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# Ecological Communities in British Columbia:

# Conservation Status Assessment Factors[1]

BC Conservation Data Centre
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**General Definitions**

Definitions, for purposes of this document, are provided for several terms that are used generally in the definition and discussion of the status rank factors below. A few additional, more specialized terms are defined in the discussion of a particular factor. Please read the definitions in Appendix 1.

**Conservation Status Factors**

NatureServe and its member programs and collaborators use the following factors in assessing conservation status of species of plants, animals, and fungi, as well as ecological communities. These factors may be used in assessing conservation status at global (rangewide), national, or subnational (state/province) levels, as well for other clearly bounded geographical areas *(e.g.,* a national park). When used globally, the factors address the element's status throughout its native range; when used at a national or subnational level, the factors address the element's status for its native range in the area of interest (nation, state, province, park, etc.).

Definitions and guidance for use are provided individually for each rank factor below. See also the general definitions in the introductory section for terms used in discussion of more than one factor.

**Range Extent**

Describes the estimated current range of the ecological community in the area of interest. (see Table 1 for examples of areas) For British Columbia, this is based on the sum of area calculations of all Biogeoclimatic units in which the community is known to occur, or portions of a single Biogeoclimatic Unit (e.g. Garry oak ecosystems in a portion of the CDFmm, vs. the Douglas-fir – dull Oregon grape throughout the CDFmm).

Select from the following values:

Z = Zero (no occurrences believed extant)
A = <100 $km^2$
B = 100-250 $km^2$
C = 250-1,000 $km^2$
D = 1,000-5,000 $km^2$
E = 5,000-20,000 $km^2$
F = 20,000-200,000 $km^2$
G = 200,000-2,500,000 $km^2$
H = > 2,500,000 $km^2$
U = Unknown
Null = Rank factor not assessed

Table 1. Examples of geographical land areas approximating each Range Extent factor value threshold

| ***Code*** | ***Threshold ($km^2$)*** | ***Examples*** | ***Approx. area ($km^2$)*** |
|---|---|---|---|
| A/B | 100 | Top of the World Provincial Park | 88 |
| | | Tahsish - Kwois Provincial Park | 110 |
| B/C | 250 | Carmanah – Walbran Provincial Park | 165 |
| | | Garibaldi Provincial Park | 195 |

| | | | |
|---|---|---|---|
| C/D | 1,000 | Itcha – Ilgachuz Provincial Park | 1,112 |
| D/E | 5,000 | Mount Robson Provincial Park | 2,248 |
| | | Prince Edward Island | 5,657 |
| E/F | 20,000 | Mountain Hemlock Zone | 35,000 |
| | | Southern Interior Mtns EcoProvince | 138,000 |
| F/G | 200,000 | Coast & Mountains EcoProvince | 308,500 |
| | | British Columbia | 950,000 |
| G/H | 2,500,000 | Combined area of Ontario and Quebec (Canada) | 2,609,271 |

**Area of Occupancy**

Estimated current area of occupancy of the ecological community in the area of interest. This is distinct from range extent in that it is based on the estimate of the actual area occupied by the community. For ecological communities in linear habitats (e.g., riparian ecological communities), consider the total length of all currently occupied habitat segments. The area can be estimated by multiplying the length by the average width.

The values must be considered for total area of occupancy regardless of viability of element occurrences; if number of element occurrences is unknown, consider the overall conversion of landscape to other uses.

Select from the following values:

Area:

Z = Zero (no occurrences believed extant)
A = <0.4 $km^2$ (less than about 100 acres)
B = 0.4-4 $km^2$ (about 100-1,000 acres)
C = 4-20 $km^2$ (about 1,000-5,000 acres)
D = 20-100 $km^2$ (about 5,000-25,000 acres)
E = 100-500 $km^2$ (about 25,000-125,000 acres)
F = 500-2,000 $km^2$ (about 125,000-500,000 acres)
G = 2,000-20,000 $km^2$ (500,000-5,000,000 acres)
H = >20,000 $km^2$ (greater than 5,000,000 acres)
U = Unknown

Length:

Z = Zero (no occurrences believed extant)
A = <4 km (less than about 2.5 miles)
B = 4-40 km (about 2.5-25 miles)
C = 40-200 km (about 25-125 miles)
D = 200-1,000 km (about 125-620 miles)
E = 1,000-5,000 km (about 620-3,000 miles)
F = 5,000-20,000 km (about 3,000-12,500 miles)
G = 20,000-200,000 km (about 12,500-125,000 miles)
H = >200,000 km (greater than 125,000 miles)
U = Unknown

Null = Rank factor not assessed

**Long-term Trend**

The degree of change (observed, estimated, inferred, or suspected) in extent of occurrence, area of occupancy, and/or number or condition of occurrences over the long term (ca. 200 years) in the area of interest.

Select from the following values:

A = Very Large Decline (decline of >90%, with <10% of population size, range extent, area occupied, and/or number or condition of occurrences remaining) e.g. Garry oak ecosystems, wetlands in the South Okanagan Basin

B = Large Decline (decline of 75-90%) e.g. associations within the CDFmm in the Fraser Lowlands

C = Substantial Decline (decline of 50-75%) e.g. grasslands in the Kootenay Trench (fire suppression, introduced species, agriculture, development & fragmentation)

D = Moderate Decline (decline of 25-50%) e.g. wetlands in the Nanaimo Lowlands

E = Relatively Stable (±25% change) Boreal White and Black Spruce ecosystems

F = Increase (increase of >25%) e.g. *Cytisus scoparius – Dactylus glomerata* non-native plant community

U = Unknown. Long-term trend in population, range, area occupied, or number or condition of occurrences unknown

Null = Rank factor not assessed

**Short-term Trend**

Consider short-term historical, for communities, 10-100 years depending on characteristics of the type. Describes the observed, estimated, inferred, suspected, or projected short-term trend in extent of occurrence, area of occupancy, number of occurrences, and/or condition of occurrences, whichever most significantly affects the rank in the area of interest.

The short-term trend may be recent, current, or projected (based on recent past), and the trend may or may not be known to be continuing. Trends may be smooth, irregular, or sporadic. Fluctuations will not normally count as trends, but an observed change should not be considered as merely a fluctuation rather than a trend unless there is evidence for this. If information on element occurrences is not available, these criteria are considered somewhat differently

**Do not consider increases in the number of occurrences due to fragmentation of previously larger occurrences into more but smaller occurrences, but instead consider fragmentation of occurrences as indicative of decreasing an area of occupancy.**

Select from the following values:

A = Severely declining (decline of >70% in range, area occupied, and/or number or condition of occurrences)
B = Very rapidly declining (decline of 50-70%)
C = Rapidly declining (decline of 30-50%)
D = Declining (decline of 10-30%)

E = Stable (unchanged or remaining within ±10% fluctuation)
F = Increasing (increase of >10% in population)

U = Unknown (short-term trend unknown)
Null = Rank factor not assessed

**Threats (Severity, Scope, and Immediacy)**

Evaluate the impact of extrinsic threats, which typically are anthropogenic but may be natural. The impact of human activity may be direct (e.g., destruction of habitat) or indirect (e.g., invasive species introduction). Effects of natural phenomena (e.g., fire, hurricane, flooding) may be especially important when the ecological community is concentrated in one location or has few occurrences, which may be a result of human activity. *Characteristics of the ecological community that make it inherently susceptible to threats should be considered under the rank factor "Intrinsic Vulnerability".*

Threats considerations apply to the present and the future. Effects of past threats (whether or not continuing) should be addressed instead under the short-term trend and/or long-term trend factors. Threats may be observed, inferred, or projected to occur in the near term.

Threats should be characterized in terms of:

- **severity** (how badly and irreversibly the area of occupancy of the ecological community is affected),
- **scope** (what proportion of the area of occupancy is affected), and
- **immediacy**, (degree of imminence, how likely the threat is and how soon is it expected).

Magnitude: is sometimes used to refer to scope and severity collectively.

Consider threats collectively, and for the foreseeable threat with the greatest magnitude (severity and scope combined), rate the severity, scope, and immediacy each as High, Moderate, Low, Insignificant, or Unknown, as briefly defined below. Identify in the comment field the threat to which severity, scope, and immediacy pertains, and discuss additional threats identified, or interactions among threats, including any high-magnitude threats considered insignificant in immediacy.

**1. Severity**: This is in reference to the extent of 'damage' that the threat(s) will take. E.g. Clearcut harvesting of Coastal forests might fall under "High" because they are long-lived forests, whereas fire maintained systems might fall under Moderate (forests) or Low (grasslands) with a shorter time to recover to original condition.

- High: destruction of ecological community in area affected with effects essentially irreversible or requiring long-term recovery (>100 years)
- Moderate: long term degradation or reduction of ecological community (50-100 years for recovery, e.g. fire maintained systems)
- Low: low but nontrivial degradation or reduction of ecological community, recover expected in 10 - 50 years.
- Insignificant: essentially no degradation of ecological community, or ecological community able to recover quickly (within 10 years) from minor temporary loss (e.g. collecting of plant material)

**2. Scope**: This is in reference to the amount of area occupied by the ecological community that is affected by the threat at any given time. For example, the invasion of spotted knapweed may threaten >60 % of the total grassland associations in the Central and South Okanagan, or harvesting affects <5% of a forested association that is not normally targeted for harvesting, may be impacted only by adjacent harvesting)

- High: > 60 % of total area affected
- Moderate: 20-60 % of total area affected
- Low: 5-20% of area affected
- Insignificant: < 5% of the area affected

**3. Immediacy**: Is this happening right now or in future?

- High: Threat is operational (now) or imminent (within a year)
- Moderate: Threat is likely to be operational within 2-5 years
- Low: Threat is likely to be operational within 5-20 years
- Insignificant: Threat not likely to be operational within 20 years.

**Number of Protected and Managed Occurrences**

Describes the observed, estimated, inferred, or suspected number of occurrences that are appropriately protected and managed for the long-term persistence of the element in the area of interest. In general, protected areas will be adequate for 'management' of forests and grasslands. However, for specific ecosystems that have significantly declined and require recovery strategies, appropriate management plans must be considered when assigning the values below. E.g. Garry oak ecosystems, Antelope brush ecosystems.

To estimate in British Columbia, the following factors are taken into account:

- protected area calculations, based on Biogeoclimatic Units
- number of protected areas within the total area (i.e. many small or few large)
- the type of community, either matrix, large or small patch, and linear as expected distribution in protected area

Select from the following values:

A = None. No occurrences appropriately protected and managed
B = Few (1-3) occurrences appropriately protected and managed
C = Several (4-12) occurrences appropriately protected and managed
D = Many (13-40) occurrences appropriately protected and managed
E = Very many (>40) occurrences appropriately protected and managed
U = Unknown whether any occurrences are appropriately protected and managed
Null = Rank factor not assessed

**Intrinsic Vulnerability**

Describes intrinsic characteristics of the Element that make it vulnerable or resilient to natural or anthropogenic stresses or catastrophes. Consider the observed, inferred, or suspected degree of vulnerability (such as likelihood of regeneration or recolonization for ecological communities). Consider characteristics of the component species rather than environmental factors per se that make the community vulnerable. *The latter belongs in the Environmental Specificity field.*

Since geographically or ecologically disjunct or peripheral occurrences may show additional vulnerabilities not generally characteristic of the element, these factors are to be assessed for the ecological community throughout the area of interest, or at least for its better occurrences. Note that the *intrinsic vulnerability factors exist independent of human influence, but may make the ecological community more susceptible to disturbance by human activities.* The extent and effects of current or projected extrinsic influences themselves should be addressed in the Threat comments field.

For ecological communities, describe the characteristics of the community that are thought to be intrinsically vulnerable and the ecological processes on which these characteristics depend. For example, a type may be defined by old growth features that require > 150 years to recover its structure and composition after a blowdown, or a pine forest type may be highly dependent on timing of masting or availability of seed sources to recover after a catastrophic fire, or a wetland may be dependent on periodic drawdowns or flash flooding for regeneration of species. Typically, intrinsic vulnerability is most readily

assessed using the dominant species and vegetation structure that characterize the community. As another community example, in communities with an abundant cryptogram crust (important for nutrient cycling, N-fixation, and moisture retention), the recovery of an intact crust after disturbance may take a long time (> 50 years) due to the slow growth of the cryptogram layer.

Select from the following values:

A = Highly Vulnerable. Ecological community [are slow to mature] occurrences are highly susceptible to changes in composition and structure that rarely if ever are reversed through natural processes even over substantial time periods (> 100 years).
B = Moderately Vulnerable. Ecological community [exhibits moderate age of maturity] occurrences may be susceptible to changes in composition and structure but tend to recover through natural processes given reasonable time (10-100 years).
C = Not Intrinsically Vulnerable. Ecological community [matures quickly] occurrences are resilient or resistant to irreversible changes in composition and structure and quickly recover (within 10 years).
U = Unknown
Null = Rank factor not assessed

**Environmental Specificity**

For ecological communities environmental specificity often refers to substrate requirements (e.g., nutrients, moisture, soil depth), specific disturbance factors, or climate (microclimate). *This factor is most important when the number of occurrences and the range extent or area of occupancy is largely unknown*.

Select from the following values:

A = Very Narrow. Community with specific key requirements scarce. Specific habitat(s), substrate(s), or other abiotic and/or biotic factor(s) are used or required, these being scarce within the generalized range of the element, and, the occurrences expected to decline significantly if any of these key requirements become unavailable. For ecological communities, environmental requirements are both narrow and scarce (e.g., calcareous seepage fens).

B = Narrow. Community with specific key requirements and these specific requirements are common in the range of the community. For ecological communities, environmental requirements are narrow but common (e.g., floodplain communities, alpine tundra).

C = Moderate. Community with broad scale requirements but some key requirements scarce in the range of the community. For ecological communities, environmental requirements are broad but scarce (e.g., talus or cliff forests and woodlands (this would be different in steep mountainous terrain), many rock outcrop communities dependent more on thin, droughty soils per se than specific substrate factors).

D = Broad. Community with all key requirements common. Broad-scale or diverse (general) habitat(s) or abiotic and/or biotic factors are used or required by the Element, with all key requirements common in the generalized range of the Element in the area of interest. For ecological communities, environmental requirements are broad and common (e.g., forests or prairies on glacial till, or forests and meadows on montane slopes).

U = Unknown
Null = Rank factor not assessed

**Number of Occurrences**

Number of estimated, inferred, or suspected number of occurrences believed extant for the species or ecological community in the area of interest (globe, nation, or subnation). *Viability of known occurrences not included in estimate.*
Select from the following values:

Z = 0 (zero)
A = 1 - 5
B = 6 – 20
C = 21 – 80
D = 81 – 300
E = >300
U = Unknown
Null = Rank factor not assessed

**Number of Occurrences with Good Viability**

The estimated number of occurrences believed extant in the area of interest that have excellent or good viability (e.g., for communities, a 95% probability of persistence over the next 20-100 years, depending on the inherent dynamics of the element, with only minor to moderate alterations to composition, structure and/or ecological processes. Use comment field to provide specifics and additional information, such as the number of occurrences with fair or moderate viability.

When Element Occurrence (EO) ranks are available for individual occurrences, occurrence ranks of "A" or "B" indicate good (to excellent) viability. These ranks provide an assessment of estimated viability, or probability of persistence (based on condition, size, and landscape context) of occurrences of a given Element.

Select from the following values:

A = No (A- or B- ranked) occurrences with good viability
B = Very few (1-3) occurrences with good viability
C = Few (4-12) occurrences with good viability
D = Some (13-40) occurrences with good viability
E = Many (41-125) occurrences with good viability
F = Very many (>125) occurrences with good viability
U = Unknown what number of occurrences with good viability
Null = Rank factor not assessed

**Other Considerations**

Provide and comment on any other information that should be considered in the assignment of a conservation status rank, especially when the status rank resulting from the overall assessment is different from the rank that the values for the formal status factors, taken alone, would suggest. This (text only) field may also be used for other general notes pertinent to multiple factors.

The following are some examples of Other Considerations:

- Preliminary rank assessment does not necessarily reflect current status, since the rank was done by inspection from review of published distribution and habitat information, or museum collection information.
- Global rank is based on particular national or subnational rank(s), or national rank is based on particular subnational rank(s).

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APPENDIX 1

**Element.** An Element is a unit of natural biological diversity. Elements represent species (or infraspecific taxa), ecological communities, or other nontaxonomic biological entities (*e.g.,* migratory species aggregation areas). See Jenkins (1985,1986) for background.

**Ecological Community.** The **Ecological Community Elements** include terrestrial, freshwater aquatic, and marine types. Communities are assemblages of species that co-occur in defined areas at certain times and that have the potential to interact with each other (McPeek and Miller 1996). For terrestrial communities, elements are classified either by vegetation criteria using the association concept (Grossman et al. 1998) or by ecological criteria (Ecological Systems) by integrating multiple factors, including composition, structure, driving processes, and local environmental setting. In British Columbia, the community element is based on the plant association concept and many of the listed communities are described by the BC Ministry of Forests Vegetation Classification.

**Occurrence** (or Element Occurrence). An Occurrence is an area of land and/or water in which a species or ecological community is, or was, present. An occurrence should have practical conservation value for the species or ecological community as evidenced by historical or potential continued presence and/or regular recurrence at a given location. For further discussion of the element occurrence concept, see "Element Occurrence Data Standard" (The Nature Conservancy and Association for Biodiversity Information 1999).

For ecological communities, the occurrence may represent a stand or patch of a natural community, or more typically a cluster of stands or patches of a natural community. Note that this definition applies primarily to terrestrial ecological communities, which are defined using the International Classification of Ecological Communities (Grossman et al. 1998), but in principle can also be used for freshwater-aquatic and marine occurrences.