

Alberta Conservation Information Center Ecological Community Sampling Guidelines

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1. Introduction

An ecological community is defined as a distinct assemblage of plant species with similar total species composition and vegetation structure that can often be associated with particular environmental conditions. Given the right conditions, it reoccurs predictably. Ecological communities can be separated into three major types: terrestrial, wetland and aquatic.

Rare ecological communities include, but are not limited to, communities on the Alberta Ecological Community Tracking and Watch List. These are community types that have been described as unusual, uncommon, of limited extent or encountered infrequently. They also include community types that have been described by vegetation experts as in decline or as threatened in some way. All are considered to be significant at the provincial scale. Some may be nationally or globally significant.

Within a given study area, there may be communities of provincial or greater significance that have not yet been included on the tracking and watch lists, as the lists are currently under development. **The tracking and watch lists** have been developed through a review process, and continue to be refined as new community types are proposed and as more information is gathered on types already on the list.

Through the course of a study, **locally significant ecological communities** might be documented. These may be communities at the edge of their known distribution, an extension of the known range of a specific community, mature or old growth forests or communities that are rare or uncommon in the local context. All of these should be considered **locally significant** ecological communities. Locally significant ecological communities contribute to local biodiversity even though they may not be ranked as rare provincially.

Rare or locally significant ecological community can be termed **special ecological communities**. They **may or may not** include individual plant species of conservation concern. It is the grouping, **the community itself**, which is the element of interest. Ecological communities are "not just containers for species but complex, dynamic systems in themselves" (Anderson *et al.* 1999).

There are many different kinds of ecological communities, ranging from those that are natural, to those that are dominated by cultivated species. Only natural, near-natural and some modified/managed communities are considered of conservation concern from the ecological community perspective. For example, communities that have formed in roadside ditches or those that have been planted or substantively altered by cultivation may well provide habitat for **species** of conservation concern, and hence be significant for other reasons, but they would **not** be considered **special communities**.

A **special ecological community** is:

- on the tracking or watch list, and hence already considered significant at the provincial or greater level
- a community that is unusual, uncommon or of limited extent and so could be considered for addition to the tracking or watch list
- one that is locally significant.

A special ecological community may be a terrestrial, wetland or aquatic community, or other.

2. Sampling the Community

Work to characterise the vegetation of a study area generally concentrates on **matrix** and **large patch** communities as the representative types that are common or spread over large areas. **Matrix communities** are widespread and cover large areas across the landscape. "**Large patch**" **communities** are less extensive and cover less of the landscape, but overall may still form large, uninterrupted patches. Together, matrix and large patch communities usually make up the main, representative vegetation of an area.

Small patch communities are often overlooked specifically because they are not extensive enough to be considered representative. However, small patch communities may add significantly to the biodiversity of a site. **Small patch communities** form small, discrete areas, usually associated with specific, specialised habitats, such as cliff faces or saline seepages. They may "contain a disproportionately large percentage of the total flora, and also support a specific and restricted set of associated fauna (*e.g.* invertebrates or herpetofauna) dependent on specialized conditions" (Anderson *et al.* 1999).

Documenting small patch ecological communities is important in documenting the biodiversity of a study area. Both as elements of biodiversity themselves that may be rare or unusual, and as specialised habitats that potentially harbour species not yet documented. Although special ecological communities will often be small patch communities, some communities that form large patches or even matrix types in a particular study area would be considered special if they are rare in the provincial or greater context.

Identifying and documenting special ecological communities is in many ways a "special features" study, and is done differently than an inventory to document representative vegetation. It requires a thorough knowledge of the vegetation types typical of the study area, and the ability to recognize those that are in some way special.

This requires a review of the available literature that covers both the study area and other areas that are reasonably similar.

Prior to fieldwork, the researcher should:

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- Note any community types in the literature reviewed that the authors consider unusual, diverse, restricted etc.
- Note any community types on the ACIMS tracking list that might occur in the study area.
- Examine aerial photographs or Satellite imagery to identify potential locations of special communities.

During the field program, the researchers would attempt to locate occurrences of the special types identified through the literature review. They would also inspect areas identified through the examination of aerial photographs or Satellite imagery that look to be unusual or that may be small patch communities of interest.

If a community is located that may be of interest, it should be adequately sampled. The purpose of sampling a special ecological community is to document the composition and condition of stands, as they are located. With this emphasis, a "relevé" approach is appropriate (for details on this approach see Mueller-Dombois and Ellenberg 1974).

- The size of each relevé will depend on the structure and size of the community type being sampled.
- The standards used in Alberta for forested sites are:
 - A 20 X 20 m plot to document species and cover value of trees
 - A 10 X 10 m plots for shrubs and understory species, nested within the larger plot (see AEP 1994 for additional information)
- If there is a diverse non-vascular species layer, 1m x 1m nested relevés should be considered.
- Smaller plots may be used for grasslands or alpine communities, generally 5 X 5 m.
- A series of smaller plots along a transect may be appropriate for some community types.
- Plot shape should be tailored to the stand being sampled. For example a rectangular plot that follows the contour lines may be more appropriate than a square plot to sample a community on a hillside
- Sampling aquatic communities presents special challenges. Often a 5x5 m relevé or a series of smaller relevés (1x1 m) along a transect will work for areas near the shoreline. A boat may be required for sampling of some less accessible aquatic communities.

Ideally, all known stands of each special community type should be sampled within the study area. This will allow compilation of data on the composition of the community throughout its known locations in the study area. In addition, for those types on or added to the tracking list, the sample data will be tied to the ACIMS database of element occurrences.

- Doing replicate relevés in large stands will be helpful in documenting their composition.

- Many occurrences of special communities will be too limited in extent to permit replicate sampling.
- For special communities that are large patch or matrix communities, it may be necessary to subjectively select a few representative stands for sampling.

3. Naming Ecological Communities

Ecological communities should be named using dominant and diagnostic species. Species within the same stratum should be separated by a hyphen (-), species in different strata separated by a slash (/). The name should be carefully chosen to include important species that identify the community, but not to be so all-inclusive as to be unwieldy. The following additional guidelines are from Grossman et. al., 1998.

- species within the uppermost strata are named first, followed successively by species in the next lower strata
- species from the same strata are listed in order of dominance, constancy or indicator value
- species deemed important in the overall community type but not consistently present in each individual stand are enclosed in parenthesis
- the lowest number of species possible should be used in the name, however enough information needs to be included to help the reader have a clear picture of the community type being discussed.
- generally, there should be no more than six species in a name. This number of species is only necessary for a community type that is very diverse, with even dominance and variable composition.

The field name given an ecological community will reflect the information collected from the site being studied. It should reflect the species dominance, constancy and indicators as noted during the field study. During report write-up, a community type noted during the fieldwork should be critically assessed and grouped under community types already documented, when there is a clear fit or there are only minor differences. Any differences should, however, be noted. If no similar types are found in the literature, that too should be noted. Much work has been done to document Alberta's ecological communities, but new types not yet documented will still be found. Field types should be related to documented types where possible, but should not be forced to fit those types.

4. Minimum Information Requirements

To document the occurrence of a special ecological community, a minimum amount of information on the community composition and its location is required. Additional information is, of course, always welcomed.

- As exact a location of the ecological community as possible, ideally a GPS reading supported by a polygon marked on an aerial photograph and a location on a map.
- Date and name of surveyor(s)
- Aspect, slope, moisture regime (e.g. xeric, mesic etc.) and drainage
- Whenever possible a full species list should be supplied including cover estimates. For species that are unknown or difficult to identify in the field, specimens should be collected and identification to the species level confirmed.
- The system used for cover estimates should be noted (e.g. percent cover, Braun-Blanquet cover abundance scale, Daubenmire cover scale or other)
- The type and size of plot used should be noted
- An estimate of the size of the occurrence (or a polygon mapped on an aerial photograph)
- A written description of the community is often helpful, including a discussion on appearance, disturbance, invasive species and any other management concerns.

5. Suggested Information

ACIMS data sheets (site description form and vegetation description form) could be used as the basis for documenting an occurrence of a special ecological community. These are available from the ACIMS website.

6. References Cited

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Mueller-Dombois, D. and H. Ellenberg. 1974. Aims and methods of vegetation ecology. John Wiley and Sons, Inc.