MA39 Spatial behavioural ecology of the Malagasy Giant Hognose snake

The Malagasy Giant Hognose snake, *Leioheterodon madagascariensis,* is Madagascar's largest colubrid snake, attaining sizes greater than 1.5m in length (Glaw and Vences, 2007). This species has been documented engaging in ritual combat and active nest defence (Glaw and Vences, 2007; Mori and Randriamboavonjy, 2010). A preliminary investigation suggests that the behavioural ecology of *L. madagascariensis* is more complex than previously thought (Williams 2013, unpublished data). The abundance of the Malagasy Giant Hognose at Mahamavo provides a great opportunity to investigate their spatial behavioural ecology i.e. how these animals select and utilize the habitats in which they are found and how they interact with conspecifics and other species.

Methodology:

Existing sampling routes and/or areas known to have high densities of these snakes will be surveyed at least once a day. All sightings of snakes will be recorded using a GPS receiver and encountered animals will be captured, measured, weighed, sexed and PIT tagged to allow individual identification. Other morphological measurements and sampling (e.g DNA) may also be taken at this time. In addition, details of the habitat in which the animals are encountered will also be recorded (e.g. canopy cover, substrate temperature, distance to water, available prey species etc.).

Daily habitat use and movement patterns will be investigated for each tagged individual. A method using fluorescent powder is usually employed but other methods (e.g. thread trailing, radiotelemetry) may also be utilised, depending on the student's interests and resources available to them. Students will also be required to undertake general observational studies to document behaviours such as interactions with conspecifics, hunting and prey choice. Documentation of opportunistic encounters and behavioural observations will be strongly encouraged as such observations can prove to be valuable sources of information and could potentially reveal important natural history information on species whose natural history is not well known.

Data collected will be visualised and analysed utilising ArcGIS software. The statistical analysis conducted will be dependent on the aim of the study and the data collected. However, most analysis is usually be carried out in 'R' or with other standard statistical packages.

Suggested Reading:

Blouin-Demers, G., and Weatherhead, P. J. 2001. Habitat use by black rat snakes (*Elaphe obsolete obsoleta*) in fragmented forests. Ecology, 82 (10) 2882-2896.

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Glaw, F. and Vences, M. 2007. A Field Guide to the Amphibians and Reptiles of Madagascar. Third Edition. – Köln, Vences & Glaw, 496 pp. (ISBN 978-3-929449-03-7).

Hyslop, N.L 2007. Movements, habitat use, and survival of the threatened Eastern Indigo Snake (*Drymarchon couperi*) in Georgia. Unpublished PhD thesis.

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Plummer, M.V., and Mills, N.E. 2000. Spatial ecology and survivorship of resident and translocated Hognose snakes (*Heterodon platirhinos*).Journal of Herpetology. 565-575.

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Row, J.R., and Blouin-Demers G. 2006. Kernels are not accurate estimators of home-range size for herpetofauna. Copeia 797-802.

Shine, R. 1979. Activity patterns in Australian elapid snakes (Squamata: Serpentes: Elapidae). *Herpetologica*, 1-11.

Simonov, E. 2009. Differences in habitat use, daily activity patterns and preferred ambient temperatures of adult and neonate *Gloydius halys halys* from an isolated population in southwest Siberia: preliminary data. Herpetology Notes. Vol. 2 1-7

Wasko, D. K., and Sasa, M. 2009. Activity Patterns of a Neotropical Ambush Predator: Spatial Ecology of the Fer-de-lance (*Bothrops asper*, Serpentes: Viperidae) in Costa Rica. Biotropica, 41 (2) 241-249.

Wasko, D. K., and Sasa, M. 2010. Habitat selection of the Terciopelo (Serpentes: Viperidae: *Bothrops asper*) in a lowland rainforest in Costa Rica. Journal Information. Vol. 66 (2) 148-158.

Wastell, A.R., and Mackessy S.P. 2011. Spatial ecology and factors influencing movement patterns of Desert Massasauga Rattlesnakes (*Sistrurus catenatus edwardsii*) in Southeastern Colorado. Copeia 29-37.

Williams, T. (2013) The effect of intraspecific and interspecific competition on space use by two Malagasy colubrids (*Leioheterodon madagascariensis* and *Leioheterodon modestus*). University of Oxford. Unpublished BSc thesis.