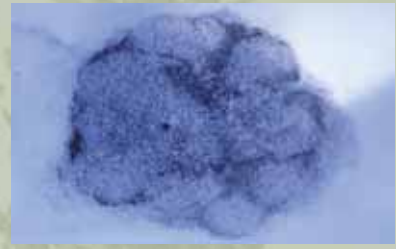


Wildlife Roadkill Identification Guide

2008 Edition

Ministry of Transportation
Engineering Branch
Environmental Management Section

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Canada V8W 9T5



Library and Archives Canada Cataloguing in Publication Data

Sielecki, Leonard E.

Wildlife roadkill identification guide. — 2008 ed.

Includes bibliographical references: p.

ISBN 978-0-7726-5918-7

1. Roadkills - British Columbia - Identification -Handbooks, manuals, etc. 2. Traffic safety and wildlife - British Columbia.
I. British Columbia. Ministry of Transportation. Environmental Management Section.
II. Title.

HE5620.W54S53 2008 591.9711 C2008-960024-X

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Wildlife Roadkill Identification Guide

2008 Edition

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Date: January 2008

Prepared for: Environmental Management Section
Engineering Branch
British Columbia Ministry of Transportation
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Abstract: The British Columbia Ministry of Transportation (BCMoT) has been monitoring motor vehicle-related wildlife mortality with its Wildlife Accident Reporting System (WARS) since the late 1970's. Detailed species information on "roadkilled" wildlife found on Provincial highways is collected on a daily basis and entered into the Ministry's WARS database.

This guide provides species-specific information on wildlife typically found on British Columbia highways to assist those identifying carcasses for WARS reporting purposes. The guide provides a general description of the physical appearance, life stages, numerical abundance and geographic distribution of each animal. Where identification of a wild animal is difficult because of the condition of its remains, more accurate reporting may be possible by observing identifiable physical characteristics, such as colour, size and footprint pattern, and cross referencing these details with typical seasonal periods of activity and known mapped habitat locations near Provincial highways.

Comments: This guide was developed to provide general, introductory information to help operational staff and private maintenance contractors of the British Columbia Ministry of Transportation identify those species of wildlife involved in wildlife-related motor vehicle collisions on Provincial highways. Improved accuracy in species identification will help support the Ministry's decision making process for wildlife accident reduction initiatives, ranging from species-specific wildlife warning signs to wildlife exclusion systems.

Keywords: Wildlife, Roadkill, Identification, Guide, British Columbia, North American Badger, Black Bear, Grizzly Bear, Bison, Woodland Caribou, Cougar, Coyote, Mule Deer, Black-tailed Deer, White-tailed Deer, Roosevelt Elk, Rocky Mountain Elk, Alaskan Moose, Northwestern Moose, Shiras Moose, Porcupine, Bighorn Sheep, Wolf

ADVISORY FOR HANDLING WILDLIFE CARCASSES

Note: This advisory does not replace or supersede any applicable Federal or Provincial legislation or regulations, or the regulations or requirements of the Worker Compensation Board, the British Columbia Ministry of Environment or Provincial Health Authorities.

The British Columbia Ministry of Transportation strongly recommends that care be taken when handling wildlife carcasses at any time. Persons handling wildlife carcasses must be aware of the need to protect themselves, co-workers and others against potential exposure to infectious agents, and the inadvertent spread of these infectious agents. Careless handling of wildlife carcasses can create potentially harmful exposures for humans, causing serious diseases, including: rabies, lyme disease, salmonella, and e-coli. Failure to properly disinfect tools and vehicles may also infect co-workers, as well as potentially spread disease to the general public and wildlife population. Diseases not known to be dangerous to humans can also be spread to unaffected wild animal populations by careless carcass handling and inadequate disinfecting of gloves, clothing and tools.

BASICS

1. Always wash hands with soap and water, or use waterless hand sanitizer, after handling wildlife carcasses.
2. Do not allow the wildlife carcass or other contaminated surfaces to come in contact with bare skin.
3. Wear heavy water impermeable gloves if your hands are in direct contact with carcasses to avoid being scratched & otherwise exposed to animal fluids. For additional protection wear long vinyl gloves inside the heavy water impermeable work gloves.
Wash your gloves thoroughly with soap and water after handling carcasses.
4. Wear coveralls if your clothes come into contact with carcasses. Wash the coveralls regularly with soap and water. In the event clothes become contaminated, they should be removed as quickly as possible, and washed separately from all other laundry, following normal washing instructions.
5. Be aware that ticks and fleas present a health risk as they leave the dead carcass in search of a new host. Ticks can be picked-up from a dead animal host. As a precaution against tick-borne diseases, a thorough personal body examination for attached ticks should be done daily.

BEFORE HANDLING A CARCASS

1. Before handling a carcass, confirm the animal is dead by prodding with a long-handled tool. Startling an injured, apparently lifeless animal, can increase potential for contamination, and can otherwise be dangerous.
2. Injured/dying animals, or animals otherwise exhibiting abnormal behaviour, should be reported to the local Conservation Officer or telephone 1-800-663-9453.

3. Numerous dead animals or birds found in one location should be reported to the local Conservation Officer or 1-800-663-9453.

LIFTING AND MOVING WILDLIFE CARCASSES

1. Care should be taken when lifting and moving wildlife carcasses to avoid back injuries. An assessment of the weight and awkwardness of a wildlife carcass should be made before attempting to lift or move it. A large or heavy wildlife carcass may require two or more people and lifting equipment.

PERSONAL CLEANING EQUIPMENT

1. Soap and hot water, or waterless hand sanitizer, should be available for personal cleaning purposes.
2. Portable eyewash and first aid kit should be available and used as necessary.

TOOLS

1. All tools used for handling dead wildlife should be dedicated to this purpose only. These tools should have no pointed or sharp edges, and should be clearly marked to identify them for carcass handling purposes.
2. Disinfect contaminated tools, equipment and vehicles regularly with a liberal application of a bleach solution (9 parts water, 1 part bleach), prepared fresh daily. Tools used for handling wildlife carcasses should be kept separately in a designated location. Cleaning tools should be done outdoors using eye protection and gloves with eyewash available.

CONTAMINATION

1. Persons with scratches or cuts that become contaminated from a carcass or its fluids should immediately wash thoroughly with soap and hot water. If not available, clean affected areas temporarily with waterless hand sanitizer, and later wash thoroughly with hot water and soap. Immediately report to work supervisor.
2. Persons splashed by animal fluids should wash and rinse affected areas immediately. Wash eyes with eyewash or clean water. Immediately report to work supervisor.
3. If exposure to rabies is suspected, the carcass should immediately be iced and retained for examination by proper authorities. Immediately report to work supervisor.

For more information on occupational and environmental health and safety information in British Columbia, please contact:

Workers' Compensation Board of British Columbia (WorkSafeBC)
Prevention Information Line

tel: (604) 276-3100 **toll-free:** 1-888-621-7233

after-hours: 1-886-922-4357 **fax:** (604) 276-3247




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Acknowledgements

This guide was made possible only because of a wealth of information, materials and services provided by a number of talented individuals and supportive organizations.

Graphics materials, photographs and information were provided by:

Natural History Section, Curatorial Services Branch, Royal British Columbia Museum;

Environmental Stewardship Division, British Columbia Ministry of Environment;

BC Parks, British Columbia Ministry of Environment; and

United States National Park Service, United States Department of the Interior.

Curatorial services for the Royal British Columbia Museum terrestrial mammal specimens collection were provided by:

Gavin H. Hanke, Ph.D., Curator of Vertebrate Zoology, Natural History Section, Curatorial Services Branch, Royal British Columbia Museum.

Referrals to government and non-government sources of species-specific information were provided by:

Laura Friis, Species Specialist, Environmental Stewardship Division, British Columbia Ministry of Environment.

Professional design, layout, mapping and graphic production services were provided by:

Beverly van Druten-Blais, Graphic Design Specialist, Engineering Branch, British Columbia Ministry of Transportation; and

Nancy Dolan, Graphic Designer, Engineering Branch, British Columbia Ministry of Transportation.





1.0 Wildlife and Highways in British Columbia

1.1 Introduction

Wildlife represents a significant and valued natural resource in the Province of British Columbia. Consequently, for over 30 years, as part of its ongoing commitment to environmental stewardship, the British Columbia Ministry of Transportation (BCMoT) has been actively working to protect wildlife near highways.

To identify and monitor highway locations where motor vehicle-related wildlife mortality occurs, BCMoT has been operating its Wildlife Accident Reporting System (WARS) since the late 1970's (Sielecki, 2004). Initially the Ministry's operational staff, and then since privatization in the 1980's, its maintenance contractors, have collected detailed species and location information on "roadkilled" wildlife found on the numbered Provincial highways under BCMoT's jurisdiction. The information is collected on a daily basis and entered into the Ministry's WARS database.

As the WARS database has grown, it has become an increasingly valuable resource for BCMoT planning and operational purposes. Although the WARS system was originally developed to meet Ministry needs, it offers a rare opportunity for other researchers to examine the wildlife habitat/highway interface over an extended period of time. Consequently, the Ministry has been working to increase the value of the information collected through the WARS system.

To assist Ministry maintenance contractors more accurately identify wildlife animals found on Provincial highways and increase the amount and quality of information on the wildlife reported in the WARS Monthly Wildlife Accident Report (H0107) (Figure 1) this wildlife "roadkill" identification guide was developed.

1.2 Purpose

This guide provides general information on a number of wildlife species found on British Columbia highways and is not intended to be an exhaustive and comprehensive reference authority on any of the species. The guide is intended to assist those identifying carcasses of wild animals by providing a general description of the physical appearance, life stages, numerical abundance and geographic distribution of each animal. Where identification of a wild animal is difficult because of the condition of its remains, more accurate reporting may be possible by observing identifiable physical characteristics, such as coat colour, physical size and footprint patterns, and cross referencing these details with typical seasonal periods of activity and known mapped habitat locations near Provincial highways.

Improvements in species identification will help support the Ministry's species-specific wildlife impact mitigation measures. In addition, accurate species identification will contribute to the decision process for Ministry investments in wildlife exclusion systems to protect motorists and wildlife.



YEAR

MONTH *(Please Circle)* Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

DISTRICT NO.

Enter the day of the month (e.g. 1, 2, 3, ... etc.) in the "Day" column below.

Please provide the following information to assist in report follow-ups:

Within 30 days of completion, please send this form to:

Leonard E. Sielecki, M.Sc., MCIP, R.P.Bio, WARS Manager
Environmental Management Branch
BC Ministry of Transportation
4B - 940 Blanshard Street
PO Box 9850 STN PROV GOVT
Victoria, BC Canada V8W 9T5
Phone: (250) 387-6161

Maintenance Contractor Contact (Please Print)

Telephone

Ministry District Contact (Please Print)

Telephone

Note: If you suspect that an animal has been the target of poachers, please contact your local Conservation Officer or call the ORR (Observe, Record, Report) Line at 1-800-663-9453.

Figure 1



(Stock Photo)

2.1 North American Badger (*Taxidea taxus*)

Appearance and Size

Badgers are shaggy, stout, short-legged animals, with characteristic black and white facial markings and a short tail. They have long curved claws upwards of 5 cm long well-suited for burrowing on their front legs, and teeth designed for tearing and shearing flesh. Their upper torso fur ranges in colour from silver grey to yellow-brown, interspersed with black and buff. The feet and lower legs of badgers are black. The markings of both sexes are similar. They have a squat, flattened appearance because they have short fur on their backs and longer fur on their sides. They are amongst the largest species in the weasel family. Mature badgers range in length from 65 to 90 centimetres, and in weight from 6 to 14 kilograms. Adult males are slightly larger and heavier than females.



(Photo: Tom Hall)

Life History

Except when females are raising young, and for brief encounters between mating pairs, badgers are relatively solitary and nocturnal animals. Mating occurs between July and August; only yearling or older males breed. Upwards of 40 percent of juvenile females, as well as yearling and older females will breed. Females can reach sexual maturity as young as four to five months. After delayed implantation, but rapid gestation, young



(Photo: Roger Packham, BC Ministry of Environment)



(Photo: Glen Lam)

are born in March or April of the following year. Litters are limited to one each year, ranging in size from one to four kits. Newborn badgers are nursed for five to six weeks, after which their mothers begin to bring prey to them. After being raised by their mothers for up to twelve weeks, juvenile badgers begin leaving to search for their own home ranges.

Abundance and Distribution

It is estimated that there are less than 200 breeding adults in British Columbia. This small population is distributed very thinly. While the home ranges for female adults average 50 square miles, the home ranges for adult males can extend to upwards of 500 square kilometres. Although badgers occur primarily in the dry southern interior valleys of the Okanagan-Similkameen and Kootenays, they have been sighted as far west as Manning Park and as far north as Williams Lake and Clearwater. Badgers are very vulnerable to human development and have recently been placed on the Provincial Red List for threatened and endangered species.

Adapted from: British Columbia Ministry of Water, Land and Air Protection, 2002, Badger, Victoria, 6pp.



(Stock Photo)



Front track
about 5 cm (1 3/4") long



Walking trail

Adapted from: McDougall (1997); and Sheldon and Hartson (1999).



(Photo: Trevor McKinley)

Characteristic Features

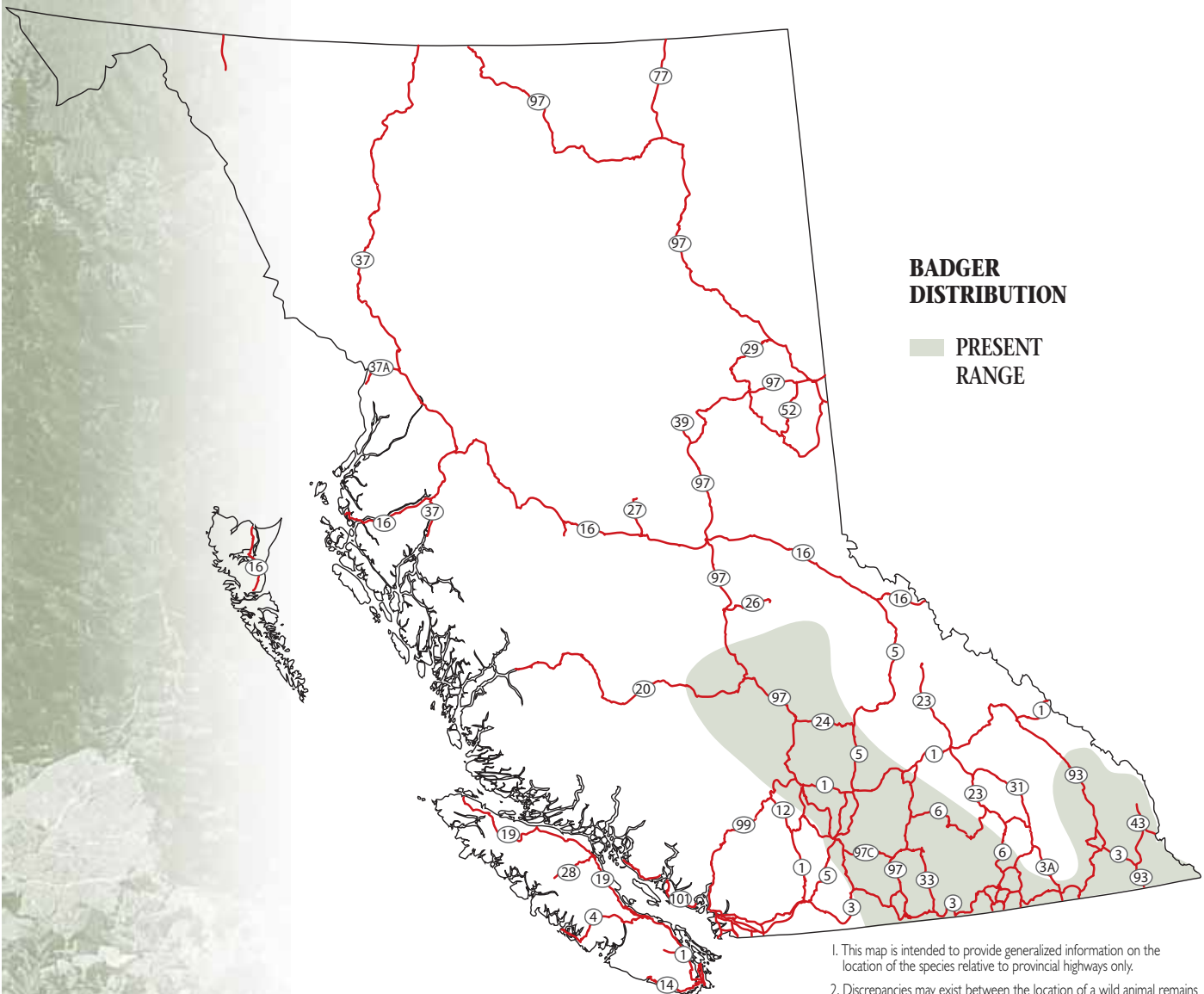


(Photo: Leonard Sielecki, BCMoT)



(Photo: Leonard Sielecki, BCMoT)

Map 2.1



2.2 BEAR: Black Bear (*Ursus americanus*: ssp: *altifrontalis*, *carlottae*, *cinnamomum*, *kermodei*, *vancouveri*)

Appearance and Size

Black bears have a bulky body, small black eyes, a broad head, rounded ears, a short tail, and a fine, long hairy covering. Usually, their fur is uniformly black, except for a tan muzzle and a white "V" on the chest. Black bears can range in colour from black to white, with cinnamon, brown and blonde not being uncommon. A blue-coloured black bear or "glacier" bear is rare. Adult size and weight varies greatly according to sex, season, food supply, and geographic area. Adult males measure about 60 cm to 90 cm in shoulder height and 130 cm to 190 cm in length and weigh 80 kg to 300 kg. Females are smaller, weighing 40 kg to 140 kg.



(Photo: Tourism BC)

Life History

Black bears have low reproductive rates compared to many other mammals. Females typically do not reach sexual maturity until four years of age, and breed only every two to three years after that. Where food is scarce, females might not bear their first litter until they are six or seven years old. Most males don't mature sexually until age five or six. Although black bears can live for 25 to 30 years in captivity, their life-span in the wild is usually much shorter. Black bears in British Columbia usually mate from early June to mid-July. Cubs are born in January or February, during hibernation. While litter sizes vary from one to five, black bears usually have two cubs. Cubs nurse while the mother continues hibernating and weigh 3 kg to 5 kg when they leave the den in spring. Cubs stay with their mother their entire first year and sometimes longer. For bears hibernation



(Photo: Tourism BC)



(Photo: Bryan Harry)



(Photo: BC Parks)

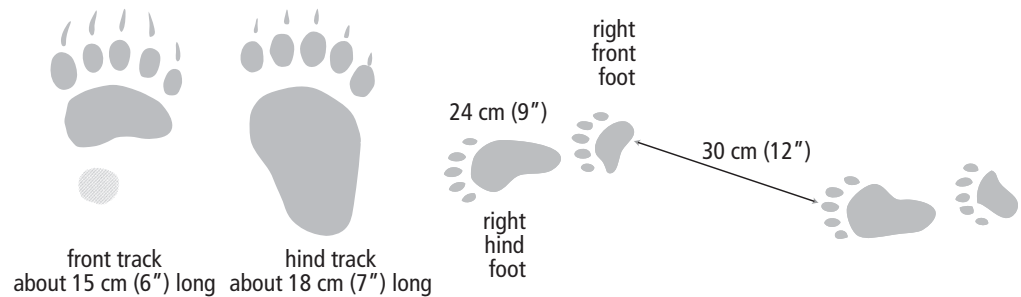
Abundance and Distribution

British Columbia supports one of the largest populations of black bears in North America. Black bear numbers vary from year to year but their population in British Columbia is estimated to be between 120,000 and 160,000 bears. This is about one quarter of all black bears in Canada. One of the most widely distributed mammals in British Columbia, the black bear is found in forestland across the province. Its natural range includes Vancouver Island and most coastal islands to the north, including the Queen Charlottes. (*Map 2.2.1*) Although bears are generally absent from alpine, grassland, and heavily settled landscapes, they often are found close to the fringes of communities and sometimes wander into them. Bear numbers are higher in wet climatic zones, where vegetation is more plentiful, than in dry regions. Coastal bear densities are higher because of access to spawning salmon.



(Photo: R. Robinson, BCMoT)

Text and map adapted from: British Columbia Ministry of Environment, Lands and Parks, 2001.



Adapted from: McDougall (1997); Shomon (1969) and Sheldon and Hartson (1999).



(Photo: Dave Dickson, ICBC)

Characteristic Features

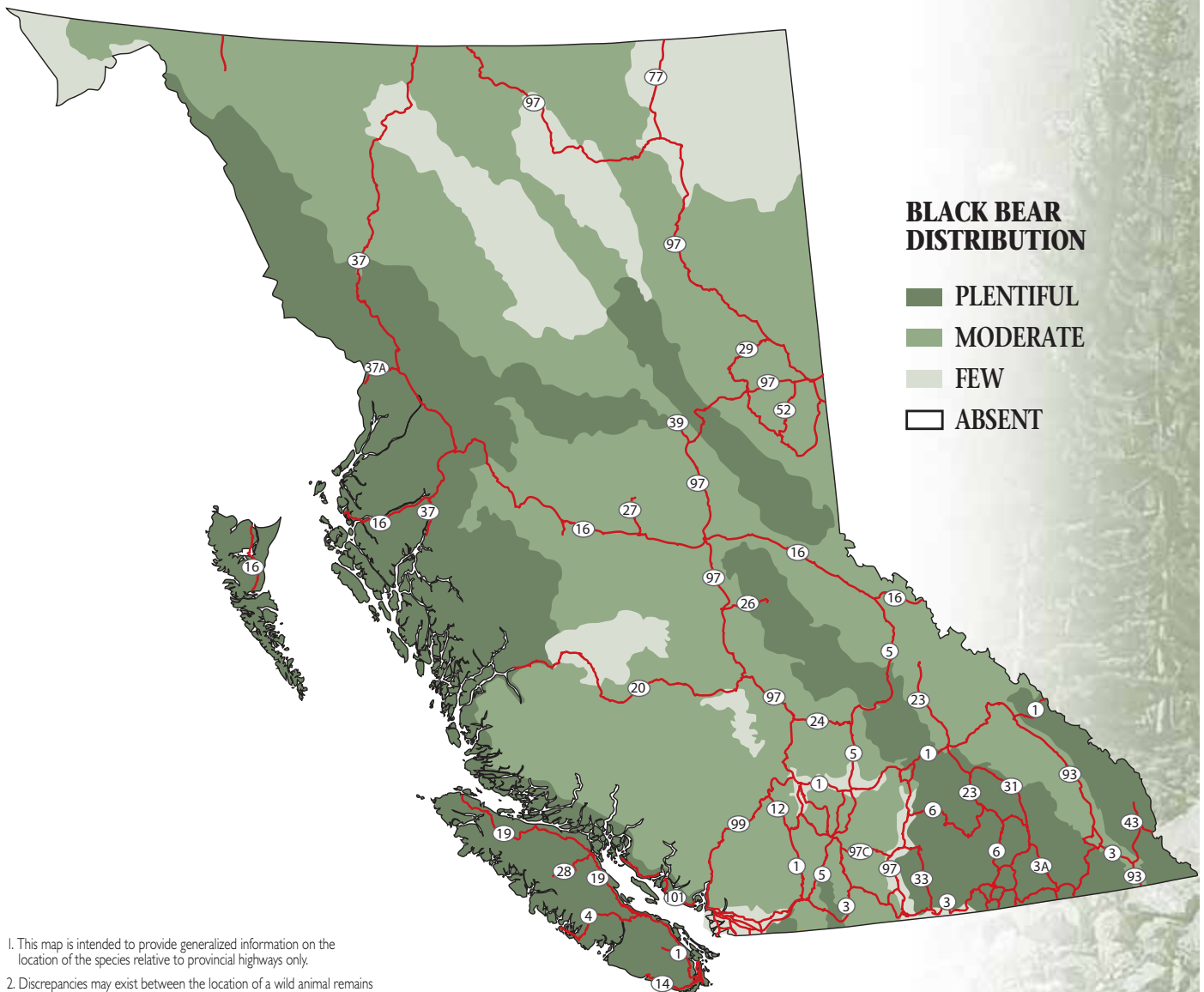


(Photo: Leonard Sielecki, BCMoT)



(Photo: Leonard Sielecki, BCMoT)

Map 2.2.1





(Photo: BC Parks)

2.2 BEAR: Grizzly Bear (*Ursus arctos horribilis*)

Appearance and Size

Grizzlies are large, heavy-bodied bears that can weigh up to 680 kg, with the average weight ranging from 270 kg to 360 kg. Average adult grizzlies reach nose-to-tail lengths of 1.8 m but have been recorded as long as 2.7 m. The long, outer guard hairs of the grizzly are often



(Photo: Dave Dickson, ICBC)

tipped with white, silver, or cream giving the bear the grizzled appearance its name denotes. Coat colour can be various shades of blond, brown, black, or a combination of these, and can be affected by spring shedding, growth of new hair, nutrition, and climate. Coat colour is not a good characteristic for distinguishing between black bears and Grizzly Bears. Black bears and grizzly bears sometimes look similar, but grizzlies are usually larger and are seldom completely black. Grizzlies

have a prominent shoulder hump, which is lacking in black bears, and a dish-shaped face instead of the straight facial profile of the black. Grizzlies have much longer claws, adapted for digging, while black bears have shorter, curved claws, well suited for tree climbing.

Life History

Grizzly bears have one of the lowest reproductive rates of North American terrestrial mammals. Females reach reproductive maturity between four and seven years of age, and once mature, normally produce young every two to three years. The breeding season begins in late May and lasts until mid-July. The gestation period is relatively short (7 to 9 months). One to four, usually two, cubs are born in the den in January or February. The cubs will remain with the female for two or three years, during which time she does not breed. Grizzlies rarely live past the age of 25.



(Photo: Tourism BC)



(Photo: Dave Dickson, ICBC)

Abundance and Distribution

Grizzly Bears inhabit most of the province except the Queen Charlotte Islands, the Lower Mainland, and portions of the south-central interior. (*Map 2.2.2*) While they are not common on Vancouver Island, a cub was found on the northern end of the island in 2003.



(Photo: Jim Peaco, US National Park Service)

Grizzly Bears occur in all major biogeoclimatic areas and utilize habitats ranging from coastal estuaries to alpine meadows. Habitat use is primarily influenced by the presence of food, denning and mating sites, and other bears. Home ranges vary in size depending on the individual bear and the locality, ranging from less than fifty to hundreds of square kilometres. Coastal bears tend to have smaller home ranges than do interior bears. Home ranges of males are generally larger than those of females. Given their secretive nature, affinity for

wilderness areas and low population densities, accurate counts of Grizzly Bear populations are almost impossible. Current estimates put the B.C. population at about 10,000 bears, approximately one-quarter of the North American population.

Text and map adapted from: British Columbia Ministry of Environment, Lands and Parks, 1994b.



(Photo: US National Park Service)



front track

about 25 cm (10") long



hind track

about 30 cm (12") long



walking tracks

Adapted from: McDougall (1997); and Sheldon and Hartson (1999).



(Photo: Leonard Sielecki, BCMoT)

Characteristic Features

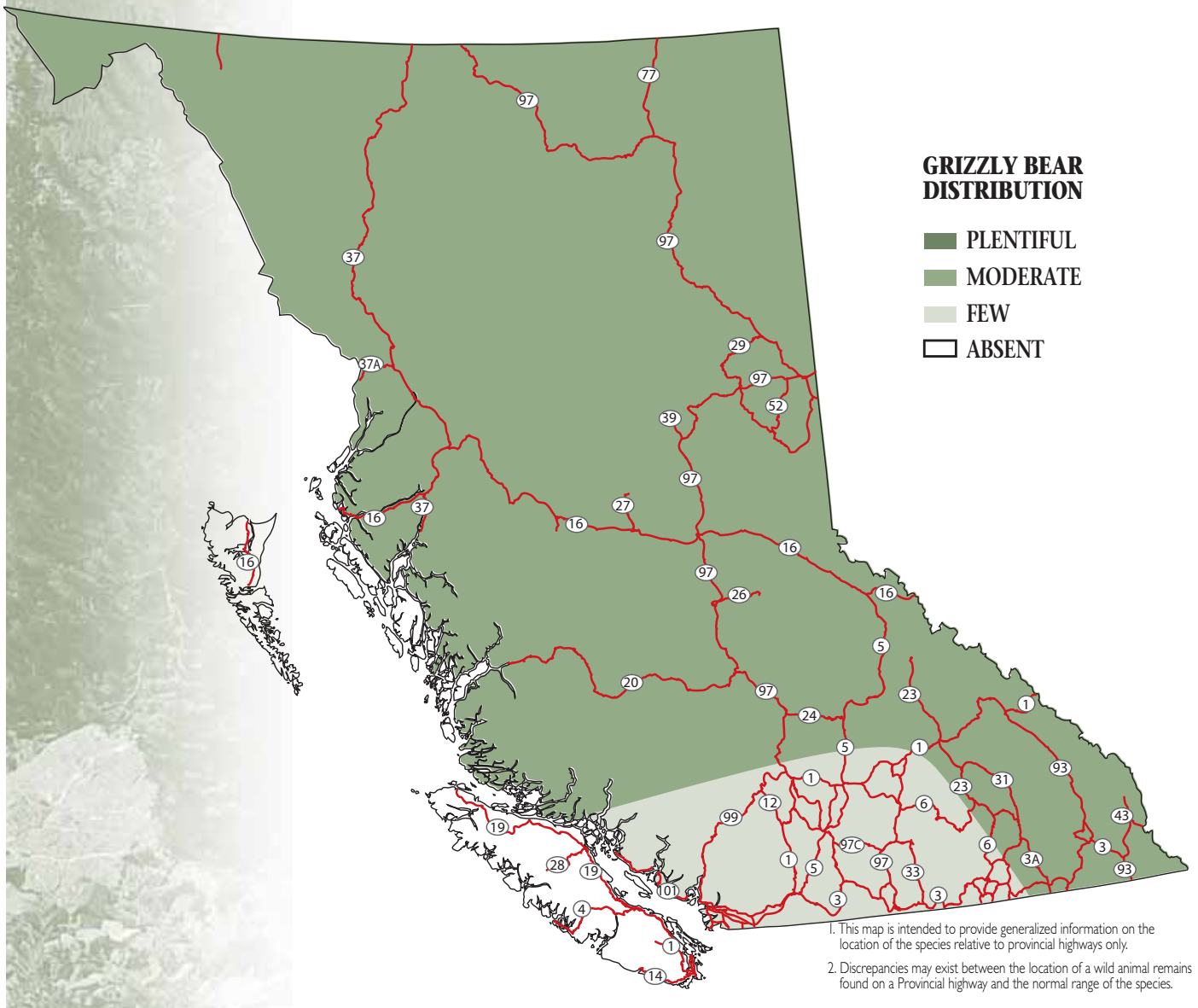


(Photo: Leonard Sielecki, BCMoT)



(Photo: Leonard Sielecki, BCMoT)

Map 2.2.2



2.3 Bison (*Bison bison*: ssp: *athabasca*, *bison*)

Appearance and Size

Bison are recognizable by their large size, massive forequarters, shoulder hump, large woolly bearded head, short black horns, and distinctive long tasseled tail. Adult bison have thick coats ranging in colour from coppery brown to dark brown. Young bison are reddish brown for the first two to three months of their lives. Wood bison (*Bison bison athabasca*) are



(Stock Photo)

bison can exceed 1.5 metres in height and weigh between 320 and 545 kilograms. Adult males have thicker horns, more prominent humps and bushier hair on the forehead, chin and neck than adult females.

Life History

In disease-free herds with low levels of predation, bison can have high reproduction rates. Well-nourished females can reach reproductive maturity in one year, but usually first conceive when three to five years old. Females rarely produce a calf every year. Calves are born from mid-April to early June, after a 9.5 month gestation period. At birth calves weigh between 15 and 25 kilograms. In captivity, bison have been reported to live as long as 30 years. Most wild bison live an average of 10 to 15 years, with few surviving 20 years.



(Photo: Tom Hall)

slightly larger and darker than Plains Bison (*Bison bison bison*), with a more pronounced shoulder hump and shorter hair on the neck and forelegs. Bison are the largest wild land mammals in North America. A typical mature bull can exceed 2 metres in height and weigh between 550 and 900 kilograms. The heaviest wild male Wood Bison recorded was 1031 kilograms. Adult female



(Stock Photo)



(Photo: Tom Hall)

Abundance and Distribution

For most of the year, bison congregate in herds of adult females, subadults and calves. While mature bulls usually form smaller bachelor groups, lone bulls are relatively common. In northern areas, mating (rutting) may extend from July to September, when groups of cows and bulls mix. Grasses and sedges constitute about 85 percent of the typical Wood Bison diet, with herbs making up the remaining 15 percent. In spring, Wood Bison usually forage in arid, grassy meadows and shrubby savannahs. Bison are rare in British Columbia, and Wood Bison are on British Columbia's Red List of species. Once extirpated, approximately 200 Wood Bison are estimated to exist in isolated pockets in the northeast corner of the province. (*Map 2.3*) Two herds of Wood Bison are located north of Nordquist Flats, along the Liard and Beaver rivers, near the Yukon-Northwest Territory border; and one herd is located at Etthithun Lake near the Alberta border. Occasionally, animals from the Hay-Zama herd in Alberta wander into British Columbia along the Hay River. Plains Bison are more numerous than Wood Bison, and over 1000 can be found in the vicinity of the Alaska Highway near Pink Mountain.



(Photo: Dave Dickson, ICBC)

Text and map adapted from: British Columbia Ministry of Water, Land and Air Protection, 2002b and British Columbia Ministry of Water, Land and Air Protection, 2002c.



track about
10 cm (4") long



Walking trail

Adapted from: McDougall (1997); and Sheldon and Hartson (1999).



(Photo: Dave Dickson, ICBC)

Characteristic Features

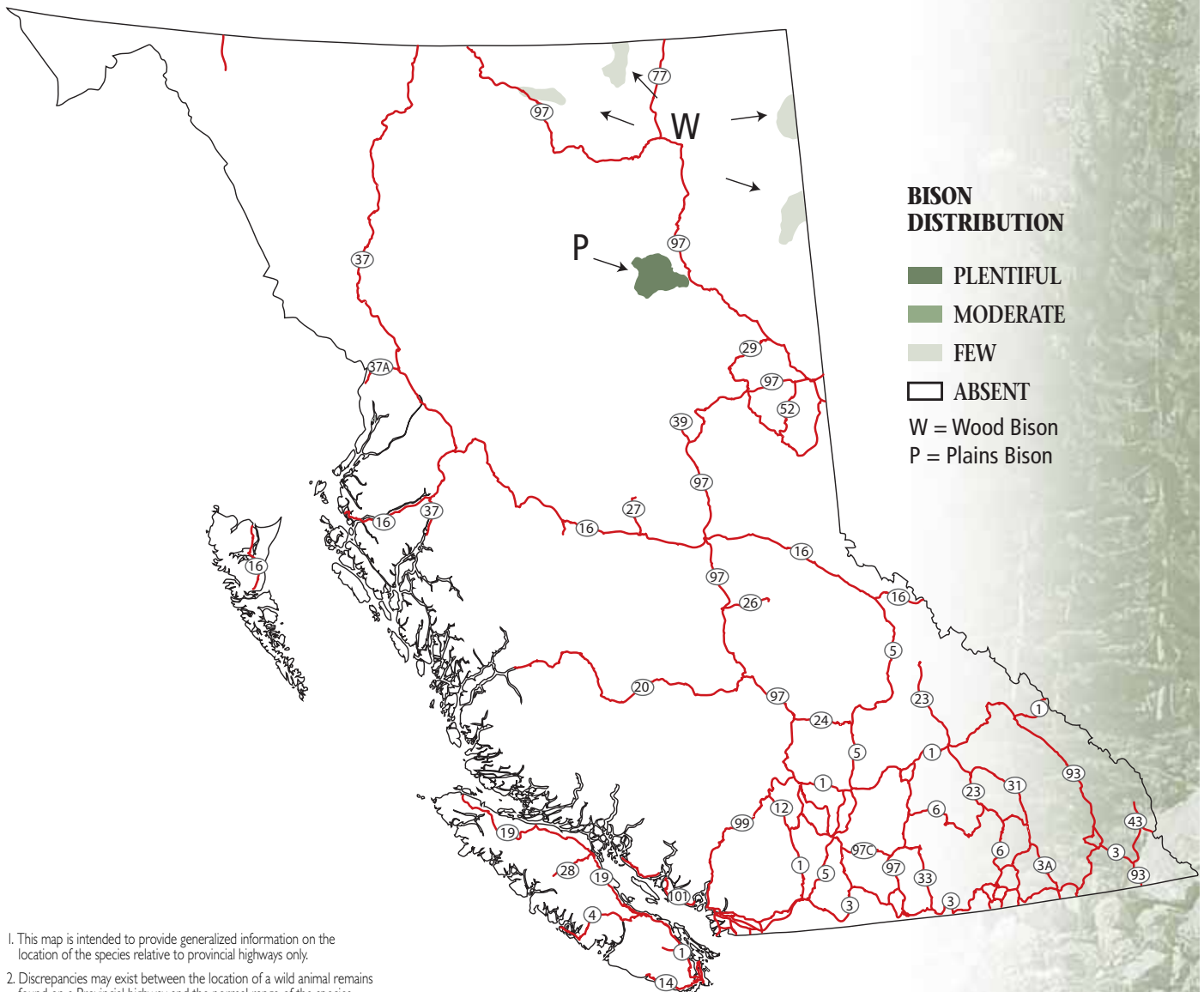


(Photo: Leonard Sielecki, BCMoT)



(Photo: Leonard Sielecki, BCMoT)

Map 2.3





(Photo: BC Parks)

2.4 Woodland Caribou (*Rangifer tarandus caribou*)

Appearance and Size

Woodland Caribou are classified into three ecotypes: Mountain, Northern and Boreal. The ecotypes look about the same but differ with behavior, habitat use, distribution and migration. Woodland Caribou have soft medium brown coats, but their colour pales as guard hairs break and fade during winter. In males, the head and neck are often white or greyish-white, with a mane on the underside of the neck. The tail and rump area, as well as a band around each hoof, are also whitish. Their long dense winter coat provides effective insulation against low temperatures and high winds. Caribou have erect, spreading antlers. Males have a flattened (palmate) brow tine that points down over the forehead. Female Caribou also have antlers, which is unique among females in the deer family. Woodland Caribou can range in height at the shoulder from 100 cm to 120 cm. Males typically weigh 180 kg to 270 kg, while females usually weigh about 90 to 135 kg.



(Photo: BC Ministry of Forests)

Life History



(Photo: Mike Fenger)

The breeding season is much shorter for Caribou than for other deer. The majority of the breeding occurs in a one-week period in the middle of October. Gestation averages seven to eight months, and calves are born in late May to early June. To avoid predators, pregnant females seek secluded sites in alpine and subalpine habitats. Single births are the most common, and females usually give birth to their first calf when they are three years old. Caribou calves are dark brown and have no spots. They are probably the most precocious of the deer family; calves must be up and travelling with their cows almost immediately in order to avoid predators. Generally, females live 10 to 15 years, while males live 8 to 12 years.



(Photo: Cliff Razzo, BC Ministry of Transportation)

Abundance and Distribution

Woodland Caribou occur east of the Coast Mountains, from the Yukon border south to the Itcha-Ilgachuz in the Western Chilcotin, eastwards to the foothills of the northern Rocky Mountains; in the Cariboo, Selkirk, Purcell, and Monashee mountains in the southeast; and throughout the highlands and plateaus (e.g. Spatsizi, Omineca) in the northern and central interior. (Map 2.4)

Caribou occupy about 85 percent of their historic distribution in British Columbia.

Mountain Caribou occupy about 60 percent of their historic range. Mountain Caribou may make four migrations each year, moving down to lower elevations in early winter, back up to higher elevations in late winter, down to lower elevations again in spring, and finally back to high elevations for the summer. The range of movement up and down varies, however, and the deepest snow areas, such as Revelstoke, usually have the widest range of vertical migrations. Northern Caribou migrate twice a year, traveling more than 140 km in some cases. The migration patterns of Boreal Caribou are largely unknown. British Columbia has about 16,500 Caribou.

Text and map adapted from: British Columbia Ministry of Environment, Lands and Parks, 2002.



Adapted from: McDougall (1997); and Sheldon and Hartson (1999).



(Photo: Colin Leake)



(Photo: Cliff Razzo, BC Ministry of Transportation)

Characteristic Features

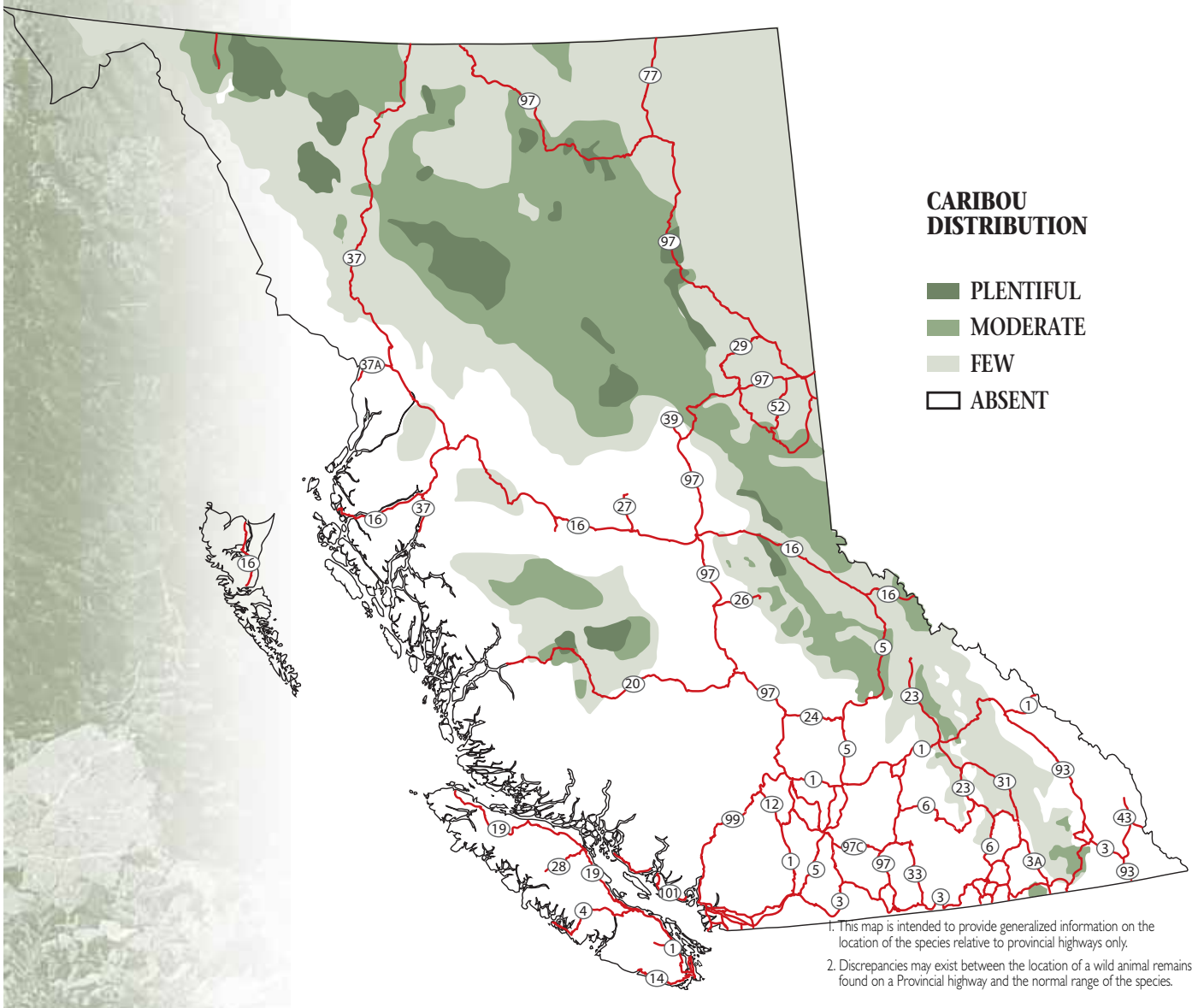


(Photo: Leonard Sielecki, BCMoT)



(Photo: Leonard Sielecki, BCMoT)

Map 2.4



2.5 Cougar (*Puma concolor*: *ssp. oregonensis*, *missoulensis*, *vancouverensis*)

Appearance and Size

In British Columbia, the average adult male weighs about 46 kg and the average adult female weighs about 37 kg. Several cougar taken have weighed between 70 kg and 78 kg. Large adult males may measure 2.7 m in length, including a 76 cm tail. The fur is short and ranges in colour from reddish-brown to a grey-brown, with light underparts. Very young kittens are spotted, with ringed tails. This coloration is gradually lost as young cougar reach adulthood. Adults are unmarked. One black cougar was reported several years ago in the North Okanagan area, while white or very light-coloured cougar are infrequently reported.

Life History

Cougar are polygamous and only the female tends the young. Females reach sexual maturity at 2 to 3 years of age. Breeding takes place at any time of the year, and one to six kittens are born after a gestation period of about 3 months. The female gives birth to her young in a rocky crevice or den, protected by roots or windfalls. Kittens are born with their eyes closed, but these open 10 to 14 days after birth. The kittens nurse for at least five to six weeks. Kittens will take meat at about six weeks of age.



(Stock photo)



(Photo: W.L. Miller, US National Park Service)



(Photo: BC Parks)

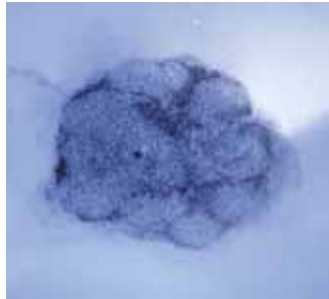


(Photo: BC Parks)

Abundance and Distribution

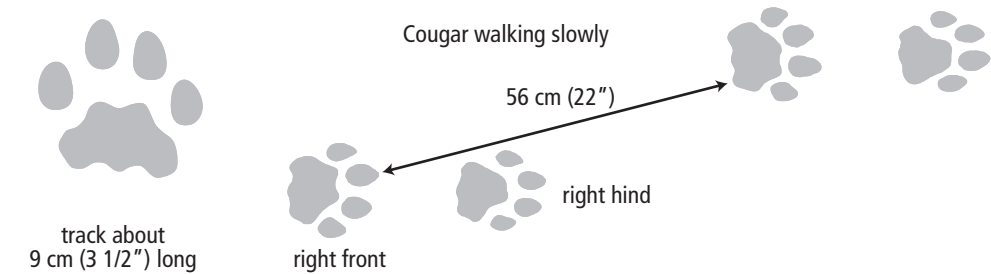
Cougar are found throughout British Columbia. Distribution extends north from the United States/British Columbia border to the Big Muddy River on the Alaska Highway, south of about 54 degrees latitude; and from the British Columbia-Alberta border west, to and including, most coastal islands. (*Map 2.5*) To date, cougar have not reached the Queen Charlotte Islands. The territory or home range maintained by individual adult cougar ranges up to, or greater than, 260 km². The female cougar maintain winter territories of 13 km² to 52 km². Females with kittens require larger ranges than females without kittens, and some overlap of female ranges occurs. Males occupy larger territories, in the range of 65 km. Resident males do not overlap ranges. Transient cougars move through occupied ranges, but avoid resident cougar. Cougar distribution is governed by the distribution of deer, its major prey species. Summer observations are scanty, but as the snow recedes cougar probably spread out from the lower

slopes and valley bottoms to inhabit virtually all elevations within their general distributional boundaries. During winter months, cougar follow deer down to the lower elevations. Cougar seem to prefer the rough, rocky, semi-open areas surrounding the major deer winter ranges in the Interior, but they do not confine their activities exclusively to this type of habitat. Cougar can be found anywhere within a game winter range.



(Photo: Jim Peaco, US National Park Service)

Text and map adapted from: British Columbia Ministry of Environment, Lands and Parks, 1994a.



Adapted from: McDougall (1997); Shomon (1969) and Sheldon and Hartson (1999).



(Photo: Keith Marcotte)

Characteristic Features

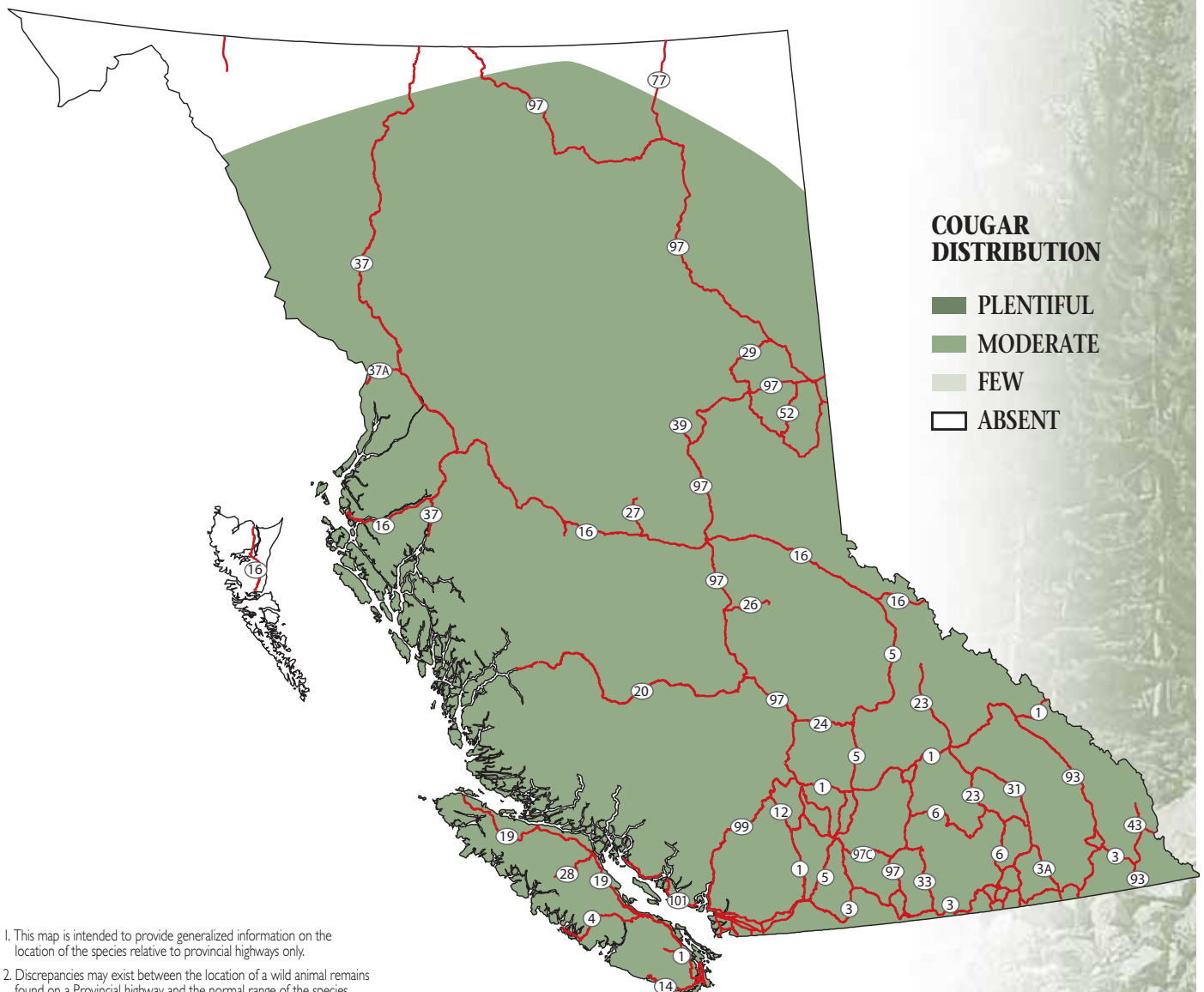


(Photo: Leonard Sielecki, BCMoT)



(Photo: Leonard Sielecki, BCMoT)

Map 2.5





(Photo: BC Parks)

2.6 Coyote (*Canis latrans* Say: ssp: *incolatus*, *lestes*)

Appearance and Size

Coyote fur is generally a tawny grey, darker on the hind part of the back where the black-tipped hair becomes wavy. Legs, paws, muzzle, and the back of the ears are more yellowish in colour; the throat, belly, and the insides of the ears are whiter. The tail, darker on top



(Stock Photo)

and lighter on the underside, is lightly fawn-coloured towards the tip, which is black.

The coyote's fur is long and soft and well suited to protect it from the cold. Because it is light-coloured in winter and dark in summer,

it blends well with the seasonal surroundings.

The coyote's ears are wide, pointed, and erect.

It has a tapering muzzle and a black nose.

Unlike most dogs, the top of the muzzle on coyotes forms an almost continuous line with

the forehead. The yellow, slightly slanting eyes, with their black round pupils, give the coyote a characteristic expression of cunning. The canine, or pointed teeth are remarkably long and can inflict serious wounds. The neck is well furred and looks oversized for the body. The typical male coyote weighs from 9 kg to 23 kg, has an overall length of 120 cm to 150 cm, including a 30 cm to 40 cm tail, and stands 58 cm to 66 cm high at the shoulder. The female is usually four-fifths as large.

Life History

Coyotes appear to be monogamous, and couples may remain together for several years. Both sexes can breed at one year of age under good conditions, although both sexes usually breed somewhat later in



(Photo: Jim Peaco, US National Park Service)

life. The mating occurs mainly during February and March. Gestation lasts from 2 months. On average, the female bears three to seven pups, covered with fine brown fur, whose eyes remain closed for the first eight or nine days. Weaning, or making the transition from the mother's milk to other food, begins about one month after birth. The adults then feed the pups by regurgitating half-digested food. At about three weeks of age, the pups begin to romp around under the adults' watchful supervision. When fall comes, the young coyotes may leave their parents to claim their own territory. If there is an abundant food supply, pups may stay with the adults to form packs, or clans.



(Photo: Bryan Harry, US National Park Service)

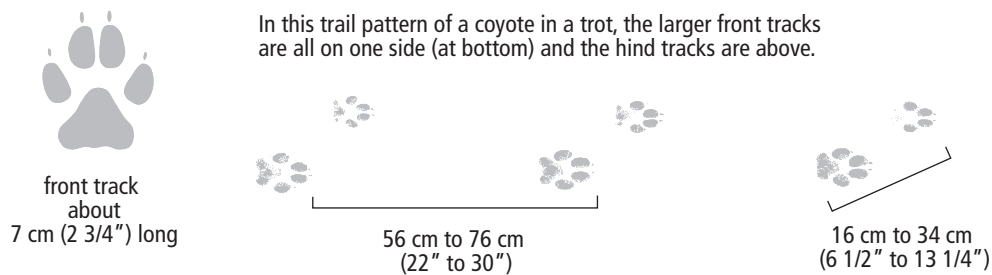
Abundance and Distribution

The coyote is one of the few mammals whose range is increasing, despite extensive persecution by people. In British Columbia, the coyote still inhabits its traditional habitats, the aspen parkland and short- and mixed-grass prairie in the Peace River. (Map 2.6) However, it has spread south and west into the mountains, and the southern and northern Interior. Coyotes are now found even in urban centres on the British Columbia Mainland, including Vancouver.

Text and map adapted from: Canadian Wildlife Service, 1990.



(Stock Photo)



Adapted from: McDougall (1997); Shomon (1969) and Sheldon and Hartson (1999).



(Photo: BC Ministry of Transportation)

Characteristic Features

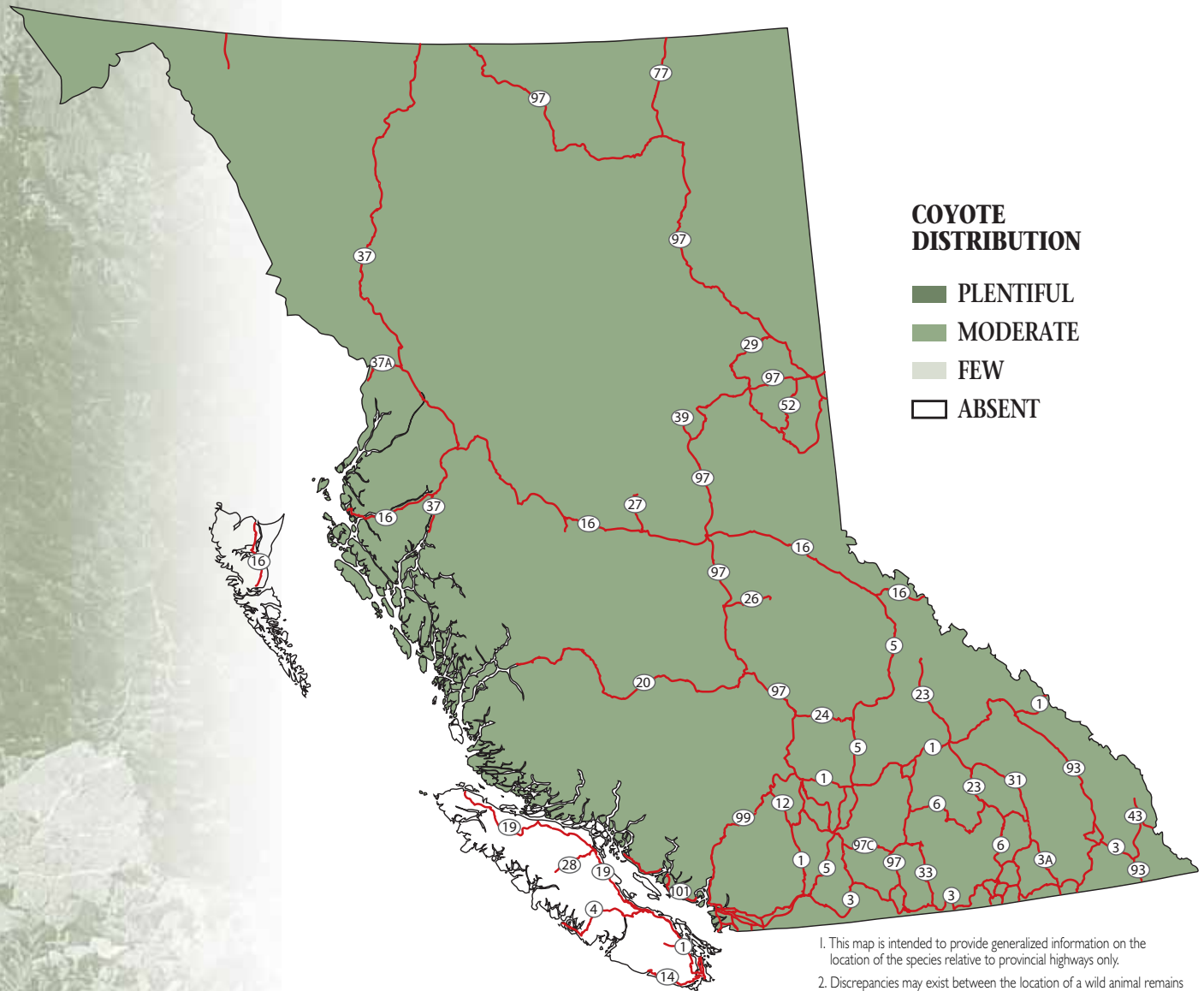


(Photo: Leonard Sielecki, BCMoT)



(Photo: Leonard Sielecki, BCMoT)

Map 2.6



2.7 DEER: Mule and Black-tailed Deer (*Odocoileus hemionus*: ssp: *columbianus*, *hemionus*, *sitkensis*)

Appearance and Size

Mule Deer have a reddish brown coat that changes from tawny brown in summer to dark or grizzled brown in winter. They have a dark brown forehead, a whitish face with a black muzzle, and a white throat patch. Their ears are large, about two-thirds the length of the head,



(Photo: Ed Austin & Herb Jones, US National Park Service)

with black borders and white hair on the inside. They have a large white rump patch with a narrow black-tipped tail. Each year male Mule Deer grow and shed a set of antlers. Their antlers have two main beams, each of which forks again into two beams (dichotomous branching). Mule Deer attain heights of 90 cm to 95 cm high at the shoulder. While most adult males, or bucks, weigh 68 kg to 113 kg, some may reach 180 kg. Females, or does, usually weigh between 50 kg to 75 kg. Blacktails are smaller than Mule

Deer and slightly darker in color, with a small rump patch and a tail that is dark brown or black for most of its length. Adult males in good condition weigh between 48 kg to 90 kg, while females weigh between 40 kg to 65 kg. Sitka blacktails tend to be smaller and darker than Columbia blacktails.

Life History

Deer are a very prolific species. Mating (rutting) occurs in late autumn, November and December. This is a time when bucks increase their displays of dominance and mature bucks engage in battles for females. Bucks are capable of breeding as yearlings, but older bucks do most of the mating. After a six to seven month long gestation period, fawns are born from late May through June. While young does often only have one fawn, twin fawns are the rule, and triplets do occur. Does usually produce offspring throughout their lives. More than 90 percent of does produce fawns every year. Usually, 45 to 70 percent of fawns die, and few Black-tailed and Mule deer live more than eight to ten years.



(Photo: Condon, US National Park Service)



(Photo: BC Parks)

Abundance and Distribution

Except for the rut, most Black-tailed and Mule deer tend to travel alone or in small groups. Black-tailed Deer numbers vary greatly depending on habitat conditions, winter severity, and predators numbers. Deer have adapted to all climates. They inhabit every kind of ecological zone, from alpine to valley bottom, and from dense coastal rainforests to dry interior rangelands. (*Map 2.7.1*) Deer



(Photo: Ron Shade, US National Park Service)

population in recent decades has ranged between 150,000 and 300,000. Blacktails are abundant in southern areas where the climate is favourable such as Vancouver Island, the islands in Georgia Strait, and the Sechelt Peninsula. Their numbers decline northward along the mainland coast. About 150,000 black-tailed deer inhabit the coastal areas of B.C. Sitka blacktails were introduced into the Queen Charlotte Islands in the early 1900's and have flourished there. About 165,000 Mule Deer inhabit the interior of the province. While most prefer the dry valleys and plateaus of the southern interior, Mule Deer are common in the south-central interior. About 20,000 to 25,000 occupy northern ranges.

Text and map adapted from: British Columbia Ministry of Environment, Lands and Parks, 2000d.



Adapted from: McDougall (1997); and Sheldon and Hartson (1999).



(Photo: Tupper Ansel Blake, US Fish and Wildlife Service)

Characteristic Features



(Photos: Leonard Sielecki, BCMoT)



black-tailed deer

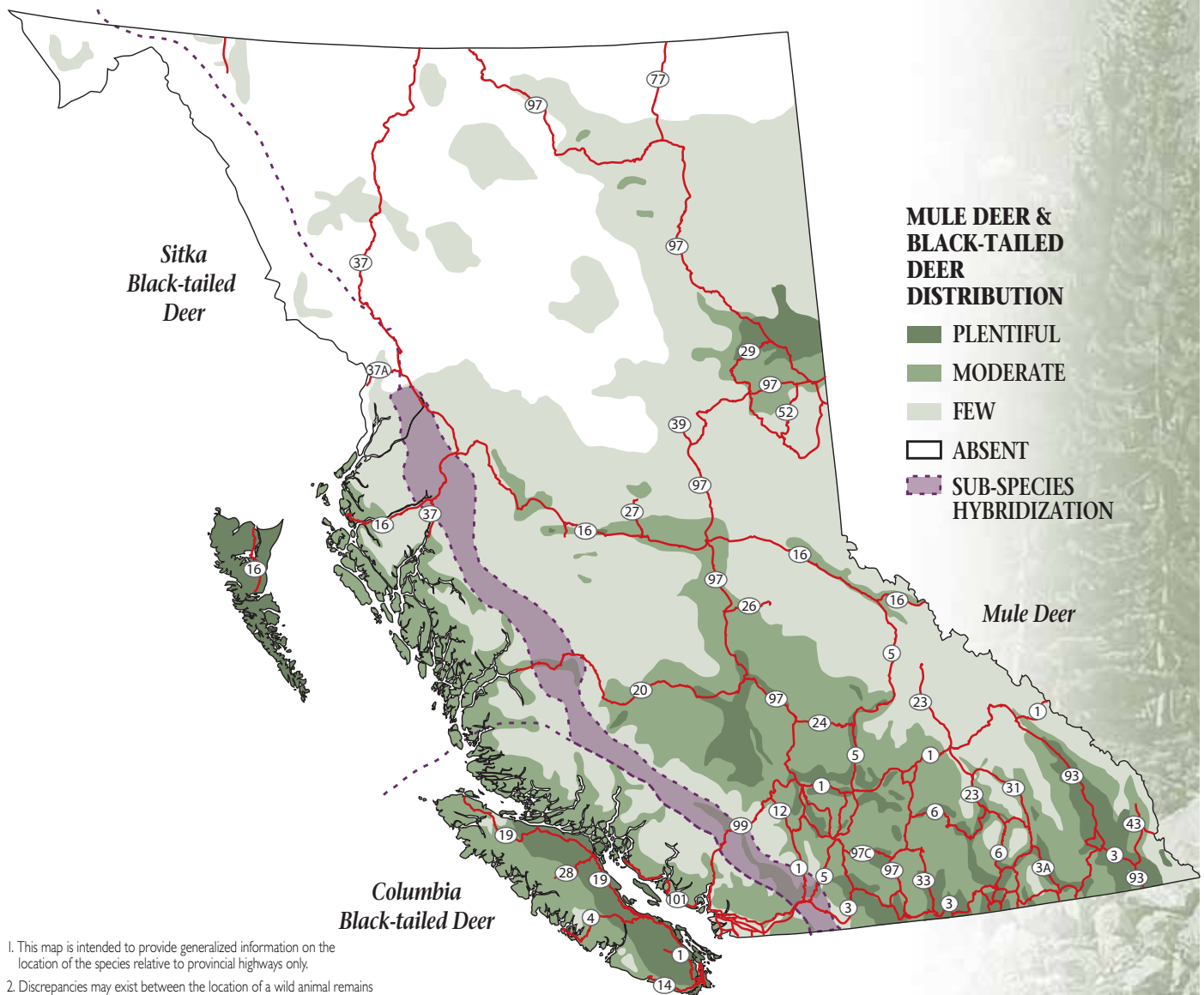


(Photos: Leonard Sielecki, BCMoT)



mule deer

Map 2.7.1





(Photo: BC Parks)

2.7 DEER: White-tailed Deer (*Odocoileus virginianus*: ssp: *dacotensis*, *ochrourus*)

Appearance and Size

White-tailed Deer have a coat mostly reddish brown in summer but which changes to grey or greyish-brown in winter, with a contrasting white hairy covering on the belly, inside of the legs, underside of the tail, around the eyes, and on the chin and throat. The most striking feature of this deer, and the source of its name, is its triangular foot-long tail. On top, the tail is brown with a prominent white fringe, but the underside is snowy white. Whitetail bucks have distinctive antlers that fall off and grow back every year. Each antler has a main beam that rises from the top of the head, curves slightly backward, then turns out and forward over the face. Each main beam holds one to several unbranched tines, or points. Male fawns have no visible antlers, but yearlings may have either a single spike or antlers with four to eight tines. Older bucks always have several tines. Mature, White-tailed Deer stand about 90 cm tall at the shoulder. Adult males, or bucks typically weigh 68 kg to 102 kg. Adult females, or does weigh 45 kg to 73 kg. Weights vary considerably depending on age, the season, and the condition of the range.



(Photo: Wisconsin Dept. of Natural Resources)



(Stock Photo)

Life History

Mating (rutting) occurs in the Fall, peaking in November when most does come into heat. During the rut, bucks travel incessantly. Most breeding involves yearlings and older animals. The gestation period for White-tailed Deer is about six to seven months. After the gestation period, does drive off their young of the previous year and give birth to new fawns. Most fawns are born in late May or June. Twin births are common, but single births and triple births are not uncommon. While some whitetails live more than 20 years, few survive more than ten. Most bucks in hunted herds are less than four years old.



(Photo: Wisconsin Dept. of Natural Resources)

Abundance and Distribution

In good years, White-tailed Deer numbers may exceed 65,000 in British Columbia. Whitetails are at the far northern edge of their vast North American range and many of them die during severe winters here.

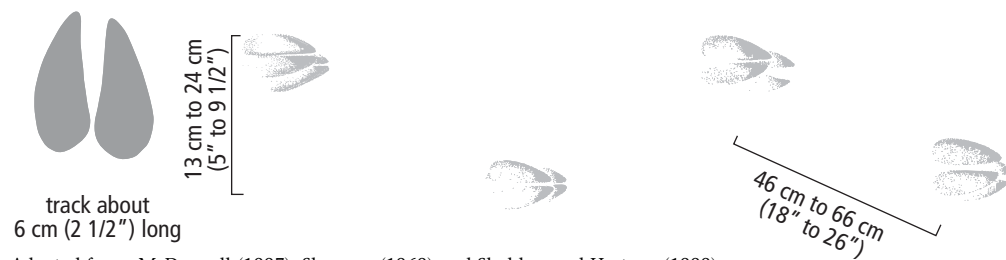
However, they come back in increasing numbers if several mild winters occur in a row. This pattern is most pronounced in the Peace River region.

The White-tailed Deer does not occur everywhere in British Columbia. (Map 2.7.2) They are most abundant along valley bottoms in the Kootenay and Okanagan regions, particularly near the US border. In the North, they are most numerous along the Peace River and the lower reaches of tributaries like the Halfway, Beatton, Moberly, Pine, and Kiskatinaw Rivers. For most of the year, valley bottoms are the main habitat for White-tailed Deer in British Columbia. In the East Kootenay area, deer find winter range on south- to southwest-facing slopes and on fans and terraces where shrub stands have developed after wildfires, logging, or land-clearing for agriculture. The distribution of Whitetailed Deer is largely governed by climate, particularly snow depth.



(Photo: Wisconsin Dept. of Natural Resources)

Text and map adapted from: British Columbia Ministry of Environment, Lands and Parks, 2000e.



Adapted from: McDougall (1997); Shomon (1969) and Sheldon and Hartson (1999).



(Photo: Leonard Sielecki, BCMoT)

Characteristic Features

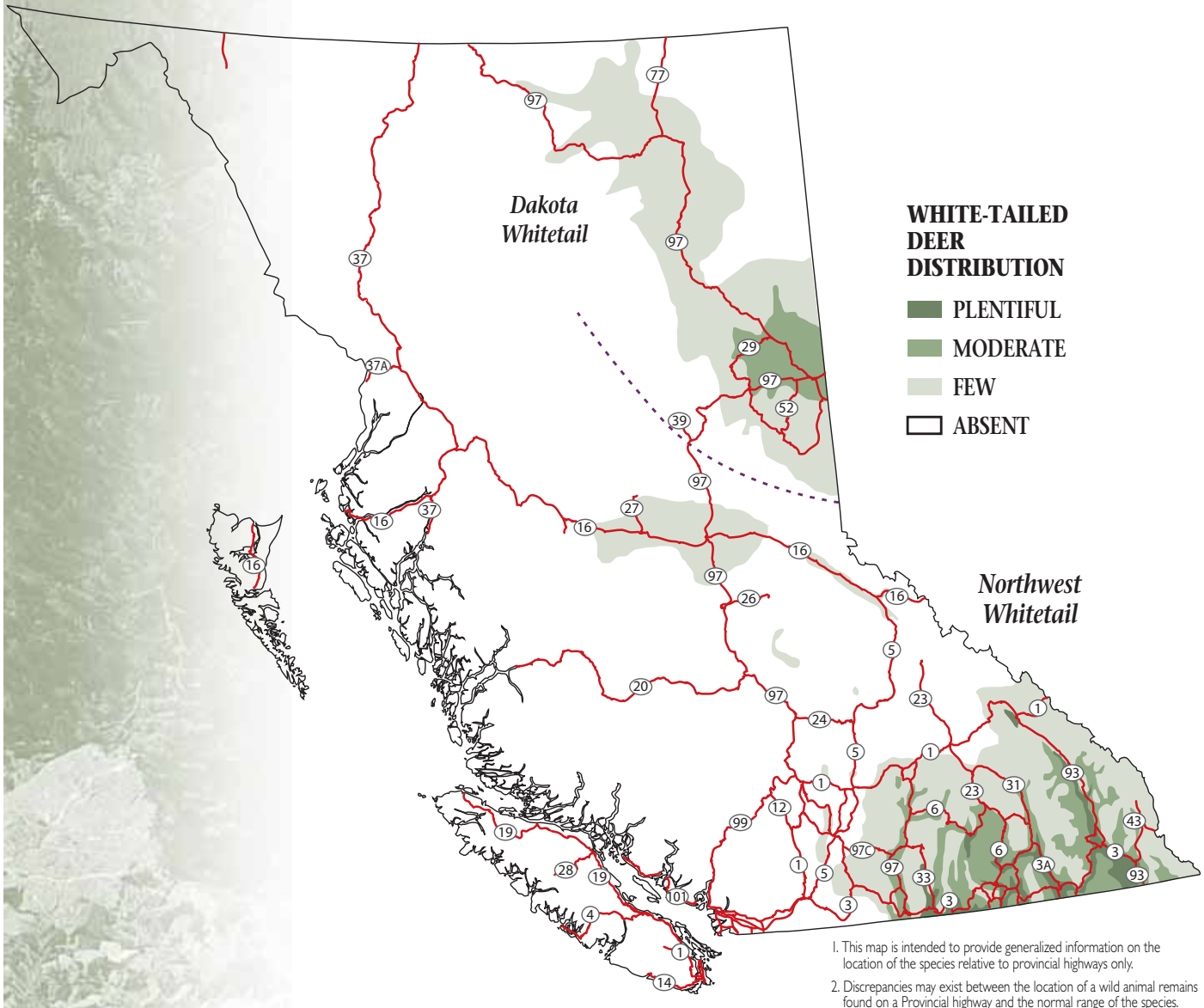


(Photo: Leonard Sielecki, BCMoT)



(Photo: Leonard Sielecki, BCMoT)

Map 2.7.2



2.8 Roosevelt Elk & Rocky Mountain Elk (*Cervus elaphus nelsoni*, *Cervus elaphus roosevelti*)

Appearance and Size

Elk have distinct winter and summer coats. In winter, the head, neck, and legs are dark brown, and the sides and back are a much lighter gray-brown. Adult males (bulls) tend to have a lighter, creamier body colour than adult females (cows). In summer, the coat is a rich



(Photo: Dave Dickson, ICBC)

reddish-brown, with little or no undercoat. Both sexes have heavy dark manes and a yellowish-white rump patch bordered by a dark brown or black stripe. Adult bull Elk stand about 140 cm high at the shoulder and weigh 265 kg to 410 kg. Cows stand about 130 cm high and weigh 190 kg to 270 kg. Roosevelt Elk and Rocky Mountain Elk look quite similar, but Roosevelt Elk are slightly larger and darker. Mature bull Elk have

Life History

rich-brown antlers, ranging in length from 110 cm to 160 cm, with ivory tips and usually five other pointed tines. Yearling bulls tend to have unbranched spike antlers.

Elk are social animals. Up to 20 or more cows, calves, and yearlings live in groups that remain apart from the smaller groups of bulls, except during the autumn mating (rutting) period. As the mid-September rutting period approaches, bull Elk become more active and aggressive. They seek out the cow groups and establish



(Photo: J. Schmidt, US National Park Service)



(Photo: US National Park Service)

harems of several cows that they jealously herd and guard. Most cows are bred from mid to late September. Elk have a gestation period of eight months. Calves are born in late May and early June. Single births are most common and twins are rare. While Elk can live as long as 20 years, most die by age 10 or 12.

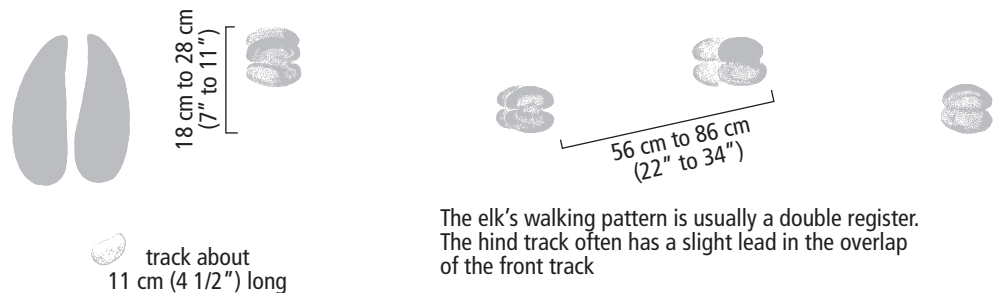


(Photo: BC Parks)

Abundance and Distribution

Elk usually live in mountainous areas. They occur both in the dense coastal old-growth rainforests and grassy interior valleys with scattered tree cover, keeping to areas where winter snows remain shallow. (Map 2.8) There are about 45,000 Rocky Mountain Elk in the British Columbia interior. About 15,000 occur in northern BC, 25,000 in the Kootenay region and 1000 in the Thompson-Okanagan area. A few hundred occur in other scattered herds. Elk are most numerous in the east and west Kootenay regions north to about Golden and west to Grand Forks. Native populations also occur along the east slope of the Rockies and adjacent foothills from the Wapiti River drainage to the Liard River, with a major concentration in the Muskwa and Tuchodi River areas. Since 1917, transplants—some from outside the province—have altered Elk distribution, supplementing some existing populations and resulting in new herds in several locations: southern Vancouver Island, the Queen Charlotte Islands, the Sechelt Peninsula, Powell River, Princeton, Lytton, Okanagan Lake, Granby River, Lower Arrow Lake, Williston Lake, and the Kechika River valley. About 3,000 to 3,500 Roosevelt Elk are located on Vancouver Island, with small herds in Phillips Arm, Sechelt and Powell River.

Text and map adapted from: British Columbia Ministry of Environment, Lands and Parks, 2000b.



Adapted from: McDougall (1997); and Sheldon and Hartson (1999).



(Photo: BC Ministry of Transportation)

Characteristic Features

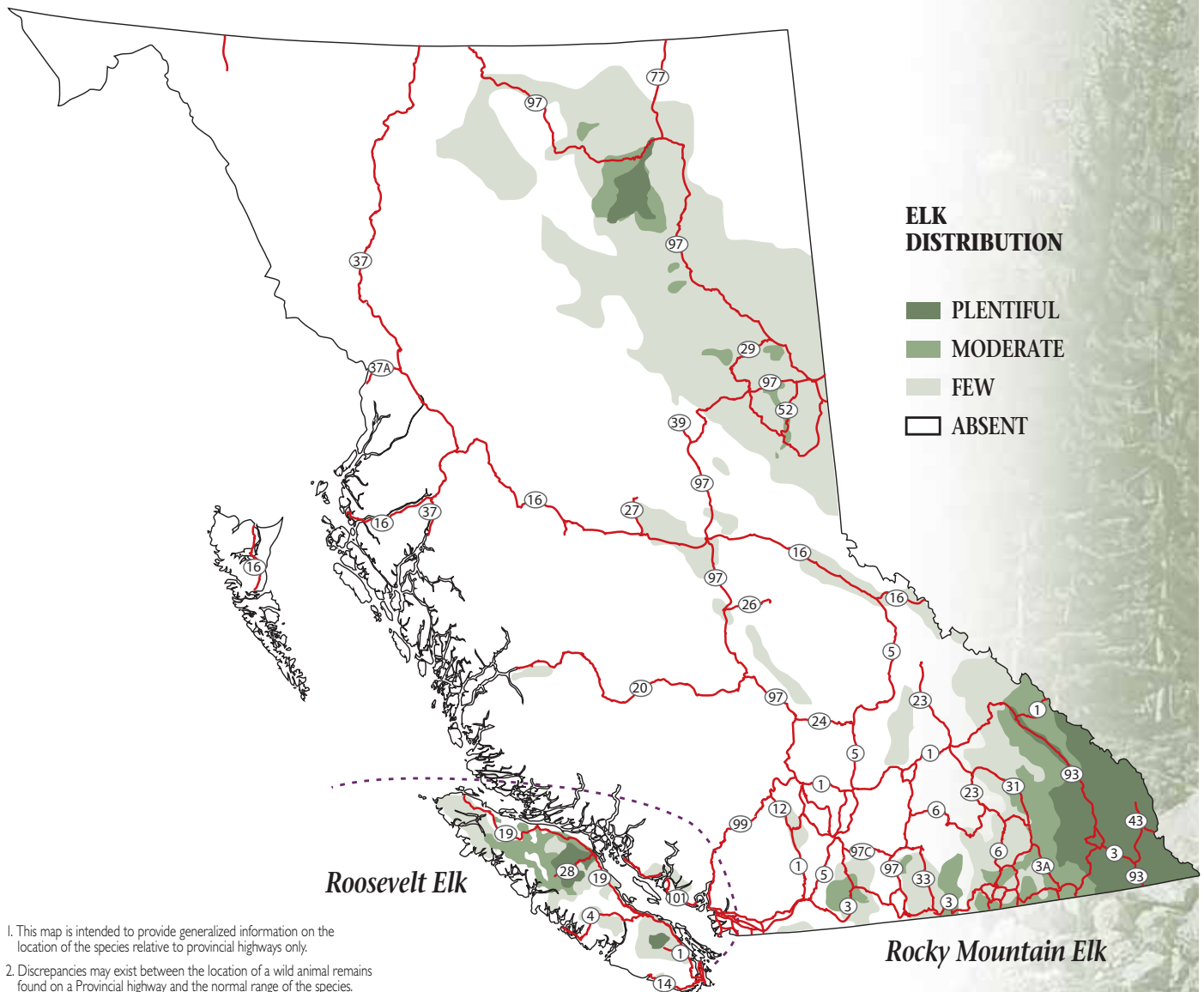


(Photo: Leonard Sielecki, BCMoT)



(Photo: Leonard Sielecki, BCMoT)

Map 2.8





(Photo: BC Parks)

2.9 MOOSE: Alaskan Moose, Northwestern Moose and Shiras Moose

(*Alces alces*: ssp: *andersoni*, *gigas*, *shirasi*)

Appearance and Size

All three moose subspecies found in British Columbia are similar in appearance. The biggest moose live in northern B.C. while the smallest ones live in the southeast. Adult bulls stand nearly 2 m tall at the shoulder and have the most massive antlers of any member of the deer

family. They are larger and have longer legs, a shoulder hump, and a dark brown to blackish coat. They have no rump patch, but they have a bell of skin and hair under the throat and a large, overhanging upper lip. Adult cows weigh on average about 340 kg



(Photo: Jeff Foott, US National Park Service)

to 420 kg; adult bulls weigh 450 kg to 500 kg. The maximum recorded weight is 595 kg. Moose have long legs to help them travel through fallen timber, muskeg, and deep snow. Their winter coat of long guard hairs and undercoat of fine wool allows them to survive in cold climate.

Life History

Moose are essentially solitary animals. Their only lasting social bond is the bond between mother and calf, which lasts for only a year. During that time the cows protect the calves from predators and lead them to the best habitats. In expansive northern shrublands, Moose commonly form groups of up to eight to ten during the rutting period. This habit is less common in forested habitats. Moose mate from September to November, but more than



(Photo: Sgt. Joshua Strang, Eielson Air Force Base)



(Photo: US National Park Service)



(Photo: BC Parks)

80 percent of calves are conceived during two weeks in late September and early October. Moose have a gestation of about eight months. In late May and June, the birthing period approaches and pregnant females seek seclusion and chase away their young of the previous year. Under normal conditions, single births are generally most common. The proportion of adult cows that produce twins is closely associated with their nutritional condition.

Abundance and Distribution

Moose are one of the most widely distributed ungulates in British Columbia. Found across almost the entire interior of the province, they are most abundant in the central and sub-boreal interior, the northern boreal mountains, and the boreal plains of northeastern British Columbia. (*Map 2.9*) Moose are also common

in mountainous valleys, except for a few dry southern valleys like the Thompson and Okanagan. Moose are not found on Vancouver Island and are usually absent from the coastal regions, but they penetrate as far as the tidewater at the heads of several inlets from Bute Inlet northward. British Columbia is estimated to have about 175,000 Moose.

Over 70 percent live in northern British Columbia and the rest in the Cariboo-Chilcotin, Thompson-Okanagan, and Kootenay regions. Population densities vary greatly from place to place, mostly in response to snow depth and the supply of winter browse. Moose move about within familiar summer and winter home ranges. In a given season, their home range seldom exceeds 5 km² to 10 km².



(Photo: Cantor, US National Park Service)

Text and map adapted from: British Columbia Ministry of Environment, Lands and Parks, 2000c.



track about
13 cm (5") long

22 cm to 41 cm
(8 1/2" to 16")



76 cm to 109 cm
(30" to 43")



The alternating pattern of the moose is generally a double register with a wide trail and long strides.

Adapted from: McDougall (1997); and Sheldon and Hartson (1999).



(Photo: Colin Leake)

Characteristic Features

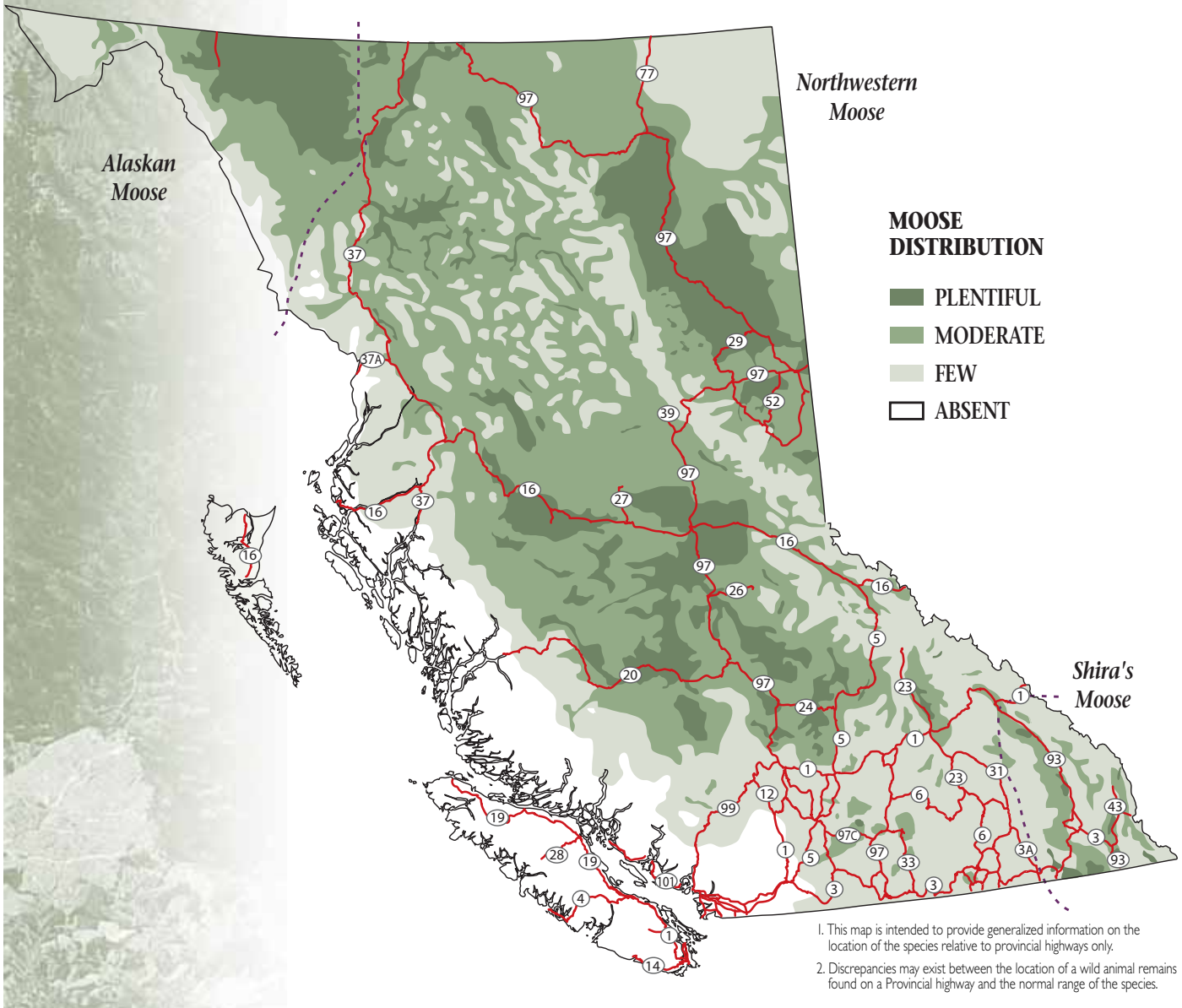


(Photo: Leonard Sielecki, BCMoT)



(Photo: Leonard Sielecki, BCMoT)

Map 2.9



2.10 Porcupine (*Erethizon dorsatum*: ssp: *myops*, *nigrescens*)

Appearance and Size

Porcupines have a short, stocky body. They have a short, blunt-nosed face with small eyes. The ears are small and round, almost concealed by the hair, which also covers the spines. The shoulders are humped, making the back look arched. The short legs are bowed, and the



(Photo: US National Park Service)

animal stands bear-like with its entire foot planted firmly on the ground. The claws are long and curved. The muscular tail is thick, short, and rounded at the tip.

The porcupine's coat consists of a soft, brown, woolly undercoat and coarse, long guard hairs. At the base, each guard hair is brown, becoming darker near the tip, which may be white in eastern populations and yellow in the western ones. The guard hairs conceal the quills until the porcupine is aroused. The quills are longest on the back and tail and when raised push the guard hairs forward, forming a crest. On the face the quills are about 1.2 cm long; on the back they may be up to 12.5 cm in length. There are no quills on the muzzle, legs, or underparts of the body. Next to the beaver, the porcupine is Canada's second largest rodent. Adult males reach an average weight of 5.5 kg after six years; the females reach 4.5 kg. The total length averages 68 cm to 100 cm, and the height at the shoulders is about 30 cm.

Life History

Porcupines are solitary animals. Porcupines first breed when they are one or two years old. In the southern part of their range, they mate in September. In the more northerly latitudes, they mate in late October to November. The gestation period is about 7 to 8 months. Birth occurs sometime between March and May depending how far north the porcupine is located. Single births are most common and twins are almost unknown. After a couple of days, the baby porcupine can climb, although it tends to spend more time on the ground. After a week or so, the female leaves the baby



(Stock Photo)



(Photo: Tom Hall)



(Photo: US National Park Service)

for longer and longer periods while she feeds on the emerging green plants. Weaning, or making the transition from mother's milk to other food, takes seven to ten days. By the Fall, most young porcupines live apart from their mothers.

Abundance and Distribution

Except for Vancouver Island, the Gulf Islands, and the Queen Charlotte Islands, Porcupines can be found throughout British Columbia. (Map 2.10)

Text and map adapted from: Canadian Wildlife Service, 1993a.



(Photo: Mary Meagher, US National Park Service)



Adapted from: McDougall (1997); and Sheldon and Hartson (1999).



(Photo: Betsy Ely, courtesy of Pasty Central)

Characteristic Features

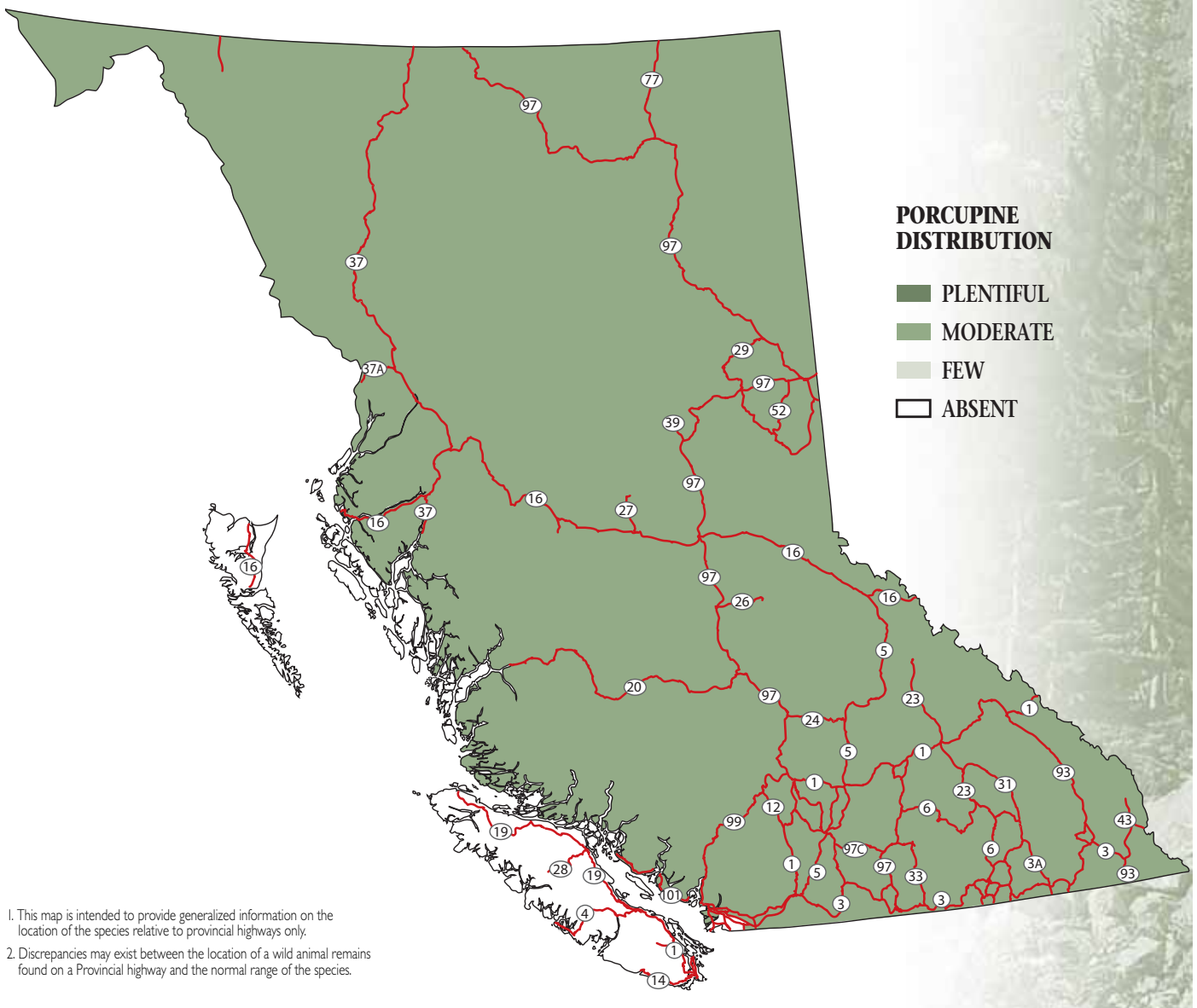


(Photo: Leonard Sielecki, BCMoT)



(Photo: Leonard Sielecki, BCMoT)

Map 2.10





(Photo: BC Parks)

2.11 SHEEP: Bighorn Sheep (*Ovis canadensis*, *Ovis dalli*: *ssp. dalli*, *stonei*)

Appearance and Size

California and Rocky Mountain bighorns look similar, but the California subspecies is slightly darker in colour, and in rams the horns flare outward more than those of Rocky Mountain rams. Bighorn Sheep have a rich brown coat with a contrasting ivory-white rump patch, a white muzzle, and white trim on the back of all four legs. The brown coat fades to a drab

grey-brown by late winter.

The adult ram's massive, brown, spiralled horns grow throughout the sheep's life, and can be as long as 127 cm around the curve and as thick as 40 cm around the base. Ewes have slightly curved horns about 30 cm long. Adult rams stand about 100 cm high at the shoulder, and usually weigh 90 kg to 135 kg. Ewes are about two thirds the size of rams.



(Photo: William S. Keller, US National Park Service)

Life History

Bighorn Sheep are among the most social of British Columbia's hoofed mammals. They breed between early November and mid-December. Most ewes do not breed until they are two years old; and rams until they are seven or eight years old. Gestation lasts about 6 months, and lambs are born from the last week in April to early June. As lambing time nears, pregnant ewes leave their social group and isolate themselves in rugged lambing cliffs near the winter-spring range. They usually produce a single lamb that weighs 3 kg to 5 kg, but some well-nourished females produce occasional twins. Bighorn Sheep can live as long as 20 years, but most do not live beyond 12 to 14 years.



(Photo: J. Schmidt, US National Park Service)



(Photo: Tourism BC)

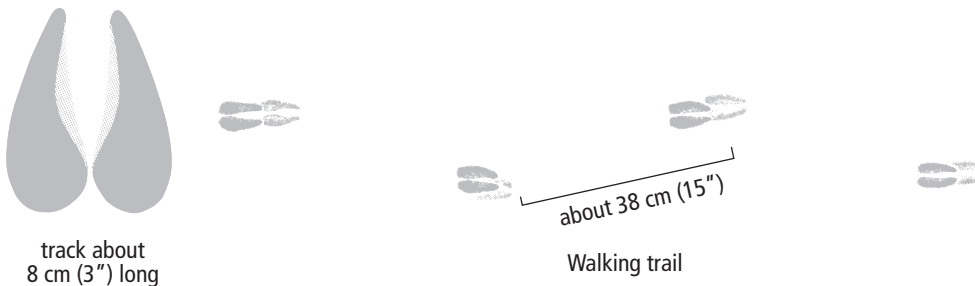
Abundance and Distribution

The main native herds of California Bighorns total about 3000 animals. They occur in the Okanagan area (Ashnola, Vaseaux Lake-Penticton Creek, Shorts Creek); on the east side of the Fraser River from Lillooet to Williams Lake; west of the Fraser around Churn and Lone Cabin Creeks; in the Bridge River watershed; in the Taseko Lake-Chilko Lake area; and at the Junction of the Chilcotin and Fraser Rivers. (*Map 2.11*) California Bighorns have been introduced in a number of locations, including the Grand Forks area, Kamloops Lake, and Dog Creek. There are about 2500 Rocky Mountain Bighorns. In the East Kootenay region, their herds occur in the Kootenay ranges on the east side of the Rocky Mountain Trench, from Radium south to Bull River; the Galton Range on the east side of the Trench from Elko to the Montana border; the Front ranges along the west side of the Elk River north of Sparwood; the west slope of the Rockies from Crowsnest Pass to Fording River; and the Kootenay River headwaters near Mount Assiniboine Park. More isolated herds also occur near Golden and north of McBride. New herds have been established near Chase, Castlegar, and Spences Bridge, which are outside of the historic range of this subspecies, and animals from an introduction in Washington State have spread into the Salmo area.



(Photo: Jim Turner, BC Ministry of Transportation)

Text and map adapted from: British Columbia Ministry of Environment, Lands and Parks, 2000a.



Adapted from: McDougall (1997); and Sheldon and Hartson (1999).



(Photo: Tom Hall)

Characteristic Features

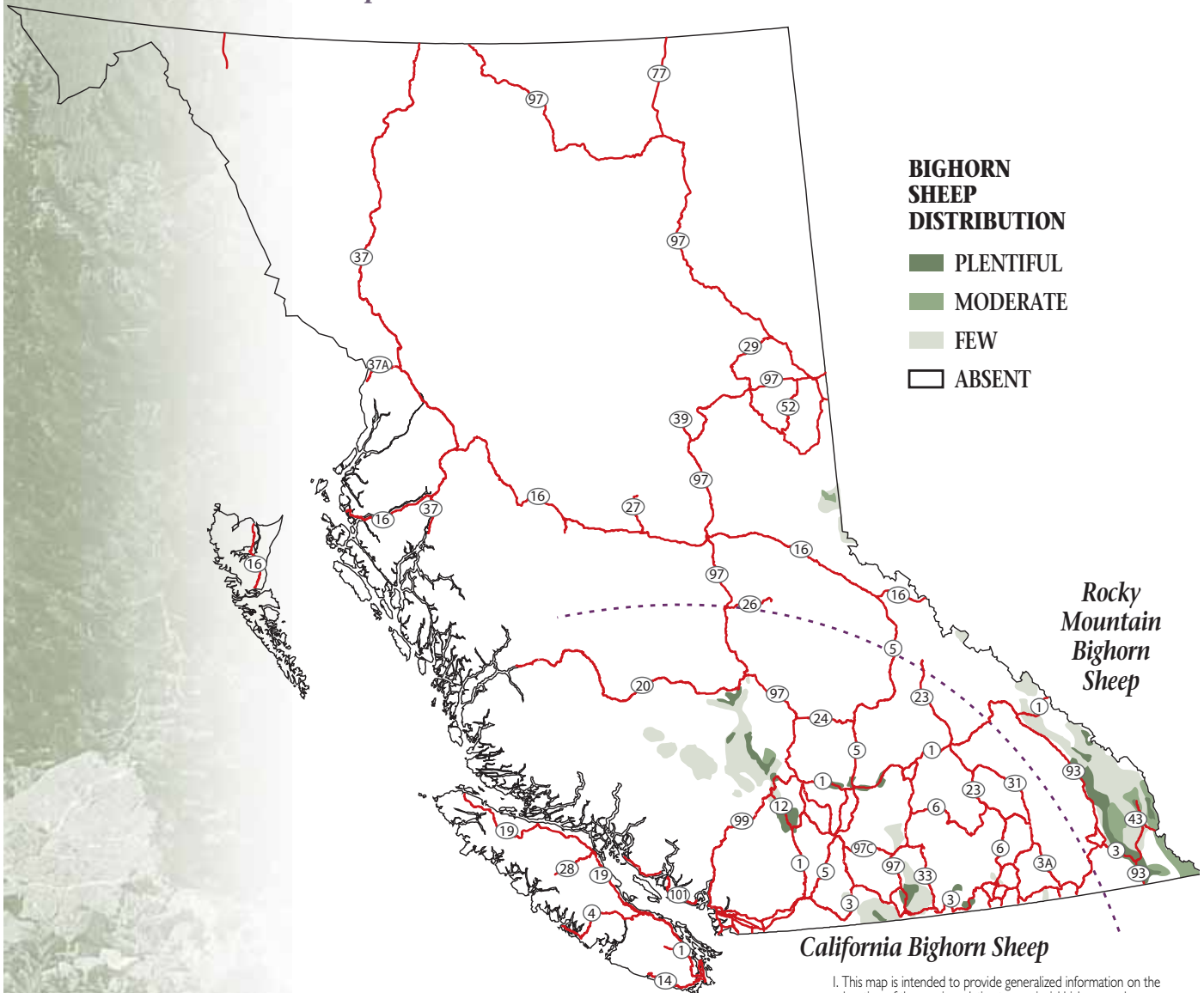


(Photo: Leonard Sielecki, BCMoT)



(Photo: Leonard Sielecki, BCMoT)

Map 2.11



2.12 Wolf (*Canis lupus: ssp: nubilus, occidentalis*)

Appearance and Size

Wolves in British Columbia vary in colour. A single pack may contain animals that are black, white, shades of grey-brown and tan, but never spotted. Wolf colors vary widely, and solid-colored wolves are common. They are often a grizzled grey-brown, similar to some German



(Stock Photo)

shepherd dogs. A wolf's winter coat is very woolly, and can be two and one-half inches thick with individual hairs as long as five inches. Dogs descended from wolves; consequently, for some breeds, they appear similar. Wolves have longer legs, bigger feet, and a narrower chests than large domestic dogs. While a domestic dog's tail may curl, a wolf's tail does not.

Life History

Wolves are social animals: they not only hunt in packs or groups but live most of their lives with other wolves. The wolves' habit of hunting in packs has resulted in the development of complex patterns of social behaviour. Wolves differ from domestic dogs in their reproductive cycles. Male dogs can breed at any time of year and females every six months, whereas both male and female wolves in the wild can breed only once a year. Wolves usually reach sexual maturity in their second year. It is possible for younger animals to have pups, but this is not normally the case. Breeding time varies with the latitude but most commonly occurs in March and April. After a nine-week gestation, litters of five or six pups (sometimes eight or more) are born. The pups remain inside



(Stock Photo)

whelping dens for approximately two weeks. By mid-autumn they are travelling with the pack and participating in hunting and other pack activities.



(Photo: Jim Peaco, US National Park Service)



(Photo: BC Parks)

Abundance and Distribution

Wolves are territorial. The sizes of their territories vary greatly and are dependent on the kind and abundance of prey available. The pack bond is strongest during winter, when the wolves travel and hunt together. In summer, when the pups are young, the adults seldom go on long forays. They may hunt together occasionally after meeting at the den or home site where the pups are being cared for. Wolves are common in lightly settled portions of British Columbia. (*Map 2.12*)



Front track
about 11 cm
(4 1/2") long



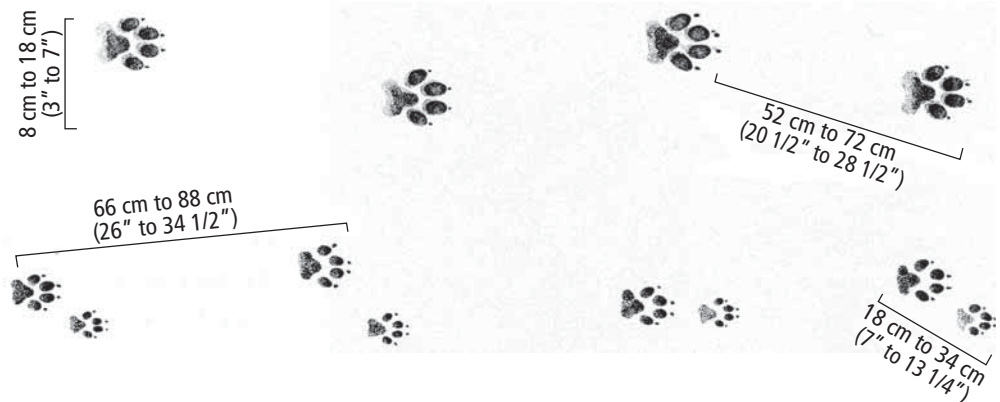
Hind track
about 10 cm
(3 3/4") long

Text and map adapted from:
Canadian Wildlife Service,
1993b and National Park Service,
2004.



(Photo: Barry O'Neill, US National Park Service)

Wolves are mostly direct-registering animals in their alternating walking gait. Their trail width is usually wider than that of coyotes, but the two animals' stride lengths overlap substantially.



Gray wolves tend to leave irregular trotting patterns. The configuration of the tracks and their spacing within each group vary considerably. The smaller hind track leads the front track in each set of tracks.

Adapted from: McDougall (1997); and Sheldon and Hartson (1999).



(Photo: Colin Leake)

Characteristic Features



(Photo: Leonard Sielecki, BCMoT)

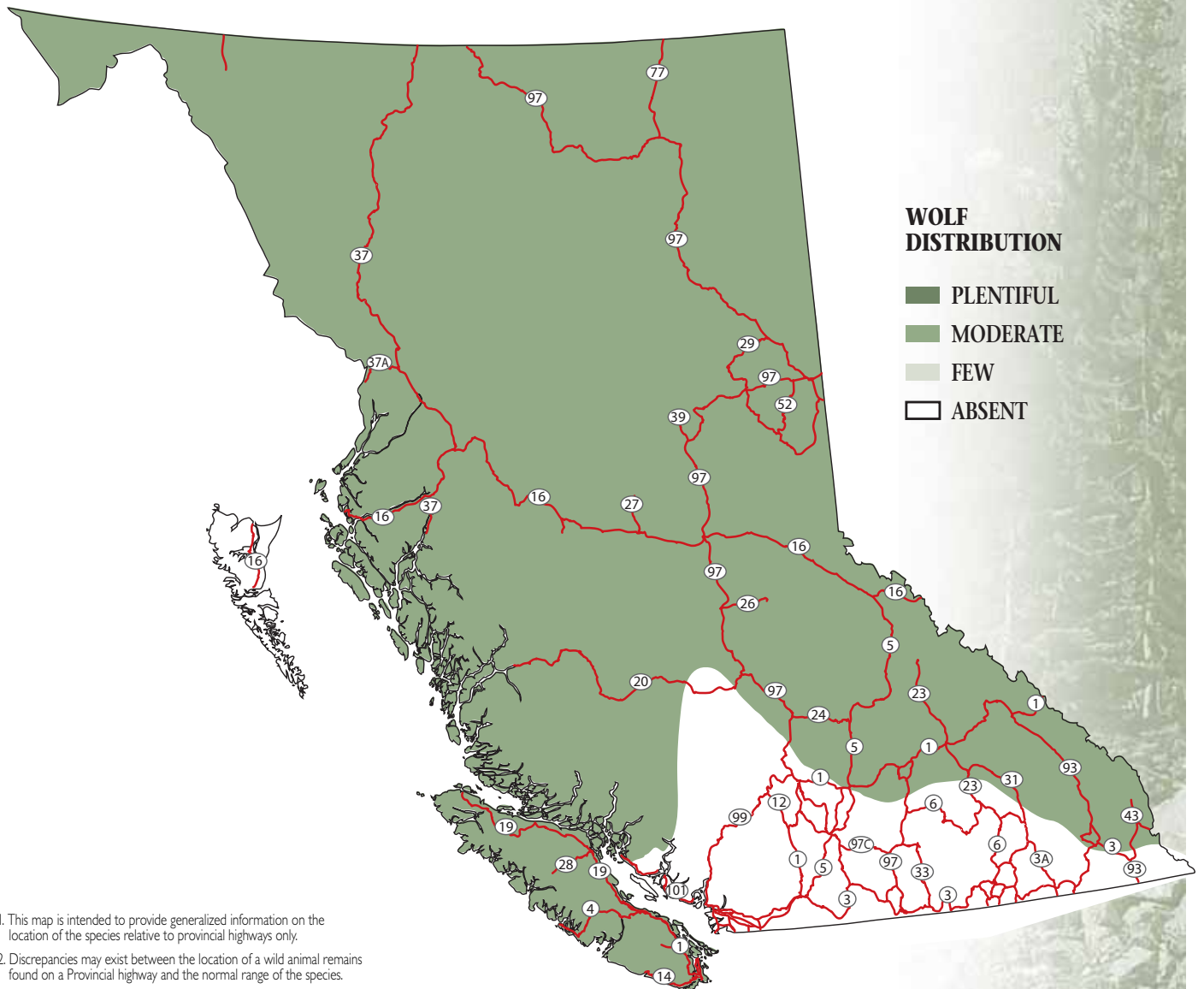


(Photo: Leonard Sielecki, BCMoT)



(Photo: Leonard Sielecki, BCMoT)

Map 2.12





3.0 References

- British Columbia Ministry of Environment, Lands and Parks, 1994a, *Cougar in British Columbia*, Victoria, 6pp.
- British Columbia Ministry of Environment, Lands and Parks, 1994b, *Grizzly Bears in British Columbia*, Victoria, 6pp.
- British Columbia Ministry of Environment, Lands and Parks, 2000a, *Bighorn Sheep in British Columbia*, Victoria, 6pp.
- British Columbia Ministry of Environment, Lands and Parks, 2000b, *Elk in British Columbia*, Victoria, 6pp.
- British Columbia Ministry of Environment, Lands and Parks, 2000c, *Moose in British Columbia*, Victoria, 6pp.
- British Columbia Ministry of Environment, Lands and Parks, 2000d, *Mule and Black-tailed Deer in British Columbia*, Victoria, 6pp.
- British Columbia Ministry of Environment, Lands and Parks, 2000e, *White-tailed Deer in British Columbia*, Victoria, 6pp.
- British Columbia Ministry of Environment, Lands and Parks, 2001, *Black Bears in British Columbia*, Victoria, 6pp.
- British Columbia Ministry of Environment, Lands and Parks, 2002, Victoria, *Caribou in British Columbia*, 6pp.
- British Columbia Ministry of Water, Land and Air Protection, 2002a, *Badger*, Victoria, 6pp.
- British Columbia Ministry of Water, Land and Air Protection, 2002b, *Bison in British Columbia*, Victoria, 6pp.
- British Columbia Ministry of Water, Land and Air Protection, 2002c, *Wood Bison*, Victoria, 6pp.
- Canadian Wildlife Service, 1990, *Hinterland Who's Who, Mammals: Coyote*, Ottawa, Ontario.
- Canadian Wildlife Service, 1993a, *Hinterland Who's Who, Mammals: Porcupine*, Ottawa, Ontario.
- Canadian Wildlife Service, 1993b, *Hinterland Who's Who, Mammals: Wolf*, Ottawa, Ontario.
- McDougall, L., 1997, *The Complete Tracker: The Tracks, Signs and Habits of North American Wildlife*, MJK Books, New York, 273 pp.
- National Park Service, 2004, *Wolves in the North Cascades*, North Cascades National Park, Sedro Woolley, Washington.
- Shackleton, D., 1999, *Hoofed Mammals of British Columbia*, Royal British Columbia Museum Handbook, Volume 3, UBC Press, Vancouver, 268 pp.
- Sheldon, I. and T. Hartson, 1999, *Animal Tracks of British Columbia*, Lone Pine Publishing, Edmonton, 160 pp.
- Shomon, J.J., 1969, *Animal Tracks*, in Ward, W.T. (ed.), *Wildlife Review*, Volume V., No. 4, Department of Recreation and Conservation, The Government of the Province of British Columbia, Victoria, pp.15-18.
- Sielecki, L.E., 2004, *WARS 1983 – 2002: Wildlife Accident Reporting and Mitigation in British Columbia: Special Annual Report*, British Columbia Ministry of Transportation, Environmental Management Section, British Columbia, Canada, 222pp.



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