

**POTENTIALLY TRACKABLE PLANT COMMUNITIES:
FOOTHILLS AND ROCKY MOUNTAIN NATURAL REGIONS**

Prepared for:
Alberta Natural Heritage Information Centre

Prepared by:
D. Downing
Timberline Forest Inventory Consultants

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INTRODUCTION

An understanding of representative and uncommon ecological communities in terms of their distribution, structure, and taxonomy is an integral component of biodiversity planning. Information at the community level is considered important at the “coarse filter” level; identification and protection of representative ecological communities ensures that most conservation objectives will be met. It is also important at the “fine filter” level, where uncommon or rare ecological communities are identified for protection (TNC, 1994a).

An intensive national effort was undertaken by TNC in 1994 to summarize all known plant communities in the conterminous United States. TNC applied a multi-level hierarchy integrating physiognomic and floristic elements to accomplish this task, and ranked communities according to their relative endangerment. In Canada, similar efforts are underway to classify plant communities in British Columbia. In 1995, the Alberta Natural Heritage Information Centre (ANHIC) undertook a pilot project to catalogue all vegetation communities in the Rocky Mountain and Foothills Natural Regions of the Province. A tabular catalogue of these communities was prepared by Ellis (1996) through a review of 63 references.

Some of the problems and challenges inherent in assigning a level of rarity to an assemblage of plants have been listed and addressed by TNC (1994a,b). These include :

1. The identification of rare communities according to their presumed global frequency and total area.;
2. The recognition of habitat characteristics as potentially important descriptors and their predictive value as potential locales for uncommon or rare types (but which are generally inaccurately or incompletely recorded);
3. The inclusion of both structural and compositional characters to describe vegetation types; and
4. The difficulties attached to recognizing successional stages and pathways within a classification.

Other issues could include: the time frame over which a community can exist (is an early successional community or an extremely old community characterized by an uncommon or rare assemblage “trackable”?); communities that are not rare over much of an area but are rare in a particular climatic region; whether the trackable communities can be relocated (are exact plot locations known?); and whether a commonly occurring vegetation community which is home to rare fauna is “trackable”.

Timberline Forestry Inventory Consultants Ltd was asked to prepare a list of potentially trackable communities from the Ellis report, and to add communities that had been described subsequent to its preparation. The process of identifying “trackable” communities has been conducted previously through a team approach in the Western U.S. (TNC 1994b; pers. comm. Peter Achuff), where several people jointly evaluated all communities and reached consensus on “trackable” elements. For the Alberta pilot, an explicit data-based means of identifying potentially trackable communities was undertaken in order to streamline the process of reviewing textual descriptions.

OBJECTIVES

The objectives of this project were to:

- create a database from text files included with the 1996 Ellis report;
- add missing community types from sources produced subsequent to the Ellis report;
- prepare a list of potentially trackable communities; and
- provide a summary of issues that might be important in Alberta with reference to organizing, defining and ranking communities.

METHODS

Definitions and considerations

TNC approach to community classification was followed to the extent allowed by the available data. In terms of guidelines for assessing trackable communities, the following two definitions are broadly applicable:

“Botanically significant plant assemblages may include assemblages such as old growth forests or diverse, representative, endemic, disjunct or unusual communities of plants. These may include relatively undisturbed examples of a natural region or a plant community which includes rare species. There are no precise definitions, but these botanical assemblages will be unique in the judgment of the surveyor with knowledge of plant ecology and the flora of the region.” -

Alberta Native Plant Council: Guidelines for Rare Plant Surveys, April 1997.

“For the terrestrial system, the community element is a plant association as defined by the Third International Botanical Congress of 1910: ‘a plant community of definite floristic composition, presenting a uniform physiognomy, and growing in uniform habitat conditions’.” (**TNC, 1994b**). This definition was modified to include a definition of scale (subjective) and a definition of uniformity (may include patterned heterogeneity). Rarity was assessed by estimating the number of occurrences and the total acreage, starting at the state level. TNC (1994b) also accepted naturally-occurring communities in any stage of succession. Important aspects of the national and western US classification scheme included an assessment of physiognomy (after Driscoll 1984) and floristics (alliance/plant association) (TNC 1994a, 1994b).

The vegetation classification system in Alberta is not structured in a rigorously defined province-wide floristic/physiognomic hierarchy as is the vegetation over much of the western U.S.¹. Plant community naming conventions in Alberta have varied widely between studies; for example, some investigators stress dominant species, while others put equal emphasis on species having significance for other reasons (e.g. indicator species occurring with low cover but high

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It may be argued that the stratification of community types distribution within major climatic zones (natural subregions) in Alberta is somewhat more advanced than that applied to the United States, although this factor is now being considered by TNC in Montana (S. Cooper, pers. comm.).

constancy, or rare/uncommon species). Ellis (1996) attempted to assign Latin community names to all of the communities encountered during his literature search, although the descriptions contained in some reports were too broad to permit this. This inconsistency of approach makes the definition of “trackable” plant communities based on the community name alone less than completely explicit, and at least for Alberta, supports the argument that other information in addition to the community name needs to be captured when the source literature is initially reviewed.

Process

The main source of information was the **Vegetation Community Type Catalogue, Rocky Mountain and Foothills Natural Region** (Ellis, 1996); the tabular summaries in that document were available as text files.

1. Text files in table format were converted to comma-delimited character strings.
2. A SAS® program was written with the objective of converting text into a searchable data file to which queries and derivative analyses could be applied. The main features of the program include:
 - compilation of a standardized community type from the species listed in the tabular records (associated with a natural subregion), the source from which it was derived, the estimated quality of data, and the original author’s comments on equivalencies or other features of the community.
 - derivation of the appropriate Driscoll² class for each community type based on the species present and some assumptions about the general nature of forested overstories in each natural subregion (e.g. mostly open woodlands in the subalpine vs closed forests in the Montane and Foothills), and.
 - attachment of a rare species index value to those communities containing rare species, as defined by ANHIC (1996).

Some of the community types listed as equivalencies in the comments column of the text files and Ellis report had not been recorded as communities elsewhere in the list of communities. Therefore, the Ellis list was somewhat incomplete, and the comments field was scanned to extract community type information from it and to create new records, to which the above manipulations were applied. Additional references from four new sources (Archibald et al 1996; Beckingham et al 1996; Willoughby et al 1997; Willoughby and Smith 1997) were added to the Ellis list³.

This process was highly iterative, as the text files contained numerous abbreviations and typographical errors which had to be corrected either in the original text files or through

² Driscoll codes were taken from Table 1, TNC (1994b). These codes represent the physiognomic level of classification integral to the U.S. TNC vegetation classifications.

³ Only those communities considered to represent potentially trackable communities were abstracted from these reports. For completeness, the entire set of communities reported should be captured.

programming statements. However, in the end, a data file was produced that contained nearly 2100 community types, spread throughout four natural subregions as follows:

Natural subregion	Number of communities
Alpine/subalpine *	204
Subalpine	461
Montane	386
Foothills	1041

* (insufficient detail in source reports to determine which subregion these communities belonged to)

This proved to be an intractable number to categorize; there was not enough similarity between vegetation types to easily permit grouping. For example, a *Picea mariana*-*Pinus contorta* stand is sorted and grouped differently than a *Pinus contorta* - *Picea mariana* stand, even though the two might be essentially identical in all respects other than the order of tree cover reported. Therefore, to reduce the level of complexity and the number of stands to be assessed, a determination of three significant features of the plant communities as reported was made:

1. Were there any rare species present and listed in the community name?
2. Is the physiognomic (Driscoll) type unusual for the area? (e.g. evergreen conical crown physiognomies would be considered unusual for the dry mixedgrass natural subregion).
3. Are there any plant species listed in the assemblage that might be at the limits of or outside their range (refer to Table 2)?

The first item was assessed with reference to ANHIC (1996)⁴. The second item was assessed by counting the total number of occurrences of a given physiognomic type in a given natural subregion; less than four occurrences of a physiognomic type was considered significant. The third item was more difficult to assess, and relied upon the species distribution maps in Moss (1983) as well as the locational accuracy of the information source given in Ellis (1996). For example, determining whether a plant was within its normal range was not possible if the survey within which it was reported spanned a broad geographic area.

RESULTS

The final result of this pattern search was a significantly smaller number of plant communities that are potentially “trackable”. The definition of global, national, or even provincial rarity is one that cannot reasonably be attempted in this document; as TNC states, this effort requires the participation of experts in adjoining provinces and states. However, it is probable that many of these communities are not extensively distributed, particularly those in the alpine, subalpine, and montane natural subregions, all of which are influenced strongly by local climatic regimes.

⁴ Rare species were considered to be those with a provincial rank of S1,S2 or S3 as listed in ANHIC (1996).

Those communities considered potentially trackable as determined by one or more of the criteria presented above are marked with a forward arrow (>) in the left hand column of the tables presented in Appendix 1. Those not marked with an arrow *may* be trackable if one or more of the associated species occur outside their normal ranges in the geographic area to which the source survey applies; more information is required. These species and their reported ranges within Alberta are shown in Table 1. Appendix 2 summarizes Driscoll codes and their relative frequency of occurrence in the Foothills and Rocky Mountain Natural Regions.

DISCUSSION AND RECOMMENDATIONS

Definition of trackable community

TNC approach to estimating rarity (total number of communities and estimated area covered) is reasonable, but a broad application of this concept particularly across the Eastern Slopes would probably result in the assignment of many plant communities in the alpine, subalpine, montane and upper foothills as trackable. For example, a montane Douglas fir-hairy wild rye (*Pseudotsuga menziesii - Elymus innovatus*) stand in the Athabasca River valley is floristically different from a montane Douglas fir-pinegrass (*P. menziesii-Calamagrostis rubescens*) stand in the Crowsnest Pass, and both appear to be different communities than any listed within the *Pseudotsuga menziesii* alliance by TNC (1994b). Both of the Alberta community types probably occupy less than 20,000 acres in each area respectively, and there are likely in excess of 100 occurrences of each type of stand in these areas. According to TNC (1994a), these communities could each be assigned a rank of G2 (imperilled globally), G3, or G4 depending on secondary factors such as the degree of threat. According to TNC (1994b), there are no strictly comparable community types in Montana.

A standard for recognizing floristically distinct plant communities therefore needs to be adopted in Alberta. This standard should be developed through consultation among experts, but the following issues should probably be considered:

- Do the major or significant species in two floristically similar community types differ in terms of their distribution in Alberta? By this criterion alone, and with reference to the example above, pinegrass-dominated communities would be notable (restricted distribution of pinegrass), but hairy wild grass dominated communities would not (cosmopolitan species).
- Do the major or significant species in two floristically similar community types occur on ecologically different sites? For example, are hairy wild rye communities in the southern parts of the lower foothills subregion ecologically similar to hairy wild rye communities in the northern parts of the lower foothills subregion? Are the associated species similar enough in terms of constancy and cover? Are soil drainages, nutrient regimes, and moisture regimes comparable? What effects do regional climatic changes through a subregion have on plant community composition?
- If the ecological conditions under which two communities occur are more or less similar, how comparable do the communities need to be floristically (in terms of composition and abundance) in order to be considered similar for the purposes of classification (70% congruence?).

Data-related recommendations

A data file structure that is consistent between natural subregions and that includes the elements important for TNC classification (floristic and physiognomic) is necessary for explicit and efficient analysis of trackable communities from a provincial, national and global perspective. Because plant community names are highly variable between authors, and might not include all of the species that are relevant to decisions on trackability, dominant and constant species of the community should be recorded in addition to the community name. Rare/uncommon species and those with suspected restricted distributions should be included in the list of species if they are constant (present in more than about 60% of sample plots) or if they are dominant. Table 2 presents a suggested format for vegetation community type catalogue data files.

Other

“Trackability” implies that the selected community can be relocated. Once a tracking list has been developed, how are “type” specimens of the trackable communities relocated. If there is sufficient detail in the source document, it may be possible to accomplish this task using available maps and appropriately annotated airphotos in combination with detailed community tables (e.g. Willoughby et al 1997a). For more generally described communities, field reconnaissance will probably be necessary.

“Trackable” communities should be surveyed over time in the same way that rare plant populations are, and the same provisos apply i.e. communities change over time as populations change. Insights into successional trends will likely be provided by this information. If possible, at least three of each selected community type should be monitored to get some idea of average trends; the type of monitoring depends on question being asked and the resources available to do it. Along the East Slopes in particular, there are numerous permanent sample plots that have been established and monitored since the 1950’s (rangeland reference areas, forestry permanent sample plots); those which contain trackable communities would provide excellent trend information.

Alberta’s classification of plant community types is considerably less structured compared to that applied by the adjoining western U.S. and British Columbia. The adoption of regionally consistent community type designations (within natural subregions) and their description according to formats as close as possible to that applied by TNC will assist greatly in the process of crosswalking across states and provinces. The comparison of trackable community types in adjacent jurisdictions will probably require a comparison of species lists, which will be facilitated by consistently structured datasets.

Table 1. Significant plant species encountered in community lists (reported as having restricted distributions in Alberta)*

Species	Approx. distribution in Alberta
<i>Acer glabrum</i>	Mostly restricted to montane of S. Alberta
<i>Angelica dawsonii</i>	Restricted to SW Alberta
<i>Balsamorhiza sagittata</i>	Restricted to extreme SW Alberta
<i>Berberis repens</i>	Restricted to southern Montane
<i>Carex rupestris</i>	Uncommon in LF, UF subregions
<i>Calamagrostis rubescens</i>	Not reported north of Red Deer R.
<i>Carex pauciflora</i>	Not reported S. of N. Sask. R; uncommon in SA subregion
<i>Corylus cornuta</i>	Not common west of Edmonton or south of Grande Prairie.
<i>Drosera anglica</i>	Uncommon, mainly N. of N. Sask R.
<i>Dryas integrifolia</i>	Uncommon in southern Alta.
<i>Festuca brachyphylla</i>	Not very common in LF, UF
<i>Kobresia myosuroides</i>	Less common in UF than SA
<i>Larix laricina</i>	Not common S. of N. Sask R.
<i>Larix lyallii</i>	Restricted distribution worldwide
<i>Linum lewisii</i>	S. of N. Sask. R.
<i>Luetkea pectinata</i>	Not reported S. of N. Sask. R.
<i>Minuartia obtusata</i>	South of Red Deer R.
<i>Oplopanax horridum</i>	Most reported occurrences in Swan Hills
<i>Pedicularis capitata</i>	Not south of Red Deer R.
<i>Phlox hoodii</i>	Mainly S. of Red Deer R.
<i>Picea mariana</i>	Uncommon S. of Bow R.; furthest known S extension is MacAbee Cr.
<i>Pinus flexilis</i>	Mainly montane
<i>Pinus albicaulis</i>	Scattered throughout SA subregion
<i>Poa cusickii</i>	Not north of N. Sask. River
<i>Populus tremuloides, Populus balsamifera</i>	Uncommon as community dominants in SA subregion.
<i>Rhamnus alnifolia</i>	Uncommon: extreme SW and eastern Alberta
<i>Rubus chamaemorus</i>	Not S. of N. Sask. R.
<i>Rubus parviflorus</i>	Disjunct: S. of Bow R. and in Swan Hills.
<i>Rubus pedatus</i>	Not common S. of Red Deer River
<i>Salix barrattiana</i>	Mainly in Alpine, SA; uncommon UF,LF
<i>Scheuzeria palustris</i>	Uncommon, mainly in central-northern Alberta
<i>Selaginella rupestris</i>	Rare; eastern Alberta
<i>Tiarella unifoliata</i>	Uncommon.
<i>Vaccinium myrtillus</i>	Uncommon N. of Bow R.
<i>Xerophyllum tenax</i>	Extreme SW Alberta

* From Moss (1983) species distribution maps.

Table 2. Data file structure recommendations for community type data capture

TYPE OF DATA	FIELD NAME	DEFINITION (type, length)	REMARKS
<i>HEADER INFORMATION</i>			Must allow unique identification of each community type in the dataset (COMNAME must be unique for each SOURCE)
EO source code	SOURCE	Char 12	Key
Original community name	COMNAME	Char 200	Key
Confidence level (TNC,1994a)	CONF	Char 1	(1=STRONG, 2=Moderate,3=WEAK, (TNC 1994a)
<i>PHYSIOGNOMIC INFORMATION</i>			
Tree crown closure >60%	CLOSCODE	Char 2	T1= tree, >60%;
Tree crown closure 26-59%	CLOSCODE	Char 2	T2= tree, >26-59%;
Tree crown closure <26%, shrub cover >26% & >0.5m	CLOSCODE	Char 2	S1= (tall shrub & open tree)
Tree crown closure <26%, shrub cover <26% & >0.5m	CLOSCODE	Char 2	S2= (tall shrub & open tree)
Tree crown closure <26%, shrub cover <26% & <0.5m	CLOSCODE	Char 2	S3= (low shrub & open tree)
Tree crown closure <26%, shrub cover >26% & >0.5m	CLOSCODE	Char 2	S4= (tall shrub & open tree)
Trees, shrubs <25% of canopy, herbs dominant	CLOSCODE	Char 2	H= (herbaceous-dominated)
Trees, shrubs <25% of canopy, bryophytes/lichens dominant	CLOSCODE	Char 2	M= (bryophyte/lichen dominated)
<i>FLORISTIC INFORMATION</i>			
Tree layer (up to 5 species)	TREE1-TREE5	Char 7	Codes per accepted Alberta species list
Shrub layer (up to 5 species)	SHRUB1-SHRUB5	Char 7	Codes per accepted Alberta species list
Herbaceous layer (other than graminoids)	FORB1-FORB5	Char 7	Codes per accepted Alberta species list
Grasses and graminoids (up to 5 species)	GRASS1-GRASS5	Char 7	Codes per accepted Alberta species list
Lichens (up to 5 species)	LICHEN1-LICHEN5	Char 7	Codes per accepted Alberta species list
Bryophytes (up to 5 species)	BRYO1-BRYO5	Char 7	Codes per accepted Alberta species list
<i>OTHER DATA</i>			
Rare species designation	RARESPP	Char 1	"Y" if one or more of the species listed in any of the species columns is designated as rare (could be obtained by merge with Alberta species list)
Source code for possible equivalencies	SOURCE2	Char 12	
Comments - possible equivalencies	COMMENT1	Char 200	Name of plant community in SOURCE2 considered as possible equivalent.
Comments- other	COMMENT2	Char 200	Species of significance that are not listed in the community name (7-letter codes preferable) and are rare/uncommon or otherwise significant.

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PERSONAL COMMUNICATIONS

Achuff, Peter, Vegetation Specialist, Waterton National Park, November 1995.

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APPENDIX 1. LIST OF POTENTIALLY TRACKABLE PLANT COMMUNITIES, ROCKY MOUNTAIN AND FOOTHILLS NATURAL REGIONS.

The columns in the following tables represent the following:

Source:	Source Code
Dqcode:	Data quality code
Location:	Natural region or subregion
Driscoll:	Driscoll code (TNC 1994b)
Provname:	Provisional community name assigned by author or by Ellis (1996)
Comment:	Why the community type is potentially trackable. “sig. plant sp”= significant plant species (range extension, limited range within province).

Potentially trackable plant communities are marked with a forward arrow (>) in the left-hand column; the species of significance is/are boldfaced and italicized. Other communities listed may be noteworthy if more information is available respecting species distribution (refer to Table 2).

SOURCE	DOCODE	LOCATION	DRISCOLL	PROVINCE	COMMENT
N82WHE01ABA	V.DETAILLED	ALP/SUBALP	sod grasses/hemicryptophytes	KOBRESIA MYOSUROIDES-ELYMUS INNOVATUS	rare sp.in type
> A78HRA1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	SALIX ARCTICA - <i>ARTIGROSTIS ARUNDINACEA</i>	rare sp. in type
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Evergreen cushion dwarf shrubland	DYVAS OCTOPETALA - <i>PEDICULARIS CAPITATA</i>	rare sp. in type
A78HRA1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	DYVAS OCTOPETALA - <i>KOBRESIA BELLAUDII</i>	rare sp. in type
N78HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	DYVAS OCTOPETALA - <i>PESTUCA BRACHYPHYLLA</i>	rare sp. in type
N78HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	DYVAS INTERGRIPILLA - <i>CAREX RUPRESTIS</i>	rare sp. in type
N78HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	DYVAS INTERGRIPILLA - <i>HEDYSARUM ALPINUM</i>	rare sp. in type
N78HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	DYVAS INTERGRIPILLA - <i>TROLLIUS ALBIFLORUS</i>	rare sp. in type
N78HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	DYVAS INTERGRIPILLA - <i>BARRATTIANA TETRAGONA</i>	rare sp. in type
N78HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	DYVAS INTERGRIPILLA - <i>HEDYSARON MACKENZII</i>	rare sp. in type
N78HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	DYVAS INTERGRIPILLA - <i>CASSIOPE PODOCARPA</i>	rare sp. in type
N78HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	CAREX SPECIATILIS-FESTUCA BRACHYPHYLLA	rare sp. in type
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Evergreen cushion dwarf shrubland	DYVAS BARRATTIANA <i>PHYLLOOCO GLANDULIFLORA</i>	rare sp. in type
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	DYVAS OCTOPETALA <i>OXYTROPIS PODOCARPA</i>	rare sp. in type
OVERVIEW	V.DETAILLED	ALP/SUBALP	Unclassified lichen/moss dominated	LAND SYSTEM YKR2 (ONOPHALODISCUS SPP.-RHIZOCARPON SPP. - PARMELIA SPP.)	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	DYVAS OCTOPETALA - <i>KOBRESIA MYOSUROIDES</i>	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	DYVAS OCTOPETALA - <i>PENTILLIA FRUTICOSA-CAREX CAPILLARIS/TOMENTHYPNUM NITENS</i>	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	SALIX BARRATTIANA-SALIX NIVALIS	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	KOBRESIA MYOSUROIDES	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	LUEHTKIA PECTINATA	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	POA CORDIKII	unusual Driscoll code
N75KUC01ABA	V.DETAILLED	ALP/SUBALP	Sod grasses/hemicryptophytes	SPHRAGmites spp.	unusual Driscoll code
N75KUC01ABA	V.DETAILLED	ALP/SUBALP	Unclassified lichen/moss dominated	SALIX BARRATTIANA	unusual Driscoll code
N75KUC01ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	RUBUS IDAEUS/ARTEMESIA MITCHAUDIANA	unusual Driscoll code
N75KUC01ABA	V.DETAILLED	ALP/SUBALP	Subalpine deciduous shrubland	ROBINIA PSEUDOACACIA	unusual Driscoll code
N75KUC01ABA	V.DETAILLED	ALP/SUBALP	Open broad leafed decid. woodland	POENOPSIS PTERIOLOIDES	unusual Driscoll code
N75KUC01ABA	V.DETAILLED	ALP/SUBALP	Open evergreen forest, conical crowns	ABIES PICEA KRIMMOLIZ	unusual Driscoll code
N75KUC01ABA	V.DETAILLED	ALP/SUBALP	Open evergreen forest, conical crowns	ABIES PICEA KRIMMOLIZ	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Sod grasses/hemicryptophytes	ROBRESIA MYOSUROIDES	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	DRY ALPINE TUNDRA (DRYAS OCTOPETALA)	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	SUCCESSIVE STAGE 4 (<i>SELAGINELLA RUPESTRIS</i> - <i>CETRARIA CUCULATA</i>)	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Alpine and subalpine meadows	DRYAS TUNDRA (DRYAS OCTOPETALA-HEYSARUM SULPHURESCENS)	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	TALUS BARREN (PENSTEMON ELLIPTICOS-ARTEMISIA MICHIGANIANA-FESTUCA BAFFINETENSIS- <i>AGROPYRON SCRIPERI</i>)	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Alpine and subalpine meadows	ABIES PICEA KRIMMOLIZ	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	ABIES PICEA KRIMMOLIZ	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Alpine and subalpine meadows	DRYAS OCTOPETALA	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Evergreen cushion dwarf shrubland	DRY ALPINE TUNDRA (DRYAS OCTOPETALA)	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	DRY ALPINE TUNDRA (DRYAS OCTOPETALA-HEYSARUM SULPHURESCENS)	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	SALIX BARRATTIANA	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Unclassified lichen/moss dominated	KOBRESIA MYOSUROIDES	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Sod grasses/hemicryptophytes	CETRARIA SPP.-CLADINA SPP.	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Unclassified lichen/moss dominated	DRY MEADOW (CAREX FASONIS-CAREX PHAECEPHALA/POLYTRICHUM PILIFERUM-TORTULA RURALIS)	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Alpine and subalpine meadows	XEROPHYLLUM TINAX	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Cold-decid. caespitose shrubland	DRYAS OCTOPETALA	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Alpine and subalpine meadows	CUSHION PLANT TUNDRA (DRYAS OCTOPETALA)	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Subalpine deciduous shrubland	ALDER AVANLACH SCRUB (ALNUS SINUATA-SAMBUCUS RACEMOSA- <i>SORBUS SITCHENSISSIS</i> /ATHYRUM FILIX-FEWINA-DRYOPTERIS SPP.-SCHIUEPPI/SPHAESPI	unusual Driscoll code
B690G10ABA	OVERVIEW	ALP/SUBALP	Foothills	CARAGA-SCHIUEPPI/SPHAESPI	unusual Driscoll code
B690G10ABA	OVERVIEW	ALP/SUBALP	Foothills	PICMAR-LARLAR/BEUTIGRO/CARESSE/ALUAPAL	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Foothills	PICMAR/LAECOM/CARSIE/SPHAESPI/BLYPINTIN	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Foothills	PICMAR/LARLAR/LEUDIGRO/FRIBUCHA/SPHASPP	unusual Driscoll code
N82HRO1ABA	V.DETAILLED	ALP/SUBALP	Foothills	PICMAR/LARLAR/LEUDIGRO-BETUPUM/CARESPP/SPHASPP	unusual Driscoll code

COMMUNITY TYPES ASSOC.

COMMUNITY TYPES ASSOC. WITH UNCOMMON DRISCOLL CLASSIFICATIONS

URCE	DOCODE	LOCATION	DRISCOLL	PRONYNAME	COMMENT
COLABCA	V-DETAILED	MONTANE	Closed evergreen forest, conical crowns	PINICON / PACHISTIMA MYRSINITES / XEROPHYLLUM TENAX	sig. plant sp., rare sp. in type
LOLABCA	V-DETAILED	MONTANE	Mainly perennial flwr. forbs, ferns	AGROPYRON DASYSTACHYUM - ANTENNARIA NITIDA	sig. plant sp.
LOLABCA	V-DETAILED	MONTANE	Mainly perennial flwr. forbs, ferns	ANTENNARIA NITIDA	sig. plant sp.
LOLABCA	V-DETAILED	MONTANE	Evergreen needle-leaved shrubland	JUNIPERUS HORIZONTALIS	unusual Driscol code, sig. plant sp.
LOLABCA	V-DETAILED	MONTANE	Short grass, soci-forming spp.	CAEX FILIFOLIA	sig. plant sp.
LOLABCA	V-DETAILED	MONTANE	Closed evergreen forest, conical crowns	PICEA GLAUCA CORNUS STOLONIFERA ANGELICA DANSONII	rare sp. in type
LOLABCA	V-DETAILED	MONTANE	Evergreen needle-leaved shrubland	FORB - RICH DEPRESSIONS & WOODLAND EDGES (JUNIPERUS HORIZONTALIS) / AGROPYRON SUBSECUNDUM - GEDM TRIFOLI	unusual Driscol code
LOLABCA	V-DETAILED	MONTANE	Subalpine deciduous shrubland	ARTEMISIA TRIDENTATA - BHEANANDA ALNIFOLIA / POAPPAT	sig. plant sp., rare sp. in type
LOLABCA	V-DETAILED	MONTANE	Mainly perennial flwr. forbs, ferns	AGROPYRON SMITHII - HALOPAPPUS UNIFLORUS	sig. plant sp., rare sp. in type
LOLABCA	V-DETAILED	MONTANE	Closed evergreen forest, conical crowns	PANTS FLEXILIS / FESTUCA SCARABEA	sig. plant sp.
LOLABCA	OVERVIEW	MONTANE	Closed evergreen forest, conical crowns	LAND SYSTEM 5M2 (PSEUDOSUGIJA MENZIESII - PINUS CONTORTA - PICEA GLAUCA / ALNUS SPP. / LINNAEA BOREALIS - CALAM	sig. plant sp.
LOLABCA	V-DETAILED	MONTANE	Closed evergreen forest, conical crowns	INUS CONIFERAL CAMALASTROSIS / RUBESCENS	sig. plant sp.
LOLABCA	V-DETAILED	MONTANE	Closed evergreen forest, conical crowns	FICHA GLANICA PRINDIDUSIS MENZIESII / STYRAX RETULIFOLIA - RIBAUS PARVIFLORUS	sig. plant sp.

COMMUNITY TYPES ASSOC. WITH UNCOMMON DRISCOLL CLASSIFICATIONS

APPENDIX 2. SUMMARY OF DRISCOLL CODES BY NATURAL SUBREGION

