



Perspective

Secrecy considerations for conserving Lazarus species

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ARTICLE INFO

Article history:

Received 7 January 2014
 Received in revised form 25 March 2014
 Accepted 31 March 2014
 Available online 10 May 2014

Keywords:

Conservation strategies
 Extinction
 Indonesia
 Media
 Sumatran rhinoceros

ABSTRACT

Lazarus species, species that were thought to be extinct until found again, are of considerable public interest and attract major media coverage as they offer a glimmer of hope in a generally glum conservation world. This publicity could potentially generate financial and political support to prevent the species from becoming 'extinct' once again. However, it can also back-fire when publicity creates threats that were previously absent. In 2013, evidence that the Sumatran rhinoceros *Dicerorhinus sumatrensis* still existed in Kalimantan, the Indonesian part of the island of Borneo, made global headlines. The species was thought to have been extinct there for over a quarter of a century. The threat of poaching for its horn, however, remains as strong as ever. We question the decision to publicise this rediscovery. We argue that in the decades the species was thought to be extirpated, the population in Kalimantan could persist precisely because of the lack of attention. Interviews with hunters suggests that without information on the presence of rhinos, the perceived financial benefits of hunting down widely dispersed rhinos no longer justified the actual costs. The "publicize-and-protect" strategy now envisaged following the widely announced rediscovery of rhinos in Kalimantan requires immediate major conservation intervention, which, given the track record of conservation in Indonesia, is unlikely to be effective. We suggest that a secrecy-based strategy for Kalimantan's rhinos would have had lower risks and potentially higher long-term returns for conservation. The trade-offs facing organizations with the exciting prospect of a Lazarus species is one between the costs and benefits of publicity. Costs and benefits change over time but may not do so at the same rate, and publicity can change these rates significantly. When, without publicity, costs are expected to remain relatively constant over time, or when publicity increases the risk significantly relatively to benefits, secrecy-based strategies should be favoured to develop ways that maximize the likelihood of benefits exceeding costs. For Kalimantan's rhinos the choice to publicize-and-protect has been made, closing the door for a strategy based on secrecy, and making effective conservation solutions now all the more urgent.

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1. Introduction

Rediscovery of so-called “Lazarus species” (Dawson et al., 2006; Flessa and Jablonski, 1983) provides some hope in a generally glum conservation world. The Cuban solenodon *Solenodon cubanus*, Banggai crow *Corvus unicolor*, and the coelacanth *Latimeria* spp. exemplify species that were thought to be extinct until found again (Scheffers et al., 2011). Lazarus taxa are of considerable public interest and attract major media coverage. Entering “Painted Frog” (the Hula painted frog *Latonia nigriventer* is endemic to the Lake Hula marshes in Israel and was thought to be extinct as a result of habitat destruction during the 1950s until it was rediscovered in 2011: Biton et al., 2013) or “La Palma Giant Lizard” (La Palma giant lizard *Gallotia auaritae* is endemic to La Palma in the Spanish Canary Islands, and was thought to have gone extinct hundreds of years ago until photographs of this large lizard were taken in 2007: Mateo, 2009) into a Google Trends search (Google Trends, 2013), which shows the relative frequency changes of a search-term over time, reveals that the years of these species’ rediscoveries stand out as clear peaks. This publicity could generate financial and political support to prevent the species from becoming extinct once again. However, the publicity can also back-fire when this in turn creates a demand that was previously absent. The Banggai cardinal fish *Pterapogon kauderni*, a marine fish with an extreme small geographic range in the Indonesian Banggai Archipelago, was described in 1933, forgotten for some 60 years, and rediscovered in 1991. Almost overnight it became very popular in the international aquarium pet trade such that a decade after its rediscovery 118,000 wild-caught individuals entered the trade each month, a level that was deemed totally unsustainable (Lunn and Moreau, 2004). In its latest IUCN threat assessment in 2007 it met the criteria to be listed as Endangered (Allen and Donaldson, 2007). Hence, there may be good reasons to keep rediscoveries quiet. Here we argue that publicizing the rediscovery of Lazarus species or populations can undermine conservation efforts, especially when the species is highly valued by collectors.

2. Dangerous announcement of rediscovered Kalimantan rhinos

In March and October 2013, evidence that the Sumatran rhinoceros *Dicerorhinus sumatrensis* still existed in Kalimantan, the Indonesian part of the island of Borneo, made global headlines (Associated Press, 2013; The Guardian, 2013). Sumatran rhinoceroses were widespread throughout most of Southeast Asia until the early 20th century (van Strien, 1974), but unabated hunting for their highly prized horn had driven the species to extinction by the 1970s in all but some small parts of Peninsular Malaysia, Sumatra and Borneo. Global population estimates based on data from 2005 to 2009 ranged between 216 and 284 animals (Ahmad Zafir et al., 2011), and based on more recent estimates in 2013 this was lowered to about 100 animals (Agence France Presse, 2013). On Borneo, some scattered individuals were thought to remain only in the Malaysian state of Sabah (Sabah Wildlife Department, 2011), but the Sabah population is now considered virtually extirpated. In Kalimantan, the species was assumed extirpated by 1986 (Rabinowitz 1995). After an apparent 27 year absence and with poaching threats remaining, how wise was it to make information about the rediscovered Kalimantan population publicly available?

In the course of our combined 30 years of research experience on Borneo, we have interviewed many hunters, including those that used to hunt rhinos in Kalimantan (Meijaard, 1996; Nijman, 2005). Killing a rhino in tropical rainforest without the help of high-powered rifles is difficult. Indonesia prohibits public gun ownership and most hunting rifles in Kalimantan are homemade and not very powerful (Kramer, 2001; EM and VN, pers. observ.).

This means that rhinos were tracked for months, eventually caught in pit traps, or worn down by machete cuts, poison darts, and spear wounds. Former nomadic people, such as the Punan, specialized in such hunts (Chan, 2007; Lumholtz et al., 1920; Mjöberg, 1929). The government settled many of these forest nomads in villages where they took up more agricultural life styles (Levang et al., 2005). This meant fewer hunters spending less time hunting in the forest. For the rhinos in Kalimantan this likely provided some respite from centuries of hunting. Hunters told us that the financial benefits of hunting down widely dispersed rhinos no longer justified the costs, especially with new economic opportunities such as artisanal mining and timber logging providing competitive alternatives. The reduced returns from tracking a few animals in ~200,000 km² of rain forest likely allowed Kalimantan’s few remaining rhinos to persist or even for the population to recover.

Our hypothesis puts the optimistically publicized rhino rediscovery in a different light. From a situation of almost non-existent public knowledge of their existence these animals have been moved into the global limelight. Unfortunately this may well include the spotlights of professional rhino hunters. The exact location of the animals was not made public but their approximate location could potentially be deduced from context. Also, the published videos gave a view of the habitat in which the rhinos were found; this included video footage of a wallow used by one of the rhinos, which is the best place to “slaughter the animals” (Banks, 1949). Unconfirmed rumours circulate of professional rhino hunters from Sumatra arriving in Kalimantan within months of the public announcement.

The conservation organizations now in charge of Kalimantan’s rhinos have set up rhino patrolling teams to protect the population. Effective patrolling is difficult enough in open landscapes as evidenced by recent severe declines in southern Africa’s populations of white rhinoceros *Ceratotherium simum* and black rhinoceros *Diceros bicornis* (Emslie et al., 2012). Effective protection is much more difficult to achieve for rhinos living in dense rainforests (Rabinowitz, 1995). While one could argue that when protection is more difficult because of the dense rainforest so is poaching it is worth remembering that for protection to be effective it needs to be so all of the time whereas for poaching to be effective it only needs to be so once. Anti-rhino poaching patrols for Sumatran rhinoceros are operational in Sumatra and Sabah (Ahmad Zafir et al., 2011). All known tiny populations of Sumatran rhino, however, remain in decline because of poaching (Goossens et al., 2013). With high demand for rhino horn and skyrocketing prices paid in the burgeoning markets of East Asia, effective protection of rhinos in rainforests against poachers is an almost impossible task.

The rediscovery of the Kalimantan rhino based on tracks and was first announced through a press release in March 2013 (WWF, 2013; Foad, 2013) and later the presence of rhinos on camera-trap footage was unveiled at the start of the Asian Rhino Range States Meeting held in Indonesia in October 2013. According to the press releases the main justification for publicly announcing the rediscovery was to generate public pressure through the media to convince local and national governments to enforce the species’ legal protection. A secondary motive was to generate local support for rhino protection. This “publicize-and-protect” strategy could include the establishment of a new protected area, designing effective patrolling and law enforcement strategies, and finding the means to pay for such a large operation. Developing such measures takes many years of effort and even then may not be fully effective. Between 2000 and 2010, national parks and other protected areas in Kalimantan lost their forests at the same rate as commercial timber concessions (Gaveau et al., 2013). Killing of protected species, such as Bornean orangutan *Pongo pygmaeus* (Davis et al., 2013; Meijaard et al., 2011) and other primates (Nijman, 2005), inside and outside protected areas, continues unabated.

We also highlight another rhino rediscovery in a context similar to Kalimantan. In 1989, a population of an estimated 15 Javan rhinoceroses *Rhinoceros sondaicus* was rediscovered in Vietnam. A new national park and protective management could not prevent the species from being poached, and the last animal was confirmed as killed in 2010 (Brook et al., 2011). Although it is not possible to say whether publicity to this population increased the threats, there appear to be risks associated with the “publicize-and-protect” strategy for a sought-after species.

We suggest that a secrecy-based strategy for Kalimantan’s rhinos would have had lower risks and potentially higher long-term returns for conservation. Effective forest and wildlife protection has been achieved in only a handful of locations in Indonesia (Whitten et al., 2001). This does not mean that such success can never happen with Critically Endangered species, but conservation in Indonesia needs time, especially to allow for political, judicial and societal change (Meijaard et al., 2012). A secrecy-based strategy would have provided more opportunities to implement necessary steps towards effective conservation: (1) better knowledge of how many rhinos remain and where; (2) designing and implementing conservation actions; and (3) identifying capable conservation partners. If implemented by people who know how to keep a secret, protective management could have been in place without any unnecessary pressure on the remaining rhinos.

3. Keeping secrets and when to publicise

Keeping secrets is admittedly difficult. Information about exciting species discoveries is likely to leak at some stage. There may also be significant pressure from financial sponsors and others to publicize information. Finally, there is personal gratification in announcing the rediscovery of a species, and the related chance that withholding information from the public might allow someone else to make and claim the rediscovery. The secrecy-based approach was effectively used during surveys of the possibly extinct ivory-billed woodpecker *Campephilus principalis* (Fitzpatrick et al., 2005), with donors, research leaders and researchers agreeing not to inform the public until the research was finished. A secrecy approach does not imply that no one (or at least not a single outsider) is informed. At the height of the surveys for the ivory-billed woodpecker over 200 people were aware of the project (Fitzpatrick et al., 2006) but communication was directed inwards. The IUCN Red List has the option for assessors to prevent locality data being displayed for Endangered and Critically Endangered species that have high economic value and that

are threatened by trade but only if these localities have not been made public previously (IUCN, 2012). In addition, for species with sensitive sites such as migratory marine turtles, maps prepared by the IUCN reveal limited detail.

Leakage of information at a localised level (staff informing their friends and family, donors informing their business partners, etc.) will be difficult to prevent the longer the secrecy policy remains in place. However, the number of people that are thus informed are infinitely less than when publicly announcing a discovery through the global media immediately following rediscovery. Even when accepting the inevitability of leakage, *caeteris paribus*, a secrecy-based strategy will give the Lazarus species more time to recover. After the initial discovery of a Lazarus species, prudence may be called for with respect to publicising new information.

4. Costs and benefits of publicizing species rediscoveries

The tradeoffs facing organizations with the exciting prospect of a Lazarus species is one between the costs and benefits of publicity, with the cost being the product of risk, i.e., the probability of something bad happening, and the impact that would have on the species. Costs and benefits change over time but may not do so at the same rate, and publicity can change these rates significantly. When costs are expected to increase rapidly over time, for example, if the last remaining habitat is scheduled to be destroyed, then the “publicize-and-protect” strategy could be useful to maximize the likelihood of benefits becoming greater than costs, e.g., the habitat destruction is prevented (Fig. 1A). When, without publicity, costs are expected to remain relatively constant over time, secrecy-based strategies should be favoured to develop strategies that maximize the likelihood of benefits exceeding costs (Fig. 1B). Publicity should also be avoided when publicity increases risk significantly relatively to benefits (Fig. 1C).

5. Conclusion

For Kalimantan’s rhinos the above strategic choice to publicize-and-protect has been made, closing the door for a strategy based on secrecy. Effective conservation solutions are now urgently needed. Government-run programs in Indonesia to sustain endangered species and habitats have limited effectiveness, suggesting that management by delegation or out-sourcing may need to be considered. The instatement of a private concession is possible under Indonesian law, which would allow for a dedicated and well-funded organization to take control. For example, since

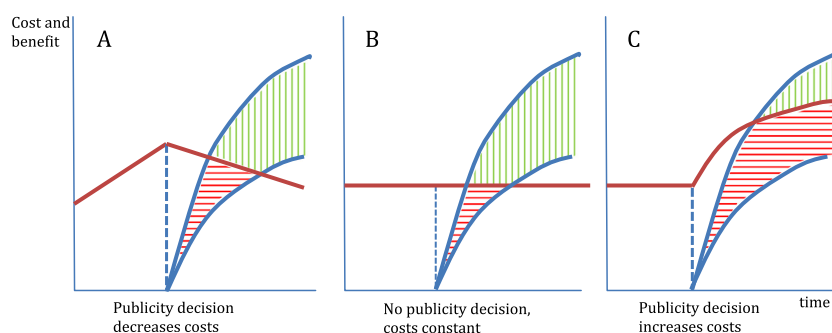


Fig. 1. Cost and benefits of publicizing Lazarus species under different cost profiles. Red line shows development of cost over time. Blue lines show upper and lower bounds of benefits of conservation interventions. Green hatched areas depict conservation success: benefits exceed costs. Red hatched areas depict conservation failure: costs exceed benefits. (A) Risk is increasing and decreases after publicity. An example of this is Gurney’s pitta *Pitta gurneyi*, for which rediscovery spurred new surveys, resulting in the discovery of significant new populations in Myanmar, although population trends are still down (Donald et al., 2009). (B) No publicity decision, risk is constant. (C) Risk was constant prior to decision, but increases with publicity. We assume that prior to a publicity decision there is no conservation action, i.e., benefits are zero. An example of this is Banggai cardinal fish *Pterapogon kauderni*, given in the text. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

1996 the 600 km² large Tambling Wildlife Nature Conservation on the southern tip of Sumatra is managed and funded by Indonesian businessman Tomy Winarta (Anonymous, 2014) and since 2006 the Begawan Giri Hotel (later the Begawan Foundation) has spear-headed the Bali starling *Leucopsar rothschildi* reintroduction programme on the islands of Nusa Penida, Nusa Ceningan and Nusa Lembongan (Begawan Foundation, 2014). Both projects have been running largely in the absence of government involvement or government funding.

Round-the-clock patrolling of the area where the rhinos are found in Kalimantan needs to be implemented immediately before the poachers move in. Longer-term strategies are needed too. It remains unclear whether the rediscovered population is genetically viable, and there have been calls to bring all remaining wild Sumatran rhinos into one captive population (Goossens et al., 2013).

As conservationists we need to learn that some information is better kept secret than made public. Most of us would happily be considered ‘conservation-heroes’, but the attraction of public recognition and attention needs to be weighed against the potentially negative impacts on species that we claim to protect. The decision-making between secrecy and publicity will rarely be easy. When dealing with endangered or Lazarus taxa, initial secrecy more often than not seems to be the better choice. Keeping the rediscovery of Lazarus species secret may be more common than one thinks. We ourselves are aware of two such discoveries. The temptation to go public is high. For now we have kept quiet.

Acknowledgments

We thank Hugh Possingham, Kerrie Wilson, John Payne and Edward Game for comments on this manuscript, Martjan Lammertink for information and three anonymous reviewers for constructive feedback.

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