



Extinct and Extirpated Species

*At least 19 species
and subspecies
have disappeared
from British Columbia
in historic times.*





Extinct and Extirpated Species in British Columbia

Although British Columbia has a more varied flora and fauna than any other province in Canada, we should not take this rich biodiversity for granted. Many species and subspecies are at risk. Worse yet, some have been extirpated from British Columbia (they are no longer found within the province, but still live elsewhere) or have become extinct (they no longer exist anywhere in the world).

When a province has nearly 500 species of birds and more than 3000 plant species, the loss of one or two of these may not seem that serious, but there are a number of reasons why every species and subspecies is worthy of conservation. For some people, the most important consideration is the known and potential economic values of plants and animals, which provide us with building materials, medicine, food, pest control, and much more. For others, it is the aesthetic or spiritual significance of living beings. In addition to these values, ecosystems are complex networks of interconnected organisms and the loss of any one component of an ecosystem can affect all the remaining species, often in ways we do not yet understand. Furthermore, certain types of organisms, such as lichens, amphibians, and fish, are valuable bioindicators – the health of these species provides us with tangible evidence about the health of the ecosystems in which they live.

British Columbia's casualty list

The BC Conservation Data Centre (CDC) maintains records on animal and vascular plant species at risk in the province, as well as mosses and

some invertebrate groups. The CDC lists 14 species or subspecies (referred to collectively as “taxa”) that are extirpated from British Columbia and 5 that are extinct. The real numbers are undoubtedly higher, since we are far from having identified every plant and animal species in the province. Of the estimated 35 000 species of insects that live in British Columbia, for example, only about half are known to science. With this many unknown species, it is inevitable that some have been lost before we even recognized their existence and that these unrecorded extinctions and extirpations will continue to happen.

In addition to the 19 extirpated and extinct taxa, 37 others are listed by the CDC as being “historic” (see table). This qualifier is applied to species

“The outstanding scientific discovery of the twentieth century is not television, or radio, but rather the complexity of the land organism. Only those who know the most about it can appreciate how little is known about it. The last word in ignorance is the man who says of an animal or plant: “What good is it?” If the land mechanism as a whole is good, then every part is good, whether we understand it or not. If the biota, in the course of aeons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering.”

ALDO LEOPOLD,
SAND COUNTY ALMANAC, 1966.

whose presence in British Columbia has not been verified for a long time – generally about 45 years – but for which there is a reasonable expectation that someday they may be found again.

Status: Extinct

Three of the five British Columbia species that have become extinct are fish. Each one was confined to a single lake. In each case, human

activity led to their demise, before biologists even had a chance to give them proper scientific names.

Whitefishes are found across northern Canada. From the time that the last major glaciation ended, about 10 000 years ago, they have been expanding into new, under-utilized habitats and evolving into new forms. For scientists who study evolution, these fishes offer a rare opportunity to analyze the process of speciation (the evolution of new species) in progress. The Dragon Lake Whitefish (*Coregonus* sp 1), which lived in Dragon Lake near Quesnel, was eradicated in 1956 when the lake was poisoned to remove unwanted fishes before introducing trout for sport fishing.

Two fishes that once lived on Lasqueti Island in the Strait of Georgia – the Hadley Lake Limnetic Stickleback (*Gasterosteus* sp 12) and the Hadley Lake Benthic Stickleback (*Gasterosteus* sp 13) – were also examples of relatively young species that had the potential to increase our understanding of the evolutionary process. The two Hadley Lake sticklebacks were what is known as a “species pair” – two distinct but closely related species living side-by-side in the same small lake. They were lost in the early 1990s when non-native catfish, which prey on stickleback eggs, were introduced to their home waters.

British Columbia's fourth extinct animal is the Dawson Caribou (*Rangifer tarandus dawsoni*). These elusive caribou lived in muskeg habitat on the Queen Charlotte Islands. Early scientific records of their presence on Graham Island were based on a few accounts by Haidas who lived there, and the discovery of tracks and antlers in the late 1800s and early 1900s. The last Dawson Caribou ever to be reported was seen in 1908.

The cause of this subspecies' extinction is a mystery. Over-hunting is one possibility, although any hunting that was done by the Haida or by

Europeans is completely undocumented. Black-tailed Deer, which have now dramatically changed the vegetation on Graham Island, were not present until government officials introduced them in 1900 and they did not start having a significant impact for some years after that.

The fifth extinct species is the Passenger Pigeon, which once existed in huge numbers across North America. We don't know how common these birds were in B.C, but there are records from the Fraser Valley and the Peace River. The last Passenger Pigeon died in captivity in the U.S. in 1914.

Status: Extirpated

Plants

Four moss species and four flowering plants are considered extirpated.

Two of the extirpated mosses, *Micromitrium tenerum* and *Pseudephemerum nitidum*, have not been found anywhere else in Canada. Each of these very tiny mosses was known only from a few sites in the Vancouver area, all of which have been destroyed by human activity.

The habitat of the extirpated moss *Discelium nudum* is naturally ephemeral – the open earth banks where it grows are subject to slumping or invasion by seed plants, which crowd it out. In the past, researchers found this species in the Vancouver area and in the Queen Charlotte Islands, but all known British Columbia populations have now been eliminated. It is still found in other parts of North America.

The moss *Physcomitrium immersum* is known from museum specimens collected from margins of cultivated and fallow fields in the Fraser Valley. It is also still found in other parts of North America.

The four flowering plants known to have been extirpated from British

Columbia are all at the northern edge of their geographic ranges.

Pink Sandverbena (*Abronia umbellata* ssp *acutalata*) (on cover) grows on coastal beaches and sand dunes. The only locations where it has been found in British Columbia are

Ahousat and Pachena Bay on the west coast of Vancouver Island. It has not been collected in this province since 1927, despite extensive searching. It is also believed to be extirpated from Washington, but is still found at the southern end of its range, in Oregon.

Another former Vancouver Island species is Lobb's Water-but-

tercup (*Ranunculus lobbii*), which grew in seasonal pools and wet sites, from the southern tip of Vancouver Island south to California. Within British Columbia it was found only in the Victoria area and has not been recorded since 1948. Urban development was most likely the major cause of its disappearance.

The range of Common Downingia (*Downingia elegans*) extends from southeastern British Columbia, south to Nevada and northern California. Restricted to wet meadows and ponds in the steppe and lower montane zones, it has been found at only one site in this province – on the muddy shores of Leach Lake near Creston. When the shoreline of this lake was permanently altered by a waterfowl enhancement project all provincial representatives of this species were eliminated.

The only location where Rabbitbrush Goldenweed (*Ericameria bloomeri*) has been found in British Columbia is near Westbridge in the south-central part of the province. This population has disappeared. South of the border, it is still found in dry sites

in the steppe and lower montane zones as far south as California.

Insects

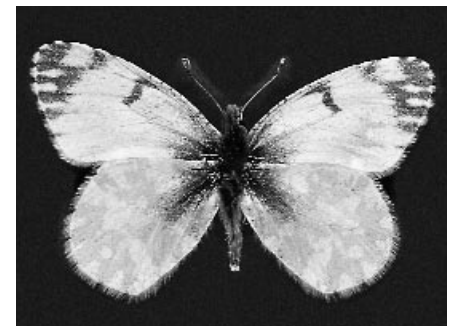
The two British Columbia insect species that are known to have been extirpated are both butterflies. It is probable that other, less showy insects have also been lost from the provincial fauna without ever having been identified.

Until very recently, biologists thought that an unnamed subspecies of the Large Marble (*Euchloe ausonides* ssp 1, the Island Large Marble) was extinct. Its known world distribution was from the Greater Victoria area, Wellington, and Gabriola Island. Despite intensive searching, this subspecies had not been seen since 1908. The discovery of two populations of butterflies that are believed to be this same subspecies on San Juan Island, Washington, changes its status from extinct to extirpated. The reasons for this butterfly's disappearance from its Canadian range are not known, but suspected causes include high levels of cattle and sheep grazing and non-native parasites associated with the introduced Cabbage White butterfly.

The Viceroy (*Limenitis archippus*), a widely distributed North American species, was recorded in British



EXTIRPATED:
RABBITBRUSH
GOLDENWEED



EXTIRPATED: ISLAND LARGE MARBLE
Chris Guppy photo

Columbia's southern interior from 1913 to 1920, and was last collected at Lillooet in 1930. Viceroy habitat here was restricted to valley bottoms, which were being converted to apple orchards; once pesticides began to be

Historical species in British Columbia

These species have historical records but their occurrence has not been verified in recent years.

SCIENTIFIC NAME	COMMON NAME	LOCATION	LAST SEEN
PLANTS: MOSSES			
<i>Bryum tenuisetum</i>	(moss)	Vancouver Island	1887
<i>Dicranum fuscescens</i> var <i>congestum</i>	(moss)	Lake Cowichan	1931
<i>Polytrichum commune</i> var <i>perigoniale</i>	(moss)	Summit Lake, New Denver	1926
PLANTS: DICOTS			
<i>Agastache foeniculum</i>	Giant-hyssop	Columbia River s. of Golden	1947
<i>Atriplex alaskensis</i>	Alaska Orache	Queen Charlotte Islands	1898
<i>Castilleja fulva</i>	Boreal Paintbrush	Kechika River area	1940
<i>Chrysosplenium iowense</i>	Golden Carpet	Upper Peace River drainage	1969
<i>Cryptantha intermedia</i> var <i>grandiflora</i>	Large-flowered Grandiflora	Nanaimo	1893
<i>Epilobium pygmaeum</i>	Smooth Spike-primrose	Douglas Lake, southern interior	1921
<i>Gilia capitata</i> var <i>capitata</i>	Globe Gilia	Victoria	1981
<i>Gilia sinuata</i>	Shy Gilia	Osoyoos	1940
<i>Leucanthemum arcticum</i>	Arctic Daisy	Observatory Inlet (nr AK border)	1893
<i>Lupinus arbustus</i> ssp <i>neolaxiflorus</i>	Spurred Lupine	Extreme SE British Columbia	1944
<i>Lupinus oreganus</i> var <i>kincaidii</i>	Sulphur Lupine	SE Vancouver Island	1929
<i>Montia diffusa</i>	Branching Montia	Alberni area	1916
<i>Orobanche pinorum</i>	Pine broomrape	SE Vancouver Island	1914
<i>Parrya nudicaulis</i>	Northern Parrya	Extreme NW British Columbia	1945
<i>Pleuricospora fimbriolata</i>	Fringed Pinesap	Vancouver Island	1916
<i>Prenanthes racemosa</i> ssp <i>multiflora</i>	Purple rattlesnake-root	Dawson Creek area	1946
<i>Primula nutans</i>	Siberian Primrose	NW British Columbia, near Atlin	1914
<i>Ranunculus rhomboideus</i>	Prairie Buttercup	NE British Columbia	1943
<i>Senecio hydrophilus</i>	Alkali-marsh Butterweed	Kootenay River Flats	1929
<i>Senecio integerrimus</i> var <i>ochroleucus</i>	White Western Groundsel	South-central B.C.	Before 1900
<i>Sphaeralcea munroana</i>	Munroe's Globe-mallow	Near Osoyoos	1922
<i>Thellungiella salsuginea</i>	Salt-water Cress	Columbia Lake	1942
PLANTS: MONOCOTS			
<i>Carex crawei</i>	Crawe's Sedge	Big Bend region, Columbia River	1948
<i>Poa laxa</i> ssp <i>banffiana</i>	Banff Bluegrass	Valley of Ten Peaks	1943
<i>Poa nervosa</i>	Coastal Bluegrass	Nootka Sound	Before 1840
<i>Polypodium sibiricum</i>	Virginia Polypody	Beatton River	1943
<i>Polystichum californicum</i>	California Sword-fern	Texada Island	1897
ANIMALS			
<i>Cicindela parowana</i>	Parowana Tiger Beetle	South Okanagan	1953
<i>Plebejus saepiolus insulanus</i>	Vancouver Island Blue	Southern Vancouver Island	1979
<i>Phrynosoma douglasi</i>	Pigmy Short-horned Lizard	South Okanagan	1910 last confirmed
<i>Eremophila alpestris strigata</i>	Horned Lark, <i>strigata</i> subspecies	Lower Fraser Valley	1987
<i>Balaenoptera borealis</i>	Sei Whale	Northeast Pacific	Unknown
<i>Eubalaena glacialis</i>	Black Right Whale	Northeast Pacific	1951
<i>Mustela frenata altifrontalis</i>	Long-tailed Weasel, <i>altifrontalis</i> subspecies	Fraser Valley	1937

used, the population was extirpated. Further south, Viceroy's survived because they inhabited a wide area that was not adjacent to apple orchards. Larval foodplants are wild crabapple, cherry, poplar and willow.

Reptiles

The Western Pond Turtle (*Clemmys marmorata*) is an inhabitant of marshes, ponds, streams, rivers, and lakes. Once found from southwestern British Columbia to Baja California, its distribution and abundance are declining throughout its range due to habitat loss and degradation, and the introduction of non-native predators. Killing of these turtles for human consumption in the 1800s and early 1900s was also a factor. In the Pacific Northwest, an upper respiratory disease epidemic exacerbated the species' decline. Two Western Pond Turtles were collected in the lower Fraser Valley in the 1930s and a third was seen in 1966. Although this species has been known to live up to 30 years of age, there have been no further sightings in this area or elsewhere in British Columbia since then.

The *catenifer* subspecies of the Gopher Snake (*Pituophis catenifer catenifer*) was last recorded in this province in the 1800s, when one specimen was collected from Galiano Island and another from the border region near Sumas, Washington. It is now considered extirpated from both British Columbia and Washington, but is still found through parts of its range south to southern California. Large portions of the grasslands where it once lived have been lost to agricultural and urban development, and on the Gulf Islands its habitat has also been degraded by Scotch broom. The disappearance of these harmless snakes may also be due to human persecution, as they can be mistaken for rattlesnakes.

Birds

Once widespread across western North

America, the Sage Grouse (*Centrocercus urophasianus*) (on cover) is now extirpated from five American states and one Canadian province – British Columbia – and is considered at risk in six other states and two other provinces. In British Columbia, this species was restricted to the Okanagan Valley south of Oliver, and possibly the lower part of the Similkameen



HISTORICAL: PIGMY SHORT-HORNED LIZARD.
Ted Lea photo

Valley. A bird shot near Oliver in 1918 was the last reported Sage Grouse from the original population. An attempt was made to reintroduce the species in 1958, but this failed. This species inhabits open shrub-steppe sagebrush communities. The main threats to its existence are habitat loss and fragmentation due to sagebrush eradication programs, livestock grazing, and land development.

The breeding range of the Yellow-billed Cuckoo (*Coccyzus americanus*) extends from eastern North America and California, south through the Caribbean and Mexico. The western subspecies is now extirpated from British Columbia, Washington, and Oregon. Most records of this species in British Columbia are from the lower Fraser Valley and southeastern Vancouver Island and were obtained

between 1881 and 1927. Breeding was assumed because of the time of year the birds were seen, but it was never absolutely confirmed. Yellow-billed Cuckoos nest in dense tangles and thickets of deciduous riparian (stream-side) vegetation. Loss of this type of habitat due to urban and agricultural development is the most likely cause of extirpation in British Columbia.

Reintroductions

British Columbia's smallest marine mammal, the Sea Otter (*Enhydra lutris*), was once extirpated from this province and throughout much of its range. Prior to decimation by the fur trade, Sea Otters were found in a great arc around the North Pacific, and the worldwide population was estimated at 150 000 to 300 000. One and half centuries of exploitation by Russian, American, British, and Spanish fur traders – which ended in 1911 – reduced their numbers to between 1000 and 2000, living in a dozen scattered locations. For many decades it appeared that the last record of this species in British Columbia would be the otter that was killed by a scientific collector in 1929.

In 1969, provincial and federal biologists began a Sea Otter reintroduction program in British Columbia. Over the next three years, 89 otters from Alaska were released on the northwest coast of Vancouver Island. Since then, their population has grown to an estimated 1600 animals and they have expanded into new areas. The return of the Sea Otter to the coastal ecosystem has helped restore the natural balance of nearshore reef communities.

In 1996, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) down-listed the Sea Otter from nationally Endangered to Threatened. Nevertheless, this species is still considered at risk, as it is vulnerable to oil spills in its two main



RETURNED: SEA OTTER. Royal BC Museum photo



EXTINCT: DAWSON CARIBOU. Royal BC Museum photo

areas of concentration. For this reason, it remains on the provincial Red List.

Wood Bison (*Bison bison athabasca*) once ranged across northern British Columbia but were extirpated by 1939. Wood Bison were re-introduced in the 1990s as part of the recovery process, and additional animals have dispersed into British Columbia from the Northwest Territories.


Should we be concerned?

Extinction is a natural process, which has been taking place ever since life first appeared on earth. This does not mean we should be unconcerned about the losses currently occurring because of human activities. Scientists estimate that the worldwide rate of extinction since the beginning of the Cambrian period (about 590 million years ago) has averaged about two species per year. The current rate is thought to be 1000 to 10 000 times higher. This extinction rate is comparable to previous mass extinctions in which at least half the world's animal species disappeared over a relatively short period. In the past, recovery from mass extinctions has taken about five million years. Even if we could conceive of waiting that long to regain the level of biodiversity that is being lost, the individual species that are gone will never return. Extinction is forever.

Extirpation, on the other hand, offers a second chance, but only to a limited extent. There have been some well-publicized instances of species being successfully reintroduced to areas from which they had disappeared, but such examples are few. Before any reintroduction can be considered, the causes of extirpation must be addressed. This may mean restoring habitat, eliminating non-native predators or competitors, or ceasing certain human activities.

In any case, reintroduction is not a cure-all, for it cannot replace the genetic diversity that is lost when a distinct

population of a species is lost. Many of the plants and animals that have been extirpated from British Columbia were at the edge of their species' geographic range. Such populations have high evolutionary significance to their species as a whole because they contribute to the genetic diversity, adaptability and versatility of their species. Therefore, the loss of these populations limits a species' long-term survival options.

Responsibility for maintaining our rich provincial biodiversity, the ecosystems of which we are part and on which we depend, rests with all of us. 

FOR MORE INFORMATION ON EXTINCT OR EXTIRPATED SPECIES, CONTACT:

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