

## Range wide ecological surveys for the Chinese giant salamander (*Andrias davidianus*)

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The Chinese giant salamander, *Andrias davidianus*, is the world's largest extant amphibian. Historically distributed across 17 Chinese Provinces, the species is now listed as Critically Endangered by the IUCN. Population declines and local population extirpations have been attributed to overexploitation and habitat loss. Despite its large size and protection by Chinese law, the current distribution of *A. davidianus* is unknown. Although some research has been undertaken, methods have not been standardised, preventing comparison of results across study sites. Robust data on species distribution and threats are pivotal if we are to prioritise areas and specific populations for conservation action.

We developed standardised techniques for field surveys by incorporating methods that have been successfully used for other Cryptobranchid species. These included Visual Encounter Surveys, whereby each transect comprised a cumulative 1km stretch of accessible river. Day-time and night-time surveys were conducted on the same day with surveyors using snorkelling, rock turning and nocturnal spotlighting to detect salamanders. In addition, 20 baited crab traps were set along the length of each transect for two consecutive nights. Field teams received intensive training by experienced amphibian surveyors. Environmental data, such as water temperature, pH, turbidity and flow rate, were also recorded. One hundred survey sites were selected from across the known historical range of *A. davidianus* using a habitat suitability model which we developed using open-source ecological data. Sites were surveyed during peak salamander activity periods over 3 years and a standardised site survey record sheet was completed for each transect. A total of 25 Chinese giant salamanders were encountered at 5 sites in 4 of the 16 provinces that were surveyed; all of these sites were in protected areas. Twenty of the encountered animals were caught, measured and sampled for genetic and pathogen screening. Most animals caught were done so using crab traps. Our surveys demonstrate that wild populations have been greatly diminished over much of their historic range and that urgent conservation action is required if extinction in the wild is to be avoided.