

Amphibian Conservation Needs Assessments

By Kevin Johnson & Luis Carrillo

Conservation Needs Assessments (CNAs) use current knowledge of species in the wild to determine those with the most pressing conservation needs and provide a foundation for the development of holistic conservation action plans that combine *in situ* and *ex situ* actions as appropriate. These assessments allow us to maximize the impact of limited conservation resources by identifying which measures could best serve those species requiring help. In conjunction with data from recent IUCN Red List assessments and other amphibian databases, the CNAs are a valuable resource for directing and prioritizing amphibian conservation planning and action at the national level.

BACKGROUND

In 2005 the IUCN Species Survival Commission (SSC) Amphibian Specialist Group (ASG) tasked the IUCN SSC Conservation Breeding Specialist Group (CBSG, now renamed the Conservation Planning Specialist Group, CPSG) with implementing the *ex situ* components of the Amphibian Conservation Action Plan (1, 2). The Amphibian Ark (AArk) was subsequently formed in 2006 as a joint effort of three principal partners: CPSG, ASG and the World Association of Zoos and Aquariums (WAZA). The AArk is an international NGO which supports a global network of captive breeding programs that are explicitly linked to conservation and research programs, and our role is to implement the *ex situ* component of the ACAP. We work closely with the ASG and the Amphibian Survival Alliance (ASA), to achieve a shared Vision: *Amphibians thriving in nature*.

AArk assists its partners in evaluating the needs of amphibian species for conservation work; leads development and implementation of training programs for building capacity of individuals and institutions; raises funds and provides grants for establishing and managing *ex situ* conservation programs; and develops communication strategies, newsletters and other messages and materials to promote understanding and action on behalf of amphibian conservation. Our mission is “Ensuring the survival and diversity of amphibian species focusing on those that cannot currently be safe-guarded in their natural environments”.

Conservation resources are limited, and the amphibian conservation community lacks the resources required to effectively manage the massive task of mitigating threats and protecting habitat to prevent further species extinctions. With 41% of amphibian species assessed by the IUCN Red List currently threatened with extinction (3) the CNA process seeks to objectively and consistently identify priority species and their immediate conservation needs, so resources can be most appropriately allocated.

THE ASSESSMENT PROCESS

In 2006, CBSG (now CPSG) and WAZA held an Amphibian *Ex Situ* Conservation Planning workshop in Panama (4), and during that workshop, a species selection working group developed a decision tree to provide high-level guidance to the *ex situ* conservation community, providing a means to identify and prioritize which amphibian species were most in need of *ex situ* intervention to prevent extinction (4). At the time the original process was developed there was no established methodology for evaluating the

suitability and need for a given amphibian species to be included in an *ex situ* program, and which of those species should have *ex situ* programs established ahead of others.

The decision tree has been further reviewed and refined and has now evolved into the AArk CNA process. While AArk’s focus remains to identify and prioritize species for *ex situ* conservation actions, the current version includes recommendations for both *in situ* and *ex situ* conservation actions (5). It is available online (www.ConservationNeeds.org), in English, Spanish and French versions, and all completed assessments and recommended conservation actions available on the web site.

Most often, national ASG Chairs help to coordinate and assemble appropriate experts in their country to collaborate on the amphibian assessments. Scientists, field biologists and researchers, animal husbandry experts and others are vital to the success of the CNAs. Sharing expertise and experiences enhances the assessments, ensuring that appropriate recommendations for national and global conservation actions are delivered where they are most needed, and participation in the process, along with the networking opportunities encourages stronger stakeholder buy-in. Assessments can be undertaken in a physical workshop-based situation, with appropriate experts, government representatives and other stakeholders present, or can be undertaken online, with trained facilitators using internet-based video conferencing services, such as Zoom. Online assessment workshops are much cheaper to hold and greatly reduce the carbon footprint associated with bringing experts together for physical workshops. With travel restrictions imposed by the global pandemic, virtual assessment consultations have become more common and have proven to be very successful. The subsequent assessments and recommendations for conservation actions generated by the data in the assessments can then be used as the basis for developing a new national amphibian action plan or updating an existing plan.

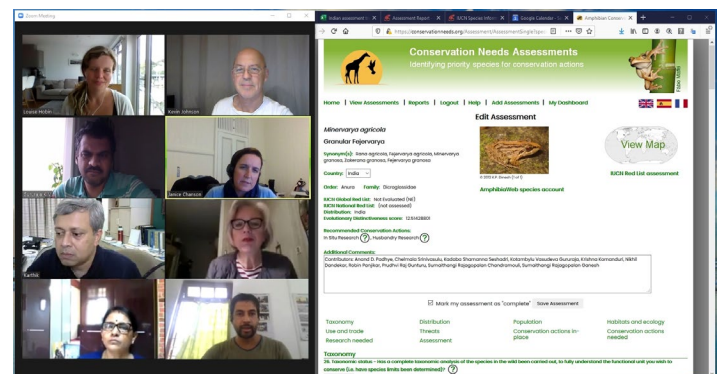


Fig. 1: Assessment workshops are increasingly being held online. Photo: Kevin Johnson.

Unlike IUCN Red List assessments, which assess the risk of species becoming globally extinct, CNAs are developed at the national level, since typically, conservation actions are also planned and implemented at the national level, hence multiple assessments, with differing recommendations might be available for the same species in different countries within its distribution.

A complete CNA for each species includes current information

on the status of the species in the wild; suitable protected habitat; the threats facing each species and the likelihood of them being mitigated in time to prevent further decline; cultural, scientific, socio-economic and phylogenetic significance; and past *ex situ* experience with the species, as well as information about potential authorization for implementing *ex situ* conservation programs, and the availability of founder animals, should captive assurance colonies be required. Any additional field research which might be required is documented, along with any conservation actions which are required *in situ*.

Once assessments are completed and saved, each species is assigned to one or more of ten different conservation actions, based on the data in the assessments. Potential actions include *Ex Situ* Rescue, *In Situ* Conservation, *In Situ* Research, Husbandry Research, Supplementation, Biobanking, Mass Production in Captivity, and Conservation Education, with none, one, or multiple actions being recommended for each species. These high-level actions, in combination with the data and extensive supporting comments recorded during the assessment process, can subsequently be used by national or regional amphibian conservation groups as a guide to develop new, or update existing amphibian action plans within each country or region or as a prioritized guide to inform future conservation program development. Species are listed according to their priority for the particular conservation action.

ASSESSMENT RESULTS

The current version of the CNA process has been used to generate almost 4,200 assessments for 3,544 species of amphibians (31% of the 8,384 currently known species (6), in 47 countries (7). Approximately 32% of completed CNAs have been for Asian species, with 25% in South America, 14% in Central America and 14% in North America (Fig. 2). CNAs for species in Africa, Europe and Oceania remain relatively low in numbers. Anurans account for 3,582 assessments, with 528 assessments for caudates and 87 for caecilians.

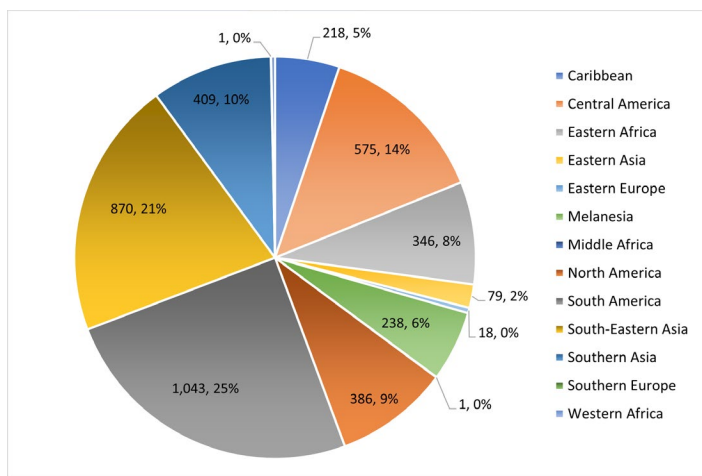


Fig. 2: Number of completed Conservation Needs Assessments by region.

Of the assessments completed to date, more than half (2,845) lack one or more critical pieces of information at this time, with further *in situ* research required to be carried out as part of the conservation action for the species. For many of these assessments, a brief description of the specific research required is included in the assessments (Fig. 3).

According to the data, 1,048 assessments (25.5%) state that no conservation actions are required at this point to ensure the species' survival, with an additional 574 assessments (13.7%) indicating that the majority of the population of the species in the wild is sufficiently protected to prevent further decline in numbers. However, for 676 assessments (16%) no knowledge about the threats to this species exists, or there is so little information known about the distribution of the species in the wild, that the threats cannot be determined. Four hundred assessments indicate that the current threats cannot be mitigated in time to prevent further decline or extinction, and these 400 assessments recommend that *ex situ* conservation-assurance programs are required for 382 different species, to prevent their eminent extinction.

The assessment process considers effectively protected habitat (i.e., actively managed to protect natural biodiversity, within a national system of protected areas or privately-owned land), with 1,754 assessments suggesting that 50% or more of known populations are currently in effectively-protected habitat, while 1,961 assessments show that less than 50% of known populations are in effectively-protected habitat. The status of populations in protected habitat is unknown in 461 assessments.

Definitions for the recommended conservation actions and the criteria for allocating them can be found on the CNA web site at <https://conservationneeds.org/Help/EN/ConservationActions.htm>.

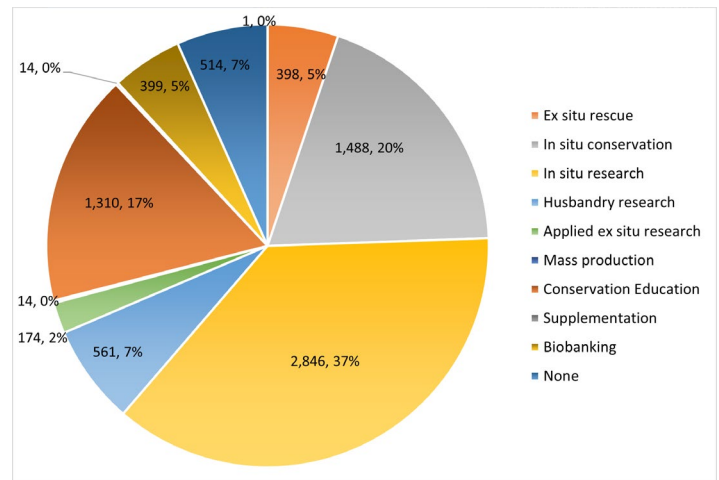


Fig. 3: Number of recommended conservation actions generated by Conservation Needs Assessments. Note that multiple actions are recommended for many species.

RED LIST & CONSERVATION NEEDS ASSESSMENTS

We are often asked if there is overlap with RLAs. Approximately 40% of the data contained within a RLA is also required within CNAs. The CNAs amplify conservation actions in RLAs, with the Conservation Needs section in many older RLAs lacking consistency and not providing guidance, although recommendations are now required in RLAs for threatened species. The CNAs complement RLAs, and when used together, they provide a more holistic guide to conservation priorities and actions.

The group of experts required to compile both RLAs and CNAs is similar and bringing them together for a single workshop is a much better use of our respective resources. Since early 2018 joint assessment workshops have been held for species in Costa Rica, Ghana, Honduras, India, Malaysia and Papua New Guinea, with a joint methodology being developed to integrate both sets of ques-

tions into a single process.

USING THE ASSESSMENTS

National groups of relevant stakeholders should make use of the recommendations to develop a national action plan, followed by holistic species-level action plans for the highest priority species that detail species actions, responsible parties and a timeline for achieving the goals outlined in the plan.

While many amphibian field researchers are well aware of research priorities within their countries, or the regions in which they work, the CNAs provide a consolidated list of species which require further research, and the most pressing needs. Species' requirements can be grouped by geographic locations and are an ideal way of developing field research projects for students and others. When additional information is discovered, the corresponding CNAs can readily be updated, and after doing so, recommended conservation actions will also be updated, based on the new data.

In many countries, zoos and aquariums work closely with their regional or national wildlife authorities, and the decision about which amphibian species are priorities for captive assurance programs is often made collaboratively, based on national assessments. However, in many countries, the decision about which amphibian species to manage in captivity is made based on information which lacks current knowledge of the situation in the wild. Field experts contribute current knowledge to the CNAs, and so the priorities and recommended actions they contain are based on a more solid input than that which generally exists within the *ex situ* community.

Although conservation resources should generally be applied to the highest priority species, this is not always practical. Some species may be facing serious threats that are unlikely to be mitigated or have such low numbers in the wild that the chance of recovery is extremely low. Likewise, some species have not been seen in the wild for many years, despite regular surveys. Thus, the potential benefit of any conservation actions directed toward an individual species must be weighed against the likelihood of success, with resources directed to those that are most likely to show the most promise of benefitting from those resources.

The CNA process has been an evolving protocol. The criteria and their rankings have been adjusted as experience with the process was gained, and we continue to work with the broader conservation community to identify goals, threats, and conservation options. This evolution is ongoing, with regular reviews of the type of information being collected in the assessments, and the methodologies used to generate priorities and recommended conservation

actions. Assessments and prioritization of individual species are reviewed and updated as we gain knowledge and as the threats to each species change. While the process was originally designed to be used with amphibians, it is now designed such that it can be applied to any group of taxa, and its use with species other than amphibians is currently being tested. The questions in the assessments, possible responses, and the text used within the interface are all customisable and can readily be modified if needed, to better suit difference taxonomic groups.

References:

1. C. Gascon, J. P. Collins, R. D. Moore, D. R. Church, J. E. McKay, and J. R. Mendelson, III, J.R. (Eds.). *Amphibian Conservation Action Plan*. (IUCN/Species Survival Commission Amphibian Specialist Group. Gland, Switzerland, and Cambridge, UK, 2007).
2. S. Wren, A. Angulo, H. Meredith, J. Kielgast, M. Do S Santos, P. Bishop (Eds.) *Amphibian Conservation Action Plan*. IUCN Species Survival Commission Amphibian Specialist Group. <https://www.amphibians.org/resources/library/acap/> (2015).
3. IUCN Red List of Threatened Species. Version 2012.2 (IUCN, 2012; www.iucnredlist.org)
4. K. Zippel, R. Lacy, and O. Byers (Eds.) *CBSG/WAZA Amphibian Ex Situ Conservation Planning Workshop Final Report*. (IUCN/SSC Conservation Breeding Specialist Group, Apple Valley, MN, USA, 2006).
5. K. Johnson, A. Baker, K. Buley, L. Carrillo, R. Gibson, *et al.* (2020). A process for assessing and prioritizing species conservation needs: Going beyond the Red List. *Oryx*, **54**(1), 125-132. doi:10.1017/S0030605317001715
6. AmphibiaWeb, <https://amphibiaweb.org> (2021).
7. Conservation Needs Assessments, <https://conservationneeds.org> (2021).

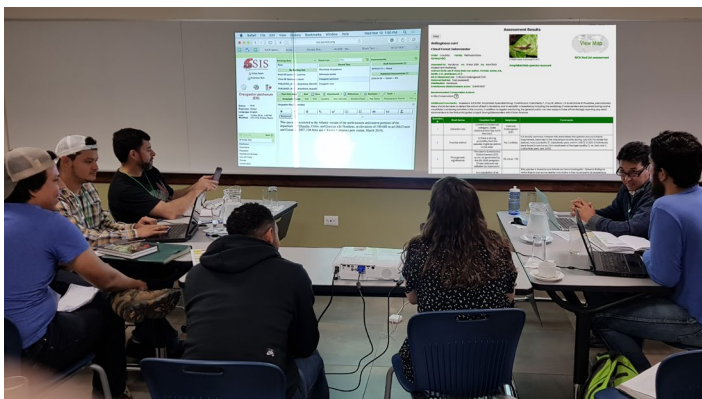


Fig. 4: Joint Red List/Conservation Needs Assessment workshops are held where country priorities overlap. Photo: Kevin Johnson.