

# The Conservation Data Centre: For the Greatest About the Least

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## ABSTRACT

Key concepts and terms such as elements at risk, Red and Blue Lists, and ranking are defined to facilitate effective communication in other presentations. How the lists are created and by whom is also explained. The British Columbia Conservation Data Centre (CDC) is a centralized, computer-assisted inventory and information system about rare and endangered species and natural communities (plant associations). The CDC has been in operation for 9 years, is part of a large network of centres (6 others of which are in Canada), and uses a common methodology to ensure data sharing and potential information integration. Many government and nongovernment initiatives that have been instigated since the CDC began have required organized information on the province's rare elements of biodiversity, and we have been there to help. The breadth of our services has increased since those early days; this paper is intended to update you on these services and our plans for the coming years. Included will be a brief discussion on related extra-provincial activities.

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**Key words:** Blue List, Conservation Data Centre, Red List.

## DEFINITIONS AND STANDARDS

One of the keys to successful communication is a common understanding of terminology for the subject area. Over the years, various organizations have used a wealth of terms to describe rarity of organisms and ecosystems. These terms have ranged from very subjective descriptions to precise indices derived from complicated algorithms. Because of this overlap between informal and formal use of terms such as "endangered," I propose some solutions. To bring some standardization to the other papers, a glossary of terms is given in Table 1. The greatest problem probably arises when directly comparing different ranking systems (Pearl 1997). Not only do the same terms differ in definition, but the rarity classes do not directly correspond to each other. For example, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) boundary for degree of "at risk" between Threatened and Vulnerable does not match the International Union for Conservation of Nature and Natural Resources (IUCN) boundary between Vulnerable and Lower Risk.

## THE CONSERVATION DATA CENTRE

The last major conference in British Columbia about provincial biodiversity was *The Living Legacy* in 1991. At that

time, the Conservation Data Centre (CDC) was only weeks old and starting out on an ambitious plan to compile and analyze information on the rare vascular plants, vertebrates, and forested ecosystems of the province. I reported what the CDC was going to do (Harcombe 1991). Now, 9 years later, I can report on what has happened, as well as the plans for the coming years. The CDC has grown in staff, scope, data, expertise, and demand. Thirteen specialists now work in botany, zoology, ecology, and data management. The CDC responds to >1,000 data requests per year, and through its Web page, makes information available to many more. We have tracking lists (lists of elements for which we actively compile element occurrence data) for vertebrates, forests, vascular plants, nonforested ecosystems (currently under expansion), bryophytes, lichens, marine seaweeds, big trees, and selected invertebrates (freshwater mollusks, dragonflies and damselflies, butterflies, robber flies, and marine benthic invertebrates). Our specialists regularly provide expert advice, and are especially valuable in those areas of wildlife and ecology where traditional knowledge is not as widespread. Besides our own professional specialists, we have incorporated the expertise of others, such as Trevor Goward, Hans Roemer, Frank Loomer, Bill Austin, the late Gerald Straley, Del Meidinger, Jim Pojar, Will McKenzie, Jon Shepard, Cris Guppy, and Michael Hawkes.

Over the past year, the CDC has produced 4 major publications on rare elements: native vascular plants (Douglas

**Table 1.** Definitions for rarity and related terminology.

at risk	elements that can be either at risk of extinction, defined in terms of the probability of extinction within a specified time period; or, elements at risk because population viability is not considered to be secure in British Columbia at this time
Blue List	vulnerable taxa that could become candidates for the Red List in the foreseeable future; taxa generally suspected to be vulnerable because information is too limited to allow designation in another category
COSEWIC	Committee on the Status of Endangered Wildlife in Canada; Canada's official body for determining national status of indigenous taxa and distinct populations
designation	official or formal assignment of an "at risk" class to an element; usually only occurs after a detailed status report is prepared (usually includes recent field data gathering) and peer-reviewed; usually assigned by legislation
ecosystems	a unit of land or water comprising populations of organisms considered together with their physical environment and interacting processes between them
element	for the CDC, a definable component of biological diversity, including species, subspecies, variety, genetically distinct population, or ecosystem
occurrence	a geographical location used predictably by an element for a specified purpose, such as breeding, feeding, staging, or resting. For plants, all populations of a species are occurrences; for animals, many observations of an element do not constitute a predictable use of a habitat or habitat element and may not be occurrences.
endangered	any indigenous species that, based on the best available scientific evidence, is indicated to be imperilled with imminent extirpation or extinction throughout all or a significant portion of its British Columbia range. The term is also used as an official legal designation of Endangered.
extant	now in existence
extinct	species that no longer exists anywhere
extirpated	species that were once part of the natural flora and fauna of British Columbia and no longer occur here but occur in captivity or in the wild elsewhere
historic	usually not verified for some time (25–40+ years); not enough up-to-date inventory is available that would remove the expectation that the taxon someday may be rediscovered. Once it is considered gone, it would be termed extirpated.
IUCN	International Union for Conservation of Nature and Natural Resources; their Species Survival Commission assesses the status of species, subspecies, populations, and stocks on a global scale to determine species at risk of extinction and promote their conservation
ranking	assessment of rarity initially based on professional evaluation that may lack the detail that would allow more formal evaluation without further field inventory
Red List	taxa have either very small local populations or biological characteristics that imperil them. This includes species or subspecies designated as Threatened or Endangered under the British Columbia Wildlife Act; species or subspecies that are candidates for legal designation as Endangered or Threatened; or species or subspecies that have been extirpated but were once part of the natural flora and fauna of British Columbia.
status	may be a formal or informal evaluation of the state of health of a species or ecosystem; in Canada, this is both done provincially by various groups and nationally by the Committee on Status of Endangered Wildlife in Canada (COSEWIC)
taxon (plural: taxa)	formally named, related group of organisms at any level in a classification (e.g., family, species, and subspecies)
threatened	any indigenous species that are likely to become endangered if the factors affecting population viability are not changed. This species, based on the best available scientific evidence, is indicated to be experiencing a definite noncyclical decline throughout all or a major portion of its British Columbia range, or any species with an extremely restricted distribution in a habitat with a high probability of environmental degradation. The term is also used as an official legal designation of Threatened. The IUCN uses the term to refer to its 3 classes of rarity: Critically Endangered, Endangered, and Vulnerable.
vulnerable/ sensitive	any indigenous species that is particularly at risk in British Columbia because of low or possibly declining populations; likely to move into the threatened category in the near future if causal factors continue operating. The IUCN uses the term as an official designation of Vulnerable.
Yellow List	taxa that are considered to be secure in British Columbia now; they are managed at the habitat level by managing for a diversity of habitats in the province
wildlife	flora and fauna of a region

**Table 2.** Conservation Data Centre ranking system.

1	Critically imperilled because of extreme rarity (5 extant occurrences or very few remaining individuals) or because of some factor(s) making it especially vulnerable to extirpation or extinction.
2	Imperilled because of rarity (typically 6–20 extant occurrences or few remaining individuals) or because of some factor(s) making it vulnerable to extirpation or extinction.
3	Rare or uncommon (typically 21–100 occurrences); may be susceptible to large-scale disturbances (e.g., may have lost extensive peripheral populations).
4	Frequent to common (>100 occurrences); apparently secure but may have a restricted distribution; or there may be perceived future threats.
5	Common to very common; demonstrably secure and essentially ineradicable under present conditions.
<b>Qualifiers</b>	
A	An element (usually an animal) that is considered accidental or casual in province; a species that does not appear annually
B	Breeding; the associated rank refers to breeding occurrences of mobile animals
E	An exotic or introduced species to the province
H	Historical occurrence; usually not verified in the last 40 years, but with the expectation that it someday may be rediscovered, H-ranked elements would typically receive a 1 rank.
N	Nonbreeding; the associated rank refers to nonbreeding occurrences of mobile animals
Q	Taxonomic validity of the element is unclear or in question
R	Reported from the province, but without persuasive documentation for either accepting or rejecting the report (e.g., misidentified specimen).
RF	Reported in error, but this error has persisted in the literature
?	Limited information is available or the number of extant occurrences is estimated
T	Designates a rank associated with a subspecies
U	Status uncertain, often because of low search effort or cryptic nature of the element; uncertainty spans a range of 4 or 5 ranks
X	Apparently extinct or extirpated, without the expectation that it will be rediscovered
Z	Occurs in the province but as a diffuse, usually moving population; difficult or impossible to map static occurrences

et al. 1998a), freshwater fish (Cannings and Ptolemy 1998), mammals, reptiles and amphibians (Cannings et al. 1999), and birds (Fraser et al. 1999). Although variable in content, these volumes attempt to synthesize the knowledge of these rare elements in British Columbia. George Douglas has taken the lead role in producing the first 3 volumes of a 7-volume *Illustrated Flora of British Columbia* (1998–1999) (Douglas et al. 1998b). We have coordinated writing species accounts for rare ecosystems and vascular plants for potential use in the Identified Wildlife program, and have collaborated on several species/ecosystems at risk brochures (e.g., Flynn 1999; Fontaine and Douglas 1999), one of the most successful wildlife publication series in recent years.

In the coming months, much of our data will become available in the British Columbia (B.C.) Ministry of Environment, Lands and Parks data warehouse, for electronic access both regionally to the Ministry and by Internet for others. Our present data request options will remain in place, either for those without electronic access or for more complex reports and maps. We are in the final stages of implementing geographic information technology, for help with

both data capture and user products. This will lead to the availability of some standard map products that will complement our database reports. Sensitive data (as defined by draft Ministry policy) will continue to have location information protected from most viewers; this privilege can be extended to requesters through the regional rare and endangered species specialists (or designates) on a need-to-know basis. The CDC has also become active in conservation evaluation of sites, assessing ecological value for both acquisition and stewardship. This service is of special use to local land trusts and other private conservation organizations. Our specialists' high ranking has encouraged such ongoing property acquisitions such as South Winchelsea Island (The Land Conservancy) and Elkington Garry oaks (Nature Conservancy of Canada).

## RANKING ELEMENTS

Each species on the CDC's list is ranked using the system developed over the past 25 years by The Nature Conservancy (U.S.). This system is now used in all Canadian provinces

**Table 3.** Conservation Data Centre ranking factors.

Known occurrences	A = 0–5 B = 6–20 C = 21–100 D = 101+
Abundance	A = <1,000 individuals B = 1,000–3,000 individuals C = 3,000–10,000 individuals D = >10,000 individuals
Range	A = global: narrow endemic (usually <100 square miles) provincial: very small range, less than 3% of territory B = global: regional endemic (100–10,000 square miles) provincial: narrow range, <10% of territory C = global: moderately widespread, or widespread with spotty distribution provincial: less than half of territory D = global: widespread (>1,000,000 square miles) provincial: more than half of territory
Trend	A = declining rapidly B = declining C = stable D = increasing
Protected occurrence	A = believed to be none protected B = 1 protected C = several protected D = many protected U = unknown
Threats	A = very threatened; species directly exploited or threatened B = moderately threatened; habitat lends itself to alternate use C = not very threatened; habitat is unsuitable for other uses D = unthreatened

and U.S. states, and some Latin American and Caribbean countries. Most government agencies within these jurisdictions have also adopted this ranking system. The CDC uses these ranks to set priorities in tracking the rare and threatened flora and fauna of British Columbia.

Regularly, and I hope at least annually, CDC specialists get together with other species specialists to assess the current status of all elements on the Red and Blue Lists. Any new information on threats, trends, and other criteria is evaluated. Table 2 describes the different rank classes used with a number of modifiers. Table 3 lists the ranking factors considered, with the specific choices for each criteria. Ranking is done at both the global level (G ranks, created by combining information across the network of data centres) and at the provincial level (S ranks).

### GLOBAL RANKING

The global (G) rank is based on the status of the species throughout its entire range. The global rank is established by a biologist assigned to that species by The Nature

Conservancy (U.S.). The status of a species is ranked on a scale of 1–5 (Table 2). The rank is based primarily on the number of extant occurrences of the species, but other factors such as abundance, trends, range, protection, and threats are also considered if the information is available. To facilitate species rankings, each of the preceding factors is given a letter rank from “A” to “D” (or “U” unknown) for each species, where “A” indicates the greatest rarity or peril, and “D” indicates the least (Table 3). The ranks assigned to particular species are dynamic; as more information is received, ranks may change.

### PROVINCIAL RANKING

The provincial or subnational (S) rank is assigned provincially in essentially the same way as the G rank is assigned globally (Tables 2 and 3); the provincial rank cannot exceed the global rank. Generally, the CDC will track only those taxa with provincial ranks of 1–3. Taxa with the ranks of introduced (E) and accidental (A) are not considered eligible for Red and Blue Lists in British Columbia.

The ranking system is related to the Red and Blue Lists as follows:

- Red List: taxa with ranks of 1, 2, 1–2, 1–3, H, or X;
- Blue List: taxa with ranks of 2–3, 3, 3–4; and
- Yellow List: taxa with ranks of 4, 5, or 4–5.

### THE FUTURE

For categorizing species at risk in Canada, COSEWIC has adopted slightly modified IUCN criteria; this will be important if federal endangered species legislation is introduced. Because CDCs are important under the National Accord on Endangered Wildlife in providing information regarding species status, we may need to make adjustments to accommodate new information needs. The Nature Conservancy (U.S.) and IUCN are discussing how to better harmonize the systems, which are already very similar. The first *National Status Report on Monitoring the General Status of Wild Species in Canada* is scheduled for preparation by the end of the year 2000 (Mike Oldham, Ont. Natural Heritage Information Centre, Peterborough, Ont., 1999, pers. comm.). A high dependence on the CDC will be required to meet this deadline.

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