Natural History of the Sharp-Tailed Snake, *Contia tenuis*, on the Gulf Islands, British Columbia

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EXPANDED ABSTRACT

"*The greatest constraint in conservation planning for either individual species or entire snake assemblages is the fundamental lack of basic biological information on most species*" (Dodd 1993, p.370).

The sharp-tailed snake, *Contia tenuis*, is considered endangered nationally by the Committee on the Status of Endangered Wildlife in Canada, and is on the Red List of species at risk in British Columbia. The species is known from only a few sites within the Coastal Douglas-fir biogeoclimatic zone on southeastern Vancouver Island and the Gulf Islands (Spalding 1993, 1995). These populations, which are isolated from the more southern parts of the species' range in the United States, might be unique both genetically and in their ecological adaptations.

During 3 field seasons, from 1996 to 1998, we studied the distribution, life history, and habitat use of the sharp-tailed snake on the southern Gulf Islands and southeastern Vancouver Island (Engelstoft and Ovaska 1997, 1998, 1999). Here, we present a summary and preliminary results of the study with emphasis on natural history of populations at 2 recapture sites on the Gulf Islands: near Magic Lake, North Pender Island (0.75 ha, 48°46'N, 123°18'W), and near Vesuvius, Saltspring Island (0.15 ha, 48°54'N, 123°35'W).

From 1996 to 1998, we searched for snakes for 284 person-hours on the Gulf Islands (North Pender, South Pender, Saltspring, Galiano, Sidney, Saturna, Mayne, Portland, and several smaller islands) and southeastern Vancouver Island (Duncan–Maple Bay area, Shawnigan Lake, Mount Finlayson, and Metchosin) by turning over rocks and logs, looking under bark on decaying logs, and scanning the ground. We found the sharp-tailed snake at 3 localities: near Magic Lake on North Pender, near Vesuvius on Saltspring (at 2 sites approx 1 km apart), and in Metchosin on the southern tip of Vancouver Island. In addition, confirmed observations of the sharp-tailed snake were reported to us from 2 localities, about 2.7 km apart from each other, on South Pender.

All of these sites are at or near previous localities reported for the species. Our observations extend the patch size of habitats occupied by the snakes at the Saltspring and South Pender sites to at least 10 ha and 30 ha, respectively. At the North Pender and Metchosin sites, the snakes are known from areas <1 ha. We were unable to confirm the persistence of the species at a second, previously reported site on North Pender and at 2 historic localities where the exact sites were unknown (Galiano, and Cowichan District, Vancouver Island; Conservation Data Centre, Victoria, files).

Habitats of the sharp-tailed snake consisted of small canopy openings and forest edges in Douglas-fir (*Pseudotsuga menziesii*)/Arbutus (*Arbutus menziesii*)-dominated stands. On the Gulf Islands, the habitats were highly fragmented by residential development and hay fields, whereas in Metchosin, habitat fragmentation was mainly due to small-scale forestry and natural forest openings on exposed bedrock. Small canopy gaps, particularly when along south-facing, rocky slopes, appear to be important for the snakes for thermoregulation, egg development, and growth of young. A 3-dimensional structure of the forest floor, which allows for burrowing or vertical movements, also appears to be required.

In 1997–1998, we caught 24 individuals 1–9 times at the Magic Lake site and 16 individuals 1–5 times at the Vesuvius site. Artificial cover objects, constructed of black asphalt roofing, unpainted tin roofing, and 1.2 cm-thick plywood, allowed us to locate and recapture individual sharp-tailed snakes with minimal disturbance to the natural habitat. Based on the seasonal distribution of captures under artificial covers and rocks, the surface activity of the snakes peaked from March to April in 1997 and from March to April and early June in 1998; a smaller peak in activity occurred from late September to early November in both years. Few snakes were found in July and August, and captures at this time were associated with rainfall. Ten of 21 fecal samples examined contained remains of gastropods, 8 samples contained remains of insects, and 1 sample contained a skeleton of a mite. The availability of prey might partially limit the surface activity of the snakes to moist periods.

The snakes caught ranged from 79 to 323 mm in snout-vent length (SVL). The smallest snakes (79–90 mm SVL)

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were found in September–October, suggesting that hatching occurs at this time. Growth rates for 12 snakes suggest that growth decreases dramatically with body size, being most rapid for first-year young; 1 individual doubled its SVL during its first year of life. The average annual growth rate of 2 larger juveniles <200-mm SVL was 22.4 mm, assuming no growth between November and February. These growth rates would result in SVL of about 200 mm, the body size of most adults, in about 3 years. Nine larger snakes showed slower growth (7.2–13.8 mm/yr).

Movements of individual sharp-tailed snakes, determined from the use of artificial cover objects, were relatively short; the average distance between 2 farthest captures was about 25 m. Six of 18 recaptured snakes were always found under the same cover. In 1997 and 1998, we tracked movements of 2 snakes tagged with subcutaneous implants (weighing approx 4 mg) as part of field trials investigating the usefulness of the harmonic direction finder technique for following movements of small snakes (see Engelstoft et al. in press, for details). The snakes were semi-fossorial and seldom found on the surface. One female snake, detected 57 times from September 1997 to April 1998, moved mainly within decayed logs, under rocks, and underground. The greatest distance between 2 relocation points was 39 m. The longest movement detected for the other tagged snake, an adult male, was 93 m in March–April 1998.

Many aspects of the life history of the sharp-tailed snake, including the age at sexual maturity, timing of mating and oviposition, and frequency of reproduction by females, remain unknown. Seasonal movements and habitat use patterns also require further study. Filling these data gaps is important for management and for the protection of adequate habitats to ensure the persistence of the species in British Columbia.

LITERATURE CITED

Dodd, C. K., Jr. 1993. Strategies for snake conservation. Pp. 363–393 *in* R. A. Seigel, and J. T. Collins, eds. Snakes. Ecology and behavior. McGraw-Hill, Inc., New York, NY.

Engelstoft, C., and K. Ovaska. 1997. Sharp-tailed snake inventory within the Coastal Douglas-fir biogeoclimatic zone, June-November 1996. Unpubl. rep. prepared for B.C. Minist. Environ., Lands and Parks, Vancouver Island Regional Office, Nanaimo, BC.

_____, and _____. 1998. Sharp-tailed snake study on the Gulf Islands and southeastern Vancouver Island, March–November 1997. Unpubl. rep. prepared for B.C. Minist. Environ., Lands and Parks, Vancouver Island Regional Office, Nanaimo, BC.

_____, and _____. 1999. Sharp-tailed snake study on the Gulf Islands and southeastern Vancouver Island, March–November 1998. Unpubl. rep. prepared for B.C. Minist. Environ., Lands and Parks, Vancouver Island Regional Office, Nanaimo, BC.

_____, _____, and N. Honkanen. In Press. The harmonic direction finder: A new method for tracking movements of small snakes. Herpetol. Rev.

Spalding, D. J. 1993. Status of the sharp-tailed snake in British Columbia. B.C. Minist. Environ., Lands and Parks, Wildl. Branch, Victoria, BC. Wildl. Work. Rep. No. WR-57.

_____. 1995. The sharp-tail snake: A British Columbia rarity. Cordillera 2:20–25.