How do we deal with conservation-reliant species?

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Summary
The aim of this working group session was to discuss the prioritization and allocation of resources for conserving species that may always be reliant on some human intervention to manage threats or foster population viability. The group discussed the need for a paradigm shift to be working under the assumption that most imperiled species will need some form of human management (whether intensive or extensive) in perpetuity. We can no longer assume that protection of imperiled species is a finite process resulting in self-sustaining populations and no further threats. The group discussed several tools, processes, and structures that can be used to prioritize resources for species. The group also emphasized the need to communicate (within our community and with the public) the normalcy of continued management of imperiled non-game species as well as the difficult decisions we face in selecting species for conservation resources.

Introduction
In the introduction to the working group, Sarah Long presented some definitions of species recovery (e.g. US Endangered Species Act) that revolve around the commonly held assumptions that threats to species can be mitigated or eliminated and that recovered species should be self-sustainable (i.e., not reliant on human intervention). These assumptions affect the metrics of success surrounding species recovery work, public perception, and funding of conservation efforts. However, many threats may not be possible to eliminate (e.g., invasive species competitors or feral predators, loss or degradation of habitats, climate changes) and human-induced threats are likely to get worse with population growth and urbanization. In an analysis of USFWS recovery plans, Scott et al 2010 found that some kind of assistance or management may be necessary in perpetuity for an estimated 84% of U.S. endangered and threatened species. Participants in the working group included biologists closely involved with some high profile examples of "successful" conservation programs that have turned out to be in fact highly reliant on continued human intervention:

> Examples: Arabian oryx: Extinct in the wild and reintroduced in the 1980's thanks to successful captive breeding and release efforts. Wild population increased and then poaching began again and population declined. Poaching and captive breeding will need to be ongoing in order to keep this species protected.
> Golden lion tamarins: Captive breeding, husbandry, and release targets were reached; however, maintaining forest on private lands is required for the program to have continued success. This involves extensive public/private partnerships, legal issues, funding, reduction in deforestation, etc.

The overall discussion of the working group focused on a few key areas relating to this topic:
- awareness (or lack thereof) of the normalcy of conservation reliance
- prioritization – how could or should conservation reliance be factored into the prioritization of species for protection and conservation resources?

- planning – how should conservation organizations incorporate long-term reliance into conservation plans for a species?

Awareness

The group agreed with the premise that all species are conservation-reliant because the majority of animal populations are managed to some degree, ranging from less intensively (e.g., monitored in a finite space *in situ)* or more intensively (e.g., *ex situ* populations). There is no "wild" left as humans imagine it. The initial discussion after the introduction focused around the simple thought that these facts sorely need increased awareness, both within and outside the conservation community. We agreed that this needs to become the accepted mindset; the new normal, and that more work needs to be done to change the government, social, public attitude about how prevalent conservation-reliant species are. Conservation to create sustainable populations should no longer exclude human intervention or be deemed as less successful if human intervention is needed for the long term. This new mindset changes the definition of conservation. These issues are relevant to humans, too, because humans will need to accept living with wildlife in order for many species to survive. Some species that are around every day are necessary for our wellbeing (ecosystem services).

Several possible action items (for different audiences – professional and public) were discussed:
- Position paper, scientific paper
  - Success stories can help provide structure for governments and organizations for programs for conservation-reliant species. A published paper showing examples might be a good way to start talking about this necessary paradigm shift.
- Can CBSG do something to contribute? As a group, CBSG members have acknowledged the paradigm shift that most species will always be conservation reliant. We've accepted that as normal. Now we need to change the awareness of other stakeholders.
  - Transparency in the decision making behind conservation projects is needed and would help increase public awareness about the real-world factors that scientists, governments, and other stakeholders need to weigh when deciding to devote resources to conserving a species. And increase public awareness that people are making decisions that ultimately result in some species surviving and some going extinct.
  - Not using the word 'save' is important because it implies an end-point to conservation management.
  - Public relations and marketing efforts of individual zoos, zoo associations, and other conservation organizations could be aimed at highlighting the inter-connectedness of species, humans, and the ecosystem should be promoted.
- Can this be on the agenda for IUCN/SSC?
  - How can the IUCN work with CBSG to help set priorities? The system of communication needs improvement. IUCN is, however, only one small part of the priority setting.
  - The gap between the Red List and the SSC needs to be resolved and has been under discussion for some time. If there are 23k listed as threatened, how do we realistically come up with the required conservation plan? How would conservation reliance be factored in? How can we be realistic in conservation?

Prioritization
A second focal point of the working group discussion was around developing a prioritization scheme to identify conservation-reliant species that have the feasible chance for recovery. However, we realized that we may not need to reinvent the wheel to do this if these prioritization tools already exist. If we use existing tools (e.g., IUCN, EDGE, AZE, COI, CNA) for prioritizing species, then viability might be a more important factor to incorporate. Open and honest discussions with government agencies and NGOs should confront whether they would step away from protecting a species if the threats cannot be completely eliminated. If conservation-reliance is penalized too heavily in a prioritization scheme, then many less 'sexy' or less charismatic species will likely not get protection.

Conservation reliance itself may be difficult to measure. Different forms of conservation reliance (from Goble 2012) were introduced which could affect prioritization, viability, and likelihood of success:
  - population-management reliance
    • Artificial recruitment (captive breeding, releases, etc)
  - threat-management reliance
    • Control of other species
    • Habitat management
    • Pollution reduction

Conservation viable vs non-viable species may be another way to look at this issue, factoring in characteristics of the population or the ability to mitigate threats. However, discussions swirled around the difficulty of determining the likelihood of a population succeeding, starting with the potentially immense data or analytical resources (e.g., PHVAs) to make an informed decision about population viability. The difficulty in predicting which populations could overcome severe demographic, genetic, or logistical bottlenecks was highlighted by examples of the success of once small and seemingly nonviable populations such as black-foot ferrets and whooping cranes (i.e., teaching whooping cranes to migrate was considered impossible). It was also noted that passion and motivation of species champions are key to the success and funding of many species, but these factors are also difficult to predict or create independently.

Existing literature on this topic from the zoological community may be useful for further reference (i.e. Deborah Jensen and Kent Redford published a commentary in Science regarding conservation-reliant species, WAZA magazine vol 13 2012). Prioritization methods are discussed in Scott *et al.* 2010, for example: cost-effectiveness (Murdoch *et al.* 2007), return on investment (Briggs 2009), and conservation opportunity index (COI) which is a compilation of indicators that quantify the possibility of achieving successful (Conde *et al.* 2015).

*Existing lists and tools for prioritizing species for conservation resources:
IUCN Red List
EDGE – Evolutionarily Distinct and Globally Endangered (Zoological Society of London)
AZE – Alliance for Zero Extinction
CNA - Conservation Needs Assessment (Amphibian Ark)

Several possible action items relating to prioritization were discussed:
  • Can the composition of the IUCN SSC groups include more CBSG members to get the prioritization process started?

- PHVAs could be used to filter some of these existing tools to identify viable species. Having PHVAs for EDGE, AZE, IUCN, CNA -listed species could help prioritize.
- CNA (Conservation Needs Assessment – has a prioritization score for *in situ* conservation) is for amphibians, but could be modified for other taxa. It's a place to start.

The discussion about prioritization led into the topic of planning - Can we come up with a feasible plan that can make a species viable in the long-term? How do we assess our confidence in developing a feasible plan? The prioritization step probably needs to come before the planning step for many species, but in the meantime while planning we (CBSG) can still use available tools.

Planning
A third topic discussed revolved around how the acknowledgment of widespread conservation reliance might change the roles or actions of government, non-governmental organizations, or private people in conservation. Conservation reliant species will likely need changes in funding (more, long-term), more creative use of public/private partnerships and legal structures, and prioritization. The discussion focused on conservation planning efforts to acknowledge reliance on human intervention in the early stages while at the same time incorporating realistic and feasible goals and actions. Continuing from information that is important in initial prioritization of species, planning should assess intrinsic and extrinsic threats to population viability and determine how to mitigate these threats. Detailed and realistic conservation actions should have a higher priority in the planning process. Social scientists need to be brought in early as well to help provide information about the human dimension.

Discussions of planning led back to concerns that ongoing funding and support that are necessary for conservation-reliant species will be difficult to secure without perhaps a change in awareness that long-term human involvement will be the new normal for conservation projects. A paradigm shift is needed in this area too as government authorities do not tend to support conservation for species indefinitely, or cannot be relied upon due to changes in administrations and policies over time. For example, in Australia, government changes ended funding for critically endangered bird species bred in zoos. Some hope for solutions to funding may lie in shifting the focus of conservation planning to be less on species and more on protected areas (which often receive government resources or protection indefinitely), or to transfer the accepted maintenance of game species to non-game endangered species (by highlighting ecosystem services or other added value of non-game species).

Specific concerns of the zoological community were also highlighted here, such as the risk that zoos will become a parking area indefinitely for endangered species, and that zoos can't assist additional species on top of the current ones they are already struggling to make viable.

Possible routes of action relating to planning for conservation-reliant species:
- CBSG can best help governments make conservation considerations by providing the data they need.
- The zoo community may need to think more broadly and flexibly about some programs being only *ex situ* and some *in situ*/*ex situ*. One Plan approach was mentioned as a framework for implementation after the prioritization has occurred.

Key actions/next steps agreed upon
- Increase collaboration between IUCN Species Survival Commission and regional zoo associations' taxonomic advisory groups (TAGs) to identify needs of species *in situ* or *ex situ* and develop more holistic conservation action plans for all species.

- Use existing lists and tools (e.g., IUCN Red List, EDGE, AZE, CPN) and processes (PHVAs, feasibility reviews, cost/benefit analyses, IUCN guidelines on *ex situ* management) to prioritize resources for species.
- Develop a communication plan to convey the ongoing need and normalcy of conservation-reliant species and the difficult decisions conservationists and policy makers face (for various audiences including the conservation community, governments, and the public).
- Write a position paper or scientific paper highlighting stories of successful conservation projects that continue to need management (e.g., Arabian oryx, golden lion tamarin)