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Staving off extinction – more than luck and fate

Adrian Burton regularly writes a fascinating column in *Frontiers*, and his article from December 2016 (“Staving off extinction”) discusses two Australian species: the Bramble Cay melomys (*Melomys rubicola*) and the Lord Howe Island stick insect (*Dryococelus australis*). However, we suggest the article misses a key and generalizable point about their fates (extinction and to-date successful conservation, respectively) as well as the factors that led to those fates. That is, the Lord Howe Island stick insect survives today not simply because of luck but because conservation managers intervened rapidly, effectively, and decisively (Priddel *et al.* 2003). Consequently, there are now captive colonies around the world and staged plans for an eventual reintroduction to Lord Howe Island (Priddel and Carlile 2010). Although its future in the wild is not yet secured, the stick insect is a remarkable story of conservation success. Conversely, the Bramble Cay melomys was rendered extinct in large part because of management inaction and disregard. As Burton noted, this was a species living on a knife-edge: it should have been evident to any person or agency with any responsibility for its survival that it needed help. Its extinction could readily have been averted – and should have been – through simple and appropriate conservation actions (Woinarski *et al.* 2017).

Many species are now on the edge of oblivion (Maxwell *et al.* 2016). In response, international policy such as the Aichi Biodiversity Targets and the UN’s Sustainable Development Goals explicitly commit governments to “prevent the extinction of threatened species”. What can these two case studies tell us about the mismatch between this clear policy commitment and its realization? Obviously, they suggest that the fate of such species will increasingly depend upon whether (and how) managers and the community respond to imperilment.

From these two cases, we recognize four factors that may influence the degree of management response:

(1) The risk of imminent extinction needs to be explicitly assessed and that risk then used to prioritize management response. There are many appropriate risk assessment procedures, such as Population Viability Analysis and IUCN Red List assessment. In these two cases, no numerical assessment of extinction risk was undertaken. But in a less formalized process for the stick insect, several factors led managers to appreciate the species’ proximity to extinction: it had disappeared from all of its previously known range, a well-defined threat (introduced predators) still operated, and its newly discovered population comprised only a handful of individuals. Managers were more complacent about risks to the Bramble Cay melomys, because it had long persisted in its (very small) range and the limited monitoring data indicated only gradual decline. Nevertheless, the low-lying island on which it occurred was at risk of inundation. Its susceptibility to catastrophic habitat loss and hence high extinction risk should have prompted policy and management response, but sadly did not.

(2) Effective advocacy is critical; politicians, policy makers, resource managers, and human societies per se are more likely to respond if a species has a

public profile and therefore a broad constituency pushing for its conservation. The stick insect’s range happened to lie within a conservation reserve staffed by committed conservation officers, and its quirky rediscovery by extreme adventurers climbing an isolated oceanic rock spire prompted media attention and fostered interest and diverse community support from schoolchildren to politicians. The Bramble Cay melomys, on the other hand, had no champions. It lived on a small, remote, and uninhabited island visited by few people; even researchers paid it scant attention. In contrast to the normal order of things, in this case, the invertebrate had charisma whereas the mammal was a “lackluster” rodent. We suggest there is a need to raise the public profile of species more in line with extinction risk and ensure that any need for emergency response (without which extinction will almost certainly occur) is widely communicated to a broad constituency within society. However, this is a complex issue because many conservationists have long used charismatic species (sometimes with relatively low extinction risk) to attract public interest and to rightly build the support needed to influence policy makers.

(3) Managers are more likely to invest in a conservation response if there is a strategic, detailed, and objectives-based



Figure 1. The Bramble Cay melomys (*Melomys rubicola*) was lost because nobody intervened to save it.

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process or plan for recovery with well-articulated priorities for action and a clearly justified budget. In the case of the stick insect, the recovery pathway – captive breeding, threat reduction, and reintroduction – was clear and practical. The recovery plan prepared for the Bramble Cay melomys provided a comparatively opaque and insufficient pathway to recovery.

(4) As per international goals, governments should strive to prevent all avoidable extinctions. To allow – through neglect, ineptitude, community disinterest, or deliberate choice – “saveable” species to become extinct is to abrogate responsibility and to open a door to ever-increasing disregard for extinctions. We recognize that this objective will be challenging to meet but not to do so is likely to result in more cases of avoidable extinction. Of course, government commitments alone do not ensure action or success. Commitments need to be more firmly based in law and implemented effectively through

organizational processes (Woinarski *et al.* 2017).

Conservation biology needs fewer failures and more success stories to engender greater support from the general public about the importance of the science and management of preserving biodiversity (Garnett and Lindenmayer 2011). The contrast between the stories of failure for the Bramble Cay melomys and of success for the Lord Howe Island stick insect is stark and illustrates the difference that informed action can make.

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