

Provincial Lists of Species at Risk

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In 1980, the first vertebrate species were designated Endangered under the Wildlife Act of British Columbia. These species were the: Vancouver Island marmot (*Marmota vancouverensis*), sea otter (*Enhydra lutris*), American white pelican (*Pelecanus erythrorhynchos*) and burrowing owl (*Athene cunicularia*). They remain the only species to have ever been legally designated. The criteria used at that time to determine the species to be considered for designation were presented in Munro and Low (1980).

Since then, Red and Blue Lists of terrestrial vertebrate taxa at risk have been created and subsequently revised (Munro, 1990). These lists are designed to aid in assigning priorities for conservation of vertebrates at risk in British Columbia. Taxa not considered at risk are placed either on the Yellow List, which is for species that are actively managed at a population level, or the Green List, which is for species that are managed only by ensuring that they have adequate habitat.

The species on the Red List (Table 2-4) are Endangered or Threatened, or are being considered for such status. Any indigenous taxon (species or subspecies) threatened with imminent extinction or extirpation throughout all or a significant portion of its range in British Columbia is Endangered. Threatened taxa are those indigenous species or subspecies that are likely to become endangered in British Columbia if factors affecting their vulnerability are not reversed. For all Red-listed taxa, status reports will be written that indicate the current condition of populations within the province.

Blue-listed species (Table 2-5) are considered to be vulnerable and "at risk," but not yet endangered or threatened. Populations of these species may not be in decline, but their habitat or other requirements are such that they are vulnerable to further disturbance.

Once a species has been identified as a potential candidate for designation as Endangered or Threatened under the Wildlife Act and placed on the Red List, a detailed status report is prepared. If legal designation is merited, a brief will be prepared for Cabinet to consider in deciding whether to issue an Order in Council designating the species as either Endangered or Threatened.

Ranking

In creating the latest version of the Red and Blue Lists, the process was changed to dovetail with the ranking system used by the B.C. Conservation Data Centre and many other jurisdictions in Canada, the United States, and Central and South America, as described in the previous article.

Based on the best available information, the provincial rank is assigned to the taxon by biologists at the Conservation Data Centre. Provincial ranks are modified and updated on a continual basis. Species placement on the Red or Blue List is based on the provincial ranks only. Species with ranks of 1, 2, 1 to 2, 1 to 3, H, or X are put

Amphibians

Ambystomatidae

*Ambystoma tigrinum**Dicamptodon tenebrosus*

Tiger Salamander

Pacific Giant Salamander

Plethodontidae

*Plethodon idahoensis**Rana pipiens*

Coeur d'Alene Salamander

Leopard Frog

Reptiles

Iguanidae

Phrynosoma douglassii

Short-horned Lizard

Colubridae

*Contia tenuis**Pituophis melanoleucus catenifer**Hypsiglena torquata*

Sharp-tailed Snake

Gopher Snake - *catenifer* subspecies

Night Snake

Birds

Gaviformes

Aechmophorus occidentalis

Western Grebe

Pelecaniformes

*Pelecanus erythrorhynchos**Phalacrocorax pelagicus pelagicus**Phalacrocorax penicillatus*

American White Pelican

Pelagic Cormorant - *pelagicus* subspecies

Brandt's Cormorant

Falconiformes

*Accipiter gentilis laingi**Buteo regalis**Falco peregrinus anatum**Falco mexicanus*Northern Goshawk - *laingi* subspecies

Ferruginous Hawk

Peregrine Falcon - *anatum* subspecies

Prairie Falcon

Galliformes

Centrocercus urophasianus

Sage Grouse

Charadriiformes

*Bartramia longicauda**Sterna forsteri**Uria lomvia**Uria aalge**Fratercula corniculata*

Upland Sandpiper

Forster's Tern

Thick-billed Murre

Common Murre

Horned Puffin

Cuculiformes

Coccyzus americanus

Yellow-billed Cuckoo

Strigiformes

*Athene cunicularia**Strix occidentalis*

Burrowing Owl

Spotted Owl

Piciformes

*Sphyrapicus thyroideus nataliae**Picoides albolarvatus*Williamson's Sapsucker - *nataliae* subspecies

White-headed Woodpecker

Passeriformes

*Eremophila alpestris strigata**Progne subis**Oreoscoptes montanus**Anthus spragueii**Dendroica castanea**Dendroica tigrina**Oporornis agilis**Icteria virens**Spizella breweri breweri**Ammodramus savannarum**Ammodramus caudacutus**Pooecetes gramineus affinis*Horned Lark - *strigata* subspecies

Purple Martin

Sage Thrasher

Sprague's Pipit

Bay-breasted Warbler

Cape May Warbler

Connecticut Warbler

Yellow-breasted Chat

Brewer's Sparrow - *breweri* subspecies

Grasshopper Sparrow

Sharp-tailed Sparrow

Vesper Sparrow - *affinis* subspecies

Table 2-4: British Columbia's 1993 Red List (64 taxa in taxonomic order)

Mammals

Insectivora

- Sorex tundrensis*
- Sorex palustris brooksi*
- Sorex bendirii*
- Scapanus townsendii*

Chiroptera

- Antrozous pallidus*
- Lasiurus blossevillii*
- Myotis keenii*
- Myotis septentrionalis*

Lagomorpha

- Lepus americanus washingtoni*
- Lepus townsendii*

Rodentia

- Aplodontia rufa rufa*
- Clethrionomys gapperi occidentalis*
- Microtus townsendii cowani*
- Synaptomys borealis artemisiae*
- Thomomys talpoides segregatus*
- Marmota vancouverensis*
- Tamias ruficaudus simulans*
- Tamias ruficaudus ruficaudus*
- Tamias minumus selkirkii*

Carnivora

- Enhydra lutris*
- Gulo gulo vancouverensis*
- Mustela erminea haidarum*
- Mustela frenata altifrontalis*

Artiodactyla

- Bison bison athabascae*
- Ovis dalli dalli*

Tundra Shrew

- Water Shrew - *brooksi* subspecies
- Pacific Water Shrew
- Townsend's Mole

Pallid Bat

- Southern Red Bat
- Keen's Long-eared Myotis
- Northern Long-eared Myotis

- Snowshoe Hare - *washingtoni* subspecies
- White-tailed Jack Rabbit

Mountain Beaver - *rufa* subspecies

- Southern red-backed vole - *occidentalis* subsp.
- Townsend's Vole - *cowani* subspecies
- Northern Bog Lemming - *artemisiae* subspecies
- Northern Pocket Gopher - *segregatus* subspecies
- Vancouver Island Marmot
- Red-tailed Chipmunk - *simulans* subspecies
- Red-tailed Chipmunk - *ruficaudus* subspecies
- Least Chipmunk - *selkirkii* subspecies

Sea Otter

- Wolverine - *vancouverensis* subspecies
- Ermine - *haidarum* subspecies
- Long-tailed Weasel - *altifrontalis* subspecies

Wood Bison

- Dall's Sheep

Table 2-4: British Columbia's 1993 Red List (Continued)

on the Red List, and those with ranks of two to 3, 3, or 3 to 4 are put on the Blue List (see Tables 2-3 and 2-4). Species with ranks of 4 or 5 are not considered to be at risk in British Columbia.

All the regularly occurring vertebrate taxa in British Columbia that fall under the mandate of the Wildlife Program (except for introduced species) have been ranked and evaluated. Fish and marine mammals, except the sea otter, have not been included. In the 1993 edition of the lists, 151 taxa are listed (19% of the 850 possible species and subspecies in the province), compared with the 1991 edition (B.C. Environment, 1991), which listed 107 species (17% of the 631 possible species in the province).

Introduced Species

The Wildlife Branch does not consider for designation those species which have been introduced into British Columbia, such as the gray squirrel (*Sciurus carolinensis*) and Eurasian Skylark (*Alauda arvensis*), or which have entered B.C. following introduction

Amphibians

Leiopelmatidae

Ascaphus truei

Tailed Frog

Pelobatidae

Scaphiopus intermontanus

Great Basin Spadefoot Toad

Reptiles

Emydidae

Chrysemys picta

Painted Turtle

Boidae

Charina bottae

Rubber Boa

Colubridae

Coluber mormon

Western Yellow-bellied Racer

*Pituophis melanoleucus deserticola*Gopher Snake - *deserticola* subspecies

Viperidae

Crotalus viridis

Western Rattlesnake

Birds

Phalacrocoracidae

Phalacrocorax auritus

Double-crested Cormorant

Ardeidae

Botaurus lentiginosus

American Bittern

Ardea herodias

Great Blue Heron

Butorides striatus

Green-backed Heron

Anatidae

Cygnus buccinator

Trumpeter Swan

Clangula hyemalis

Oldsquaw

Melanitta perspicillata

Surf Scoter

Cathartidae

Cathartes aura

Turkey Vulture

Accipitridae

Haliaeetus leucocephalus

Bald Eagle

Buteo swainsoni

Swainson's Hawk

Falconidae

Falco peregrinus pealei

Peale's Peregrine Falcon

Falco rusticolus

Gyr Falcon

Phasianidae

*Lagopus leucurus saxatilis*White-tailed Ptarmigan - *saxatilis* subspecies*Tympanuchus phasianellus columbianus*Sharp-tailed Grouse - *columbianus* subspecies

Gruidae

Grus canadensis

Sandhill Crane

Charadriidae

Pluvialis dominica

Lesser Golden-plover

Recurvirostridae

Recurvirostra americana

American Avocet

Scolopacidae

Heteroscelus incanus

Wandering Tattler

Numenius americanus

Long-billed Curlew

Limosa haemastica

Hudsonian Godwit

Limnodromus griseus

Short-billed Dowitcher

Phalaropus lobatus

Red-necked Phalarope

Laridae

Larus californicus

California Gull

Sterna caspia

Caspian Tern

Alcidae

Brachyramphus marmoratus

Marbled Murrelet

Synthliboramphus antiquus

Ancient Murrelet

Table 2-5. British Columbia's 1993 Blue List (87 taxa in taxonomic order)

| | |
|--|---|
| Alcidae con't | |
| <i>Ptychoramphus aleuticus</i> | Cassin's Auklet |
| <i>Fratercula cirrhata</i> | Tufted Puffin |
| Tytonidae | |
| <i>Tyto alba</i> | Barn Owl |
| Strigidae | |
| <i>Asio flammeus</i> | Short-eared Owl |
| <i>Otus flammeolus</i> | Flammulated Owl |
| <i>Otus kennicottii macfarlanei</i> | Western Screech-owl - <i>macfarlanei</i> subspecies |
| <i>Otus kennicottii kennicottii</i> | Western Screech-owl - <i>kennicottii</i> subspecies |
| <i>Glaucidium gnoma swarthy</i> | Northern Pygmy-owl - <i>swarthy</i> subspecies |
| <i>Aegolius acadicus brooksi</i> | Northern Saw-whet Owl - <i>brooksi</i> subspecies |
| Apodidae | |
| <i>Aeronautes saxatalis</i> | White-throated Swift |
| Trochilidae | |
| <i>Archilochus alexandri</i> | Black-chinned Hummingbird |
| Picidae | |
| <i>Melanerpes lewis</i> | Lewis' Woodpecker |
| <i>Sphyrapicus thyroideus thyroideus</i> | Williamson's Sapsucker - <i>thyroideus</i> subspecies |
| <i>Picoides villosus picoideus</i> | Hairy Woodpecker - <i>picoideus</i> subspecies |
| Tyrannidae | |
| <i>Empidonax flaviventris</i> | Yellow-bellied Flycatcher |
| <i>Empidonax wrightii</i> | Gray Flycatcher |
| Corvidae | |
| <i>Cyanocitta stelleri carlottae</i> | Steller's Jay - <i>carlottae</i> subspecies |
| Troglodytidae | |
| <i>Catherpes mexicanus</i> | Canyon Wren |
| Vireonidae | |
| <i>Vireo huttoni</i> | Hutton's Vireo |
| <i>Vireo philadelphicus</i> | Philadelphia Vireo |
| Emberizidae | |
| <i>Dendroica virens</i> | Black-throated Green Warbler |
| <i>Dendroica palmarum</i> | Palm Warbler |
| <i>Wilsonia canadensis</i> | Canada Warbler |
| <i>Chondestes grammacus</i> | Lark Sparrow |
| <i>Calcarius pictus</i> | Smith's Longspur |
| <i>Dolichonyx oryzivorus</i> | Bobolink |
| <i>Pinicola enucleator carlottae</i> | Pine Grosbeak - <i>carlottae</i> subspecies |
| Mammals | |
| Soricidae | |
| <i>Sorex arcticus</i> | Black-backed Shrew |
| <i>Sorex trowbridgii</i> | Trowbridge's Shrew |
| Vespertilionidae | |
| <i>Myotis thysanodes</i> | Fringed Myotis |
| <i>Myotis ciliolabrum</i> | Western Small-footed Myotis |
| <i>Euderma maculatum</i> | Spotted Bat |
| <i>Plecotus townsendii</i> | Townsend's Big-eared Bat |
| Leporidae | |
| <i>Sylvilagus nuttallii</i> | Nuttall's Cottontail |
| Aplodontidae | |
| <i>Aplodontia rufa rainieri</i> | Mountain Beaver - <i>rainieri</i> subspecies |
| Sciuridae | |
| <i>Spermophilus saturatus</i> | Cascade Golden-mantled Ground Squirrel |
| <i>Tamias minimus oreocetes</i> | Least Chipmunk - <i>oreocetes</i> subspecies |

Table 2-5. British Columbia's 1993 Blue List (Continued)

| | |
|-------------------------------------|---|
| Heteromyidae | |
| <i>Perognathus parvus</i> | Great Basin Pocket Mouse |
| Cricetidae | |
| <i>Reithrodontomys megalotis</i> | Western Harvest Mouse |
| Arvicolidae | |
| <i>Clethrionomys gapperi galei</i> | Southern Red-backed Vole - <i>galei</i> subspecies |
| <i>Synaptomys borealis borealis</i> | Northern Bog Lemming - <i>borealis</i> subspecies |
| Zapodidae | |
| <i>Zapus hudsonius alascensis</i> | Meadow Jumping Mouse - <i>alascensis</i> subspecies |
| Ursidae | |
| <i>Ursus americanus emmonsii</i> | Glacier Bear |
| <i>Ursus arctos</i> | Grizzly Bear |
| Mustelidae | |
| <i>Martes pennanti</i> | Fisher |
| <i>Mustela erminea anguinae</i> | Ermine - <i>anguinae</i> subspecies |
| <i>Gulo gulo luscus</i> | Wolverine - <i>luscus</i> subspecies |
| <i>Taxidea taxus</i> | Badger |
| Cervidae | |
| <i>Cervus elaphus roosevelti</i> | Roosevelt Elk |
| <i>Rangifer tarandus</i> | Woodland Caribou - southern populations |
| Bovidae | |
| <i>Bison bison bison</i> | Plains Bison |
| <i>Ovis canadensis californiana</i> | California Bighorn Sheep |
| <i>Ovis canadensis canadensis</i> | Rocky Mountain Bighorn Sheep |
| <i>Ovis dalli stonei</i> | Stone Sheep |

Table 2-5. British Columbia's 1993 Blue List (Continued)

into neighbouring regions, such as the fox squirrel (*Sciurus niger*) and some populations of Wild Turkey (*Meleagris gallopavo*). The reasons for not including exotic species are:

- 1) they have been introduced by humans and are not part of British Columbia's natural wildlife heritage;
- 2) they may compete with native species of fauna;
- 3) they may not be adapted to conditions found in British Columbia; and
- 4) the effort to maintain viable populations of these species could be more profitably directed toward native species.

Subspecies

Previous editions of the Red and Blue Lists did not include subspecies, unless there was significant public concern for their management. However, as part of the recent change in emphasis toward managing for biological diversity, all subspecies are now considered. Most subspecies represent recognizable genetic diversity, and management at the subspecies level is a first step in preserving this diversity.

Recognizing that some genetic differences may not be expressed in gross morphological (physical) features, we must proceed with the best assessments we have, until molecular technology provides us with better measures. In some instances, taxa that are currently recognized as subspecies may well prove to be distinct species. For example, the northern pocket gopher (*Thomomys*

talpoides), red-tailed chipmunk (*Tamias ruficaudus*), and Brewer's Sparrow (*Spizella breweri*) all have subspecies that may prove to be separate species. Unless this variation is retained, we could lose these species even before they are formally recognized.

In general, clearly disjunct British Columbian populations are evaluated as separate taxa, and most intergrading subspecies (ones that are intermediate in form) are grouped and considered as a single species. As taxonomic studies increase our knowledge of British Columbia's fauna, these lists will be updated. In some cases, it will be wise to further investigate the taxonomy of a subspecies before initiating expensive conservation initiatives.

Peripheral Species

Peripheral species are those that are at the edge of their range. In previous editions of the Red and Blue Lists, species that were considered peripheral could be placed no higher than the Blue List, so even those that were threatened or endangered were down-listed to Blue. This policy was changed for a number of reasons.

- 1) There is increasing evidence that populations at the edges of their ranges possess unique genetic traits that may be important contributors to the long term survival and evolution of a species (Mayr, 1967, 1982). Scudder (1989) states, "Marginal populations have a high adaptive significance to the species as a whole, and marginal (peripheral) habitat conservation, preservation and management is one of the best ways to conserve the genetic diversity....."
- 2) Due to their geographic position, populations at the edges of their ranges may also be important in enabling the species as a whole to survive long term environmental changes, such as global warming.
- 3) Taken to its logical conclusion, the exclusion of peripheral species from legal protection (especially if applied to plants, invertebrates and plant communities) could result in a tremendous loss of British Columbian genetic resources.
- 4) The diversity of British Columbia's fauna is lower than that of similar geographic areas which have not been glaciated. Many species that are on our current Red and Blue Lists are taxa that have colonized (or recolonized) British Columbia relatively recently and they may still require protection to establish viable populations.
- 5) Responses of species to environmental changes may be more easily recognized at the periphery of their ranges than at the core and, therefore, peripheral populations should be monitored for impacts before a particular species becomes threatened or vulnerable throughout its range.

These lists will change frequently, and the status of each species is not permanent. The ecological systems in which these species live are dynamic; populations will grow and shrink. Species may be added to these lists as a result of habitat loss and fragmentation. The status of a species may change as we gather more infor-

mation on its abundance, distribution, and taxonomy, and some species will respond to management efforts and be down-listed or delisted.

The Red and Blue Lists play an important role in facilitating initial identification of endangered, threatened, and vulnerable species, but serve only as a first step in proper conservation of British Columbia's biota which are at risk.

National Criteria for the Designation of Endangered and Threatened Species

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was formed in 1977 as a result of a recommendation of the Federal-Provincial Wildlife Conference. It arose from the need for a single official, scientifically sound national listing of wild species at risk in Canada. Its mandate is to determine the national status of wild species, sub-species and geographically separate populations in Canada. All native plants and animals, except invertebrates, fall under COSEWIC's purview.

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COSEWIC consists of one representative from the wildlife agency of each province or territory, one from each of four federal agencies (Canadian Wildlife Service, National Museums, Department of Fisheries and Oceans, and Parks Canada), and one from each of three nationally-based private conservation agencies (Canadian Nature Federation, Canadian Wildlife Federation, and World Wildlife Fund Canada). COSEWIC elects its own chairperson for a two year term. Sub-committees carry out the work of bringing status reports on species from the various biological groups (birds, terrestrial mammals, fish, marine mammals, amphibians, reptiles, and plants) to the attention of COSEWIC. For each sub-committee, COSEWIC appoints a chairperson who is an expert in that field and who, in turn, recruits knowledgeable sub-committee members.

These sub-committees obtain, review and present to COSEWIC the reports upon which all determinations of species status are based. Each report provides an up to date description of the distribution, abundance and population trends of a species. These status reports may be submitted to the appropriate sub-committee by individuals, COSEWIC members, or a contractor hired by COSEWIC to prepare the report. It is the sub-committees' job to ensure scientific quality, propose an appropriate national status for the species, subspecies or population in question, and present the status report to COSEWIC membership for formal assignment of status.

COSEWIC meets annually in April to declare official status for all the species for which status reports have been prepared and circulated. Following each annual meeting, a news release is issued listing new designations. In addition, up to date lists of all species evaluated and their new designations are available annually from the COSEWIC Secretariat. The status reports for designated species can be obtained from the Canadian Nature Federation in Ottawa. COSEWIC recognizes five categories of species at risk: vulnerable, threatened, endangered, extirpated and extinct. Definitions of these categories are provided in Table 2-6. Sometimes, when a status