

ABSTRACT

Title of Thesis: UNDERSTANDING
CONSERVATIONISTS' PERSPECTIVES
CONCERNING THE ETHICAL
DILEMMAS ASSOCIATED WITH
DECLINES IN AFRICAN VULTURE
POPULATIONS

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Several African vulture populations are declining due to anthropogenic causes. This research explored viewpoints of conservationists to identify ethical dilemmas and extrapolate potential solutions that balance the needs of African vultures and the welfare of impacted societies. The methodology consisted of two parts: A Q-Methodology activity and a semi-structured interview. The Q-Methodology activity used statements in a ranked system to discover what the participants prioritized. The semi-structured interview allowed for an in-depth understanding as to why the respondents ranked the statements as they did. These steps addressed not only what the subjects believed, but why they believed it, a key element in uncovering the ethical standpoints of the respondents. One major finding demonstrated that overall, participants held a deontological (duty-driven) viewpoint that fuels them to pursue

conservation work. Exploring views of conservationists familiar with the African
vulture declines is the first step to creating ethical policies to save the vultures.

UNDERSTANDING CONSERVATIONISTS' PERSPECTIVES CONCERNING
THE ETHICAL DILEMMAS ASSOCIATED WITH DECLINES IN AFRICAN
VULTURE POPULATIONS

by

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Dedication

For my father, mother, brother, and husband. I wouldn't be half the person I am without you.

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Chapter 1: Introduction and Objectives

Colloquially known as a member of the “Ugly 5,” African vultures are not a fan favorite as opposed to more charismatic African wildlife. Vultures do, however, play a critical role in the ecosystem via providing ecosystem services as scavengers. They can digest the rotting flesh of dead animals (also known as carrion) helping to limit the spread of disease.(1) Seven of the 11 species of African vultures are categorized as “endangered” or “critically endangered” according to the IUCN Red List of Threatened Species.(2) This listing includes the Egyptian vulture (*Neophron percnopterus*), Hooded vulture (*Necrosyrtes monachus*), Rüppell's vulture (*Gyps rueppelli*), Lappet-faced vulture (*Torgos tracheliotos*), Cape vulture (*Gyps coprotheres*), White-backed vulture (*Gyps africanus*), and White-headed vulture (*Trigonoceps occipitalis*). The decline of many African vulture species is concerning for the health and safety of the ecosystem and the species that depend on it, including humans.

This paper reports the findings of evaluating the ethical concerns from conservationists and those familiar with the field of conservation. Participants engaged in the evaluation of ethical concerns included local indigenous peoples, individuals from non-governmental organizations (NGOs), and government wildlife agency personnel. Each demonstrated conservation knowledge about South Africa and Kenya, two areas affected by decreased vulture populations.

The focus of the evaluation was on the following anthropogenic factors affecting the population decline: poisoning (both intentional and unintentional),

power line collisions, lead ingestion, and the demand for vulture body parts in traditional medicine, known as muti (or muthi) in southern Africa and voodoo in western Africa.(3,4) Beliefs and reasons associated with anthropogenic factors impacting vultures are explored to tease out why such behavior may lead to potential ethical dilemmas and, if so, suggest appropriate policy recommendations addressing both ecological and cultural concerns. The analysis of key ethical dilemmas lays the groundwork to formulate effective and informed environmental policies to save the vultures.

Study Objectives:

1. Identify and understand the justifications behind the differing perspectives of professional conservationists.
2. Identify potential ethical dilemmas or discrepancies related to the intentional and unintentional killing of vultures.
3. Develop and propose ethical solutions that protect the vultures and the welfare of the impacted human societies.

Chapter 2: Literature Review

To give a proper assessment to understanding conservationists' ethical point of views about the African vulture decline, it is necessary to recognize the components of this study. First, an understanding of the importance of vultures establishes reasons for why their conservation is essential. Next, a look at the anthropogenic causes of the African vulture population declines shows how humans are affecting the populations through a variety of ways. Last, an overview of underlying philosophical concepts traces what values and beliefs people hold and how they shape different environmental viewpoints.

Why Vultures are Important

Health

One of the most prominent health benefits humans and other species derive from vultures is disease control.(1) The vulture's ability to assist in disease control is a primary example of a regulatory ecosystem service, as it is a benefit of the regulation of ecosystem processes.(5)

One of the most notable examples demonstrating the essentiality of these birds in regulating ecosystem services was the Indian Vulture Crisis created by the widespread use of Diclofenac.(6) Diclofenac is an anti-inflammatory drug often administered to livestock, the use of which rose in popularity in India in the 1990s.(6) However, Diclofenac is lethal to vultures as it causes kidney failure.(6) When the livestock that had been administered Diclofenac died, the vultures consuming the carcasses inadvertently ingested the Diclofenac as well, causing a decrease in

population of over 95% in 10 years.(6) The decrease in vultures allowed for another scavenger, feral dogs, to take advantage of the abundant carcasses no longer being eaten by vultures, resulting in a feral dog population increase. This population increase posed a huge risk to humans because dogs can carry diseases such as rabies.(7) Unlike feral dogs, vultures do not contract rabies nor do they as often come in contact with humans, allowing vultures to dispose of degrading organic matter in a more sanitary fashion.

Another health component involves the consumption of vulture parts through traditional African medicine. The first risk of using vultures in traditional medicine comes from the fact that vulture parts used in the medicine are obtained illegally and may be unsafe to consume because they are unmonitored by government agency oversight.(8) Additionally, humans also run the risk of ingesting poison second hand from consuming the vulture parts. Buechley and Şekercioğlu (9) explained there have been cases of deliberate poisoning of vultures because vultures circle the carcasses, giving away the location of a poached animal. Ogada et al. (10) stated that deliberate poisoning also occurs for belief use trade. If the vultures have eaten from poisoned carcasses and are subsequently consumed by humans for traditional medicines, humans are at risk of ingesting some of the poison. As a result, these concerns directly impact human health and may cause serious issues in the future if they are not addressed.

Traditional Belief Use

The WHO (11, p.15) defined traditional medicine as:

The sum total of knowledge, skill, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness.

The Traditional Medicine Strategy Plan: 2014-2023 outlined the regulations and objectives for traditional medicines, as they are an integrated part of healthcare in most countries.(11) The plan also acknowledges the use of non-plant ingredients such as animal or mineral materials in traditional medicines.(11, p. 31) With the widespread use of traditional medicine, it is essential to recognize the cultural importance traditional medicine plays for different people around the world.

Many south and east Asian countries such as Korea and Bhutan have and continue to use traditional medicines to take care of their people.(12, p. iii) Korean Oriental Medicine, known as *Hanbang*, uses a combination of herbal prescriptions, acupuncture, and moxibustion to treat many health problems such as strokes and Parkinson's disease.(12, p. 281; 13) Traditional medicine is the primary healthcare system for about 20% of the Korean population and can be used in conjunction with Western practices,(13,14) showing its continued cultural relevance and versatility. In Bhutan, the traditional medicine, known as *gSo-ba-rig-pa* or *sowa rigpa*, contains ingredients from high altitude and low altitude plants, minerals, and animals.(12, p. 279) Their practice looks at a person's health in a holistic manner to achieve balance within an individual's body.(15) Traditional Bhutanese medicine is positively received by its constituents and is sought after from people of all ages(15,16) and can also incorporate Western medicine as well.(12, p. 279; 16) These two countries are just a snapshot of the many ways people around the world have different traditional medicines and practices to help take care of their people.

There are numerous kinds of traditional medicine practitioners in Africa as well, and the demand for these services are still prominent. Its prominence is due, in part, to its long standing history within the culture and the lack of access and high costs associated with Western medicine.(17) In 2007, traditional medicine in South Africa was estimated to be worth 2.9 billion ZAR per year, accounting for 5.6% of the National Health budget.(18) In general, traditional doctors are known for treating patients holistically, healing not only physical ailments, but spiritual and emotional needs as well.(17,19) A study in the Sukuma Tribe in north-western Tanzania reported several uses of animal parts for different problems, including using a lion's adipose tissue for treating ear pus and a lion's skin for protection.(20) Additionally, they also serve as a median between the living and dead ancestors.(17,21,22)

Intrinsic Value

Intrinsic value is described as the value found in a thing "in itself" and "in its own right", regardless of extrinsic considerations.(23,24) It revolves around the thought that something is valuable simply because it exists. Well-known forester and conservationist Aldo Leopold applied this notion towards the environment in "The Land Ethic" as he explained, "It is inconceivable to me that an ethical relation to land can exist without love, respect, and admiration for land, and a high regard for its value. By value, I of course mean something far broader than mere economic value . . .".(25) Leopold suggested that a thing's value, in this case the environment and its components, is not complete without aspects of care and admiration.

Intrinsic value can be found across cultures, as traditional African communities saw nature as something to be respected and revered.(21) Many

communities found that living within nature allowed for a fuller appreciation and a greater understanding of the non-instrumental value of the environment.(21) This value was instilled before colonialism in Africa, demonstrating its presence in African viewpoints before Western influence.(21,26)

Similarly, an appreciation for the African vultures simply for existence resonates a value not tied to money or quantitative data, but a more personal, empathetic value. Russow (27) supported this notion, explaining that humans find aesthetic value in both individual animals and species in general and therefore feel the need to protect them because of it. She determined that humans derive value from seeing and experiencing an animal, as well as having future opportunities to experience the animal again. People may find an intrinsic value in vultures and the environment because of a good found within its own right. Unlike the functionality of the instrumental value found in vultures from its health benefits and traditional use, intrinsic value is not contingent on functionality or serving a useful purpose.

Spirituality and Religion

Around the globe, people experience spiritual connections with the environment and wildlife. Traditional African environmental ethics have been described as a holistic, interdependent community, incorporating human communities, gods, spirits, stones, animals, plants, and more.(21,28) Ikuenobe (21) explained how some African peoples such as the Bantu find a hierarchy in the community, but it is nonetheless an interconnected system. This holistic point of view provides a kind of spiritual connection not only with the biotic and abiotic components of the environment, but with deities as well. Kelbessa (26) described how

some Oromo people in Ethiopia find value in nature because it is given by *Waaqa* (God). They believe that humans are beneficiaries of nature but not owners and therefore they need to respect the gift that *Waaqa* has given them.

John Muir, an American philosopher who found solace in the presence of the environment, stated, “Come to the woods, for here is rest. There is no repose like that of the green deep woods . . . Sleep in forgetfulness of all ill. Of all the upness accessible to mortals, there is no upness comparable to the mountains”.(29, p. 235) As a prominent promoter of preservation, he explained the healing power he experienced when he is within nature. There is value derived not only knowing it exists (as reflected in intrinsic value), but being present in a natural setting.

Further, some people place significance in nature and wildlife because of religious beliefs which emphasize the importance of conserving nature. In the Islamic tradition, humans are only allowed to take animals lives as necessary and how animals are not only a part of Allah’s creation, but a representation of “His might and wisdom”.(30) According to these teachings, humans are to depend on wildlife not only for sustenance but for learning and appreciating Allah’s creation as well.

In the Judeo-Christian belief, value stems from the importance of managing God’s creation. Genesis 1:24-31 demonstrated the story of the creation of wildlife and man, and how He put man in charge of what was created. There are two interpretations of what “in charge” means: dominionism or domination. For dominionism, because God’s creation is “good”, humans have the moral obligation to treat animals with respect.(31) Humans are not only to rule over His creation, but in fact take care of it, also known as stewardship.(29, p.235; 32) The concept of

domination is on the other side of the spectrum, where man's ruling on Earth allows for consumption of resources at man's discretion.(33) This perspective is known as domination because animals and resources found on Earth are for man's use. Thus, religious practices can shape one's worldview of the environment and wildlife.

From a Tibetan Buddhist perspective, the Himalayan vulture (*Gyps himalayensis*), is an integral component to the practice of sky burials. Here, the people of Tibet place dead loved ones in specified sites for the vultures to consume the bodies.(34) Although cremation is the common funeral rite for Buddhists, sky burials, or *Jhator* ("offering to the birds"), are more popular in Tibet (about 80% of the 5 million Tibetan people), as fuel supplies are limited.(35) Sky burials align with the Buddhist outlook that all living beings are united, interconnected, and should be respected.(35) The sky burial ritual is a method of coping with the grieving process through the exhibition of the impermanence of life, which is a critical Buddhist belief showing conditioned existence is constantly in flux and not permanent.(36) Because of cultural services, the Tibetan people are protective of the vultures, showing the spiritual importance vultures can possess.

Anthropogenic Causes of the Vulture Population Decline

Given all the factors that affect vulture population resilience, the contributing impact of humans on their declines is significant.(37) Anthropogenic threats to African vultures include poisoning (both intentional and unintentional), lead ingestion from game meat, demand for parts in traditional belief use, interactions with electrical infrastructure, and bushmeat.(3)

Poisoning

Poisoning is one of the main concerns surrounding vulture mortality.

Carbamate and organophosphorus pesticides are commonly used as a poison to control wildlife deemed as problematic in Africa.(38) Carbofuran is well-known poison in the carbamate category, as it is easily accessible and therefore commonly used.(9,39) Likewise, other poisons are known to be used as well, including aldicarb, strychnine, and synthetic organic pesticides.(9,38)

One reason people poison carcasses is to eliminate carnivores or undesired wild animals, such as African lions (*Panthera leo*) and Spotted hyenas (*Crocuta crocuta*), that pose a threat to humans or livestock.(39,40,41) Carcass meat laced with poison indiscriminately kills what the poisoner considers to be nuisance animals. In addition to intentional poisoning of carcasses to protect humans and livestock from nuisance animals, there are acts of poisoning by poachers. These individuals illegally kill their targeted animal such as an elephant (*Loxodonta africana*) for their tusks to sell illegally, particularly to Asian countries for art and medicinal purposes.(10,42) After the poached animal dies and the tusks are removed, the poacher laces the carcass with poison with the intent to kill scavenging vultures.(43) The intentional poison targets vultures because circling vultures alert rangers or landowners to the presence of and the location of a poached animal.(3,43).

Another reason for wanting to eliminate vultures is fear that these birds of prey may kill livestock or carry away small children.(40) Lappet-faced vultures (*Torgos tracheliotos*), for example, can be intimidating because they stand 78-115cm tall (about 31-45in) and have the largest wingspan of the African vultures.(44)

Poisoning events prove to be highly destructive because the adverse effects can extend to a large number of scavengers, including Spotted hyenas (*Crocuta crocuta*) and Black-backed jackals (*Canis mesomelas*).⁽⁴⁵⁾ Furthermore, African vultures demonstrate a social feeding behavior, meaning that they will eat together as a group rather than individually.⁽³⁹⁾ This behavior can lead to a widespread impact, as many vultures will likely eat from the same carcass. In 2013, there was an incident in Namibia where up to 600 vultures were seen on site with a single, poisoned elephant carcass.⁽⁹⁾

The lack of regulation of pesticides in Africa is an important contributor to both their widespread use and ease in application. Ogada ⁽³⁹⁾ examined the laws of 46 African countries and found that although in 38 of the countries it is illegal to poison as a means to killing wildlife, there are loopholes such as pest control laws that contradict the wildlife laws. On a larger scale, Ogada ⁽³⁹⁾ pushed for a stronger overarching African legislation, particularly in the African Convention on the Conservation of Nature and Natural Resources that highlights key environmental and natural resource goals for the integrity of Africa and its people. Ogada ⁽³⁹⁾ found the legislation to be ineffective because of the lack of repercussions for law breakers and pushed for stricter punishments for the legislation to be taken seriously. In 2014, however, the African Union received the last signature required for the ratification of a revised version of the document that placed much stricter provisions and accountability.^(46,47) Adoption of the law took place in March 2017, meaning the improvements that Ogada ⁽³⁹⁾ sought may occur.⁽⁴⁶⁾

Lead

The consumption of lead from bullets poses a concerning issue as wildlife hunting is an established and sometimes expanding market in many countries such as South Africa.(48) Exposure to lead can negatively affect scavengers internally, as consumption of lead-laced carrion can infiltrate the scavenger's body. In the United States, bullet fragments in hunted deer (*Odocoileus spp.*) are suggested to have been a factor for lead toxicity or death of many avian scavengers such as Golden eagles (*Aquila chrysaetos*) and California condors (*Gymnogyps californianus*).⁽⁴⁹⁾ Similarly Naidoo et al. (4) reported that a likely source of lead contents in African vultures may be due to them consuming game that had been hunted using lead bullets. Other sources of lead contamination can be linked to anthropogenic factors such as mining.⁽⁵⁰⁾ High body concentrations of lead can contribute to early mortality or interfere with reproduction, making the already endangered vultures more at risk at a population level.⁽⁴⁾

Interactions with Electrical Infrastructure

Electrical infrastructure problems are a global problem facing avian taxa, killing thousands of birds every year.^(51,52,53,54,55) The power lines provide the height and stability favored by tree nesting birds; however, vultures, along with other tree nesting birds, have been known to be electrocuted by these structures because of their large wingspans, heavy bodies and gregarious nature.⁽⁵⁶⁾ Additionally, power line collisions are an area of concern contributing to the mortality of these birds since birds may not be able to see the power lines while they are flying.^(53,57)

There is concern particularly for birds that are listed as vulnerable or endangered.(52) In South Africa, 14 raptor species are known to be killed because of power line infrastructure, with Cape vultures (*Gyps coprotheres*) and African White-backed vultures (*G. africanus*) included.(54,58) Mortality from electrical infrastructure (including both electrocutions and flying into power lines) are thought to be an important but not well-enough documented issue contributing to the decline of many bird species.(40,54,58) As the use of electricity grows in many areas of the world including Asia, Africa, and the Middle East,(55,59) it is imperative to address current problems with electrical infrastructure to prevent the risk of bird mortality issues in the future.

Traditional Belief Use

A cultural concern surrounding the vulture population declines is the use of vulture parts for traditional belief use.(39,60) Williams et al. (8) noted how in western and southern Africa, there is a high demand for birds, particularly vultures and hornbills, for traditional belief use. The trade of bird parts for traditional belief use has become lucrative as the demand increases because the animal parts are believed to provide clairvoyance and heightened intelligence,(61) with an estimated annual value from vulture sales estimating 1.2 million ZAR, or \$120 thousand USD.(37) Desired outcomes through clairvoyance include foresight for picking lottery numbers and betting on sporting events, while outcomes for increased intelligence include performing well in school.(37,40,61,62) Prized body parts vary depending on the purpose of the belief use and can include the brain, vertebrae, wings, loose feathers, heart, eyes, beak, and more, but the exact species of vulture is irrelevant.(61,63)

Vultures are usually harvested from both protected and unprotected areas, most notably in KwaZulu-Natal and the Eastern Cape of South Africa, Lesotho and southern Mozambique.(37) Although it was estimated that only 35 vultures are used in the traditional markets each year,(61) this is a conservative estimation from one study at a Lesotho marketplace, which is not a hot spot for such a trade as western Africa. These cultural demands link closely with the decrease in vulture populations, as the already low populations and low breeding rate of 8% pose as a sizeable threat to the population of African vultures.(40) It is also important to note that these studies were published later than 2013, and trends in both traditional belief use and wildlife trafficking may have changed since these studies took place.

Bushmeat

Another potential detriment to the African vulture populations is the pursuit of bushmeat, or the meat of non-domesticated animals used for sustenance.(3,64) In Ogada et al. (3)'s findings, 1% out of 7,819 recorded vulture deaths were attributed to killing for sustenance. The hunting of bushmeat appears to be most common in west and central Africa, as it is the most important source of protein.(64,65,66) The sale of animal parts for bushmeat is potentially connected to the sale of animal parts for traditional medicine.(8,64,67) There is a particularly high rate of raptor trade recorded for the West Africa where approximately 70% of the region's diurnal raptor species were on sale in a market in Nigeria,(64,68) likely for the sale of traditional belief use or bushmeat.

Philosophical Concepts

Although the following terms only scratch the surface of ethical concepts in consideration of this study, they are fundamental to understanding ethical viewpoints discussed herein (Table 1). The categories are values, normative ethics, environmental perspectives, and other ethical terminology.

Table 1: Key definitions and concepts associated with ethical consideration of protecting endangered African vulture species.

Terminology	General Definition	An Example in this Study
<i>Values (23)</i>		
Instrumental Value	Value relates to how it can be <i>used</i> and what it can <i>do</i> for the user(s) as a whole; good because of its functionality	A vulture is valuable because of its ability to eat carrion and naturally limit the spread of disease.
Intrinsic Value	Value <i>derived from its own nature</i> rather than its place within a larger whole, or its ability to generate good results; good in itself, apart from extrinsic considerations	A vulture is valuable because simply because it exists. It does not need a functional reason to justify its existence.
<i>Normative Ethics (69)</i>		
Deontology	“The means justify the ends”; there is an imperative or a duty to fulfill; it is the intent that matters.	Pursuing works that contribute to the conservation of African vultures is most important because of a sense of obligation.
Consequentialism	“The ends justify the means”; it does not matter if the wrong thing was done for the right reason, and vice versa.	The end result of the African vulture populations being stable again is most important, not how it was achieved.
Virtue Ethics	The right actions are those that build character of the person; the emphasis is not on the action itself but how it develops the actor.	Pursuing works that contribute to the conservation of African vultures is important because it builds up character and makes me a better person.
<i>Environmental Perspectives (70)</i>		
Anthropocentrism	Care for non-humans <i>when human well-being</i> depends on non-human well-being	Working towards the conservation of vultures is important because without vultures, humankind may suffer from the spread of disease.
Biocentrism	Concerned about the loss of wildlife because of effect of <i>individual</i> humans, fish, trees, etc.	Working towards the conservation of vultures is important because a vulture is a living creature that deserves the chance to survive.
Ecocentrism	Concerned about environmental systems as <i>wholes</i> , and their abiotic aspects	Working towards the conservation of vultures is important because vultures have a sizable effect on the entire ecosystem.
<i>Other Ethical Terminology (71)</i>		
Situational Ethics	Considering the context of a situation rather than by absolute moral standards	The use of vultures is only acceptable if it is used for sustenance to survive.

Values are the basis from which other opinions and points of view are created.

The two main types of value are instrumental value and intrinsic value.(23)

Instrumental value is more objective and focuses on the functionality of the object, while intrinsic value finds a more subjective, personal perspective of value.

Understanding what and why someone finds certain qualities to be valuable is the first step to defining one’s environmental ethic. Thus, it is important to note that these

terms are not limited to only one option in each category: someone may find both instrumental value and intrinsic value in an object; one may hold an ecocentric point of view and still have anthropocentric concerns. Recognizing the range of possibilities of values and viewpoints is the first step to understanding the complexity of ethical perspectives.

Normative ethics works to determine what we should do.(69) It is the evaluation as to why an action is considered right or wrong. A deontologist would focus on the intent of the action, not whether the action was successful, whereas a consequentialist would focus on the outcome of the action, not the intention. Thus, deontology and consequentialism are commonly thought as opposites, since deontology focuses on the actions of a process while consequentialism focuses on the results of the process.(72) Virtue ethics, however, does not focus necessarily on the intent of actions or consequences but instead on pursuing qualities that build upon one's moral character such as temperance (phronesis), training, happiness (eudaimonia), and friendship.(73,74) These definitions of normative ethics are from a Western perspective, but there are aspects that may prove to be important across cultures. The three most notable normative ethics mentioned above guide our reasoning towards the morally correct actions to achieve our deontological, consequentialist, or virtue ethicist goals.

The values and normative ethics we follow shape the environmental perspectives of anthropocentrism, biocentrism, and ecocentrism. Anthropocentrists may be concerned with what happens with the overall ecosystem, but the emphasis goes back to how it will affect humans. Biocentrists care about the well-being of

individual living creatures, including humans, fish, and trees. Ecocentrism looks at how different components of the ecosystem work together and not necessarily every individual's well-being. It is important to note that none of these perspectives should be considered as inherently good or bad; they are simplified labels to categorize what has moral standing.(70) It is important to identify the main driver that pushes someone to make a decision.(75) Is it for the health of mankind, individuals, or the functioning of the ecosystem?

In contrast to the normative ethics mentioned above, situational ethics is relativistic or subjective and places consideration of the context of the situation before assessing whether an action is right or wrong.(71) In other words, moral rules are flexible rather than universally absolute in situational ethics,(76) and decisions can become complex because of the grey area left for interpretation.(71,76) However, situational ethics are important to keep in mind because we live in a pluralistic world, and there are many perspectives that include making exceptions for certain moral codes.

Throughout the literature review, studies and texts were covered to provide a fuller context for why vulture conservation is important to pursue and how different viewpoints play a role in the decision making. Having reviewed these topics, there is a knowledge gap regarding the ethical component of the African vulture decline, which this study aims to address.

Chapter 3: Materials and Methods

The methods and protocol for this research were approved by the University of Maryland's Institutional Review Board (IRB Project 1074563-1) before interviews began. Discussion of confidentiality, methods of conduct, risks, benefits, and contact information should the participant want to rescind their answers are clearly defined in this protocol, and the participants were given a copy to keep for their records.

Study Area and Eligibility Rationale for Participants

The study took place in South Africa and Kenya, countries that have both experienced a loss in African vultures. Focusing on two different regions in Africa, in this case the south and the east, allowed for exploration and comparison of different ethical backgrounds between the two countries with different cultural experiences with vultures. For example, members from the Zulu peoples in South Africa and the Maasai peoples in Kenya adhere to different traditions and values, making it worthwhile to compare their viewpoints about conservation. Specifically, among all individuals interviewed, I targeted natural resource and wildlife conservationists and people who were familiar with conservation. These individuals were aware of critical problems that the vultures face. With this valued expertise and insight, underlying ethical dilemmas were identified and possible solutions were suggested and discussed. The interviewed conservationists included both those doing on-the-ground fieldwork and those in more managerial positions. This diversity allowed both practicing management and decision-maker perspectives to be considered. Many interviewees included individuals associated with the SESYNC Pursuit project. I used

snowball sampling, wherein some respondents identified others who might be interested in being interviewed,(77) to increase the number of study participants.

Preliminary Research

Preliminary research took place in South Africa in March 2017 using informal, one-on-one semi-structured interviews. I interviewed 12 conservationists to gather an understanding of some opinions on the African vulture decline, as well as insights on what conservation ethics meant to them. The semi-structured interview format followed a set of questions while allowing the freedom for participants to voice their opinions in a more relaxed, conversational style. The interviews were conducted in English, as this was a language commonly used by both me and the respondents. A digital recorder was used to record all interviews for accuracy and for aid when later referencing the data. During the interview, handwritten notes were taken to highlight key points in participant responses, as well as to record personal observations and thoughts related to the participants' answers. The initial questions were derived from categories emphasized in published literature around the subject: i.e., the value of nature, the role of humans in the ecosystem, poaching, management, and problems contributing to the African vulture decline. These subdivisions became the basis for my categories of emphasis in my formal interviews: 1) the value of nature, 2) the role of humans in the ecosystem, 3) poaching, 4) management, and 5) problems contributing to the African vulture decline.

Formal Research

A second trip to collect formal data from participants in Kenya and South Africa took place in July-August, 2017. I completed 24 of 37 interviews during the summer trip and the remaining 13 interviews at the end of October into November while African conservationists gathered in Annapolis, MD in the US for a conference. The formal research consisted of two parts: A quantitative Q-Methodology activity and a qualitative semi-structured follow up interview.

Q-Methodology examines subjective perspectives through a ranking activity and analyzes the averages of the perspectives.(78,79) Participants are given a set of statements that need to be ranked against each other to show what statements were the most valued. In this study, I derived 30 statements from the preliminary research covering the categories of emphasis mentioned before (Table 2).

Table 2: List of Q-Methodology statements used in evaluating the type of normative ethic interviewees expressed regarding the well-being of African vultures.

Category of Emphasis	Statements	Type of Normative Ethics (Deontological, Consequential, Virtue Ethics)	Anthropocentric, Biocentric, Ecocentric, Character
Value of Nature	1. Endangered species should be given special attention to be protected.	Deontological	Ecocentric
	2. Some species are more important than other species.	Deontological	Biocentric
	3. Animals should have rights.	Deontological; Virtue Ethics	Biocentric; Character

	4. Individual animals have a right to be considered in policy discussion.	Deontological	Biocentric
	5. Species have a right to be considered in policy discussion.	Deontological	Biocentric
	6. The conservation of the species is more important than the conservation of an individual organism.	Deontological	Biocentric
	7. The conservation of the ecosystem is more important than the conservation of the species.	Deontological	Ecocentric
	8. The demands for a healthy ecosystem are greater than the cultural/spiritual needs of humans.	Deontological; Consequential	Ecocentric; Anthropocentric
	9. The demands for a healthy ecosystem are greater than the personal needs of humans.	Deontological; Consequential	Ecocentric; Anthropocentric
Role of Humans in the Ecosystem	10. Nature would be better off without humans.	Deontological	Ecocentric
	11. Humans are a part of nature.	Deontological; Consequential	Ecocentric; Anthropocentric
	12. Humans should be the dominant species.	Consequential	Anthropocentric
	13. Humans need to change the way they treat nature.	Deontological; Virtue Ethics	Ecocentric; Character

Poaching	14. Illegal taking of wild animals should be treated the same as theft of personal property.	Deontological; Virtue Ethics	Biocentric; Character
	15. Illegal taking of wild animals is acceptable if it is for sustenance.	Consequential	Anthropocentric
	16. Humans should be allowed to hunt any kind of wildlife.	Consequential	Anthropocentric
Problems Contributing to the African Vulture Decline	17. Humans use of vultures is acceptable if it is done in a sustainable manner.	Deontological	Ecocentric
	18. Humans use of vultures is acceptable if it is done in a humane manner.	Deontological; Virtue Ethics	Biocentric; Character
	19. Vultures need to be protected because of their value to the ecosystem.	Deontological	Ecocentric
	20. The use of vulture parts for knowing the future is important.	Consequential	Anthropocentric
	21. Killing vultures by poisoning carcasses for any reason is wrong.	Deontological; Virtue Ethics	Biocentric; Character
	22. The main reason for the vulture decline is because of the size of the human population.	Deontological; Consequential	Ecocentric; Anthropocentric
Management	23. Humans managing nature is good.	Deontological; Consequential; Virtue Ethics	Ecocentric; Anthropocentric; Character

	24. The government has an obligation to protect nature.	Deontological	Ecocentric
	25. Individuals have an obligation to protect nature.	Deontological; Virtue Ethics	Biocentric; Character
	26. The application of conservation management needs to be stronger.	Deontological; Consequential	Ecocentric; Anthropocentric
	27. It is important to practice sustainable management for future generations.	Deontological; Virtue Ethics	Ecocentric; Character
	28. It is necessary to adapt old practices to more effective practices as information is discovered.	Deontological	Ecocentric
	29. People's opinions are only validated if there is scientific evidence to support it.	Consequential	Anthropocentric
	30. One does not have a right to impose upon another's culture even if the cultures conflict.	Consequential	Anthropocentric

The statements were made into physical cards, and the respondents used the statement cards to recreate the preset quasi-normal distribution (Figure 1). The quasi-normal distribution created by each participant is called a Q-sort, and each Q-sort was reflective of the values and beliefs held by the subject.(78,79) The participants ranked

the statement cards in a Likert-scale format ranging from least agree (-4) to most agree (+4). For every column, participants could put only the number of statement cards as indicated, thus pushing them to prioritize their concerns. Letter A is an example of how the -4 column may only contain one statement card. All 30 statements had to be used, and the placement within the column did not affect the prioritization. For example, the -3 column contains Statements B and C. Statement C is higher up the column than Statement B, but it does not matter because both are representative of the -3 category.

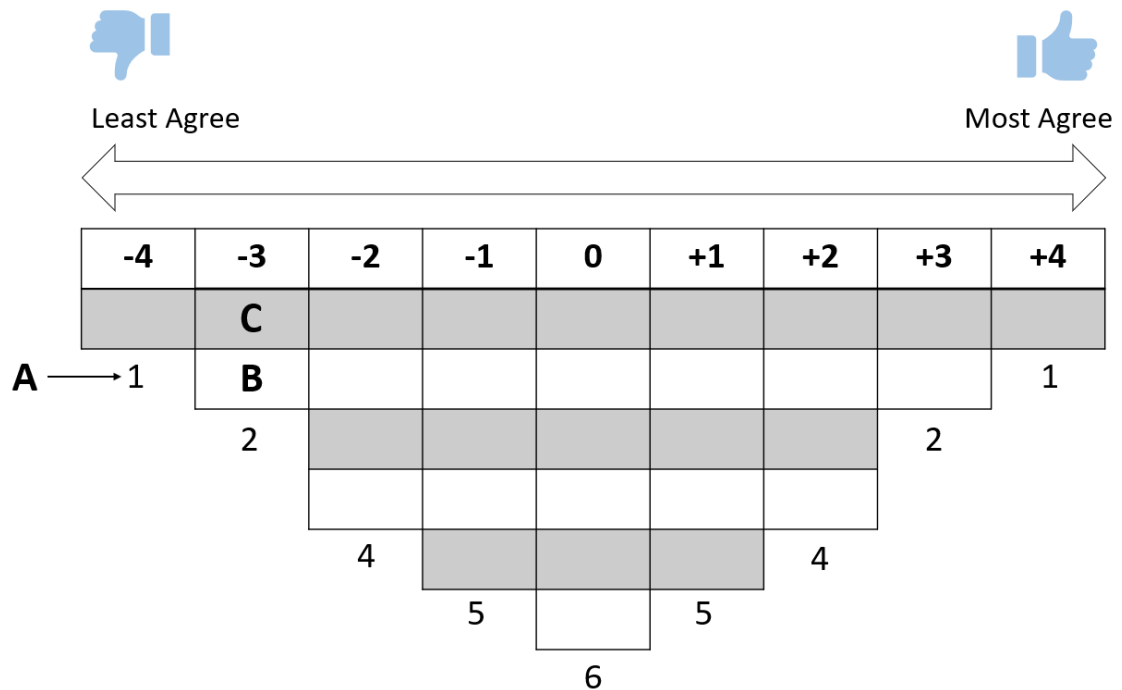


Figure 1: The Q-Methodology activity used statements where participants ranked statement cards in a Likert-scale format ranging from least agree (-4) to most agree (+4), yielding a preset quasi-normal distribution.

For the results analysis, I used the PQMethod software created by Schmolck and Atkinson (80), a statistical tool designed to correlate and interpret Q-sorts. The program used the culmination of the Q-sort data to generate factors that represent

archetype perspectives (or simply archetypes) that need to be interpreted by the investigator, as the investigator would be familiar with what aspects tie these responses together. Factors are weighted averages of a group of participants who arranged their Q-sorts similarly.(79) When a factor is generated, it has its own Q-sort arrangement representative of that group of respondents. There are two kinds of scores: z-scores and factor scores. These scores explain how a statement compares to the other statements in the sort. Z-scores are the weighted average of each statement within the factor Q-sort.(78,79) The higher the z-score, the more favorable the statement. Factor scores are the integer rankings of the factor Q-sort.(78,79) In this study, the factor scores would be column rankings such as +1, 0, -1, etc. In other words, the statement with the highest z-score received the factor score of +4, the next highest z-score received the factor score of +3, the following highest z-score also received the factor score of +3, continued until all the statements are placed. The program also created factor loadings that are used to determine the correlation a participant has with each factor.(78,79) Because factors are averages, no participant exactly aligned with any one factor, but typically a respondent was more similar to one factor.(79)

After the data are generated, a data reduction was performed to identify the most important information. Principal Component Analysis (PCA) was performed to produce eigenvalues. Eigenvalues are a way to reduce data, as eigenvalues less than one represented factors that explained variance found to be insignificant.(78,81) Then, a Varimax factor rotation was completed to further reduce the factors because it is a form of automated factor rotation commonly used in Q-Methodology that

eliminates the concerns of incomparability that manual rotations demonstrate.(79)
From there, it was up to interpretation to decide how many factors were most important and best representative of the participants' ideals.

The semi-structured formal interviews provided an in-depth understanding to the rationale behind the rankings. The formal interview questions were refined from the preliminary research interviews. Like in the preliminary research, the interviews were conducted in English, as it was a language comfortable for both parties. A digital recorder was used to record all formal interviews as well for accuracy and for aid when later referencing the data. During the interview, handwritten notes were taken to highlight key points in participant responses, as well as to record personal observations and thoughts related to the participants' answers.

Afterwards, the interviews were transcribed using the recordings and the notes for ease of reference. Transcribing the interviews made it simple to find parallel or outstanding results between what was shown in the Q-sort that could be compared to what was said in the interview itself. I used pseudonyms for all participants to keep their identities confidential.

I used Google Sheets to code and analyze data by using conditional formatting to highlight and organize information when certain words or phrases appeared in a cell (Figure 2). First, I placed the text from the transcriptions into Google Sheets in column A (Letter A). Each cell contained a paragraph covering a different topic. Second, I used the conditional formatting tool to set rules to identify key words applicable for the entire spreadsheet (Letter B). For instance, to look for the cells that contained the word "sustain" for the topic of sustainability, I set the custom formula

rule (Letter C) as: =SEARCH("sustain", A1:A1000) (Letter D). The custom role identified cells in column A that contained “sustain” somewhere in the text. Third, to aid in locating the specified word, the desired word was color coded. I used the color green, for instance (Letter E) as the rule to dictate that “sustain” was found in any cell. If the cell follows the above criteria, the cell would be highlighted green. Setting different colors for each trend made the coding process visually appealing and easy to organize. Google Sheets was efficient to access information and work remotely. Access to the Google account is password protected, and security measures such as duo authentication are in place should an unfamiliar source attempt to access the transcriptions.

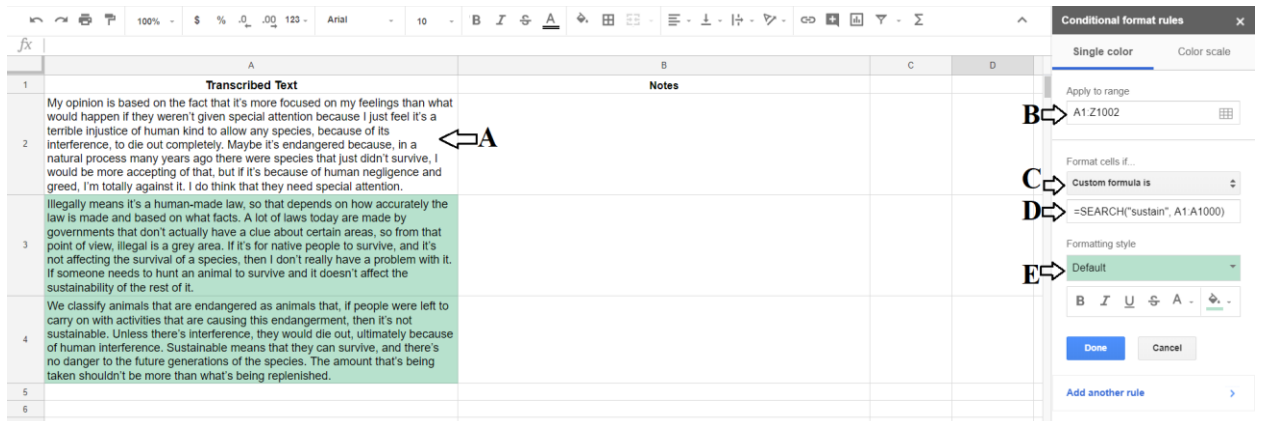


Figure 2: Google Sheets made the coding process simple and customizable. The customization options allowed for a variety of formatting styles and color coordination.

Chapter 4: Results

The quantitative data collected for this study includes showing how well each participant lined up with each factor, how the statements ranked within each factor, and how some statements were defined as a “distinguishing statement” or “consensus statement” by the PQMethod program. The qualitative data was structured into the five categories of emphasis (the value of nature, the role of humans in the ecosystem, poaching, management, and problems contributing to the African vulture decline), in line with how the interview questions were constructed.

Q-Methodology Statistics

The PCA factor analysis listed six eigenvalues greater than one. However, the subsequent Varimax rotation of these six factors did not clearly define overarching perspectives, and two of the six factors only incorporated answers from a single participant. After trials with varying rotated factors, three distinct factors accurately demonstrated the ethical perspectives among the subjects, accounting for 62% variance. The factors displayed by the participants were 1) biocentrism with a critical reception towards humans, 2) virtue ethics with a favorable reception towards humans, and 3) ecocentrism with little emphasis on humans.

Factor loadings show how respondents correlate with each factor (Table 3). The higher the factor loading, the more the respondent was aligned with the factor. It is important to note that factor loading does not show what factors the participants found relevant, as these factors were defined by the trends in the data, not by the participants free choice. A respondent with no X next to a factor loading shows that

the participant's answers were not strongly aligned with one factor but instead may have had many answers in multiple factors.

Archetype perspectives were based on the z-score distribution for each factor (Table 4), as well as the distinguishing statements for each factor, where "distinguished" is defined by Schmolck and Atkinson (80) as having a p-value of less than 0.05 (Table 5). The z-scores and factor scores demonstrated the compatibility each statement had with the corresponding factor (Table 4). The distinguishing statements are important because they show the z-scores for an archetype that are outstanding compared to the other archetypes. Statement 22, for example, has a much higher z-score for Factor 1 than for Factor 2 or Factor 3 (Table 5). Additionally, there were consistencies between the three factors that were crucial to understanding the study, as the PQMethod program determined consensus statements that did not distinguish between any pair of factors (Table 6).

Table 3: Factor loadings showing how well the responses of each respondent aligned with the factors, with an X indicating that the participant's answers were defining to that factor.

Q-Sort Participant	Factor Loadings		
	Factor 1 Biocentrism	Factor 2 Virtue Ethics	Factor 3 Ecocentrism
106	0.4407	0.1606	0.6445X
108	0.0927	0.2352	0.7900X
109	0.2403	0.5575X	0.0015
110	0.7208X	0.2810	0.2008
111	0.5307	0.4379	0.3131
112	0.6540X	0.3428	0.2711
113	0.7897X	0.4099	0.1104
114	0.5717	0.6335X	0.2682
115	0.2506	0.7938X	0.1077
116	0.5477	0.2306	0.5479
117	0.5030	0.2720	0.4755
122	0.8683X	0.1610	0.0886
123	0.4337	0.0774	0.5824X
124	0.7451X	0.0552	0.4232
125	0.5695X	0.3950	0.2468
126	0.0767	0.7371X	0.1764
127	-0.0081	0.6260X	0.5193
128	0.5823	0.6648X	0.0610
129	0.2764	0.5045X	0.2338
130	0.5118	0.4733	0.3506
131	0.5186	0.0438	0.5750X
132	0.0210	0.5210	0.5232X

Table 4: Z-scores and factor scores showing how each statement ranked according to each archetype perspective.

Statement Number	Statement	Factor 1 Biocentrism		Factor 2 Virtue Ethics		Factor 3 Ecocentrism	
		Factor Score	Z-Score	Factor Score	Z-Score	Factor Score	Z-Score
1	Endangered species should be given special attention to be protected.	+1	0.552	0	0.269	+3	1.511
2	Some species are more important than other species.	-2	-0.991	-3	-1.410	+1	0.616
3	Animals should have rights.	-1	-0.328	+1	0.660	0	0.120
4	Individual animals have a right to be considered in policy discussion.	0	0.151	-1	-0.585	-2	-1.204
5	Species have a right to be considered in policy discussion.	+1	0.593	0	-0.072	+1	0.483
6	The conservation of the species is more important than the conservation of an individual organism.	+1	0.321	+1	0.481	+2	0.957
7	The conservation of the ecosystem is more important than the conservation of the species.	0	0.116	0	0.293	+2	1.237
8	The demands for a healthy ecosystem are greater than the cultural/spiritual needs of humans.	-1	-0.151	0	-0.444	0	0.165
9	The demands for a healthy ecosystem are greater than the personal needs of humans.	-1	-0.243	0	0.281	+2	0.730
10	Nature would be better off without humans.	0	0.299	-2	-1.115	0	0.019
11	Humans are a part of nature.	0	0.133	+4	1.958	+1	0.700
12	Humans should be the dominant species.	-2	-1.284	-2	-1.198	-3	-1.708
13	Humans need to change the way they treat nature.	+3	1.308	+2	0.990	-1	-0.423
14	Illegal taking of wild animals should be treated the same as theft of personal property.	+1	0.415	+1	0.497	+2	0.802
15	Illegal taking of wild animals is acceptable if it is for sustenance.	-2	-1.217	-3	-1.225	-2	-1.247
16	Humans should be allowed to hunt any kind of wildlife.	-4	-2.022	-2	-1.214	-4	-1.757

17	Humans use of vultures is acceptable if it is done in a sustainable manner.	-2	-1.024	-1	-0.543	-1	-0.301
18	Humans use of vultures is acceptable if it is done in a humane manner.	-3	-1.470	-2	-0.972	-1	-0.805
19	Vultures need to be protected because of their value to the ecosystem.	+2	0.923	+3	1.376	0	0.352
20	The use of vulture parts for knowing the future is important.	-3	-2.011	-4	-1.952	-3	-1.426
21	Killing vultures by poisoning carcasses for any reason is wrong.	+4	1.647	-1	-0.705	+3	1.252
22	The main reason for the vulture decline is because of the size of the human population.	+3	1.462	0	-0.332	-1	-0.791
23	Humans managing nature is good.	-1	-0.784	+1	0.695	-2	-1.044
24	The government has an obligation to protect nature.	+2	1.292	+2	0.844	0	-0.081
25	Individuals have an obligation to protect nature.	0	0.176	+2	1.038	+1	0.535
26	The application of conservation management needs to be stronger.	+2	0.859	+2	0.967	0	0.303
27	It is important to practice sustainable management for future generations.	+2	0.974	+3	1.717	+4	2.076
28	It is necessary to adapt old practices to more effective practices as information is discovered.	+1	0.822	+1	0.761	+1	0.550
29	People's opinions are only validated if there is scientific evidence to support it.	-1	-0.430	-1	-0.583	-2	-1.180
30	One does not have a right to impose upon another's culture even if the cultures conflict.	0	-0.087	-1	-0.478	-1	-0.442

Table 5: Distinguishing statements showing the z-scores for an archetype that are noticeably different compared to the other archetypes, with z-scores with a p-value of at least less than 0.05, and z-scores with an asterisk (*) having a p-value less than 0.01.

Statement Number	Statement	Factor 1 Biocentrism		Factor 2 Virtue Ethics		Factor 3 Ecocentrism	
		Factor Score	Z-Score	Factor Score	Z-Score	Factor Score	Z-Score
<i>Distinguishing Statements for Factor 1</i>							
22	The main reason for the vulture decline is because of the size of the human population.	3	1.46*	0	-0.33	-1	-0.79
27	It is important to practice sustainable management for future generations.	2	0.97*	3	1.72	4	2.08
4	Individual animals have a right to be considered in policy discussion.	0	0.15*	-1	-0.58	-2	-1.20
<i>Distinguishing Statements for Factor 2</i>							
11	Humans are a part of nature.	0	0.13	4	1.96*	1	0.70
23	Humans managing nature is good.	-1	-0.78	1	0.69*	-2	-1.04
4	Individual animals have a right to be considered in policy discussion.	0	0.15	-1	-0.58	-2	-1.20
21	Killing vultures by poisoning carcasses for any reason is wrong.	4	1.65	-1	-0.71*	3	1.25
10	Nature would be better off without humans.	0	0.30	-2	-1.11*	0	0.02
<i>Distinguishing Statements for Factor 3</i>							
1	Endangered species should be given special attention to be protected.	1	0.55	0	0.27	3	1.51*
7	The conservation of the ecosystem is more important than the conservation of the species.	0	0.12	0	0.29	2	1.24*
2	Some species are more important than other species.	-2	-0.99	-3	-1.41	1	0.62*
24	The government has an obligation to protect nature.	2	1.29	2	0.84	0	-0.08*
13	Humans need to change the way they treat nature.	3	1.31	2	0.99	-1	-0.42*
29	People's opinions are only validated if there is scientific evidence to support it.	-1	-0.43	-1	-0.58	-2	-1.18
4	Individual animals have a right to be considered in policy discussion.	0	0.15	-1	-0.58	-2	-1.20

Table 6: Consensus statements showing statements of similar ranking between all the archetypes, where statements are not significant at a p-value of greater than .01, and the statements with an asterisk (*) are non-significant at a p-value greater than 0.05.

Statement Number	Statement	Factor 1 Biocentrism		Factor 2 Virtue Ethics		Factor 3 Ecocentrism	
		Factor Score	Z-Score	Factor Score	Z-Score	Factor Score	Z-Score
5	Species have a right to be considered in policy discussion.	1	0.59	0	-0.07	1	0.48
6	The conservation of the species is more important than the conservation of an individual organism.	1	0.32	1	0.48	2	0.96
8	The demands for a healthy ecosystem are greater than the cultural/spiritual needs of humans.	-1	-0.15	0	-0.44	0	0.16
12*	Humans should be the dominant species.	-2	-1.28	-2	-1.20	-3	-1.71
14*	Illegal taking of wild animals should be treated the same as theft of personal property.	1	0.42	1	0.50	2	0.80
15*	Illegal taking of wild animals is acceptable if it is for sustenance.	-2	-1.22	-3	-1.22	-2	-1.25
17	Humans use of vultures is acceptable if it is done in a sustainable manner.	-2	-1.02	-1	-0.54	-1	-0.30
18	Humans use of vultures is acceptable if it is done in a humane manner.	-3	-1.47	-2	-0.97	-1	-0.80
20	The use of vulture parts for knowing the future is important.	-3	-2.01	-4	-1.95	-3	-1.43
26	The application of conservation management needs to be stronger.	2	0.86	2	0.97	0	0.30
28*	It is necessary to adapt old practices to more effective practices as information is discovered.	1	0.82	1	0.76	1	0.55
29	People's opinions are only validated if there is scientific evidence to support it.	-1	-0.43	-1	-0.58	-2	-1.18
30*	One does not have a right to impose upon another's culture even if the cultures conflict.	0	-0.09	-1	-0.48	-1	-0.44

Category of Emphasis: The Value of Nature

What Constitutes the Value of a Species?

The first category of emphasis from the interview questions revolved around what factors contributed to the value of a species. The Q-sort Statement 2, “Some species are more important than other species” addressed the concern of the valuation of a species. It was noted as a distinguishing statement for Factor 3, with a z-score of 0.62, factor score of +1, and a statistically significant p-value of less than 0.01 shown by the asterisk (*) (Table 5). This was interesting, as the statement itself is more biocentric (learning towards Factor 1) but was distinguished with Factor 3 which

emphasized the well-being of the ecosystem as a whole and less so on the comparison between species. Participants could have looked at the importance a species had on the ecosystem as a whole, making it a possible ecocentric point of view. For example, a participant under the pseudonym Fred stated how some species have a more critical role to play in the ecosystem, making them more important. He cited how the health of Yellowstone National Park changed dramatically with the reintroduction of wolves, as they are a top predator that keep the number of secondary and primary consumers in check. In a similar way, Fred explained how the ecosystem would change drastically should African vultures become extinct. Fred noted that he does find all species to be of importance, but he personally found influential species (e.g., keystone species) to be more important. He prioritized the instrumental utility derived from keystone species for the benefit of the ecosystem as a whole (Factor 3) and less so on the individual species level (Factor 1).

Conservationists in Factors 1 and 2 disagreed with Statement 2, providing a ranking of -2 for Factor 1 and -3 for Factor 2 (Table 5). Lawrence, for example, held a biocentric point of view (Factor 1), stating, “Every organism is a part of a species. The vulture is important, but when it comes to conservation, he’s not more important than any other. That bird over there is just as important because he eats the ants and insects”. Lawrence clarified how all species serve an equal importance to the ecosystem, even if we do not see the full extent of their importance. Taylor, another person who disagreed with Statement 2, raised the point that some species are more noticeably functional to the ecosystem than others, but this functionality does not constitute more value. She stated: “Species all serve each other somehow. Vultures

may eat more than just rhino carcasses, but that doesn't mean that if the rhinos disappear, the vultures will be okay”.

Intrinsic Value

The valuation of a species led to clarification on the importance of intrinsic value during the formal interview, as it was not a direct question stated in the Q-sort activity. Intrinsic value was an overlapping theme between all three factors. All respondents acknowledged the benefits derived from instrumental value during the interview; however, all but one interviewee mentioned how they recognized an intrinsic value derived from nature and its components. Joey explained his thoughts about nature, saying “It has monetary value, but it also has value in that pristine condition such as spiritual value and cultural value. Often you can't put a price on that. That's something that's internal, an intrinsic value”. Joey illustrated how nature generates an internal sense of satisfaction that cannot be understood using numbers.

Conversely, Jimmy was the one conservationist who did not personally feel the benefit of intrinsic value. He explained how although nature does extend value beyond human use, it does not possess an intrinsic value alongside its ecological value. He described the importance of having species rely on the stability of the ecosystem, but when asked if there was any other value nature brings besides its utilization, he replied, “No, not really”. The respondent demonstrated a consequentialist point of view, emphasizing the usefulness of nature rather than an internal value extended from nature simply existing.

Sustainability

The concept of sustainability found in Statement 27 proved to be an essential component when defining the value of nature. Respondents defined sustainability along the lines of providing for the needs of the present while not compromising the needs of future generations. Statement 27 is categorized as a distinguishing statement for Factor 1 (Table 5), as it ranked relatively lower for Factor 1, but it played a critical role for all factors, as the statement received high rankings for each of the factors.

Statement 27 demonstrated virtue ethics, as working to provide for the future is a righteous quality to strive for, reflected in Factor 2. Participants explained further in the interviews how critical it was for upcoming generations to have the opportunity to experience nature as they have. Tom addressed this component of sustainability when speaking about his sons: “Everyone has to work together. I teach my kids, my sons. I’m going out now, but they’re coming in, and that’s why this is important. I think it’s the beginning of a big story”.

Statement 27 also held a deontological, ecocentric mindset as it focused on caring for the upcoming generations, not just the needs of people today, resonating with Factor 3. Tina shared her thoughts as an educator because she found it part of her duty to educate others about the interconnectedness of humans and the environment, stating, “I don’t have kids, but it’s leaving the world a better place for all the living beings. I mean that to be very inclusive, not just humans, but for all that are going to come after me . . . When I think of other living beings, it’s because I’m thinking of being part of a bigger picture”. She invests her time with education

because it is one of the most critical components of changing behavior, and she feels the need to do her part in being the change. She acknowledged how the strife to conserve is not truly a matter of saving the Earth but prolonging the existence of humankind as we know it on the Earth.

Instrumental Value

As participants defined their viewpoints on what gives a species value, we narrowed the scope to focus on what specific qualities constitute the value in vultures. All respondents valued the instrumental use of vultures as carrion eaters. This was reflected in Statement 19, “Vultures need to be protected because of their value to the ecosystem”. Although it was not a distinguishing statement for any one factor nor was it deemed a consensus statement, it received positive z-scores for all three factors: 0.923 (Factor 1), 1.376 (Factor 2), and 0.352 (Factor 3) (Table 6). About 68% of respondents particularly mentioned that the use of vultures for research or education was acceptable because of the benefits towards better care and management of the birds in the future. Two participants specified that using vultures for research or education should exclusively use birds that were injured or dead. They did not want researchers to capture birds from the wild unless it was for breeding purposes because of the limited numbers. The instrumental uses of vultures for ecological or educational purposes were positively received among the interviewed conservationists, as these reasons further promoted the health of the individual animals (Factor 1), the health of people (Factor 2), and the health of the ecosystem (Factor 3).

The distinction between ethical viewpoints arose from the question of incorporating vultures in traditional belief use. The Q-sort analysis found that the interviewed conservationists did not find the use of vultures for traditional beliefs to be acceptable, particularly for knowing the future. Statement 20, “The use of vulture parts for knowing the future is important”, was a consensus statement among all three factors, with z-scores of -2.01 (Factor 1), -1.95 (Factor 2), and -1.43 (Factor 3) (Table 6). This statement, reflective of a consequentialist, anthropocentric point of view, was not a value that the respondents held. During the interview, all of the participants reported that they personally were not users of traditional belief use products involving animal parts. About 35% of the respondents stated that traditional medicine use, including herbal medicines not containing animal parts, was “not part of their culture”.

There were varying viewpoints on the level of acceptance of using vulture parts in traditional medicine. Gerald, for example, found that using animal parts in traditional medicine was unacceptable, stating “It is only based off of superstition. Animals are suffering because some people say it helps with winning the lotto, but no one has ever won because of it. It’s just a belief that is not true”. Gerald exhibited a biocentric point of view in line with Factor 1 because of the emphasis on individual animals suffering, particularly for anthropocentric causes. Respondents such as Kevin expressed situational ethics (unaligned with a factor) towards the use of vulture parts in traditional use if the vulture population were sustainable, as he explained “I’m not comfortable because it’s not sustainable. If they were to take vultures that have already died, or if they were breeding vultures for the purpose of muti, I think that

would be doable. I don't like the idea, but it would be doable". Jeffery was also unaligned with any factor, mentioning how although he does not agree with the use, he cannot dismiss the idea because it is not his culture. He said: "There is no scientific evidence that having a vulture's head will help you win the lotto or whatever you might want it for, but I respect other beliefs and traditions. You can't go into a market with a big stick and loud mouth because no one will respect you".

Category of Emphasis: Role of Humans in the Ecosystem

Views on Human Domination

First, the respondents mutually agreed that humans should not hold dominance as a species, as addressed in Statement 12. Statement 12 was a consensus statement, with factor scores of -2 (Factor 1), -2 (Factor 2), and -3 (Factor 3) (Table 6). This is not surprising, considering the training the interviewees went through as conservationists. One participant, Bart, stated his reason for the low ranking was that he is dissatisfied with how humans currently treat the environment and therefore he does not think they should be in charge. He demonstrated a situational ethics perspective (unaligned with any factor) because if humans were doing a better job caring for the environment, he would not have an issue with humans being the dominant species. Another participant, Virginia, explained that her negative ranking was due to the history of destruction humans have had on the environment as a whole (Factor 3), saying "I think humans do a lot of damage to nature, and they should definitely not be the dominant species. Please don't let humans be the dominant species".

Another respondent who did not align with any of the defined factors is Miguel, who defended that humans should hold a dominant position in the ecosystem. Miguel stated that “Humans should be the dominant species because they’ve got knowledge, and they’ve got more sense than wild animals. They can reason for themselves”.

Reasons for Environmental Stewardship

All participants agreed that humans have an ethical duty to protect nature. This was not an explicit Q-Methodology statement but rather a question presented in the interview. Arnold shared that “It also feels like our purpose to ensure that there’s a healthy environment left or sustained. So nature mustn’t just be there for human consumption. We are part of nature. We’re not there to exploit nature for our personal gains.”

There were five justifications (four deontological, one consequential) behind why respondents held a sense of environmental stewardship: 1) duty because of previous human manipulation of the environment, 2) duty because of future generations, 3) duty because of the influence humans have on the environment, 4) duty because of religious teachings, and 5) duty because of human survival (Figure 3). Each interviewee is accounted for in only one category (i.e., it is mutually exclusive), as they were asked to identify what justification meant the most to them.

Of the 37 participants, 11 out of 37 (29.7%) explained during their interview how a sense of duty rose because humans have already manipulated and made a negative impact on the system (Figure 3). Bart explained that although humans do have power, they need to start using it for remedial reasons, saying “I do think

humans do have a duty because we're on the top of the food chain. We have the power to control, and for the better or worse, we can do as we please too often. It's up to us to correct the wrongs we've done".

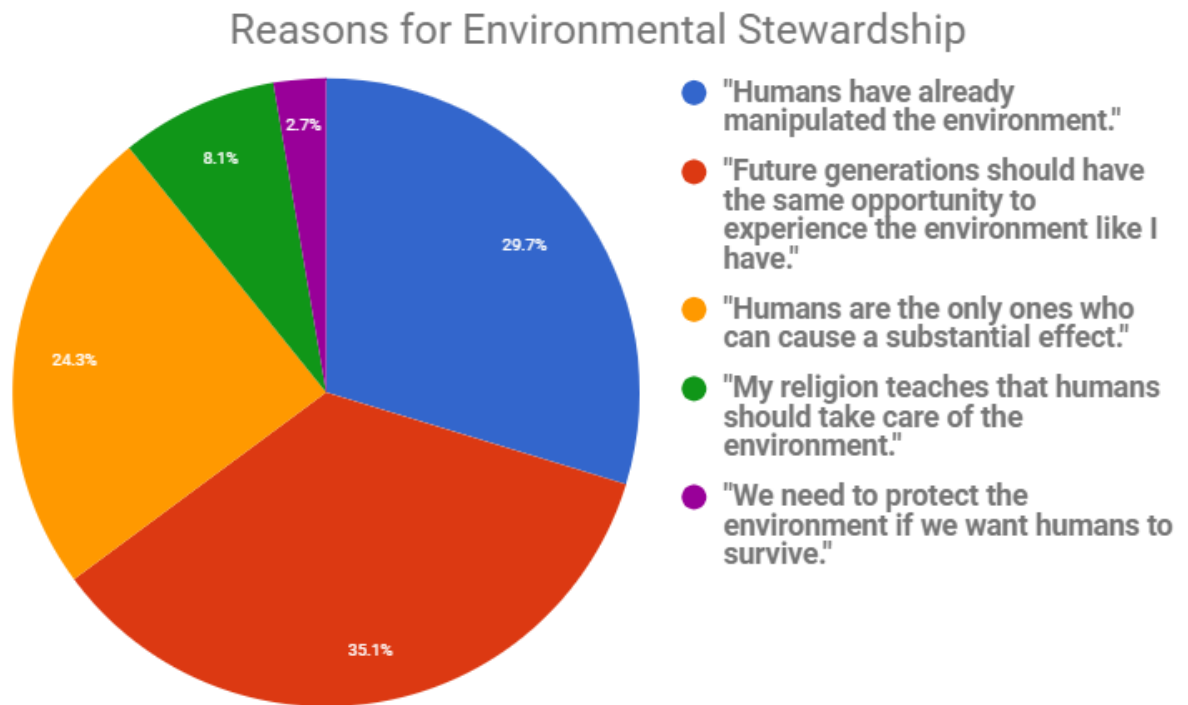


Figure 3: Reasons provided by conservationists studying African vultures why we should practice environmental stewardship.

There were 13 participants (35.1%) who exhibited duty towards allowing future generations the opportunity to experience wildlife and the natural environment (Figure 3). For example, Miguel mentioned how important it was for younger generations to understand wildlife like he did, saying “We should be responsible for what we did to the wildlife. My children might someday ask me, ‘What does a rhino look like’? I cannot just take out a picture. I should show them in the wild because it was there before me”. Being able to share the aesthetic and intrinsic value he finds in wildlife with people to come is essential to why he strives for conservation.

For nine respondents (24.3%), the sense of duty came from the influence humans have over the environment (Figure 3). Joey explained how humans are the only species who are able to cause a substantial effect, stating “Who else is going to do it? . . . We do have the ability to manipulate the system, so if our ethics are right and our knowledge is correct, then we can do this successfully”. Joey concluded that it is our responsibility to use this ability to better the system that we live in, not just for humans, but for all things within the system.

The concept of religion played a part in shaping the ethical worldviews towards environmental stewardship. The three conservationists (8.1%) who mentioned religion specifically cited Christianity as an influential factor driving their passion for conservation, particularly stemming from the concepts of stewardship and dominionism (Figure 3). One participant, Johnny, gave his perspective, explaining “. . . I try and bridge my science understanding and our role and responsibility as complex creation to extend moral consideration for other organisms and our responsibility for caring for those who can’t speak for themselves”. The dominionism construct has a scriptural connection in multiple faiths but especially from a Judeo-Christian perspective, as Miguel noted: “I read in the Bible that the human is put on the Earth to take care of and manage nature”. Similarly, Zack summed up the importance of stewardship and dominionism from a Christian perspective how “The world was created by God, not only for our enjoyment, but to sustain us. We don’t know how long the world’s going to exist, so it’s a stewardship mentality that we have to have”. For these participants, Christianity was central to influencing and instilling a sense of duty towards the care for the environment.

The remaining interviewee (2.7%) said how it is less of a deontological reason to protect nature as it is the end result of pursuing human survival, displaying a consequentialist point of view (Figure 3). Anna emphasized the fact that without a healthy ecosystem, humans are in danger of suffering, stating “We do have an obligation, but I think it’s far more important to protect it for our own well-being. I don’t think ethics are really important. I think it’s common sense that if we don’t protect it, we are going to suffer”. At the end of the day, it is more crucial to strive for what will allow humans to continue to exist rather than doing the right thing; it is a matter of survival.

Category of Emphasis: Poaching

Use of Poached Animals for Sustenance

All the conservationists stated that the act of poaching is wrong because it is written in the law, demonstrating a deontological viewpoint to dutifully follow the law. This viewpoint was in line with the consensus found with Statement 15, in which “Illegal taking of wild animals is acceptable if it is for sustenance” was found to be generally disagreed upon, with factor scores of -2 for Factor 1, -3 for Factor 2, and -2 for Factor 3 (Table 6). Jimmy’s basis for following the rules came from his desire to be credible, particularly because of his status at his job: “My view is still that one should follow the law. I get calls on a daily basis, where we might have contravened the law, and you always have your view that ‘well, legislation is a minimum requirement’. You need to adhere to legislation”.

However, about 11% of participants during the interview explained that this statement was not as straightforward as the Q-sort may make it seem, demonstrating a situational ethics point of view. Bart, for example, explained how “A lot of laws today are made by governments that don’t actually have a clue about certain areas, so from that point of view, illegal is a grey area. If it’s for native people to survive, and it’s not affecting the survival of a species, then I don’t really have a problem with it”.

Legalization of Rhino Horn Trade

Another point brought about naturally over the course of the interview was the question of whether selling rhino horn should be made legal or not. Only one of the participants supported rhino horn trade becoming legal. One participant Miguel supported the idea because it would “give the animals a purpose and help farmers get money back from owning them. I get no economic benefit from raising them, only an economic liability. I want rhinos to survive, but if I could also have an economic incentive to raise them, that would help me. You can’t kill the demand, so you might as well play it”. Miguel contested that although he personally finds intrinsic value in the species, that may not be enough reason for others breed and care for rhinos. Instead, he proposed legalizing rhino horn to give rhinos an instrumental, economic purpose to be protected. The people farming the rhino will not only help the conservation of the rhinos by purposefully breeding them, but the farmers will receive money back through selling the rhino horns.

However, Lawrence proposed that supplying the market with rhino horns is not the ethically correct decision because he believes that legalizing the sale of rhino horns will not stop people from poaching, nor will it help the poorer people who

poach gain any income: “The guys on the floor is going to forever poach because he’s still going to get the same amount he’s always gotten. Even if the top guy gets 40% of what he used to get, if he gets \$400,000 instead of a million, he’s still making a hell of a profit”.

The other argument against legalizing rhino horn trade came from Jimmy, who believes that the consumers do have the power to change the market: “Am I going to buy something that I know will eradicate the species? No, but through consumer behavior, you can influence conservation. I’m not going to buy this product because it’s going to create a market. The moment that I buy it, someone’s going to supply it. Cut of the demand. It’s the consumer that’s got that power through their choices”. Jimmy’s beliefs are rooted in virtue ethics, where he values a consumer’s character to either encourage or discourage the market for rhino horns and that this decision can make a difference.

Category of Emphasis: Management

Because of the prevalence of the management topic within the interviews, it was important to further comprehend what the interviewees thought of current laws and enforcement. Although the question of if the government has an obligation to protect nature was not heavily emphasized in the Q-sort as seen in Statement 24 (Table 5), the interviews uncovered that there were different viewpoints of how much faith the participants had in their respective governments. Therefore, this section split participants by country, either South Africa or Kenya. The conservationists from the US did not feel adequately knowledgeable to give valid opinions of either country-

specific or pan-African legislation, so their viewpoints are not represented in the following section.

Strictness and Enforcement of Poaching Laws

In South Africa, respondents stated that poaching laws were either strict enough but not enforced (23 out of 27, or about 85%), or not strict enough because of the lack of consequences (4 out of 27, or about 15%). None of the South African participants said the poaching laws were too strict. Joan explained that the laws and knowledge behind them are adequate, but it is the lack of enforcement that is holding back progress, saying “I think we have all the tools already at our disposal. We’ve asked and answered a lot of the questions about conservation, yet we do nothing with that information. We don’t apply it correctly, and we don’t apply it intensively enough. That is right from conservation tools all the way up to the legal system”. Bart noted that stricter laws and punishments would be the appropriate consequence for law breakers, stating “I believe that it’s possible to control any law, even outside of conservation, if there are consequences and law enforcement. There are countries that are very severe with their punishment of people stepping out of line, even just littering, and those countries don’t have that problem at all. It doesn’t exist. I think that it just boils down to being more strict [sic] with law enforcement and consequences”. These attitudes towards the strictness of the law did not fail to come without a comment concerning the lack of enforcement.

For Kenya, all seven participants agreed that there needed to be stronger enforcement of poaching to truly be effective, but there was a division in responses about the strictness of the laws. Four of the seven (about 57%) said the laws were

strict enough but poorly communicated. One of the seven (about 14%) affirmed the laws were too strict. The remaining two of the seven (about 29%) stated the laws were too strict for people who are struggling to survive, but not strict enough for wealthy poachers. Luis explained that these viewpoints on strictness were in context of Kenya's Wildlife Conservation and Management Act of 2013 (WCMA), which explicitly details the criminalizing of hunting of protected animals and unlicensed game and trophy hunting.(82) Under §92, the WCMA states that an offense involving endangered and threatened species will subject to a minimum 20 million KES (about \$200,000 USD) and/or life imprisonment.(82)

Luis is a conservation biologist working with the Maasai Mara National Reserve, and part of his job is to fill the gap between national law and local communities living in the reserve by creating awareness of conservation laws. He explained that the law is strict enough, but there is poor education of the laws to communities, leaving local members unfairly treated. He said: "It's been about four years since [the WCMA] was enacted, but local populations still don't have enough understanding. The government should be making sure the communities understand the obligations stated in the Act to be of good use for both wildlife and people". Luis has seen first-hand the communication gap between the law and its constituents, so to ensure the Maasai people do not unknowingly break the law, he finds it to be his responsibility to bridge the gap and spread awareness.

Benjamin argued that laws are too strict. He said that, for uninformed people, a fine of 20 million shillings or life imprisonment is too steep a punishment. For knowledgeable poachers, however, he stated that the laws are strict because the

severity of the punishment would incite fear rather than learning what is right and what is wrong. As a supporter of virtue ethics, he would rather people not poach because of the implications of poaching on their character, not because of harsh laws: “People are cheeky. There will always be people who find ways of doing things and run unnoticed. But if people understand the value of wildlife and the ecosystem, regardless of whether there are stringent laws, they will have the ethical values to conserve. People should not do things out of fear but out of understanding”.

Last, Tiffany’s viewpoint on strictness was that the act is too strict for those who are trying to survive, but not strict enough for commercial poachers. She held a situation ethics perspective out of concern for those who poach for their survival, not for profit, saying “For a poor person with limited alternatives trying to feed his family, the punishment is too great, but when it comes to commercial poaching of elephant and rhino, it might even be too lenient and not a sufficient deterrent. I do understand that policies are across the board, but I still feel like it could outline divergences in poaching to make them more effective”.

Laws Concerning Compensation

Miguel, in South Africa, has personally felt the financial hit of having his wildlife poached, and he said the compensation he received was not enough to atone for his loss. He shared that he finds intrinsic value in his rhinos and, as a precaution, he has sawed off the horns of his rhinos so that he does not risk his animals being poached again.

In Kenya, two members of the Maasai tribe shared how they have lost sheep because of protected carnivores, but they did not want to run the risk of attacking the

predatory animal in fear of being severely fined. The members filed for compensation from the government, but they have yet to hear back. They stated that the ethics of the situation was not central because at the end of the day, they were still financially hurt from the loss of their livestock. They stated that they were disappointed in the lack of responsiveness and care towards their loss of privately-owned animals.

Role of Private Citizens

All the interviewees shared that private citizens have a duty to work towards conservation efforts, but they do not necessarily have to go above and beyond general expectations to make a difference. For example, Maasai elders, Joshua and Quincy, affirmed how they believe that “It is each individual persons role to take care of their own land, and within that land, one should take part in sustainable practices”. Megan agreed with this sentiment, discussing how one person’s sphere of influence can have a substantial effect. She noted how “Humans must look after their own sphere of influence and teach your children those ethics. We don’t have to be heroes. We just have to look after our own daily existence and the habits that we occupy”. The recipients indicated how private citizens can bring about change within their normal everyday lives.

Category of Emphasis: Problems Contributing to the African Vulture Decline

The South African and Kenyan respondents expressed similarities and differences when explaining the anthropogenic factors attributing to the African vulture decline. The main similarity between the two countries was the severity and prominence of poisoning. Out of the 37 interviews, 76% of them had cited poisoning

as the main issue across Africa (Figure 4). Benjamin expanded on why he found poisoning to be the most dangerous threat: “Poisoning is indiscriminate. Vultures are very vulnerable. One carcass has the potential of killing hundreds of them, and if you were to round all of those up, you have so much more to sell”.

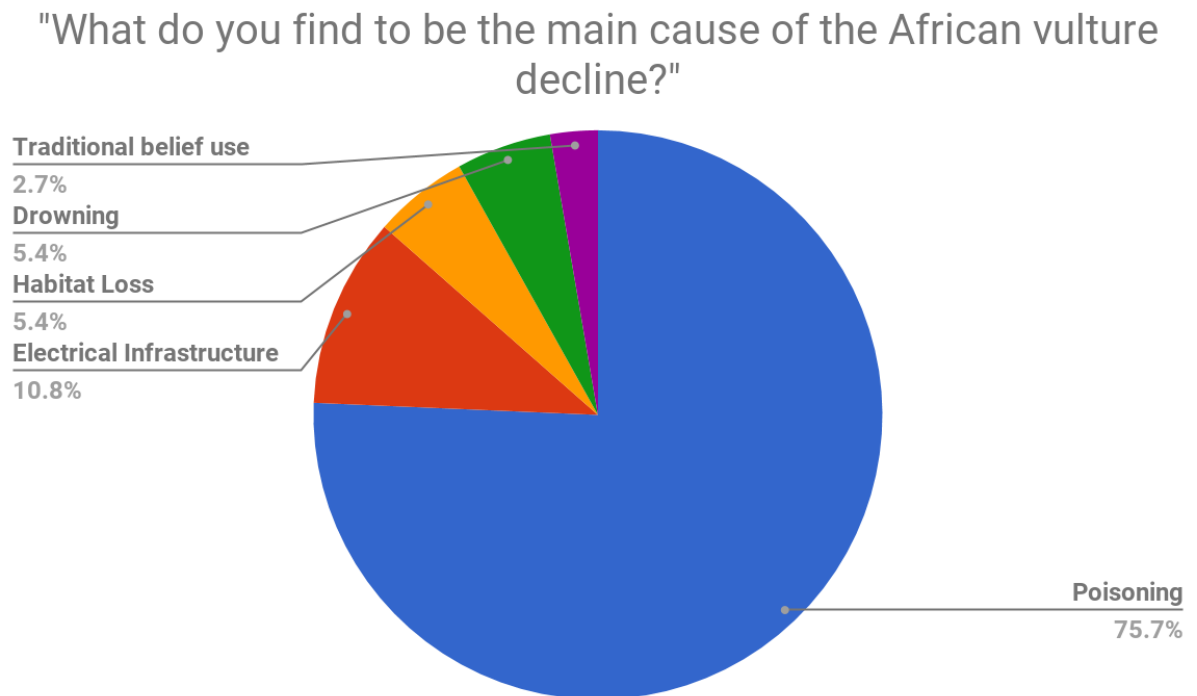


Figure 4: The participants' point of view of what was the main cause of the African vulture decline.

Respondents explained that intentional poisoning from poachers was the most concerning reason related to poisoning. Kevin, a ranger at a national park, disclosed that there have been reports of people poaching in the park, mainly targeting animals like elephants for their tusks and rhinos for their horns. He explained the interconnectedness between poaching and the subsequent vulture deaths, because “everything works together. Once you disturb one part of the ecosystem, others will suffer. You need balance”.

In addition to poisoning, participants mentioned other problems affecting the vulture decline that pose a considerable threat to vultures, but the asperity of the situation is not on the same level as poisoning (Figure 4). Electrical infrastructure issues, for instance, was not mentioned in any of the Kenyan interviews, but they were mentioned in the South African interviews, particularly in the Northern Cape region. Jimmy is a member of an electrical public utility company in South Africa who looks at environmental management plans, and he explained how the company has redesigned the infrastructure to be safer for birds. He stated that these new designs have been in place since around 1990. As for the older power lines already in place, he noted the company is aware of the current problems and in the midst of making those more bird-friendly, although he did not give specific details. In addition to the traditional electrical power lines, another conservationist manager Alfred mentioned how the increase in wind farms has also been a rising threat to birds in general, as the draft created by the windmills sucks the birds into the machine causing bird mortality; however, he was not certain that this proved to be an issue with vultures or other bigger bird species.

Two interviewees mentioned habitat loss as a factor to the decline. Alfred explained how habitat loss in South Africa is increasingly becoming a problem in two main ways. First is the increase in human settlements that disrupt the current state of the habitat, and second is the physical encroachment of humans into undeveloped land. These reasons aligned with Thomas's viewpoint in the Maasai Mara Nature Reserve in Kenya. Thomas mentioned that although the wildlife in the reserve are

generally undisturbed by humans, outside of the reserve is in worsening shape, making the game reserves even more important.

Traditional belief use was only a topic for South African participants, as the respondents from Kenya did not feel equipped to talk about the topic. In South Africa, conservationists in Kimberley and the Kruger National Park area acknowledged the traditional practice, but they did not feel equipped to provide in-depth knowledge. It was not until visiting KwaZulu-Natal that participants appeared to be more personally invested in the subject, as these respondents were actively involved in better understanding how the muti market works. For instance, Robert has been speaking to members in the traditional market for a few years, gaining the trust of shopkeepers to spread awareness of conservation movements. He wanted to work from a grassroots level to educate and change people's mind about the use of animal parts in traditional medicine. From his time at the market, he recalled that prices for vulture parts are "heavy", with 3000 ZAR for the body, 700 ZAR for the head, 400 ZAR for one wing, and 200 ZAR for one foot. He explained that patrons particularly use the head for keen eyesight for hunting and the foot for agility when fighting.

Two respondents mentioned incidences of vultures drowning, but they did not emphasize drowning as a predominant problem for Africa as a whole. Justin in particular noted that vultures drowning was common in the Northern Cape region of South Africa, as the birds may fall into water reservoirs but have no way of stepping out. Bart, a private game reserve owner also from the Northern Cape region, noticed vultures drowning first-hand in watering stations he placed for his livestock, so he

adjusted by placing branches or a small pile of rocks in the troughs for birds and other small creatures to stand on while drinking.

Chapter 5: Discussion

Q-Methodology Statistics

This study explored the viewpoints of conservationists to highlight the ethical dilemmas underlying the African vulture population declines. The Q-Methodology activity suggested three factors that blended the respondents' values into distinct archetypes: 1) biocentrism with a critical reception towards humans, 2) virtue ethics with a favorable reception towards humans, and 3) ecocentrism with little emphasis on humans. Although these factors are distinct from one another, they can all understandably be viewpoints of those who work in the field of conservation.

Factor 1, biocentrism with a critical reception towards humans, emphasized not only the duties humans have towards the life but how humans are not currently treating the biota with the respect that it deserves. This factor was biocentric because of the focus on the importance of individual vultures affected by poisoning, as expressed in Statements 21 and 22, the two highest ranking statements (Table 4). Additionally, the top three highest ranked statements expressed that humans are a major contributor to both the decline in African vultures through methods such as poisoning, but the "humans need to change the way they treat nature" aspect implied that there is an element of responsibility that is not currently being addressed. The critical reception towards humans is shown through Statements 22, 13, and 24 (factor scores of +3, +3, and +2, respectively), as they expressed how humans have a duty to protect and respect nature, but they are not achieving these goals to a satisfactory level. Statement 22 and 27 were particularly important to note because of their high

rankings, as well as being distinguishing statements with a statistical significance of less than 0.01 (Table 5).

Factor 2, virtue ethics with a favorable reception towards humans, articulated that humans should pursue virtuous acts because humans are integral in the ecosystem. I hesitated to classify Factor 2 as “anthropocentrism” because although there was an emphasis on humans, the focus was on how humans have a large role to play. This is seen with Statement 11, as it is the highest factor score statement (+4) for Factor 2, but only neutral or slightly agree for Factors 1 and 3 (factor scores of 0 or +1, respectively) (Table 4). Statement 11 is also the top distinguishing statement, with a z-score of 1.96 (Table 5). Statement 23 also had a positive rating of +1 given for Factor 2, contrasting the negative rating of -1 for Factor 1 and -2 for Factor 3 and further emphasizing the favorable reception towards humans (Table 4). Statement 10 was a slightly disagree ranking of -2 for Factor 2, whereas Factors 1 and 3 have it as a neutral ranking of 0; this placement showed that although humans are a part of nature, it did not mean that the participants who aligned with this archetype agreed that humans were doing a satisfactory job. Factor 2 held high expectations for the performance of humans, and therefore was critical of their performance. Additionally, Factor 2 deemed that it was important for humans to recognize their influential role and to build upon moral principles. Statements 27, 25, and 13 were three of the top five highest ranked statements, all emphasizing the need for humans to take care of nature (Table 4). Factor 2 offered a viewpoint that greatly contrasted the other two factors.

Factor 3, ecocentrism with little emphasis on humans, demonstrated a holistic point of view, with minimal attention towards the needs of people. This is not to be confused with the notion that human needs were not considered at all but it was the needs of the entire ecosystem that were the most important. Statements 27, 7, and 6 in particular affirmed this holistic view (Table 4), as they received positive factor scores of +4, +2, and +2, respectively. Statement 27 considered sustainability in the context of the need for resources for future generations, not just the needs of people today. Statements 7 and 6 looked at the comparison of the needs of a bigger system compared to a smaller one, and in both instances, the needs of the bigger system were prioritized for Factor 3. Statement 1's focus on giving special attention to endangered species placed as the second highest ranking statement as well as a distinguishing statement, whereas it was only ranked as slightly agree or neutral for Factor 1 and 2, respectively. Statement 13 was noteworthy because it was a distinguishing statement for Factor 3 because of its slightly disagree status, versus the stronger agreement for Factors 1 and 2.

The overall strong disagreement with the anthropocentric statements (Table 6) came as no surprise considering the sample population works to incorporate more than just the immediate needs and wants of humans. Their overall deontological, ecocentric perspective drives them to work for a better world for all. Statement 20 particularly stood out, where all factors strongly disagreed with the sentiment, receiving a factor score of either -3 or -4, and a z-scores of no higher than -1.43. Interestingly, Statement 4 was listed as a distinguishing statement (Table 5) for all three factors, with its p-value<0.01 for Factor 1 and p-value<0.05 for Factor 2 and

Factor 3. However, the biocentric nature of the statement truly only belongs with Factor 1 because it focuses on the importance of individuals, not humans.

The PQMethod program did not sort Statements 3, 9, 16, 19, and 25 into either distinguishing statements or consensus statements. This was not surprising because these statements did not have drastically different rankings, and neither were they similar enough to each other to be considered a consensus statement. Statement 29 was listed as both a distinguishing statement for Factor 3 as well as a consensus statement. The program determines whether a statement is “distinguishing” or “consensus” by z-score, but in reality, Statement 29 cannot be both a distinguishing and a consensus statement. Because the factor score had only one ranking difference at most and the z-score has only a 0.75 difference at most which is not significant, it would be more appropriate to categorize it as a consensus statement.

Value of Q-Methodology

Using Q-Methodology and semi-structured interviews were a good fit for completing the objectives of this study. Q-Methodology was an appropriate tool because ethical points of view are inherently subjective. Examining each conservationists’ individualized Q-sort was insightful to better understanding their points of view. The Q-sort activity complimented the semi-structured interviews, as the Q-sort showed *what* the respondents valued, while the interviews teased out *why* they valued it accordingly. Together, they pieced together a fuller understanding of conservationists’ perspectives on the African vulture crisis, having both quantitative and qualitative data for support.

Category of Emphasis: Value of Nature

Instrumental and Intrinsic Value

The respondents expanded on the topic of the functionality, or utility, that a species provides. The diversity of responses arose when discussing whether or not valuation qualifies the species as “more important” than another species, which coincided with the variety of factors. Participants with a biocentric point of view (Factor 1) acknowledged that all species play a beneficial role to the ecosystem, but all species also have a value in itself for existing (intrinsic value), regardless of its functionality or utility. Those conservationists with a virtue ethicist worldview (Factor 2) focused on saving the species because it was a virtuous characteristic of kindness that they would want to achieve. The ecocentric respondents (Factor 3) placed more emphasis on the species that played a larger role in the ecosystem as a whole, as said species would have a considerable effect.

Understanding the different ethical viewpoints surrounding the levels of instrumental value is an important element to consider and acknowledge when making decisions. Instrumental value is a means to an ends, as humans have a use for the goods and services that the environment provides.(23) In contrast, those with a biocentrist worldview hold all species on the same level rather than on a hierarchy and apply an element of intrinsic value to the situation, the caveat being the possibility that there might be an unknown benefit that is a knowledge gap to consider.(70)

The study shows that most of the conservationists interviewed found an intrinsic value in nature and use it as part of the reason they pursue their work in

conservation. The one exception who did not personally find intrinsic value in nature acknowledged how intrinsic value exists for others, but he was not an adherent to the concept of intrinsic value for his belief system. The two points of view, although oppositional, demonstrate a mutual understanding of the importance and urgency to work towards conserving nature and strive to achieve this balance for all, whether they derive intrinsic value from it or not. The challenge lies with cooperating with stakeholders who do not share a mutual understanding of intrinsic value, as it is viewed as a more personal and spiritually self-beneficial experience.(69)

Sustainability

The concept of sustainability in Statement 27 was crucial to understanding the conservationists' ethical standpoints. Statement 27 was insightful because it not only quantified as one of the highest ranked statements among the three factors, but the interviews revealed a strong sense of duty to work for future generations. There were minor distinctions within the conservationists concerning the why sustainability was important. Ecocentrists focused on a holistic point of view, where the more anthropocentric participants focused on the opportunities and welfare for the future generations. The elements of planning and thinking ahead unite conservationists to work towards a common goal of a better future and is characteristic of the participants because of their overarching deontological ethic.(70,75)

Category of Emphasis: Role of Humans in the Ecosystem

The role of humans in the ecosystem focused on stewardship,(29) as all of the participants mentioned that humans have a duty to care for the environment in some

way. All of the reasons for environmental stewardship were deontological except for the statement “We need to protect the environment if we want humans to survive”, made by one respondent (Figure 3). This latter consequentialist point of view was important to acknowledge because it poses an ethical contrast with the ideals of deontologists. Although it was not the popular viewpoint of the participants, it showed how those within the conservation field can have varied viewpoints but still pursue their work in conservation.

None of the respondents agreed with the perspective of a dominating role of humans. Although Miguel had mentioned that he is in favor of humans being the “dominant” species, his commentary following that answer is line with dominionism, particularly because of his Christian background.(31,32) Not all who had a dominionist perspective stated that they had a Christian background, but those who stated they had a Christian background held a dominionist perspective.

The concept of religion was not a prompted topic of discussion, as the study was not designed to persuade the respondent that religion had a role to play. Although there were three participants who mentioned religion, specifically Christianity, as their reason for environmental stewardship, this does not discredit the role religion can have for conservationist motives. For example, Muslim beliefs(30) as well as native African faiths and relations to spirituality and creation care(21,83) may be a relevant reason why people participate in conservationist efforts. However, no other faith beliefs besides Christianity were mentioned during the interviews, including traditional African beliefs, as a reason for their personal motivation towards environmental stewardship.

Category of Emphasis: Poaching

Use of Poached Animals for Sustenance

The debating sides concerning the use of poached animals for sustenance is attributed to contrasting worldviews. This topic put into question the justification for situational ethics.(71) In general as noted with Statement 15, there was a consensus among the factors that the illegal taking of wild animals for sustenance was not acceptable. Statement 15 is a consequentialist, anthropocentric point of view because it condones the needs of a person over that of the perceived justice of the legal system.(69) However, Bart explained how situational ethics can take place, as the question of the sustainability of the poached animal came into question. He clarified that if the hunted animal was used for sustenance and if the species was sustainable, he would not find this to be problematic. He pointed out two exceptional conditions to be satisfied to make poaching acceptable, showing how situational ethics can confound ethical considerations when making decisions.

Legalization of Rhino Horn Trade

The arguments behind legalizing rhino horn trade in South Africa ultimately examine the possibility to influence the market demand and how to go about protecting the species. The supporting side expressed that because the rhino owners can cut the horn off and profit from it, taking the targeted object off of the animal will protect them from being poached. They expressed it was part of their duty to protect their rhinos from poachers, and the legalization of rhino horn trade has given them

more purpose to breed and care for rhinos because they can also profit from the horn sale.

However, the opposing side expressed that the rhino horn trade is a utilitarian, anthropocentric perspective rather than a deontological point of view. The desire to protect rhinos is not coming from the duty to protect rhinos, but it is the economic profit that is giving rhino owners more of a reason to care for rhinos. Legalizing rhino horn trade would only save rhinos on personal property, not rhinos overall. A person can cut the horns off of personally-owned rhinos and save those rhinos from being poached (which poses another ethical question in itself), but the thousands of rhinos on public land (i.e., Kruger National Park) are still at risk of being hunted.(84) It is extremely difficult to keep track of all the rhinos on public lands in general, which is why poaching is a tricky issue to tackle in the first place. Therefore, the legalization of rhino horn trade will only help save a small portion of rhinos. The anthropocentric point of view is not wrong, but it is important to recognize the limited scope it has for saving rhinos from being targeted.

In 2017, National Geographic reported that the domestic trade of rhino horn had been legalized in South Africa, where traders are required to hold a permit to buy and sell the horns.(85) At the time this research was conducted, the decision to legalize the trade had not been decided. The arguments presented by the subjects focused largely on the economic outcomes of legal sale of rhino horns and effect the trade will have on the population. There was no discussion of potential alternative sources of revenue from rhinos should the sale of rhino horn not be enough to cover the upkeep cost (i.e., ecotourism, legal game reserve hunting). It is difficult to

determine the overall effects this legalization will have on the South African rhino population and the local economy. There are many stakeholders involved in rhino horn trade, including rhino horn product users, conservationists, private game owners, the state that creates the laws and oversees enforcement, and local communities.(86) It is essential to consider the outcomes this change in legislation may have for all involved.

Category of Emphasis: Management

The management of poaching laws was a vital component to discerning conservationists' points of view. There was a contrast in answers between those in South Africa and those in Kenya, understandably because each government has its own unique laws in place. As such, the respondents answered differently as to how they view the government's role in managing wildlife. However, there was an overall trend of dissatisfaction in the way poaching laws are currently handled due to the inconsistencies in strictness of the law and poor or unfair enforcement. All three archetype factors, biocentric, virtue, and ecocentric, possess a strong deontological ethic towards conservation efforts,(70) so the disappointment in enforcement of poaching laws is understandable.

Three of the study participants were also disappointed with the laws that concerned compensation, as they did not feel the compensation they received (if any) was sufficient to cover the value of their lost animals. They experienced an economic, instrumental loss, as well as the disappointment mentioned above, so their ethical perspective of how the government is not doing a sufficient job with management is understandable. The local livestock owner's point of view is essential to consider

when discussing how ethics affect stakeholders because it shows how these management decisions are affecting its constituents on a personal level rather than just on a broader managerial or ecological level.

Category of Emphasis: Problems Contributing to the African Vulture Decline

Both in literature and in this study, poisoning appeared to be the most serious problem contributing to the African vulture population declines.(3,9,37,39,40,43,62,67) The severity of the problem was mainly due to the widespread negative effects one poisoning incident may cause. Benjamin noted how poisoning is indiscriminate and has the power to kill hundreds of creatures, not just vultures. Understandably, poisoning incidents were noted more often where prized game animals are found. Therefore, the effects of the poison on vultures and other scavengers were likely to be possible in those areas as well.

In the Northern Cape region of South Africa, participants explained how there was not a large density of highly-prized game animals like elephants and rhinos, so poisoning was not as big a threat in this region. They stated that they believe poisoning to be the bigger, more serious concern across Africa, but regionally they identified electrical infrastructure and drowning to be more prominent problems. Electrical infrastructure conflicts are widespread issues for birds around the world, and vultures are no exception. Problems with collisions and electrocutions are a concern, especially because the older, more dangerous infrastructure (to wildlife) needs to be replaced, but this is costly and will take considerable effort and resources to complete.(39,51,53,54,56,58) Drowning was another concern, but this is possibly

because the game reserve owners and farmers who were interviewed would have seen firsthand that drowning was a problem.

Traditional belief use of vultures and other animal parts was a familiar concept to those in South Africa, but not so much in Kenya. As traditional belief use is prominent in the western and southern regions of Africa, the lack of familiarity in Kenya is not surprising. Three out of the seven Kenyan respondents (about 43%) had not even heard of the use of vulture parts as a component of belief use, reiterating its lack of presence in at least this eastern part of Africa.(8)

In South Africa, the participants who resided in Kimberley and the Kruger National Park area explained that they were not the most knowledgeable on the topic of traditional belief use because they do not personally work with those incidences. This finding may be because those participants were involved in the management portion of larger organizations such as NGOs and larger governmental offices, not so much on the ground field work. In KwaZulu-Natal, I was able to connect with conservationists who work directly with traditional markets. The harvesting of vultures has been reported in this region,(37) and Robert told me about products and prices that added to the information found by Beilis and Esterhuizen (61), who looked at this issue in Lesotho. Although the exact demand for these items are still unknown, Robert's insight on prices (3000 ZAR for the body, 700 ZAR for the head, 400 ZAR for one wing, and 200 ZAR for one foot) and vulture part uses showed that the use of animals in traditional belief use is still an active part of the muti market today.

Not surprisingly all of the participants stated that they did not engage in traditional belief use, fitting with the identified archetype factors and their occupation

as conservationists. However, the respondents' differing viewpoints about the acceptance of using vultures in traditional belief use show diversity of opinion can arise. For instance, biocentrists (Factor 1) such as Gerald were not accepting of the practice because of the suffering individual animals would endure for a cultural benefit. In contrast, the situational ethics perspective expressed by those such as Kevin explained that if under circumstances wherein the vulture population were sustainable, then it would be acceptable. These varying levels of acceptance demonstrated different ethical approaches on the matter, as well as the complexity of the traditional belief use situation.

The use of vultures for bushmeat was mentioned as a contributing factor for vulture population declines, but it was not mentioned as a "main cause" as displayed in Figure 4.(3,64) The participants who acknowledged the use of bushmeat stated that it was not as an ecological problem so much as it is a poverty problem. They explained how people who eat animals for bushmeat is a result of poverty because the hunters cannot afford to buy meat on the market.(65,66) Although bushmeat was said to be a factor to the vulture decline, the interviewed conservationists emphasized it was not an overarching ecological concern.

Surprisingly, none of the conservationists interviewed mentioned the ingestion of lead(4,48) or belief in vultures killing livestock or stealing children(40) as contributing factors, even though these were issues mentioned in the literature. Although the concept of hunting and poaching was discussed in length, none of the participants mentioned how the lead in the bullets may have an effect on the scavengers who eat the carcasses of the hunted animal. No participants mentioned

stories of vultures capturing children and killing livestock as a reason to hunt vultures. This result is possibly because the belief may not be as prominent as it once was or possibly because I was not able to sample a population that may have been exposed to such folklore or possibly because as trained or semi-trained conservationists, they understood the limited probability of such possibilities.

Limitations

Most participants consisted of those who had affiliation with conservation work. However, a few interviewees both from South Africa and Kenya considered themselves lay practitioners with some knowledge of vultures and conservation rather than specialists. Therefore, it is important to consider that there is a limited representation of ordinary citizens because of the targeted audience. Additionally, because of nuanced language differences, the Q-sort activity was modified for a number of participants from Kenya, as the statements on the Q-sort cards are precise and not all words in English carry the same meaning when translated. Therefore, the Q-sort factor analysis only takes into account the 22 participants who completed the activity correctly. This limitation did not pose a statistical problem because all the Q-Methodology data were relative to the 22 participants, and the results that came straight from the interview portion were relative to all 37 total participants. It is, however, an important piece to note. The data from participants who sorted the statements into Yes/No categories were not included in the calculated data but were considered when finding general trends and opinions. However, I considered all subjects in the qualitative portion of my results.

Because of the temporal and fiscal constraints of two years to complete the project, I could only conduct field research in two of Africa's many countries working on the vulture crisis. The discussion section is built around these observations and literature review. Thus, this study should not be taken as representative of all of Africa.

Chapter 6: Policy Recommendations

Ethical Summary

It was valuable to explore different points of view of conservationists because they have a vested interest and insightful perspective that will ultimately have an influence on policies because they work in the field of conservation. Understanding different points of view is essential to creating an ethical, well-rounded policy decision that is working for the benefit of all. Because policy decisions will ultimately depend on the science and stakeholder input to develop a mandate, it is important to keep the range of ethical viewpoints in mind.

The main normative viewpoints explored in this study were deontological (including biocentrism and ecocentrism), virtue-based, consequential, and situational forms of ethics. Ethical dilemmas may arise when the duty to do what is right (deontological) or the pursuit of personal virtuous growth (virtue ethics) conflicts with the desired final results of the outcome (consequential). These viewpoints can and will be in conflict because a duty or personal character building may not be enough justification for a consequentialist to agree to a policy decision if the outcome does not seem worth the effort. Conversely, focusing solely on the outcome of the situation can be disconcerting to deontologists because of the ways the outcome was achieved. Likewise, a virtue ethicists may not find any personal growth through the activity. More importantly, such actions are contrary or an affront to their personal character. Situational ethicists may add another layer of complexity by suggesting circumstances that question the absolutism of an ethical construct. Normative deontology, consequentialism, and virtue ethics come from a perceived absolute set

of values, but situational ethics offer a relative point of view, which by its nature stands in contrast to the more absolute points of normative ethical perspectives.

Another ethical dilemma that may arise is associated with the importance of intrinsic value in the environment. Because intrinsic value is a personal, subjective benefit, it may prove a difficult argument as a standalone reason to pursue conservation efforts. Although intrinsic value may be important to some people, the wide variability of benefit one may derive from it makes it more of a supplementary or supporting justification rather than an independent pursuit.

The controversy of animal parts in traditional belief use presents a huge ethical dilemma. The most obvious issue is the difficulty of balancing needs and wants from both traditional and Western beliefs. *Should* using animal parts in belief use be acceptable and who has the right or authority to make such personal determinations since it is predicated on spiritual connections? If it is deemed acceptable, should this practice be regulated? How can a regulating authority be sure all parties are satisfied without compromising the integrity of another? Even among conservationists in this study there were differing viewpoints on the subject.

In addition to the cross-cultural tensions that arise between traditional and Western beliefs, there are human health risks and ecosystem health problems that can occur, thus warranting regulatory consideration. For instance, humans are at risk of unintentionally consuming poisoned vulture parts, and the effects of this poison on people are not well-known. Additionally, African vulture populations are still declining, posing possible ecosystem health issues in the future if the declines are not addressed.

The ethical issue of poaching is relevant as well. Sustenance and an income are two instrumental needs, but where to draw the line of right and wrong is difficult, as evidenced from the conflicting perspectives presented during the study. Poaching laws are made to protect wild animals, but under what conditions, if any, would it be acceptable for humans to consume for their own benefit? An anthropocentrist may find the needs of hungry people more valuable than the needs of an endangered or protected species. An ecocentric person may find that the consumption of bushmeat acceptable if it does not have a substantial effect on the ecosystem as a whole. One could also argue that poaching for the sake of survival such as the consumption of bushmeat or only making enough money from the poached animal to meet basic needs would be acceptable (situational ethics), but it would then have to be considered on a case by case basis, which would be difficult to enforce overarching laws. Who determines what are considered “basic needs”? The severity of poaching laws is another point of contention, as it is one way to handle the balance between protecting the wild animals and deterring people from poaching and other illegal activities.

The legalization of rhino horn trade is a controversy that may have a solution, depending on how the 2017 legalization in South Africa pans out. Should the trade be successful, and the needs of conservationists and consumers of rhino horn are satisfied, this may be a viable solution for other countries to follow. However, should this trade come to a point where it is no longer beneficial but detrimental to a party, revisions need to be explored to properly handle the wants from different parties.

Although it may be difficult to satisfy all viewpoints, it is necessary to consider how a decision would align with other ethical viewpoints when making decisions. There are not easy or possibly any “correct” responses to these ethical dilemmas (hence why they are dilemmas), but acknowledging their presence and finding common ground is vital towards addressing the problems that can be solved.

The following recommendations include exploring poaching motivations, increasing conservation education, improving enforcement, and increasing community engagement. These suggestions consider a broad array of areas to address the situation.

Explore Motivations for Poaching

Because illegal poaching and poisoning incidences were found to be main contributors to the decline in African vultures, it is essential that we understand why poachers take part in illegal wildlife hunting. Part of this concern appears to be poverty. Addressing poverty is thus a major concern, as illegal hunting can provide both food and quick money for those in financial need.(87,88) Harrison et al. (89) reported that poverty alleviation is one of the most effective ways to reduce illegal wildlife hunting. However, Duffy et al. (90) suggested that poverty is a multifaceted issue with roots that extend far beyond hunger and money. The anthropocentric, consequentialist needs that are highlighted above, but further exploring other ethical viewpoints to figure out the values and drivers of these poachers would give a fuller understanding as to how to address the issue. Exploring the connections between poaching and poverty using ethnographic methods that are attuned to sensitive issues is necessary to effectively prevent more poaching.(90)

Increase Education

Raising awareness and increasing education on the interconnectedness of environmental issues is another root issue that should be addressed. It is not that the connection with the environment is news to the African people, but because of colonization and pressure to keep up with demands, many countries in Africa are in a state of rapid development,(21,83) making the push for natural resource extraction and other development projects a priority.(28,83) Additionally, because of colonialism, much of the education system is becoming westernized, thereby marginalizing the traditional views on the environment.(21,91) Although it is rash to assume that all peoples in Africa held an environmental awareness or the same belief system, it is also naïve to think that there is and was no education about natural surroundings. Understanding how both traditional and Western practices that have contributed to environmental degradation is key to making educated decisions moving forward.(21,83) It is imperative that all peoples have access and the ability to assessments of environmental conditions as they stand now, with goals in mind for where we want to be in the future.

Improve Enforcement

Conservation efforts need the support from both the governmental and local people.(92) Even in the more secure protected areas, there are accounts of poaching on the property because of the extensiveness of the land. For example, the South African Department of Environmental Affairs (84) reported that in 2012, 362 of the 588 poached rhinos were found in Kruger National Park, the largest national park in the country. Kruger National Park lies on the border of South Africa, Zimbabwe, and

Mozambique, making it even more difficult to apprehend poachers.(93) Drone tracking and ranger patrols have been used to collect data on where and when poaching incidents may occur,(94) but poaching is still prevalent. Further investing in tracking and mapping technologies is essential to understanding more about what areas of the park need to be more protected. Although both South Africa and Kenya have rigorous laws in place, continuously building and adapting strategies to overcome the difficulties of enforcement is necessary to the progression towards providing proper wildlife management.

Community Engagement

There is an ethical dilemma concerning what should be done to balance the needs of both the African people and the needs of the ecosystem. Kabiri (95) proposed solutions to conservation efforts, mainly centered around establishing community engagement. Dyer et al. (96) found that two-way communication throughout the entire process was vital to the success of the project, along with mutual respect and clear establishment of roles and responsibilities. Gardiner et al. (97) suggested that including local peoples in conservation law enforcement can be beneficial to both the people and the wildlife. However, there have been reports of cases of violence and retaliation within communities because poaching was a vital source of income.(97,98) Therefore, it is necessary to keep in mind the mindsets and perspectives of all community members affected. If the members agree that community involvement is a way to better the community rather than imposed opposition to anti-poaching intervention, there is hope that the initiatives will be effective. Two participants in this study expressed how they want to be included in

conservation efforts, showing signs for potential action. They stated that they want to be involved because it is ultimately they who interact with the wildlife and are affected by these wildlife conservation laws, not the policy makers. The criminals will continue to find ways to pursue their endeavors, but tightening these laws without consulting the constituents leads to feelings of disregard.(96)

Four policy recommendations were suggested to address different components of this complex issue. Increasing education and community engagement would be good places to start because they focus on gaining a mutual understanding between constituents and policy makers. There are many cultures that span the entirety of Africa, so being able to establish this dialogue and understand how different people think is essential to make a difference.

Chapter 7: Conclusion

Conservation is a transdisciplinary field that involves the cooperation of many different stakeholders and this study discovered the ethical perspectives of just one group of the stakeholders involved, namely those who are actively involved in conservation works. Through conducting a Q-sort activity, three distinct viewpoints were discovered: biocentrism with a critical reception towards humans; virtue ethics with a favorable reception towards humans; and ecocentrism with little emphasis on humans. With these viewpoints in mind, further understanding of the participants' values and beliefs were explored using relevant, open-ended interview questions concerning the value of nature, role of humans in the ecosystem, poaching, management, and reasons for the African vulture decline.

A Q-sort factor analysis linked with the interview responses to find trends regarding ethical dilemmas and how differing perspectives might construct the issues. The dilemmas discussed included the importance of intrinsic value, the incorporation of vulture parts in traditional belief use, and strictness of poaching laws for bushmeat and profit. The most surprising finding was the diversity in answers about using vulture parts in traditional belief use. It is an issue that incorporates many different complex and sensitive factors, and no one answer can be construed as truth.

From this study, the next steps needed for research include understanding other stakeholder groups who are not directly associated with conservation work but who are more directly affected by the African vulture population decline, such as traditional belief users, agriculturalists, and pastoralists. Valuable insight could be

gained by learning more about if and how the vultures have influenced the culture and livelihood of such stakeholders.

As noted in Chapter 6, more research of the ethical drivers behind why people poach is a major component that should be explored. Although focused on African vultures, this study can be applied to different demographic and geographic contexts investigating how cultures and backgrounds influence the way people behave and what people think about the role of vulture in culture and nature. Other studies focused on discovering how cultures perceive and handle ethical issues can be a derivative of this work.

This study is the beginning of investigating the deep ethical issues surrounding the African vulture declines. However, the value of this study reveals the complexity of how science and personal worldviews interact to help conservationists approach vulture population declines as it uncovered the wide array of viewpoints that demonstrated not just conservation beliefs and values and the justifications behind them, but how they all interact to construct management strategies to protect vultures and provide for their long-term sustainability.

Appendices

Appendix A: IRB Consent Form

Project Title	Understanding Conservationists' Perspectives Concerning the Ethical Dilemmas Associated with Declines in African Vulture Populations
Purpose of the Study	<i>This research is being conducted by Natalie Yee (under advisor Dr. Reginal Harrell) at the University of Maryland, College Park. We are inviting you to participate in this research project because you demonstrate an understanding of the African vulture population and its cultural uses. The purpose of this research project is to explore cultural concerns of conservationists, many of which have differing ethical opinions about vulture population declines. Information will be used to find alternative solutions to both ecological and cultural concerns.</i>
Procedures	<p><i>Participation in this study involves an interview with Natalie Yee taking place at the participant's location of choice. Topics to be covered include current conservation concerns for local African vulture populations, the roles different stakeholders play in vulture conservation, and suggestions for future management decisions.</i></p> <p><i>Any individuals who are named will be made anonymous with a coding system. Only Natalie Yee and Dr. Reginal Harrell will see the names and coding system.</i></p> <p><i>The procedures involve:</i></p> <ol style="list-style-type: none"> <i>1. Ranking a group of statements regarding the level of agreement (e.g., agree, neutral, disagree). This should take about 10 minutes.</i> <i>2. A discussion through a semi-structured oral interview. I will ask why the participant chose to place the cards in that order, the current situation of vulture declines, and why they might feel this way. The participant may opt to not answer a question at any time. An audio recorder will be used during this portion for accuracy. This is anticipated to take about 30 minutes, but time may vary depending on how much information the participant chooses to share.</i> <p><i>The overall duration is anticipated to take about 40 minutes. The study will be conducted in English and in as much privacy as possible. The exact location depends on the accessibility of the participant and how comfortable the participant feels in this space. If clarification is required, the participant may be contacted via email to discuss responses further.</i></p> <p><i>Sample question:</i> <i>Can you provide insight as to why you ranked this statement as the most important?</i></p>

Potential Risks and Discomforts	<i>There are no known risks anticipated in this study beyond those experienced in everyday life. There is a potential for discomfort of having an unfavorable opinion; however, the participant does not have to any question that makes them uncomfortable.</i>
Potential Benefits	<i>There are no direct benefits from participating in this research. This research is not designed to help you personally but the results may help the investigator learn more about the different ethical perspectives surrounding the vulture population declines. We hope that, in the future, other people might benefit from this study through improved understanding of these perspectives to make appropriate management decisions.</i>
Confidentiality	<p><i>Any potential loss of confidentiality will be minimized by having the data stored only on a password protected computer and on an external flash drive not shared with other users. The flash drive will be locked away in Dr. Harrell's office on campus. The audio recordings will be deleted off both the computer and the flash drive. Any hard copy notes will be destroyed as well. This will occur a maximum time of one year after the project is complete.</i></p> <p><i>The participant's identity will be protected by having the information coded with an identification key. This identification key will be in its own separate file. Only Natalie Yee and Dr. Reginal Harrell will have access to the identification data. All interviews will be transcribed by Natalie Yee. She will take the maximum precautions to limit a breach in confidentiality.</i></p> <p><i>Anonymized electronic data will be stored and may be shared with others involved in the SESYNC Vulture project or the Digital Repository at the University of Maryland (DRUM). Any publications involving these data will have codes representing people and therefore will not associate individuals with certain ideals.</i></p> <p><i>If we write a report or article about this research project, your identity will be protected to the maximum extent possible. Your information may be shared with representatives of the University of Maryland, College Park or governmental authorities if you or someone else is in danger or if we are required to do so by law.</i></p>
Right to Withdraw and Questions	<p><i>Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.</i></p> <p><i>If you decide to stop taking part in the study, if you have questions, concerns, or complaints, or if you need to report an injury related to the research, please contact the investigator:</i></p> <p><i>Natalie Yee</i> <i>2113 Animal Sciences/Agricultural Engineering Building</i></p>

	<p>University of Maryland College Park, MD 20742 301-395-4142 Nyee1@terpmail.umd.edu</p> <p>Dr. Reginal Harrell 2113 Animal Sciences/Agricultural Engineering Building University of Maryland College Park, MD 20742 301-405-6511 rharrell@umd.edu</p>	
Participant Rights	<p><i>If you have questions about your rights as a research participant or wish to report a research-related injury, please contact:</i></p> <p style="text-align: center;">University of Maryland College Park Institutional Review Board Office 1204 Marie Mount Hall College Park, Maryland, 20742 E-mail: irb@umd.edu Telephone: 301-405-0678</p> <p><i>This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects.</i></p>	
Statement of Consent	<p><i>Your signature indicates that you are at least 18 years of age; you have read this consent form or have had it read to you; your questions have been answered to your satisfaction and you voluntarily agree to participate in this research study. You will receive a copy of this signed consent form.</i></p> <p><i>If you agree to participate, please sign your name below.</i></p>	
Signature and Date	NAME OF PARTICIPANT	
	[Please Print]	
Signature and Date	SIGNATURE OF PARTICIPANT	
Signature and Date	DATE	

Appendix B: Self Introduction:

Hello,

My name is Natalie Yee, and I am a Master's student at the University of Maryland. For my thesis, I am researching ethical viewpoints surrounding African vulture population declines. I hope to reach out to as many people as possible to have a well-rounded understanding of how people feel about the relationship between humans and vultures, but more importantly, why. Being a part of conservationist efforts within (Organization/Agency), you would be an insightful point of view to learn. The ultimate goal will be to represent these perspectives during the decision-making process.

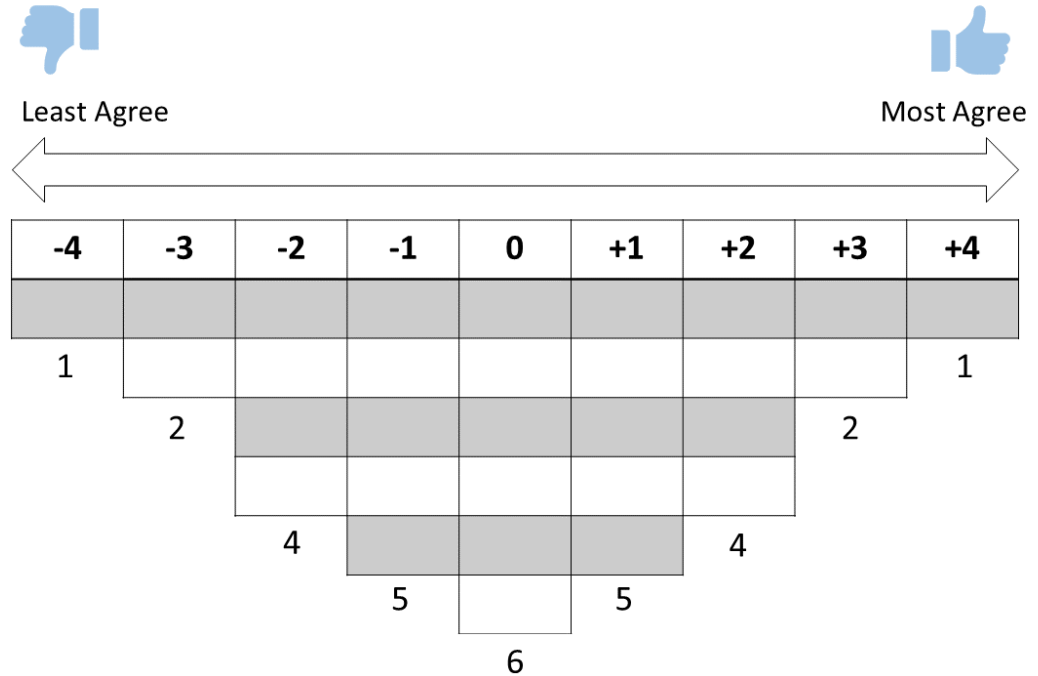
The procedures involve ranking a group of statements regarding the level of agreement (e.g., agree, neutral, disagree), and a follow-up discussion through a semi-structured oral interview. You may opt to not answer a question at any time. An audio recorder will be used during this portion for accuracy. The overall duration is anticipated to take about 40 minutes.

Although there are no direct benefits from participating in this research, the results may help the investigator learn more about the different ethical perspectives surrounding the vulture population declines. This research is not designed to help you personally, but we hope that, in the future, other people might benefit from this study through improved understanding of these perspectives to make appropriate management decisions.

If you are willing to participate, please suggest a time and date that works best for you, and I will do my best to accommodate. Thank you for your time, and I hope you have a wonderful day.

Appendix C: Data Collection Instruments

Q-Methodology Board



Base Interview Questions

General Information

1. Could you please state your name and job title?
2. Could you describe how your work specifically relates to vultures?

Q-Sort Follow-Up

3. Is there a theme as to why you sorted your cards this way?
4. Why were these statements most important to you?
5. Why were these statements least important to you?
6. Is there anything you can tell me about the middle section?
7. Were there any statements that were difficult to sort? If so, which ones?
 - a. Why were they difficult to sort?
8. If you could leave out 3-4 cards, which ones would they be? Why?

Animal Welfare/Integrity of Nature

9. What is most important about conservation in your opinion?
10. Do humans have an ethical duty to protect nature? Why or why not?
11. Does nature have a value beyond human use? If so, can you describe this value?

Poaching

12. What is your opinion on the taking of an animal illegally?
13. Do you agree with the current enforcement of poaching laws in Kenya/South Africa?
14. What suggestions, if any, would you have to improve enforcement of poaching laws?

What are Vulture Ethics?

15. What is the main problem regarding the African vulture decline?
16. What do you understand about the use of vultures for African medicine?
17. Are there any ethical ways humans can utilize vultures? If so, what are they and why?

Management

18. What role should the government play in managing nature?
19. What role do private citizens play in vulture management currently?

Closing

20. Is there anything from the sorting activity or the interview that you would like to discuss further?

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