Illegal and Unsustainable Taking of Species - a Scoping Analysis

Goitered gazelle on Ustyurt Plateau © USNR/CADI

Prepared by the CMS Scientific Council Working Group on Illegal and Unsustainable Taking of Species, October 2025

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Executive Summary

The illegal and unsustainable taking of migratory species is a critical, escalating global challenge with severe consequences for biodiversity, ecosystem resilience and human well-being. Although there has been notable progress, illegal and unsustainable taking and trade continues to undermine conservation efforts. Importantly, while global attention often focuses on high-value international trafficking, the majority of exploitation occurs domestically, with all international trade originating within national borders.

This scoping analysis examines the multifaceted drivers behind illegal and unsustainable taking and use, including economic, social, cultural, and governance factors. It highlights a representative set of CMS Appendix I and II species across terrestrial, avian, and aquatic taxa that are among the most severely impacted. These profiles illustrate both the scale of the threat and the context-specific pressures that contribute to population declines.

The analysis also presents a selection of case studies showcasing measures that CMS Parties and partners have successfully implemented to improve compliance, strengthen enforcement, reduce bycatch and support community-led conservation, demonstrating that effective solutions exist and can be scaled.

Finally, the analysis provides a set of targeted recommendations.

On legislation:

To CMS Parties, with the support of the CMS Secretariat

- Adopt and implement national legislation in accordance with Articles III.5 and V.1 of CMS to strengthen measures addressing the illegal take of CMS species (participation in the CMS National Legislation Programme, implementation of the recommendations provided in the National Legislation Profile, use of the CMS Legislative Guidance Relating to Implementation of Article III.5);
- Strengthen the national regulatory framework through support for the integration of CMS listings into national legislation for listed species; and
- Promote policy coherence and inter-agency coordination to harmonize legislative measures under CMS with related obligations and objectives under other biodiversity-related MEAs, minimizing overlaps and maximizing synergies in addressing illegal and unsustainable taking of species.

On international cooperation:

To CMS Parties, with the support of the CMS Secretariat, scientific institutions and NGOs

- Establish collaborative mechanisms, including MOUs, in particular with neighbouring countries and those on migratory routes of shared species, to jointly address illegal and unsustainable trade in CMS species, enhancing regional conservation impact (e.g. reduce demand, confiscate illegal shipments, and share intelligence and enforcement data, strengthening cross-border responses);
- Participate and contribute in CMS Task Forces on Illegal Taking of Migratory Birds for the Mediterranean, Asia-Pacific and South-West Asia respectively (MIKT, ITTEA

and SWAITB), as well as consult and use legislative guidance developed by MIKT as relevant; and

- Establish regional cooperation through networking of research institutes and management agencies, and harmonization of protocols for monitoring migratory species between states.

On monitoring of species and illegal take and trade:

To CMS Parties, with the support of scientific institutions and NGOs

- Strengthen monitoring and data collection including through developing identification guides for CMS species, training in monitoring techniques, and using new technologies; and
- For aquatic species, train observers on fishing vessels and landing centre staff.

On capacity-building and improving detection of illegal take and trade:

To CMS Parties, with the support of the CMS Secretariat, scientific institutions and NGOs

- Build capacity among enforcement, prosecution and judicial authorities to effectively detect and address illegal take and trade in CMS species, integrating training on wildlife crimes into the national curricula of relevant academies and institutions;
- Share experience and adopt international best practice as regards setting of deterrent penalties for wildlife crime;
- Share experience on the use of new technologies for detection, evidence gathering, enforcement and prevention of wildlife crime;
- Improve monitoring and enforcement for aquatic species, through on-board observers and electronic monitoring on 100% of vessels to detect bycatch and infringements (including illegal trade), through port-based outreach, training for port, customs and maritime authorities, and deployment of onboard observers to reduce bycatch and other non-target catch of migratory species; and
- Address illegal online trade in CMS species (including policies and legislation regulating online wildlife trade, regular monitoring of digital platforms, and public awareness campaigns promoting responsible online behaviour).

On addressing unsustainable take:

To CMS Parties, with the support of the CMS Secretariat, scientific institutions and NGOs

- In line with CMS Article V.1, establish robust and clear procedures for scientifically set quotas for sustainable taking of migratory species that address risks of compounded harvesting pressure, ensuring that transboundary populations of CMS species are not overexploited by different countries due to lack of coordinated assessment/decision-making. Where appropriate, apply bycatch mitigation measures where threatened CMS-listed species are being bycaught in fishing gear and beach seines;
- Strengthen and coordinate national and international monitoring of size and trajectory of populations of migratory species to improve understanding of what

levels of cumulative offtake can be supported and how populations are responding to any management measures in place; and

- Strengthen international systems that gather information on levels of take of migratory species in all the countries supporting a population, assess sustainability and advise on which countries need to address levels of take of particular species as a priority.

On involvement of local communities:

- Implement effective community-led approaches to address illegal and unsustainable taking of species, including co-management of wildlife, participatory monitoring of taking, and inclusive consultation on legislation; and
- Develop strategies to effectively address illegal and unsustainable taking of migratory species based on identified drivers in engagement with local communities (e.g. supporting behaviour change, promoting sustainable livelihoods, and integrating other locally relevant measures).
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Oceanic Whitetip Shark © WWF

1. Background

At the 14th meeting of the Conference of Parties of the Convention on Migratory Species (CMS), Parties adopted Decision 14.185 which requests that the CMS Secretariat, subject to the availability of external resources, undertake an analysis on:

i. the main drivers and scale of illegal and unsustainable take of species listed in CMS Appendices I and II, based on comparable and collatable data;

ii. the impacts of illegal and unsustainable take on the conservation status of such species, including cumulative impacts on species at the migration range and population level; and the consequences of these impacts on affected ecosystems and the services they provide;

iii. measures used by Parties, non-Parties and relevant international and regional organizations such as CITES and RFMOs aimed at ensuring that taking of wildlife is legal and sustainable, with a view to identifying case studies of effective practices; and

iv. priorities for increasing capacity of Parties for monitoring and enforcement of national legislation and regulations and other measures pertaining to the taking of migratory species.

Decision 14.182 also asked the CMS Scientific Council (ScC) to review the analysis commissioned by the Secretariat at the 7th or 8th meeting of its Sessional Committee and provide recommendations on further measures to be taken by Parties and other stakeholders to address the illegal and unsustainable taking of migratory species for consideration by the COP15; and b) establish a Working Group on the taking of migratory species for various uses.

During the first meeting of the ScC Working Group on July 15, 2025, members agreed with the Secretariat's proposed approach to prepare a scoping analysis that would focus on i), iii) and iv) of Decision 14.185.

Members also agreed that the analysis would highlight a limited number of species from each taxon that are the most impacted by illegal and unsustainable use and trade and that they would contribute: case studies on measures adopted aimed at ensuring that taking of wildlife is legal and sustainable; and share priorities for increasing Parties' capacity to address illegal and unsustainable use and trade.

On July 23, 2025, the CMS Secretariat published a Notification to the Parties asking Parties globally to contribute examples of measures adopted.

The analysis hereto was developed in response to the proposed approach, including case studies received and/or developed based on examples of measures shared.

2. Introduction

The illegal and unsustainable taking of migratory species represents a pressing global challenge with profound implications for biodiversity, ecosystem health, and human well-being.

Despite efforts by international bodies like the Convention on the Conservation of Migratory Species of Wild Animals (CMS), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention on Biological Diversity (CBD) and its Global Biodiversity Framework (GBF), and regional conservation initiatives, the illegal and unsustainable take and trade in migratory species continues to undermine biodiversity conservation globally. Poaching, trafficking (domestic and international), and illegal fishing practices, driven by demand, and the often-lucrative market for these species and their products, have made it increasingly difficult to reverse these trends.

While high-profile attention has often been placed on international trafficking in endangered species and their products, a substantial portion of wildlife exploitation occurs within domestic borders (and all international trade begins domestically, other than that which originates in marine areas beyond national jurisdiction). This includes the taking of species for food, medicine, rituals, and subsistence in addition to commerce. The domestic consumption of wild meat—particularly in tropical and subtropical regions—accounts for the majority of wildlife offtake globally (Ingram et al., 2021).

Historically, wildlife has been used sustainably by indigenous and local communities in some places. However, population growth, urbanization, habitat degradation, and increased market access have contributed to a rapid escalation in both the volume and scale of wildlife extraction and exploitation. Technological advancements (such as the proliferation of firearms), loss of regulation, and weak enforcement have further exacerbated the crisis (Coad et al. 2021).

This brief analysis will highlight the drivers of illegal and unsustainable taking and use. In this document the term ‘illegal and unsustainable taking’ refers to taking that may be either illegal, unsustainable or both. To meaningfully discuss illegal and unsustainable taking of wildlife, clear definitions are essential.

Illegal taking refers to the removal from the wild of species (live or dead) in contravention of local, national, and/or international laws and regulations.

Unsustainable taking denotes exploitation levels that exceed the regenerative capacity of species populations, leading to population declines or collapse. Importantly, not all legal wildlife use is sustainable, and not all illegal use is inherently unsustainable (Hughes et al. 2023).

Domestic use encompasses wildlife exploitation and consumptive use (including both subsistence and commercial uses) within the borders of a country where the species is sourced from the wild. This includes subsistence use by local communities, market sales (commercial trade often involving urban or peri-urban markets), and use for cultural or local medicinal purposes. It is distinct from international trade, which is regulated by CITES for a subset of species.

3. Drivers of Illegal and Unsustainable Taking

The illegal and unsustainable exploitation of migratory species is a complex issue driven by various economic, social, political, environmental, and governance factors. Understanding these interconnected factors is essential to formulating effective policy responses.

Persian Leopard, Kopetdag, Turkmenistan ©Team Bars Turkmenistan/MoEPT/CXL

3.1 Illegal taking and use

A scoping review by Janssen et al. (2024) identified ten key drivers and/or motivations and enablers behind illegal wildlife harvesting (descriptions adapted below):

Drivers and/or Motivations	
Commercial Gain (income)	illegal harvest and subsequent sale of wildlife for economic/financial gain i
Household Consumption (food)	illegal harvesting of wildlife for consumption as food and/or traditional medicine within the household
Protection of self and property	illegal harvesting of wildlife motivated by protection of self or property as the violator believes that they represent a threat to his or her property, livelihood, or game species that he or she fishes for or hunts

Traditional right	illegal harvesting of wildlife motivated by a sense that traditional rights of access, or participation in a traditional activity, have been unjustly prohibited
Disagreement with specific regulations	illegal harvest of wildlife because they object to the content of specific regulations governing the harvest of, or access to, wildlife resources
Recreational	illegal harvesting of wildlife for the purpose of experiencing the satisfactions associated with hunting and fishing as a legitimate recreational activity
Status or Identity	illegal harvesting of wildlife motivated by a harvester's status or identity
Gamesmanship	illegal harvesting of wildlife fueled by the game like interactions with law enforcement personnel, trying to outsmart the other
Rebellion	illegal harvesting of wildlife as a way of acting out a more generalized notion of protest

Enablers	
Failed Governance	Illegal harvest of wildlife enabled by failure of governance

Often, multiple motivations can coexist within a single context. Need for income and food are dominant drivers in many parts of the Global South but are not always the case. Wild meat provides a critical protein source, especially where livestock production is marginal or unaffordable (Ingram et al. 2021). In some regions, wildlife is the most accessible, and/or inexpensive source of protein.

Cultural preferences and traditions also drive domestic illegal or unsustainable use. Wild meat can be considered a delicacy, or be valued for perceived health or medicinal benefits, as a way to connect to rural heritage, and/or a symbol of social status. This is evident even in urban centres (e.g., Cisse et al., 2025), where people eat wild meat despite the availability of domesticated alternatives. Domesticated alternatives can be less desirable in some places where the meat has long international supply chains.

Market access and commercialization contribute to unsustainable and illegal use. Ingram et al. (2025) found that hunters near towns were more likely to sell rather than consume their catch, increasing offtake rates. Additionally, commercial hunters are often equipped with more efficient hunting technology, amplifying pressures on wildlife.

Weak governance and political will, limited enforcement, and corruption are not in themselves primary *drivers* of illegal harvesting but rather act as *enablers* that allow underlying motivations to flourish. These conditions do not necessarily create the desire to engage in illegal practices; instead, they reduce the perceived risks and consequences associated with those practices. In effect, they weaken deterrents, create opportunities for exploitation, and lower the barriers to entry for offenders. As highlighted in the *World Wildlife Crime Report* (UNODC 2020), systemic governance failures and corruption at multiple levels—ranging from local permitting to border controls—can facilitate illegal activity by eroding oversight, distorting rule enforcement, and shielding offenders from accountability. In such environments, existing drivers such as commercial gain, subsistence needs, or cultural traditions face fewer constraints, resulting in an overall increase in both the prevalence and scale of illegal and unsustainable acts.

There are still many knowledge gaps on what drives taking when looking at the species level. For example, this is compounded by limited evidence available in the English academic literature documenting the scale and drivers of intentional take of migratory seabirds (Birdlife International 2025).

3.2. Unsustainable take and use

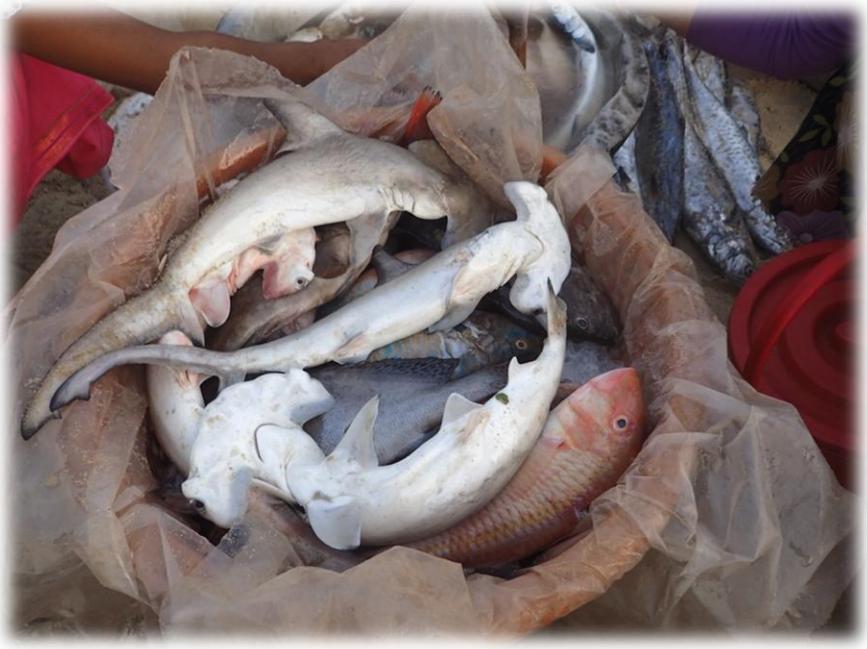
The governance of domestic wildlife use is fraught with systemic challenges that undermine the sustainability and legality of use. As Hughes et al. (2023) note, a pervasive lack of reliable population data and effective population monitoring systems means that use decisions are rarely grounded in an accurate understanding of species status or ecosystem dynamics. For many species, lack of information on life history traits, migratory route, as well as population and offtake data at the same sites hinders the ability to conduct in-depth sustainability assessments (Ingram et al. 2021), so hunting and trade often proceeds regardless. In all-too-many cases, management action is only undertaken after a species has declined to the point that it is locally, nationally, or globally threatened, when such management action would be far more effective if taken before a species declines to that level (where the decline also often impacts other species). For migratory species this situation is compounded by individuals passing through multiple jurisdictions every year, the potential for unsustainability of this cumulative take across countries and, for many species, the lack of international coordination in any quota setting.

Domestic markets, which often operate informally and are geographically dispersed, present particular regulatory and governance challenges. Their decentralized nature makes systematic oversight costly and logistically complex, while also creating space for unreported or misreported transactions. Where legal offtakes permitted, Coad et al. (2021) highlight that quotas are frequently set without robust scientific justification, and in many cases are poorly monitored or unenforced. Such conditions not only enable

overexploitation but also blur the line between legal and illegal take, eroding public trust in wildlife management frameworks.

In the absence of targeted reforms—such as standardized monitoring protocols, transparent quota-setting processes, and strengthened enforcement and governance capacity—the current trajectory risks driving many species toward population declines or local extirpation, particularly those most valued in trade or subsistence contexts.

4. The Scale of the Problem



Juvenile hammerhead sharks, Thaboseik, fish market, Myanmar. © Robert Howard / Fauna & Flora

Illegal and unsustainable take of CMS-listed species is both widespread and persistent, spanning terrestrial and aquatic taxa, and for many taxa driven largely by demand for wild meat. A CMS-commissioned global review of 105 terrestrial mammal species in Appendices I and II found that almost two-thirds (64%) are recorded as hunted; when bats are excluded, this figure rises to 98% of non-bat CMS terrestrial mammals. 70% are hunted specifically for wild meat, and 60% are recorded as traded—either domestically or internationally. Complementary analyses of global hunting and trade databases show that 51% of CMS terrestrial mammals appear in records of legal or illegal wild meat take (Coad et al. 2021).

Threat assessments underline the scale of the problem. Among the 99 CMS species with an IUCN Red List assessment, half are considered threatened by taking, and for those already classified as Endangered, Critically Endangered, or Extinct in the Wild, the proportion rises sharply to 95% (Coad et al. 2021). These figures make clear that illegal and unsustainable take is not a marginal issue—it is central to the survival prospects of many CMS-listed species.

Terrestrial CMS-listed Species

The main drivers of this take are domestic and national, rather than international. For CMS mammals used as wild meat, 27 species are reported as consumed for subsistence, 12 are linked to national-scale trade, and only two appear in the context of international wild meat trade (see tables below). While this does not diminish the significance of global

trade in wildlife parts and products, it does highlight that the largest measured impacts on CMS mammals come from local consumption and domestic market chains (Coad et al. 2021).

Species reported as consumed for subsistence (Coad et al. 2021):

	Species name (Latin)	Species name (English)	IUCN Red List status
1.	*Addax nasomaculatus*	Addax	Critically Endangered
2.	*Ammotraguslervia*	Barbary sheep	Vulnerable
3.	*Bos grunniens*	Wild yak	Vulnerable
4.	*Bos sauveli*	Kouprey	Critically Endangered
5.	*Camelus bactrianus*	Bactrian camel	Critically Endangered
6.	*Equus africanus*	African wild ass	Critically Endangered
7.	*Equus grevyi*	Grevy's zebra	Endangered
8.	*Equus hemionus*	Asiatic wild ass	Near Threatened
9.	*Equus kiang*	Kiang	Least Concern
10.	Eudorcas rufifrons	Red-fronted gazelle	Vulnerable
11.	Gazella cuvieri	Cuvier's gazelle	Vulnerable
12.	Gazella dorcas	Dorcas gazelle	Vulnerable
13.	*Gazella leptoceros*	Slender-horned gazelle, Rhim	Endangered
14.	*Gazella subgutturosa*	Goitered gazelle	Vulnerable
15.	*Giraffa camelopardalis*	Giraffe	Vulnerable
16.	*Gorilla beringei graueri*	Eastern lowland gorilla	Critically Endangered
17.	*Gorilla gorilla diehli*	Cross river gorilla	Critically Endangered
18.	*Gorilla gorilla gorilla*	Western lowland gorilla	Critically Endangered
19.	*Hippocamelus bisulcus*	Huemul, south Andean deer	Endangered
20.	*Kobus kob leucotis*	White-eared kob	Least Concern
21.	*Loxodonta africana*	African elephant	Endangered
22.	*Loxodonta cyclotis*	Forest elephant	Endangered
23.	*Pan troglodytes*	Chimpanzee	Endangered
24.	*Procapra gutturosa*	Mongolian gazelle	Least Concern
25.	*Procapra picticaudata*	Tibetan gazelle	Near Threatened
26.	*Saiga tatarica, Saiga borealis*	Saiga antelope	Near Threatened
27.	*Ursus maritimus*	Polar bear	Vulnerable

Species reported as traded nationally (Coad et al. 2021):

	Species name (Latin)	Species name (English)	IUCN Red List status
1.	*Bos grunniens*	Wild yak	Vulnerable
2.	*Bos sauveli*	Kouprey	Critically Endangered
3.	*Elephas maximus indicus*	Asian elephant	Endangered
4.	*Equus hemionus*	Asiatic wild ass	Near Threatened
5.	Eudorcas rufifrons	Red-fronted gazelle	Vulnerable
6.	*Gazella dorcas*	Dorcas gazelle	Vulnerable
7.	*Gazella subgutturosa*	Goitered gazelle	Vulnerable
8.	*Gorilla gorilla gorilla*	Western lowland gorilla	Critically Endangered
9.	*Kobus kob leucotis*	White-eared kob	Least Concern
10.	*Pan troglodytes*	Chimpanzee	Endangered
11.	*Procapra gutturosa*	Mongolian gazelle	Least Concern
12.	*Saiga tatarica, Saiga borealis*	Saiga antelope	Near Threatened

Species reported as traded internationally (Coad et al. 2021):

	Species name (Latin)	Species name (English)	IUCN Red List status
1.	*Elephas maximus indicus*	Asian elephant	Endangered
2.	Gazella dorcas	Dorcas gazelle	Vulnerable

Aquatic CMS-listed species

Aquatic CMS-listed species face similarly severe pressures. Across tropical and subtropical regions, many migratory marine and freshwater megafauna—including small cetaceans, sirenians, marine turtles, birds, and crocodilians—are exploited for "aquatic wild meat" (Ingram et al. 2022). Impacts are especially severe in riverine systems, where hunting overlaps with additional stressors such as dam construction, intensive fishing, and pollution in densely populated areas (Ingram et al. 2022; He et al. 2017). On and near islands the overexploitation pressure on migratory species is also often high, traditionally linked to shortages in food and other commodities that wildlife such as seabirds can supply. Despite its profound implications for conservation, livelihoods, and sustainable management, aquatic wild meat use remains under-researched. In many cases, particularly where Indigenous Peoples and local communities rely on these resources, responsibility for management falls between conservation and fisheries agencies—creating governance gaps that enable unsustainable exploitation to persist (Ingram et al. 2022).

Intensifying Pressures

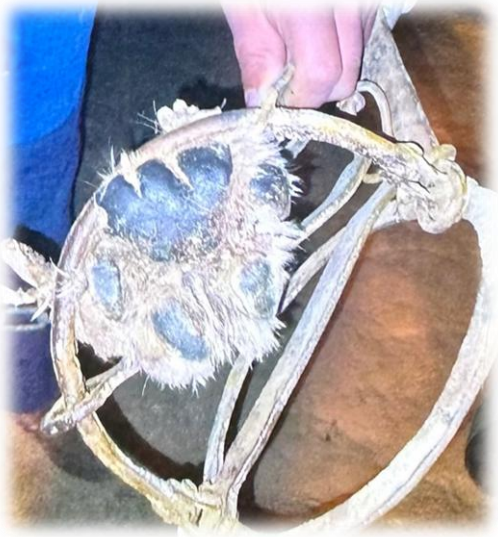
Regional evidence indicates that pressures are intensifying. In African tropical forests, hunting offtakes are highest where a greater share of the catch is sold rather than consumed locally, and since the early 1990s there has been a marked increase in both market-oriented hunting and firearm use—trends that threaten multiple CMS species, particularly large-bodied ungulates (Ingram et al. 2025).

Some of the most pervasive and damaging impacts come from indiscriminate gear methods such as snaring terrestrially, and gill nets, long-lines and other gear types used without appropriate mitigation action in the marine environment. Animals are either not retrieved or die from injuries, representing both a major conservation and animal welfare concern and abandoned fishing gear can continue to cause mortality even though not in use

For example, across Africa, tens of millions of snares are thought to be set annually, killing or injuring vast numbers of animals (Denny et al. 2025). Tens of millions of kilograms of wild meat are discarded and wasted when rotten each year in this region alone (Denny et al 2025). In the marine realm, dolphins are both deliberately targeted and incidentally caught as bycatch in artisanal gillnets, drift gillnets, beach seines, and other fishing gear (Ingram et al. 2022). More than one million seabirds are killed unintentionally as bycatch each year in fisheries (Melvin et al. 2023). Žydelis et al (2013) conducted a comprehensive global review of seabird bycatch in gillnet fisheries, identifying 148 seabird species at risk,

with 81 species confirmed as having been caught incidentally. Their findings suggest that at least 400,000 seabirds die annually due to gillnet entanglement.

Many CMS Appendix I and II species occur in areas where the use of snaring, trapping, gill net and other unselective and high impact gear types is commonplace (for example *Gorilla gorilla, Panthera onca, Panthera pardus* e.g. *Clay et al. 2019; TRAFFIC, 2022*), making this a priority issue for Parties.



A snare set for wolves in northwest Turkmenistan instead trapped a Persian leopard, which managed to chew through its paw, escape, and survive (© T. Rosen)

It is important to distinguish between deliberate and incidental take given that the incentives for the killing of migratory species are different. Furthermore, where there is no monetary or other benefit in the taking, there are usually less barriers to identifying and implementing mitigation action.

Taken together, the evidence points to broad, cross-continental exploitation, with certain fishing practices leading to the overexploitation of migratory species, with local and national consumption often driving declines, international trade affecting some taxa, and unsustainable offtake impacting terrestrial, avian and aquatic species. Comparable data **highlight clear priorities for CMS Parties:**

→ strengthen national and local monitoring systems (for offtake, animal populations, and life history traits) needed to distinguish sustainable from unsustainable take;

→ strengthen compliance of hunting communities with the law including through awareness, training, development of bag reporting tools and promotion of their use and leadership from national and international hunting organisations

→ strengthen and coordinate national and international monitoring of size and trajectory of populations of migratory species to improve understanding of what

levels of cumulative offtake can be supported and how populations are responding to any management measures in place;

→ strengthen international systems that gather information on levels of take of migratory species in all the countries supporting a population, assess sustainability and advise on which countries need to address levels of take of particular species as a priority;

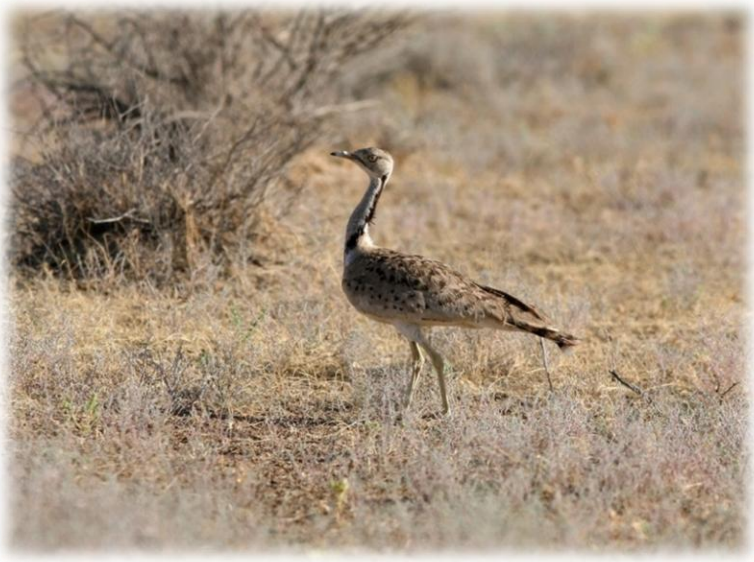
→ co-design actions and management to ensure any legal hunting and/or meat exploitation and trade is sustainable;

→ curb hunting pressure and reduce urban demand for wild meat;

→ reduce bycatch of migratory species in rice fields, aquaculture and global fisheries by implementing appropriate mitigation action and monitoring the application of these;

→ increase quantitative assessments of consumption and trade in wild meat to better understand demand and trade pathways; and

→ in both Africa and Asia, rapid action to reduce snaring, trapping and taking which could yield immediate and substantial conservation benefits as well as action to reduce taking of wild birds using shooting, nets, traps and poisons.



Asian houbara bustard © Maxim Koshkin

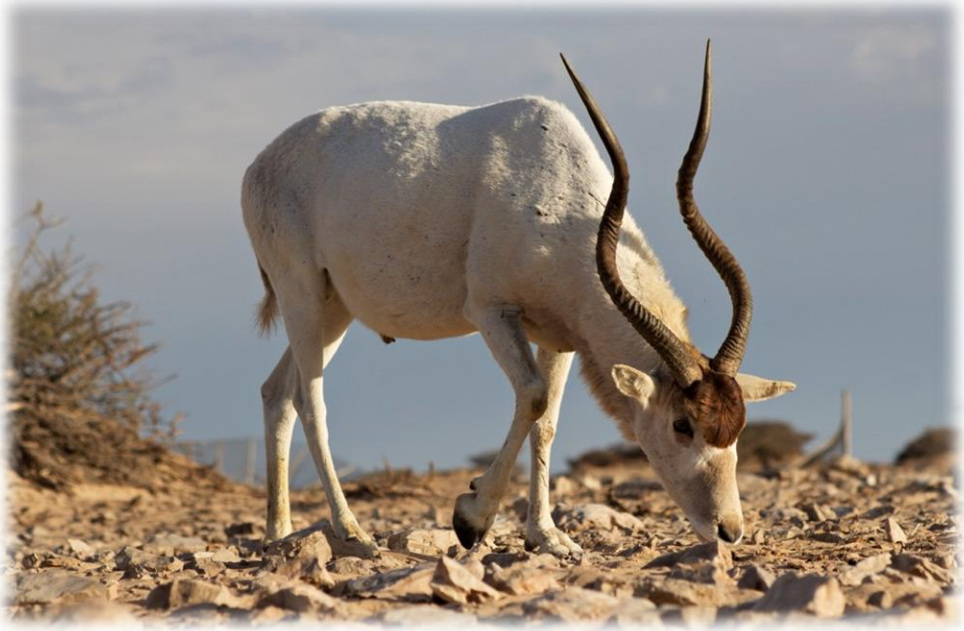
5. Selection of species severely impacted by illegal and unsustainable take

Goitered gazelle, Badhyz reserve, Turkmenistan © Team Bars Turkmenistan/MoEPT/CXL

This section profiles a selection of Appendix I and II CMS-listed species that illustrate both the diversity of taxa affected and the reasons behind their decline from illegal and unsustainable take. The list is not intended to be comprehensive; rather, it offers a representative snapshot of those species facing some of the most severe pressures, underscoring both the scale of the threat and its key underlying causes. Species were identified using a combination of evidence from IUCN Red List assessments, a UNEP-WCMC report (2023), findings from recent peer-reviewed studies, and expert knowledge provided by members of the CMS Working Group on Illegal and Unsustainable Take. Together, these sources present a targeted view of where impacts are most acute, and where urgent action is needed to prevent further declines.

5.1 Terrestrial Species

CMS Appendix I Species



Addax, in Safia near the Morocco-Mauritania border © Haytem Bouchri

Addax

The addax (*Addax nasomaculatus*) is classified as Critically Endangered on the IUCN Red List and assessed as Critically Depleted on the IUCN Green List. It is listed on Appendix I of both CITES and CMS and is included in the CMS Concerted Action for Sahelo-Saharan Antelopes, which also encompasses the Action Plan for the Conservation and Restoration of Sahelo-Saharan Antelopes. In 2016, the IUCN Species Survival Commission Antelope Specialist Group, together with Sahara Conservation, developed an updated conservation roadmap for the species.

Historically, the addax ranged across virtually all desert and semi-desert areas of the Sahara, from Mauritania and Morocco in the west to Egypt and Sudan in the east. However, the species has suffered catastrophic declines over the past century. By the early 2000s, the wild population was already reduced to just a few remnant pockets. The largest remaining population is now found in Niger's Termit and Tin-Toumma National Nature Reserve, though security challenges and oil exploration have undermined protection (IUCN SSC Antelope Specialist Group 2020). Small, scattered groups persist in Chad and possibly Mali.

Current estimates suggest that fewer than 100 individuals remain in the wild, making the addax one of the rarest large mammals on Earth. The majority of the global population survives in captivity, where an estimated 600–700 individuals are managed in zoos and breeding centers, and more than 1,000 roam free in reintroduction projects, mainly in Tunisia and Morocco (Sahara Conservation 2024)

Illegal take, use and trade

Uncontrolled hunting has been the main cause of the addax's decline. Modern firearms and off-road vehicles have enabled hunters to pursue addax deep into remote desert areas where they once found refuge. Soldiers, pastoralists, and poachers alike have contributed to the decline, with animals taken opportunistically for meat, skins, and trophies.

In Niger, oil exploration and associated infrastructure have facilitated access to previously remote areas, increasing illegal hunting pressure. Insecurity and armed conflict across the central Sahara further complicated law enforcement, allowing poaching to persist with near impunity. Although there is little evidence of large-scale international trade in addax parts, local consumption of meat and skins remains a persistent driver.

Conservation measures implemented to date

Under the CMS Sahelo-Saharan Antelope Concerted Action, addax have benefited from coordinated conservation planning, awareness campaigns, and targeted reintroduction programs. Niger's Termit and Tin-Toumma Reserve was formally established to conserve addax and other desert fauna, though enforcement capacity has been undermined by insecurity.

Reintroduction initiatives in Tunisia and Morocco, supported by Sahara Conservation, the Environment Agency – Abu Dhabi, and national partners, have established semi-wild herds in protected areas. In 2024, 25 addax were released in Chad under the ALBIA Local Development and Adaptation Project, contributing to a growing free-ranging population.

Protection capacity has been strengthened in Chad's Ouadi Rimé–Ouadi Achim Faunal Reserve, with expanded patrols, more rangers and eco-guards, and improved operational infrastructure. Firebreak construction and wildfire response have been scaled up to safeguard critical habitats.

Community engagement reached over 28,000 people in 2024 through awareness campaigns, reserve zoning, and natural resource management initiatives. Healthcare and education services delivered to remote communities further strengthened trust and support for conservation.

Monitoring has become more systematic, with regular field surveys, body condition checks, and aerial reconnaissance, ensuring rapid detection of mortality events and improved ecological data.

Recommendations

To prevent the extinction of the addax in the wild and secure long-term recovery, the following measures are recommended:

→ Increase on-the-ground protection in Niger and Chad, including ranger patrols, surveillance technologies (e.g., drones, satellite monitoring), and improved law enforcement capacity;

→ Strengthen engagement with oil companies and other industries operating in addax range to reduce disturbance, enforce “no hunting” policies, and secure ecological corridors;
→ Enhance international funding for community-based conservation in range states, linking livelihood support (e.g., education, healthcare, alternative income) to wildlife stewardship; and
→ Strengthen targeted awareness campaigns across the Sahel and Sahara to reduce poaching pressure and promote pride in desert wildlife heritage.

Dama gazelle

The dama gazelle (*Nanger dama)* is classified as Critically Endangered on the IUCN Red List and assessed as Critically Depleted on the IUCN Green List. It is listed on Appendix I of both CITES and CMS and is included in the CMS Concerted Action for Sahelo-Saharan Antelopes, which includes the Action plan for conservation and restoration of Sahelo-Saharan antelopes (UNEP/CMS 1999). Al Ain Zoo, IUCN Antelope Specialist Group and Royal Zoological Society of Scotland also developed a Conservation strategy 2019-2028 (2019).

Historically, the dama gazelle’s range extended across the Sahelian steppe zone from the Atlantic Ocean to the Nile River. By the early 21st century, its distribution contracted dramatically as a direct result of hunting. Since 2000, confirmed occurrences have been limited to just five areas: the Tamesna plains in Mali; the Ouadi Rimé–Ouadi Achim Faunal Reserve (OROA), Manga, and Alifa (Ati) in Chad; and the Aïr and Ténéré National Nature Reserve and Termit and Tin-Toumma National Nature Reserve in Niger.

According to the Dama Gazelle Conservation Strategy (2018), most remaining dama gazelle populations in the region are small, isolated, and face uncertain futures. The Alifa and Manga populations are unprotected and possibly extinct in Alifa, making further investment doubtful. The Tamesna population’s status is unknown due to security conditions preventing conservation work. The three other populations (Aïr, Termit, OROA) occur in protected areas with stable but non-growing numbers. In Aïr and Termit, gazelles occupy rugged terrain that may be suboptimal habitat but offers protection from vehicle poaching. In OROA, they remain in a limited area despite more suitable habitat. Dispersal between sites is highly unlikely due to isolation.

Current estimates suggest that fewer than 200 adults survive in the wild, and possibly as few as 90–140 individuals.

Reintroduction efforts, especially in historical habitat, have had challenges. In 2015, a group of 24 dama gazelles was released from the Safia Centre in Morocco. However, some individuals were reportedly poached, and the last confirmed sighting occurred in October 2017. Due in part to ongoing concerns about poaching, no further releases have been planned in this area (Al Ain Zoo et al. 2019).

Illegal take, use and trade

Uncontrolled hunting remains one of the principal threats to the species, involving a range of actors including nomadic pastoralists, military personnel, and others. In remote pastoralist communities, wild meat can be a vital source of protein, making the dama gazelle a target for illegal and unregulated hunting. Direct exploitation has been facilitated by the introduction of modern firearms and off-road vehicles, which enable hunters to access remote areas and pursue gazelles more effectively. The species is particularly vulnerable when congregating at water points or in seasonal aggregation zones, where hunters can predictably intercept them. Arab hunting parties were frequent in Sudan (Cloudsley & Thompson 1992) and were recorded in Chad in 1998 and again in 2001; in the latter case, activity was temporarily halted following publicity generated by a local NGO (Scholte 2013).

In addition to meat, dama gazelle gallstones have been highly prized in parts of the western range as talismans (Cuzin 2003).

Conservation measures implemented to date

Under the $5 million ALBIA Local Development and Adaptation Project, Sahara Conservation supports Chad's Ministry of Environment in enhancing OROA's protected area management and biodiversity conservation. Activities include conducting an environmental and social impact assessment for new headquarters, enabling anti-poaching patrols, equipping and mobilizing personnel, and engaging over 18,000 people through awareness campaigns on reserve protection, and wildlife. A team of 9 community rangers leads engagement and awareness activities, 20 protected area rangers handle community outreach, wildlife monitoring, anti-poaching, and bushfire control, and 40 ecoguards assist rangers in all tasks except law enforcement.

In Niger's Aïr and Ténéré National Nature Reserve, 4 community agents assist with monitoring, camera trap maintenance, community liaison, and ranger support, while 10 rangers focus on combating illegal activities, monitoring wildlife and livestock, and engaging with communities.

In 2023, in partnership with humanitarian supporters, healthcare missions and educational resources were delivered to remote rural communities near protected areas. These services improved community well-being, strengthened relationships with conservation teams, and encouraged environmental dialogue in Chad and Niger. (Sahara Conservation Annual Report 2023).

Despite critical declines and severe fragmentation, recent gains in protected area management, community engagement, and threat reduction offer a foundation for recovery of the dama gazelle.

Recommendations

Below are some recommendations on how to improve the conservation status of dama gazelle:

- → Continue to increase patrol capacity and coverage in protected areas;
- → Enhance training and resources for rangers to improve detection and deterrence of illegal activities;
- → Develop incentive-based schemes (e.g., eco-tourism, conservation payments) that link community benefits to gazelle protection;
- → Promote community-led monitoring and stewardship initiatives.
- → Strengthen awareness campaigns to reduce demand along supply chains; and
- → Deepen understanding of the drivers and supply chains behind poaching to address the root causes of exploitation.

CMS Appendix II Species

Asiatic wild ass in Tersakan valley, Turkmenistan. © Team Bars Turkmenistan

Asiatic Wild Ass

The Asiatic wild ass or kulan (*Equus hemionus*) is classified globally as Near Threatened on the IUCN Red List. Subspecies assessments differ: the Persian onager (E. h. onager) and Turkmen kulan (E. h. kulan) are listed as Endangered, while the Gobi khulan (E. h. hemionus) and Indian khur (E. h. khur) are considered Near Threatened. It is included in CITES Appendix I (Gobi khulan, Indian khur) and Appendix II (Persian onager, Turkmen kulan) and listed on CMS Appendix II.

Historically, the Asiatic wild ass ranged widely across the steppes and deserts of Central and Western Asia, extending from the Middle East and the Caucasus through Iran and Central Asia to Mongolia, northern China, and India. Today, its distribution has contracted severely, with remnant wild populations surviving only in Mongolia, China, India, and Iran, while reintroduced populations exist in Kazakhstan, Uzbekistan, Turkmenistan, and Israel.

The global population is estimated at around 87,000 individuals, with approximately 80% occurring in southern Mongolia, making it the species' global stronghold. Other populations remain small, fragmented, and highly vulnerable. Population trends vary: some are stable or increasing (e.g., India, South Gobi, Kazakhstan reintroduction sites), while others are declining or extirpated. Long-term viability is threatened by habitat fragmentation, fencing, and human pressures.

Illegal Take, Use and Trade

Poaching remains a significant threat across parts of the range. In Iran and Turkmenistan, wild asses are hunted for meat, hides, and occasionally for use in traditional medicine. In

Mongolia, kulan are sometimes illegally taken for meat, particularly during harsh winters when herders suffer livestock losses. Weak enforcement in remote steppe habitats exacerbates illegal offtake.

Habitat degradation and fragmentation from overgrazing, competition with domestic livestock, border fencing, roads, and industrial development restrict access to water and seasonal pastures, increasing conflict with herders. Linear infrastructure is a major barrier to migration, especially border fences between Mongolia and China.

Conservation Measures Implemented to Date

The Asiatic wild ass benefits from protection under CITES and CMS, as well as national legislation across range states. Protected areas hold key populations, such as the Great Gobi Strictly Protected Area in Mongolia, Khar Turan National Park in Iran, and Little Rann of Kutch in India.

Reintroduction projects have been carried out in Kazakhstan, Uzbekistan, Turkmenistan, and Israel. In Kazakhstan, kulan were successfully reintroduced to the Altyn Emel National Park and Central Kazakhstan steppes, with populations showing signs of growth. In Israel, Persian onagers introduced in the 1960s have established a small but viable population.

Under the CMS Central Asian Mammals Initiative (CAMI), the Asiatic Wild Ass is a priority species, stimulating measures for the conservation of the species.

Recommendations

To ensure the long-term survival of the Asiatic wild ass, the following actions are recommended:

→ Expand ranger presence and capacity in key habitats, combat poaching, and improve cross-border cooperation on illegal hunting; and

→ Provide alternative livelihoods and benefits to herders and rural communities to reduce reliance on poaching and foster stewardship.

Goitered Gazelle

The goitered gazelle (*Gazella subgutturosa*) is currently classified as Vulnerable on the IUCN Red List. It is listed on Appendix I of CMS and Appendix II of CITES. Historically, this antelope ranged continuously across arid steppe and desert habitats from the Arabian Peninsula and Middle East through Central Asia to Mongolia and northern China. Today, populations are highly fragmented and declining due to uncontrolled hunting, habitat degradation, and competition with livestock.

Global population estimates are uncertain but likely number fewer than 120,000 mature individuals, with strongholds persisting in Iran, Kazakhstan, Uzbekistan, Turkmenistan, and Mongolia. In many regions, such as Central Asia, the Caucasus, Arabian Peninsula, and western parts of its range, populations have collapsed or been extirpated. They have been reintroduced in new sites in Azerbaijan and brought back to Georgia and Kyrgyzstan.

Illegal Take, Use and Trade

Unregulated hunting is the primary threat. Across Central Asia and the Middle East, goitered gazelles are targeted for meat and trophies, often with firearms and off-road vehicles, which enables hunters to access remote habitats. In some areas, they are also hunted opportunistically for subsistence protein, particularly by pastoralists.

Commercial poaching and illegal trade in gazelle meat are reported from several range states, including Iran, Kazakhstan, and Turkmenistan. Cross-border hunting is facilitated by porous borders and weak enforcement capacity. In addition, gazelles are sometimes captured alive for private menageries.

Habitat degradation from overgrazing by domestic livestock, fencing, agricultural expansion, and infrastructure development has further reduced carrying capacity. Human disturbance and conflict exacerbate pressures, and in some regions, gazelles are killed in retaliation for perceived competition with livestock.

Conservation Measures Implemented to Date

The goitered gazelle is among the priority species covered under the CMS Central Asian Mammals Initiative (CAMI). CAMI provides a regional framework for coordinating conservation of wide-ranging ungulates and other migratory mammals across Central Asia. For gazelles, CAMI's priorities include reducing illegal hunting, safeguarding and restoring steppe and desert habitats, and maintaining connectivity between fragmented populations.

In Kazakhstan, efforts such as drone-based surveys in Altyn Emel and Barsa Kelmes have helped monitor population trends. However, across much of its range, systematic monitoring is inconsistent or lacking, and populations are often assessed through indirect signs or rough estimates, making it difficult to determine exact numbers or detect subtle trends.

Conservation organizations and governments have engaged in habitat protection, anti-poaching patrols, and population surveys. Despite these efforts, the overall trend remains concerning.

Recommendations

To halt the illegal taking of the goitered gazelle and support recovery, the following actions are recommended:

→ Improve anti-poaching patrols, ranger capacity, and cross-border cooperation to reduce illegal hunting and trade; and

→ Develop incentive-based conservation approaches linking community benefits (livelihoods, healthcare, education) with gazelle protection; promote awareness campaigns to reduce demand for wild meat.

Leopard

The Leopard (*Panthera pardus*) is classified as Vulnerable on the IUCN Red List, though several subspecies face higher extinction risks. The Sri Lankan leopard (*P. p. kotiya*), Persian leopard (*P. p. tulliana*), Arabian leopard (*P. p. nimr*), Amur leopard (*P. p. orientalis*), and Javan leopard (*P. p. melas*) are all listed as Endangered or Critically Endangered. The species is included in CITES Appendix I, and on CMS Appendix II.

Historically, leopards had one of the widest distributions of any large carnivore, occurring across most of Africa and Asia. Today, their range is highly fragmented, with local extirpations across the Middle East, Central Asia, Southeast Asia, and parts of Africa. Global population estimates are difficult, but the species has undergone sharp declines, with most subspecies restricted to small, isolated populations.

Illegal Take, Use and Trade

Leopards are targeted across their range for skins, teeth, bones, claws, and other body parts, which are used in traditional medicine and the illegal wildlife trade. Skins are still found in markets in parts of Africa and Asia, while bones are trafficked as substitutes for tiger bone in traditional Asian medicine.

Persian leopards, which are implicated in human–wildlife conflict in some regions, may create a new supply for illegal trade (Farhadinia et al 2019).

Illegal live trade also occurs leopard cubs are sometimes taken for private menageries or as exotic pets. The scale of illegal trade is difficult to quantify, but seizures in Africa, South Asia, and the Middle East suggest ongoing demand.

Trophy hunting, both legal and illegal, has contributed to declines in parts of Africa. In Asia, retaliatory killings due to livestock predation are widespread. Across Central and South-East Asia, poisoning and snaring are common causes of mortality.

Conservation Measures Implemented to Date

Leopards are legally protected across most of their range, with varying degrees of enforcement. In Africa, some countries still allow regulated trophy hunting, while others impose full bans. In Asia, national protections are in place, though enforcement capacity remains weak in many regions.

Range states and NGOs have developed subspecies-specific action plans, such as, in the frame of the CAMI, the Range-Wide Strategy for the Conservation of the Persian Leopard.

Conservation initiatives include improved patrolling through the use of SMART, community-based livestock insurance schemes, hiring of community-members as rangers and community liaisons to generate greater acceptance towards leopards, support of nature-based solutions that use leopards as flagship species, and the use of human–wildlife conflict mitigation tools (predator-proof corrals, Foxlights as well as locally-designed tools that integrate visual and auditory deterrents).

Recommendations

To halt the illegal killing and trade of leopard and reduce human-leopard conflict (which leads to retaliatory killing), the following actions are recommended:

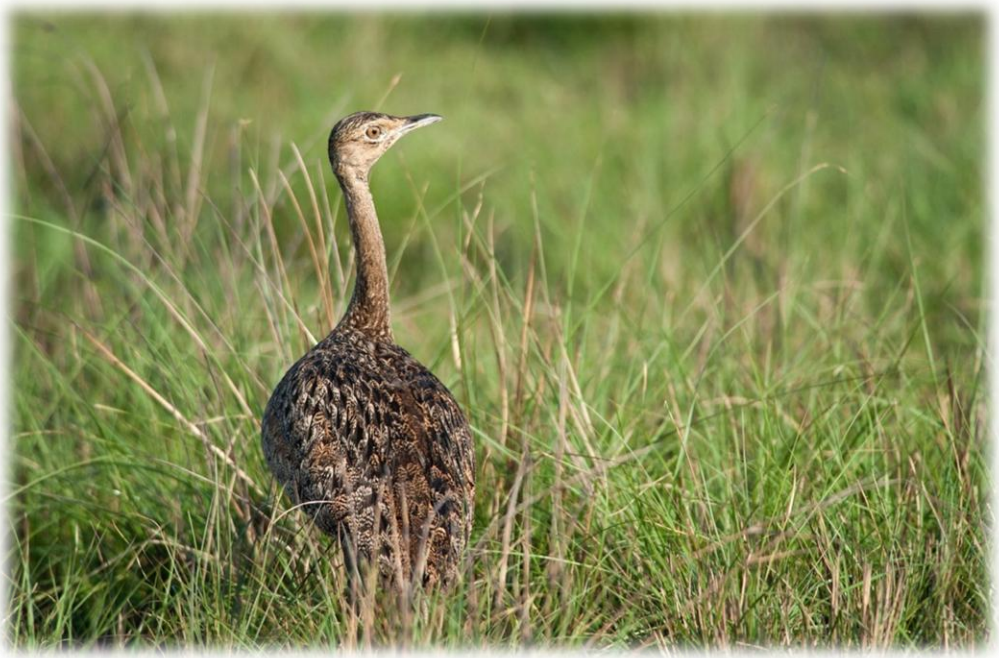
→ Use successfully tested leopard-livestock conflict mitigation tools;

→ Foster local stewardship by linking leopard conservation to benefits from nature-based solutions; and

→ Expand intelligence-led operations to dismantle trafficking networks and monitor online and physical markets for leopard products.

5.2 Avian Species

CMS Appendix I Species



Female Bengal florican, Kampong Thom, Cambodia © Jeremy Holden/ Fauna & Flora

Great Indian Bustard

The Great Indian Bustard (*Ardeotis nigriceps*) is classified as Critically Endangered on the IUCN Red List. Once widespread across the Indian subcontinent, the species now persists mainly in Rajasthan, India, and Cholistan, Pakistan. Fewer than 200 individuals are estimated to survive in the wild, making it one of the most threatened large birds in the world. It is listed on Appendix I of CITES and Appendix I of CMS.

Illegal Take, Use and Trade

Historically, Great Indian Bustards were widely hunted across India and Pakistan for sport and meat, and persecution contributed significantly to their decline in the 19th and 20th centuries. Today, direct hunting pressure has greatly reduced but may persist in some areas of Pakistan where the species is targeted for sport and meat. There is no significant commercial international trade in the species.

The species is particularly vulnerable because of its large size, ground-dwelling habits, and predictable use of breeding and display sites. Hunting has a significant impact on population dynamics due to this species' long generation time and naturally low reproductive rates. Bustard eggs and chicks are sometimes taken opportunistically, compounding losses.

The most urgent threat to Great Indian Bustards is from collision with powerlines, which are proliferating as renewable energy expands particularly in the species' strongholds in Rajasthan and Gujarat, India. The sensory ecology and flight mechanics of bustards make

these species particularly vulnerable to this threat (Martin & Shaw 2010; Silva et al. 2023). Population viability analysis indicates that powerline mortality puts this species at imminent risk of extinction (Uddin et al. 2021).

Conservation Measures Implemented to Date

In India, the Great Indian Bustard is legally protected under Schedule I of the Wildlife Protection Act, 1972. However, the country lacks a comprehensive grassland conservation policy or programme and officially considers these habitats to be "wastelands". A National Bustard Recovery Plan (Dutta et al. 2013) has been developed but implementation has proven challenging. Court rulings which would require rerouting or undergrounding of powerlines in sensitive regions for this species have been under contestation for some years.

In 2023 the Government of Punjab, Pakistan designated a 168 km^2 area in the Cholistan Desert as the Great Indian Bustard Wildlife Sanctuary for the protection of the Great Indian Bustard and its habitat, including the sites where the species is most frequently noted and believed to reproduce. Ten wildlife check-posts have been activated around the sanctuary to enhance surveillance measures, safeguard the bustard's habitat and curb illegal hunting.

The listing of the species under CMS Appendix I has stimulated international attention and has prioritized the species for coordinated conservation planning under the CMS framework.

Recommendations

The following actions are recommended:

- → Curb residual hunting and egg collection through establishment of additional protected areas in key habitats, improved capacity of provincial departments for surveillance, patrolling and monitoring;
- → Expand community-based conservation: incentivize pastoralist and farming communities to participate in bustard protection through eco-compensation, and conservation agreements. Sensitize local communities about the importance and critical status of this species;
- → Urgently undertake regional planning in Gujarat and Rajasthan to minimize the threats of planned energy infrastructure to remaining Great Indian Bustards. Ensure that any powerlines within core habitats as mapped by the Wildlife Institute of India are undergrounded or rerouted. In lower priority areas ensure that all powerlines are fitted with bird flight diverters with the highest effectiveness in diverting bustards specifically (due to their particular sensory requirements). Proactively monitor mortality at existing lines and undertake mitigations at lines causing mortality.

African Houbara Bustard

The African Houbara Bustard (*Chlamydotis undulata*) is classified as Vulnerable on the IUCN Red List due to widespread population declines. Resident populations of this species formerly bred across northern Africa west of the Nile River, with a distinct subspecies *C. u. fuertaventurae* recognized in the Canary Islands.

The wild population of this species is estimated at approximately 15,000 individuals and declining. It is listed on Appendix I of CITES and Appendix I of CMS.

Illegal and Unsustainable Take, Use and Trade

The primary cause of population declines is unsustainable hunting and poaching. Houbara bustards are a favoured quarry in contemporary Arabian falconry practices, and hunting parties arrive to Northern Africa for its pursuit. Wild populations of the species are now largely extirpated, with only small and fragmented wild breeding groups believed to remain.

Across northern Africa and the Middle East, captive-breeding efforts have produced hundreds of thousands of African Houbara through artificial insemination. These have been released in every range country with the exception of Spain (Canary Islands population) (Collar 2022). The purpose of these releases is sometimes framed directly as hunting, and other times as reintroduction, though hunting may be undertaken soon after the release, and/or in or adjacent to release sites.

Releases of thousands of captive-bred birds are regularly undertaken where wild populations persist. This creates conditions for collateral damage to wild populations through hunting as well as competition for resources, increases in predator populations, and spread of disease from captive-bred birds which have been held at high densities. Research indicates that the high volume of releases of captive-bred birds in at least one range country has weakened the viability of the wild population, such that it is not likely to persist without continued annual releases of captive bred birds (Monnier-Corbel et al. 2022; Dunham et al. 2025). This population is no longer considered 'wild' per Red Listing procedures, and its numbers are excluded from Red List calculations.

The growing number of captive breeding facilities and high volume of captive breeding production create demand for removal and trade of wild birds to build and refresh captive breeding stocks. Sources of breeding stock, the dates and number of individuals brought in to build or refresh breeding stock are not generally publicly available.

Conservation Measures Implemented to Date

Though releases of captive-bred African Houbara are often discussed as conservation measures, no data are publicly available which indicate that these releases have contributed to the development of any self-sustaining population. CITES permits indicate that the number of Houbara traded internationally to North Africa with the purpose code "N" is approximately 40,000 through 2023 (CITES Trade database v2024.1). This total does not include the number of Houbara raised and released domestically within range countries. Domestic production is significant in Morocco, where data concerning

releases by the multiple breeding centers are not publicly available but may be in the range of 20,000 Houbara per year. In comparison, the wild population of African Houbara across the entire range of the species is calculated by IUCN as only 15,000 individuals and declining.

Recommendations

The following actions are recommended:

- → Per IUCN Conservation Translocation guidelines, address causes of population declines, specifically overhunting and habitat degradation, before releasing captive-bred birds for the re-establishment of breeding populations;
- → By undertaking a holistic approach to conservation, reduce dependence on captive breeding and halt the proliferation of captive breeding centres, which create demand for trade in wild Houbara for use in breeding stock;
- → Annually undertake standardized monitoring in all range states, and provide transparent accounting of monitoring results as well numbers of birds hunted;
- → Within each subpopulation, annually establish a scientifically derived, precautionary harvest limit based on population monitoring results and take measures to ensure that hunting does not surpass these limits;
- → Ensure that satellite tracking and genomic data gathered from wild and captive-bred birds are made publicly available to facilitate analyses of the impacts of both hunting and release programmes;
- → Require independent oversight of flocks in captive-breeding centers, including robust techniques of individual identification such as genetic fingerprinting, to reduce possibilities for overharvesting or illegal trade of wild birds; and
- → Develop guidance concerning the appropriate usage of CITES purpose codes in the context of international trade in Houbara (e.g. the usage of "Reintroduction" code for birds released into or near sites where hunting is intended).

Bengal Florican

The Bengal Florican (*Houbaropsis bengalensis*) is classified as Critically Endangered on the IUCN Red List due to catastrophic population declines across its limited range. Global population estimates suggest only 250-999 individuals remain. Two subspecies are recognized: *H. b. bengalensis* in the Indian subcontinent (India and Nepal) and *H. b. blandini* in Southeast Asia (Cambodia and historically Vietnam). Today, viable populations survive mainly in Cambodia's floodplain grasslands of the Tonle Sap and Mekong regions, with smaller remnant groups in Assam, Uttar Pradesh, and Nepal's Terai grasslands. The species is listed on Appendix I of CITES and Appendix I of CMS.

Illegal Take, Use and Trade

The Bengal Florican has long been targeted by hunting and poaching. Colonial hunting was intense in the Indian subcontinent during the era of the British Raj, at which time this taxon was known scientifically as *Otis deliciosa* (Collar 1996). More recently, across the species' range in Cambodia, India and Nepal, local and opportunistic subsistence hunting for bushmeat and egg collection has continued, but at a reduced level due to legal protection. Egg collection is particularly damaging given the species' very small, fragmented populations and low reproductive rates.

Collisions with overhead powerlines are now the most urgent threat to the subspecies *H. b. blandini* (Mahood et al. 2022), the powerline network is expanding quickly across this taxon's remaining range.

Conservation Measures Implemented to Date

The Bengal Florican is legally protected throughout its range. In Cambodia, it has been the focus of intensive conservation programs led by the Wildlife Conservation Society (WCS), Angkor Centre for Conservation of Biodiversity (ACCB) and BirdLife International. Bengal Florican Conservation Areas (BFCAs) have been established, designed to protect critical grassland breeding habitats within the Tonle Sap floodplain. These community-managed reserves cover thousands of hectares and are co-managed with local communities. Within the BFCAs, community conservation agreements are signed with local villages. In exchange for committing to protect grasslands, reduce poaching, and refrain from egg collection, communities receive livelihood support. An assurance population of *H. b. blandini* has been brought into captivity, and genomic screening has been conducted to inform conservation breeding.

Recommendations

The following measures are recommended:

- → Strengthen conservation outcomes and community benefits from BFCAs in Cambodia. Local communities agree to undertake conservation measures for the Bengal Florican at these sites; however, the habitats are overgrazed and florican breeding conditions worsened by large numbers of livestock brought in from remote communities. Removal of these livestock to alternative grazing areas will improve conditions for floricans on these grasslands and also ensure their sustainable use by the local host communities;
- → Scale up community conservation agreements linking livelihood benefits to habitat protection and anti-poaching commitments to additional sites in Cambodia and other Bengal Florican range states;
- → Across the range of the Bengal Florican, expand awareness among local communities about the protected status of this species. Strengthen enforcement: enhance patrolling in breeding areas, increase penalties for poaching and egg collection, and improve judicial follow-up of cases;
- → Urgently undertake regional planning to avoid placement of powerlines within and near the core remaining habitats of both subspecies of the Bengal Florican.

On already extant powerlines, fit bird flight diverters with the highest effectiveness for this species (due to its specific sensory requirements) and monitor rates of mortality. Underground or re-route lines causing significant mortality at breeding grounds or during seasonal movements.

Antipodean Albatross

The Antipodean Albatross (*Diomedea antipodensis*) is classified as Endangered on the IUCN Red List due to rapid and continuing population declines. This large, long-lived seabird breeds almost exclusively on the Antipodes Islands, Campbell Island, and other subantarctic islands of New Zealand, with a small number recorded nesting on Auckland Island. The global population is estimated at 25,000–30,000 individuals, but breeding numbers continue to fall sharply, with some colonies declining by more than 50% since the 1990s.

The species is listed on Appendix I of CMS and Appendix I of CITES, affording the highest levels of international protection. It is also covered under the Agreement on the Conservation of Albatrosses and Petrels (ACAP), which provides a framework for coordinated action among range and fishing states.

Illegal Take, Use and Trade

Historically, albatrosses were exploited for food and feathers, but widespread poaching has largely ceased. However, on remote islands, occasional illegal egg collection and poaching of adults has been reported, particularly in earlier decades. While direct exploitation is no longer considered the primary threat, even small levels of poaching pose risks for such a slow-breeding species.

The dominant current threat is incidental bycatch in longline and trawl fisheries. Birds are hooked when attempting to take bait from longlines or struck by cables and nets during trawling. Satellite tracking shows that Antipodean Albatrosses range widely across the South Pacific, overlapping with the fishing fleets of New Zealand, Australia, Chile, and international waters regulated by RFMOs such as the Western and Central Pacific Fisheries Commission (WCPFC), the South Pacific Regional Fisheries Management Organisation (SPRFMO), and the Inter-American Tropical Tuna Commission (IATTC). Mortality in these fisheries is estimated to kill thousands of albatrosses annually, undermining recovery efforts.

Conservation Measures Implemented to Date

At sea, New Zealand requires mitigation measures such as bird-scaring lines, line weighting, and night setting in domestic longline fisheries. Under ACAP, best-practice guidelines have been developed and promoted to reduce bycatch across all fisheries operating in albatross range. Internationally, advocacy efforts within WCPFC, IATTC, and SPRFMO have led to binding bycatch reduction requirements, though compliance and enforcement vary.

Public awareness campaigns and collaborations with the fishing industry (e.g., "Hookpod" deployment trials) are also underway, with promising results for reducing seabird bycatch while maintaining fishing efficiency (Sullivan et al 2018).

Recommendations

To halt the decline of the Antipodean Albatross, urgent actions should focus on curbing both poaching and bycatch mortality:

- → Strengthen surveillance of breeding islands, maintain strict access controls, and engage local communities and tour operators in conservation to reduce illegal egg collection or disturbance;
- → Require mandatory use of ACAP best-practice mitigation (bird-scaring lines, line weighting, and night setting) across all longline fleets operating within the species' range;
- → Scale up adoption of innovative bycatch-reduction technologies such as Hookpods and smart bait delivery systems;
- → Improve observer coverage and electronic monitoring in tuna and toothfish fisheries to ensure compliance with bycatch regulations;
- → Strengthen engagement of key RFMOs (WCPFC, IATTC, SPRFMO) to harmonize and enforce seabird bycatch rules; and
- → Expand population monitoring at breeding colonies and continue satellite tracking to identify overlap with high-risk fisheries.

Rüppell's Vulture

Rüppell's Vulture (*Gyps rueppelli*) is classified as Critically Endangered on the IUCN Red List. Its populations are severely fragmented, with steep declines across most of its range in the Sahel and East Africa due to multiple threats including poisoning, habitat loss, and delayed demographic recovery. It is listed in CMS Appendix I and proposed for uplisting to CITES Appendix I.

Historically, Rüppell's Vulture ranged widely across the Sahel region (from Senegal/Eastern Sahel through Sudan, Ethiopia and into East Africa), and across highlands and arid zones in East Africa. Today, its range has contracted dramatically, and remaining populations are in much smaller, isolated patches.

Population estimates vary, but the trend is sharply downward. Exact numbers are hard to ascertain owing to lack of consistent survey coverage, but credible sources note continuing decline in mature individuals.

Illegal Take, Use and Trade

Belief-based use of vultures is one of the major drivers of decline. Across West and Southern Africa, vulture body parts are widely used in traditional medicine and rituals, believed to cure physical and mental illnesses, improve business or gambling success, or enhance intelligence in children. In Nigeria, where the species is known as Akala in Yoruba, these uses remain widespread. In Burkina Faso, vultures are regarded as sacred for their ecological role, but increasing profitability of the trade in their parts has driven

intentional poisoning of entire flocks to supply local and regional markets. In Benin, fetish markets openly sell live vultures, carcasses, and heads for ritual use.

The scale of this trade is substantial. Surveys estimate that between 1,128 and 1,692 Rüppell's Vultures were traded in West Africa over a six-year period, representing a significant proportion of the regional population. In Nigeria alone, more than 1,500 vultures per year are believed to be sold, with markets supplied by birds sourced both domestically and from neighbouring countries including Niger, Benin, Sudan, Cameroon, Chad, Burkina Faso, and Mali. Traders in Nigeria are predominantly Yoruba, and demand is reinforced by cultural traditions that extend into the diaspora, including Brazil and Cuba.

This demand has driven not only opportunistic hunting but also mass poisoning events, with poisoned carcasses laid out to harvest large numbers of vultures for trade. Evidence from Burkina Faso suggests deliberate poisoning campaigns aimed at supplying regional markets. Overall, it is estimated that belief-based trade and consumption account for 29% of recorded vulture deaths across Africa, and in some countries—such as Nigeria—declines and near-extirpations are attributable almost entirely to trade in body parts for traditional juju practices (CoP20 Prop.16).

Conservation Measures Implemented to Date

The Rüppell's Vulture is one of 15 species included in the Multi-species Action Plan (Vulture MsAP), developed under the Raptors MoU. Priorities under the plan include eliminating poisoning (both unintentional from predator control and intentional for trade), tackling belief-based use and trade, as well as regional coordination to combat cross-border trade and trafficking.

The African Vultures SAFE Action Plan for 2022-2027 by the Association of Zoos and Aquariums includes Rüppell's Vulture amongst its target species, seeking to coordinate actions on poisoning, bycatch, belief-based trade, and habitat protection among priority countries.

Some range states have already begun implementing anti-poisoning campaigns, community awareness and outreach to reduce demand, and improved carcass disposal protocols. Protected area coverage includes some key nesting or foraging zones, though often with weak enforcement.

A lot of work is being done by NGOs like the BirdLife International partnership on vultures including on research, awareness and combatting poisoning and belief-based use.

Recommendations

To prevent further decline and promote recovery of Rüppell's Vulture, actions should include:

→ Criminalize the trade in parts, ensure range states have adequate legal frameworks, and improve capacity to enforce them;

→ Expand anti-poisoning efforts: establish sentinel programs, promote safer livestock carcass management (e.g. avoiding use of poisons), and respond to mass-poisoning incidents rapidly;

→ Enhance monitoring and data collection: regular population surveys, sampling of markets for vulture parts, reporting of mortality events, mapping of key nesting, feeding, and belief-use hotspots; and

→ Engage with communities where belief-based use occurs, promote alternatives, partner with cultural leaders and organizations to shift norms.

White-Headed Vulture

The White-headed Vulture (*Trigonoceps occipitalis*) is classified as Critically Endangered on the IUCN Red List due to severe and ongoing declines across its range. Once widespread throughout sub-Saharan Africa, the species has disappeared from many former strongholds and now persists in small, fragmented populations. Current estimates suggest fewer than 5,500 mature individuals remain, with rapid declines continuing in West, East, and Southern Africa. It is listed on Appendix II of CITES and Appendix I of CMS. The species is also covered by the CMS Raptors MoU and the Vulture MsAP.

Illegal Take, Use and Trade

Like other African vultures, the white-headed vulture is threatened by belief-based use and trade. In West and Southern Africa, vulture body parts are widely used in traditional medicine and rituals, believed to bring good luck, enhance intelligence, or cure illness. Although traded less frequently than species such as the white-backed or Rüppell's vulture due to its relative scarcity, the white-headed vulture nevertheless appears regularly in markets.

Surveys indicate that this species is among those most targeted when other vultures become scarce. In West African markets, white-headed Vultures have been recorded alongside Rüppell's and hooded vultures, with hundreds of individuals estimated to be traded annually across the region (Buij et al. 2016). For example, between 1,128 and 1,692 Rüppell's and White-headed Vultures combined were found in trade in West Africa over a six-year period, representing a significant proportion of their wild populations.

Intentional poisoning to obtain vultures for belief-based use is a major driver of mortality. In Burkina Faso, vultures are deliberately poisoned for trade, undermining cultural values that once considered them sacred. Beyond direct trade, these vultures are also killed through retaliatory poisoning of carcasses aimed at predators and incidentally poisoned by pesticides and agrochemicals.

Illegal cross-border trade in body parts is widespread and poorly monitored, with vultures sourced from Niger, Benin, Chad, and Burkina Faso feeding demand in Nigeria and beyond.

Conservation Measures Implemented to Date

The white-headed vulture benefits from coverage under the Raptors MoU and Vulture MsAP, which provide a coordinated framework to tackle poisoning, trade, and infrastructure threats. National action plans for vultures have been developed in several range states guided by the Vulture MsAP.

Anti-poisoning awareness campaigns and rapid response mechanisms have been rolled out in Southern and East Africa. Market awareness programs in Nigeria and Benin are beginning to address belief-based use, although demand reduction remains challenging. International NGOs are supporting ranger training, judicial follow-up of poisoning cases, and market monitoring.

Recommendations

To secure the survival of the white-headed vulture, urgent actions are required:

- → Strengthen monitoring and research: establish regular population surveys, trade monitoring, and mortality reporting systems across West Africa and the Sahel;
- → Strengthen market surveillance, dismantle trafficking networks, and target demand through partnerships with traditional healers and faith leaders;
- → Implement national anti-poisoning strategies, promote safe carcass disposal, and establish trained rapid response teams in hotspot areas; and
- → Ensure effective protection of key strongholds and integrate vulture needs into broader land-use and grazing systems.

Balearic Shearwater

The Balearic Shearwater (*Puffinus mauretanicus*) is classified as Critically Endangered on the IUCN Red List. It is listed on Appendix I of both CITES and CMS. The species is endemic to the Balearic Islands (Spain), where it breeds exclusively, and disperses widely into the Atlantic and western Mediterranean outside the breeding season.

Historically, the species nested in caves and crevices along the coasts of Mallorca, Menorca, Ibiza, and Cabrera. Its non-breeding distribution includes waters off Portugal, France, and the UK, with individuals recorded as far north as the North Sea. The global population is estimated at 10,000–30,000 individuals, with steep declines documented in recent decades.

Illegal Take, Use and Trade

While large-scale international trade is not a major factor for this species, illegal take persists at the local level. Incidental capture (bycatch) in longline and gillnet fisheries is the most significant threat, accounting for thousands of deaths annually across the western Mediterranean. Brochet et al. (2019) documented illegal killing of seabirds in the Mediterranean, including shearwaters, through shooting and trapping.

Conservation Measures Implemented to Date

The Balearic Shearwater is legally protected under EU and Spanish laws and is included in the EU Birds Directive and Habitats Directive. Several Special Protection Areas (SPAs) have been designated to protect colonies and foraging grounds. The species is also protected by the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention) Protocol concerning Specially Protected Areas and Biological Diversity (SPA/BD Protocol), including the Action Plan for the conservation of bird species listed in the Annex II of the SPA/BD Protocol.

BirdLife Malta's EU-funded LIFE PanPuffinus! project address two of the main threats facing the Balearic Shearwater: predation by invasive species at colonies and fisheries bycatch at sea. On the bycatch front, the project developed a multi-approach strategy: mapping bycatch risk through data on fisheries activity, seabird distribution, and bycatch rates; collaborating with professional fishers to trial deterrent and mitigation measures; and tailoring the most effective tools to local fisheries contexts. Knowledge-sharing among Mediterranean partners and training for national authorities were also key components.

As the project nears completion, it has identified which fisheries (gear types, locations, and seasons) are most problematic and determined which mitigation techniques work best. These outcomes are now feeding into national and regional bycatch monitoring and reduction policies.

Recommendations

The following measures are recommended:

- → mandate effective bycatch mitigation measures (e.g., bird-scaring lines, night setting, weighted lines, and alternative gear types) in all Mediterranean longline and gillnet fisheries;
- → improve enforcement against deliberate shooting and trapping of seabirds across the Mediterranean; and
- → standardize population and bycatch monitoring across the range.

Saker Falcon

The Saker Falcon (*Falco cherrug*) is classified as Endangered on the IUCN Red List due to rapid population declines driven primarily by trapping for falconry, habitat degradation, and loss of prey species populations. It is listed on Appendix II of CITES, and on Appendix I of CMS (excluding the Mongolia population listed in Appendix II only). In 2014, CMS adopted a Global Action Plan for the Saker Falcon (Resolution 11.18), which underpins the multi-stakeholder Saker Falcon Task Force.

Historically, the Saker Falcon ranged widely across the Palearctic, from Central and Eastern Europe across the Middle East, Central Asia, and into western China and Mongolia. It breeds across grasslands, deserts, and steppe habitats, and a part of the northern populations migrates southwards into the Middle East, Arabian Peninsula, East

Africa, and South Asia during winter. However, a large part of the global population is non-migrating.

Populations have contracted sharply since the late 20th century. Estimates suggest that the global breeding population is between 12,200-29,800 mature individuals, with steep declines documented in Eastern Europe and Central Asia. The Mongolian steppe now holds the largest remaining stronghold, though pressures there are also significant.

Illegal take, use and trade

International trade for falconry remains the dominant threat to the saker falcon. Historic estimates suggested 6,800–8,400 birds were trapped annually for Gulf falconers, disproportionately targeting juvenile females and skewing wild population structure (ERWDA 2003). More recent records from Saudi Arabia indicate much lower official averages of 20–30 birds per year, with 575 taken between 1996–2013 (Shobrak 2015). However, social media posts from the Gulf region including Saudi Arabia in the past years suggest that this number is likely higher (unpublished). Illegal trapping of migrating juvenile Central European sakers in North Africa, and especially in Libya is not uncommon either (Prommer et al. 2012). According to Libyan sources, Sakers (and other large falcons) trapped in North Africa are regularly bought by Qatari citizens, who then re-sell falcons in Doha (unpublished), thus transforming a traditionally small-scale trapping supplying only local needs into a lucrative broad-scale business that has likely a population-level effect. Illegal harvest continues, with at least 1,200 birds per year trapped in Qinghai, China (Zhang et al. 2008) and cases reported in Jordan (Eid & Handal 2018).

Conservation measures implemented to date

Although it heavily needs an update, the CMS Global Action Plan for the Saker Falcon (2014) (SakerGAP) provides the primary international framework. It prioritizes reducing illegal trade, mitigating powerline electrocution, and strengthening monitoring across the species' range. Range states have collaborated under the Saker Falcon Task Force under the Raptors MOU.

Capacity building has also been advanced through training enforcement officers, awareness programs for trappers and falconers, and cooperative agreements with Gulf states to reduce demand for wild-caught birds.

Although falcon passports, ringing and registration are standard in many countries where falconry is practiced, these are not robust methods of identification and can be subject to fraud to obscure the procurement of new falcons. Wild-caught falcons may also be held in the country of hunting, rather than the home country of the falconer, thus avoiding customs inspections or regulations in the home country.

Though regulations about wild-take falcons are in place in most Gulf countries, enforcement is weak, and at least in some countries, apparently, there is no real political will to change that. Likely, some pressure from the international conservation community is needed to bring a change.

Despite progress, enforcement of CITES regulations remains uneven across regions, and monitoring of trade flows continues to be insufficient. That latter is especially true for the largest falcon markets in the Gulf region.

Though the release of falcons previously used for falconry, and now unwanted, are sometimes framed as conservation activities, it is not clear whether these make positive contributions to the status of wild populations, and indeed, have the potential to cause harm through the release of individuals which are genetically inappropriate to the location (including hybrid birds popular in falconry), or spread of disease from birds held in captivity. Such releases cannot be viewed as compensation or offset for the take of wild birds.

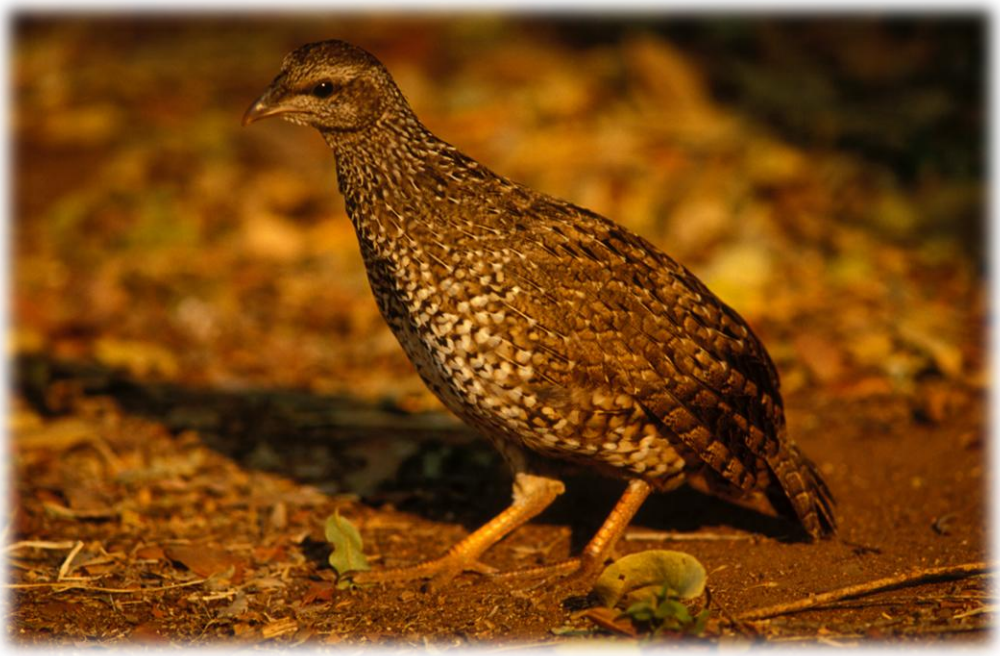
Existing legitimate trade of captive-bred falcons creates a “grey zone”, where often legalization of illegally taken falcons happens. Breeding centres in some Asian countries in close relations with Gulf countries are especially of concern because even though large falcon species are under the protection of national conservation law in all countries, enforcement is lagging behind.

Recommendations

To secure the long-term future of the saker falcon, the following is recommended:

- → strengthen enforcement of CITES regulations (particularly in the Middle East and Asia), and improve protection, customs control, and trade monitoring (including through DNA sampling, microchipping, and market surveillance);
- → National-level, annual monitoring of breeding populations, as well as trade is essential to estimate population changes, to map negative factors affecting the populations, as well as assess the impact of illegal take, and other threats;
- → Establish robust methods of individual falcon identification and registration, such as genomic fingerprinting; and
- → Undertake studies of the impacts, positive and negative, of previous releases of birds used in falconry to the wild and develop recommendations concerning the future use of this practice.

CMS Appendix II Species



Portrait of a female Common Quail © Juan Pablo Moreiras / Fauna & Flora

Long-Tailed Duck

The Long-tailed Duck (*Clangula hyemalis*) is classified as Vulnerable on the IUCN Red List. Once among the most abundant sea ducks in the northern hemisphere, the species has suffered significant declines, especially in the Baltic Sea population. Global estimates suggest around 3.2–3.7 million individuals remain, but regional declines threaten its long-term viability.

The species is listed on Appendix II of CMS and is covered by AEWA. is not listed under CITES.

Illegal Take, Use and Trade

This duck has long been subject to hunting for food and sport, particularly in northern Europe, Russia, and North America. In many areas, it remains a popular quarry species for subsistence and recreational hunting. While harvest is legal under national frameworks (e.g., EU Birds Directive, US Migratory Bird Treaty Act, Russian hunting laws), questions remain regarding sustainability, especially where populations are in decline.

Large-scale hunting of the Baltic Sea population, once estimated at hundreds of thousands annually, was identified as a major driver of its collapse. Although restrictions have since been introduced, significant legal hunting continues, and enforcement gaps persist in some range states.

Illegal killing is less well-documented than for other migratory birds, but unregulated harvest is reported in parts of eastern Europe, the Caucasus, and Russia. Trade in long-tailed ducks is generally limited to local markets for consumption. However, the combined impact of legal and illegal harvest, bycatch in fishing gear, and habitat degradation threatens population recovery.

Conservation Measures Implemented to Date

Under AEWA, the International Single Species Action Plan for the Conservation of the Long-tailed Duck (2016–2025) calls for reducing unsustainable hunting, addressing bycatch in gillnets, and restoring key habitats such as coastal wetlands and benthic feeding grounds.

Some range states (e.g., Finland, Estonia, Latvia) have introduced hunting bans or reduced quotas for long-tailed ducks, while awareness campaigns have been launched to encourage sustainable practices among hunters. In addition, measures to mitigate bycatch—such as alternative fishing gear and temporal/spatial closures—are being tested in the Baltic and Arctic seas.

Monitoring programs, including midwinter waterbird counts coordinated under AEWA and Wetlands International, provide important data on trends and inform adaptive management.

Recommendations

The following measures are recommended:

- → Strengthen regulation of harvest by aligning national hunting seasons and quotas with the AEWA Action Plan and scientific evidence on sustainability;
- → Improve enforcement against illegal killing and promote compliance among hunters through awareness campaigns and community engagement; and
- → Reduce bycatch mortality by scaling up trials and adoption of bird-safe fishing gear, temporal/spatial restrictions, and bycatch monitoring programs, particularly in the Baltic Sea.

European Turtle Dove

The European Turtle Dove (*Streptopelia turtur*) is classified as Vulnerable on the IUCN Red List. The global population is estimated at 14.2–52 million mature individuals, but declines exceeding 30% over three generations have been recorded, with some regional populations contracting by over 70% since the 1980s. The species is listed on Appendix II of CMS and on Annex II of the EU Birds Directive, which regulates its hunting in Europe. It is not listed under CITES.

The species breeds across Europe, North Africa, and western and central Asia, and winters in sub-Saharan Africa. Habitat loss due to agricultural intensification, combined with unsustainable levels of hunting along its migration routes and in wintering grounds, have been the principal drivers of decline.

Illegal Take, Use and Trade

The European Turtle Dove is one of the most heavily hunted migratory landbirds in the western Palearctic. Each year, millions are legally harvested in southern Europe (particularly Spain, France, Italy, Greece, and Cyprus), where hunting remains permitted under national frameworks aligned with the EU Birds Directive.

In addition to legal harvest, significant illegal killing and trapping is documented along major flyways, especially in the Mediterranean and Middle East. It is estimated that up to 2–4 million Turtle Doves may be illegally killed annually in the Mediterranean region. This includes shooting during closed seasons, exceeding quotas, and large-scale trapping with nets and lime-sticks (Brochet et al 2016).

Trade is typically local and linked to food consumption or traditional cultural practices. The combined scale of legal and illegal offtake far exceeds sustainable levels, especially given the species' declining productivity due to habitat degradation.

Conservation Measures Implemented to Date

The EU has taken steps to address unsustainable harvest through the European Turtle Dove Management Plan and the adaptive harvest management (AHM) frameworks, piloted under the EU Birds Directive. In 2021, the European Commission issued guidance recommending a full suspension of hunting along the central and eastern flyways, and strict quotas in the western flyway, based on AHM modelling.

The turtle dove is included in the CMS AEMLAP, which emphasizes reducing illegal killing and ensuring sustainable use. Public campaigns in the Mediterranean have also raised awareness of the unsustainability of current practices.

Recommendations

To secure the future of the European turtle dove, urgent measures are required to address both sustainability of legal hunting and elimination of illegal killing:

- → Implement and enforce adaptive harvest management across all EU member states, ensuring that harvest levels are scientifically justified and adjusted annually to reflect population status;
- → Suspend hunting where populations are in steep decline, particularly in central and eastern flyways, until recovery is evident; and
- → Address illegal hunting by strengthening law enforcement, increasing penalties, and monitoring hotspots such as the Mediterranean islands and North African coast.

Asian Houbara Bustard

The Asian Houbara Bustard (*Chlamydotis macqueenii*) is classified as globally Vulnerable on the IUCN Red List. It is listed on Appendix I of CITES and Appendix II of CMS. IUCN estimates that 33,000-67,000 individuals persist globally, with a declining population trend.

The resident (non-migratory) form of Asian Houbara, formerly found in southwest Asia, including Iran, has suffered steep declines and extinction from several range states. Populations breeding in Central Asia, Mongolia and China and East Asia are obligate migrants, crossing multiple international borders to reach their wintering grounds in SW Asia, Pakistan and India.

Illegal and unsustainable Take, Use and Trade

The primary threat to the Asian Houbara Bustard is unsustainable hunting, poaching, and trade of live birds for sport hunting, the training of falcons, and use in captive breeding centers. Asian Houbara are pursued with by falcons and firearms. Satellite tracking and field monitoring show extensive offtake during wintering in Pakistan, Iran, Iraq, and the Arabian Peninsula (Burnside et al 2018). Social media is used by some to sell the geographic coordinates of Houbara spotted in the wild to falconers making the highest bid.

Several range states ban the hunting of wild Houbara but have some exceptions for the hunting of released captive-bred Houbara. However, captive-bred birds may be released at times and locations where wild-born birds are also present. This creates conditions for collateral damage to wild populations through hunting as well as competition for resources, increases in predator populations, and spread of disease from birds raised in factory conditions.

Despite legal protections, large numbers of Asian Houbara continue to be traded illegally. Live birds are captured and sold for use in falcon training and to supplement stock in captive breeding facilities. These facilities now operate in almost every range state of this species, and continue to increase in number.

Conservation Measures Implemented to Date

Some protected areas have restored habitat and reduced threats of poaching through robust fencing, patrolling, and removal of domestic livestock, e.g. Imam Saud bin Abdulaziz Royal Reserve (formerly Mahazat-as-Sayd) in Saudi Arabia.

Large-scale captive breeding and release programs have been developed with the aim of offsetting hunting pressure. Hundreds of thousands of these captive-bred birds are reported as released across Central and Southwest Asia.

Despite these efforts, the conservation status of the species continues to decline, and the overall effectiveness of captive breeding and release as a conservation tool remains contested (Dolman et al. 2021), particularly when conducted without prior reduction in the threats which precipitated declines (primarily hunting and habitat degradation). Moreover, without transparent reporting, monitoring, or independent evaluation, it remains unclear whether releases are compensating for wild harvest or inadvertently encouraging continued unsustainable offtake.

Moreover, the high volume of production of captive-bred Houbara, and expanding number of captive breeding centers, in turn create incentives for legal and illegal trade in the species, to supplement and refresh breeding stocks.

Satellite telemetry and genetic studies have been undertaken on both captive-bred released and wild-born Asian Houbara, within the work programs of some captive breeding programs (Combreau et al. 2011). However, most of these data are held proprietarily and not available for public evaluation of the impacts of captive-breeding and release efforts, nor for conservation uses including the siting of new overhead powerlines (with which Houbara are prone to collisions), enhancement of anti-poaching protection, or denotation of new protected areas.

Recommendations

The following actions are recommended:

- → Establish standardized monitoring methods across range states alongside transparency regarding numbers of birds hunted;
- → Establish scientifically derived, precautionary harvest limits across range states, and adjust quotas annually based on population monitoring results;
- → Ensure that satellite tracking and genomic data gathered from wild and captive-bred birds are made publicly available to facilitate analyses of the impacts of both hunting and release programs and inform conservation measures for this species more broadly;
- → Require independent monitoring of breeding flocks in captive-breeding centres, including robust techniques of individual identification such as genetic fingerprinting, to reduce illegal trade of wild birds into breeding centres;
- → Require independent evaluations of release programs, including demographic and genetic assessments, and publish annual reports on survival, recruitment, and harvest of released captive-bred birds;
- → Develop guidance concerning the appropriate usage of CITES purpose codes in the context of international trade in Houbara (e.g. the usage of “Reintroduction” code for birds released into sites where hunting is undertaken);
- → Ensure that releases framed as for conservation purposes are used as conservation tools to bolster wild populations, not as a mechanism to justify continued overhunting;
- → Increase patrolling of key wintering sites, and strengthen customs controls to detect illegal cross-border trade;
- → As per IUCN Guidelines for Conservation Translocations, undertake comprehensive conservation measures including addressing the root causes of species declines, before undertaking releases. For Asian Houbara, these include habitat restoration and reduction in hunting pressure;
- → Refocus reintroduction programs towards the establishment of self-sustaining populations. Reduce dependence on captive breeding and halt the proliferation of captive breeding centers, which create demand for trade in wild birds; and

→ Work with falconry communities to reduce demand for wild-caught Houbara, including through awareness campaigns, development of alternative falconry sports (e.g., falcon racing), and engagement with religious and traditional leaders.

Common Quail

The Common Quail (*Coturnix coturnix*) is classified as Least Concern on the IUCN Red List, reflecting its wide range across Europe, North Africa, and Asia, and its large global population, estimated at 40–80 million mature individuals. Despite this global status, regional declines have been reported, particularly in Western Europe, due to habitat change and hunting pressure. The species is listed on Appendix II of CMS but is not included in the CITES Appendices.

The species is one of the few migratory gamebirds hunted legally and in very large numbers across its range. It migrates seasonally between breeding grounds in Europe and western Asia and wintering grounds in Africa. Populations in North Africa and the Middle East are heavily exploited, often at key migration bottlenecks, raising concerns about long-term sustainability.

Illegal Take, Use and Trade

Hunting of common quail is widespread and deeply embedded in cultural and subsistence traditions. The species is hunted for sport, food, and, in some cases, for commercial sale in markets and restaurants. While legal harvest is regulated under national hunting frameworks and the EU Birds Directive, large-scale illegal or unregulated hunting persists, particularly in Mediterranean flyway states.

In Egypt and Lebanon, nets are set along hundreds of kilometers of coastline during autumn migration, capturing millions of small passerines and quail. Estimates from BirdLife International suggest that between 1.5 and 3.5 million quail may be killed annually in the Mediterranean region alone, many outside legal frameworks. These offtakes raise serious concerns for sustainability, as they occur in addition to legal hunting elsewhere in Europe. Use of electronic calling devices to increase catch is rife and greatly increases the catch.

Trade is typically domestic and localized, with quail consumed fresh or sold in local markets. There is little evidence of large-scale international trade comparable to that seen in falcons or bustards. However, the scale of take for human consumption—both legal and illegal—remains the dominant anthropogenic threat to the species.

Conservation Measures Implemented to Date

The Common Quail is subject to hunting regulations in the European Union under the EU Birds Directive (2009/147/EC), which sets closed seasons and prohibits hunting during spring migration. Quail are also covered under the CMS African-Eurasian Migratory Landbirds Action Plan (AEMLAP), which promotes sustainable use and improved monitoring of hunted migratory species.

At national levels, quotas, bag limits, and hunting seasons are used to regulate harvest, though enforcement is uneven. In some countries, civil society organizations (e.g., BirdLife partners) have mobilized to monitor coastal trapping, raise awareness, and advocate for stronger restrictions on illegal netting and use of calling devices.

Research initiatives, including ring-recovery and satellite tracking projects, have improved understanding of quail migratory routes and survival rates, helping to assess the impact of hunting mortality.

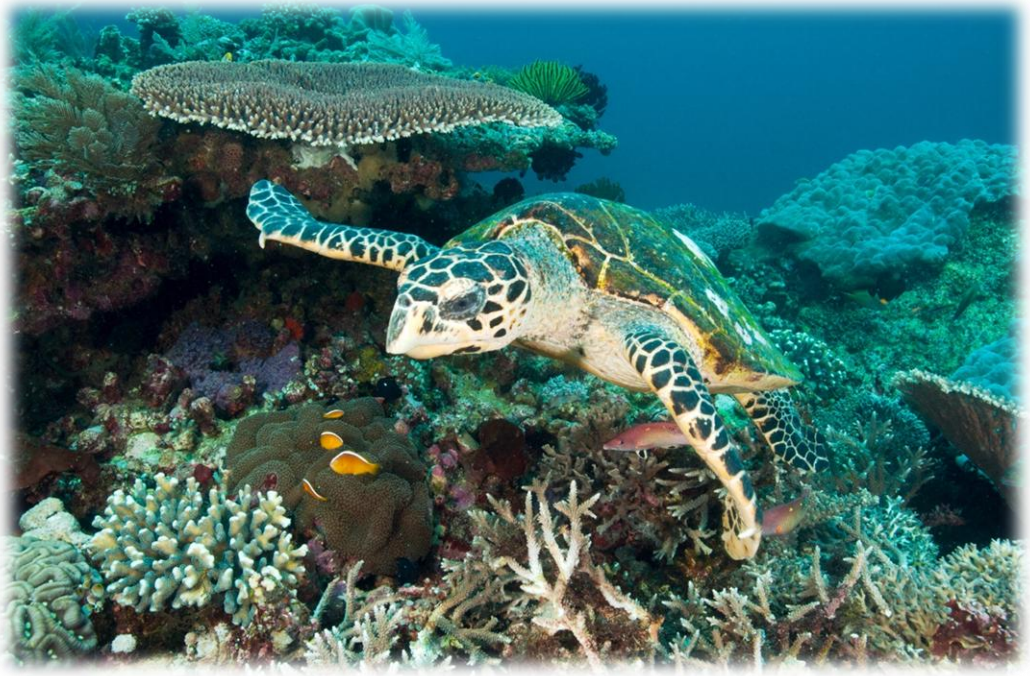
Recommendations

To ensure the long-term sustainability and legality of common quail use, the following measures are recommended:

- → Strengthen enforcement of existing laws against illegal trapping and netting, particularly in migration bottlenecks in the Mediterranean and Middle East;
- → Promote sustainable hunting frameworks by harmonizing quotas and closed seasons across range States, in line with scientific data on population dynamics;
- → Enhance monitoring of harvest levels, including systematic data collection on legal and illegal take, to better assess sustainability;
- → Support community engagement in regions where quail hunting is culturally important, by promoting alternative livelihoods and awareness campaigns on sustainable use;
- → Strengthen international coordination under CMS AEMLAP, ensuring that range states work collaboratively to reduce unsustainable offtake; and
- → Invest in research on population trends, migration ecology, and hunting impacts to inform adaptive management.

5.3 Aquatic Species

CMS Appendix I Species



Hawksbill turtle, Eretmochelys imbricata, Raja Ampat Indonesia © Zafer Kizilkaya

Bull Ray (Duckbill Eagle) Ray

The bull ray (also known as duckbill eagle ray) (*Aetomylaeus bovinus*) is classified as Critically Endangered on the IUCN Red List, reflecting severe population declines and fragmentation across its historical range. Once widespread throughout the eastern Atlantic Ocean and Mediterranean Sea—from Portugal and Morocco through the Mediterranean basin to West Africa and the Canary Islands—the species has now disappeared from much of its former distribution. It is listed on Appendix II of CITES, prohibiting unregulated international commercial trade, and on both Appendix I and Appendix II of CMS.

Illegal Take, Use and Trade

The bull ray is heavily exploited across much of its range, both as targeted catch and incidental bycatch in gillnets, trawls, and longlines. Its large size and slow reproductive rate make populations especially vulnerable. Meat from this species is widely consumed locally in coastal communities, often sold in domestic markets without regulation.

Unreported landings and illegal sales have been documented in ports where rays are marketed with other elasmobranchs. In many parts of its range, fisheries remain unmanaged, enforcement is weak, and catch is rarely recorded to species level. In addition to exploitation, widespread coastal habitat degradation—including mangrove clearance, estuary modification, aquaculture expansion, oil and gas activities, and rapid urban growth—has accelerated population declines.

Conservation measures implemented to date

Some regional actions exist: the EU has set combined skate and ray Total Allowable Catches (TACs) in parts of the northeast Atlantic; Turkey has banned fisheries for all Myliobatidae since 2018; and West African states under the Sub-Regional Fisheries Commission have adopted Regional or National Plans of Action for sharks and rays. However, implementation and enforcement have been minimal, and pressure from unmanaged artisanal and industrial fisheries remains high.

The species occurs in some marine protected areas (e.g., Banc d'Arguin in Mauritania), but enforcement and management capacity are limited, and these areas are unlikely to provide meaningful refuge.

Conservation NGOs have initiated awareness campaigns and community engagement programs in several hotspots, emphasizing the ecological role of large rays and the unsustainable nature of gill plate trade. Pilot projects for bycatch mitigation, including gear modifications and safe release training, have been introduced but remain limited in scope.

Recommendations

To secure the survival of the bull ray, coordinated and targeted measures are needed, including:

- → develop and implement species-specific legal protections across all range states, including bans on targeted capture, retention, and sale;
- → strengthen CITES implementation by improving capacity for species identification, inspection of landings, and monitoring of gill plate trade;
- → promote bycatch reduction strategies through gear modifications, time–area closures, and fisher training in safe release techniques;
- → support community-based conservation programs that provide alternative livelihoods, education, and stewardship opportunities in fishing communities; and
- → invest in population research and monitoring, including genetic and fisheries-dependent data collection, to better understand distribution, abundance, and trends.

Largetooth Sawfish

The largetooth sawfish (*Pristis pristis*) is classified as Critically Endangered on the IUCN Red List, reflecting dramatic global population declines. Historically widespread across tropical and subtropical seas, the species has now disappeared from most of its former range, persisting only in a few isolated strongholds, across the Western Atlantic, Eastern Pacific, Eastern Atlantic, and the Indo-West Pacific. It is listed on Appendix I of CITES, prohibiting international commercial trade, and on both Appendix I and Appendix II of CMS.

Illegal Take, Use and Trade

Globally, despite legal protections across much of its range, the largetooth sawfish continues to be exploited for its fins, rostra, rostral teeth, meat, liver, and skin. Its fins are especially valuable in the shark fin trade, and although all international trade was banned under CITES, evidence suggests some illegal trade persists, with sawfish fins recently detected in Hong Kong markets. Meat is mainly consumed locally by coastal communities rather than entering international markets, and the species is also kept in public aquaria.

Habitat degradation and fragmentation—caused by dam construction, river modification, mangrove loss, and climate change—further exacerbate population declines by reducing the availability of critical nursery and feeding grounds.

Today, the global population is highly fragmented. While Australia has implemented strict conservation and fisheries management measures, most of the populations face an elevated risk of extinction due to low numbers, restricted distribution, and continuing threats from bycatch and habitat loss.

Conservation measures implemented to date

Despite multiple international protections, largetooth sawfish remain inadequately protected in many parts of their range due to weak or absent national regulations and poor enforcement. A 2018 analysis highlighted four priority regions for coordinated conservation action—the Caribbean, Amazon Delta, Western Indian Ocean, and Australasia—with countries such as Mexico, Panamá, Brazil, Madagascar, Sri Lanka, and Papua New Guinea singled out for urgent surveys, stronger legal protections, and species-specific bans on killing, retention, sale, and trade.

The largetooth sawfish is legally protected in at least 17 countries, including Australia, Brazil, India, Indonesia, Mexico, and South Africa. However, the effectiveness of these protections is limited by generally weak enforcement. Australia is considered a “lifeboat” for the species, but its populations remain highly dependent on strong safeguards.

Recommendations

A set of coordinated and targeted measures is urgently required, including:

- → develop and implement national protection measures in all range states, with emphasis on reducing bycatch, conserving critical coastal habitats, and enforcing species-specific bans on killing, retention, sale, and trade;
- → expand capacity for community- and Indigenous-led conservation programs in key strongholds supported by education, training (including species identification), and enforcement capacity-building;
- → invest in long-term population monitoring using standardized methodologies, while also expanding fisheries monitoring (including artisanal catches) and research programs to improve understanding of population trends; and

→ mobilize international funding and technical support to assist developing countries where remnant populations may persist, but conservation capacity is limited.

Oceanic Whitetip Shark

The oceanic whitetip shark (*Carcharhinus longimanus*) is classified as Critically Endangered on the IUCN Red List. Once among the most abundant pelagic shark species in tropical and subtropical seas, the oceanic whitetip has now been extirpated from large parts of its former range. It is listed on Appendix II of CITES, and on Appendix I of CMS.

Illegal Take, Use and Trade

The oceanic whitetip shark is a highly valued species in the global shark fin trade, with its large, rounded fins considered premium quality. Although international trade in this species is contingent upon specimens being legally acquired (in line with national laws, RMFO provisions and the CMS Appendix I listing) and a positive CITES Non-Detriment Finding (NDF) confirming that such trade will not adversely impact wild populations, fins from this species continue to appear in Hong Kong and Guangzhou markets, suggesting persistent illegal, unreported, and unregulated trade (Cardeñosa et al 2020).

Bycatch in longline, purse seine, and gillnet fisheries is the major driver of population declines. Though rarely targeted directly, oceanic whitetip sharks are retained for their fins and meat. Post-release survival rates are very low, as the species is slow-swimming, surface-dwelling, and prone to stress during capture.

The species' life history (slow growth, late maturity, and low fecundity) renders it highly vulnerable to exploitation. Combined with high value in trade and weak enforcement in many range states, exploitation continues to undermine recovery despite international protections.

Conservation measures implemented to date

In addition to CITES and CMS protections, the species is subject to retention bans in several regional fisheries management organizations (RFMOs), including the International Commission for the Conservation of Atlantic Tunas (ICCAT), the Inter-American Tropical Tuna Commission (IATTC), and the Western and Central Pacific Fisheries Commission (WCPFC). These bans prohibit keeping oceanic whitetip sharks caught in tuna and swordfish fisheries, although compliance remains uneven.

Ecuador provides an illustrative case of national action. Other countries, including the United States, European Union member states, Brazil, and several Pacific Island nations, have also prohibited retention. However, national regulations remain absent or poorly enforced in many parts of the Indian Ocean and West Africa, where illegal retention and finning persist.

Recommendations

To secure recovery of the oceanic whitetip shark, the following actions are required:

- → Support bycatch mitigation through gear modifications (Ziegler 2023) and improved handling protocols to maximize post-release survival;
- → Invest in fisher training and community engagement to improve species identification, compliance, and stewardship;
- → Establish standardized global monitoring of bycatch, landings, and trade flows to track population status and the effectiveness of conservation measures.
- → CMS Parties to amend the bycatch resolution (CMS COP15 Doc.25.1) to prohibit retention of listed in CMS Appendix I caught in fisheries - this would be in alignment with RFMO retention bans that are already in place for the oceanic whitetip shark;
- → Scale up national prohibitions on retention, modeled on Ecuador's comprehensive ban, including enforcement capacity in artisanal and industrial fleets;
- → Enhance regional cooperation and intelligence-sharing to disrupt illegal trade networks in oceanic whitetip shark fins; and

Common Guitarfish

The common guitarfish (*Rhinobatos rhinobatos*) is classified as Critically Endangered on the IUCN Red List due to severe population declines throughout its range. Historically distributed widely across the eastern Atlantic, from Portugal to Angola, and throughout the Mediterranean Sea, the species has been extirpated from large parts of its former range and is now largely restricted to fragmented populations in West Africa and parts of the southern and eastern Mediterranean. The common guitarfish is listed on Appendix II of CITES, and on Appendix I of CMS.

Illegal Take, Use and Trade

The common guitarfish has been heavily exploited for both its fins and meat. Its fins are of exceptionally high value in the shark fin trade, often fetching prices comparable to wedgefish and sawfish fins. Despite the CITES Appendix II listing in 2019, fins of *R. rhinobatos* and related species continue to appear in Asian markets, indicating persistent illegal, unreported, and unregulated trade.

Meat from *R. rhinobatos* is widely consumed locally and regionally, sold fresh, dried, or salted in fish markets in West Africa and the Mediterranean. The species is taken in trawl, gillnet, and artisanal fisheries, both as targeted catch and as retained bycatch. Due to its shallow distribution in sandy and muddy habitats, it is highly vulnerable to bottom trawling, with mortality rates extremely high upon capture.

Habitat degradation further compounds exploitation pressures. Loss of coastal nursery habitats through mangrove clearance, dredging, coastal development, and pollution has reduced available refuges for juveniles. In the Mediterranean, historical declines have exceeded 80%, while in West Africa fishing mortality remains very high and largely unmanaged.

Conservation measures implemented to date

The common guitarfish is listed under national legislation in several range states, including Turkey, Mauritania, and within EU waters under the Common Fisheries Policy framework. However, compliance and enforcement remain patchy, and the species continues to be landed and marketed across much of its range.

Awareness campaigns have begun to highlight the plight of "rhino rays" (wedgefish and guitarfish) as a group, but targeted conservation actions for *R. rhinobatos* remain rare. There is no dedicated recovery plan in place.

Recommendations

To avert further declines the following measures are urgently needed:

- → Expand observer coverage and electronic monitoring in Mediterranean and West African fisheries to quantify catches and improve compliance;
- → Introduce bycatch reduction measures, including spatio-temporal closures of critical habitats and gear modifications to reduce mortality in trawl fisheries;
- → Develop and implement regional action plans under CMS to align protections across the Mediterranean and West Africa, with joint enforcement against fin trade networks; and
- → Support community engagement and alternative livelihoods in artisanal fishing communities to reduce dependence on catches and fin sales.

African Manatee

The African manatee (*Trichechus senegalensis*) is classified as Vulnerable on the IUCN Red List and listed on Appendix I of CITES, and on Appendix I of CMS.

While its extent of occurrence remains broadly comparable to historic range, the species faces increasing threats from hunting, incidental capture, habitat loss, and fragmentation. Its distribution spans western Africa - from southern Mauritania through coastal and riverine systems to Angola - and includes both inland river systems and coastal-estuarine habitats.

Illegal Take, Use and Trade

The African manatee is hunted throughout its range for meat, oil, skin, bones, and other body parts. In many countries, manatee meat is openly sold in markets, despite national legal protections (Mayaka et al 2013; Laudisoit et al 2017).

Hunting is both subsistence and commercial. In some regions, trade in manatee parts has become cross-border. For example, black-market trade occurs between Guinea, Sierra Leone, Côte d'Ivoire, and between Chad, Cameroon, and Nigeria.

Incidental capture (bycatch) in fishing gear is a significant source of mortality. Dams and infrastructure projects fragment rivers and reduce habitat connectivity, further exacerbating isolation and limiting access to feeding and breeding grounds. Coastal development, mangrove harvesting, pollution, siltation, and the damming of rivers contribute to habitat loss and degradation.

Conservation Measures Implemented to Date

Through the Memorandum of Understanding concerning the Conservation of the Manatee and Small Cetaceans of Western Africa and Macaronesia (Western African Aquatic Mammals MOU), adopted in 2008 under CMS, Range States have adopted an Action Plan specifically for the African manatee. The MOU and Action Plan aim to improve legislation, research, monitoring, awareness, reduce hunting, and protect habitats. The Action Plan to Address Aquatic Wild Meat Harvests in West Africa also seeks to focus policy and science attention on regional harvests that affect the African manatee.

There are grassroots and community-based conservation projects in several countries which include year-round monitoring networks, creating protected areas, alternative livelihoods for hunters, outreach and education to local communities. Projects are building local capacity and awareness.

In Cameroon, a local conservation initiative around Lake Ossa led by the African Marine Mammal Conservation Organization (AMMCO) has promoted measures including banning manatee hunting locally, removing manatee meat from restaurant menus, involving local fishermen in both monitoring and habitat restoration, and active campaigns to control invasive species (e.g. *Salvinia molesta*) that degrade lake habitat (AMCO 2024)

Recommendations

To support recovery of the African manatee, based on the Western African Aquatic Mammals MOU Manatee Action Plans and experience from AMMCO, the following actions are recommended:

- → Enact and enforce stricter national laws banning hunting, trade, and retention of manatee parts, with increased penalties to deter illegal take;
- → Review and update the Western African Aquatic Mammals MOU Manatee Action Plan, including ensuring that range states fully report, share data, and align their laws with international obligations;
- → Expand community-based monitoring networks across more range states to collect standardized data on population status, hunting incidence, habitat quality, and bycatch;
- → Support alternative livelihoods for communities dependent on manatee hunting (e.g. sustainable aquaculture, ecotourism, handicrafts) to reduce hunting pressure; and
- → Raise public awareness campaigns to reduce demand for manatee meat, oil, and other products, including cross-border trade.

Caspian Seal

The Caspian seal (*Pusa caspica*) is classified as Endangered on the IUCN Red List, with a population estimated at roughly 68,000 mature individuals and continuing to decline. It is listed on Appendix I and Appendix II of CMS. Unlike many marine mammals, the Caspian seal is not listed under CITES. Endemic to the Caspian Sea—the world's largest

landlocked body of water—the Caspian seal breeds almost exclusively on the northern winter ice fields, then disperses across the basin to coastal haul-out sites in the five littoral countries: Russia, Kazakhstan, Turkmenistan, Iran, and Azerbaijan.

Illegal Take, Use and Trade

The Caspian seal faces multiple, compounding threats. Bycatch in gillnets in illegal sturgeon and other fisheries continues to cause considerable mortality: interviews from the 2008–09 season documented a minimum of 1,215 seals bycaught, likely representing just a fraction of total impact; this equates to 5–19% of annual pup production (Dmitrieva et al 2013). Historical commercial hunting also contributed to this collapse, with quotas as high as 18,000 seals annually, and actual take reaching up to 4,600 seals per year in some years (Dmitrieva et al 2013). More recently underwater noise and conflict-related disturbances are likely to add further pressure on the seal populations.

Despite national hunting bans, illegal killings persist, particularly in conjunction with illegal sturgeon fishing operations and at haul-out sites. Seals are exploited locally for meat, oil, and other products, which further undermines population recovery.

Each year, it is estimated that more than 15,000 Caspian seals are killed in association with fisheries, with many of these animals entering the regional wildlife trade (Alberts 2021). Their skins are processed, while the blubber is rendered into oil, which is widely marketed as a traditional medicinal tonic. This seal oil has long been promoted in the Caspian region as a remedy for a variety of ailments, particularly respiratory illnesses. During the COVID-19 pandemic, demand surged further as local communities began circulating claims that seal oil could serve as a cure for the coronavirus (Svolkinas et al 2020).

Conservation measures implemented to date

The Caspian seal's 2017 listing on CMS Appendices I and II established a foundation for international coordination. All range states have enacted national hunting bans, and several Important Marine Mammal Areas (IMMAs) have been designated to protect breeding and haul-out sites. In Kazakhstan, the Caspian seal Research & Rehabilitation Center (CSRRC), established in 2019, enhances rescue capacity, public awareness, and rehabilitation efforts.

Recommendations

To effectively halt, and ultimately reverse, ongoing population declines, it is essential to implement a set of targeted, evidence-based measures, including the following:

- → reduce bycatch and illegal fishing: promote adoption of higher penalties for violations;
- → expand real-time surveillance systems (e.g., vessel monitoring, satellite tracking, drones) to detect and deter illegal activity;
- → Provide training and resources for local fisheries to adopt bycatch-reducing gear and selective fishing practices;

- → use the Tehran Convention to align conservation actions with broader ecosystem goals;
- → set up a joint enforcement mechanism for cross-border violations, ensuring accountability across jurisdictions;
- → implement a shared data platform for population monitoring, bycatch reports, and habitat status; and
- → conduct annual joint assessments to evaluate progress and adjust strategies as needed.

Atlantic Humpback Dolphin

The Atlantic humpback dolphin (*Sousa teuszii*) is classified as Critically Endangered on the IUCN Red List, reflecting steep population declines, small and fragmented subpopulations, and a very restricted geographic range. It is endemic to shallow coastal waters of western Africa, from Western Sahara southward to Angola, living in nearshore, tidal-influenced habitats such as estuaries, mangroves, sandbanks, and deltas. The species is listed on Appendix I of CITES, and on Appendix I of CMS.

Illegal Take, Use and Trade

The major threats to *S. teuszii* include bycatch in artisanal gillnet fisheries, deliberate capture, prey depletion, coastal development, and anthropogenic noise. Of these, fisheries bycatch is ranked as "catastrophic" in the risk matrix in the Single Species Action Plan for the Atlantic Humpback Dolphin.

The meat of Atlantic humpback dolphins is increasingly used locally, particularly when individuals are incidentally caught. In many west African coastal communities, the animal is consumed rather than discarded, and there is growing evidence of a market for dolphin meat (Collins 2015). Similarly, there is new evidence that indicates that dolphin hunting is still occurring, with reports of flensed dolphin carcasses found in the Tristao Islands in 2017 (Bamy et al. 2021) and a 2021 social media video showing a Nigerian coastal community celebrating the killing of an Atlantic humpback dolphin (Single Species Action Plan for the Atlantic Humpback Dolphin).

Habitat degradation is another significant factor. Coastal development, pollution, mangrove destruction, estuarine habitat modification, and loss of prey species combine to degrade or eliminate critical habitat. Small population size means that localized extirpations can have large effects on the species' overall risk.

Conservation Measures Implemented to Date

The species is covered under the Western African Aquatic Mammals MOU under CMS and its Action Plan for the Conservation of Small Cetaceans of Western Africa and Macaronesia. It is also covered by the Action Plan to Address Aquatic Wild Meat Harvests in West Africa which focuses policy and science attention on regional harvests that affect the dolphin.

Due to increasing concerns about continuously negative population trends, at COP14 CMS Parties adopted the Single Species Action Plan for the Atlantic Humpback Dolphin (*Sousa teuszii*) through Resolution 14.10.

Some countries along its range have legal protections against direct hunting or capture. Cameroon, for example, has listed the Atlantic humpback dolphin as a legally protected species. However, in many other range states, protection laws are weak, enforceability is low, and bycatch remains largely unregulated (see Single Species Action Plan for the Atlantic Humpback Dolphin for more detail).

Marine protected area (MPA) coverage in parts of Africa overlaps with some of the dolphin's habitat, but few MPAs are designed with *S. teuszii* in mind, and many lack the enforcement, monitoring, or specificity needed. Awareness raising, community engagement, and survey/photographic identification work are ongoing in some areas but remain patchy.

Recommendations

To halt decline and support recovery of the Atlantic humpback dolphin, the following measures are urgently needed (for more recommendations see Single Species Action Plan for the Atlantic Humpback Dolphin):

- → Improve knowledge of where *S. teuszii* bycatch is occurring, and what types of fisheries/fishing gear is responsible so that appropriate mitigation measures can be designed and implemented;
- → Develop and test viable bycatch reduction methods;
- → Implement effective bycatch reduction policies;
- → Stop direct hunting of *S. teuszii* in those communities where it occurs or is developing;
- → Reduce demand or utilization of dolphin meat where it occurs, by promoting both awareness of the species' status and legal alternatives or economic incentives to stop use; and
- → Increase awareness and capacity building among local fishers, law enforcement, coastal communities about the species' vulnerability and legal protections.

Hawksbill Turtle

The hawksbill turtle (*Eretmochelys imbricata*) is classified as Critically Endangered on the IUCN Red List, with global populations estimated to have declined by more than 80% over the last century. It is listed on Appendix I of both CMS and CITES. Hawksbills are widely distributed throughout tropical and subtropical regions of the Atlantic, Indian, and Pacific Oceans, nesting on sandy beaches and foraging primarily on coral reefs where they play an important ecological role as spongivores. Their late maturity, low reproductive output, and strong nesting site fidelity make them highly vulnerable to overexploitation and habitat loss.

Illegal Take, Use and Trade

The hawksbill turtle faces multiple, overlapping threats from illegal exploitation. Historically, global demand for "tortoiseshell" handicrafts drove massive declines. Although international trade has been banned since 1977, the illegal trade of shells and shell products continues to be prevalent in some southeast Asian countries, and it urgently requires international management interventions and effective enforcement of existing laws (Hamann et al 2021).

Egg poaching remains widespread, with reports of near-total nest harvest on some beaches in Central America, Southeast Asia, and West Africa. Eggs are consumed locally, sold in markets, or used in traditional medicine. Adult turtles are also hunted for meat in parts of the Caribbean, Indian Ocean islands, and coastal Southeast Asia, despite national prohibitions (CITES Secretariat 2019).

Bycatch in artisanal and industrial fisheries represents an additional source of mortality. Gillnets, trawl nets, and longlines are the principal gears involved, with many incidental captures going unreported. Together, direct exploitation and incidental mortality continue to prevent recovery of hawksbill populations, despite decades of formal protection.

Conservation measures implemented to date

Hawksbill turtles benefit from comprehensive international protections, including CITES Appendix I, CMS Appendix I, and regional instruments such as the Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC). Under CMS, the species is covered both by the Memorandum of Understanding concerning Conservation Measures for Marine Turtles of the Atlantic Coast of Africa (Atlantic Turtle MOU) and the Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia (IOSEA Marine Turtle MOU). In addition, a dedicated Single Species Action Plan for the Hawksbill Turtle (*Eretmochelys imbricata*) in South-East Asia and the Western Pacific Ocean Region was adopted by CMS Parties through Resolution 14.11, which focuses entirely on the addressing the threats of use and trade (the IOSEA Marine Turtle MOU Hawksbill SSAP).

Most range states prohibit take, possession, and trade under national law, with varying degrees of enforcement.

The IOSEA Marine Turtle MOU Hawksbill SSAP implementation report (Hamann et al 2022) highlighted that Range States showed significant progress in strengthening the criminal justice process, legislative reform for hawksbill protection, and efforts to close legal gaps and enforce international commitments, particularly in addressing shortcomings in the criminal justice process with regard to illegal activities involving hawksbill turtles.

On-the-ground conservation has increasingly relied on community-based models. In Nicaragua, conservation groups recruited former egg poachers as "turtle rangers" and introduced egg buy-back schemes, reducing poaching rates on key beaches from nearly 100% of nests to below 20%. In the Dominican Republic, strong national laws have been

complemented by community engagement, youth education, and scientific monitoring, helping to curb hunting and nest poaching in monitored areas.

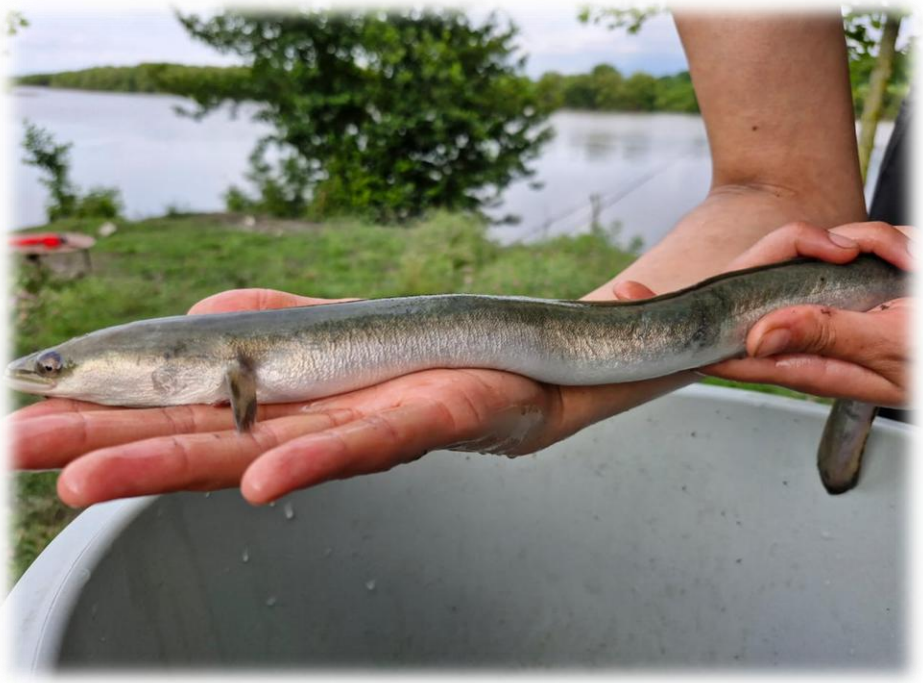
Awareness campaigns targeting both local communities and international tourists have reduced demand for tortoiseshell products in some regions. Parallel efforts to introduce turtle excluder devices (TEDs) in industrial shrimp and prawn trawl fisheries and to modify artisanal gears have shown promise in reducing bycatch, though adoption and efficiency of any solutions remain uneven.

Recommendations

To address continuing illegal take, use, and trade, the following measures are recommended (see also the IOSEA Marine Turtle MOU Hawksbill SSAP):

- → Strengthen enforcement of existing legal protections through capacity building of customs, fisheries, and judicial authorities;
- → Expand community-based nest protection programs and alternative livelihoods, building on successful models from Nicaragua (egg buy-back schemes and ranger programs) and the Dominican Republic (youth education and community monitoring)
- → Establish best-practice standards and protocols to guide on-ground monitoring and management of hawksbill turtles;
- → Intensify demand-reduction campaigns focused on tortoiseshell products in tourist markets and consumer countries;
- → Scale up adoption of bycatch mitigation tools, including TEDs and low-cost gear modifications in artisanal fisheries;
- → Support targeted research or other data collection methods to fill current data gaps, for addressing illicit financial flows linked to hawksbill turtle trafficking; and
- → Enhance international intelligence-sharing and joint enforcement to dismantle trafficking networks in tortoiseshell products, based on models such as the ASEAN Wildlife Enforcement Network (WEN).

CMS Appendix II Species



A European eel was captured as part of research fishing activities (with suitable permits) and was released alive and well. © Tamar Edisherashvili / Fauna & Flora

Amazon River Dolphin

The Amazon River Dolphin (*Inia geoffrensis*) is classified as Endangered on the IUCN Red List. It is listed in CITES Appendix II and in CMS Appendix II.

The species is endemic to the Amazon and Orinoco basins, occurring in Brazil, Peru, Colombia, Ecuador, Bolivia, and Venezuela. It inhabits rivers, floodplains, lakes, and channels, playing a critical ecological role as an apex predator and indicator of freshwater ecosystem health.

Illegal take, use and trade

The primary direct threat to the species has been deliberate killing for bait in catfish fisheries, especially targeting piracatinga. Studies in Brazil during the early 2000s documented thousands of dolphins killed annually to supply bait, leading to the 2015 ban on piracatinga fishing. Despite this measure, reports indicate continued illegal take in remote regions.

Dolphins are also exploited for traditional medicine and belief-based practices, with fat, eyes, and genitalia sold in local markets, often promoted as cures or charms. Opportunistic bycatch in gillnets, strikes from increasing boat traffic, mercury contamination from gold mining, and habitat fragmentation from dams compound these threats.

While there is little evidence of international trade, domestic and regional markets play an important role in perpetuating unsustainable exploitation, particularly in areas with weak enforcement capacity.

Conservation measures implemented to date

A number of promising initiatives have been developed to protect the Amazon River Dolphin. In Brazil's Mamirauá Sustainable Development Reserve, long-term research and monitoring programs have been combined with eco-tourism initiatives, generating income for local communities while incentivizing dolphin protection. These efforts have increased public awareness, provided robust population data, and created local guardianship of freshwater ecosystems.

In Colombia, community-based agreements have been piloted in parts of the Amazon and Orinoco basins. These agreements involve negotiated commitments by fishing communities to cease dolphin killings in exchange for benefits such as improved access to social services, sustainable fisheries support, and education programs.

To address growing conflict between fishers and dolphins overfishing resources, pilot projects have begun exploring technological solutions. In 2023, WWF-Brazil and the Society for Environmental Research and Protection tested the use of acoustic deterrents ("pingers") with the Prainha I community in Pará's Tapajós National Forest, an area where conflicts are common. Initial trials reduced gillnet damage by 40% and tripled fish catch, though effectiveness later declined as dolphins adapted to the sound. Researchers note that adapting pingers—originally designed for marine environments—for river systems requires significant technical adjustment. Adoption faces further barriers, including high costs and fishers' concerns that deterrents could reduce catches.

Recommendations

To halt and reverse declines of the Amazon River Dolphin, the following measures are recommended:

- → Address domestic trade in dolphin parts, with regular market inspections, targeted awareness campaigns to reduce belief-based demand, and alternative livelihoods for traders;
- → Expand and replicate community agreements, building on successful models in Colombia, linking dolphin conservation with socio-economic benefits such as eco-tourism, health, and education;
- → Reduce bycatch mortality, by promoting dolphin-safe fishing practices, adapting gillnets, and training fishers in safe release protocols; and
- → Support conflict-mitigation technologies, including further development and subsidized deployment of acoustic deterrents ("pingers") adapted for river systems, alongside participatory trials to ensure fisher acceptance.

Tucuxi

The tucuxi (*Sotalia fluviatilis*) is a small freshwater dolphin endemic to the Amazon and Orinoco river basins of South America. It is classified as Endangered on the IUCN Red List, listed on CITES Appendix II and on CMS Appendix II.

The tucuxi is distributed widely across Brazil, Peru, Colombia, Ecuador, and Bolivia, inhabiting rivers, lakes, channels, and floodplain systems. It is often confused with the Amazon River Dolphin, though it is smaller and less robust.

Illegal take, use and trade

Bycatch in gillnets is a leading cause of mortality, with studies showing high incidental capture rates across much of its range. Like the Amazon river dolphin, tucuxis are also killed deliberately in some areas, often as bait for catfish (piracatinga) fisheries, or in retaliation by fishers who perceive them as competitors for fish resources.

There are also reports of illegal use of body parts for traditional medicine or spiritual practices, though at smaller scales than for the Amazon river dolphin. Local markets occasionally trade dolphin oil or fat, sold as remedies or for ritual purposes. While large-scale international trade has not been documented, domestic demand contributes to continued exploitation.

Conservation measures implemented to date

National laws in Brazil, Colombia, and Peru prohibit dolphin hunting, and some protected areas such as the Mamirauá Sustainable Development Reserve (Brazil) indirectly safeguard tucuxi populations.

Pilot community engagement programs in Colombia and Peru have sought to reduce bycatch through fisher awareness campaigns and gear modification trials. Some localized initiatives have promoted dolphin-watching tourism as an economic alternative to exploitation, though most efforts remain limited in scope and funding.

Recommendations

The following measures are recommended:

- → Reduce bycatch mortality, through the introduction of modified gillnets, acoustic deterrents adapted for freshwater systems, and fisher training on safe handling and release;
- → Enforce bans on deliberate killing, with increased patrols in high-risk areas and stronger penalties for illegal use of dolphins as bait;
- → Monitor domestic use and trade, particularly in local markets where dolphin fat and oil are sold, and develop awareness campaigns to reduce demand; and
- → Promote community-based agreements, linking conservation with socio-economic benefits, modeled on successful experiences with the Amazon River Dolphin.

Bottlenose Wedgefish

The bottlenose wedgefish (*Rhynchobatus australiae*) is classified as Critically Endangered on the IUCN Red List, listed on CITES Appendix II (with proposal to add annotation for zero export quota at CITES CoP20) and on CMS Appendix II. The species is also covered by the Sharks MOU. In addition, a concerted action for the common guitarfish (*Rhinobatos rhinobatos*) and the bottlenose wedgefish (*Rhynchobatus australiae*) was established in 2020.

The species historically ranged widely across shallow coastal waters of the Indo–Pacific, from the eastern coast of Africa and the Red Sea through Southeast Asia to northern Australia and Melanesia. It prefers sandy and muddy habitats, estuaries, and lagoons, where its benthic feeding behaviour makes it highly susceptible to trawl and gillnet fisheries.

Illegal take, use and trade

The bottlenose wedgefish is heavily targeted for its high-value fins, considered among the most expensive in the global shark fin trade. Fins from wedgefish and giant guitarfish are known as “white fins” and are among the most sought-after in Asian markets, particularly in Hong Kong and Guangzhou. Evidence suggests that illegal, trade continues, often through mislabelling or laundering via legal channels.

In addition to fins, wedgefish are exploited for their meat, which is sold domestically in many range states, often dried and salted. Skins are used in leather production, while cartilage and liver oil are sometimes marketed for traditional medicine. This multi-product demand has placed unsustainable pressure on populations.

Bycatch is another significant source of mortality, particularly in industrial bottom trawl and gillnet fisheries across the Indo–Pacific.

Conservation measures implemented to date

At the national level, several countries, including Australia, Indonesia, and India, have adopted varying degrees of protection. Australia has designated the species as a no-take species in Commonwealth waters, while Indonesia listed it under its National Protected Species framework in 2018. Enforcement, however, remains weak in many parts of Southeast Asia, where most fishing pressure persists.

NGOs and research groups have promoted species identification training for customs and fisheries officers to improve detection of wedgefish fins in trade. Pilot projects in Indonesia and the Philippines have explored gear modifications to reduce bycatch, while awareness campaigns in coastal communities highlight the conservation status of wedgefish.

Recommendations

Urgent action is needed at both the national and international levels, including:

- → Ensure that range states build capacity for identification, monitoring, and reporting of wedgefish products;
- → Adopt species-specific bans on targeted fishing and retention, particularly in Southeast Asia where fishing pressure is most intense;
- → Reduce bycatch mortality, through the promotion of selective fishing practices, gear restrictions (e.g., bycatch reduction devices in trawls), and spatial closures in wedgefish hotspots; and
- → Engage coastal communities in stewardship programs and providing alternative livelihoods to reduce dependence on wedgefish exploitation.

Scalloped Hammerhead

The scalloped hammerhead (*Sphyrna lewini*) is classified as Critically Endangered on the IUCN Red List, listed on CITES Appendix II and on CMS Appendix II, and is further covered by the CMS Sharks MOU, reflecting its highly migratory nature and need for coordinated conservation.

Historically, the species was distributed widely across tropical and warm-temperate oceans, with strongholds in the Eastern Pacific, Western Atlantic, Indian Ocean, and West Africa. Hammerheads are particularly vulnerable due to their predictable aggregations around seamounts and coastal areas, as well as life-history traits of slow growth, late maturity, and low fecundity.

Illegal take, use and trade

The scalloped hammerhead is heavily targeted for its fins, which are among the most valuable in the global shark fin trade. Fins are exported primarily to East Asian markets, where demand remains. Meat is consumed locally in many range states, while cartilage and oil are used in supplements and traditional medicine.

Illegal, unreported, and unregulated (IUU) fishing continues to threaten the species. Hammerheads are also frequently taken as bycatch in gillnets and longlines, particularly in tuna fisheries.

While CITES regulates international trade, persistent challenges include inadequate monitoring, misreporting, and laundering of fins through major shark-exporting ports. Regional bycatch in tuna fisheries remains a significant driver of mortality, compounded by weak enforcement in high seas areas.

Conservation measures implemented to date

Ecuador has progressively strengthened protection of hammerhead sharks. Early evidence suggests reduced fishing mortality and better survival prospects for juveniles and reproductive adults.

WWF Pakistan has promoted a series of measures to reduce bycatch.

Regional cooperation has been promoted under RFMOs (such as IOTC), with measures banning shark finning and encouraging safe release of live sharks. Awareness campaigns

in coastal communities and training for artisanal fishers have supported improved compliance.

Recommendations

Below are some recommendations:

- → Enforce national bans and CITES Appendix II obligations, including strict monitoring of landings, improved traceability systems, and prosecution of illegal trade in fins and meat;
- → Scale up bycatch mitigation practices such as subsurface gillnetting and circle hooks across artisanal and industrial fisheries;
- → Strengthen port inspections and customs capacity, with training on fin identification and the use of genetic barcoding to prevent laundering of hammerhead fins in international trade; and
- → Engage local communities in stewardship programs, linking shark conservation to alternative livelihoods such as eco-tourism, and reinforcing awareness of hammerhead declines.

Great Hammerhead

The great hammerhead (*S. mokarran*) is classified as Critically Endangered on the IUCN Red List, listed on CITES Appendix II and on CMS Appendix II, as well as under the CMS Sharks MOU.

The species has a circumglobal distribution in tropical and warm-temperate waters, occurring along continental shelves, lagoons, and offshore areas. As the largest of the hammerhead sharks, it plays a crucial role as an apex predator. Its life-history traits—slow growth, late maturity, and low fecundity—render populations particularly vulnerable to overexploitation.

Illegal take, use and trade

The great hammerhead is heavily targeted for its large dorsal fins. Fins are exported to East Asian markets despite CITES trade controls, while meat is locally consumed in many range States. Body parts, including cartilage and oil, are also used in traditional medicine.

The species is highly susceptible to bycatch mortality in longline and gillnet fisheries. Because of its large size and fighting strength, hammerheads often die before being hauled onboard, even when caught incidentally. This high at-vessel mortality exacerbates population declines.

IUU fishing and weak enforcement of existing bans contribute significantly to ongoing exploitation.

Conservation measures implemented to date

A number of national and regional measures have been adopted to reduce mortality of the great hammerhead, although implementation and enforcement remain uneven.

Following CITES CoP16, Ecuador introduced a total ban on capture, marketing and export.

WWF Pakistan has supported the adoption of bycatch monitoring and mitigation techniques in artisanal gillnet fisheries.

Recommendations

To strengthen protection and recovery of the Great Hammerhead, the following actions are recommended:

- → Ensure compliance with CITES Appendix II listings and national prohibitions, supported by stronger traceability and port inspection systems;
- → Use bycatch reduction models such as Pakistan's subsurface gillnets and Ecuador's mandatory release protocols across other hammerhead range states, with training for artisanal and industrial fleets;
- → Expand observer coverage; and
- → Build fisher-community partnerships, linking shark conservation to alternative livelihoods (eco-tourism, community monitoring, sustainable fisheries certification).

European Eel

The European Eel (*Anguilla Anguilla)* is classified by the IUCN Red List as Critically Endangered, reflecting severe declines. It is listed in CITES Appendix II and CMS Appendix II.

The species is panmictic (a single breeding stock) with a complex life cycle: adults migrate from freshwater and estuarine habitats across Europe, North Africa, spawn in the Sargasso Sea; offspring disperse back to continental waters where they grow through yellow and silver stages.

Illegal Take, Use, and Trade

The European eel faces intense pressure from legal and illegal trade, especially of juvenile stages (glass eels). The demand for glass eels is high, and so is illegal trade.

Recent DNA barcoding studies have revealed widespread, and likely illegal, consumption of endangered European eels in food products globally. Researchers analyzing eel dishes (e.g. jellied eels, unagi) found that many contained European eel, even in markets outside Europe. In one study, about 40 % of North American unagi samples tested positive for European eel, despite limited legal export allowances (Goymer et al 2023).

This evidence suggests that illegally harvested eels are being "laundered" into the supply chain, mislabelled, smuggled across borders, and sold alongside legally sourced products. The study also documented a "stark mismatch" between eel species' natural ranges and where they were consumed, indicating that eels are traveling thousands of hidden food miles.

Conservation Measures Implemented to Date

Following its CITES Appendix II listing (effective March 2009), the European Union adopted Council Regulation (EC) No. 1100/2007 to complement trade controls by establishing Eel Management Plans (EMPs) for member states, aiming to restore eel stocks.

Under the regulation, EU states must define Eel Management Units (EMUs), set escapement targets, monitor recruitment, restrict transfers of live eels, and prevent illegal trade.

CMS and the Sargasso Sea Commission have since 2016 coordinated a series of Range States workshops/meetings. In the frame of these meetings, a draft Single Species Action Plan for the European eel has been developed which will be discussed at 4th Meeting of the Range States for finalization, with an expectation it will be presented to CMS COP15 in March 2026 for adoption.

Recommendations

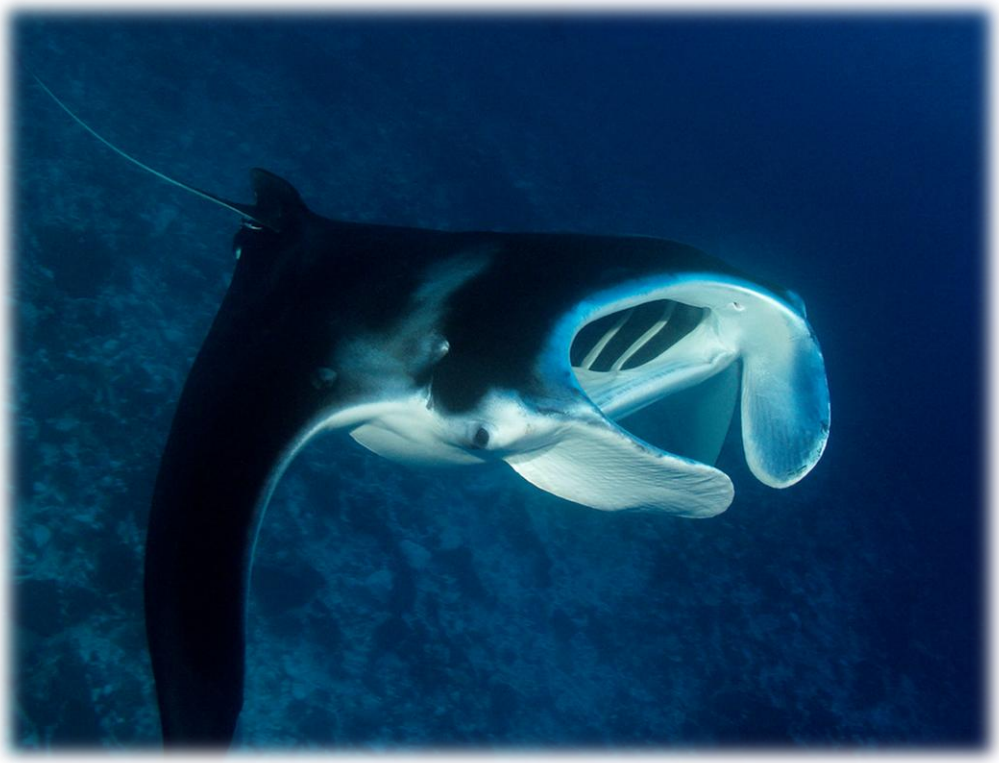
To address the threats European Eel face from illegal and unsustainable taking, the following measures should be prioritized:

Ensure all exports of eels are supported by up-to-date, science-based NDFs;

Improve coordination among range states (EU and non-EU), customs authorities, and CITES implementation to reduce laundering and misreporting; and

Raise awareness and stakeholder engagement: involve fishers, aquaculture operators, and local communities in conservation efforts, encourage voluntary compliance, and reduce demand for illegally sourced eels.

6. Case studies on measures that States have successfully implemented to reduce illegal taking



Manta Ray © WWF

6.1 Terrestrial Species

The Altyn Dala Conservation Initiative and the Recovery of the Saiga Antelope

Introduction

The saiga antelope (*Saiga tatarica*), once widespread across the Eurasian steppes and semi-deserts, has faced dramatic declines due to poaching, habitat fragmentation, disease, and climate stress. Today Kazakhstan, Russia, Uzbekistan and Mongolia are the primary range states, with no presence of saigas in Turkmenistan for more than two decades and saigas going locally extinct in China in the 1940s. The species was assessed as Critically Endangered in 2002, mainly due to an almost 90% crash of the global population within a decade in the 1990s following the collapse of the Soviet Union, when poaching for meat (sold locally) and horns used in Traditional Chinese Medicine surged. Since 1995 saigas are listed under CITES Appendix II and since 2002 under CMS, with a dedicated CMS Memorandum of Understanding since 2006.

It remained listed as Critically Endangered through subsequent reassessments until 2015 when it crossed the threshold and met Endangered criteria. In 2023 it was re-assessed as Near Threatened.

In Kazakhstan, saiga populations collapsed catastrophically in the 1990s–2000s due to unregulated hunting and trade in horns (used in traditional medicine). By the mid-2000s, some populations had dropped to just a few thousand individuals.

Declines were compounded by four mass-mortality events. Pasteurellosis was implicated based on bacteriology, but very little pathology was undertaken, and the clinical signs were more aligned with fog fever or bloat, caused by an excess of protein-rich grass (Kock et al. 2018, Robinson et al. 2019).

In 2015, more than 200,000 saiga died within three weeks in central Kazakhstan, in the Altyn Dala region. The proximate cause of death, based on multiple strands of evidence, was confirmed as haemorrhagic septicaemia caused by the bacterium *Pasteurella multocida* type B (Kock et al. 2018, Robinson et al. 2019).

Restoring viable populations required coordinated habitat protection, anti-poaching enforcement, disease monitoring and species recovery planning, particularly in the Altyn Dala region.

The Altyn Dala Conservation Initiative (ADCI) was established to serve as a flagship saiga recovery program in Kazakhstan, which is home to the vast majority of saigas. It is a collaborative partnership that unites the Government of Kazakhstan with leading national and international conservation organizations. At its core, the initiative is spearheaded by the Committee for Forestry and Wildlife of the Ministry of Ecology and Natural Resources, which provides the national policy framework and enforcement capacity. On the ground, the Association for the Conservation of Biodiversity of Kazakhstan (ACBK, national

BirdLife partner) serves as the national lead, coordinating research, protected area management, and community engagement. International expertise and resources are brought in through long-standing partners: the Frankfurt Zoological Society (FZS), which contributes to large-scale wildlife monitoring and reintroduction efforts; the Royal Society for the Protection of Birds (RSPB), which provides technical guidance, ecological expertise, and links to global conservation networks; and Fauna & Flora, which strengthens capacity building, landscape-level planning, and international advocacy.

ADCI integrates protected area creation, community engagement, and cross-sector monitoring to reverse saiga declines. Over time, ADCI has become a model for how to drive saiga recovery through long-term political, technical, and social investment.

Measures adopted

The CMS Memorandum of Understanding (MoU) Concerning Conservation, Restoration and Sustainable Use of the Saiga Antelope, which came into effect in 2006, and the associated Medium-Term International Work Programme (MTIWP) bolstered transboundary and institutional cooperation, including the establishment of ADCI. The Saiga Conservation Alliance and ACBK have since supported implementation of CMS and CITES commitments and conservation action, including in the Altyn Dala region.

Under ADCI, multiple protected areas and saiga corridors were established or expanded, linking core habitats across steppe and semi-desert landscapes. Using monitoring data, officials and conservation partners delimited key movement zones and identified bottlenecks for protection.

ADCI improved wildlife monitoring: satellite telemetry, aerial surveys, camera traps, and community-based patrol networks generate real-time data, enabling adaptive management of habitat, threats, and population trends.

Enforcement capacity was strengthened with well-equipped rangers, joint patrols, anti-poaching units, and legal reforms to increase penalties for illegal saiga hunting and horn trafficking.

Community engagement has been central in the approach. Local communities participate in monitoring, and sustainable land-use planning. ADCI supports alternative livelihoods to reduce dependence on poaching or unsustainable practices.

Impact of measures adopted

The ADCI has yielded measurable recovery: saiga numbers in the core Altyn Dala populations have rebounded. The protected corridors and movement zones have reduced mortality, allowed recolonization of vacant habitat, and improved genetic connectivity.

Better monitoring and data-driven planning have allowed for timely protection of calving grounds and seasonal ranges, reducing overlap with human disturbance. Poaching losses declined significantly in law-enforced zones.

Social outcomes include stronger community support for saiga conservation, more local buy-in for patrols and monitoring, and diversification of livelihoods reducing pressure on wildlife.

Scalability to other species

The ADCI illustrates how government/NGO partnerships built around data-driven conservation, protected area design, corridor planning, enforcement, and community engagement can reverse declines for a migratory species even in challenging landscapes.

That model is transferable to other threatened species, especially where poaching and habitat fragmentation are major threats. By integrating CMS and CITES commitments with strong on-the-ground action, Parties can scale such initiatives to support broader biodiversity recovery across Central Asia and beyond.

6.2 Avian Species

Reducing Seabird Bycatch in Namibia's Demersal Fisheries (information drawn from Da Rocha et al. 2021)

Introduction

Namibia's Benguela current upwelling system supports some of the world's most productive demersal fisheries. However, it has also been a hotspot for seabird bycatch and mortality, involving albatrosses and large petrels. Recognizing the scale of the problem and Namibia's obligations under international agreements, the government adopted fishery-wide bycatch regulations to curb seabird deaths following analysis and recommendations of the Albatross Task Force, led by BirdLife International and its UK partner RSPB.

Seabirds, such as albatrosses and petrels, are highly vulnerable to trawl warp strikes and longline hook interactions. Their slow life history means even modest additional mortality can drive population declines, making mitigation in industrial fisheries a conservation priority.

Measures adopted

Following national policy review and multi-stakeholder engagement, Namibia mandated seabird bycatch mitigation across its two most hazardous fleets:

- on demersal trawl compulsory bird-scaring (tori) lines on both warps, offal management to reduce scavenger attraction, and crew training on correct deployment/maintenance; and

- on demersal longline, compulsory bird-scaring lines, night setting, and line-weighting to increase sink rates, coupled with bycatch recording and compliance monitoring.

The regulation package was accompanied by observer coverage, standardised mortality estimation methods, and ongoing industry training, ensuring mitigation was not only required on paper but also implemented effectively at sea.

Impact of measures adopted

Analysis comparing periods before vs. after the regulation showed large, statistically significant reductions in seabird mortality in both demersal trawl and longline fisheries once bird-scaring lines and associated measures became mandatory. The study showed that fleet-wide regulation and compliance can convert a global bycatch hotspot into a low-mortality fishery within a short timeframe.

Beyond conservation gains, the program minimised operational disruption, with crews able to integrate mitigation into normal fishing practices after training.

Scalability to other species

Namibia's approach can be transferable to other regions and taxa. The same toolbox (tori lines, night setting, line-weighting, offal management) that reduced albatross and petrel deaths can also lower bycatch of other large seabirds and complement measures aimed at turtles and marine mammals in mixed-gear fleets. Adoption by neighbouring states and RFMOs can scale these benefits across migratory flyways and shared stocks.

6.3 Aquatic Species

Conservation and Management Measures for Manta Rays in Ecuador (information provided by Ecuador)

Introduction

The manta and devil rays are large, filter-feeding elasmobranchs inhabiting tropical, subtropical, and temperate waters worldwide, including the coastal and oceanic environments of the Eastern Tropical Pacific. They play a vital ecological role in regulating plankton dynamics but are especially vulnerable to human pressures due to their life history traits: slow growth, late maturity, long gestation periods, and the production of only a single pup every few years. Populations tend to be small and localized, with individuals showing site fidelity, which increases the risk of local depletion.

These species face multiple threats, including incidental capture in artisanal and industrial fisheries, and targeted fishing for meat and the gill plate trade. The growing international demand for gill plates has placed pressure on manta and devil ray populations, leading to sharp declines in some regions, with local decreases of 50–90% reported over relatively short timescales.

Because of these risks, all manta and devil rays are recognized under major international conservation frameworks. On the IUCN Red List, most are classified as Vulnerable or Endangered, with the Oceanic Manta Ray (*Manta birostris*) listed as Endangered. Under CITES, the entire genus *Mobula* is included in Appendix II, which regulates international trade to prevent unsustainable exploitation. They are also proposed for uplisting to Appendix I at CITES CoP20. In addition, manta and devil rays are listed under CMS in both Appendix I and Appendix II. They are also covered by the CMS Sharks MOU.

Those found in Ecuador include *Manta birostris, Mobula mobular, M. thurstoni, M. munkiana, and M. tarapacana*.

Measures adopted

In Ecuador, targeted fishing of manta rays has been prohibited since 2010. This national protection was reinforced in 2015 through Resolution C-15-04 of the Inter-American Tropical Tuna Commission (IATTC), followed by the issuance of Ministerial Agreement No. MPCEIP-SRP-2024-0210A on July 11, 2024. The Agreement establishes management and regulatory measures for all fishing gears, including purse seine, longline, trawl, gillnet, trammel net, sport, and recreational fishing, and applies both nationally and to vessels flying the Ecuadorian flag.

The Agreement prohibits the capture, retention, transshipment, landing, storage, transport, sale, or consumption of *Manta birostris*, *Mobula mobular*, *M. thurstoni*, *M.*

munkiana, and *M. tarapacana*. In cases of incidental capture, specimens must be released unharmed whenever possible; if they die, handling must follow specific procedures depending on the fishing gear used. Purse seine vessels that accidentally catch manta rays are required to deliver specimens to fisheries inspectors and to record all releases and discards—whether live or dead—in logbooks or observer reports, with this information submitted to the fisheries authority and the IATTC.

Impact of measures adopted

The prohibition of targeted manta ray fishing has significantly reduced direct pressure on populations in Ecuador. The introduction of release protocols, along with mandatory reporting of incidental catches, has improved monitoring and traceability of fishing operations and aligned national management with international conservation commitments. Although incidental captures and environmental threats remain, these regulations have contributed to the continued presence of manta rays in Ecuadorian waters and generated valuable scientific data for assessing their conservation status.

Scalability to other species

The measures developed for manta rays in Ecuador provide a model that can be extended to other vulnerable marine species with similar life-history traits. The combination of prohibitions, release requirements, standardized recording and reporting, and international cooperation forms a replicable framework for sharks, sea turtles, and other threatened species. By scaling up such measures, Ecuador and its partners can expand conservation impact, reduce unintentional mortality, and strengthen compliance with regional and international fisheries management commitments.

Conservation and Management Measures for Hammerhead and Oceanic Sharks in Ecuador (information provided by Ecuador)

Introduction

The hammerhead sharks (*Sphyrna zygaena, S. lewini, S. tiburo, S. mokarran*) and the oceanic whitetip shark (*Carcharhinus longimanus*) are highly vulnerable species that inhabit coastal and oceanic waters of Ecuador. As apex predators, they play a vital role in maintaining ecosystem balance, but they face significant threats including incidental capture, illegal fishing, demand for fins and meat, habitat degradation, pollution, and climate change. Their biological traits—slow growth, late maturity, and low reproductive capacity—make them particularly susceptible to overfishing.

According to the IUCN Red List, several of these species are classified as Critically Endangered (*S. lewini, S. mokarran, C. longimanus*), Endangered (*S. tiburo*) or Vulnerable (*S. Zygaena)*), reflecting severe population declines globally. Internationally, all five species are listed under CITES Appendix II (there is a proposal to uplist the oceanic whitetip shark to Appendix I of CITES at CoP20), which regulates international trade in these species and their products, particularly fins, while the oceanic whitetip shark is

further recognized under CMS Appendix I. In addition, all these sharks are covered by the CMS Sharks MOU. Hammerhead species are also included in CMS Appendix II, highlighting the need for international cooperation in their conservation.

Measures adopted

In response to international commitments, Ecuador has progressively strengthened its protection of hammerhead and oceanic sharks. Following CITES CoP16 in 2013, *S. lewini* (scalloped hammerhead) and *S. zygaen*a were listed in Appendix II of the Convention, with implementation in Ecuador through Ministerial Agreement No. 116 of August 2013. This introduced control measures, including limited bycatch quotas for artisanal fishing, a retention ban for industrial fishing, and mandatory release protocols.

In 2020, these measures were reinforced by Ministerial Agreement No. MPCEIP-SRP-2020-0084-A (July 27, 2020), which established a total ban on the external trade and export of *S. zygaena, S. lewini, S. tiburo, S. mokarran,* and *Carcharhinus longimanus*. This regulatory shift applied the precautionary principle and made the release of all incidental catches—alive or dead—mandatory. The oceanic whitetip shark (*C. longimanus)* also received additional international recognition through its inclusion in Appendix I of CMS, which requires strict protection and international cooperation.

Impact of measures adopted

The adoption of these measures has had a significant impact on reducing direct fishing pressure on hammerhead and oceanic sharks. Ecuador moved from allowing limited incidental catches in artisanal fisheries to a comprehensive ban on capture, marketing, and export. This regulatory development has strengthened the precautionary approach and aligned Ecuadorian management with international commitments under CITES and CMS. The requirement to release incidental catches and the prohibition on retention in industrial fisheries have reduced mortality of reproductive and juvenile individuals, improving the potential for population recovery. Nonetheless, the effectiveness of these measures depends heavily on strong landing controls, a robust traceability system, and continued regional cooperation to combat persistent challenges such as illegal fishing, high seas bycatch, and undeclared trade in fins and meat.

Scalability to other species

The framework developed for hammerhead and oceanic sharks in Ecuador highlights the importance of combining precautionary bans with international cooperation. While these measures could be extended to other species, any expansion should be guided by robust and up-to-date scientific evidence on population status. Given the highly migratory nature of sharks, effective management requires coordinated regional strategies that integrate biological, fisheries, and conservation criteria.

Conservation and Management Measures for Largetooth Sawfish in Australia (information provided by Australia)

Introduction

The largetooth sawfish (P. *pristis)* was historically widespread across tropical seas but is now extirpated from much of its former global range. Northern Australia represents the most significant stronghold for the species in the Indo-West Pacific. Despite this, the species has undergone substantial, though largely unquantified, declines in Australian waters, and there is currently no evidence of recovery.

The largetooth sawfish depends on a range of habitats, which makes it particularly vulnerable to a combination of historic and ongoing threats. In Australia, the primary threats include:

- → incidental capture as bycatch in commercial trawl and gillnet fisheries, particularly in Queensland, the Northern Territory, and Commonwealth-managed waters, and
- → habitat degradation and loss driven by climate change and water resource development.

The species is listed as Endangered under the Environment Protection and Biodiversity Conservation (EPBC) Act. Under Australian law, any largetooth sawfish caught must be released alive and unharmed. To strengthen conservation outcomes, Australia has introduced measures to improve fishery-independent monitoring (e.g., observers and electronic monitoring) and is enhancing species-specific reporting across fisheries operating under Wildlife Trade Operation (export) approvals.

Enforcement and compliance measures include at-sea patrols, in-port inspections, compliance risk assessments, stringent reporting requirements, and the mandatory use of Vessel Monitoring Systems in many fisheries. Penalties apply for non-compliance. Australia is not aware of significant illegal, unreported, or unregulated (IUU) fishing by domestic operators, although some IUU activity by foreign vessels, particularly from Indonesia, occurs in northern waters—primarily targeting sea cucumbers but also involving sharks and rays. Australia implements its National Plan of Action to Prevent, Deter and Eliminate IUU Fishing to address this issue.

In November 2015, Australia released the sawfish and River Sharks Multispecies Recovery Plan (*P. pristis, P. zijsron, P. clavata, G. glyphis and G. garricki*). The Plan outlines the research and management actions required to halt further declines and support recovery of sawfish populations in Australian waters.

More recently, the Australian Threatened Species Action Plan 2022–2032 identified the largetooth sawfish as one of 110 Priority Species. Under this framework, key actions have been defined to ensure the species is on an improved recovery trajectory by 2032, with progress reviews planned for 2027.

Research supported by the Australian Government's National Environmental Science Program (NESP) is ongoing to develop effective reporting mechanisms for fishers, improve accuracy of catch data, and estimate population size and trends using advanced methods such as close-kin mark-recapture (CKMR). These efforts aim to provide robust scientific evidence to guide adaptive management and recovery strategies.

Impact of measures adopted

The introduction of mandatory release requirements, enhanced monitoring, and improved compliance measures has strengthened protections for the largetooth sawfish in Australian waters. However, ongoing bycatch, habitat loss, and climate-driven impacts remain significant concerns. The implementation of targeted research and recovery planning is generating critical data to support adaptive management and long-term recovery.

Scalability to other species

The management measures adopted such as mandatory release, enhanced monitoring, species-specific reporting, compliance frameworks, and integration with national recovery and threatened species action plans, provide a replicable model for other threatened marine species with similar ecological vulnerabilities. These approaches can be scaled to conserve other sawfish species, and a range of threatened elasmobranchs, contributing to broader biodiversity protection in Australia and beyond.

Conservation and Management Measures for Grey Nurse Shark in Australia (information provided by Australia)

Introduction

The grey nurse shark, also known as the sand-tiger shark (*Carcharias taurus*) is recognized as Critically Endangered on the IUCN Red List, reflecting severe population declines driven by historical overfishing, ongoing bycatch in commercial and recreational fisheries, and the species' very low reproductive rate. Unlike many other threatened elasmobranchs, the grey nurse shark is not listed under CITES. However, it is included on both Appendix I and Appendix II of CMS.

This shark occurs in two distinct populations in Australian waters: the east coast population, listed as Critically Endangered under the Environment Protection and Biodiversity Conservation (EPBC) Act, and the west coast population, listed as Vulnerable. Historically, grey nurse sharks were widely distributed across coastal habitats, but significant declines occurred due to historical fishing pressures.

The primary threats to the species today are incidental capture by commercial and recreational fishers and mortality in shark control programs. While direct targeting of grey nurse sharks is prohibited, bycatch continues to cause injury and mortality, particularly when individuals ingest hooks or become entangled in fishing gear.

The species has been protected under fisheries legislation since 1984 in New South Wales, Tasmania, Queensland, and Western Australia. The Grey Nurse Shark Recovery Plan, first introduced in 2002, provides the framework for recovery, including regulation of fishing activities and protection of key aggregation sites.

Mitigation measures include restrictions on fishing at 19 designated critical habitat sites along the New South Wales and southern Queensland coasts to reduce the risk of bycatch and hook ingestion. Significant penalties apply for illegal take or interference with the species, with fines of up to AUD 110,000 and/or two years' imprisonment. These protections were established through extensive community consultation to balance conservation and local economic activities.

Broader marine park and fisheries management frameworks also embed protections for the grey nurse shark. The Australian Threatened Species Action Plan 2022–2032 identifies the east coast population as one of 110 Priority Species, with actions designed to place the species on a recovery trajectory by 2032, and progress reviews scheduled for 2027.

Ongoing monitoring programs are supported by research initiatives applying advanced techniques such as close-kin mark-recapture (CKMR) and genetic sampling to estimate population size and trends. These data underpin adaptive management strategies and provide insight into the effectiveness of current protections.

Impact of measures adopted

The combination of targeted recovery planning, fishing restrictions at aggregation sites, and integration with broader marine management frameworks has reduced direct pressures on grey nurse sharks. Evidence from population modelling suggests the east coast population is showing signs of recovery, although continued bycatch and incidental mortality remain significant challenges.

Scalability to other species

The conservation measures developed for the grey nurse shark—such as recovery planning, designation of critical habitats, strict penalties for illegal take, and integration into marine park management—provide a model applicable to other threatened shark and ray species. These approaches demonstrate how legislative protections, targeted fisheries management, and advanced scientific monitoring can be combined to improve recovery outcomes for vulnerable elasmobranchs.

Integrated Conservation and Bycatch Mitigation for Marine Turtles, Sharks and Rays, and Small Cetaceans in Pakistan (information provided by WWF Pakistan)

Introduction

Pakistan's Arabian Sea waters and coastline support a rich diversity of migratory marine megafauna, including marine turtles, sharks, rays, and small cetaceans. Marine turtles in

Pakistan include the green turtle (*Chelonia mydas*), classified as Endangered on the IUCN Red List, and the olive ridley (*Lepidochelys olivacea*), listed as Vulnerable. Both species are included in CMS Appendix I and CITES Appendix I, as well as covered by the IOSEA Marine Turtle MOU. The CITES designation prohibits all international commercial trade in these species, including their products.

Among sharks and rays, the whale shark (*Rhincodon typus*) is categorized as Endangered, the scalloped hammerhead (*Sphyrna lewini*) and the giant guitarfish (*Rhynchobatus djiddensis*) are both considered Critically Endangered, while mobulid rays (*Mobula spp.)* are assessed as Endangered or Vulnerable under IUCN. These species are listed in CITES Appendices I and II, as well as included in CMS Appendices I and II. For small cetaceans, the Indus river dolphin (*Platanista gangetica minor*) is listed as Endangered under IUCN, while the coastal bottlenose dolphin (*Tursiops aduncus*) is considered Near Threatened. Most small cetaceans in the region are listed in CITES Appendix I and CMS Appendix I, ensuring strict bans on trade and obligating range states to implement measures to avoid bycatch and habitat degradation.

These species play essential ecological roles, but their late maturity, low reproductive rates, and site fidelity make them highly susceptible to fisheries bycatch, targeted exploitation, habitat degradation, and illegal trade.

Measures adopted

Supported by WWF Pakistan, Pakistan has taken a comprehensive, multi-level approach to conserve marine turtles, sharks, rays, and small cetaceans, combining community engagement, fisheries management innovations, and strengthened policy frameworks.

At the community level, trained turtle patrollers have been deployed along key nesting beaches in Sindh and Balochistan. These patrollers prevent egg harvesting, protect nests from disturbance, and record data such as GPS waypoints and hatchling emergence. Outreach programs in schools and coastal villages have raised awareness about the ecological importance of turtles and discouraged the illegal trade in turtle products. This has fostered a strong sense of stewardship among coastal residents, transforming them from resource users into conservation partners.

In the fisheries sector, innovative bycatch mitigation practices have been introduced, most notably the adoption of subsurface gillnet settings. By setting nets deeper in the water column, entanglement of air-breathing species such as dolphins and turtles was drastically reduced, with studies showing nearly a 95% reduction in turtle entanglement, a 98% reduction in cetacean mortality, and a 15% reduction in shark and ray bycatch. These results highlight the effectiveness of this low-cost, easily replicable technique.

Safe handling and live release protocols have also been mainstreamed across artisanal tuna gillnet fisheries. Fishermen were trained using illustrated field guides developed by conservation partners, and as a result, thousands of marine turtles, along with over 110 whale sharks, 90 mobulid rays, dozens of dolphins and porpoises, and other vulnerable species, were safely released back into the sea between 2012 and 2019.

Data collection and monitoring capacity has improved through the Crew-Based Observer Program (CBOP). This initiative enabled trained fishermen to record catch and bycatch information, providing critical biological and operational data from fisheries that previously had limited observer coverage. The program was endorsed by the Indian Ocean Tuna Commission (IOTC) as a cost-effective alternative to traditional observer schemes, and reporting compliance in Pakistan increased dramatically—from 5% (of total vessel activity) in 2015 to 65% by 2019.

At the policy and governance level, Pakistan has taken proactive steps to align national fisheries management with international conservation commitments. National advocacy contributed to the notification of bans on finning and the protection of CITES-listed marine wildlife, including sharks, rays, and turtles. Pakistan has also played an active role in regional fora, lobbying for the adoption of IOTC Resolution 19/01, which established Conservation and Management Measures for mobulid rays. At the same time, capacity building for fisheries officers and customs authorities improved species identification at landing sites, strengthened enforcement of CITES trade controls, and reduced the likelihood of illegal exports.

Impact of measures adopted

These efforts have reduced bycatch mortality of multiple megafauna groups, curtailed turtle nest poaching, and enhanced survival of dolphins and rays. Subsurface gear has proven a cost-effective bycatch reduction tool for artisanal fleets. Crew-based observer programs improved fisheries monitoring, while community engagement fostered local stewardship of marine wildlife. At the policy level, Pakistan aligned national measures with CMS, including MOUs and CITES obligations, supporting regional cooperation for highly migratory species.

Scalability to other species

Pakistan's integrated model demonstrates the effectiveness of combining community involvement, low-cost fishing gear innovations, safe release training, and policy reform. This approach is transferable to other coastal states where bycatch threatens marine megafauna. By scaling such measures, countries can reduce unintentional mortality across taxa, strengthen international compliance, and secure broader ecological resilience in marine ecosystems.

Conservation of the hawksbill sea turtle in the Dominican Republic (information provided by the Dominican Republic)

Introduction

The hawksbill sea turtle (*Eretmochelys imbricata*), a migratory species widely distributed in tropical and subtropical seas, is listed in Appendix I of CMS and classified as Critically Endangered by IUCN.

In the Dominican Republic, the species benefits from legal protection under the General Law on the Environment and Natural Resources (Law No. 64-00), as well as complementary regulations that permanently prohibit its capture, trade, and exploitation.

Yet, despite these safeguards, the hawksbill continues to face significant threats. Illegal hunting for meat and shell—highly valued in handicrafts and collectibles—along with nest looting and the loss of nesting habitats to human activity, remain pressing dangers.

In May 2025, these challenges were highlighted when authorities in Miches, El Seibo province, arrested a man for illegally capturing hawksbill turtles. He now faces potential fines or imprisonment under current legislation.

To strengthen protection efforts, the Executive Branch issued Decree 285-23, which established a ten-year ban on the taking of all four sea turtle species present in Dominican waters and beaches. This decree not only reinforces existing legislation but also prioritizes surveillance, environmental education, and community participation as the main pillars of protection.

Measures adopted

The Dominican Republic has pursued a comprehensive approach to safeguard hawksbill sea turtles, combining law enforcement, education, inter-institutional coordination, and scientific monitoring.

Legal and regulatory framework

Protection of the hawksbill is anchored in strong legislation. Law No. 64-00 on the Environment and Natural Resources and Decree No. 285-23 prohibit the capture, trade, and possession of sea turtles. Penalties under Law No. 307-04 on Fisheries range from fines equivalent to 10–200 minimum wages and prison terms of two to ten years. Law No. 64-00 adds fines ranging from 2 to 3,000 minimum wages, creating a stringent system of deterrence.

Surveillance and control

The Ministry of Environment and Natural Resources, in coordination with the Dominican Council for Fisheries and Aquaculture (CODOPESCA), carries out patrols and control operations in nesting areas and marine protected zones. Special operations are organized during nesting seasons to prevent poaching and nest looting, while collaboration with local communities enables early detection of illegal activities.

Community education and awareness

Awareness-raising has become a cornerstone of conservation. Talks in schools, workshops, and training sessions have been held across key coastal communities, including Miches, Catalina Island, Saona Island, Bayahibe, Samaná, La Altagracia, Santo Domingo, La Romana, and Pedernales. Partnerships with organizations such as ProMiches and EcoBahía have reinforced local education efforts in Miches, María Trinidad Sánchez, and Samaná, while the Ministry of the Environment has coordinated initiatives in other regions.

Scientific monitoring and follow-up

Conservation actions are guided by ongoing monitoring. Nests and nesting sites are recorded to track population trends, while critical areas are identified and prioritized for conservation and surveillance.

Impact of measures adopted

The measures adopted have already delivered tangible results:

- ✓ Poaching has decreased in several monitored areas, particularly where surveillance and enforcement are strongest;
- ✓ Community awareness has grown, with more people participating in educational activities and fewer reports of turtle captures in key communities;
- ✓ Youth involvement has expanded, thanks to lectures and workshops in schools, fostering a culture of environmental responsibility among younger generations; and
- ✓ Inter-institutional cooperation has been strengthened, improving response capacity to incidents of illegal activity.

Scalability to other species

The Dominican Republic's model for protecting the hawksbill sea turtle is both effective and replicable. Its key components—extended protection periods, inter-institutional coordination, targeted education, and partnerships with private and community actors—can be adapted to safeguard other endangered marine and coastal species, both migratory and resident.

Collaboration between local communities, non-governmental organizations, and the Ministry of the Environment has proven to be a particularly successful formula, one that offers valuable lessons not only for other Caribbean nations but also for countries worldwide that face similar conservation challenges.

Conserving Marine Turtles in the Eastern Pacific of Nicaragua (information provided by Fauna & Flora)

Introduction

The Pacific coast of Nicaragua provides critical nesting habitat for marine turtles, particularly the Olive Ridley (Lepidochelys olivacea), Green Turtle (Chelonia mydas), Hawksbill (Eretmochelys imbricata), and leatherback turtles (Dermochelys coriacea). All of these species are included in CITES Appendix I, prohibiting international commercial trade, and CMS Appendix I, obligating range states to protect their habitats and reduce incidental mortality.

The region hosts globally important nesting sites, including mass nesting events (arribadas) of Olive Ridley turtles and strategic nesting sites for the hawksbills and leatherback turtles, both of which have declined by up to 98% over three generations, with only about 500 nesting females of each species remaining in the Eastern Pacific.

Despite their ecological and cultural significance, these species face severe threats, including the widespread illegal collection of the eggs during nesting seasons, hunting of adults for their meat and shells, predation by domestic animals, fisheries bycatch, and habitat degradation.

Egg poaching has historically been the most significant direct threat, with nearly 100% of nests raided in some communities, especially in the biggest nesting beaches in the country. Eggs are consumed locally or traded to neighbouring countries, they can be sold illegally in markets, shops or restaurants as a perceived delicacy or for medicinal purposes to increase fertility in men. Low levels of enforcement capacity, the country political context and the poverty in coastal communities *have made conservation especially challenging*.

Measures adopted

In collaboration with Community Cooperatives, Nicaragua has piloted a comprehensive community-centered conservation model. The approach combines in situ nest protection, creation of hatcheries, alternative livelihoods, incentive schemes, behaviour change campaigns and education, addressing both the supply and demand drivers of turtle eggs exploitation.

The programme began in 2002 with beach patrols and an incentive scheme, expanding in 2005 to include an alternative livelihoods component. Since then, it has continued to evolve and expand through a holistic approach, introducing bycatch monitoring in 2007/8 and strengthening community engagement with behavioural change campaigns launched in 2018.

At the community level, local "turtle rangers" were recruited and trained to patrol beaches, monitor nesting activity, and protect nests. Unlike traditional enforcement-led measures, rangers were drawn directly from egg-poaching families, transforming former poachers into conservation stewards. Rangers are provided with stipends, uniforms, and equipment, and their activities are closely supervised to ensure accountability. Annual refresher training and ongoing technical support to community patrol teams and cooperative members is done, ensuring that robust patrol protocols, nest relocation (when needed), and monitoring are conducted at high standards. Each nesting season begins with a two-day, site-specific workshop for community coordinators, cooperative partners, university students and beach patrollers.

Complementing nest protection, a conservation incentive scheme that rewards community members for reporting nests to patrol teams rather than poaching is a pivotal part of the approach. Payments take the form of local-kiosk credit to retain benefits locally. The person receives a first payment after the eggs are safely transferred to the hatchery (paid by the number of eggs) and *a second payment upon the successful release of hatchlings, ensuring the nests remain intact throughout the season*.

Education and outreach campaigns in schools and coastal villages emphasized the ecological importance of marine turtles, their legal protection under CITES, and the role

of communities in safeguarding them. Culturally resonant messaging and school activities fostered pride in turtles as symbols of Nicaraguan natural heritage.

Partnerships with law enforcement were strengthened to improve compliance with national wildlife laws. Collaboration with the judiciary helped ensure that confiscated eggs were redirected to hatcheries, while awareness training for police and prosecutors reinforced the illegality of turtle product trade.

Impact of measures adopted

These efforts led to dramatic improvements in nesting beach protection. On project beaches, poaching rates fell from near-total nest loss to below 20%, resulting in the safe release of tens of thousands of hatchlings annually. Community involvement built strong local ownership of conservation initiatives, transforming former exploiters into active protectors of turtle populations.

Beyond biological outcomes, the project generated tangible social benefits. Stipends for rangers, new livelihood opportunities, and community pride in conservation enhanced resilience in coastal areas. The incentive scheme, though resource-intensive, demonstrated that conservation outcomes can be achieved even in contexts of high demand for turtle products.

Scalability to other species

Nicaragua's model illustrates the power of combining direct nest protection with socioeconomic interventions. By aligning conservation incentives with community livelihoods, it is possible to achieve rapid reductions in egg poaching and improve population outcomes for marine turtles. The approach is transferable to other regions where exploitation of eggs or wildlife products is driven by poverty and weak enforcement. By scaling such integrated models, Parties can strengthen compliance with CITES and CMS commitments, reduce illegal trade, and build durable community stewardship for endangered marine megafauna.

7. Case studies on measures that States have successfully implemented to reduce illegal and unsustainable taking

Snow leopard in Baiboosun conservancy, Kyrgyzstan © Ilbirs Foundation/CXL

7.1 Terrestrial Species

The Snow Leopard and Conservation of Prey Species

Introduction

The snow leopard (*Panthera uncia*) is classified as Vulnerable on the IUCN Red List, with an estimated global population of 4,000–6,500 individuals spread across 12 Asian countries. It is listed in CITES Appendix I and CMS Appendix I. As an apex predator of Central Asia's high mountains, its survival is closely tied to the abundance of wild ungulate prey, particularly argali (*Ovis ammon*), listed in CMS Appendix II, as well as Asiatic ibex (*Capra sibirica*), and markhor (*Capra falconeri*) – not listed in CMS Appendices.

Following the collapse of the Soviet Union, poaching of ungulates intensified in Kyrgyzstan and Tajikistan, driven by weak governance, poverty, and ready access to firearms. Declines in ibex and argali populations reduced prey availability for snow leopards, which in turn fueled conflict with herders as leopards turned to livestock depredation.

Illegal hunting of ibex and argali for meat and trade has historically had a higher impact than regulated trophy hunting. In Kyrgyzstan, domestic quotas for ibex once reached 1,200 animals per year, with little spatial regulation, leading to open-access overexploitation. In Tajikistan, poaching during the 1990s civil war drove drastic ungulate declines.

Since the early 2000s, hunting concessions and community-based conservancies have emerged as experimental tools to restore ungulate populations while creating local incentives for wildlife management (Michel et al 2024; Zuther et al 2024)

Revenue from trophy hunting has been identified as a means to incentivize wildlife conservation and improve local livelihood. That said, trophy hunting, especially by foreign hunters, has been controversial. While quotas have been generally low enough not to threaten population viability, concerns remain about selective harvesting reducing trophy quality, the fairness of quota allocations, and occasional illegal hunts on protected species like snow leopard or brown bear.

Measured adopted

In Kyrgyzstan and Tajikistan, private commercial and community-based conservancies have been established that have successfully restored argali, ibex and markhor populations. Revenue from trophy hunts has been shared between government and conservancies, funding ranger salaries, patrols, and community projects.

Across both countries, NGOs such as the Tajik Nature Foundation, Ilbirs Foundation, Camp Alatoo and NABU have supported community organizations with training, equipment, and monitoring. Community-led management has demonstrated reduced poaching, ungulates becoming less shy and easier to observe, and increased prey availability for snow leopards.

Impact of measured adopted

These efforts have reduced poaching, stabilized or increased prey ungulate populations, and improved snow leopard conservation outcomes. In community-managed areas of Tajikistan, ibex and markhor densities have increased, while camera-trapping consistently documents snow leopard presence. In Kyrgyzstan, reforms have curbed excessive quotas and encouraged more sustainable management, though implementation remains uneven. Overall, community-based and concession-based models have demonstrated that economic incentives tied to hunting and tourism can motivate local stewardship of ungulates and indirectly the snow leopard.

Scalability to other species

Experiences in Kyrgyzstan and Tajikistan highlight the potential of community-based wildlife management and well-regulated hunting concessions to restore ungulate populations and indirectly benefit snow leopards. While not a panacea, these models can be replicated in other mountainous regions where outright hunting bans are unenforceable, and where communities require incentives to conserve wildlife. Effective scalability depends on transparent governance, scientific quota-setting, and equitable benefit-sharing with local stakeholders.

7.2 Avian Species

The Taiga Bean Goose and the implementation of an adaptive harvest management framework

Introduction

The Taiga Bean Goose (*Anser fabalis fabalis*) is a migratory waterbird that breeds across the boreal forests of northern Europe and Asia. It is one of the few goose populations in the Western Palearctic exhibiting a marked long-term decline. In the mid-1990s, the wintering population was estimated at approximately 100,000 individuals. However, by 2009, numbers had dropped to around 63,000—a troubling trend that raised conservation concerns across its range. The exact causes behind this decline remain only partially understood, but unsustainable hunting practices, both legal and illegal, are widely regarded as key contributing factors.

While the IUCN Red List currently classifies the broader Bean Goose species as of *Least Concern*, it does not differentiate between the stable Tundra Bean Goose (*Anser fabalis rossicus*) and the declining Taiga Bean Goose. In contrast, the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) recognizes the need for species-specific management and treats the Taiga Bean Goose as a distinct management unit considering its declining trend and specific conservation needs.

Measures Adopted

In response to the decline, AEWA adopted an International Single Species Action Plan (ISSAP) for the Taiga Bean Goose in 2015. This marked a significant milestone, as it was the first such plan under AEWA for a species that was both in decline and still subject to legal hunting. The ISSAP introduced a structured and collaborative conservation strategy centred on four distinct Management Units (MUs), each defined by geographic breeding and wintering distributions: Western Unit – breeds in central Scandinavia; winters in the UK and northern Denmark; Central Unit – breeds in Sweden, Finland, Norway, and Russia; winters in Denmark, Germany, the Netherlands, and southern Sweden; Eastern 1 Unit – breeds in Russia; winters in central Europe (Germany, Netherlands, Poland) and Eastern 2 Unit – poorly known, breeds in Western Siberia and winters in Central Asia (Kazakhstan, Kyrgyzstan, China).

A major innovation of the ISSAP was the introduction of an agreed population target across Range States, providing a clear conservation benchmark. These targets served as interim milestones toward achieving a favourable conservation status for the species. Importantly, the plan sought to reconcile conservation goals with the continuation of regulated recreational hunting. To that end, it called for the development of an Adaptive Harvest Management (AHM) framework—a structured approach to managing hunting pressure while responding to changes in population size and demographics.

At the time of the plan's development, AEWA had not yet established standardized procedures for defining Favourable Reference Values (FRVs), which are benchmarks for determining a population's viability. Nevertheless, the ISSAP embedded a population objective implicitly representing a size that minimized extinction risk while allowing for sustainable harvest. Target population sizes were set as follows: 5,000–10,000 individuals in the Western MU, 60,000–80,000 in the Central MU, and a combined 100,000 for the Eastern 1 and 2 MUs.

Impact of Measures Adopted

Significant progress has been made in implementing the ISSAP and moving toward its stated objectives (Taiga Bean Goose Task Force, 2025*)*. The Central MU, which had historically accounted for the largest portion of the population, has seen encouraging trends. As of March 2024, population estimates for this unit reached 75,363 individuals (Johnson et al. 2024), placing it within the target range set by the ISSAP.

The development and application of AHM has been particularly noteworthy in Finland—a Range State with ongoing legal harvests of Taiga Bean Goose. Finland has instituted a comprehensive AHM framework that includes spatial and temporal hunting restrictions, seasonal and daily bag limits, and mandatory reporting of harvests. Crucially, the Finnish system allows for annual adjustments to regulations based on current data and population models.

Scalability to other species

The Taiga Bean Goose case presents a promising model for the application of AHM to other migratory bird species, particularly those that are hunted yet face conservation concerns. The process of establishing population targets, defining management units, and implementing flexible harvest regulations based on scientific evidence can be adapted to a range of species with similar ecological and sociopolitical contexts. The success seen in Finland also illustrates the critical importance of cooperation between policymakers, scientists, and stakeholders, including hunting communities.

However, scalability requires careful consideration of species-specific ecological dynamics, data availability, and the capacity for governance and enforcement. For species with limited monitoring infrastructure or poorly understood migration routes, more investment in research and international collaboration will be essential before a functional AHM system can be introduced. Nonetheless, the Taiga Bean Goose initiative demonstrates that with sufficient political will, scientific input, and stakeholder engagement, adaptive, sustainable harvest strategies can be not only possible, but effective in reversing population declines and securing the future of vulnerable species.

8. Priorities for increasing capacity of Parties for monitoring and enforcement of national legislation and regulations and other measures pertaining to the taking of migratory species – recommendations

African Houbara, "El Jable" plains, Lanzarote © Frank Vassen

Factors to consider

This analysis across migratory species demonstrates that illegal and unsustainable taking occurs because of a variety of drivers and enabling factors.

Migratory species face vulnerabilities as their movements take them across multiple jurisdictions, exposing them to diverse threats and creating regulatory gaps. Some of their biological characteristics further reduce their capacity to recover from exploitation.

Legal frameworks, even where relatively strong, sometimes fail in practice. Limited enforcement capacity, inconsistent prosecution and judicial follow-up, porous borders, and fragmented institutional responsibilities at national and subnational levels can hinder the effectiveness of laws and undermine progress in achieving the goals of internationally agreed plans (BirdLife International and EuroNatur 2025).

Conversely, community-led or community-benefit models, such as conservancies, and co-management agreements, can be effective in reducing poaching, improving compliance, and enabling recovery of populations, but they may need to be maintained long term, posing funding challenges.

Technical measures to address some the threats faced by CMS species (by catch avoidance measures, antipoaching tools, conflict reduction tools) exist but their application is often constrained by resources.

Taken together, these findings point to a set of cross-cutting overarching priorities. As described in paragraph 34, they point to the following recommended actions:

- → strengthen national and local monitoring systems (for offtake, animal populations, and life history traits) needed to distinguish sustainable from unsustainable take;
- → strengthen compliance of hunting communities with the law including through awareness, training, development of bag reporting tools and promotion of their use and leadership from national and international hunting organisations
- → strengthen and coordinate national and international monitoring of size and trajectory of populations of migratory species to improve understanding of what levels of cumulative offtake can be supported and how populations are responding to any management measures in place;
- → strengthen international systems that gather information on levels of take of migratory species in all the countries supporting a population, assess sustainability and advise on which countries need to address levels of take of particular species as a priority;
- → co-design actions and management to ensure any legal hunting and/or exploitation and trade is sustainable;
- → curb hunting pressure and reduce urban demand for wild meat;

- → reduce bycatch of migratory species in rice fields, aquaculture and global fisheries by implementing appropriate mitigation action and monitoring the application of these;
- → increase quantitative assessments of consumption and trade in wild meat to better understand demand and trade pathways; and
- → in both Africa and Asia, rapid action to reduce snaring, trapping and taking which could yield immediate and substantial conservation benefits as well as action to reduce taking of wild birds using shooting, nets, traps and poisons.

Based on the species profiles and case studies shared, the members of the Working Group further identified priorities for increasing capacity of Parties in monitoring and enforcement of national legislation and regulations and other measures related to the taking of migratory species and proposed the following recommendations.

Recommendations

On legislation:

To CMS Parties, with the support of the CMS Secretariat

- → Adopt and implement national legislation in accordance with Articles III.5 and V.1 of CMS to strengthen measures addressing the illegal take of CMS species (participation in the CMS National Legislation Programme, implementation of the recommendations provided in the National Legislation Profile, use of the CMS Legislative Guidance Relating to Implementation of Article III.5);
- → Strengthen the national regulatory framework through support for the integration of CMS listings into national legislation for listed species; and
- → Promote policy coherence and inter-agency coordination to harmonize legislative measures under CMS with related obligations and objectives under other biodiversity-related MEAs, minimizing overlaps and maximizing synergies in addressing illegal and unsustainable taking of species.

On international cooperation:

To CMS Parties with the support of the CMS Secretariat, scientific institutions and NGOs

- → Establish collaborative mechanisms, including MOUs, in particular with neighbouring countries and those on migratory routes of shared species, to jointly address illegal and unsustainable trade in CMS species enhancing regional conservation impact (e.g. reduce demand, confiscate illegal shipments, and share intelligence and enforcement data, strengthening cross-border responses);
- → Participate and contribute in CMS Task Forces on Illegal Taking of Migratory Birds for the Mediterranean, Asia-Pacific and South-West Asia respectively (MIKT, ITTEA and SWAITB), as well as consult and use legislative guidance developed by MIKT as relevant; and

→ Establish regional cooperation through networking of research institutes and management agencies, and harmonization of protocols for monitoring migratory species between states.

On monitoring of species and illegal take and trade:

To CMS Parties with the support of scientific institutions and NGOs

→ Strengthen monitoring and data collection including through developing identification guides for CMS species, training in monitoring techniques, and using new technologies; and
→ For aquatic species, train observers on fishing vessels and landing centre staff.

On capacity-building and improving detection of illegal take and trade:

To CMS Parties with the support of the CMS Secretariat, scientific institutions and NGOs

→ Build capacity among enforcement, prosecution, and judicial authorities to effectively detect and address illegal take and trade in CMS species, integrating training on wildlife crimes into the national curricula of relevant academies and institutions;
→ Share experience and adopt international best practice as regards setting of deterrent penalties for wildlife crime;
→ Share experience on the use of new technologies for detection, evidence gathering, enforcement and prevention of wildlife crime;
→ Improve monitoring and enforcement for aquatic species, through on-board observers and electronic monitoring on 100% of vessels to detect bycatch and infringements (including illegal trade), through port-based outreach, training for port, customs and maritime authorities and deployment of onboard observers to reduce bycatch and other non-target catch of migratory species; and
→ Address illegal online trade in CMS species (including policies and legislation regulating online wildlife trade, regular monitoring of digital platforms, and public awareness campaigns promoting responsible online behaviour).

On addressing unsustainable take:

To CMS Parties with the support of the CMS Secretariat, scientific institutions and NGOs

→ In line with CMS Article V.1, establish robust and clear procedures for scientifically set quotas for sustainable taking of migratory species, which may be taken, that address risks of compounded harvesting pressure, ensuring that transboundary populations of CMS species are not overexploited by different countries due to lack of coordinated assessment/decision making. Where appropriate, apply bycatch mitigation measures where threatened CMS listed species are being bycaught in fishing gear and beach seines;
→ Strengthen and coordinate national and international monitoring of size and trajectory of populations of migratory species to improve understanding of what

levels of cumulative offtake can be supported and how populations are responding to any management measures in place; and

→ Strengthen international systems that gather information on levels of take of migratory species in all the countries supporting a population, assess sustainability and advise on which countries need to address levels of take of particular species as a priority.

On involvement of local communities:

→ Implement effective community-led approaches to address illegal and unsustainable taking of wildlife, including co-management of wildlife, participatory monitoring of taking, inclusive consultation on legislation; and

→ Develop strategies to effectively address illegal and unsustainable taking of migratory species based on identified drivers in engagement with local communities (e.g. supporting behaviour change, promoting sustainable livelihoods, and integrating other locally relevant measures).

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