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Flagship species and their significance in biodiversity conservation

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Flagship species are the species, chosen to represent an environmental cause, such as an ecosystem in need of conservation. Moreover, these species are chosen for their vulnerability, attractiveness or distinctiveness in order to engender support and acknowledgement from the public at large. It can also be used as an important biodiversity conservation tool in the conservation of a significant number of other species across a wide array of taxonomic groups, and in functioning natural systems. An action plan for building public support for flagship species is the need of the hour for conserving the biodiversity.

INTRODUCTION

Species are the fundamental building blocks of nature and ecology. Without the continued survival of many of their number, the goals of ecosystem and biosphere management are unattainable. As of now, there are a total of 34 world biodiversity hotspots. These biodiversity hotspots cover just 2.1 per cent of the Earth's land area which are home for half of its plant species.

All human beings are dependant on biodiversity for their wellbeing. People living in poor economic conditions are particularly vulnerable to biodiversity loss as they depend on primary food and fuel sources for their livelihoods. The increasing loss of biodiversity due to anthropogenic causes represents an irreversible depletion of genetic material upon which evolutionary potential can work in future. Hence, extinctions arising from man's influence are the events that the conservation movement aims to prevent.

Flagship species are an important conservation tool because they can be used to reach out to the general public and raise funds (Bowen-Jones and Entwistle, 2002). The conservation of a flagship species '*in situ*' will result in the conservation of a significant number of other species also (Dietz and Nagagata, 1994). An approach is needed that can attract funds to land outside the protected areas system and find flagship species with a broad appeal. A national bird, mammal, plants or flower is an institutionalized example of the flagship species concept.

Environmental organizations employ flagship species for public campaigns, distinguishing them from keystone and indicator species. While the other three terms for species of special conservation concern are based on concepts that require considerable biological and ecological understanding. Flagship species are most effective when information from market research is available and moreover, what the public thinks of it and how much they like, appreciate, or approve the species.

Important flagship species of the world

Flagship species based biodiversity conservation is one of the main conservation strategy evolved in the mid-1980's in Brazil. Since then many such conservation programme were planned and executed successfully around the globe. Some of the important flagship species of the world have been mentioned in Table 1.

Table 1: Some important flagship species of the world

Name of species	Country	Status	Economic, ecological, cultural or religious value	Purpose	References
<i>Dalbergia melanoxylon</i> (African black wood)	Tanzania	Endemic. 8,500 species of plants (54% endemic)	Excellent and expensive timber.	Conservation of habitat	Ball, 2004
<i>Elephas maximus</i> (Asian Elephant)	India (Western Ghats)	Number of individuals: 45,000 (wild)	Cultural symbol of the people of South and Southeast Asia	Conservation of elephant habitat	Venkataraman <i>et al.</i> , 2002
<i>Macaca silenus</i> (Lion-tailed Macaque)	Southern India	Number of individuals: 3,000 – 5,000 (wild)	Effective seed disperser and can maintain tree diversity	Habitat conservation	Singh <i>et al.</i> , 2009
<i>Lagothrix lagotricha</i> (Woolly monkey)	Columbian Amazon	Endemic. 81 primate species (25 – 40% frugivorous)	Effective seed disperser and can maintain tree diversity	Habitat conservation	Maldonado, 2005
<i>Leontopithecus chrysomelas</i> (Golden-headed lion tamarins)	Brazil	Number of individuals: 850 – 3,100 (wild)	Effective seed disperser and can maintain tree diversity	Ecosystem conservation	Mittermeier, 1986
<i>Dipterocarpus indicus</i> , <i>Dysoxylum malabaricum</i> , <i>Calophyllum apetalum</i> , <i>Saraca asoca</i> , <i>Vateria indica</i> , <i>Artocarpus hirsutus</i> , <i>Hopea parviflora</i> , <i>Diospyros paniculata</i> and <i>Palaquium ellipticum</i>	India (Western Ghats)	Endemic	Excellent expensive timber	Habitat conservation	Sarkar <i>et al.</i> , 2011; Sarkar <i>et al.</i> , 2012; Hegde <i>et al.</i> , 2012

Protected areas in the habitats of the flagship species

The conservation of one flagship species will lead to the conservation of entire ecosystems and all species contained therein and thereby conservation of large protected areas. Some of the important protected areas of the world in the habitats of the flagship species are tabulated in Table 2.

Table 2: Protected areas in the habitats of the flagship species (NEASPEC, 2007)

Flagship species	Country	Name of protected area	Purpose	Area (ha)
Amur tiger	China	Jilin Hunchun Nature Reserve	Protection of habitat for the north-east tiger, Amur leopard and migratory birds	1,08,700
Snow leopard	China	Sichuan Fengtongzhai Nature Reserve	Protection of giant panda and forest ecosystems	39,039
White naped crane	China	Heilongjiang Zhanlong Nature Reserve	Protection of rare birds (<i>Grus japonensis</i>) and wetlands ecosystem in temperate zone	2,10,000
Amur tiger	Democratic People's Republic of Korea	Mt. Paektu Biosphere Reserves	To protect variety of species composition of mammalian and sufficient resource amount	1,32,000
Amur tiger, Amur leopard	Democratic People's Republic of Korea	Mt. Oga Natural Reserves	To preserve the ecological system. To provide good conditions of habitation to seasonal birds	6,000
Black faced spoonbill	Democratic People's Republic of Korea	Mt. Kuwol Biosphere Reserve	To protect the old typical forest ecosystem	52,715
Black faced spoonbill, Hooded crane	Japan	The Estuary of the Zuibaiji River and Hakata Bay	To protect habitats of water birds	26,708
Snow leopard	Mongolia	Great Gobi Strictly Protected Areas, Part A and B	Conservation of Great Gobi ecosystem and endangered wildlife such as Wild camel, Gobi bear	53,11,730
White napped crane, Hooded crane	Mongolia	Nomrog	Conservation of grassland	3,11,205
Black faced spoonbill	Republic of Korea	Kangwha Tidalflats	To improve their habitat	3,70,660
White napped crane	Russian Federation	Far East State Marine Reserve	Protection of Migratory/sea bird colonies and habitat	64,360

Role of flagship species

The major roles of flagship species are being described hereunder:

- a) The effectiveness of using flagship species that people feel emotional about to help raise funds for species (through donations and tourism) and habitat conservation (Ginsberg, 2001).
- b) Critically endangered flagship species should not be cast aside as they definitely have a role to play in raising awareness.
- c) Many government and independent organizations welcome flagship species as they have the potential to result in the protection of whole habitats.
- d) It is a driver of cash income.
- e) It has important role in strengthening local governance.
- f) It also helps in improving social well-being.

Criteria for selection of effective flagship species

Bowen-Jones and Entwistle (2002) presented detailed suggestions on how to identify flagship species and suggested ten criteria that need to be considered, out of which, two are focused on biological characteristics and other eight criteria deal with qualities that involve socio-cultural relations between the species and the society in question. In another study, Sarkar *et al.* (2012) had suggested different criteria for identification of flagship species like species endemism, RET status, uses, distribution and management interests with weightage followed by scoring of the plant species.

Generally, criteria for selection are based on the following broad headings (Bowen-Jones and Entwistle, 2002):

- i) **Geographical location:** Priority should be given to *in situ* conservation projects for those regions having high biological diversity or endemism. Moreover, the selected area should be relatively undisturbed.
- ii) **Ecological characteristics:** Any species that functions to reduce anthropogenic deforestation or that facilitates habitat recovery. The species selected as flagship one should possess maximum ecosystem value.
- iii) **Potential for building public support:** The selection of species should be based on public interest, having economic, cultural or religious values and also having the practical aspect of visibility in the forest.

One can choose a flagship species that urgently needs conservation whose population size is less than 100; but choosing such a species for conservation measures possesses certain merits and demerits, as mentioned hereunder:

- a) **Merits:** Selection of flagship species may facilitate secure funding, legislative intervention, press attention and other necessary resources. For example, critically endangered species such as “Northern spotted owl” have legal mandates for conservation in many countries.
- b) **Demerits:** The high value of each surviving animal favours a conservation strategy which can be designed around protecting individuals and not populations or communities. Moreover, there is also a risk of losing the flagship species before achieving higher priority objectives such as conservation of habitat.

CONCLUSION

Conservation of biodiversity is a global concern. Flagship species can be used as an important biodiversity conservation tool in the conservation of a significant number of other species across a wide array of taxonomic groups, and in functioning natural systems. An action plan for building public support for flagship species is utmost needed for biodiversity conservation.

REFERENCES

- [1]. Bowen-Jones, E. and Entwistle, A. [2002]. Identifying appropriate flagship species: The importance of culture and local contexts. *Oryx*, 36(2):189-195.
- [2]. Dietz, J.M., Dietz, L.A. and Nagagata, E.Y. [1994]. The effective use of flagship species for conservation of biodiversity: the example of lion tamarins in Brazil. *In: Creative conservation: Interactive management of wild and captive animals*, (eds.) Olney, P.J.S., Mace, G.M. and Feistner, A.T.C.. Chapman and Hall, London, UK, pp. 32-49.
- [3]. Ginsberg, J. [2001]. Flagship Panda. *Trends in Ecology and Evolution*, 16(1): 56-57.
- [4]. Hegde, K., Sarkar, P.K., Hareesh, T.S., Maheswarappa, V., Ahir, K.C., and Hegde, R. [2012]. Distribution and population structure of *Dipterocarpus indicus* and *Calophyllum apetalum* in Western Ghats of Karnataka: An important flagship species. Abstract *In: National seminar of Second Indian Biodiversity Congress (IBC 2012)* (Eds.) M. P. Nayer, G. G. Gangadharan, T. V. Ramachandra, C. Sureshkumar, Priyadarshan Dharmarajan and Bhaskar Acharya. Indian Institute of Science, Bangalore, p. 31.
- [5]. Maldonado, A. [2005]. The role of woolly monkeys as a flagship species for conservation in the Columbian Amazon. Oxford Brookes University, UK and The Woolly Monkey Project, Columbia, pp. 1-5.
- [6]. Mittermeier, R.A. [1986]. Primate conservation priorities in the Neotropical region. *Springer Verlag*, 17 p.
- [7]. NEASPEC. [2007]. Saving the flagship species of north-east Asia: Nature conservation strategy of NEASPEC. ESCAP, United Nations, 70 p.
- [8]. Sarkar, P.K., Ahir, K.C., Hegde, R. and Poonacha, N.M. [2011]. Assessment of density, population structure of selected flagship tree species in the Western Ghats of Southern Karnataka. *In: National Conference on "Plant Diversity: Prospects and Problems of Conservation (27th – 29th October, 2010)"* The Journal of the Swamy Botanical Club (Eds.) D. Sivaramakrishna, Bangalore. *The Journal of the Swamy Botanical Club, A Journal of Plant Sciences*, 28: 49-58.
- [9]. Sarkar, P.K., Ahir, K.C., Hegde, R. and Poonacha, N.M. [2012]. Identification of flagship tree species in the Western Ghats of southern Karnataka. *In: Proceedings of the National Seminar on Tropical Ecosystems: Structure, Function and Services – TESFS 2010* (Eds.) B. Nagarajan, C. Kunhikannan, K. R. Sasidharan and N. Krishnakumar. Institute of Forest Genetics and Tree Breeding (ICFRE), Coimbatore, India, pp 170-173.
- [10]. Singh, M., Kaumanns, W., Singh, M., Sushma, H.S. and Molur, S. [2009]. The Lion-tailed Macaque, *Macaca silenus* (Primates: Cercopithecidae): conservation history and status of a flagship species of the tropical rainforests of the Western Ghats, India. *Journal of Threatened Taxa*, 1(3): 151-157.
- [11]. Venkataraman, A.B., Kumar, N.V., Varma, S. and Sukumar R. [2002]. Conservation of a flagship species prioritizing Asian Elephant (*Elephas maximus*) conservation units in southern India. *Current Science*, 82(8): 1022-1032.
- [12]. Ball, S.M.J. [2004]. Stocks and exploitation of East African blackwood: A flagship species for Tanzania's Miombo woodlands? *Oryx*, 38(3): 1-7.