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# An Examination of Intrinsic Existence Value Towards Wildlife of Columbus Zoo and Aquariums Tourists: Evaluating the Impact of Behind the Scenes Programming

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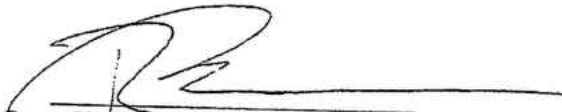
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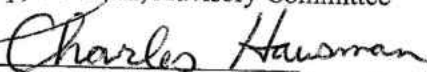
AN EXAMINATION OF INTRINSIC EXISTENCE VALUE TOWARDS WILDLIFE  
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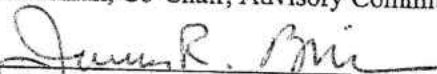
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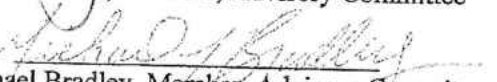
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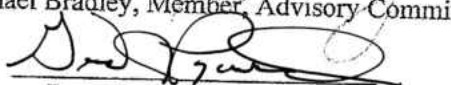
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AN EXAMINATION OF INTRINSIC EXISTENCE VALUE TOWARDS WILDLIFE  
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## DEDICATION

This dissertation is dedicated to my mother, George Ann Lakes, who showed me through her actions that good things can happen if you never give up. This dissertation is also dedicated to Lana Spicer, without whom my research would not have been possible.

Lana's support on every level allowed me to complete both my masters and my doctorate. I am forever in the debt of my mother and Lana Spicer.

## ACKNOWLEDGEMENTS

I would like to thank my co-chairs, Dr. Ryan Sharp and Dr. Charles Hausman, for their tutelage, guidance, and patience. I also would like to thank my other committee members, Dr. Michael Bradley and Dr. James Bliss, for their guidance, patience, comments, and assistance over the past year. I thank my family for their love and support. I would especially like to thank my mother, George Ann Lakes, my sister, Kathryn, and my nephews, Jacob and Matthew, without whom I would not have been able to make the needed trips to the Columbus Zoo and Aquarium.

## ABSTRACT

Changes in climate and the corresponding environmental issues are major concerns facing the world today. Human consumption, which is leading the rapid depletion of the earth's finite resources and causing a dramatic loss of biodiversity, is largely to blame (Pearson, Lowry, Dorrian, & Litchfield, 2014). American zoos and aquariums are positioned to create positive experiential relationships between zoo tourists and animals that have the potential to positively change the zoo tourists' conservation behaviors. Challenges to changing the conservation behaviors of zoo tourists are many. One particularly important challenge is conservation/environmental education. Zoos and aquariums aim to provide effective and quality environmental education to the public, as well as a framework for conservation ethics (Ballantyne, Packer, Hughes, & Dierking, 2007; Falk et al., 2007). Some research suggests presentations combining educational talks with animal training, or other multilayered interpretive animal presentations, are associated with greater learning (Visscher, Snider, & Vander Stoep, 2009; Weiler & Smith, 2009). The immense amount of effort put into designing zoo education programs that allow for meaningful and intimate interactions between tourists and animals is undertaken to produce behavior change in the zoo tourist.

Behind the scenes tours are one of the multilayered interpretive presentations that have the ability to impact visitors' intrinsic existence value of wildlife and ecosystems. This study aimed to examine how more intimate interactions with animals in zoos may lead to an increased sense of conservation. Zoo education research has gained momentum only in the last few years (Ogden & Heimlich, 2009), and research into behind the scenes education programming is just beginning.



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## CHAPTER 1: INTRODUCTION

### **Early Animal Collections**

Humans have had a fascination with wild animals before the beginning of recorded history. We, human animals, were capturing other animals in the form of paintings and drawings as far back as the Upper Paleolithic period (*c.* 40,000-10,000 years ago) in a cave near Chauvet, France. One can theorize that the cave paintings were put there, at least partly, to illicit feelings and emotions about the animals being displayed (Lewis-Williams, 2003). Tens of thousands of years later, Egyptian rulers sent forth expeditions to collect giraffes and cheetahs as early as 1400 B.C., while Chinese emperor Wen Wang established a “garden of intelligence” around 1000 B.C. The garden included deer, antelope, and pheasants. During his conquests, Alexander the Great sent exotic animals back to Greece for Aristotle to study (Hanson, 2002). Only the very privileged and connected citizens had the ability to see the animal collections during these times. These private collections began to be open slowly to the public in the form of menageries. These menageries were ill kept institutions that treated their animals poorly and had no intent other than providing entertainment to the public.

### **The First Modern Zoo**

Zoos for the use, amusement, and education of the public are primarily an invention of modern Western society (Hanson, 2002). The Paris botanical garden was founded in 1793, and the London zoo was founded in 1826. Both these zoos were founded to promote scientific research and education. They were designed to help understand the natural world, and the animals living in that world, instead of mere exhibitions and curiosities. Zoos were places for the middle class public to visit and relax

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while observing exotic wild animals, but little, if any thought was given to the education of the public. Many early zoos were free to the public, but eventually the need to cover the cost of scientific research and travels required the zoos to begin charging modestly. American zoo's emulated and modeled themselves after these early European zoos.

### **Early American Zoos**

The Philadelphia Zoo, opened in 1874, was designed as a meticulously landscaped park that visitors, and particularly families, could take leisurely strolls through (Hanson, 2002). The Cincinnati Zoo, opened the following year in 1875, was modeled after zoos in Germany, since Cincinnati had a large German immigrant population. The German born immigrant, Andrew Erkenbrecher, led the endeavor of establishing a zoological society in 1873 with the stated purpose of “the study and dissemination of a knowledge of the nature and habits of the creatures of the animal kingdom” (Hanson, 2002, p. 16). From the earliest onset, zoos were under constant pressure to show they had a purpose beyond that of mere entertainment. The public school system in Cincinnati began sending tens of thousands of students on regular zoo trips to the Cincinnati Zoo and Botanical Gardens in 1896 (Hanson, 2002). Zoos and aquariums are constantly undergoing transformations, and must continue to transform if they wish to stay relevant, and possibly to exist, in the future (Rabb & Saunders, 2005). Rabb and Saunders (2005) argue, and illustrate, that zoos must continue to honor the early missions of zoos, while evolving into holistic conservation centers (Figure 1.1).

### **American Zoo Transformations**

Figure 1.1 illustrates some of the changes zoos have undergone since the early nineteenth century, and it shows what zoos must transition into if they are to remain



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relevant institutions in conservation education. American zoos, in large part, have already transitioned themselves from the 19<sup>th</sup> century institutions that kept animals in cages, were themed around taxonomic organization, specialized in the subjects of species diversity, and were mainly concerned with species propagation and husbandry. The 19<sup>th</sup> century American zoo transitioned into more of a “living museum” which had an ecological theme and created dioramic exhibits. The newer 20<sup>th</sup> century exhibits continued to concentrate on the scientific foundations of the 19<sup>th</sup> century zoos, but increased their concerns to include cooperative species management and professional development. Rabb and Saunders (2005) effectively argue that zoo’s must continue to work off the early positive foundations of the 19<sup>th</sup> and 20<sup>th</sup> century zoo’s while transitioning into institutions which more closely resemble environmental resource centers, and have an overall environmental theme where the subjects are ecosystems and the survival of species, which are wrapped around the goal of holistic conservation funneled through, and by, organizational networks. This broader, ecosystem centered, “conservation center” will be filled with immersion exhibits allowing for a stronger connection between the tourist, the displayed species, and the ecosystem in which it resides, with the purpose being to impact tourist behavior.

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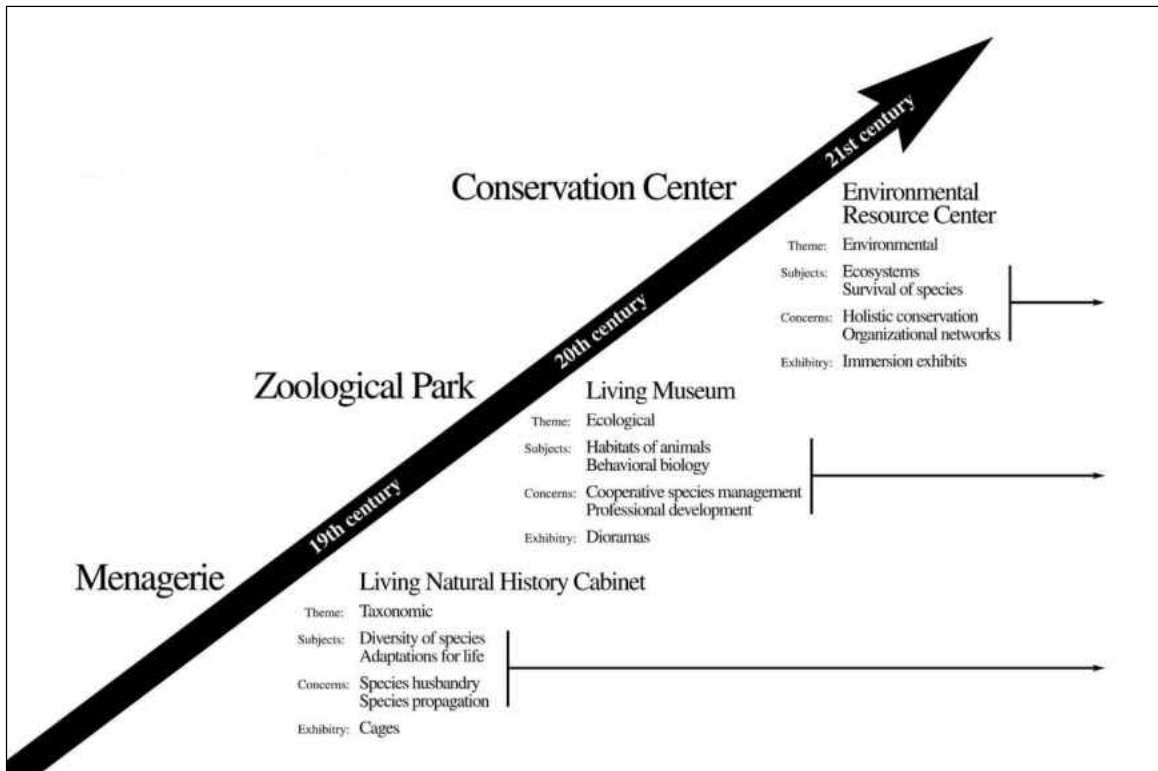


Figure 1.1. Evolution of Zoos and Aquariums. Zoos and aquariums must evolve into conservation centers which are engaged holistically while taking on many new, and different, roles to engage and educate citizens.

Source: Rabb, G. B., & Saunders, C. D. (2005). The future of zoos and aquariums: Conservation and caring. *International Zoo Yearbook*, 39, 1–28.

One of the main objectives to Rabb and Saunders (2005) discussion about the transformation of zoos, is that zoos become institutions which connect the tourists to the larger ecosystems in which they, and the animals they view, exist. A main goal in creating the connection between tourist, the animals, and the ecosystem, is to have the tourist contemplate the meaning of their newly realized, or their increased realization of, connectedness to nature. The goal of creating the holistic conservation center geared toward emotional connections brought about by experiential interactions between zoo

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tourist and animals is behavior change. The zoo experience is increasingly designed to bring about emotional connections with zoo tourists to increase pro-conservation behaviors.

Pro-conservation behaviors can be energy conservation, water conservation, recycling, and purchasing products from environmentally responsible companies (Barr, 2003; Clayton & Myers, 2009). Some specific conservation behaviors zoos may wish to impact are purchasing products made only with sustainable palm oil to protect the orangutan's habitat (Pearson et al., 2014), sustainable purchasing of seafood to protect dolphin populations while also reducing the impacts of overfishing (Miller et al., 2013), and the recycling of cell phones to reduce destruction of gorilla habitat because of resource extraction (Mehlman, 2008). These behavior changes can be brought about by increasing emotions, specifically intrinsic existence value, and intrinsic existence value can be increased through education programs, especially BTST, which are thoughtfully and carefully designed.

One of the mechanisms which may be able to positively impact tourist's actions is that of the intrinsic value of wildlife. The concept of intrinsic value is an abstract concept. Intrinsic value is said to be a value in which something has "in itself", "for its own sake, or "in its own right" (Zimmerman, 2015). These meanings, slight differences aside, mean that something has a value "for its own sake" rather than having a value "for the sake of something else." This difference is what distinguishes ethical existence value from economic existence value.

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## **Who and What Zoos Impact**

Zoos and aquariums (hereafter zoos) have always been a popular destination for middle class families. Zoos drew thousands of visitors in the late 1800s, and today they draw tens, if not hundreds, of millions of people each year. The AZA estimates over 181 million people visited zoos in the United States during 2014 (AZA, 2015). With the vast numbers of people visiting zoos each year, there are numerous possibilities to the impacts which can be made. One of the possible impacts zoos can have on their tourists include changing conservation behaviors. Some positive conservation behavior changes include the increased use of renewable energy sources, reducing overall consumption levels, and conserving water, and these are just a few of the possible positive conservation related behavior changes which can be impacted by zoos. What must be discerned, is what actions are causing negative impacts, and what actions are causing positive impacts through zoo education programs. Zoos deliver their messages in myriad of ways. From formal education classes, directed primarily at school age children, to free-choice learning and interpretation directed at adults and families (Andersen, 2003), zoo guests have become wildlife tourists. This study views zoo education programming as a form of wildlife tourism, and the guests who visit zoo's as wildlife tourists.

## **Zoo Guests or Wildlife Tourists**

Wildlife tourism has been defined as an activity which allows encounters with non-domesticated (wild) non-human animals, in either captive or wild settings, and the tourism can be either "non-consumptive" or "consumptive" (Higginbottom, 2004). Zoos would be considered, by this definition, as non-consumptive *ex situ* wildlife tourism. There are many different arguments related to the impact of having so many people

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exposed to nature, in wild (*in situ*) or captive (*ex situ*). Proponents of increased wildlife tourism, including wildlife tourism occurring in zoos, argue that bringing the public into closer contact with nature, particularly certain types of wildlife such as elephants, tigers, rhinos, lions, and the four great apes, fosters an appreciation for that wildlife, and can produce a connection with nature (Curtin, 2010; Ryan, Chirgwin, & Hughes, 2000; Skibins, 2012; Zaradic, Pergams, & Kareiva, 2009). Having the sheer number of people come through the gates of zoos (including repeat tourists), provides them ample opportunity to impart valuable educational information.

While there are many supporters of wildlife tourism, there are also many who argue against the current level of *in situ* wildlife tourism, not to mention the concerns they have towards increasing the number of people involved in *in situ* wildlife tourism. Some have argued that increased *in situ* wildlife tourism has decreased fertility in some species and increased disease transmission in others (Berman, Jinhua Li, Ogawa, Ionica, & Huabao Yin, 2007; Sandbrook & Semple, 2006; Skibins, 2012). Others who argue against increased *in situ* wildlife tourism cite the increase in habitat destruction caused by the search for rarer and more exotic animals, as well as the massive impact that tourism has on the ecosystem (Markwell, 2001; Skibins, Powell, & Hallo, 2013; Terborgh, 1999). Ensuring zoo education programs are designed to meet the mission of the zoo, and to reach broader conservation education goals, can allow zoos to reach a broader *ex-situ* wildlife tourism demographic, and has the potential to reduce the impact of *in-situ* wildlife tourism by providing positive, powerful, and meaningful tourist/animal interactions.

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## **Zoo Education Programs for the Wildlife Tourist**

It seems for the near future there will continue to be increasing numbers of wildlife tourists for both *in-situ* and *ex-situ* experiences (Higginbottom, 2004). Increasingly, and for some time, there has been a call to make sure zoos are participating in education programs and initiatives since zoos are a major attraction for wildlife tourists (Miller et al., 2004; Moss & Esson, 2013; Ogden & Heimlich, 2009; Smith, Broad, & Weiler, YEAR) There are many types of zoos in the United States, but for the purposes of this paper, zoos will be limited to those accredited by the Association of Zoos and Aquariums (AZA). The AZA Accreditation Standards and Related Policies state that (a) Education must be a key component of the institution's mission, and (b) The institution must have a written education plan that matches current industry standards, and that includes goals and objectives. The AZA accreditation standards state, "Exhibits, interpretive programs and other education programs should be evaluated on a regular basis" (AZA, 2015; Moss & Esson, 2013, p. 14). Zoos have begun producing research into the impacts of zoo visits. Research is showing that when properly undertaken, wildlife tourism can, and does, produce a great many beneficial outcomes. Some of these outcomes include an increase in conservation actions leading to additional research for species of particular concern, funding influx, educational opportunities for varying demographics, and political support that may increase the adoption of socio-cultural sustainability initiatives (Fuhrman & Ladewig, 2008; Jacobs, 2009; Miller, 2005; Orams, 1997; Russell, 1994; Saunders, 2003; Skibins & Powell, 2013; Skibins et al., 2013; Skibins, 2012; Wilson & Tisdell, 2003).

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Research also suggest that zoos which create supervised guest interactions with animals, which have interpreted stories told by zoo keepers or education facilitators using various forms of communication, cause the visitors to have heightened awareness to that species, and a stronger connection to nature (Miller et al., 2013; Pearson et al., 2014; Penn, 2009; Visscher, Snider, & Vander Stoep, 2009). The increased feelings created from these encounters suggest the ability to drive support for varying conservation actions (Saunders, Brook, & Myers, 2006; Skibins & Powell, 2013; Skibins et al., 2013; Zaradic et al., 2009). What has been lacking in the research is what particular types of education programs bring about these feelings which engage tourists in a way to produce such actions as, increased recycling, the use of sustainable palm oil to reduce deforestation, the recycling of cell phones to help save western lowland gorilla habitat, and increasing the use of renewable energy sources while decreasing the use, and dependence, on fossil fuels, and why particular elements of education programming have the impact they do.

### **The Animals Tourists Prefer**

Zoo visitors like to see large strong animals, with attributes and actions, which can be easily anthropomorphized. Considerable research has been conducted on what attributes and characteristics tourists perceive as increasing the charisma of animals (Fuhrman & Ladewig, 2008; Kellert, 1996; Skibins et al., 2013; Tisdell, Wilson, & Nantha, 2005). Some of the many attributes visitors report as increasing an animal's charisma are: large body size, large eyes, being carnivorous, having human like attributes, showing signs of intelligence, and a high activity level. Lions, tigers, the great apes, elephants, and wolves are some of the animals visitors from previous research have

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identified as being charismatic. Animals that have some, or all, of these attributes have been given the name “charismatic megafauna” (CMF), and are being used by many zoos as “Flagship Species” to increase conservation donations by being the species which the zoo uses to increase zoo tourists (Leader-Williams & Dublin, 2000; Skibins, 2014).

### **Charismatic Mega-Fauna (CMF)**

Some research suggests zoo tourists have limited preferences as to the animals they wish to view, with CMF being the primary types of animals, and this narrow viewing preference limits the ability to create fundable conservation programs for less charismatic animals (Di Minin, Fraser, Slotow, & MacMillan, 2013a; Leader-Williams & Dublin, 2000). Newer research suggests tourists with more education and experience may have an increased curiosity about less charismatic fauna (Di Minin, Fraser, Slotow, & MacMillan, 2013b; Skibins, 2014). Research is finding many different types of animals can create connections with tourists, even though CMF are still the reason many visitors trek to the zoo (Bradshaw & Rice, 2009; Di Minin et al., 2013a; Home, Nagel, & Keller, 2009; Skibins, 2014; Skibins, 2012; Small, 2011). The connections tourists make with CMF’s, and flagship species of all types, leads many zoos to ascribe a considerable amount of anthropomorphism in their education programming. Anthropomorphism of animals, by tourists or zoo employees, can be useful, but must be used with care, and a full understanding of the possible consequences.

### **Anthropomorphism**

Visitors acknowledgement that an animals similarity to humans increases the level of charisma, (Gunnthorsdottir, 2001; Kellert, 1984; Plous, 1993; Tisdell et al., 2005) calls into question the impact of anthropomorphism in zoo interpretation. Newer research



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suggests using anthropomorphism as an educational tool can increase the connectedness visitors feel to nature, and can foster conservation behavior in participants (Tam, Lee, & Chao, 2013). The resurgence of anthropomorphism goes against decades of scientific pushback against such uses in scientific research. Some researchers caution that we cannot actually know the conscious states of animals, and their actions may be mechanical in nature (Wynne, 2004). Other research cautions that using anthropomorphism in conservation education risks limiting the animals which people connect with to only those animals which are CMFs, prosocial, or suffering, which could lead to “overlooking the application of a powerful tool to the promotion of low-profile species with high biological conservation value” (Root-Bernstein, Douglas, Smith, & Verissimo, 2013, p. 1577). Additional research must be undertaken to expand, and verify these findings, but education programs might find it beneficial to consider using, with considerable care, anthropomorphism in their pedagogy. Many CMFs that are prone to considerable anthropomorphism may be used as an umbrella species. The idea behind umbrella species is that even if so much attention is given to the umbrella species that it diverts attention away from other species in need of saving in the same area, then the other species will still benefit from the conservation programs geared towards the CMF. Because CMFs generally require large geographic areas to be preserved for their conservation, all other species which live in the same geographic area will be protected due to the protection of the CMF.

### **Different Personalities and Varying Motivations**

Zoos offer a chance to educate a broad range, and a huge number, of people each year. The number and range of people, in and of itself, presents challenges in meeting

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education goals (Falk, 2006; Fraser & Sickler, 2009; Morgan & Hodgkinson, 1999; Roe, McConney, & Mansfield, 2014). Visitors, as a group studied, consist of individuals who have their own personalities. The varying personalities will cause people to engage each interpretive message slightly different. Along with different personalities, visitors enter the zoo for different reasons. Some of the many possible motivations people may have for visiting zoos include people on spiritual quests, professional hobbyists, thrill seekers, explorers, or facilitators (Falk, 2006; Roe et al., 2014).

### **Evolving Zoo Education and BTS Tours**

Providing educational opportunities for visitors has undergone a tremendous transformation over the decades. The earliest education provided to zoo guests were basic taxonomic signs with basic information about the species. Zoo interpretive signage evolved over the years, and by the middle of the 20<sup>th</sup> century, zoos began trying interactive interpretation, such as push button audio and video feeds (Andersen, 2003; Roe et al., 2014; Smith & Broad, 2007). The use of varying media interactive interpretation methods led to the implementation of fully immersive exhibits, where the guest could walk into the world from which the specific animal was from, and be fully surrounded by the sounds, smells, and fauna present in the far off exotic location (Andersen, 2003; Roe et al., 2014; Smith & Broad, 2007). The immersive exhibits were meant to entice guests into reading the interpretive signage about the animals they were viewing by increasing their sensory stimulation (Andersen, 2003; Larsen, 2002; Roe et al., 2014; Smith & Broad, 2007). Unfortunately for the new immersive exhibits, research conducted by Larsen (2002), has shown that most visitors did not make the desired

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connection of the importance of the ecosystems which the animals on exhibit live *in-situ* and the actual animals on display in the immersive exhibit.

With the expansion of immersive exhibits, and the possibility that the impact is less than desired (Larsen, 2002), zoos are using animal handlers, docents, volunteers, and other educators to allow face to face interactions with guests. Significant research suggests live interactions between zoo personnel and visitors can enhance the visitor's experience, and possibly facilitate connections between guests and animals, as well as better deliver the conservation education message the zoo intends (Anderson, Kelling, Pressley-Keough, Bloomsmith, & Maple, 2003; Falk et al., 2007; Miller et al., 2013; Packer & Ballantyne, 2010; Pearson et al., 2014; Penn, 2009; Roe et al., 2014; Swanagan, 2000; Visscher et al., 2009). Having a wide variety, and compliment, of communicative activities available for guests is one way for zoos to increase the opportunity for conservation education to take place in their free choice learning environment.

One experience which combines several of the interpretive communications which have been found to have a positive impact on guest's environmental education learning outcomes is behind the scenes tours (BTS). BTS tours have the ability to provide face-to-face education, in the presence of CMF, while providing tourists with a unique experience they would not be able to obtain by a self-tour of the zoo. BTS tours, as with any live interpretive event, can be impacted by the use of drama and humor, the animals activity levels, and the skill of the presenter (Falk, 2006; Fraser & Sickler, 2009; Morgan & Hodgkinson, 1999; Roe et al., 2014; Visscher et al., 2009; Weiler & Smith, 2009). Even with the complexities of BTS tours, they can be an important part of a zoo's

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conservation education programming, and further research needs to be completed to determine their impact upon guests.

### **The Need for Research**

This research seeks to examine the impact that a behind the scenes tour program, located at the Columbus Zoo and Aquarium, has on visitors feelings of intrinsic existence value toward wildlife, as compared to regular zoo tourists, which will be used as the control group. This study will look at the four BTS tours offered by the Columbus Zoo and Aquarium. Research into the impacts of behind the scenes (BTS) tours has just recently begun, and more is needed to determine the potentially large impact of combining several different education and interpretive methods into an inclusive, systematic, well planned tour that elicits emotions and engrains positive sentiments.

This research examined the impact of intrinsic existence value on conservation behavior intentions as compared to a control group, in this case regular zoo tourists. As tourists have an increase in their feelings that wildlife have an “intrinsic” value to exist, they may be more willing to change their current negative conservation behaviors to more positive conservation behaviors.

A regular zoo visit has the power to remind people that what they consider to be “human” and what they consider to be “natural” are not located in two different worlds (Clayton & Myers, 2009). Reminding people that we are dependent on an ecosystem may be the first step in adjusting their conservation behaviors. BTS tours have the potential, through using several effective interpretive methods wrapped around behavioral theories, to bring about a greater positive level of intrinsic existence value by providing an atmosphere where animals are present which the average zoo tourist may never see in *in-*

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*situ*. This increased positive intrinsic existence value may lead the tourist to alter their conservation behaviors in ways that a self-guided regular zoo tour may not.

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## CHAPTER 2: LITERATURE REVIEW

### **Introduction**

The evolution of zoos is important to zoos being a part of conservation education in the future. Zoos, and the public, are increasingly putting emphasis on the importance of the role played by zoos in conservation education undertakings. The purpose behind conservation education is behavior change. Zoos are in the ideal position to provide informed and scientific conservation education which will bring about behavior change in visitors. BTS tours, presented by zoos, have the potential to influence tourists' conservation behaviors.

### **Responsible Conservation Behaviors**

The number of behaviors which BTS tours attempt to change are almost as numerous as the multitude of BTS tours which exist in zoo's around the country. Some of the broad pro-conservation behaviors which BTS tours might attempt to influence are energy conservation, water conservation, recycling, and purchasing products from environmentally responsible companies (Barr, 2003; Clayton & Myers, 2009). Some specific conservation behaviors which BTS tours may wish to change are repurposing items to reduce consumption, creating compost bins to reduce the amount of refuse going to landfills, and increasing the energy efficiency of homes. The particular conservation behavior, or behaviors, which a BTS tour will focus on are determined by the particular BTS tours, and the particular animals and ecosystems which are presented to the tourists during their visit. Creating BTS tours which positively impact the intrinsic existence value of wildlife held by tourists may be another way to impact tourist's behavior change. Studying behaviors, and how to change behaviors, has been researched for decades.

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It is important to examine some of the most influential models and theories used in understanding human behavior, specifically for this research, models and theories which have been used to examine environmental and conservation behaviors, and how to change those behaviors as our understanding of their origins broadens.

Many years of practical application, and considerable research, has led to today's modern BTS tour. Conservation psychology, conservation education, human dimensions of wildlife, and interpretive methods, are just a few of the areas which must be examined to begin understanding the impact which BTS tours may have on conservation behaviors. Theories from each of these fields come into play during a BTS tour, and this literature review examines some of the prominent theories from different disciplines, and how those theories tie into the present research.

This research uses components of a cognitive hierarchy model of human behavior (Fulton, Manfredi, & Lipscomb, 1996; Vaske, 1999), combined with Kellert's typologies of wildlife attitudes (Kellert, 1984), and Putney's typology of intangible values (Harmon & Putney, 2003). Research from Perkins (2010), on measuring love and care for nature, and Skibins (2013), research on developing a model to measure Conservation Caring, are also used to support the reasoning for researching the intrinsic existence value of wildlife held by participants in zoo BTS.

### **Cognitive Hierarchy Model of Human Behavior**

The cognitive hierarchy theory of human behavior (CHM), developed by Rokeach and later adapted by Fulton to include environmental views, suggests a person's views can be arranged into a cognitive hierarchy comprised of values, value orientations, attitudes and norms, behavioral intentions, and behaviors, with each cognition being

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somewhat predicated by its precedent (Ball-Rokeach, Rokeach, & Grube, 1984; Fulton et al., 1996; Homer & Kahle, 1988; Vaske, 1999; Rokeach & Rokeach, 1979, 1973) (Figure 2.1). The CHM has been fundamental in the research from multiple disciplines for determining how behavior change takes place in populations with opposing, or contrary, values as related to the desired behavioral outcome.

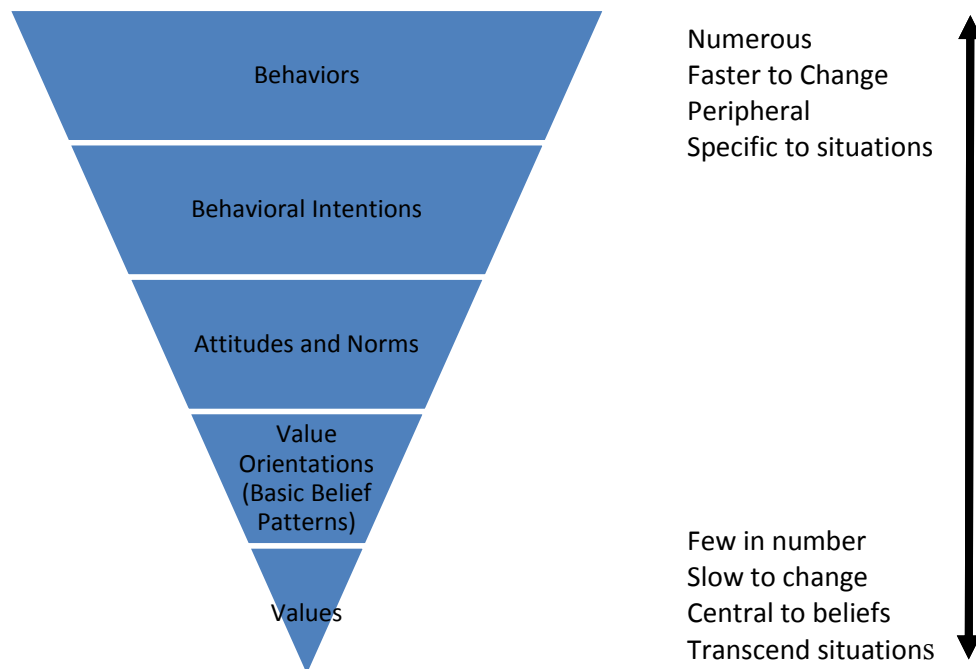


Figure 2.1. The cognitive hierarchy model of human behavior.

Adapted from: Fulton, D., Manfredi, M., & Lipscomb, J. (1996). Wildlife value orientations: A conceptual and measurement approach. *Human Dimensions of Wildlife*, 1(2), 24–47. Adapted from: Vaske, J. J. (1999). A value-attitude-behavior model predicting wildland preservation voting intentions. *Society & Natural Resources*, 12(6), 523–537. Retrieved from <http://doi.org/10.1080/089419299279425>

The CHM posits that people’s behavioral intentions, and the behaviors which follow, are, in large part, driven by the values which individuals hold. Values are defined



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as “an enduring belief that a specific mode of conduct is personally or socially preferable to an opposite or converse mode of conduct or end state of existence” (Rokeach & Rokeach, 1973, p. 5). Examples of values are integrity, accountability, and discipline. Using the CHM, researchers have looked at what influences people’s behavior choices, and how their behavior choices are impacted at different levels within the model. The CHM has been instrumental in studying behaviors, and possible behavior change, in many different disciplines, and the CHM, as modified by Fulton to include environmental behaviors, has been used in the research of human dimensions of wildlife management and conservation education, such as the research completed by Kellert on the reintroduction of the grey wolf to Yellowstone National Park. The knowledge gained from research using CHM has been the foundation for much of today’s research and theories, including the research into how feelings and emotions impact behavior. To understand the how the mechanisms of the impact of intrinsic value, and feelings and emotions, impact people’s behavior, it is necessary to understand the foundation from which these theories are based, and part of that foundation is the CHM. Some of the early research which came from Fulton’s adaptation of Rokeach’s model was informed by Kellert’s (1984) typologies of wildlife attitudes.

### **Kellert’s Wildlife Attitudes and Putney’s Intangible Values**

Between 1973 and 1976, Dr. Stephen Kellert created a typology (Table 2.1) of basic attitudes people hold towards animals (Kellert, 1984). Kellert’s work has led to a marked increase in the understanding of the connection between how people feel towards animals, how people act towards animals, and what conservation-related behaviors people may participate in to protect animals. Kellert’s initial “naturalistic” category listed

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people as having “a primary interest and affection for wildlife and the outdoors” (Kellert, 1985, p. 48). Kellert’s initial “naturalistic” category helped lay the foundation for today’s research into how people care for, and about, nature, and Kellert’s research plays a key role in understanding people’s intrinsic existence value of wildlife.

Scientists have been expanding on Kellert’s research for decades, and the understanding of the connection between how people feel towards wildlife, and how they act, is becoming clearer. Kellert’s research has been instrumental in the study of how residents view urban wildlife management actions (Whittaker, Vaske, & Manfredi, 2006), the attitudes children hold towards animals based on age (Kellert, 1985), Americans attitudes and knowledge of certain animals (Kellert, 1984), and how to better protect large carnivores in North America by understanding human culture (Kellert, Black, Rush, & Bath, 1996). The early research using Kellert’s typologies laid the foundation for newer research which use the typologies to understand people’s environmental values. Research looking into how the likeability of wildlife may impact conservation donations (Tisdell et al., 2005), how we decide what animals to like and dislike (Jacobs, 2009), how CMF’s might influence pro-conservation behaviors (Skibins et al., 2013), and in the creation of a “conservation caring” model to help predict pro-conservation behaviors (Skibins & Powell, 2013). The importance of Kellert’s typologies, and the research which has been conducted on those attitudes, are of great importance to the study of BTS tours, and the impact those tours may have on pro-conservation behaviors.

Kellert’s typologies can be used to understand the attitudes zoo tourists have toward the wildlife they are viewing and the possible conservation actions that follow.

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Kellert's typologies are presented in Table 2.1 to illustrate the different attitudes zoo tourists bring on their visit. Kellert's typologies of attitudes provide the groundwork for many of today's theories dealing with the how behaviors may be changed by impacting, in a positive way, people's emotions and feelings.

Table 2.1

Kellert's typology of wildlife attitudes

Level	Attributes
Naturalistic	Primary interest and affection for wildlife and the outdoors.
Ecologistic	Primary concern for the environment as a system, for interrelationships between wildlife species and natural habitats.
Humanistic	Primary interest and strong affection for individual animals, principally pets. Regarding wildlife, focus on large attractive animals with strong anthropomorphic associations.
Moralistic	Primary concern for the right and wrong treatment of animals, with strong opposition to exploitation of and cruelty toward animals.
Scientific	Primary interest in the physical attributes and biological functioning of animals.
Aesthetic	Primary interest in the artistic and symbolic characteristics of animals.

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Table 2.1 (continued)

Level	Attributes
Utilitarian	Primary concern for the practical and material value of animals.
Dominionistic	Primary satisfactions derived from mastery and control over animals typically in sporting situations.
Negativistic	Primary orientation on avoidance of animals due either to indifference, dislike or fear.

Adapted from Kellert, S. (1984). *American attitudes toward and knowledge of animals: An update*. Retrieved from [http://animalstudiesrepository.org/acwp\\_sata/2](http://animalstudiesrepository.org/acwp_sata/2)

Dr. Allen Putney gives a list of intangible values (Table 2.2) which the World Commission on Protected Areas (WCPA) created to define how visitors view protected areas, and the animals that live within those areas, and which he lists in his introduction to *The Full Value of Parks: From Economics to the Intangible* (Harmon & Putney, 2003). Many of those typologies are pertinent to how visitors feel about zoos, especially the intangible value of existence. An intangible value, for the purposes of this paper, refers to “that which enriches the intellectual, psychological, emotional, spiritual, cultural, and/or creative aspects of human existence and well-being” (Harmon & Putney, 2003, p. 4). The definition for existence value which the WCPA created, and which Dr. Putney listed, (Table 2.2) is, the satisfaction, and willingness to pay, brought about by knowing phenomenal natural and cultural landscapes have been protected, valued, and held sacred (Harmon & Putney, 2003, p. 8).

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The intangible values created for the WCPA, and listed by Putney, have been used to create valuable research in the areas of intangible values, much in the same way Kellert's typologies of attitudes has been used to research values and attitudes towards wildlife. Some of the tangible research associated with the intangible values listed by Putney are, the source and significance of values in protected areas (Putney & Harmon, 2003), why people have the impulse to conserve areas deemed sacred (Ramakrishnan, 2003), and how to manage protect areas with a holistic approach by using intangible values (Putney & Harmon, 2003). Understanding intangible values is important for the creation of impactful pro-conservation zoo programming, especially BTS tours, and the use of the values listed by Putney will be instrumental in researching zoo education programming.

The WCPA's intangible values can be used by researchers to understand how people are connected to nature, and to what extent they may be willing to participate in protecting/conserving areas, animals, and ecosystems. Along with Kellert's attitudes, the WCPA's intangibles can be used as a guide to map people's behaviors. The WCPA's intangible values, as well as Kellert's wildlife attitudes, have laid the foundation for current theories on the connection between behavior change, feelings, and emotions. While Kellert's attitudes, and WCPA's intangible values, have been used extensively to research human behavior, little of that research has been in the realm of zoo education programs. Their work, and the research which it created, will be used in this research to look at the impact attitudes and intangible values have upon the intrinsic value of zoo tourists, as compared to zoo BTS tourists.

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Table 2.2

Typology of Intangible Values Created for the WCPA

Value Type	Attributes
Recreational values	The intrinsic qualities of natural areas that interact with humans to restore, refresh, or create anew through stimulation and exercise of the mind, body, and soul (i.e., re-creation)
Spiritual values	Those qualities of protected areas that inspire humans to relate with reverence to the sacredness of nature
Cultural values	The qualities, both positive and negative, ascribed to natural, cultural, and mixed sites by different social groups, traditions, beliefs, or value systems that fulfill humankind's need to understand, and connect in meaningful ways, to the environment of its origin and the rest of nature
Identity values	Those natural sites that link people to their landscape through myth, legend, or history
Existence values	The satisfaction, symbolic importance, and even willingness to pay, derived from knowing that outstanding natural and cultural landscapes have been protected and exist as physical and conceptual spaces where all forms of life and culture are valued and held sacred

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Table 2.2 (continued)

Value Type	Attributes
Artistic values	The qualities of nature that inspire human imagination in creative expression
Aesthetic values	Appreciation of the harmony, beauty, and profound meaning found in nature
Educational values	The qualities of nature that enlighten careful observer with respect to human relationships with the natural environment, and by extension, people’s relationships with one another, thereby creating respect and understanding
Research and monitoring values	The function of natural areas as refuges, benchmarks, and baselines that provide scientists and interested individuals with relatively natural sites less influenced by human-induced change or conversion
Peace values	The function of protected areas in fostering regional peace and stability through cooperative management across international land or sea boundaries (trans frontier conservation areas) or as “intercultural spaces” for the development of understanding between traditional and modern societies, or between distinct cultures

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Table 2.2 (continued)

Value Type	Attributes
Therapeutic values	The relationship between people and natural environments in protected areas that creates the potential for healing and for enhancing physical and psychological well-being

Adapted from Putney, A. D. (2003). Introduction. In D. Harmon & A. D. Putney (Eds.), *The full value of parks: From economics to the intangible* (pp. 3–11). Oxford: Rowman & Littlefield.

## **Empathy and Caring Research Tools**

Considerable research has been completed on the use of values and attitudes in attempting to measure people’s possible behaviors, and in measuring the amount of actual behavior change taking place. Increasingly, research is looking into the use of empathy, caring, and our sense of self to determine individual’s possible behavioral intentions and behavior’s (Clayton & Opatow, 2003; Mayer & Frantz, 2004; Schultz, 2000). Different methods have been researched to create scales for determining people’s level of caring for, about, and towards nature. Some of the scales are the connectedness to nature scale (CNS) (Mayer & Frantz, 2004), the love and care for nature scale (LCN) (Perkins, 2010), and the conservation caring scale (CC) (Skibins & Powell, 2013).

Mayer and Frantz (2004) created their scale as a tool to measure “situational factors and personality characteristics that might impact connection to nature” (p. 512). Other possible, and intended, uses include: measuring the impact of programs intended to connect people with nature, and measuring the impact of biophilic architecture on inhabitant’s connectedness to nature (Mayer & Frantz, 2004). Zoos can use this scale to



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measure the impact their educational programs have on people's connection with nature, which will allow zoos to design programs to impact pro conservation behaviors by impacting tourist's connection with nature.

Perkins (2010), researched the LCN scale to provide an instrument for researchers to use in measuring individuals emotional connection/relationship with nature. In particular, the researchers designed the LCN scale to further research into the "differential effect of various psychological determinants of environmental altruism across a range of contexts" (Perkins, 2010, p. 462). Knowing the differential effect of psychological determinants in the context of environmental altruism can allow zoos to better understand what motivates people to act in certain ways. This knowledge will allow zoos to design education programs that use the psychological determinants from the LCN to help adjust zoo tourist's conservation behaviors.

Skibins & Powell (2013), created a Conservation Caring Scale, (CCS), in part, to give zoos a tool for measuring visitors' "connection" with an animal. In Skibins's statistical analysis, the researchers determined that all seven of the Conservation Caring items were invariant for each zoo involved in the research. Statistical equivalence between zoos will allow the CCS to be applied in a consistent manner, regardless of differences in zoo appearance and presentation. This statistical equivalence also suggests that quests conceptualize Conservation Caring items in similar ways (Skibins & Powell, 2013).

Intrinsic existence value is part of each of the above mentioned scales and each of the theories. The attitudes created by Kellert, and the values listed by Putney, laid the foundation for the current research into people's feelings, level of caring, and connection

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to nature and wildlife. Intrinsic existence value is an integral part of each scale created to measure how people feel about wildlife. Knowing how people feel, and their level of intrinsic existence value of wildlife, can help zoos develop ever more effective educational programs, which have the possibility to impact tourist's behavioral intentions and their behaviors themselves. The research listed above informed the current research by showing what attributes, and which questions to ask, so as to measure the intrinsic existence value of wildlife held by zoo tourists. Little research has been conducted on the impact of feelings, level of caring, and/or connections with wildlife, including the importance of intrinsic existence value, in zoo education programming and specifically in BTS tours at zoos.

### **Existence Value**

Existence value, for some groups of people, has more of an economic meaning than it does an ethical one (Dietz, Fitzgerald, & Shwom, 2005). There is a train of thought which reduces all things to a dollar amount. This value reduction allows all things, regardless of other values, to be attributed to an economy. This reductionist, non-inclusive way of thinking about values states that concerns of people not directly involved in the situation should be excluded from any cost-benefit analysis (Rosenthal & Nelson, 1992). The recurring problem with the environment and other species having intrinsic value or only having value because they are a means to human ends, instrumental value, is a core issue in environmental ethics (Dietz et al., 2005). The economic meaning of existence value is not what this research attempts to measure. Instead, this research attempts to measure the existence value of zoo visitors in terms of

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the ethical meaning closest to that of intrinsic value. Existence value, as defined in *The Full Value of Parks*, is

The satisfaction, symbolic importance, and even willingness to pay, derived from knowing that outstanding natural and cultural landscapes have been protected and exist as a physical and conceptual space where all forms of life and culture are valued and held sacred.” (Harmon & Putney, 2003)

The concept of intrinsic value is an abstract concept. Intrinsic value is said to be a value in which something has “in itself,” “for its own sake,” or “in its own right” (Zimmerman, 2015). These meanings, slight differences aside, mean that something has a value “for its own sake” rather than having a value “for the sake of something else”. This difference is what distinguishes ethical existence value from economic existence value. A gorilla has a value solely as and for being a gorilla, as opposed to solely having a monetary value to local hunters to sell on the bush meat market.

This quandary of intrinsic versus instrumental value in environmental ethics leads to one of the basic questions found in the study of human behavior (Dietz et al., 2005). That question being: How much altruism can we expect to find in conservation/environmental related behaviors? As Dietz et al. (2005) states, “assigning intrinsic value to other species or ecosystems is saying that we should care about them regardless of the importance of those systems for humans” (p. 343). Assigning intrinsic value to animals and ecosystems in the study of ecology and conservation is often attributed to Aldo Leopold (Dietz et al., 2005). Aldo Leopold, considered by many to be instrumental in founding modern environmental ethics and conservation study, wrote in his essay *land ethic*: “A thing is right when it tends to preserve the integrity, stability, and

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beauty of the biotic community. It is wrong when it tends otherwise” (Leopold, 2001, p. 189). This belief system is at the base of much environmental and conservation education and interpretation.

Designing zoo education programs, and BTS tours, which strive to positively increase visitors intrinsic existence value of wildlife could impact tourist’s conservation behaviors by aligning them with the goals and mission of the education program being delivered, and the zoo’s education goals.

### **Existence Value’s Connection with Conservation Behaviors**

Using the definitions of existence value from above, it is clear emotions play a considerable role in a person’s level, and/or, feelings about the value a particular animal has to exist. Knowledge-attitude-behavior research has been inconclusive about the impact which knowledge actually has on either attitudes, or behaviors (Myers, Saunders, & Birjulin, 2004). Emotions, however, can be a predictor of behavior when combined with moral conviction (Kagan, 1994; Myers et al., 2004). We know far more about the emotions and feelings connecting people with existence value than may seem readily apparent. Considerable research has been completed on the attitudes and values people hold towards wildlife (Kellert, 1985, 2012; Manfredo, 2008; Schultz & Zelezny, 2003; Stets & Biga, 2003; Whittaker, Vaske, & Manfredo, 2006). The attitude and value research which has been conducted has indirectly laid the groundwork for how emotions play a role, since values and attitudes are partly affective (Myers et al., 2004).

American society is becoming increasingly urban, and people are feeling more and more disconnected with nature (Ballantyne, Packer, & Sutherland, 2011; Forestell, 1993). The more disconnected people become from nature the more difficult it becomes

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for them to understand the impact their actions have on the larger ecosystem (Ballantyne et al., 2011; Forestell, 1993). Education alone cannot bring about the behavior change which conservation programs, whether in a zoo or not, wish to obtain (Heberlein, 2012). However, education programs that have been properly designed, and contain a strong, well-researched, experiential component, may lead people to adjust their environmental behaviors (Ballantyne et al., 2011; Clayton & Myers, 2009; Miller et al., 2013; Myers et al., 2004; Pearson et al., 2014; Roe et al., 2014).

Designing zoo education, or any free-choice learning education experience, to have the most impact will require an interdisciplinary approach. Using an interdisciplinary approach may allow zoos to impart a greater feeling that animals have the right to exist, and this feeling of increased existence value may be a function in changing the visitor's environmental behavior. It is important to note that zoo visitors, as reported by Kellert (1996), often have a higher level of humanistic attitudes towards non-human animals. This increased humanistic attitude means the average zoo guest is more likely to extend emotional bonds normally reserved for fellow humans, onto non-human animals (Clayton, Fraser, & Saunders, 2009; Kellert, 1996). Which could lead to more pro-conservation related behavior change, yes?

Along with having higher levels of humanistic attitudes towards non-human animals, zoo visitors also have varying reasons for making the trip to the zoo. Considerable research has been completed on the reasons why people decide to go to the zoo. These reasons include, to have a good day, as professional hobbyists, being part of a social group, and to provide valuable information to children (Clayton et al., 2009; Falk et al., 2007; Kellert et al., 1996; Roe et al., 2014). It is important not to dismiss the

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different reasons people have for visiting zoos (Clayton et al., 2009), and careful consideration of visitor motivations can allow for effective design of interactive educational programs that impart a more empathetic existence value towards animals upon visitors. Often times the values which zoo tourists bring with them to the zoo are closely tied to the motivations they have for making the trip to the zoo. It is important to understand the motivations zoo tourists have so an understanding can be gained into how those motivations might impact their values and vice versa. Understanding the motivations which people have for making the trip to the zoo allows zoo management to design programming which can positively impact conservation behaviors for differing motivations. It may not be possible to design a program which accounts for all motivations, but creating pedagogy accounting for as many motivations as possible can increase the impact of zoo education programming on conservation behaviors.

Clayton et al. (2009) researched how visitors perceive their trips to zoos. The research produced three conclusions that are valuable when thinking of the importance of existence value of wildlife in zoos.

1. Zoos are visited primarily to provide an enjoyable outing which facilitates social interaction which includes animals. Clayton et al. (2009) recommends zoos design conservation education interactions based upon visitor's reasons for coming to the zoo.
2. Clayton et al.'s (2009) results suggest that because animals stimulate curiosity and cognitive engagement, that "enjoyment is not incompatible with learning" (p. 395).

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3. Zoo exhibits present an opportunity for people to be connected with animals of many different types. Correctly organized, zoos have the potential to increase feelings, such as existence value, that may lead to greater support for, and participation in, conservation programs.

Clayton et al.'s findings (2009) lend credence to the supposition that an increase in positive feelings of existence value of animals, through carefully created visitor-animal engagement, interaction, and interpretation, may be a crucial component in directing visitor's conservation behaviors.

Research conducted by Bruni, Frasier, and Schultz (2008) led to the conclusions that zoos do increase visitor connectedness with nature, but seemingly on an implicit level that may not be instantly apparent to the visitor. The findings from Bruni, Frasier, and Schultz (2008) are replicated by similar research completed at the San Diego Wild Animal Park by Schultz and Tabanico (2007). Continued work by zoos to develop interactive educational programs that will impact visitors on an explicit level is still recommended and needed (Bruni, Fraser, & Schultz, 2008; Schultz & Tabanico, 2007).

When determining the best way to deliver, and research, existence value, it is important to know what types of education and interpretive programs are being offered by zoos. Roe, McConney, and Mansfield (2014), found in American zoos 91% offered animal feeding with verbal presentation, 82% offered zoo keeper talks, 75% offered animal shows, 87% offered animal contact areas, and 82% offered docents/guides/volunteers, to their visitors. Further research needs to be conducted into each of the education programs offered by American zoos, so a better understanding of their impact can be determined (Roe et al., 2014). Each of the components listed above

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make up a section of a behind the scenes tour. With each educational offering having the potential to impact visitors feelings of existence value in a positive way, and each individual education and interpretive program being a part of a behind the scenes tour, it is crucial to study the impact such an immersive type of program can have on visitor's pro-conservation related behaviors.

### **Emotions and Their Connection to Intrinsic Existence Value and Behavior**

The use of emotion in zoo education programming is just beginning. However, initial research points to a positive increase in behavior change when emotions, such as an increase in positivity towards wildlife's intrinsic existence value, are elicited through zoo education programs (Bruni et al., 2008; Clayton et al., 2009; Perkins, 2010; Schultz & Tabanico, 2007). Many values, attitudes, norms, and behaviors are partly driven by underlying emotions which visitors are unaware (Clayton et al., 2009). Myers, Saunders, and Birjulin, (2004) found that viewing animals during a zoo visit has a clearly positive "affective-evaluative" tone. They discovered this tone was characterized by "an optimal form of arousal-alertness, engagement, and relaxation" (Myers, Saunders, & Birjulin, 2004, p. 315). The emotions measured by this research were not as intense as emotions usually found in people participating in "emotion-eliciting" events. Because of the emotional intensity was less than expected, the researchers believe that the zoo experience may be striking at a visitors sentiments, instead of momentary emotions (Myers et al., 2004). Emotion is an instinctive feeling triggered by certain situational events, while sentiment is a mental attitude, longer lasting and more deeply ingrained, produced by feelings (Delamater, 2006; Hovy, 2015). The researchers state the visitors may be pre-disposed to experience sentiment instead of emotions, because they have self-



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selected to attend the zoo, so their baseline attitudes towards the zoos message may already be higher. Zoos have been criticized for having animals in captivity that spread a message to a group of people that already understand the message, and have a greater understanding for why the pro-conservation behavior changes are needed.

Zoos trying to educate and interpret for a self-selected pro-conservation audience has been a recurring criticism. Myers, Saunders, and Birjulin (2004) are not suggesting that education and interpretation should not take place for a self-selected audience, only that we must be aware of the potential bias, but also that we may be tapping into something deeper with the self-selected audience. Heberlein (2012) has found educating the already highly motivated individual is one way to bring about environmental behavior change, and is a process that should continue. One of the stories Heberlein (2012) uses is that of how the University of Wisconsin-Madison motivated an already positive group to undertake quick positive pro-conservation behavior change. One building on the Madison campus instituted a program to conserve energy called “We Conserve.” The idea quickly spread campus wide, and the people of the University of Wisconsin-Madison campus, most likely, had a higher baseline of caring before the program began. Once individuals around campus, possessing high levels of pro-conservation caring, were motivated by the energy conservation actions of one building, the pro-conservation behavior swept the campus with little additional effort. Skibins and Powell (2013) present research which suggest that preexisting levels of conservation ideas are not a clear predictor of biodiversity oriented behavior. Zoo visitors may well be agreeably minded to the conservation messages being presented to them, but this like-mindedness does not lead to behavior, or behavior change (Skibins & Powell, 2013). Even if zoos are talking to a

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largely like-minded, and self-selected, audience, it is well worth the effort to commit additional research efforts to determine the impact of interpretive and educational programs on zoo visitors.

### **Charismatic Mega-Fauna (CMF)**

A greater impact on conservation behaviors by way of eliciting emotion and sentiment, and increasing feelings of existence value towards wildlife, can be accomplished, in part, by using a wide variety of animals. A study by Myers, Saunders, and Birjulin (2004) used three animals; the gorilla, okapi, and snake, to test emotion among visitors, and the authors found that while all the animals elicited emotion, the animals which were most closely associated with humans caused a greater increase in emotion among visitors. The authors noted more research on a broader range of animals in a zoo setting is necessary to better understand the impact each different type of animal has on emotion. It is important to understand the impacts of each type of animal on tourist's emotions. It is also important to not overlook sub-sets of tourists which might hold an affinity for certain animals, which would not be considered as the mainstream or charismatic type of animal which a zoo tourist would wish to see, and could possibly be used as a "flagship species" for zoo conservation efforts (Skibins, 2013). Considerable research dealing with how people value, and relate, to wildlife has been undertaken, and this research shows people hold very different values towards different species (Kellert, 1984, 1985; Kellert et al., 1996; Skibins, Hallo, Sharp, & Manning, 2012). Animals that tend to have more anthropomorphic features lend visitors to be more empathetic (Eddy & Gallup, 1993; Kellert et al., 1996; Myers et al., 2004; Nakajima, Arimitsu, & Lattal, 2002), though maybe not active in pro-conservation behaviors, in conservation programs

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designed towards that species (Fuhrman & Ladewig, 2008; Gunnthorsdottir, 2001; Lindsey, Alexander, Mills, Romañach, & Woodroffe, 2007; Tisdell et al., 2005).

The importance of visitor's likeability perceptions of different animals cannot be understated. Certain animals, CMF's, draw large crowds of people to the zoo, and the potential impact on behaviors is impressive. Knowing what types of animals people enjoy seeing, can allow zoos to design education and interpretive experiences that create powerful, long lasting, sentimental memories for visitors to associate conservation messages and actions with. Since we know many of the animals visitors want to see during their visit to a zoo, and realizing more research needs to be completed on the impacts of species which fall out of the normal CMF realm, we can design programs that impact visitor's memories of their visits. Ballantyne, Packer, and Sutherland (2011) found visitors who experienced an emotional experience were more apt to think deeper about the consequences of human actions not just on the individual animal present, but on species which remain *in situ*. To capitalize on these feelings, visitors need to be motivated, possibly through an interpretive guide present at the event, to deeply consider what they have seen and heard, so as to bring about a personal response by the guest (Ballantyne et al., 2011).

### **Education**

Education programs in zoos are made up of several different sets of tools designed to reach a goal of responsible conservation action through education. Employing intrinsic existence value in the pedagogy of zoo education programs can be an important way of meeting the missions of zoo education programs. That is why additional research needs to be conducted into the importance of existence value to zoo education

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programs, and how behind the scenes tours impact existence value. One way to research and demonstrate that a zoo experience is linked to the zoo's conservation mission is to look at how visitors derive, and/or construct, meaning from their zoo experience, and if that derived meaning can be linked to a change in conservation values (Clayton et al., 2009). One value that can be used in connecting visitors change in conservation values is existence value, which can be measured by researching education and interpretive zoo programs, particularly behind the scenes tours, to determine if there has been a change in the visitor's level of existence value of wildlife as a result of direct interaction with wildlife.

Non-monetary existence value, or an existence value on the intrinsic ethical level, and the caring and feelings associated with this form of existence value, is an important concept in zoo education programs. It is important for zoo's to understand how caring and feelings comprise a large part of what makes up existence value. Aldo Leopold did a wonderful job in connecting the importance of feelings, caring, and intrinsic existence value with love and how all these things are an extension of our ecological ethics (Leopold, 2001). Leopold (2001) was speaking of our ecological ethics in relation to wide open areas of the American west, but ecological ethics can be transferred by zoos to people whom will never see the wilderness Leopold loved. Zoos provide a setting that may allow people to reduce the tendency for humans to put "people" and "nature" into separate realms, which may encourage a mindset that people's lives should include a connection with nature and animals (Clayton & Myers, 2009; Perkins, 2010). It could be argued that intrinsic existence value, and the actions it may cause, are created through base feelings of love, caring and empathy (Perkins, 2010; Skibins & Powell, 2013).

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While considerable research has been completed on people's attitudes, values, and beliefs of wildlife, little research has been completed on the impact of zoo education programs on values and attitudes, particularly intrinsic existence value, and how positively increasing intrinsic existence value may also increase pro-conservation behaviors.

One program that combined many of the education and interpretive methods discussed earlier, was the "Don't Palm Us Off" conservation education and action program to reduce the use of palm oil to help protect the orangutan. The study suggests a well-organized conservation program with clear goals can make a difference in behaviors of zoo guests, such as changing the palm oil purchasing decisions of zoo tourists to a more sustainable decision pattern (Pearson et al., 2014). It has been argued that creating all the different atmospheres needed for behavioral change in a zoo education program would be nearly impossible in one visit (Ballyntyne et al., 2011). What the Melbourne Zoo was able to do was, in essence, extending the visit by providing cards allowing visitors to voice their opinion about palm oil labeling, and then sending them, postage paid, to their governmental representative or agency (Pearson et al., 2014). The amount of time visitors spent reflecting on their experience was a predictive measure of the level of learning the guests acquired (Ballantyne et al., 2011). Pearson's (2014) study findings, support Ballantyne et al.'s (2011) findings, and also heavily suggest the increase in reflection leads to an increase in behavioral action. This study suggests properly designed programs can potentially create the needed atmospheres to bring about positive conservation behavior change.

Some research shows there is an increase in knowledge after visitors participate in zoo education and interpretive programs (Miller et al., 2013; Pearson et al., 2014; Penn,

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2009; Visscher et al., 2009). Miller et al. (2013), compared the impact of regular dolphin shows with dolphin interactive interpretive programs on visitors levels of conservation-related knowledge, attitude, and intended behavior. Miller et al. (2013) found conservation-related knowledge, attitude, and intended behavior were all significantly higher three months following the interactive program, than they were when compared to entry level. The impact of dolphin shows was considerably different compared to the dolphin interactive programs. Findings showed that for participants of regular dolphin programs conservation-related knowledge, attitudes, and behavioral intentions had short term increases, but attitudes and behavioral intentions returned to baseline after two to three months. Miller et al.'s (2013) findings are consistent with other research on impacts to visitors participating in zoo education programs and the amount of time it takes for visitor's conservation related activities to return to baseline (Dotzour, Houston, Manubay, Schulz, & Smith, 2002; Dierking, YEAR; Falk & Adelman, 2003; Miller et al., 2013). Visitors to both the dolphin show and the dolphin interactive program stated the show/program had increased their desire to learn more about dolphins. Participants of the interactive dolphin program indicated the experience was one of the best in their lives (Miller et al., 2013). BTS tours have the potential for impacting knowledge, attitude, and intended behavior through proper design of the programs, and animal interactions. While BTS tours may not be available, or affordable, for all zoo tourists, they do have the potential to impact zoo tourists in a pro-conservation direction.

### **The Impact of CMF on Zoo Education Programs, and Its Uses in BTS Tours**

CMF have the ability to impact wildlife tourism, which zoos are a part of, in many ways. Wildlife tourism allows encounters with non-domesticated (wild) non-human

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animals, in either captive or wild settings, and the tourism can be either “non-consumptive” or “consumptive” (Higginbottom, 2004). Zoos would be considered, by this definition, as non-consumptive *ex situ* wildlife tourism. Selecting the correct CMF, or knowing visitors wants related to less charismatic animals, can greatly increase the success of conservation education goals and missions. CMF have been shown to have wide and varying impacts on participants, which gives the potential for increased impacts with carefully designed zoo education and interpretive programs.

A study to look at the impact of dolphin, an aquatic CMF, interactive swimming programs, found participants to feel the encounter, for reasons such as touch or eye contact, to be amazing and an almost unimaginable facet of the interactive encounter (Curtin, 2006). The findings suggest that participants were able to take the connections they had made with the individual dolphins, and use those connections to think about the species in broader terms. This study suggests the possibility that experiential interactions between tourists and animals might increase positive feelings toward wildlife, especially the possibility of increasing the tourist’s belief in the intrinsic existence value of wildlife.

Another study looking at *in situ* wildlife tourism in South Africa found that the main CMF are still important in wildlife tourism, but tourists preferences are not limited to only the normal “flagship” species (Lindsey et al., 2007). The researchers found the more experienced tourists were inclined to seek out a broader selection of flora and fauna that may be rare, and less easily seen, than the normal CMF (Lindsey et al., 2007). Other research has shown that knowing the level of tourist experience can allow for programs to be designed which are beneficial to non-CMF conservation efforts (Di Minin et al., 2013b). This information is vital in zoo education and interpretive program design.

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Knowing visitors experience level with conservation ideals allows zoos to design programs around CMF that also include a diverse amount of flora and fauna to keep the interest of the repeat visitor at a heightened level. As zoo conservation programs expand, it will be of greater importance to know what message is needed in the *in situ* wildlife tourism programs, so *ex situ* programs, which may be providing the funding for the conservation project, do not give education messages which may be contradictory to what is needed *in situ*.

CMF and flagship species are central to zoo education and interpretive programs, especially BTS tours, and understanding how, and why, certain species are chosen, and what the guest response to those species may be, is important in ensuring conservation messages, goals and missions are being met. In choosing our flagship species, we need to fine tune our understanding of how to increase visitors understanding, and appreciation, of less charismatic fauna (Di Minin et al., 2013a). Some research suggests species need not be charismatic to be flagship species (Home et al., 2009), and choosing less charismatic flagship species should be done carefully, so visitor's preferences are not misinterpreted or overlooked (Verissimmo et al., 2014), and there is concern that using CMF's as flagships species, without integration of less charismatic fauna, may not have the "trickle down" impact intended (Small, 2011). One of the BTS tours for this research dealt with what many consider to be less charismatic animals. The Discover Reef tour dealt specifically with aquatic animals, mostly small fish, and aquatic exhibits, along with aquatic animals, often have difficulty making the same connections with visitors as more charismatic land animals do. Understanding the impact of less charismatic animals,



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regardless of ecosystem, can help guide the design of zoo programming, especially BTS tours.

Research suggests we must be attentive to negative human-CMF interactions, as these interactions drive perceptions, and can turn an important flagship species into a species with poor local public support for conservation efforts (Barua, Tamuly, & Ahmed, 2010). Because of the possibility that a flagship species may “mutiny,” it is important to mitigate negative human-animal interactions *in situ*, so the conservation efforts, programs, and fund raisers *ex situ*, are not undermined. A tourist’s connection, and/or perception, with any type of animal is a significant predictor of that visitors willingness to behave in certain ways (Skibins, 2014; Skibins & Powell, 2013), and if human interactions are used as times to broaden thought patterns of animals, then peoples relative perceptions of less charismatic fauna might be changed (Bradshaw & Rice, 2009). Wildlife tourism sites need careful planning when choosing which CMF to have in their collection, and how those CMFs are presented to the public.

### **The Potential of Behind the Scenes Interpretive Tours**

The need for research into BTS tours, which combine several methods of eliciting positive emotions which may help bring about pro-conservation behaviors, is needed. The potential of BTS tours is considerable, in part, because of the combining of several different interpretive methods. The combining of several different interpretive messages into a BTS tour may spur visitors in a pro-conservation manner.

BTS tours, correctly designed and implemented, may impact pro-conservation behaviors. One tool zoos may use in designing BTS tours is creating atmospheres which increase tourist’s attitudes of the intrinsic existence value of wildlife. This increase in

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tourist's attitudes of the intrinsic existence value of wildlife may translate into pro-conservation behavior change, such as picking more fuel efficient modes of transportation and buying locally grown food to reduce the carbon footprint of meals eaten. Additional research will be needed to determine if this pro-conservation behavior impact is occurring. It is important to note the behavior impact potential may be present whether the tourist has a higher base-line of pro-conservation behavior intention, or if it is a first time tourist looking to have a good time on a nice day. The potential to change conservation behaviors through BTS tours seems to be present, but little research has been conducted on the actual impact of BTS tours. This research attempts to increase the knowledge of if BTS tours positively impact tourist's attitudes of the intrinsic existence value of wildlife.

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## CHAPTER 3: PURPOSE AND RATIONALE

### **Purpose Statement**

This study is being conducted to add additional research to the growing body of research available on BTS tour impacts in zoos. BTS tours have the potential, both positive and negative, to impact tourist views on the intrinsic existence value of wildlife, and this can impact the conservation behaviors of BTS zoo tourists. This research is important in gaining a better understanding into the impacts the Columbus Zoo and Aquarium Wild Encounters behind the scenes tours have on tourist's views of the intrinsic existence value of wildlife.

### **Rationale**

Changes in our climate, and the corresponding environmental issues, are major concerns facing the world today. Human consumption, which is leading the rapid depletion of the earth's finite resources and causing a dramatic loss of biodiversity, is largely to blame (Pearson et al., 2014). Challenges to changing the behaviors which make up the foundations of the environmental issues are many, but one challenge particularly important is that of education. Zoos and aquariums aim to provide effective and quality environmental education to the public and provide a framework for conservation ethics (Ballantyne et al., 2007; Falk et al., 2007). Some research suggests presentations combining educational talks with animal training, or other multilayered interpretive animal presentations, are associated with greater learning, and which could lead to pro-conservation behaviors (Visscher et al., 2009; Weiler & Smith, 2009).

Behind the scenes tours are one of the multilayered interpretive presentations which have the ability to impact visitor's existence value of wildlife and ecosystems.

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Zoo education research has gained momentum only in the last few years (Ogden & Heimlich, 2009) and research into behind the scenes education programming is just beginning.

This project will allow Columbus Zoo and Aquarium the opportunity to advance their knowledge concerning Wild Encounters Tours and to increase the body of scientific research on zoo education programs.

### **Objectives and Hypothesis**

Objective 1: Determine the efficacy of behind the scenes tours to impact existence value of wildlife to better guide development of program pedagogy.

H<sub>1</sub>: BTS tourists will have stronger positive associations of intrinsic existence value towards wildlife than regular tourists.

H<sub>2</sub>: BTS tourists will have stronger positive behavioral intentions to participate in responsible conservation behaviors than regular zoo tourists.

H<sub>3</sub>: BTS tourists will be more likely to urge family and friends to change their conservation behaviors than will regular tourists.

H<sub>4</sub>: Level of intrinsic existence value will be positively correlated with level of behavioral intentions.

Objective 2: Provide data to park managers about regular park visitor existence value beliefs and existence value beliefs of behind the scenes participants.

### **Methods**

This study consisted of four phases including quantitative data collection and summary. Phase 1 consisted of developing research objectives and goals. Research objectives and goals were approved by the Columbus Zoo and Aquarium and the

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researcher's dissertation committee. During Phase 2, investigators used Phase 1 objectives and goals to design and structure a survey instrument that was used to understand visitors' existence value of wildlife and ecosystems. Phase 2 also involved obtaining Institutional Review Board, (IRB) approval from Eastern Kentucky University. After approval a test of the survey was conducted (N=30). Upon approval, a pilot test (N=54) was conducted in order to examine the survey measure. In Phase 3, the questionnaire was administered to visitors and guests onsite at Columbus Zoo and Aquarium (N=278). The two groups being surveyed were (1) behind the scenes (BTS) tour guests and (2) a control group of zoo visitors who have not taken a BTS tour. The investigators used a stratified randomized probability sampling approach and data were collected throughout a zoo season (spring and summer 2015) to provide a robust representation of the visiting population. In Phase 4, data was analyzed and the final project report and dissertation was completed.

### **Site Description/Columbus Zoo History**

Today's zoos and aquariums are built upon purposeful collections of animals used to advance conservation education ideals and messages by the use of systematic research and education (Ogden & Heimlich, 2009; Rabb, 2004). The Columbus Zoo and Aquarium is an internationally known zoo which has built a large and purposeful collection of animals. Columbus Zoo and Aquarium attracts over 2.4 million local, regional, national, and international guests per year (R. Griffith, personal communication, January 10, 2016).

The Columbus Zoo and Aquarium offers many different educational opportunities, from free choice opportunities to programs designed for different groups, with behind the

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scenes tours being a commonly requested package by park visitors. This research supports the efforts of Columbus Zoo and Aquariums mission of providing current and relevant conservation education by producing strong scientific data for evaluating behind the scenes educational programs. Participation in Columbus Zoo's BTS tours has increased each of the past four years, with 2015 tourists exceeding 3500 tourists (R. Griffith, personal communication, January 10, 2016).

Columbus Zoo opened in 1927, and is located NNW of Columbus in Powell, Ohio. The zoo is bordered on the east by the O'Shaughnessy Reservoir on the Scioto River. The zoo also owns an 18 hole golf course, 140 acres, known as Safari Golf club, and a water park called Zoombezi Bay.

The Columbus Zoo and Aquarium includes 450 acres, and houses over 10,000 animals representing over 1000 species. The zoo is divided up into ten different regions, representing different parts of the world, and the flora and fauna found in those areas.

### **Constructing the Survey Instrument and Pilot Study**

The survey was constructed based upon current literature and feedback from researchers and park staff. Survey questions were also guided by the researcher's objectives and hypotheses. Previous surveys used to measure attitudes and knowledge (Bremmer & Park, 2007; Brooks et al., 1999; Cornell, 2008; Strack & Miller, 2008) were also used as guides to construct survey questions. The construction of questions was further guided by the tailored design method for survey construction (Dillman, 2007). The questions were posed as categorical, multiple choice, open-ended, or a Likert-type scale. A preliminary survey was given to a group of 30 graduate and undergraduate students at Eastern Kentucky University to check for content and clarity of wording.

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Adjustments were made using the feedback from the preliminary survey and then a pilot study of 71 people, which is an acceptable pre-test population (Dillman, 2007), was conducted at the park to test for response rate, non-response rate of certain questions and to test the validity and reliability of the instrument. The pilot test was given to every third visitor to randomize the sample collected.

The pilot test data were analyzed using Cronbach's alpha to assess the survey's validity and reliability before the final survey was administered to BISO visitors. None of the test questions failed to meet the minimum alpha score of 0.60. While there is some debate as to what is a "minimum" acceptable size for Cronbach's alpha, 0.60 to 0.70 has been deemed acceptable in parks, recreation, and human dimensions research (Vaske, 2008). The survey was acceptable after initial testing, so no changes were required.

### **Final Survey Instrument**

The two final survey instruments (Appendices A & B) were two-page questionnaires with an introductory page, two pages of questions (four sections for regular visitors and five sections for BTS tours) and a section for comments. The first section contained questions concerning first time visitors, visitation patterns, if visitors had participated in BTS tours at the Columbus Zoo, if they had participated in BTS tours at another zoo, and if children were part of the group that day. The second section was comprised of six questions on a Likert scale, and dealt with visitor's wildlife views. The third section was comprised of four Likert scale questions concerning conservation actions. For regular guest surveys, the fourth section was comprised of demographic information questions. For BTS tour participants, the fourth section was comprised of four Likert scale questions concerning tour impacts. Each survey had a section for

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comments. The Institutional Review Board at Eastern Kentucky University approved this survey on March of 2015. This study received approval from the Columbus Zoo and Aquarium on February 27, 2015 (Appendix C).

### **Participants**

This research involved two types of participants. BTS tourists and regular zoo tourists not participating in a BTS tour. Regular tourists were chosen by asking non-organized group visitors, who were identifiable by means of wrist bands given to organized groups, and were above the age of 18, if they would participate in a research project being conducted by the researcher for the purposes of completing his degree. The following script was used when speaking with zoo guests:

My name is \_\_\_\_\_ and I am a doctoral student at Eastern Kentucky University. You are being asked to participate in a survey research project which is being conducted by Max Lakes from Eastern Kentucky University. This survey is anonymous. No one, including the researcher, will be able to associate your responses with your identity. Your participation is voluntary. You may choose not to take the survey, to stop responding at any time, or to skip any questions that you do not want to answer. You must be at least 18 years of age to participate in this study. Your completion of the survey serves as your voluntary agreement to participate in this research project and your certification that you are 18 or older.

Frequencies, and percentages, were calculated for gender, age, education level, income, if it was the tourist's first trip to the zoo, how many times they had been to the zoo, if they had visited other zoos in the past twelve months, if the tourists had participated in BTS tours at other zoos, and if children were part of the group.



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### **Data Collection Site for Regular Visitors**

The data collection site for regular visitors was located across from the education building and in front of the large pond near the entrance. This location is part of a loop which connects all areas of the zoo. Most visitors take the loop to visit different areas of the zoo, which gave researchers access to the broadest amount of visitors possible.

### **Data Collection Sites for Wild Encounters Behind the Scenes Tours**

The Columbus Zoo offers four regular one hour behind the scenes tours which it calls Wild Encounters Tours (WEs). The four tours are: Giraffe Barn, Animal Hospital, Manatee Coast, and Discovery Reef. Each lasts approximately one hour and is capped at a maximum of ten participants. Each tour is led by an education department interpreter. Each interpreter is given a list of several suggested talking points (Appendices D, E, F, and G) which are designed to help meet the goals of each WE tour (Appendices H, I, J, and K), but the talking points are guidelines which can be adjusted to fit the needs, desires, and questions of participants. Different education interpreters were scheduled for each tour. The tour guide was dependent on the daily schedule, and no one guide was assigned to any tour. Tours cost \$25 per person. Reservations are needed, but the reservation can be made up to fifteen minutes before the beginning of the tour.

The Giraffe Barn Tour begins outside of the vervet monkey viewing area. A large sign marking the starting point of the tour is present. The tour guide then begins the tour by explaining the design, and reasoning for that design, to the guests. The tour then moves from the regular part of the zoo, through secured gates, and into the back area of the zoo around the giraffe barn. Outside of the giraffe barn, the tour guides explain the workings of the specially designed barn, and how it impacts the giraffes. The tour then

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moves inside the barn where the tour guide explains the dietary process involved in taking care of the animals, and then moves into the barn itself. Giraffes, and other animals, are sometimes present in the barn, but there is no way of knowing ahead time, because of the needs of the animals. Some tour participants witnessed giraffes, and other animals, while some tours had the tour of the facility with no animals present. Once the interior tour is complete, the tour guides lead the visitors to the giraffe shamba, where they can participate in a giraffe feeding.

The Animal Hospital tour begins outside of the yurt where Jack Hanna films some of his television show, *Into the Wild*. There is also a large sign outside of the yurt marking the spot where the tour will begin. The tour begins with a walk to the animal hospital. The tour guide explains the purpose of the different buildings along the way, tells different stories pertinent to animal health, and asks guests if they have any questions. Upon entering the hospital, the tour guide takes the guests throughout the hospital, explaining different rooms, their purpose, and why the hospital is designed in the way it is. As with the giraffe barn, it is not known before arriving if animals will be present in the hospital. Either over walkie talkies, or through personal communication, the tour guide determines if any procedures are taking place. Depending on the procedure, type of animal, and safety of the situation, the guests may, or may not, be allowed to view the entire hospital. Many times, guests are asked if they would like to witness the procedure, through a viewing window, and they are allowed to watch if they would like. During other visits, there may not be any animals present, and the tour guides will use photos, and other forms of media, to represent what takes place in the hospital. When the interior portion of the animal hospital tour is complete, the tour guides escort

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the guests back to the regular part of the zoo, thank them for taking part in the tour, give them special key rings for participating, and then return them to their regular zoo visit.

Discovery Reef begins outside of the aquarium by a sign designating the beginning of a Wild Encounters tour. The tour either leads through the front door of the aquarium, or if it is a very busy day, the tour guides will take the guests through the rear entry. The tour guide takes guests through the workings of the aquarium, talks about the immense amount of mechanics and engineering involved in the making the place work, then takes the guest upstairs to see the aquarium from the top of the tank. The Discovery Reef tour always has animals present. The tour guests view the same tank as regular guests, just from a different vantage point, which allows them to see how the aquarium operates. It is also a time when the tour guides are able to explain the different aquatic animals, the artificial coral reef, and the threats to each. The guests also have time to ask questions about topics which interest them. Once the tour is completed, the guests are given souvenir key rings and led back to the main lobby of the aquarium where they can view the aquarium from the viewing area.

Manatee Coast begins outside of the Manatee building, which is connected to the Discovery Reef Aquarium, under a sign notifying guests that the Manatee Coast Tour will begin at that location. Tour guides, depending on visitor count for the day, take guests through the front lobby, or around the back through the kitchen. The guests are interacted with during the walk, and the tour begins with a quick anatomy lesson of the manatee. Different topics are covered during the first few minutes, where manatees are found in the wild, threats to the manatee, their closest relative, and other assorted information. The tour then moves to the kitchen, where the dietary protocol for the

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manatees is covered. Guests are given the opportunity to see what the manatee's diet consists of, as well as the diet of the other animals that reside in manatee coast. Guest are then taken to the dock, where they see how the manatees are feed. If an animal handler is present, the guests may have the opportunity to feed the manatees, or the hawksbill sea turtle. Animals are always present on the Manatee Coast tour, but guest do not always have the opportunity to interact with the animals. Guests are then taken to see the northern most mangrove forest, which is located around the back of the manatee exhibit. Here, the tour guides give facts about the importance of mangrove forests along the coast, as well as the threats the mangrove forests face. The tour ends with a discussion of the engineering required to keep the water at a temperature, and brackish level, suitable for the manatees. Guests are given souvenir key chains, then led back to the public portion of the Manatee Coast exhibit.

### **Variables and Measures**

Three groups of Likert-type scale questions assessed three constructs: Wildlife views (which measured intrinsic existence value), conservation actions, and tour impacts. Only BTS tourists completed surveys with all three constructs. Regular tourists responded to a survey with the wildlife views and conservation actions but not the tour impact variable.

### **Analysis**

For this research independent sample *t*-tests were run for H<sub>1</sub>, H<sub>2</sub>, and H<sub>3</sub>, and a Pearson's correlation was run for H<sub>4</sub>. The independent sample *t*-tests were the most appropriate test to run for each of the first three hypothesis since a comparison of means

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for two groups was needed. The Pearson's correlation was the appropriate test to run for  $H_4$  since a test for correlation between question groups was needed to test the hypothesis.

### **Limitations**

Additional research needs to be completed to further look at the level of emotional connection created between animal and tourist. Additional research, possibly a longitudinal study, needs to be conducted to determine if the connection created between animal and tourist translates into pro-conservation behaviors.

This research is not meant to be an all-inclusive exhaustive project into each method used to design BTS tours, as time limits and monetary limitations, did not allow for this research project to include each of the different education and interpretive methods which make up BTS tours. Additional future research should be conducted which can look into the combined impact of each of the multiple methods used in BTSTs. This research is meant to increase the scientific knowledge already in existence, and produce a platform from which to conduct further research into the impacts of all BTSTs as compared to the impact of a regular zoo visit on zoo tourists.

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CHAPTER 4: RESULTS

**Frequency Results**

Frequency tests were conducted for each of the three groups surveyed: total tourists, regular tourists, and behind the scenes (BTS) tourists (Table 4.1). There were 137 regular tourist surveys obtained, and 142 BTS tourist surveys obtained, with one being unusable due to more than 50 percent of the survey being incomplete, for a total of 141 BTS surveys. There were 278 total usable surveys. Frequencies, and percentages, were calculated for gender, age, education level, income, if it was the tourist's first trip to the zoo, how many times they had been to the zoo, if they had visited other zoos in the past twelve months, if the tourists had participated in BTS tours at other zoos, and if children were part of the group.

Table 4.1

Demographic Information by Tourist Type

		Tourist Groups					
		Regular (N=137)		BTS (N=141)		Overall (N=278)	
		Freq.	%	Freq.	%	Freq.	%
<b>Gender</b>	Female	90	65.7	88	62.4	178	64.0
	Male	47	34.3	53	37.6	100	36.0
<b>Education</b>	High School or less	25	18.2	18	12.8	43	15.5
	Some College	28	20.4	37	26.2	65	23.4
	College Degree	51	37.2	52	26.9	103	37.1
	Grad./Prof. Degree	33	24.1	34	24.1	67	24.1

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Table 4.1 (continued)

		Tourist Groups					
		Regular (N=137)		BTS (N=141)		Overall (N=278)	
		Freq.	%	Freq.	%	Freq.	%
<b>Income</b>	< \$10,000	9	7.0	8	6.3	17	6.6
<b>Status</b>	\$10,000-\$29,999	14	10.9	12	9.4	26	10.1
	\$30,000-\$59,999	40	31.0	17	13.3	57	22.2
	\$60,000-\$89,999	36	27.9	24	18.8	60	23.3
	\$90,000-\$109,999	17	13.2	25	19.5	42	16.3
	\$110,000+	13	20.1	42	32.8	55	21.4
<b>Zoo Visits</b>	First-time tourist	25	18.2	63	44.7	88	31.7
<b>(Columbus)</b>	Repeat tourist	112	81.8	78	55.3	190	68.3
	<sup>a</sup> 2+ Visits in last yr		81.1		70.1		76.5
<b>Zoo Visits</b>	Yes	48	35.0	75	53.2	123	44.2
<b>(Other)</b>	No	89	65.0	66	46.8	155	35.8
<b>Prior BTS</b>	Yes	N/A	N/A	74	52.9	62	22.5
	No	N/A	N/A	66	47.1	214	77.5
<b>Children</b>	Present	60	43.8	76	54.3	136	49.1
<b>w/Group</b>	Not Present	77	56.2	64	45.7	141	50.9

**Total Tourists**

Of the total tourist population, 64.0% were female. Ages ranged from 18 to 77 with a mean age of 37.8 years. Of the total population, 15.5% of respondents had a high school education or less, 23.4% had completed some college but not attained a degree, 37.1% had a college degree, and 24.1% had a graduate or professional degree. For the total population 6.6% of respondents had an income under \$10,000, 10.1% had an income of \$10,000 to \$29,999, 22.2% had an income of \$30,000 to \$59,999, 23.3% had

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an income of \$60,000 to \$89,999, 16.3% had an income of \$90,000 to \$109,999, and 21.4% had an income of \$110,000 or higher. It was the first visit to the Columbus Zoo and Aquarium for 31.7% of respondents, and 68.3% had been to the Zoo before. For repeat tourists, 76.5% had visited more than once in the past year. For the total tourist population 44.2% of tourists had visited other zoos in the past year. Of the total population surveyed 22.5% of tourists had participated in BTS tours at other zoos in the past, and 49.1% of respondents had children present during their visit.

### **Regular Tourists**

Of the regular tourist population surveyed, 65.7% were female. Ages ranged from 18 to 69 with a mean age of 36.3 years. For the regular tourist population 18.2% had a high school education or less, 20.4% had some college, but had not graduated, 37.2% had a college degree, and 24.1% had a graduate or professional degree. Of the regular tourist population 7.0% had an income of under \$10,000, 10.9% had an income of \$10,000 to \$29,999, 31.0% had an income of \$30,000 to \$59,999, 27.9% had an income of \$60,000 to \$89,999, 13.2% had an income of \$90,000 to \$109,999, and 20.1% had an income of \$110,000 or higher. Of the regular tourist population 18.2% were first time tourists, and 81.8% were repeat tourists. Of repeat tourists, 81.1% had visited more than one time in the past twelve months. Of the regular tourist population surveyed 35.0% of regular tourists had visited other zoos in the past twelve months, and 65.0% had not visited another zoo in the past twelve months. For the regular tourists 43.8% had children present during the visit, and 56.2% did not have children present for their visit.



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### **Behind the Scenes Tourists**

Of the BTS tourists 62.4% were female, and 37.6% were male. Age ranged from 18 to 77 with a mean age of 39.12 years. For the BTS tour population 12.8% had a high school education or less, 26.2% had some college, but had not graduated, 36.9% had a college degree, and 24.1% had a graduate or professional degree. Of the BTS tourists surveyed 6.3% had an income of under \$10,000, 9.4% had an income between \$10,000 and \$29,999, 13.3% had an income of \$30,000 to \$59,999, 18.8% had an income between \$60,000 and \$89,999, 19.5% had an income between \$90,000 and \$109,999, and 32.8% had an income of \$110,000 or over. For the BTS tourists surveyed 44.7% were first time visitors to the zoo and 55.3% were repeat visitors. Of the repeat visitors 70.1% had visited the zoo more than once in the past twelve months. Of the BTS tourists surveyed 53.2% had visited other zoos in the past twelve months and 46.8% had not. Of the BTS tourists surveyed 52.9% had participated in other Columbus Zoo BTS tours, and 47.1% had not. Of the 141 BTS surveys conducted, 44 (31.2%) visited the Animal Care Center, 42 (29.8%) visited the Giraffe Barn, 42 (29.8%) visited the Manatee Coast, and 13 (9.2%) visited the Discovery Reef. 54.3% of BTS tourists had children present for the tour and 45.7% did not.

Three groups of Likert-type scale questions assessed three constructs: Wildlife views (which measured intrinsic existence value), conservation actions, and tour impacts. Only BTS tourists completed surveys with all three constructs. Regular tourists responded to a survey with the wildlife views and conservation actions but not the tour impact variable.

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Two surveys were used to reduce confusion as to which questions should be answered by regular tourists versus which questions should be answered by BTS tourists. Cronbach's alpha was used to measure the reliability of these sets of questions. A Cronbach's alpha of .60 to .70 has been deemed acceptable in parks, recreation, and human dimensions research (Vaske, 2008), but, many researchers consider .70 or higher to be ideal (Pallant, 2007). The wildlife views grouping of questions had an alpha of .80, conservation actions had an alpha of .94, and tour impacts alpha was .91. The reliability analysis determined the questions in each group were measuring the same subject matter.

### **Intrinsic Existence Values**

The independent samples *t*-test showed no difference between the regular tourists association of intrinsic existence value towards wildlife ( $M = 6.61, SD = .48$ ) from that of the BTS tourists associations of intrinsic existence value towards wildlife ( $M = 6.66, SD = .67$ ) [ $t(277) = -.77, p > .05$ ]. Thus, the hypothesis that BTS tourists will have stronger positive associations of intrinsic existence value towards wildlife than regular tourists was not supported. It should be noted, however, that both groups had very high means, suggesting that each group started with a high level of positive associations of intrinsic existence value towards wildlife. Medium to strong correlations, which will be discussed in the conclusion, were found to exist between levels of intrinsic existence value, behavioral intentions, and tour impact.

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Table 4.2

Independent samples *t*-test Comparing Levels of Intrinsic Existence Value Towards  
Wildlife Between BTS tourists and Regular Tourists.  $P < .05$

<b>Tourist Type</b>	<b>Mean</b>	<b>S.D.</b>	<b><i>t</i></b>
BTS Tourist	6.66	.48	-.77
Regular Tourist	6.61	.48	-.77

**Self-Conservation Behaviors**

An independent samples *t*-test (Table 4.2) revealed a statistically significant difference between BTS tourists' positive intentions to participate in responsible conservation behaviors ( $M = 6.11$ ,  $SD = .95$ ) versus regular tourists' positive intentions to participate in responsible conservation behaviors ( $M = 5.73$ ,  $SD = 1.08$ ) [ $t(269) = -3.16$ ,  $p < .01$ ]. Responsible conservation behaviors were measured using a bank of four questions (Table 4.3) called "Behavioral Intentions." Thus, the hypothesis that BTS tourists will have stronger positive intentions to participate in responsible conservation behaviors than regular zoo tourists was supported.

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Table 4.3

Mean and *t*-value for BTS Tourist vs Regular Tourist Behavioral Intentions.  $p < .05$

<b>Tourist Type</b>	<b>Mean</b>	<b>S.D.</b>	<b><i>t</i></b>
BTS Tourist	6.11	.95	-3.16
Regular Tourist	5.73	1.08	-3.16

Table 4.4

Individual means for each Behavioral Intention Group Questions

<b>Descriptive Statistics</b>			
	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
I will urge my friends and family to limit their use of products made from scarce resources.	278	5.82	1.18
I will reduce consumption of products from companies that pollute the environment even though it has been inconvenient.	278	5.94	1.13
I will make personal sacrifices for the sake of protecting wildlife.	278	5.91	1.14
I will try to reduce overall consumption to conserve resources to help protect wildlife.	278	6.03	1.05
Behavioral Intentions	278	5.92	1.03

### **Influencing Conservation Behaviors of Others**

An independent samples *t*-test (Table 4.4) revealed a statistically significant difference between BTS tourists willingness to urge friends to change their conservation

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behaviors ( $M = 6.05$ ,  $SD = 1.08$ ) versus regular zoo tourists willingness to urge friends to change their conservation behaviors ( $M = 5.58$ ,  $SD = 1.24$ ) [ $t(276) = -3.53$ ,  $p < .01$ ].

Thus, the hypothesis that BTS tourists will be more likely to urge friends to change their conservation behaviors than regular tourists was supported.

Table 4.5

Independent samples *t*-test for “Willingness to Urge Friends to Change their Behavior” between BTS Tourist and Regular Tourist.  $p < .05$

<b>Tourist Type</b>	<b>Mean</b>	<b>S.D.</b>	<b><i>t</i></b>
BTS Tourist	6.05	1.08	3.53
Regular Tourist	5.58	1.24	3.53

### **The Relationship of Intrinsic Existence Value with Conservation Actions and Tour Impacts**

A Pearson’s correlation (Table 4.5) showed a substantial, positive correlation between tourists’ intrinsic existence value of wildlife and tourists’ behavioral intentions ( $r = .587$ ,  $p < .001$ ). Thus, the hypothesis that there would be a correlation between the level of positive intrinsic existence value of wildlife and the level of positive conservation actions was supported. Additionally, a Pearson’s correlation showed a substantial, positive correlation between BTS tourists intrinsic existence value of wildlife and how impactful they felt their tour to be ( $r = .606$ ,  $p < .001$ ).

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Table 4.6

Pearson's correlation between "Intrinsic Value," "Behavioral Intentions," and "Tour Impact" group questions

<b>Correlations</b>				
		Behavioral		
		Intrinsic Value	Intentions	Tour Impact
Intrinsic Value	Pearson Correlation	1	.587**	.606**
	Sig. (2-tailed)		.000	.000
	N	277	277	140
Behavioral Intentions	Pearson Correlation	.587**	1	.571**
	Sig. (2-tailed)	.000		.000
	N	277	278	141
Tour Impact	Pearson Correlation	.606**	.571**	1
	Sig. (2-tailed)	.000	.000	
	N	140	141	141

\*\* . Correlation is significant at the 0.01 level (2-tailed).

### **Tour Impacts**

Descriptive statistics were run for each of the four questions which made up the Tour Impact construct. Means for each question were high. This suggests BTS Tours had a positive impact upon tourists desire to "increase knowledge of this animal" (M = 6.65); "made wildlife more important to me" (M = 6.40); "increased desire to learn about wildlife" (M = 6.40); and "increased my level of concern for wildlife" (M = 6.27).

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Table 4.7

Descriptive statistics for each Tour Impact question

<b>Descriptive Statistics</b>			
	N	Mean	Std. Deviation
This Wild Encounter tour has increased my knowledge of this animal.	141	6.65	.767
This Wild Encounter tour has made wildlife more meaningful to me.	141	6.40	.963
I have an increased desire to learn about wildlife.	141	6.40	.925
This Wild Encounter tour has increased my level of concern for wildlife.	141	6.27	.999

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## CHAPTER 5: CONCLUSION

### **Conclusions**

This study supported three hypotheses, while failing to confirm a third. The three supported hypotheses were: (H<sub>2</sub>); BTS tourists will have stronger positive behavioral intentions to participate in responsible conservation behaviors than regular zoo tourists; (H<sub>3</sub>); BTS tourists will be more likely to urge friends to change their conservation behaviors than will regular tourists, and (H<sub>4</sub>); Level of intrinsic existence value will be positively correlated with level of behavioral intentions, will be addressed first. H<sub>1</sub>, the unconfirmed hypothesis that BTS tourists will have stronger positive associations of intrinsic existence value towards wildlife than regular tourists (H<sub>1</sub>), will be addressed last.

### **The Impact of BTS Tours on Conservation Behaviors: Implications for Zoos**

BTS tourists were shown to have stronger positive behavioral intentions to participate in responsible conservation behaviors than regular zoo visitors. This finding can help in the design of BTS tours by creating interpretive messaging specifically designed to address the precise conservation behavior changes needed to help protect the animal and ecosystem being showcased in the BTS tour. It should be noted that this sample only measured the behavioral intentions after the BTS tour was completed, and additional research involving a pre and posttest is necessary to determine the level, if any, of direct impact the BTS tour has on increases in conservation behavior intentions. It also is important to note that while regular tourists had less intention to participate in responsible conservation behaviors than did BTS tourists (M = 6.11), the mean for the regular tourists (M = 5.73) is well above the mid-point of 4.0. This suggests there is



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opportunity to increase regular tourists' positive intentions to participate in responsible conservation behaviors, but their intentions are already relatively high. It also suggest there exist opportunities to influence behavioral intentions of regular visitors through interpretive messaging.

### **The Impact of BTS Tours on Willingness to Influence the Conservation Behavior of Others**

This research also found BTS tourists are more likely to urge friends to change their conservation behaviors than regular zoo tourists. There are many different influences, both internal and external, on an individual's behavior and their behavioral intentions. One of the more powerful external influences is that of social norms (Manfredo, 2008). In the context of social norms, one's friends and family can have a significant impact upon the behavioral choices and behavioral intentions a person chooses (Kellert, 1984; Manfredo, 2008). This research did not measure the attitudes of the tourist's friends and family, nor the impact which those attitudes have upon the tourists on decisions, but the implication that BTS tourists may be willing to influence behaviors outside their own is striking. Even if the tourists' friends and family hold similar behavioral intentions, which is often the case of those they are most emotionally near (Manfredo, 2008), the potential impact of BTS tourists' willingness to address behavioral change in others could be an important step in producing responsible conservation behaviors at a faster rate. Heberlein (2012) states that motivating those who already hold similar beliefs may be one way to produce rapid change.

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### **The Relationship between Intrinsic Existence Value of Wildlife and Conservation Behaviors: Implications for Zoos**

This research found a substantial (as defined by Vaske, 2008), positive correlation between tourists' heightened levels of intrinsic existence value of wildlife and their level of positive intention to change conservation behaviors. This finding is significant in that it suggests increasing tourists', BTS tourists' or regular tourists', positive associations to the intrinsic existence value of wildlife may enhance their pro-conservation behaviors. This finding is limited in that it only measures tourists' behavioral intentions. However, it lends strong statistical support for increased research into the connection between intrinsic existence value and pro-conservation behaviors.

Previous research has suggested that a connection with a species, particularly flagship species, should be expected, at the least, to cause tourists to have an increase in overall support for conservation, and possibly motivate tourists into pro-conservation behavior change (Lindsey et al., 2007; Manfreda, 2008; Skibins et al., 2012; Skibins & Powell, 2013). A growing body of research, (Myers et al., 2004; Bruni et al., 2008; Smith et al., 2011) has examined how a zoo visit may foster an emotional connection between tourist and animal (Skibins & Powell, 2013). This finding supports this studies' focus on the connection between visitors' level of intrinsic existence value of wildlife and their intention to change their conservation behaviors. This research lends credence to the "belief that a connection to a species influences pro-conservation behaviors" (Skibins & Powell, 2013, p. 2), by showing a correlation between levels of intrinsic existence values of wildlife and conservation behavioral intentions. Further research should be conducted to ascertain if the correlation between positive levels of intrinsic existence value of

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wildlife and conservation behavioral intentions translates into actual behavioral change. Additional research, using a pre and post-test, needs to be conducted to determine tourists' levels of intrinsic existence value before and after their zoo visit.

### **Differences in BTS Tourists' Intrinsic Existence Value and the Intrinsic Existence Value of Regular Tourists**

This research did not support the hypothesis that BTS tourists will have higher levels of intrinsic existence value towards wildlife than regular tourists. There are several reasons this may have happened, and additional research is needed to better understand the impact of BTS tours on levels of intrinsic existence value towards wildlife.

While there was no significant difference between BTS tourists and regular zoo tourists in their level of intrinsic existence value towards wildlife, it is important to note each group had very high means (BTS  $M = 6.66$ , Regular tourist  $M = 6.61$ ). These high means could be due to self-selection biases of tourists choosing to visit the zoo and choosing to attend a BTS tour, which could be determined by using a different, more exhaustive data collection method. This research did not conduct a pre-post-test on BTS tourists or regular zoo tourists, which would have provided valuable data regarding BTS tour impacts on tourists' levels of intrinsic existence value towards wildlife. Along with using a pre-post-test, obtaining a higher  $N$  also may provide additional insight into the impact of BTS tours on tourists' levels of intrinsic existence value of wildlife. However, the high means on a pre-test may create a ceiling effect that limits the ability to show gains on a post-test. Expanding the research to include a higher  $N$  for each individual BTS tour may also yield useful information into the impacts of different tours, and

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different animals, on tourist's levels of intrinsic value of wildlife, and the impact that has on their conservation behavioral intentions and their actual behaviors.

It is important to note that BTS tourists ranked the impact of their BTS tour very high. This suggests BTS Tours had a positive impact upon tourists desire to “increase knowledge of this animal” ( $M = 6.65$ ); “made wildlife more important to me” ( $M = 6.40$ ); “increased desire to learn about wildlife” ( $M = 6.40$ ); and “increased my level of concern for wildlife” ( $M = 6.27$ ). These are important and powerful behaviors which BTS Tours may be impacting. Additional research discerning if the BTS tourists actually turned these behavioral intentions into behaviors is needed.

### **Implications for Future Research**

This research was not an exhaustive study into the impact of BTS tours. But, the findings from this research suggest additional research is warranted in several different areas. First, research using pre and post-test should be conducted to determine the impact of BTS tours on levels of intrinsic existence value towards wildlife. The pre and post-tests is necessary to determine the actual impact of the BTS tours and to account, at least partially, for the self-selection bias. Second, additional research should be conducted on the impact of each BTS tour as compared to other tours. This will advance the knowledge base on connection between different animals, tourists connections to those animals, and the impact those connections have on pro-conservation behaviors. Third, additional research into why BTS tourists are more likely to urge their friends and family into changing their conservation behaviors is needed. Qualitative data would be most helpful in this case. Finally, future research needs to be conducted into the substantial, positive

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correlation found between intrinsic existence value and behavioral intentions. Research should be conducted to determine what impacts BTS tours have on levels of intrinsic existence value towards wildlife, the impacts they have on behavioral intentions, and if the behavioral intentions translate into verifiable behavioral change.

Research has only begun into the impacts of BTS tours. The implications of BTS tours impacting tourists' intrinsic existence value towards wildlife are tremendous. Skibins and Powell (2013) note the belief that connections with animals can translate into pro-conservation behaviors. BTS tours have the potential to create such a connection, and more exhaustive research studies should be undertaken to further address the impacts of BTS tours on the connection between levels of intrinsic existence value of wildlife and pro-conservation behavior change.

### **Implications for Zoos**

This research provides considerable data useful to zoos in their decision making and conservation education programming design. This research gives strong statistical credence to the impact BTS tours can have on tourists' behavioral intentions, and possibly their behaviors. This research suggests BTS tourists have strong desires to both change their conservation behaviors, but also, to influence the conservation behaviors of their friends and family. This information can be used to deliver messages to BTS tourists on how they can both change their behavior and influence the behaviors of friends and family.

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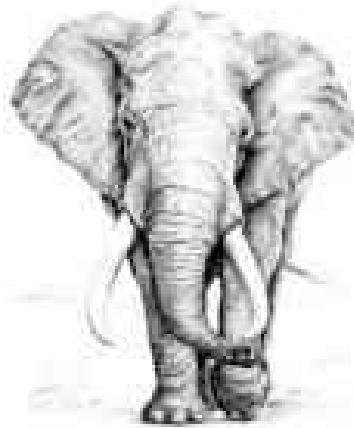
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APPENDIX A:  
Regular Visitor Survey

# EXISTENCE VALUE OF WILDLIFE



**The Columbus Zoo and Aquarium**

*in cooperation with*

**The Department of Educational Leadership and Policy Studies at  
Eastern Kentucky University**

The Columbus Zoo and Aquarium and the Department of Educational Leadership and Policy Studies at Eastern Kentucky University is requesting disclosure of information that is necessary to assist in the understanding of educational programming efficacy at Columbus Zoo and Aquarium. Disclosure of information is voluntary. Your completion of the survey serves as your voluntary agreement to participate in this research project and your certification that you are 18 or older.

**Section I.** This survey of visitors is being conducted to help us maintain a quality visitor experience and continued quality education programs. Please take a few minutes to complete this questionnaire and return it to the survey volunteer before leaving the zoo. Thank you for your assistance.

1. Is this your first visit to Columbus Zoo and Aquarium?  
 Yes  No  
 1a. If no, how many times in the past year have you visited? \_\_\_\_\_
2. Have you visited other zoos and/or aquariums in the past 12 months?  
 Yes  No
3. Have you participated in a Wild Encounters behind the scenes tour at the Columbus Zoo and Aquarium?  
 Yes  No  
 3a. If "Yes," in which Wild Encounters behind the scenes tour(s) did you participate? (Check all that apply)  
 Giraffe Barn  Animal Care Center  
 Discovery Reef  Manatee Coast
4. Have you participated in behind the scenes tours at other zoos and/or aquariums?  
 Yes  No
5. Are children part of your group today?  
 Yes  No

**Section II. Wildlife Views (Please circle one response for each statement.)**

	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Somewhat Disagree</i>	<i>Neither Agree Nor Disagree</i>	<i>Somewhat Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
Wildlife are important for a healthy ecosystem.	1	2	3	4	5	6	7
Wildlife have a right to exist for their own sake, regardless of human concerns and uses.	1	2	3	4	5	6	7
Wildlife and humans have equal right to live and grow.	1	2	3	4	5	6	7
Seeing wildlife increases my appreciation of nature.	1	2	3	4	5	6	7
I am glad animals exist in the wild, even if I never see them in their natural habitat.	1	2	3	4	5	6	7
Seeing wildlife makes me think about my conservation practices.	1	2	3	4	5	6	7

**Section III. Conservation Actions (Please circle one response for each statement.)**

	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Somewhat Disagree</i>	<i>Neither Agree Nor Disagree</i>	<i>Somewhat Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
I will urge my friends and family to limit their use of products made from scarce resources.	1	2	3	4	5	6	7
I will reduce consumption of products from companies that pollute the environment even though it has been inconvenient.	1	2	3	4	5	6	7
I will make personal sacrifices for the sake of protecting wildlife.	1	2	3	4	5	6	7
I will try to reduce overall consumption to conserve resources to help protect wildlife.	1	2	3	4	5	6	7

**Section IV. General Information.** The following questions are important to help us understand more about visitors to Columbus Zoo and Aquarium. Please check all responses that apply. All responses are voluntary and are kept completely confidential.

1. What is your gender?

\_\_\_\_\_ Male

\_\_\_\_\_ Female

2. Please give your age:

\_\_\_\_\_ Years

3. What is the highest level of school you have completed? (Please check one response.)

\_\_\_\_\_ High school or less

\_\_\_\_\_ College degree

\_\_\_\_\_ Some college, but have not graduated

\_\_\_\_\_ Graduate or professional degree

4. What is your annual household income? (Please check one response.)

Under 10,000 \_\_\_\_\_

60,000 to 80,000 \_\_\_\_\_

10,000 to 20,000 \_\_\_\_\_

90,000 to 100,000 \_\_\_\_\_

30,000 to 50,000 \_\_\_\_\_

110,000 or over \_\_\_\_\_

5. Please provide your email address so we may follow up with you:

\_\_\_\_\_

COMMENTS?

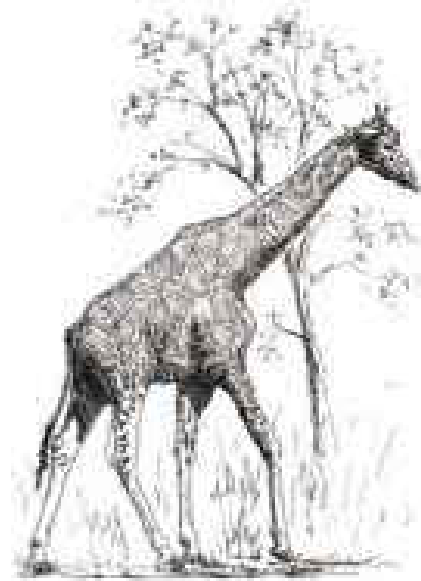
**THANK YOU FOR YOUR TIME AND ASSISTANCE!**

Your input will help us understand more about visitor perceptions of wildlife conservation.  
Please contact Max Laker at [robort\\_laker6@mymail.cdm.edu](mailto:robort_laker6@mymail.cdm.edu) with any questions.

APPENDIX B:  
BTS Tour Survey



# EXISTENCE VALUE OF WILDLIFE



**The Columbus Zoo and Aquarium**

*in cooperation with*

**The Department of Educational Leadership and Policy Studies at  
Eastern Kentucky University**

The Columbus Zoo and Aquarium and the Department of Educational Leadership and Policy Studies at Eastern Kentucky University is requesting disclosure of information that is necessary to assist in the understanding of educational programming efficacy at Columbus Zoo and Aquarium. Disclosure of information is voluntary. Your completion of the survey serves as your voluntary agreement to participate in this research project and your certification that you are 18 or older.

**Section I.** This survey of visitors is being conducted to help us maintain a quality visitor experience and continued quality education programs. Please take a few minutes to complete this questionnaire and return it to the survey volunteer before leaving the zoo. Thank you for your assistance.

- Is this your first visit to Columbus Zoo and Aquarium?  
 Yes  No  
 1a. If no, how many times in the past year have you visited? \_\_\_\_\_
- Have you visited other zoos and/or aquariums in the past 12 months?  
 Yes  No
- Have you participated in a Wild Encounters behind the scenes tour at the Columbus Zoo and Aquarium?  
 Yes  No  
 3a. If "Yes," in which Wild Encounters behind the scenes tour's did you participate? (Check all that apply)  
 Giraffe Barn  Animal Care Center  
 Discovery Reef  Manatee Coast
- Have you participated in behind the scenes tours at other zoos and/or aquariums?  
 Yes  No
- Are children part of your group today?  
 Yes  No

**Section II. Wildlife Views** (Please circle one response for each statement.)

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree Nor Disagree	Somewhat Agree	Agree	Strongly Agree
Wildlife are important for a healthy ecosystem.	1	2	3	4	5	6	7
Wildlife have a right to exist for their own sake, regardless of human concerns and uses.	1	2	3	4	5	6	7
Wildlife and humans have equal right to live and grow.	1	2	3	4	5	6	7
Seeing wildlife increases my appreciation of nature.	1	2	3	4	5	6	7
I am glad animals exist in the wild, even if I never see them in their natural habitat.	1	2	3	4	5	6	7
Seeing wildlife makes me think about my conservation practices.	1	2	3	4	5	6	7

**Section III. Conservation Actions** (Please circle one response for each statement.)

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree Nor Disagree	Somewhat Agree	Agree	Strongly Agree
I will urge my friends and family to limit their use of products made from scarce resources.	1	2	3	4	5	6	7
I will reduce consumption of products from companies that pollute the environment even though it has been inconvenient.	1	2	3	4	5	6	7
I will make personal sacrifices for the sake of protecting wildlife.	1	2	3	4	5	6	7
I will try to reduce overall consumption to conserve resources to help protect wildlife.	1	2	3	4	5	6	7

**Section IV. Tour Impact (Please circle one response for each statement.)**

	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Somewhat Disagree</i>	<i>Neither Agree Nor Disagree</i>	<i>Somewhat Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
This Wild Encounter tour has made wildlife more meaningful to me.	1	2	3	4	5	6	7
This Wild Encounter tour has increased my knowledge of this animal.	1	2	3	4	5	6	7
I have an increased desire to learn about wildlife.	1	2	3	4	5	6	7
This Wild Encounter tour has increased my level of concern for wildlife.	1	2	3	4	5	6	7

**Section V. General Information.** The following questions are important to help us understand more about visitors to Columbus Zoo and Aquarium. Please check all responses that apply. All responses are voluntary and are kept completely confidential.

1. What is your gender?  
 Male  Female
2. Please give your age  
 Years
3. What is the highest level of school you have completed? (Please check one response.)  
 High school or less  College degree  
 Some college, but have not graduated  Graduate or professional degree
4. What is your annual household income? (Please check one response.)  
 Under 10,000  60,000 to 80,000   
 10,000 to 20,000  90,000 to 100,000   
 30,000 to 50,000  110,000 or over
5. Please provide your email address so we may follow up with you:

COMMENTS?

**THANK YOU FOR YOUR TIME AND ASSISTANCE!**  
 Your input will help us understand more about visitor perceptions of wildlife conservation.  
 Please contact Max Lukens at [robert\\_lukens@myemail.csu.edu](mailto:robert_lukens@myemail.csu.edu) with any questions.

APPENDIX C:

Columbus Zoo Research Permission Letter



February 27, 2015

To Whom It May Concern:

On behalf of the Columbus Zoo and Aquarium I am writing to offer our support for the research proposed by Max Lakes, *"An Examination of Columbus Zoo and Aquarium's Behind the Scenes Education Tours: Their Impact on Visitors' Existence Value Toward Wildlife and Ecosystems."*

We are aware that Max intends to conduct his research by surveying our tour participants as well as general Zoo visitors.

If you have any questions or concerns, please don't hesitate to contact me.

Sincerely,

A handwritten signature in black ink that reads "Danielle Ross". The signature is written in a cursive style.

Danielle Ross  
Vice President of Education  
Columbus Zoo and Aquarium, the Wilds  
PO Box 400  
Powell, OH 43065  
(614) 724-3551

APPENDIX D:

Wild Encounters: Discovery Reef, Behind the Scenes

## **Wild Encounters: Discovery Reef, Behind the Scenes**

### **Meet and greet outside near entrance to Discovery Reef**

#### **Introduce Self**

Welcome to the Columbus Zoo. Thank you for choosing the Wild Encounters: Discovery Reef Tour. During our tour today we will be going behind the scenes to see what happens behind the reef and what the Zoo Keepers do to keep the Discovery Reef Aquarium running smoothly.

Some of the areas that we will be touring are the diet prep area, the lab, we will point out the massive filtration system that is vital to the aquarium and then we will go up top and look down onto the exhibit and talk about some interesting things while we are up at the top.

Just a few facts about the exhibit before we go inside; the Discovery Reef exhibit opened in 1993 and includes a 65 foot long aquarium holding 85,000 gallons of salt-water. The exhibit is an authentic representation of a coral reef from the Indian Ocean.

We will be entering the building from the back, so please follow me to the back of the building.

#### **Walk around to back of building**

#### **Before entering back door:**

Before we enter the building I would like to go over a few rules that the Zookeepers would like for us to follow while we are in their area.

- Please no food or drink
- No photography while inside the building

- Please secure any loose items that you may have at this time (sunglasses, phones, cameras, hats, etc.) When we go up top and look down onto the aquarium it is very important that items do not fall into the water. I will be reminding you of this inside before we go up the stairs. There will be a plastic bin provided if you choose to leave items there before you go up.

O.K, let's go inside and start our tour!

### **Enter Building: Go left at hallway, Stop at World Map**

#### **Map**

Let's take a look at our World Map, here is where we are located (point out United States) and here is the area that our exhibit represents (point out Indo-Pacific region).

The Discovery Reef exhibit here at the Columbus Zoo represents a coral reef from the Indo-Pacific region. The Indo-Pacific region includes the Indian Ocean, the western and central Pacific Ocean, and the seas connecting the two in the general area of Indonesia. The water in this area is warm salt-water about 76-80 degrees. All of the fish and coral you will see today are found in this Indo-Pacific region.

#### **Kitchen**

This is the kitchen where the zookeepers prepare the food for the animals in the Discovery Reef. All of our animals in the reef get a different food item offered daily. This provides them a variety in their diet and allows us to meet all their nutritional needs by ensuring they get all of the vitamins and minerals they need. All of the food that we use is restaurant quality.



The keepers feed the animals many of the same kinds of food that they would eat in the wild and another important method that the keepers follow is to feed the animals in the aquarium in the same way that they would eat in the wild. So, if an animal is one that would usually eat its food from the bottom of the ocean, then the keepers make sure that they feed that animal at the bottom of the tank. We will be talking some more about that and the techniques the keepers use a little later in the tour.

Let's look at some of the foods that are used:

Open refrigerator show different types of food. Show freeze dried seaweed and Diver Bag.

- Brie Shrimp- type of plankton (tiny fish)
- Scallops
- Cod
- Smelt
- Shrimp
- Mackerel
- Nori- type of seaweed (used in Sushi)

Fish that have smaller/tiny mouths eat the plankton, and fish that have larger mouths eat the larger food items such as the squid.

There is also a variety of produce that is fed to the animals:

Sea vegetation (Nori-seaweed) has a thinner cell wall and can be feed to the animals straight from the package but terrestrial vegetation (Broccoli) has a thicker cell wall and is harder for the animals to eat, so the Keepers microwave it before feeding it to the animals to break down the cell wall making it easier for the animals to eat.

- Broccoli
- Kale
- Corn
- Peas
- Gel-diet
- Romaine Lettuce
- Flake
- Nori

The Keepers spend about 1 hour each day to prep the food. Some animals eat once a day and others eat twice a day.

Because there are animals that only eat one type of food, such as mackerel, the Animal Nutrition department keeps a 6 month supply.

### **Lab**

The next room on our stop is the lab. The lab is very important because the aquarium is an artificial environment and we need to make sure the fish are getting proper amounts of ozone.

Here in the lab is where tests are performed each day to monitor water quality; some tests are done daily, some weekly or monthly. Types of tests include temperature, salinity, nitrates, PH, and calcium.

### **Invertebrate Room**

Follow me across the hallway to our Invertebrate Room. Feel free to walk around and look at the different tanks but please no touching or reaching into tanks.

These tanks are the homes for our Touch Pool animals. When these animals are not on display outside in our Touch Pool they are in here in these tanks. The staff makes sure that each animal that is being used outside for the public to see and touch is brought back in here to rest. The Keepers rotate the animals so that each animal is given the proper amounts of rest after their turn in the Touch Pool.

Allow guests to walk around the tanks and point out the different species:

- Slipper Lobster
- Horseshoe Crab
- Starfish
- Sea Urchins

**New as of 2012, if you are trained on Touch Pool, you can get one of the inverts out and have guests touch it. Follow the same procedure you would use at TP to get the animal out – use bucket if necessary and make sure the water comes from and goes back to the same holding tank.**

### **Quarantine Tank**

Our next stop is the quarantine tank. When new animals for the Discovery Reef exhibit are brought to the Zoo they must first stay in a quarantine tank. The purpose of the quarantine tank is to hold the animal in the tank for 30-45 days to make sure that they are acclimating to Zoo life, eating properly and to make sure that they are healthy.

It is important to make sure that every new animal that is placed in the aquarium is healthy and free of disease to protect the Discovery Reef collection. As a rule of thumb the staff assumes that any new fish that comes in has some amount of parasites and so

they are treated as such to ensure that no parasites are introduced into the collection. They give them medication both orally and in the water.

There are 15 quarantine tanks in the Shores region. The Shores region is also the quarantine area for animals for the Wetlands, Manatees and Shores exhibits. This is the only region that does not keep quarantined animals at the hospital. The hospital has a quarantine area for animals that come in for the rest of the Zoo.

### **Filtration System**

Filtration is very important here at the aquarium because it helps to keep the water clean and the animals healthy. Every tank in the building has its own filtration system.

Let's take a look right here at the filtration system for the Quarantine Tank so that we can see a good example of the three types of filtration: Mechanical, Biological, and Chemical.

**Mechanical-** Process that physically removes particles from water.

- Sand Filter- This is a mechanical filter that uses sand, just like the ocean floor, to filter out particles from the water. Point out the large tan sand filter.
- Protein Skimmer- Just above the sand filter is the Protein Skimmer (skinny tube with bubbles running through it).

The Protein Skimmer creates bubbles in the filter, the bubbles are sticky. As the bubbles rise particles stick to the bubbles, when the bubbles reach the top they pop and the particles stay at the top of the tube. Staff members clean the particles from the top.

Point out the Protein Skimmer

**Chemical-** The Protein Skimmer as it is being used currently is considered a mechanical filter, however if ozone is used to operate it then it is considered a **Chemical filter**.

Another example of a chemical filter is carbon filtration.

**Biological-** When bacteria that occurs in nature is used in the cleaning process.

- Bio-Tower- The two large cylinders in the corner is called a Bio-Tower. Inside there is bacteria that naturally occurs in nature and uses the waste from the fish as food. The bacteria grow in and around all of the little Bio-balls. Point out the Bio-Tower.

As you can imagine with an aquarium this size that it would take a large filtration system to keep it all clean! Just imagine a home swimming pool filter that cleans a 20,000 gallon pool in 24 hours the filters here at the Discovery Reef clean the entire 85,000 gallon aquarium in 1 hour!

Inside the Life Support Room here is where the filtration system is located for the Reef. We will not be entering this room but as you pass by the door take a look through the windows and notice the size difference. The four large grey tanks are sand filters.

Also, found behind those doors is an 8,000 gallon underground vat that is used to reclaim waste water. The dirty water goes into the tank, is cleaned and then pumped back in to reuse!

Another interesting fact is that we make our own salt water by adding a salt mixture “Instant Ocean” to the water as necessary.

Allow guests to look through the windows on the door to the Life Support Room as they walk by.

Now we are going to go up the stairs and look at the Discovery Reef Aquarium from above.

A few things before we go upstairs.

- We will be standing and walking around the perimeter of the reef and not walking on the catwalk.
- Please do not lean on the railing, it is designed to be removed for tank access so it is not anchored.
- Please secure any loose items so that they do not fall into the water. You can place any loose items in this plastic bin before we go upstairs and then retrieve them when we return. **Remind guests: no photos, please.**

### **Above the Aquarium**

First a few facts about the tank: The tank is 65 feet long, 20 feet wide, 13 feet deep and holds 85,000 gallons of water. Our Discovery Reef Collection consists of 70 species with approx. 350 individual animals

The large plunger that you see over there in the corner mixes water. It sucks up water and pushes it back out.

The tank is on a natural daylight cycle including sunrise and sunset by season. All the coral in this tank are fake. They are artistic replicas based on real coral species. Coral need large amounts of sunlight to grow and we are unable to replicate the natural sunlight in a tank this size. The coral in the submarine tank and the Coral Research tank is real.

Show example of coral

The Keepers feed the fish in a manner consistent with how they eat in the wild.

- For the fish that eat from the bottom of the ocean floor the keepers use long poles to drop the food straight down for them to eat.
- For the fish that are smaller and like to hide in the cracks and rocks of the coral, the keepers use squirt bottles to squirt the food into the cracks.
- The fish that like to browse on vegetation throughout the day, keepers use browse poles and attach broccoli and other vegetables to it so the fish can pass by throughout the day.
- Epaulette and Bamboo sharks are hand-fed on the gravel on the bottom; unless there are no divers then they are fed with the long tubes on the bottom.
- The Southern Stingrays are fed on the glass to keep the Epaulette and Bamboo sharks away from their food.
- The Zebra and Bonnethead sharks are fed from the surface. The Keepers use a pair of tongs

Point out the different fish species as they swim by.

Sharks: List and point out the different types of sharks

- Epaulette- spots on shoulder
- Bamboo Shark
- Bonnethead Shark- Reef species, small cousin of Hammerhead, fully grown
- Zebra Shark- female

The Zebra shark is target trained. Show target

It is a “pesky puppy” to divers that enter the tank so it is trained to transfer to the holding/Hospital tank when divers are in the water (2x a day). The Hospital tank has become the shark’s “happy place” because it is fed there when it enters!

The Hospital tank is also used to isolate an animal if it needs medical treatment. The water level can be lowered to better administer medication. Point out the Hospital tank.

Divers clean and feed. Cleaning is done twice a week. Divers that enter the Reef are volunteers and Keeper staff. Point out diver area, checklist

## **Conservation & Sustainable Seafood**

### **Coral Reefs are endangered for many reasons:**

- Increasing temperatures in the water are causing bleaching of corals
- Coastal development, construction of harbors, roads and hotels all affect the reef
- Deforestation- this results in soil erosion and then eventually the soil is carried to the oceans where sediments smother the reef.
- Pollution
- Irresponsible tourists-damage from boat anchors, and irresponsible divers
- Illegal collection of live coral and fish

### **Sustainable Seafood**

The Columbus Zoo and Aquarium is trying to raise awareness about the importance of choosing seafood that is environmentally friendly.

Why is this important? Because increased consumer demand is depleting seafood at an alarming rate and harming the health of the oceans. 70% of the world's fisheries are fully fished or overfished

Here at the Columbus Zoo and Aquarium we are helping out by changing some of the seafood we feed to our animals. We now feed sustainable seafood to our fish here in the Discovery Reef as well as other animals around the Zoo.



Sustainable seafood means seafood from sources, whether fished or farmed, that can be used without jeopardizing long-term survival for the species or the integrity of the ecosystem.

You can help too! You can use this Seafood Watch app to help you make the best choice the next time you are at a restaurant or supermarket. There is a lot of great seafood out there that is abundant and environmentally sound. Keep eating seafood! Use this app or the web site to guide your choices. **(If guest is not tech-savvy, we can hand out the cards, but the keepers prefer to push the app/web at this point if possible.)**

For more information, there is an information video near the entrance to the Discovery Reef or you can visit the Monterey Bay Aquarium's Website or Seafoodwatch.org or visit our website at ColumbusZoo.org for a link.

**Give each guest a tour souvenir. If it's a keychain, remind them that there are conservation tips on the back that everyone can do to help the oceans and their creatures. If it's a WIDECAST bottle bead, please briefly tell guests the story of the bead.**

This is the end of our tour. Does anyone have any questions?

I hope you have enjoyed your behind the scenes look at our Discovery Reef

Thank you for visiting our Zoo today!

#### **End of tour**

Lead guests back downstairs

Collect any items left in bin (loose articles)

Exit out back door

Thank guests for visiting

APPENDIX E:

Wild Encounters: Giraffe Barn, Behind the Scenes

## **Wild Encounters: Giraffe Barn**

### **Behind the Scenes (2014)**

#### **Meet and greet guests in front of Vervet monkey habitat**

- Introduce self
- Go over rules while behind the scenes
  - No Photos while behind the scenes.
  - No touching giraffes/animals (probably will not be giraffes in building)
  - Have fun & learn about giraffes and their care

#### **Brief general facts about Heart of Africa region and Giraffe Barn**

- Heart of Africa-Newest region at the Columbus Zoo- Open May 2014
- Entire region is 40 Acres
- Designed after savanna region of eastern and southern Africa and the animals that live there. (Kenya, Tanzania, Botswana, Namibia, Zambia, Zimbabwe and South Africa)
- The giraffe barn was one of the first buildings to be built in the new Heart of Africa region. Many of the animals including the giraffes were brought in several months before opening of the new region to help them get settled into their new home.
- Giraffes are unique animals, after all they are the world's tallest mammal and so they have very unique needs and require special care. This barn has been built with special features to meet those needs and to provide the most excellent care and safety for the giraffes and the keeper staff.

**Enter Building at Kitchen door.**

**Radio Africa Giraffe Barn Keepers on channel 2 while in kitchen to inform them of tour.**

- Wait for approval from keeper
- If giraffe is in building- then wait until keeper gives approval
- If no giraffe in building- keeper will confirm and then can proceed

**Photo/Giraffe**

Giraffe/*Giraffa* comes from the Arabic word “zarafah”, which means “one who walks swiftly”

The scientific species name for giraffe is *Camelopardalis* = camel (camelus), leopard (pardus). Centuries ago, it was thought that giraffes were part camel and part leopard. They have a small hump on their back and spotted pattern. Closest living relative and only other member of the family: *Giraffidae* is the okapi.

### **Kitchen**

This is the kitchen where the food is prepared.

- Food is weighed and measured
- Giraffes are fed twice a day
- Eat 18-20 hrs a day
- They get most of their grain at night/closing
- Animal Nutrition delivers food

**Photo/stomach**

- Giraffes are ruminants, which mean that they regurgitate and chew again food that has already been swallowed. They have a 4-chambered stomach.
- Ruminants eat quickly, storing large amounts of grasses or foliage in the first stomach chamber, called the rumen, where it softens. They later regurgitate the material, called the cud, and chew it again to break down the indigestible cellulose. The chewed cud is then swallowed again and goes directly to the other chambers, where various microorganisms help in its digestion.
- Other ruminants include: antelope, camels, cows, deer, goats, sheep, pronghorn, okapis
- Busy tongues- Giraffes are the tallest mammals on earth but they also have a pretty special tongue. Giraffes eat/browse between 18-20 hours a day and so their tongue is kept very active. Their tongue is very long at 18 inches and comes in handy when they reach to the very top of the trees. An average human tongue is 4 inches.
- Tongue is black in color to protect from sunburn

**Photo/Busy Tongue**

**Photo/How long**

**Food/Diet**

- Grain and alfalfa hay are the main diet for the giraffes.
- Grain (Amount of grain used depends on group)

- Wild Herbivore- pellets
- Alfalfa Hay
- Mineral block
- Romaine lettuce-for public feeding only (not part of their diet) 10 heads per feeding
- Cubes- if not eating Romaine lettuce from public can hand feed cubes and also use cubes for training.
- Browse
- Crackers (Rye Crisp) used for training. (Blood draws, Injections)
- Treats
  - Bananas
  - Sweet Potatoes
  - Carrots
  - Apples
  - Celery

**Open food buckets- show pellets and cubes**

**Show/Open Refrigerator-** Lettuce cases (currently using 10 heads per feeding)

**Show (white) buckets with holes**

- Since giraffe tongues are active 18-20 hrs. a day, they are provided several different ways to use their tongues during the day for food and enrichment
- Keepers cut hole in the buckets so the giraffes can use their tongues to get food
- Buckets filled with grain

- Sometimes lettuce cores are put in the buckets, so the giraffes have to work to get them out with their tongues

#### **Show (red) Mineral block holder**

- Keepers hang the mineral block
- Sometimes lettuce is put in the wire holders, so giraffes have to use their tongues to get to the lettuce, offers them a different way to get food
- Giraffes can lick the mineral blocks at any time throughout the day

**Show milk jugs-** Fill with grain, provides another way for giraffes to use their tongue and get grain.

#### **Show Likit (red ball)**

**“Let’s take a look at the Barn”**

#### **Exit kitchen**

#### **Enter hallway**

- Barn Size= 180 feet long and 54 feet wide. Approx.. 9,500 square feet
- The Giraffe Barn is a state-of-the-art facility that has been designed to incorporate special features for the animals and the animal care staff.
- The barn was built at this large size in order to give the giraffes a lot of space in the winter when the region is closed and the giraffes are kept inside.

#### **Giraffe’s Day**

- 18-20 hrs a day eating/browsing
- 2 ½ hrs a day sleep (a little at a time)
- Training
- Rest of day ruminating

### **Open Hay Door**

- Eat 18-20 hrs a day
- Giraffes have access to Alfalfa Hay and can eat as much as they like
- Hay is placed in hay racks
- Purchase best quality

### **Climate controlled Browse Room**

#### **Open Browse Cooler**

- Room kept cold- as cold as your refrigerator (37 degrees) Climate Controlled
- The giraffes are “priority” for browse of all other animals on Zoo grounds
- Browse is cut from all over
- A list of 30 trees approved for browse (maple, ash, dogwood, sycamore, willow, tuliptree, serviceberry, forsythia- are on the list of 30)
- Browse is kept cool to extend the viability in the summer.
- In the winter, dormant plants can be forced into leafing out or into blooming earlier.
- Since giraffes spend 18 to 20 hours a day eating and browsing, in the wild they can consume as much as 75 pounds of leaves daily. In the wild, their favorite leaves are from the Acacia tree.
- With their thick muscular lips and their 18 inch long prehensile tongue they can pluck leaves and foliage or pull branches into their mouth.
- Unlike other ruminants, giraffes can chew cud while walking allowing them to spend more time feeding.



- Thorns! No problem. Giraffes have thick papillae (bumps) on their tongues and thick, gluey saliva that protect the lips and tongue from thorns. Acacia trees have thorns but giraffe molars crush the thorns. **Photo/Thorns**
- Their tongues are also protected from infection from the few abrasions they do sustain by some very thick, very antiseptic saliva. That same saliva coats the thorns so thoroughly that they exit the animal in their original form, with no harm done to the digestive tract. Giraffes also capitalize on the antiseptic and prehensile qualities of their tongues by using them to routinely clean their ears.

#### **Point out Hay Racks**

- 3 different heights
- Cranks are used to raise and lower hay racks
- Hay is placed in the hay racks for feeding

#### **Point out White Pipe/Water “Licks It” (like hamsters use )**

- This is where giraffes get water
- Giraffes need a large amount of water
- Giraffes can go longer than camels without water- when they come to drink they drink a large amount.
- They get a lot of their water from their food

#### **Tallest Mammal**

- Being tall has its advantages and disadvantages.

**Photo/Tall**

- The tall giraffe has very little competition for food and with its keen eyesight can spot predators from a long distance.
- “Watchtower of the Serengeti”- If a giraffe herd begins to run all of the other animals run also.
- Giraffes are the tallest mammal
- Height: 14-19 feet Males taller than females
- Newborn giraffe stands over 6 feet tall from ground to shoulder
- But its height makes it hard to bend down to get a drink of water and when it does bend down for a drink it is very vulnerable to predators and so for this reason they drink infrequently in the wild. In human care, giraffes are provided water and drink daily.
- The giraffe has a special adaptation in its neck to regulate pressure, which prevents excessive blood flow to its brain when it lowers its head. The *rete mirabile* – a complex web of arteries, veins and valves that carefully regulate the blood flow to their heads.
- The giraffe is the world’s tallest animal, and as a result requires a lot of extra help to pump the blood all the way to its head. Their extra-large hearts weigh about 25 lbs. and pumps fast enough to keep their central arterial blood pressure at 250 mmHg (compared to 100 mmHg in

**Photo/drink**

**Photo/support hose**

humans). Under normal conditions, that would result in a pressure of 400 mmHg in the legs (in simple terms: severely swollen ankles), but the giraffe has a secret weapon - the skin on its legs is extra thick and extremely tight-fitting, and it prevents the blood vessels from expanding and the blood from pooling. As they walk, their leg muscles help to vigorously pump the blood back upwards to the rest of the body.

#### **Longest Neck- Show comparison of Giraffe/Human vertebra**

- Like humans and most other mammals, a giraffe possess only 7 cervical vertebrae
- Each vertebra is greatly elongated- up to 10 inches long, producing the longest neck of any mammal.
- The vertebrae are linked with ball and socket joints for improved flexibility.



Photo

#### **Barn Features:**

- Barn Size= 180 feet long and 54 feet wide. Approx. 9,500 square feet
- Barn can hold 15-20 giraffes at max
- Currently the Columbus Zoo is caring for 11 giraffes: 9 males & 2 females
- The barn is separated into 9 different areas with a large arena/community room in the center.

- It features 3 types of specialized flooring to help diminish long-term stress on joints and assist with good hoof wear.
- There is an elevated catwalk that permits staff to evaluate and train giraffes at eye level.
- Also included are exterior yards on two sides of the building to allow the giraffes access to the outdoors, but not into the savanna.
- Back stalls-heated for joint comfort
- Pink stall has rubberized floor to help with recoveries (?) and easy on joints
- Concrete is better on hoof wear
- DG- Dissolved Granite in Big Room
- Doors- 18 ft tall Outside doors 16 ft. tall
- Barn has many features designed to protect the giraffes from themselves-they are very flighty-spook easily
- All of these features are trials to see what giraffes like and what works best and things may/can change in the barn.

**Chute:**

**Show chute-Can open chute**

- This is the chute that is used to bring the giraffes into the building off of the truck
- Transporting a giraffe- A special modified horse trailer is used. The trailer is enclosed (giraffe is not exposed) and is heated and air-conditioned. Giraffes stand and are awake

**No other information should be given about transporting a giraffe.**

**Show Rubber Block** (hanging on wall)

- Giraffes hooves are trimmed when needed (like horses)
- Keepers trim hooves
- Giraffes are trained to place foot on rubber block
- Whistle is used and treats are used for positive reinforcement

**Never go past pole at steps (on first floor)**

**Proceed up the stairs to second floor**

**While walking along the walkway on the second floor-Keep guests back towards the back of the walkway-do not let them walk towards the front of the walkway nearest the giraffe side**

Here at the Columbus Zoo, many of our animals are trained for medical procedures. With positive reinforcement animals are trained to do various behaviors to better assist the medical staff. Some of the behaviors are: To step onto a scale; enter a crate, stall or chute; present body parts to the mesh for injections or blood draws; open mouth for visual check of teeth; present claws at mesh for trimming; place hoof/foot onto block; present body parts for ultrasounds and many others.

This next feature that was included in the design of the giraffe barn is a device that assists the medical staff when performing well-checks and medical procedures on the giraffes. This device, called a GRD provides a less stressful method to perform the necessary check-ups for the overall care and health of the giraffes.

## **GRD**

**Show GRD- Giraffe Restraining Device**

- Calms them
- Prevents movement during medical procedures

**Photo/GRD**



- Giraffes are being trained to enter the GRD
- Police Whistle is used for training
- Rye Crisp crackers used for positive reinforcement
- GRD is used for medical procedures
  - Blood Draws- blood draws are taken from jugular vein in neck
  - Weights
  - Injections
  - Veterinarian comes to giraffe barn for medical procedures
  - Giraffes receive annual check-ups
  - They get vaccinations once a year
- Scale at bottom
- Padded
- Can squeeze if needed
- Black doors open

**Training:**

**Show Target Training Pole with orange ball**

- Hoof trims
- Hoof examinations/ Giraffe are trained to present their hooves both from front top and underside bottom
- Trained to enter GRD (police whistle)

- Trained for Public Giraffe Feedings. Bell is used to signal the giraffes to come for feedings. (9:00, 11:00, 1:00, 3:00, 5:00)

**Barn Features** (to be pointed out from second floor)

- Quarantine pen- has higher mesh. Can be used for quarantine or can be used for giraffe that needs to be isolated for bad behavior. (bull)
- Mesh on Ceiling- required by USDA to prevent birds from nesting
- Plywood to protect them from themselves
- Giraffes can reach a height of 18 ft.
- Cameras (will eventually have 5)
- Keeper can watch/ keeper observation
- Keeper on call
- Barn kept at 60's
- Giraffes are sensitive to temperature because of their height
- Security does temperature checks every evening (from kitchen)
- Every hour – air exchanges (pulling air from outside and exchanging the inside air with fresh air)
- Filters cost \$2,000 a month- will look for better more cost effective way
- Ceiling fans to circulate air and cool
- Mesh door for summer time

Zebras, Ostrich and Thompson Gazelles will occupy last stall in the summer months.

This will help with shifting of animals from barn to savanna and watering hole areas.

At night giraffes will have access in & out of barn to holding yards—except if raining or bad weather.

If raining or bad weather the giraffes will be brought in the barn and the door will be closed-there is a mesh door /screen door that can be shut for air circulation in summer.

Lights are turned out at night

### **Skylights in ceiling- called Ciralights**

Same conservation method as warehouse- tracks the sunlight throughout the day  
Skylights that have mirrors which are programmed to track the sun and maximize daylight within the buildings. These will reduce the need for traditional lights while providing maximum natural light.

### **Community Room**

#### **Do not go past pole at beginning of Community Room**

Dissolved Granite floor- 8 inches

May change to crushed seashells in future

The floor is designed in layers: **Earth-Gravel-Dissolved Granite**

- 8 inches of dissolved granite
- Underneath the dissolved granite is 8 inches of 50/50 clay/sand mix
- Underneath the gravel is ground/earth or substrate
- This design aids in the cleaning and also another type of flooring for the giraffe hooves

Cleaning Procedure:

- Hose the area first
- Rake
- Hose again
- Do not need to use disinfectant



- The other stalls without this type of floor need to be hosed plus disinfected

**Species/Patterns:**

- According to the AZA (Association of Zoos & Aquariums) there are 9 subspecies of giraffe.

**Photo/Dist. map**

- Angolan, Kordofan, Nubian, South African, West African/Nigerian, Reticulated, Rothschild's, Thornicroft's, Masai

- Subspecies are based on type of pattern, color and geographic origin.

**Photo/pattern map**

- Giraffe distribution is patchy in a non-continuous pattern in portions of Sub-Saharan Africa.

- Not present in most of western, central and far southern Africa.

- Giraffes prefer savanna habitats especially where Acacia trees are plentiful.

- They can also be found in semi-arid, open woodlands with scattered trees and bushes.

- Columbus Zoo has two subspecies: Reticulated and Masai

- Each subspecies has a characteristic type of color and pattern.

**Photo/unique pattern**

- Individuals can be recognized by their unique markings.

- In their natural habitat, the giraffe's spots/pattern serve as camouflage, helping them to blend in with leaves and shadows.
- Subspecies can and do interbreed resulting in hybrids with intermediate patterns

**Enrichment:**

- Hang tree branches and browse on mesh
  - Giraffes rub head on it
  - Rip the bark off
- May get ice blocks with fruit inside in the summer

**Behavior:**

- Giraffes live in loose herds composed of males and females of all ages.
- They are social, curious animals, but also aloof, not forming a permanent bond with their mates.
- Giraffes typically roam the open grasslands in small groups. They are not territorial, and they must travel a great distance to find food.
- Males establish and maintain their hierarchy by “necking”.

**Photo/curious aloof**

- Bulls will slam their necks together, push, shove, and even wrap their necks around each other to determine dominance for mating or breeding rights with females.
- Giraffes can run up to 35 mph for short distances. They can travel comfortably at 10 mph over longer distances.
- Giraffes rest with their eyes open, standing or lying for three to five minutes at a time. Throughout the night, a giraffe may deeply sleep for five to ten minutes lying down. They rarely sleep more than 20 minutes total per day.
- Communication: Usually silent, but they can grunt, whistle and bleat. They snort when alarmed. Some studies suggest that giraffes vocalize below the level of human hearing and can communicate over a long distance.

Photo/running & resting

#### **Interspecies Interaction/Predation:**

- Giraffes are host to ticks
- Oxpecker birds rest on the backs and necks of giraffes, removing ticks from the giraffe's skin.
- There is a mutually beneficial relationship between giraffes and oxpecker birds.
- Cattle egrets and other birds take advantage of insects that are stirred up as the giraffes walk.

Photo/Friends & predators

- Giraffes often forage with other species, such as zebras, antelope and ostriches.
- Giraffes act as sentinels for other animals due to their height and ability to see danger from far away. An alarm reaction by a giraffe quickly spreads to the other species.
- Lions are the main predators of giraffes
- Leopards and hyenas have also been known to prey on giraffes
- Crocodiles may also prey on giraffes when they come to waterholes to drink.
- Adult giraffes are very able to defend themselves. They remain vigilant and are capable of running quickly and delivering deadly blow with their front hooves.
- Most predators of giraffes target young, sick, or elderly giraffes

### **Reproduction:**

- They are sexually mature at 4-5 years.
- Mating is year-round, peaking at the rainy season
- Following a 14-16 month gestation period, the calf is born feet first, dropping up to 6 feet to land on the ground.
- Calves are 6 ft. tall at birth, 120 lbs.
- Calves can stand up and walk within an hour after birth.
- The mother leaves her young calf alone for most of the day.

**Photo/Mother & babies**

- Older calves stay together in a “nursery” tended by one of the mothers.
- Young giraffes can eat leaves at 4 months, but they continue to nurse until they are 6-9 months old.
- Young giraffe can be quite playful

### **Conservation:**

- Giraffe populations are in rapid decline
- Major threats include habitat loss, poaching and population fragmentation.
- Most stable giraffe populations are now restricted to African national parks and preserves.
- ICUN Red List: Least Concern
- The Columbus Zoo and Aquarium supports giraffe conservation projects in the African savanna region.
  - **Serengeti Giraffe Project**- Initiated in 2008. In response to the declining giraffe numbers across Africa, researchers developed effective monitoring and conservation tools to track and monitor giraffe numbers across Africa.
  - **Giraffe Conservation Foundation**- Giraffe Conservation Foundation’s mission is to develop a world class network of individuals and organizations

**Photo/Conservation projects**

dedicated to securing the future of all giraffe populations and subspecies. Including protecting vital habitat, support research to better understand giraffe ecology and conservation management and to increase awareness about the plight of the giraffe.

- **Reticulated Giraffe Project-** This project is a partnership between Queen's University Belfast and the Kenya Wildlife Service which aims to provide information through research and investigation aspects of giraffe behavior and ecology. Dispersal patterns are studied to better understand giraffe social networks; bioacoustics are used to investigate the possible use of infrasound in giraffe communication; remote-sensing as well as telemetry devices monitor movements, energy use, behavior and environmental parameters.
- **South Luangwa Conservation Society-** Established in 2003, the SLCS is a community based organization committed to the conservation and preservation of the local wildlife and natural resources in Luangwa. Projects include supporting local village scouts with uniforms, equipment and training to help them protect and monitor the wildlife and game animals in the National Park. Funds also assist a wildlife rescue and

rehabilitation project to treat animals caught in snares.

Projects also include human wildlife conflict management. The society supports elephant-human conflict strategies involving community farmers to discourage elephants from raiding local crops such as chili fencing, farming and blasting.

### **Keepers:**

- 4 full-time keepers
- 17 seasonals
- 1 Part-time keeper
- Keepers in this area are trained to work with all of the animals in the Africa region

### **General**

- Heart as big as a basketball
- Giraffes can reach 18 feet in height
- 18 inch tongue
- Black tongue to protect from sunburn
- Tongue is active 18 hrs a day
- Tough tongue can lick around thorns on trees in the wild
- Can eat up to 75 lbs of food a day
- Median Life expectancy-unknown
- Columbus Zoo will breed the Masai species because it is the most uncommon

- Number of subspecies- 9 according to AZA
- The Masai subspecies is the largest
- Both male and female giraffes have hair-covered horns called ossicones
- They have prehensile lips
- They have a small hump on their back- which is where they got their name:  
*camelopardalis*
- *Camelopardalis*= camel leopard
- The giraffe's front legs look longer than the back, but they are the same length-6 feet
- Giraffes belong to the family *Giraffidae*, which has only one other species, the okapi
- They have excellent vision
- Conservation programs- Zoo supports

**Props-** (Keep in kitchen area or backpack hung on hook inside barn)

- Tour Binder
- Vertebrae
- Skull
- Mark/bright colored tape on stall to show 18 feet



APPENDIX F:

Wild Encounters: Manatee Coast, Behind the Scenes (2013 Version)

## **Wild Encounters: Manatee Coast**

### **Behind the Scenes (2013 version)**

#### **Radio Manatee Coast Keepers on channel 2 to inform them of tour**

#### **Meet and greet guests in front of Manatee Coast Building (near Manatee sculpture)**

- Introduce self
- Go over rules while behind the scenes
  - No Photos while behind the scenes.
  - No touching manatees/animals
  - Have fun & learn about manatees
- Brief general facts about Manatee Coast exhibit
  - The Columbus Zoo is a participant in the US Fish & Wildlife Service's Manatee Rescue and Rehabilitation Program.
  - Building opened in 1999
  - In 1999 we brought 4 rescued manatees here to the Manatee Coast: Gene, Comet, Dundee, Hurricane
  - Designed after the Ten Thousand Islands region in Florida
    - Ideal for manatees- Sea Grass, warm shallow water

#### **Inside Building near Florida Map & Tracking device**

- Point out the Ten Thousand Island area on the map
- Great place for manatees but also a popular boating & recreational area

- Explain reason the Columbus Zoo has manatees. We are excited to have manatees here but the reason we have them is that they are having trouble where they live in the wild.
- The Columbus Zoo is a Rescue, Rehabilitate & Release facility for manatees.
- To date, the Columbus Zoo has rehabilitated and released 14 manatees back to Florida.
- Problems that manatees face in the wild:
  - Boat strikes
  - Cold Stress
  - Population/Litter
  - Habitat Loss
  - Red Tide
- Point out release areas: Crystal River, Homosassa Springs, Blue Springs,
- Point out the tracking device. Used when a manatee is released back into the wild to track its movements.
  - Placed on tail
  - Stays on 2-3 months
  - To make sure that manatee is staying away from danger and is staying in areas where there is plenty of food.
  - Researchers will later remove the tracking device and estimate manatee weight.
  - Designed to pop off if the device gets caught on something
  - Tracking device tracks the manatee when it surfaces

**Optional Route:** Depending on congestion inside the Manatee Coast exhibit. If it is too congested and difficult to maneuver tour guests through the crowd then an optional entrance can be used.

**Optional Entrance:** Enter building from back door accessible through the gate next to the carousel.

**Behind the Scenes (Exit manatee exhibit- Enter behind the scenes area thru door along back wall of gift shop)**

### **General Manatee Information**

- Marine mammals
- Relative of elephant
- Prehensile lips
- Marching molars- **Use skull from closet in front-** show worn out teeth
- **Manatee Poster/skeleton-** Same bones in flipper as human hand
- **Tape on floor-** Actual size of manatee -10-13 feet
- Skin feels like basketball
- Length of intestine- 147 feet
- Most highly arc ribs of any mammal
- Need to live in warm water- only 1 inch of fat
- Endangered
- Protected by the Marine Mammal Protection Act & Endangered Species Act

### **Kitchen**

This is the kitchen where the ZooKeepers prepare the food for the animals here at Manatee Coast.

- The container with the blue solution cleans and holds the brushes the Keepers use to brush the manatees to remove algae. This is done on a daily basis. The manatees like it. It feels good to be brushed and cleaned.
- Sometimes the Manatees need medicines. When the ZooKeepers have to give medicines to the Manatees they can put them in their treats. Pixie gets her medicines crushed up in her bottle.
- All the food that is fed to the animals here at the Manatee Coast is weighed, so the animals get just the right portions. It is important that we do not overfeed and also that the animals' get all the nutrition that they need each day.
- Pixie is now weaned. Sometimes we receive manatees that have been rescued at an early age and are still taking a bottle. When Pixie came to us she was getting a bottle- 4 times a day.
- Fish get a fasting day but Manatees do not fast.

**Freezer:**

- The Animal Nutrition department delivers the food. Animal Nutrition is the department that orders all the food for the animals at the Zoo. They receive the food at the warehouse and then deliver it to the Animal regions each morning.
- Manatees get food enrichment.
  - Manatee Ice Block- fruits and vegetables frozen in a 5 gallon bucket. A weight is placed in the bucket to keep the ice block at the bottom.
- There are many different species of animals sharing the Manatee Coast habitat here at the Columbus Zoo. (Fish, birds, stingrays, manatees, turtle) so there is a

variety of food for the different animals as well as different methods of preparation and care to be considered.

**Walk-in cooler:** (Do not allow guests to walk inside of cooler)

- Manatees are herbivores, in the wild they would eat sea grasses, hydrillia, and other plants found in the shallow water areas. But here at the Zoo they eat mainly lettuce and lots of it! Romaine Lettuce
- Manatees spend 6 to 8 hours a day feeding and browsing on plants. They can eat up to 10% of their body weight. Which means a 1,000 pound manatee can eat 100 pounds of lettuce a day! (Manatees can weigh between 1,000-3,000 lbs.)
- So, as you can imagine we have to buy a lot of lettuce. Here is the cooler where we store all the lettuce. (Do not allow guests to walk inside of cooler)
- We currently are feeding 12-13 cases of lettuce per day to our manatees. This amount will change depending on the number of manatees that we have at one time. (1 case = 24 heads of lettuce..12 cases per day = 288 heads of lettuce)
- All the lettuce has to be cleaned before feeding it to the manatees. The large white roller buckets are what the Zookeepers use to clean the lettuce.
- It takes about 45 minutes to 1 hour for the Zookeepers to chop fish and prepare food each day, not including the additional time to clean the lettuce.
- One case of lettuce is cleaned at a time. The lettuce is peeled by removing each leaf, the brown leaves are discarded. The leaves are placed in the bucket and then rinsed and drained. The lid is put on the bucket and then the bucket is placed in the cooler.

- The waste lettuce is sent to compost whenever possible, there are times when the compost is full and the lettuce is sent out with the animal waste trucks.

### **Manatee Transport:**

- Since the Columbus Zoo is part of a Rescue, Rehabilitate and Release program with the US fish & Wildlife, we do have procedures in place for transporting manatees.
- When a manatee is being transported either into our Manatee Coast or moving from our Zoo back into the wild in Florida we use the back door here for loading and unloading.
- The manatee is brought into the back pool, the sling is lowered down and the manatee is placed in the sling.
- Once in the sling, the manatee relaxes and feels safe because the sling is like a swaddle technique much the same technique used on a human infant in a blanket.
- The sling is lifted up by the crane and then the manatee is lowered into a transport container called a “whale crate” The sides are made of soft foam for the manatee’s comfort. The crane can lift 3 tons (6,000 lbs)
- The manatee is then loaded into a truck and driven to the airport. At the airport the manatee is loaded onto a cargo airplane and flown to Florida.
- Once in Florida, the manatee is taken to a holding facility (sometimes SeaWorld) where it is observed for a few days, fitted with a tracking device and then later taken to the release area. Many times manatees are paired with other manatees and released as a group.

**Filtration:**

This is the filtration system for our back pool. We will see the filtration system for the main pool as we make our way through the Manatee Coast habitat.

- Large tank on left is a Contact Tower. It adds ozone to the water.
- Large tank on right is a Degas Tower. It removes ozone and allows ozone to escape.
- Above are 4 giant Sand filters.

**Zookeepers/Certified Divers:**

- Diver certification is a requirement to be a Zookeeper in this region.
- Zookeepers also have to pass a Zoo Certification which includes:
  - Physical Exam
  - Dive in Discovery Reef exam
  - Swim test
  - Skills test
- Dive every day. Clean glass and rock surface with scrubbers. Clean filters.

**Back Pool:**

The back pool gives the staff the ability to bring an animal back here to this pool and isolate it for treatment in case of illness.

- 60,000 gallons
- 15 feet deep

**Chute:**

This area is called the chute. In the chute we can perform medical procedures and training. Zookeepers use positive reinforcement to train the animals to enter the chute.



- Water tight door
- Treats for positive reinforcement during training procedures
- USFWS approves the training for husbandry purposes and medical procedures only.
- Treats are given by hand only for procedures
- Trained to come into chute
- Positive place

**Procedure for Manatee medical exam: Exams are given to the manatees every 6 months**

- When the manatee comes into the chute the door is closed.
- The water is drained completely
- The padded ladder is lowered into the chute
- Veterinarian puts on wet suit
- Crane can be brought over with the sling attached
- Scale hangs off of crane
  - Take weights
  - Measurements
  - Blood draws
  - Listen to digestive sounds
  - Check mouth, ears, eyes
  - Check overall skin condition. Skin condition can often times be first sign of problem- Virus or Cold Stress
  - Take photos

**Enrichment:**

Manatees are very curious. They will investigate their environment.

- Every enrichment item is approved by the US Fish & Wildlife Service
- A list of approved items is provided.
- Brushes-Love to scratch themselves
- Chewing- Manatees like to chew on ropes and other items because they have Marching Molars. When they lose a tooth another one pushes forward to replace it.

**Dock:**

**(Life Preserver rings are located on the wall in case of emergency. Also, there is a child size life jacket available)**

**We currently have 3 manatees here with us at the Manatee Coast.**

**Stubby** Stubby was a victim of a boat strike which caused significant damage to her tail. She came to the Columbus Zoo in 2005

**Wheezy** Rescued in Jan 2011 suffering from cold stress (Brought to Columbus Zoo Nov. 2011)

**Pixie** Rescued in July 2010. She is the smallest manatee ever to come to the Columbus Zoo. When rescued she was alone, disoriented and estimated to be only a few weeks old. She weighed only 42 lbs. when rescued. Pixie still takes a bottle 4 times a day. She is a small manatee. Some possibilities are that she is small because she was orphaned at a young age, stunted growth or maybe she was a twin. We are not sure why she is

small, she is just a unique manatee and we love her. (Brought to Columbus Zoo Nov. 2011)

**Chart on wall has current weights**

- Show lettuce tubes for feeding from bottom
- Retractable Roof- for natural sunlight
- Live mangrove trees
- 190,000 gallons-main pool- 60,000 gallons back pool – 300,000 gallons total
- Several species of animals sharing the pool with the manatees
  - Southern stingray
  - Cow nose stingray
  - Several species of fish
  - Hawksbill Sea Turtle
  - Ducks
    - Wood Duck
    - Merganser
    - Bufflehead
    - Pintail
    - Ringbill
    - Canvasback

**Walkway Bridge: (400 lb. limit)**

We are about to cross over this walkway bridge to explore more areas of the Manatee Coast Habitat.

- **Please watch your step**
- **Hold on to the handrail**
- **Please no more than two people on the walkway at one time!**

**Back Side of Manatee Pool:**

- Buddy, the Hawksbill Sea Turtle that shares the habitat here at Manatee Coast is target trained to come to this pole to receive his food. The pole has red tape on the end that Buddy recognizes. The Zookeeper lowers the pole into the water and then taps on the pole so Buddy can hear the noise underwater he then comes to the red tape at the end of the pool. He is also trained to come into the Chute for weight checks.
- Buddy is not releasable due to the extent of his injuries.
- This is the fresh water bowl for the Manatees. Fresh water is provided for the manatees every day. This is required by law due to the protection of manatees under the Endangered Species Act and the Marine Mammal Protection Act.
- Duck feeding bowl for the ducks that share the Habitat. All the ducks are species that are native to Florida and the areas where manatees are found.
- Stingrays are fed on the side.
- Mangroves: These are live mangrove trees. We have two species of mangrove trees here at the Manatee Coast Habitat; black and red mangroves. Mangrove trees are native to Florida and are extremely vital to the ecosystem of the coastal areas.
  - Nursery for baby fish

- Breeding grounds for fish, shrimp, crab and other marine organisms
- Shelter for hermit crabs
- Buffers between land and sea
- Mangroves protect the shoreline from erosion.
- Point out new growth sprouts
- Unfortunately, they are the first to be removed when there is Development along the coastline. (Housing, beaches, Shopping malls,)
- When the mangrove trees need trimmed, the Zookeepers trim the branches and as a special treat give them to the manatees to chew on and even to the Moose for enrichment!

**Tidal Basin:**

- Mangrove trees live along the shoreline where they experience both the low and high tidal periods. Mangrove trees need both the dry period-low tide and a wet period-high tide that the tidal area provides, so to duplicate this daily tidal period we have a system that simulates the tidal periods.
- Earlier we looked at the filtration system that cleaned the smaller back pool, now we are going to look at the filtration system that cleans the large Manatee Coast Pool.

**Filtration Room: Keep guests on the landing- do not go down the stairs onto the floor of the filtration room.)**

- 3- Protein Skimmers for the main pool
- Bio-Tower (cannot see from this area) Very large—2 stories high!

- Salt Sink- Zookeepers dump salt in there. It goes into vats underneath and gets mixed to make the **Brackish** water for the Manatee Pool
  - 17-18 parts salt per 1,000 gallons of water- Manatee Coast
  - 32-34 parts salt per 1,000 gallons of water- Normal Sea water
  - Brackish water advantages-- cuts down on fish diseases and expenses
  - Manatees live in brackish water areas in Florida and all of the fish in our Manatee Coast habitat also live in brackish water areas.
- Washer/Dryer- There is a lot of laundry to do everyday because of the towels used for diving.
- Backwashing- Everyday the Keepers come back here and turn valves to do the backwash procedure- Changing out water for cleaning and then adding new water.
- Vats in floor for water changes- reclaim water/backwash
- The system is all computerized and will even send messages to the Zookeepers if there is a problem at any time day or night.
- The Zookeepers have an “On-call” schedule. Rotate schedule for on-call duties
- On average, the Zookeepers are called in 1-2 times a week for problems
  - Levels off
  - Filters clogged
  - The North America region keepers get called in frequently because when the brown bears get in the pool and wrestle around that kicks up the mud and clogs the filters. Low-Flow Alarm
  - If the filters need cleaned out it requires a diver to go down- So, that requires 2 people to come in- always 2 people when diving.

**Zookeepers:**

It takes a special dedication to be a Zookeeper. The animals are cared for 7 days a week. The hours can be long if an animal needs special care and attention. The Keepers come in on weekends and Holidays and work in all kinds of weather.

- In the Manatee Coast region there are 2 full-time keepers scheduled every day
- Seasonal staff and Internship positions are also used to assist the Keepers
- There are 11 full-time Keepers in the entire Shores Region. (Manatees, Flamingos, Reptiles, Penguins, Aldabra tortoise, Alligator, Discovery Reef)
- All Zookeepers in the Shores region are cross-trained to work in all areas
- Duties:
  - Prepares food
  - Feeds
  - Cleaning
  - Training
  - Water Quality checks

**What public can do to help manatees:**

- Learn about manatees
- Don't litter
- Recycle
- Do not discard old fishing line in waterways
- Obey signs when boating to "slow down" in manatee areas
- Adopt a manatee
- Website to track released manatees [www.wildtrack.org](http://www.wildtrack.org)

- Visit [www.savethemanatee.org](http://www.savethemanatee.org) to learn more about manatees

**Thank Guests**

**Exit**



APPENDIX G:  
Hospital Tour Talking Points

## Hospital Tour Outline – AS

**NOTE:** The tour is **VERY** flexible and fluid, and does not have to include all of the following information! As you get comfortable leading the tour, you will be able to pick and choose what to highlight in the 45 minutes of tour time. It's an art that will change with each tour! ☺ Obviously if an animal comes up to Procedure/Treatment and the staff gives the OK for us to watch, that is much more interesting than looking at the lab and freezer. Be ready to be flexible, read your guests and their interests, and adjust accordingly.

1. **Prep Time:** Get tour badges and tour radio and meet guests at Jack's Yurt in Asia Quest across from the outdoor pachyderm yard.
2. **Welcome Guests:** At the appointed time, meet and greet the guests at the Yurt.
3. **Second Intro** Just outside building if weather is nice; just inside lobby if weather is bad.
  - Information about Dr. Cross and when/how hospital was built (from packet)
  - Very brief outline of the rooms we'll see (FROM HALL ONLY)
  - Purpose of Hospital
  - We would be happy to **take pics for you. No pics of animals in crates or cages.**
  - Be aware this is a working hospital with dynamic nature. Flexible. Radio on channel 2 to listen to keepers/vets in case anything heads our way.
4. **Labs and Freezer:** These are our laboratories. We are equipped to run many different tests here (fecal, urine, blood, tissue, etc.). With 653 species and

8800+ individual animals at the Zoo, this is a VERY busy place! **\*Updated numbers: 577 species and 10210 animals as of 10/12.**

**A sample may be tested for:**

- **Quarantine** – making sure they are clear of disease before they can go to their new exhibit home at the Zoo
- **Diagnostic** – Animal is acting ill or presenting symptoms
- **Determine the gender** of animals – birds, etc Ex – we had seven baby penguin chicks being raised in Promo in winter 2010; when they were about a month old we learned their genders through blood tests. Fun to guess what gender we thought they each were.
- **Preventative/Wellness:** Proactively collect fecals from all birds, for example, in a department. Try to catch potential illness before it becomes a problem.

**The Labs are designed for research**, too – partnerships outside zoo, including OSU Vet students. They can do their research out of the way of the busy hospital schedule.

**The freezer** is here to preserve tissue samples. It is kept at -80 degrees F.

#### 1. **Surgery: It Takes a Team**

**State of the art surgery room for procedures:** Like humans, animals must have health check-ups, and may require surgery from time to time. Sterile room with space for several doctors, techs, and large animals. One procedure you might see in here would be tumor removal from older animal. Viewing windows are for keepers and staff to observe.

**It takes a team** to care for an animal, and our animals are like family. Keeper staff is not only present for a procedure, but very involved in the general health of the collection. They work closely with the vets to keep our animals healthy.

**Introduce Vet Staff:** Staff is top-notch and the field is VERY competitive. **Animals can't talk**, so our staff has to be focused, experienced, and attentive to properly care for them. We are very proud of our Animal Health team. Go through each picture and give a brief bio of our staff.

- In addition to working around the clock at the Zoo, our staff also volunteers their time in the community. MedVet, OWC, teaching and mentoring OSU Vet students, etc. These are busy people with a passion for animals.

## 2. Procedure/Treatment Room

**The majority of work happens here** – big room for the animal and roughly 20 people. (Takes a team.) Vet staff, students, interns, specialists, photographer, Zoo Administration, etc could be in room on any given day.

This room can accommodate animals up to 1,000 lbs. Larger animals are treated in their housing areas (elephants, moose pics). It is not unusual to look in this window and see an orang, tiger, gorilla, etc, on the table. (pictures)

Animals might be here for: **Preventative/Wellness, Scheduled procedure, or Emergency Care.**

**Scheduled Procedure:** Examples include a bird beak trim (kookaburra pic), armadillo nail trim, smaller animal teeth check-up (no sedation needed). One of our baby cheetahs needed breathing treatments and would come over every day.

**Preventative:** Checking to see how an animal is doing overall, or since its last procedure. Some of the tools used in preventative medicine are:

- a. **Vitals:** blood pressure, listen to heart and lungs, check for bumps, lesions, physical abnormalities, etc.
  
- b. **Dental** machine – oral health of the animals is just as important as it is for people. Vets perform a cleaning as well as check-up to make sure there are no abscesses, gum disease, etc.
  
- c. **Weight:** Weight is a very important health indicator. If it is dramatically lower or higher, must check with keepers about changes in diet, appetite.  
Could be indicator of serious health issue.

- **Large animals** travel by van up to the hospital. Weight is attained on a large scale on the floor of the loading dock. Animal can be weighed in crate, then once animal is on table, weigh the crate only and subtract.
  
- **Smaller animals (Tree Roo)** can be placed on scale.
  
- **Uncooperative/skittish animals (Caribbean Flamingo pic)** can be weighed creatively – weigh keeper holding animal; then just keeper and subtract, etc.

- d. **Specialists:** We have many animal **AND HUMAN** specialists who donate their time for the care of the animals. These include ophthalmologists, cardiologists. This practice goes back to the beginnings of the Zoo. In fact, some of the first people our Zoo staff called with Colo was born were human

infant doctors. Another such example is in the **Pongi picture**: Dr. Adam Watson does an ultrasound on Pongi the gorilla. He is an Internal Medicine specialist from MedVet. Also pictured are 2 students (khaki shirt, and blonde in purple scrubs). In this particular picture she is not pregnant; it is just a check-up.

**Transition to next area:**

After the initial exam, it may be determined that something is not right with the animal, and the only way to know more is to look closer. **Ask guests: if you had a small child who couldn't tell you what's wrong but is holding their arm and crying, what might be the next step to take?** [May be determined in this room that we need to take radiographs.]

**1. Radiology**

In 2008, our hospital received a state-of-the-art digital rad system. Detailed images captured digitally – instantly processed, evaluated, and stored.

**Show table** where rads are taken and pictures of animals on the table. Point out mask shields, large green gloves, and the part of the room to the left where the tech sets up the shot. Then all without gear must clear area while xrays are taken, just like at dentist or doctor's office. Can be tricky depending on the animal! Some are very squirmy. ☺ Some are still under anaesthesia. Can you imagine a team of keepers lifting a 900 lb grizzly bear onto the table for an x-ray? It happens.

**Show examples of x-rays**, see if guest can tell what the problem is.

- **Bird with coins in stomach. Toad with gun pellets. Kangaroo intubation.**

- Once we have radiographs, course of treatment is discussed. Procedure to remove object? Need to make a cast? Inconclusive?

When animals are done being examined, vets/keepers discuss whether they can go back to their exhibit area or if they need to stay at hospital. We have holding areas for every sized animal.

## 2. ICU

- As name suggests, for animals who are in critical situations. Newborn penguins stayed here. (Cheetah picture).
- Incubation system regulates temp and humidity.
- Docs are on call around the clock. Keepers will come in, sometimes stay overnight to monitor animal. If anything changes, they call the vet. With the baby penguins, they needed to be fed six times a day! Keepers came in after hours for MONTHS for the 11pm feeding, and then were back at 7am for the next one. Dedication.
- Dr. Myers' ball pythons are also in here – independent study/research encouraged.

## 3. Large Carnivore/Primate

- All of this is to prevent cross-contamination
- Bars on cells are extremely strong – can hold primates or large cats. Extreme care is used in keeping large animals in here.
- Foli, Mo'ana stayed here.
- Keepers come up each day to care for their animals. Easy access for vet staff to administer meds, keep an eye on patients, prep for procedures, etc.

#### 4. **Small Animal/Hoofstock**

- Small animal is across from Hoofstock. Same as large carnivore, but smaller.  
Famous residents include: Carmel the Camel, markhor mountain goats
- Animal has indoor/outdoor holding
- Hoofstock has non-skid floor to prevent slipping
- Often a VERY quiet part of the hospital, as hoofstock are flighty creatures.

#### 5. **Quarantine/Isolation**

- Final holding area. Off limits to public.
- Standard quarantine is 30 days for mammals, 90 days for reptiles
- Animals must be quarantined so that nothing is introduced to our Zoo collection. During their time up here, keepers can build relationships with the animal, monitor health, provide enrichment. Throughout its time in quarantine, samples will be taken from the animal and tested in our lab.
- A keeper's day might include coming to hospital to check on one cat, and then turning around and going back down to work with another cat. So that nothing is transmitted from the keeper's clothing, preparations are made. Hand washing, Tyvek suits, boots, gloves, masks all may be used so that nothing is carried back to the collection. (PICTURE)
- Famous patients include new tiger Mara, many of our songbirds, kangaroos, reptiles, Promotions sloth, most animals at the Zoo other than fish!
- We are one of a handful of Zoos that has CDC Primate International quarantine capability: room in the back with its own air/water/drainage so there's no cross-contamination.



## 6. Diet Kitchen

**FOOD** plays three important roles at the hospital: Diet, Medication, Reward

a. **Diet:** Keeper staff is in charge of daily husbandry of each animal (cleaning) as well as DIET (food!) Will keep a supply of dry food at the hospital, and then bring up fresh produce, meat, etc. **Show Examples, have guests guess which animal gets which food.**

b. **Delivering Medication:** Either Vets or keeper, depending on the medication. Favorite foods can be used to deliver medications to the animals. But animals are very smart! So staff has to be creative.

- **Annie the Red Ruffed Lemur** – had a tooth abscess and didn't want to take her pill. Put in banana. Learned to pick it out. Put in FIG – perfect! Loved fig too much to notice tiny pill.
- **Lugnut the Langur** – loves peas. Keepers put his pain meds in individual peas after a procedure, knowing that he would eat every single one!

c. **Rewarding the Animal** – Staff uses positive reinforcement training with animals. This for that – if you offer me your arm so I can draw a blood sample, you will get your favorite treat. Animal might otherwise be reluctant, but now that favorite food is on the table, becomes VERY eager to work with Vet! Some favorites:

- Mo'ana the gorilla – Twizzlers
- Ginger the Grizzley – butterscotch pudding
- Colo – yogurt, juice, and if she's a verrrrry good girl – a sip of Coke

## **7. Walking Back Through Hallway**

- Vet staff stays very busy with all of our animals
- Anyone here interested in working in Animal Health? How to begin
- Questions?
- Thanks for visiting!

### **PROP LIST**

**Fecal cup**

**Chip reader**

**scale**

**x-rays**

**syringe**

**food treats: Twizzlers, banana, peas, juice, yogurt, butterscotch pudding**

**diet: instant ant, rodent pellets, parrot pellets, lemur biscuits, happy hopper**

**Tyvek suit**

**Gloves, mask, boots etc**

### **GUEST WILL LEAVE WITH**

**Twizzler mini pack**

**Token**

APPENDIX H:

Discovery Reef BTS Tour Mission and Goals

Program Name: **Wild Encounters: Behind the Scenes**

Class Name/Topic: **Discovery Reef**

When will this specific class be taught? **Daily Summer 10:00 & 3:00 Spring, fall, winter 3:00**

Intended Audience: **General Public, Families**

My name: **Susanne Gatesman**

Please check which goals this program meets and provide an explanation of how the goal is met.

*For this program I will create opportunities that address multiple (two or more) learning styles for engagement in program goals by: **Auditory-** speaking, verbalizing facts, **Visual-** map, food , filtration, tanks **Kinesthetic-** coral biofacts, training target **Verbal-** Guest discussion and question and answer*

*For this program I will provide opportunities within our market that are unique to the Columbus Zoo and Aquarium and/or the Wilds by: **Behind the Scenes opportunity at Discovery Reef exhibit is a unique opportunity only available at Columbus Zoo & Aquarium.***

*For this program I will actively encourage program participants to take conservation actions, either individually or through community based action and collaboration by: **Discussing ocean conservation and overfishing and offering guests an opportunity to receive a Seafood Watch card or inform them of the Mobile App. Also talk about the WIDECAST jewelry for sale***

**in the gift shop which supports Conservation of Ocean habitat and helps communities.**

*For this program I will create messaging about animals, habitats and conservation that is consistent with the Zoo's overall messages by:*

***Explanation of Columbus Zoo & Aquarium's projects relating to Discovery Reef and ocean wildlife and habitats- Rising Tide and SECORE***

*For this program I will provide effective programs and products for school aged students which integrate STEM education standards identified for Ohio K-12 schools both on and offsite by*

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*For this program I will develop at least one of the 21st Century Skills of Critical Thinking, Collaboration, Creativity or Communication by*

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*For this program I will create an environment where participants develop an appreciation for our natural world by: **Describing and providing details about the care of the animals in the Discovery Reef exhibit and the explaining the interconnectedness of the oceans and the surrounding world.***

APPENDIX I:

Giraffe Barn BTS Tour Mission and Goals

Program Name: **Wild Encounters: Behind the Scenes**

Class Name/Topic: **Giraffe Barn**

When will this specific class be taught? **Daily: March-October 11:00**

Intended Audience: **General Public, Families**

My name: **Susanne Gatesman**

Please check which goals this program meets and provide an explanation of how the goal is met.

*For this program I will create opportunities that address multiple (two or more) learning styles for engagement in program goals by: **Auditory-** speaking, verbalizing facts, stories **Visual-** Use of binder with pictures, GRD, barn rooms and features **Kinesthetic-** Human and giraffe vertebra biofact, Food, Target training tool **Verbal-** Guest discussion and question and answer*

*For this program I will provide opportunities within our market that are unique to the Columbus Zoo and Aquarium and/or the Wilds by: **Behind the Scenes at Giraffe Barn is a unique opportunity only available at Columbus Zoo & Aquarium.***

*For this program I will actively encourage program participants to take conservation actions, either individually or through community based action and collaboration by: **Describing the Conservation projects and efforts made by the Columbus Zoo & Aquarium to support wildlife worldwide and ways that they can also help- supporting the animals through participation***

*in the tour and admission to the Zoo, learning more about endangered animals and bringing awareness to others.*

*For this program I will create messaging about animals, habitats and conservation that is consistent with the Zoo's overall messages by: **Relating information to the guests about the African Savanna and the animals that live there. Specific information and facts will be related about the animals and how they coexist and survive. Giraffe Conservation projects that are supported by the Columbus Zoo & Aquarium will be shared with the guests.***

*For this program I will provide effective programs and products for school aged students which integrate STEM education standards identified for Ohio K-12 schools both on and offsite by*

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*For this program I will develop at least one of the 21st Century Skills of Critical Thinking, Collaboration, Creativity or Communication by*

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*For this program I will create an environment where participants develop an appreciation for our natural world by: **Providing an opportunity to see the Giraffe Barn facilities and the special features and techniques used to care***



*for the giraffes, guests will appreciate and understand the beauty and uniqueness of the tallest mammal on earth.*

APPENDIX J:

Manatee Coast BTS Tour Mission and Goals

Program Name: **Wild Encounters: Behind the Scenes**

Class Name/Topic: **Manatee Coast**

When will this specific class be taught? **Daily Summer 11:00 & 2:00 Spring, fall, winter 2:00**

Intended Audience: **General Public, Families**

My name: **Susanne Gatesman**

Please check which goals this program meets and provide an explanation of how the goal is met.

*For this program I will create opportunities that address multiple (two or more) learning styles for engagement in program goals by: **Auditory-** speaking, verbalizing facts, **Visual-** map, food , pictures, tracking device **Kinesthetic-** biofacts, jaw bone, rib bone **Verbal-** Guest discussion and question and answer*

*For this program I will provide opportunities within our market that are unique to the Columbus Zoo and Aquarium and/or the Wilds by: **Behind the Scenes opportunity at Manatee Coast exhibit is unique to Columbus Zoo & Aquarium.***

*For this program I will actively encourage program participants to take conservation actions, either individually or through community based action and collaboration by: **Informing guests about ways that they can help- Talk about not littering, while visiting Florida they should obey boating laws “slowdown in manatee areas”, do not discard fishing line in water- use the provided disposals, join the Save the Manatee club.***

*For this program I will create messaging about animals, habitats and conservation that is consistent with the Zoo's overall messages by:*

***Explanation of the Columbus Zoo & Aquarium's involvement in the USFWS Manatee Rescue, Rehabilitation and Release program. Discuss that manatees are endangered and why-problems they face in the wild.***

*For this program I will provide effective programs and products for school aged students which integrate STEM education standards identified for Ohio K-12 schools both on and offsite by*

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*For this program I will develop at least one of the 21st Century Skills of Critical Thinking, Collaboration, Creativity or Communication by*

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*For this program I will create an environment where participants develop an appreciation for our natural world by: **Creating messages about manatees and their habitats and explain their importance in the ecosystem. Providing an experience for the participants to see the manatees and other residents of Manatee Coast up-close and learn about the care given to rehabilitate and release.***

APPENDIX K:

Animal Hospital BTS Tour Mission and Goals

Program Name: **Wild Encounters: Behind the Scenes**

Class Name/Topic: **Joseph C. Cross Animal Health Center**

When will this specific class be taught? **Daily- Summer 1:00 & 4:00 Spring, fall, winter 11:00**

Intended Audience: **General Public, Families**

My name: **Susanne Gatesman**

Please check which goals this program meets and provide an explanation of how the goal is met.

*For this program I will create opportunities that address multiple (two or more) learning styles for engagement in program goals by: **Auditory-** speaking, verbalizing facts, stories **Visual-** Use of binder with pictures, pictures mounted on wall, Treatment rooms and instruments **Verbal-** Guest discussion and question and answer*

*For this program I will provide opportunities within our market that are unique to the Columbus Zoo and Aquarium and/or the Wilds by: **Behind the Scenes opportunity at Animal Hospital is a unique opportunity only available at the Columbus Zoo & Aquarium***

*For this program I will actively encourage program participants to take conservation actions, either individually or through community based action and collaboration by: **By offering guests the opportunity to receive a souvenir of the tour that relates to one of the conservation projects supported by the Columbus Zoo & Aquarium and leaving them with the conservation message- by supporting the Columbus Zoo through their***

**participation in the tour and admission fee helps support animals and people worldwide.**

*For this program I will create messaging about animals, habitats and conservation that is consistent with the Zoo's overall messages by:*

***Discussion during tour about the excellent care given to the animals at the Columbus Zoo by describing techniques and training used by veterinarians and keeper staff.***

*For this program I will provide effective programs and products for school aged students which integrate STEM education standards identified for Ohio K-12 schools both on and offsite by*

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*For this program I will develop at least one of the 21st Century Skills of Critical Thinking, Collaboration, Creativity or Communication by*

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*For this program I will create an environment where participants develop an appreciation for our natural world by: **Relating stories about our Columbus Zoo animals and some of the unique experiences and characteristics that the staff has encountered- Grizzly bear trained for nail trims. Also the***

*creative ways that staff has found to assist in animal care-mirror in  
recovery room for flamingo for companionship. “Touch the Heart to Teach  
the Mind”*



VITA

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