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ASSESS TO PLAN: CONSERVATION ACTION PLANNING FOR THE SNAKES AND LIZARDS OF SRI LANKA

Report from the IUCN Red List Assessment, Key Biodiversity Areas and Assess to Plan workshop

14 – 19th September 2019, Simpson's Forest Hotel, Elkaduwa, Wattegama, Sri Lanka

Acknowledgements

We would like to thank everyone who participated in the IUCN Red List assessment, Key Biodiversity Areas and Assess to Plan (A2P) workshop for snakes and lizards of Sri Lanka, and subsequently contributed to the completion of this workshop report. A full list of workshop participants is provided in **Appendix II** of this document and all are thanked for their time and contributions.

The workshop was funded by Rainforest Trust, with generous support from the IUCN Red-List Committee, Conservation International and the Global Conservation Network (GCN). Workshop organisation and logistical support was carried out by Zoo Outreach Organization.

Cover photo ©: Philip Bowles.

Implementation of the actions recommended within this report are being managed by a working group, established by participants of the workshop. For further details, please contact Anslem de Silva kalds@sltnet.lk and Suranjan Karunarathna dmsameera@gmail.com, who are coordinating this working group.

A collaboration between IUCN-Conservation International Biodiversity Assessment Unit (IUCN-CI BAU), IUCN SSC Conservation Planning Specialist Group (CPSG), and Zoo Outreach Organization (ZOO).

Recommended citation: Gibson, C.; de Silva, A.; Tognelli, M.F. and Karunarathna, S. (Eds.) 2020. Assess to Plan: Conservation Action Planning for the Snakes and Lizards of Sri Lanka. IUCN Conservation Planning Specialist Group, Apple Valley, MN, USA.

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EXECUTIVE SUMMARY

In September 2019, the IUCN/CI Biodiversity Assessment Unit held a workshop to complete IUCN Red List assessments for 169 species of snakes and lizards of the 230 currently (September 2019) described reptile species known from Sri Lanka, as part of the Global Reptile Assessment. Additionally, a preliminary Key Biodiversity Area (KBA) assessment was conducted and the IUCN SSC Conservation Planning Specialist Group facilitated the Assess to Plan (A2P) process to identify the next steps towards conservation action for all species assessed as threatened.

Of the 169 species assessed during the workshop, 102 (60%) were categorised as threatened (Critically Endangered, Endangered or Vulnerable), with 100 (98%) of these being endemic to Sri Lanka. Additionally, 17 species (10%) were assessed as Data Deficient, all of which are Sri Lankan endemics.

The main overarching threats to Sri Lankan snakes and lizards identified during the workshop were habitat loss, fragmentation, alteration and degradation. The principal underlying causes included forest clearance for plantation agriculture, tourism and urban development. Collection of animals for the international pet trade and persecution of snakes were also recognised as significant threats to certain species. Additionally, road traffic mortality, pollution, invasive species and predation from an increasing number of domestic animals including cats and poultry were identified as contributing to the threatened status of species. Droughts attributed to climate change and forest die-back (the cause of which remains poorly understood but has been linked to lead pollution (Ranasinghe *et al.*, 2009), were also considered current or potential threats to reptile species that are found in affected forest habitats.

During the workshop, 114 species were preliminary identified as Key Biodiversity Area trigger species, 101 of which were assessed as threatened. Additionally, three Near Threatened and three Data Deficient species also qualified as KBA trigger species because of their restricted ranges (<10,000 km^2). A total of 33 KBA sites were either adopted (from existing KBAs) or newly delineated for 102 of the trigger species. Adequate information was available for 96 of the threatened trigger species, which were included in one or more of the KBA sites.

The Asses to Plan (A2P) process carried out by participants during the workshop determined that site-based conservation action planning was considered necessary for all 102 threatened species. KBA sites identified during the workshop were used as the focal sites for multi-species conservation planning bundles and next steps were mapped out for 10 of the 33 KBA sites. Habitat-based conservation action planning was identified as a requirement for 41 species dependant on and/or restricted to a specific habitat type (the specific habitat type could occur at multiple sites). Key habitats for which conservation action planning was recommended included montane tropical / sub-tropical forest characterised by numerous mid height (up to 8m) canopy trees, lowland rainforest, dry evergreen forest, sand dunes and coastal scrubland and also specific areas that have quality, thick leaf litter and humus layer on which a number of threatened fossorial species depend. Threat-based conservation action planning was recommended for 26 species. Threat bundles included species impacted by collection for the international pet trade, persecution and predation. Intensive care conservation action planning was recommended as one of the planning priorities for two species, in conjunction with site and habitat planning. Details of the A2P conservation action planning sessions and next steps are presented in this report, along with multi-species conservation action planning summary tables.

5. Threat-based conservation planning

Persecution of snakes

A2P PROJECT LEADS

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Persecution was identified as a specific threat to six of the species assessed as threatened during the workshop (one Endangered and five Vulnerable): ***Hypnale nepa, Boiga barnesii, Dendrelaphis caudolineolatus, Dendrelaphis schokari, Oligodon sublineatus, Oligodon sublineatus*** and ***Cylindrophis maculatus***. However, the issue of snake persecution applies to many snake species in Sri Lanka.

In Sri Lanka, snakes are of cultural and religious importance, for example, cobras have cultural significance to Tamil, Hindu and Buddhist populations. However, venomous snake bites are an issue in Sri Lanka and people have an inherent fear of snakes, which results in a tendency for people to kill snakes if they encounter them. Epidemiological studies have shown that fatality rates due to snake bite envenoming was 5.2 per 100,000 population, which was one of the highest death rates in the world (de Silva & Ranasinghe, 1983). Many non-venomous snakes look like venomous species in appearance and it is not possible for most people to distinguish between the venomous and non-venomous species (Figures 4*a* and *b*). This means that generally, any snake encountered is highly likely to be killed, due to a fear of snake bites from venomous snakes.

Figure 4. Venomous species (Fig 4a) and non-venomous species (Fig 4b), which are similar in appearance difficult for people to differentiate.

Figure 4a. Sri Lanka Krait *Bungarus ceylonicus* © Panduka de Silva

Figure 4b. Sri Lanka wolf snake *Lycodon carinata* © Panduka de Silva

The table below list the venomous species of snake most frequently encountered by humans and potential consequences if bitten by them.

Species	Impact of bite
Naja naja (cobra)	Bites can cause systemic reaction of which some could culminate in fatality
Daboia russelii (Russell's viper)	
Bungarus caeruleus (common krait)	
Bungarus cetlonicus (Ceylon krait)	
Hypnale hypnale (Merrem's hump nose viper)	
Hypnale zara	
Echis carinatus (saw scale viper)	Bites which can cause severe systemic reaction, but have no deaths reported
Other pit viper species	

Snakebite is an occupational hazard in Sri Lanka and farmers are the most vulnerable people. Human-snake conflict is particularly an issue in the Dry Zone of Sri Lanka as there is a large proportion of rural and agricultural land here. These areas are farther away from the capital and so tend to receive less attention from the government, which means schools and hospital are less developed and resourced. Teachers, doctors and government officials are not attracted to the dry zone, rural areas for work, as opportunities are rarer than in the capital. Alongside this, these areas have a high abundance of snakes, including a high number of venomous species and human/snake interaction is frequent.
Snake bites are most prevalent during harvesting periods in paddy fields. The demographic of snake bites is largely made of adult male farm workers and snake bites occur most during early morning and late afternoon/early evenings. When snake bites do occur, it is difficult to get help in time. Doctors also have a lack of knowledge to be able to correctly identify the snake responsible for a bite, which occasionally leads to the incorrect treatment being administered. For example, there are instances where patients have been given anti-venom for non-venomous snake bites, which has disastrously proved fatal for the patient. Snake training is provided to medical students during the third year of their studies; however, the curriculum only covers treatment of snake bites, not snake identification.

There are also many myths surrounding snakes, for example if you cut a python in half, they can stick themselves back together. The media often perpetuates this fear and mystery surrounding snakes through publishing negative snake-related hype stories, which influence people's views.

CONSERVATION NEEDS IDENTIFIED DURING A2P DISCUSSIONS

- Education and awareness programme for schools on how to avoid snakes in gardens and what to do in the case of a snake bite. School education is considered appropriate as school children going home and talking with their families has proved to be the most effective way of educating adults.
- Education and training for doctors - doctors need to be able to identify non-venomous verses venomous species in order to be able to provide the correct treatment quickly and with confidence. Trained, aware doctors could help educate the public on snake identification, which may gradually help to reduce the fear of all snakes amongst rural populations, over time. Currently, the Snakebite Expert Committee of the Sri Lanka Medical Association (of which Anslem is a founder member) has published the latest information on the correct management of snake bite patients and an identification sheet of venomous species (Appendix VI).
- Nation-wide education and awareness campaign to nurture a positive connection between and snakes. This would include promoting the wonderful diversity of snakes in Sri Lanka, that not all species are venomous, myth-busting around snakes to eliminate some elements of fear, highlight the important of the ecological roles snakes provide in our environments and guidelines on what to do if you encounter a snake, without killing it. This campaign could involve partnering with national public heroes (such as cricketers Kumar Sangakar, Mahela Jawardina, Muttayya Muralidaran) to become champions for snakes in the publicity campaign.

Opportunity:
Funding is available to help improve the issue of snake persecution in Sri Lanka, through the World Bank ESCAMP (Ecosystem Management Programme), which is managed by the Wildlife Department and Forestry Department. In order to access funds, a proposal with objectives needs to be produced and submitted through the formal procedure.

A2P IMMEDIATE NEXT STEPS	ACTION LEAD
- Hold a workshop to develop a nation-wide snake awareness and publicity campaign strategy.	Anslem de Silva – Snakebite Expert Committee of the Sri Lanka Medical Association is

	conducting awareness programmes for doctors and the public
POTENTIAL EXTERNAL COLLABORATORS AND STAKEHOLDERS	
- Biodiversity Conservation Society - IUCN Sri Lanka - Government officials - Health officials - Relevant NGO's - Snakebite Expert Committee of the Sri Lanka Medical Association	