Temperature effects on the Chinese giant salamander

December 4 2014, by Jason Snell

Currently, there are over 3,000 animal species on the verge of extinction worldwide. Hunting, land development, and habitat relocation have contributed to a rapid decline in the number of most of these species.

Since the 1950s, Chinese Giant Salamanders have experienced an 80% decline in their population sizes. More recently, this giant salamander was listed as critically endangered in 2004, making it the most vulnerable species of the Family Cryptobranchidae. This drastic decline has been caused by habitat destruction, water pollution, as well as overexploitation of its flesh and body parts. The article "The Effect of Water Temperature on the Growth of Captive Chinese Giant Salamanders (Andrias davidianus) Reared for Reintroduction: A Comparison to Wild Salamander Body Condition," in the journal Herpetologica, introduces a method of captive rearing and habitat reintroduction in order to preserve this species of salamander.

Unfortunately, the only option for giant salamander reintroduction is by purchasing them from breeding farms, which can be costly, as there are no conservation organizations, government agencies, or zoos promoting reintroduction. The authors believe that older, more fully formed salamanders have a stronger chance of survival compared with smaller larval forms, as well as being more cost effective. In order to demonstrate this, the authors studied two conditions: (1) salamanders raised in warmer temperatures would grow faster and have more energy than those raised in cooler temperatures; and (2) salamanders raised in warmer water temperatures and fed at will would be heavier and have

more energy than wild giant salamanders.

The study was conducted at two types of facilities: one using groundwater (Facility 1) and one using river water (Facility 2). After 7 months of being raised in warmer temperatures, the salamanders from Facility 1 exhibited a higher mean daily growth rate, along with being heavier and longer. Within the timeframe of 7 months, the salamanders from Facility 1 were more akin to the wild salamander, but after an additional 11 months, there was no noticeable difference between the captive and wild species.

After the initial 7 months, it was clear that cooler water temperatures produced a slower growth rate in salamanders housed in Facility 2 compared with those in Facility 1. The salamanders in Facility 1 had higher energy levels than those in Facility 2, supporting the authors' hypothesis that warmer water temperature results in faster growth rates. It was clear, however, that both groups of salamanders ultimately weighed less than their wild counterparts. More research is needed to determine the optimal temperatures for giant salamander growth that will lead to successful reintroduction into their natural habitat.

In order to off-set the high costs of raising giant salamanders and reintroducing them with the best chances of survival, the authors currently suggest releasing older (4- to 5-year-old) salamanders, that cost more, allowing a greater number of 1- to 2-year-old salamanders to be purchased and raised in their place. Releasing older salamanders will increase their likelihood of survival, while more extensive research can be done in order to determine the optimal temperatures for younger members of the species to reach their full growth potential.

More information: Lu Zhang, Andrew Kouba, Qijun Wang, Hu Zhao, Wei Jiang, Scott Willard, and Hongxing Zhang (2014) "The Effect of Water Temperature on the Growth of Captive Chinese Giant

Salamanders (Andrias davidianus) Reared for Reintroduction: A Comparison With Wild Salamander Body Condition." *Herpetologica*: December 2014, Vol. 70, No. 4, pp. 369-377. doi: dx.doi.org/10.1655/HERPETOLOGICA-D-14-00011R1