Racer

Coluber constictor mormon

Original[1] prepared by Mike Sarell

Species Information

Taxonomy

Racers belong to the largest family of snakes, the Colubridae. The genus *Coluber* is represented by one species in British Columbia (Gregory and Gregory 1999). Eleven subspecies are described (Wilson 1978) but only *C. constictor mormon* occurs in British Columbia (Gregory and Gregory 1999). This subspecies may represent a distinct species (Fitch et al. 1981) but this is not widely accepted (Corn and Bury 1986).

Description

Racers have long, sleek bodies. Adults are a uniform olive to bluish grey dorsally, with a yellowish venter that often becomes whiter toward the throat and head (Brown et al. 1995). Young resemble Gopher Snakes (*Pituophis catenifer deserticola*), as there is a series of saddle-shaped markings along the back (Matsuda et al., in press). This pattern gradually fades from the tail toward the head during the first year. Racers seldom reach lengths >1 m (Matsuda et al., in press).

Distribution

Global

Racers are found throughout much of the United States, bordering parts of Canada and down into Central America. *Coluber constrictor mormon* occurs in the Pacific Northwest south to California (Brown et al. 1995).

British Columbia

In British Columbia, Racers generally occur in the south and central interior. Populations are known from the south Columbia, Kettle, Okanagan, Similkameen, Nicola, Thompson, and Fraser watersheds but there are two records from Anderson Lake (J. Hobbs pers. comm.) and Churn Creek.

Forest region and districts

Coast: Squamish

Southern Interior: 100 Mile House, Arrow Boundary, Cascades, Central Cariboo, Kamloops, Okanagan Shuswap

Ecoprovinces and ecosections

CEI: FRB

SIM: SFH

SOI: GUU, LPR, NIB, NOB, NOH, OKR, PAR, SCR, SHB, SOB, SOH, STU, THB, TRU

Biogeoclimatic units

BG: xh, xw

ICH: dw, mk1, xw

IDF: dm, mw, ww, xh, xm, xw

PP: dh, xh

Broad ecosystem units

AB, BS, CF, CR, DF, DP, IH, LS, OV, PP, RO, SS

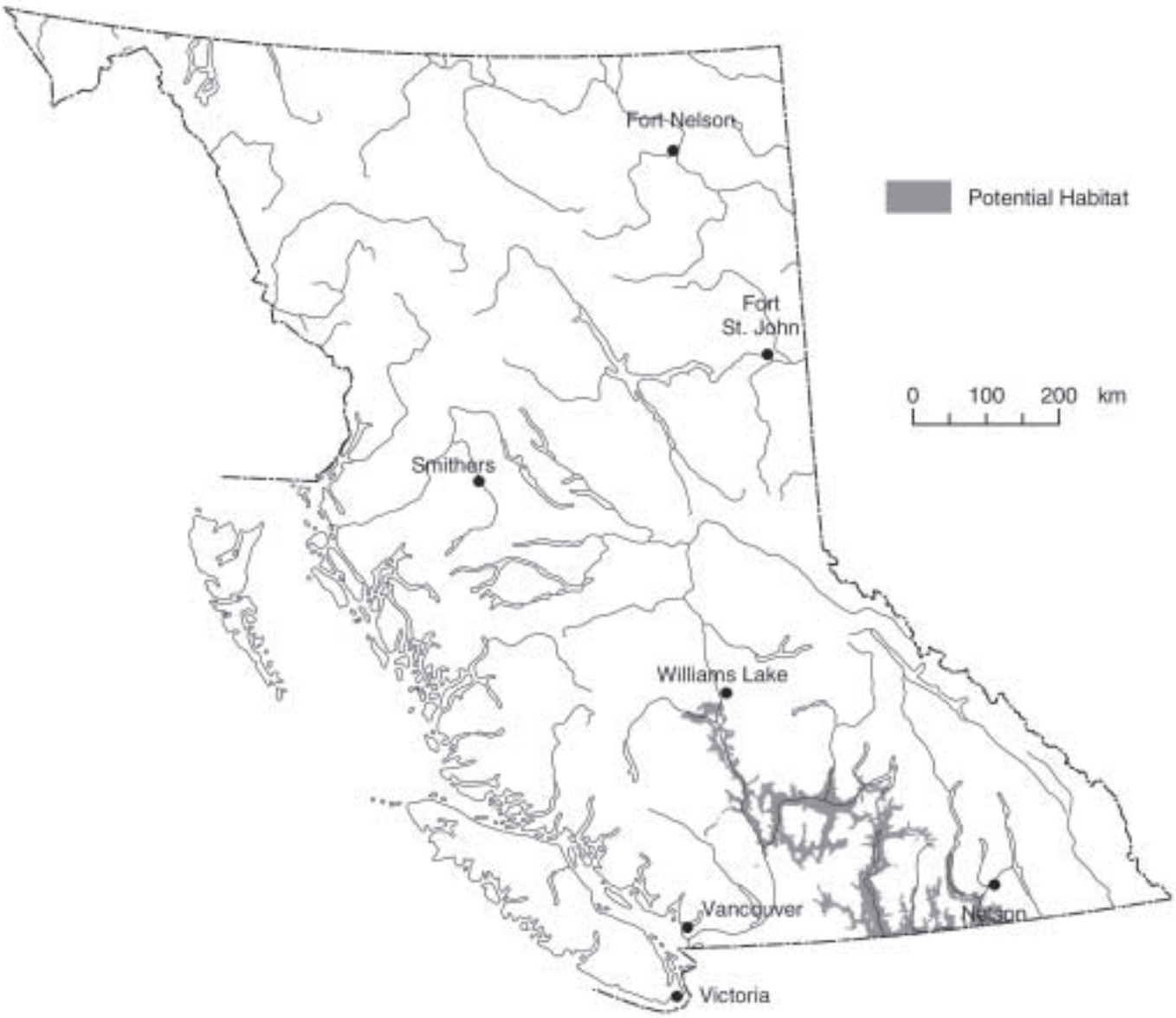
Elevation

Generally found at low to mid-elevations, up to almost 900 m in British Columbia (Sarell et al. 1997) and up to 1080 m in Washington State (Brown et al. 1995).

1 Volume 1 account prepared by C. Shewchuk.

Racer

(Coluber constrictor)



Note: This map represents a broad view of the distribution of potential habitat used by this species. The map is based on several ecosystem classifications (Ecoregion, Biogeoclimatic and Broad Ecosystem Inventory) as well as current knowledge of the species' habitat preferences. This species may or may not occur in all areas indicated.

Life History

Diet and foraging behaviour

Racers are generalists, preying on small mammals, lizards, snakes, and insects (Brown et al. 1995). Racers are atypical of other British Columbia snake species, as they seem to demonstrate a greater dependency on vision when foraging and navigating. Prey are stealthily approached, ambushed, or chased. Unlike the scientific name implies, Racers do not constrict their prey but instead swallow their prey alive. Young Racers are suspected to feed predominantly on crickets and grasshoppers (Brown et al. 1995).

Reproduction

Racers mate shortly after emergence from winter dens. Between three to seven eggs are laid (June–July) in subterranean chambers on warm slopes. Racers will sometimes take advantage of other snake egg-laying sites and have been documented sharing egg-laying sites with Gopher Snakes (Shewchuk 1996). Eggs hatch almost 2 months after laying (August), although the development period is suspected to partially depend on incubation temperature (Shewchuk 1996).

Site fidelity

Racers are suspected to use the same den throughout their lives. Repeated use of summer home ranges is also suspected (Brown et al. 1995). The same egg-laying site may be used for several years.

Home range

Although these snakes are probably the most active of the snakes in British Columbia and are able to travel great distances over short periods, they tend to have discrete summer home ranges (Brown et al. 1995). Home ranges are usually located within 1 km of the den but one record shows a movement of almost 2 km (Brown et al. 1995). Daily movements of approximately 200 m have been documented within their home ranges during the summer foraging period (Shewchuk and Waye 1995).

Movements and dispersal

Snakes emerge in late March and April and travel from the den before mating in May. Racers have been reported to travel up to 1.8 km from the den to reach summer range (Brown et al. 1995). During the summer, daily movements are typically small (<100 m); however, gravid females may make larger journeys (>500 m) to reach egg-laying sites in July.

Habitat

Structural stage

Racers are most common in non-forested ecosystems. Where they do occur in forested habitats, they seem to prefer openings (Sarell et al. 1997; Sarell and Alcock 2000). Structural stage does not appear to be important, providing the canopy is not closed. It is not known whether Racers are impacted by grassland seral condition but it is possible that a reduction in cover may lead to greater predation. They can be found in all range conditions, however, they are more conspicuous in grazed grasslands.

Important habitats and habitat features

Denning

Racers hibernate during the winter (November through March). Dens may be used by solitary individuals but most often Racers share their den with other individuals and often den communally with other species of snakes (Brown and Parker 1976; Macartney 1985; Charland 1989; Radke 1989; Sarell 1993) such as Gopher Snakes and Western Rattlesnakes (*Crotalus oreganus*).

Dens are usually found on warm slopes in rock outcroppings or talus (Sarell 1993) in grasslands or open forest habitats. Den sites are suspected to be used in consecutive years, which may reflect a scarcity of special conditions required for suitable refuge from winter conditions. Den sites have also been found on warm slopes of unconsolidated material, usually glacio-fluvial deposits (Sarell and Alcock 2000). These dens house fewer individuals and are probably transitory due to gradual sloughing. Evidence from Washington State suggests

that Racers are also able to den in small mammal burrows under the base of shrubs (Folliard and Larsen 1990).

Breeding

Eggs are laid in subterranean chambers on warm slopes. These chambers are sometimes excavated in soft, sandy banks although females will more typically use abandoned rodent burrows when available.

In the south Okanagan, egg-laying sites have been found near the crest of a sandy hill, with little surrounding vegetation (Shewchuk and Waye 1995; Shewchuk 1996).

Foraging

Foraging habitats are most often shrub-steppe and grasslands (Matsuda et al., in press), although open forests and riparian areas are also used.

Conservation and Management

Status

The Racer is on the provincial *Blue List* in British Columbia. It is designated as *Not at Risk* in Canada (COSEWIC 2002).

Summary of ABI status in BC and adjacent jurisdictions (NatureServe Explorer 2002)

BC	CA	OR	ID	MT	WA	Canada	Global
S3S4	S5	S4?	S5	S5	S5	N4	G5

Trends

Population trends

Racers often appear to be the most abundant snake in arid ecosystems. Estimating their apparent relative abundance is misleading, as they are active during the day and are obvious when active, which increases the probability of detection. Populations seem to be most abundant in the south Okanagan and Lower Similkameen. Population studies have not been conducted but Racers are one of the most commonly killed snake species on roadways (M. Sarell, pers. obs.). It is suspected that population declines are widespread and significant (Campbell and Perrin 1990).

Habitat trends

The arid landscapes occupied by Racers probably remained suitable during the mining and ranching eras but intensive agricultural developments and rapid urbanization in recent years has significantly altered their habitats. In the late 1980s, it was calculated that about 10% of ecosystems in the south Okanagan remained relatively undisturbed (Redpath 1990).

Threats

Population threats

Populations are seasonally concentrated at den sites, causing this species to be susceptible to disturbance and local extirpation. Hibernating populations are vulnerable to mortality from earth-moving activities. During the summer, individuals are often killed by domestic cats and humans when they are encountered in agricultural areas. Road construction, urban developments, utility construction, and quarrying are the most likely activities to impact communal dens. Individual Racers are prone to mortality from vehicle traffic, intensive agricultural practices, and domestic pets.

Habitat threats

In British Columbia, the main threat to this species is habitat loss due to human development. This includes urbanization, agriculture, and the development of utility corridors. Road mortality is also of concern. Human population growth, roads, and volume of traffic have increased over the last few years in the south Okanagan and are expected to continue to increase. Road use statistics are available for a number of highways in the south Okanagan (B.C. Ministry of Highways 1999). In the summer, use of paved roads ranged from 2872 vehicles per summer day just north of the Canadian border at Osoyoos to 20 017 vehicles per summer day on the highway near Penticton.

Livestock grazing may be a concern in heavily or intensively grazed grasslands. Impacts from grazing may include trampling, reduced movements during critical foraging and mating periods, changes to habitat structure that may result in increased predation, and reduced prey abundance (Macartney and Weichel 1989; Didiuk and Macartney 1999). However, the impacts of livestock grazing have not been well studied and results are contradictory.

Legal Protection and Habitat Conservation

Under the provincial *Wildlife Act*, the Racer is protected in that it cannot be killed, collected or held in captivity without special permits.

A number of communal dens occur within protected areas including Okanagan Mountain Provincial Park, Kalamalka Provincial Park, Throne Ecological Reserve, White Lake Protected Area, Kobau Provincial Park, Churn Creek Protected Area, as well as other areas managed for conservation (e.g., Nature Trust of BC). However, many communal dens are isolated from protected areas and continuums of habitat are not protected.

Under the results based code, range use plans that consider the requirements of this species may be sufficient to meet the needs of the species. However, for a species to be specifically addressed within these plans, they must be designated as Identified Wildlife. Wildlife habitat features may be used to protect den sites.

Identified Wildlife Provisions

Sustainable resource management and planning recommendations

❖ Maintain and maximize connectivity between hibernacula and foraging habitats.

Wildlife habitat area

Goal

Maintain and link denning habitat, foraging habitat, travel corridors, and egg-laying sites within and between adjacent populations.

Feature

Establish WHAs for communal dens, especially multi-species dens, and talus slopes, rock outcrops, or cliff habitats identified to be important for the conservation of this species.

Size

Approximately 200–300 ha but will depend on site-specific factors such as area of suitable habitat, nearness to foraging areas, and egg-laying sites.

Design

The boundaries of the WHA should be designed to include and connect den sites, travel corridors, egg-laying sites, and important foraging areas.

General wildlife measures

Goals

1. Minimize disturbance and mortality, particularly road mortality.
2. Maintain critical structural elements such as rock outcrops, talus slopes, friable soils, coarse woody debris, concentrations of boulders, or other unconsolidated materials and vegetative cover.
3. Maintain microclimatic conditions of hibernacula.
4. Maintain moderate to dense cover to conceal snakes and maintain foraging opportunities.
5. Maintain riparian areas in a properly functioning condition.

Measures

Access

- Place roads as far as practicable from hibernacula and known snake travel corridors. Avoid construction between April and October when snakes are active. When recommended by MWLAP, rehabilitate temporary access roads immediately after use or gate less temporary roads to reduce traffic.
- Where determined to be necessary by MWLAP, use snake drift fences and drainage culverts at intersections of roads and known travel corridors. Drift fences should be ≥75 cm high. Length will vary by site depending on area used by snakes. Consult MWLAP for more

information. Seasonal use restrictions may be appropriate for some roads.

- Do not remove or disturb rock or talus.

Range

- Plan livestock grazing (e.g., timing, distribution, and level of use) to prevent trampling and maintain suitable vegetative cover (i.e., >15 cm stubble height in upland; >10 cm in riparian areas).
- Do not concentrate livestock within 200 m of den during spring dispersal (March/April) and fall (September/October) aggregations.
- Do not place livestock attractants or corrals within 200 m of den site.
- Do not trail livestock within 200 m of den site during spring and fall aggregations.

Pesticides

- Do not use pesticides.

Recreation

- Do not establish recreation sites within WHA.

Additional Management Considerations

Where migration routes from denning locations to summer habitats have been transected by roadways, use methods such as drift fences, culverts, or seasonal road restrictions, to allow the safe passage of snakes.

Rock climbing should be considered a disturbance at sensitive sites.

Riparian areas adjacent to WHAs should be managed or restored to ensure range foraging habitat is maintained.

Avoid converting areas adjacent to WHAs to an early seral grassland condition. Early seral stages may have less cover for concealing Racers from predators and may experience greater threats from trampling due to higher livestock pressures.

Information Needs

1. Identification of hibernacula sites and characteristics.
2. Dispersal behaviour from dens.
3. Foraging habitats.

Cross References

Bighorn Sheep, "Great Basin" Gopher Snake, Lewis's Woodpecker, White-headed Woodpecker, water birch – red-osier dogwood

References Cited

B.C. Ministry of Highways. 1999. Traffic volumes: Thompson Okanagan Region. 1995–1999. Victoria, B.C.

Brown, H.A., R.B. Bury, D.M. Darda, L.V. Diller, C.R. Peterson, and R.M. Storm. 1995. Reptiles of Washington and Oregon. Seattle Audobon Society. Seattle, Wash. 176 p.

Brown, W.S. and W.S. Parker. 1976. Movement ecology of *Coluber constrictor* near communal hibernacula. Copeia 1976(2):225–242.

Campbell, C.A. and D.W. Perrin. 1990 Status report on the Racer *Coluber constrictor* in Canada. Prepared for the Committee on the Status of Endangered Wildlife in Canada. Ottawa, Ont.

Charland, M.B. 1989. Size and winter survivorship in neonatal western rattlesnakes (*Crotalus viridis*). Can. J. Zool. 67:1620–1625.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2002. Canadian Species at Risk. www.speciesatrisk.gc.ca

Corn, P.S. and R.B. Bury. 1986. Morphological variation and zoogeography of Racers (*Coluber constrictor*) in the Central Rocky Mountains. Herpetologica 42:258–264.

Didiuk, A. and M. Macartney. 1999. Status report on the Prairie Rattlesnake (*Crotalus viridis viridis*) and the Northern Pacific Rattlesnake (Crotalus viridis oreganus) in Canada. Draft report prepared for the Committee on the Status of Wildife in Canada, Ottawa, Ont.

Fitch, H.S., W.S. Brown, and W.S. Parker. 1981. *Coluber mormon*, a species distinct from *Coluber constrictor*. Trans. Kans. Acad. Sci. 84:196–203.

Folliard, L.B. and J.H. Larsen, Jr. 1990. Distribution and status of shrub-steppe reptiles on the Hanford Reservation (Washington State). First year report to the Nongame Wildl. Program, Wash. Dep. Wildl., Olympia, Wash. 35 p.

Gregory, L.A. and P.T. Gregory. 1999. The reptiles of British Columbia: a taxonomic catalogue. B.C. Min. Environ., Lands and Parks, Victoria, B.C. Wildl. Bull. B-88.

Macartney, J.M. 1985. The ecology of the Northern Pacific Rattlesnake, *Crotalus viridis oreganus*, in British Columbia. M.Sc. thesis. Univ. Victoria, Victoria, B.C.

Macartney, M. and B. Weichel. 1989. Prairie Rattlesnake survey and management plan. Report to Sask. Nat. History Soc. Unpubl.

Matsuda, B.M., D.M. Green, P.T. Gregory, and R.W. Campbell. In press. The amphibians and reptiles of British Columbia. Royal B.C. Mus., Victoria, B.C., and UBC Press, Vancouver, B.C.

NatureServe Explorer. 2002. An online encyclopaedia of life. Version 1.6. NatureServe. Arlington, VA. Available at http://www.natureserve.org/explorer/

Radke, W.R. 1989. Ecology of the northern Pacific rattlesnake on Columbia NWR. U.S. Fish and Wildl. Serv. Unpubl. Progr. Rep. 3 p.

Redpath, K. 1990. Identification of relatively undisturbed areas in the South Okanagan and Similkameen valleys, British Columbia. Report to the Can. Wildl. Serv., Delta, B.C. Tech. Rep. Series No. 108. 9 p.

Sarell, M.J. 1993. Snake hibernacula in the South Okanagan. Report prepared for B.C. Min. Environ., Lands and Parks, Penticton, B.C. Unpubl.

Sarell, M.J. and W. Alcock. 2000. Wildlife mitigation activities for the Southern Crossing Pipeline at Beaver Creek. Prepared for B.C. Gas, Vancouver, B.C.

Sarell, M.J., S. Robertson, and A. Haney. 1997. Inventory of snakes within forest developments of the Boundary, Penticton, Merritt, and Vernon Forest Districts. Prepared for B.C. Environ. and Forest Renewal BC.

Shewchuk, C.H. 1996. The natural history of reproduction and movement patterns in the Gopher Snake (*Pituophis melanoleucas*). M.Sc. thesis. Univ. Victoria, Victoria, B.C.

Shewchuk, C.H. and H.L. Waye. 1995. Status of the Western Yellow-bellied Racer in British Columbia. Report prepared for B.C. Environ., Wildl. Br., Victoria, B.C.

Wilson, L.D. 1978. *Coluber constrictor*. Cat. Am. Amphib. Rep. 218.1–218.4.

Personal Communications

Hobbs, J. 2002. Min. Water, Land and Air Protection, Victoria, B.C.