

# *Communication of flagship species in conservation: lessons from invasive management projects*

Article

Accepted Version

Melero, Y. ORCID: <https://orcid.org/0000-0002-4337-1448>  
(2017) Communication of flagship species in conservation:  
lessons from invasive management projects. *Biodiversity and  
Conservation*, 26 (12). pp. 2973-2978. ISSN 1572-9710 doi:  
10.1007/s10531-017-1389-6 Available at  
<https://centaur.reading.ac.uk/83098/>

It is advisable to refer to the publisher's version if you intend to cite from the work. See [Guidance on citing](#).

To link to this article DOI: <http://dx.doi.org/10.1007/s10531-017-1389-6>

Publisher: Springer

All outputs in CentAUR are protected by Intellectual Property Rights law, including copyright law. Copyright and IPR is retained by the creators or other copyright holders. Terms and conditions for use of this material are defined in the [End User Agreement](#).

[www.reading.ac.uk/centaur](http://www.reading.ac.uk/centaur)

**CentAUR**

Central Archive at the University of Reading

Reading's research outputs online

1 **Communication of flagship species in conservation: lessons from invasive management**  
2 **projects**

3 Yolanda Melero<sup>1</sup>

4 <sup>1</sup>CREAF, Cerdanyola del Vallés 08193, Spain

5 E mail: [y.melero@creaf.uab.cat](mailto:y.melero@creaf.uab.cat), Phone: +34 935814677

6

7 **Running title:** Communication with the public in conservation

8 **Keywords:** Communication, Flagship species, Invasive species, Management, Volunteers

9 **Type of article:** Policy Perspective

10 **Number of words in abstract:** 127

11 **Total number of words (including abstract but excluding references):** 1903

12 **Number of references:** 30

13

14 **Abstract**

15 With the increase of public awareness and involvement in conservational projects, flagship  
16 species have become a common tool to appeal to people's motivations. Yet, the effectiveness  
17 of these species depends on a proper communication of their conservational importance.  
18 Using two projects aiming to control the invasive species American mink, I illustrate how  
19 communication can positively or negatively impact on succeeding at involving the public; and  
20 consequently on the projects. The Scottish mink initiative project managed to increase the  
21 number of volunteers involved by selecting flagship species and their communication adapted  
22 to the public needs. Meanwhile, in the Spanish project, while no volunteers are yet involved,  
23 there has been an increase of public awareness via using the European mink as native flagship  
24 species. However, as its nativeness remains unconfirmed I suggest there is a high risk of  
25 potential miss-communication with the public that can negatively impact on their perception.

## Introduction

Public awareness and participation in management projects aiming to safeguard biodiversity have become key to bring support, funds and success. The reason behind people awareness or involvement in conservation projects is a complex compound of personal, social and environmental factors (Smith and Sutton 2008; Beirne and Lambin 2013); among which empathy, self and community benefit, and sense of responsibility about biodiversity loss have been reported as key motivational drivers (Hart & Larson 2014; Verissimo et al. 2011). To promote public awareness and participation, scientists and managers need to connect these motivational drivers with the objective behind management. Confronted with the difficulty of dealing with numerous personalized interactions between them and the network of citizens, generalized motivational arguments such as the protection of flagship species are of common use (Caro 2010).

The idea behind the use of flagship species is that management focused on one or a few species will benefit an entire ecosystem. Thus, frequently the selection of these species is based on ecological factors including (but not exclusively) their role in the ecosystem or on their vulnerable status (Simberloff 1998; Kalinkat et al. 2016). Besides, among the potential set of species those most charismatic and appealing to the target audience are frequently selected (Verissimo et al. 2011; Verissimo et al. 2014) because they better enhance public awareness and participation (Smith and Sutton 2008). Yet, the effectiveness at driving people motivation highly depends on properly communicating the reasons behind this selection. To make projects and the ecological concepts accessible to a wide audience of citizens, communication is sometimes simplified. However, citizen knowledge is an important component of their involvement and resilience (Hou 2016), and therefore transmitting proper information can be crucial for the long term viability of the project. Where scientist and managers fail at proper communicating with citizens the latest may lose awareness, and if involved in participation, their motivation and commitment, potentially dropping out from the project.

54

55 The appropriate selection of flagship species and the communication strategy is especially  
56 important in projects aiming to reduce or eradicate invasive animal species via removal since  
57 this type of project is generally less attractive by the general public than those dealing directly  
58 with species protection; yet, the support and, frequently, involvement via volunteer  
59 participation in projects managing invasive species is essential for assuring success at a  
60 significant spatial scale, especially when leading with highly dispersive species (e.g., Delaney  
61 et al. 2008; Oliver et al. 2016).

62

63 Here I illustrate the importance of the selection of the flagship species and of the proper  
64 communication of the reasons behind their selection for the management of invasive species.  
65 To do so I use the successful example of a management project aiming to control the invasive  
66 American mink (*Neovison vison*) in Scotland based on volunteer involvement. Then, I use the  
67 example of the Spanish management project, which recently started to work on public  
68 awareness via the use of (unconfirmed native) flagships species and the potential future  
69 caveats this could face. I've been actively involved as project scientist in both and, in the first  
70 case, also as volunteer. I explain here their respective communication strategies and how they  
71 affected or may affect public awareness and participation.

72

### 73 **The American mink control in Scotland**

74 The American mink control in Scotland, one of the largest mammal control project in Europe,  
75 was initiated in 2006 centered on the Cairngorms National Park covering 3,800 km<sup>2</sup> (CNP  
76 57°0'N 3°3'W; NE Scotland) and gradually expanded over time to ca. 20,000 km<sup>2</sup> in 2012  
77 supported by ca. 400 volunteers (Bryce et al. 2011). Starting with 186 volunteers involved  
78 during the first years of the project, the number raised to 450 ca. in 2014, mostly composed of  
79 local residents, non professional naturalists and wildlife professionals; which have been key  
80 in the success of the project (Beirne & Lambin, 2013; Bryce et al. 2011).

81

The project started using the water vole (*Arvicola terrestris*) as flagship species to protect native species affected by American mink. Water voles are key stones in the ecosystem functioning but in the UK they suffered near catastrophic declines of over 80% partly attributed the predation to mink predation (Aars et al. 2001). The selection of the water vole as kick start flagship species for the project primary responded to ecological factors given its declining status and its role in ecosystem functioning (Aars et al. 2001; Bryce 2006). Besides, the species has a charismatic value within the general public in the UK, since it has been symbolised for generations of children by the character Ratty (though actually a water vole) in Kenneth Grahame's tale "The Wind in the Willows" (1908); which provides a cultural attachment and familiarity to species, traits positively related to citizens' motivation (Bowen-Jones and Entwistle 2002; Jepson and Barua 2015). When expanding, the project evolved to incorporate other flagship species depending on the public interests in the area. For example, using native birds in the coastal West Scotland and salmonids in the East because their ecological and economical value in nature-based and fishing-based tourism (e.g., Fraser et al. 2014).

Communication about the species and the project itself, has been focused on the ecological, economical and cultural value of the flagship species; recurrently done using different set of media, from one to one interactions with citizens to public talks, newsletters, automated feedback to those citizens being volunteers (e.g., Tintarev et al. 2012) and local and national press and TV news (e.g., <http://www.bbc.com/news/science-environment-19503827>).

The success of the control project at reducing American mink densities (e.g., Melero et al., 2015; Oliver et al., 2016), the ability to adapt the project to the different public needs and a customised and recurrent communication helped at ensuring the public support as well as the recruitment and the long term retention of volunteers (Beirne & Lambin 2013; Fraser et al. 2014).

## **The American mink control in Spain**

Most of the regional and national scale American mink control projects in Spain started in the decade of the 1990s with little success in controlling or reducing the species (e.g., Melero et al. 2010). The wide distribution of the species, with most populations still expanding, and the continuous and drastic reductions in funding have limited the successful control of mink populations. Besides, the public awareness has been for long poor and the participation close to null. (e.g., ca. < 5 volunteers in the population at NE Spain in 2007, > 20000km<sup>2</sup>; Melero 2007).

Notwithstanding, during the last years project scientist and managers have worked on increasing public awareness. In NW Spain, awareness is raised towards the impacted breeding birds of special conservational and touristic interest (Velando & Munilla, 2008; Barros et al. 2016). In central and NE Spain, the American mink poses a threat to the endangered Pyrenean desman (*Galemys pyrenaicus*) but it is rarely used as flagship species because it is yet a poorly known species between the general public despite the scientific recognition of its high value for biodiversity and evolution due to its relic and narrow endemic character (Nowak 1999). The biggest part of the communication strategy, both regional (North Spain) and national, relies on the effect of the American mink on its counterpart the European mink (*Mustela lutreola*).

As in the case of the Scottish project, communication is done using different media from public talks (e.g. in civic centers and schools) to dissemination of media videos in the social media (see e.g. <https://youtu.be/lkPXLmDSBHs>) and local or national news. There are not recurrent newsletters but there is an active involvement with the local communities via public activities (see eg. <http://lifelutreolaspain.com/en/education-awareness>). The main message of this communication is the need to conserve the native European mink from the introduced American mink. Overall, it seems communication is effectively increasing public awareness on the presence and risks of the American mink related to the conservational status of the

European mink. However, this message confronts with the current ongoing debate on the nativeness of the European mink population in the area among scientist (Clavero, 2015; Clavero, 2014; Zuberogoitia et al. 2016). Defenders of the species' nativeness claim that the populations in the is the result of constrictions of its native distribution who left the population on the western France and northern Spain isolated (e.g. Zuberogoitia et al. 2016); but the late detection of the species (1831 and 1955 for France and Spain; Saint-Girons 1994) and its low genetic variability compared to the populations in Russia and the Danube points to human mediated introductions (Michaux et al. 2005). Without entering in this debate but aware of its existence, a logical concern follows in relation to the communication strategy: What would happen if the human mediated introduction hypothesis was eventually confirmed?

At least two processes will be directly impacted, the motivational reason for its conservation and the public perception. In the first case, scientist, managers and conservationists would need to decide whether continuing working towards the conservation of the population or shift towards its control based on its introduced non native status. This last, in my opinion, is unlikely to occur since the critically endangered situation of the species and its endemic character in Europe (Maran et al. 2016) makes any remaining population worth to conserve for the global benefit of the species and biodiversity. Therefore, the motivational argument for the conservation of the species in Spain (and France) would need to change towards safeguarding an endangered species rather than because its nativeness. However, the impact on the public perception might be harder to shift after public awareness linked to the conservation importance of the species as a native facing the invasion of the introduced American.

Under the face of this possibility one may wonder why communication on the European mink as a flagship species is not generally focus on its overall importance as endangered endemic species in Europe, instead of its unconfirmed nativeness; and why communication is based on



this species only rather than expanding it to other species of confirmed nativeness and interest such as the Pyrenean desman. Even supporters of its nativeness could consider to follow this “conservative approach” when communicating given the impact on public perception that could occur if the introduction is confirmed.

## **Conclusions**

The two projects presented here illustrated how similar strategies on communicating the selection of flagship species may have different impact on people’s perception and interest on management initiatives. Beyond potential cultural differences, the success of volunteers’ involvement in the Scottish project is linked to the success of its strategy to appeal to the public interest by adaptive the selection and communication of flagships species to their background. Meanwhile, the Spanish project is mostly focused on the importance of the nativeness of a single species, rather than using a wider range of available species of interest or fully explaining the controversy behind this selection. As such, while public awareness is increasing, there is a high risk of people’s rejection if the main message (the species nativeness) is confirmed to be wrong.

## **References**

- Aars J, Lambin X, Denny R, Griffin AC (2001) Water vole in the Scottish uplands: distribution patterns of disturbed and pristine populations ahead and behind the American mink invasion front. . *Anim Conserv* 4:187–194. doi: doi:10.1017/S1367943001001226
- Beirne C, Lambin X (2013) Understanding the Determinants of Volunteer Retention Through Capture-Recapture Analysis: Answering Social Science Questions Using a Wildlife Ecology Toolkit. *Conserv Lett* 6:391–401. doi: 10.1111/conl.12023
- Bowen-Jones E, Entwistle A (2002) Identifying appropriate flagship species: the importance of culture and local contexts. *Oryx* 36:189–195. doi: 10.1017/S0030605302000261
- Bryce R, Oliver MK, Davies L, et al (2011) Turning back the tide of American mink invasion

194 at an unprecedented scale through community participation and adaptive management.  
 195 Biol Conserv 144:575–583. doi: 10.1016/j.biocon.2010.10.013  
 196 Bryce RL (2006) The ecosystem engineering and trophic effects of the water vole : species  
 197 loss and ecosystem processes. University of Aberdeen  
 198 Caro T (2010) Conservation by proxy: indicator, umbrella, keystone, flagship, and other  
 199 surrogate species. Island Press, Washington, D.C.  
 200 Clavero M (2015) Non-Native species as conservation priorities: response to Díez-León et al.  
 201 Conserv Biol. doi: 10.1111/cobi.12524  
 202 Clavero M (2014) Shifting Baselines and the Conservation of Non-Native Species. Conserv  
 203 Biol n/a-n/a. doi: 10.1111/cobi.12266  
 204 Delaney DG, Sperling CD, Adams CS, Leung B (2008) Marine invasive species: validation of  
 205 citizen science and implications for national monitoring networks. Biol Invasions  
 206 10:117–128. doi: 10.1007/s10530-007-9114-0  
 207 Fraser EJ, Macdonald DW, Bryce R, Lambin X (2014) Controlling invasive species by  
 208 empowering environmental stakeholders: ecotourism boat operators as potential  
 209 guardians of wildlife against the invasive American mink. Oryx 48:605–612. doi:  
 210 10.1017/S003060531300046X  
 211 Garcia P (2012) Situación actual del desmán ibérico, *Galemys pyrenaicus* (E. Geoffroy Saint  
 212 Hilaire, 1811), en la provincia de Salamanca. University of Salamanca  
 213 Grahame K (1908) The Wind in the Willows.  
 214 Hart PS, Larson BMH (2014) Communicating About Invasive Species: How “Driver” and  
 215 “Passenger” Models Influence Public Willingness to Take Action. Conserv Lett 7:545–  
 216 552. doi: 10.1111/conl.12109  
 217 Hou D (2016) Divergence in stakeholder perception of sustainable remediation. Sustain Sci.  
 218 doi: 10.1007/s11625-015-0346-0  
 219 Jepson P, Barua M (2015) A Theory of Flagship Species Action. Conserv Soc 13:95. doi:  
 220 10.4103/0972-4923.161228  
 221 Kalinkat G, Cabral JS, Darwall W, et al (2016) Flagship umbrella species needed for the

222 conservation of overlooked aquatic biodiversity. *Conserv Biol*. doi: 10.1111/cobi.12813  
 223 Manfredo MJ, Teel TL, Dietsch AM (2016) Implications of human value shift and persistence  
 224 for biodiversity conservation. *Conserv Biol* 30:287–296. doi: 10.1111/cobi.12619  
 225 Maran T, Skumatov D, Gomez A, et al (2016) *Mustela lutreola*. The IUCN Red List of  
 226 Threatened Species 2016.  
 227 Melero Y, Palazón S, Bonesi L, Gosálbez J (2010) Relative abundance of culled and not  
 228 culled American mink populations in northeast Spain and their potential distribution: are  
 229 culling campaigns effective? *Biol Invasions* 12:3877–3885. doi: 10.1007/s10530-010-  
 230 9778-8  
 231 Melero Y, Robinson E, Lambin X (2015) Density- and age-dependent reproduction partially  
 232 compensates culling efforts of invasive non-native American mink. *Biol Invasions*  
 233 17:2645–2657. doi: 10.1007/s10530-015-0902-7  
 234 Michaux JR, Hardy OJ, Justy F, et al (2005) Conservation genetics and population history of  
 235 the threatened European mink *Mustela lutreola*, with an emphasis on the west European  
 236 population. *Mol Ecol* 14:2373–2388. doi: 10.1111/j.1365-294X.2005.02597.x  
 237 Nowak RM (1999) *Walker’s mammals of the world*. The Johns Hopkins University Press,  
 238 Baltimore  
 239 Oliver M, Luque-Larena JJ, Lambin X (2009) Do rabbits eat voles? Apparent competition,  
 240 habitat heterogeneity and large-scale coexistence under mink predation. *Ecol Lett*  
 241 12:1201–1209. doi: 10.1111/j.1461-0248.2009.01375.x  
 242 Oliver MK, Piertney SB, Zalewski A, et al (2016) The compensatory potential of increased  
 243 immigration following intensive American mink population control is diluted by male-  
 244 biased dispersal. *Biol Invasions*. doi: 10.1007/s10530-016-1199-x  
 245 Saint-Girons MC (1994) Wild mink (*Mustela lutreola*) in Europe. *Nature and environment* 54.  
 246 Strassbourg  
 247 Simberloff D (1998) Flagships, umbrellas, and keystones: Is single-species management  
 248 passé in the landscape era? *Biol Conserv* 83:247–257. doi: 10.1016/S0006-  
 249 3207(97)00081-5

250 Smith AM, Sutton SG (2008) The Role of a Flagship Species in the Formation of  
 251 Conservation Intentions. *Hum Dimens Wildl* 13:127–140. doi:  
 252 10.1080/10871200701883408  
 253 Tintarev N, Melero Y, Sripada S, et al (2012) MinkApp: Generating Spatio-temporal  
 254 Summaries for Nature Conservation Volunteers. In: *Proceedings of the International*  
 255 *Conference of Natural Language generation*. Association for Computational Linguistics,  
 256 Utica, Illinois, pp 17–21  
 257 Velando A, Munilla I (2008) *Plan de Conservación del Cormorán moñudo en el Parque*  
 258 *Nacional de las Islas Atlánticas*. Vigo  
 259 Veríssimo D, Fraser I, Girão W, et al (2014) Evaluating Conservation Flagships and Flagship  
 260 Fleets. *Conserv Lett* 7:263–270. doi: 10.1111/conl.12070  
 261 Verissimo D, MacMillan DC, Smith RJ (2011) Toward a systematic approach for identifying  
 262 conservation flagships. *Conserv Lett* 4:1–8. doi: 10.1111/j.1755-263X.2010.00151.x  
 263 Zuberogoitia I, Põdra M, Palazón S, et al (2016) Misleading interpretation of shifting baseline  
 264 syndrome in the conservation of European mink. *Biodivers Conserv* 25:1795–1800. doi:  
 265 10.1007/s10531-016-1156-0  
 266