

# **Status Survey and Conservation of Himalayan Crocodile Salamander**

*(Tylototriton verrucosus)*  
in the Eastern Himalayas

December 2014

Final Report



**Status Survey and Conservation of Himalayan Crocodile  
Salamander (*Tylototriton verrucosus*)  
in the Eastern Himalayas**

**Final Report**

**December 2014**

**Investigators: Dr. Karthikeyan Vasudevan**

**Sh. R. Suresh Kumar**

**Researcher: Shruti Sengupta**

**Citation:**

Vasudevan, K., Kumar, R. S. and Sengupta, S. 2014. Status survey and conservation of the Himalayan Crocodile Salamander *Tylototriton verrucosus* in the Eastern Himalayas. Final Report. Wildlife Institute of India, Dehradun. pp. 31

## Contents

---

<i>List of figures</i>	ii
<i>List of tables</i>	ii
<i>Acknowledgements</i>	iii
<i>Summary</i>	iv
Introduction	1
Methods	7
Results	10
Discussion	25
References	28
Plates	31
Annexures	34
Publication	56

The Himalayan crocodile salamander *Tylototriton verrucosus* was first described in 1871 from the Nantin, Momien and Hotha valleys, in western Yunnan, China. Subsequently, there have been sporadic reports of the species from Nepal, Bhutan, India, Burma, China, Thailand and Vietnam. At present, the species is known to have a vast geographic distribution and thereby assigned as 'Least Concern' by the IUCN. This species shows considerable morphological overlap with 13 other known con-generics from the region, and is now considered to be a species complex. To predict the distribution of the species in India field surveys were conducted during the breeding period between May and August 2012 in parts of northern West Bengal State and northeast India. Along with the data from field surveys, historical data was compiled from published literature, Natural History Museum collections and from GBIF portal. Using ecological niche mapping tool - MAXENT 3.3.3k predictive modeling of the species distribution was done. For the analysis, 61 locations collected from field surveys in northern West Bengal and Manipur State, and 50 locations from archives were used. Fifty percent of the locations were used as training sites for the analysis. Using prior knowledge of the species a candidate set of 19 environmental layers (~1 km<sup>2</sup> resolution) from WORLDCLIM 1.4 was used for the analysis. The variables were: precipitation, minimum and maximum temperature for six months, when the species is active during the year, and altitude. The predicted geographic distribution shows the salamander populations to occur in small, discrete sites in mountain ranges of South East Asia. It is hypothesized that historical factors to may have led to the observed pattern in its geographic distribution.