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Research interests

Animal ecology, museology

Urgent! Protecting Japanese giant salamanders by building a preservation model to save them from extinction

The Japanese giant salamander, a species of salamander native to Japan, is one of the largest amphibians in the world and is found mainly in western Japan (west of Gifu Prefecture). Its two forelegs have four fingers each, and its hind legs have five fingers each, somewhat resembling human hands.



I carry out research on the Japanese giant salamander, *Ôsanshō-uo*, which is designated as Japan's Special Natural Monument, and its preservation activities in collaboration with universities, local communities, and municipalities. I am also involved in the Higashi Hiroshima Eco-museum campaign, in which we define *Ôsanshō-uo* as a regional resource (exhibit) and its overall local habitat as an open-air museum, to sustainably protect *Ôsanshō-uo* and satoyama (mountain foothill grasslands subjected to moderate human intervention over many years for ideal coexistence between humans and nature).

Ôsanshō-uo is a Special Natural Monument, also called a "living national treasure," meaning that it is an animal species that represents Japan. Yet when you actually go to an area where you can find and study these creatures, you find them in a deplorable situation. Human-made concrete banks have divided clusters of individuals, keeping some individuals from breeding and causing others to thin out and die due to lack of food. Some larvae are flushed out into paddy fields. On a national scale, hybrid populations resulting from the introduction of non-native species have been increasing. This is a major threat. Moreover, the increasing frequency and intensity of rainstorms and flooding in recent years have displaced the majority of *Ôsanshō-uo* from upstream areas. There is no time to waste to save *Ôsanshō-uo*.

To protect *Ôsanshō-uo*, it is essential to build and act on a protection model that covers an entire catchment area. It would involve (1) protecting individuals that have been displaced or are found to be malnourished; (2) checking the status of hybridization, registering individuals while recording their sex, and releasing them in streams that are ideal for breeding; and (3) nurturing larvae. These steps must be followed by (4) constructing slopes along artificial streambanks to enable spontaneous movements by *Ôsanshō-uo* and (5) verifying the effectiveness of the slopes through studies. For the future, (6) carrying out information-sharing and awareness-raising activities to make the precarious situation of *Ôsanshō-uo* widely known in society is also important.

All these activities require the understanding and cooperation of local communities. So I am trying to improve society's recognition of the *Ôsanshō-uo* issue by conducting and participating in a broad range of activities, such as field trips, public lectures, and visiting exhibitions held by the university museum; developing merchandise and stamps on the chat app LINE; and publishing educational booklets for elementary schools. I seriously believe that more local people will understand and support our cause when they can visualize the concrete benefits that can come from *Ôsanshō-uo* by presenting them as a regional resource (tourism asset), and that this will boost the preservation of *Ôsanshō-uo*. Recently, local companies have begun to offer their support. Many local satoyama are facing the problem of depopulation, but I am hoping that collaboration among universities, local communities,

municipalities, and local companies can actually realize a new model that realizes regional vitalization and natural conservation at the same time as the eco-museum project.

When I work in the field, I can discern many secrets that have been hidden in Great Nature. There is real pleasure in finding them, forming hypotheses about them, and collecting data to demonstrate them. Since my research concerns living things, it does not always progress as I hope, and I have to collect data outdoors, even on rainy and snowy days. But that's great fun! We human beings are inhabitants of the spaceship Earth, one of the numerous species that make up the Earth's ecosystem. As calls for action to realize the SDGs are becoming louder today, it should be clear that learning about other animals and understanding them better is to safeguard our own future as well. To do so, it is important to acquire the practical ability to study them outdoors with your own eyes and touch them with your own hands, rather than just looking at them on your computer screen. For field studies, it is also important to learn how to effectively communicate with local people, which is essential for quality research. I hope to continue my field research in satoyama collaborating with local communities and contributing to the protection and preservation of *Ôsanshō-uo*.

Prof. Shimizu commenced his research on *Ôsanshō-uo* 10 years ago. It began with his encounter with an elderly man who had been studying *Ôsanshō-uo* independently for 30 years in Toyosaka-cho. Preserving the old man's wishes, Prof. Shimizu vigorously pursues his research and information sharing with the local communities.



(Left) Netsuke ornaments are commercially produced based on ideas generated by children whom Prof. Shimizu met during his visiting lessons.
 (Center) Educational booklet titled *Ôsanshō-uo ga iru rashii* (We hear there are *Ôsanshō-uo* around here), published by the Higashi Hiroshima City Board of Education, 100 yen including tax.
 (Right) *Ôsanshō-uo to kurasu tamemo 50 no koto* (50 things you should know to live with *Ôsanshō-uo*), the winner of the Amazon NextPublishing POD Award 2020, is a book combining four-panel comic strips and scientific knowledge to present *Ôsanshō-uo* in a broad, deep manner.

Background photo: A female *Ôsanshō-uo* sheltered at *Ôsanshō-uo-no-yado* (*Ôsanshō-uo* inn) in Toyosaka-cho, Higashi Hiroshima City (75 cm in total length, 4 kg in weight)

HU Research Topics 2020-2021

Education and Research Center for Artificial Intelligence and Data Innovation established in October 2020

Contribution to regional innovation through AI and data science

The application of digital and smart technologies are expected to further accelerate in the coming post-COVID-19 society. In anticipation of this trend, Hiroshima University has established the Education and Research Center for Artificial Intelligence and Data Innovation on the Higashi-Senda Campus to promote joint research with, and conduct personnel education for, local private businesses and governmental agencies. As its name indicates, the center is slated to serve as a base for education and research relating to AI, data science, and ICT that contributes to innovative creation by local entities and regional promotion.



The center is located within the Higashi-Senda Innovative Research Center (Higashi-Senda Campus).

Collaboration agreement signed with the National Institute of Special Needs Education in March 2021

For special needs education that truly meets individual needs

Hiroshima University signed an agreement for comprehensive collaboration with the National Institute of Special Needs Education, Japan's only state-run organization dedicated to special needs education. The two institutions will engage in joint research and regional support to propose ways to overcome challenges in special needs education and inclusive education — focusing on the mainstreaming of children with disabilities — in Western Japan. They aim to realize a special needs education that truly meets the individual educational needs of all children with disabilities.



Ceremony marking the signing of the comprehensive collaboration agreement with the National Institute of Special Needs Education