

Flagship individuals in biodiversity conservation

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Flagship species are an important tool for mobilizing support for conservation. Here, we extend this concept to include individual organisms, whose characteristics, fates, and connections to people can garner public attention, attract conservation support, and spur activism. Flagship individuals typically share a similar suite of characteristics, including (1) species-level traits associated with charisma; (2) individual traits that are unique or distinctive; (3) a high degree of exposure to humans; and (4) a known, noteworthy life history or fate. The interplay between these characteristics and human agency establishes unique connections between flagship individuals and people, and generates widespread media attention. We discuss how the selection and promotion of flagship individuals can inspire empathy and, ultimately, conservation action. Finally, we identify the limitations of the flagship individual approach, while arguing that, if carefully and strategically implemented, it has the potential to produce substantial benefits for conservation policy and practice.

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A key challenge for biodiversity conservation is the lack of strong public support and mobilization (Courchamp *et al.* 2018). To cope with ongoing rates of biodiversity loss, conservation practitioners must find effective ways to mobilize support, including through different marketing approaches and strategies (Veríssimo *et al.* 2014). One common strategy in conservation marketing campaigns is the use of flagship species: namely, “species used as foci of broader conservation

marketing campaigns, based on their possession of one or more traits that appeal to the target audience” (Veríssimo *et al.* 2011). Flagship species are considered one of the most effective approaches for garnering public support and attracting funding for conservation (Barua *et al.* 2011; McGowan *et al.* 2020).

The flagship species concept has also been expanded to focus on multiple species (“flagship fleets”), as well as landscapes and ecosystems (Veríssimo *et al.* 2014; Lundberg *et al.* 2020; Dobson *et al.* 2021). Here, we argue that this concept can also be especially powerful and effective when applied at the level of individual organisms. Selection of particular individuals – what we term “flagship individuals” – as figureheads of conservation marketing, advocacy, or education can not only generate empathy through communicative and psychological mechanisms but also serve as an embodiment or archetype to symbolize a cause (Wald *et al.* 2021). Although the potential of individuals to generate intense public attention, attract conservation support, and spur activism has been previously discussed in the literature (eg Nicholls 2006; Due *et al.* 2014; Carpenter and Konisky 2019), this capacity has not yet been properly recognized and more widely applied in conservation.

Here, we introduce the concept of flagship individuals as a promising approach for biodiversity conservation. We highlight several case studies of flagship individuals and explore their impacts, including improved awareness and education (eg Smokey Bear), changed attitudes and behaviors (eg Tilikum the orca [*Orcinus orca*]), public initiatives (eg Lua the Antillean manatee [*Trichechus manatus manatus*]), fundraising (eg 480 Otis the bear [*Ursus arctos*]) and policy changes (eg Grecia the chestnut-mandibled toucan [*Ramphastos ambiguus swainsonii*]) (WebTables 1–4). We also provide an overview of key characteristics of flagship individuals, guidelines for their selection, notable risks and caveats, and recommendations for conservation practice.

In a nutshell:

- The unique characteristics and life stories of some individual organisms, termed flagship individuals, have enormous potential to mobilize public support for and raise awareness of biodiversity conservation
- Flagship individuals are typically affiliated with idiosyncratic traits (such as charisma), high exposure to humans, and noteworthy life histories or fates
- Such individuals can be used to create unique connections with people, gain leverage and agency (by generating empathy), raise awareness, encourage public engagement and behavioral change, attract funding, and induce changes in policy
- The use of flagship individuals is complementary to the use of flagship species and other related concepts

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■ The concept and characteristics of flagship individuals

We define flagship individuals as organisms whose individual traits, species characteristics, exposure to humans, and/or fates serve to engage and motivate people and garner support for broader conservation goals (Figure 1). The concept of the flagship individual corresponds in part with the idea of an identifiable victim (see glossary in WebTable 5) of anthropogenic threats posed to wildlife (Thomas-Walters and Raihani 2017). The flagship individual's main potential lies in people's tendencies to connect more strongly and emotionally to a specific individual than to an abstract group or category, such as a species (Deshpande and Spears 2016).

Flagship individuals commonly share some combination of the following four characteristics (Figure 1): (1) traits associated with species charisma; (2) unique or distinguishing individual traits; (3) high levels of exposure to humans; and (4) known, noteworthy life histories, sets of circumstances, or fates.

As they typically belong to charismatic species, flagship individuals therefore exhibit the “charismatic traits” (eg beautiful, impressive, endangered) of their conspecifics (Albert *et al.* 2018; Courchamp *et al.* 2018). Moreover, individuals with recognized flagship potential (WebTables 1–4)

are more often than not large, terrestrial mammals, taxa that were frequently identified as being the “most charismatic” by Albert *et al.* (2018).

In addition to species characteristics, flagship individuals may also possess unique traits that distinguish them from their conspecifics. For example, they may attain unusual or extreme size (eg General Sherman, a giant sequoia [*Sequoiadendron giganteum*], considered to be the largest living single-stem tree on Earth; Figure 2a) or extreme longevity (eg Wisdom the Laysan albatross [*Phoebastria immutabilis*], the oldest known bird in the world), have more pronounced or unique morphological features, or exhibit uncommon behaviors.

Flagship individuals also tend to have high levels of exposure to humans, for example in protected areas that are popular tourist destinations, or in urban areas (eg Ruthi the striped hyena [*Hyaena hyaena*]; WebTables 1–4). Furthermore, they may have high levels of direct human interaction, for instance as zoo attractions (eg Tilikum, a captive killer whale kept at SeaWorld Orlando) or by having become so habituated to people that they tend to approach them (eg Lua the manatee; Panel 1 and Figure 3). Such visibility can be further enhanced internationally through social media (eg the widespread popularity of Knut, a polar bear [*Ursus maritimus*] formerly at the Berlin Zoo, which led to a global phenomenon labeled “Knutmania”; WebTables 1–4).

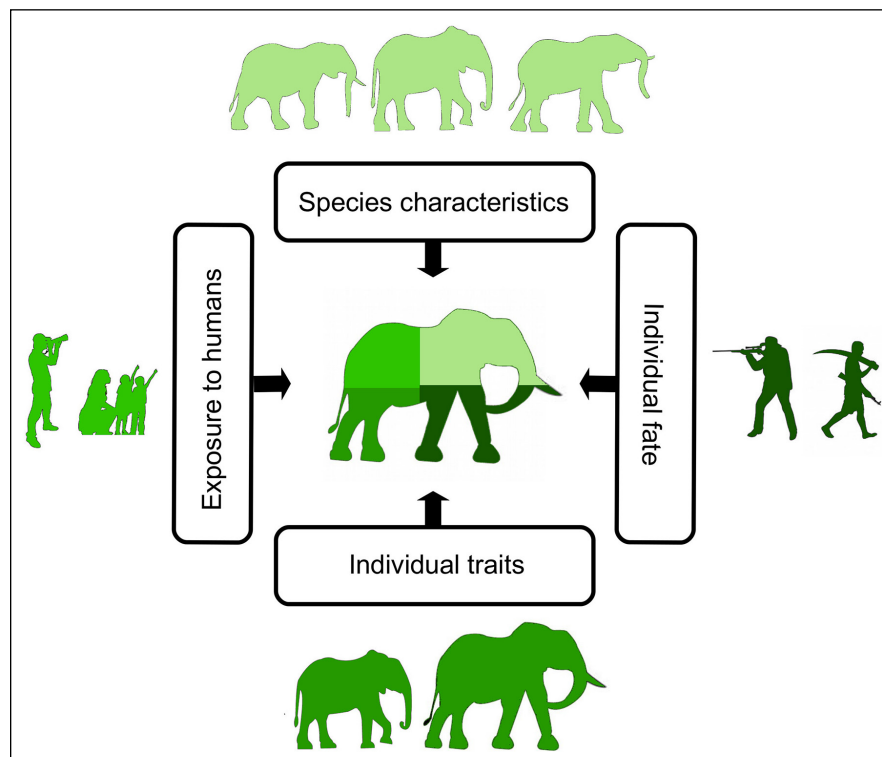


Figure 1. Defining characteristics of flagship individuals, presented through the example of an African elephant (*Loxodonta africana*). A flagship individual (the central composite image with four shades of green) is distinguished by species characteristics, individual traits (here, larger body size and prominent tusks), its level of exposure to humans (tourism), and its individual fate (a victim of poaching).

Flagship individuals are often brought to prominence by their unusual life history or circumstances, dramatic events, and/or often tragic fate. These events can generate an emotional response, raise awareness of specific conservation issues, and draw public support and direct engagement. For example, the killing of Cecil the lion (*Panthera leo*) by a trophy hunter in Zimbabwe drew global condemnation and directed attention toward the complex conservation issue of trophy hunting (Figure 2b; Carpenter and Konisky 2019). In another case, in Costa Rica, the story of Grecia the toucan, who, after being abused and losing her upper beak, was taken to an animal shelter and fitted with a prosthetic 3D-printed replacement, inspired public activism and policy change (WebTables 1–4). Notably, success stories and positive outcomes can also be effective in attracting and mobilizing public attention.

Individuals who are recognized as the last remaining representatives of their species may also become flagships. They can be either a living or a deceased individual, such as Sudan, the last male northern white rhinoceros (*Ceratotherium simum cottoni*; Fink *et al.* 2020), and Lonesome George, the last known Pinta Island tortoise (*Chelonoidis niger abingdonii*; Nicholls 2006). They can



Figure 2. Examples of flagship individuals. (a) General Sherman, a giant sequoia (*Sequoiadendron giganteum*) in California, believed to be the world's largest known living single-stem tree (image credit: J McNair, ©CaliforniaThroughMyLens); (b) Cecil the lion (*Panthera leo*), whose killing by a trophy hunter in Zimbabwe provoked global condemnation (image credit: Daughter#3/Flickr.com [CC BY-SA 2.0]); (c) Keiko, a captive orca (*Orcinus orca*), who starred in the movie *Free Willy* (image credit: author unknown/Wikimedia Commons [public domain]); (d) taxidermied mount of Sam, a female koala (*Phascolarctos cinereus*), who attracted global attention to bushfire impacts in Australia (image credit: B Healley, ©Museums Victoria [CC-BY 4.0]); (e) Sudan, a captive northern white rhinoceros (*Ceratotherium simum cottoni*) and the last known male of the subspecies (image credit: G Goodwin); and (f) Grecia, a chestnut-mandibled toucan (*Ramphastos ambiguus swainsonii*), a victim of abuse who inspired public activism and policy changes (image credit: Rescate Wildlife Rescue Center–Costa Rica). See WebPanel 1 for additional information.

also be historic representatives of extinct species, such as Benjamin, the last known thylacine (*Thylacinus cynocephalus*), and Martha, the last passenger pigeon (*Ectopistes migratorius*; Avery 2014). However, the fate of a flagship individual can also be uplifting, as was the case for Diego, the Hood Island giant tortoise (*Chelonoidis niger hoodensis*), who played a pivotal role in pulling his species back from the brink of extinction (Cayot 2021).

As is apparent from the examples mentioned above, flagship individuals also require an easily recognizable moniker. Most often such identifiers consist of both the personal name

given to the individual and the common name of the species (eg Smokey Bear, Herman the sturgeon; WebTables 1–4). The assigned name allows flagship individuals to become recognized, be referred to as unique individuals, and be attributed a status not unlike personhood (Levin 2015). Although links between the common name of a species and the success of conservation efforts remain unclear (eg Carvell *et al.* 1998; Gregg *et al.* 2020; Díaz-Restrepo *et al.* 2022), the possession of a name seems to be important for the effectiveness of flagship individuals. For example, Cecil the lion's popularity has been partly attributed to use of

Panel 1. Lua the Antillean manatee

The Antillean manatee (*Trichechus manatus manatus*) was once widespread, ranging from the southeastern coast of Brazil north through Central America and into the Caribbean. In Brazil, habitat loss and overhunting have severely reduced and fragmented the wild population, restricting extant subpopulations to the northern and northeastern coasts. An ambitious reintroduction program was initiated in 1994, the goal of which was to release rehabilitated orphaned manatee calves into the southernmost subpopulation. The ongoing program is unique within Brazil, and considerable resources have been invested in rehabilitation and post-release monitoring. As of 2015, 30 manatees have been released at three sites, with a high rate of success (75% survival; Normande *et al.* 2015).

The individual manatee eventually given the name Lua (Figure 3) was found stranded in March 1991 in Morro Branco, in northeastern Brazil. Her stranding coincided with the initiation of the manatee reintroduction program, and she was one of the first rescued calves to enter rehabilitation. In 1994, Lua and another named manatee (Astro) were the first to be released in the wild. Lua quickly became the symbol of the reintroduction program, being used in local media and community activities to gain public attention. Underwater photographers took advantage of her docile nature to capture iconic pictures used in national campaigns to raise awareness for the manatee reintroduction program.



Figure 3. Lua the Antillean manatee (*Trichechus manatus manatus*) (image credit: L Candisani).

Because of her docility and willingness to approach humans and boats, Lua was for many people their first direct contact with a wild manatee. Her habituation to humans greatly facilitated the creation of a local sustainable tourism industry that currently supports up to 400 families in the communities of Porto de Pedras and Barra de Manganape (Normande *et al.* 2015, 2016). However, Lua's tameness has also brought challenges, including health concerns (some visitors offer her food and water and, occasionally, even beer and fried fish). Such interactions could reduce the amount of time she spends foraging, resting, or mating. Nonetheless, Lua was the first released manatee to successfully breed in the wild (Lima *et al.* 2005) and has had six calves (almost half of all reported calves from released mothers), contributing to the area's repopulation and increasing connectivity between subpopulations.

At the time of writing, Lua is a middle-aged (a 31-year-old) manatee of around 3.1 m length and 640 kg weight. Her body size and unique features, including an "algae mask" on her face, make her easily recognizable and facilitate tracking, and due to her friendly disposition toward humans she remains one of the most important conservation assets on the northeastern coast of Brazil.

his personal name instead of his research code number (MAGM1) in marketing (Macdonald *et al.* 2016; Carpenter and Konisky 2019). Similarly, it is believed that his personal name was one of the reasons why Diego the tortoise received more media attention than E5, another male conspecific involved in the same captive-breeding program, despite the latter making a greater contribution to the species' recovery based on the number of offspring produced (Moore 2021).

Flagship individuals can also be objects of research, such as tagged and tracked individuals, which are often used for conservation communication and outreach (eg tracked great white sharks [*Carcharodon carcharias*], such as Mary Lee;

WebTables 1–4). Moreover, they can represent a succession of individuals, where a new individual assumes the identity held by the previous individual after their death (eg Sir Nils Olav, a king penguin [*Aptenodytes patagonicus*] at the Edinburgh Zoo, is in fact in his third incarnation). Flagship individuals are sometimes also promoted as a group of individuals, as was the case with the Magnificent Seven tuskers (Dzombo, João, Kambaku, Mafunyane, Ndlulamithi, Shawu, and Shingwedzi), African elephant bulls (*Loxodonta africana*) used to promote conservation work in South Africa's Kruger National Park (WebTables 1–4): an approach analogous to the concept of flagship fleets (Veríssimo *et al.* 2014).

A particular subgroup of flagship individuals are fictional characters, such as those from animated movies (eg Nemo from *Finding Nemo*, Blu from *Rio*; De Matos 2019), public campaigns (eg Smokey Bear, also personified by a rescued American black bear [*Ursus americanus*] cub kept in the National Zoo in Washington, DC), and movie/television characters played by animal actors (eg Flipper the bottlenose dolphin [*Tursiops truncatus*], Skippy the eastern gray kangaroo [*Macropus giganteus*]). Fictional flagship individuals offer opportunities for conservation organizations to collaborate with the producers of digital visual media to further their objectives (Dorward *et al.* 2017; Silk *et al.* 2018). They may even be linked with the concept of a virtual influencer, an increasingly popular marketing tool (eg Eric the pangolin; Verissimo 2021).

■ Drivers of a flagship individual's effects

Flagship individuals have the potential to gain leverage where other flagship types may be less effective through psychological (inspiring empathy) and communicative (storytelling) pathways. Empathy may be generated and strengthened via processes of personification and anthropomorphism, which help people to better relate to an individual organism and reduce perceptions of distance between humans and nonhumans (Kusmanoff *et al.* 2020; Wald *et al.* 2021). Empathy can be further strengthened through negative emotional responses such as anger, driven by events perceived as morally wrong (Levin 2015; Macdonald *et al.* 2016; Boissat *et al.* 2021).

Different storytelling techniques by news media and organizations involved in conservation marketing, advocacy, or education can substantially affect the promotion and effectiveness of flagship individuals. These include personalized narratives focused on individuals rather than groups (Wald *et al.* 2021), which are often featured in natural history documentaries (Boissat *et al.* 2021). Traditional and social media play important roles in selecting, covering, and promoting flagship individuals, often with their own agendas and rules for choosing and framing stories (Harcup and O'Neill 2017; Arbieu *et al.* 2021). In particular, stories that involve celebrities (such as named individuals) or criteria that match those of flagship individuals (such as elements of surprise, bad news, and relevance for the target audience) are generally more likely to be selected and spread by the media (Harcup and O'Neill 2017). Zoos regularly personify captive animals in their displays (Levin 2015), which may drive establishment of a flagship individual. For example, captive individuals are typically named, receive frequent media coverage, and occasionally even have their own webcams, blogs, and social media pages through which they "communicate" with the public (Levin 2015).

The salience or appeal of a flagship individual can vary spatially and temporally, and is affected by various sociocultural factors. For example, the death of Sudan, the last male northern white rhinoceros, primarily attracted media and public attention and provoked emotional responses in Western

countries, far outside the natural range of the subspecies (Fink *et al.* 2020).

■ Effects of flagship individuals

Flagship individuals not only garner support for conservation of their own species but also often have positive impacts on broader conservation challenges (eg Sam the koala [*Phascolarctos cinereus*], who helped raise awareness about both threats to koalas and the larger impacts of bushfires; Figure 2d; Due *et al.* 2014). Flagship individuals can generate focusing events (Carpenter and Konisky 2019; Jarić *et al.* 2023) and may even catalyze conservation movements (Boissat *et al.* 2021). Besides being used to raise public awareness of and funds to address conservation problems and initiatives, they can also lead to attitudinal shifts, behavioral changes, and policy development (Panel 1; WebTables 1–4). Their wide reach can be used to attract new audiences, and provide common focal points and advocacy goals for both conservation and animal protection activists (Carpenter and Konisky 2019). However, data for evaluating the scale of contributions of flagship individuals to conservation are lacking, which stems from the overall dearth of data on the impact of conservation efforts generally.

■ Emergence, selection, and use of flagship individuals

Flagship individuals typically rise to prominence either suddenly, through a focusing event (eg Cecil the lion, Grecia the toucan; WebTables 1–4), or gradually, through continuous interactions with people (eg Lua the manatee; Panel 1). Media often play a key role in driving a focusing event. Following the initial surge of attention, the flagship status of an individual will emerge once it is selected and promoted by conservation-oriented individuals or organizations. Such actors play an essential role in communicating the relevance of the individual story or fate beyond the immediate context, to create circumstances in which broader societal awareness and flagship status coincide, and together pave the way toward concrete conservation actions. While predicting focusing events is very challenging, practitioners can maximize effectiveness through timely and carefully targeted conservation marketing strategies, interventions, education campaigns, and advocacy (Lundberg *et al.* 2020; Jarić *et al.* 2023).

Flagship individuals can also be selected, promoted, and used without having been previously popular or publicly known. This is common for individuals featured in scientific or conservation projects, such as individuals that have been reintroduced or that are being remotely tracked. For example, Mary Lee the great white shark was selected and used for a campaign to promote research on animal tracking, in the process becoming one of the most famous individual sharks worldwide (WebTables 1–4).

Flagship individuals should be selected and promoted based on the target audience and intended goal of the campaign (Barua *et al.* 2011; Veríssimo *et al.* 2011; Dobson *et al.* 2021). For instance, individuals of globally recognizable species may be better suited to international fundraising efforts, whereas individuals of species that are primarily recognizable only within their native range may be more suitable for local or regional efforts. Societal preferences can vary both among and within different flagship types, which allows maximization of their effectiveness through the development of carefully targeted marketing strategies that may include different types of flagships, and that are tailored for specific target groups (Lundberg *et al.* 2020). Flagship individuals have great potential for inclusion in such outreach efforts and, when combined with other flagship types, for deployment in a wide range of contexts. Their selection process could follow a similar framework to that proposed for flagship species by Veríssimo *et al.* (2011), as well as the set of selection criteria established by Barua *et al.* (2011), while taking into account specific characteristics of flagship individuals (Figure 1). According to Veríssimo *et al.*'s (2011) framework, those seeking to use flagship individuals in a conservation campaign must first identify and understand the conservation issue and the target audience, as well as the relationship between the two. Such knowledge should influence the selection of a flagship individual, while also considering its societal and ecological characteristics and intended uses (Barua *et al.* 2011). Finally, a marketing, advocacy, or education strategy involving a selected flagship individual should be developed and implemented, followed by an evaluation of campaign success (Veríssimo *et al.* 2011). Evaluation of the effectiveness of flagship individuals should be conducted using evidence-based methods, such as brand awareness (Veríssimo *et al.* 2014), counterfactual approaches (Veríssimo *et al.* 2020), and coalition models (Boissat *et al.* 2021).

■ Caveats and challenges

Although the concept of the flagship individual can be an effective tool for conservation marketing, several caveats and challenges must be acknowledged and addressed. Some of these are inherent to the use of individuals in conservation campaigns, whereas others are mainly associated with their improper use. Ultimately, the concept we present here requires further research, including testing the relative effectiveness of different flagship types through experimental designs that explore the societal impacts of individual- versus species-focused conservation marketing, advocacy, and education campaigns. Moreover, a thorough assessment of the importance and relative frequency of the four characteristics thought to be common to flagship individuals has yet to be performed.

Flagship individuals are inherently more fleeting than other flagship types, and they will ultimately cease to perform their flagship role. This may be due to the death or

disappearance of the individual or the loss of the key structures that generated and maintained its appeal – for example, the cessation of an animal tracking program, the individual's release from captivity, its translocation, or simply diminishing media interest. This can lead to negative eventual outcomes, such as a reduction of public support or a rise of conservation pessimism and apathy. The effects of these challenges might be mitigated by shifting focus onto another individual, by using “fleets” of individual flagships, or by developing fictional flagship characters. In certain cases involving rare or highly threatened populations or species, such as the kākāpō (*Strigops habroptilus*) in New Zealand, all remaining individuals known have been assigned names, which facilitates switching between individuals in the campaign or their use as flagship fleets.

Focusing events generated by flagship individuals are also inherently transient (Jarić *et al.* 2023). Therefore, it is critical to adapt conservation marketing, advocacy, or education strategies to anticipate their occurrence so as to maximize effectiveness, mitigate the effects of attention decay, and ensure that flagship individuals are used to drive long-term attention and effects.

Improper use of flagship individuals through the spread of misleading, oversimplified, or sensationalized information may distort reality; provide a false characterization of the individual, species, or conservation issue; and ultimately undermine conservation efforts (Somerville *et al.* 2021). This also includes exaggerated anthropomorphism and promotion of certain stereotypes, which are further associated with the tendency of the media to sensationalize conservation issues (Bradshaw *et al.* 2007).

Flagship individuals often appeal to people concerned with animal welfare, which may be a challenge when the priorities of animal welfare and conservation organizations do not align (Hayward *et al.* 2019). Flagship individuals could also be negatively perceived within the species range due, for instance, to human conflicts over wildlife management (Jepson *et al.* 2011). There is also concern that some applications of the concept, such as the use of captive or fictional flagship individuals, may provide a false sense of the presence and stability of a threatened species, or even of one already extinct in the wild (Courchamp *et al.* 2018). Furthermore, the popularity of a flagship individual can potentially harm the species overall if it leads to unsustainable tourism or greater inclusion in the pet trade, as well raising important ethical concerns. Bringing an individual into the spotlight can lead to unintended consequences, such as increased disturbance, undesirable interactions with people (Newsome and Rodger 2008), or risks to public safety. For example, Freya the walrus (*Odobenus rosmarus*), who visited harbors in several northern European countries, attracted increasingly large crowds as her popularity grew, which ultimately led to the decision to euthanize her due to concerns for human safety (Nikel 2022). Further work is needed to understand how flagship individuals can be most effectively employed at minimal risk both to the individual and to people.

Conclusions

Our primary objectives here were to present the concept of the flagship individual, raise awareness on its potential for conservation action, and discuss challenges associated with its implementation. This concept has great potential for biodiversity conservation, by enhancing public support (eg Lua the manatee), education (eg Smokey Bear), fundraising (eg 480 Otis the bear), and policy-making outcomes (eg Grecia the toucan). The use of flagship individuals is complementary to the use of flagship species and other related concepts, and diversifying the flagship concept may generate wider support for conservation and attract new audiences (Veríssimo *et al.* 2014; Lundberg *et al.* 2020; Dobson *et al.* 2021). Despite some challenges, if properly implemented the flagship individual approach could produce substantial benefits for conservation from global to local scales.

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Data Availability Statement

No original data were collected for this study.

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