Discover Conservation

PERSPECTIVE Open Access

Reorienting flagship species funding to support sustainable conservation efforts in developing countries

Achyut Aryal[1,2,3,4,5*], Daniel Ramp[1], David Raubenheimer[6], Weihong Ji[7], Sony Baral Gauli[4] and Xinquan Zhao[8]

*Correspondence:
Achyut Aryal
achyut.aryal@uts.edu.au;
savefauna@gmail.com

Full list of author information is available at the end of the article

Abstract

Conservation of large and iconic species in developing nations captures a considerable share of international funding. Flagship species with charismatic appeal and ecological importance, such as the Tiger, Elephant, Panda and Leopard, are used to get attention and funds. Although there are benefits, this approach also presents challenges by diverting attention from the broader ecosystem, including prey and habitat. Most flagship species-based approaches ignore key aspects of other species conservation and their ecosystem. Therefore, this paper discusses the effects that large mammal/flagship species-centred conservation funding has on developing nations and considers various integrated strategies for developing sustainable ecological outcomes. We do not intend to discourage flagship species-focused fundraising initiatives, but suggest that governments and other conservation authorities should expand their focus to wider ecological systems aspects such as habitat, prey-predator populations and human-wildlife interactions. This offers opportunities to bridge the gap between traditional ecosystem-based and individual species-based approaches and develop sustainable conservation funding strategies in which flagship species can serve as financial catalysts without detracting from, and preferably enhancing, ecosystem-level goals and give equal priorities for other species in developing countries.

Keywords Ecosystem approach, Flagship species, Rewilding, Sustainable human-wildlife interaction

1 Introduction

The conservation of wildlife in developing countries has become an urgent global concern, especially in areas with high biodiversity, such as Nepal, India, Bhutan, Bangladesh, and Southeast Asian countries [1–3]. These areas accommodate many apex predators and megaherbivores, such as Tigers (*Panthera tigris*), Leopards (*Panthera pardus*), and Elephants (*Elephas maximus*). These large fauna are keystone species in their ecosystems and have a major influence on the health of the habitats where they occur [2, 4]. These species are mostly endangered and are typically the focus of conservation initiatives that attract international funding [5, 6]. However, directing disproportionately large

amounts of limited conservation funds to these flagship species has created an enormously complex situation in which attention is diverted from broader aspects of the ecosystem health and resilience [1, 6].

Starting in the 1990s, ecosystem-based approaches have increasingly gained recognition as vital means for biodiversity conservation. These include a focus on restoring and protecting ecological processes and functions they provide, especially those that are key to supporting biodiversity [7, 8]. Additionally, recent developments also recognise the need to integrate socio-economic-ecological factors, particularly in the developing world, where conservation has traditionally depended on voluntary efforts by local communities and flagship species-driven finance. The tactics have evolved from a conservation concern that is limited to biodiversity protection to encompass broader social aims, such as climate change adaptation and support for sustainable development [9]. The combination of ecosystem-based tactics with innovative finance mechanisms based on charismatic species can enhance the efficacy of conservation outcomes in economically poor regions [7, 9] (Fig. 1). However, in the long term, the actual conservation success of the target species will depend on a range of other factors, including the success of their prey species, protection of habitat, carrying capacity, and human-wildlife interactions/conflict (HWC) [10].

In this paper, we address conservation finance in the developing world with a focus on flagship species dependency. We evaluate how the focus on apex predators, like Tigers,

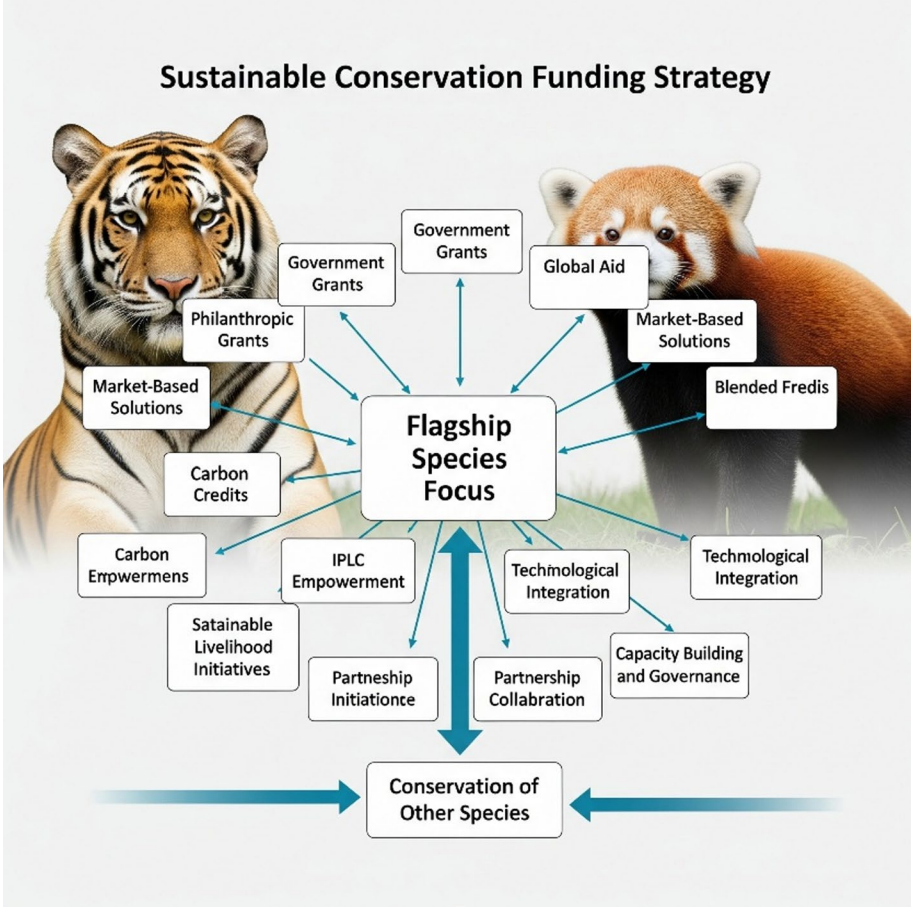

Fig. 1 Sustainable Conservation Funding Strategy with the flagship species centre

Table 1 Major funding organizations and regions that received their contributions (2015–2023)

Funding organization	Region focus	Total funding (USD)	Main species targeted	Key conservation mechanism
World Wildlife Fund (WWF)	Nepal, India, Bhutan	$200 million	Tigers, elephants	Anti-poaching, habitat restoration
Global Environment Facility (GEF)	South Asia, Africa	$1.3 billion (global)	Tigers, snow leopards	Biodiversity protection, policy development
United Nations Development Programme	Bangladesh, Sri Lanka	$150 million	Bengal tigers, crocodiles	Climate resilience, conflict mitigation
Wildlife Conservation Society (WCS)	Southeast Asia, Africa	$100 million	Leopards, rhinos	Protected area management, research
U.S. Agency for International Development	Global	$500 million	Various endangered species	Policy frameworks, capacity building

and megaherbivores, like Elephants, may have contributed to the underfunding of other vital aspects of ecosystem health [11, 12]. We also draw attention to the implications not only for these species but also broader conservation needs that support ecosystem functioning, prey populations, rewilding, and ecological dynamism [13, 14]. Through this approach, we offer recommendations that centre upon improving resource allocation, long-term sustainability, and support for ecosystem processes that transcend the current species-specific conservation model.

2 Large species

Large mammals and top predators usually are prioritised in wildlife conservation campaigns because of their ecological importance and their ability to attract public interest and financial support. In countries like Nepal and India, which are examples of countries where biodiversity hotspots are considerably entwined with human development (among numerous others such as Cunningham and Beazley [15]), the presence of apex predators signifies a healthy ecosystem that supports diverse species and intricate ecological interactions. For example, through their predation Tigers and Leopards regulate prey populations and maintain habitat structure [16]. These predators' survival depends on the availability of prey as well as on the carrying capacity of their natural habitats.

3 Fund-granting agencies and financial contributions

Global conservation continues to be facilitated through financial assistance provided by international and state funding agencies. The WWF, GEF, and UNDP are some prominent international organisations that have played a major role in channelling funds toward developing countries (Table 1). The 2023 GEF annual report projected that it has committed close to $1.3 billion for biodiversity projects worldwide, with major distributions in Asia and Africa. Nepal and India have been notable recipients due to their high-profile conservation programs for tigers and rhinoceroses [17].

For example, the WWF's Tiger Alive Initiative has placed a strong concentration on tiger habitat conservation in the Terai Arc Landscape of both Nepal and India. From 2016 to 2022, the program directed almost US$200 million towards anti-poaching efforts, habitat restoration, and community engagement (Table 1). Similarly, Bhutan's rich ecological network has benefited from multi-million-dollar grants from GEF and WWF for its conservation of snow leopards and their prey (Table 1) [18].

Nepal and India provide several examples of how conservation funding is disproportionately attracted by flagship species. Nepal's National Tiger Conservation Program

has benefited from over $30 million in grants from international donors, focusing on anti-poaching measures and habitat protection [19]. While these efforts have led to an increase in tiger numbers from 121 in 2010 to 355 in 2022, prey populations have not witnessed the same degree of recovery [20].

Similarly, Project Elephant in India has received wide funding from GEF and national programs. This has shaped habitat corridors and mitigated the level of human-elephant conflict. However, studies reveal that funding for bamboo and grassland ecosystems, which are highly essential for the dietary needs of elephants, has been low compared to anti-poaching operations [21]. In Africa, countries like Kenya and Tanzania have faced similar issues where flagship species such as lions and elephants draw significant conservation funds. Despite this, the ecological needs of herbivores like Zebras and antelope, essential for maintaining predator-prey dynamics, often lack prioritisation [22].

4 The dilemma of focusing on flagship species

While these funds have benefits through enhancing high-profile conservation programs, the focal prominence on flagship species like tigers and elephants engenders a paradox. The attraction of funds is often directly linked with the visibility and charisma of these species, which sometimes overshadows less charismatic but similarly critical components of the ecosystem, such as the prey populations and their habitats [23]. This focus can skew conservation priorities towards an imbalanced approach that ignores foundational species and the broader socio-ecological context that support large predators.

For example, carrying capacities of a habitat for top predators are directly influenced by the abundance of prey species like deer, wild boar, and other herbivorous species. Studies conducted at the Kanha Tiger Reserve in India have shown that tiger density is closely related to the biomass of available prey [24]. Prey depletion naturally results in reductions in predator populations when prey are limiting, driving predator-prey dynamics [25]. However, with increasing encroachment of humans into tiger habitat, prey depletion is often offset through depredation of livestock, resulting in increased tensions between people and tigers, especially where conservation priorities and reporting requirements disproportionately prioritise the maintenance of charismatic prey populations.

With a species focus, conservation can become grounded in trade-offs and triage [26], deciding who to protect and who not to. For example, critics argue that flagship species occupy the limelight in conservation funding, thereby downgrading other equally valuable but less charismatic species and ecosystems and preventing their funding [27]. Excessive funding focus on elephants and lions in Africa may translate to less funding for equally threatened species such as pangolins [28]. Indeed, charismatic megafauna typically receive 60% more investment than similarly threatened, less charismatic species [28]. Such imbalanced investment can result in other forms of conservation to be overlooked. Thus, rectifying this disparity will include an improved strategy with the utilisation of flagship species without sacrificing the ecological strategy overall (Fig. 1).

Further challenges arise because of inattentiveness to the potential for negative human-wildlife interactions. Human-wildlife conflict is among the important barriers to conservation in areas where human settlements are adjacent to animal habitats. For example, human-tiger conflict in Nepal's Chitwan National Park has resulted in livestock losses and even human deaths, leading to retaliatory killings of tigers [29, 30]. Likewise,

conservation efforts in the Sanjiangyuan region, Qinghai-Tibet plateau, China, and some parts of Nepal, have successfully recovered populations of Snow leopard (*Panthera uncia*) [31, 32] and Tibetan brown bear (*Ursus arctos pruinosus*) [32], such that interactions with humans is now widespread and driving increased tensions. Bears and Leopards can threaten the livelihood and safety of local herders, decreasing the community's tolerance to wildlife and affecting the conservation of these species [21, 32]. Such overlapping in landscape uses between wildlife and humans implies potential competition for shared resources, livestock predation, and the risk of retaliatory killing of predators by people [33, 34].

5 Solutions

With the challenges articulated above, conservation strategies must reach beyond charismatic species to strive for holistic approaches that prioritise not just single species, but broader properties of socio-ecological systems that bring in diverse knowledges. Programs such as India's Project Tiger have integrated community-based conservation models that emphasise alternative livelihoods (such as alternative farming, ecotourism, handicrafts, etc.) and compensation schemes for losses due to wildlife including microfinance schemes, conservation-based subsidies. Despite these efforts, however, long-term success hinges on addressing ecological health by supporting functioning trophic systems that lead to sustainable predator-prey dynamics [35]. While this may be conceptually more challenging to sell to funding bodies, targeted outcomes can be made rather simply. For example, Aryal et al. [30] emphasised that the current prey biomass within protected areas in Nepal were insufficient to maintain tiger populations over 250 individuals. They showed that unless prey populations and protected areas are expanded, growth in tiger numbers would be unsustainable and could lead to increased human-wildlife conflict, both of which are inimical to tiger conservation efforts [30]. Evidence for this outcome is strong, as significant increases in livestock depredation and human deaths have been noted [29, 36–40]. Knowledge of these situations supports a few key conservation strategies crucial for overcoming the issues inherent in species-centred conservation.

5.1 Predator-prey dynamics

It is self-evident that recovery of predator species requires attention to the species they prey upon. A healthy population of prey species are central to the survival of large carnivores to avoid conflict as predator populations grow [41]. In developing countries, monitoring and managing prey species is not always easy due to a scarcity of resources or dependence on foreign funding sources. The research has revealed that snow leopard populations depend greatly on blue sheep (*Pseudois nayaur*), which constitute a great deal of their diet [42]. In this case, conservation programs that fail to protect such prey species ultimately put at risk of the stability of apex predators. Similar dynamics are documented in Nepal's conservation areas, where the conservation of Blue sheep and Himalayan tahr (*Hemitragus jemlahicus)* support not only snow leopards but also the broader food web [42].

5.2 Rewilding

Rewilding is one of the conservation strategies that moves beyond the protection of isolated flagship species to rehabilitating entire ecosystems, taking into consideration the socioeconomic well-being of the human communities dependent on these landscapes. Rewilding offers solutions to ecological balance by reintroducing keystone or apex species, such as elephants, tigers, and wolves, while capitalising on the charismatic appeal of these species to attract substantial conservation funding [43, 44]. There are many successful examples where the rewilding concept has been implemented. For example, the Iberian lynx in Spain links to flagship species campaigns and ecosystem restoration, hence the rewilding strategy can also attract significant funding to protect flagship species and related ecosystems with socioeconomic benefits [45]. Beyond conservation, rewilding gives real benefits to people via the promotion of economic enterprise, ecotourism and/or sustainable farming, hence allowing for gainful employment locally and thus directly improving community lifestyles. Put together, all these are a part of bigger strategies concerned with sustainable development for nature's benefit as much as that of the people who depend on it [46, 47].

5.3 Integrating communities within conservation strategies

Large carnivore populations are only sustainable when conservation strategies work closely with the human communities who live nearby. Community-based natural resource management is increasingly integral to efforts in parts of Africa and Asia through initiatives where locals are empowered to participate in conservation, enhancing coexistence between people and wildlife because the agency and engagement of communities is validated [48]. In Nepal, Community Forest User Groups (CFUGs) and Buffer Zone Management Committees are playing a key role in conserving biological diversity, resulting in the recovery of biodiversity and wildlife.

However, continued improvement is required, particularly for sustainable funding mechanisms should be developed that are not solely reliant on the appeal of flagship species but which explicitly emphasise and valorise the socio-ecological systems on which they depend. The importance factors are improving the participation of local people to conservation of wildlife habitat and people who are often in poor socio-economic condition to ensure they have assistance in the participation of such conservation solutions. Hence, alternative funding models could include ecosystem service payments, conservation tourism, and partnerships with local government, such as NGOs, research institutes, donor agencies, district councils, forest and wildlife management authorities. Greater involvement of local NGOs and community-based organisations in financial and project management has had promising holistic conservation impacts [49].

6 Recommendations

While much of what we propose here is not new, there is a real need for greater advocacy of holistic approaches that catalyse value from conservation funding beyond flagship species, particularly for regions where tensions exist over the entanglement of biodiversity hotspots and human development:

(a) Integrating species- and function-based conservation: Conservation efforts are inclined to focus on highly flagship predator species at the cost of overlooking

the irreplaceable role of prey species in maintaining predator-prey dynamics and wider ecosystem processes. Conservation schemes should be encouraged to ensure funding models sufficiently capture strategies that explicitly target the conservation and replenishment of prey species. This involves clear policy and regulation of prey population management poaching mitigation, and improving the the habitats through grassland management, conservation activities, and livestock encroachment control. We also need to consider that increasing the population of prey species also reduces predator interventions into human habitations and arising conflicts [41].

(b) Incentivising community-based conservation: Involvement of local communities in conservation through participation in decision making, provision of education programs, payment for ecosystem services, and support for adoption of alternative livelihoods is essential for reducing human-wildlife conflict. Livestock insurance, compensation for crop damage, and employment through ecotourism or forest-based sustainable forest enterprises and coexistence programs can help to redefine public attitude towards wildlife. Facilitating local benefits and engagement in conservation increases tolerance and facilitates long-term conservation of natural resources and wildlife [29].

(c) Establishing sustainable financial mechanisms: Long-term goal realisation requires the establishment of sustainable financing mechanisms that outlive short-term donation cycles. Utilisation of tools like Payments for Ecosystem Services (PES), conservation tourism, and public-private partnerships can help to enhance the predictability of economic support in the achievement of conservation ambitions. These models are highly relevant to rewilding initiatives and ecosystem and species restoration, while also providing opportunities for sequestering of carbon and eco-tourism. These models ensure financial sustainability while incorporating conservation planning in long-term and national development planning [48, 49].

(d) Bridging the gap: Biodiversity conservation policies in developing countries must be developed in a manner consistent with national development priorities and budgetary constraints. This could include integrating biodiversity goals into broad land-use planning, stimulating cost-effective community-based solutions, and leveraging international funding sources to fill budgetary gaps. The goal should be to fill the gap between traditional ecosystem-based solutions and new sources of funding by balancing flagship species conservation strategies with ecosystem-level goals (Fig. 1).

7 Conclusion

The Conservation Funding Strategy (Fig. 1) is a comprehensive and strategic model designed to overcome the socio-ecological and economic challenges of conservation. The core of the strategy is Sustainable Conservation Funding, centred on several connected strategies that encourage resilience, scalability, and sustainable effect. The approach entails a mix of finance sources, such as government grants, philanthropic grants, and global aid, combined with innovative finance structures like blended finance, carbon credits, and project finance for sustainability. It uses community-level approaches in enabling IPLC (Indigenous Peoples and Local Communities) through direct finance and sustainable livelihood initiatives to facilitate inclusivity and local ownership [50]. One of

the major characteristics of this model is that it adopts Market-Based Solutions like payment for ecosystem services and conservation trust funds, which provide self-generating sources of revenue. The model also practices Technological Integration by making use of crowdfunding platforms and blockchain technologies, thus enhancing transparency and efficiency in the disbursement of funds [51]. Partnership and collaboration through public-private partnerships and inter-institutional coordination increase synergies, while capacity building and governance concentrate on institutional strengthening, monitoring, and evaluation to enhance accountability. The inclusion of rewilding approaches and flagship species focus brings new avenues of conservation that emphasise ecosystem restoration and species-based approaches, which are policy and publicly popular [52]. Such approaches tap into public participation and visibility to mobilise economic investment and clientele, hence securing ecological as well as socio-economic benefits. This model represents a paradigm shift in conservation financing, away from ad hoc and short-term mechanisms towards collaborative, collective, and technology-enabled approaches. Such a strategy fills the current gaps in funding by balancing economic attractiveness and ecological sustainability and has been adaptable across different ecological and socio-political realities. This can be a solution that governments or organisations may use to implement long-term sustainable financing, build influence, and achieve resilience against economic and environmental stress [53].

Author contributions
Achyut Aryal: Write and review; Daniel Ramp: Review and edit; David Raubenheimer: Review and edit; Weihong Ji: Review and edit; Sony Baral Gauli: Review and edit; Xinquan Zhao: Review and edit.

Funding
No funding for this work was received.

Data availability
No data associated with this manuscript.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Competing interests
Achyut Aryal declares that he is an Editorial Board Member of Discover Conservation and confirms that he was not involved in the handling or decision-making of their own submission.

Author details
[1]Centre for Compassionate Conservation, TD School, University of Technology Sydney, Sydney, Australia
[2]CC Training Academy/Auckland College of Tertiary Studies, Auckland, New Zealand
[3]Institute of Forestry, Tribhuvan University, Dean office, Kathmandu, Nepal
[4]School of Resources and Environment, Aba Teachers College, Chengdu, China
[5]AKA Education Group/AGI Education, Auckland, New Zealand
[6]Charles Perkins Centre, School of Life and Environmental Sciences, The University of Sydney, Sydney, NSW 2006, Australia
[7]The University of Auckland, Auckland, New Zealand
[8]The State Key Laboratory of Plateau Ecology and Agriculture, Qinghai University, Xining 100091, China

Received: 7 June 2025 / Accepted: 18 September 2025
Published online: 29 September 2025

References

1. Mishra C, Young JC, Fiechter M, Rutherford B, Redpath SM, Wangchuk R. Building partnerships with communities for biodiversity conservation: lessons from Asian mountains. J Appl Ecol. 2017;54(6):1583–91. https://doi.org/10.1111/1365-2664.12918.

2. Gross E, Jayasinghe N, Brooks A, Polet G, Wadhwa R, Hilderink-Koopmans F. (2021). A future for all: the need for human-wildlife coexistence. *WWF, Gland, Switzerland). Design and infographics by Levent Köseoglu, WWF-Netherlands Text editing by ProofreadNOW. com Cover photograph: DNPWC-WWF Nepal*, *3*. https://www.wwf.nl/globalassets/pdf/nieuws/a-future-for-all-the-need-for-human-willdife-coexistence.pdf
3. Jarić I, Normande IC, Arbieu U, Courchamp F, Crowley SL, Jeschke JM, Ladle RJ. (2024). Flagship individuals in biodiversity conservation. Front Ecol Environ, 22(1), e2599.
4. Shameer TT, Mungi NA, Ramesh B, Kumar SV, Easa PS. How can spatio-temporal overlap in mammals assist in maximizing biodiversity conservation? A case study of periyar tiger reserve. Biologia. 2021;76(4):1255–65.
5. Devkota D, Miller DC, Wang SW, Brooks JS. Biodiversity conservation funding in bhutan: Thematic, temporal, and Spatial trends over four decades. Conserv Sci Pract. 2022;5(5):e12757. https://doi.org/10.1111/csp2.12757.
6. McGowan J, Beaumont LJ, Smith RJ, Chauvenet AL, Harcourt R, Atkinson SC, Possingham HP. Conservation prioritization can resolve the flagship species conundrum. Nat Commun. 2020;11(1):994.
7. Tobias JA, Bullock JM, Dicks LV, Forester BR, Razgour O. 2025. Biodiversity conservation requires integration of species-centric and process-based strategies. Proc. Natl. Acad. Sci. U. S. A. 122, e2410936122.
8. Ferraro KM, Ferraro AL, Lundgren E, Sommer NR. The use and abuse of ecosystem service concepts and terms. Biol Conserv. 2025;308:111218.
9. Seddon N, et al. Nature-based solutions in nationally determined contributions. IUCN and University of Oxford; 2020.
10. Redpath SM, Bhatia S, Young J. Tilting at wildlife: reconsidering human–wildlife conflict. Oryx. 2015;49(2):222–5.
11. Lindsey PA, Alexander R, Miller AR. The impact of flagship species conservation efforts on ecosystem health and local communities. Ecol Soc. 2018;23(3):18. https://doi.org/10.5751/ES-10158-230318.
12. Mertens AC, Redpath SM, Young JC. The influence of human-wildlife conflict on wildlife populations in the global south: A review of emerging threats. Conserv Biol. 2020;34(2):322–34. https://doi.org/10.1111/cobi.13388.
13. Bastin JF, Zohner CM, Tuanmu MN. Global land restoration and the value of large-scale conservation. Science. 2021;374(6566):320–5. https://doi.org/10.1126/science.abf5677.
14. Lynam AJ, Wilkie DS, Lutz RS. The role of prey species in predator conservation: implications for sustainable wildlife management. Biol Conserv. 2023;271:109536. https://doi.org/10.1016/j.biocon.2022.109536.
15. Cunningham C, Beazley KF. Changes in human population density and protected areas in terrestrial global biodiversity hotspots, 1995–2015. Land (Basel). 2018;7:136.
16. Ripple, W. J., Estes, J. A., Beschta, R. L., Wilmers, C. C., Ritchie, E. G., Hebblewhite,M., … Schmitz, O. J. (2014). Status and ecological effects of the world's largest carnivores. Science, 343(6167), 1241484.
17. GEF. (2023). *Annual Report: Global Contributions to Biodiversity*. Global Environment Facility.
18. Jackson R, Mallon D, McCarthy T, Chundawat R. Snow Leopard survival strategy: addressing prey and habitat needs. Snow Leopard Trust; 2021.
19. DNPWC. (2023). *Annual Report: Tiger Conservation in Nepal*. Department of National Parks and Wildlife Conservation, Nepal.
20. DNPWC and DFSC. (2022). Status of Tigers and Prey in Nepal 2022. Department of National Parks and Wildlife Conservation and Department of Forests and Soil Conservation. Ministry of Forests and Environment, Kathmandu, Nepal. Access on status-of-tigers-and-prey-nepal-2022-1.pdf
21. Choudhury AU. The status and conservation of Asian elephants in the Brahmaputra Valley, Northeast India. Gajah. 2019;50:3–13.
22. Ogutu JO, Owen-Smith N, Piepho HP, Said MY. Continuing wildlife population declines and range contraction in the Mara region of Kenya during 1977–2009. J Zool. 2017;311(1):65–86.
23. Berger J, Wangchuk T, Briceño C, Vila A, Lambert JE. Disassembled food webs and messy projections: modern ungulate communities in the face of unabating human population growth. Front Ecol Evol. 2020;8:128.
24. Karanth KU, Nichols JD. (2002). Monitoring tigers and their prey. *Wildlife Institute of India: A manual for wildlife researchers, managers and conservationists in tropical Asia*, Bangalore, India.
25. Barbier M, Wojcik L, Loreau M. A macro-ecological approach to predation density-dependence. Oikos. 2021;130(4):553–70.
26. Bottrill MC, Joseph LN, Carwardine J, Bode M, Cook C, Game ET, Grantham H, Kark S, Linke S, McDonald-Madden E, Pressey RL, Walker S, Wilson KA, Possingham HP. Is conservation triage just smart decision making? Trends Ecol Evol. 2008;23:649–54.
27. Leader-Williams N, Dublin HT. Charismatic megafauna asflagship species'. CONSERVATION BIOLOGY SERIES-CAMBRIDGE-; 2000. pp. 53–84.
28. Smith J, Brown A. Funding patterns in species conservation: A global analysis. Conserv Lett. 2023;16(2):45–58.
29. Acharya KP, Paudel PK, Neupane PR, Köhl M. (2016). Human-wildlife conflicts in nepal: patterns of human fatalities and injuries caused by Laroe mammals. PpLoS ONE, 11(9), e0161717.
30. Aryal A, Lamsal RP, Ji W, Raubenheimer D. Are there sufficient prey and protected areas in Nepal to sustain an increasing tiger population? Ethol Ecol Evol. 2016;28(1):117–20.
31. Aryal A, Brunton D, Ji W, Barraclough RK, D Raubenheimer. Human-Carnivore conflict: ecological and economical sustainability of predation on livestock by snow Leopard and other carnivores in the himalaya. Sustain Sci. 2014;9(3):321–9.
32. Su J, Aryal A, Hegab IM, Shrestha UB, Coogan SC, Sathyakumar S, Dalannast M, Dou Z, Suo Y, Dabu X, Fu H, Ji W. Decreasing brown bear (*Ursus arctos*) habitat due to climate change in central Asia and the Asian highlands. Ecol Evol. 2018. https://doi.org/10.1002/ece3.4645.
33. Tang P, Kulbhushansingh RS, Xiao L, Charudutt M, Lu Z, Justine SA. Factors shaping the tolerance of local Tibetan herders toward snow leopards. J Nat Conserv. 2023;71:126305.
34. Lu Q, Xiao L, Chen Cheng C, Lu Z, Zhao J, Yao M. Snow Leopard dietary preferences and livestock predation revealed by fecal DNA metabarcoding: no evidence for apparent competition between wild and domestic prey. Front Ecol Evol. 2021;9:783546.
35. Sankar K, Qureshi Q, Harihar A. Tigers and their prey: Understanding the dynamics of Indian wildlife. Wildl Res. 2020;46(6):529–43.
36. Harihar A, Pandav B, Goyal SP. Responses of tiger (Panthera tigris) and their prey to removal of anthropogenic influences in Rajaji National Park, India. Eur J Wildl Res. 2011;57(3):373–83. https://doi.org/10.1007/s10344-010-0435-9.
37. Goodrich JM. Human–tiger conflict: A review and call for comprehensive plans. Integr Zool. 2010;5(4):300–12. https://doi.org/10.1111/j.1749-4877.2010.00218.x.

38. Dhungana R, Savini T, Karki JB, Dhakal M, Bumrungsri S. Living with Tigers Panthera tigris: Patterns, correlates, and contexts of human-tiger conflict in Chitwan National park. Nepal Oryx. 2018;52(1):55–65. https://doi.org/10.1017/S0030605316001237.
39. Acharya KP, Paudel PK, Neupane PR, Köhl M. Enhancing human-tiger coexistence in forest corridors of Nepal through a socio-ecological approach to conservation. Trees Forests People. 2023;13:100402. https://doi.org/10.1016/j.tfp.2023.100402.
40. Karki S, Thapa K, Dhakal M, Subedi N. Spatio-temporal patterns of Tigers in response to prey species and anthropogenic activities. Ecol Evol. 2023;13(6). https://doi.org/10.1002/ece3.10123. e10123.
41. Miller JRB, Jhala YV, Ripple WJ. Prey depletion as a critical threat to large carnivore conservation. Biol Conserv. 2016;203:319–28.
42. Aryal A, Brunton D, McCarthy T, Karmachharya D, Ji W, Bencini R, D Raubenheimer. Multipronged strategy including genetic analysis for assessing conservation options for the snow Leopard in the central himalaya. J Mammal. 2014;95(4):871–81.
43. Perino, A., Pereira, H. M., Navarro, L. M., Fernández, N., Bullock, J. M., Ceauşu,S., … Svenning, J. C. (2019). Rewilding complex ecosystems. Science, 364(6438), eaav5570.
44. Fernández N, Svenning JC, Pereira HM, Nogués-Bravo D, Faurby S. Rewilding is the best option for restoring large carnivores and herbivores in anthropogenic landscapes. Nat Ecol Evol. 2022;6(3):215–24.
45. Lorimer J, Sandom CJ, Jepson P, Doughty CE, Barua M, Kirby KJ. Rewilding and its implications for conservation and society. Front Ecol Environ. 2020;18(9):491–501.
46. Svenning, J. C., Pedersen, P. B. M., Donlan, C. J., Ejrnæs, R., Faurby, S., Galetti,M., … Vera, F. W. M. (2016). Science for a wilder Anthropocene: synthesis and future directions for trophic rewilding research. Proceedings of the National Academy of Sciences, 113(4), 898–906.
47. Corlett RT. Restoring tropical forests for biodiversity recovery: A rewilding approach. Curr Biol. 2020;30(9):R495–500.
48. Berkes F. Rethinking community-based conservation. Conserv Biol. 2004;18(3):621–30.
49. Salafsky N, Margoluis R, Redford KH. Adaptive management: A tool for conservation practitioners. Biodiversity Support Program; 2001.
50. FAO. Forests, poverty and livelihoods: transformations to inclusive development. Food and Agriculture Organization; 2020.
51. OECD. Blended finance in the least developed countries 2019. Organisation for Economic Co-operation and Development; 2019.
52. Soulé ME, Noss R. Rewilding and biodiversity: complementary goals for continental conservation. Wild Earth. 1998;8(3):18–28.
53. UNEP. State of finance for nature: tripling investments in Nature-Based solutions by 2030. United Nations Environment Programme; 2021.

Publisher's note