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Perspective

A unifying theoretical framework for conservation flagships

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ABSTRACT

Conservation flagships are an effective approach to mobilize support for conservation. The flagship concept has recently been expanded beyond species, to include also fleets, protected areas, ecosystems, individuals, and events. Here, we present a unifying framework of flagship categories and their use, provide a roadmap for flagship selection, and give recommendations for their use in conservation practice. We also propose the flexible encompassing term 'flagship entity', broadly defined as a unique and recognizable entity that can be easily communicated for conservation purposes. Flagship entities are characterized by their biological and ecological organization level, temporal state, geographical reach, current level of use, and effectiveness. Flagship selection should be driven by sound knowledge and a clear understanding of the target audience's conscious and subconscious preferences and its intended use. Further work is needed to evaluate the effectiveness of various flagship categories and concepts, and the positive and negative economic outcomes of flagship strategies.

1. Introduction

Societal support for conservation goals and initiatives is essential to address the global biodiversity crisis. Public engagement with action around conservation efforts can be promoted through various conservation marketing and education strategies (Veríssimo et al., 2014; Jarić et al., 2023). One of the most effective approaches to mobilize support for conservation is the use of flagship species, which can serve as biodiversity surrogates (Barua et al., 2011; Lindenmayer et al., 2015; McGowan et al., 2020). Flagship species are usually conspicuous, charismatic, and culturally salient species used as foci of broader conservation campaigns by leveraging one or more traits that appeal to the target audience (Verissimo et al., 2011). Flagship species are essentially a conservation marketing tool used to promote broader conservation targets, including other species or entire ecosystems (Lundberg and Arponen, 2022; Caro, 2010).

In recent years, the flagship concept has been expanded beyond species, with new flagship categories being described: individuals,

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fleets, protected areas, ecosystems, and events (Figs. 1, 2). Flagship individuals have been defined as organisms whose individual traits, species characteristics, exposure to humans, and individual stories serve to engage and motivate people, and garner support for broader conservation goals (Jarić et al., 2024a). For example, Lonesome George, the last known individual of the Pinta Island tortoise (*Chelonoidis niger abingdonii*), became a symbol of conservation efforts in the Galápagos Islands (Fig. 2a; Jarić et al., 2024a). Flagship fleets signify the simultaneous use of multiple flagship species within a conservation campaign. Flagship fleets can raise support for a wider range of threatened species, cover preferences of multiple stakeholders, and increase chances that the target audience will be mobilized by at least one of the species (Veríssimo et al., 2014; Santarém et al., 2019). Such an approach is, for example, frequently used in campaigns of various conservation organizations in the Danube River basin, with the six Danube sturgeon species (Acipenseridae) used simultaneously as flagships (Fig. 2c; Kalinkat et al., 2017). Using protected areas or whole ecosystems as flagships is based on the idea that these can be employed by conservation campaigns as salient, 'celebrity' sites, to promote the conservation of a wider range of similar sites (Fig. 2d; Lundberg et al., 2020; Dobson et al., 2022). This can allow greater flexibility for investing resources, more efficiency in attracting new audiences and donors, and encourage new types of engagement (Lundberg et al., 2020; Dobson et al., 2022). Finally, conservation flagships can also include specific events that represent natural or anthropogenic occurrences that are sudden, relatively uncommon (Fig. 2e; Jarić et al., 2023), and attract public attention towards biodiversity conservation (Jarić et al., 2024b). Natural flagship events include conspicuous seasonal events such as massive blossoming, animal migrations or huge swarms, such as the emergence of the Tisza mayfly (*Palingenia longicauda*) in the Tisza River (Serbia) which is an object of tourism and conservation-themed events (Jarić et al., 2024b). Flagship anthropogenic events can include animal awareness days, planned conservation events, human-driven extinctions, or invasive species introductions (Jarić et al., 2024b).

This recent expansion of the flagship concept makes it timely to review their similarities and differences, understand how they fit together, and how they can be effectively harnessed for different conservation goals. To this end, we present a unifying flagship framework that encompasses all flagship categories proposed so far, and recognizes the potential for additional concepts. We discuss relationships between different flagship categories, possibilities for their simultaneous use, and their key challenges and caveats. Finally, we provide a roadmap to select flagships and associated recommendations for conservation practice.

2. Flagship concept

The process of choosing flagship entities is analogous to the 'branding' process in marketing, i.e. constructing terms, signs, or symbols to allow a target audience to recognize, recall, and distinguish specific products or services within a competing market (Verissimo et al., 2011). However, while the act of flagship selection and promotion (i.e., 'flagshipping') represents a branding strategy, it is most commonly aimed at leveraging pre-existing high levels of public recognition rather than promoting a new, largely unknown entity (Lundberg and Arponen, 2022). This reduces marketing costs and leverages existing attitudes, knowledge, and cultural associations. While flagships are primarily a marketing and communication concept, other types of surrogates represent mainly ecological concepts (i.e., umbrella or indicator species; Caro, 2010) that rest on a fundamentally different theory, even though the same entity can embody both.

3. Proposed flagship framework

We propose the overarching term 'flagship entity' that can refer to a flagship belonging to any flagship category. The concept of a flagship entity can be broadly defined as a unique and recognizable entity that distinguishes itself from others and is easily communicated to a given target audience for conservation purposes. As such, flagship entity is a

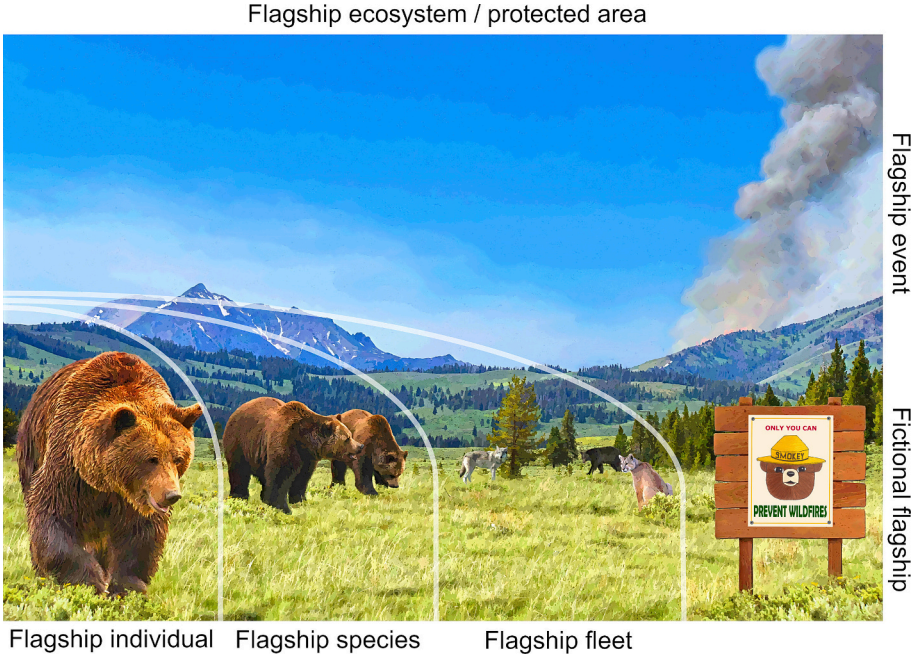

Fig. 1. Conservation flagships. The figure presents an overview of different co-occurring flagship categories, with the Greater Yellowstone Ecosystem used as an example: Grizzly 399 as a flagship individual – a female grizzly bear (*Ursus arctos horribilis*), considered the most famous bear in the Greater Yellowstone Ecosystem, attracts huge attention and drives tourism (Gunther et al., 2015; Jarić et al., 2024a); grizzly bears as a flagship species; large predators, here also including American black bear (*Ursus americanus*), wolf (*Canis lupus*), and cougar (*Puma concolor*), as a flagship fleet or flagship community; Greater Yellowstone Ecosystem and Yellowstone National Park as a flagship ecosystem or flagship protected area; the wildfire visible in the background represents a flagship event (Jarić et al., 2024b), while the Smokey Bear drawing on the panel sign represents a fictional flagship (in this case, a flagship individual; Jarić et al., 2024a). Artwork: Snežana Leskovar and Irena Jarić.

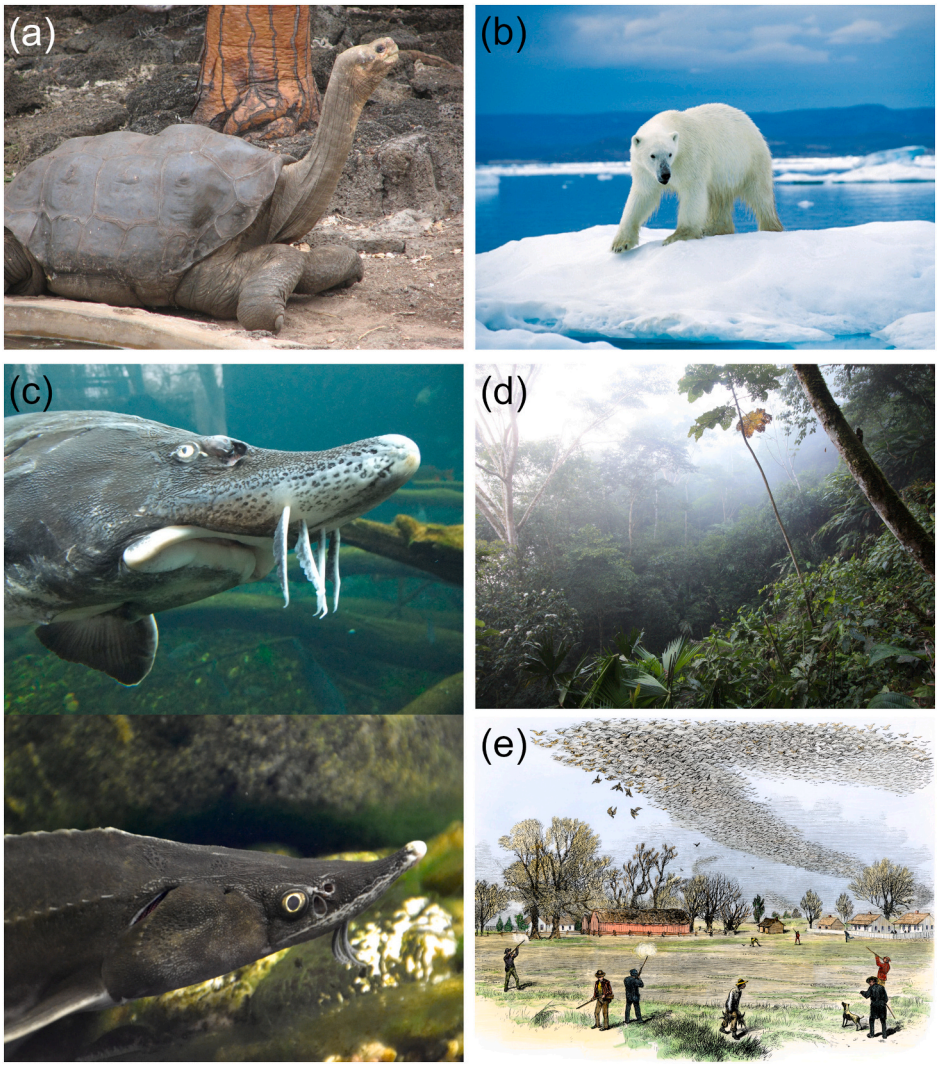

Fig. 2. Examples of different flagship categories. (a) Flagship individual: Lonesome George, a male Pinta Island tortoise (*Chelonoidis niger abingdonii*), the last known individual of the subspecies that became widely known as the rarest creature in the world and a symbol of conservation efforts in the Galápagos Islands (Nicholls, 2006; Jarić et al., 2024a; photo: Mike Weston; CC BY 2.0); (b) flagship species: the polar bear (*Ursus maritimus*), arguably the most iconic symbol of the efforts to mitigate climate change (photo: Ansgar Walk; CC BY 2.5); (c) flagship fleet: the six Danube sturgeon species (*Acipenseridae*), four extant and two extinct in the Danube River, are used as flagships by various conservation organizations (Kalinkat et al., 2017); the two species featured in the figure are the beluga (*Huso huso*; photo: Phyllis Rachler) and sterlet (*A. ruthenus*; photo: High Contrast; CC BY 3.0 DE); (d) flagship ecosystem: the Amazon rainforest is one of the most well-known ecosystems and conservation icons worldwide (photo: Jay; CC BY 2.0); (e) flagship event: the occurrence of massive flocks of several billions of nowadays extinct passenger pigeons (*Ectopistes migratorius*) continues to be used as a historic conservation flagship, especially for restoration and rewilding efforts, as well as for de-extinction initiatives (Jarić et al., 2024b; photo: Smith Bennett; public domain).

flexible term not limited by present boundaries between flagship concepts and can include new categories that may be conceptualized in the future. Essentially, any concept or entity can be used as a flagship if it can be singled out and has flagship attributes relevant for the audience it is intended to influence. To reduce ambiguity, however, it is always preferable to refer to a specific flagship category when it is known than to an entity.

Flagship entities can be characterized across several dimensions. First, they can be positioned at different levels of biological and ecological organization, ranging from individuals, through populations, species and communities, to ecosystems, landscapes and their processes (Verissimo et al., 2011). Second, based on their temporal state they can be either current, existing entities, or historic, such as flagship individuals that are no longer living (Jarić et al., 2024a), extinct flagship species (Kyne and Adams, 2017), or fully degraded ecosystems. They can also be future entities, for example, novel landscapes or ecosystems planned to be established, or novel communities being generated through rewilding practices (Lorimer et al., 2015). Third, they can either be real or fictional, such as fictional flagship individuals (Jarić et al., 2024a), or virtual influencers (Veríssimo, 2021). Fourth, based on their geographical context and use, their reach can range from local to global. Finally, they may comprise single or multiple entities, such as flagship fleets. It should be noted that the concept of flagship fleets was originally limited to sets of flagship species (Veríssimo et al., 2014). However, under our framework, a fleet could represent a set of multiple entities from any flagship category, such as multiple flagship individuals (Jarić et al., 2024a) or ecosystems, or even heterogeneous sets of entities belonging to different flagship categories.

Charisma is a key attribute associated with flagship species and is also referred to in the literature as 'attractiveness', 'appeal', or 'beauty' (Jarić et al., 2020a). Charisma is an elusive concept, and while there is no consensus on its definition, charismatic species can be defined as species whose characteristics positively affect people's perceptions, attitudes and behaviors surrounding them (Jarić et al., 2020a). This

understanding of species charisma means that although it can be driven by certain visual, acoustic, olfactory, behavioral, and symbolic characteristics, charisma is ultimately highly subjective and context-dependent (Lorimer, 2007; Shackleton et al., 2019; Jarić et al., 2020a). However, while charisma may be an appropriate attribute for flagship species and individuals, it is probably less so for other types of flagship entities, such as ecosystems or events. Essentially, what is typically meant when referring to a species as being charismatic is that it is a distinctive and memorable species within a given cultural context, in line with the definition of a flagship entity provided above. Therefore, for a wider pool of flagship entities, it is preferable to move away from the opaque term of charisma and towards other attributes such as distinctiveness, attractiveness, and memorability.

Flagship entities are also characterized by evolving attributes that include the extent and effectiveness of their use (Fig. 3). These features, typically measured on a continuous scale, allow us to evaluate and track the success of flagships in space and time. Flagship effectiveness indicates its fit to the target audience (X axis in Fig. 3), while the level of flagship use defines the level of its adoption in conservation marketing (Y axis in Fig. 3). Currently used flagships can therefore be categorized as either effective or ineffective, while those not yet used can be differentiated into promising but currently overlooked entities ('Cinderella flagships'; Smith et al., 2012) and those that are both overlooked and likely to be ineffective (which we named 'Drizellas', after Cinderella's unappealing sister; Fig. 3). The latter includes species perceived as nuisances, disgusting, fear-inducing, or potentially harmful to humans, such as mosquitoes, spiders, rats, or large carnivores involved in conflicts with local communities (Correia and Mammola, 2024). The use of the two axes allows mapping and comparing different flagship entities based on their effectiveness and use, as well as tracking how they change over time.

Public understanding and knowledge of taxonomy and ecological features is often not aligned with what is recognized by science, which may also affect the choice of a flagship entity. For instance, eagles, sharks, bats, or snakes might be culturally relevant to some communities and suitable as flagship entities, without clearly distinguishing particular species that are relevant for conservation (Macdonald and Wester, 2020). Such folk taxonomies might also apply for ecosystems and other flagship categories (e.g., with people recognizing 'forest' as a general entity, without specifying a particular type of forest), and can represent taxonomically or otherwise complex entities (e.g., marine taxa; Mazzoldi et al., 2019). However, if folk taxonomies clash with scientific classifications, this could lead to confusion, potentially affecting flagship effectiveness and requiring added efforts in conservation practice (e.g. through conservation marketing).

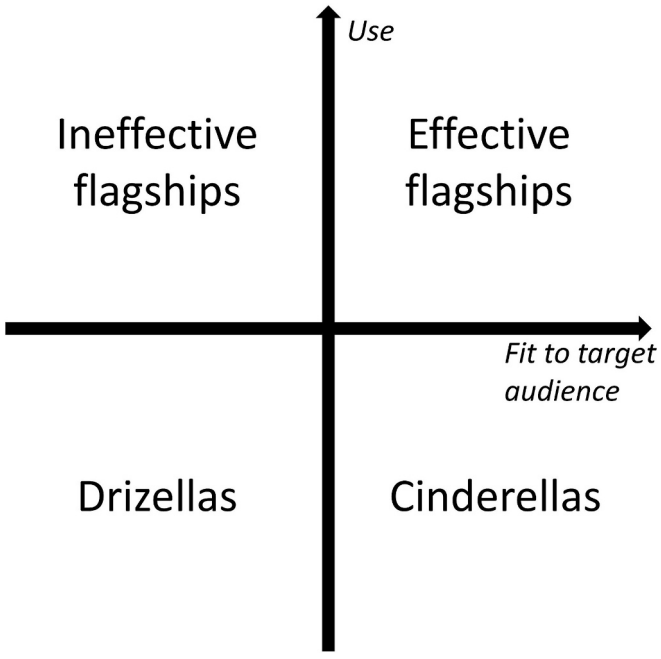

Fig. 3. Framework for flagship effectiveness categorization based on their use and fit to target audience. Potential and actual flagship entities can be differentiated along two axes: 1) their fit to target audience (effective versus ineffective entities); and 2) their use (currently used versus overlooked entities).

4. Selecting and using flagship entities

The selection of the right flagship entity should be driven by sound knowledge and clear understanding of the target audience's preferences. However, this is rarely followed in practice (Verissimo et al., 2011; Lundberg and Arponen, 2022). The most commonly used flagship entities, flagship species (Lundberg et al., 2020), are typically selected based on their overall popularity and particular traits that are assumed to drive species charisma, such as large body size, anthropomorphic features, or distinctive coloration (Barua et al., 2011; Mammola et al., 2023). For most flagship species, their ability to mobilize the target audience and attract support for a wide range of conservation targets has to our knowledge rarely been assessed in the selection process. Furthermore, the promotion of most flagship species tends to be aimed at broad and undefined audience groups commonly labeled as the 'general public' (Verissimo et al., 2011; Smith et al., 2012; Lundberg and Arponen, 2022). Such an approach can dilute conservation messaging by overlooking the diverse interests, values, and motivations within heterogeneous public groups, ultimately reducing the flagship's ability to effectively engage and mobilize target audiences.

Verissimo et al. (2011) proposed a flagship species selection framework grounded in marketing approaches. Accordingly, the planning phase of a flagship marketing campaign should include identifying the conservation issue and associated measurable targets, defining the target audience and its relationship with the conservation issue, and devising an optimal marketing strategy. Such a framework could be applied to any flagship entity. As the conservation marketing audience does not represent a single, homogenous group, flagship selection and use should be based on targeting particular societal groups through a segmentation strategy (i.e., the process of dividing an audience into meaningful sub-groups for targeting with distinct marketing strategies), defined based on a sound understanding of their interests and preferences (Metcalf et al., 2019; Lundberg et al., 2020; Lundberg and Arponen, 2022).

The choice of a flagship entity should also be based on its intended use. Barua et al. (2011) defined a set of flagship species selection criteria, such as spatial distribution, conservation relevance, appearance, conspicuousness, distinctiveness, and cultural significance. The importance of each of the criteria for a particular flagship entity should be determined by the intended type of conservation action – raising conservation awareness, fundraising, promoting ecotourism, community-based conservation, scientific outreach, species/habitat protection, or policy change (Barua et al., 2011). There are various approaches to identify key flagship attribute preferences of the target audience, including contingent valuation and choice experiments (Verissimo et al., 2011).

5. Using the COM-B model of behavioral change to support the use of flagship entities

Considering that flagship marketing is largely about promoting behavioral change, the 'COM-B' (Capability, Opportunity, Motivation, and Behavior) model of behavioral change (Michie et al., 2011) could be adapted as a promising framework for the use of flagship entities. This framework is based on three key components necessary for any behavior to occur: (i) capability (individual psychological and physical capacity

to engage in a particular activity), (ii) opportunity (external factors that make behavior possible), and (iii) motivation (cognitive processes that drive behavior; Michie et al., 2011). When applied to flagship use, the three components can be adapted as follows: (i) capability represents the fit of a flagship entity to the target audience and the user's ability to promote it; (ii) opportunity corresponds to the timing and available resources for making a flagship effective; and (iii) motivation pertains to conservation goals and people promoting the flagship entity. While the 'flagshipping' process can be fully implemented through all the stages from flagship selection to branding and marketing, flagship entities can also emerge independently, and some aspect of their established cultural profile is then leveraged for conservation campaigns (Jarić et al., 2024b). In line with the COM-B model, in some cases there can be existing motivation to use a flagship entity, but the opportunities or capabilities can be lacking and would need to be created; in others, it is the flagship opportunities and capabilities that exist or emerge gradually, and then the motivation would emerge to leverage them. Flagship entities can emerge either rapidly through a focusing event or gradually through continuous interactions with people (Jarić et al., 2023, 2024a, 2024b).

6. Evaluating flagship entities

The evaluation of flagship effectiveness is crucial but rarely implemented (Verissimo et al., 2011; Lundberg and Arponen, 2022). Impact can be measured through effects on awareness raising, driving attitudinal or behavioral changes, and attracting financial or political support (Verissimo et al., 2011). Flagship-based campaigns should be carefully assessed using a variety of methods, including experimental designs and innovative approaches like culturomic indices (Jarić et al., 2023, 2024b). The field of conservation culturomics (Ladle et al., 2016) can be used to support flagship selection and evaluation. Using data from various sources, such as social and news media, media repositories, online encyclopedias, and search engines, it can provide relevant insights for peoples' awareness, interests, preferences, attitudes, behavior, and values related to potential and existing flagship entities, conservation issues, and conservation marketing campaigns (Fink et al., 2020; Correia et al., 2021). Culturomics can help identify promising flagship entities by screening societal interest across a wide range of flagship candidates, monitor effects of public outreach campaigns and behavior change interventions that employed selected flagship entities, and help evaluate and adapt marketing strategies (Jarić et al., 2020b; Kau et al., 2025). Evaluation of flagship effectiveness should also assess whether funds collected through flagship use are translated into conservation gains, and lead to effective conservation actions.

Public awareness, interests, perceptions, and values tend to change over time, which may affect the fit of a flagship entity to the target audience, and its potential to attract conservation support. This makes it important to ensure continued evaluation or re-evaluation of the effectiveness of a selected flagship entity, as well as to adapt their use in line with any observed changes.

7. Challenges and caveats

For flagship selection and marketing planning, potential challenges and caveats need to be carefully considered and accounted for, to reduce the risk of unforeseen impacts (Verissimo et al., 2011; Jarić et al., 2024a, 2024b). Considering the heterogeneity of target audiences and that perceptions and preferences tend to vary both within and among target groups, it is unlikely to have a universally fitting flagship entity, or that large-scale or global campaigns based on a single flagship entity will be as effective as more tailored efforts. Furthermore, flagship marketing can resort to anthropomorphism, to emphasize appealing and charismatic traits, and can present an oversimplified, stereotypical, or sensationalized image (Jarić et al., 2024a, 2024b). This can diminish the effectiveness of a flagship campaign by distorting or falsely characterizing the flagship entity, which can lead to unforeseen conflicts or feelings of resentment within local communities and stakeholders towards the flagship and the conservation campaign (Verissimo et al., 2011; Jarić et al., 2024b). Additionally, a flagship campaign can make flagship entities more desirable as pets or tourism destinations, lead to increased disturbance, undesired human-nature interactions, wildlife trade, unsustainable or illegal exploitation, and unsustainable tourism (Šmelhausová et al., 2022; Jarić et al., 2024b). Moreover, marketing campaigns for flagship ecosystems, landscapes, and protected areas designed to present them as historically untouched land can lead to marginalization and disavowing presence of local communities in those areas, and conceal histories of Indigenous Peoples' dispossession by promoting myths that those areas were historically uninhabited (Banerjee and Dunaway, 2023). Finally, all types of flagship entities are inherently transient, especially flagship individuals and events (Jarić et al., 2024a, 2024b), although other flagship categories can also cease to perform their role – flagship species can become extinct, while flagship ecosystems can be degraded or completely lost. This can lead to conservation pessimism and apathy, reduce public support, and complicate conservation campaigns (Jarić et al., 2024a). These issues can be mitigated through efforts to anticipate timespans of flagship entities to timely and effectively leverage those that may be more transient, for example by employing flagship fleets with alternative flagship entities, as well as by using fictional or historic flagships (Jarić et al., 2024a).

8. Future outlook

Conservation marketing, advocacy, and fundraising campaigns could benefit from employing a wider range of flagship entities that are designed to attract diverse target audiences (Lundberg et al., 2020). However, further assessment is needed for the continued use of such a diverse range of flagship entities, including those beyond the categories presented here. Research synthesis (e.g., meta-analyses) should be conducted to evaluate the effectiveness of various flagship categories and concepts, while empirical and experimental studies should investigate which flagship types and framing best motivate and drive particular conservation actions. It is also crucial to examine both conscious and subconscious preferences of different target audiences, borrowing social science approaches to distinguish between stated and revealed preferences. Additionally, current gaps in understanding the cost-effectiveness of flagship entities must be addressed, along with evaluations of the positive and negative economic outcomes of flagship strategies.

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CRediT authorship contribution statement

Ivan Jarić: Writing – review & editing, Writing – original draft, Visualization, Supervision, Conceptualization. **Sarah L. Crowley:** Writing – review & editing, Conceptualization. **Jonathan M. Jeschke:** Writing – review & editing, Conceptualization. **Ugo Arbieu:** Writing – review & editing, Conceptualization. **Gabriel Henrique de Oliveira Caetano:** Writing – review & editing, Conceptualization. **Ricardo A. Correia:** Writing – review & editing, Conceptualization. **Arjun Kamdar:** Writing – review & editing, Conceptualization. **Richard J. Ladle:** Writing – review & editing, Conceptualization. **Stefano Mammola:**

Writing – review & editing, Conceptualization. **Uri Roll:** Writing – review & editing, Conceptualization. **Diogo Veríssimo:** Writing – review & editing, Visualization, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

No data was used for the research described in the article.

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