	40
288	94JIC9142	70
289	94JIC9145	70
290	94JIC9150	40
291	94JIC9156	70
292	94JJC6045	12
293	94JJC6048	3
294	94JJC6053	12
295	94JJC6055	25
296	94JJC6056	25
297	94JJC6057	20
298	94JJC6059	40
299	94JJC6081	3
300	94JJC6082	70
301	94JJC6090	12
302	94JJC6091	12
303	94JJC6092	40
304	94JJC6093	12
305	94JJC6094	12
306	94JJC6095	12
307	94JJC6105	12
308	94JJC6108	12
309	94JJC6109	9
310	94JJC6114	35
311	94JJC6117	20
312	94JJC7020	50
313	94JJC7031	3
314	94JJC7036	3
315	94JJC7052	40
316	94JJC7053	9
317	94JJC7057	9
318	94JJC7068	70
319	94JJC7069	20
320	94JJC7072	12
321	94JJC7078	40
322	94JJC7079	70
323	94JJC7096	70
324	94JJC7100	12
325	94JJC7107	70
326	94JJC7114	70
327	94JJD9010	3
328	94JJD9026	25
329	94JJD9031	70
330	94JJD9037	50
331	94JJD9052	70
332	94JJD9054	70
333	94JJD9060	19
334	94JJD9070	19
335	94JJE9001	3
336	94JJE9021	34
337	94JJE9032	1

338	94JJE9033	97
339	94JJE9034	25
340	94JJE9035	3
341	94JJE9037	3
342	94JJE9052	3
343	94JJE9057	3
344	94JJE9058	6
345	94JJE9064	19
346	94JJE9071	12
347	94JJE9076	3
348	94JJE9077	25
349	94JJE9079	70
350	94JJE9080	3
351	94JJE9081	70
352	94JJE9082	70
353	94JJE9084	70
354	94JJE9095	6
355	94JJE9096	70
356	94JJE9110	3
357	94JJE9112	70
358	94JJE9147	70
359	94JJE9152	34
360	94JJE9153	3
361	94JJE9172	25
362	94JJE9173	19
363	94JJE9181	3
364	94JJM7074	70
365	94JJM7080	35
366	94JJM7086	12
367	94JJM7088	70
368	94JJM8010	3
369	94JJM8011	97
370	94JJM8030	50
371	94JJM8035	3
372	94JJM8036	9
373	94JJM8037	3
374	94JJM8047	2
375	94JJM8086	50
376	94JJM8095	3
377	94JLC9001	3
378	94JLC9028	3
379	94JLC9029	55
380	94JLC9044	3
381	94JLC9081	97
382	94JLC9083	19
383	94JLC9134	25
384	94JLC9139	55
385	94JLC9158	25
386	94JLC9173	2
387	94JLC9174	19
388	94JLC9175	19
389	94JLC9185	25
390	94JPA9001	34
391	94JPA9015	35
392	94JPA9033	35
393	94JPA9034	50
394	94JPA9040	22

395	94JPA9047	12
396	94JPA9057	3
397	94JPA9060	12
398	94JPA9074	3
399	94JPA9075	20
400	94JPA9076	40
401	94JPA9077	22
402	94JPA9098	3
403	94JPA9099	70
404	94JPA9111	70
405	94JPA9112	40
406	94JPA9114	9
407	94JPA9121	19
408	94JPA9129	12
409	94JPA9130	3
410	94JPA9131	3
411	94JPA9135	12
412	94JSJ7038	3
413	94JSJ7039	97
414	94JSJ7049	70
415	94JSJ7053	2
416	94JSJ7059	3
417	94JSJ7060	20
418	94JSJ7076	12
419	94JSJ7085	70
420	94JSJ8009	50
421	94JSJ8024	52
422	94JSJ8031	2
423	94JSJ8036	1
424	94JSJ8040	3
425	94JSJ8050	2
426	94JSJ8065	50
427	94JSJ8067	35
428	94JSJ8071	50
429	94JSJ8072	35
430	94JSJ9022	50
431	94JSJ9040	25
432	94JSJ9058	50
433	94JSJ9064	6
434	94JSJ9065	70
435	94JSJ9073	40
436	94JSJ9074	40
437	94JSJ9080	22
438	94JSJ9081	19
439	94JSJ9083	40
440	94JSJ9084	70
441	94JSJ9093	70
442	94JSJ9094	70
443	94JSJ9108	25
444	94JSJ9109	20
445	94JSJ9110	6
446	94JSJ9118	2
447	94JSJ9130	9

Appendix 3b. Summary statistics of species cover for treeless high elevation cluster groups.

Group 1

C:\SYSTATW5\TINOCRCL.SYS

TOTAL OBSERVATIONS: 16

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	2.000	0.000	1.000	1.000
MEAN	1.438	0.500	0.000	0.313	0.063
MEDIAN	1.000	0.000	0.000	0.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	12.000	1.000	10.000
MEAN	0.063	0.250	1.625	0.438	1.188
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	1.000
MEAN	0.125	0.000	0.000	0.000	0.125
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	0.000	0.000	0.000	3.000
MEAN	0.438	0.000	0.000	0.000	0.250
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	1.000	0.000
MEAN	0.000	0.000	0.125	0.250	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	5.000	0.000	0.000	5.000
MEAN	0.063	0.688	0.000	0.000	0.313
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET

N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	0.000	1.000	0.000	0.000
MEAN	0.875	0.000	0.063	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	1.000	1.000
MEAN	0.188	0.000	0.250	0.063	0.313
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	2.000	0.000	0.000	1.000
MEAN	0.563	0.438	0.000	0.000	0.125
MEDIAN	1.000	0.000	0.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	3.000	1.000
MEAN	0.000	0.000	0.500	0.313	0.250
MEDIAN	0.000	0.000	0.500	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	3.000
MEAN	0.000	0.000	0.000	0.000	0.688
MEDIAN	0.000	0.000	0.000	0.000	0.500

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	4.000	1.000	0.000
MEAN	0.125	0.188	0.375	0.063	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	1.000	0.000
MEAN	0.063	0.063	0.125	0.125	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI
N OF CASES	16	16	16	16	16

MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	35.000	20.000	0.000	20.000	1.000
MEAN	6.938	5.000	0.000	1.750	0.188
MEDIAN	0.500	1.500	0.000	0.000	0.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	10.000	2.000	0.000
MEAN	0.000	0.313	1.313	0.438	0.000
MEDIAN	0.000	0.000	1.000	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	3.000	2.000
MEAN	0.063	0.063	0.375	0.438	0.125
MEDIAN	0.000	0.000	0.000	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU	KOBRMYO
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	0.000	7.000	0.000	10.000
MEAN	0.813	0.000	0.500	0.000	1.625
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC	LUZUPIP
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	4.000
MEAN	0.000	0.000	0.000	0.000	0.500
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LUZUSPI	LYCOALP	MINUOBT	MINURUB	MYOSALP
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	1.000	1.000
MEAN	0.125	0.000	0.000	0.250	0.125
MEDIAN	0.000	0.000	0.000	0.000	0.000

	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE	PEDIARC
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	2.000	1.000	0.000	0.000
MEAN	0.000	0.188	0.125	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PEDIBRA	PELTAPH	PELTCAN	PELTRUF	PELTSPP
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	1.000	0.000
MEAN	0.188	0.125	0.063	0.500	0.000

MEDIAN	0.000	0.000	0.000	0.500	0.000

	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA	PHYSMUS
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	20.000	0.000
MEAN	0.125	0.188	0.000	3.125	0.000
MEDIAN	0.000	0.000	0.000	0.500	0.000

	POAALP	POASPP	POGOALP	POLYJUN	POLYPIL
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	2.000	0.000	1.000	0.000
MEAN	0.000	0.125	0.000	0.438	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POLYSPP	POLYVIV	POTEDIV	POTEFRU	POTENIV
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	2.000	6.000	10.000	0.000
MEAN	0.125	0.625	1.500	0.813	0.000
MEDIAN	0.000	1.000	1.000	0.000	0.000

	PSEUPUB	PSEURAD	RANUESC	RHIZGEO	RHYTRUG
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	0.000
MEAN	0.000	0.000	0.000	0.125	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SALIARC	SALIBAA	SALIGLA	SALIRET	SAXIBRO
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	5.000	0.000	0.000
MAXIMUM	1.000	20.000	75.000	3.000	0.000
MEAN	0.063	5.000	30.813	0.188	0.000
MEDIAN	0.000	0.000	22.500	0.000	0.000

	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN	SENELUG
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	5.000	2.000
MEAN	0.063	0.000	0.438	0.750	0.250
MEDIAN	0.000	0.000	0.000	0.500	0.000

	SENETRI	SIBBPRO	SILEACA	SMELCAL	SOLIMUL
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	0.000	10.000
MEAN	0.000	0.313	0.188	0.000	1.875
MEDIAN	0.000	0.000	0.000	0.000	1.000

	SOLOCRO	STERALP	STERSPP	THAMSUB	THUIABI
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	1.000	1.000
MEAN	0.000	0.125	0.000	0.125	0.188
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TORTFRA	TORTNOR	TORTRUR	TORTTOR	TRISSPI
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	15.000	15.000	0.000	5.000
MEAN	0.000	1.000	3.875	0.000	0.750
MEDIAN	0.000	0.000	1.000	0.000	0.000

	TROLALB	UMBIHYP	UMBIPRO	VACCSCO	VAHLATR
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	8.000	1.000	0.000	1.000	0.000
MEAN	0.688	0.063	0.000	0.125	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VALESIT	VEROALP	XANTELE	ZIGAELE
N OF CASES	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	5.000	1.000	0.000	1.000
MEAN	0.438	0.063	0.000	0.188
MEDIAN	0.000	0.000	0.000	0.000

Group 2
TOTAL OBSERVATIONS: 16

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	1.000	1.000
MEAN	0.000	0.000	0.063	0.125	0.063
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	2.000	1.000	0.000
MEAN	0.063	0.250	0.313	0.063	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	0.000	8.000
MEAN	0.000	0.063	0.063	0.000	0.813

MEDIAN	0.000	0.000	0.000	0.000	0.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	14.000	0.000	0.000	1.000
MEAN	0.125	1.188	0.000	0.000	0.188
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	1.000	1.000	1.000	2.000
MEAN	0.188	0.188	0.438	0.250	0.125
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	0.000	3.000	1.000	0.000
MEAN	0.313	0.000	0.250	0.063	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	35.000	0.000	9.000	1.000	0.000
MEAN	2.563	0.000	0.688	0.125	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	2.000	15.000	5.000
MEAN	0.375	0.188	0.188	1.563	0.500
MEDIAN	0.000	0.000	0.000	0.500	0.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	4.000	8.000	2.000	0.000	0.000
MEAN	0.500	1.625	0.438	0.000	0.000
MEDIAN	0.000	1.000	0.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	2.000	15.000	1.000
MEAN	0.000	0.000	0.688	1.000	0.063
MEDIAN	0.000	0.000	1.000	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	1.000	0.000
MEAN	0.125	0.375	0.000	0.125	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	8.000	0.000
MEAN	0.063	0.063	0.000	0.813	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	2.000	1.000	5.000	6.000
MEAN	0.313	0.313	0.125	0.313	0.375
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	35.000	0.000	1.000	0.000	1.000
MEAN	10.938	0.000	0.125	0.000	0.125
MEDIAN	3.000	0.000	0.000	0.000	0.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	2.000	1.000	1.000
MEAN	0.063	0.250	0.250	0.125	0.125
MEDIAN	0.000	0.000	0.000	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	2.000	1.000	0.000
MEAN	0.125	0.000	0.188	0.063	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU	KOBRMYO
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	0.000	25.000
MEAN	0.000	0.000	0.375	0.000	3.438
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC	LUZUPIP
N OF CASES	16	16	16	16	16

MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	0.000	1.000
MEAN	0.375	0.000	0.063	0.000	0.063
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LUZUSPI	LYCOALP	MINUOBT	MINURUB	MYOSALP
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	1.000
MEAN	0.250	0.000	0.000	0.000	0.375
MEDIAN	0.000	0.000	0.000	0.000	0.000

	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE	PEDIARC
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	12.000	0.000	2.000
MEAN	0.125	0.125	2.313	0.000	0.313
MEDIAN	0.000	0.000	1.000	0.000	0.000

	PEDIBRA	PELTAPH	PELTCAN	PELTRUF	PELTSPP
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	5.000	0.000
MEAN	0.063	0.125	0.063	0.625	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA	PHYSMUS
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	15.000	2.000
MEAN	0.250	0.000	0.000	1.063	0.375
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POAALP	POASPP	POGOALP	POLYJUN	POLYPIL
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	7.000	3.000	2.000	2.000	0.000
MEAN	0.563	0.250	0.250	0.250	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POLYSPP	POLYVIV	POTEDIV	POTEFRU	POTENIV
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	8.000	8.000	0.000	1.000
MEAN	0.000	2.875	1.188	0.000	0.250
MEDIAN	0.000	2.500	1.000	0.000	0.000

	PSEUPUB	PSEURAD	RANUESC	RHIZGEO	RHYTRUG
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	1.000	7.000

MEAN	0.125	0.000	0.125	0.500	0.750
MEDIAN	0.000	0.000	0.000	0.500	0.000

	SALIARC	SALIBAA	SALIGLA	SALIRET	SAXIBRO
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	5.000	0.000
MAXIMUM	15.000	0.000	0.000	70.000	1.000
MEAN	3.688	0.000	0.000	23.625	0.063
MEDIAN	1.500	0.000	0.000	20.000	0.000

	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN	SENELUG
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	10.000	1.000
MEAN	0.063	0.375	0.188	0.938	0.188
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SENETRI	SIBBPRO	SILEACA	SMELCAL	SOLIMUL
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	12.000	1.000	2.000
MEAN	0.063	0.125	2.125	0.375	0.313
MEDIAN	0.000	0.000	1.000	0.000	0.000

	SOLOCRO	STERALP	STERSPP	THAMSUB	THUIABI
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	5.000	1.000	3.000	10.000
MEAN	0.000	0.813	0.063	0.688	0.875
MEDIAN	0.000	0.000	0.000	1.000	0.000

	TORTFRA	TORTNOR	TORTRUR	TORTTOR	TRISSPI
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	5.000	1.000	1.000
MEAN	0.063	0.313	1.563	0.188	0.250
MEDIAN	0.000	0.000	1.000	0.000	0.000

	TROLALB	UMBIHYP	UMBIPRO	VACCSCO	VAHLATR
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	1.000	1.000	0.000	0.000
MEAN	0.188	0.188	0.125	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VALESIT	VEROALP	XANTELE	ZIGAELE
N OF CASES	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	1.000
MEAN	0.063	0.188	0.188	0.063
MEDIAN	0.000	0.000	0.000	0.000

Group 3

TOTAL OBSERVATIONS: 99

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	3.000	1.000	2.000	1.000
MEAN	0.020	0.051	0.162	0.283	0.162
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	5.000	5.000	25.000
MEAN	0.000	0.152	0.182	0.212	0.758
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	1.000	5.000
MEAN	0.051	0.121	0.000	0.010	0.293
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	1.000	1.000	0.000	1.000
MEAN	0.424	0.010	0.020	0.000	0.030
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	3.000	1.000	0.000
MEAN	0.010	0.000	0.202	0.071	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	25.000	15.000	2.000
MEAN	0.091	0.061	1.586	0.212	0.101
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET

N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	0.000	25.000	3.000	12.000
MEAN	0.606	0.000	0.636	0.030	0.768
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	1.000	1.000	10.000	10.000
MEAN	0.394	0.030	0.020	1.283	0.980
MEDIAN	0.000	0.000	0.000	1.000	1.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	10.000	10.000	1.000	1.000
MEAN	0.737	1.667	0.737	0.010	0.040
MEDIAN	0.000	1.000	0.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	3.000	10.000	4.000	1.000
MEAN	0.040	0.091	0.465	0.222	0.081
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	5.000	3.000	2.000	1.000
MEAN	0.010	0.404	0.162	0.182	0.020
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	2.000	5.000	5.000	5.000
MEAN	0.131	0.071	0.111	0.242	0.081
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	2.000	35.000	25.000
MEAN	0.131	0.182	0.172	0.394	0.505
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI
N OF CASES	99	99	99	99	99
MINIMUM	6.000	0.000	0.000	0.000	0.000

MAXIMUM	80.000	10.000	3.000	1.000	1.000
MEAN	34.939	0.212	0.232	0.020	0.071
MEDIAN	33.000	0.000	0.000	0.000	0.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	3.000	1.000	6.000	1.000
MEAN	0.000	0.323	0.071	0.212	0.101
MEDIAN	0.000	0.000	0.000	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	4.000	1.000	3.000	6.000	15.000
MEAN	0.121	0.091	0.212	0.222	0.667
MEDIAN	0.000	0.000	0.000	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU
N OF CASES	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	3.000	1.000	5.000	1.000
MEAN	0.101	0.010	0.414	0.010
MEDIAN	0.000	0.000	0.000	0.000

	KOBRMYO	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	35.000	1.000	10.000	1.000	0.000
MEAN	1.293	0.162	0.152	0.040	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LUZUPIP	LUZUSPI	LYCOALP	MINUOBT	MINURUB
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	2.000	0.000	1.000	1.000
MEAN	0.040	0.273	0.000	0.081	0.081
MEDIAN	0.000	0.000	0.000	0.000	0.000

	MYOSALP	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	4.000	5.000	15.000	1.000
MEAN	0.192	0.131	0.091	1.323	0.030
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PEDIARC	PEDIBRA	PELTAPH	PELTCAN	PELTRUF
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	1.000	1.000	1.000	1.000
MEAN	0.081	0.051	0.051	0.071	0.232
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PELTSPP	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	1.000	1.000	40.000
MEAN	0.030	0.091	0.010	0.010	1.222
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PHYSMUS	POAALP	POASPP	POGOALP	POLYJUN
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	2.000	5.000	1.000	10.000
MEAN	0.242	0.162	0.202	0.030	0.303
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POLYPIL	POLYSPP	POLYVIV	POTEDIV	POTEFRU
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	30.000	14.000	10.000	5.000	12.000
MEAN	0.556	0.182	1.162	0.687	0.263
MEDIAN	0.000	0.000	1.000	1.000	0.000

	POTENIV	PSEUPUB	PSEURAD	RANUESC	RHIZGEO
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	4.000	2.000	0.000	1.000	5.000
MEAN	0.323	0.162	0.000	0.040	0.424
MEDIAN	0.000	0.000	0.000	0.000	0.000

	RHYTRUG	SALIARC	SALIBAA	SALIGLA	SALIRET
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	15.000	40.000	3.000	10.000	28.000
MEAN	0.475	3.040	0.061	0.242	4.657
MEDIAN	0.000	0.000	0.000	0.000	2.000

	SAXIBRO	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	8.000	1.000	5.000	1.000	20.000
MEAN	0.303	0.040	0.343	0.192	1.162
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SENELUG	SENETRI	SIBBPRO	SILEACA	SMELCAL
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	2.000	10.000	4.000
MEAN	0.101	0.000	0.162	1.091	0.263
MEDIAN	0.000	0.000	0.000	1.000	0.000

	SOLIMUL	SOLOCRO	STERALP	STERSPP	THAMSUB
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	1.000	15.000	6.000	5.000
MEAN	0.354	0.020	0.495	0.162	0.697
MEDIAN	0.000	0.000	0.000	0.000	1.000

	THUIABI	TORTFRA	TORTNOR	TORTRUR	TORTTOR
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	1.000	12.000	7.000	5.000
MEAN	0.162	0.141	0.141	0.869	0.131
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TRISSPI	TROLALB	UMBIHYP	UMBIPRO	VACCSCO
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	7.000	0.000	5.000	5.000	15.000
MEAN	0.495	0.000	0.182	0.202	0.172
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VAHLATR	VALESIT	VEROALP	XANTELE	ZIGAELE
N OF CASES	99	99	99	99	99
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	1.000	2.000
MEAN	0.030	0.000	0.020	0.131	0.051
MEDIAN	0.000	0.000	0.000	0.000	0.000

Group 5

TOTAL OBSERVATIONS: 7

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	3.000	0.000	3.000	1.000
MEAN	1.000	0.714	0.000	0.571	0.143
MEDIAN	1.000	0.000	0.000	0.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	1.000	5.000
MEAN	0.000	0.143	0.143	0.286	0.857
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	0.000	1.000
MEAN	0.143	0.143	0.143	0.000	0.143

MEDIAN	0.000	0.000	0.000	0.000	0.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	1.000
MEAN	0.286	0.000	0.000	0.000	0.143
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	5.000	0.000	0.000
MEAN	0.000	0.000	0.714	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	1.000	1.000	0.000	1.000
MEAN	1.714	0.143	0.143	0.000	0.143
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	0.000	1.000	0.000	0.000
MEAN	0.429	0.000	0.143	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	2.000	1.000	1.000
MEAN	0.286	0.000	0.571	0.286	0.143
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	0.000	0.000
MEAN	0.429	0.571	0.143	0.000	0.000
MEDIAN	0.000	1.000	0.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	0.000	1.000
MEAN	0.000	0.000	0.143	0.000	0.286
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	0.000	1.000
MEAN	0.000	0.286	0.143	0.000	0.143
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	0.000
MEAN	0.286	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	1.000	1.000
MEAN	0.000	0.143	0.143	0.143	0.143
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI
N OF CASES	7	7	7	7	7
MINIMUM	0.000	10.000	0.000	0.000	0.000
MAXIMUM	30.000	55.000	1.000	3.000	0.000
MEAN	7.286	30.714	0.143	0.714	0.000
MEDIAN	0.000	25.000	0.000	0.000	0.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	10.000	5.000	2.000
MEAN	0.000	0.286	1.714	0.714	0.571
MEDIAN	0.000	0.000	0.000	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	1.000	7.000
MEAN	0.143	0.000	0.000	0.286	1.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU	KOBRMYO
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	0.000	1.000	0.000	1.000
MEAN	1.000	0.000	0.143	0.000	0.286
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC	LUZUPIP

N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	2.000
MEAN	0.143	0.000	0.000	0.000	0.286
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LUZUSPI	LYCOALP	MINUOBT	MINURUB	MYOSALP
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	1.000	5.000
MEAN	0.143	0.000	0.000	0.571	1.429
MEDIAN	0.000	0.000	0.000	1.000	0.000

	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE	PEDIARC
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	7.000	1.000	0.000	0.000
MEAN	0.000	1.286	0.143	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PEDIBRA	PELTAPH	PELTCAN	PELTRUF	PELTSPP
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	8.000	0.000
MEAN	0.143	0.000	0.000	1.429	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA	PHYSMUS
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	2.000	1.000
MEAN	0.000	0.000	0.000	0.286	0.286
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POAALP	POASPP	POGOALP	POLYJUN	POLYPIL
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	1.000	0.000
MEAN	0.143	0.000	0.000	0.286	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POLYSPP	POLYVIV	POTEDIV	POTEFRU	POTENIV
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	5.000	8.000	3.000	5.000
MEAN	0.000	0.857	2.429	0.429	1.000
MEDIAN	0.000	0.000	1.000	0.000	0.000

	PSEUPUB	PSEURAD	RANUESC	RHIZGEO	RHYTRUG
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	1.000

MEAN	0.000	0.000	0.000	0.000	0.286
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SALIARC	SALIBAA	SALIGLA	SALIRET	SAXIBRO
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	10.000	0.000	3.000
MEAN	0.143	0.000	1.571	0.000	0.571
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN	SENELUG
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	5.000	1.000
MEAN	0.143	0.000	0.000	1.857	0.143
MEDIAN	0.000	0.000	0.000	1.000	0.000

	SENETRI	SIBBPRO	SILEACA	SMELCAL	SOLIMUL
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	0.000	3.000
MEAN	0.000	0.143	0.286	0.000	0.857
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SOLOCRO	STERALP	STERSPP	THAMSUB	THUIABI
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	1.000
MEAN	0.000	0.000	0.000	0.143	0.143
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TORTFRA	TORTNOR	TORTRUR	TORTTOR	TRISSPI
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	3.000	5.000	0.000	1.000
MEAN	0.000	0.429	2.000	0.000	0.429
MEDIAN	0.000	0.000	1.000	0.000	0.000

	TROLALB	UMBIHYP	UMBIPRO	VACCSCO	VAHLATR
N OF CASES	7	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	0.000
MEAN	0.000	0.000	0.000	0.143	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VALESIT	VEROALP	XANTELE	ZIGAELE
N OF CASES	7	7	7	7
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	7.000
MEAN	0.000	0.143	0.143	1.143
MEDIAN	0.000	0.000	0.000	0.000

Group 6

TOTAL OBSERVATIONS: 21

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	0.000	0.000
MEAN	0.000	0.048	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	8.000	0.000	0.000
MAXIMUM	15.000	5.000	60.000	15.000	0.000
MEAN	1.571	0.286	29.571	0.952	0.000
MEDIAN	0.000	0.000	28.000	0.000	0.000

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	12.000	0.000	1.000	3.000	7.000
MEAN	1.286	0.000	0.048	0.286	0.476
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	1.000	5.000
MEAN	0.000	0.095	0.095	0.048	0.286
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	0.000	10.000
MEAN	0.095	0.048	0.048	0.000	1.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	3.000	15.000	0.000
MEAN	0.000	0.000	0.190	1.905	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	1.000	6.000	7.000	22.000
MEAN	0.476	0.190	0.381	0.762	1.190

MEDIAN	0.000	0.000	0.000	0.000	0.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	1.000	0.000	0.000	10.000
MEAN	1.143	0.095	0.000	0.000	0.571
MEDIAN	1.000	0.000	0.000	0.000	0.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	1.000
MEAN	0.095	0.000	0.000	0.000	0.143
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	0.000	1.000	16.000	0.000
MEAN	1.000	0.000	0.095	1.381	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	0.000
MEAN	0.095	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	20.000	15.000
MEAN	0.143	0.048	0.000	1.286	1.714
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	0.000
MEAN	0.000	0.000	0.000	0.095	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	0.000
MEAN	0.048	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	2.000	28.000	2.000	0.000
MEAN	0.048	0.476	2.905	0.286	0.000
MEDIAN	0.000	0.000	1.000	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	3.000	0.000	0.000	0.000
MEAN	0.095	0.524	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU	KOBRMYO
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	15.000	0.000
MEAN	0.000	0.381	0.048	1.381	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC	LUZUPIP
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	23.000	10.000
MEAN	0.000	0.095	0.095	1.095	1.857
MEDIAN	0.000	0.000	0.000	0.000	1.000

	LUZUSPI	LYCOALP	MINUOBT	MINURUB	MYOSALP
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	0.000	1.000
MEAN	0.143	0.048	0.048	0.000	0.048
MEDIAN	0.000	0.000	0.000	0.000	0.000

	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE	PEDIARC
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PEDIBRA	PELTAPH	PELTCAN	PELTRUF	PELTSPP
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	4.000	0.000	1.000	1.000
MEAN	0.143	0.381	0.000	0.190	0.143
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA	PHYSMUS

N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	4.000	8.000	35.000	0.000
MEAN	0.000	0.952	0.667	9.952	0.000
MEDIAN	0.000	1.000	0.000	9.000	0.000

	POAALP	POASPP	POGOALP	POLYJUN	POLYPIL
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	0.000	20.000	25.000	10.000
MEAN	0.238	0.000	1.714	2.619	1.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POLYSPP	POLYVIV	POTEDIV	POTEFRU	POTENIV
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	8.000	3.000	5.000	0.000	0.000
MEAN	1.190	0.476	1.095	0.000	0.000
MEDIAN	0.000	0.000	1.000	0.000	0.000

	PSEUPUB	PSEURAD	RANUESC	RHIZGEO	RHYTRUG
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	20.000	3.000	1.000	0.000
MEAN	0.000	1.381	0.524	0.048	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SALIARC	SALIBAA	SALIGLA	SALIRET	SAXIBRO
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	17.000	0.000	20.000	10.000	0.000
MEAN	5.810	0.000	0.952	1.238	0.000
MEDIAN	5.000	0.000	0.000	0.000	0.000

	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN	SENELUG
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	5.000	1.000
MEAN	0.000	0.000	0.143	0.381	0.143
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SENETRI	SIBBPRO	SILEACA	SMELCAL	SOLIMUL
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	10.000	1.000	0.000	1.000
MEAN	0.190	1.810	0.095	0.000	0.095
MEDIAN	0.000	1.000	0.000	0.000	0.000

	SOLOCRO	STERALP	STERSPP	THAMSUB	THUIABI
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	5.000	3.000	1.000	0.000

MEAN	0.095	0.524	0.143	0.048	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TORTFRA	TORTNOR	TORTRUR	TORTTOR	TRISSPI
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	2.000	1.000	0.000	1.000
MEAN	0.000	0.333	0.048	0.000	0.333
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TROLALB	UMBIHYP	UMBIPRO	VACCSCO	VAHLATR
N OF CASES	21	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	7.000	0.000	0.000	30.000	6.000
MEAN	0.524	0.000	0.000	3.429	0.476
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VALESIT	VEROALP	XANTELE	ZIGAELE
N OF CASES	21	21	21	21
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	1.000	12.000	0.000	0.000
MEAN	0.048	1.190	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000

Group 9

TOTAL OBSERVATIONS: 11

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	3.000	0.000	0.000	0.000
MEAN	0.091	0.818	0.000	0.000	0.000
MEDIAN	0.000	1.000	0.000	0.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	15.000	18.000	0.000
MEAN	0.273	0.091	2.273	3.000	0.000
MEDIAN	0.000	0.000	1.000	0.000	0.000

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	2.000	15.000
MEAN	0.000	0.000	0.000	0.545	3.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	11	11	11	11	11

MINIMUM	0.000	32.000	0.000	0.000	0.000
MAXIMUM	0.000	90.000	1.000	0.000	0.000
MEAN	0.000	61.545	0.273	0.000	0.000
MEDIAN	0.000	60.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	3.000	1.000	0.000	10.000
MEAN	0.182	0.818	0.091	0.000	3.091
MEDIAN	0.000	1.000	0.000	0.000	1.000

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	15.000	0.000	20.000	0.000
MEAN	0.000	1.364	0.000	4.636	0.000
MEDIAN	0.000	0.000	0.000	1.000	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	6.000	3.000	2.000	0.000
MEAN	0.000	0.909	0.364	0.182	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	10.000	0.000	0.000	0.000
MEAN	0.545	1.182	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	0.000
MEAN	0.091	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	1.000	0.000
MEAN	0.000	0.000	0.091	0.091	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	1.000

MEAN	0.182	0.000	0.000	0.000	0.091
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	1.000	2.000
MEAN	0.091	0.000	0.091	0.273	0.182
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	15.000	0.000
MEAN	0.000	0.000	0.000	1.636	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	2.000
MEAN	0.000	0.000	0.000	0.000	0.273
MEDIAN	0.000	0.000	0.000	0.000	0.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	15.000	1.000	0.000
MEAN	0.091	0.000	7.273	0.091	0.000
MEDIAN	0.000	0.000	8.000	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	0.000	0.000
MEAN	0.000	0.091	0.091	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU	KOBRMYO
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	1.000	0.000
MEAN	0.000	0.091	0.000	0.273	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC	LUZUPIP
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	3.000	10.000
MEAN	0.000	0.000	0.182	0.273	2.545
MEDIAN	0.000	0.000	0.000	0.000	1.000

	LUZUSPI	LYCOALP	MINUOBT	MINURUB	MYOSALP
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	0.000
MEAN	0.091	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE	PEDIARC
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	2.000
MEAN	0.000	0.000	0.000	0.000	0.182
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PEDIBRA	PELTAPH	PELTCAN	PELTRUF	PELTSPP
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	1.000	1.000	1.000	0.000
MEAN	2.000	0.182	0.091	0.091	0.000
MEDIAN	1.000	0.000	0.000	0.000	0.000

	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA	PHYSMUS
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	12.000	1.000	1.000	0.000
MEAN	0.000	1.909	0.091	0.182	0.000
MEDIAN	0.000	1.000	0.000	0.000	0.000

	POAALP	POASPP	POGOALP	POLYJUN	POLYPIL
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	5.000	5.000
MEAN	0.091	0.000	0.091	0.636	0.455
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POLYSPP	POLYVIV	POTEDIV	POTEFRU	POTENIV
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	4.000	10.000	0.000	0.000
MEAN	0.000	1.727	1.636	0.000	0.000
MEDIAN	0.000	1.000	0.000	0.000	0.000

	PSEUPUB	PSEURAD	RANUESC	RHIZGEO	RHYTRUG
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	4.000	0.000	0.000
MEAN	0.000	0.182	0.909	0.000	0.000
MEDIAN	0.000	0.000	1.000	0.000	0.000

	SALIARC	SALIBAA	SALIGLA	SALIRET	SAXIBRO

N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	25.000	75.000	10.000	1.000	0.000
MEAN	4.727	22.000	1.091	0.182	0.000
MEDIAN	2.000	20.000	0.000	0.000	0.000

	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN	SENELUG
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SENETRI	SIBBPRO	SILEACA	SMELCAL	SOLIMUL
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	15.000	5.000	1.000	0.000	1.000
MEAN	5.091	1.455	0.091	0.000	0.091
MEDIAN	3.000	1.000	0.000	0.000	0.000

	SOLOCRO	STERALP	STERSPP	THAMSUB	THUIABI
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	0.000	0.000
MEAN	0.000	0.091	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TORTFRA	TORTNOR	TORTRUR	TORTTOR	TRISSPI
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	0.000	5.000
MEAN	0.091	0.091	0.000	0.000	0.636
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TROLALB	UMBIHYP	UMBIPRO	VACCSCO	VAHLATR
N OF CASES	11	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	40.000	0.000	0.000	10.000	1.000
MEAN	12.636	0.000	0.000	0.909	0.182
MEDIAN	9.000	0.000	0.000	0.000	0.000

	VALESIT	VEROALP	XANTELE	ZIGAELE
N OF CASES	11	11	11	11
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	10.000	5.000	0.000	0.000
MEAN	1.091	1.273	0.000	0.000
MEDIAN	0.000	1.000	0.000	0.000

Group 12

TOTAL OBSERVATIONS: 67

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	3.000	1.000	0.000	1.000
MEAN	0.030	0.075	0.015	0.000	0.045
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	30.000	1.000	30.000	1.000	0.000
MEAN	0.985	0.164	5.627	0.045	0.000
MEDIAN	0.000	0.000	3.000	0.000	0.000

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	6.000	1.000	1.000	1.000	10.000
MEAN	0.284	0.045	0.075	0.060	0.657
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	0.000	12.000	10.000	5.000
MEAN	0.179	0.000	0.463	0.567	0.075
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	0.000	2.000	0.000	0.000
MEAN	0.134	0.000	0.090	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	5.000	1.000	25.000	1.000
MEAN	0.060	0.104	0.060	0.627	0.015
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	15.000	6.000	2.000	55.000	20.000
MEAN	0.522	0.284	0.209	10.836	1.328
MEDIAN	0.000	0.000	0.000	2.000	0.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI

N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	6.000	1.000	1.000	2.000
MEAN	0.507	0.149	0.045	0.015	0.119
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	3.000	1.000	15.000	1.000
MEAN	0.746	0.075	0.030	0.343	0.045
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	5.000	2.000	5.000	5.000
MEAN	0.731	0.299	0.119	0.493	0.119
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	1.000	1.000	1.000
MEAN	0.104	0.015	0.015	0.015	0.030
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	10.000	15.000	20.000	20.000
MEAN	0.194	0.343	0.582	1.388	1.134
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	1.000	1.000	20.000	0.000
MEAN	0.075	0.030	0.045	0.388	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	20.000	0.000	1.000	1.000	1.000
MEAN	2.463	0.000	0.015	0.045	0.060
MEDIAN	0.000	0.000	0.000	0.000	0.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000

MAXIMUM	2.000	2.000	8.000	1.000	1.000
MEAN	0.164	0.343	1.060	0.015	0.119
MEDIAN	0.000	0.000	0.000	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	2.000	1.000	0.000	0.000
MEAN	0.045	0.269	0.045	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU	KOBRMYO
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	2.000	2.000	1.000	1.000
MEAN	0.000	0.343	0.045	0.060	0.060
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC	LUZUPIP
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	5.000	15.000
MEAN	0.000	0.075	0.060	0.209	0.627
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LUZUSPI	LYCOALP	MINUOBT	MINURUB	MYOSALP
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	15.000	1.000	1.000	1.000
MEAN	0.239	0.478	0.090	0.045	0.090
MEDIAN	0.000	0.000	0.000	0.000	0.000

	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE	PEDIARC
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	3.000	1.000
MEAN	0.000	0.015	0.000	0.090	0.030
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PEDIBRA	PELTAPH	PELTCAN	PELTRUF	PELTSPP
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	5.000	10.000	8.000	2.000
MEAN	0.731	0.179	0.179	0.343	0.179
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA	PHYSMUS
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	20.000	0.000
MAXIMUM	1.000	1.000	10.000	70.000	0.000
MEAN	0.030	0.134	0.194	39.119	0.000
MEDIAN	0.000	0.000	0.000	40.000	0.000

	POAALP	POASPP	POGOALP	POLYJUN	POLYPIL
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	2.000	5.000	5.000	2.000
MEAN	0.179	0.075	0.284	0.448	0.104
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POLYSPP	POLYVIV	POTEDIV	POTEFRU	POTENIV
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	25.000	4.000	2.000	0.000	0.000
MEAN	0.448	0.448	0.761	0.000	0.000
MEDIAN	0.000	0.000	1.000	0.000	0.000

	PSEUPUB	PSEURAD	RANUESC	RHIZGEO	RHYTRUG
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	20.000	2.000	10.000	0.000
MEAN	0.015	0.791	0.194	0.299	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SALIARC	SALIBAA	SALIGLA	SALIRET	SAXIBRO
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	25.000	5.000	25.000	20.000	1.000
MEAN	5.791	0.134	0.642	2.313	0.015
MEDIAN	5.000	0.000	0.000	1.000	0.000

	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN	SENELUG
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	3.000	7.000	3.000
MEAN	0.075	0.000	0.134	0.881	0.104
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SENETRI	SIBBPRO	SILEACA	SMELCAL	SOLIMUL
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	5.000	1.000	0.000	3.000
MEAN	0.075	0.687	0.239	0.000	0.149
MEDIAN	0.000	1.000	0.000	0.000	0.000

	SOLOCRO	STERALP	STERSPP	THAMSUB	THUIABI
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	2.000	1.000	1.000	0.000
MEAN	0.149	0.090	0.030	0.045	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TORTFRA	TORTNOR	TORTRUR	TORTTOR	TRISSPI

N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	20.000	1.000	1.000	5.000
MEAN	0.000	0.791	0.015	0.030	0.343
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TROLALB	UMBIHYP	UMBIPRO	VACCSCO	VAHLATR
N OF CASES	67	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	5.000	0.000	15.000	5.000
MEAN	0.045	0.119	0.000	1.448	0.224
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VALESIT	VEROALP	XANTELE	ZIGAELE
N OF CASES	67	67	67	67
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	15.000	1.000	1.000	1.000
MEAN	0.403	0.239	0.015	0.045
MEDIAN	0.000	0.000	0.000	0.000

Group 19

TOTAL OBSERVATIONS: 22

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	0.000	1.000	0.000
MEAN	0.136	0.045	0.000	0.045	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	12.000	2.000	25.000	15.000	0.000
MEAN	0.591	0.318	5.227	0.864	0.000
MEDIAN	0.000	0.000	0.500	0.000	0.000

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	3.000	0.000	1.000	40.000
MEAN	0.045	0.136	0.000	0.045	4.864
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	40.000	4.000	0.000	10.000
MEAN	0.318	4.682	0.227	0.000	0.500
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	1.000	1.000	0.000	12.000
MEAN	0.273	0.273	0.091	0.000	0.591
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	2.000	1.000	0.000
MEAN	0.000	0.091	0.136	0.182	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	2.000	5.000	2.000	15.000
MEAN	0.227	0.091	0.409	0.318	0.727
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	20.000	0.000	1.000	1.000	3.000
MEAN	2.136	0.000	0.091	0.091	0.409
MEDIAN	1.000	0.000	0.000	0.000	0.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	1.000	1.000
MEAN	0.136	0.136	0.000	0.045	0.091
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	2.000	7.000	5.000	1.000
MEAN	0.182	0.227	0.955	0.227	0.091
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	0.000	1.000	0.000	1.000
MEAN	0.273	0.000	0.045	0.000	0.091
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP

N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	5.000	2.000	10.000	15.000
MEAN	0.045	0.318	0.091	1.000	0.682
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	1.000	0.000	20.000	0.000
MEAN	0.318	0.182	0.000	1.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	1.000	0.000	1.000	6.000
MEAN	0.818	0.045	0.000	0.045	0.636
MEDIAN	0.000	0.000	0.000	0.000	0.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	30.000	25.000	10.000	1.000	5.000
MEAN	2.636	1.273	2.045	0.091	0.273
MEDIAN	0.000	0.000	0.500	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	2.000	0.000	0.000
MEAN	0.091	0.182	0.182	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU	KOBRMYO
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	3.000	1.000	0.000
MEAN	0.091	0.045	0.227	0.045	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC	LUZUPIP
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	35.000	2.000	0.000	2.000
MEAN	0.000	1.636	0.091	0.000	0.227
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LUZUSPI	LYCOALP	MINUOBT	MINURUB	MYOSALP
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000

MAXIMUM	2.000	1.000	1.000	1.000	1.000
MEAN	0.318	0.045	0.045	0.045	0.227
MEDIAN	0.000	0.000	0.000	0.000	0.000

	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE	PEDIARC
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	1.000
MEAN	0.000	0.000	0.000	0.045	0.182
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PEDIBRA	PELTAPH	PELTCAN	PELTRUF	PELTSPP
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	4.000	2.000	3.000	1.000
MEAN	0.318	0.409	0.182	0.500	0.045
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA	PHYSMUS
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	10.000	10.000	5.000	0.000
MEAN	0.136	1.227	0.500	0.682	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POAALP	POASPP	POGOALP	POLYJUN	POLYPIL
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	1.000	20.000	15.000
MEAN	0.318	0.091	0.045	1.727	0.818
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POLYSPP	POLYVIV	POTEDIV	POTEFRU	POTENIV
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	15.000	5.000	0.000	1.000
MEAN	0.000	2.182	1.000	0.000	0.045
MEDIAN	0.000	1.000	1.000	0.000	0.000

	PSEUPUB	PSEURAD	RANUESC	RHIZGEO	RHYTRUG
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	10.000	1.000	1.000
MEAN	0.000	0.182	0.727	0.136	0.045
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SALIARC	SALIBAA	SALIGLA	SALIRET	SAXIBRO
N OF CASES	22	22	22	22	22
MINIMUM	20.000	0.000	0.000	0.000	0.000
MAXIMUM	55.000	1.000	1.000	23.000	1.000
MEAN	30.909	0.182	0.045	3.682	0.045
MEDIAN	30.000	0.000	0.000	0.000	0.000

	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN	SENELUG
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	2.000	15.000
MEAN	0.091	0.000	0.182	0.227	0.818
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SENETRI	SIBBPRO	SILEACA	SMELCAL	SOLIMUL
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	8.000	4.000	0.000	5.000
MEAN	0.727	1.000	0.500	0.000	0.455
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SOLOCRO	STERALP	STERSPP	THAMSUB	THUIABI
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	3.000	0.000	1.000	4.000
MEAN	0.091	0.545	0.000	0.045	0.182
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TORTFRA	TORTNOR	TORTRUR	TORTTOR	TRISSPI
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	15.000	10.000	0.000	1.000
MEAN	0.500	0.682	0.682	0.000	0.455
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TROLALB	UMBIHYP	UMBIPRO	VACCSCO	VAHLATR
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	0.000	0.000	2.000	1.000
MEAN	0.773	0.000	0.000	0.227	0.091
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VALESIT	VEROALP	XANTELE	ZIGAELE
N OF CASES	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	10.000	1.000	0.000	1.000
MEAN	0.727	0.227	0.000	0.045
MEDIAN	0.000	0.000	0.000	0.000

Group 20

TOTAL OBSERVATIONS: 10

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000

MAXIMUM	0.000	0.000	0.000	0.000	1.000
MEAN	0.000	0.000	0.000	0.000	0.100
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	8.000	0.000	40.000	1.000	0.000
MEAN	0.800	0.000	7.100	0.100	0.000
MEDIAN	0.000	0.000	1.500	0.000	0.000

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	2.000	1.000
MEAN	0.000	0.000	0.100	0.200	0.100
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	40.000	1.000	3.000	0.000
MEAN	0.000	4.100	0.200	0.500	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	40.000
MEAN	0.200	0.000	0.000	0.000	4.100
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	25.000	0.000
MAXIMUM	0.000	1.000	0.000	90.000	0.000
MEAN	0.000	0.100	0.000	48.600	0.000
MEDIAN	0.000	0.000	0.000	40.000	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	5.000	2.000
MEAN	0.000	0.000	0.100	0.700	0.200
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	0.000
MEAN	0.200	0.000	0.000	0.000	0.000

MEDIAN	0.000	0.000	0.000	0.000	0.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	1.000	1.000
MEAN	0.100	0.000	0.000	0.400	0.100
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	1.000	0.000
MEAN	0.100	0.000	0.100	0.100	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	0.000
MEAN	0.100	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	5.000	60.000
MEAN	0.100	0.000	0.000	0.500	6.500
MEDIAN	0.000	0.000	0.000	0.000	0.500

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	2.000	0.000	2.000	0.000
MEAN	0.000	0.200	0.000	0.300	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	1.000
MEAN	0.000	0.000	0.000	0.000	0.100
MEDIAN	0.000	0.000	0.000	0.000	0.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	0.000	1.000	0.000	0.000
MEAN	0.500	0.000	0.100	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	0.000	0.000
MEAN	0.000	0.100	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU	KOBRMYO
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	2.000	0.000	5.000	0.000
MEAN	0.000	0.400	0.000	0.900	0.000
MEDIAN	0.000	0.000	0.000	0.500	0.000

	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC	LUZUPIP
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	8.000	1.000	9.000	5.000
MEAN	0.000	0.800	0.200	1.700	1.700
MEDIAN	0.000	0.000	0.000	0.000	1.000

	LUZUSPI	LYCOALP	MINUOBT	MINURUB	MYOSALP
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	0.000	0.000
MEAN	0.100	0.200	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE	PEDIARC
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PEDIBRA	PELTAPH	PELTCAN	PELTRUF	PELTSPP
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	0.000	1.000
MEAN	0.100	0.200	0.100	0.000	0.100
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA	PHYSMUS
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	3.000	0.000	4.000	0.000
MEAN	0.000	0.500	0.000	0.600	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POAALP	POASPP	POGOALP	POLYJUN	POLYPIL

N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	3.000	3.000	3.000
MEAN	0.100	0.000	0.400	0.400	0.600
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POLYSPP	POLYVIV	POTEDIV	POTEFRU	POTENIV
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	18.000	1.000	1.000	0.000	0.000
MEAN	1.800	0.200	0.100	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PSEUPUB	PSEURAD	RANUESC	RHIZGEO	RHYTRUG
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	5.000	1.000	0.000
MEAN	0.000	0.100	1.200	0.100	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SALIARC	SALIBAA	SALIGLA	SALIRET	SAXIBRO
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	30.000	0.000	0.000	1.000	0.000
MEAN	6.900	0.000	0.000	0.100	0.000
MEDIAN	1.000	0.000	0.000	0.000	0.000

	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN	SENELUG
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SENETRI	SIBBPRO	SILEACA	SMELCAL	SOLIMUL
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	4.000	0.000	0.000	0.000
MEAN	0.000	0.900	0.000	0.000	0.000
MEDIAN	0.000	0.500	0.000	0.000	0.000

	SOLOCRO	STERALP	STERSPP	THAMSUB	THUIABI
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	1.000	0.000	0.000
MEAN	0.200	0.200	0.100	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TORTFRA	TORTNOR	TORTRUR	TORTTOR	TRISSPI
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000

MAXIMUM	0.000	1.000	0.000	0.000	0.000
MEAN	0.000	0.200	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TROLALB	UMBIHYP	UMBIPRO	VACCSCO	VAHLATR
N OF CASES	10	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	2.000	15.000
MEAN	0.000	0.000	0.000	0.300	2.500
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VALESIT	VEROALP	XANTELE	ZIGAELE
N OF CASES	10	10	10	10
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	0.000	0.000
MEAN	0.200	0.400	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000

Group 21

TOTAL OBSERVATIONS: 3

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	1.000	1.000
MEAN	0.333	0.000	0.000	0.667	0.333
MEDIAN	0.000	0.000	0.000	1.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	0.000
MEAN	0.000	0.000	0.000	0.333	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	0.000	0.000
MEAN	0.333	0.333	0.333	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	0.000
MEAN	0.333	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP

N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	0.000
MEAN	0.333	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	0.000	0.000
MEAN	0.000	0.000	0.333	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	0.000	1.000	0.000	0.000
MEAN	2.000	0.000	0.333	0.000	0.000
MEDIAN	1.000	0.000	0.000	0.000	0.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	0.000	0.000
MEAN	0.667	0.000	0.333	0.000	0.000
MEDIAN	1.000	0.000	0.000	0.000	0.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	0.000
MEAN	0.000	0.000	0.000	0.333	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000

MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	0.000	0.000
MEAN	0.000	0.333	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	0.000	0.000	10.000	0.000
MEAN	1.333	0.000	0.000	3.333	0.000
MEDIAN	1.000	0.000	0.000	0.000	0.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	0.000	0.000
MEAN	0.000	0.333	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	5.000	0.000
MEAN	0.000	0.000	0.000	1.667	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU	KOBRMYO
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	0.000	0.000
MEAN	0.000	0.000	0.333	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC	LUZUPIP
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LUZUSPI	LYCOALP	MINUOBT	MINURUB	MYOSALP
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	1.000
MEAN	0.333	0.000	0.000	0.000	0.333

MEDIAN	0.000	0.000	0.000	0.000	0.000

	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE	PEDIARC
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	0.000	0.000
MEAN	0.000	0.000	0.333	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PEDIBRA	PELTAPH	PELTCAN	PELTRUF	PELTSPP
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA	PHYSMUS
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	1.000	0.000
MEAN	0.000	0.333	0.000	0.333	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POAALP	POASPP	POGOALP	POLYJUN	POLYPIL
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POLYSPP	POLYVIV	POTEDIV	POTEFRU	POTENIV
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	2.000	0.000	0.000
MEAN	0.000	0.333	1.000	0.000	0.000
MEDIAN	0.000	0.000	1.000	0.000	0.000

	PSEUPUB	PSEURAD	RANUESC	RHIZGEO	RHYTRUG
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SALIARC	SALIBAA	SALIGLA	SALIRET	SAXIBRO
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	4.000	0.000	1.000	1.000	0.000
MEAN	1.667	0.000	0.333	0.667	0.000
MEDIAN	1.000	0.000	0.000	1.000	0.000

	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN	SENELUG
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	1.000	0.000
MAXIMUM	0.000	1.000	1.000	1.000	1.000
MEAN	0.000	0.667	0.333	1.000	0.333
MEDIAN	0.000	1.000	0.000	1.000	0.000

	SENETRI	SIBBPRO	SILEACA	SMELCAL	SOLIMUL
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	1.000
MAXIMUM	0.000	0.000	1.000	0.000	1.000
MEAN	0.000	0.000	0.667	0.000	1.000
MEDIAN	0.000	0.000	1.000	0.000	1.000

	SOLOCRO	STERALP	STERSPP	THAMSUB	THUIABI
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TORTFRA	TORTNOR	TORTRUR	TORTTOR	TRISSPI
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	1.000
MEAN	0.000	0.000	0.000	0.667	0.667
MEDIAN	0.000	0.000	0.000	1.000	1.000

	TROLALB	UMBIHYP	UMBIPRO	VACCSCO	VAHLATR
N OF CASES	3	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VALESIT	VEROALP	XANTELE	ZIGAELE
N OF CASES	3	3	3	3
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000
MEAN	0.333	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000

Group 22

TOTAL OBSERVATIONS: 6

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	1.000
MEAN	0.333	0.000	0.000	0.000	0.333
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	8.000	1.000	31.000	1.000	0.000
MEAN	3.833	0.167	6.167	0.167	0.000
MEDIAN	5.000	0.000	0.500	0.000	0.000

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	2.000	2.000	0.000	30.000
MEAN	0.000	0.500	0.667	0.000	11.000
MEDIAN	0.000	0.000	0.500	0.000	3.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	0.000	1.000	0.000	2.000
MEAN	2.167	0.000	0.333	0.000	0.500
MEDIAN	0.500	0.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	0.000	0.000
MEAN	0.000	0.000	0.333	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	0.000	0.000
MEAN	0.000	0.000	0.167	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	4.000	0.000	10.000	15.000
MEAN	0.000	0.667	0.000	3.000	2.500
MEDIAN	0.000	0.000	0.000	1.500	0.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	3.000	0.000	0.000	1.000
MEAN	0.833	0.500	0.000	0.000	0.167
MEDIAN	1.000	0.000	0.000	0.000	0.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC

N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	1.000	0.000
MEAN	0.167	0.000	0.000	0.167	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	1.000	1.000
MEAN	0.333	0.000	0.333	0.167	0.167
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	0.000	0.000	0.000	0.000
MEAN	0.667	0.000	0.000	0.000	0.000
MEDIAN	0.500	0.000	0.000	0.000	0.000

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	1.000	0.000
MEAN	0.333	0.000	0.000	0.167	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	20.000	2.000	0.000	1.000	0.000
MEAN	5.000	0.333	0.000	0.167	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	5.000	1.000	0.000
MEAN	0.167	0.167	2.333	0.167	0.000
MEDIAN	0.000	0.000	2.000	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	6	6	6	6	6

MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	0.000	0.000
MEAN	0.167	0.167	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU	KOBRMYO
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	0.000	0.000
MEAN	0.000	0.333	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC	LUZUPIP
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	0.000	2.000
MEAN	0.000	0.167	0.167	0.000	0.333
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LUZUSPI	LYCOALP	MINUOBT	MINURUB	MYOSALP
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	3.000	0.000	0.000	2.000
MEAN	0.333	0.500	0.000	0.000	0.667
MEDIAN	0.000	0.000	0.000	0.000	0.500

	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE	PEDIARC
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	2.000	0.000	0.000	0.000
MEAN	0.000	0.333	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PEDIBRA	PELTAPH	PELTCAN	PELTRUF	PELTSPP
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	0.000	5.000	1.000	0.000
MEAN	0.833	0.000	0.833	0.333	0.000
MEDIAN	0.500	0.000	0.000	0.000	0.000

	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA	PHYSMUS
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	65.000	15.000	0.000
MEAN	0.000	0.167	28.833	3.000	0.000
MEDIAN	0.000	0.000	27.500	0.000	0.000

	POAALP	POASPP	POGOALP	POLYJUN	POLYPIL
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	1.000	1.000

MEAN	0.167	0.000	0.000	0.500	0.167
MEDIAN	0.000	0.000	0.000	0.500	0.000

	POLYSPP	POLYVIV	POTEDIV	POTEFRU	POTENIV
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	2.000	0.000	0.000
MEAN	0.000	0.333	0.833	0.000	0.000
MEDIAN	0.000	0.000	1.000	0.000	0.000

	PSEUPUB	PSEURAD	RANUESC	RHIZGEO	RHYTRUG
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	0.000	0.000
MEAN	0.000	0.333	0.167	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SALIARC	SALIBAA	SALIGLA	SALIRET	SAXIBRO
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	20.000	0.000	1.000	1.000	0.000
MEAN	6.500	0.000	0.167	0.333	0.000
MEDIAN	4.000	0.000	0.000	0.000	0.000

	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN	SENELUG
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	1.000	1.000
MEAN	0.000	0.000	0.333	0.333	0.167
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SENETRI	SIBBPRO	SILEACA	SMELCAL	SOLIMUL
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	4.000	1.000	0.000	0.000
MEAN	0.167	0.833	0.167	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SOLOCRO	STERALP	STERSPP	THAMSUB	THUIABI
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TORTFRA	TORTNOR	TORTRUR	TORTTOR	TRISSPI
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	18.000	0.000	0.000	0.000
MEAN	0.000	3.333	0.000	0.000	0.000
MEDIAN	0.000	0.500	0.000	0.000	0.000

	TROLALB	UMBIHYP	UMBIPRO	VACCSCO	VAHLATR
N OF CASES	6	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	2.000	0.000
MEAN	0.000	0.000	0.000	0.333	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VALESIT	VEROALP	XANTELE	ZIGAELE
N OF CASES	6	6	6	6
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	0.000	3.000	0.000	3.000
MEAN	0.000	0.667	0.000	0.500
MEDIAN	0.000	0.000	0.000	0.000

Group 25

TOTAL OBSERVATIONS: 14

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	0.000	0.000
MEAN	0.000	0.000	0.071	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	13.000	1.000	0.000
MEAN	0.000	0.000	2.714	0.143	0.000
MEDIAN	0.000	0.000	1.000	0.000	0.000

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	5.000	0.000	0.000	5.000
MEAN	0.000	0.357	0.000	0.000	1.643
MEDIAN	0.000	0.000	0.000	0.000	1.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	2.000	0.000
MEAN	0.000	0.071	0.071	0.143	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000

MAXIMUM	0.000	0.000	1.000	0.000	0.000
MEAN	0.000	0.000	0.071	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	3.000	6.000	7.000	0.000
MEAN	0.000	0.214	0.786	0.929	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	1.000	9.000	15.000	12.000
MEAN	0.429	0.071	1.500	1.714	2.214
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	4.000	0.000	0.000	1.000	2.000
MEAN	0.500	0.000	0.000	0.214	0.500
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	8.000	5.000	1.000	0.000	4.000
MEAN	1.143	0.857	0.071	0.000	0.786
MEDIAN	1.000	0.000	0.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	5.000	10.000	12.000	0.000
MEAN	0.286	0.786	1.214	1.643	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	2.000	0.000	0.000
MEAN	0.000	0.000	0.214	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	22.000	8.000
MEAN	0.000	0.214	0.000	4.571	1.071

MEDIAN	0.000	0.000	0.000	0.000	0.000

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	0.000
MEAN	0.000	0.000	0.000	0.071	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	0.000	0.000	1.000	1.000
MEAN	1.857	0.000	0.000	0.071	0.071
MEDIAN	0.000	0.000	0.000	0.000	0.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	1.000	10.000
MEAN	0.071	0.143	0.071	0.286	0.857
MEDIAN	0.000	0.000	0.000	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	3.000	0.000	0.000	0.000
MEAN	0.071	0.929	0.000	0.000	0.000
MEDIAN	0.000	1.000	0.000	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU	KOBRMYO
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	2.000	0.000
MEAN	0.000	0.143	0.000	0.143	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC	LUZUPIP
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	10.000	0.000	1.000	4.000
MEAN	0.000	1.143	0.000	0.071	1.071
MEDIAN	0.000	0.500	0.000	0.000	1.000

	LUZUSPI	LYCOALP	MINUOBT	MINURUB	MYOSALP
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	8.000	1.000	1.000	0.000
MEAN	0.214	1.000	0.214	0.071	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE	PEDIARC
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	1.000
MEAN	0.000	0.000	0.000	0.286	0.071
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PEDIBRA	PELTAPH	PELTCAN	PELTRUF	PELTSPP
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	6.000	2.000	5.000	5.000
MEAN	0.071	0.429	0.143	0.500	0.357
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA	PHYSMUS
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	3.000	10.000	0.000
MEAN	0.000	0.071	0.357	2.071	0.000
MEDIAN	0.000	0.000	0.000	0.500	0.000

	POAALP	POASPP	POGOALP	POLYJUN	POLYPIL
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	7.000	1.000	25.000	6.000
MEAN	0.429	0.500	0.071	3.000	0.857
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POLYSPP	POLYVIV	POTEDIV	POTEFRU	POTENIV
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	30.000	1.000	3.000	0.000	1.000
MEAN	2.929	0.286	0.643	0.000	0.143
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PSEUPUB	PSEURAD	RANUESC	RHIZGEO	RHYTRUG
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	0.000	1.000	3.000	0.000
MEAN	0.357	0.000	0.143	0.786	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SALIARC	SALIBAA	SALIGLA	SALIRET	SAXIBRO
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	17.000	0.000	0.000	15.000	0.000
MEAN	4.714	0.000	0.000	4.000	0.000
MEDIAN	2.000	0.000	0.000	2.000	0.000

	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN	SENELUG
N OF CASES	14	14	14	14	14

MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	8.000	0.000
MEAN	0.000	0.000	0.071	0.857	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SENETRI	SIBBPRO	SILEACA	SMELCAL	SOLIMUL
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	8.000	2.000	0.000	1.000
MEAN	0.214	2.643	0.429	0.000	0.071
MEDIAN	0.000	1.000	0.000	0.000	0.000

	SOLOCRO	STERALP	STERSPP	THAMSUB	THUIABI
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	5.000	1.000	1.000	1.000
MEAN	0.357	0.643	0.214	0.357	0.071
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TORTFRA	TORTNOR	TORTRUR	TORTTOR	TRISSPI
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	5.000	0.000	5.000
MEAN	0.071	0.000	0.357	0.000	0.500
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TROLALB	UMBIHYP	UMBIPRO	VACCSCO	VAHLATR
N OF CASES	14	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	3.000	2.000	45.000	0.000
MEAN	0.000	0.571	0.286	3.571	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VALESIT	VEROALP	XANTELE	ZIGAELE
N OF CASES	14	14	14	14
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	0.000	3.000	0.000	0.000
MEAN	0.000	0.286	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000

Group 34

TOTAL OBSERVATIONS: 15

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	1.000	0.000
MEAN	0.067	0.000	0.200	0.400	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	2.000	1.000	0.000
MEAN	0.000	0.067	0.133	0.067	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	0.000	0.000
MEAN	0.067	0.000	0.067	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	0.000	10.000	1.000	1.000
MEAN	0.667	0.000	1.000	0.067	0.067
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	0.000	70.000	0.000	25.000
MEAN	0.200	0.000	15.467	0.000	3.333
MEDIAN	0.000	0.000	1.000	0.000	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	0.000	0.000
MEAN	0.067	0.000	0.200	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	2.000	3.000
MEAN	0.133	0.000	0.133	0.400	0.533
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC

N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	3.000	3.000	0.000	0.000
MEAN	0.133	1.133	0.933	0.000	0.000
MEDIAN	0.000	1.000	1.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	10.000	1.000
MEAN	0.000	0.000	0.267	0.733	0.067
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	1.000	0.000
MEAN	0.000	0.533	0.000	0.333	0.000
MEDIAN	0.000	1.000	0.000	0.000	0.000

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	0.000
MEAN	0.067	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	1.000	1.000	0.000	10.000
MEAN	0.933	0.467	0.067	0.000	0.800
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	30.000	0.000	1.000	0.000	0.000
MEAN	5.867	0.000	0.067	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	1.000	0.000
MEAN	0.000	0.200	0.000	0.133	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000

MAXIMUM	1.000	1.000	0.000	0.000	2.000
MEAN	0.133	0.067	0.000	0.000	0.200
MEDIAN	0.000	0.000	0.000	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU	KOBRMYO
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	0.000	1.000
MEAN	0.067	0.000	0.333	0.000	0.200
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC	LUZUPIP
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	1.000	0.000
MEAN	0.267	0.133	0.000	0.067	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LUZUSPI	LYCOALP	MINUOBT	MINURUB	MYOSALP
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	2.000	1.000	1.000
MEAN	0.267	0.000	0.133	0.133	0.133
MEDIAN	0.000	0.000	0.000	0.000	0.000

	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE	PEDIARC
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	5.000	0.000	2.000
MEAN	0.133	0.067	1.400	0.000	0.133
MEDIAN	0.000	0.000	1.000	0.000	0.000

	PEDIBRA	PELTAPH	PELTCAN	PELTRUF	PELTSPP
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	1.000
MEAN	0.000	0.000	0.000	0.133	0.067
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA	PHYSMUS
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	1.000
MEAN	0.000	0.000	0.000	0.000	0.333
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POAALP	POASPP	POGOALP	POLYJUN	POLYPIL
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	0.000	0.000
MEAN	0.200	0.067	0.000	0.000	0.000

MEDIAN	0.000	0.000	0.000	0.000	0.000

	POLYSPP	POLYVIV	POTEDIV	POTEFRU	POTENIV
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	2.000	5.000	1.000	5.000
MEAN	0.000	0.600	0.400	0.067	0.533
MEDIAN	0.000	1.000	0.000	0.000	0.000

	PSEUPUB	PSEURAD	RANUESC	RHIZGEO	RHYTRUG
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	5.000	8.000	25.000
MEAN	0.200	0.000	0.333	0.800	1.733
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SALIARC	SALIBAA	SALIGLA	SALIRET	SAXIBRO
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	7.000	0.000
MEAN	0.067	0.000	0.000	2.000	0.000
MEDIAN	0.000	0.000	0.000	1.000	0.000

	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN	SENELUG
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	5.000	1.000	3.000	0.000
MEAN	0.133	1.200	0.133	0.533	0.000
MEDIAN	0.000	1.000	0.000	0.000	0.000

	SENETRI	SIBBPRO	SILEACA	SMELCAL	SOLIMUL
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	7.000	1.000	0.000
MEAN	0.067	0.067	1.733	0.067	0.000
MEDIAN	0.000	0.000	1.000	0.000	0.000

	SOLOCRO	STERALP	STERSPP	THAMSUB	THUIABI
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	3.000	0.000
MEAN	0.000	0.067	0.133	0.867	0.000
MEDIAN	0.000	0.000	0.000	1.000	0.000

	TORTFRA	TORTNOR	TORTRUR	TORTTOR	TRISSPI
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	10.000	5.000	1.000	1.000
MEAN	0.200	1.000	0.800	0.133	0.267
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TROLALB	UMBIHYP	UMBIPRO	VACCSCO	VAHLATR
N OF CASES	15	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	2.000	0.000	0.000	1.000
MEAN	0.000	0.200	0.000	0.000	0.067
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VALESIT	VEROALP	XANTELE	ZIGAELE
N OF CASES	15	15	15	15
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	0.000
MEAN	0.000	0.067	0.133	0.000
MEDIAN	0.000	0.000	0.000	0.000

Group 35

TOTAL OBSERVATIONS: 16

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	1.000	1.000
MEAN	0.000	0.000	0.063	0.063	0.125
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	5.000	1.000	0.000
MEAN	0.000	0.313	0.813	0.063	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	3.000
MEAN	0.000	0.000	0.000	0.000	0.313
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	1.000	0.000
MEAN	0.000	0.000	0.063	0.125	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	1.000	0.000
MEAN	0.063	0.063	0.000	0.063	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	7.000	0.000	0.000
MEAN	0.125	0.063	0.500	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	10.000
MAXIMUM	10.000	0.000	1.000	1.000	55.000
MEAN	1.125	0.000	0.188	0.063	32.313
MEDIAN	0.000	0.000	0.000	0.000	35.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	0.000	0.000	15.000	3.000
MEAN	0.875	0.000	0.000	1.188	0.313
MEDIAN	1.000	0.000	0.000	0.000	0.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	3.000	1.000	1.000	1.000
MEAN	1.438	0.438	0.063	0.125	0.063
MEDIAN	1.000	0.000	0.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	2.000	1.000	5.000	1.000
MEAN	0.125	0.250	0.313	0.563	0.063
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	1.000	0.000
MEAN	0.063	0.000	0.188	0.125	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	5.000	4.000	12.000
MEAN	0.125	0.000	0.438	0.563	0.938
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT

N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	1.000	0.000
MEAN	0.125	0.063	0.063	0.250	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	40.000	0.000	0.000	0.000	1.000
MEAN	13.625	0.000	0.000	0.000	0.188
MEDIAN	13.500	0.000	0.000	0.000	0.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	5.000	1.000	1.000	1.000
MEAN	0.000	0.688	0.063	0.125	0.125
MEDIAN	0.000	0.000	0.000	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	0.000	0.000
MEAN	0.125	0.125	0.063	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU	KOBRMYO
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	2.000	1.000	0.000	1.000
MEAN	0.063	0.125	0.188	0.000	0.125
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC	LUZUPIP
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	0.000	1.000
MEAN	0.000	0.125	0.125	0.000	0.188
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LUZUSPI	LYCOALP	MINUOBT	MINURUB	MYOSALP
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	1.000	1.000
MEAN	0.125	0.063	0.125	0.063	0.125
MEDIAN	0.000	0.000	0.000	0.000	0.000

	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE	PEDIARC
N OF CASES	16	16	16	16	16

MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	2.000	1.000	3.000
MEAN	0.000	0.000	0.125	0.063	0.313
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PEDIBRA	PELTAPH	PELTCAN	PELTRUF	PELTSPP
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	2.000	0.000
MEAN	0.000	0.375	0.125	0.313	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA	PHYSMUS
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	15.000	25.000	0.000
MEAN	0.125	0.000	1.000	4.813	0.000
MEDIAN	0.000	0.000	0.000	1.500	0.000

	POAALP	POASPP	POGOALP	POLYJUN	POLYPIL
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	4.000	1.000	1.000	3.000	1.000
MEAN	0.375	0.125	0.125	0.313	0.125
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POLYSPP	POLYVIV	POTEDIV	POTEFRU	POTENIV
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	5.000	5.000	0.000	1.000
MEAN	0.000	1.250	1.125	0.000	0.063
MEDIAN	0.000	1.000	1.000	0.000	0.000

	PSEUPUB	PSEURAD	RANUESC	RHIZGEO	RHYTRUG
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	55.000	0.000
MEAN	0.000	0.000	0.188	3.500	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SALIARC	SALIBAA	SALIGLA	SALIRET	SAXIBRO
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	12.000	2.000	5.000	30.000	2.000
MEAN	3.000	0.125	0.438	6.063	0.188
MEDIAN	1.500	0.000	0.000	3.500	0.000

	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN	SENELUG
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	2.000	1.000
MEAN	0.000	0.188	0.125	0.438	0.125

MEDIAN	0.000	0.000	0.000	0.000	0.000

	SENETRI	SIBBPRO	SILEACA	SMELCAL	SOLIMUL
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	8.000	0.000	1.000
MEAN	0.000	0.250	2.000	0.000	0.250
MEDIAN	0.000	0.000	1.000	0.000	0.000

	SOLOCRO	STERALP	STERSPP	THAMSUB	THUIABI
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	4.000	1.000	1.000	0.000
MEAN	0.125	0.375	0.063	0.125	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TORTFRA	TORTNOR	TORTRUR	TORTTOR	TRISSPI
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	1.000	1.000
MEAN	0.125	0.000	0.313	0.063	0.375
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TROLALB	UMBIHYP	UMBIPRO	VACCSCO	VAHLATR
N OF CASES	16	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	30.000	5.000	0.000	0.000
MEAN	0.000	1.875	0.313	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VALESIT	VEROALP	XANTELE	ZIGAELE
N OF CASES	16	16	16	16
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	0.000
MEAN	0.000	0.063	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000

Group 40

TOTAL OBSERVATIONS: 20

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	1.000	0.000
MEAN	0.050	0.050	0.000	0.050	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000

MAXIMUM	20.000	3.000	8.000	1.000	0.000
MEAN	5.750	0.250	2.200	0.050	0.000
MEDIAN	1.000	0.000	1.000	0.000	0.000

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	5.000	3.000	20.000
MEAN	0.000	0.050	0.650	0.450	4.450
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	30.000	10.000	2.000	5.000
MEAN	0.400	4.300	0.650	0.150	0.350
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	1.000	1.000	0.000	23.000
MEAN	0.650	0.250	0.200	0.000	4.350
MEDIAN	0.000	0.000	0.000	0.000	1.500

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	15.000	0.000
MEAN	0.000	0.050	0.000	2.500	0.000
MEDIAN	0.000	0.000	0.000	0.500	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	4.000	5.000	10.000	1.000
MEAN	0.150	0.500	0.400	2.950	0.050
MEDIAN	0.000	0.000	0.000	1.000	0.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	2.000	0.000	0.000	1.000
MEAN	0.400	0.300	0.000	0.000	0.050
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	1.000
MEAN	0.000	0.000	0.000	0.050	0.100
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	1.000	1.000	1.000	0.000
MEAN	0.900	0.050	0.100	0.100	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	12.000	0.000	0.000	0.000	1.000
MEAN	1.150	0.000	0.000	0.000	0.050
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	10.000	1.000	10.000	0.000
MEAN	0.500	0.500	0.050	1.250	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	1.000	0.000	15.000	0.000
MEAN	0.200	0.050	0.000	1.600	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	10.000
MEAN	0.000	0.000	0.000	0.050	0.500
MEDIAN	0.000	0.000	0.000	0.000	0.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	20.000	0.000	0.000
MEAN	0.150	0.050	9.500	0.000	0.000
MEDIAN	0.000	0.000	10.000	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	3.000	5.000	0.000
MEAN	0.000	0.050	0.250	0.250	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU	KOBRMYO
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	2.000	2.000	0.000
MEAN	0.000	0.100	0.150	0.300	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC	LUZUPIP
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	3.000	1.000
MEAN	0.000	0.000	0.050	0.150	0.100
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LUZUSPI	LYCOALP	MINUOBT	MINURUB	MYOSALP
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	0.000	1.000
MEAN	0.000	0.100	0.000	0.000	0.100
MEDIAN	0.000	0.000	0.000	0.000	0.000

	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE	PEDIARC
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PEDIBRA	PELTAPH	PELTCAN	PELTRUF	PELTSPP
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	15.000	1.000	0.000	10.000	5.000
MEAN	2.150	0.200	0.000	0.700	0.250
MEDIAN	1.000	0.000	0.000	0.000	0.000

	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA	PHYSMUS
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	15.000	4.000	15.000	0.000
MEAN	0.000	1.050	0.450	2.200	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POAALP	POASPP	POGOALP	POLYJUN	POLYPIL
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	1.000	0.000
MEAN	0.150	0.050	0.000	0.250	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POLYSPP	POLYVIV	POTEDIV	POTEFRU	POTENIV
N OF CASES	20	20	20	20	20

MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	20.000	10.000	0.000	0.000
MEAN	0.050	2.350	1.900	0.000	0.000
MEDIAN	0.000	1.000	1.000	0.000	0.000

	PSEUPUB	PSEURAD	RANUESC	RHIZGEO	RHYTRUG
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	3.000	4.000	0.000	0.000
MEAN	0.000	0.450	0.500	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SALIARC	SALIBAA	SALIGLA	SALIRET	SAXIBRO
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	15.000	85.000	12.000	10.000	0.000
MEAN	5.450	4.550	0.600	0.650	0.000
MEDIAN	5.000	0.000	0.000	0.000	0.000

	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN	SENELUG
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SENETRI	SIBBPRO	SILEACA	SMELCAL	SOLIMUL
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	20.000	4.000	1.000	0.000	1.000
MEAN	3.500	0.850	0.050	0.000	0.050
MEDIAN	2.000	1.000	0.000	0.000	0.000

	SOLOCRO	STERALP	STERSPP	THAMSUB	THUIABI
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TORTFRA	TORTNOR	TORTRUR	TORTTOR	TRISSPI
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	25.000	1.000	0.000	1.000
MEAN	0.000	1.900	0.050	0.000	0.250
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TROLALB	UMBIHYP	UMBIPRO	VACCSCO	VAHLATR
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	45.000	0.000	0.000	15.000	4.000
MEAN	16.500	0.000	0.000	1.350	0.300

MEDIAN	13.500	0.000	0.000	0.000	0.000

	VALESIT	VEROALP	XANTELE	ZIGAELE
N OF CASES	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	20.000	1.000	0.000	0.000
MEAN	4.850	0.500	0.000	0.000
MEDIAN	2.500	0.500	0.000	0.000

Group 50

TOTAL OBSERVATIONS: 20

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	3.000	2.000	1.000
MEAN	0.000	0.000	0.450	0.400	0.150
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	2.000	1.000	1.000	1.000
MEAN	0.000	0.200	0.050	0.050	0.050
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	0.000	1.000
MEAN	0.000	0.050	0.000	0.000	0.050
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	0.000	1.000	0.000
MEAN	0.150	0.100	0.000	0.050	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	5.000	1.000	1.000	0.000
MEAN	0.000	0.400	0.300	0.150	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000

MAXIMUM	5.000	0.000	15.000	0.000	5.000
MEAN	0.500	0.000	1.500	0.000	0.550
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	7.000	0.000	1.000
MEAN	0.050	0.000	0.650	0.000	0.100
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	25.000	5.000
MEAN	0.000	0.050	0.100	2.700	1.400
MEDIAN	0.000	0.000	0.000	1.000	1.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	10.000	26.000	1.000	0.000
MEAN	0.350	2.050	1.900	0.050	0.000
MEDIAN	0.000	1.000	1.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	1.000	2.000
MEAN	0.050	0.100	0.400	0.050	0.100
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	3.000	1.000	1.000	0.000
MEAN	0.000	0.800	0.150	0.500	0.000
MEDIAN	0.000	1.000	0.000	0.500	0.000

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	15.000	0.000
MEAN	0.150	0.100	0.000	1.150	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	1.000	1.000	50.000
MEAN	0.250	0.500	0.300	0.100	18.800

MEDIAN	0.000	0.500	0.000	0.000	15.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	20.000	1.000	11.000	0.000	2.000
MEAN	3.750	0.050	0.750	0.000	0.250
MEDIAN	2.000	0.000	0.000	0.000	0.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	2.000	0.000
MEAN	0.000	0.000	0.000	0.150	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	2.000	0.000	15.000	5.000
MEAN	0.000	0.200	0.000	0.950	0.550
MEDIAN	0.000	0.000	0.000	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU	KOBRMYO
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	2.000	0.000	15.000
MEAN	0.000	0.000	0.550	0.000	2.650
MEDIAN	0.000	0.000	0.500	0.000	0.000

	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC	LUZUPIP
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	1.000	1.000	0.000
MEAN	0.400	0.050	0.100	0.150	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LUZUSPI	LYCOALP	MINUOBT	MINURUB	MYOSALP
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	15.000	0.000	0.000	1.000	2.000
MEAN	0.900	0.000	0.000	0.150	0.400
MEDIAN	0.000	0.000	0.000	0.000	0.000

	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE	PEDIARC
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	2.000	20.000	1.000	5.000
MEAN	0.200	0.200	4.650	0.050	0.350
MEDIAN	0.000	0.000	1.500	0.000	0.000

	PEDIBRA	PELTAPH	PELTCAN	PELTRUF	PELTSPP
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	1.000	1.000
MEAN	0.000	0.050	0.100	0.200	0.050
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA	PHYSMUS
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	7.000
MEAN	0.050	0.000	0.000	0.000	0.800
MEDIAN	0.000	0.000	0.000	0.000	0.500

	POAALP	POASPP	POGOALP	POLYJUN	POLYPIL
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	2.000	1.000	2.000	1.000
MEAN	0.050	0.300	0.100	0.150	0.050
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POLYSPP	POLYVIV	POTEDIV	POTEFRU	POTENIV
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	18.000	10.000	0.000	5.000
MEAN	0.000	3.000	0.650	0.000	1.050
MEDIAN	0.000	1.000	0.000	0.000	0.000

	PSEUPUB	PSEURAD	RANUESC	RHIZGEO	RHYTRUG
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	5.000	2.000
MEAN	0.050	0.000	0.000	0.400	0.550
MEDIAN	0.000	0.000	0.000	0.000	0.500

	SALIARC	SALIBAA	SALIGLA	SALIRET	SAXIBRO
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	0.000	0.000	15.000	1.000
MEAN	1.200	0.000	0.000	3.400	0.050
MEDIAN	0.000	0.000	0.000	2.000	0.000

	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN	SENELUG
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	5.000	0.000	10.000	0.000
MEAN	0.050	0.750	0.000	0.700	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SENETRI	SIBBPRO	SILEACA	SMELCAL	SOLIMUL

N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	1.000	0.000	0.000
MAXIMUM	0.000	0.000	5.000	9.000	1.000
MEAN	0.000	0.000	2.000	1.100	0.100
MEDIAN	0.000	0.000	1.000	0.000	0.000

	SOLOCRO	STERALP	STERSPP	THAMSUB	THUIABI
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	3.000	27.000
MEAN	0.000	0.250	0.050	0.900	1.600
MEDIAN	0.000	0.000	0.000	1.000	0.000

	TORTFRA	TORTNOR	TORTRUR	TORTTOR	TRISSPI
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	0.000	30.000	1.000	3.000
MEAN	0.250	0.000	3.800	0.050	0.350
MEDIAN	0.000	0.000	1.000	0.000	0.000

	TROLALB	UMBIHYP	UMBIPRO	VACCSCO	VAHLATR
N OF CASES	20	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	0.000	0.000
MEAN	0.000	0.000	0.050	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VALESIT	VEROALP	XANTELE	ZIGAELE
N OF CASES	20	20	20	20
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	0.000
MEAN	0.000	0.000	0.250	0.000
MEDIAN	0.000	0.000	0.000	0.000

Group 52

TOTAL OBSERVATIONS: 22

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	4.000	0.000	1.000	2.000	1.000
MEAN	0.182	0.000	0.045	0.682	0.091
MEDIAN	0.000	0.000	0.000	1.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	1.000	15.000
MEAN	0.000	0.227	0.045	0.045	1.227
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	2.000	1.000	0.000	0.000
MEAN	0.000	0.227	0.045	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	0.000	0.000	0.000	0.000
MEAN	0.318	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	1.000	0.000
MEAN	0.000	0.000	0.273	0.227	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	1.000
MEAN	0.045	0.000	0.000	0.000	0.182
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	1.000	5.000	0.000	0.000
MEAN	0.773	0.045	0.455	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	5.000	10.000	15.000
MEAN	0.273	0.000	0.591	1.318	1.727
MEDIAN	0.000	0.000	0.000	1.000	1.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	20.000	10.000	0.000	0.000
MEAN	0.864	3.455	1.273	0.000	0.000
MEDIAN	0.000	1.000	0.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	22	22	22	22	22

MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	3.000	1.000
MEAN	0.000	0.045	0.364	0.318	0.136
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	2.000	1.000	3.000
MEAN	0.000	0.591	0.227	0.227	0.136
MEDIAN	0.000	1.000	0.000	0.000	0.000

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	1.000	0.000
MEAN	0.045	0.000	0.000	0.045	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	0.000	20.000
MEAN	0.091	0.227	0.182	0.000	2.409
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	40.000	10.000	1.000	5.000	0.000
MEAN	15.273	2.136	0.318	0.227	0.000
MEDIAN	15.000	0.000	0.000	0.000	0.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	5.000
MEAN	0.000	0.000	0.000	0.136	0.273
MEDIAN	0.000	0.000	0.000	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	7.000	5.000
MEAN	0.045	0.045	0.273	0.773	0.500
MEDIAN	0.000	0.000	0.000	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU	KOBRMYO
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	15.000
MAXIMUM	20.000	0.000	10.000	0.000	60.000

MEAN	1.455	0.000	0.818	0.000	30.227
MEDIAN	0.000	0.000	0.000	0.000	27.500

	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC	LUZUPIP
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	0.000	0.000
MEAN	0.182	0.045	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LUZUSPI	LYCOALP	MINUOBT	MINURUB	MYOSALP
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	1.000	5.000
MEAN	0.227	0.000	0.045	0.227	0.682
MEDIAN	0.000	0.000	0.000	0.000	0.000

	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE	PEDIARC
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	5.000	15.000	0.000	1.000
MEAN	0.364	0.455	2.318	0.000	0.091
MEDIAN	0.000	0.000	1.000	0.000	0.000

	PEDIBRA	PELTAPH	PELTCAN	PELTRUF	PELTSPP
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	1.000	0.000
MEAN	0.000	0.045	0.045	0.227	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA	PHYSMUS
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	1.000
MEAN	0.227	0.000	0.000	0.000	0.455
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POAALP	POASPP	POGOALP	POLYJUN	POLYPIL
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	4.000	0.000	0.000	0.000
MEAN	0.045	0.227	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POLYSPP	POLYVIV	POTEDIV	POTEFRU	POTENIV
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	10.000	5.000	6.000	3.000
MEAN	0.000	2.455	1.091	0.955	0.591
MEDIAN	0.000	1.000	0.500	0.000	0.000

	PSEUPUB	PSEURAD	RANUESC	RHIZGEO	RHYTRUG
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	5.000	1.000
MEAN	0.000	0.000	0.000	0.364	0.182
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SALIARC	SALIBAA	SALIGLA	SALIRET	SAXIBRO
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	10.000	10.000	0.000
MEAN	0.000	0.045	1.500	1.636	0.000
MEDIAN	0.000	0.000	0.000	1.000	0.000

	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN	SENELUG
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	3.000	1.000	3.000	1.000
MEAN	0.227	0.273	0.136	0.864	0.091
MEDIAN	0.000	0.000	0.000	1.000	0.000

	SENETRI	SIBBPRO	SILEACA	SMELCAL	SOLIMUL
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	15.000	5.000	1.000
MEAN	0.000	0.000	1.773	0.318	0.545
MEDIAN	0.000	0.000	1.000	0.000	1.000

	SOLOCRO	STERALP	STERSPP	THAMSUB	THUIABI
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	8.000	1.000
MEAN	0.000	0.045	0.000	1.227	0.136
MEDIAN	0.000	0.000	0.000	1.000	0.000

	TORTFRA	TORTNOR	TORTRUR	TORTTOR	TRISSPI
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	5.000	1.000	1.000
MEAN	0.227	0.000	0.909	0.045	0.227
MEDIAN	0.000	0.000	1.000	0.000	0.000

	TROLALB	UMBIHYP	UMBIPRO	VACCSCO	VAHLATR
N OF CASES	22	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	0.000	1.000
MEAN	0.000	0.091	0.045	0.000	0.045
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VALESIT	VEROALP	XANTELE	ZIGAELE

N OF CASES	22	22	22	22
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	6.000
MEAN	0.000	0.045	0.091	0.318
MEDIAN	0.000	0.000	0.000	0.000

Group 55

TOTAL OBSERVATIONS: 8

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	0.000	0.000	3.000	0.000
MEAN	0.625	0.000	0.000	1.000	0.000
MEDIAN	0.500	0.000	0.000	1.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	20.000
MAXIMUM	2.000	0.000	0.000	1.000	50.000
MEAN	0.250	0.000	0.000	0.125	31.250
MEDIAN	0.000	0.000	0.000	0.000	27.500

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	0.000	0.000
MEAN	0.000	0.125	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	0.000
MEAN	0.125	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	2.000	0.000	0.000
MEAN	0.000	0.000	0.500	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	10.000	0.000	3.000
MEAN	0.000	0.000	1.250	0.000	0.625
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	0.000	0.000
MEAN	0.250	0.125	0.125	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	1.000	1.000
MEAN	0.125	0.000	0.500	0.500	0.125
MEDIAN	0.000	0.000	0.500	0.500	0.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	0.000	0.000
MEAN	0.125	0.375	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	1.000
MEAN	0.000	0.000	0.000	0.000	0.125
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	0.000	0.000
MEAN	0.000	0.250	0.125	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI

N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	20.000	20.000	0.000	2.000	0.000
MEAN	5.250	7.875	0.000	0.250	0.000
MEDIAN	3.000	7.000	0.000	0.000	0.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	1.000
MEAN	0.000	0.000	0.000	0.000	0.125
MEDIAN	0.000	0.000	0.000	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	8.000	0.000	2.000	0.000	5.000
MEAN	1.000	0.000	0.625	0.000	0.625
MEDIAN	0.000	0.000	0.500	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU	KOBRMYO
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	9.000	0.000	0.000	0.000	20.000
MEAN	3.125	0.000	0.000	0.000	4.625
MEDIAN	1.500	0.000	0.000	0.000	0.000

	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC	LUZUPIP
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LUZUSPI	LYCOALP	MINUOBT	MINURUB	MYOSALP
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	1.000
MEAN	0.000	0.000	0.000	0.250	0.125
MEDIAN	0.000	0.000	0.000	0.000	0.000

	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE	PEDIARC
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	3.000	1.000	0.000	0.000
MEAN	0.125	0.625	0.125	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PEDIBRA	PELTAPH	PELTCAN	PELTRUF	PELTSPP
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	1.000

MEAN	0.000	0.000	0.000	0.125	0.125
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA	PHYSMUS
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	0.000
MEAN	0.000	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POAALP	POASPP	POGOALP	POLYJUN	POLYPIL
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	1.000	0.000
MEAN	0.125	0.000	0.000	0.125	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POLYSPP	POLYVIV	POTEDIV	POTEFRU	POTENIV
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	5.000	1.000	5.000	1.000
MEAN	0.000	1.000	0.250	2.125	0.250
MEDIAN	0.000	0.000	0.000	1.500	0.000

	PSEUPUB	PSEURAD	RANUESC	RHIZGEO	RHYTRUG
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	0.000
MEAN	0.000	0.000	0.000	0.125	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SALIARC	SALIBAA	SALIGLA	SALIRET	SAXIBRO
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	5.000	5.000	0.000	0.000
MEAN	0.000	0.625	1.250	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN	SENELUG
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	0.000
MEAN	0.000	0.000	0.000	0.250	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SENETRI	SIBBPRO	SILEACA	SMELCAL	SOLIMUL
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	0.000	1.000
MEAN	0.000	0.000	0.125	0.000	0.250
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SOLOCRO	STERALP	STERSPP	THAMSUB	THUIABI
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	0.000
MEAN	0.000	0.000	0.000	0.375	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TORTFRA	TORTNOR	TORTRUR	TORTTOR	TRISSPI
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	3.000	1.000	3.000
MEAN	0.250	0.000	0.625	0.125	0.500
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TROLALB	UMBIHYP	UMBIPRO	VACCSCO	VAHLATR
N OF CASES	8	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	2.000
MEAN	0.000	0.000	0.000	0.000	0.250
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VALESIT	VEROALP	XANTELE	ZIGAELE
N OF CASES	8	8	8	8
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	4.000
MEAN	0.000	0.000	0.000	1.000
MEDIAN	0.000	0.000	0.000	0.500

Group 70

TOTAL OBSERVATIONS: 42

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	0.000	0.000
MEAN	0.000	0.024	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	15.000	3.000	20.000	0.000	0.000
MEAN	0.738	0.071	4.071	0.000	0.000
MEDIAN	0.000	0.000	2.000	0.000	0.000

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	10.000	1.000	10.000

MEAN	0.024	0.000	0.690	0.024	1.071
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	40.000	15.000	1.000
MEAN	0.071	0.000	1.429	0.786	0.048
MEDIAN	0.000	0.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	0.000	9.000
MEAN	0.048	0.000	0.095	0.000	0.238
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	2.000	1.000
MEAN	0.024	0.000	0.000	0.262	0.024
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	5.000	0.000
MAXIMUM	3.000	5.000	3.000	85.000	10.000
MEAN	0.119	0.333	0.214	43.452	0.357
MEDIAN	0.000	0.000	0.000	45.000	0.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	0.000	0.000	2.000
MEAN	0.214	0.071	0.000	0.000	0.238
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	0.000	0.000	1.000	1.000
MEAN	0.571	0.000	0.000	0.143	0.119
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	6.000	20.000	5.000	1.000
MEAN	0.881	0.476	0.595	0.214	0.024
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	9.000	0.000	1.000	0.000	0.000
MEAN	0.429	0.000	0.048	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	14.000	1.000	30.000	5.000
MEAN	0.214	0.690	0.024	2.357	0.214
MEDIAN	0.000	0.000	0.000	1.000	0.000

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	5.000	0.000
MEAN	0.000	0.071	0.024	0.167	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	30.000	0.000	0.000	0.000	1.000
MEAN	0.833	0.000	0.000	0.000	0.071
MEDIAN	0.000	0.000	0.000	0.000	0.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	10.000	0.000	1.000
MEAN	0.048	0.048	0.929	0.000	0.048
MEDIAN	0.000	0.000	0.000	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	2.000	1.000	0.000	0.000
MEAN	0.000	0.452	0.024	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU	KOBRMYO
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	8.000	0.000	5.000	0.000
MEAN	0.000	0.810	0.000	0.214	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC	LUZUPIP
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	12.000	5.000
MEAN	0.000	0.119	0.214	1.429	0.881
MEDIAN	0.000	0.000	0.000	0.000	1.000

	LUZUSPI	LYCOALP	MINUOBT	MINURUB	MYOSALP
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	1.000	1.000	0.000	3.000
MEAN	0.119	0.238	0.024	0.000	0.214
MEDIAN	0.000	0.000	0.000	0.000	0.000

	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE	PEDIARC
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	1.000	1.000
MEAN	0.000	0.000	0.000	0.167	0.024
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PEDIBRA	PELTAPH	PELTCAN	PELTRUF	PELTSPP
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	1.000	1.000	1.000
MEAN	0.476	0.238	0.024	0.167	0.071
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA	PHYSMUS
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	25.000	20.000	0.000
MEAN	0.000	0.095	6.381	6.167	0.000
MEDIAN	0.000	0.000	5.000	4.000	0.000

	POAALP	POASPP	POGOALP	POLYJUN	POLYPIL
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	3.000	1.000	25.000	20.000
MEAN	0.143	0.357	0.048	1.310	0.881
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POLYSPP	POLYVIV	POTEDIV	POTEFRU	POTENIV
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	2.000	1.000	0.000	0.000
MEAN	0.048	0.214	0.143	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PSEUPUB	PSEURAD	RANUESC	RHIZGEO	RHYTRUG

N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	5.000	14.000	3.000	0.000
MEAN	0.000	0.452	0.405	0.190	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SALIARC	SALIBAA	SALIGLA	SALIRET	SAXIBRO
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	30.000	0.000	0.000	5.000	0.000
MEAN	3.738	0.000	0.000	0.190	0.000
MEDIAN	1.000	0.000	0.000	0.000	0.000

	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN	SENELUG
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	0.000	0.000	3.000	1.000
MEAN	0.048	0.000	0.000	0.167	0.024
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SENETRI	SIBBPRO	SILEACA	SMELCAL	SOLIMUL
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	1.000	1.000	0.000	1.000
MEAN	0.524	0.381	0.024	0.000	0.048
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SOLOCRO	STERALP	STERSPP	THAMSUB	THUIABI
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	3.000	10.000	0.000	0.000
MEAN	0.262	0.119	0.238	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TORTFRA	TORTNOR	TORTRUR	TORTTOR	TRISSPI
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	15.000	1.000	1.000	1.000
MEAN	0.000	0.667	0.071	0.024	0.024
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TROLALB	UMBIHYP	UMBIPRO	VACCSCO	VAHLATR
N OF CASES	42	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	6.000	2.000	0.000	10.000	1.000
MEAN	0.310	0.071	0.000	0.786	0.167
MEDIAN	0.000	0.000	0.000	0.000	0.000

	VALESIT	VEROALP	XANTELE	ZIGAELE
N OF CASES	42	42	42	42
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	15.000	4.000	0.000	0.000

MEAN	0.881	0.286	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000

Group 97

TOTAL OBSERVATIONS: 12

	ACHIMIL	AGOSGLA	ALECOCH	ANDRCHA	ANEMLIT
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	0.000	0.000	1.000
MEAN	0.417	0.083	0.000	0.000	0.167
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ANEMOCC	ANEMPAR	ANTELAN	ANTEPAR	ARCTUVA
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	1.000	1.000	10.000
MEAN	0.000	0.417	0.417	0.083	0.833
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ARENCAP	ARNIANG	ARNILAT	ARNIMOL	ARTENOR
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	1.000	0.000	7.000
MEAN	0.083	0.000	0.083	0.000	0.750
MEDIAN	0.000	0.000	0.000	0.000	0.000

	ASTRALP	AULAPAL	BARBLYC	BARBSPP	BRACGRO
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	10.000	1.000	0.000	5.000	5.000
MEAN	1.417	0.083	0.000	0.500	0.417
MEDIAN	0.500	0.000	0.000	0.000	0.000

	BRACSPP	BRYUPSE	BRYUSPP	CALOJUN	CALTLEP
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	1.000	0.000	0.000
MEAN	0.333	0.167	0.167	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CAREALB	CAREATS	CARENAR	CARENIG	CARERUP
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	1.000	0.000	1.000	0.000
MEAN	0.417	0.083	0.000	0.083	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CARESCI	CARESPE	CARESPP	CASSMER	CASSTET

N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	20.000	0.000	5.000	0.000	3.000
MEAN	2.250	0.000	0.667	0.000	0.333
MEDIAN	0.500	0.000	0.000	0.000	0.000

	CASTOCC	CASTRAU	CERAARV	CETRCUC	CETRERI
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	0.000	1.000	1.000	1.000
MEAN	0.417	0.000	0.167	0.083	0.083
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CETRISL	CETRNIV	CETRTIL	CLADCAN	CLADCOC
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	0.000
MEAN	0.417	0.000	0.000	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLADECM	CLADMIT	CLADPYX	CLADSPP	CLADSQU
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	2.000	1.000	0.000
MEAN	0.000	0.000	0.417	0.167	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	CLAYLAN	COELACU	DACTARC	DACTRAM	DELPGLA
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	0.000	1.000
MEAN	0.083	0.000	0.000	0.000	0.417
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DESMLAT	DICRBRE	DICRMUE	DICRSCO	DICRSPP
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	0.000	0.000	10.000	5.000
MEAN	0.417	0.000	0.000	0.833	0.500
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DISTCAP	DITRFLE	DRABSPP	DREPUNC	DRYAINT
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	5.000	2.000	0.000	0.000
MEAN	0.000	0.667	0.167	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	DRYAOCT	ELYMINN	ENCARHA	EPILANG	EQUISCI
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	35.000	17.000	0.000	4.000	5.000

MEAN	7.583	1.833	0.000	0.583	1.000
MEDIAN	0.000	0.000	0.000	0.000	1.000

	EQUIVAR	ERIGAUR	ERIGPER	FESTBRA	FESTSAX
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	1.000	10.000	0.000	1.000
MEAN	0.083	0.083	1.833	0.000	0.083
MEDIAN	0.000	0.000	0.500	0.000	0.000

	FESTSPP	GENTGLA	GENTPRP	HEDYALP	HEDYBOR
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	1.000	8.000	0.000
MEAN	0.167	0.167	0.250	1.083	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	HEDYSUL	HIERTRI	HYPNREV	JUNCDRU	KOBRMYO
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	5.000	0.000	1.000	1.000	25.000
MEAN	0.500	0.000	0.167	0.083	2.417
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LECAEPI	LEPRNEG	LOPHSPP	LUETPEC	LUZUPIP
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	0.000	0.000	1.000
MEAN	0.000	0.000	0.000	0.000	0.167
MEDIAN	0.000	0.000	0.000	0.000	0.000

	LUZUSPI	LYCOALP	MINUOBT	MINURUB	MYOSALP
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	0.000	3.000
MEAN	0.000	0.000	0.167	0.000	0.500
MEDIAN	0.000	0.000	0.000	0.000	0.000

	OCHRUPS	OXYTCUS	OXYTPOD	PARAENE	PEDIARC
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	0.000	0.000
MEAN	0.000	0.000	0.083	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	PEDIBRA	PELTAPH	PELTCAN	PELTRUF	PELTSPP
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	15.000	1.000	2.000	2.000	0.000
MEAN	1.750	0.167	0.333	0.667	0.000
MEDIAN	1.000	0.000	0.000	0.500	0.000

	PELTSPU	PHLECOM	PHYLEMP	PHYLGLA	PHYSMUS
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	35.000	0.000	10.000	0.000
MEAN	0.000	3.833	0.000	2.833	0.000
MEDIAN	0.000	0.000	0.000	1.000	0.000

	POAALP	POASPP	POGOALP	POLYJUN	POLYPIL
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	2.000	3.000	1.000	5.000	0.000
MEAN	0.417	0.417	0.083	0.750	0.000
MEDIAN	0.000	0.000	0.000	0.000	0.000

	POLYSPP	POLYVIV	POTEDIV	POTEFRU	POTENIV
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	5.000	5.000	15.000	0.000
MEAN	0.000	1.333	1.500	2.917	0.000
MEDIAN	0.000	1.000	1.000	0.000	0.000

	PSEUPUB	PSEURAD	RANUESC	RHIZGEO	RHYTRUG
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	0.000	2.000
MEAN	0.000	0.000	0.250	0.000	0.167
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SALIARC	SALIBAA	SALIGLA	SALIRET	SAXIBRO
N OF CASES	12	12	12	12	12
MINIMUM	0.000	20.000	0.000	0.000	0.000
MAXIMUM	3.000	40.000	35.000	10.000	0.000
MEAN	0.500	29.167	5.917	2.333	0.000
MEDIAN	0.000	27.500	0.500	0.500	0.000

	SAXIOCC	SAXIOPP	SEDUSTE	SELADEN	SENELUG
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	0.000	1.000	1.000	2.000
MEAN	0.000	0.000	0.083	0.167	0.250
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SENETRI	SIBBPRO	SILEACA	SMELCAL	SOLIMUL
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	3.000	1.000	1.000	0.000	5.000
MEAN	0.333	0.333	0.167	0.000	0.667
MEDIAN	0.000	0.000	0.000	0.000	0.000

	SOLOCRO	STERALP	STERSPP	THAMSUB	THUIABI
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	0.000	1.000	0.000	0.000	20.000
MEAN	0.000	0.083	0.000	0.000	1.667
MEDIAN	0.000	0.000	0.000	0.000	0.000

	TORTFRA	TORTNOR	TORTRUR	TORTTOR	TRISSPI
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	1.000	10.000	15.000	1.000	20.000
MEAN	0.167	1.333	2.083	0.167	2.083
MEDIAN	0.000	0.500	0.000	0.000	0.000

	TROLALB	UMBIHYP	UMBIPRO	VACCSCO	VAHLATR
N OF CASES	12	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000	0.000
MAXIMUM	20.000	0.000	0.000	5.000	0.000
MEAN	3.250	0.000	0.000	0.583	0.000
MEDIAN	0.500	0.000	0.000	0.000	0.000

	VALESIT	VEROALP	XANTELE	ZIGAELE
N OF CASES	12	12	12	12
MINIMUM	0.000	0.000	0.000	0.000
MAXIMUM	2.000	1.000	0.000	0.000
MEAN	0.417	0.167	0.000	0.000
MEDIAN	0.000	0.000	0.000	0.000

Appendix 3c. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%). **Bolded** species in the association name are always present. **Group 1**, n=16. Association Name: ***Salix glauca***.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Achimil	1	0	5
Cetrisl	1	0	1
Elyminn	1.5	0	20
Polyviv	1	0	2
Potediv	1	0	6
Saligla	22.5	5	75
Tortrur	1	0	15

Appendix 3d. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%). **Bolded** species in the association name are always present. **Group 2**, n=16. Association Name: ***Salix reticulata***.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Cetrniv	1	0	8
Cladpyx	1	0	2
Dryaoct	3	0	35
Oxytpod	1	0	12
Polyviv	2.5	0	8
Saliarc	1.5	0	15
Saliret	20	5	70
Sileaca	1	0	12
Thamsub	1	0	3
Tortrur	1	0	5

Appendix 3e. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%). **Bolded** species in the association name are always present. **Group 3**, n=99. Association Name: ***Dryas octopetala***.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Cetrcuc	1	0	10
Cetreri	1	0	10

Cetrniv	1	0	10
Dryaoct	33	6	80
Polyviv	1	0	10
Potediv	1	0	5
Saliret	2	0	28
Sileaca	1	0	10
Thamsub	1	0	5

Appendix 3f. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%)**. Bolded** species in the association name are always present. **Group 5**, n=7. Association Name: ***Elymus innovatus***.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Achimil	1	0	3
Cetrniv	1	0	1
Elyminn	25	10	55
Minurub	1	0	1
Potediv	1	0	8
Tortrur	1	0	5

Appendix 3g. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%)**. Bolded** species in the association name are always present. **Group 6**, n=21. Association Name: ***Antennaria lanata***.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Antelan	28	8	60
Castocc	1	0	5
Erigper	1	0	28
Luzupip	1	0	10
Phlecom	1	0	4
Phylgla	9	0	35
Potediv	1	0	5
Saliarc	5	0	17
Sibbpro	1	0	10

Appendix 3h. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%). **Bolded** species in the association name are always present. **Group 9**, n=11. Association Name: ***Aulacomnium palustre***.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Agosgla	1	0	3
Antelan	1	0	15
Aulapal	60	32	90
Bryupse	1	0	3
Caltlep	1	0	10
Carenig	1	0	20
Erigper	8	0	15
Luzupip	1	0	10
Pedibra	1	0	10
Phlecom	1	0	12
Polyviv	1	0	4
Ranuesc	1	0	4
Saliarc	2	0	25
Salibaa	20	0	75
Senetri	3	0	15
Sibbpro	1	0	5
Trolalb	9	0	40

Appendix 3i. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%). **Bolded** species in the association name are always present. **Group 12**, n=67. Association Name: ***Phyllodoce glanduliflora***.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Antelan	3	0	30
Cassmer	2	0	55
Phylgla	40	20	70
Potediv	1	0	2
Saliarc	5	0	25
Saliret	1	0	20
Sibbpro	1	0	5

Appendix 3j. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%). **Bolded** species in the association name are always present. **Group 19**, n=22. Association Name: ***Salix arctica***.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Castocc	1	0	20
Polyviv	1	0	15
Potediv	1	0	5
Saliarc	30	20	55

Appendix 3k. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%). **Bolded** species in the association name are always present. **Group 20**, n=10. Association Name: ***Carex nigricans.***

Species Code	Median Cover	Minimum Cover	Maximum Cover
Antelan	1.5	0	40
Carenig	40	25	90
Luzupip	1	0	5
Saliarc	1	0	30

Appendix 3l. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%). **Bolded** species in the association name are always present. **Group 21**, n=3. Association Name: ***Selaginella densa***.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Andrcha	1	0	1
Caresci	1	0	5
Castocc	1	0	1
Dryaoct	1	0	3
Potediv	1	0	2
Saliarc	1	0	4
Saliret	1	0	1
Saxiopp	1	0	1
Seladen	1	1	1
Sileaca	1	0	1
Tortrur	1	0	1
Trisspi	1	0	1

Appendix 3m. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%). **Bolded** species in the association name are always present. **Group 22**, n=6. Association Name: *Phyllodoce empetriformis*.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Anemocc	5	0	8
Artenor	3	0	30
Cassmer	1.5	0	10
Castocc	1	0	2
Erigper	2	0	5
Phylemp	27.5	0	65
Potediv	1	0	2
Saliarc	4	0	20

Appendix 3n. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%). **Bolded** species in the association name are always present. **Group 25**, n=14. Association Name: *Salix arctica - Salix reticulata*.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Antelan	1	0	13
Artenor	1	0	5
Cetrisl	1	0	8
Gentgla	1	0	3
Luzupip	1	0	4
Saliarc	2	0	17
Saliret	2	0	15
Sibbpro	1	0	8

Appendix 3o. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%). **Bolded** species in the association name are always present. **Group 34**, n=15. Association Name: *Carex nardina / lichen*.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Carenar	1	0	70
Cetrniv	1	0	3
Cetrtil	1	0	3

Coelacu	1	0	1
Oxytpod	1	0	5
Polyviv	1	0	2
Saliret	1	0	7
Saxiopp	1	0	5
Sileaca	1	0	7
Thamsub	1	0	3

Appendix 3p. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%)**. Bolded** species in the association name are always present. **Group 35**, n=16. Association Name: ***Cassiope tetragona***.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Casstet	35	10	55
Castocc	1	0	5
Cetrisl	1	0	5
Dryaoct	13.5	0	40
Phylgla	1.5	0	25
Polyviv	1	0	5
Potediv	1	0	5
Saliarc	1.5	0	12
Saliret	3.5	0	30
Sileaca	1	0	8

Appendix 3q. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%)**. Bolded** species in the association name are always present. **Group 40**, n=20. Association Name: *Trollius albiflorus*.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Anemocc	1	0	20
Antelan	1	0	8
Caltlep	1.5	0	23
Cassmer	1	0	10
Erigper	10	0	20
Pedibra	1	0	15
Polyviv	1	0	20
Potediv	1	0	10
Saliarc	5	0	15
Senetri	2	0	20
Sibbpro	1	0	4
Trolalb	13.5	0	45
Valesit	2.5	0	20

Appendix 3r. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%). **Bolded** species in the association name are always present. **Group 50**, n=20. Association Name: *Dryas integrifolia* - **Silene acaulis**.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Cetrcuc	1	0	25
Cetreri	1	0	5
Cetrniv	1	0	10
Cetrtil	1	0	26
Coelacu	1	0	3
Dryaint	15	0	50
Dryaoct	2	0	20
Oxytpod	1.5	0	20
Polyviv	1	0	18
Saliret	2	0	15
Sileaca	1	1	5
Thamsub	1	0	3

Appendix 3s. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%). **Bolded** species in the association name are always present. **Group 52**, n=22. Association Name: ***Kobresia myosuroides***.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Andrcha	1	0	2
Cetrcuc	1	0	10
Cetreri	1	0	15
Cetrniv	1	0	20
Coelacu	1	0	1
Dryaoct	15	0	40
Kobrmyo	27.5	15	60
Oxytpod	1	0	15
Polyviv	1	0	10
Saliret	1	0	10
Seladen	1	0	3
Sileaca	1	0	15

Solimul	1	0	1
Tortrur	1	0	5

Appendix 3t. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%)**. Bolded** species in the association name are always present. **Group 55**, n=8. Association Name: ***Arctostaphylos uva-ursi***.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Andrcha	1	0	3
Arctuva	27.5	20	50
Dryaoct	3	0	20
Elyminn	7	0	20
Hedysul	1.5	0	9
Potefru	1.5	0	5

Appendix 3u. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%)**. Bolded** species in the association name are always present. **Group 70**, n=42. Association Name: ***Cassiope mertensiana***.

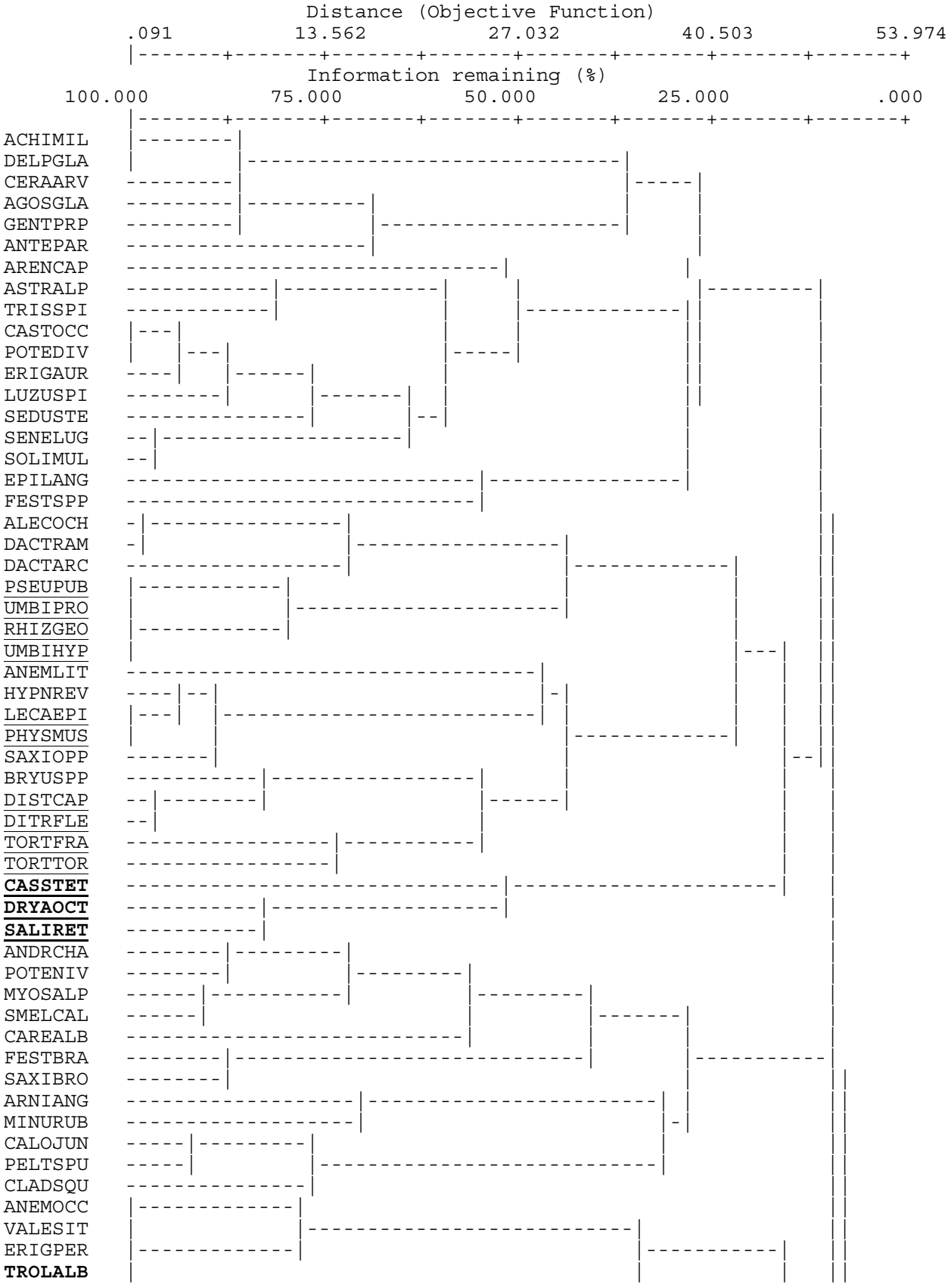
Species Code	Median Cover	Minimum Cover	Maximum Cover
Antelan	2	0	20
Cassmer	45	5	85
Dicrsco	1	0	30
Luzupip	1	0	5
Phylemp	5	0	25
Phylgla	4	0	20
Saliarc	1	0	30

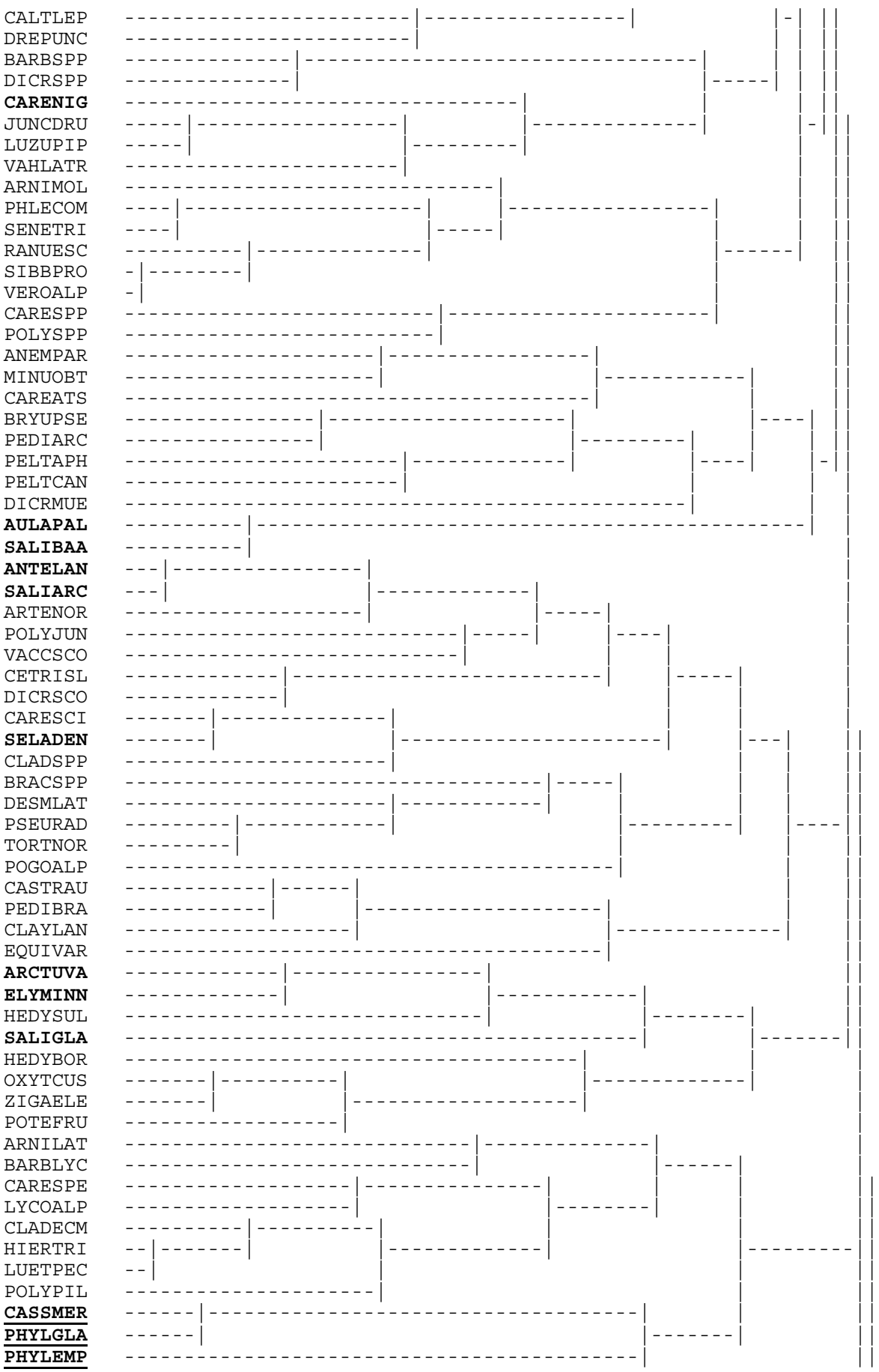
Appendix 3v. "Treeless high elevation" associations and cover values of dominant species (those with median cover values =/>1%)**. Bolded** species in the association name are always present. **Group 97**, n=12. Association Name: ***Salix barrattiana***.

Species Code	Median Cover	Minimum Cover	Maximum Cover
Pedibra	1	0	15
Phylgla	1	0	10
Polyviv	1	0	5

Potediv	1	0	5
Salibaa	27.5	20	40

Appendix 4. Cluster Analysis of species from treeless high elevation sites. SORENSEN (1-2W/A+B) DISTANCE, FARTHEST NEIGHBOR. Percent chaining = 4.60. Eponymous species of the cluster groups are **bolded**. Species clusters discussed in the text are underlined.

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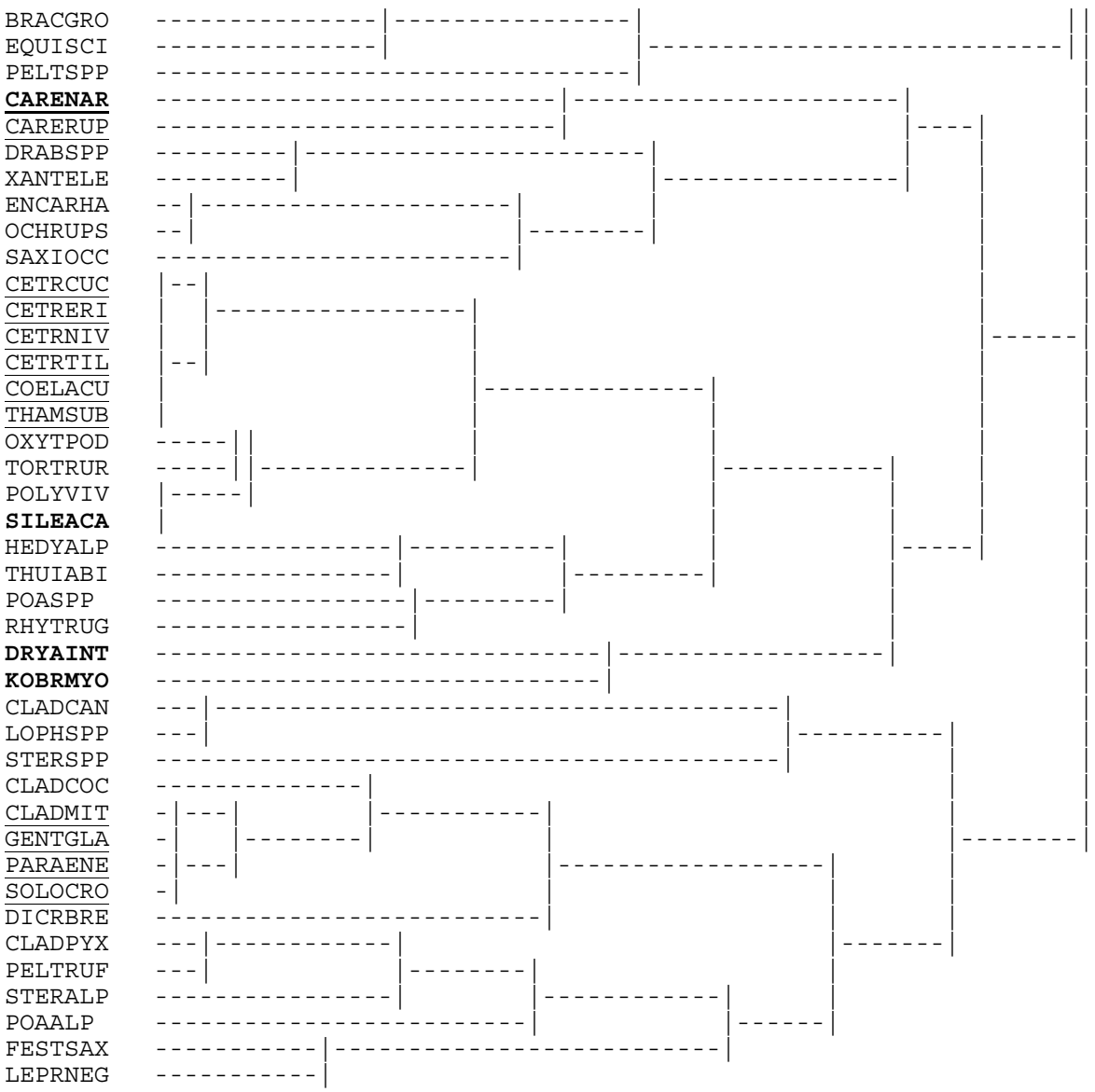
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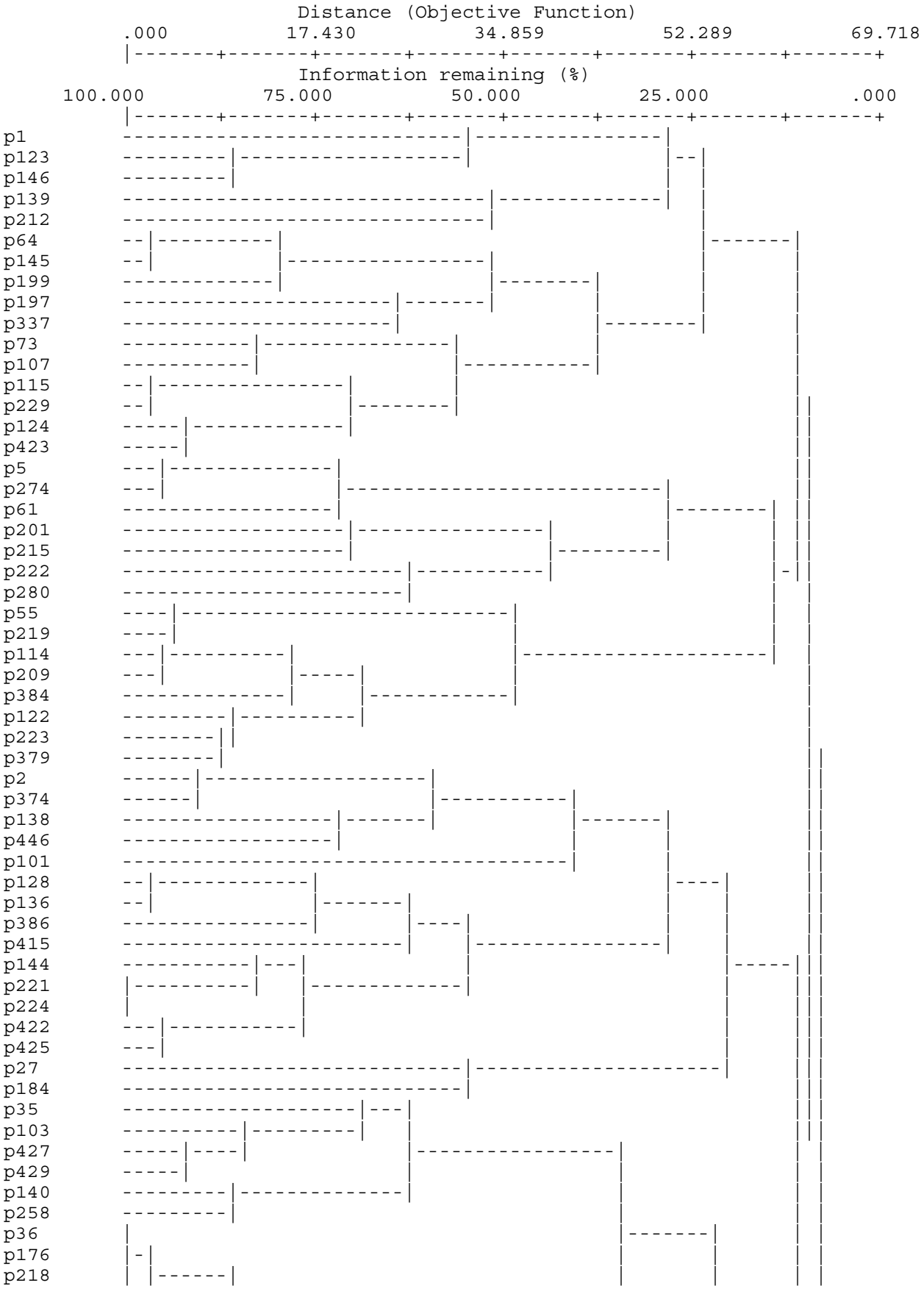
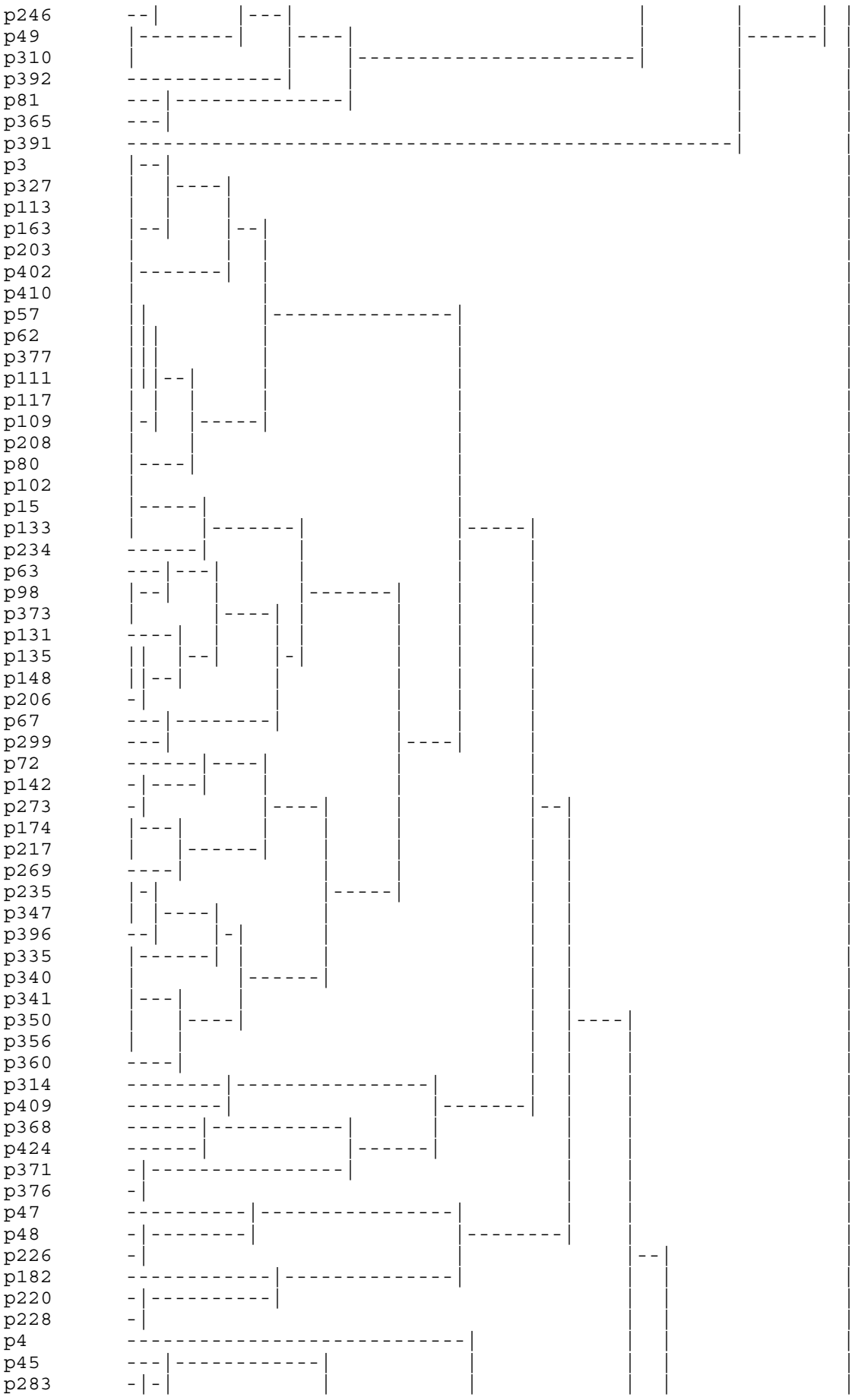
Appendix 5. CLUSTER ANALYSIS of plots from treeless high elevation sites.
SORENSEN (1-2W/A+B) DISTANCE, FARTHEST NEIGHBOR. Percent chaining = 1.99.

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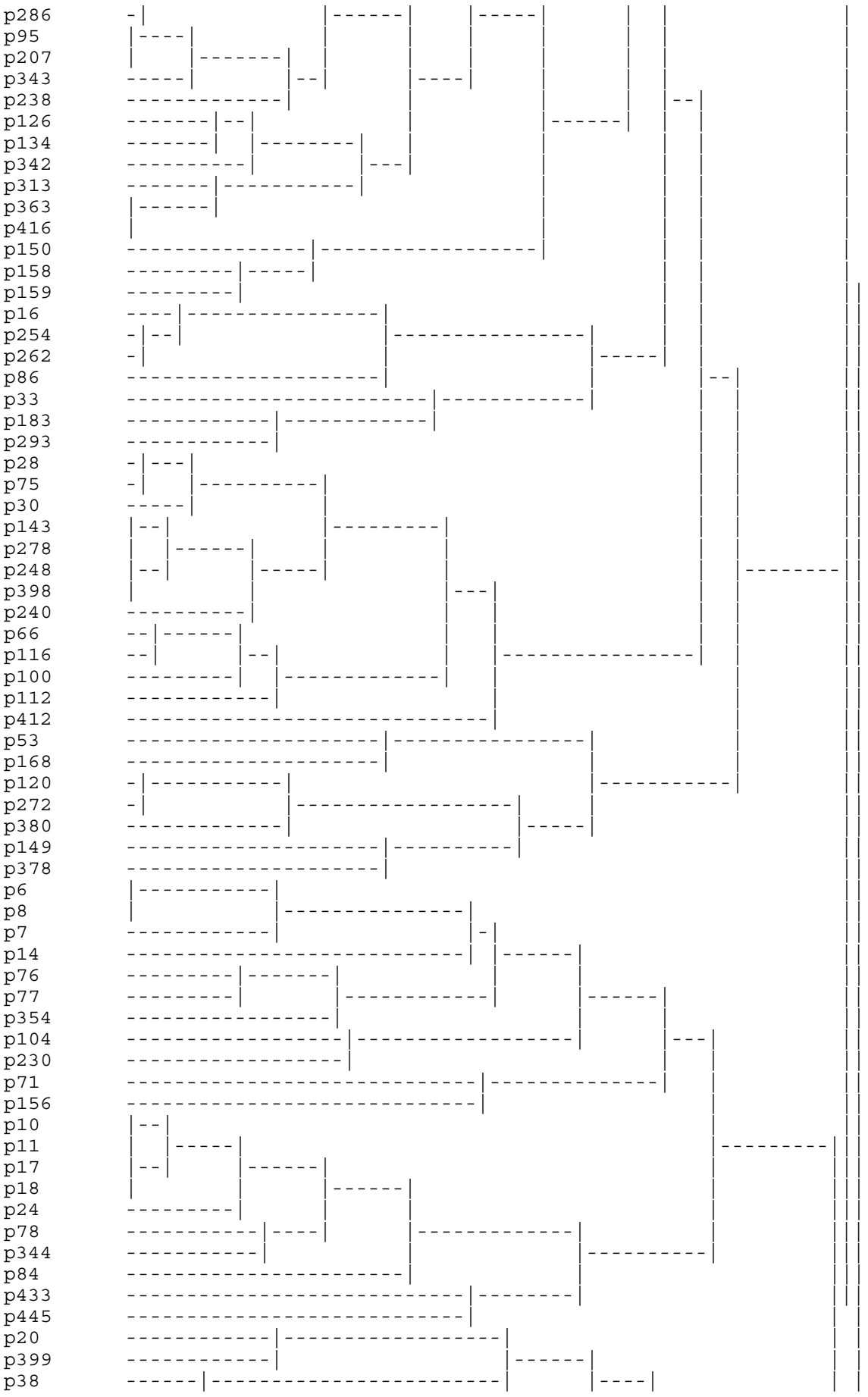
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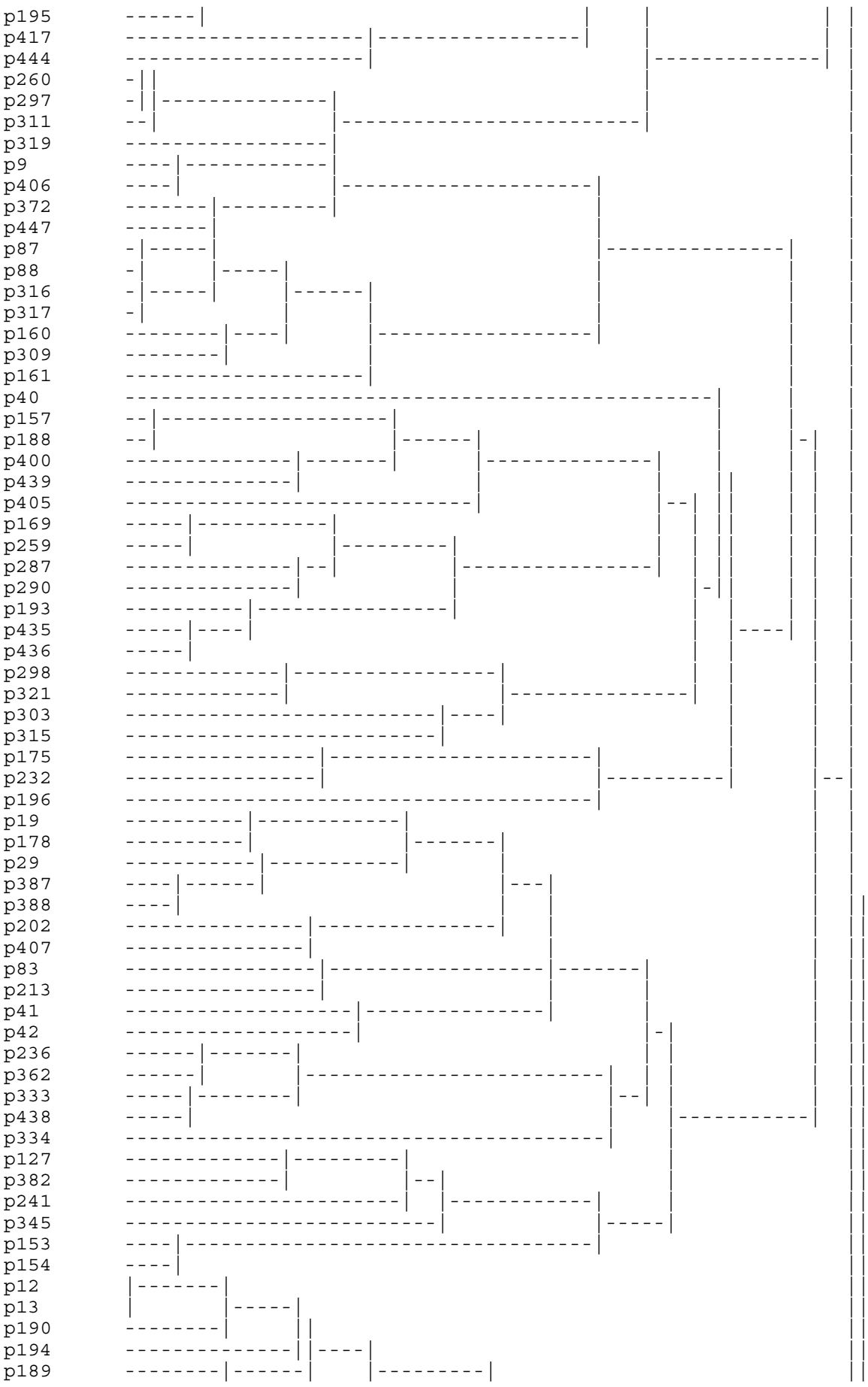
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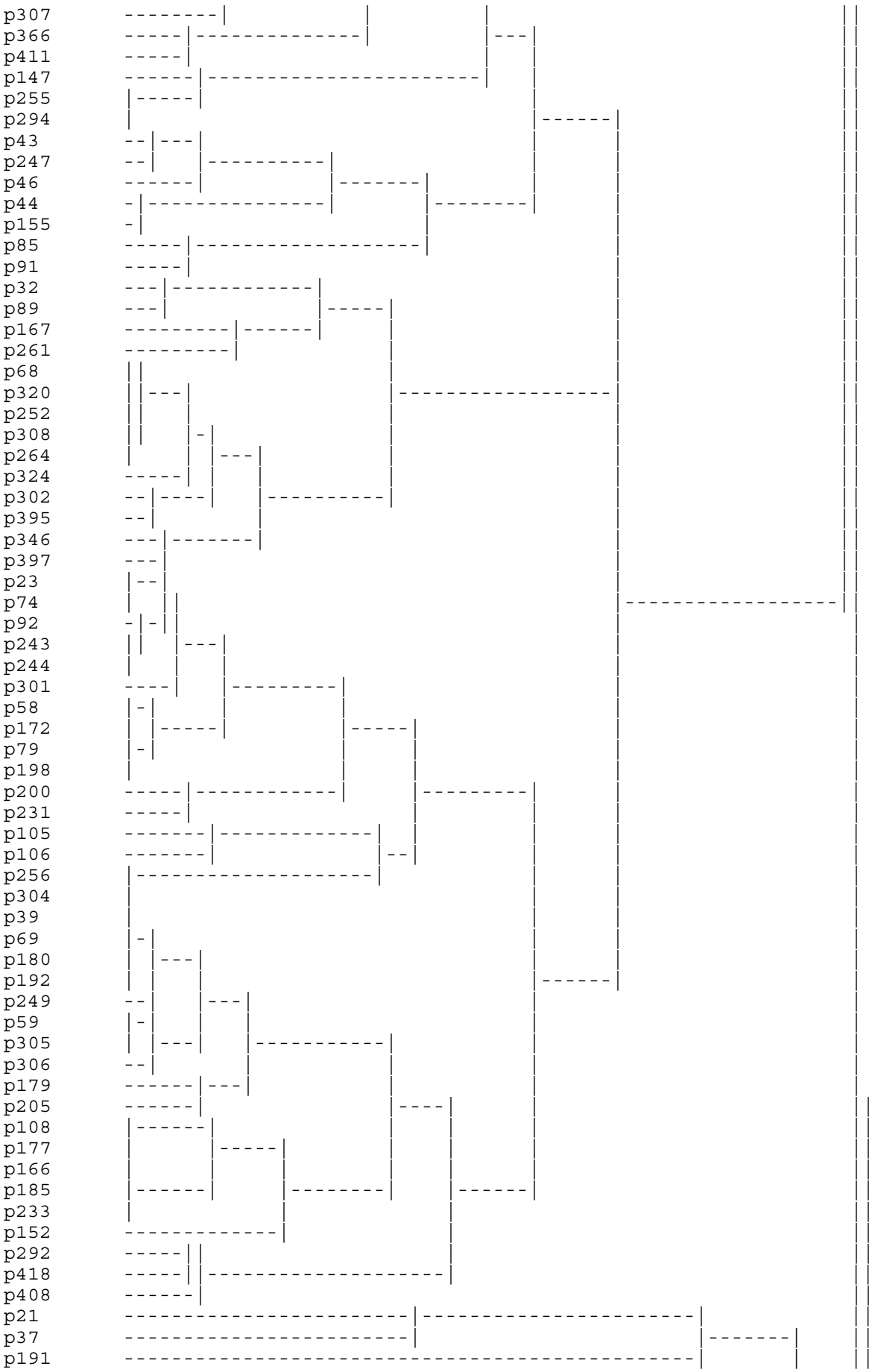
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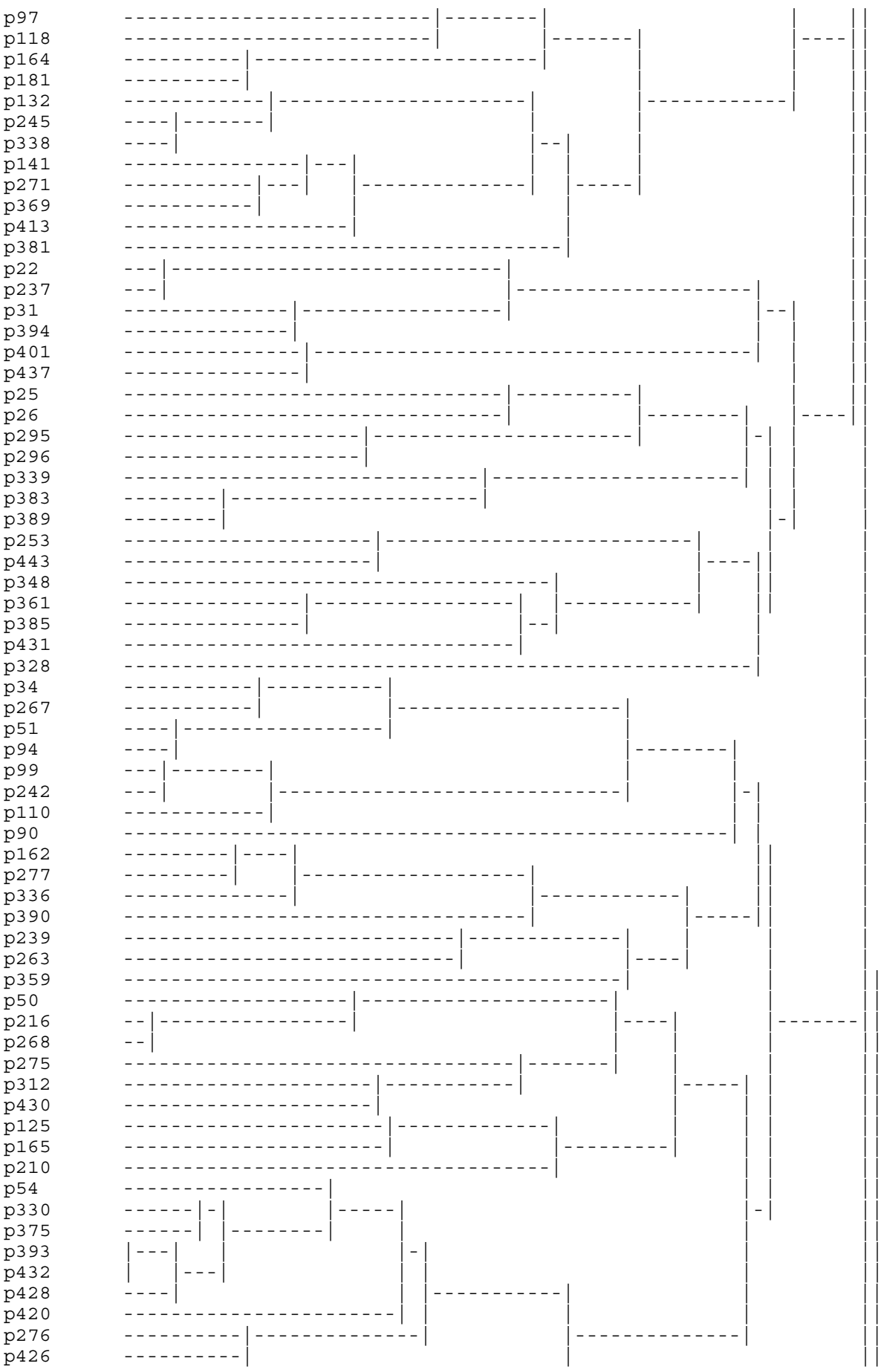
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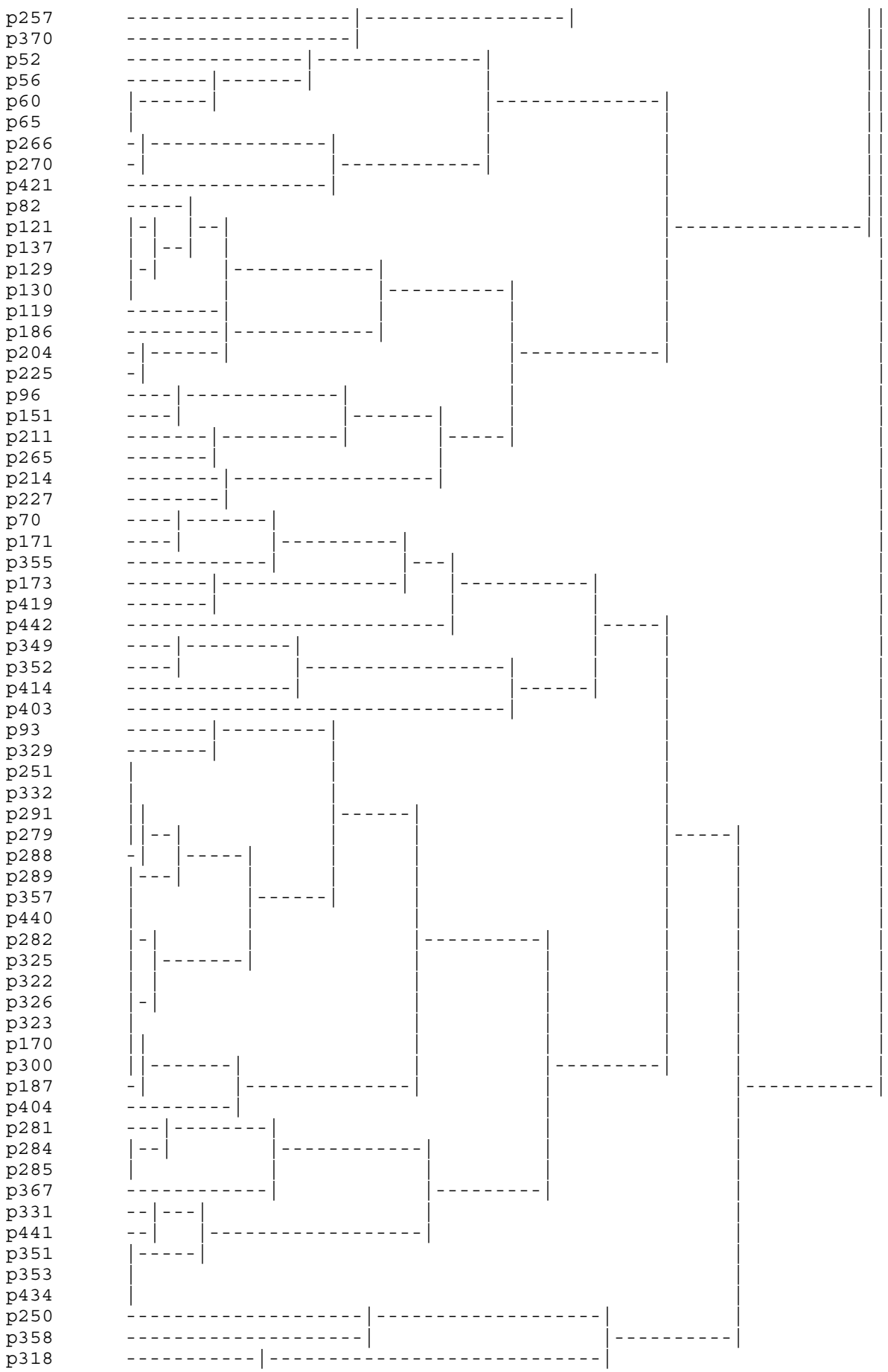
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Appendix 6. Community characterization abstracts for associations within the limber pine, whitebark pine, and alpine heath alliances or super-groups in Alberta.

Community characterization Abstract
Limber Pine

A. Identifiers

1. SELSUMMARY: The *Pseudotsuga menziesii - Pinus flexilis / Juniperis communis / Festuca scabrella* woodland (savannah) type is characteristic of montane sites in southwestern Alberta. It is found on moderate elevation crests and upper slopes that are rapidly to well-drained and subxeric in which bedrock is not close to the surface.
2. SNAME: *Pseudotsuga menziesii - Pinus flexilis / Juniperis communis / Festuca scabrella*
3. SCOMNAME: Douglas Fir - Limber Pine / Ground Juniper / Rough Fescue

B. Classification

1. SYSTEM: Terrestrial
2. CLASS: Woodland
3. SUBCLASS: Evergreen
4. GROUP: Needle-leaf
5. FORMATION: Rounded-crowns
6. ALLIANCE: *Pinus flexilis*
7. SSIMILAR.COMMUNITIES: *Pinus flexilis / Festuca idahoensis, Festuca scabrella* phase (Pfister et al. 1977); *Pinus flexilis / Festuca scabrella* (Bourgeron and Engelking 1994) outside Alberta.

C. Related Nomenclature

1. SOTHER.NAMES: *Pinus flexilis / Festuca scabrella* (Willoughby et al. 1997); *Pinus flexilis / Arctostaphylos uva-ursi* (Achuff et al. (1997) in Alberta.
2. SOTHERNAMES.RELATION: 1 | 1
3. SOTHERNAMES.RELATION.NOTE: none.
4. SNAMES.COM: This type and the *Pinus flexilis / Arctostaphylos uva-ursi - Juniperis horizontalis* type and other types described for SW Alberta do not appear to be separable into distinct associations. At one extreme are the types with significant grass and perhaps *Pseudotsuga* cover; at the other extreme are types with high cover of shrubs (*Arctostaphylos uva-ursi* and *Juniperis* spp.).

D. Distribution

1. SRANGE:
2. SRANGECOM: montane ecoregion of southwestern Alberta
3. SDISTRIBUTION.COM: may extend into lower subalpine

E. Environmental Factors

1. SMINELEV: 1475 m
2. SMAXELEV: 1845 m
3. SLANDFORM: colluvial, residual, morainal
4. STOPO.POSITION: crests, upper slopes
5. SSLOPE: 38% median (0-51%)
6. SASPECT: W
7. SGEOLOGY.COM:
8. SSOILTYPE: Orthic Regosols
9. SSOILMOISTURE: subxeric
10. SSOILCOM: may tend toward Chernozemic if grass cover is high and soil deep
11. SHYDRO.INFLUENCE: apparently soils are deeper and moister in this type than in the *Pinus flexilis / Arctostaphylos uva-ursi - Juniperis horizontalis* type
12. SSEASONAL.VAR:
13. SKEY.ENVIRO.FACTORS: deeper soils and less wind exposure than typical of limber pine associations
14. SENVIRO.COM: subxeric, submesotrophic; bedrock not at surface

F. Biological and Structural Description

F.a. Vegetation

1. SSTRATA.LIFEFORM: tree, shrub, grass, herb, bryoid
2. SPCT.COVER: tree >30%; shrub >12%; grass >5% (up to 95%); herb>8%; bryoid >7%
3. SHEIGHT:

4. SMOST.ABUND.SPP: *Pseudotsuga menziesii, Pinus flexilis; Juniperis communis, Arctostaphylos uva-ursi; Festuca scabrella*, *Elymus innovatus, Tortula ruralis*
5. SUNVEGETATED.SURFACE: decaying wood
6. SUNVEGETATED.SURFACE.COVER: <5%
7. SCONSTANT.SPP: *Achillea millefolium, Allium cernuum, Fragaria virginiana, Galium boreale, Pinus flexilis*
8. SCHARACTERISTIC.SPP: *Festuca scabrella, Pseudotsuga menziesii*
9. SVEGETATION.COM: There are five strata in the type: tree >30%; shrub >12%; grass >5% (up to 95%); herb>8%; and bryoid >7%. *Pseudotsuga menziesii, Pinus flexilis; Juniperis communis, Arctostaphylos uva-ursi; Festuca scabrella*, *Elymus innovatus,* and *Tortula ruralis* are the most abundant species. Constant species are *Achillea millefolium, Allium cernuum, Fragaria virginiana, Galium boreale, Pinus flexilis. Festuca scabrella* and *Pseudotsuga menziesii* are characteristic. Decaying wood occupies <5%. There do not appear to be discrete associations within the limber pine alliance, but rather convenient abstractions along a continuum. The alliance is most closely-related to that of *Pseudotsuga menziesii*.
F.b. Other Species
1. SHIGH.RANK.SPP: none found.
2. SFAUNA.COM: blue grouse, mountain chickadee, Hammond's flycatcher, Clark's nutcracker, mule deer, elk, Columbian ground squirrel (Achuff 1994)
3. SOTHER.SPP.COM: *Cronartium ribicola* (white pine blister rust)
F.c. Variability
1.SSPP.COMP.VAR: see Timoney (1999, Appendix 1a); *Festuca scabrella* and *Pseudotsuga* cover are widely variable.
2.SPHYSIOG.VAR:
3. SSUBTYPES:
4. SVARIABILITY.COM:
G. Dynamic Processes:
1. SNAT.DISTURBANCE: High frequency, low intensity fire may be important in maintaining this type and in minimizing the potential for a high intensity burn; white pine blister rust causing decline.
2. SSUCCESS.STATUS: mature
3. SSUCCESS.DYNAM.COM:
H. Spatial Relations:
1. SSIZE:
2. SSPATIAL.DISTRIBUTION:
3. SADJACENT.COMMUNITIES: rough fescue (downslope)
4. SINCLUSION.COMMUNITIES: rough fescue
5. SMOSAIC.COM:
6. SSPATIAL.COM:
I. Status
1. SRANK: S2?
2. SREASONS: 5 ESIS plots; limited occurrence; declining due to white pine blister rust
3. SEXEMP.EO.SITENAME: ESIS plot 17SW60
4. SSTATCOM:
J. Management
1. SECONCOM: livestock grazing (1.2 Ha / AUM cited by Willoughby et al. 1997), watershed protection, habitat, recreation, and tourism
2. SMANAGE.COM: High frequency, low intensity fire may be important in maintaining this type and in minimizing the potential for a high intensity burn; white pine blister rust causing decline.
K. Inventory and Sampling Procedures
1. SIMAGERY.COM:
2. SSAMPLE.STRATEGY:
3. SINVENTORY.COM:
L. Analysis Procedures and Data Management
1. SANALYSIS.COM: association delineated through quantitative analysis of Alberta ESIS plots via cluster analysis, DCA, and statistics by Timoney (1999).
2. SANALYSIS.DATA.MANAGE.COM:
M. SCOMMUNITY.COM: Within the "Evergreen needle-leaved woodland with rounded crowns" (II.A.2.a) formation, Bourgeron and Engelking (1994) list 14

associations within the limber pine alliance. They are *Pinus flexilis / Arctostaphylos uva-ursi; Pinus flexilis / Calamagrostis purpurascens; Pinus flexilis / Cercocarpus ledifolius; Pinus flexilis / Festuca idahoensis; Pinus flexilis / Festuca scabrella; Pinus flexilis / Juniperis communis; Pinus flexilis / Juniperis osteosperma; Pinus flexilis / Juniperis scopulorum; Pinus flexilis / Leucopoa kingii* (= *Hesperochloa kingii*); *Pinus flexilis / Mahonia repens; Pinus flexilis / Potentilla fruticosa / Distichlis stricta; Pinus flexilis / Pseudoroegneria spicata; Pinus flexilis / Purshia tridentata*; and *Pinus flexilis* / scree. The *Pinus flexilis / Purshia tridentata* woodland association is known only from Craters of the Moon National Monument and is globally rare (G1 conservation rank) (Reid et al. 1994). A *Pinus flexilis / Trifolium dasyphyllum* type for cool dry sites in the mountains of north-central Colorado has been defined by Hess (1981), with understory associates *Calamagrostis purpurascens* and *Carex foenea*; it is likely equivalent to the *Pinus flexilis / Calamagrostis purpurascens* type of Bourgeron and Engelking (1994).

N. CITATION: Timoney (1999, (Group 1, n=5 plots); Willoughby et al. (1997); Achuff et al. (1997) for type delineation.

References:

Achuff, P.L. 1994. Natural regions, subregions and natural history themes of Alberta. A classification for protected areas management. Alberta Environmental Protection, Edmonton, AB.

Achuff, P.L., R.L. McNeil, and M.L. Coleman. 1997. Ecological land classification of Waterton Lakes National Park, Alberta. Parks Canada, Waterton Lakes National Park.

Bourgeron, P.S. and L.D. Engelking (eds.). 1994. A preliminary vegetation classification of the western United States. The Nature Conservancy, Western Heritage Task Force, Boulder, CO.

Hess, K. 1981. Phyto-edaphic study of habitat types of the Arapaho and Roosevelt National Forests. Ph.D. thesis, Colorado State Univ., Ft. Collins, CO.

Pfister, R.D., B.L. Kovalchik, S.F. Arno, and R.C. Presby. 1977. Forest habitat types of Montana. USDA Forest Service General Technical Report INT-34.

Reid, M.S., L.D. Engelking, and P.S. Bourgeron. 1994. Rare plant communities of the conterminous United States. Western region. The Nature Conservancy, Boulder, CO.

Timoney, K.P. 1999. Limber pine, whitebark pine, alpine heath, and terricolous alpine lichen vegetation alliances in Alberta. Alberta Environmental Protection, Resource Data Division, Edmonton.

Willoughby, M.G., M.J. Alexander, and K.M. Sundquist. 1997. Range plant community types and carrying capacity for the montane subregion. Second approximation. Alberta Environmental Protection, Lands and Forest Services. Edmonton.

Community characterization Abstract
Limber Pine

A. Identifiers
1. SELSUMMARY: The *Pinus flexilis / Arctostaphylos uva-ursi - Juniperis horizontalis* woodland type is characteristic of montane sites in southwestern Alberta. It is found on lower elevation middle and lower slopes that are rapidly to well-drained and subxeric in which bedrock is close to the surface.
2. SNAME: *Pinus flexilis / Arctostaphylos uva-ursi - Juniperis horizontalis*
3. SCOMNAME: Limber Pine / Bearberry - Creeping Juniper
B. Classification
1. SYSTEM: Terrestrial
2. CLASS: Woodland
3. SUBCLASS: Evergreen
4. GROUP: Needle-leaf
5. FORMATION: Rounded-crowns
6. ALLIANCE: *Pinus flexilis*
7. SSIMILAR.COMMUNITIES: *Pinus flexilis* / *Arctostaphylos uva-ursi* (DeVelice 1983; DeVelice and Ludwig 1983; DeVelice et al. 1986; Larson and Moir 1987; Bourgeron and Engelking 1994); *Pinus flexilis* / *Juniperis communis* (Pfister et al. 1977; Hess 1981; Johnston 1987; Bourgeron and Engelking 1994; [*Pinus flexilis* / scree (Bourgeron and Engelking 1994)]; *Pinus flexilis* / *Juniperis* / *Arctostaphylos uva-ursi* (Kuchar 1973) outside Alberta.
C. Related Nomenclature
1. SOTHER.NAMES: *Pinus flexilis - Pseudotsuga menziesii / Juniperis communis / Arctostaphylos uva-ursi* (Willoughby et al. 1997);
Pseudotsuga menziesii - Pinus flexilis - Pinus contorta / Arctostaphylos uva-ursi - Juniperis communis (Achuff et al. 1997);
Pinus flexilis - Pseudotsuga menziesii / Juniperis / Arctostaphylos uva-ursi (Corns and Achuff 1982) in Alberta.
2. SOTHERNAMES.RELATION: 1 | 1 | 1
3. SOTHERNAMES.RELATION.NOTE: None.
4. SNAMES.COM: This type and the *Pseudotsuga menziesii - Pinus flexilis / Juniperis communis / Festuca scabrella* woodland (savannah) type of Timoney (1999), and other types described for SW Alberta do not appear to be separable into distinct associations. At one extreme are the types with significant grass and perhaps *Pseudotsuga* cover; at the other extreme are types with high cover of shrubs (*Arctostaphylos uva-ursi* and *Juniperis* spp.).
D. Distribution
1. SRANGE:
2. SRANGECOM: montane of SW Alberta
3. SDISTRIBUTION.COM:
E. Environmental Factors
1. SMINELEV: 1405 m
2. SMAXELEV: 1450 m
3. SLANDFORM: colluvial, residual
4. STOPO.POSITION: middle and lower slopes
5. SSLOPE: 17% median (0-60%)
6. SASPECT: SW
7. SGEOLOGY.COM:
8. SSOILTYPE: Orthic Regosols, rockland
9. SSOILMOISTURE: subxeric
10. SSOILCOM: sometimes eroding
11. SHYDRO.INFLUENCE: bedrock close to surface
12. SSEASONAL.VAR:
13. SKEY.ENVIRO.FACTORS: bedrock, aspect, wind
14. SENVIRO.COM:
F. Biological and Structural Description
F.a. Vegetation
1. SSTRATA.LIFEFORM: tree, shrub, herb, grass
2. SPCT.COVER: 12% tree; >30% shrub; herb >2%; grass ~3%
3. SHEIGHT:
4. SMOST.ABUND.SPP: *Pinus flexilis; Arctostaphylos uva-ursi, Juniperis horizontalis, Potentilla fruticosa; Koeleria macrantha*

5. SUNVEGETATED.SURFACE: cobbles and stones, mineral soil, and bedrock
6. SUNVEGETATED.SURFACE.COVER: ~35%
7. SCONSTANT.SPP: *Pinus flexilis; Arctostaphylos uva-ursi,*
8. SCHARACTERISTIC.SPP: *Juniperis horizontalis*.
9. SVEGETATION.COM: There are four strata in the type: 12% tree; >30% shrub; herb >2%; grass ~3%. The most abundant species are *Pinus flexilis; Arctostaphylos uva-ursi, Juniperis horizontalis, Potentilla fruticosa; Koeleria macrantha*. *Pinus flexilis* and *Arctostaphylos uva-ursi* are constants. *Juniperis horizontalis* is characteristic. Cobbles and stones, mineral soil, and bedrock compose ~35% of the surface. It is interesting that *Juniperis horizontalis* seems characteristic, while e.g., Corns and Achuff (1982) list *J. scopulorum* as characteristic. Perhaps there is some taxonomic confusion in the ESIS data or there is hybridization between the two species (see Moss 1983). There do not appear to be discrete associations within the limber pine alliance, but rather convenient abstractions along a continuum. The alliance is most closely-related to that of *Pseudotsuga menziesii*.

F.b. Other Species

1. SHIGH.RANK.SPP: none found.
2. SFAUNA.COM: blue grouse, mountain chickadee, Hammond's flycatcher, Clark's nutcracker, mule deer, elk, Columbian ground squirrel (Achuff 1994)
3. SOTHER.SPP.COM: *Cronartium ribicola* (white pine blister rust)

F.c. Variability

1.SSPP.COMP.VAR: see Timoney (1999, Appendix 1a)
2.SPHYSIOG.VAR:
3. SSUBTYPES:
4. SVARIABILITY.COM:

G. Dynamic Processes:

1. SNAT.DISTURBANCE: High frequency, low intensity fire may be important in maintaining this type and in minimizing the potential for a high intensity burn; white pine blister rust causing decline
2. SSUCCESS.STATUS: mature
3. SSUCCESS.DYNAM.COM

H. Spatial Relations:

1. SSIZE: probable that patch size is relatively small due to requirement for shallow bedrock
2. SSPATIAL.DISTRIBUTION: associated with ridges
3. SADJACENT.COMMUNITIES: *Arctostaphylos uva-ursi*, saxicolous herb and lichen
4. SINCLUSION.COMMUNITIES: *Arctostaphylos uva-ursi*, saxicolous herb and lichen
5. SMOSAIC.COM: bedrock controlled
6. SSPATIAL.COM:

I. Status

1. SRANK: S2?
2. SREASONS: 7 ESIS plots; of limited distribution; declining
3. SEXEMP.EO.SITENAME: ESIS plot 34KP2
4. SSTATCOM::

J. Management

1. SECONCOM: watershed protection, habitat, recreation, and tourism
2. SMANAGE.COM: High frequency, low intensity fire may be important in maintaining this type and in minimizing the potential for a high intensity burn; white pine blister rust causing decline.

K. Inventory and Sampling Procedures

1. SIMAGERY.COM:
2. SSAMPLE.STRATEGY:
3. SINVENTORY.COM:

L. Analysis Procedures and Data Management

1. SANALYSIS.COM: association delineated through quantitative analysis of Alberta ESIS plots via cluster analysis, DCA, and statistics by Timoney (1999).
2. SANALYSIS.DATA.MANAGE.COM:

M. SCOMMUNITY.COM: Within the "Evergreen needle-leaved woodland with rounded crowns" (II.A.2.a) formation, Bourgeron and Engelking (1994) list 14 associations within the limber pine alliance. They are *Pinus flexilis / Arctostaphylos uva-ursi; Pinus flexilis / Calamagrostis purpurascens; Pinus flexilis / Cercocarpus ledifolius; Pinus flexilis / Festuca idahoensis;*

Pinus flexilis / Festuca scabrella; Pinus flexilis / Juniperis communis; Pinus flexilis / Juniperis osteosperma; Pinus flexilis / Juniperis scopulorum; Pinus flexilis / Leucopoa kingii (= *Hesperochloa kingii*); *Pinus flexilis / Mahonia repens; Pinus flexilis / Potentilla fruticosa / Distichlis stricta; Pinus flexilis / Pseudoroegneria spicata; Pinus flexilis / Purshia tridentata*; and *Pinus flexilis* / scree. The *Pinus flexilis / Purshia tridentata* woodland association is known only from Craters of the Moon National Monument and is globally rare (G1 conservation rank) (Reid et al. 1994). A *Pinus flexilis / Trifolium dasyphyllum* type for cool dry sites in the mountains of north-central Colorado has been defined by Hess (1981), with understory associates *Calamagrostis purpurascens* and *Carex foenea*; it is likely equivalent to the *Pinus flexilis / Calamagrostis purpurascens* type of Bourgeron and Engelking (1994).

N. CITATION: Timoney (1999, Group 5, n=7 plots); Willoughby et al. (1997); Achuff et al. (1997); Corns and Achuff (1982); Kuchar (1973) for type delineation.

References:

Achuff, P.L. 1994. Natural regions, subregions and natural history themes of Alberta. A classification for protected areas management. Alberta Environmental Protection, Edmonton, AB.

Achuff, P.L., R.L. McNeil, and M.L. Coleman. 1997. Ecological land classification of Waterton Lakes National Park, Alberta. Parks Canada, Waterton Lakes National Park.

Bourgeron, P.S. and L.D. Engelking (eds.). 1994. A preliminary vegetation classification of the western United States. The Nature Conservancy, Western Heritage Task Force, Boulder, CO.

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Kuchar, P. 1973. Habitat types of Waterton Lakes National Park. Parks Canada, Calgary.

Larson, M. and W.H. Moir. 1987. Forest and woodland habitat types of northern New Mexico and northern Arizona. USDA Forest Service, Region 2. Albuquerque, NM.

Moss, E.H. 1983. Flora of Alberta. Univ. of Toronto Press, Toronto, ON. Second edition.

Pfister, R.D., B.L. Kovalchik, S.F. Arno, and R.C. Presby. 1977. Forest habitat types of Montana. USDA Forest Service General Technical Report INT-34.

Reid, M.S., L.D. Engelking, and P.S. Bourgeron. 1994. Rare plant communities of the conterminous United States. Western region. The Nature Conservancy, Boulder, CO.

Timoney, K.P. 1999. Limber pine, whitebark pine, alpine heath, and terricolous alpine lichen vegetation alliances in Alberta. Alberta Environmental Protection, Resource Data Division, Edmonton.

Willoughby, M.G., M.J. Alexander, and K.M. Sundquist. 1997. Range plant community types and carrying capacity for the montane subregion. Second approximation. Alberta Environmental Protection, Lands and Forest Services. Edmonton.

Community characterization Abstract
Whitebark Pine
A. Identifiers
1. SELSUMMARY: The *Abies lasiocarpa - Pinus albicaulis / Xerophyllum tenax* association is known only from Waterton Lakes National Park. It is found on mesic to subxeric, rapidly- to well-drained, lower subalpine sites with moderate to steep, southerly and westerly aspects.
2. SNAME: *Abies lasiocarpa - Pinus albicaulis / Xerophyllum tenax*
3. SCOMNAME: Subalpine Fir - Whitebark Pine / Beargrass
B. Classification
1. SYSTEM: Terrestrial
2. CLASS: Woodland//Forest
3. SUBCLASS: Evergreen//Evergreen
4. GROUP: Needle-leaf//Non-giant (5-50 m tall)
5. FORMATION: Rounded-crowns//Rounded-crowns
6. ALLIANCE: *Pinus albicaulis*
7. SSIMILAR.COMMUNITIES: Outside Alberta, the *Pinus albicaulis / Festuca idahoensis* (Bourgeron and Engelking 1994) and *Pinus albicaulis - Abies lasiocarpa* types of Pfister et al. (1977) and Bourgeron and Engelking (1994) are similar.
C. Related Nomenclature
1. SOTHER.NAMES: In Alberta. Type W1 of Timoney (1999), based on type O28 *Picea engelmannii - Abies lasiocarpa - Pinus albicaulis / Shepherdia* (Achuff et al. 1997); *Abies lasiocarpa - Pinus albicaulis* (Kuchar 1973).
2. SOTHERNAMES.RELATION: = | l
3. SOTHERNAMES.RELATION.NOTE: none.
4. SNAMES.COM: Kuchar's (1973) type *Abies lasiocarpa - Pinus albicaulis* is probably equivalent.
D. Distribution
1. SRANGE:
2. SRANGECOM: known only from two plots in Waterton Lakes National Park
3. SDISTRIBUTION.COM: subalpine
E. Environmental Factors
1. SMINELEV: 1850 m
2. SMAXELEV: 1950 m
3. SLANDFORM: colluvial
4. STOPO.POSITION: mid-slopes?
5. SSLOPE: moderate to steep
6. SASPECT: southerly to westerly
7. SGEOLOGY.COM:
8. SSOILTYPE: Orthic and Cumulic Regosols; Orthic Eutric Brunisols
9. SSOILMOISTURE: mesic to subxeric
10. SSOILCOM:
11. SHYDRO.INFLUENCE:
12. SSEASONAL.VAR:
13. SKEY.ENVIRO.FACTORS: long absence of fire
14. SENVIRO.COM:
F. Biological and Structural Description
F.a. Vegetation
1. SSTRATA.LIFEFORM: tree, shrub, herb-dwarf shrub
2. SPCT.COVER: tree 15-25%; shrub 35-55%; herb-dwarf shrub 75-90%
3. SHEIGHT:
4. SMOST.ABUND.SPP: trees: *Picea engelmannii* 5-10%, *Abies lasiocarpa* 10-15%, *Pinus albicaulis* 1-5%; shrubs: *Shepherdia canadensis* 20-30%, *Abies lasiocarpa*, *Potentilla fruticosa, Lonicera utahensis, Ribes* spp.; herb-dwarf shrub: *Xerophyllum tenax* 15-40%, *Thalictrum occidentale* 15-30%, *Spiraea betulifolia* 10%.
5. SUNVEGETATED.SURFACE:
6. SUNVEGETATED.SURFACE.COVER:
7. SCONSTANT.SPP: many species since only two plots (see Achuff et al. 1997, Table 23)
8. SCHARACTERISTIC.SPP: *Abies lasiocarpa, Pinus albicaulis, Shepherdia canadensis, Potentilla fruticosa, Lonicera utahensis, Xerophyllum tenax*
9. SVEGETATION.COM: There are three strata: tree 15-25%; shrub 35-55%; herb-

dwarf shrub 75-90%. The most abundant species are *Picea engelmannii* 5-10%, *Abies lasiocarpa* 10-15%, *Pinus albicaulis* 1-5%; *Shepherdia canadensis* 20-30%, *Abies lasiocarpa* (shrub), *Potentilla fruticosa, Lonicera utahensis, Ribes* spp.; *Xerophyllum tenax* 15-40%, *Thalictrum occidentale* 15-30%, and *Spiraea betulifolia* 10%. There are too few plots to describe constant species (see Achuff et al. 1997, Table 23). Characteristic species are *Abies lasiocarpa, Pinus albicaulis, Shepherdia canadensis*, *Potentilla fruticosa, Lonicera utahensis,* and *Xerophyllum tenax*.

F.b. Other Species

1. SHIGH.RANK.SPP: *Heuchera glabra*
2. SFAUNA.COM: hermit thrush, white-crowned sparrow, fox sparrow, Brewer's sparrow, golden-crowned sparrow, American robin, American dipper, harlequin duck, grizzly bear, elk, mule deer, woodland caribou, golden-mantled ground squirrel are characteristic of high subalpine (forest-tundra) sites in Alberta (Gadd 1995; Achuff 1994).
3. SOTHER.SPP.COM: *Cronartium ribicola* (white pine blister rust). If decline of whitebark pine continues, decline of Clark's nutcracker would likely follow. Since Clark's nutcracker is the prime dispersal agent for whitebark pine, there may be a positive-feedback, downward spiral of both species, and of the communities in which these species live.

F.c. Variability

1.SSPP.COMP.VAR:
2.SPHYSIOG.VAR: Varying amount of canopy cover related to dieback and gap regeneration.
3. SSUBTYPES: None known
4. SVARIABILITY.COM: too little known

G. Dynamic Processes:

1. SNAT.DISTURBANCE: disease (white pine blister rust)
2. SSUCCESS.STATUS: mature to old-growth
3. SSUCCESS.DYNAM.COM: "O28 stands are about 100-250 years old... stands contain many dead *Pinus albicaulis* trees and formerly had greater tree cover... opening of the canopy is permitting increasing amounts of small *Abies lasiocarpa* ... to grow into the canopy. Understory shrubs and herbs probably have also benefitted from the increased light and precipitation penetration as the tree canopy has thinned." Achuff et al. (1997).

H. Spatial Relations:

1. SSIZE:
2. SSPATIAL.DISTRIBUTION:
3. SADJACENT.COMMUNITIES: probably *Picea engelmannii - Abies lasiocarpa* types
4. SINCLUSION.COMMUNITIES:
5. SMOSAIC.COM:
6. SSPATIAL.COM:

I. Status

1. SRANK: S1
2. SREASONS: known only from two plots from Waterton Lakes National Park
3. SEXEMP.EO.SITENAME: plots PA40-90 and PA40-90.1 (Achuff et al. 1997)
4. SSTATCOM:: more information needed

J. Management

1. SECONCOM: watershed protection, habitat, recreation, and tourism
2. SMANAGE.COM: declining due to white pine blister rust; action needed?

K. Inventory and Sampling Procedures

1. SIMAGERY.COM:
2. SSAMPLE.STRATEGY:
3. SINVENTORY.COM:

L. Analysis Procedures and Data Management

1. SANALYSIS.COM: qualitative type based on Achuff et al. (1997)
2. SANALYSIS.DATA.MANAGE.COM:

M. SCOMMUNITY.COM:

N. CITATION**:** Achuff et al. (1997);Timoney (1999); Kuchar (1973) for type delineation.

References:

Achuff, P.L. 1994. Natural regions, subregions and natural history themes of Alberta. A classification for protected areas management. Alberta Environmental Protection, Edmonton, AB.

Achuff, P.L., R.L. McNeil, and M.L. Coleman. 1997. Ecological land classification of Waterton Lakes National Park, Alberta. Parks Canada, Waterton Lakes National Park.

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Pfister, R.D., B.L. Kovalchik, S.F. Arno, and R.C. Presby. 1977. Forest habitat types of Montana. USDA Forest Service General Technical Report INT-34.

Timoney, K.P. 1999. Limber pine, whitebark pine, alpine heath, and terricolous alpine lichen vegetation alliances in Alberta. Alberta Environmental Protection, Resource Data Division, Edmonton.

Community characterization Abstract
Whitebark Pine
A. Identifiers
1. SELSUMMARY: The *Pinus albicaulis - Abies lasiocarpa / Luzula hitchcockii - Vaccinium myrtillus* association is known from seven plots in Waterton Lakes National Park. It is found on mesic to subxeric, rapidly- to well-drained, upper subalpine sites with moderate to steep southerly and westerly aspects on colluvial landforms.
2. SNAME: *Pinus albicaulis - Abies lasiocarpa / Luzula hitchcockii - Vaccinium myrtillus*
3. SCOMNAME: Whitebark Pine - Subalpine Fir / Smooth Wood-Rush - Low Bilberry
B. Classification
1. SYSTEM: Terrestrial
2. CLASS: Woodland//Forest
3. SUBCLASS: Evergreen//Evergreen
4. GROUP: Needle-leaf//Non-giant (5-50 m tall)
5. FORMATION: Rounded-crowns//Rounded-crowns
6. ALLIANCE: *Pinus albicaulis*
7. SSIMILAR.COMMUNITIES: Outside Alberta. *Pinus albicaulis - Abies lasiocarpa* habitat types of Pfister et al. (1977) and Bourgeron and Engelking (1994).
C. Related Nomenclature:
1. SOTHER.NAMES: In Alberta. Type W2 of Timoney (1999), based on type O30 *Pinus albicaulis - Abies lasiocarpa / Luzula hitchcockii - Vaccinium myrtillus* of Achuff et al. (1997).
Outside Alberta. *Pinus albicaulis / Luzula hitchcockii* (and similar to *Pinus albicaulis / Carex geyeri*) (Cooper 1975; Hall 1973; Johnston 1987; Steele et al. 1983; Williams and Smith 1990; Bourgeron and Engelking 1994).
2. SOTHERNAMES.RELATION: = | 1
3. SOTHERNAMES.RELATION.NOTE: Relationship with US type needs examination; may be equivalent.
4. SNAMES.COM: none.
D. Distribution
1. SRANGE:
2. SRANGECOM: may be restricted to Waterton Lakes National Park
3. SDISTRIBUTION.COM: upper subalpine
E. Environmental Factors
1. SMINELEV: 2000 m
2. SMAXELEV: 2250 m
3. SLANDFORM: colluvial
4. STOPO.POSITION:
5. SSLOPE: moderate to steep
6. SASPECT: southerly and westerly
7. SGEOLOGY.COM:
8. SSOILTYPE: Orthic Regosols, Eluviated Eutric Brunisols
9. SSOILMOISTURE: mesic to subxeric
10. SSOILCOM: more mesic than the *Pinus albicaulis - Picea engelmannii / Dryas octopetala* type of Achuff et al. (1997; = W3 type of Timoney 1999).
11. SHYDRO.INFLUENCE:
12. SSEASONAL.VAR:
13. SKEY.ENVIRO.FACTORS: too few plots to be certain
14. SENVIRO.COM: a type apparently restricted to upper subalpine (2000-2250 m) mesic to subxeric sites in WLNP.
F. Biological and Structural Description
F.a. Vegetation
1. SSTRATA.LIFEFORM: tree, shrub, herb-dwarf shrub, bryoid
2. SPCT.COVER: tree 15-40%; shrub 5-15%; herb-dwarf shrub 50-80%, bryoid 5-15%..
3. SHEIGHT:
4. SMOST.ABUND.SPP: tree: *Pinus albicaulis, Picea engelmannii, Abies lasiocarpa;* shrub: *Abies lasiocarpa, Pinus albicaulis*; herb-dwarf shrub: *Vaccinium myrtillus, Luzula hitchcockii*; bryoid: *Brachythecium, Racomitrium*
5. SUNVEGETATED.SURFACE:
6. SUNVEGETATED.SURFACE.COVER:

7. SCONSTANT.SPP: *Pinus albicaulis, Picea engelmannii, Abies lasiocarpa, Vaccinium myrtillus.*
8. SCHARACTERISTIC.SPP: *Luzula hitchcockii*
9. SVEGETATION.COM: There are four strata: tree 15-40%; shrub 5-15%; herb-dwarf shrub 50-80%, bryoid 5-15%. The most abundant species are *Pinus albicaulis, Picea engelmannii, Abies lasiocarpa;* shrub: *Abies lasiocarpa, Pinus albicaulis*; herb-dwarf shrub: *Vaccinium myrtillus, Luzula hitchcockii*; bryoid: *Brachythecium, Racomitrium*. Constant species are *Pinus albicaulis, Picea engelmannii, Abies lasiocarpa, Vaccinium myrtillus.* The characteristic species is *Luzula hitchcockii.* This type commonly has an open tree canopy; many stands with numerous dead whitebark pine. As canopy continues to suffer mortality, the gaps may be filled by *Abies lasiocarpa* and *Picea engelmannii*. " Smaller, probably younger, *Pinus albicaulis* trees are in the understory of most stands but are likely to succumb to white pine blister rust as they grow older." "Epiphytic lichens are in moderate abundance, with *Letharia vulpina* and *Ahtiana sphaerosporella* most common." (Achuff et al. 1997)
F.b. Other Species
1. SHIGH.RANK.SPP: *Racomitrium heterostichum*
2. SFAUNA.COM: hermit thrush, white-crowned sparrow, fox sparrow, Brewer's sparrow, golden-crowned sparrow, American robin, American dipper, harlequin duck, grizzly bear, elk, mule deer, woodland caribou, golden-mantled ground squirrel are characteristic of high subalpine (forest-tundra) sites in Alberta (Gadd 1995; Achuff 1994).
3. SOTHER.SPP.COM: *Cronartium ribicola* (white pine blister rust). If decline of whitebark pine continues, decline of Clark's nutcracker would likely follow. Since Clark's nutcracker is the prime dispersal agent for whitebark pine, there may be a positive-feedback, downward spiral of both species, and of the communities in which these species live.
F.c. Variability
1.SSPP.COMP.VAR:
2.SPHYSIOG.VAR: degree of canopy closure varies widely
3. SSUBTYPES: none known
4. SVARIABILITY.COM: too few for generalization
G. Dynamic Processes:
1. SNAT.DISTURBANCE: disease (white pine blister rust).
2. SSUCCESS.STATUS: Mature to old-growth (100-300 years)
3. SSUCCESS.DYNAM.COM: declining.
H. Spatial Relations:
1. SSIZE:
2. SSPATIAL.DISTRIBUTION:
3. SADJACENT.COMMUNITIES: probably *Picea engelmannii - Abies lasiocarpa* types
4. SINCLUSION.COMMUNITIES:
5. SMOSAIC.COM:
6. SSPATIAL.COM:
I. Status
1. SRANK: S2
2. SREASONS: known from seven plots from WLNP
3. SEXEMP.EO.SITENAME: see Achuff et al. (1997, Table 25).
4. SSTATCOM:
J. Management
1. SECONCOM: watershed protection, habitat, recreation, and tourism
2. SMANAGE.COM: declining; action required?
K. Inventory and Sampling Procedures
1. SIMAGERY.COM:
2. SSAMPLE.STRATEGY:
3. SINVENTORY.COM:
L. Analysis Procedures and Data Management
1. SANALYSIS.COM: qualitative type based on Achuff et al. (1997)
2. SANALYSIS.DATA.MANAGE.COM:
M. SCOMMUNITY.COM:
N. CITATION: Achuff et al. (1997); Timoney (1999) for type delineation.
References:
Achuff, P.L. 1994. Natural regions, subregions and natural history themes of Alberta. A classification for protected areas management. Alberta Environmental Protection,

Edmonton, AB.
Achuff, P.L., R.L. McNeil, and M.L. Coleman. 1997. Ecological land classification of Waterton Lakes National Park, Alberta. Parks Canada, Waterton Lakes National Park.
Bourgeron, P.S. and L.D. Engelking (eds.). 1994. A preliminary vegetation classification of the western United States. The Nature Conservancy, Western Heritage Task Force, Boulder, CO.
Cooper, S.V. 1975. Forest habitat types of northwestern Washington and the contiguous portion of Montana and Idaho. PhD dissertation, Washington State University, Pullman, WA.
Gadd, B. 1995. Handbook of the Canadian Rockies. Second edition. Corax Press, Jasper, AB.
Hall, F.C. 1973. Plant communities of the Blue Mountains in eastern Oregon and southeastern Washington. USDA Forest Service, Pacific Northwest Region, Area Guide 3-1.
Johnston, B.C. 1987. Plant associations of Region Two (edition 4). USDA Forest Service, Rocky Mountain Region, R2-Ecol-87-2.
Pfister, R.D., B.L. Kovalchik, S.F. Arno, and R.C. Presby. 1977. Forest habitat types of Montana. USDA Forest Service General Technical Report INT-34.
Steele, R., S.V. Cooper, D.M. Ondov, D.W. Roberts, and R.D. Pfister. 1983. Forest habitat types of eastern Idaho-western Wyoming. USDA Forest Service, Intermountain Forest and Range Experiment Station. Ogden, UT. General Technical Report INT-144.
Timoney, K.P. 1999. Limber pine, whitebark pine, alpine heath, and terricolous alpine lichen vegetation alliances in Alberta. Alberta Environmental Protection, Resource Data Division, Edmonton.
Williams, C.K. and B.G. Smith. 1990. Forested plant associations of the Wenatchee National Forest. USDA Forest Service, unpublished field guide.

Community characterization Abstract
Whitebark Pine
A. Identifiers
1. SELSUMMARY: The *Pinus albicaulis - Picea engelmannii / Dryas octopetala* association is found on exposed, subxeric upper subalpine sites with moderate to steep slopes on colluvial and residual landforms of various aspects. Elevation range is 2050-2300 m and soils are Orthic Regosols. It is known from three plots in Waterton Lakes National Park.
2. SNAME: *Pinus albicaulis - Picea engelmannii / Dryas octopetala*
3. SCOMNAME: Whitebark Pine - Engelmann Spruce / White Mountain Avens
B. Classification
1. SYSTEM: Terrestrial
2. CLASS: Woodland//Forest
3. SUBCLASS: Evergreen//Evergreen
4. GROUP: Needle-leaf//Non-giant (5-50 m tall)
5. FORMATION: Rounded-crowns//Rounded-crowns
6. ALLIANCE: *Pinus albicaulis*
7. SSIMILAR.COMMUNITIES: *Pinus albicaulis / Juniperis communis - Arctostaphylos uva-ursi* of Timoney (1999, Group 9)
C. Related Nomenclature
1. SOTHER.NAMES: Type W3 of Timoney (1999), which is based on type O31 of Achuff et al. (1997).
2. SOTHERNAMES.RELATION: =
3. SOTHERNAMES.RELATION.NOTE: none.
4. SNAMES.COM: none.
D. Distribution
1. SRANGE:
2. SRANGECOM: may be restricted to Waterton Lakes National Park.
3. SDISTRIBUTION.COM: upper subalpine
E. Environmental Factors
1. SMINELEV: 2050 m
2. SMAXELEV: 2300 m
3. SLANDFORM: colluvial and residual
4. STOPO.POSITION: exposed
5. SSLOPE: moderate to steep
6. SASPECT: various
7. SGEOLOGY.COM:
8. SSOILTYPE: Orthic Regosols
9. SSOILMOISTURE: subxeric
10. SSOILCOM: more xeric than the *Pinus albicaulis - Abies lasiocarpa / Luzula hitchcockii - Vaccinium myrtillus* type of Achuff et al. (1997; = W2 type of Timoney 1999).
11. SHYDRO.INFLUENCE: rapidly-drained
12. SSEASONAL.VAR:
13. SKEY.ENVIRO.FACTORS: too few plots to be certain
14. SENVIRO.COM: An association of exposed, subxeric, upper subalpine moderate to steep slopes in Waterton Lakes National Park.
F. Biological and Structural Description
F.a. Vegetation
1. SSTRATA.LIFEFORM: tree, shrub, herb-dwarf shrub, bryoid
2. SPCT.COVER: tree 10-15%; shrub 10-15%; herb-dwarf shrub 15-45%; bryoid 5-25%.
3. SHEIGHT:
4. SMOST.ABUND.SPP: tree: *Pinus albicaulis, Picea engelmannii, Abies lasiocarpa*; shrub: *Pinus albicaulis, Picea engelmannii, Abies lasiocarpa*; herb-dwarf shrub: *Dryas octopetala, Juniperis communis, Penstemon spp., Saxifraga bronchialis, Shepherdia canadensis, Selaginella densa, Minuartia nuttallii, M. obtusiloba*, and *M. rubella*; bryoid: *Rhizocarpon geographicum*.
5. SUNVEGETATED.SURFACE: probably some bedrock.
6. SUNVEGETATED.SURFACE.COVER:
7. SCONSTANT.SPP: *Dryas octopetala, Saxifraga bronchialis, Rhizocarpon geographicum*.
8. SCHARACTERISTIC.SPP: *Pinus albicaulis, Juniperis communis, Penstemon* spp., *Shepherdia canadensis, Selaginella densa, Minuartia nuttallii, M. obtusiloba,*

and *M. rubella*.
9. SVEGETATION.COM: There are four strata: tree 10-15%; shrub 10-15%; herb-dwarf shrub 15-45%; bryoid 5-25%. The most abundant species are *Pinus albicaulis, Picea engelmannii, Abies lasiocarpa*; shrub: *Pinus albicaulis, Picea engelmannii, Abies lasiocarpa*; herb-dwarf shrub: *Dryas octopetala, Juniperis communis, Penstemon spp., Saxifraga bronchialis, Shepherdia canadensis, Selaginella densa, Minuartia nuttallii, M. obtusiloba*, and *M. rubella*; bryoid: *Rhizocarpon geographicum*. Constant species are *Dryas octopetala, Saxifraga bronchialis, Rhizocarpon geographicum*. Characteristic species are *Pinus albicaulis, Juniperis communis, Penstemon* spp., *Shepherdia canadensis, Selaginella densa, Minuartia nuttallii, M. obtusiloba*, and *M. rubella*. There is probably some exposed bedrock. The type is distinguished from *Pinus albicaulis - Abies lasiocarpa / Luzula hitchcockii - Vaccinium myrtillus* by dominance of subxeric species in the herb-dwarf shrub layer, such as *Dryas octopetala* and *Saxifraga bronchialis*, rather than the more mesic species *Luzula hitchcockii, Xerophyllum tenax*, and *Vaccinium myrtillus*.
F.b. Other Species
1. SHIGH.RANK.SPP:
2. SFAUNA.COM: hermit thrush, white-crowned sparrow, fox sparrow, Brewer's sparrow, golden-crowned sparrow, American robin, American dipper, harlequin duck, grizzly bear, elk, mule deer, woodland caribou, golden-mantled ground squirrel are characteristic of high subalpine (forest-tundra) sites in Alberta (Gadd 1995; Achuff 1994).
3. SOTHER.SPP.COM: *Cronartium ribicola* (white pine blister rust). If decline of whitebark pine continues, decline of Clark's nutcracker would likely follow. Since Clark's nutcracker is the prime dispersal agent for whitebark pine, there may be a positive-feedback, downward spiral of both species, and of the communities in which these species live.
F.c. Variability
1.SSPP.COMP.VAR: too few to be certain.
2.SPHYSIOG.VAR: variation in openness of canopy due to varying amounts of dieback.
3. SSUBTYPES: none known.
4. SVARIABILITY.COM:
G. Dynamic Processes:
1. SNAT.DISTURBANCE: Stands are old-growth (150-300 years). White pine blister rust continues to kill the larger trees.
2. SSUCCESS.STATUS: old-growth.
3. SSUCCESS.DYNAM.COM: Old-growth stands in which blister rust is causing mortality of the whitebark pine.
H. Spatial Relations:
1. SSIZE:
2. SSPATIAL.DISTRIBUTION:
3. SADJACENT.COMMUNITIES: probably *Picea engelmannii - Abies lasiocarpa* types
4. SINCLUSION.COMMUNITIES: patches of *Dryas octopetala*?
5. SMOSAIC.COM:
6. SSPATIAL.COM:
I. Status
1. SRANK: S1
2. SREASONS: known from three plots in Waterton Lakes National Park
3. SEXEMP.EO.SITENAME: see Table 26 of Achuff et al. (1997).
4. SSTATCOM:: apparently a restricted type that should be tracked and studied.
J. Management
1. SECONCOM: watershed protection, habitat, recreation, and tourism
2. SMANAGE.COM:
K. Inventory and Sampling Procedures
1. SIMAGERY.COM:
2. SSAMPLE.STRATEGY:
3. SINVENTORY.COM:
L. Analysis Procedures and Data Management
1. SANALYSIS.COM: qualitative type based on Achuff et al. (1997)
2. Summary:
M. SCOMMUNITY.COM:
N. CITATION:Achuff et al. (1997); Timoney (1999) for type delineation.

References:

Achuff, P.L. 1994. Natural regions, subregions and natural history themes of Alberta. A classification for protected areas management. Alberta Environmental Protection, Edmonton, AB.

Achuff, P.L., R.L. McNeil, and M.L. Coleman. 1997. Ecological land classification of Waterton Lakes National Park, Alberta. Parks Canada, Waterton Lakes National Park.

Gadd, B. 1995. Handbook of the Canadian Rockies. Second edition. Corax Press, Jasper, AB.

Timoney, K.P. 1999. Limber pine, whitebark pine, alpine heath, and terricolous alpine lichen vegetation alliances in Alberta. Alberta Environmental Protection, Resource Data Division, Edmonton.

Community characterization Abstract
Whitebark Pine
A. Identifiers
1. SELSUMMARY: The *Abies lasiocarpa - Pinus albicaulis - Picea engelmannii / Vaccinium scoparium* association has relatively few dominant plant species, and appears to be characteristic of mesic subalpine sites over a wide elevational range. Slope is variable and bedrock is not near the surface. Within the whitebark pine alliance, this is the most abundant group in the Alberta ESIS data.
2. SNAME: *Abies lasiocarpa - Pinus albicaulis - Picea engelmannii / Vaccinium scoparium*
3. SCOMNAME: subalpine fir - whitebark pine - engelmann spruce / grouseberry
B. Classification
1. SYSTEM: Terrestrial
2. CLASS: Woodland//Forest
3. SUBCLASS: Evergreen//Evergreen
4. GROUP: Needle-leaf//Non-giant (5-50 m tall)
5. FORMATION: Rounded-crowns//Rounded-crowns
6. ALLIANCE: *Pinus albicaulis*
7. SSIMILAR.COMMUNITIES: Most similar type is *Abies lasiocarpa - Pinus albicaulis - Picea engelmannii / Empetrum nigrum* (Timoney 1999); see also *Picea engelmannii - Pinus albicaulis / Menziesia glabella* (= *M. ferruginea*) (Corns and Achuff 1982) in Alberta.
C. Related Nomenclature
1. SOTHER.NAMES: May be equivalent to the *Pinus albicaulis* types of Pfister et al. (1977) and Bourgeron and Engelking (1994);
the *Pinus albicaulis* / Vaccinium scoparium type of Steele (et al. 1983) and Bourgeron and Engelking (1994);
and the *Abies lasiocarpa - Pinus albicaulis / Vaccinium scoparium* type of Bourgeron and Engelking 1994) outside Alberta.
2. SOTHERNAMES.RELATION: 1 | 1 | 1
3. SOTHERNAMES.RELATION.NOTE: The three types listed under SOTHER.NAMES may be US equivalents but it is not possible to be certain without analysis of original data.
4. SNAMES.COM: none.
D. Distribution
1. SRANGE:
2. SRANGECOM: high subalpine
3. SDISTRIBUTION.COM: probably widespread at subalpine elevations above 1700 m
E. Environmental Factors
1. SMINELEV: 1700 m
2. SMAXELEV: 2180 m
3. SLANDFORM: colluvial and morainal
4. STOPO.POSITION: upper slope (macro), mid-slope (meso)
5. SSLOPE: 50% median (0-70%)
6. SASPECT: variable
7. SGEOLOGY.COM:
8. SSOILTYPE: Eutric and Dystric Brunisols (Corns and Achuff 1982)
9. SSOILMOISTURE: mesic (subxeric to subhygric)
10. SSOILCOM: one of the moister whitebark pine types.
11. SHYDRO.INFLUENCE: well-drained (rapid to imperfect)
12. SSEASONAL.VAR:
13. SKEY.ENVIRO.FACTORS: low fire frequency
14. SENVIRO.COM:
F. Biological and Structural Description
F.a. Vegetation
1. SSTRATA.LIFEFORM: trees, shrubs, herbs, bryoids
2. SPCT.COVER: ~50% trees; >8% shrubs; herbs >1%; bryoids >2%
3. SHEIGHT:
4. SMOST.ABUND.SPP: tree: *Abies lasiocarpa, Picea engelmannii, Pinus albicaulis;* shrub*: Vaccinium scoparium*, *Menziesia ferruginea*; herb: *Arnica cordifolia*; bryoid: *Pleurozium schreberi, Peltigera aphthosa.*
5. SUNVEGETATED.SURFACE: decaying wood, cobbles and stones
6. SUNVEGETATED.SURFACE.COVER: ~10%

7. SCONSTANT.SPP: *Abies lasiocarpa, Pinus albicaulis*
8. SCHARACTERISTIC.SPP: *Vaccinium scoparium*, *Menziesia ferruginea*
9. SVEGETATION.COM: There are four strata: ~50% trees; >8% shrubs; herbs >1%; bryoids >2%. The most abundant species are *Abies lasiocarpa, Picea engelmannii, Pinus albicaulis; Vaccinium scoparium*, *Menziesia ferruginea*; *Arnica cordifolia*; *Pleurozium schreberi, Peltigera aphthosa. Abies lasiocarpa, Pinus albicaulis* are constants. *Vaccinium scoparium* and *Menziesia ferruginea* are characteristic. Decaying wood, and cobbles and stones cover ~10% of the surface. There are few dominant species.

F.b. Other Species

1. SHIGH.RANK.SPP: will require analysis of ESIS data
2. SFAUNA.COM: hermit thrush, white-crowned sparrow, fox sparrow, Brewer's sparrow, golden-crowned sparrow, American robin, American dipper, harlequin duck, grizzly bear, elk, mule deer, woodland caribou, golden-mantled ground squirrel are characteristic of high subalpine (forest-tundra) sites in Alberta (Gadd 1995; Achuff 1994).
3. SOTHER.SPP.COM: *Cronartium ribicola* (white pine blister rust). If decline of whitebark pine continues, decline of Clark's nutcracker would likely follow. Since Clark's nutcracker is the prime dispersal agent for whitebark pine, there may be a positive-feedback, downward spiral of both species, and of the communities in which these species live.

F.c. Variability

1.SSPP.COMP.VAR: see Timoney (1999, Appendix 2a)
2.SPHYSIOG.VAR: variation in tree cover, due most probably to dieback.
3. SSUBTYPES: needs study.
4. SVARIABILITY.COM:

G. Dynamic Processes:

1. SNAT.DISTURBANCE: disease (white pine blister rust)
2. SSUCCESS.STATUS: mature to old-growth?
3. SSUCCESS.DYNAM.COM

H. Spatial Relations:

1. SSIZE:
2. SSPATIAL.DISTRIBUTION:
3. SADJACENT.COMMUNITIES: probably *Picea engelmannii - Abies lasiocarpa* types
4. SINCLUSION.COMMUNITIES:
5. SMOSAIC.COM:
6. SSPATIAL.COM:

I. Status

1. SRANK: S3?
2. SREASONS: n=24 ESIS plots; declining due to white pine blister rust
3. SEXEMP.EO.SITENAME: ESIS plot 17SW84
4. SSTATCOM:

J. Management

1. SECONCOM: watershed protection, habitat, recreation, and tourism
2. SMANAGE.COM:

K. Inventory and Sampling Procedures

1. SIMAGERY.COM:
2. SSAMPLE.STRATEGY:
3. SINVENTORY.COM:

L. Analysis Procedures and Data Management

1. SANALYSIS.COM: association delineated through quantitative analysis of Alberta ESIS plots via cluster analysis, DCA, and statistics by Timoney (1999).
2. SANALYSIS.DATA.MANAGE.COM:

M. SCOMMUNITY.COM:

N. CITATION: Timoney (1999, Group 1, n=24 plots); Corns and Achuff (1982); for type delineation.

References:

Achuff, P.L. 1994. Natural regions, subregions and natural history themes of Alberta. A classification for protected areas management. Alberta Environmental Protection, Edmonton, AB.

Bourgeron, P.S. and L.D. Engelking (eds.). 1994. A preliminary vegetation classification of the western United States. The Nature Conservancy, Western Heritage Task Force, Boulder, CO.

Corns, I.G.W. and P.L. Achuff. 1982. Vegetation type descriptions. *In:* W.D. Holland & G.M. Coen, G.M. (eds.). Ecological (biophysical) Land Classification of Banff and Jasper National Parks. Volume II: Soil and vegetation resources. Alberta Institute of Pedology Publication SS-82-44. pp. 75-142.

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Timoney, K.P. 1999. Limber pine, whitebark pine, alpine heath, and terricolous alpine lichen vegetation alliances in Alberta. Alberta Environmental Protection, Resource Data Division, Edmonton.

Community characterization Abstract
Whitebark Pine
A. Identifiers
1. SELSUMMARY: *Abies lasiocarpa - Pinus albicaulis - Picea engelmannii / Empetrum nigrum* is an unusual association of high subalpine, mesic, stony sites, probably restricted to acidic parent materials north of the Bow River.
2. SNAME: *Abies lasiocarpa - Pinus albicaulis - Picea engelmannii / Empetrum nigrum*
3. SCOMNAME: subalpine fir - whitebark pine - engelmann spruce / crowberry
B. Classification
1. SYSTEM: Terrestrial
2. CLASS: Woodland//Forest
3. SUBCLASS: Evergreen//Evergreen
4. GROUP: Needle-leaf//Non-giant (5-50 m tall)
5. FORMATION: Rounded-crowns//Rounded-crowns
6. ALLIANCE: *Pinus albicaulis*
7. SSIMILAR.COMMUNITIES: Perhaps allied to the *Picea engelmannii - Abies lasiocarpa* / heather / feathermoss (C34) and *Pinus contorta - Picea engelmannii* / crowberry / *Cladonia mitis* (C35) types of Corns and Achuff (1982). Query of ESIS plot/species database prior to filtering found that one of the plots (24SD197) in this association contained *Xerophyllym tenax* at 20% cover, thus this assocation may also be allied with the *Abies lasiocarpa - Pinus albicaulis / Xerophyllum tenax* association of Timoney (1999), the equivalent of the *Picea engelmannii - Abies lasiocarpa - Pinus albicaulis / Shepherdia* of Achuff et al. (1997) and *Abies lasiocarpa - Pinus albicaulis* of Kuchar (1973). Outside Alberta. None found.
C. Related Nomenclature:
1. SOTHER.NAMES: none found.
2. SOTHERNAMES.RELATION: none.
3. SOTHERNAMES.RELATION.NOTE: none.
4. SNAMES.COM: Evidently a rare type, at least from Alberta southward. May be looked for in northern cordillera.
D. Distribution
1. SRANGE:
2. SRANGECOM: high subalpine, probably primarily north of the Bow River
3. SDISTRIBUTION.COM: probably restricted to acidic parent materials
E. Environmental Factors
1. SMINELEV: 1800 m
2. SMAXELEV: 2200 m
3. SLANDFORM: morainal and colluvial slopes
4. STOPO.POSITION: probably upper slope (macro) and middle-slope (meso)
5. SSLOPE: 48% (6-65%)
6. SASPECT: variable (may have preference for SE)
7. SGEOLOGY.COM:
8. SSOILTYPE: likely Dystric Brunisols
9. SSOILMOISTURE: mesic (xeric to subhygric)
10. SSOILCOM: probably acidic parent materials (shales, sandstones, conglomerates)
11. SHYDRO.INFLUENCE:
12. SSEASONAL.VAR:
13. SKEY.ENVIRO.FACTORS: acidic soils; northern range preference for *Empetrum nigrum*
14. SENVIRO.COM:
F. Biological and Structural Description
F.a. Vegetation
1. SSTRATA.LIFEFORM: trees, shrubs
2. SPCT.COVER: >25% trees; ~6% shrubs
3. SHEIGHT:
4. SMOST.ABUND.SPP: *Abies lasiocarpa, Pinus albicaulis, Picea engelmannii; Vaccinium membranaceum, Empetrum nigrum*
5. SUNVEGETATED.SURFACE: cobbles and stones, some bedrock
6. SUNVEGETATED.SURFACE.COVER: >40%
7. SCONSTANT.SPP: *Abies lasiocarpa, Pinus albicaulis, Picea engelmannii*
8. SCHARACTERISTIC.SPP: *Vaccinium membranaceum, Empetrum nigrum*

9. SVEGETATION.COM: There are two strata: >25% trees; ~6% shrubs. The most abundant species are *Abies lasiocarpa, Pinus albicaulis, Picea engelmannii; Vaccinium membranaceum,* and *Empetrum nigrum. Abies lasiocarpa, Pinus albicaulis,* and *Picea engelmannii* are constants. *Vaccinium membranaceum and Empetrum nigrum* are characteristic. Cobbles and stones and bedrock cover >40% of the surface. This type occupies a central position in the stand ordination of whitebark pine type of Timoney (1999).
F.b. Other Species
1. SHIGH.RANK.SPP: need to analyze the ESIS data
2. SFAUNA.COM: hermit thrush, white-crowned sparrow, fox sparrow, Brewer's sparrow, golden-crowned sparrow, American robin, American dipper, harlequin duck, grizzly bear, elk, mule deer, woodland caribou, golden-mantled ground squirrel are characteristic of high subalpine (forest-tundra) sites in Alberta (Gadd 1995; Achuff 1994).
3. SOTHER.SPP.COM: *Cronartium ribicola* (white pine blister rust). If decline of whitebark pine continues, decline of Clark's nutcracker would likely follow. Since Clark's nutcracker is the prime dispersal agent for whitebark pine, there may be a positive-feedback, downward spiral of both species, and of the communities in which these species live.
F.c. Variability
1.SSPP.COMP.VAR: see Timoney (1999, Appendix 2a)
2.SPHYSIOG.VAR: probable variation in tree cover.
3. SSUBTYPES:
4. SVARIABILITY.COM:
G. Dynamic Processes:
1. SNAT.DISTURBANCE: disease (white pine blister rust); likely prefers a low fire frequency
2. SSUCCESS.STATUS: mature to old-growth?
3. SSUCCESS.DYNAM.COM
H. Spatial Relations:
1. SSIZE:
2. SSPATIAL.DISTRIBUTION:
3. SADJACENT.COMMUNITIES: acidic heaths
4. SINCLUSION.COMMUNITIES:
5. SMOSAIC.COM:
6. SSPATIAL.COM:
I. Status
1. SRANK: S2?
2. SREASONS: n=10 ESIS plots; probable restricted range and distribution; declining due to white pine blister rust
3. SEXEMP.EO.SITENAME: ESIS plot 94JSJ7084
4. SSTATCOM::
J. Management:
1. SECONCOM: watershed protection, habitat, recreation, and tourism
2. SMANAGE.COM:
K. Inventory and Sampling Procedures
1. SIMAGERY.COM:
2. SSAMPLE.STRATEGY:
3. SINVENTORY.COM:
L. Analysis Procedures and Data Management
1. SANALYSIS.COM: association delineated through quantitative analysis of Alberta ESIS plots via cluster analysis, DCA, and statistics by Timoney (1999).
2. SANALYSIS.DATA.MANAGE.COM:
M. SCOMMUNITY.COM:
N. CITATION: Timoney (1999, Group 6, n=10) for type delineation.
References:

Achuff, P.L. 1994. Natural regions, subregions and natural history themes of Alberta. A classification for protected areas management. Alberta Environmental Protection, Edmonton, AB.

Achuff, P.L., R.L. McNeil, and M.L. Coleman. 1997. Ecological land classification of Waterton Lakes National Park, Alberta. Parks Canada, Waterton Lakes National Park.

Corns, I.G.W. and P.L. Achuff. 1982. Vegetation type descriptions. *In:* W.D. Holland & G.M. Coen, G.M. (eds.). Ecological (biophysical) Land Classification of Banff and Jasper

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Gadd, B. 1995. Handbook of the Canadian Rockies. Second edition. Corax Press, Jasper, AB.
Kuchar, P. 1973. Habitat types of Waterton Lakes National Park. Parks Canada, Calgary.
Timoney, K.P. 1999. Limber pine, whitebark pine, alpine heath, and terricolous alpine lichen vegetation alliances in Alberta. Alberta Environmental Protection, Resource Data Division, Edmonton.

Community characterization Abstract
Whitebark Pine
A. Identifiers
1. SELSUMMARY: The *Pinus albicaulis / Juniperis communis - Arctostaphylos uva-ursi* association appears to be a widespread type of high elevation high subalpine subxeric sites with significant exposure of bedrock and bare mineral soil. Probable preference for south or SW facing steep slopes over a wide elevational range (1690-2310 m).
2. SNAME: *Pinus albicaulis / Juniperis communis - Arctostaphylos uva-ursi*
3. SCOMNAME: whitebark pine / ground juniper - bearberry
B. Classification
1. SYSTEM: Terrestrial
2. CLASS: Woodland//Forest
3. SUBCLASS: Evergreen//Evergreen
4. GROUP: Needle-leaf//Non-giant (5-50 m tall)
5. FORMATION: Rounded-crowns//Rounded-crowns
6. ALLIANCE: *Pinus albicaulis*
7. SSIMILAR.COMMUNITIES: *Picea engelmannii - Abies lasiocarpa - Pinus albicaulis / Shepherdia* (Achuff et al. 1997); *Abies lasiocarpa - Pinus albicaulis* (Kuchar 1973); *Picea engelmannii - Abies lasiocarpa - Pinus albicaulis - Pinus contorta* (Corns and Achuff 1982); *Pinus albicaulis* timberline type (Willoughby and Smith 1997) in Alberta. *Pinus albicaulis / Juniperis communis* (Steele et al. 1983) outside Alberta.
C. Related Nomenclature
1. SOTHER.NAMES: *Abies lasiocarpa - Pinus albicaulis / Arctostaphylos uva-ursi* (Bourgeron and Engelking 1994) outside Alberta.
2. SOTHERNAMES.RELATION: l
3. SOTHERNAMES.RELATION.NOTE: Insufficient detail provided in Bourgeron and Engelking (1994) to decide re: equivalency.
4. SNAMES.COM: none.
D. Distribution
1. SRANGE:
2. SRANGECOM: probably widespread on appropriate sites
3. SDISTRIBUTION.COM: dry slopes with significant bedrock and mineral soil exposure
E. Environmental Factors
1. SMINELEV: 1690 m
2. SMAXELEV: 2310 m
3. SLANDFORM: colluvial, morainal, rockland, residual slopes
4. STOPO.POSITION: probably mid-slope (meso)
5. SSLOPE: 63% median (5-80%)
6. SASPECT: probably prefers south or SW
7. SGEOLOGY.COM:
8. SSOILTYPE: probably Dystric and Eutric Brunisols, Orthic Regosols
9. SSOILMOISTURE: subxeric (xeric to mesic), rapidly-drained
10. SSOILCOM:
11. SHYDRO.INFLUENCE: droughty sites
12. SSEASONAL.VAR: probably early snowmelt; thin winter snowcover
13. SKEY.ENVIRO.FACTORS: drought
14. SENVIRO.COM:
F. Biological and Structural Description
F.a. Vegetation
1. SSTRATA.LIFEFORM: trees, shrubs, grasses, herbs
2. SPCT.COVER: ~25% trees; >7% shrubs; grasses >1%; herbs >4%
3. SHEIGHT:
4. SMOST.ABUND.SPP: tree: *Pinus albicaulis, Abies lasiocarpa, Picea engelmannii;* shrub: *Juniperis communis, Arctostaphylos uva-ursi*, *Potentilla fruticosa*; grass: *Elymus innovatus*; herb: *Achillea millefolium, Antennaria racemosa, Fragaria virginiana*
5. SUNVEGETATED.SURFACE: bedrock and mineral soil
6. SUNVEGETATED.SURFACE.COVER: ~35%
7. SCONSTANT.SPP: *Pinus albicaulis, Juniperis communis*
8. SCHARACTERISTIC.SPP: *Juniperis communis, Arctostaphylos uva-ursi*
9. SVEGETATION.COM: There are four strata: ~25% trees; >7% shrubs; grasses

>1%; herbs >4%. The most abundant species are *Pinus albicaulis, Abies lasiocarpa, Picea engelmannii;* shrub: *Juniperis communis, Arctostaphylos uva-ursi*, *Potentilla fruticosa*; grass: *Elymus innovatus*; herb: *Achillea millefolium, Antennaria racemosa, Fragaria virginiana*. *Pinus albicaulis, Juniperis communis* are constants. *Juniperis communis* and *Arctostaphylos uva-ursi* are characteristic. Bedrock and mineral soil cover ~35% of the surface. This type is at the dry end of whitebark pine moisture gradient.
F.b. Other Species
1. SHIGH.RANK.SPP: need to analyze the ESIS data
2. SFAUNA.COM: hermit thrush, white-crowned sparrow, fox sparrow, Brewer's sparrow, golden-crowned sparrow, American robin, American dipper, harlequin duck, grizzly bear, elk, mule deer, woodland caribou, golden-mantled ground squirrel are characteristic of high subalpine (forest-tundra) sites in Alberta (Gadd 1995; Achuff 1994).
3. SOTHER.SPP.COM: *Cronartium ribicola* (white pine blister rust)
F.c. Variability
1.SSPP.COMP.VAR: see Timoney (1999, Appendix 2a)
2.SPHYSIOG.VAR:
3. SSUBTYPES:
4. SVARIABILITY.COM:
G. Dynamic Processes:
1. SNAT.DISTURBANCE: seasonal drought; winter sun and wind exposure; disease (white pine blister rust)
2. SSUCCESS.STATUS: mature to old-growth?
3. SSUCCESS.DYNAM.COM: probable very low fire frequency
H. Spatial Relations:
1. SSIZE:
2. SSPATIAL.DISTRIBUTION:
3. SADJACENT.COMMUNITIES: probable *Arctostaphylos uva-ursi*
4. SINCLUSION.COMMUNITIES:
5. SMOSAIC.COM:
6. SSPATIAL.COM:
I. Status
1. SRANK: ?S3?
2. SREASONS: n=22 ESIS plots; declining due to white pine blister rust
3. SEXEMP.EO.SITENAME: ESIS plot 94JIC9038
4. SSTATCOM:
J. Management
1. SECONCOM: watershed protection, habitat, recreation, and tourism
2. SMANAGE.COM:
K. Inventory and Sampling Procedures
1. SIMAGERY.COM:
2. SSAMPLE.STRATEGY:
3. SINVENTORY.COM:
L. Analysis Procedures and Data Management
1. SANALYSIS.COM: association delineated through quantitative analysis of Alberta ESIS plots via cluster analysis, DCA, and statistics by Timoney (1999).
2. SANALYSIS.DATA.MANAGE.COM:
M. SCOMMUNITY.COM:
N. CITATION: Timoney (1999, Group 9, n= 22); Corns and Achuff (1982); Willoughby and Smith (1997) for type delineation.
References:

Achuff, P.L. 1994. Natural regions, subregions and natural history themes of Alberta. A classification for protected areas management. Alberta Environmental Protection, Edmonton, AB.

Achuff, P.L., R.L. McNeil, and M.L. Coleman. 1997. Ecological land classification of Waterton Lakes National Park, Alberta. Parks Canada, Waterton Lakes National Park.

Bourgeron, P.S. and L.D. Engelking (eds.). 1994. A preliminary vegetation classification of the western United States. The Nature Conservancy, Western Heritage Task Force, Boulder, CO.

Corns, I.G.W. and P.L. Achuff. 1982. Vegetation type descriptions. *In:* W.D. Holland & G.M. Coen, G.M. (eds.). Ecological (biophysical) Land Classification of Banff and Jasper

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Timoney, K.P. 1999. Limber pine, whitebark pine, alpine heath, and terricolous alpine lichen vegetation alliances in Alberta. Alberta Environmental Protection, Resource Data Division, Edmonton.
Willoughby, M.G. and D. Smith. 1997. Range plant community types and carrying capacity for the subalpine and alpine subregions. First approximation. Alberta Environmental Protection, Land and Forest Service. Edmonton.

Community characterization Abstract
Whitebark Pine
A. Identifiers
1. SELSUMMARY: The *Pinus albicaulis - Pinus contorta / Juniperis communis - Elymus innovatus - Linnaea borealis* association is characteristic of low to high subalpine elevations transitional to lodgepole pine types. Sites tend to be subxeric, well-drained, of SW aspect, and with significant exposure of bedrock and mineral soil.
2. SNAME: *Pinus albicaulis - Pinus contorta / Juniperis communis - Elymus innovatus - Linnaea borealis*
3. SCOMNAME: whitebark pine - lodgepole pine / ground juniper - hairy wildrye - twinflower
B. Classification
1. SYSTEM: Terrestrial
2. CLASS: Woodland//Forest
3. SUBCLASS: Evergreen//Evergreen
4. GROUP: Needle-leaf//Non-giant (5-50 m tall)
5. FORMATION: Rounded-crowns//Rounded-crowns
6. ALLIANCE: *Pinus albicaulis*
7. SSIMILAR.COMMUNITIES: *Picea engelmannii - Abies lasiocarpa - Pinus albicaulis / Shepherdia* (Achuff et al. 1997); *Abies lasiocarpa - Pinus albicaulis* (Kuchar 1973); *Picea engelmannii - Abies lasiocarpa - Pinus albicaulis - Pinus contorta* (O4 type of Corns and Achuff 1982); *Pinus albicaulis* timberline type (Willoughby and Smith 1997) in Alberta.; *Abies lasiocarpa - Pinus albicaulis / Arctostaphylos uva-ursi* (Bourgeron and Engelking 1994) outside Alberta.
C. Related Nomenclature
1. SOTHER.NAMES: *Pinus albicaulis / Juniperis communis* (Steele et al. 1983).
2. SOTHERNAMES.RELATION: =
3. SOTHERNAMES.RELATION.NOTE: The *Pinus albicaulis / Juniperis communis* type of Steele et al. (1983) may be equivalent.
4. SNAMES.COM: none.
D. Distribution
1. SRANGE:
2. SRANGECOM:
3. SDISTRIBUTION.COM: low subalpine to high subalpine dry sites associated with lodgepole pine
E. Environmental Factors
1. SMINELEV: 1650 m
2. SMAXELEV: 2040 m
3. SLANDFORM: colluvial, morainal, rockland
4. STOPO.POSITION: probably mid-slope (meso)
5. SSLOPE: 50% median (45-75%)
6. SASPECT: SW
7. SGEOLOGY.COM:
8. SSOILTYPE: probably Eutric and Dystric Brunisols and Regosols
9. SSOILMOISTURE: subxeric (xeric to mesic), well to rapidly-drained
10. SSOILCOM:
11. SHYDRO.INFLUENCE: droughty
12. SSEASONAL.VAR: probably early snowmelt; thin winter snowcover
13. SKEY.ENVIRO.FACTORS: moisture stress
14. SENVIRO.COM:
F. Biological and Structural Description
F.a. Vegetation
1. SSTRATA.LIFEFORM: trees, shrubs, herbs, grasses, bryoids
2. SPCT.COVER: ~16% trees; ~17% shrubs; herbs >1.5%; grasses >3.5%; bryoids >1%
3. SHEIGHT:
4. SMOST.ABUND.SPP: trees: *Pinus albicaulis, Pinus contorta*; shrubs: *Juniperis communis, Betula glandulosa, Linnaea borealis, Shepherdia canadensis*; herbs: *Fragaria virginiana* (herbs); grasses: *Elymus innovatus*; bryoids: *Cladonia ecmocyna*.
5. SUNVEGETATED.SURFACE: bedrock and mineral soil
6. SUNVEGETATED.SURFACE.COVER: >25%

7. SCONSTANT.SPP: *Pinus albicaulis, Juniperis communis*
8. SCHARACTERISTIC.SPP: *Pinus contorta, Juniperis communis, Elymus innovatus, Linnaea borealis*
9. SVEGETATION.COM: There are five strata: ~16% trees; ~17% shrubs; herbs >1.5%; grasses >3.5%; bryoids >1%. The most abundant species are *Pinus albicaulis, Pinus contorta*; shrubs: *Juniperis communis, Betula glandulosa, Linnaea borealis, Shepherdia canadensis*; herbs: *Fragaria virginiana* (herbs); grasses: *Elymus innovatus*; bryoids: *Cladonia ecmocyna*. *Pinus albicaulis* and *Juniperis communis* are constants. *Pinus contorta, Juniperis communis, Elymus innovatus* and *Linnaea borealis* are characteristic. Bedrock and mineral soil cover >25% of the surface. This is probably a transitional type between lodgepole pine forests (downslope) and *Pinus albicaulis / Juniperis communis - Arctostaphylos uva-ursi* sites (upslope).
F.b. Other Species
1. SHIGH.RANK.SPP: need to analyze the ESIS data
2. SFAUNA.COM: hermit thrush, white-crowned sparrow, fox sparrow, Brewer's sparrow, golden-crowned sparrow, American robin, American dipper, harlequin duck, grizzly bear, elk, mule deer, woodland caribou, golden-mantled ground squirrel are characteristic of high subalpine (forest-tundra) sites in Alberta (Gadd 1995; Achuff 1994).
3. SOTHER.SPP.COM: *Cronartium ribicola* (white pine blister rust)
F.c. Variability
1.SSPP.COMP.VAR: see Timoney (1999, Appendix 2a)
2.SPHYSIOG.VAR: variation in tree canopy closure due to dieback
3. SSUBTYPES:
4. SVARIABILITY.COM:
G. Dynamic Processes:
1. SNAT.DISTURBANCE: seasonal drought; winter sun and wind exposure; disease (white pine blister rust)
2. SSUCCESS.STATUS: mature to old-growth?
3. SSUCCESS.DYNAM.COM
H. Spatial Relations:
1. SSIZE:
2. SSPATIAL.DISTRIBUTION:
3. SADJACENT.COMMUNITIES: lodgepole pine forests (downslope) and *Pinus albicaulis / Juniperis communis - Arctostaphylos uva-ursi* sites (upslope)
4. SINCLUSION.COMMUNITIES: probably dwarf shrub *Juniperis communis*
5. SMOSAIC.COM:
6. SSPATIAL.COM:
I. Status
1. SRANK: S3?
2. SREASONS: n=8 ESIS plots; may be common in association with lodgepole pine forests; declining due to white pine blister rust
3. SEXEMP.EO.SITENAME: ESIS plot 94JJE9131
4. SSTATCOM::
J. Management
1. SECONCOM: watershed protection, habitat, recreation, and tourism
2. SMANAGE.COM:
K. Inventory and Sampling Procedures
1. SIMAGERY.COM:
2. SSAMPLE.STRATEGY:
3. SINVENTORY.COM:
L. Analysis Procedures and Data Management
1. SANALYSIS.COM: association delineated through quantitative analysis of Alberta ESIS plots via cluster analysis, DCA, and statistics by Timoney (1999).
2. SANALYSIS.DATA.MANAGE.COM:
M. SCOMMUNITY.COM:
N. CITATION: Timoney (1999, Group 26, n=8); Corns and Achuff (1982); Willoughby and Smith (1997); for type delineation.
References:

Achuff, P.L. 1994. Natural regions, subregions and natural history themes of Alberta. A classification for protected areas management. Alberta Environmental Protection, Edmonton, AB.

Achuff, P.L., R.L. McNeil, and M.L. Coleman. 1997. Ecological land classification of Waterton Lakes National Park, Alberta. Parks Canada, Waterton Lakes National Park.

Bourgeron, P.S. and L.D. Engelking (eds.). 1994. A preliminary vegetation classification of the western United States. The Nature Conservancy, Western Heritage Task Force, Boulder, CO.

Corns, I.G.W. and P.L. Achuff. 1982. Vegetation type descriptions. *In:* W.D. Holland & G.M. Coen, G.M. (eds.). Ecological (biophysical) Land Classification of Banff and Jasper National Parks. Volume II: Soil and vegetation resources. Alberta Institute of Pedology Publication SS-82-44. pp. 75-142.

Gadd, B. 1995. Handbook of the Canadian Rockies. Second edition. Corax Press, Jasper, AB.

Kuchar, P. 1973. Habitat types of Waterton Lakes National Park. Parks Canada, Calgary.

Steele, R., S.V. Cooper, D.M. Ondov, D.W. Roberts, and R.D. Pfister. 1983. Forest habitat types of eastern Idaho-western Wyoming. USDA Forest Service, Intermountain Forest and Range Experiment Station. Ogden, UT. General Technical Report INT-144.

Timoney, K.P. 1999. Limber pine, whitebark pine, alpine heath, and terricolous alpine lichen vegetation alliances in Alberta. Alberta Environmental Protection, Resource Data Division, Edmonton.

Willoughby, M.G. and D. Smith. 1997. Range plant community types and carrying capacity for the subalpine and alpine subregions. First approximation. Alberta Environmental Protection, Land and Forest Service. Edmonton.

Community characterization Abstract
Alpine Heath
A. Identifiers
1. SELSUMMARY: The *Phyllodoce glanduliflora* association is a large heath group found on a wide range of sites (rapid to imperfectly-drained, 0-70% slope, subxeric to subhygric, 2050-2620 m elevation, 0-315 degrees aspect). *Phyllodoce glanduliflora* is the only constant species; characteristic species are *Salix arctica, Antennaria lanata*, and *Cassiope mertensiana*.
2. SNAME: *Phyllodoce glanduliflora*
3. SCOMNAME: Yellow Heather
B. Classification
1. SYSTEM: Terrestrial
2. CLASS: Dwarf-Shrubland
3. SUBCLASS: Mainly Evergreen
4. GROUP: Open
5. FORMATION: Cushion
6. ALLIANCE: Alpine Heath
7. SSIMILAR.COMMUNITIES: This type is differentiated from the related *Cassiope mertensiana* association of Timoney (1999) by the dominance of *P. glanduliflora*, and the characteristic *Sibbaldia procumbens* and *Potentilla diversifolia* in this type vs. the dominance of *C. mertensiana*, with the characteristic *Luzula piperi* and *Dicranum scoparium* in the *Cassiope mertensiana* association. Outside Alberta. Similar to *Phyllodoce empetriformis / Antennaria lanata* (Cooper et al. 1997); the *Cassiope mertensiana / Luetkea pectinata* association (Bourgeron and Engelking 1994) is probably equivalent to Kuchar's (1975) *Luetkea pectinata* type. Within their *Phyllodoce glanduliflora* alliance, Bourgeron and Engelking (1994) list the *P. glanduliflora / Aster alpigenus* (G? rank) association.
C. Related Nomenclature
1. SOTHER.NAMES: In whole or in part, synonyms are: *Cassiope mertensiana - Phyllodoce glanduliflora* (Hrapko and La Roi 1978);
Phyllodoce glanduliflora - Cassiope mertensiana (Kuchar 1975, with *Phyllodoce* and *Cassiope* subtypes);
Phyllodoce glanduliflora - Cassiope mertensiana - Antennaria lanata (Corns and Achuff 1982);
alpine heath (Griffiths 1982);
Phyllodoce glanduliflora / Salix spp. - *Antennaria lanata* and *Phyllodoce glanduliflora - Cassiope mertensiana / Trollius albiflorus* associations (Lee et al. 1982);
Phyllodoce association (Trottier 1972; Crack 1977).
2. SOTHERNAMES.RELATION: + | + | + | 1 | 1 | 1
3. SOTHERNAMES.RELATION.NOTE: This association is likely a more specific type than previously defined associations, made possible through analysis of many plots.
4. SNAMES.COM: none.
D. Distribution
1. SRANGE:
2. SRANGECOM: In Alberta, probably widespread in the Rocky Mountains (possible preference for the Front Ranges). In the United States, the *P. glanduliflora* alliance is found in Washington, Oregon, and Montana (Bourgeron and Engelking 1994), but the association in Alberta is likely distinct.
3. SDISTRIBUTION.COM: wide elevational range.
E. Environmental Factors
1. SMINELEV: 2050 m (may occur below 2000 m, especially in association with trees)
2. SMAXELEV: 2620 m
3. SLANDFORM: morainal and residual (L5 type of Corns and Achuff 1982)
4. STOPO.POSITION: mid and upper slopes
5. SSLOPE: 18% median (0-70%)
6. SASPECT: various
7. SGEOLOGY.COM: sedimentary rocks
8. SSOILTYPE: Eutric, Dystric, Melanic, and Sombric Brunisols, Orthic Humo-Ferric Podzols (L5 type of Corns and Achuff 1982)
9. SSOILMOISTURE: mesic median (subxeric to subhygric)

10. SSOILCOM: turfy
11. SHYDRO.INFLUENCE: well-drained median (rapidly to imperfectly-drained)
12. SSEASONAL.VAR:
13. SKEY.ENVIRO.FACTORS: snow catchment important; adequate moisture
14. SENVIRO.COM:
F. Biological and Structural Description
F.a. Vegetation
1. SSTRATA.LIFEFORM: shrubs, herbs
2. SPCT.COVER: ~52% shrubs; >4% herbs
3. SHEIGHT:
4. SMOST.ABUND.SPP: shrubs: *Phyllodoce glanduliflora, Salix arctica, S. reticulata, Cassiope mertensiana, Sibbaldia procumbens*; herbs: *Antennaria lanata, Potentilla diversifolia*
5. SUNVEGETATED.SURFACE: turf?
6. SUNVEGETATED.SURFACE.COVER:
7. SCONSTANT.SPP: *Phyllodoce glanduliflora*
8. SCHARACTERISTIC.SPP: *Antennaria lanata*, *Cassiope mertensiana, Salix arctica*
9. SVEGETATION.COM: There are two strata: ~52% shrubs; >4% herbs. The most abundant species are shrubs: *Phyllodoce glanduliflora, Salix arctica, S. reticulata, Cassiope mertensiana, Sibbaldia procumbens*; herbs: *Antennaria lanata, Potentilla diversifolia*. *Phyllodoce glanduliflora* is constant. *Antennaria lanata*, *Cassiope mertensiana* and *Salix arctica* are characteristic. There is probably some unvegetated turf.
F.b. Other Species
1. SHIGH.RANK.SPP: need to analyze the ESIS data
2. SFAUNA.COM:
3. SOTHER.SPP.COM:
F.c. Variability
1.SSPP.COMP.VAR: see Timoney (1999, Appendix 3b)
2.SPHYSIOG.VAR:
3. SSUBTYPES: probable
4. SVARIABILITY.COM:
G. Dynamic Processes:
1. SNAT.DISTURBANCE: nivation
2. SSUCCESS.STATUS: mature
3. SSUCCESS.DYNAM.COM:
H. Spatial Relations:
1. SSIZE:
2. SSPATIAL.DISTRIBUTION:
3. SADJACENT.COMMUNITIES: probably krüppelholz and *Dryas octopetala*
4. SINCLUSION.COMMUNITIES: perhaps *Cassiope mertensiana* type
5. SMOSAIC.COM:
6. SSPATIAL.COM:
I. Status
1. SRANK: probably S4
2. SREASONS: 67 ESIS plots
3. SEXEMP.EO.SITENAME: ESIS plot 94JIC6108
4. SSTATCOM:
J. Management
1. SECONCOM: watershed protection, habitat, recreation, and tourism
2. SMANAGE.COM: protection
K. Inventory and Sampling Procedures
1. SIMAGERY.COM:
2. SSAMPLE.STRATEGY:
3. SINVENTORY.COM
L. Analysis Procedures and Data Management
1. SANALYSIS.COM: Association was delineated through quantitative analysis of Alberta ESIS plots via cluster analysis, DCA, and statistics by Timoney (1999); may be analysed further for subtypes (associations).
2. SANALYSIS.DATA.MANAGE.COM:
M. SCOMMUNITY.COM:
N. CITATION: Timoney (1999, Group 12, n=67 plots) for type delineation.
References:
Bourgeron, P.S. and L.D. Engelking (eds.). 1994. A preliminary vegetation classification of the

western United States. The Nature Conservancy, Western Heritage Task Force, Boulder, CO.
Cooper, S.V., P. Lesica, and D. Page-Dumroese. 1997. Plant community classification for alpine vegetation on the Beaverhead National Forest, Montana. USDA Forest Service, Intermountain Research Station, Ogden, UT. INT-GTR-362.
Corns, I.G.W. and P.L. Achuff. 1982. Vegetation type descriptions. *In:* W.D. Holland & G.M. Coen, G.M. (eds.). Ecological (biophysical) Land Classification of Banff and Jasper National Parks. Volume II: Soil and vegetation resources. Alberta Institute of Pedology Publication SS-82-44. pp. 75-142.
Crack, S.N. 1977. Flora and vegetation of Wilcox Pass, Jasper National Park. M.Sc. thesis, Univ. of Calgary, Calgary.
Griffiths, G.C.D. 1982. Vegetation survey and mapping of the Plateau Mountain candidate ecological reserve. Natural Areas Program, Alberta Energy and Natural Resources, Edmonton.
Hrapko, J.O. and G.H. La Roi 1978. The alpine tundra vegetation of Signal Mountain, Jasper National Park. Canadian Journal of Botany 56: 309-332.
Kuchar, P. 1975. Alpine tundra communities and Dryas octopetala ssp. hookeriana in the Bald Hills, Jasper National Park. Ph.D. thesis, Univ. of Alberta, Edmonton.
Lee, P., L. Allen, and P. McIsaac. 1982. Vegetation and flora of the Alpine and Upper Subalpine zones - Whitegoat and Siffleur Wilderness Areas. File report, Natural Areas Program, Alberta Energy & Natural Resources, Edmonton.
Timoney, K.P. 1999. Limber pine, whitebark pine, alpine heath, and terricolous alpine lichen vegetation alliances in Alberta. Alberta Environmental Protection, Resource Data Division, Edmonton.
Trottier, G.C 1972. Ecology of the alpine vegetation of Highwood Pass, Alberta. M.Sc. thesis, Univ. of Calgary, Calgary.

Community characterization Abstract
Alpine Heath
A. Identifiers
1. SELSUMMARY: The *Phyllodoce empetriformis* association is found on well-drained, mesic to subhygric, morainal and residual, strong to extreme, middle and upper slopes. Its maximum elevation is only 2360 m (range 2080-2360 m). Subdominant species are *Anemone occidentalis, Salix arctica, Cassiope mertensiana*, and *Artemisia norvegica*.
2. SNAME: *Phyllodoce empetriformis*
3. SCOMNAME: Red Heather
B. Classification
1. SYSTEM: Terrestrial
2. CLASS: Dwarf-Shrubland
3. SUBCLASS: Mainly Evergreen
4. GROUP: Open
5. FORMATION: Cushion
6. ALLIANCE: Alpine Heath
7. SSIMILAR.COMMUNITIES: In Alberta. The closest type in Corns and Achuff (1982) is L5 (*Phyllodoce glanduliflora - Cassiope mertensiana - Antennaria lanata*), but both *P. glanduliflora* and *Antennaria lanata* are of low cover in this association. Outside Alberta. Within their *Phyllodoce empetriformis* alliance, Bourgeron and Engelking (1994) list *P. empetriformis* parkland (G5), *P. empetriformis / Antennaria lanata* (G3), *P. empetriformis - Lupinus latifolius* (G?), and *P. empetriformis / Vaccinium deliciosum* (G4) associations.
C. Related Nomenclature
1. SOTHER.NAMES: none found.
2. SOTHERNAMES.RELATION: none.
3. SOTHERNAMES.RELATION.NOTE: none.
4. SNAMES.COM: This association is likely a more specific type than previously defined similar communities, made possible through analysis of many plots.
D. Distribution
1. SRANGE:
2. SRANGECOM: In the United States, the *P. empetriformis* alliance is found in Washington, Oregon, and Montana (Bourgeron and Engelking 1994). In Alberta, the association is rare, and is probably most similar to the *P. empetriformis / Antennaria lanata* association (S3, G3) of Montana.
3. SDISTRIBUTION.COM:
E. Environmental Factors
1. SMINELEV: 2080 m
2. SMAXELEV: 2360 m
3. SLANDFORM: morainal and residual (L5 type of Corns and Achuff 1982)
4. STOPO.POSITION: mid and upper slopes
5. SSLOPE:25% median (17-60%)
6. SASPECT: various
7. SGEOLOGY.COM: sedimentary rocks
8. SSOILTYPE: Eutric, Dystric, Melanic, and Sombric Brunisols, Orthic Humo-Ferric Podzols (L5 type of Corns and Achuff 1982)
9. SSOILMOISTURE: mesic median (mesic to subhygric)
10. SSOILCOM: turfy
11. SHYDRO.INFLUENCE: well-drained median (well-drained)
12. SSEASONAL.VAR:
13. SKEY.ENVIRO.FACTORS: snow catchment; adequate moisture
14. SENVIRO.COM: snow accumulation areas; may be limited by upper elevations;
F. Biological and Structural Description
F.a. Vegetation
1. SSTRATA.LIFEFORM: shrubs, herbs
2. SPCT.COVER: >34% shrubs; >11% herbs
3. SHEIGHT:
4. SMOST.ABUND.SPP: shrubs: *Phyllodoce empetriformis*, *Cassiope mertensiana, Salix arctica*; herbs: *Anemone occidentalis, Artemisia norvegica*, *Castilleja occidentalis, Erigeron peregrinus, Potentilla diversifolia*
5. SUNVEGETATED.SURFACE: turf?

6. SUNVEGETATED.SURFACE.COVER:
7. SCONSTANT.SPP: none
8. SCHARACTERISTIC.SPP: *Phyllodoce empetriformis*, *Salix arctica*, *Anemone occidentalis, Artemisia norvegica*
9. SVEGETATION.COM: There are two strata: >34% shrubs; >11% herbs. The most abundant species are shrubs: *Phyllodoce empetriformis*, *Cassiope mertensiana, Salix arctica*; herbs: *Anemone occidentalis, Artemisia norvegica*, *Castilleja occidentalis, Erigeron peregrinus,* and *Potentilla diversifolia*. There are no constant species. *Phyllodoce empetriformis*, *Salix arctica*, *Anemone occidentalis,* and *Artemisia norvegica* are characteristic. There may be unvegetated turf.

F.b. Other Species
1. SHIGH.RANK.SPP: need to analyze the ESIS data
2. SFAUNA.COM:
3. SOTHER.SPP.COM:

F.c. Variability
1.SSPP.COMP.VAR: see Timoney (1999, Appendix 3b)
2.SPHYSIOG.VAR:
3. SSUBTYPES: none
4. SVARIABILITY.COM:

G. Dynamic Processes:
1. SNAT.DISTURBANCE: nivation
2. SSUCCESS.STATUS: mature
3. SSUCCESS.DYNAM.COM:

H. Spatial Relations:
1. SSIZE:
2. SSPATIAL.DISTRIBUTION:
3. SADJACENT.COMMUNITIES: probably krüppelholz and *Dryas octopetala*
4. SINCLUSION.COMMUNITIES:
5. SMOSAIC.COM:
6. SSPATIAL.COM:

I. Status
1. SRANK: S2
2. SREASONS: 6 ESIS plots
3. SEXEMP.EO.SITENAME: ESIS plot 94JPA9040
4. SSTATCOM:

J. Management
1. SECONCOM: watershed protection, habitat, recreation, and tourism
2. SMANAGE.COM: protection

K. Inventory and Sampling Procedures
1. SIMAGERY.COM:
2. SSAMPLE.STRATEGY:
3. SINVENTORY.COM

L. Analysis Procedures and Data Management
1. SANALYSIS.COM: association delineated through quantitative analysis of Alberta ESIS plots via cluster analysis, DCA, and statistics by Timoney (1999).
2. SANALYSIS.DATA.MANAGE.COM:

M. SCOMMUNITY.COM:

N. CITATION: Timoney (1999, Group 22, n=6 plots); for type delineation.

References:

Bourgeron, P.S. and L.D. Engelking (eds.). 1994. A preliminary vegetation classification of the western United States. The Nature Conservancy, Western Heritage Task Force, Boulder, CO.

Corns, I.G.W. and P.L. Achuff. 1982. Vegetation type descriptions. *In:* W.D. Holland & G.M. Coen, G.M. (eds.). Ecological (biophysical) Land Classification of Banff and Jasper National Parks. Volume II: Soil and vegetation resources. Alberta Institute of Pedology Publication SS-82-44. pp. 75-142.

Timoney, K.P. 1999. Limber pine, whitebark pine, alpine heath, and terricolous alpine lichen vegetation alliances in Alberta. Alberta Environmental Protection, Resource Data Division, Edmonton.

Community characterization Abstract
Alpine Heath
A. Identifiers
1. SELSUMMARY: The *Cassiope tetragona* association occupies of wide range of alpine sites. Typically the sites are well-drained, mesic, morainal and colluvial, moderate, middle and upper slopes. Elevational range is 2130- 2490 m. *Dryas octopetala* and *Salix reticulata* may be codominant.
2. SNAME: *Cassiope tetragona*
3. SCOMNAME: White Mountain-Heather
B. Classification
1. SYSTEM: Terrestrial
2. CLASS: Dwarf-Shrubland
3. SUBCLASS: Mainly Evergreen
4. GROUP: Open
5. FORMATION: Cushion
6. ALLIANCE: Alpine Heath
7. SSIMILAR.COMMUNITIES: Another subtype of Kuchar (1975) *Cassiope tetragona - Dryas octopetala*, dominated by a crust of the lichen *Lepraria neglecta*, may be ascribable to an alpine lichen alliance. In the High Subarctic of northwestern Canada, *Cassiope tetragona* sometimes occurs as a subdominant with *Dryas integrifolia, Betula glandulosa,* and *Salix glauca* in basic, mesic tundras, and also in basic, hygric to mesic tussock tundras with *Eriophorum vaginatum, Carex lugens, C. scirpoidea, C. vaginata,* and *Betula glandulosa* (Timoney et al. 1993). In the above cases, the associations are distinct from the present *Cassiope tetragona* association.
C. Related Nomenclature
1. SOTHER.NAMES: *Cassiope tetragona - Dryas octopetala* (Hrapko and La Roi 1978);
Cassiope tetragona - Dryas octopetala (Kuchar 1975; contains a *Cassiope tetragona - Phyllodoce glanduliflora* subtype);
Cassiope heath association (Kondla 1978);
Cassiope tetragona association (Beder 1967);
Cassiope tetragona - Phyllodoce glanduliflora type with *Dryas octopetala* (Timoney 1991a);
Cassiope tetragona - Dryas octopetala - Salix nivalis (Corns and Achuff 1982);
Cassiope tetragona - Dryas octopetala (D. integrifolia) - Salix nivalis (Lee et al. 1982);
Cassiope association (Trottier 1972; Crack 1977).
2. SOTHERNAMES.RELATION: = | = | 1 | = | + | = | + | +
3. SOTHERNAMES.RELATION.NOTE: a widespread association that is most closely-related to the large *Dryas octopetala* complex.
4. SNAMES.COM: none.
D. Distribution
1. SRANGE:
2. SRANGECOM: Sporadic in cordilleran Alberta with perhaps a preference for the Front Ranges. May exist as an association in the cordillera north of Alberta and in the Arctic.
3. SDISTRIBUTION.COM:
E. Environmental Factors
1. SMINELEV: 2130 m
2. SMAXELEV: 2490 m
3. SLANDFORM: morainal and colluvial slopes
4. STOPO.POSITION: mid and upper slopes
5. SSLOPE: 15% median (3-50%)
6. SASPECT: tendency to easterly (northerly: Corns and Achuff 1982)
7. SGEOLOGY.COM: sedimentary rocks
8. SSOILTYPE: Eutric, Dystric, Melanic, and Sombric Brunisols, Regosols (L4 type of Corns and Achuff 1982)
9. SSOILMOISTURE: mesic median (subxeric to subhygric)
10. SSOILCOM:
11. SHYDRO.INFLUENCE: well-drained median (well to imperfectly-drained)
12. SSEASONAL.VAR: probably late snowmelt and short growing season
13. SKEY.ENVIRO.FACTORS:
14. SENVIRO.COM:

F. Biological and Structural Description
F.a. Vegetation
1. SSTRATA.LIFEFORM: shrubs, herbs, bryoids
2. SPCT.COVER: >58% shrubs; >3% herbs; bryoids >1%
3. SHEIGHT:
4. SMOST.ABUND.SPP: shrubs: *Cassiope tetragona, Dryas octopetala, Phyllodoce glanduliflora, Salix arctica, S. reticulata*; herbs: *Silene acaulis, Castilleja occidentalis, Polygonum viviparum, Potentilla diversifolia*; *Cetraria islandica* (bryoids)
5. SUNVEGETATED.SURFACE:
6. SUNVEGETATED.SURFACE.COVER:
7. SCONSTANT.SPP: *Cassiope tetragona*
8. SCHARACTERISTIC.SPP: *Dryas octopetala, Phyllodoce glanduliflora, Salix reticulata, Salix arctica, Silene acaulis*
9. SVEGETATION.COM: There are three strata: >58% shrubs; >3% herbs; bryoids >1%. The most abundant species are shrubs: *Cassiope tetragona, Dryas octopetala, Phyllodoce glanduliflora, Salix arctica, S. reticulata*; herbs: *Silene acaulis, Castilleja occidentalis, Polygonum viviparum, Potentilla diversifolia*; and bryoids: *Cetraria islandica*. *Cassiope tetragona* is constant. *Dryas octopetala, Phyllodoce glanduliflora, Salix reticulata, Salix arctica,* and *Silene acaulis* are characteristic. This association lies between the typical alpine heaths dominated by *Phyllodoce glanduliflora, P. empetriformis,* and *C. mertensiana*, and the non-heath upland association(s) dominated by *Dryas octopetala*.
F.b. Other Species
1. SHIGH.RANK.SPP: need to analyze the ESIS data
2. SFAUNA.COM:
3. SOTHER.SPP.COM:
F.c. Variability
1.SSPP.COMP.VAR: see Timoney (1999, Appendix 3b)
2.SPHYSIOG.VAR:
3. SSUBTYPES: none
4. SVARIABILITY.COM:
G. Dynamic Processes:
1. SNAT.DISTURBANCE:
2. SSUCCESS.STATUS: mature
3. SSUCCESS.DYNAM.COM:
H. Spatial Relations:
1. SSIZE:
2. SSPATIAL.DISTRIBUTION:
3. SADJACENT.COMMUNITIES: probably *Dryas octopetala*
4. SINCLUSION.COMMUNITIES:
5. SMOSAIC.COM:
6. SSPATIAL.COM:
I. Status
1. SRANK: probably S3
2. SREASONS: 16 ESIS plots
3. SEXEMP.EO.SITENAME: ESIS plot 94BPA7119
4. SSTATCOM:
J. Management
1. SECONCOM: watershed protection, habitat, recreation, and tourism
2. SMANAGE.COM:
K. Inventory and Sampling Procedures
1. SIMAGERY.COM:
2. SSAMPLE.STRATEGY:
3 .SINVENTORY.COM
L. Analysis Procedures and Data Management
1. SANALYSIS.COM: association delineated through quantitative analysis of Alberta ESIS plots via cluster analysis, DCA, and statistics by Timoney (1999).
2. SANALYSIS.DATA.MANAGE.COM:
M. SCOMMUNITY.COM:
N. CITATION: Timoney (1999, Group 35, n=16 plots) for type delineation.
References:

Beder, K. 1967. Ecology of the alpine vegetation of Snow Creek Valley, Banff National Park, Alberta. M.Sc. thesis, Univ. of Calgary, Calgary.

Corns, I.G.W. and P.L. Achuff. 1982. Vegetation type descriptions. *In:* W.D. Holland & G.M. Coen, G.M. (eds.). Ecological (biophysical) Land Classification of Banff and Jasper National Parks. Volume II: Soil and vegetation resources. Alberta Institute of Pedology Publication SS-82-44. pp. 75-142.

Crack, S.N. 1977. Flora and vegetation of Wilcox Pass, Jasper National Park. M.Sc. thesis, Univ. of Calgary, Calgary.

Hrapko, J.O. and G.H. La Roi 1978. The alpine tundra vegetation of Signal Mountain, Jasper National Park. Canadian Journal of Botany 56: 309-332.

Kondla, N. 1978. An overview vegetation survey of Kananaskis Provincial Park. Alberta Recreation, Parks and Wildlife. Edmonton.

Kuchar, P. 1975. Alpine tundra communities and Dryas octopetala ssp. hookeriana in the Bald Hills, Jasper National Park. Ph.D. thesis, Univ. of Alberta, Edmonton.

Lee, P., L. Allen, and P. McIsaac. 1982. Vegetation and flora of the Alpine and Upper Subalpine zones - Whitegoat and Siffleur Wilderness Areas. File report, Natural Areas Program, Alberta Energy & Natural Resources, Edmonton.

Timoney, K.P. 1991a. Biophysical inventory of the Mount Livingstone Natural Area. Alberta Forestry, Lands and Wildlife. Edmonton.

Timoney, K.P., G.H. La Roi, S.C. Zoltai, and A.L. Robinson. 1993. Vegetation communities and plant distributions and their relationships with parent materials in the forest-tundra of northwestern Canada. Ecography 16: 174-188.

Timoney, K.P. 1999. Limber pine, whitebark pine, alpine heath, and terricolous alpine lichen vegetation alliances in Alberta. Alberta Environmental Protection, Resource Data Division, Edmonton.

Trottier, G.C 1972. Ecology of the alpine vegetation of Highwood Pass, Alberta. M.Sc. thesis, Univ. of Calgary, Calgary.

Community characterization Abstract
Alpine Heath
A. Identifiers
1. SELSUMMARY: The *Cassiope mertensiana* association is typically found on well-drained, mesic to subhygric, very gentle to extreme, middle and upper slopes. Its maximum elevation is only 2340 m. *C. mertensiana* is the only constant. Characteristic species include *Phyllodoce empetriformis, P. glanduliflora, Dicranum scoparium, Salix arctica*, and *Antennaria lanata*.
2. SNAME: *Cassiope mertensiana*
3. SCOMNAME: Western Mountain-Heather
B. Classification
1. SYSTEM: Terrestrial
2. CLASS: Dwarf-Shrubland
3. SUBCLASS: Mainly Evergreen
4. GROUP: Open
5. FORMATION: Cushion
6. ALLIANCE: Alpine Heath
7. SSIMILAR.COMMUNITIES: This type is differentiated from the related *Phyllodoce glanduliflora* association of Timoney (1999) by the dominance of *P. glanduliflora*, and the characteristic *Sibbaldia procumbens* and *Potentilla diversifolia* in the *Phyllodoce glanduliflora* type vs. the dominance of *C. mertensiana*, with the characteristic *Luzula piperi* and *Dicranum scoparium* in the *Cassiope mertensiana* association. Outside Alberta. Similar to *Phyllodoce empetriformis / Antennaria lanata* (Cooper et al. 1997); also similar to Kuchar's (1975) *Luetkea pectinata* type. Within their *Cassiope mertensiana* alliance, Bourgeron and Engelking (1994) list the *Cassiope mertensiana* (G? rank), *C. mertensiana / Carex paysonis* (G2), *C. mertensiana / Luetkea pectinata* (G?), and *C. mertensiana - Phyllodoce empetriformis* (G5) associations.
C. Related Nomenclature
1. SOTHER.NAMES: Synonyms in whole or in part, in Alberta: *Cassiope mertensiana - Phyllodoce glanduliflora* (Hrapko and La Roi 1978);
Phyllodoce glanduliflora - Cassiope mertensiana (Kuchar 1975, with *Phyllodoce* and *Cassiope* subtypes);
Phyllodoce glanduliflora - Cassiope mertensiana - Antennaria lanata (Corns and Achuff 1982);
alpine heath (Griffiths 1982);
Phyllodoce glanduliflora / *Salix* spp. - *Antennaria lanata* and *Phyllodoce glanduliflora - Cassiope mertensiana / Trollius albiflorus* associations (Lee et al. 1982);
Phyllodoce association (Trottier 1972; Crack 1977).
2. SOTHERNAMES.RELATION: + | + | + | l | + | +
3. SOTHERNAMES.RELATION.NOTE: none.
4. SNAMES.COM: This association is likely a more specific type than previously defined similar communities, made possible through analysis of many plots.
D. Distribution
1. SRANGE:
2. SRANGECOM: In Alberta, may be widespread in the cordillera, with a preference for the Main Ranges. In the United States, the *Cassiope mertensiana* alliance exists in Idaho, Montana, Oregon, and Washington (Bourgeron and Engelking 1994).
3. SDISTRIBUTION.COM:
E. Environmental Factors
1. SMINELEV: 2000 m (probably extends below 2000 m, especially in association with trees)
2. SMAXELEV: 2340 m
3. SLANDFORM: morainal and residual slopes (L5 type of Corns and Achuff 1982)
4. STOPO.POSITION: mid and upper slopes
5. SSLOPE: 20% median (4-58%)
6. SASPECT: various
7. SGEOLOGY.COM: sedimentary rocks
8. SSOILTYPE: Eutric, Dystric, Melanic, and Sombric Brunisols, Orthic Humo-Ferric Podzols (L5 type of Corns and Achuff 1982)

9. SSOILMOISTURE: mesic median (mesic to subhygric)
10. SSOILCOM:
11. SHYDRO.INFLUENCE: well-drained median (rapidly to imperfectly-drained)
12. SSEASONAL.VAR:
13. SKEY.ENVIRO.FACTORS: snow accumulation areas; may be limited by upper elevations;
14. SENVIRO.COM:
F. Biological and Structural Description
F.a. Vegetation
1. SSTRATA.LIFEFORM: shrubs, herbs, "grasses", bryoids
2. SPCT.COVER: >55% shrubs; >2% herbs; >1% "grasses"; >1% bryoids
3. SHEIGHT:
4. SMOST.ABUND.SPP: shrubs: *Cassiope mertensiana*, *Phyllodoce glanduliflora, P. empetriformis, Salix arctica;* herbs: *Antennaria lanata*; "grasses": *Luzula piperi*; bryoids: *Dicranum scoparium*
5. SUNVEGETATED.SURFACE: turf?
6. SUNVEGETATED.SURFACE.COVER:
7. SCONSTANT.SPP: *Cassiope mertensiana*
8. SCHARACTERISTIC.SPP: *Antennaria lanata, Luzula piperi, Dicranum scoparium*
9. SVEGETATION.COM: There are four strata: >55% shrubs; >2% herbs; >1% "grasses"; >1% bryoids. The most abundant species are shrubs: *Cassiope mertensiana*, *Phyllodoce glanduliflora, P. empetriformis, Salix arctica;* herbs: *Antennaria lanata*; "grasses": *Luzula piperi*; and bryoids: *Dicranum scoparium. Cassiope mertensiana* is a constant. *Antennaria lanata, Luzula piperi,* and *Dicranum scoparium* are characteristic. There may be some unvegetated turf. This type might be found below treeline, as inclusions with tree communities, or in a mosaic.
F.b. Other Species
1. SHIGH.RANK.SPP: need to analyze the ESIS data
2. SFAUNA.COM:
3. SOTHER.SPP.COM:
F.c. Variability
1.SSPP.COMP.VAR: see Timoney (1999, Appendix 3b)
2.SPHYSIOG.VAR:
3. SSUBTYPES: possible
4. SVARIABILITY.COM:
G. Dynamic Processes:
1. SNAT.DISTURBANCE: nivation
2. SSUCCESS.STATUS: mature
3. SSUCCESS.DYNAM.COM:
H. Spatial Relations:
1. SSIZE:
2. SSPATIAL.DISTRIBUTION:
3. SADJACENT.COMMUNITIES: probably krüppelholz and *Dryas octopetala*
4. SINCLUSION.COMMUNITIES:
5. SMOSAIC.COM:
6. SSPATIAL.COM:
I. Status
1. SRANK: S3-S4
2. SREASONS: 42 ESIS plots
3. SEXEMP.EO.SITENAME: ESIS plot 94JSJ9084
4. SSTATCOM:
J. Management
1. SECONCOM: watershed protection, habitat, recreation, and tourism
2. SMANAGE.COM: protection
K. Inventory and Sampling Procedures
1. SIMAGERY.COM:
2. SSAMPLE.STRATEGY:
3 SINVENTORY.COM
L. Analysis Procedures and Data Management
1. SANALYSIS.COM: Association was delineated through quantitative analysis of Alberta ESIS plots via cluster analysis, DCA, and statistics by Timoney (1999); may be analysed further for subtypes (associations).
2. SANALYSIS.DATA.MANAGE.COM:

M. SCOMMUNITY.COM:
N. CITATION: Timoney (1999, Group 70, n=42 plots) for type delineation.
References:

Bourgeron, P.S. and L.D. Engelking (eds.). 1994. A preliminary vegetation classification of the western United States. The Nature Conservancy, Western Heritage Task Force, Boulder, CO.

Cooper, S.V., P. Lesica, and D. Page-Dumroese. 1997. Plant community classification for alpine vegetation on the Beaverhead National Forest, Montana. USDA Forest Service, Intermountain Research Station, Ogden, UT. INT-GTR-362.

Corns, I.G.W. and P.L. Achuff. 1982. Vegetation type descriptions. *In:* W.D. Holland & G.M. Coen, G.M. (eds.). Ecological (biophysical) Land Classification of Banff and Jasper National Parks. Volume II: Soil and vegetation resources. Alberta Institute of Pedology Publication SS-82-44. pp. 75-142.

Crack, S.N. 1977. Flora and vegetation of Wilcox Pass, Jasper National Park. M.Sc. thesis, Univ. of Calgary, Calgary.

Hrapko, J.O. and G.H. La Roi 1978. The alpine tundra vegetation of Signal Mountain, Jasper National Park. Canadian Journal of Botany 56: 309-332.

Kuchar, P. 1975. Alpine tundra communities and Dryas octopetala ssp. hookeriana in the Bald Hills, Jasper National Park. Ph.D. thesis, Univ. of Alberta, Edmonton.

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Timoney, K.P. 1999. Limber pine, whitebark pine, alpine heath, and terricolous alpine lichen vegetation alliances in Alberta. Alberta Environmental Protection, Resource Data Division, Edmonton.

Trottier, G.C 1972. Ecology of the alpine vegetation of Highwood Pass, Alberta. M.Sc. thesis, Univ. of Calgary, Calgary.