Characterizing the thermal ecology of the Sharptail Snake, Contia tenuis in coastal BC

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Physical conditions (e.g. temperature and moisture regimes) have profound effects on the behaviour and physiology of ectotherms. In squamates (snakes & lizards), the performance of various biological functions (e.g. developmental rate, locomotion and digestion) is temperature sensitive and is maximized over a relatively narrow region of high body temperatures (Tbs). Thermal fluctuations in the environment cause variation not only in physiological processes but also in the behaviours associated with them. Thus, when conditions allow it, many species of snakes thermoregulate behaviourally to maintain optimum Tbs. Thermal qualities thus play a key role in habitat selection by snakes.

In Canada, the presence of the Sharptail Snake (Contia tenuis) has been recently confirmed from only a few localities on Southern Vancouver Island and the Gulf Islands. Habitat loss, modification and fragmentation associated with increased human settlement in these areas continue to be the primary threats to the persistence of this species. The Sharptail Snake is listed as Endangered by COSEWIC (1999) and is ranked as S1 (critically imperiled) by the BC Conservation Data Centre.

The main goal of this project was to investigate thermal habitat preferences through a combination of field and laboratory work. To date, I have measured temperature selection of snakes in the field by taking 'spot' measurements of cloacal temperatures using fast-reading thermometers. Although my sample size is small, I typically found Sharptail Snakes on cool days (Tb between 10-20°C). I characterized the thermal habitat by using various devices (e.g. copper-pipe snake models) to measure temporal variation in temperature between known and potential habitats. Generally speaking, temperatures were particularly high (temperatures> 50°C under the cover boards) during the summer. In forthcoming weeks, I will determine the preferred or 'target' Tb of snakes when given a choice (i.e. thermal gradient) in the laboratory. I predict that snakes will select moderate Tbs. I will also measure how behavioural performance (i.e. crawling & tongue flick rate) varies with Tbs. I predict that optimum performance will occur at moderate (≈20°C) vs. high Tbs (≈30°C).

A thorough understanding of thermal habitat preferences can provide important information to assist in the identification of habitats that may be critical to the survival and recovery of the Sharptail Snake in Canada.