EDITORIAL

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Gorgeous villains: When the charisma plays against effective conservation strategies

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Resumen

Las especies exóticas invasoras (EEIs) son consideradas la segunda mayor amenaza para la biodiversidad después de la pérdida de hábitat; y por lo tanto, deben ser controladas con celeridad para evitar daños irreversibles a los ecosistemas y pérdida de especies. Sin embargo, esta no es una tarea fácil cuando la EEI resulta además ser un animal carismático. Aquí analizo el caso de los hipopótamos invasores en la cuenca del río Magdalena (Colombia) como ejemplo de EEI carismática. El carisma de este mega-mamífero podría haber afectado las percepciones y actitudes de la sociedad colombiana con respecto a su manejo y, en última instancia, retrasar o impedir la implementación del control efectivo de la población. Para resolver este dilema ambiental es fundamental abordarlo desde un enfoque transdisciplinario, que considere los muy diversos aspectos biológicos y no biológicos del manejo del hipopótamo en Colombia.

Palabras clave: Hipopotamos, Rio Magdalena, Manejo, Percepciones

Abstract

Invasive alien species (IAS) are considered the second greatest threat to biodiversity after habitat loss; and therefore, they need to be controlled promptly to avoid irreversible damages to the ecosystems and loss of species. However, this is not an easy task when the IAS is also a charismatic animal. Here, I analyze the case of the invasive hippos in the Magdalena River basin (Colombia) as an example of an IAS charisma. The charisma of this mega-mammal may have affected the Colombian people's perceptions and attitudes toward its management, and ultimately delayed or prevented control implementation. A transdisciplinary approach considering both biological and non-biological aspects of hippo's management in Colombia is critical in solving this environmental dilemma.

Key words: Hippopotamus, Magdalena River basin, Management, Perceptions

An invasive alien species (IAS) is an organism introduced –intentionally or not– into an area outside of its natural distribution range, then establishing a population and spreading autonomously, and often representing perilous repercussions for the invaded ecosystem (Simberloff 2010). In many documented cases, IASs have impaired the structure of the community, altered the food web, and modified fundamental processes such as nutrient cycling and sedimentation (Molnar et al. 2008). Since they increase the risk of

native species extinction, IASs are widely conceived as one of the most important direct threats to biodiversity (Didham et al. 2005). For instance, a review of reported cases of extinction showed that from 680 extinct animal species, 54% included the effects of IASs, and for 20% of them, IASs were the only reported source of extinction (Clavero & García-Berthou 2005). Besides their well-documented impacts on ecosystems and native species, IASs also can harm ecosystem services and human well-being (Pejchar & Mooney 2009), as well as effects on agriculture, fisheries, and trade (Lovell et al. 2006), leading to economic damages on a worldwide scale (Olson 2006). On this basis, environmental managers around the globe have invested substantial efforts towards the design and implementation of ideal management strategies to identify, prevent, detect, and control/eradicate IASs (Mehta et al. 2007).

Colombia is situated in a privileged geographical location of the Neotropics, which has promoted the development of rich biodiversity. It has a long history of the introduction of IAS, some of them with clear beneficial impacts (Baptiste et al. 2010). Among the IASs recorded for the country, the hippos (*Hippopotamus amphibious*), originally native from Africa, probably stand as the most challenging one. In the 1980s, Pablo Escobar imported 4 hippos to his zoo in Hacienda Nápoles within the Magdalena River Basin, where they have successfully reproduced and expanded ever since. Environmental agencies attempts to control their reproduction have had no impact on population growth, and nowadays an estimate of between 93 and 102 hippos inhabit an area of around 2,000 square kilometers (Castelblanco-Martínez et al. 2021). Empirical evidence has demonstrated that hippos are important drivers of habitat modification, being capable to dramatically change the chemical and structural features of aquatic and terrestrial ecosystems (Stears et al. 2018; Subalusky et al. 2019). In the long term, this may pose an important risk to many native species and environmental services. Hippos are also large-bodied, unpredictable, and dangerous animals (Chomba et al. 2012), and represent a potential threat to people safety. To control this IAS, the authors of a recent study proposed a multi-strategic management plan by strict enclosing of sterilized animals, culling, or a combination of both (Castelblanco-Martínez et al. 2021).

Management plans aiming to control IAS typically include extraction and culling (e.g.Côté et al. 2014; Moon et al. 2015), and have been implemented in Colombia to manage giant African snail (*Achatina fulica*, Patiño-Montoya et al. 2019), lionfishes (*Pterois volitans*, Rojas-Vélez et al. 2019), among others. Why those invaders do not receive as much attention or concern from the public and activist groups? One of the most likely explanations is based on the fact that those animals are not as charismatic as hippos.

But, how can we define 'charisma'? With many wildlife species requiring urgent management and in scenarios of limited resources, a typical practice in conservation biology is to focus on surrogates species (e.g. indicator, keystone, umbrella, and flagship), as a proxy to solve conservation problems (Caro & O'Doherty 1999, Albert et al. 2018). In particular, flagship species serve as a symbol to increase conservation awareness and action (Caro et al. 2004) and are often *de facto* charismatic species. Hence, charisma is an abstract concept that can be considered a particular trait of a flagship species (Albert et al. 2018). Some of the arguments supporting charisma-based approaches in defining conservation objectives are (Ducarme et al. 2013): 1) it can promote conservation actions based on people's emotions and can strongly mediate the involvement of local people, 2) most charismatic animals are also often large-bodied, top predators (e.g. big cats, sharks, and cetaceans, Albert et al. 2018), which makes them also keystone and umbrella species

and enhances their role as surrogate species, 3) charismatic species can be used for conservation purposes even if they don't have an actual relevance as key or umbrella species. Charisma, however, is considered a "subjective, non-scientific, changeable parameter" (Ducarme et al. 2013). Not all wild creatures trigger emotions of the same nature or intensity in humans. A recent study suggested that the magnitude and ability to connect emotionally with other organisms mostly depends on the phylogenetic distance that separates humans from them (Miralles et al. 2019). According to this, mammals would represent the most charismatic taxa for humans, and we would naturally tend to protect them more than, for example, reptiles, invertebrates, or plants.

Most of the populations of hippos in Africa are declining in response to human-related disturbances, including habitat degradation and uncontrolled hunting for meat and ivory (Lewison & Pluháček 2017). But hippos are also among the twenty most charismatic animal species in the world according to the views of the public in Western countries (Albert et al. 2018), which would be advantageous for their conservation in Africa, for example through ecotourism (Lindsey et al. 2007; Skibins et al. 2013), or the funding of conservation initiatives. Nevertheless, hippo's charisma represents a hindrance to communicate and implement effective management plans, when it becomes an invasive species thriving in a megadiverse environment. Charisma affects the public support for IAS management, promoting conflicts among society sectors, and ultimately delaying or preventing the implementation of control actions (Jarić et al. 2020). Furthermore, charisma has facilitated the invasion process across a wide range of taxonomic groups of IASs including birds (Avery et al. 2012; Ellis & Elphick 2007), reptiles (Williams et al. 2019), and mammals (La Morgia et al. 2017).

In conclusion, the charisma of an animal can be counter-productive if the species is considered as flagship in its native area but problematic in an exotic environment (Ducarme et al. 2013). The case of the hippos has called the media attention like no other, due first to its historic background, which includes many sensationalist elements as the life and death of the most infamous cocaine trafficker in the country. Second, the management proposals have fueled a furious debate on social media, revealing two opposite postures: On one side, conservation biologists promote a technical decision that guarantees the protection of the native ecosystem and its species, and on the other side, animal activists demand a solution that avoids the suffering or dead of these sentient animals. These positions also correspond to two contrary viewpoints (Williams et al. 2019): The first group is aligned with the 'Precautionary, informed concern' approach while the second group supports the "Innocent until proven guilty" approach. These opinions are defined by differences in levels of ecological knowledge, beliefs, and overall relationship with nature (Williams et al. 2019), but are also likely determined by human perceptions such as a strong empathy for a charismatic animal.

The public discussions around the management of hippos in Colombia are not new, but the scientific approach to this problem is relatively recent. In the last years, several research teams have addressed this case from the ecological point of view (e.g. Castelblanco-Martínez et al. 2021; Shurin et al. 2020; Subalusky et al. 2019), providing necessary input for the debate. However, we need a transdisciplinary approach to solve the dilemma related to the management of this non-native species in Colombia. Serious considerations of both biological and non-biological (ethical, economical, and social) criteria when evaluating management proposals can better inform the much needed decisions, and facilitate the communication to the public.

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