

Understanding the dynamics and determinants of recovery of a regionally iconic wild food resource following its near-extinction due to infectious disease

Supervisory team:

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Host institution: Cardiff University

Project description:

The Mountain Chicken Frog (MCF) is one of the world's largest amphibians and is endemic to the Caribbean islands of Dominica and Montserrat. This iconic species has traditionally been an important part of the local cultures, playing a major role in nutrition with an estimated 36,000 animals harvested annually for human consumption on Dominica alone. However, the emergence of chytridiomycosis due to infection with the fungus, *Batrachochytridium dendrobatidis* - Bd, in 2002 in Dominica led to the near-extinction of the species on the island. Despite efforts to avoid its introduction to Montserrat, Bd reached that island, with mass mortality first being detected in February 2009. Bd is major threat to amphibian populations, having caused the extinction of >200 amphibian species worldwide in recent decades. The Bd infection of MCF on Dominica and Montserrat is an ideal case study that can be used to understand the dynamics and determinants of species recovery following catastrophic declines due to infectious disease .

This project is of a multidisciplinary nature, combining laboratory and field work, next generation sequencing techniques, bioinformatics and epidemiology, as well as engagement with stakeholders involved in the management of remaining populations of MCF. The student will carry out field work in Dominica with the Institute of Zoology and local partners involved in MCF research. Using a combination of chytridiomycosis susceptible and tolerant animals identified in the past two years and during the course of the project, a combination of analyses aiming to characterise immune related genes (e.g. MHC) and the skin microbiome (skin is the only tissue infected by Bd in adult frogs) will be carried out to identify differences between the two types of animals that might be related to resistance to the development of chytridiomycosis. Also, genetic analyses will be conducted on archived and proactively-obtained samples of Bd to investigate if there has been any evolution of fungal virulence factors (some of which are already known for Bd). The student will engage with stakeholders locally and in the UK involved in MCF research to transfer knowledge and inform the species management plan.