STRATEGIC FRAMEWORK FOR BIRD CONSERVATION

Kavango Zambezi Transfrontier Conservation Area

Blue-cheeked Bee-eater *Merops persicus*
Non-breeding Palearctic migrant to Southern Africa
IUCN Red List: Least Concern © I. White

Great KAZA Birding Route Zambia Bird Guide Training in Kafue National Park
© Photo Birdlife Zimbabwe

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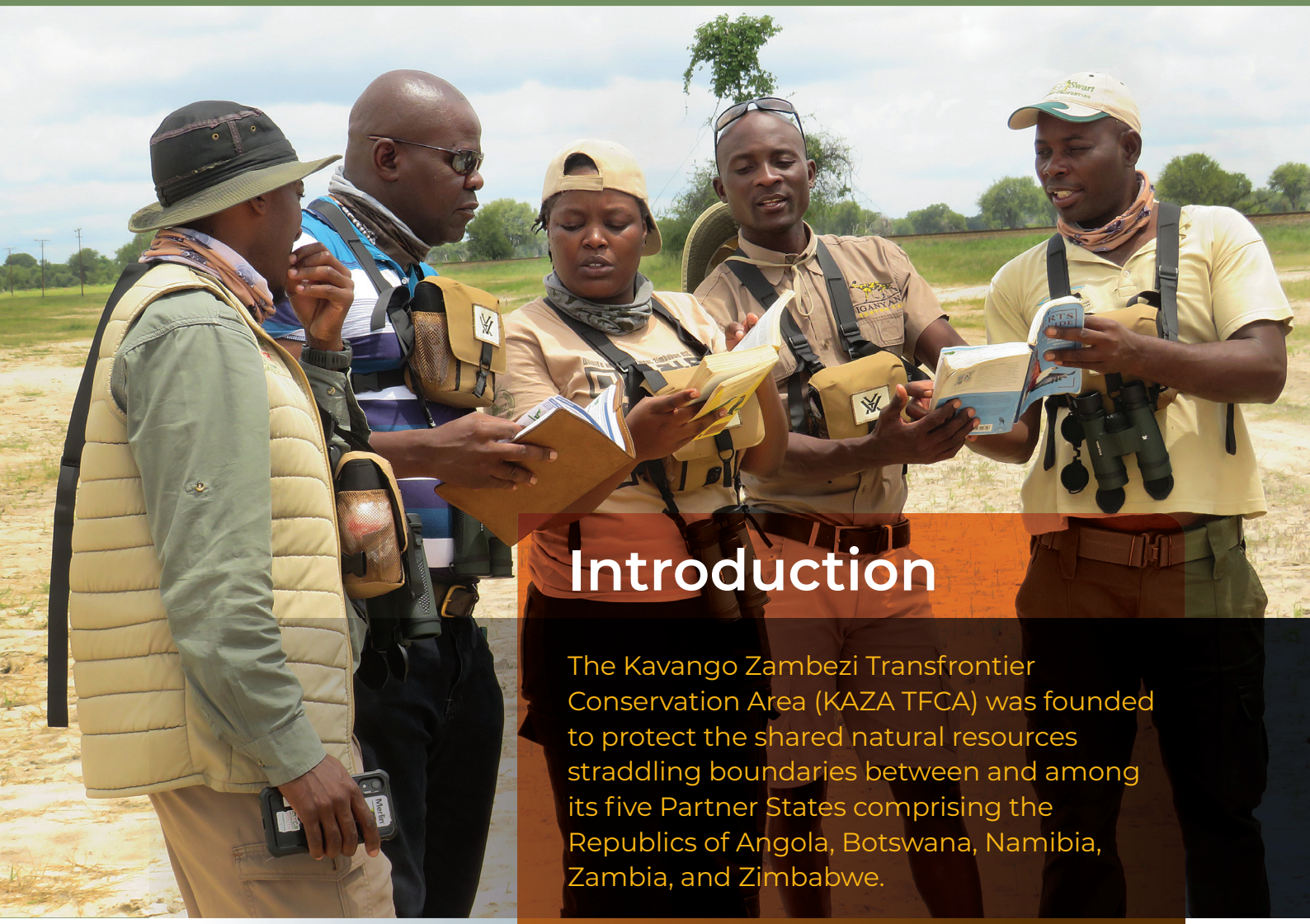


Introduction

The Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA) was founded to protect the shared natural resources straddling boundaries between and among its five Partner States comprising the Republics of Angola, Botswana, Namibia, Zambia, and Zimbabwe.

Great KAZA Birding Route Bird Guide Training-Discussion on the difference between a Tawny and a Wahlberg's Eagle-Hwange, Zimbabwe © Photo by BirdLife Zimbabwe

Plans by the Southern African Development Community began in 1999 and were finalized in 2006 to establish the largest transboundary conservation area in the world. Protecting the shared assets of the partner nations affords substantial opportunities to meaningfully contribute to global biodiversity conservation and the socio-economic development of rural communities living in and around this region.

Avian biodiversity is rich in the KAZA region with over 600 bird species observed in the area. In addition to avian residents of, e.g., savannah and floodplain ecosystems, migrant birds find seasonal habitat in KAZA, which they reach via intercontinental flyways from their breeding territories in Asia and Europe. The natural resources provided by the KAZA TFCA are critical assets for global avian conservation, and the transboundary collaboration allows decision-making on a scale relevant to the distribution of these resources.

1. Situational Analysis

1.1 Critical Sites and Habitats

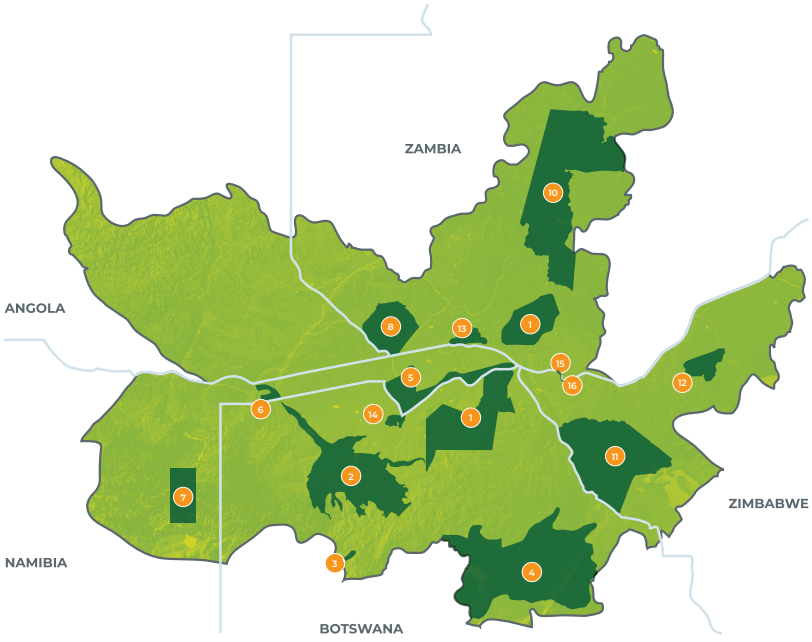
KAZA comprises 520,000 km^2 of unique ecosystems, adjacent to the Okavango and Zambezi River systems, including the Kwando Basin and a network of 36 formally protected areas with globally recognized biodiversity.

In addition to the challenges of biodiversity conservation with expanding anthropogenic pressures and projected climate change impacts, effective transfrontier conservation implementation requires coordination of policy across borders that transect species distributions, often with minimal data on which to base management decisions (Kapuka and Hlasny 2021). Collaborative planning and implementation of common enforcement objectives and monitoring strategies ensures a means of shared influence and responsibility for biodiversity conservation across political boundaries.

The KAZA TFCA comprises a mosaic of land uses and connects multiple areas preserved for wildlife habitat and migration. In addition to the primarily savannah landscape occupied by Zambezian biome species, KAZA contains unique saltpan areas, marshes and wetlands, and woodlands and scrublands that provide habitat for endemic and more widespread species.

Its location on the African continent is frequented by numerous resident species as well as intercontinental migrants moving across flyways connecting regions globally. Seasonal precipitation patterns influence the distribution of inundated wetland habitats crucial for migrating wildlife.

Many Important Bird and Biodiversity Areas (IBA) and Key Biodiversity Areas (KBA) have been identified in KAZA. Some are recognized globally for their ecological importance, such as the Bwabwata-Okavango Delta, one of the largest Ramsar sites in the world, and renowned Victoria Falls, which is surrounded by Batoka Gorge and Mosi-oa-Tunya National Park, a UNESCO World Heritage Site. IBAs cover the large National Parks (NP; Chobe in Botswana; Liuwa Plain, Sioma Ngwezi, and Kafue in Zambia; Hwange and Chizarira in Zimbabwe; Figure 1) as well as smaller sources of water (Lake Ngami and Linyanti swamp in Botswana, Eastern Zambezi wetlands and Mahango Core Area in Namibia, Nkanga river conservation area in Zambia, and Matobo Hills in Zimbabwe) and floodplains or seasonal wetlands critical for migrating birds (Makgadikgadi Pans in Botswana; Tsumkwe Pan system in Namibia; Barotse floodplain, Simungoma, and Machile in Zambia). Lake Ngami is currently listed as the only Important Bird and Biodiversity Area in danger in KAZA (http://datazone.birdlife.org/site/ibasindanger) due to low water flow to the area and biodiversity threats from over-hunting, disturbance from livestock, and egg removal (BirdLife International 2023), although these concerns are not unique to this locale.



IBAs/KBAs in KAZA

1. Chobe National Park
2. Okavango Delta
3. Lake Ngami
4. Makgadikgadi Pans
5. Eastern Caprivi Wetlands
6. Mahango Game Reserve and Kavango River
7. Tsumkwe Pan System
8. Sioma Ngwezi National Park
9. Machile
10. Kafue National Park
11. Hwange National Park
12. Chizarira National Park
13. Simungoma
14. Linyanti Swamp/Chobe River
15. Mosi-Oa-Tunya National Park
16. Batoka Gorge

Figure 1. The Important Bird and Biodiversity Areas (IBAs)/Key Biodiversity Areas (KBAs) in KAZA

1. Situational Analysis (continued)

1.2 Globally Significant Species

Over 600 bird species have been identified within the KAZA TFCA. For the purposes of focusing on priority areas of biodiversity and conservation of available resources, birds are attributed to broad habitat groups herein, with notable species of conservation concern further described in terms of regional threats and potential conservation actions.

In addition to reflecting similarities in habitat use, these groupings include some shared behavioral traits (e.g., diet and resource use) that could influence vulnerability to specific threats as well as life history traits (e.g., lifespan, reproductive rate, annual survival) that represent the capacity of a species to respond to extrinsic stressors and conservation strategies. As possible, exceptions to the commonalities assumed in each group are noted, especially for species with habits that make them particularly vulnerable. Common groups of birds identified here comprise raptors, representing unique trophic level and nesting requirements, with vultures as a subset category based on specific population threats; waterbirds, including wading birds and waterfowl; grassland birds, primarily those unique to savannah ecosystems such as landfowl and bustards; and woodland birds, specifically smaller perching birds nesting or foraging in forested areas. These species categories are neither mutually exclusive nor all-encompassing but provide a framework for initial habitat-related prioritization of conservation actions to preserve avian biodiversity. The importance of savanna and wetland ecosystems across these habitat categorizations merits recognition, especially with the immediate threats to these areas, outlined below.

Within the habitat-based categories of birds, focal species are identified as representative case studies to outline known conservation priorities. Initial focal species were determined based on documented threat, global recognition, and the potential for habitat protection (White-backed Vulture, ***Gyps africanus***; Martial Eagle, ***Polemaetus bellicosus***; Grey-crowned Crane, ***Balearica regulorum***; and Secretarybird, ***Sagittarius serpentarius***; McGowan et al. 2020). Additional focal species were identified based on knowledge of regional conservation concerns and potential actions for raptors (Steppe Eagle, ***Aquila nepalensis***; Taita Falcon, ***Falco fasciinucha***; and Red-footed Falcon, ***Falco vespertinus***), waterbirds (Wattled Crane, ***Bugeranus carunculatus***; Lesser Flamingo, ***Phoeniconaias minor***; and Slaty Egret, ***Egretta vinaceigula***), grassland birds (Southern Ground-hornbill, ***Bucorvus leadbeateri***), and woodland birds (Black-cheeked Lovebird, ***Agapornis nigrigenis***).

Secretarybird *Saggittarius serpentarius*
IUCN Red List: Endangered © Photo R. MacDonald

Species' conservation status presented herein represents global classification by the International Union of Conservation of Nature (IUCN). Initial assessment of focal species' threats and conservation priorities were based on IUCN accounts and refined to represent situational awareness of ornithologists and wildlife managers within the KAZA region. Independent action plans for at-risk species require data and monitoring which are not always available or practical for single-species response. Because conservation concerns and responses often vary based on specific ecosystems or resources, birds have been categorized by these taxonomic and ecological similarities here, with focus on representative species of conservation concern. Particularly when resource availability or quality impacts population dynamics, these categories could broadly identify species at-risk where specific data are lacking, although further site-specific threats warrant a more targeted response. Given the importance of habitat availability in the future, strategic elements of conservation are also prioritized according to ecosystem. Beyond KAZA, additional information might need to be considered for migratory species, which are often under-protected throughout their entire range (Runge et al. 2015).

African Fish Eagle *Haliaeetus vocifer*
IUCN Red List: Least Concern © Photo C. Collyer

Raptors

Raptors feature prominently on savannah landscapes, including KAZA, with particular conservation concerns related to life history strategies and habits. Raptors are relatively long-lived and forage at higher trophic levels, representing greater prey resource needs as well as the potential for biomagnification and bioaccumulation of any local contaminants. Extrinsic sources of mortality affect populations more in species with relatively high annual adult survival rates. The Endangered Martial Eagle, Bateleur (***Terathopius ecaudatus***, Kemp et al. 2020a), and Steppe Eagle, and Vulnerable Red-footed Falcon and Tawny Eagle (***Aquila rapax***; Kemp and Kirwin 2020) are some of the charismatic raptor species found in KAZA that are associated with particular threats. The distribution of the Vulnerable Taita Falcon is limited to a few small areas including the Batoka Gorge / Victoria Falls area (Zambia and Zimbabwe) of sub-Saharan Africa, and therefore is particularly affected by habitat alteration that provides more open habitat for larger falcon species competing for nesting sites and resources (Kemp et al. 2020b). Limited breeding sites are also a restriction for the Vulnerable Red-footed Falcon, which is opportunistically harvested during migration and is classified as Critically Endangered in the Mediterranean range of its distribution, although breeding populations appear to be increasing in some Eastern European locations (Orta et al. 2022). Other raptors of conservation concern are the Endangered Steppe Eagle due to extirpation in its breeding range (Meyberg et al. 2020) and the Martial Eagle, which faces threats from power line collisions as well as farming and ranching persecution in southern Africa (Kemp et al. 2020c).

White-headed Vulture *Trigonoceps occipitalis*
IUCN Red List: Critically Endangered © Photo C. Collyer

Vultures

Vultures are distributed throughout the KAZA range, many scavenging on carcasses and cleaning potential sources of disease and decay from the savannah ecosystem. Most species of African vultures, including those within the KAZA region, are considered Threatened or Endangered (Margalida et al. 2019), owing to their foraging methods, potential lead toxicity, and local poisoning threats described below. These long-lived predators are sensitive to additional sources of mortality, and therefore a primary conservation focus within Africa as populations decline. Of particular concern in this group are the Critically Endangered White-backed (Kemp et al. 2020d), Hooded (***Necrosyrtes monachus***; Kemp et al. 2020e), and White-headed (***Trigonoceps occipitalis***; Kemp et al. 2020f) Vultures, and the Endangered Lappet-faced (***Torgos tracheliotos***; Kemp et al. 2020g) Vultures.

1. Situational Analysis (continued)

1.2 Globally Significant Species (continued)

African Skimmer *Rynchops flavirostris* Partial Intra-African migrant IUCN Red List: Least Concern © Photo R. MacDonald

Waterbirds

Water availability and quality are a primary concern for persistence of waterbirds, with population monitoring recommended for Southern African species (Tarakini et al. 2018). Vulnerability of waterbird species is influenced by diet and life history traits, with those consuming largest and smallest prey items more likely to have declining populations (Tarakini et al. 2021). Dependent on the consistent availability of non-polluted wetlands, waterbirds of particular concern are the Endangered Grey-crowned Crane and the Vulnerable Slaty Egret and Wattled Crane. Grey-crowned Cranes, impacted by wetland degradation, are also harvested for international trade, such that trapping and egg collection contribute to population declines (Archibald et al. 2020a). Regionally distributed Wattled Cranes are also impacted by power line collisions and poisoning in addition to the degradation of wetland habitat through human activities and agriculture (Archibald et al. 2020b). The Slaty Egret has a very limited spatial distribution, and its habitat is often impacted by the movement of mammalian wildlife and predators as well as fires and flood levels (Martínez-Vilalta et al. 2020). The Near Threatened Lesser Flamingo is also highlighted because of breeding habitat that is limited to a few isolated wetlands, some of which are located in KAZA. The Lesser Flamingos are affected by changing water levels and water quality in addition to proposed soda ash extraction (del Hoyo et al. 2020a). Destruction of nests by grazing livestock is a concern for some ground nesting species of waterbirds. Other regional species of lesser conservation concern also rely on wetland resources (e.g., African skimmer ***Rynchops flavirostris***; Rock Pratincole, Glareola nuchalis; Pel's Fishing Owl, ***Scotopelia peli***; Saddle-billed Stork, ***Ephippiorhynchus senegalensis***).

Grassland birds

Grassland birds of conservation concern include the Endangered Secretary bird, for which broad data monitoring is needed to fully assess apparent population declines (Kemp et al. 2020h), and the Vulnerable Southern Ground Hornbill which is captured for trade and affected by human encroachment related to agriculture and forestry (Kemp and Boesman 2020). The Kori Bustard (***Ardeotis kori***), classified as Near Threatened, is also considered to be in decline as a result of habitat loss, powerline collisions, and hunting impacts (Collar and Garcia 2020). Management of hunted landfowl species is another potential area of future conservation efforts, including potential effects of lead ammunition use on predators. Expanding agricultural activity and livestock range often impinges on grassland habitat, as does inadequate wildfire management.

Kori Bustard *Ardeotis kori*
IUCN Red List: Near Threatened © Photo R. MacDonald

Southern Carmine Bee-eater *Merops nubicoides*
Intra-African migrant IUCN Red List: Least Concern
© Photo R. MacDonald

Woodland birds

A vast number of smaller, perching woodland species comprise the majority of the species biodiversity motivating the classification of IBAs within KAZA (Fishpool and Evans 2001; Table 1), including weavers, barbets, hornbills, sunbirds, and parrots. Many of these more cryptic species are more likely to be data deficient and therefore not always portrayed adequately by documented conservation status and threats. A few focal species of particular concern due to collection for international trade are included here. The limited distribution of the Vulnerable Black-cheeked Lovebird, around the Machile IBA, makes it a priority woodland species for KAZA (Collar and Boesman 2020). The Southern Carmine Bee-eater (***Merops nubicoides***) is a colonial burrow nester in cliffs subject to flooding and exploitation, and therefore also a conservation priority (del Hoyo et al. 2020b). Furthermore, around 60% of the Zambian Barbet (***Lybius chaplini***)'s distribution falls within KAZA. The species is classified as Vulnerable in the IUCN red list and is heavily threatened by habitat loss as its specialized savanna woodland habitat is converted for agriculture expansion. Logging activity provides a specific threat to cavity nesting woodland species as well.

Scientific Name	Common Name
Agapornis nigrigenis	Black-cheeked Lovebird
Agoapornis lilianae	Nyasa Lovebird
Anthreptes anchietae	Anchieta's Sunbird
Calamonastes fasciolata	Barred Wren-warbler
Calamonastes stierlingi	Stierling's Wren-warbler
Calamonastes undosus	Miombo Wren-warbler
Centropus cupreicaudus	Coppery-tailed Coucal
Cercotrichas barbata	Miombo Scrub Robin
Cercotrichas paena	Kalahari Scrub Robin
Cisticola pipiens	Chirping Cisticola
Coracias spatulatus	Racket-tailed Roller
Cossypha humeralis	White-throated Robin-chat
Eremomela atricollis	Black-necked Eremomela
Falco dickinsoni	Dickinson's Kestrel
Lagonosticta nitidula	Brown Firefinch
Lamprotornis acuticaudus	Sharp-tailed Starling
Lamprotornis australis	Burchell's Starling
Lamprotornis mevesii	Meves' Starling
Lanius souzae	Souza's Shrike
Lybius chaplini	Zambian Barbet
Lybius minor	Black-backed Barbet
Macronyx fuellebornii	Fuelleborn's Longclaw
Merops boehmi	Boehm's Bee-eater
Monticola angolensis	Miombo Rock Thrush
Muscicapa boehmi	Boehm's Flycatcher
Myrmecocichla arnoti	White-headed Black-chat / Arnot's Chat
Nectarinia manoensis	Miombo Sunbird
Nectarinia shelleyi	Shelley's Sunbird
Nectarinia talatala	Southern White-bellied Sunbird
Parus griseiventris	Miombo Tit
Parus rufiventris	Rufous-bellied Tit
Pinarornis plumosus	Boulder Chat
Plocepasser rufoscapulatus	Chestnut-backed Sparrow-weaver
Pterocles burchelli	Burchell's Sandgrouse
Serinus mennelli	Black-eared Seedeater
Stactolaema whytii	Whyte's Barbet
Sylvietta ruficapilla	Red-capped Crombec
Tockus bradfieldi	Bradfield's Hornbill
Tockus pallidirostris	Pale-billed Hornbill
Tricholaema frontata	Miombo Barbet
Turdoides hartlaubii	Angola Babbler
Turdoides melanops	Black-lored Babbler
Turdus libonyanus	Kurrichane Thrush
Vidua codringtoni	Twinspot Indigobird
Vidua obtusa	Broad-tailed Paradise Whydah

Table 1. Bird species of ornithological importance, restricted by range and/or biome (Zambezian biome), thereby determining unique high biodiversity areas for avian conservation, according to global IBA criteria, within KAZA.

1. Situational Analysis (continued)

1.3 Key Threats

The threats to avian biodiversity in KAZA are largely reflective of conservation concerns across Africa (BirdLife International 2018). Identification and classification of impacts on focal species was based on the scope and severity of threats identified in IUCN accounts, with modifications based on regional awareness of ornithologists and wildlife managers working within KAZA (Appendix A).

Miombo Woodland © Photo Ian Riddell

Primary threats affecting birds broadly with moderate scope and severity across focal groups include agricultural and livestock expansion into habitat, hunting and collection of birds and their eggs, exposure to agrichemicals and lead, and interactions with pylons and utility lines. Coupled with agriculture expansion is the indiscriminate cutting of hard wood species such as mopane (*Colophospermum mopane*) for charcoal production, in addition to other local species (e.g., Zambezian teak, *Baikaea plurijuga*).

Residential and urban expansion, along with developing transportation infrastructure also contribute to habitat degradation and loss. Additionally, habitat degradation related to infrastructure, agricultural, and residential expansion will require continued foresight for sustainable development, including growing efforts to promote ecotourism.

The greatest and most irreversible threat to avian biodiversity globally is projected changes in habitat availability and increasing water scarcity due to climate change. Water availability on non-breeding grounds is linked to adult survival in long-distance migratory species (Telensky et al. 2020). IBAs in Sub-Saharan Africa are projected to have some of the highest turnover rates for species of conservation concern in response to climate change, and a network of protected areas offers potential mitigation to preserve biodiversity (Hole et al. 2009). To this end, combined effort within the KAZA network provides a broad-scale strategic opportunity. A climate-linked habitat suitability reduction of 87% is projected for waterbirds in Africa (Breiner et al. 2022). In addition to diverse resident species, KAZA is an integral part of migratory flyways connecting southern Africa with varied habitats across Europe and Asia, demonstrating the importance of KAZA to global avian biodiversity. Response to projected climate change and increasing anthropogenic pressures underscore the necessity to coordinate conservation actions across the ecosystems on which migratory species depend, further highlighting the crucial role of KAZA partnerships.

Epidemiological threats associated with global connectivity appear to be relatively low currently. The presence of avian influenza via migratory pathways has not been identified within KAZA, and previous research suggests that its transmission in Sub-Saharan Africa is largely dependent on ecological conditions that are frequently suboptimal for pathogen persistence (Fusaro et al. 2019). Although reports of epidemiological concerns for avian biodiversity are minimal in KAZA, regional evidence suggests that panzootic impacts are underestimated; outbreaks in South African domestic and wild birds warrant consideration of responsive as well as proactive measures (Klaassen and Wille 2023).

In addition to cross-boundary movements of migratory birds motivating collaborative response, another especially difficult issue for transboundary management areas is Human-Wildlife Conflict (HWC; Stoldt et al. 2020). Such regional concerns for bird species involve intentional harvesting and poisoning pressures that are possible to deter, as well as international illegal wildlife trade requiring coordinated action. Management of HWC that presents an ongoing risk to avian species requires guidance and additional investment in monitoring, enforcement, and prevention.

Agricultural expansion, increased insecticide use, and logging are stressors that impact bird species globally, while additional threats associated with bird harvesting and belief-based use are more geographically defined (BirdLife International 2022). In addition to emerging concerns of potentially broad impact related to climate change, panzootics, and environmental contamination, details describing documented avian conservation threats within KAZA are outlined below.

Poisoning

Carcass poisoning is a critical threat to scavenger species, particularly vultures (Margalida et al. 2019). A related threat on livestock farms is poisoning that targets other scavenger species. As predators in surrounding areas increase, predation pressure on livestock is greater, and ranchers engage in retaliatory baiting of carcasses, intended to lure and kill predators. Carcasses unattended by carnivores are frequently consumed by scavenging birds, making incidental poisoning a unique threat of significant severity. Vultures comprise the most threatened taxonomic group, owing to their scavenging method of foraging and the propensity of sentinel poisoning by poachers harvesting parts of animals (e.g., elephant tusks) and seeking to prevent vultures from drawing attention to carcass sites. Other scavenging species of raptors such as the Endangered Bataleur Eagle and Vulnerable Tawny Eagle are also susceptible to poisoning at carcasses. Overfishing and the indirect poisoning effects of fishing with treated mosquito nets contribute to reduction of aquatic prey resources for waterbirds and raptors (Larsen et al. 2021). Likewise, the use of avicides to reduce Red-billed Quelea populations in agricultural areas can have effects on non-target bird species in the area (Cheke et al. 2012).

Lappet-faced Vulture *Torgos tracheliotus* poisoning (Fort Rixon, Zimbabwe) IUCN Red List: Endangered
© Photo BirdLife Zimbabwe

The potential threat of lead exposure via ammunition in scavenged carcasses is unknown in KAZA; however, elevated lead levels in scavenging species in South Africa suggests evaluation of potential exposure effects, particularly to developing chicks, should be assessed in areas where lead ammunition is used for bovid hunting (Garbett et al. 2018, van den Heever 2019, van den Heever et al. 2022). Restrictions of lead ammunition use for waterfowl hunting is under review globally in response to contamination of wetlands (Ellis and Miller 2023). In addition to threats from impacted waterbodies, waterbirds are also susceptible to being intentionally poisoned where they are perceived as a threat to croplands or encounter tainted waters. Although poisoning can be extremely detrimental to affected populations, the potential to reverse the impacts through revision of ammunition and pesticide use, educational outreach, and awareness campaigns is promising.

Hunting and collecting

For various reasons, hunting and collecting present an important threat to birds in KAZA. In addition to harvesting birds for consumption, cultural perceptions of species can affect human-bird interactions and potential collection of birds, whether the species is seen as favorable (e.g., Grey-crowned Crane), its parts are thought to confer certain properties (e.g., vultures), or the species is valued in international trade markets (e.g., Southern Carmine Bee-eater) or for the pet trade (e.g., Black-cheeked Lovebird). Suspicions of ill-fortune portended by some species might also affect their hunting or harvest (e.g., Southern Ground Hornbill). Hunting and collecting of birds and their eggs are often driven by illegal markets. For example, the Carmine Bee-eater is a target for illegal trade and consumption in addition to belief-based use. This species is especially impacted by harvest due to its vulnerable nesting habits (del Hoyo et al. 2020b). Countering long-held beliefs or financial incentives associated with particular species could be an intermediate-duration strategy of raising awareness and focusing on identified hotspots of harvest and capture, in addition to establishing sustainable take limits for legally hunted species.

Habitat loss and degradation

Of the many stressors impacting avian biodiversity, habitat loss and degradation is the most ubiquitous and persistent threat, with various drivers influencing habitat quality across ecosystems. Among these drivers, impacts of projected climate effects on water availability for both resident and migrant species are likely to be underrepresented in documentation of observed population effects (e.g., Telensky et al. 2020). Agricultural expansion as a response to increasing human population needs reduces habitat availability for all types of species, but particularly impacts species in surrounding grasslands or in cases where crops might entice species in surrounding areas to forage on farms and be perceived as pests.

1. Situational Analysis (continued)

1.3 Key Threats (continued)

Habitat loss and degradation (continued)

Likewise, livestock expansion and overgrazing of pastures is most likely to impact grassland birds (e.g., Southern Ground Hornbill; Shito et al. 2020) in nearby areas. Agricultural expansion is a global threat to raptor populations and African vultures, and waterbird populations are also impacted by common stressors in the region resulting from human disturbance and encroachment of farming and ranching activities in addition to more dramatic threats inflicted by intentional and incidental poisoning (Ogada et al. 2016, Krüger et al. 2022). In addition to habitat modification by livestock, wildlife populations (e.g., elephants) can also alter grassland and woodland terrain, impacting resources available to avian species (Rushworth et al. 2018).

Some habitat threats do not impact all focal groups of birds but are reported frequently in certain ecosystems. Among these threats, logging can have a dramatic effect on raptors and woodland birds, particularly cavity-nesters, as well as some grassland species. Natural resource use reducing woodland habitat and water availability are the greatest threat to woodland species, including parrots, hornbills, weavers, and barbets. These resource-related impacts on functional biodiversity in birds are particularly dramatic in Southern Africa (BirdLife International 2022).

In addition to logging and agriculture and livestock expansion, birds are impacted by resource management practices altering hydrological regimes. Frequent threats among waterbirds, as well as birds reliant on savanna ecosystems, are those related to ecosystem management that impacts resource availability and water quality for many of the focal species groups (e.g., fire suppression, water use, mining, pesticide use, and introduction of invasive species). Recent years in KAZA have received anomalously low precipitation, and changes in temperature or water availability as a result of climate change is projected to have broad impacts on birds within KAZA, impacting both resident and migratory species. Residential and commercial development could also negatively impact biodiversity and resource availability as Africa is expected to see some of the highest rates of urban expansion and infrastructure development in areas that overlap Key Biodiversity Areas (BirdLife International 2022).

Martial Eagle *Polemaetus bellicosus*
IUCN Red List: Endangered © Photo C. Collyer

Future consideration

While many threats, such as alternative energy impacts or projected climate change, lack sufficient data and documentation within the KAZA area to assess population effects, their known effects elsewhere and projected local impacts prioritize them as potential threats to consider for future conservation assessment. The flight altitude of Southern African raptors, particularly vultures, increase their risk of collision with wind turbines (McClure et al. 2021). Additional threats, particularly for raptors, include electrical energy infrastructure (e.g., Martial Eagle) as well as proposed dam construction (e.g., Taita falcon). Data acquisition relevant to emerging conservation concerns should be included as sites and species are prioritized. Additional data acquisition is needed to accurately portray conservation threats for more cryptic species, particularly smaller woodland birds. The lasting and widespread impacts of projected climate change on Southern African birds is a primary concern for prioritizing conservation actions.

1.4 Opportunities

For individual species with existing conservation action plans, sharing protocols and monitoring plans provides added value to current approaches and improves the knowledgebase of threatened species across their distributions at meaningful spatial scales with standardized methodology. Likewise, existing monitoring protocols could be leveraged to document poaching, poisoning, and direct threats to listed species, which would ensure the effective allocation of law enforcement resources and monitoring activities to hotspots of concern.

For threats unique to certain habitat types, or species vulnerable to severe threats, conservation action plans often exist that could be updated or amended to be useful to the larger KAZA region. A Multi-species Action Plan to Conserve African-Eurasian Vultures (Botha et al. 2017) addresses severe threats to scavenger species. Documentation of poisoning hotspots and the establishment of Vulture Safe Zones have provided a means of creating and expanding protected areas with a focus on a specific conservation threat (Safford et al. 2019) until more widespread actions can be implemented (Kane et al. 2022). A Memorandum of Understanding on the Conservation of Migratory Birds of Prey in Africa and Eurasia was recently revised, documenting updates to strategic plans to improve the legal protection of raptors, important sites, and flyways and to promote habitat conservation and sustainable management (Pritchard 2020). Research and monitoring plans in 30 countries exist under the auspices of these efforts; however, most signatories are European countries. The Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) Plan of Action for Africa (2019-2027) seeks to strengthen the conservation and recovery of listed migratory waterbirds across four global flyways and ensure habitat quantity and quality through maintenance and restoration of protected areas. AEWA conservation guidelines are available for a broad range of topics including waterbird monitoring, sustainable harvest, wetland ecotourism development, and preparation of single-species action plans. Many international single-species action plans have been developed for waterbirds, including the Wattled Crane, Slaty Egret and the Lesser Flamingo (e.g., Childress et al. 2008, Tyler et al. 2012). Likewise, country-specific single-species action plans could be adapted to fit additional countries (e.g., Shito et al. 2020). Waterbird conservation actions within KAZA have been identified as education, law enforcement, and sustainable use guidelines in addition to increasing surface water availability and drinking troughs (Tarakini et al. 2018).

Additionally, working groups for species of concern provide an opportunity for sharing strategies and combining efforts. IUCN working groups that focus on relevant avian taxa include Specialist Working Groups for flamingos, vultures, hornbills, waterfowl, and storks among others (IUCN 2023). Collaborative efforts via different coordination platforms include crane monitoring efforts, biennial waterbird counts, Taita Falcon surveys, vulture monitoring of nesting sites and safe zone establishment, poisoning response training, and bird use and trade investigation. Continued collaboration on pathogen detection at the wild and domestic disease interface will also facilitate species protection. Regional examples of site-specific habitat preservation or restoration include the Kafue Flats restoration project and community involvement in the Sua Flamingo sanctuary.

Collection of monitoring data can be resource intensive, but existing repositories of bird data are publicly available and incorporate citizen science accounts of species sightings and locations. Variability in observer skill and accuracy as well as distribution of effort are potential sources of bias; however, data collected are particularly abundant in areas of ecotourism and environmental interest. Although spatial representation may under-represent residential areas or cryptic species, a reasonable portrayal of species distribution can be gleaned from these data given the quantity and duration of recorded observations. In addition to citizen science resources, a growing body of ornithologists in Southern Africa are able to contribute to more in depth and coordinated research related to bird conservation. Therefore, this strategic framework can also be considered an investment guide, prioritizing actions that have the potential to make the most impact on biodiversity conservation.

Southern Ground-hornbill *Bucorvus leadbeateri*
IUCN Red List: Vulnerable (Africa wide), Endangered in Namibia © Photo D. Dell

2. Priority Conservation Actions

2.1 Objective 1: Secure long-term conservation of sites important for birds and biodiversity

Site and habitat protection is broadly advisable, given the ubiquitous pressures of agricultural and industrial development as well as human recreational and infrastructure expansion. Among the most vulnerable habitats are wetlands, which are suffering from environmental pollution as well as unpredictable hydrodynamics that are further exacerbated by a changing climate.

Waterbodies provide critical foraging habitat for waterbirds and are essential for migrating wildlife. To ensure lasting preservation of biodiversity, restoration of wetlands must address water availability as well as water quality, which includes the management of agricultural and industrial effluents. Such runoff and contamination pollute regional waterbodies and can cause further habitat degradation by encouraging harmful algal blooms in areas of minimal water availability.

Red-billed Quelea *Quelea quelea*
IUCN Red List: Least Concern © Photo Ian Riddell

Additionally, long-term evaluation and planning for water management strategies is needed. Borehole placement and reallocation of water resources can dramatically change the landscape and resource availability for all species in the area. Likewise, dam construction and its potential impacts on available resources should also be considered in advance, particularly in cases like the Taita Falcon and Lesser Flamingo where the limited distribution of these species could be impacted. Expansion of human populations and infrastructure, to include increased tourism in remote areas, can increase demands on available water resources as well.

Likewise, grasslands provide critical habitat for savanna resident and migratory species. These areas are threatened by burning and fire management decisions in addition to expanding agricultural and residential areas. Ground breeding birds rely on these resources as do foraging raptors and woodland species. Logging practices further compromise available breeding habitat for woodland species, motivating promotion of sustainable wood harvest.

Invasive and problematic species control and management are also time-sensitive issues in which immediate action is prudent. Continued management of invasive plant and animal (e.g., Australian Red-claw Crayfish) species in waterbodies comprising vital habitat is important, as is the development of a management plan for the invasive Common Mynah and continued management of pest-species such as the Red-billed Quelea using methods that minimally impact other native species. Maintaining habitat quality to support diverse native species is frequently recommended in addition to direct removal procedures for invasive species.

Although water and fire management determinations lie beyond the purview of the bird sub-working group, the impacts relative to avian conservation are provided for further consideration. Widespread threats of habitat loss and degradation require a multinational and multidimensional response but are limited by the resources necessary to enact such action plans. Development of consistent transboundary management plans for fire response, forestry permitting, anti-poaching, and illegal trade law enforcement could motivate resource allocation to funding oversight of management activities. Likewise, consistent transboundary hunting and harvesting limits would facilitate the enforcement of management strategies relevant to the entire range of species, rather than impacting some locations within a species range more under variable national management.

Strategic interventions

Under this objective, indicated strategic interventions will focus on an improved understanding of risks to bird habitats across KAZA, especially those known for threatened and endangered species as well as habitat-restricted species. Accordingly, a suite of interventions aimed at securing bird habitats will be prioritized as will the risks identified for particular IBAs.

- Support IBA/KBA assessments to identify risks and determine the status of bird habitats, including measures to address the risks for Lake Ngami IBA which is currently categorized as an Important Bird and Biodiversity Area in danger.
- Recognize sites/habitats protected by communities.
- Protect habitat through initiatives such as fire management, control of invasive plants and animals, woodlands conservation, and sustainable management and utilization of wetlands.
- Identify pesticide use and potential runoff areas, for management, enforcement, and/or education, including use of treated mosquito nets for fishing.
- Mainstream wetland management practices that contribute to the protection of wading bird and waterfowl habitats and curb over-exploitation of water, plant, and fish resources in natural resource governance systems.
- Collect baseline survey data on priority bird species abundance and distribution as well as threats to these species at different sites.
- Monitor priority species distribution and movement through methods such as satellite telemetry.
- Sustain and expand community stewardship in natural resources conservation and management to cover all open areas within KAZA.
- Implement technologies available for spatial monitoring of critical habitat and species for data-based solutions.
- Support mainstreaming woodland management practices into natural resource governance systems that contribute to the protection of priority bird habitats and curb over-exploitation of forest resources.
- Implement initiatives that encourage shifts in livelihood practices to those that utilise and increase the values communities attach to species and ecosystem functions at project sites that are important habitat to priority bird species.

Key partners: BirdLife International and partners; VFWT, Wildlife authorities; NGOs and CBOs operating in the landscape; local communities; academic institutions; Scientific Services within Governments, Ministry of Agriculture, Water and Land Reform, DVS State Veterinarians, Rural district councils, Traditional Medical Practitioner Council

Grey-Crowned Crane Balearica regulorum
IUCN Red List: Endangered © Photo R. MacDonald

Wetland Restoration

Preservation of water sources prevents degradation in designated Ramsar sites which improves consistency of wetland habitat for migratory species as well as waterbirds with established single-species conservation action plans. Resources for surrounding communities and fishing villages are also improved. These sites protect biodiversity in surrounding grassland and woodland habitats and provide opportunities for population monitoring, sustainable resource use, and community engagement.

2. Priority Conservation Actions (continued)

2.2 Objective 2:
Reduce illegal killing and trade in birds, bird parts, and products

Illegal Wildlife Trade (IWT) motivates harvesting, poaching, and poisoning practices that are the primary threat to a number of bird species. IWT, specifically illegal trade in birds, bird parts, and products leads to extensive extrinsic mortality in some species. KAZA is both a source and transit region for various wildlife products and the extent of trade in birds and their body parts or products is not well known.

Transboundary enforcement of anti-poaching and trafficking laws could reduce illegal harvesting in some species, a strategy that would benefit from parallel strategic plans under development within KAZA.

In addition to addressing IWT-related poaching, collection and harvest associated with cultural belief systems should also be addressed as a driver of illegal hunting of particular bird species (discussed below under objective on awareness and communication). Another priority intervention under this objective relates to the challenge of sentinel poisoning, which requires community awareness creation and capacity building initiatives as well as training in the management of poisoning hotspots and linkages with wildlife crime investigations. Sentinel poisoning and attempted carnivore poisoning are severe threats to multiple endangered bird species but with the potential to reverse population declines quickly once the threat is removed. Timely response involves preventing poaching as well as raising awareness among livestock ranchers about the dramatic impacts on avian populations and ecosystem services that result from marginally effective attempts to lure predators to poisoned bait. Likewise, discussions about the belief-based use of parts of birds should address the lasting detrimental effect of overharvesting on culturally valued species.

Belief-based use Traditional Healers workshop in Matabeleland (Zimbabwe) in 2024 about vulture conservation to demystify myths and misconceptions about vultures in traditional medicine. © Photo BirdLife Zimbabwe

Strategic interventions

- Support initiatives to define consistent hunting limits across borders and to document illegal take in a central database.
- Collaborate with customs and border control measures to identify illegal wildlife products and help in investigations.
- Build partnerships to coordinate documentation efforts and develop mitigation measures from insights obtained from tagged birds (vultures) in cases of sentinel poisoning.
- Provide poison response training with wildlife authorities, communities, and other stakeholders and establish Poison Response Teams amongst communities.
- Support initiatives to mainstream and integrate law enforcement efforts and awareness about illegal wildlife trade of birds and their body parts.
- Support initiatives to mainstream law enforcement efforts to document known cases of intentional poisoning.
- Support local government authorities in strengthening and implementing regulations against import and sale of poisons, pesticides, rodenticides.
- Collaborate with conservation groups focused on other species impacted by poisoning.
- Establish Vulture Safe Zones backed by some statutory instruments (SI) and gazetted as such in the respective member states. The SI should be binding and enforce compliance.
- Increase awareness about the actual impacts of wildlife poisoning as a necessary first step in reducing extrinsic mortality from poisoning.

Training of bird guides to expand ecotourism in Zambia © Photo BirdLife Zimbabwe

Key partners: *TRAFFIC, WWF, Endangered Wildlife Trust, Victoria Falls Wildlife Trust, BirdLife Partners, International Crane Foundation and partnerships, community groups, Traditional Medicinal Practitioner Council*

Gwayi Environmental Conservation Area (GECA) Vulture Safe Zone launch in 2023 (Zimbabwe). GECA is important as a buffer zone to Hwange National Park KBA. Establishment of VSZs promotes connectivity across landscapes eg. Gwayi connects important sites within the KAZA region. © Photo BirdLife Zimbabwe

Vulture Safe Zones

Establishing safe breeding, roosting, and feeding areas for vultures provides protection, population monitoring opportunities via vulture support groups, educational campaigns, and community engagement. These targeted protective efforts are a preliminary measure of reducing mortality and increasing awareness in portions of the species range.

2. Priority Conservation Actions (continued)

2.3 Objective 3: Research and Monitoring

The need for species data is paramount. While the strategy herein broadly defines focal groups of birds and habitat- or species-specific threats, many species are data deficient or lack the long-term research to allow evaluation of population trends or estimation of population size.

This lack of knowledge precludes the identification of serious impacts in terms that are sufficient to define the scope and severity of known threats or to objectively determine changes in conservation status. Changes in species distribution have been documented for many species, and given the anticipated changes in habitat quality as well as water availability and demand, documentation of spatial distribution and population trends is of utmost importance for strategic intervention.

Critical wildlife needs requiring immediate response have garnered the majority of conservation attention, and efforts to mitigate HWC have been prudently prioritized. Widespread loss of avian biodiversity on a continental scale has been documented elsewhere among relatively common species even without targeted or severe threats to population persistence (Rosenberg et al. 2019).

Long-term datasets and monitoring are required to detect gradual population decline of more cryptic and common species. To this end, targeted species monitoring programmes could be expanded across IBAs in the KAZA region, and citizen science data resources such as eBird, BirdLasser, SABAP, etc. could be analyzed for trends in abundance and distribution over time. Tracking migrant species of concern would provide additional spatial insights on habitat use and potential threats encountered in other portions of their range (e.g., breeding season habitat constraints or threats outside of the KAZA region that impacts populations).

Information about specific threats also provides a means of prioritizing response efforts or sites. For example, maps of projected climate-related changes in species distribution based on habitat suitability (e.g., BirdLife International) enable planning for maximum impact of future conservation or restoration projects. Additionally, continued testing for emerging pathogens of concern could identify epidemiological threats early in their transmission. Likewise, assessment and documentation of lead levels in scavenging species, particularly near known areas of lead ammunition use, might reveal hotspots of potential poisoning for both birds and humans. Increased knowledge about threat distribution and severity throughout KAZA facilitates efficient and targeted action.

Capacitation of bird guides in Zambezi, Namibia in 2024 will assist with research and data collection © Photo BirdLife Zimbabwe

Strategic interventions

Under this objective, strategic interventions will focus on updating information about bird species distribution, estimated population size, and establishing data to determine population trends and local threats, such that current conservation status and priority focal species can be determined.

- Exchange standardized data among collaborating partners through a central repository, fostering knowledge sharing, bridging gaps, and facilitating the dissemination of valuable lessons and best practices.
- Conduct range, habitat, and movement studies to understand population connectivity of the bird species in KAZA.
- Conduct long-term population monitoring of key species including associated capacity building measures of local wildlife authority staff and communities as appropriate.
- Develop and conduct baseline surveys to understand the poisoning risk in targeted areas within KAZA.
- Partner with institutions to deploy appropriate tracking technology for the collection of real-time bird movement data.
- Assess the status, pressures, threats, and responses of IBAs/KBAs in KAZA, leveraging the network and methodologies of Birdlife International.
- Consolidate existing bird movement data into one rich dataset for further analysis to understand connectivity better, e.g., movement of vultures across KAZA.
- Identify Vulture Safe Zones as components of wildlife dispersal areas (WDA) or other effective area-based conservation measures (OECM).
- Consult existing resources and reports (e.g., Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Birdlife International's State of the World's Birds) on global conservation status) for updated information.

Bird guide training of local guides in Kafue National Park, Zambia in 2024 will assist in securing long-term population monitoring of key species © Photo BirdLife Zimbabwe

Key partners: Birdlife partners in KAZA Partner States, Universities and research institutions (Okavango Research Institute, University of Namibia), Birdlife organisations, Namibia Nature Foundation, World Wildlife Fund, International Fund for Animal Welfare, Lupane State University

European Roller *Coracius garrulus* IUCN Red List: Least Concern © Photo A. MacDonald

Monitoring Species of Lesser Concern

Migratory indicator species, such as the European Roller, are monitored in areas where habitat fragmentation is a concern, as is determining the minimum viable area for savannah and woodland species. Global conservation perspectives for more common species could be effectively updated with local research and data collection targeted toward specific concerns about unique ecosystems such as teak and mopane forests.

2. Priority Conservation Actions (continued)

2.4 Objective 4: Awareness and Advocacy

Incidents of HWC or illegal trade require diligent enforcement as well as the opportunity for raising awareness about the long-term impacts of harvesting on the resources collected or the misuse of pesticides and poison in agriculture and livestock management.

Practices impacting avian habitat or sustainable resource use might initially be addressed with discussions about agrichemical use and effects, forest management practices, or control of pest species.

Concurrent strategic plans are under development within KAZA to identify alternative livelihoods and reduce financial incentives motivating illegal harvest and trade. Likewise, parallel development of anti-poaching law enforcement can be linked to data monitoring for avian species to add value to these endeavours. Standardizing objective timelines across strategic plans will optimize the utility of shared information within targeted conservation action plans. Land management and resource allocation are issues involving multiple stakeholders and perspectives, and the impacts of, e.g., fire and water management, on avian habitat availability are decisions in which the stakeholder group can advocate in future discussions.

Training of local bird guides in Botswana in 2025 involved discussions around nature resource management © Photo BirdLife Zimbabwe

Strategic interventions

- Promote initiatives that encourage shifts in livelihood practices to those that utilise resources and increase the values communities attach to species and ecosystem functions in IBA and sites important to priority bird species.
- Implement a regional communication and education strategy.
- Encourage community-based monitoring of birds, e.g., woodland and wetlands birds, as a strategy to create awareness and advance stewardship. Instruction could also target school children as part of their extra-curricular activities.
- Increase awareness of the impacts of poisoning and overharvesting on bird populations.
- Promote initiatives that increase enforcement of natural resource management and habitat protection.

Involving anti-poaching unit personnel in bird guide trainings to increase data monitoring and enforcement of habitat protection in Kafue National Park, Zambia, 2024 © Photo BirdLife Zimbabwe

Key partners: *Birdlife partners in KAZA Partner States, Speak Out for Animals – Zimbabwe*

Initiatives that encourage shifts in livelihood practices and provide options are necessary in many of KAZA's water bodies. © Photo BirdLife Zimbabwe

2. Priority Conservation Actions (continued)

2.5 Objective 5: Community Stewardship

Community stewardship in natural resources conservation and management has long been promoted in the KAZA Partner States to different degrees with the support of legal and policy frameworks which have given rise to community governance and management structures and deliberate effort towards stronger rights and beneficiation mechanisms.

While information sharing and a unified approach to conservation solutions is crucial for the greater TFCA, both the problems and the means to implement solutions will vary by location. Guidance from both global conservation efforts and regional resource management representatives allows realistic targets for action plans and evaluation of progress. Prioritizing and addressing specific conservation concerns requires unique implementation of strategies based on the differing needs of the communities comprising KAZA. Tailoring conservation approaches to both the available resources and the primary challenges of each location improves efficiency and relevance of targeted responses. Likewise, leveraging available expertise and including stakeholders in planning encourages broad investment in actionable plans and strategies. Input from policy advocates, private sector representatives, and local citizens with awareness of the specific issues fosters stewardship towards a common goal.

Decisions implemented with the support and involvement of local stewards are more likely to be long-term sustainable solutions. Campaigns to increase awareness about threats to biodiversity can also include solution-oriented options for mitigating human impacts of natural resource use and agricultural activities without compromising socioeconomic stability. Long-term strategic interventions should define specific actions in support of climate change response, sustainable agricultural practices, and sustainable economic opportunities. Presently, much of this work has tended to focus on megafauna and to a lesser degree on other assets such as range and forest resources, fisheries, and bird life. Community stewardship initiatives that integrate avian conservation are also likely to strengthen efforts such as habitat protection which have wider relevance to conservation beyond bird populations. Working with communities in productive landscapes the aim is to formally secure key sites and improve sustainable management and connectivity of the natural environment while promoting the wise use of resources and improving livelihoods. To this end, the current strategy is an opportunity to strategically integrate avian conservation in ongoing community conservation initiatives, including associated opportunities of leveraging the Great KAZA Birding Route, to promote tourism as well as other opportunities outlined in the livelihoods strategy.

Capacity building of community environmental stewards in Hwange Key Biodiversity Area, Zimbabwe © Photo BirdLife Zimbabwe

Strategic interventions

- Promote stronger inclusion of bird conservation in community-based natural resource management (CBNRM) efforts that foster socioeconomic stability.
- Form strategic alliances among local stakeholders to address conservation priorities and leverage available knowledge and capacity towards the goal of community stewardship.
- Develop baseline data on priority focal species' population status and threats collected for each project site.
- Implement projects to improve ecosystem services project sites, which are sites important to priority bird species and local communities (e.g., KAZA birding route and local guide training for community empowerment).
- Support awareness-creation initiatives to reinforce indigenous knowledge systems and the improvement of knowledge, attitudes, and practices.
- Promote sustainable/climate smart agriculture practices to reduce the clearing of additional land for agriculture.
- Work with communities to secure key sites and improve sustainable resource management and local opportunities (e.g., ecotourism).
- Build capacity in avian and ecological research including citizen science support.

Training of local bird guides in Kafue National Park, Zambia in 2024 will assist to promote avian biodiversity © Photo BirdLife Zimbabwe

Key partners: *Birdlife International and partners, Namibia Nature Foundation, Integrated Rural Development and Nature Conservation, World Wildlife Fund, African Parks, Peace Parks Foundation, Namibian Chamber of Environment, KAZA partner states, Community-Based Natural Resource Management organisations, Local fishermen, farmers, and ranchers, private sector stakeholders, strategic policy advocates*

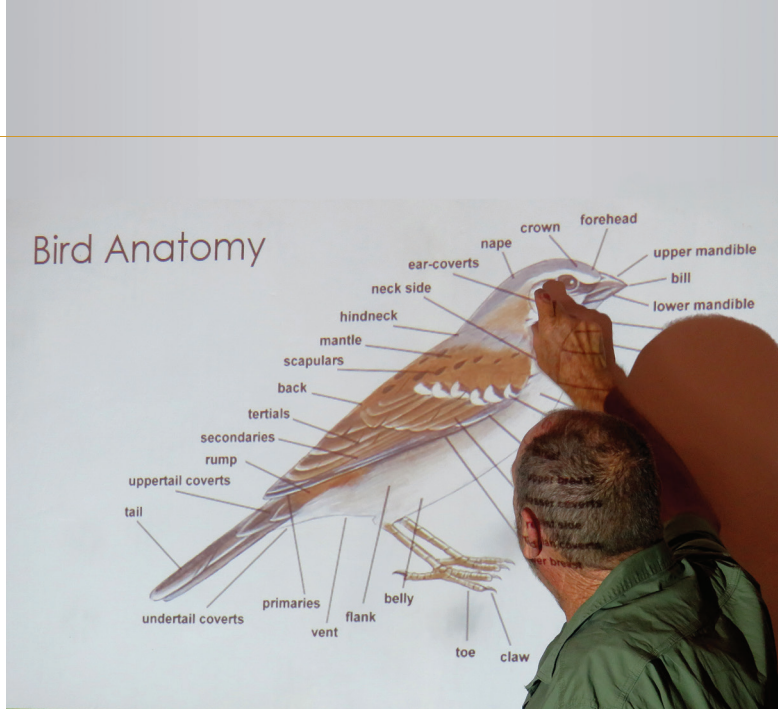
Strategic partnerships were harnessed for the rolling out in the Okavango Delta in Botswana of bird guide trainings in 2025 © Photo BirdLife Zimbabwe

Great KAZA Birding Route

Highlighting the avian biodiversity in the area and the recognizing global interest from the birding community, this network facilitates ecotourism connectivity throughout the year within KAZA, reducing pressure on highly visited areas, and providing access to unique birding opportunities across different ecosystems, tourism providers, and partner countries.

3. Partnerships

Beyond the partners identified in relation to strategic interventions, KAZA Secretariat will continue to build and reinforce partnerships aimed at leveraging resources, core-competencies, and expertise as well as strategic roles of potential partners in advancing mutual objectives of securing bird habitats, species, and populations in KAZA.



Partnering in bird guide training in Zambezi, Namibia in 2024 to advance the objective of securing bird habitats, species and populations in the KAZA TFCA. © Photo BirdLife Zimbabwe

Threat and Risks	Potential Partners
Poisoning	Endangered Wildlife Trust; Victoria Falls Wildlife Trust; International Crane Foundation, Liz Komen from Narrec (Namibia Lead Poisoning)
Illegal Trade	TRAFFIC; WWF; Birdlife International; NGO's, Rooikat (Namibia)
Habitat loss/fragmentation	Research institutions, planning authorities, communities, NGOs and CBOs, farmers, Wild Bird Trust;
Community stewardship	Community-based organisations (Conservancies, Trusts, Resource Boards, etc). traditional leaders, local government authorities, wildlife and other resource management authorities, schools/teachers, farmers, BirdLife partners

KAZA Secretariat

Birdlife International

INBAC- Ministério da Cultura Turismo e Ambiente

(MCTA) – Angola

BirdLife Botswana

Department of Wildlife and National Parks (DWNP) – Botswana

Ministry of Environment, Natural Resources Conservation and Tourism (MENT) – Botswana

Department of Environmental Affairs (DEA) – Botswana

Ministry of Environment, Forestry and Tourism (Natural Resource Management and Utilization) – Namibia

- **Directorate:** Scientific Services
- **Directorate:** DWNP (Department of Wildlife and National Parks)
- **Directorate:** Forestry

UNAM – Namibia

NUST – Namibia

BirdWatch Zambia

Department of National Parks and Wildlife – Zambia

International Crane Foundation – Zambia

Manchester Metropolitan University – Zambia

Sioma Ngwezi National Park – Zambia

BirdLife Zimbabwe

Zimbabwe Parks and Wildlife Management Authority (ZimParks) – Zimbabwe

National University of Science and Technology (NUST) – Zimbabwe

Gwanda State University – Zimbabwe

BirdLife South Africa

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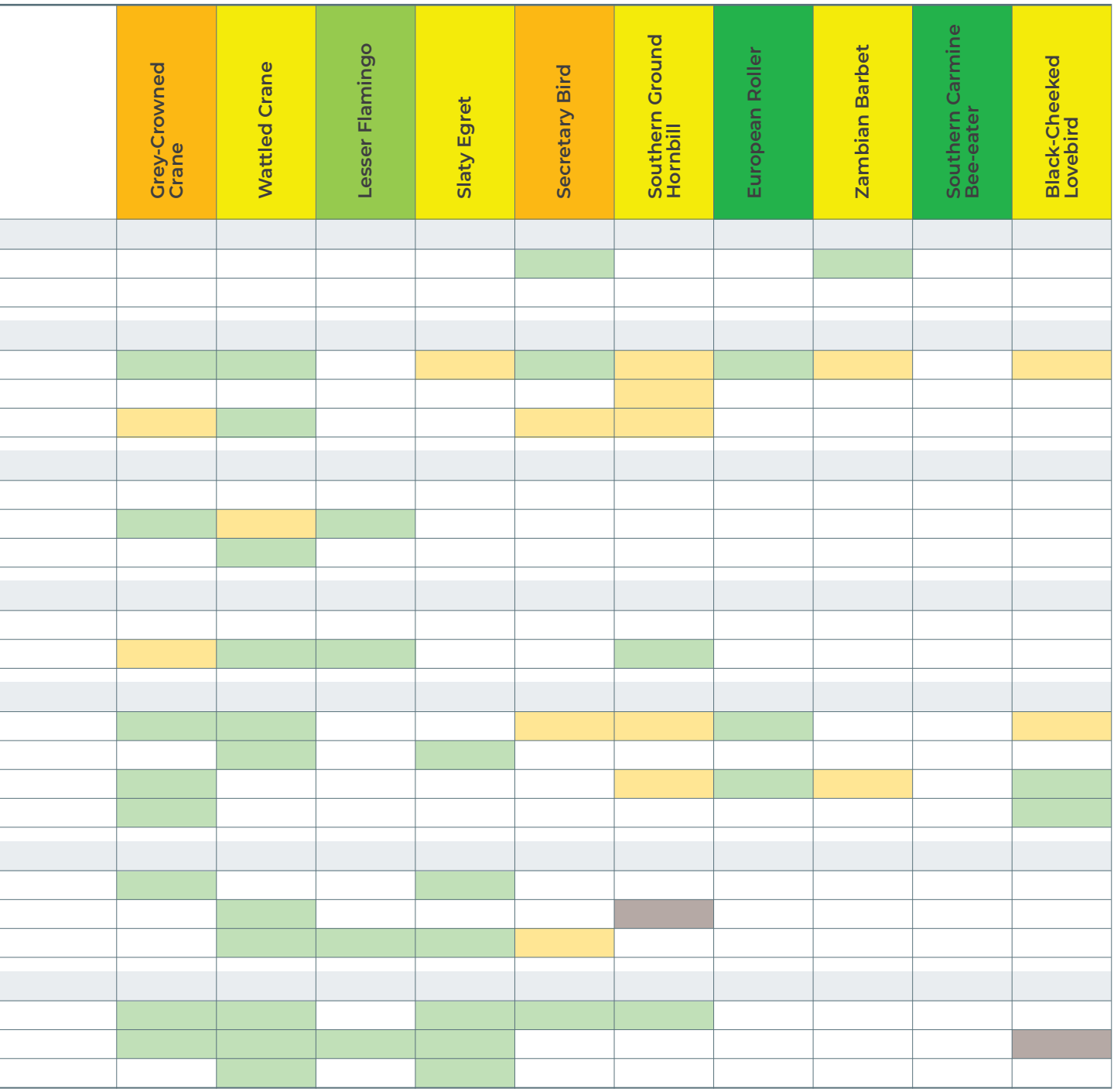
Appendix A.

Threat rankings used to classify conservation status of representative focal species in the KAZA area

Both IUCN conservation status (Least Concern, Near Threatened, Vulnerable, Endangered, and Critically Endangered) and threat rankings (data deficient, moderate, high, and extreme) are presented on scales of green to red with grey indicating known threats of unknown scope and/or severity. Status and threats are based on available global assessments and might not adequately represent local observations and priorities within KAZA or recent changes in threat evaluation.

CMP Direct Threats Classification v 2.0 Classification Levels		White-backed Vulture	Martial Eagle	Steppe Eagle	Taita Falcon	Red-footed Falcon	
1.	**Residential & Commercial Development**						
1.1	Housing & Urban Areas						
1.2	Commercial & Industrial Areas						
2.	**Agriculture & Aquaculture**						
2.1	Annual & Perennial Non-Timber Crops						
2.2	Wood & Pulp Plantations						
2.3	Livestock Farming & Ranching						
3.	**Energy Production & Mining**						
3.1	Oil & Gas Drilling						
3.2	Mining & Quarrying						
3.3	Renewable Energy						
4.	**Transportation & Service Corridors**						
4.1	Roads & Railroads						
4.2	Utility & Service Lines						
5.	**Biological Resource Use**						
5.1	Hunting & Collecting Terrestrial Animals						
5.2	Gathering Terrestrial Plants						
5.3	Logging & Wood Harvesting						
5.4	Fishing & Harvesting Aquatic Resources						
6.	**Human Intrusions & Disturbance**						
6.1	Recreational Activities						
6.2	War, Civil Unrest & Military Exercises						
6.3	Work & Other Activities						
7.	**Natural System Modifications**						
7.1	Fire & Fire Suppression						
7.2	Dams & Water Management / Use						
7.3	Other Ecosystem Modifications						

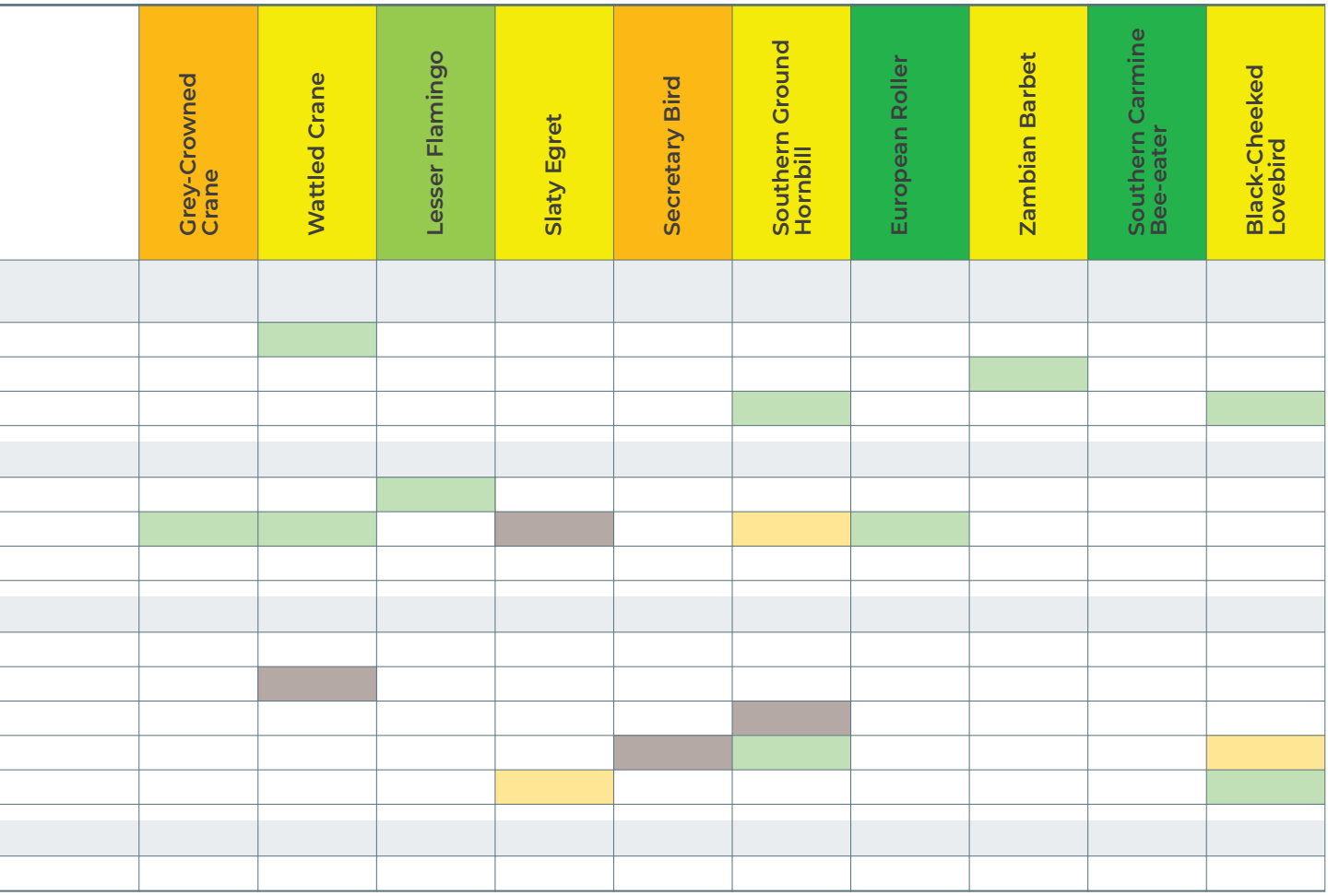

Grey-Crowned Crane
Wattled Crane
Lesser Flamingo
Slaty Egret
Secretary Bird
Southern Ground Hornbill
European Roller
Zambian Barbet
Southern Carmine Bee-eater
Black-Cheeked Lovebird

Appendix A. (continued)

Threat rankings used to classify conservation status of representative focal species in the KAZA area (continued)

CMP Direct Threats Classification v 2.0 Classification Levels	White-backed Vulture	Martial Eagle	Steppe Eagle	Taita Falcon	Red-footed Falcon	
8. Invasive & Problematic Species, Pathogens & Genes						
8.1 Invasive Non-Native / Alien Plants & Animals						
8.2 Problematic Native Plants & Animals						
8.3 Viral/prion-induced Diseases						
9. Pollution						
9.1 Industrial & Military Effluents						
9.2 Agricultural & Forestry Effluents						
9.3 Garbage & Solid Waste						
10. Climate Change						
10.1 Ecosystem Encroachment						
11.2 Changes in Geochemical Regimes						
11.3 Changes in Temperature Regimes						
11.4 Changes in Precipitation & Hydrological Regimes						
11.5 Severe / Extreme Weather Events						
12. Other						
12.1 Poisoning						

CR EN VU NT LC


Grey-Crowned Crane
Wattled Crane
Lesser Flamingo
Slaty Egret
Secretary Bird
Southern Ground Hornbill
European Roller
Zambian Barbet
Southern Carmine Bee-eater
Black-Cheeked Lovebird
DD
Mod
High
Ext

Appendix B.

Critical threats to KAZA bird species and strategic interventions identified by the Bird Sub Working Group

Implementation of targeted approaches and timelines will be further defined in conjunction with other KAZA Sub Working Groups as appropriate (e.g., Forestry, Carnivores, Safety and Security).

Critical issues	Components	Approach
Mass poisoning of scavenger species	Intentional sentinel poisoning at poaching sites	Enhance implementation of national and transboundary enforcement of anti-poaching strategies and policy
	Incidental poisoning at baited livestock carcasses	Increase awareness of impacts on vulture population and shortcomings in curtailing predation
Hunting and collecting of eggs and bird species	Unregulated harvest for international trade	Transboundary enforcement of combating illegal trade policy
	Belief-based harvest of parts	Increase awareness of impacts on culturally valued species
	Sport hunting exceeding regulated limits	Improve national enforcement of harvest limits
Human expansion and disturbance	Commercial and industrial development	Habitat protection through international legislation, integrated development plans and national compliance
	Housing and urban development	Habitat protection through international legislation, integrated development plans and national compliance
	Recreational activity disturbance	Foster sustainable tourism and recreation practices
Water pollution	Pesticides and agricultural effluent	Encourage transboundary information exchange on pesticide use near IBAs; Encourage national enforcement of pesticide regulation and use
	Mining and quarrying effluent	National enforcement of mining practices
	Invasive aquatic plant species	Continued mechanical and biological removal of plants

Lead Coordinator	Implemented by:	Timeframe (immediate, medium, or long term)
KAZA Secretariat	KAZA Partner States under the auspices of the Bird Conservation Sub Working Group (ornithologists) & the wildlife law enforcement officers through the Safety and Security Working Group (SSWG)	Immediate
Partner States	Partner States under the auspices of the Bird Conservation Sub Working Group (ornithologists) & the wildlife law enforcement officers through the SSWG	Immediate
KAZA Secretariat	Partner States under the auspices of the Bird Conservation Sub Working Group (ornithologists), CITES Scientific and management authorities through the SSWG	Medium
Partner States	Partner States under the auspices of the Bird Conservation Sub Working Group (ornithologists) & the wildlife law enforcement officers through the SSWG	Immediate
Partner States	Partner States under the auspices of the Bird Conservation Sub Working Group (ornithologists) & the CITES scientific and management authorities	Medium
Partner States	KAZA Partner States under the auspices of the Bird Conservation Sub Working Group (ornithologists) and, where applicable, Legal Working Group & SSWG	Long-term
KAZA Secretariat	KAZA Partner States under the auspices of the Bird Conservation Sub Working Group and, where applicable, Legal Working Group	Long-term
KAZA Secretariat	KAZA Partner States under the auspices of the Bird Conservation Sub Working Group (ornithologists/ecologist) & where applicable, the Tourism and Communications Working Group (T&CWG)	Medium
Partner States	Partner States	Medium
Partner States	Partner States through environmental management department	Medium
Partner States	Partner States through aquatic ecologists	Immediate

Appendix B. (continued)

Critical threats to KAZA bird species and strategic interventions identified by the Bird Sub Working Group (continued)

Critical issues	Components	Approach
Agricultural expansion	Expansion of cropland	Foster sustainable agriculture practices
	Expansion of livestock ranching	Foster sustainable ranching practices
Habitat loss or degradation	Illegal logging and wood harvest	Transboundary enforcement of combating illegal logging and forest crimes
	Legal logging with unsustainable limits	Review transboundary forestry policies; National harvest enforcement protocols
	Domestic wood harvest	Foster sustainable forestry practices
	Unplanned Fires	Transboundary development and enforcement of fire management strategies
	Water management and availability	Advocacy for transboundary development of water management strategies (e.g., borehole allocation or flooding); Assessment of impacts on listed species
	Dam construction	Transboundary assessment of habitat accessibility for listed species
	Invasive species management	Develop management plan for response to Common mynah
Data collection and monitoring	Population size	Initial data mining from open sources to be improved by shared monitoring protocols for focal species
	Population trends	Initial data mining from open sources to be improved by shared monitoring protocols for focal species
	Spatial distribution	Transboundary use of monitoring protocols for focal species; Tracking studies for focal species

Lead Coordinator	Implemented by:	Timeframe (immediate, medium, or long term)
Partner States	Partner States	Medium
Partner States	Partner States	Medium
KAZA Secretariat	Partner States under the auspices of the Forestry Sub Working Group (FSWG) through forestry law enforcement officers	Immediate
KAZA Secretariat	Partner States under the auspices of the FSWG	Medium
KAZA Secretariat	Partner States under the auspices of the FSWG	Medium
KAZA Secretariat	Partner States under the auspices of the FSWG	Long-term
KAZA Secretariat	Partner States under the auspices of the Freshwater and Fisheries Sub Working Group	Long-term
KAZA Secretariat	Partner States under the auspices of the Freshwater and Fisheries Sub Working Group	Long-term
KAZA Secretariat	Partner States under the auspices of the Bird Conservation Sub Working Group	Medium-term
KAZA Secretariat	Partner States under the auspices of the Bird Conservation Sub Working Group and the KAZA Impact Monitoring (KIM) Working Group	Medium
KAZA Secretariat	Partner States under the auspices of the Bird Conservation Sub Working Group and the KIM Working Group	Long-term
KAZA Secretariat	Partner States under the auspices of the Bird Conservation Sub Working Group (ornithologists) and the KIM Working Group	Medium

Appendix C.

Examples of existing action plans and legislative agreements relevant to bird conservation in KAZA

No.	Document title	Date of Publication	Period of validity	Country
	Species Review Wattled Crane (IUCN SSC Crane Specialist Group – Crane Conservation Strategy)	2019		
	International Single Species Action Plan for the Conservation of the Grey-crowned Crane (AEWA GGC International Working Group)	2015, updated 2019		
	International Single Species Action Plan for the Conservation of the Lesser Flamingo (CMS/AEWA)	2008, updated 2022		
	International Single Species Action Plan for the Conservation of the Slaty Egret (CMS/AEWA)	2012, update in progress for 2024		
	Multi-species Action Plan to Conserve African-Eurasian Vultures (CMS Raptors)	2017	**10 years**	All vulture range states
	Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) Plan of Action for Africa		**2019-2027**	
	Conservation Strategy and Action Plan 2020-2021: Southern Ground-Hornbill	2020	**2021-2022**	Zimbabwe
	Zimbabwe Vulture Action Plan	2019		Zimbabwe

Fostering community involvement in avitourism in Zambia in 2024 will promote bird monitoring and stewardship © Photo BirdLife Zimbabwe

Bateleur *Terathopius ecaudatus*
IUCN Red List: Endangered © Photo N. Cerrrano


kaza
Kavango Zambezi Trans Frontier
Conservation Area
Angola
Botswana
Namibia
Zambia
Zimbabwe