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Evaluating Conservation Flagships and Flagship Fleets

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Abstract

Flagship species are widely used in conservation but this single species approach has attracted criticism. One response is the “flagship fleet,” which uses several flagship species in one conservation marketing campaign. However, marketing theory suggests multibrand campaigns can be counter-productive. Here, we develop an evaluation strategy for conservation flagships, and use it to: measure the effectiveness of an existing bird flagship species; detect whether additional species are needed; and, if appropriate, identify which species should be added to create a flagship fleet. We show the bird species has high levels of visibility and recognition, but has traits that appeal to only half the target audience. We also show that this shortcoming could be overcome by forming a flagship fleet based on adding an endemic mammal or fish species but there are additional strategic considerations that must be taken into account, namely in terms of costs and potential future conflicts.

Introduction

Reducing the current rate of biodiversity loss depends on raising awareness about the value of biodiversity, as is reflected in the Convention on Biological Diversity's Aichi Target 1. Flagship species could play a major role in such awareness raising and behavior change (Bowen-Jones & Entwistle 2002; Veríssimo et al. 2011) but this single-species approach has been criticized for skewing priorities, so that the focal species receives the majority of funding and attention (Smith et al. 2012). This is why several articles have recently discussed the use of “flagship fleets,” which use several flagships in a single campaign so as to: (1) benefit a wider range of biodiversity; (2) increase campaign impact by highlighting the plight of more species; and (3) increase the likelihood the target audience will find at least one of the species appealing (Yezerinac & Moola 2006; Barua et al. 2011; Root-Bernstein & Armesto 2013). However, marketing theory suggests using many flagships simultaneously could be counter-productive, as each species might target small subgroups within the target audience leading to less

cost-effective campaigns and overly complex campaign messages.

Moreover, it is rare for conservationists to measure the effectiveness of existing flagship species and so potentially premature to consider adding to them to produce a fleet without appropriate evaluation. This is another reason why it is essential to evaluate the effectiveness of conservation flagships. Thus, assessments should focus on their two main roles, which are: (1) improving the visibility and recognition of conservation issues and the associated people and organizations and (2) ensuring that flagships resonate with the target audience, based on their possession of appealing traits. The importance of visibility, recognition and appeal has long been recognized in marketing (Abbey 2010; Wilcove 2010; Nicholls 2011) and many companies already use biodiversity as part of their branding strategy (Brown 2010). This importance provides another example where conservationists can adopt techniques pioneered in another field, so here we use marketing approaches to measure awareness and appeal of an existing flagship and

determine the appropriateness of developing a flagship fleet.

Brand awareness, the extent to which a brand is recognized by potential customers, and associated with a product, consists of two main aspects, visibility and recognition, and is known to strongly influence consumer decisions (Jones 2005; Konecnik & Gartner 2007) in some cases overriding considerations of quality or cost (Hoyer & Brown 1990; Macdonald & Sharp 2000). Thus, flagship awareness can be an indicator of potential for improving campaign visibility and recognition. In addition, if the species is an existing flagship, this metric can help understand the impact of ongoing conservation campaigns in combination with precampaign information on awareness and attitudes.

However, high awareness is not enough as it could be accompanied by negative attitudes toward the flagship species. Thus, it is also vital to understand the flagship appeal of a species by investigating whether its characteristics match the target audiences' preferences and if there are distinct preference groups within the target audience. This information, which can be obtained via nonmarket valuation techniques such as choice experiments, mimics research on commercial brand positioning and can inform the selection of additional flagships for use in a "flagship fleet." In this way, we could ensure that all relevant audience groups are covered. This approach parallels the multibrand strategy used in the commercial sector, where companies market the same product under different brands (Kotler & Armstrong 2010). For example, aspirin is sold under different names to different people by emphasizing different medical benefits (Kotler & Armstrong 2010). Thus, although there are clear differences between commercial brands and conservation flagships, there is also scope for using marketing methodologies to improve conservation practice.

In this manuscript we use the analogy between commercial brands and flagship species to develop methods, based on marketing and economic theory, for better understanding the effectiveness of single and multi-species conservation marketing campaigns. We apply these methods to a conservation project in Brazil to: (1) measure the impact of an ongoing conservation outreach project to raise the profile of a flagship species and (2) determine whether this flagship matches the preferences of the target audience and if it should be supplemented with other species to form a flagship fleet.

Methods

Our analysis focused on a conservation project involving the Araripe manakin (*Antilophia bokermanni*), a bird endemic to the slopes of the Araripe Plateau in the Cariri

region, northeast Brazil (Rêgo et al. 2010). Described only in 1998 (Coelho & Silva 1998) this critically endangered species (IUCN 2011) has since been used as a regional flagship for sustainable forest and water management (e.g., Girão 2009).

To assess the Araripe manakin's role as a conservation flagship, we first needed to identify the target audience (Veríssimo et al. 2011; Veríssimo et al. 2013). We selected the rural communities living adjacent to the species habitat, as the main threat to the species is habitat degradation due to subsistence-level resource use by local villagers. We focused on four localities spread across the three municipalities that contain the distribution of the Araripe manakin. These villages were selected based on their population size and proximity to the larger habitat fragments. A team of five enumerators conducted the surveys face-to-face, and respondents were asked to choose the species they felt it was important to conserve, assuming that flagship campaigns are most successful when focusing on species of high target audience concern. In the first part of the survey we adapted surveys used for measuring brand awareness to investigate the visibility and recognizability of the Araripe manakin. In the second part we used a choice experiment to understand how species attributes influence the preferences of the target audience and if there is the need to select additional flagships (see Supplementary Material for further details).

Measuring flagship visibility and recognition

To evaluate the visibility of the Araripe manakin we measured both unaided awareness, where no prompts about the species are offered to respondents, and aided awareness where the name of the species is given (Aaker 1996). The first survey question, aimed at measuring unaided awareness, asked respondents to name any bird species they could recall, with the researcher noting down the first three species mentioned. This method combines traditional unaided-awareness questions, where all answers given are recorded, with the "top-of-mind" method where only the first answer is recorded (Aaker 1996).

The second and third questions evaluated aided awareness of the image and common name of the Araripe manakin, as is often done with brand names and logos (Aaker 1996; Keller 1998). This required the use of other species as benchmarks. These species were selected based on their different expected levels of awareness. The selected benchmark species were the Red-cowled Cardinal (*Paroaria dominicana*), a popular cage bird, the Great Kiskadee (*Pitangus sulphuratus*), a common bird around human settlements, the Blue Dacnis (*Dacnis cayana*), a secretive forest bird and the Hoopoe (*Upupa epops*), a distinctive species that does not occur in South America

and was included to account for potential yea-saying bias (see Srinivasan et al. 2005). Thus, the second question presented respondents with illustrations of the above mentioned species plus the Araripe manakin (Van Perlo 2009) and asked if respondents knew their common names.

The third question asked respondents if they recognized any bird names out of a list containing local and nationally accepted common names for the five species mentioned above. Common names are especially relevant to understand the impact of the conservation outreach campaigns focused on the Araripe manakin, as this species has several common names with different origins. Prior to its scientific discovery, the few people who knew the species used several common names, such as *língua-de-tamanduá* and *lavadeira-da-mata*. However, when it was described as a new species it was given a new common name, *Soldadinho-do-Araripe*, based on the name of its closest taxonomic relative (de Farias & Alves 2007; Silva et al. 2011). This last name was subsequently used in all conservation outreach activities (Silva & Rêgo 2004; Aquasis 2006). Thus, we could identify the information sources with which respondents had been in contact with by looking at the common names they recognize.

The fourth question prompted respondents to mention any facts they knew about the Araripe manakin to detect if respondents only had a superficial awareness of the species, which would diminish the importance of the findings (see Srinivasan et al. 2005). The fifth question asked respondents to list who they believed was responsible for the conservation of the Araripe manakin, so as to gauge attitudes toward the species and its conservation.

Understanding flagship appeal

To understand the species attributes that are important for audience appeal we used choice experiments (Figure 1). The first step was to define the species attributes to be tested (Mangham et al. 2009) by conducting a pilot survey to consult stakeholders. The selected species attributes were: abundance, regional endemism, size, and biological group (Table 1). The inclusion of biological group as an attribute, which included all vertebrate groups and trees, meant that attribute levels had to be qualitative to allow for the differences between groups. We used PASW SPSS 18.0 to design a choice experiment consisting of these four attributes and then used this to survey the respondents at the same time as they were asked about flagship visibility and recognition. We then used NLogit 4.0 to produce a Latent Class Model that grouped the respondents based on their attribute preferences and their socioeconomic (see Supplementary Material for further details).

Results

Visibility and recognition



We conducted the surveys in November 2010, with 263 respondents distributed across the localities of Romualdo ($n = 71$), Riacho do Meio ($n = 53$), Guaribas ($n = 56$), and Gameleira de S. Sebastião ($n = 83$). The sample was gender balanced (46% male; 54% female) and was similar to the reference dataset for the municipalities surveyed (48% male; 52% female) (IBGE 2010). The median age of 31 was similar to that of the reference dataset for the municipalities surveyed, which was 32 (IBGE 2010).



Unaided awareness of the Araripe manakin was 10%, making it the seventh most recalled species (Figure 2). Aided awareness of the Araripe manakin's image was 28% (Figure 3). Aided awareness of the Araripe manakin's common names was 74% (Figure 3). For both these indicators to avoid "yea-saying bias," we excluded the fewer than 2% of respondents who claimed to recognize all five species, including the hoopoe. Knowledge of the Araripe manakin was substantial, with 57% of respondents knowing the species was threatened, 40% recognizing the species was dependent on forest water springs and 34% acknowledging its endemic status to the Cariri region (Figure 4). Finally, 65% of respondents mentioned IBAMA, the government conservation agency, when asked to list who was responsible for conserving the Araripe manakin, while 61% mentioned local communities (Figure 5).



Appeal

The Latent Class Model, which groups people according to their preferences and socioeconomic characteristics, found the respondents were best described by three groups (additional details on model selection are provided in the Supplementary Material). Group 1 included about half of the respondents who were more likely to be from the localities of Guaribas and Riacho do Meio, and showed a preference for less abundant and endemic fish and mammals (Table 2). Group 2, included about a quarter of respondents, who were more likely to be from the localities of Guaribas and Riacho do Meio and work outdoors, and showed a preference for small sized endemic, fish, birds, or trees (Table 2). Group 3, included about a quarter of respondents, who were more likely from the localities of Romualdo and Gameleira de São Sebastião and work mostly indoors, and showed a preference toward endemic fish, reptiles, birds, and trees (Table 2).

Thus, to cover the full range of preferences of the target audience and considering the Araripe manakin as an established and successful flagship, another flagship would

Choice 1	Population size	A Rare	B Abundant
	Distribution	Widespread	Only in the Cariri
	Body size	Small	Large
	Type		

Choice 2	Population size	A Rare	B Abundant
	Distribution	Only in the Cariri	Widespread
	Body size	Large	Small
	Type		

Choice 3	Population size	A Rare	B Abundant
	Distribution	Widespread	Only in the Cariri
	Body size	Large	Small
	Type		



Choice 4	Population size	A Rare	B Abundant
	Distribution	Only in the Cariri	Widespread
	Body size	Large	Small
	Type		

Figure 1 Example of one page of the choice experiment survey used to select a flagship species for the slope forests neighboring the Araripe plateau.

have to be chosen to account for the preferences of Group 1. This suggests that the armored catfish *Aspidoras menezesi* or the climbing mouse *Rhipidomys cariri cariri*, which are both endemic to the Cariri region, have potential to be successful additions to a flagship fleet.

Discussion

Flagships are one of the most common marketing tools for biodiversity conservation. Here we present the first methodology designed to evaluate an existing conservation flagship. This methodology evaluates the flagship's visibility, recognition and it provides an understanding of the success of a particular flagship, whether additional

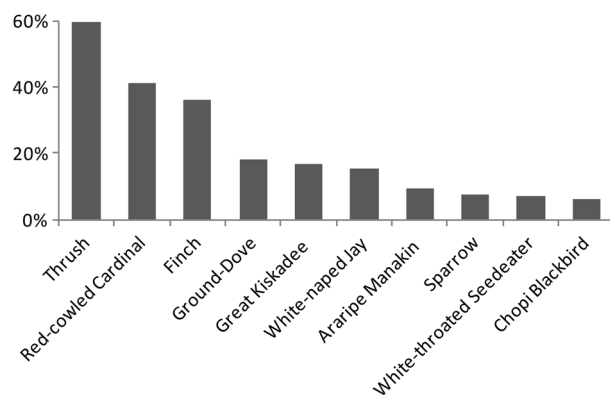
flagships should be used to broaden campaign effectiveness and, if so, which new flagships should be used to reach all of the target audience groups. This would allow for the evidence-based construction of flagship fleets, based on target audience preferences.

Existing flagship visibility, recognition, and appeal

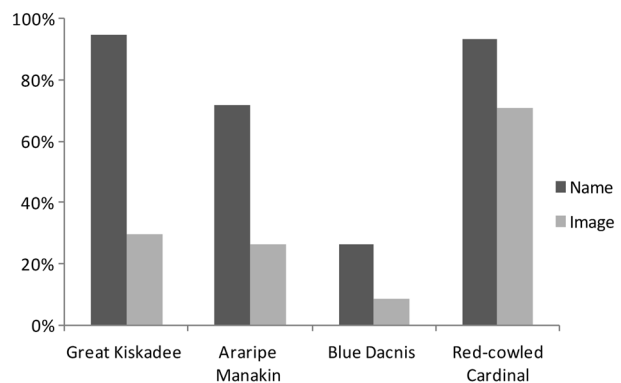
We found the Araripe manakin is currently an effective conservation flagship in terms of target audience visibility and recognition. This was shown in three ways. First, the Araripe manakin was the seventh most recalled bird in terms of unaided awareness, surpassing common

Table 1 Description of attributes and levels used in choice experiment, and socioeconomic data

Attribute	Description
Abundance	How abundant a species is, presented in two levels: low abundance (coded as 0) and high abundance (coded as 1)
Regional endemism	If the species is geographically limited to the Cariri region, presented in two levels: not endemic (coded as 0) and endemic abundance (coded as 1)
Size	Size of the species, divided into two levels: small (coded as 0) and large (coded as 1)
Biological group	Broad biological group the species belongs to, divided into six levels: fish, reptiles, amphibians, birds, mammals, and trees (dummy coded). Amphibians were used as the reference group as they were shown by preliminary analysis to be, overall, the least liked group.
Socioeconomic variable	Description
Gender	Female or male (coded 0/1)
Age	Number of years
Community	Name of the community (dummy coded)
Occupation	Divided in indoor and outdoor occupations (coded 0/1)
Numbers of years living in the community	Number of years

**Figure 2** Unaided awareness of bird species. Only the ten most recognized species are shown.

birds like the sparrow or the swallow (Figure 1). Second, the Araripe manakin's aided recognition was much closer to the Great Kiskadee, one of the most common birds in Brazil, than to the Blue Dacnis, which is similar to the Araripe manakin in having a restricted geographical distribution and being sensitive to human disturbance (Figure 2). Furthermore, 90% of the respondents recognized the species only by its more recent common name, which was first used during the conservation outreach efforts, providing evidence that this outcome is the result of previous conservation campaigns. Third, 57% of respondents knew that the Araripe manakin was threatened, while more than a third was aware of its dependence on water springs and its endemism to the Cariri region. Fourth, a high proportion of respondents recognized their own role in the conservation of the Araripe manakin by naming local communities as key players in the species conservation.

**Figure 3** Aided recognition of the common names and visual representation of the Araripe manakin compared with other bird species.

Nevertheless, only two of the three target audience groups, who made up 48% of the respondents, said that endemic bird species were appealing, and this includes the Araripe manakin. The remaining group favored endemic mammals as a flagship, together with a weaker preference for fish species with low abundance. This ubiquitous preference for endemic species is possibly a reflection of the regions strong cultural identity, as people from the Cariri region have long seen themselves as culturally distinct. This region is also relatively poor, which might explain why some people preferred fish and mammal species, as these have important direct use values.

Building a flagship fleet

Our choice experiment showed only half the target audience found birds to be appealing, suggesting that a flagship fleet could broaden the appeal of the conservation

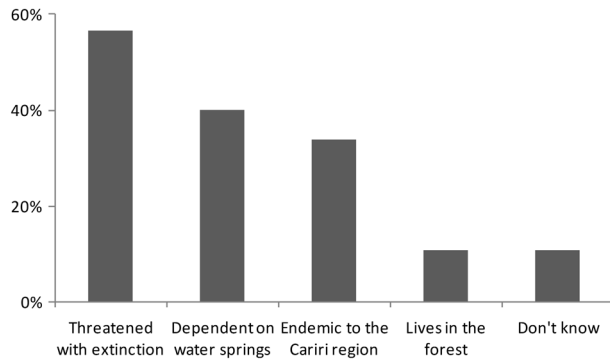


Figure 4 Knowledge of respondents about the Araripe manakin. Only the five most frequent answers are shown.

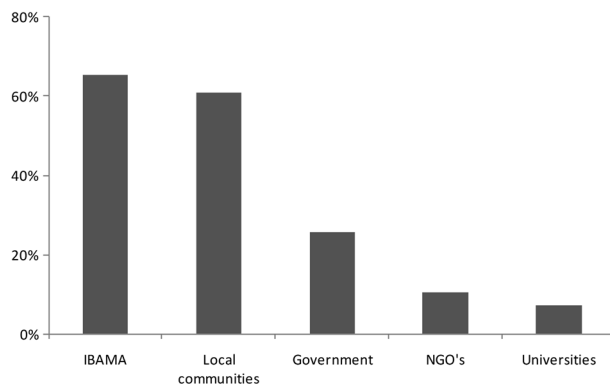


Figure 5 Whose respondents' thought responsible for the conservation of the Araripe manakin. Only the five most frequent answers are shown.

campaign, even though the Araripe Manakin had relatively high levels of recognition and visibility. In addition, our results provide data to identify these additional flagships and suggest the most suitable candidate would

either be an endemic mammal or fish species with low abundance. However, applying these models to identify the exact species can be more difficult as conservationists are obviously limited to the species that are found within the study area. For example, the model showed that mammals were most appealing to Group 1 but the only endemic mammal in Cariri region is the climbing mouse, and previous research has shown rodents are generally perceived as unappealing (Smith et al. 2012). Thus, the armored catfish would probably be a more suitable flagship, especially as fish species were favored by all groups within the target audience.

However, there are two reasons why additional research is needed in this case to select which candidate species should be used in the final flagship fleet campaign. First, the additional species are currently unknown to the target audience and there are several other species with similar physical characteristics, making them hard to distinguish. Thus, it could prove expensive to raise their profile. Second, the modeling process identified audience preferences for broad taxonomic groups, whereas the eventual campaigns are based on individual species. This means this broad approach should be followed by qualitative studies such as focus groups that investigate the relative merits of each specific flagship candidate.

There are also broader strategic considerations when developing a flagship fleet. One is the potential for ecological and management competition between flagship species (Veríssimo et al. 2012). This could place different target audience groups in conflict and create conflict between conservationists working on different projects (Simberloff 1998). Another consideration is whether to use species within a flagship fleet in a single campaign to promote a common conservation goal, or in parallel campaigns targeting different audience groups. The former may be cheaper, as only one set of campaign materials

Table 2 Preferences for species attributes per group for the multinomial logit (MNL) and latent class model with three classes

Utility function variables	MNL	Group 1 (52%)	Group 2 (23%)	Group 3 (25%)
Abundance	-0.313 (0.066) ***	-0.256 (0.135) +	0.121 (0.154)	-1.969 (0.354) ***
Endemism	0.193 (0.066) **	0.247 (0.118) *	0.426 (0.141) **	0.652 (0.206) **
Size	-0.6 (0.067)	0.192 (0.133)	-0.638 (0.156) ***	-0.342 (0.291)
Fish	0.732 (0.127) ***	0.34 (0.2) +	0.735 (0.246) **	3.235 (0.627) ***
Reptile	0.332 (0.121) **	0.321 (0.227)	-0.811 (0.261) **	2.051 (0.414) ***
Bird	1.334 (0.189) ***	0.46 (0.349)	3.29 (0.51) ***	4.082 (0.687) ***
Mammal	1.233 (0.192) ***	2.044 (0.473) ***	0.5 (0.434)	0.027 (0.703)
Tree	1.758 (0.208) ***	0.544 (0.461)	0.395 (0.591) ***	7.023 (1.257) ***
ASC	-3.882 (0.42) ***	-4.721 (1.008) ***	-2.781 (0.366) ***	-12.67 (98.65)
Class variables				
Community		-0.471 (0.215) *	-1.432 (0.423) ***	
Profession		0.684 (0.505)	2.105 (0.823) *	

Significance levels are indicated by asterisks (+ $P < 0.1$; * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$). ASC, alternative specific constant.

is needed, whereas the latter allows more tailored campaigns and could be more effective if target audience preferences conflict. These strategic factors also relate to the conservation organisation running the flagship fleet campaign. All the species have to fit within the mission of organizations, which might rule out certain taxonomic groups or ecosystems combinations. Finally, organizations generally prefer to use long-standing flagships, even if they only partially meet target audience preferences, as to avoid wasting previously invested resources. But these resources are a sunk cost and as such could be disregarded if substantially more appealing species can be found. How much the appeal of two species would have to differ for this trade-offs to be beneficial is likely to be highly context specific and would be an important topic for future research.

Conclusions

Flagship evaluation is an important step in making conservation marketing campaigns more evidence-based. Focusing on evaluation also lets conservationists establish feedback loops to ensure that lessons learned are used to inform future marketing campaigns. This will be even more crucial for campaigns based on flagship fleets, whose selection and evaluation is more complex than that of single conservation flagships because they must account for target audience preferences as well as preference heterogeneity within this audience. By giving conservation flagships such an evidence-based grounding, we can harness their full potential to promote biodiversity conservation.

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's web site:

Table S1 Statistical criteria for determining the number of groups of the latent class model (LCM). Multinomial logit (MNL) presented for comparative purposes

This material is available as part of the online article from: <http://www.blackwell-synergy.com/doi/full/10.1111/j.1755-263X.2008.00002.x>

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