

Working Together to Develop Madagascar's Amphibian Captive Breeding Capacity

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The Amphibian Conservation Action Plan (ACAP) 2005 highlighted captive programs as being an essential component of integrated amphibian conservation plans and central to this long-term success was the establishment of captive operations in range countries (1). Doing this however is easier said than done, especially in countries lacking infrastructure, resources and capacity to easily implement them. One such country is Madagascar.

A mega-diverse island nation, Madagascar has a tremendously rich diversity of amphibian species, with four families, 25 genera and potentially upwards of 400 species, of which over 99% are endemic and many are yet to be described. Along with much of Madagascar's other unique fauna its amphibians face a number of threats, most notably habitat loss but also the ongoing effects of climate change, overharvesting for the international pet trade and the recent discovery of chytridiomycosis in exported frogs is a new potentially devastating threat.

It was threat of chytridiomycosis and its potentially catastrophic consequences that the 2008 Sahonagasy Action Plan used to urge the need for investment in *ex situ* breeding programs (2). Now that it has been discovered in exported Malagasy frogs immediate attention is therefore warranted to develop the infrastructure and personnel in Madagascar needed to enact *ex situ* conservation programs as an important component in safeguarding Madagascar's threatened amphibian species.

BUILDING ON SOLID FOUNDATIONS

Fortunately this process is not starting from the complete beginning. In early 2011, through a collaborative effort between Association Mitsinjo, the Amphibian Specialist Group of Madagascar, and the Direction Générale des Forêts a breeding facility was developed in Andasibe, east-central Madagascar. Currently operating a breeding program for the Critically Endangered Golden mantella (*Mantella aurantiaca*), the biosecure facility now manages nine species, all of which are native to the local area, in addition to sustaining populations of a range of live food cultures. These species comprise a variety of breeding and life history types which provide information and guidelines for future threatened species.

The breeding facility is operated by the locally-run conservation organization Association Mitsinjo and is staffed by a team of eight residents from the Andasibe area. This impressive operation is testament to what can be achieved in Madagascar and is an exemplary model for other breeding facilities to follow.

To help this initiative and expand on the existing knowledge developed in Andasibe, Durrell Wildlife Conservation Trust (Durrell) jointly ran an EAZA funded Amphibian Conservation Husbandry training course in 2012. This included Malagasy participants from eight institutions, including Madagascar Flora and Fauna Group's (MFG) Parc Ivoloina, a zoo and forestry station located near the eastern coastal city of Toamasina.

Parc Ivoloina is now the site of a second small amphibian captive



Guibemantis pulcher at Mitsinjo's captive facility Photo: Devin Edmonds.

breeding facility. Completed in October 2013, staff have since been culturing fruit flies, developing biosecurity protocols, and finally maintaining a captive group of the Common reed frog *Heterixalus madagascariensis* as a practice species. It is imperative that any new captive breeding facility or initiative begins on the correct foundation on which to build and develop. Parc Ivoloina is in the fortunate position of having the technical expertise and a successful model in country with Mitsinjo.

COLLABORATIVE ACTIONS

As a key component of Durrell's Madagascar amphibian pro-



A technician caring for frogs at Mitsinjo's captive facility. Photo: Devin Edmonds.

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gram Durrell are facilitating a series of training exchanges between Association Mitsinjo and MFG Parc Ivoloïna. These exchanges will enable the specialized amphibian technicians at Mitsinjo to share their expertise with the MFG team, working together to trade ideas and to improve the park's newly developed facilities.

Mitsinjo made an initial visit to Ivoloïna at the beginning of May 2014. Following this trip a plan for the coming months was drafted which includes minor infrastructure improvements—for example the installation of an isolated quarantine room—and then training exchanges whereby staff from Parc Ivoloïna work alongside Mitsinjo in Andasibe and vice versa. An improved version of the curriculum used to train Mitsinjo technicians during the first six month period in 2010-2011 when the facility in Andasibe was being constructed will be used with Ivoloïna staff. Not only will this be useful for keepers at Ivoloïna, but it will also provide an opportunity for Mitsinjo's technicians to become teachers of captive amphibian husbandry themselves, building upon their more than three years existing experience working with captive frog populations in Andasibe.

These training exchanges are being supported by additional activities to guide future captive breeding initiatives. Mitsinjo and MFG with assistance from Durrell and Amphibian Ark are applying the AArk Amphibian Conservation Needs Assessment Tool (3) to the species in the Andasibe and Betampona areas respectively. Doing so will provide information on which species to prioritize for future captive breeding and allow the necessary preparations to be made. This could involve taking in a common analogue species so as to develop husbandry guidelines and protocols prior to bringing in threatened species when needed.

Following on from this assessment, collecting crucial life history and ecological information on priority species is critical for their future captive breeding. Durrell will be working with Mitsinjo to do just this for five Data Deficient species that have been identified as being at high risk from chytridiomycosis in the Andasibe area (4). Through this Mitsinjo staff and local community members will be trained in amphibian survey and monitoring techniques again improving the local capacity for amphibian conservation.

We are hopeful that through these training exchanges, further capacity will be built in Madagascar to allow rapid *ex situ* action to take place for the unique and highly endemic amphibian fauna of the island. Importantly we also hope this will be the beginning of a broader goal to build a national captive breeding network for Madagascar. This will enable the sharing of ideas, techniques and skills amongst the centres and develop an integrated collaborative ethos within the amphibian captive breeding community which will ultimately benefit the threatened amphibian fauna of Madagascar.



Mitsinjo and MFG staff working together at Parc Ivoloïna in May 2014. Photo: Devin Edmonds.



Feeding *Boophis* tadpoles at Mitsinjo. Photo: Devin Edmonds.

References

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