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COMMUNITY PARTICIPATION AND LIVELIHOODS

(Prepared by the Secretariat)

Summary:

This document presents the analysis referred to in UNEP/CMS/COP14/Doc.30.2.3.

ANALYSIS OF COMMUNITY-BASED INITIATIVES FOR THE CONSERVATION AND MANAGEMENT OF CMS-LISTED SPECIES

Contents

1. Introduction

Decision 13.119 *Community Participation and Livelihoods* was adopted at the 13th meeting of the Conference of the Parties of the Convention on Migratory Species (CMS), and directs the Secretariat to identify and compile ongoing initiatives and best practice case studies related to community involvement in the conservation and management of CMS-listed species, and to '*analyse the case studies … to assist Parties in using community-based initiatives for the conservation and management of CMS-listed species along their migratory pathways*'.

Communities encompass both Indigenous Peoples, who possess unique characteristics and internationally recognised rights, and non-indigenous local communities, who live near to nature but without the distinct rights of Indigenous Peoples. Both are often referred to as 'local communities' or 'communities', particularly at site level scales, and as Indigenous Peoples and Local Communities (IPLCs) at the broader scale and in international policy[1] [2].

IPLCs, which often have strong cultural and socioeconomic reliance on the natural environments in which they live, are greatly affected by the degradation and loss of biodiversity (Reyes-Garcia *et al.* 2019). The need to effectively integrate biodiversity conservation and the needs of local communities in the development of sustainable livelihoods – where people earn a living to meet their current needs without detrimentally impacting the natural environment for future generations[3] - is increasingly recognised[4].

Attitudes towards biodiversity conservation have changed since the 1960's, from a focus on prioritising wilderness and species protection, to a current '*people and nature*' approach (Mace 2014). This emphasises the development of sustainable shared human-nature environments (Mace 2014), and the value of including local and indigenous knowledge in understanding the contributions of nature for people (Diaz *et al.* 2018).

Mainstream approaches to conservation based around exclusionary protected areas have been criticised for negatively impacting local communities, for example through economic displacement, evictions from their territories and lands, or restriction of their customary rights to use ecosystem services and resources around or within protected areas. In contrast, there is now increasing recognition of the role of IPLCs in achieving effective conservation can produce long term, sustainable benefits for both people and nature[1] [5] [6] (Diaz *et al.* 2019, Springer 2009).

Reference to the rights and inclusion of IPLCs can be found in multiple international commitments and policies for biodiversity and sustainable development. The Convention of Biological Diversity (CBD) has established a working group to implement Article 8 (j) regarding traditional knowledge, innovations, and practices[7], which states that Parties should, as far as possible and appropriate, '*Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices'*.

[1] https://wedocs.unep.org/bitstream/handle/20.500.11822/22864/WLWL_Report_web.pdf
[2] https://wwfint.awsassets.panda.org/downloads/report_the_state_of_the_indigenous_peoples_and_local_communities_lands_and_territor.pdf
[3] https://cites.org/sites/default/files/eng/prog/Livelihoods/Guia_Parte1_CITES_eng_final.pdf
[4] https://portals.iucn.org/library/sites/library/files/documents/2021-005-En.pdf
[5] https://www.cbd.int/doc/publications/cbd-ts-97-en.pdf
[6] https://wwfint.awsassets.panda.org/downloads/report_the_state_of_the_indigenous_peoples_and_local_communities_lands_and_territor.pdf
[7] Article 8(j) - Traditional Knowledge, Innovations and Practices (cbd.int)

The Kunming-Montreal Global Biodiversity Framework integrates the inclusion of IPLC contributions and rights throughout, including explicit reference to IPLC rights, customary sustainable use, traditional knowledge, and equitable inclusion in several of the 23 targets for 2030. Furthermore, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Resolution 16.6 on Livelihoods [8] includes recognition that the '*implementation of CITES is better achieved with the engagement of rural communities, especially those which are traditionally dependent on CITES-listed species for their livelihoods*' [9], and has developed a working group to develop tools for sustainable implementation of CITES species listings, including mitigating negative impacts and enhancing opportunities for local communities [10].

This document aims to address Decision 13.119 to further understand the role of community-based conservation in the conservation of CMS-listed migratory species. Existing principles for successful community involvement in conservation are introduced, and the challenges presented for community conservation of migratory species. A compilation of case studies involving local communities in migratory species conservation is then analysed and discussed, and information synthesised to formulate guiding principles for consideration in future involvement of local communities in migratory species conservation.

2. Existing guidance on successful community involvement in conservation

The features of successful, sustainable community-based conservation that benefit local communities and nature conservation have been established through over five decades of research and numerous initiatives involving communities in conservation. This has included a shift from viewing community-based conservation as being 'natural resources or biodiversity protection by, for, and within the local community' (Western and Wright, 1994) to 'ground-up' governance that includes the multi-level interactions, institutional linkages, and drivers that that influence communities as part of complex social-ecological systems (Berkes 2003, Berkes 2007).

Many insights, lessons, and guidelines have been developed. In particular, through drawing on several examples of successful collective action by communities to manage shared resources, Ostrom (1990) defined eight guiding principles for the conditions under which common property resource management by communities is achieved. These are:

i) Clearly defined group boundaries,

ii) Matching rules governing use of shared resources to local conditions and needs,

iii) Ensuring those affected by rules can participate in modifying them,

iv) Monitoring of behaviours is done by community members,

v) Graduated sanctions are applied by resource users to those who violate rules,

vi) Rapid, low-cost means for local conflict resolution are available,

vii) The rights of communities to devise their own institutions to govern resources are not challenged by external government authorities,

viii) When local institutions are part of larger systems, governance responsibility is organised into multiple layers of nested enterprises from the lowest level to the entire connected system.

These principles, along with other works, have provided important insights for the development of successful, interdisciplinary community conservation initiatives (Berkes 2004).

[8] https://cites.org/sites/default/files/document/E-Res-16-06-R18.pdf
[9] Resolutions (cites.org)
[10] https://cites.org/eng/node/17130

Secure land and resource rights, devolved responsibilities, inclusion of local communities in management and decision-making, respect for and inclusion of traditional ecological knowledge are important conditions for community based management. In addition the use of local institutions to manage resources and resolve conflict and ensuring community benefits from their stewardship - including through monetary incentives, rights and empowerment – are key components for successful community-based approaches to conservation[11] (Berkes 2004). However, it has also been noted that implementing best-practice for community involvement has been challenging, particularly regarding the devolution of rights from government to IPLCs to engage in and benefit from sustainable wildlife management[12].

3. Community involvement in conservation for migratory species

The CMS defines migratory species as those where a significant proportion of the entire population, or a geographically separate part of the population, '*cyclically and predictably cross one or more national jurisdictional boundaries*'[13]. Indigenous territories, community conserved areas and other effective area-based conservation measures (OECMs) can have an important role in the conservation of these species as part of their migratory routes [14].

However, migratory species have also been identified as being challenging for community involvement in their conservation, as gaining consensus on ownership and the rights to use migratory species can be complex[9]. This can create uncertainty around how to determine sustainable use, decision-making authority, and fair and equitable distribution of the benefits and the costs associated with conservation of migratory species across communities[11]. A key challenge for migratory species conservation is the risk of over-exploitation due to a '*tragedy of the commons*' scenario[11]. In this, individuals or communities act independently to over-use a shared resource, maximising their own short-term benefits but resulting in the destruction of the resource for future use (Pires & Moreto, 2011).

Furthermore, migratory species ranges can span different ecosystems and continents, particularly for avian and marine species, requiring international coordination of conservation actions at scales greater than those at which many communities interact. Communication and coordination between communities across a migratory species range can present a major challenge as there are potentially many stakeholders, who may have varied social, economic, and cultural backgrounds[11].

Threats driving migratory species population declines, such as overexploitation or loss of habitat or connectivity along migratory routes, can negatively impact communities that rely on them directly or on the ecosystem services they provide across their migratory range[11]. However, the benefits of conservation action in one part of a migratory species range can be lost if threats elsewhere are high (Runge *et al.* 2014). Therefore, if only some communities that interact with a species commit to conservation they may not gain from their actions, reducing the incentive to conserve the species[8].

It has been noted that non-consumptive use of migratory species can avoid some of the risks related to over-exploitation[11], such as ecotourism or Payment for Ecosystem services (PES) approaches to pay communities for wildlife presence on their lands. Whilst the seasonal nature of many migratory species presence can make it difficult for communities to develop PES or conservation enterprise-based approaches that depend on the species' presence, there are successful examples for both identified in the case studies below.

[11] https://portals.iucn.org/library/sites/library/files/documents/2021-005-En.pdf
[12] https://wedocs.unep.org/bitstream/handle/20.500.11822/22864/WLWL_Report_web.pdf
[13] https://www.cms.int/sites/default/files/instrument/CMS-text.en_.PDF
[14] https://www.iied.org/sites/default/files/pdfs/migrate/14616IIED.pdf

4. Methods

Case studies of local community involvement in CMS-listed migratory species conservation were submitted by CMS Parties, intergovernmental (IGOs) and non-governmental organisations (NGOs) as requested by the CMS Secretariat. Additional CMS-relevant case studies were also sourced from CITES[15], published literature, conservation organisation websites and project reports.

Overall, 78 case studies were reviewed, covering terrestrial (39), avian (24), and aquatic (15) ecosystems, and originating from 50 countries, 75% of which are Parties to the CMS. All species in the case studies are CMS-listed, and when referred to in the discussion their status on the CMS appendices is given in the text.

Information was extracted from case studies following a template developed by the CMS Secretariat. In addition to species name, Range State, and CMS, CITES and IUCN Red listings, information answering the following questions was sought:

- *What is the legal status of the species?*
- *Who holds management responsibility over the species within the scope of the programme?*
- *What access or user rights do local communities hold on the species?*
- *How are communities involved in conservation / use activities?*
- *How are benefits that are received from use of the species (both consumptive and non-consumptive) distributed?*
- *Are communities aware that the species is a 'migratory species' i.e. crosses international borders?*
- *Are there any spiritual values within communities connected to the (use of) the species?*
- *Have there been any bi- or multilateral agreements which regulate the management (including use) of the species? If Yes, what do they provide?*
- *If the conservation/ use is part of a specific programme, what is the name of the programme and who initiated it?*

This information was used to investigate the challenges and opportunities surrounding five themes highlighted in Decision 13.119: (i) land and user rights; (ii) management responsibilities; (iii) authority over the distribution of benefits; (iv) spiritual values and attitudes towards species; and (v) cooperation among communities along migratory pathways. Whilst several of the themes discussed are general to community-based conservation, they are of notable importance or pose unique challenges in the context of migratory species.

For each theme, 'feature case studies' are used to provide detailed on-the-ground examples of community-based conservation for, where possible, terrestrial, avian, and aquatic species. Based on the analysis and discussion of case studies, a set of guiding principles have been identified, highlighting best practices for the future inclusion of communities in migratory species conservation.

5. Analysis and discussion of case studies

a. Land and user rights

[15] https://cites.org/eng/prog/livelihoods

Secure and enforceable land tenure and usage rights are important features in successful community-based conservation[16] [17], and can be fundamental for underpinning Community Based Wildlife Management (CBWM) approaches in indigenous territories and community-conserved areas.

For migratory species communally managed lands can be critically important as migratory corridors but also face threats from rising anthropogenic pressures. The Maasai Mara ecosystem, for example, is 75% privately or communally owned (Oduor, 2020) and faces increasing division by fenced areas that challenge migratory species movement (Lovscal *et al.* 2017).

Area-based community-conservation approaches were integral to many of the case studies, particularly where devolution of user rights and management responsibilities for migratory species to communities enable them to benefit from the species presence, reduce conflict and improve livelihood security. In Zimbabwe, for example, the Community Areas Management Programme for Indigenous Resources (CAMPFIRE) programme allows communities to lease sustainable trophy hunting quotas for African elephants *Loxodonta africana* (Appendix II), using the revenue to invest in community infrastructure and increase the food and livelihood security of local people[18].

In Namibia, Communal Conservancies aim to manage wildlife within their boundaries to improve food security, employment, and support rural enterprises. They also aim to reduce negative human-wildlife interactions, including through '*Wildlife Credits*'[19]. This PES approach encourages the protection of wildlife within communal conservancies, such as preventing farming from encroaching on key elephant corridors, through financial incentives. In Tanzania, Wildlife Management Areas (WMAs) have been developed in communal lands adjacent to protected areas to involve local communities in wildlife management, such as the Burunge WMA (Lee, 2018). Communities restrict resource extraction, livestock grazing and agriculture, but benefit from the revenue from photo-tourism of migratory species such as giraffes *Giraffa camelopardalis* (Appendix II).

Importantly, resolving land tenure conflict can also enable communities to participate in broader land-scape level conservation actions. In Peru, resolution of land tenure conflicts with Indigenous Peoples led to the former Gueppi Reserved Zone, designated in 1997, being reformed into the Gueppi Sekime National Park and two communal reserves[20]. This complex also forms part of the Trinational Program for Conservation and Sustainable Development of the Corridor of Protected Natural Areas alongside protected areas in Colombia and Ecuador. Communities play important roles in participatory conservation and management of wildlife in the area, including in monitoring Jaguar *Panthera onca* (Appendix I/II) populations[21].

Empowerment of communities to protect their land and resource rights can also protect migratory species within their lands from external influences, especially important nesting or breeding sites. In Brazil, Peru and Columbia, seasonal guarding of Arrau Turtle *Podocnemis expansa* (Appendix I/II)) nesting beaches from egg collectors has been found to have a large impact on success of nesting areas outside of protected areas (Andrade *et al.* 2022), for both the turtles and migratory waterbirds (Campos-Silva *et al.* 2021). For example, when a monitoring programme run in Columbia and Peru stopped for a year due to lack of funding, almost 97% of eggs were poached, highlighting the important role of community protection[22]. It has been noted that community perceptions of tenure security can be important in

[16] https://portals.iucn.org/library/sites/library/files/documents/2021-005-En.pdf
[17] https://wedocs.unep.org/bitstream/handle/20.500.11822/22864/WLWL_Report_web.pdf
[18] CITES_&_livelihoods_fact_sheet_Elephant_Zimbabwe_0.pdf
[19] https://conservationnamibia.com/articles/cn2021-wildlife-corridors.php
[20] Putumayo: conservation without borders | WWF (panda.org)
[21] Napo-Putumayo Corridor is estimated to have a jaguar population of 2,000 | WWF
[22] Fundacion Biodiversa Colombia | Empowering Local Conservation Groups

influencing decision-making for favourable conservation and social outcomes (Fariss *et al.* 2023, Robinson *et al.* 2018). Fishermen on Vamizi Island, Mozambique, for example, required stronger rights to control access to marine resources before implementing conservation measures for green turtles *Chelonia mydas* (Appendix I/II), shown in Feature case study 1 (Garnier *et al.* 2012).

The long-term success of many approaches that devolve wildlife management rights to local communities relies on the sustainability of the benefits that communities gain. However, this can be negatively impacted by external forces, for example the increasing controversy around trophy hunting has reduced numbers of hunters, which has led Zimbabwe to recognise a need to diversify the CAMPFIRE programme[27]. In Tajikistan, the community-based NGO Burgut was founded by former hunters to lease a game management area for integrated conservation of argali *Ovis ammon* (Appendix II) and social initiatives. As argali populations recovered sufficiently for small hunting quotas to be issued, pressure increased from external authorities interested in commercial hunting of argali populations in the area and eventual reassignment of the lease to a commercial concession[23].

Internal conflicts can also occur, for example lack of sufficient empowerment of communities in communally managed areas can lead to reduced adherence to agreed rules, illegal behaviours, and unsustainable use. In Tanzania's Burunge WMA, for example, illegal fishing still occurs, and some villages wish to withdraw from the programme over dissatisfaction and lack of involvement with policymaking and the increasing recentralisation of control (Kicheleri *et al.* 2018).

Managing communal or privately owned land for migratory species can require trade-offs, for example tailoring management for wildlife rather than other activities, such as agriculture. In such cases, gaining buy-in from the whole community can take time, as seen in the decision to conserve African lions *Panthera leo* (Appendix II) in the Olderkesi Community Conservancy in Kenya (Feature case study 2). In addition, the engagement of many individual landowners can have variable success, as seen in the conservation of blue cranes *Anthropoides paradiseus* (Appendix II) and wattled cranes *Bugeranus carunculatus* (Appendix II) in South Africa's biodiversity stewardship programme (Feature Case study 3).

Strong governance to support communities' rights is also important, particularly as many migratory species are commercially valuable and at risk of external pressures. A notable success in this regard is the sustainable use of vicuña *Vicugna vicugna* (Appendix I/II) in Bolivia and Peru, where local communities were given rights to use traditional practices to shear live wild vicuña for their fibre, a high value commodity for luxury fashion. This has been a valuable source of income, with communities in Bolivia receiving 85% of the benefits, worth USD 3,720,000 between 2007 – 2014. Communities' tolerance for rising vicuña population numbers has also increased, whereas they had previously been viewed as a competitor for livestock[24]. Importantly, the communities were granted custody and legal ownership of the vicuña in their jurisdiction, whereas in Argentina ownerships were not specified, allowing private companies to also establish vicuña shearing businesses[25].

Feature case study 1: Green turtle *Chelonia mydas*, Mozambique

CMS: I/II **CITES:** I **IUCN Red List:** EN

[23] CAMI CBMW – not yet published

[24] https://cites.org/sites/default/files/eng/prog/Livelihoods/case_studies/CITES_livelihoods_Fact_Sheet_2019_Bolivia_Vicuna.pdf

[25] https://www.iied.org/sites/default/files/pdfs/migrate/14648IIED.pdf

Vamizi island, part of the Northern Querimbas archipelago off the coast of Mozambique, is the most important nesting site for green turtles *Chelonia mydas* in Mozambique, with over 90% of clutches laid on the island (van de Geer *et al.* 2022). The island has been part of a successful community-based conservation initiative, the Maluane Project (Garnier *et al.* 2012) [26] since 2003, which aims to develop sustainable biodiversity conservation through scientifically based management, as well as sustainable socio-economic development of communities through project partnership and the promotion of luxury tourism[27].

Fishermen with local ecological knowledge were selected by local leaders to be trained to monitor nesting beaches. Awareness campaigns with local fishing communities have increased awareness around turtles' ecological value and legal status, whilst an incentive programme provides fishermen a small reward for bringing live sea turtles caught as bycatch in fishing nets to the project headquarters to be tagged and released (Garnier *et al*. 2012). The project also developed alternative economic activities chosen by the local communities and supported by the government and the Global Environment Facility, including craft making, vegetable farming, and sustainable fishing techniques, to reduce poverty in the local community (Garnier *et al.* 2012).

Rising pressure from itinerant fishermen and the risk of overfishing was identified by communities as a key threat to livelihoods (Garnier *et al.* 2012). With capacity building and support provided by the project and government, two Community Fisheries Councils (CCPs) were established and legally empowered to manage resources and regulate fishing within three nautical miles of the coastline, allowing communities to regain control over access to their marine resources. Due to increased local awareness of turtle conservation in the community, illegal killing of nesting females, taking of eggs, and bycatch substantially reduced after the start of the project. Communities decided to self-regulate fishing pressure and designated a marine sanctuary to the north-east of the island, protecting important turtle nesting and feeding grounds as well as critical fish habitats from overexploitation (Garnier *et al.* 2012).

These successes have led the project to be considered a leading example of marine turtle conservation (Williams *et al.* 2019), with the area declared a '*Hope Spot for the Planet*', and as such, the model is being replicated in other locations[28]. However, future threats to green turtles on the island include increasing commercial fishing pressure (Garnier *et al.* 2012), and flooding and erosion of nests due to sea level rise (Anastacio *et al.* 2014).

Feature case study 2: African lion *Panthera leo,* Kenya

CMS: II **CITES:** II **IUCN Red List:** VU

The Olderkesi Community Wildlife Conservancy (OCWC) was established in 2013 (Oduor 2020) and borders the Maasai Mara National Reserve and Tanzania. The area is home to several large migratory species, including African lion *Panthera leo,* African elephants *Loxodonta africana,* and giraffe *Giraffa camelopardalis* [29].

Cottar's Wildlife Conservation Trust (CWCT) is a high-end tourism operator who leases 7000ha from Maasai community landowners to set the land aside for wildlife conservation. The community receives lease payments, which are competitive with other land uses such as

[26] http://awsassets.wwfmz.panda.org/downloads/co_management_of_the_reef_at_vamizi_island.pdf
[27] https://www.miga.org/sites/default/files/archive/Documents/Project_Management_Plan.pdf
[28] https://www.odysseyconservationtrust.com/our-work/projects/kimwani-people
[29] https://www.iied.org/sites/default/files/pdfs/migrate/14648IIED.pdf

agriculture or livestock grazing, and employment as security scouts[30]. Payments are made directly to the community landowners to reduce the risk of corruption, and is used for community infrastructure development, such as healthcare and education[27], including an ambulance and school lunch programme (Oduor 2020). Lease payments are reduced if agreed land use rules are not followed, such as when poaching occurs, whereas information relating to wildlife crime is rewarded[26]. This encourages the community to be collectively responsible and reduces threats to migratory wildlife within the conservancy from poaching and the fencing of land for farming[31] which can disrupt migratory routes.

Whilst setting up the conservancy took over 10 years of negotiations, complete community involvement is likely to increase the long-term sustainability of the project[28]. However, rising human populations have led to concerns over increasing competition with wildlife, and within communities for resources within the conservancy (Oduor 2020). Whilst generally, perceptions around livelihoods and employment opportunities have been positive, there has been discontent over perceived inequal distribution of benefits from tourism within the community (Oduor 2020). The long-term security of the conservancy requires stable external funding and must remain competitive with other land-uses, to outweigh the costs for the community associated with living alongside potentially dangerous large wildlife[32,33].

Feature case study 3: Blue cranes *Anthropoides paradiseus* and wattled cranes *Bugeranus carunculatus*, South Africa

Blue crane **CMS:** II **CITES:** II **IUCN Red List:** VU
Wattled crane **CMS:** II **CITES:** II **IUCN Red List:** VU

South Africa implements a Biodiversity Stewardship Programme, encouraging private and communal landowners to form agreements with government to manage their land to support conservation and sustainable resource use[34]. There are five categories of support, ranging from informal biodiversity partnership areas to highly protected nature reserves, with higher protection receiving greater support due to the greater restrictions on land-use[31].

The African Crane Conservation Programme has been promoting this scheme to involve landowners in crane conservation, including in Chrissiesmeer and South Drakenberg, both home to blue cranes *Anthropoides paradiseus,* wattled cranes *Bugeranus carunculus* and non-CMS listed grey-crowned cranes *Balearica regulorum,* in intensively farmed private land[35]. Chrissiesmeer is also particularly at risk of pollution and anthropogenic impacts[32].

Landowners in Chrissiesmeer were successfully involved in the scheme, with around 80 landowners agreeing to manage their land as part of a system to maintain crane habitat at the landscape scale. Covering 85,065 ha, the Chrissiesmeer Lake district forms the largest 'Protected Environment' (the second highest protection level) in South Africa, designated in 2014[32]. The area also benefits from tourism related to birdwatching, and now hosts an annual 'Chrissiesmeer Crane Festival' to celebrate crane conservation and raise awareness of species and habitat conservation in the area[36].

[30] https://www.cms.int/en/conservation/lion-community-conservation
[31] https://www.iied.org/sites/default/files/pdfs/migrate/14648IIED.pdf
[32] https://www.cms.int/en/conservation/lion-community-conservation
[33] Projects - Cottar's Wildlife Conservation Trust (cottarswildlifeconservationtrust.org)
[34] Biodiversity-Stewardship-Factsheet-Oct-2015-2nd-edition.pdf (sanbi.org)
[35] cranes_and_agriculture_web_2018.pdf (savingcranes.org)
[36] https://savingcranes.org/2017/07/2017-chrissiesmeer-crane-festival-in-south-africa/

In contrast, landowners in Southern Drakensberg were reluctant to be part of the Biodiversity Stewardship scheme. Despite over 50 landowners being approached by the Endangered Wildlife Trust to encourage them to protect crane habitat, uptake was low, with only a limited amount of crane habitat in the area protected[37]. Further efforts to conserve cranes in this area are being undertaken by the International Crane Foundation and Endangered Wildlife Trust[38]

b. Management responsibilities

Devolvement of authority and management responsibilities to the local level is critical for effective '*bottom-up*' conservation management[39], but can be complex for migratory species. Migratory species can be at particular risk of over exploitation, as consensus on ownership and user rights across multiple communities can be difficult to achieve[40].

Due to the transboundary nature of migratory species movement, there is a need for international cooperation and management. Listing of migratory species on CMS Appendix II indicates the need for international agreements for their conservation and management. Listing on Appendix I provides further legal protection, as Parties must prohibit all take of the species and endeavour to protect their habitat and migration routes.

It is increasingly recognised that local community involvement is often important for the effective implementation of internationally agreed conservation management decisions. Several case studies demonstrate how local communities are successfully involved in managing the sustainable use of CMS and CITES listed migratory species. In northern Australia, for example, saltwater crocodile *Crocodylus porosus* (Appendix II) eggs are collected from the wild for ranching, as their skins are valuable in high-end fashion, as well as for meat and other products[41]. Involvement of Aboriginal rangers has strengthened traditional and cultural practices by utilising traditional knowledge regarding the location of nests, timing of egg harvest, and habitat management. Community involvement in habitat and wildlife management within Aboriginal lands has increased, as has tolerance for growing crocodile populations. Management at the higher level by the regional and national government to monitor and ensure use is sustainable, as well as communication between stakeholders, has been identified as key for the project's success[42].

Similarly, in Canada, Inuit communities have protected and exclusive rights to harvest polar bears *Ursus maritimus* (Appendix II) for food and livelihoods, an important part of traditional culture. To ensure use is sustainable, adaptive management is coordinated from local to international scales[43]. Together, these case studies illustrate a role for clear inter-level communication between local and wider authorities in the managed sustainable use of migratory species.

Many migratory species are legally protected from consumptive use. However, enforcement can be challenging for high-value species, species with traditional subsistence uses, or species which compete or come into conflict with local communities. Engaging with communities in the area-based management of these species can incentivise conservation, through co-management of protected areas and collaborative decision-making, and ensuring agreement on restricted access to protected resources. There are several examples of co-

[37] FINAL PROJECT COMPLETION REPORT (cepf.net)
[38] Icons of Africa's Wetlands and Grasslands Need Multi-faceted Approach to Ensure Their Future | AEWA (unep-aewa.org)
[39] https://portals.iucn.org/library/sites/library/files/documents/2021-005-En.pdf
[40] https://wedocs.unep.org/bitstream/handle/20.500.11822/22864/WLWL_Report_web.pdf
[41] https://cites.org/sites/default/files/eng/prog/Livelihoods/case_studies/1.%20Australia_crocodiles_long_Aug2.pdf
[42] CITES_livelihoods_Fact_Sheet_2019_Australia_Crocodiles.pdf
[43] CITES_livelihoods_Fact_Sheet_2019_Canada_Polar Bear.pdf

management of protected areas, such as local community involvement in managing Shamshy Wildlife Sanctuary in Kyrgyzstan[44], a habitat for snow leopards *Uncia uncia* (Appendix I), and Indigenous community involvement in the collaborative management of the Papahānaumokuākea Marine National Monument Reserve in Hawaii (Feature case study 4)[45]. The Niassa Carnivore Project, Mozambique, developed and implemented a community conservation partnership with a local village, which agrees joint responsibilities, revenue sharing, and performance payments for the conservation of large carnivores (Feature case study 5)[46].

Local management and leadership in the conservation of migratory species can be particularly important in improving co-existence with migratory species, as involving stakeholders in both understanding local challenges and the design of solutions can develop a sense of ownership and long-term investment in the success of conservation measures[47]. Several successful case studies focus on local capacity building and management by communities to mitigate conflict with migratory species. In India, the Assam Haathi project empowered communities to develop and construct Asian elephant *Elephas maximus* (Appendix I) proof fences to improve coexistence, using their own materials and labour, draw on local knowledge to position them effectively, and organise village committees to ensure fences are maintained[48]. To prevent crop-raiding by elephants on farms in Kenya, local farmers were involved in a project to develop bee-hive deterrents, adapting hives using local knowledge, and using community decisions over where to implement the hives to create a sense of communal ownership of the bees[49].

Feature case study 4: Laysan albatross *Phaobastria immutabilis* and black-footed albatross *Phoebastria nigripes*, Hawaii

Laysan albatross **CMS:** ACAP **CITES:** - **IUCN Red List:** NT
Black-footed albatross **CMS:** II **CITES:** II **IUCN Red List:** VU

The Papahānaumokuākea Marine National Monument Reserve is of great cultural importance to native Hawaiians and is an important breeding site for Laysan albatross *Phoebastria immutiabilis* and Black-footed albatross *Phoebastria nigripes* (Vierros *et al.* 2020). Up to 70% of global nesting populations of Laysan albatross nest on Midway Atoll National Wildlife Refuge within the Reserve[50]. Both species are culturally significant for native Hawaiians, as albatrosses are seen as the embodiment of the god Lono, and their arrival signifies a four-month period of peace (Vierros *et al*. 2020). The reserve is co-managed as a biocultural landscape by the Secretary of Commerce, Secretary of the Interior, State of Hawaii and Office of Hawaiian Affairs, with the latter representing the native Hawaiian community[51]. Through collaborative management, Hawaiian culture, traditional knowledge and management concepts are integrated into the management strategy of the reserve[48] (Vierros *et al.* 2020). Whilst access to the reserve is limited, management aims to '*bring the place to the people*' through outreach and engagement[52]. For example, materials have been

[44] https://snowleopard.org/from-hunting-reserve-to-wildlife-sanctuary/
[45] https://www.oha.org/news/new-guidance-document-to-integrate-native-hawaiian-culture-into-management-of-papahanaumokuakea/
[46] https://niassalion.org/
[47] https://portals.iucn.org/library/sites/library/files/documents/2021-005-En.pdf
[48] https://www.chesterzoo.org/what-we-do/our-projects/the-assam-haathi-project/
[49] https://elephantsandbees.com/
[50] Papahānaumokuākea Marine National Monument (papahanaumokuakea.gov)
[51] New guidance document to integrate Native Hawaiian culture into management of Papahānaumokuākea - The Office of Hawaiian Affairs (OHA)
[52] Papahānaumokuākea Marine National Monument is the only mixed UNESCO World Heritage Site in the U.S. (papahanaumokuakea.gov)

developed to teach local schoolchildren about albatross migration, clean oceans, and plastic pollution[47].

Feature case study 5: African lion *Panthera leo*, leopard *Panthera pardus* and African wild dog *Lycaon pictus,* Mozambique

African lion	**CMS:** II	**CITES:** II	**IUCN Red List:** VU
Leopard	**CMS:** II	**CITES:** I	**IUCN Red List:** VU
African wild dog	**CMS:** II	**CITES:** -	**IUCN Red List:** EN

The Niassa Carnivore Project was established in 2003[53] and operates within the Niassa Special Reserve (NSR) in Mozambique. The project aims to monitor and conserve large carnivores with the full participation and support of local communities, focussing on the African lion *Panthera leo,* but also including leopards *Panthera pardus*, spotted hyaenas *Crocuta crocuta* and African wild dogs *Lycaon pictus*.

One of the projects five key goals is to develop a community partnership with the Mbamba village to manage 58,000 ha in a community conservation partnership. The region also forms the intensive study area and base of the project, and is the only concession within the Niassa reserve managed in partnership with a community using a Community Based Natural Resource Management approach, as communities do not own land within the protected reserve.

The legally binding agreement gives joint responsibilities, revenue sharing and performance payments to the village for managing a 58,000 ha area inside NSR for conservation-friendly community development. The local community also benefits from seasonal work in conservation services, revenue from ecotourism and performance-based payments, which reduces wildlife conflict and provides support for children to attend school. The project has been running for over 10 years, and has been resilient to the covid pandemic and insecurity from insurgency to the east of the project. The populations of ungulates, hippo, lion and leopard have increased in the area since 2012, with lions increasing from 2 to 7 prides, whilst illegal activity such as snaring has declined. The project's approach is believed to be sustainable as funding is secure, and growing as the community engages with ecotourism, and consequently it has been suggested to be scalable to implement in Tanzania, Botswana and Namibia[54].

C. Authority over the distribution of benefits

A strong motivator behind successful community-based conservation is the prospect of gaining benefits from their stewardship[55]. Benefits can be realised at a range of levels, from individual households, community-wide, or cross-community benefits.

Many of the case studies reviewed provided benefits at the individual level from direct involvement with conservation, such as through employment as wildlife guards or tourism guides. Alternative sustainable livelihood or conservation enterprise approaches also benefit individuals and households which participate, through increasing income and food security. For example, Snow Leopard Enterprises, which operates across Kyrgyzstan, India, Mongolia and Pakistan, develops women's artisan skills for craft making and connects them to

[53] Our Approach - (niassalion.org)
[54] 2021-NCP-Annual-report.pdf (niassalion.org)
[55] https://portals.iucn.org/library/sites/library/files/documents/2021-005-En.pdf

sustainable markets, which can boost household incomes by up to 40%, in return for signing conservation agreements to avoid poaching[56]. In Uzbekistan, the Kuralai Alternative Livelihood Project raises women's income through teaching embroidery skills and awareness of saiga *Saiga tatarica* and *Saiga borealis* (Appendix II) conservation, empowering women to make decisions around purchasing more sustainable and expensive meat instead of cheaper poached saiga meat[57].

Community institutions often have authority over the distribution of financial benefits generated from conservation. Local institutions can play important roles in livestock insurance schemes, for example through local verification of agricultural or property damage from elephants in a livelihoods insurance scheme operating in Kenya and Sri Lanka[58], or local management of funds, such as in livestock insurance schemes against snow leopard depredation in India and Mongolia[59]. Payments from PES schemes, leasing land, or revenue from community enterprises are often paid to local authorities, who are then responsible for investing in community-level infrastructure projects, such as health or educational facilities. It is important to note that this requires transparency at the community authority level, to ensure equitable sharing of benefits within communities.

For migratory species, a key challenge can be ensuring fair and equitable sharing of benefits across communities involved in species conservation. Using equitable and participatory agreements to determine benefits at the start of initiatives can help to ensure equitable benefit sharing, such as in the Ruaha Carnivore Project camera trapping programme[60] in Tanzania (Feature study 6). Alternatively, promoting complementary opportunities between communities with different local contexts can also encourage shared benefits from conservation, such as the 'social production chain' in the marine turtle conservation by Projeto TAMAR-IBAMA in Brazil (Feature case study 7)[61].

Corruption in the form of elite capture of benefits can be a major challenge in conservation, as it can increase inequalities, reduce compliance with rules, and disenfranchise community members from conservation – leading to unsustainable use of species. In Indonesia, traditional conservation approaches had limited success in protecting Leatherback turtles *Dermochelys coriacea* (Appendix I) nesting on beaches. It was identified that local communities viewed conservation as prioritising turtles and a limited group of community members who owned or had access rights to the beaches. A community empowerment program was therefore used to develop community skills and alternative sustainable livelihoods, including employment in turtle conservation, which worked to significantly change attitudes towards turtle conservation (Pakiding *et al.* 2020).

Feature case study 6: African lion *Panthera leo,* African wild dog *Lycaon pictus,* leopard *Panthera pardus* and cheetah *Acinonyx jubatus*, Tanzania

African lion	**CMS:** II	**CITES:** II	**IUCN Red List:** VU
African wild dog	**CMS:** II	**CITES:** -	**IUCN Red List:** EN
Leopard	**CMS:** II	**CITES:** I	**IUCN Red List:** VU
Cheetah	**CMS:** I	**CITES**: I	**IUCN Red List:** VU

The Ruaha landscape is an important habitat for several CMS-listed carnivore species, supporting over 10% of the world's African lion *Panthera leo* population, the third largest

[56] https://snowleopard.org/our-work/conservation-programs/snow-leopard-enterprises/
[57] http://saiga-conservation.org/projects/alternative-livelihoods/
[58] https://www.iied.org/livelihoods-insurance-elephants-life-kenya-sri-lanka
[59] https://snowleopard.org/our-work/conservation-programs/livestock-insurance/
[60] https://www.hwctf.org/_files/ugd/7acc16_c5d09699e8c54bdeaf98e870cbbb3bd5.pdf
[61] https://www.cms.int/sites/default/files/publication/cms_pub_pop-series_wildlife_watching-tourism_e.pdf

population of African wild dogs *Lycaon pictus*, and significant populations of leopards *Panthera pardus* and cheetahs *Acinonyx jubatus* (Abade *et al.* 2014).

In 2009, the Ruaha Carnivore Project was founded to research the high levels of human-wildlife interactions and associated mitigation in village land south of the protected Ruaha National Park. Over 98% of residents have experienced problems with wildlife[62], mainly driven by the predation of livestock, which leads to retaliatory killings. Lion killing in particular also has a cultural element, with young warriors killing lions to gain status and prestige[59].

The project worked with communities to reduce the costs of living alongside carnivores, through improving livestock enclosures, providing guard dogs, and raising awareness of living safely with wildlife. The project also worked to engage with warriors to adapt cultural practices and skills to become lion defenders, tracking lions and warning people of their presence.

It was identified that benefit initiatives were also needed, which were developed based on key priorities identified by communities around healthcare, educational opportunities, and veterinary medicine for livestock[63]. However, provision of community benefit schemes directly by the project failed to link benefits to wildlife presence, and so in 2015 the project started a community camera trapping programme. In this, groups of four villages compete for a share of $5,000 of additional community benefits, based on wildlife presence recorded by camera traps deployed and monitored by the villages themselves. Points are gained for every animal image, with species that pose a higher risk of conflict assigned higher point values. Rules were decided collaboratively at the start and documented for transparency, including camera placement, species point values, and the value of the share that communities would receive for placing first, second, third or fourth. A celebration is held in the winning village to distribute benefits and bring the communities together[60].

The programme has been successful in providing data on wildlife populations, engaging communities in conservation through training in wildlife monitoring, and linking wildlife to community development[60]. This has been recognised by local government, village leaders, and park authorities as impacting both local development and conservation[64]. In 2019, the project employed 32 community camera trapping officers across 16 villages, as well as 17 lion defenders, with benefits reaching 40,000 people[65]. The photographs are shared with communities, increasing villager's awareness of species on their lands. Some communities have also banned lion and elephant hunting and impose fines when this occurs[62]. The project aims to expand to include all 22 villages in the area, and the model is also being shared with other projects in Tanzania[61]. Furthermore, in 2020, it became part of the transboundary Lion Landscapes project[66] which also operates in Kenya and Zambia.

Feature case study 7: Green turtle *Chelonia mydas,* hawksbill turtle *Eretmochelys imbricata*, loggerhead turtle *Caretta caretta*, leatherback turtle *Dermochelys coriacea*, Olive ridley turtle *Lepidochelys olivacea*, Brazil

Green	**CMS:** I/II	**CITES:** I	**IUCN Red List:** EN
Hawksbill	**CMS:** I/II	**CITES:** I	**IUCN Red List:** CR
Leatherback	**CMS:** I/II	**CITES:** I	**IUCN Red List:** VU
Loggerhead	**CMS:** I/II	**CITES:** I	**IUCN Red List:** VU

[62] *7acc16_c5d09699e8c54bdeaf98e870cbbb3bd5.pdf (hwctf.org)
[63] *7acc16_c5d09699e8c54bdeaf98e870cbbb3bd5.pdf (hwctf.org)
[64] Ruaha Carnivore Project
[65] RCP-Annual-Report-2019.pdf (ruahacarnivoreproject.com)
[66] Our programmes | Lion Landscapes

Olive-ridley **CMS:** I/II **CITES:** I **IUCN Red List:** VU

The National marine Turtle Conservation Programme in Brazil, Projeto TAMAR-IBAMA, was initiated in 1980 by the Brazilian government as an NGO affiliated with the government's environmental institute IBAMA and the first programme to conserve sea turtles in the country[67].

The project focusses on conservation of the five turtle species found along Brazil's coastline, the olive ridley turtle *Lepidochelysi olivacea*, hawksbill turtle *Eretmochelys imbricata*, loggerhead turtle *Caretta caretta*, leatherback turtle *Dermochelys coriacea*, and green turtle *Chelonia mydas,* all of which became fully protected in Brazil in 1986 (Marcovaldi and dei Marcovaldi, 1999). Turtles were widely exploited for subsistence and cultural use by fishing villages, primarily for eggs, meat, and shells. However, there was little consideration for population sizes and long-term impacts, with almost 100% of eggs poached along some parts of the coast (Marcovaldi and dei Marcovaldi, 1999).

The project therefore aimed to engage local communities in sea turtle protection and research [68]. The project has 22 stations at major nesting and feeding sites along 1,100km of coastline and three islands. The stations employ local people, around 80% of whom are fishermen and their relatives[65]. A key success has been the appointment of former egg poachers as beach patrollers and nest protectors, who gain status from the employment and disseminate knowledge across communities (Marcovaldi and dei Marcovaldi, 1999). By 1999, harvest of nesting females and eggs had stopped in all major turtle nesting areas (Marcovaldi and dei Marcovaldi, 1999). The project has also contributed to globally significant scientific research on sea turtle biology and migration patterns, and had released over 15 million turtle hatchlings by 2016 (da Silva *et al.* 2016).

In addition, the project has engaged communities in education programmes, improved fishing practices to raise income and reduce turtle bycatch, developed alternative livelihoods, and trained local people for employment in ecotourism, such as through a 'Mini Guides Programme' for young people[65].

At 10 sites, visitor centres have opened to generate tourism revenue, receiving around 1.5 million visitors per year. However, as some stations have low tourism potential, the project has also developed a 'social production chain' where stations without tourism produce products to sell at sites that do[65]. This is an important component of social inclusion within the project, ensuring benefits are received by all sites and directly linking social development and income to turtle conservation (da Silva *et al*. 2016). This has been particularly important for communities where local natural resource use has been restricted through creation of Biological Reserves (da Silva *et al.* 2016). At the same time, promotion of local and cultural crafts for commercialisation has also promoted communities' sense of identity (da Silva *et al*. 2016), further promoting positive attitudes and the long-term sustainability of the project.

d. Spiritual values and attitudes towards species

Communities can value migratory species in different ways; for example, as economic commodities (Aiyadurai and Banerjee 2020), as having intrinsic value in nature or traditional cultural practices[69], through the ecosystem services that they provide, or as possessing spiritual value (Chester *et al.* 2022).

[67] https://www.cms.int/sites/default/files/publication/cms_pub_pop-series_wildlife_watching-tourism_e.pdf
[68] https://www.cms.int/sites/default/files/publication/cms_pub_pop-series_wildlife_watching-tourism_e.pdf
[69] https://portals.iucn.org/library/sites/library/files/documents/2021-005-En.pdf

Some communities have traditional belief systems that provide direct protection to species. In Ethiopia, cultural taboos mean that migratory birds such as common cranes *Grus grus* (Appendix II) are not hunted, although increasing habitat loss and agricultural conflict pose other threats for the species[70]. Traditional farming communities in India have co-existed with Sarus cranes *Antigone antigone* (Appendix II) in highly populated agricultural floodplain and wetland landscapes for centuries[67]. Traditional practices provide good habitat for the cranes, and farmers have developed positive beliefs and folklore around the species; killing cranes is seen as bad luck. In this case, threats to traditional farming livelihoods by conversion of land for development and erosion of local traditional belief systems are now key threats facing these populations[67].

Building on and reinforcing spiritual and cultural links can be a way to motivate community involvement and establish migratory species as flagships for conservation. Snow leopards have strong spiritual value across their Range States; Buddhist communities designate '*sacred snow leopard sites*', and they are viewed as spiritual beings by the Wakhi community of Shimshal in Pakistan[71]. This strong spiritual relationship between communities and snow leopards forms the basis for the innovative, indigenous led initiative '*Land of the Snow Leopard Network*' (Feature case study 8).

In contrast, some spiritual or traditional practices may be detrimental to conservation where they involve exploitation of endangered species, such as where a species is hunted, used in religious or traditional practices, or used in traditional medicine. Certain communities in parts of Africa use vulture body parts in belief-based rituals to cure illnesses, and so conservation in these locations involves raising awareness among local traditional healers of plant-based alternatives (Feature case study 9)[72]. The saker falcon *Falco cherrug* (Appendix I/II) is considered an iconic species in falconry, a traditional practice in many of its Range States. Local community members are often involved in illegal trapping of wild birds for use in falconry. However, due to rapid declines in wild populations, driven in part by capture of wild birds for the falconry trade, a global action plan was developed to promote the species recovery. The action plan aims to use the diverse knowledge of the many stakeholders involved in conservation and falconry to implement adaptive management and sustainable use of the species, whilst also generating awareness and benefits for local communities involved[73].

It is important to note that positive cultural and spiritual values are not always sufficient to prevent local communities from hunting migratory species. A key threat to the critically endangered spoon-billed sandpiper *Calidris pygmaea* (Appendix I/II) in Myanmar was hunting (Zockler et al. 2010). Hunters were predominantly the poorest in their communities and hunted the birds due to a lack of livelihood alternatives, despite social stigma and the belief that they would incur bad karma. On provision of livelihood resources such as fishing boats and nets, hunters agreed to sign contracts committing to cease poaching[74].

Feature case study 8: Snow leopards *Uncia uncia*, Russia, Tajikistan, Mongolia and Kyrgyzstan

CMS: I **CITES:** I **IUCN Red List:** VU

[70] https://savingcranes.org/wp-content/uploads/2022/05/cranes_and_agriculture_web_2018.pdf
[71] https://snowleopardconservancy.org/text/myth/pakmyths.htm
[72] Working with traditional healers to end vulture poaching - BirdLife International
[73] https://www.cms.int/raptors/sites/default/files/publication/SakerGAP_e.pdf
[74] https://www.cms.int/raptors/sites/default/files/document/Inf_11_Spoon_billed_Sandpiper_in_Myanmar_Eonly_0.pdf

The Land of the Snow Leopard (LOSL) network started in 2013[75] in partnership with the Snow Leopard Conservancy and aims to integrate western and indigenous approaches for conservation. In the project, Indigenous Cultural Practitioners (ICPs) are equal partners, using cultural and spiritual knowledge to secure landscapes for snow leopard conservation[76], and promote understanding of the snow leopard's fundamental roles in indigenous practices[73].

The network includes over 100 members, and enables ICPs to be involved in high level, international conservation for snow leopards. The project empowers transboundary collaboration between indigenous cultural practitioners. The core membership (including ICPs, country coordinators, and select community members) meets annually, to exchange knowledge, ideas, and experiences. The meetings also include technical training and ceremonies led by cultural and spiritual practitioners.

Key achievements of the programme include gaining recognition of sacred sites, including recognition of Okinsky District in Russia as a Territory of Traditional Use of Natural Resources, allowing communities to protect external exploitation of resources, and acknowledgement of Sutai Mountain in Mongolia as a spiritually and culturally sacred site[77].

In addition, there is a strong focus on education and understanding of the spiritual importance of snow leopards. For example, the IUCN supported the '*Elders and Youth for Conservation of the Snow Leopard*' program in Kyrgyzstan, to strengthen understanding of spiritual practices for conservation of snow leopards as sacred animals and '*protectors of the sacred mountains*'[78]. An education programme, the '*Mongolian Nomadic Nature Trunks Program*', has also been established, and incorporate scientific and traditional knowledge in teaching schools about snow leopard conservation programmes. In 2019, this also expanded to include Kyrgyzstan and Tajikistan[75]. The project has also developed online technologies, enabling ICPs to build communication and monitor snow leopard observations and poaching activity.[74]

Feature case study 9: Egyptian vulture *Neophron percnoptrus*, Nigeria

CMS: I **CITES:** II **IUCN Red List:** EN

Throughout history, vultures have been an important part of human culture, possessing symbolic cultural values in many parts of the world[79].

Vultures have experienced rapid population declines, with Egyptian vulture *Neophron percnoptrus* populations declining by over 80% in the last 30 years in their breeding grounds in the Balkans[80]. The Egyptian Vulture New LIFE Project, which launched in 2017 to continue the work of the Return of the Neophron Project (2011-2016), is a collaboration of institutions and organisations from 14 countries. The project aims to reverse population declines by addressing known threats within the species' breeding grounds in the Balkans, along its 8,000km migration route, and in wintering grounds in Africa.

The three primary threats facing the species are poisoning, electrocution, and direct persecution, but the significance of each varies across the flyway. The project therefore aims to work with stable local institutions to achieve country or region-specific goals. In the Balkans,

[75] *SLC2022Impact.pdf (snowleopardconservancy.org)
[76] Land of Snow Leopard Network (arcgis.com)
[77] Land of Snow Leopard Network (arcgis.com)
[78] *SLC2022Impact.pdf (snowleopardconservancy.org)
[79] https://lifenephron.eu/#a-relation-to-human
[80] https://lifenephron.eu

for example, over 80% of deaths are due to illegal poisoning – both deliberate and accidental, and work has focussed on developing anti-poison networks and dog patrols[81]. The project has also worked with local communities to provide supplementary feeding sites that now support over 50% of the breeding vulture population and allow farmers to save money disposing of carcasses and instead contribute to conservation[82].

In Niger and Nigeria, some communities use vulture body parts in belief-based rituals (Stara *et al.* 2022). Demand is highest in Nigeria, where persecution for trade is seen as the greatest threat to vultures, despite the killing of the vultures being illegal (Oppel *et al.* 2021). Here, traders also source vulture parts from neighbouring countries due to the scarcity of vultures as a result of persecution (Oppel *et al.* 2021).

To combat illegal persecution for belief-based rituals, the Nigerian Conservation Foundation (NCF) has focussed on developing local capacity and knowledge related to vulture conservation[77]. NCF has engaged with traditional healers to raise awareness of plant-based alternatives through workshops, in which over 80 traditional healers have taken part to develop a manual on '*Plant based alternatives to Vulture use for traditional Medicine practitioners*'[83]. A social media group has also been developed to share experiences, and many healers are now using plant-based alternatives and promoting their use to others [84].

e. Cooperation among communities along migratory pathways

Communities can cooperate along migratory species' pathways in a range of ways. Several case studies show communication at local scales, where conservation initiatives have expanded naturally between communities. For example, installation of small-scale elephant proof fences to protect villages and crops to improve co-existence with elephants has spread between communities bordering protected forest areas in India, facilitated by a manual produced by the communities originally involved[85]. In Tanzania, innovations to improve predator-proofing of bomas that house livestock has increased within the local community and is being adopted in neighbouring districts as well[86], reducing livestock predation and prevent retaliatory killing of carnivores. In these cases, community ownership and low-tech approaches that can be employed and shared between communities without external support were important features of the intervention.

Community cooperation can be facilitated by bringing community representatives together to exchange knowledge. In the Mali elephant project (Feature case study 10), workshops were used to first understand local perspectives around African elephant conservation, and then to empower local communities to work together to collectively manage their shared resources. Through local leadership and empowering communities to work together, sustainable systems were developed to protect elephants and their habitat, and were resilient when poaching pressure increased in the area (Canney 2019).

As migratory species cross international boundaries, transboundary conservation – the process of cooperation to achieve conservation goals across one or more international boundary[87] – is critical, including through the establishment of Transboundary Conservation Areas (TBCAs). Community collaboration can be promoted within these landscapes by park

[81] https://www/neophon.eu/#a-how-life-is-securing-a-brighter-future-for-the-egyptian-vulture
[82] https://lifeneophron.eu/#a-new-vulture-restaurant-in-northern-bulgaria
[83] https://lifenephron.eu/back2/public/files/documents/plant-based-alternatives-to-vulture-use-guide-book-for-traditional-practitioners-639c4bc59ff63.pdf
[84] https://www.birdlife.org/news/2020/06/10/working-with-traditional-healers-to-end-vulture-poaching/
[85] https://www.hwctf.org/_files/ugd/7acc16_9e86b05b7d78450eb3cfb80a03ed87db.pdf
[86] https://www.thegef.org/sites/default/files/publications/GEF_SGP_Communities_Conserving_Wildlife_2021.pdf
[87] https://portals.iucn.org/library/sites/library/files/documents/PAG-023.pdf

administration, for example the Kavango-Zambezi Transfrontier Conservation Area (KAZA) involves five countries committing to sustainable development and tourism within the landscape and supports several community projects to restore migratory corridors[88].

The Mayumba-Conkouati Transfrontier Park, comprising the Conkouati-Douli National Park in the Republic of Congo and the Mayumba National Park (MNP) in Gabon[89] is an important marine habitat for Atlantic humpback dolphins *Sousa teuszii* (Appendix I). Conservation of the species involves working with local fishing communities to support fishery exclusion zones, provide compensation for releasing live dolphins, reporting sightings, and outreach with coastal fishing communities. In South America, transboundary governance in the conservation of critical Andean flamingo *Phoenicoparrus andinus* (Appendix I/II) and James's flamingo *Phoenicoparrus jamesi* (Appendix I/II) nesting sites in the Eduardo Avaroa National Refuge, Bolivia, and adjacent Los Flamencos National Reserve, Chile, involves government, NGOs and Indigenous community representatives (Feature case study 11)[90].

The important role of local communities in regional, transboundary, and international conservation initiatives is increasingly recognised. In the '*Trinational Programme for the Conservation and Sustainable Development of the Protected Areas Corridor*', cross border protected areas in Ecuador, Columbia, and Peru, including two communal reserves, are coordinating regional management for biodiversity conservation and sustainable development, including using camera traps to identify the status of jaguars *Panthera onca* (Appendix I/II) in the region[91]. This landscape is also identified as a priority Jaguar Conservation Unit (JCU) by the World Wildlife Fund (WWF) as part of the organisation's contributions to the Jaguar 2030 Roadmap[92]. The Jaguar 2030 Roadmap was released in 2018 as a collaborative effort between jaguar Range States, including governments, NGOs, IGOs, local communities and the private sector, to conserve jaguar ecosystems[93].

Furthermore, strong international and national cooperation can coordinate conservation among discontinuous communities along migratory routes, which can be especially challenging for avian and marine species. In the Seagrass Ecosystem Services project, for example, Local Marine Managed Areas (LMMAs) managed by coastal communities and important for migratory marine species such as dugongs, are supported across Indonesia, Malaysia, Philippines, Thailand, and Timor-Leste. Through participatory research, raising public awareness, and collaboration with global technical experts, local communities are empowered to develop and apply locally adapted conservation and management solutions. This project is supported by the Memorandum of Understanding on the Conservation and Management of Dugongs (*Dugong dugon*) and their habitats throughout their range which highlights the need to promote local stewardship of the species and its habitat[94]. Dugongs are listed as an CMS Appendix II species.

Feature case study 10: African elephants *Loxodonta africana*, Mali

CMS: II **CITES:** I **IUCN Red List:** EN

[88] Community Project Involvement in the Kavango Zambezi TFCA (ppf.org.za)

[89] https://wildernessexplorersafrica.com/african-safari-destinations/congo-brazzaville-safaris-tours-holidays/congo-brazzaville-national-parks/conkouati-douli-national-park/

[90] https://portals.iucn.org/library/sites/library/files/documents/PAG-023.pdf

[91] https://wwf.panda.org/wwf_news/?210674/putumayoconservationwithoutborders

[92] WWF launches regional plan for jaguar protection in Latin America | WWF (wwfca.org)

[93] *Panthera_Jaguar2030Roadmap_ENG_Draft03 (panda.org)

[94] https://www.cms.int/en/legalinstrument/dugong-mou#:~:text=The%20Memorandum%20of%20Understanding%20on,habitats%20throughout%20their%20extensive%20range.

The Gourma region of Mali contains a small population of desert adapted elephants, which follow an annual cyclical migration driven by resource availability in the wet and dry seasons. In 2003, research was initiated to investigate the elephants' resource needs, migration routes and threats. It was discovered that whilst the elephants covered over 32,000km^2, they spent most of their time in forested areas around water holes (Canney, 2019) where rising anthropogenic development and resource over-exploitation was a key threat. The Mali Elephant project aims to conserve elephants through reducing competition with local communities.

Stakeholder workshops in 2007 identified that local people wanted to conserve the elephants, as they recognised the link between elephant presence and the environment's capacity to support their own livelihoods (Canney, 2019). To build on these positive attitudes, the project developed educational and outreach materials for stakeholder groups.

However, over-extraction of resources continued (Canney, 2021), and further workshops were initiated to alleviate rising pressure around Lake Banzena, a critical water source for elephants. Increasingly large cattle herds risked the lake drying completely, and elephants were reportedly dying of potential livestock diseases (Canney 2019). These workshops found that 96% of cattle were commercially owned by wealthy urban individuals who employed migratory herders, and that local people were willing to relocate if there was clean water available elsewhere, as over half suffered from chronic water-borne illnesses associated with contaminated lake water. Notably, whilst the ethnic groups present had resource management systems in place, lack of respect for each other's systems was leading each group to use, and deplete, the shared resources independently (Canney 2021).

Communities were brought together and empowered to work collaboratively through electing a shared leadership committee to set rules on resource use, elect '*ecoguards*' to protect elephants and their habitat, and charge commercial herders for water and pasture access. Clean water boreholes were also constructed for each social group to prevent conflict. This led to over 90,000 ha being protected as reserve pasture, reduced water-borne illness, and created occupations for young men. The project also worked with womens' groups to develop alternative livelihood options and capacity building. Other communities across the elephant range also requested help to take similar actions (Canney, 2019).

Insurgency in 2012 led to a breakdown in law enforcement and increased poaching pressure by militant groups. As a result, local leaders issued edicts that elephant poaching was considered thieving, and encouraged young men to protect elephants with small payments and prestige in their communities. Poaching was successfully limited to 20 elephants over 3 years, before further security declines and illegal trafficking led to 83 elephants being killed in 2015, and 51 in 2016. A transboundary anti-poaching unit was developed, working with local communities to empower them to protect elephants to effectively reduce poaching. In addition, whilst the decentralised control of natural resources designated by the government to local communities has been critical to the project, communities and the Mali elephant project are now working to request the elephant range to be protected as an UNESCO Biosphere reserve to further strengthen local communities' ability to enforce protection of core elephant habitat and regulate resource use in buffer zones (Canney 2019, Canney 2021).

Feature case Study 11: Andean flamingo *Phoenicoparrus andinus* and James's flamingo *Phoenicoparrus jamesi*, Chile and Bolivia

Andean flamingo **CMS:** I/II **CITES:** II **IUCN Red List:** VU

James's flamingo CMS: I/II **CITES:** II **IUCN Red List:** NT

Andean flamingo *Phoenicoparrus andinus* populations and James's flamingo *Phoenicoparrus jamesi* historically faced major threats to their populations in critical high-altitude wetlands in Chile and Brazil from local communities, who hunted them for feathers, meat, and eggs. In addition, mining operations for materials such as borax also posed a threat for the species' wetland habitats[95]. The Group for the Conservation of High Andean Flamingos (GCFA) has carried out transboundary conservation activities since 1996 to protect the flamingos in their nesting sites, including in two adjacent national parks, Eduardo Avaroa National Refuge, Bolivia, and Los Flamencos National Reserve, Chile.

An important initial challenge for conservation was the lack of coordination in flamingo management between the parks, as well as a lack of trust between the countries affecting collaboration in the border region[93]. As such, a core part of the group's activities has been strengthening inter-institutional coordination for efficient management of the species and their network of wetland habitats, emphasizing regional connectivity [96].

Reducing local threats involved capacity building in local communities, deploying guards on both sides of the border, and educational and awareness campaigns in the indigenous Atacemenos communities (Chile) and Aymara communities (Bolivia). The project has successfully motivated communities to protect the flamingo populations, and now they feel proud of the biodiversity value of their ancestral homelands. Local threats from egg collecting and poaching have ceased, and local community members are instead involved in protecting flamingos from external poachers during the nesting season, monitoring the flamingo populations and ringing juvenile flamingos to monitor migration.

The project has successfully reduced local threats from unsustainable harvesting of flamingo populations, but other threats remain for the populations, including climate change and pollution from mining activity. Mining pressure for lithium, for example, has increased greatly in the region since 2016 due to rising international demand (Marconi, Arengo and Clark, 2022).

6. Intersectional Issues

The themes discussed above can be interrelated, with the case studies often incorporating elements across different themes. However, several intersectional situations of particular relevance to migratory species are discussed below.

a. Aggregation sites along migratory routes

Numerous migratory species aggregate in high densities at particular sites for part of the year, such as breeding grounds, stop-over sites, or feeding grounds. These locations can pose challenges and opportunities for community involvement in conservation. Species are at particular risk from loss or degradation of habitat at these sites, or overexploitation due to the perceived overabundance of the species. At the same time, community-based conservation at these sites can have particularly large benefits for the species with involvement of relatively few communities.

Amur falcons *Falco amurensis* (Appendix II) for example, congregate in Nagaland, India, at high densities for around one month of the year. Thousands were being killed by local villagers as they were seen as an abundant but temporary economic resource (Aiyadurai and

[95] https://portals.iucn.org/library/sites/library/files/documents/PAG-023.pdf
[96] http://www.redflamencos-gcfa.org/tematicas.html

Banerjee, 2019). Amur falcons are legally protected in India, and when a documentary brought the practice to national and international attention[97] there was great external pressure for communities involved to end the hunting of Amur falcons. Awareness of the negative perceptions around their communities, both nationally and internationally, alongside campaigns highlighting falcon conservation, led village leaders to ban hunting in 2013 (Aiyadurai and Banerjee, 2019). Community attitudes towards the falcons changed, as it became a mascot for their involvement in global conservation and a source of pride as the '*falcon capital of the world*' (Aiyadurai and Banerjee, 2019).

A similar situation occurred with whale sharks *Rhincodon typus* (Appendix I/II) in the Philippines, a species heavily depleted by poaching in the 1990s[98]. High numbers were discovered in Donsol Bay, Philippines, at the same time that a nearby poaching incident occurred. This led to international pressure to protect the species and the area was rapidly designated as protected for whale sharks. Tourist interest in the area also increased, and a successful whale shark watching ecotourism business has developed to supplement local livelihoods for part of the year[96].

b. Contrasting impacts for local communities across migratory ranges

Migratory species provide important ecosystem service roles across their ranges. Local threats or management decisions in some parts of a migratory specie range can therefore influence ecosystem services across other Range States (Lopez-Hoffman *et al.* 2017). Some species, particularly birds, have different ecosystem impacts in different parts of their range, and this can lead to conflict where action in one part of a species range has adverse impacts on communities in distant areas. Recognising potential disparities between the costs of conservation and the benefits along migratory species ranges is important to avoid inequitable outcomes and increase the long-term sustainability of conservation (Chester *et al.* 2022). It can also present opportunities and motivation for international cooperation in species conservation (Lopez-Hoffman et al. 2017).

The Monarch butterfly *Danaus plexippus* (Appendix II) is the only CMS-listed insect and has declined significantly since the 1990s (Taylor *et al.* 2020). In Mexico, the species congregates in a few wintering sites in highly protected forested areas, designated as a UNESCO Monarch Butterfly Biosphere reserve[99]. The butterflies are an important part of sustainable development among local communities, who have developed ecotourism and sustainable forestry practices to conserve the species[100] [101]. The butterfly is also of spiritual importance, as their arrival in autumn coincides with the Day of the Dead celebrations, where they are traditionally believed to be spirits[102]. When the species migrates to North America, it is dispersed in its habitats in the US and Canada and is highly valued for its contribution to crop-pollination (Chester *et al.* 2020). However, increasing herbicide use in agricultural production and changing land use in the 1990s greatly reduced milkweed presence, the plant on which monarch caterpillars feed exclusively, and the capacity to support monarch butterfly populations (Taylor *et al.* 2020). This has the potential to impact Mexico's biosphere ecosystem and the long-term sustainability of local community-based conservation.

In Europe, Barnacle geese *Branta leucopsis* (Appendix II) are highly protected throughout their range. The species provides ecosystem services such as seed dispersal and nutrient

[97] Villagers, scientists and policy-makers unite to conserve the Amur Falcon in Nagaland (cms.int)
[98] https://wwf.org.ph/wp-content/uploads/2022/12/WWF-Philippines-Impact-Report-2022.pdf
[99] CMS Wildlife Watching. And Tourism
[100] https://www.worldwildlife.org/stories/protecting-monarch-butterflies-and-their-forests
[101] Home • Monarch Butterfly Fund (monarchconservation.org)
[102] MBF-Fun-Facts-Feb-21.FINAL .pdf (monarchconservation.org)

cycling in arctic ecosystems, as well as possessing cultural and aesthetic values[103]. However, on the Isle of Islay in Scotland, average barnacle geese numbers have increased from around 3,000 in 1952 to almost 50,000 in 2005 - 2006 (Mckenzie and Shaw, 2017). The species is seen as an agricultural pest threatening local livelihoods, with grazing on improved grassland causing considerable damage and rising financial costs for compensating farmers. This causes conflict at local and international scales, as much of the species conservation is top-down and internationally coordinated, but management is also needed at the local level to reduce conflict and support farmers to adhere to management decisions. The Islay Sustainable Goose Management Strategy (2014 - 2024) was co-developed by conservation NGOs, farmers, land managers and government, and uses adaptive management to meet the UK's conservation obligations and reduce losses for farmers[104].

c. Illegal Wildlife Trade

The illegal trade in wildlife and wildlife products can potentially undermine community-based conservation, particularly for high value species. The sustainable use of vicuña, for example, is threatened by increasing poaching intensity as there is little way to distinguish legally live-sheared fibre and fibres from poached animals, and the fibre has a high value on international markets[105]. As a result, poaching reduces the value of vicuña for the entire community (McAllister *et al.* 2009). As poaching is directly related to the international demand, and largely stopped when previous bans led to no demand for the species fibre (Mcallister *et al.* 2009), it has been suggested that ensuring international markets source the fibre carefully will be vital to keep vicuña fibre use sustainable.

For species where demand is deeply entrenched, such as for traditional medicine, control of legal international trade can have little impact on poaching levels (Cooney *et al.* 2022). Instead, engaging consumer communities can have greater impacts on conservation, as well as increasing enforcements and disincentives to discourage community members from engaging in poaching of high value species. Migratory species also face challenges as transboundary regions can be remote with little infrastructure, which further makes enforcement of legal bans on international trade challenging (Liu *et al.* 2020).

7. Gaps and future work

a. Climate change

Climate change may alter migratory pathways, for example species may be forced to migrate at different times, or critical habitats may no longer be suitable[106]. This may change their relationships with local communities that make use of migratory species, altering their availability as a resource, or intensifying competition for shared resources such as water. Greater understanding of the potential socioeconomic impacts of climate change for communities' relationships with migratory species is needed to develop mitigation. Integrating nature-based solutions that target climate change and biodiversity recovery together could be important for successful community-based conservation in the future.

b. Communication and evaluation

[103] https://egmp.aewa.info/sites/default/files/download/population_status_reports/AEWA%20International%20Single%20Species%20Management%20Plan%20for%20the%20Barnacle%20Goose.pdf

[104] https://www.nature.scot/sites/default/files/2017-07/A1434517%20-%20ISLAY%20SUSTAINABLE%20GOOSE%20MANAGEMENT%20STRATEGY%202014%20-%202024%20-%20October%202014%20%28A2332648%29.pdf

[105] https://www.iied.org/sites/default/files/pdfs/migrate/14648IIED.pdf

[106] https://www.cms.int/en/page/migratory-species-and-climate-change

In several case studies, information regarding measurable ecological and community benefits were limited. Greater transparency and communication in relation to intervention outcomes – including successes, challenges, and the impacts for nature and communities – will be valuable for promoting and improving community involvement in the conservation of migratory species, and will empower communities to compare and adapt conservation for local conditions. Notably, the focus on the status of species as migratory varied among case studies. Raising awareness of the wider international context of migratory populations could promote conservation and sustainable management, such as in the conservation of Amur falcons in India, or international Saiga day celebrations. Facilitating communication directly between indigenous and local communities involved in conservation, for example through workshops, could have potential for expanding community cooperation, innovation, and integration of traditional knowledge into migratory species conservation.

C. Taxonomic or regional bias

Of 657 species listed on the CMS website[107], the case studies in this analysis covered 82 species, including 35 birds, 28 mammals (both terrestrial and marine), seven reptiles, six fish, one shark species and one insect.

Within the case studies, there was a strong taxonomic bias towards terrestrial mammals which, despite only targeting 12 terrestrial mammal species (with the remaining 16 mammals targeted being marine species), comprising half of the case studies. It may be that community-based conservation is of greater necessity for large terrestrial mammals, which can interact closely with communities through livestock depredation or competition over resources, or it may potentially reflect a bias towards these charismatic terrestrial species.

Of the eight listed turtle species, six were the focus of community-based conservation in these case studies. These often aimed at protecting nesting beaches, and it may be that the life-histories of these species, to lay eggs at sites with high fidelity, make them easy to effectively monitor, and thus well-suited for site-based community conservation. Less efforts were targeted towards turtles along their migratory routes, although some projects aimed to reduce bycatch, which may impact migratory movements, by local fishermen. In contrast, the taxonomic groups with lowest community involvement in conservation are fish, with one multi-species case study, and sharks, with one case study on a single species.

In terms of regional distribution, case studies were sourced from 50 countries, including 18 African countries, 13 Asian countries, eight South American, Central American and Caribbean countries, four European countries and four Oceanian countries.

Further work is required to determine whether the biases presented here reflect true biases in community involvement in the conservation of migratory species, or simply biases in reporting. It will be particularly important to understand how characteristics of migratory species taxa may influence opportunities or form potential barriers for community involvement in conservation.

8. Key Conclusions and Guiding Principles

This review has provided better understanding of the challenges and best practices regarding the inclusion of communities in CMS-listed species conservation. However, it is important to note that due to the time limited nature of this review, only a sample of initiatives being undertaken globally could be considered. Whilst more work is needed to understand the

[107] Species | CMS

general applicability of these findings, overall, they currently indicate there is great potential for community involvement in migratory species conservation.

Many of the insights surrounding the effective conservation of migratory species apply to community engagement in conservation generally. These include the need for secure and equitable land tenure, protected user rights, incorporating local ecological knowledge, and community involvement in local and area-based management activities. In other ways, however, the temporal pattern of migratory species' presence as they move between international borders and encounter different communities and stakeholders presents unique challenges for their conservation. For example, the case studies in this review evidenced the need for adaptive management and cooperation at international scales to support range wide sustainable use of culturally or economically valuable species, but that local communities can play valuable roles within this to simultaneously achieve sustainable livelihoods and contribute to conservation.

From the discussion and analysis above, **10 guiding principles** have been developed for consideration in the future involvement of communities in the conservation of migratory species.

Land and user rights

1. **Secure and equitable land and resource user rights for communities are important for migratory species conservation.** Communal conservancies and locally managed areas can form valuable corridors for migratory species outside of protected area networks. Rights to land and wildlife resources can enable communities to benefit from the presence of migratory species economically, such as through wildlife-based enterprises, or payments for conservation. Communities also gain socially from empowerment to manage their own landscapes and resources, for example through land use zoning, or reinstating traditional management practices.

2. **Communities need to be supported in their rights to manage and protect migratory species from external influences.** Capacity building and establishing or reinforcing local institutions to sustainably manage migratory species and distribute benefits from their conservation is required to enable communities to provide effective protection and stewardship. Communities may carry out actions such as designating protected areas, self-restricting resource use, or implementing anti-poaching and monitoring efforts to protect migratory species from poaching and overexploitation. Wider governance is also important to support communities' interests from powerful external actors who may compete for resources, such as commercial resource extraction or the illegal wildlife trade.

Management responsibilities

3. **Local management can support the long-term sustainability of conservation measures to increase coexistence with migratory species.** Community-based management is particularly important in local scale co-existence projects between communities and large migratory species such as big cats and elephants. Through supporting local leadership, management and implementation of conservation measures, communities gain ownership of projects and are invested in their success. As such, capacity building and community participation in all stages of a project is important, and also serves to increase the suitability of interventions to local needs.

4. **Co-management and collaboration can integrate traditional ecological knowledge and practices into successful migratory species conservation.** For area-based management in particular, community involvement in management decisions can increase effectiveness through adapting measures to local needs, socio-

economic contexts and beliefs, increasing acceptance of conservation and promoting conservation of broader biocultural landscapes.

5. **Community involvement can facilitate sustainable use of migratory species as part of international coordinated and regulated management.** Achieving sustainable use of migratory species is challenging, requiring range-wide information on species population status. However, involvement of local stakeholders is increasingly recognised in the successful implementation of international trade regulations, such as CITES, and adaptive management strategies. This enables local cultural and livelihood considerations to be recognised and supported, preventing illegal trade and subsistence from undermining sustainable use, and encouraging local involvement in the management of migratory species.

Spiritual values and attitudes

6. **Understanding and integrating traditional beliefs can increase migratory species conservation effectiveness.** Positive attitudes and traditional practices can promote co-existence and management of migratory species and the habitats they rely on and can motivate engagement in conservation. An understanding of cultural practices regarding species is vital to prevent conflict and promote involvement of cultural practices and stakeholders in conservation activities, for example through changing local perceptions of species use, or encouraging participation in sustainable management.

Cooperation among communities along migratory pathways

7. **Bottom-up knowledge exchange between community members promotes effective cooperation in migratory species conservation and can be facilitated through top-down involvement in transboundary initiatives.** Successful conservation measures can spread between communities, requiring local leadership and management. At larger scales, bringing community representatives together for knowledge exchange can also promote cooperation to target specific threats for migratory species. International NGOs and transboundary initiatives also play an important role in supporting the inclusion of communities along migratory pathways and promoting collaboration and knowledge exchange between communities.

Intersectional Issues

8. **Communities located around important migratory species aggregation sites can be a priority for engagement with conservation.** Communities around important stop-over, breeding, or feeding grounds for migratory species can have a disproportional impact on migratory populations. Whilst overexploitation or threats in these areas can be particularly damaging for species, effective conservation involving local communities can provide substantial benefits, both for the migratory species, and for local communities through promoting sustainable development or providing a source of pride and connection to nature.

9. **Conflict can arise between migratory species management in different parts of their range, leading to disbenefits for some local communities.** A key challenge in migratory species conservation occurs when benefits or disbenefits of migratory species presence are localised to different parts of their ranges. Management in these locations can therefore come into conflict. An understanding of the impacts of this on local communities and livelihoods, and who has authority over reconciling these differences, is important for ensuring that all communities can sustainably benefit from conservation.

10. **Community-based conservation of migratory species can be undermined by the illegal wildlife trade.** A key feature required for long-term community commitment to conservation is for benefits to outweigh costs, such as restricted access to resources or living close to potentially dangerous wildlife. For some migratory species, there is an added pressure when species are particularly high value, such as elephants for ivory, which can undermine community conservation as individuals can make more money from poaching than protection. This can be exacerbated in remote transboundary landscapes with poor law enforcement and high levels of poverty. In such cases, strong disincentives to prevent poaching by community members through strengthening law enforcement, can be required.

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10. Table of Case studies

Table showing the focal species, Range State, project name and a key reference for each case study in this analysis. Range States which are Parties to the CMS are indicated in bold.

Case study	Species	Range State	Name	Key Reference
Terrestrial				
1.	Snow leopard (*Uncia uncia*)	**Kyrgyzstan**	Shamshy Wildlife Sanctuary	https://snowleopard.org/from-hunting-reserve-to-wildlife-sanctuary/
2.	Snow leopard (*Uncia uncia*)	**Kyrgyzstan** **India** **Mongolia** **Pakistan**	Snow Leopard Enterprises	https://snowleopard.org/our-work/conservation-programs/snow-leopard-enterprises/
3.	Snow leopard (*Uncia uncia*)	**India** **Mongolia**	Livestock Insurance and Grazing Set-Aside Areas	https://snowleopard.org/our-work/conservation-programs/livestock-insurance/
4.	Snow leopard (*Uncia uncia*)	**India**	Himalayas Homestays Program	Jackson & Wangchuk (2004). A Community-Based Approach to Mitigating Livestock Depredation by Snow Leopards. *Human Dimensions of Wildlife*. 9. 307–315 Vanelli *et al.* (2019). Community participation in ecotourism and its effect on local perceptions of snow leopard (*Panthera uncia*) conservation. *Human Dimensions of Wildlife.* 24**.** 2. 180-193
5.	Snow leopard (*Uncia uncia*)	**Pakistan**	Livestock Vaccination	https://snowleopard.org/our-work/where-we-work/pakistan/
6.	Snow leopard (*Uncia uncia*)	China	National Park Pilot Program	http://en.shanshui.org/sub_project/985/
7.	Snow leopard (*Uncia uncia*)	Russia **Tajikistan** **Mongolia** **Kyrgyzstan**	Land of the Snow Leopard Network	https://storymaps.arcgis.com/stories/1bf1faa02a2c4b9a8329c9c4e828d121
8.	Snow leopard (*Uncia uncia*)	Nepal	One Health Project	https://www.ivo.vet/impact/project-three-3tda9
9.	African elephant (*Loxodonta africana)*	**Zimbabwe**	Partnership for improved anti-poaching and	https://tfcaportal.org/partnership-improved-anti-poaching-and-compatible-land-use-community-lands-lower-zambezi%E2%80%93mana-pools

Case study	Species	Range State	Name	Key Reference
			compatible land use in community lands of Lower Zambezi-Mana Pools Transboundary Conservation Area Project	
10.	African elephant (*Loxodonta africana)*	**Zimbabwe**	Hwange Rural District Council – CAMPFIRE	KAZA, ZIMPARKS national annual reports
11.	African elephant (*Loxodonta africana)*	Namibia	Wildlife Credits Namibia	https://conservationnamibia.com/articles/cn2021-wildlife-corridors.php
12.	African elephant (*Loxodonta africana)*	**Mali**	The Mali Elephant Project: protecting elephants amidst conflict and poverty	Canney (2019) The Mali Elephant Project: protecting elephants amidst conflict and poverty. *International Zoo Yearbook*. 53. 174-188
13.	African elephant (*Loxodonta africana)*	**Kenya**	Elephant and Bees Project by Save the Elephants	https://elephantsandbees.com/
14.	African elephant (*Loxodonta africana)*	**Kenya** **Sri Lanka**	Livelihoods Insurance from Elephants (LIFE) project	https://www.iied.org/livelihoods-insurance-elephants-life-kenya-sri-lanka
15.	Asian elephant (*Elephas maximus*)	**India**	Assam Haathi Project	https://www.chesterzoo.org/what-we-do/our-projects/the-assam-haathi-project/
16.	Giraffe (*Giraffa camelopardalis*)	**Tanzania**	Burunge Wildlife Management Area	Lee (2018). Evaluating conservation effectiveness in a Tanzanian community wildlife management area. *The Journal of Wildlife management*. 82. 1767-1774
17.	Argali (*Ovis ammon*)	**Tajikistan**	Burgut Community Based Wildlife Management	CAMI Community-based wildlife management study
18.	Argali (*Ovis ammon*)	**Kyrgyzstan**	Janaydar Game Management Area	CAMI Community-based wildlife management study
19.	Saiga (*Saiga tatarica, Saiga borealis*)	**Kyrgyzstan**	Altyn Dala Conservation Initiative	https://altyndala.org/

Case study	Species	Range State	Name	Key Reference
20.	Saiga (*Saiga tatarica, Saiga borealis*)	**Kazakhstan**	Community-based conservation of saiga antelope through village level wildlife areas in Kazakhstan	https://www.cms.int/en/news/first-community-based-area-saiga-conservation-kazakhstan
21.	Saiga (*Saiga tatarica, Saiga borealis*)	**Kazakhstan**	Ecological Park Alty-Say	https://www.acbk.kz/article/default/view?id=11
22.	Saiga (*Saiga tatarica, Saiga borealis*)	**Uzbekistan**	Kuralai Alternative Livelihood Project	http://saiga-conservation.org/projects/alternative-livelihoods/
23.	Saiga (*Saiga tatarica, Saiga borealis*)	**Uzbekistan** Russia **Kazakhstan**	Saiga Day Celebration Initiative	http://saiga-conservation.org/projects/saiga-day/
24.	Saiga (*Saiga tatarica, Saiga borealis*)	**Uzbekistan Kazakhstan**	Resurrection Island Project	http://saiga-conservation.org/2021/06/09/resurrection-island-a-new-saiga-habitat-has-been-found-in-the-aral-sea/
25.	Saiga (*Saiga tatarica, Saiga borealis*)	Russia	Rotating Cows as a Tool for Conserving Saiga Antelope (2005-2006)	http://saiga-conservation.org/2007/10/01/rotating-cows-as-a-tool-for-conserving-saiga-antelopes/
26.	Mountain gorilla (*Gorilla beringei beringei*)	**Uganda Rwanda DRC**	Certified Gorilla Friendly Park Edge Products	https://wildlifefriendly.org/the-first-ever-certified-gorilla-friendly-park-edge-community-enterprises-around-volcanoes-national-park-rwanda/
27.	Mountain gorilla (*Gorilla beringei beringei*)	**Uganda**	Conservation Through Public Health	https://ctph.org/about-us/
28.	African lion (*Panthera leo*)	**Zimbabwe**	Protecting lions and other large carnivores through promoting human-wildlife coexistence in human dominated wildlife landscapes in Mbire district Zimbabwe	https://www.wildlifeconservationaction.org/our-projects

Case study	Species	Range State	Name	Key Reference
29.	African lion (*Panthera leo*)	**Tanzania**	GEF small Grants Programme (SGP) – Communities Conserving Wildlife African Lion	https://www.thegef.org/sites/default/files/publications/GEF_SGP_Communities_Conserving_Wildlife_2021.pdf
30.	African lion (*Panthera leo*)	**Kenya**	Olderkesi Wildlife Conservancy Kenya	https://www.iied.org/sites/default/files/pdfs/migrate/14648IIED.pdf
31.	African lion (*Panthera leo*)	**Tanzania**	Camera Trapping Programme Ruaha Carnivore Project (RCP)	https://www.hwctf.org/_files/ugd/7acc16_c5d09699e8c54bd eaf98e870cbbb3bd5.pdf
32.	African lion (*Panthera leo*)	**Tanzania**	Livestock Enclosure fortification programme Ruaha Carnivore Project (RCP)	http://www.ruahacarnivoreproject.com/protecting-livelihoods%20/predator-proofing-enclosures/
33.	African elephant, African lion, leopard, African wild dog, giraffe (*Panthera leo, Loxodonta africana, Panthera pardus, Lycaon pictus, Giraffa camelopardalis*)	**Angola** Botswana Namibia Zambia **Zimbabwe**	KAZA Kavango Zambezi Transfrontier Conservation Area	https://www.kavangozambezi.org/
34.	African lion, leopard, African wild dog, cheetah (*Panthera leo, Panthera pardus, Lycaon pictus, Acinonyx jubatus*)	**Mozambique**	Niassa Carnivore Project	https://niassalion.org/
35.	Vicuña (*Vicugna vicugna*)	**Bolivia**	Vicuna fibre harvesting and trade in Bolivia	https://cites.org/sites/default/files/eng/prog/Livelihoods/case_studies/CITES_livelihoods_Fact_Sheet_2019_Bolivia_Vicuna.pdf

Case study	Species	Range State	Name	Key Reference
36.	Vicuña (*Vicugna vicugna*)	**Peru**	Community-based harvest and trade of Vicuna fibre in Peru	https://cites.org/sites/default/files/eng/prog/Livelihoods/case_studies/2022/CITES_%26_livelihoods_fact_sheet_Vicuna%20Peru.pdf
37.	Leopard (*Panthera pardus*)	**India**	Project Mumbaikars for Sanjay Gandhi National Park (MfSGNP)	https://www.hwctf.org/_files/ugd/7acc16_e4101e1cf769432b96871d1d3009473b.pdf
38.	Jaguar (*Panthera onca*)	Guyana	Sustainable Wildlife Management Programme	https://www.swm-programme.info/country-guyana
39.	Jaguar (*Panthera onca*)	**Ecuador** Colombia **Peru**	Trinational Program: Conservation without borders in Putumayo	https://wwf.panda.org/wwf_news/?210674/putumayoconservationwithoutborders
Avian				
40.	Egyptian vulture (*Neophron percnopterus*)	**Nigeria** **Bulgaria**	Egyptian Vulture LIFE Project	www.LifeNeophron.eu
41.	White-backed vulture, hooded vulture, lappet-faced vulture, white-headed vulture (*Gyps africanus, Necrosyrtes monachus, Torgos tracheliotos, Trigonoceps occipitalis*)	**Zimbabwe**	Gwaji Environmental Conservation Area (ECA)	https://www.birdlife.org/news/2022/04/15/promoting-community-vulture-conservation-efforts-in-southern-africa/
42.	Great Indian bustard (*Ardeotis nigriceps*)	**India**	Project Great Indian Bustard	https://forest.rajasthan.gov.in/content/raj/forest/en/footernav/department-wings/project-great-indian-bustard.html
43.	Great bustard (*Otis tarda*)	China	Community Conservation Area for Great Bustards	http://www.cbcgdf.org/english/NewsList/5002.html

Case study	Species	Range State	Name	Key Reference
44.	Siberian crane (*Leucogeranus leucogeranus*)	China	Community Conservation Area for Siberian Cranes	http://www.cbcgdf.org/english/NewsList/5002.html
45.	Black-necked crane (*Grus nigricollis*)	China	Community Conservation Area for Black-necked Cranes	http://www.cbcgdf.org/english/NewsList/5002.html
46.	Blue crane, wattled Crane (*Anthropoides paradiseus, Burgeranus carunculatus*)	**Zimbabwe**	Scaling up mitigation of human-crane conflict in Driefontein Grasslands	https://www.conservationleadershipprogramme.org/media/2016/04/F01149413_Zimbabwe_FinalReport__Scaling-up-Mitigationof-Human-Crane-Conflict-in-Driefontein-Grasslands_25thSept15.pdf
47.	Blue crane, wattled crane (*Anthropoides paradiseus, Burgeranus carunculatus*)	**South Africa**	Biodiversity Stewardship Programme	https://savingcranes.org/wp-content/uploads/2022/05/cranes_and_agriculture_web_2018.pdf
48.	Common crane (*Grus grus*)	**Germany**	Crane Tickets – Muritz National Park	https://www.cms.int/sites/default/files/publication/cms_pub_pop-series_wildlife_watching-tourism_e.pdf
49.	Common crane (*Grus grus*)	**Ethiopia**	For people and nature: Establishment of a UNESCO Biosphere Reserve at Lake Tana in Ethiopia	https://en.nabu.de/topics/protected-areas/lake-tana/goals.html
50.	Oriental white stork (*Ciconia boyciana*)	China	Community Conservation Area for Oriental White Storks	https://www.iucn.org/news/commission-environmental-economic-and-social-policy/202101/community-conservation-area-volunteers-safeguard-5000-wintering-oriental-storks-tianjin-china
51.	White stork (*Ciconia ciconia*)	**Zimbabwe**	Sustainable Wildlife Management Project	https://www.swm-programme.info/zimbabwe-and-zambiae.info
52.	Blue swallow (*Hirundo atrocaerulea*)	**Zimbabwe**	Blue swallow population and habitat monitoring in Nvanga National Park	https://www.cms.int/en/project/conservation-blue-swallow-eastern-highlands-zimbabwe

Case study	Species	Range State	Name	Key Reference
53.	Killdeer, ruff, buff-breasted sandpiper, purple heron, black vulture, black kite. yellow-throated hawk, yellow-throated vireo, black whiskered vireo, bobolink, cerulean warbler (*Charadrius vociferus, Calidris pugnax, Calidris subruficollis, Ardea purpurea, Coragyps atratus, Milvus migrans, Geranoaetus albicaudatus, Vireo flavifrons, Vireo altiloquus, Dolichonyx oryzivorus, Setophaga cerulea*)	**Trinidad and Tobago**	Trinidad and Tobago National Wetlands Policy	https://agriculture.gov.tt/wp-content/uploads/2021/03/National-Wetland-Policies-2001.pdf
54.	Amur falcon (*Falco amurensis*)	**India**	Amur Falcon Conservation Project	Aiyadurai and Banerjee (2019) Bird conservation from obscurity to popularity: a case study of two bird species from Northeast India. *GeoJournal*. 85:901-912
55.	Spoon-billed sandpiper (*Calidris pygmaea*)	Myanmar	Emergency Action for the Conservation of the Spoon-billed Sandpiper in Myanmar	https://www.cms.int/sites/default/files/document/Inf_11_Spoon_billed_Sandpiper_in_Myanmar_Eonly_0.pdf
56.	Spoon-billed sandpiper (*Calidris pygmaea*)	Myanmar	Conservation of Sppon-billed Sandpiper in Gulf of Mottama and	https://www.eaaflyway.net/wp-content/uploads/2022/05/EAAFP_WGTF_2022_Report_NCS_Myanmar_Report2804 2022-%EC%95%95%EC%B6%95%EB%90%A8.pdf

Case study	Species	Range State	Name	Key Reference
			Tanintharyi Coastal of Myanmar	
57.	Laysan albatross, black-footed albatross (*Phoebastria immutabilis, Phoebastria nigripes*)	Hawaii, United States of America	Papahānaumokuāke a Marine National Monument	Vierros *et al.* (2020). Considering Indigenous Peoples and local communities in governance of the Ocean commons. *Marine Policy.* 119. DOI10.1016/j.marpol.2020.104039
58.	Andean flamingo, James's flamingo (*Phoenicoparrus andinus, Phoenicoparrus jamesi*)	**Bolivia** **Chile**	High Andean Flamingo Conservation in Bolivia and Chile	https://portals.iucn.org/library/sites/library/files/documents/PAG-023.pdf
59.	Monarch butterfly (*Danaus plexippus*)	Mexico	Monarch Butterfly Conservation Fund	https://monarchconservation.org/
60.	Monarch butterfly (*Danaus plexippus*)	Mexico	Monarch butterfly Model Forest	https://www.cms.int/sites/default/files/publication/cms_pub_pop-series_wildlife_watching-tourism_e.pdf
61.	Barnacle goose (*Branta leucopsis*)	**United Kingdom**	Islay Sustainable Goose Management Strategy	McKenzie and Shaw 2017. Reconciling competing values placed upon goose populations: The evolution of and experiences from the Islay Sustainable Goose Management Strategy. Ambio. 46. 198-209
62.	Sarus crane (*Antigone antigone*)	**India**	Sarus Cranes and Indian Farmers: An ancient Coexistence	https://savingcranes.org/wp-content/uploads/2022/05/cranes_and_agriculture_web_2018.pdf
63.	Saker falcon (*Falco cherrug*)	**All Range States**	Saker falcon *Falco cherrug* Global Action Plan (SakerGAP)	Kovács, A., Williams, N. P. and Galbraith, C. A. 2014. Saker Falcon *Falco cherrug* Global Action Plan (SakerGAP), including a management and monitoring system, to conserve the species. Raptors MOU Technical Publication No. 2. CMS Technical Series No. 31. Coordinating Unit - CMS Raptors MOU, Abu Dhabi, United Arab Emirates.
Aquatic				
64.	Dugong (*Dugong dugon*)	Indonesia Malaysia **Philippines** Thailand Timor-Leste	Seagrass Ecosystem Services Project	https://www.dugongseagrass.org/

Case study	Species	Range State	Name	Key Reference
65.	Dugong (*Dugong dugon*)	China	Guangxi Hepu Dugong National Nature Reserve	http://www.cbcgdf.org/english/NewsList/5002.html
66.	Indo-Pacific humpback dolphin (*Sousa chinensis*)	China	Community Conservation Area for Indo-Pacific humpback dolphins at Sanya Big and Small Cave Scenic Spot	http://www.cbcgdf.org/english/NewsList/5002.html
67.	Atlantic humpback dolphin (*Sousa teuszii*)	**Gabon Congo**	Empowering local fishing communities to conserve coastal dolphins in Congo	https://www.cms.int/en/project/empowering-local-fishing-communities-conserve-coastal-dolphins-congo
68.	Blue whale, sperm whale, fin whale, humpback whale, sei whale, orca, white-beaked dolphin, Risso's dolphin, bottlenose dolphin, common dolphin, long-finned pilot whale, harbour porpoise (*Balaenoptera musculus, Physeter macrocephalus, Balaenoptera physalus, Megaptera novaeangliae, Balaenoptera borealis, Orcinus orca, Lagenorhynchus*	**United Kingdom**	WDC Shorewatch Programme	https://uk.whales.org/whales-dolphins/how-we-help/shorewatch-citizen-science-scotland/

Case study	Species	Range State	Name	Key Reference
	albirostris, Grampus griseus, Tursiops truncates, Delphinus delphis, Globicephala melas, Phocoena phocoena)			
69.	Leatherback turtle (*Dermochelys coriacea*)	**Ecuador**	Fishery Improvement Project (FIP) de mahi mahi	https://seafoodsustainability.org/portfolio/ecuador-mahi/
70.	Leatherback turtle (*Dermochelys coriacea*)	Indonesia	Abun Leatherback Project	Pakiding *et al.* (2020) Community Engagement: An Integral Component of a Multifaceted Conservation Approach for the Transboundary Western Pacific Leatherback. *Frontiers in Marine Science*. Doi:10.3389/fmars.2020.549570
71.	Olive ridley turtle hawksbill turtle, loggerhead turtle, leatherback turtle, green turtle (*Lepidochelysi olivacea, Eretmochelys imbricata, Caretta caretta, Dermochelys coriacea, Chelonia mydas*)	**Brazil**	Projeto TAMAR-IBAMA	Andrade *et al*. (2022) Community Based Conservation and the Management of Chelonians in the Amazon. *Frontiers in Ecology and Evolution*. Doi:10.3389/fevo.2022.769328
72.	Sevruga, Russian Sturgeon, Ship Sturgeon, Persian sturgeon, sterlet, beluga (*Acipenser stellatus, Acipenser gueldenstaedtii, Acipenser nudiventris,*	Russia	Ural Basin Project	https://wwfeu.awsassets.panda.org/downloads/7_2007_ural_river_sturgeon_habitats_lagutov_russia_1.pdf

Case study	Species	Range State	Name	Key Reference
	Acipenser persicus, Acipenser ruthenus, Huso huso)			
73.	Green turtle (*Chelonia mydas*)	**Mozambique**	Muluane Project	Garnier J., Hill N., Guissamulo A., Silva I., Witt M., Godley B. (2012). Status and community-based conservation of marine turtles in the northern Querimbas Islands (Mozambique). *Oryx*. 46. 3. 359-367
74.	Arrau turtle (*Podocnemis expansa*)	**Brazil**	Pe-de-Pincha Programme	Andrade et al. (2022) Community Based Conservation and the Management of Chelonians in the Amazon. *Frontiers in Ecology and Evolution*. Doi:10.3389/fevo.2022.769328
75.	Arrau turtle (*Podocnemis expansa*)	Colombia **Peru**	Fundacion biodiverse Community-based Conservation Program	https://www.fundacionbiodiversa.org/wordpress/wp-content/uploads/2014/08/Final-report-2012.pdf
76.	Polar bear (*Ursus maritimus*)	Canada	Polar Bear Management in Canada	https://cites.org/sites/default/files/eng/prog/Livelihoods/case_studies/CITES_livelihoods_Fact_Sheet_2019_Canada_Polar%20Bear.pdf
77.	Salt-water crocodile (*Crocodylus porosus*)	**Australia**	Wildlife Trade Management Plan – crocodile fariming in the Northern Territory	https://cites.org/sites/default/files/eng/prog/Livelihoods/case_studies/CITES_livelihoods_Fact_Sheet_2019_Australia_Crocodiles.pdf
78.	Whale shark (*Rhincodon typus*)	**Philippines**	Community based Whale Shark Ecotourism Project	https://wwf.org.ph/wp-content/uploads/2022/12/WWF-Philippines-Impact-Report-2022.pdf