African Vultures SAFE Action Plan for 2022-2027

Background

African vultures play a key role in disease control and waste removal that is critical for the stability of the ecosystems in which they live. In addition to their ecosystem service role, the threats to their survival and their conservation needs also overlap heavily with a number of other key species, such as African elephants and lions, and they are thus an ideal group of species to focus on for wide-reaching, landscape-level conservation efforts. The plight of African vultures has only recently been recognized, but rapid declines have been noted for almost all species in the African continent. This has led to the up-listing of nearly all the African vulture species on the IUCN Red List with initial up-listing in 2012 and further up-listing in 2015. Denver Zoo, North Carolina Zoo, and San Diego Zoo Global proposed African Vultures as a SAFE program in February 2017, which was accepted in August 2017. The initial action plan was completed in February 2018 and used through February 2022 (after we were given a one year extension due to delays associated with the Covid-19 pandemic). This action plan is intended to be used from February 2022 to February 2025.

Conservation Target: Species Included in the Action Plan and their IUCN Status

The following species have been selected as the conservation target for this plan.

Common Name	Scientific Name	IUCN Status
Cape Vulture	*Gyps corprotheres*	Vulnerable
Hooded Vulture	*Necrosyrtes monachus*	Critically endangered
Lappet-faced Vulture	*Torgos tracheliotus*	Endangered
Ruppell's Vulture	*Gyps rueppelli*	Critically endangered
White-backed Vulture	*Gyps africanus*	Critically endangered
White-headed Vulture	*Trigonoceps occipitalis*	Critically endangered

All species are considered CITES Appendix II.

African vulture species function as a scavenging guild with each species providing unique adaptations necessary to find and dispose of carrion collectively. As such, it makes more sense to focus conservation efforts on a suite of African vulture species rather than a single species. This subset of African vultures was selected for the SAFE program for a number of reasons. First, these are the most common African vulture species found in AZA institutions. Second, a number of zoos already had conservation initiatives linked to these species at the time of the submission of the proposal for African Vultures as a SAFE program. Finally, these species have a large amount of overlap in their geographic distribution (with the exception of Ruppell's and Cape Vultures) and share similar threats and conservation needs. Our program can thus focus on a few key activities that can have a positive effect on all six species considered here.

Our initial target areas were Botswana, Kenya, South Africa, and Tanzania (as highlighted in red in the map below) as these were where current programs from our partners were most active and also represent areas with significant populations of the target species. In this new action plan, our focus has shifted to Kenya, South Africa, and Tanzania. However, we

plan to expand and fill gaps in knowledge in other key geographic areas both within the current countries outlined and in new countries as well. In particular, priority countries for expanded efforts would include Angola, Mozambique, Namibia, Uganda, Zambia, Ethiopia and Zimbabwe, where current information is limited but where significant vulture populations are expected to occur.

Vision

The vision of this action plan is to improve the population status of all six target species in at least 25% of their African distribution by 2040. Areas of focus would be southern Tanzania, central Kenya, and South Africa.

Program Participants

Program Leader: Corinne Kendall, North Carolina Zoo

Vice Program Leader: Molly Maloy, Denver Zoo

Additional Steering Committee Members:

Nicole Chaney, Cheyenne Mountain Zoo
Ann Knutson, Dallas Zoo
Megan Victoriano, St. Augustine Alligator Farm Zoological Park
Kelsey Kriesch, Zoo Atlanta
Estelle Sandhaus, Santa Barbra Zoo
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WCC Liaison: Lisa Kelley, St. Louis Zoo

Raptor TAG advisor: Beau Parks, San Diego Zoo Global

Field Partners: Wildlife Conservation Society (WCS), The Peregrine Fund, Lion Landscapes (LL), Frankfurt Zoological Society (FZS), VulPro

Advisors: Darcy Ogada (The Peregrine Fund), Kerri Wolter (VulPro), Evan Buechley (The Peregrine Fund), Claire Bracebridge (North Carolina Zoo)

Initial Program Partners: Brandywine Zoo, Cheyenne Mountain Zoo, Dallas Zoo, Denver Zoo, Los Angeles Zoo, North Carolina Zoo, San Diego Zoo Global, St. Augustine Alligator Farm Zoological Park, St. Louis Zoo, Tracy Aviary, Zoo Atlanta

Status of Taxa within AZA Community

Five of the African Vulture species considered within this program are, at the time of writing, all a part of the Raptor TAG. However, four of the African Vulture species are likely to

be shifted to TAG monitored species as they do not meet current criteria for continued management at the SSP level. Rüppell's vulture will continue as an SSP and is considered a yellow level program. This is mostly due to the small number of individuals in the collection and the changes in the management of animal programs within AZA. However, a number of institutions have already successfully bred several of these species and there is potential to grow these populations and potentially for them to become SSPs again in the future. Despite this change in listing, the TAG will continue to work with African Vultures SAFE and all of our conservation partners to continue to support these captive programs and field initiatives.

While the total number of institutions currently displaying African vulture species is small, many AZA institutions house vulture or condor species from around the world and there is potential to use these non-African vulture species as ambassadors for the African vulture SAFE program. In addition, because of the close connection between African vulture conservation and the needs of lions and other carnivores, we hope that partners may utilize these connections such that even institutions not housing African vultures might support the African Vultures SAFE program and its core messages.

Progress towards previous African Vulture SAFE Action Plan from February 2018 to August 2021

Strategic Objective 1. Continue and expand population monitoring of target vulture species

Population monitoring has been an important evaluation and monitoring tool for all four countries with different techniques and frequency of surveys as was deemed appropriate by each site. In Kenya, country-wide road surveys were conducted from 2010-2020 and compared to data from the 1970s resulting in a publication on population trends. From 2018-2020, twice yearly aerial surveys, plus one survey in 2021, of three of the largest breeding cliffs for Ruppell's vultures in Kenya covered an average of 155 nest sites and 936 individuals. Additional aerial surveys covered approximately 18 currently known or historical breeding sites. In Tanzania, approximately 700 km of surveys are completed one to four times per year (typically once in wet and once in dry season) from 2018 to 2021 in three critical protected areas, Ruaha, Katavi, and Nyerere National Parks. In Botswana, 15,000 km of road surveys were completed over a three-year time period throughout most of the country. In addition, 12 counts were made at Cape Vulture colonies in eastern Botswana. In South Africa, VulPro has consistently monitored 12 sites covering nearly 75% of the Cape Vulture population and over 2000 active nests, though surveys were limited by travel restrictions in 2020. Over 100 White-backed vultures and 11 Hooded vulture nests have also been monitored. Unfortunately, in Kenya, Botswana, and Tanzania there is evidence of declines and in South Africa there were mixed results depending on the colony. Vultures are still very much under threat of extinction.

Strategic Objective 2. Reduce poisoning prevalence

Poison response training for rangers and community trainings on the dangers of poisoning as well as constructing predator-proof bomas have been important tools for reducing poisoning prevalence, though this is hard to measure directly. In Kenya, 609 predator proof bomas have been built, 2398 community members and 512 professionals have been trained. In Kenya, community trainings as well as creating a network of 48 trained Lion Rangers has helped to increase patrolling and therefore reporting and response to poisoning events: 170 poisoning incidents were reported through this team, although only 6 involved vultures. In Tanzania, 229 rangers have been trained in several key areas. In Botswana, 11 Kgotla meetings have been held to discuss the impacts of poisoning.

One of the most effective ways to find poisoning events is through vultures tagged with telemetry units. Across Botswana, Kenya, and Tanzania, over 100 vultures have been tagged since 2018 (with 40 of these in Tanzania and 52 in South Africa). In Tanzania, tagged vultures provide useful information in addressing poaching and poisoning and the utility of this work has grown more sophisticated over time. Five clear poisoning events have been identified. In particular, mortalities discovered in and around Nyerere National Park have highlighted issues of bushmeat hunting, encroachment, and human-wildlife conflict, which will help guide future action there.

Strategic Objective 3. Improve knowledge of vulture biology

Cumulative work across the last 3.5 years from this partnership has resulted in 33 peer-reviewed publications with 4 additional papers currently in review. These papers contribute to our knowledge about vulture conservation as well as their movement, population trends, behavior, and ecosystem services. In addition, in Tanzania 32 vultures have been tested for lead as we build a better understanding of this threat in the country. Lead testing is also commonly conducted on rehabilitated vultures at VulPro, where further knowledge is being built about this threat. Tagged vultures from all four sites have also greatly contributed to our understanding of vulture ranging, habitat use, and overlap with threats like powerlines and poisoning. In South Africa, a large re-sighting database for tagged vultures has over 40,000 sightings and expands our knowledge of dispersal and mortality. Detroit Zoo and Saint Louis Zoo also worked closely with VulPro to develop a new tool to monitor cholinesterase which may allow for monitoring of pesticide exposure in live birds. VulPro also has several on-going health studies using their captive vulture populations in South Africa. St. Louis Zoo, in partnership with North Carolina Zoo, also conducted a systematic review of causes of disease and death in vultures worldwide.

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Publications in Review

1. Aspenström S*, Kemp R*, Howard A, Hannweg, CG, Chetty K, Briers RA & Wolter K. *(submitted*) The threat of power lines on two African Vulture species. *Biodiversity and Conservation* (* co-first authors)

2. Bromfield M, Webster K, Hannweg CG, Kemp R & Wolter K. (*submitte*d) A GIS investigation of terrain and topographic characteristics at Cape Vulture (Gyps coprotheres) power line hotspots within the Eastern Cape, South Africa.

3. Kane A, Monadjem A, Bildstein K, Botha A, Bracebridge C, Buechley ER, Buij R, Davies JP, Diekmann M, Downs C, Farwig N, Galligan T, Kaltenecker G, Kelly C, Kemp R, Kolberg H, MacKenzie M, Mendelsohn J, Mgumba M, Nathan R, Nicholas A, Ogada D, Pfeiffer MB, Phipps WL, Pretorius M, Rösner S, Schabo DG, Spiegel O, Thompson LJ, Venter JA, Virani M, Wolter K, Kendall C (*Submitted)* Understanding continent-wide variation in vulture ranging behavior to

assess feasibility of Vulture Safe Zones in Africa: challenges and possibilities. *Biological Conservation*

4. Galligan T, Green R, Wolter K, Taggart M, Duncan N, Mallord J, Naidoo V. Alderson D & Li Y (*Submitted*) The non-steroidal anti-inflammatory drug nimeslide kills *Gyps* vultures at concentrations found in the muscle of treated cattle. *Conservation Biology.*

Strategic Objective 4. Monitor and reduce threat of infrastructure collision and electrocutions

Tagged vultures also provide useful information about the threat of powerline collision, which is a major issue in South Africa and likely more broadly. Annually VulPro conducted powerline surveys (up to 165 km in a single year) with support from Cheyenne Mountain Zoo, have identified over 100 incidents and also cared for 100s of birds from powerline incidents. VulPro works with Eskom and local municipalities to identify and mitigate high-risk powerlines. In Kenya, The Peregrine Fund and other partners completed the Strategic Environmental Assessment for Wind Power and Biodiversity in Kenya report and annexes, which can be downloaded here: https://www.thebiodiversityconsultancy.com/map/sea-wind-power-kenya-nairobi/. The report presents sensitivity mapping in relation to planned and potential wind power developments, and good practice measures to reduce potential impacts on biodiversity. It also includes a review of wind power status and outlook in Kenya and an overview of relevant policy. In partnership with National Museums of Kenya and other organizations, The Peregrine Fund are engaging with the energy and private sectors to begin to address the challenge of energy infrastructure and bird collisions/electrocutions through the Wildlife-Energy Working Group.

Strategic Objective 5. Enhance rehabilitation, breeding, and release of Cape Vultures

VulPro's rehabilitation program only continues to grow as demand increases and VulPro becomes more recognized. Over the reporting period, VulPro rescued 261 individuals of all species, and 128 were released. Non-releasable vultures are integrated into the captive breeding program. All released vultures are monitored with colored leg bands and/or GPS transmitters. Rehabilitation data collection was enhanced with the acquisition of RaptorMed software. A 4-room on-site hospital tailored to urgent vulture care, including ICU units, was constructed at the facility. VulPro plans to fully equip the hospital with an x-ray machine, surgery table, and other supplies to facilitate on-site treatments and avian veterinary trainings.

A total of 134 eggs (115 Cape, 18 African White-backed, and 1 White-headed Vulture) were produced from VulPro's non-releasable captive population. From these, 31 chicks were successfully reared (28 Cape and 3 African White-backed Vultures). All parent-reared individuals were released with GPS transmitters at the Nooitgdacht colony in the Magaliesberg Mountains, South Africa (2019) or at Rookwood Farm in the Eastern Cape Province, South Africa (2020). A new captive breeding facility was opened in partnership with GHB Farms and CS Vet. 42 non-releasable adult Cape Vultures were moved to the facility at GHB Farms, in Gauteng Province, South. Africa. This expansion allows for growth of the program and reduces the risk of disease spread in a single large community of captive birds.

Strategic Objective 6. Increase Public Engagement in Vulture Conservation

Denver Zoo and Botswana partner KRC/Raptors Botswana were successful in increasing IVAD awareness and celebrations throughout Botswana. Increased involvement from local and national Government, education departments, agriculture sectors and other conservation-based organizations increased their involvement in IVAD celebrations annually. More recently, IVAD celebration got relocated to the capitol city of Gaberone which allowed for increased coverage and awareness. In addition, the group hosted ten vulture awareness kgotla meetings with target communities of Zutswa, Hukuntsi and Lokwaba and lead over 150 youth and adults to the CL Woolcott Vulture Restaurant to gain positive attitudes, knowledge of and action towards Botswana's vultures. Finally they conducted over 65 community interviews to gather baseline knowledge on knowledge and perceptions on vultures in target communities.

VulPro have celebrated IVAD most years throughout the program at their center and have raised awareness through their social media engagement (with over 15,000 followers on Facebook), distribution of educational booklets, on-site work with school groups, and features of their work in local media.

In 2018, North Carolina Zoo updated signage at our lion exhibit to highlight the threat of poisoning to carnivores and scavengers in Africa and provide information about our and SAFE's conservation efforts to save vultures.

Many of the AZA partners involved with this SAFE program launch large on-site or virtual IVAD events every year throughout this program. Such events have been made more successful through efforts the Education Subcommittee which has provided a toolkit containing relevant activities and social media graphics each year. In 2020, the Education Subcommittee also adapted prior years' International Vulture Awareness Day (IVAD) toolkit and materials to create education toolkit for classroom teachers and one for parents, both of which provided multiple options for vulture-specific programming. The toolkit was advertised in 2020 to help reach those organizations, educators and care takers who were now looking for creative, virtual components to accommodate those having to learn from home. The toolkit for teachers included station-based activities or group/classroom lessons, and the parents' toolkit provided activities parents and kids could do at home, like making "vulture vomit" slime. Additionally, it provided a recommended "vulture book club" reading list for both kits, coloring pages, and other fun activities. In 2021, the toolkit was again revised and updated to support the education challenges during the Covid-19 pandemic. The Education Subcommittee's coloring book pages, created in 2018 feature all Africa Vulture SAFE species and are available in banner-size for multi-participant coloring opportunities. Through the Raptor TAG Facebook page, the AV SAFE program highlights vulture conservation under the hashtags #VultureSAFE and #SaveOurScavengers. In 2020, at least 153 people from 58 facilities accessed and used the toolkit. In 2021 it was accessed more than 260 times from 48 different facilities (that chose to report their facility).

The committee also worked with graphic artist Alize Veillard Muckensturm to produce a 3-part series of short videos on the African Vulture Crisis and the work of the SAFE program partners. These videos were integrated into the 2020 toolkit and used in conjunction with virtual 2020 IVAD activities (social media, etc.), and can be found here: https://www.youtube.com/channel/UCVV7_CiLT3PEAy_ImY69pMQ

Finally, the committee continues to create an annual T-shirt fundraiser, which comes out each year just prior to International Vulture Awareness Day each summer. To date, this annual fundraiser has raised $9,475.49 for vulture conservation through AV SAFE.

Strategic Objective 7. Increase Funding Directed at African Vulture Conservation

From February 2018 to August 2021, over $1 million has been contributed to African Vulture conservation across all partners. Funding didn't necessarily increase year to year due to major grants as well as Covid limitations, but individual institutions have increased funding over time. Cheyenne Mountain Zoo increased its funding support for African Vulture conservation from the $5,000 level annually (prior to 2018) to approximately $20,000 per year (2019-2021). Detroit Zoo provided consistent funding to The Peregrine Fund and Vul Pro each year for their vulture conservation efforts, totaling $25,000 to The Peregrine Fund and $45,000 to Vul Pro over the entire reporting period. North Carolina Zoo's Tanzania vulture program budget was over $300,000 during this report period and increased substantially from 2018 to 2019 with about 50% of funds annually coming directly from the zoo. Additional funding from AZA SAFE, AZA CGF, National Geographic, Leiden Conservation Foundation, Mohamed bin Zayed Species Conservation Grant, Wildlife Conservation Society, Dallas Zoo, NC Aquarium at Pine Knoll Shores, Natural Encounters Conservation Fund, Disney Conservation Fund, Puget Sound AAZK, Bowling for Rhinos, SeaWorld-Busch Gardens, Lion Recovery Fund, Tusk Trust, The Nature Conservancy and Frankfurt Zoological Society have supported this work. AV SAFE Fundraising totals from 2018-2021 through annual T-shirt sales were $9,209.42. Membership in AV SAFE has also increased from the initial 4 partners to 17 AZA partners currently.

Strategic Objective 8. Develop National Action Plans for African Vultures

VulPro continues to participate in meetings of South Africa's National Vulture Task Force, National Poison Prevention Working Group, and the National Lead Task Force. We have assisted in the production of the national vulture strategy document (National Vulture Biodiversity Management Plan), and National Poison Working Group

document, both drafts are in progress. In Kenya and Tanzania, national action plans are still needed and in development. On-going vulture conservation work in these countries have helped pave the way for government support of creation of these plans, which we hope to complete as part of this current 3-year action plan.

Strategic Objective 9. Train and mentor in-country nationals in vulture research and conservation

In Kenya, Martin Odino has been pursuing his Masters degree at the University of Exeter and is co-supervised by Darcy Ogada. The Peregrine Fund is also co-supervising a Nigerian PhD student who is working on Hooded vultures in the Gambia. In addition, 5 full time Kenyan employees are involved in educating communities about vultures, their importance and threats. In Tanzania, North Carolina Zoo has supported and supervised one PhD student, Natasha Peters at University of York, three Masters students, including two Tanzanians. Work with Selous Game Reserve's head ecologist has led to his involvement in trainings as co-instructor. VulPro has supported at least 3 undergraduate internships, community service learning for high school students, and more than 3 PhD students. In Botswana, with support from Denver Zoo, 4 Batswanan students completed their Masters degrees and Rebecca Garbett completed her PhD on population trends in raptors of Botswana.

Other Achievements

North Carolina Zoo and Wildlife Conservation Society were awarded the William G. Conway International Conservation Award from the AZA for Significant Achievement for Southern Tanzania Vulture Monitoring and Conservation Program in 2020.

Existing Action Plans

This action plan aligns closely with the Multi-Species Action Plan to Conserve African-Eurasian Vultures, which was adopted by the Convention on Migratory Species Parties in October 2017. This plan encompasses all species considered here.

Botha, A.J., Andevski, J., Bowden, C.G.R., Gudka, M., Safford, R. J., Tavares, J. and Williams, N. P. (2017) CMS Multi-species Action Plan to conserve African-Eurasian Vultures. Coordinating Unit of UNEP/Raptors MoU, Abu Dhabi.

Potential Connections to other SAFE Programs and Conservation Initiatives

While African vulture conservation is important for its own sake, as a wide-ranging species and a scavenger, the threats to vultures overlap heavily with those of several other species, particularly African elephants and lions. Vultures can lead rangers to poaching events targeting elephants and some social carnivores. Reducing elephant poaching is thus important for vulture conservation as well. Similarly, retaliatory killings of carnivores in response to livestock predation often leads to pesticide poisoning, which is a major cause of mortality for lions and hyenas as well as vultures and other scavenging raptors. Other types of human-wildlife conflict can also lead to poisoning of large herbivores, such as hippos. Using satellite telemetry on vultures, researchers have been able to determine poisoning rates and hotspots, which affect both vultures and carnivores. Reducing human-wildlife conflict is critical not just for lion conservation but for vultures as well. In this way, vulture conservation efforts can be over-arching and linked to the conservation of many other species which AZA institutions currently hold or work with in the field. As such, conservation strategies that affect vultures can also improve outcomes for these species. This provides an important opportunity for collaboration and we hope to work with other SAFE programs, AZA institutions, and conservation partners to achieve shared conservation goals within this plan.

Threats

Poisoning

The primary threat, shared by all six species covered in this plan, is poisoning. Poisoning occurs when carcasses are laced with pesticides or other poisons with the intent to kill vultures or carnivores. Poisoning can be motivated by retaliatory killings for livestock losses, by elephant poachers working to prevent rangers from detecting their illegal activities by killing vultures, and by direct persecution for vulture body parts and trade. Because this is the broadest and most significant threat across the African continent, most of the strategies in this plan aim to address poisoning. In addition to poisoning, there are a number of additional threats to vultures, but the majority of these are minor in magnitude in comparison to poisoning.

Collisions and Electrocutions

Of particular significance for Cape vultures in Botswana and South Africa and of increasing concern for Rüppell's and other vultures in Kenya is electrocution and collision with powerlines or wind turbines, which is also addressed in this plan. Vulture mortality by electrocution on power poles and injuries resulting from collisions with power lines have become more prevalent in recent years as energy demand increases in Africa. Additionally, wind farms are increasing in popularity across Africa and vulture collisions and resulting mortality are an additional threat to vultures.

Education Subcommittee

African Vulture SAFE has an active education subcommittee which will focus efforts around International Vulture Awareness Day (IVAD) and through the development and distribution of resources that can be used by the general public, at AZA institutions, and by other partners working to conserve vultures. Because many organizations are involved in conservation education related to vultures, this group also hopes to utilize and distribute existing resources.

In addition, this subcommittee will work to amplify the efforts and impacts of the AV SAFE field partners (Tanzania, Kenya, South Africa) through the uses of IVAD event days, social media, and other storytelling/communication channels at AZA institutions and through AZA itself. Beyond awareness, the intent of elevating the field work will be to raise funds and support for on the ground conservation efforts.

Strategies Overview

Our main program objectives, actions, metrics, timeframe, and budget are outlined in the chart below. Our number one priority is to address the devastating threat of poisoning. However, we also recognize the need to monitor populations both to evaluate our success and also to determine threat levels. As part of this we also hope to continue current monitoring activities and increase knowledge about vulture population status in current gap areas.

African Vulture SAFE Program 5 Year Strategy (2022-2027)

Strategic Objective 1. Continue and expand population monitoring of target vulture species						
Action	**Metrics**	**Timeframe**	**AZA Zoos**	**Field Partners**	**Country**	**Annual Budget**
1.1 Conduct roadside surveys or breeding site surveys to maintain up-to-date information on known populations	a) Surveys completed	Surveys conducted every one to five years depending on needs of the site	North Carolina Zoo	WCS	Tanzania	$7000
				Peregrine Fund	Kenya	$4000
			St. Augustine	VulPro	South Africa	$30,000
Strategic Objective 2. Reduce poisoning prevalence						
Action	**Metrics**	**Timeframe**	**AZA Zoos**	**Field Partners**	**Country**	**Annual Budget**
2.1 Mitigate human-wildlife conflict	a) Demonstrated behavioral change or increased reporting of conflict and poisoning	To be conducted every year with assessment at the end of each year	NC Zoo	WCS, FZS, LL	Tanzania	$5000
				Peregrine Fund, LL	Kenya	$40,000
2.2 Train poisoning response teams	a) Develop consistent training materials to be used across sites b) Train 100 personnel within 2 new sites c) Provided refresher training to 100 personnel in sites that have already received training d) Develop training of trainer system and evaluation measures for these trainings	Train at least 100 people annually		Peregrine Fund	Kenya	$40,000
			NC Zoo	WCS, FZS	Tanzania	$5000
2.3 Track vulture mortality	a) 30 vultures tagged in 5 sites to help establish mortality rates, identify poisoning hotspots, and determine critical habitats b) Poisoning incidents in all areas of study entered into African Wildlife Poison Database	Tag at least 10 vultures each year		Peregrine Fund	Kenya	$5000
			NC Zoo	WCS, FZS	Tanzania	$10000
			New sites outside current work			$20000
Strategic Objective 3. Improve knowledge of vulture biology						
Action	**Metrics**	**Timeframe**	**AZA Zoos**	**Field Partners**	**Country**	**Annual Budget**
	a) 100 vultures tagged in 5 sites to determine population range	Tag at least 34 vultures each year	NC Zoo	WCS, FZS	Tanzania	See 2.3

3.1 Establish population range and lead exposure for significant populations	b) Test at least 30 vultures for lead exposure and assess threat of lead to vulture health in at least two sites			Peregrine Fund	Kenya	See 2.3
			St. Augustine Alligator Farm	VulPro	South Africa	See 5.1
3.2 Establish baseline blood values for several species, including measures relevant for identifying poison exposure	a) VulPro hospital and lab fully operational b) Cholinesterase analyzer baseline values identified and lab tested for pesticide exposure to work towards development of field analyzer c) Study baseline calcium levels and identify deficiencies	Progress made in each year		VulPro	South Africa	
3.3 Study and quantify the role vultures have in disease control and waste removal	a) Study completed in 2 sites to investigate the role of vultures in disease control and waste removal	By end of year three		ILRI, Brandenburg Uni of Tech	Kenya	$5000
			NC Zoo		Tanzania	$10000
Strategic Objective 4. Monitor and reduce threat of infrastructure collision and electrocutions						
Action	**Metrics**	**Timeframe**	**AZA Zoos**	**Field Partners**	**Country**	**Annual Budget**
4.1 Monitor number of vultures killed or injured due to collisions and electrocutions	a) Survey at least 100 km of key powerlines on foot in South Africa to assess number of vulture mortalities	Annually	Cheyenne Mountain Zoo	VulPro	South Africa	$10000
4.2 Minimize threat of collision and electrocution	a) Communicate with local infrastructure companies to flag areas of concern b) Work to prevent construction of electrical lines, wind farms, or other structures of collision risk in known areas of high use c) Implement training workshops to transfer knowledge about addressing energy infrastructure threats to countries outside South Africa			VulPro	South Africa	$500
				Peregrine Fund	Kenya	$500
Strategic Objective 5. Enhance rehabilitation, breeding, and release of SAFE African Vulture species						
Action	**Metrics**	**Timeframe**	**AZA Zoos**	**Field Partners**	**Country**	**Budget**
5.1 Rehabilitate, breed, and release Cape, White-backed, and Lappet-faced Vultures in South Africa	a) Rehabilitate injured or poisoned vultures in South Africa b) Captive breeding of non-releasable vultures and release of offspring in South Africa c) Explore potential for and if feasible construct new rehabilitation and release sites in Eastern Cape Province, South Africa d) Monitor released vultures to assess success of release programs	Progress made each year	St. Augustine Alligator Farm, Cheyenne Mountain Zoo, Detroit Zoo	VulPro	South Africa	South Africa: $10000 annually
Strategic Objective 6. Increase Public Engagement in Vulture Conservation						
Action	**Metrics**	**Timeframe**	**AZA Zoos**	**Field Partners**	**Country**	**Annual Budget**

6.1 Increase resources available to AZA organizations, the general public, and Vultures SAFE partner organizations to increase awareness of African vulture conservation	a) Maintain and increase accessible resources for AZA institutions, conservation-based organizations and general public focused on African vulture conservation b) Explore options for tracking the downloading of AV SAFE created resources to measure interest levels and usage.	Development of additional resources (and updating of current ones) by August 1st.	Cheyenne Mountain Zoo, NC Zoo, Raptor TAG, Zoo Atlanta, St. Augustine Alligator Farm, Dallas Zoo			
6.2 Increase awareness of African vulture conservation through IVAD events and marketing strategies	a) Increase collective efforts of SAFE committee to create more intentional messaging and efforts for IVAD events with in AZA institutions. b) Leverage the role of AZA institutions in global IVAD events to increase awareness about African vulture conservation	Creation of aligned messaging to promote and support IVAD events by August 1st.	NC Zoo, Raptor TAG, Zoo Atlanta, St. Augustine Alligator Farm, Dallas Zoo			
6.3 Amplify the conservation impact of the AV SAFE Field partners through channels accessible through AZA	a) Ensure that through Connect, AZA listserves, social media, etc, AV SAFE is celebrating and amplifying the impact of committee and its field partners to generate funding support	Biannual reporting through SAFE reports, quarterly communication on accomplishments/benchmarks being accomplished by field partners.	Field partners and leadership within AV SAFE			
Strategic Objective 7. Increase Funding Directed at African Vulture Conservation						
Action	**Metrics**	**Timeframe**	**AZA Zoos**	**Field Partners**	**Country**	**Annual Budget**
7.1 Increase AZA institution funding for African vulture conservation	a) At least three new AZA institutions become Program Partners for African Vulture SAFE b) 25% increase in funding from AZA institutions to African vulture conservation (based on AZA Annual Report on Conservation and Science) c) All SAFE partners contribute $1500 per year	Across three years	All partners	N/A	N/A	N/A
Strategic Objective 8. Develop National Action Plans for African Vultures						
Action	**Metrics**	**Timeframe**	**AZA Zoos**	**Field Partners**	**Country**	**Total Budget**
8.1 Develop national action plan for African Vultures	a) Develop National Action Plans for Tanzania and Kenya, following models from South Africa and Zimbabwe	Progress made each year	NC Zoo	WCS	Tanzania	$30000
				Peregrine Fund	Kenya	$41,900
Strategic Objective 9. Train and mentor in-country nationals in vulture research and conservation						
Action	**Metrics**	**Timeframe**	**AZA Zoos**	**Field Partners**	**Country**	**Annual Budget**
9.1 Work closely with in-country nationals to build local capacity for vulture conservation and research,	a) 6 in-country nationals receive training in relevant skills b) Provide $10,000 annually to African Raptor Leadership grant to support African nationals conducting vulture-focused research	Work with at least 2 people each year	NC Zoo	WCS	Tanzania	$5000
				Peregrine Fund, VulPro	Kenya, South Africa	$4600

particularly seeking opportunities to mentor early career conservationists from West Africa where capacity is lowest						