ON THE ISSUES OF TRIAGE IN CONSERVATION

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ABSTRACT

The process of determining the priority of patients' treatment based on the severity of their condition is termed triage. This principle attempts to ration the treatment of patients efficiently in the midst of insufficient resources for all to be treated immediately. In a conservation context, triage is the considered to be a process of prioritizing the allocation of limited resources to maximize conservation returns in the midst of a constrained budget. This practice requires accounting for the cost, benefits and likelihood of success for such alternative conservation efforts as protection, restoration, pest eradication, education and training. It seems more attention is paid to considering the probability of success and cost, prioritization of conservation efforts for threatened and endangered species than focusing on factors measuring risk of extirpation. This paper provides additional insight to reasons why we should reject triage. It also tried to direct attention to what is essential instead of triage. The kind appeal to the conscience of every conservationist is that extinction should not be considered as imminent as the situation of injured soldiers to battlefield doctors. Thereby, bringing it once more to our minds that the presently threatened species were once abundant, but it took human greedy attitudes to bring them to their present conditions. As such, removal of the threats and with less cost than we suppose, the populations of these species will be restored over time. Let triage principles and practices be triaged among conservationists, and let us deploy our utmost capability to conservation efforts.

Keywords: Triage, conservation, biodiversity, ecosystem, habitat, species, extinction, management.

INTRODUCTION

Making wrong decisions may have far-reaching consequences in achieving the ultimate goal in conservation of biodiversity. The current trends in making decisions in conservation in the midst of limited resources is the use of triage principles and practices. Triage has its origin in military clinical history (e.g. Iserson and Moskop, 2007) and today is used at most hospitals and in a variety of conservation settings. Triage stems from the French verb *trier* which means to separate, sift or select. It was used during the Napoleonic Wars and World War I by French doctors in treating wounded soldiers at aid stations (Chipman *et al*, 1980). In this scenario, the battlefield wounded is classified into three categories:

- Those who are likely to live, regardless of what care they receive;
- Those who are likely to die, regardless of what care they receive;
- Those for whom immediate care might make a positive difference in outcome.

Four conditions under which triage are invoked include:

- Existence of insufficient capacity to adequately treat all patients.
- Patients in critical condition cannot wait until additional capacity becomes available.
- Existence of differences in the likely outcome and

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- Requirement of differential amounts of treatment.

On this basis, triage is defined as the process of determining the priority of patients' treatment based on the severity of their condition. This tries to ration the treatment of patients efficiently in the midst of insufficient resources for all to be treated immediately. In a conservation context, triage is the process of prioritizing the allocation of limited resources to maximize conservation returns, relative to the conservation goals, under a constrained budget (Bottrill *et al.* 2008). Achieving this will require accounting for the cost, benefits and likelihood of success for such alternative conservation efforts as protection, restoration, pest eradication, education and training.

Providing the rational process by triage to maximise the protection of life in periods of crisis does not make it an absolute ideal in all conservation issues. The use of triage has been argued to promote defeatism when it seems that assets have become very difficult to salvage (Pimm, 2000). This makes triage an 'ethically pernicious' approach to conservation and may lead to the protection of only moderately threatened biodiversity assets.

Rather than considering the probability of success and cost, prioritization of conservation efforts for threatened and endangered species has tended to focus on factors measuring risk of extirpation (Schneider *et al.*, 2010).

REASONS

Why we should Reject Triage?

The lack of absolute or complete information about ecosystem functions, to allow us to know which species are the 'load-bearing' ones whose presence keeps a complex ecosystem from collapsing constitutes one of the major reasons we should reject triage principles and practices. Norman Myers, a fellow of the University of Oxford, UK, and adjunct professor at Duke University in Durham, North Carolina, says "We are so fundamentally ignorant." On the platform of limited precision and accuracy in conservation research, we cannot afford to say which species are dispensable or not. In support of this, Andrew Balmford, a conservation biologist at the University of Cambridge, UK, affirmed that spotting key species is "an interesting exercise intellectually ... but by the time we've figured it out the forest will have gone anyway." How much trust should we place on our calculation of the likelihood of success in conserving one species over the other?

Induced extinction is unacceptable in biodiversity conservation efforts. We should be asking whether extinction should be encouraged at all-even in its mild form called triage. It is pertinent to state that triage is a subtle way of encouraging extinction of some species considered low in value, ecological benefit and high in the cost of their conservation (Bottrill *et al.* 2008). In the name of using triage as a prioritizing tool in conservation, we seem to decide which species should be conserved and which we should not. In this, most conservationists have denied encouragement of extinction by being implicit over sacrificing some species to conserve other species in the name of prioritization. In such a country as Australia with stable government, well-enforced laws and the highest median income in the world, "the only reason they cannot hand over the extraordinary array of life they have inherited to future generations would be lack of commitment," says Stephen Garnett. Who would not accept the successful increase of the wild population of the Californian Condor from 22 to 237 as a typical 'anti-triage' success story, having saved the evolutionary distinct genus *Gymnogyps* --not to mention those of the Black-footed Ferret (*Mustela nigripes*), Mauritius Kestrel (*Falco punctatus*) or Red-cockaded Woodpecker (*Picoides borealis*), which on their own speak to the idea of hope (Pimm, 2000).

Triage strikes heavily at the fundamental concepts in conservation biology - that species have inherent value and that extinction is unacceptable (Leopold, 1949). Aldo Leopold, the founder of modern conservation, concisely mentioned that "the first rule of an intelligent tinkerer is to keep all the pieces" (*ibid*). To sanction extinction in the name of efficiency would justify the course of those whose interests are contrary to conservation (Soule, 1985). Thus, to argue that efficiency calculation should include the impacts on corporate profits of conservation programs that hinder resource extraction may end up prescribing extinction of species when recovery interferes with economic progress.

Jachowski and Kesler (2009) agree with Bottrill *et al.* (2008) on the need for efficient distribution of conservation resources, but disagree on the inclusion of extinction as an acceptable outcome for ecosystems or species falling at the 'inefficient' end of the spectrum of resource allocation models. Better still, conservation biologists who are 'squeamish' about extinction need to carefully consider the long-term effects of their decisions and strive towards allocation of resources to monitoring and recovery of all species and systems (Noss, 1996). In the words of Jachowski and Kesler (2009), "we must always retain hope for breakthroughs that could lead to recovery, even if only minimal resources are dedicated to the direst situations. Advances are a product of initiative and discovery, which cannot occur without investment."

Triage principles and practices may encourage under-investment in the conservation of our biodiversity. If we can allow one species to go extinct to accommodate other economic issues, we may also allow as many other species as possible to go extinct in order to accommodate more economic and developmental issues. Estimates suggest that only US$6 billion was spent per year globally on protecting biodiversity in the last twentieth century (James *et al*., 1999). Can this be compared to an estimated US$33 trillion direct and indirect benefits derived per year from ecosystem services provided by biodiversity? This implies that we are dealing with an asset worth US$33 trillion (Costanza *et al*., 1997). On the premise that species can be allowed to go extinct coupled with less effort on the side of government to conserve our biodiversity, if governments that fund conservation tighten their purse strings, the next resort by the conservationist using triage would be to assign more species and systems to the ever-increasing extinction pile.

What is essential instead of triage?

There is a great benefit in avoiding the need to spend, rather than deciding what spending prioritization framework should be applied. This stems from the fact that no amount of spending will reverse species population downward trends unless the causal agents are taken care of. We can reduce the need to rely on retrospective conservation management approaches through appropriate avoidance and minimisation controls, coupled with enacting positive change by being proactive. Also, developing frameworks that reduce human greed, consumption and mitigating the effects of unchecked human population growth and other ecologically unsustainable practices such as land clearing and pollution will contribute immensely to achieving our conservation goals.

Among the fundamental resource allocation questions faced by conservation scientists and practitioners include whether conservation goals are best met by managing single species or whole ecosystems (Simberloff, 1998). Ecosystem-based priorities which determine where and when to acquire protected areas have been the historical platform for efforts in setting conservation priorities (Ferrier *et al.*, 2000; Margules & Pressey 2000; Pressey & Taffs, 2001; Meir *et al*. 2004).

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Triage principles and practices are species-based conservation management approaches, which concentrate on allocating conservation resources to single species (Leader-Williams & Dublin, 2000). Some of the questions that arise from single-species conservation include how individual species should be prioritized, whether management of one focal species would not be detrimental to another, whether evidence exists for the effectiveness of one focal species in adequately protecting viable populations of other species, as in the case of umbrella species. A single-species conservation approach considers selecting some species and prioritizes which to save and which to sacrifice in the face of limited conservation resources. As a result of the problems associated with a single-species approach, management focus has been turning toward multispecies approaches, ecosystem and habitat-based approaches, and systematic conservation planning.

Conservation methods based on several focal species, or protecting a specific habitat type, might be a more appropriate and efficient means of conserving species (Lambeck, 1997; Fleishman *et al*., 2000; Sanderson *et al*., 2002b) than even triage-based single-species practices. Setting conservation priorities on a single species is considered improbable on the basis that the requirements of one species would encapsulate those of all other species (Noss *et al*., 1996; Basset *et al*., 2000; Hess & King, 2002; Lindenmayer *et al*., 2002). Thus, there is a clear need for multispecies strategies to enlarge the coverage of species conservation efforts (Miller *et al*., 1999; Fleishman *et al*., 2000, 2001; Carroll *et al*., 2001). Lambeck's (1997) 'focal species' approach seems quite promising, as it provides a systematic procedure for selecting several focal species which are used to define the spatial, compositional and functional attributes that must be present in a landscape. Additionally, this approach identifies the main threats to biodiversity and selects the species that is most sensitive to each threat. Conservation actions are based on the requirements of these species. This outweighs the triage concept, as multiple threatened species are captured in a single conservation plan. Furthermore, Sanderson *et al*. (2002a) proposed the 'landscape species approach'. In this, landscape species are defined by their use of large, ecologically diverse areas and their impacts on the structure and function of natural ecosystems such that their requirements in time and space make them particularly susceptible to human alteration and use of wild landscapes. Meeting the needs of landscape species would provide ample protection for the species with which they interact and co-occur in the ecosystem.

Instead of using triage to prioritise at species level, it will pay more to set conservation priorities at the scale of ecosystems and habitats levels. This ensures that viable populations of all native species are maintained *in situ*, all native ecosystems are represented across their natural range of variation, with evolutionary and ecological processes maintained, together with the evolutionary potential of species (Grumbine, 1994).

The essence of systematic conservation planning includes locating and designing protected areas that maximally represent the biodiversity of each region. This focuses on removing the threat of development and complements species recovery plans by mitigating threats.

CONCLUSION

It is a faulty assumption that efforts to reverse extinction are unfeasible due to an attributed 'astronomical' cost. Saving highly threatened species is not automatically impossible, or necessarily prohibitively costly. We need to avoid painting the picture that these animals do see our currencies to start breeding for their survival, nor uses our fund to purchase a home or food. The protection of sites which species naturally inhabit is a frontline of global defence against species extinctions. Stuart Pimm, a conservation ecologist at Duke University and world expert on extinction, points out that recovery programs for critically endangered species such as the condor and whooping crane are valuable testing grounds. "These projects teach conservation scientists what works. Pushing the frontier is not cheap," Pimm says.

The realities involved in conservation are more complex than triage theory of deciding which patient to treat and which not. The prediction for possible survival is far less certain for a threatened species than for a human patient (Parr *et al.,* 2009). Extinction is not as imminent as the situation of injured soldiers to battlefield doctors. Conservationists need not dumb their thinking minds by the idea that all conservation intervention must be costly to work. The presently threatened species were once abundant, but it took human greedy attitudes to bring them to their present conditions. Let the threat be removed and with less cost than we suppose, the populations of these species will be restored over time. Let triage principles and practices be triaged among conservationists, and let us deploy our utmost capability to conservation efforts.

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