Natural Sciences Learning through Collaboration of Community-level Educational Outreach & Holistic Conservation Practices:

Goodknecht Professional Paper

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ABSTRACT

Inspirational & sensory-based educational outreach principles through STEM learning is an exceptional first-step approach to engaging with all generations and stakeholders within a community, so that those individuals may take grassroot & holistic initiatives to support their local wildlife regions through applied conservation and awareness. With the collaborative partnership of Imire Rhino & Wildlife Conservancy in Zimbabwe-Africa, and by utilizing ethically sourced specimens & replicas - in addition to visual aids like wildlife photography that depicts the resident animals at the conservancy site - an interactive approach was taken to inspire select undergraduate communities within a midwestern township (along with colleagues at the Field Museum) to care passionately for the wildlife preserved on the African continent, while also contrasting the relevant importance of synonymous environmental stewardship for the midwestern U.S. and its native wildlife. Audiences were made aware of the need for support of local indigenous communities overall, so that the local communities of Zimbabwe in particular can be given the best opportunities to provide stewardship and traditional wisdom to help preserve their natural landscapes & charismatic wildlife.

Keywords: natural history, wildlife conservation, natural sciences, educational outreach, Informal Science Education (ISE), community engagement, citizen science, STEM learning, grassroot conservation, holistic conservation, diversity, inclusion, indigenous sovereignty, stakeholdership, indigenous stewardship.

STUDY AREA

While this capstone project serves a qualitative objective, local communities were involved for the purposes of educational outreach and public displays, on behalf of an international wildlife conservancy based in Africa. The local communities that were involved in public outreach

demos include that of two distinct undergraduate collegiate schools (Kankakee Community College, Olivet Nazarene University) within Kankakee County, located an hour south of the city of Chicago. The third demo was given to a private audience amongst peers within the volunteer center of the Field Museum of Natural History in the city of Chicago. For the purposes of advocacy and acting as an ambassador, the primary site within the scope of this project is Imire Rhino & Wildlife Conservancy in Zimbabwe, Africa (Fig. 3). This conservancy site comprises an estimated 10 thousand acres in total, is located in the northeastern section of the country of Zimbabwe in Mashonaland, and an estimated 90 minutes away from the capital of Harare.

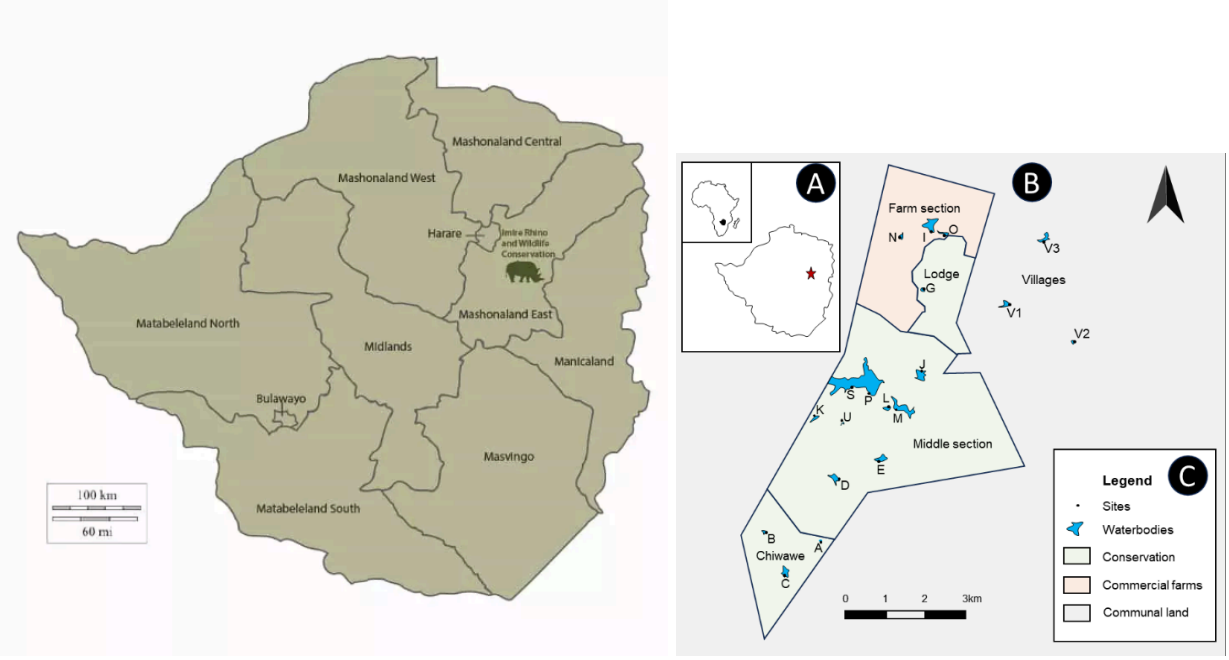

Fig.3 - Maps of *Imire Conservancy* left to right frame (*About Imire* ; Mudavanhu et al., 2024 Fig.1 Map).

INTRODUCTION

Inspiration through ISE

At the most basic level of action, educational outreach can help support conservation practices within communities by spreading awareness and inspiring people to care passionately about wildlife. However, this can be difficult in itself to present to the general public about environmental initiatives in order to gain their support. That is where early STEM-based learning

principles can be implemented into youth education, utilizing an inclusive approach to convey the importance of environmental stewardship within local communities.

STEM fields have traditionally been non-inclusive, instituting a systematic form of gatekeeping, which wrongly prevented individuals diagnosed on autistic or other synonymous spectrums as representatives in science fields (Essex 2020), in addition to the systematic prevention of peoples from indigenous backgrounds (Winkler‐Schor 2024). Through personal experiences of volunteerism with public education programs at the Field Museum in Chicago, the need for inclusive learning opportunities has been witnessed by utilizing principles of ISE with guests who have special needs and personal accounts of their demeanour change in a positive manner by interaction with the program's specimens (i.e. pelts & skulls) which can be ensured to enlighten their overall visit to the museum. For this project, the author has implemented his own independent outreach program, ACCO: Animal-Care-Conservation-Outreach, for which principles of ISE have been adopted and practiced from the skillsets learned at the Field Museum, and utilized to spearhead nature programming facilitated by the author and the ACCO program for the local township community of Kankakee County-IL. With the collaborative efforts of a partner that is focused on natural sciences topics (i.e. wildlife conservation, ecology, natural history and evolution, etc.,), the capstone project goal focused on the involvement of members within the community of Kankakee County through sensory-based learning principles with the implementation of the author's solely-owned collection of ethically acquired replicas and specimens that represent species of wildlife or extinct species.

The topic of natural history (i.e. evolutionary biology, paleontology, prehistoric or extinct species, extant wildlife species, etc.,) often captivates the imagination of youth, and acts as a recruitment tool for younger generations to enter other STEM fields later in their career paths (Nanglu 2023). The concept of interactive learning acts as a catalyst for creative structure, especially for adolescents interested in these fields, in addition to other methods that offer creative engagement (Gomes 2021) for this targeted demographic - including practices in early

citizen science applications (Von Konrat 2018). The author has had the grand pleasure of witnessing these types of impactful experiences through vocational volunteerism at the Field Museum, serving a year-long presidency directing the live animal outreach program at a local undergraduate university, and with the author's current ACCO program as it slowly progresses focusing on native & international wildlife, in addition to showcasing extinct species in the fossil record.

The cumulation of these interactive opportunities and inclusive tactics can be translated to other generations within a community as well, creating stakeholder involvement in regard to the participation in conservation policies or decision-making of native wildlife within the community's region (Mahajan 2020).

Colonized Africa

Stewardship, land rights & usage, individualistic politics, and conservation policies itself are currently a multifaceted issue on the sacred continent, especially in regard to both ecosystem & wildlife preservation. In the Southern region of Africa (comprising countries such as Namibia, Botswana, South Africa, Zimbabwe, Mozambique, Kenya, etc.,), the natural landscape was divided up by colonist nations, centuries prior. European powers such as Britain and Germany, were some of the first to seize dominance by the 1800s. It is noted that the various indigenous and tribal nations of pre-colonized Africa already possessed a vast culture in which their societal systems flourished, economic trade was fair but localized, material goods processed and maintained well within their communities. However, through the combination of colonization and imperialism - accelerated by the emergence of the Industrial Revolution, traditional systems and practices amongst the already present nations were quickly suppressed by European interference. Soon afterwards, precious resources such as natural materials, rock and mineral, lands and the wildlife, were heavily exploited for the international market - much of the land being converted to agricultural farmland with unsustainable practices for the long-term (Ocheni & Nwankwo 2012).

The colonized region of modern-day Zimbabwe was established by 1890 under direct British rule. After nearly a century of revolts, ill-constructed treaties, and malicious segregation laws that affected the socio-economic policies of local communities, the country of Zimbabwe gained global recognition for its independence from UK rule in 1980 (Takudzwa 2022). However, the damage had been done, causing self-identity crises amongst the prior tribal nations and newcoming nations to the region from other settlements established throughout the continent - today, although debated heavily on legitimacy and as a means of a creating a homogeny of the various identities of tribal nations with one another, Zimbabwe is said to be primarily represented by the Shona nation, a comprising of prior nations that were represented individually - while simultaneously minimizing the identity and impacts of the Ndebele nation that is represented as a minority to the region (Ndlovu-Gatsheni 2009).

Conservation in Africa

Due to the aforementioned complicated history of colonization and its resounding presence in the current era, the policies and practices of the entire continent as a whole are still in disarray; this also regards the conservation of the land and its wildlife species. It has been recognized within the last few decades that there is an allure or incentive with the global trade to market based upon the practices of trophy hunting of native megafaunal species (i.e. regulated hunting for body-parts which can be taken back to country of origin for display) (Lindsey et al. 2009). Due to this demand for products, habitats have been revitalized to support the original biodiversity of species-in the form of game ranches-that would have been recognized in pre-colonial eras, and intensive breeding stocks of each species, including threatened or endangered species have been established on these ranches to supply this global demand - which adds to the pro-argument of regulated hunting for the method of population control (Lindsey et al. 2009).

There are several arguments in favour of the legalized act of hunting Africa's native species - some of which are still categorized as threatened or endangered by their respective conservation

statuses, such as species of African rhinos (‘T Sas-rolfes et al. 2022). One of the most prominent arguments is the benefit of economic growth that hunting generates, resulting in hundreds of millions of dollars annually from nations of the UK, Europe, and the U.S., in addition to the job opportunities it creates, and because it is a subset of ecotourism which brings international visitors (Saayman et al. 2018). The U.S. is recognized as the top importer of mammalian trophies from Africa under CITES regulations, and the practice of trophy hunting in Africa is internationally regulated through the allowance of localized hunting permits and under the importation of trophy materials for example to the U.S. under Fish & Wildlife services (Sheikh & Bermejo 2019). With these factors considered, trophy hunting remains a highly controversial debate - even amongst academic professionals in the field of wildlife conservation, who express views that are in a stalemate on the preface of overall ethical perspectives (Ghasemi et al. 2023). The same is true of the general public, of which typically side with the practicality of hunting and what it can provide (i.e. generation of wealth and distribution of bush meat to the local communities), but the moral concerns still remain (Hare et al. 2024).

Due to the regions for which land has been set aside for hunting applications and the breeding of native species to supply the demand for hunting, there have been influxes of species - particular what is considered to be some of the most dangerous species (i.e. the big five - elephant, rhinos, lions, cape buffalo, and leopards), for which the higher concentration of species like elephants in confined regions can disrupt the natural ecology of habitats and even causes issues with local communities: endangering the villagers’ safety, or encroaching on the farmer’s lands with respective crops, which results in the unfortunate act of government mandated culls (killings) to stabilize the dense animal populations (Best 2007). Not to mention, the influx of visitors from other countries that come into these regions through mass ecotourism (Maciejewski & Kerley 2014, Scholte et al 2023). In some cases, the incentivised killing and monetization of wildlife species regarding the economical disparagement of local communities has even spurred the act of poaching, due in addition to the allotment of bush meat for the communities that is processed

from regulated kills (Wiggins 2015). Other fallacies in the arguments for trophy hunting include the genetic breeding of featured species, selecting for the magnification of desirable traits (i.e. tusks, horns, vibrant coat patterns, etc.,) which in itself is an act of removing what would be deemed the healthiest individuals rather than those that are argued to be merciful kills (i.e. old males, sick, etc.,), and can even affect the social hierarchies or behavioural ecology of these species in naturalized settings (Dube 2023, Wiggins 2024). Long-term sustainability of hunting practices is a foreboding concern, as population control is always a necessary factor - yet, the ecology of these settings still tend to be in decline with the biodiversity of species (IUCN 2022). One of the most prominent moral concerns on the topic of social justice that has risen from the original argument of hunting proponents, is that of the economics for the local communities. It is stated that the wealth generated from these hunting excursions is later donated to the communities - However, some regional statistics do not reflect this. As little as 3% of the gross wealth generated from a hunt has been documented in cases to reach the local communities, where the majority of the funds are relayed back to the hunting outfit organizations or the operational costs to get tourists to visit (McCarthy 2015).

With these concerns in mind for the preservation of wildlife species in Africa, there are alternative conservation models for which are on a steady incline to becoming more favourably acceptable. Previously, it was stated how land is set aside to establish game ranches for hunting escapades. However, it has been recognized that when a conservancy, which acts to solely preserve the local wildlife is established on these land sites, it can yield beneficial results for the preface of wildlife conservation; assemblages of biodiversity can seen to return to these areas (i.e. plant, insect, and bird populations), in addition to a thriving ecology instituted by the megafaunal species that may be translocated to these regions (the action of translocation itself allows for more genetic diversity, and combats anthropogenic interference like habitat fragmentation) (Lindsey et al. 2009). Conservancies have also been recognized to allow for synonymous growth in socio-economic opportunities, including careers in direct and positively

impactful wildlife management for local indigenous communities. (Lindsey et al. 2009). The value of lands for which conservancies were established in some cases have increased 25 times in value five years after the establishment of the preserve site, especially when the big five species (i.e. elephant, rhino, lion, leopard, buffalo) are reintroduced as an eco-touristic aspect (Lindset et al. 2009).

Indigenous Communities as Stakeholders

Indigenous sovereignty and independence is a crucial aspect for wildlife conservation practices. The entire continent went through a traumatic span of centuries under imperialistic rule, for which it is still recovering yet gaining independence in some aspects. In order for the preservation of wildlife and natural landscapes to be successful, one has to possess empathy for the local indigenous communities. Otherwise, it becomes an imposing and one-sided perspective (as seen through colonialism and imperialism). Therefore, it must be collaborative and in partnership. Without the traditional values or involvement of indigenous stakeholders, we tend to see the consumerist-based principles of manifest destiny that ravaged natural spaces and resources in the previous centuries in North America (Fisk et al. 2025).

The first step of true and admirable collaboration through conservation is recognizing the sovereignty and independent decision-making of indigenous nations; this serves as the foundation for wildlife management principles that can be later implemented (Meng et al. 2025). Simultaneously, land back policies ensure the allotment of stakeholdership over previously stolen land that once belonged to indigenous nations, which goes hand-in-hand with sovereignty and independence (Hall 2024). Once this is enacted, true collaboratorship can be established predicated on mutualism and respect for the cause of wildlife conservation; a reciprocity or mutualism through two perspectives (i.e. western and traditional or indigenous knowledge) (Fisk et al. 2024) that allows for Natural Resource Management (NRM) under the principles of Indigenous Knowledge (IK) (Fisk et al. 2025). Tribal Wildlife Management (TWM) has been on a steady increase in certain regions of the world, including Africa, but there are still instances of

politicization and disparagement that limit this possibility from reaching its full potential - hence, why true sovereignty and collaboratorship is necessary (Ciocco et al. 2023). The translocations of species from highly dense populated areas to low-scale populated areas is crucial for the survivability of species and increase genetic diversity/gene flow; there are recent measures being taken to center IK or Traditional Knowledge on the the management of these procedures, lessening the pressures of high concentrations of species in specific regions (Rayne et al. 2020).

Due to the principles of most traditional knowledge presets seen in indigenous nations, there is an inherent or intrinsic value to nature without monetization or exploitation as seen with western principles; therefore, there is more of a justification with indigenous communities to protect their landscapes or wildlife, because they realize that we rely on those systems for sustenance through sustainable practices. Because of this, indigenous communities in Africa have been incentivized to help support or even join anti-poaching units, especially in regard to imperiled species like Elephants (Ngorima et al. 2020), which have been hunted for their tusks and has produced ivory trinkets in global markets. This same incentive, as well as some of the previously mentioned collaborative efforts with Indigenous communities, are currently practiced at Imire Conservancy regarding the protection of all their resident wildlife, with a primary concentration on the threatened rhinoceros species and savanna elephants.

Imire Rhino & Wildlife Conservancy

The land for which the conservancy of Imire is located today, was once farmland that was established by the Travers family, Norman & Gilly, who possessed a fascination and wonderment for wildlife conservation. They founded the property of the conservancy in 1948, and the site was later established as a conservancy in 1972. It was in 1987, that the conservancy began rescuing black rhinos (and other wildlife species), and instituted practices in the selective and accredited breeding program of black rhinos, then later translocating and rewilding some of those individuals for conservation purposes. The conservancy also predicates itself on volunteerism through ecotourism, which allows visitors from other countries to come and lodge, learn about

wildlife conservation and see Africa's megafaunal species up close at a respectful distance, while simultaneously advocating on the involvement and stewardship of neighboring indigenous communities, and providing support through physical volunteer tasks and monetary donations (*The Imire Story* 2024). These are are ever-present and admirable qualities through altruism that can be recognized in Imire Rhino & Wildlife Conservancy in Zimbabwe; this model of practices is the exact opposite as seen in the aforementioned traditional methods of conservation and community support (i.e. commercialized ecotourism, trophy hunting, trickle-down economics, etc.,) (Fig.1 used for educational outreach). These practices are instead direct and involve the physical support from visitors through volunteerism. It may be small-scale, but in the long-term it stokes unity and forges communal practices for the betterment of people and wildlife: grassroots & holistic practices at their finest.

Fig.1 - ACCO x Imire diagram demonstrating the contrast of mainstream tourism (i.e. Commercialized Safaris and other forms of mass Eco-tourism, and sport/trophy hunting) to the holistic and community-level tourism present at Imire Conservancy.

Collaborator Agreement

The essence of the collaborative project utilized natural history and/or wildlife specimens and replicas that are independently & ethically sourced, and with showcased demonstrations on the community level (Kankakee County & Chicago, IL-USA) in order to provide outreach and act as an ambassador for the collaborator organization. This was strictly a qualitative project rather than quantitative - in order to adhere to the ethical standards regarding identity anonymity by means of avoiding the need for IRB approval/exemptions. No surveys were taken from the audiences during the demonstrations. This collaboration between the author's independent ACCO program and Imire acted as a project-based capstone, where the deliverables were presented to the conservancy in the form of educational materials, PowerPoints, and demonstration events scheduled. Continuous contact with Imire representative and volunteer manager, Maddie Turner, was implemented to determine whether interest or donations from individuals of Kankakee County had been expressed for Imire and its respective missions. This was a key aspect, as demos were given on behalf of Imire to the local university and community college, where direct volunteerism could serve as an opportunity for interested audience members to schedule a volunteer trip to the conservancy in Zimbabwe for their path to future vocational work (either zoological or community-based intent) or to possibly serve as an internship opportunity for their related degree requirements. For general audiences of various demographics, this project served as a means to relate the direct and community-based conservation tactics of a conservancy in another country, to what could be applied here for the conservation of wildlife in the midwest or North America.

Project Objective

Through the utilization of open science tools, such as diagrams, open-access articles, and the mainframe use of replicas & specimens - audiences will have a better opportunity of inclusive engagement (as witnessed in public outreach experiences) while simultaneously receiving the education necessary for understanding environmental advocacy (Zuliani & Lortie 2025). Other means of tools regard the use of QR codes that lead to Imire website links where more

information about the conservancy is provided, including volunteer forms to visit the conservancy, and support/donation links to wildlife missions or community projects that Imire is involved with. Deliverables for the project bestowed to Imire Conservancy included the designed slides and/or learning materials that included maps, diagrams, or other related sourced materials: these will help assist Imire in how they could possibly work off of these materials to reach the emotions of various audience demographics, or how they can potentially form related collaborations with other organizations that focus more on local and community engagement.

Other goals for the collaborative project entailed those that regard acting as an inclusive force in education purposes, forging unity where other previous practices have failed - implementing social & democratic values to science learning such as the concept of dominance vs. mutualism (Manfredo et al. 2021, Monsalve-Silva et al. 2025). In addition, this approach helped implement a 3rd-person perspective on the recognition of traditional ecological knowledge in regard to natural sciences, while also offering de-colonization ideals and recognizing the harm caused in previous scenarios by colonialism in regard to ecological sciences (Miriti et al. 2022).

With the entirety of these principles and teachings, this project offered a truly collaborative and all inclusive opportunity for the local community to engage with interactive learning of natural sciences and wildlife conservation. The project objective organized the recently acquired specimens and replicas within the author's personal collection that relate to the resident species of Imire, along with wildlife photography that the author took in September 2024 when visiting for volunteer work at the conservancy, in addition to diagrams, statistics, etc., from academia or related sources. Representative species of interest for this demonstrative project included African Savanna Elephant (*Loxodonta africana*), Black Rhino (*Diceros bicornis*), White Rhino (*Ceratotherium simum*), Sable Antelope (*Hippotragus niger*), Common Warthog (*Phacocheorus africanus*), and the Common Ostrich (*Struthio camelus*) (IUCN Redlist 2025). Continuous contact was kept with representatives from Imire in order to adhere to any and all scripts, information, or concept points that they desired to convey to the public. The author's assumed

role was similar to an interactive ambassador with the action of a showman on behalf of the conservancy and provided sensory engagement with the public through ISE tactics with my independent ACCO program and museum collection (Schaadt 2009).

Transparency, true & equal collaboration, indigenous sovereignty & recognition, wildlife advocacy, and ethical sourcing of specimens are all forms of ethos that both the author's independent ACCO outreach program and the purposes of this capstone project will always strive to support.

METHODOLOGY

Curation of Museum Collection

Through means of ethical sourcing for animal byproducts (i.e. legal hunting, government culling, death from natural causes, avoiding products from neglectful or exploitative conditions, poaching, etc.,), non-living specimens (i.e. skulls, pelts, naturally shed - teeth, hair, integument material, etc.,) and replicas (casts or molded replicas of skulls and other animal byproducts) were procured that originate from the accredited website, skulls unlimited. This organization acts as an international supplier for museums or other science learning centers under regulatory bodies like the Convention on International Trade in Endangered Species of Wild Fauna & Flora (CITES), and ethically sourced specimens by the aforementioned processes or ethical management-based settings (i.e. legal hunting, culling, etc.,) (Responsible Luxury Initiative, 2016). All physical receipts and/or purchase invoices will be catalogued (i.e. scanned physical invoices & inventory chart) to reinforce transparency for the ACCO program's ethos and practices, and have been shared as part of the deliverables of this project to Imire. Within the inventory chart, information such as ethical resource (i.e. skull unlimited website), African species, and ACCO museum collection (replica or specimen) have been included to verify the legality of purchases in regard to CITES protocols, and to ensure transparent ethos of the ACCO program that all specimens & replicas within the author's personal museum collection have been ethically sourced and do not

reflect criminal activity or the endangerment of species. For this collaborative project with Imire, recently acquired specimens that represent resident species at Imire include (1.) Ethically sourced real sable antelope skull with horns set. (2.) Replica black rhino horn set. (3.) Elephant faux scrimshaw (bone carving) ivory tusk set (topic of anti-poaching and illegal wildlife market), replica molar tooth, and replica skeletal foot. (4.) Replica warthog skull. (5.) Life cast replica of a singular ostrich foot. Other replica skulls were considered for more resident species representation at Imire (i.e. chacma baboon, vervet monkey, Nile crocodile, giraffe), but were not ordered due to low funds and limited time.

Content Creation

Using free online programs like Microsoft Word, Google Drive applications, PowerPoint slides, etc., - and free online editing websites for visual aids like Adobe, Canva, Pixlr (personal preference), etc., - learning materials were designed for Informal Science Education (ISE) purposes. Some of these materials will depend upon what is available for demonstrations to the public (i.e. projectors, print outs, fliers, etc.,). If a projector is not available, it is recommended that an electronic tablet, or fliers and printouts will be used. For the presentation portion of a demonstration, it is recommended to remember key concepts and to rely on printouts (possibly laminated) of diagrams, wildlife photography of resident species at Imire, etc., that can help assist with the demonstration while also using the specimens and replicas for sensory or interactive engagement. Allow for time to create the learning materials; this is the most important part and the most time consuming. These necessities for a demonstration that will only last 30 min - 1 hour; yet, this preliminary process can sometimes take more than a month for designing, revising, organization, sourcing of topics, etc., The procurement of data collection or zoological resources in regard to the resident wildlife at Imire Conservancy can be sourced from open-search engine websites like the IUCN Redlist, iNaturalist App, or from academic literature found in wildlife journals that are species specific - African savanna elephant (Scholes & Mannell 2008, Van Der Westhuizen et al. 2025), rhinoceros (black & white) (Groves et al. 2010,

Cromsigt & Beest 2014), sable antelope (Furstenburg 2016), common warthog (De Jong et al. 2022), and common ostrich (Cooper et al. 2009). Typical search terms that regard these academic resources includes: species' geographic distributions, behavioural ecology, conservation status, diets, lifespans, size or length or height or weight, evolutionary biology, etc.,

Within this step, learning and/or informational materials also includes the scripts, talking points, and overall concepts that Imire (collaborator) wishes to convey to the public for demonstrations. These scripts and talking points will reflect the information that Imire provides and that the demo will strictly abide by rather than deviate. It is then the responsibility of the ambassador to present this information and speak for Imire in a collaborative sense so that Imire can receive more recognition before a localized communal stage.

Several concepts were discussed beforehand with Imire representatives to illustrate the best picture of conditions that are faced in Zimbabwe, so that the local community of Kankakee County can better understand. One of the concepts that proposes a challenge to interpret with some audiences is the idea of indigenous sovereignty; conservative biases and rhetoric can be present, and will intend to view this human right as least concern for conservation efforts. Due to personal skillsets and background at the Field Museum and with working diverse colleagues, this concept which can usually prove to be a challenge to convey came with ease for the purposes of this outreach project. Cultures that have traditionally lived alongside nature tend to be more sustainable and even respectful towards resources than those of western cultures. There is data to support indigenous stakeholders providing better alternatives than those conceived by western, and this can be attributed to factors like the Indigenous Knowledge (IK) that tribal nations have relied upon for millennia. Other concepts that needed clarification from Imire representatives include those of practices regarding anti-poaching efforts, and the translocations of resident species to other regions in Zimbabwe. Lastly, a comparative analysis that cross references the beneficial policies and tactics of Imire as a true conservancy, in contrast to traditional and

over-commercialized ventures offered in Africa through trophy hunting or eco-tourism, was designed and highlighted.

Scheduling Demonstrations

Reaching out to local community organizations; this can include grade schools, high schools, community colleges or universities, libraries and park districts - yet, it can also include senior centers, special needs and education centers, or any other unlikely organizations that are willing to collaborate for the intended cause. Advertise wherever possible, by printing out fliers that can be delivered to the aforementioned organizations, posting on social media (i.e. Instagram, Facebook, Twitter, etc.,). If fliers are able or permitted to be made on behalf of Imire, they would be created by means of utilizing the free online editing program, Pixlr, which is used for all other visual aids. Once the flier is completed with corresponding QR code leading to Imire links, it could be printed out and then laminated for easy public access. Allow time for scheduling - all parties through collaboration have tight schedules and these organizations typically run on a business-based model or scheduling. Some demonstrations will be scheduled with ease, while others may need more time or understanding in their processes. Plan to reach out via email to these organizations through their online contacts (typically found at the bottom of website pages under the contact us section) at least a week or more in advance so that there is ample time to respond and schedule. On the day of a scheduled demonstration, it is best to allow for time to transport of storage bins containing specimens, set up, and deconstruct the event - at least an hour or more in advance so that handling fragile specimens or replicas is not rushed - this is a precautionary measure to prevent damage to museum collection pieces.

Professorial Showmanship

This particular step reflects a Pathos or emotional state. It may come easily with some people, but may require practice for others. The ambassador will likely be talking in front of audiences with mixed age groups, or even specified age groups. Regardless, it is imperative that one conducts themselves as an entertainer; captivate the audience's imaginations, be animated in our

voice and actions, think like a ringleader, and electrify the audience. This personally inspires me, recognizing that I essentially possess an arsenal of natural history or wildlife specimens and replicas at my disposal, and I visualize the wonderment that these items will bring people, how inspired they will be to see these pieces up close. Thousands or millions of years of evolutionary history in the form of small-scale objects that can be held within someone's grasp; it's poetic and even magical to a degree. Some audience members may never be able to see these animals alive in the wild, or may rarely visit a museum or any other facility that houses these types of curiosities, or even a zoological facility with living representatives. Through personal expertise, I recognize that I have the ability to inspire these particular audience members by bringing a small piece of that world that I have experienced, all that I have learned, and channeling that energy in a way that enriches their personal experience. If one wants to achieve this level of outreach, but is finding difficulty in how to practice or conduct themselves, one can watch videos of their favorite entertainers - whether fictional or real persons. We can study how they conduct themselves, mimic their actions if necessary and mold it to our objective. Simultaneously, it is important to remember our respective educational backgrounds, and to act as a professor - deemed as a Showman Professorship for which leading researchers have been awarded for such a presence (Arbanas 2016). Animated, yet educated: this can be difficult but achievable. If someone is not confident that this is not the role that identifies them personally, and that they may be better suited to solely organizing the other steps and materials of the outreach project, then perhaps collaborate with a friend or colleague who best fits this animated description.

Encouraging Audience Participation

In addition to the obvious action of interacting with the audience through sensory engagement and working with props, specimens & replicas, etc., it is imperative to remember that we are teaching new concepts to an audience; it is best to allow audience members to ask questions. They are the equivalent of students - but nobody enjoys boring lectures: one must ask the audience members questions about the educational props, make them interact, allow them to

make observations on their own and then build upon that intrigue. These are things they will remember and are more likely to retain for long-term memory or even an enjoyable experience. This can be successfully accomplished by asking leading questions or open-ended prompts that are observationally-based. Examples of this include: “what do you notice about this skull?” (i.e. size, shape, dentition, ect.,) or “what color patterns do you notice?” - that would trigger easy responses from the audience.

RESULTS

ACCO X Imire Museum Collection

With regard to educational outreach, the ACCO program allowed for myself to collaborate with Imire Conservancy, and act as a professional ambassador for their cause & missions. My ACCO program utilizes the principles & skillsets of ISE that I have acquired through my nine years of volunteering for the Field Museum in Chicago, IL.-talking with the public about complex topics in natural history while creating an interactive experience with specimens and replicas. The ACCO program possesses its own museum collection, specimens and replicas paid out of pocket by the author’s expense for future programming topics.

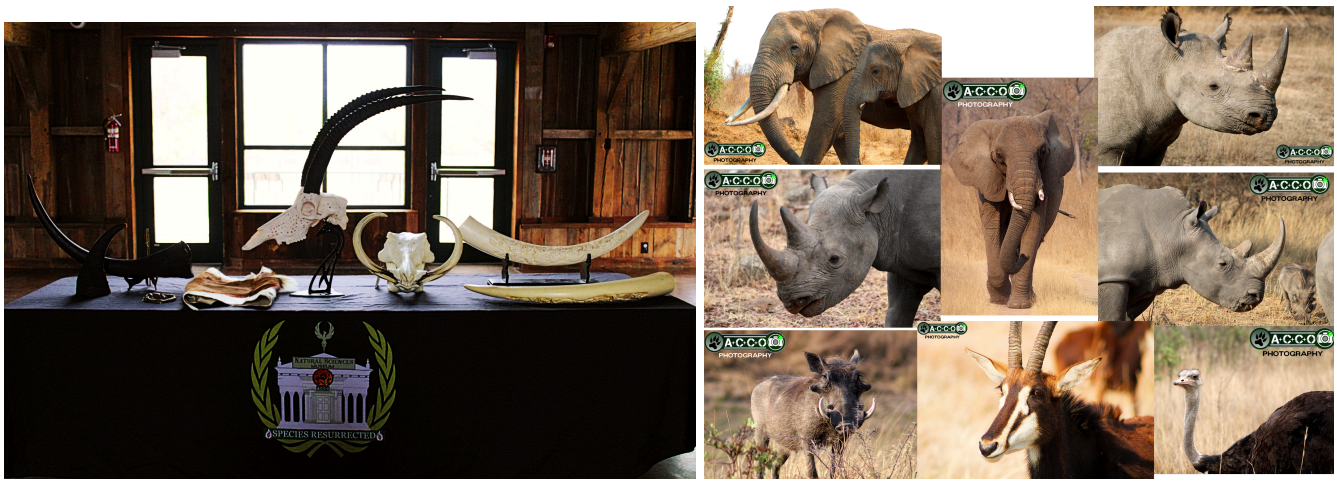

Fig.2 - Left-frame: collection of replicas & specimens representing species of Southern African region (including Zimbabwe). This collection is the sole property of the ACCO Natural Sciences Museum collection, but has been utilized for this collaborative capstone project of ACCO X Imire Conservancy, featuring particular specimens & replicas that represent the resident species on the conservancy site in Zimbabwe. Right-frame: ACCO Wildlife Photography of primary resident species featured (these particular photos were used in presentation and informal displays for the project).

For the Imire collaboration, all specimens and replicas (Fig.2) were procured through the skulls unlimited website, and mandated by CITES regulations, with the inclusion of legally hunted species within the trophy hunting industry. For full transparency and ease of public audiences, my ACCO program strictly utilized replicas that represented the endangered or threatened species from Africa, specifically those that are found on Imire Conservancy within the country of Zimbabwe. Replicas purchased included: black rhinoceros (*D. bicornis*) horn set, African elephant (*L. africana*) skeletal foot armature & molar tooth, and common warthog (*P. africanus*) skull with tusks. Other previously acquired replicas within the museum collection included faux elephant ivory scrimshaw (Indian Oaks Antique Mall-Bourbonnais, IL), and a lifecast of an adult common ostrich (*S. camelus*) foot (Stockton Skulls-Etsy). One piece of this collaborative collection is a true specimen, ethically sourced from the skulls unlimited website and represents a least concern species that is legally hunted within the trophy hunting industry: a sable antelope (*H. niger*) skull with horns. This skull also features a scrimshaw (carving) depiction of the animal's silhouette on the forehead with other carving styles throughout the skull.

Curriculum & Learning Materials

Various sources were compiled and used, from raw academic literature that focuses on particular species that represent the resident animals on Imire Conservancy, to more broad-scale resources such as IUCN Redlist for conservation statuses and distribution maps. From these resources, photo editing skills using the free Pixlr website were utilized, as similar learning materials have been created personally for my other ACCO programming topics.

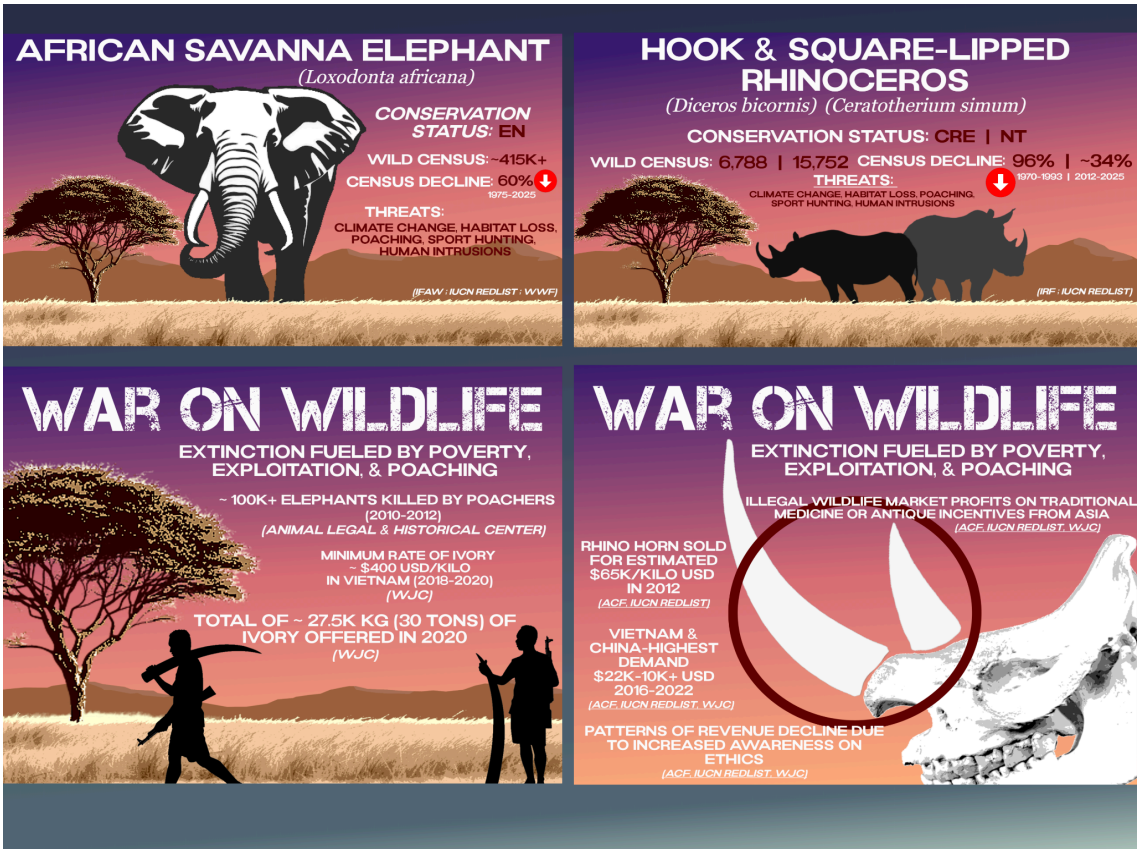

Fig.4 - Examples of photo-edited designs from Pixlr website of displayed learning materials regarding species' conservation status & poaching statistics w/ in-text citations for ACCO X Imire collaboration.

These visual aids (Fig.4) help to captivate the audience-providing statistics, and a cinema-styled scope. In addition, personal wildlife photography (Fig.2 & 5) that I took of the resident Imire species in September 2024 were also utilized, to help portray the animals in a living sense and to create a more welcoming atmosphere instead of solely relying on the replicas & specimens which can sometimes be morbid or foreboding with audiences on their own.

Fig.5 - ACCO Wildlife Photography of resident female Black Rhinoceros featured during all presentations to discuss topics regarding the processes & protocols of Imire's selective breeding, translocation, and anti-poaching measures for the salvation of the critically endangered Black Rhinoceros (*Diceros bicornis*) species.

Maps of the Mashonaland region for which Imire resides within Zimbabwe, and of the Conservancy site as well, were provided to audiences to give a sense of location (Fig.3).

Public Demonstrations

Due to the expedited timeframe for the completion of this project, the original number of demonstrations for an intended quota was six demos, with the project intended to spread ACCO X Imire demos for all public outlets (libraries, schools, etc.,) within the region of Kankakee County. In contrast, the objective for educational outreach on behalf of Imire Conservancy was completed, but with half the amount of the intended number of demos (three demos) and with only one of these demos displayed for the general public.

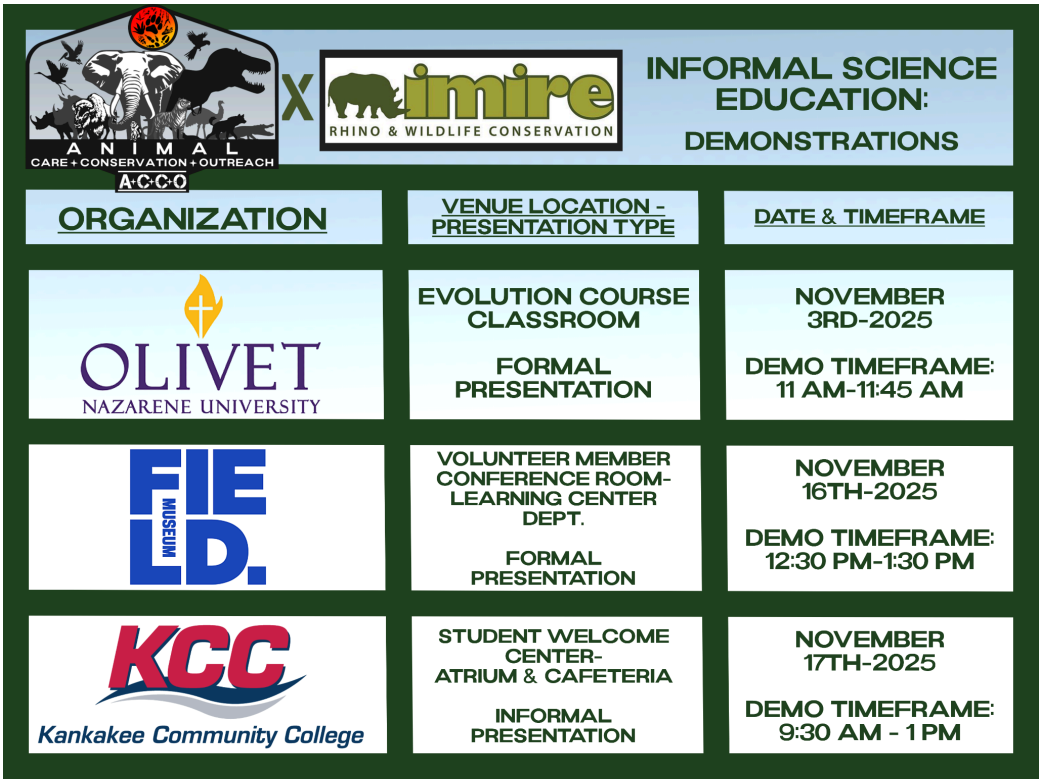

Fig.6 - ACCO X Imire Presentation Table: Organizations, Dates, timeframes, and facilitation-style of presentations involved with demonstrations on behalf of IRWC for ACCO X Imire collaboration project. Formal presentation for evolution course Volunteer Conference Room of the Learning Center Dept. @ the Field Museum; Open campus area @ Kankakee Community College; QR code link on tablet (with other QR code links) provided to student body @ Kankakee Community College.

One of the professors of undergraduate zoological sciences at Olivet Nazarene University (ONU), was contacted with a limited timeframe for a small classroom demo that was completed for the students within his evolution course. In addition, a private demonstration was scheduled for fellow volunteer colleagues and supervisors within the Learning Center Dept. of the Field Museum of Natural History in Chicago, IL. The final demonstration scheduled was public, and instead of a formal presentation it was performed as an informal table set up on the indoor campus of Kankakee Community College (KCC) which offers a diverse variety of students of numerous ages and backgrounds working towards their associate degree or pre-requisite course studies (Fig.6 & 7).

Fig.7 - ACCO X Imire formal & informal presentation displays. Left-right: Volunteer Conference Room of the Learning Center Dept. @ the Field Museum; Open campus area @ Kankakee Community College; QR code link on tablet (with other QR code links) provided to student body @ Kankakee Community College.

No ONU display photos were provided for right to privacy. For all demonstrations, QR codes were available which led to specified webpages for Imire regarding donation links, volunteer forms and sign-up links, or more information links about Imire and its missions in general. Informational PDFs regarding these QR Code links and other partnership possibilities were later emailed to KCC, ONU, and Learning Center Dept. officials who helped organize these demos. For presentation topics (Fig.8), there were 3 primary topics, along with subtopics within those categories, that were presented to audiences during these demonstrations.

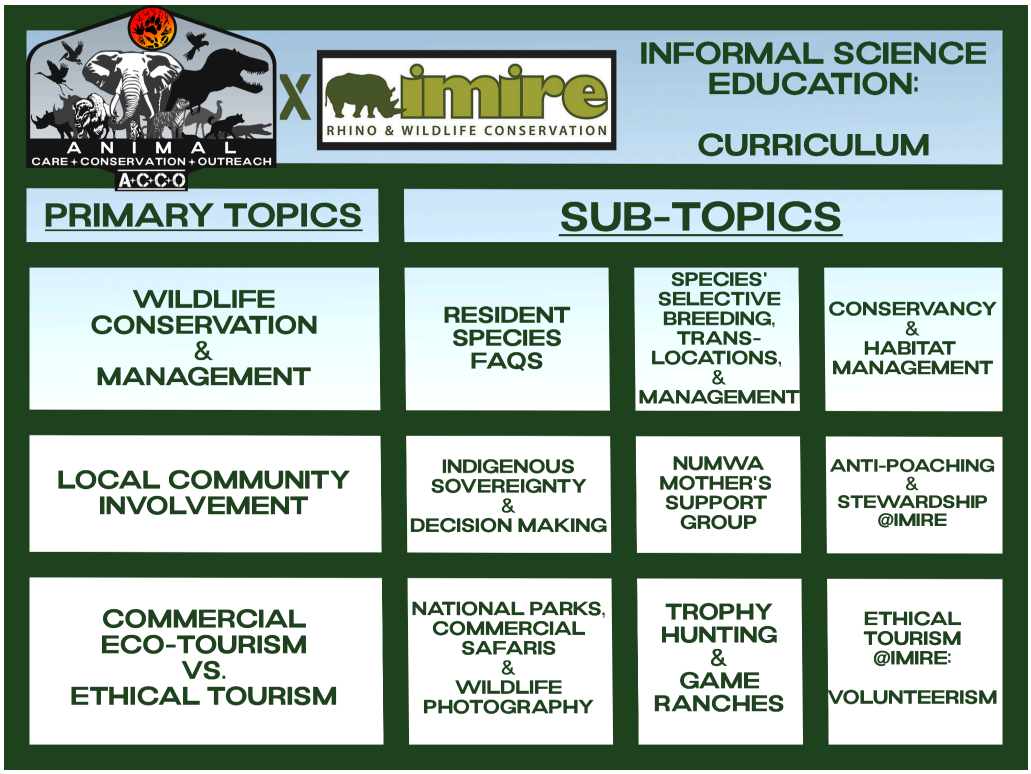

Fig.8 - ACCO X Imire Curriculum. The columns of this table present the Primary & Sub-topics featured within the presentations to the public. The rows of this table demonstrate how those subtopics fit within each of the primary topic categories. This curriculum was the guideline schematic for the ambassador's narrative while conversing with the public.

Primary concepts such as the wildlife conservation & management protocols that take place on Imire, the involvement of the local communities their roles in stewardship practices on the conservancy site, and how Imire's ethical tourism initiatives compare to that which is seen in mainstream commercialized eco-tourism (i.e. trophy hunting, game safaris, national parks or similar sites, etc.,). This table acted as a schematic for the guideline of conversing with the general public or private audiences.

Acting as an Ambassador for the Public

When interacting with the public, whether private or public audiences, the sole objective was to talk with the public on behalf of Imire Rhino & Wildlife Conservancy and their missions for both conservation of threatened species and local community support/inclusive involvement. This was accomplished and was the main mindset when engaging with audiences. While my independent ACCO program provided the interactive experience, ACCO is merely a form of outlet to advocate for Imire without any further gain in return other than the experience to demonstrate my personal knowledge and skillsets within my vocational backgrounds. Therefore, any questions about the ACCO program itself were prolonged until the end of presentations and only after all questions and answers regarding Imire were addressed first & foremost as a priority.

DISCUSSION

Ethical Standards of Museum Collection

All specimens and replicas purchased by the author and within his independent program, ACCO, were sourced from the skulls unlimited website, while operating in accordance with CITES regulations for the ethical procurement of specimens from possibly threatened or endangered species. Therefore, the collaborative project of ACCO X Imire was successful in maintaining transparency and ethical standards, as the museum collection that represents this collaboration consists primarily of replicas that represent endangered species (i.e. savannah elephant and black rhinoceros) while the only true specimen in this collection represents the skull & horn set of a sable antelope (*H. niger*), which is listed as a least concern status species under IUCN Redlist, and legally hunted in the trophy hunting industry. This museum collection will remain in the custody of the author and his ACCO program, for potential collaborative demos in the future with Imire, or for other synonymous demos that feature African wildlife (i.e. anti-poaching, wildlife conservation, zoological species, etc.,). Physical invoices, and scanned copies of these invoices, have been kept for which virtual copies will be available for the deliverables presented to Imire for transparency of practices.

Curriculum Learning Materials

Due to the expedited timeframe, the timeliness of creating the visual aid learning materials was lacking to the full ability of what could have been achieved. In addition to this, handouts like fliers, stickers, or other interactive materials were not able to be created as intended, with little communication between the collaborator and the author not wanting to overstep boundaries with licensing issues. With more time allotted in future collaboration, this would be a great asset for younger audiences and with advocacy for Imire to local communities here in the Midwest or in other states across the nation. However, visual aids were available for all audiences during this project, and assisted to illustrate the need for local community involvement within the particular region of Zimbabwe, along with species' conservation and poaching statistics with in-text citations.

Public Interactions through Presentations

Throughout the demonstrations, the general consensus presented that audience members were both curious and intrigued by the concept of ethical conservation at Imire. Several audience members from KCC took photos or followed the QR code links for Imire Conservancy that were provided, showing interest in donating, learning more, or possibly volunteering in the future at the conservancy site. All audiences were given the opportunity to interact with the ambassador, asking vital questions about the protocols or practices of Imire Conservancy, and making observations about the museum collection on display for presentations regarding resident species' facts. This is an imperative aspect of ISE practices, as it helps audiences of varying professional or general backgrounds to better retain information for a meaningful experience of inspiration.

CONCLUSION

Final arrangements will be made with the volunteer manager of Imire Conservancy, Maddie Turner, to host a Zoom meeting in which a full discussion on the satisfaction of this collaborative project through advocacy and ISE tactics can be investigated. Overall, the author is satisfied with the accomplishments made throughout the term and with the expedited scheduling, especially in

regard to providing interactive experiences for undergraduate students at local collegiate schools within the midwestern community that often do not experience such interactive programming with topics on natural history, wildlife conservation, or environmental sciences learning. With the prospect of future collaboration between Imire Conservancy, the primary objective would be to continuously refine and convey the missions of Imire to the general public or fellow peers, especially in regard to black rhino and elephant conservation. A secondary objective, would be to expand on other charismatic resident species at Imire by securing more replicas that represent those species (i.e. Nile crocodile skull, giraffe skull, chacma baboon skull, blue wildebeest, etc.,) to captivate the attention of more audiences. Other objectives would include better marketing or handout initiatives with the full permission of the conservancy (i.e. stickers, fliers, etc.,). The author and his ACCO program are also securing collaborations with similar zoological parks, to advocate for their respective missions in conservation and resident species through ISE initiatives. Overall, tactics under ISE and interactive experiences with species' representation will be pursued through all avenues to better equip vocational opportunities with wildlife conservation and animal welfare in the future programming of ACCO.

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The author would like to give sincere gratitude and thanks to the representatives of Imire Rhino & Wildlife Conservancy of Zimbabwe, Africa - for entrusting him as an ambassador for the conservancy through local community public outreach. Special thanks to the Volunteer Manager of Imire, M. Turner, for her guidance and support throughout this project. Lastly, the author would like to thank Dr. D. Romanello of Unity Environmental University, for his guidance and support in the design of this capstone project, and to the author's fellow graduate colleagues for their insightful peer-reviewed feedback which positively impacted the finalization of this project.

ETHICS STATEMENT

Provisions for a professional ethos regarding this project were maintained by various means. For demonstrations and public outreach, no surveys or questionnaires were collected. Standards of

ethically sourced specimens and replicas were facilitated, filing all invoice receipts for legal proof of purchase and legally hunted species. No live animals were used as ambassadors for this project, and are never used for public demonstrations as part of the ethos for the author's ACCO program.

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APPENDICES

Appendix A: Deliverables, Learning Curriculum Diagrams, Invoices and Public Presentation slides

Presentation Slides: ACCO X Imire Rhino & Wildlife Conservancy Demo

Invoices: ACCO X Imire Museum Collection Inventory

Learning Curriculum Diagrams: ACCO X Imire Learning Curriculum Diagrams

Appendix B: Glossary of Terms

Grassroot Conservation - Conservation style that recognizes the positive impacts provided by particular individuals or local community support and efforts through a ground level approach and working its way upward to other superseding organizations.

Holistic Conservation - Conservation style that recognizes the interconnectedness rather than isolation between societal systems, humanity, organismal health & sustainability, and wildlife conservation and management

Volunteerism - Any form of direct impact where individuals voluntarily give direct support for a mission or cause. For the purposes of this project, volunteerism regards physical labor at Imire Conservancy, educational outreach through public engagement

Appendix C: Supporting Literary References for Figures and Learning Curriculum

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