

ABSTRACT

Living Collections in Museums

Bradley C. Roop, M.A.

Mentor: Julie L. Holcomb, Ph.D.

This thesis focuses on the uniquely dynamic nature of living collections in museums. Emphasis will be placed on the interaction between the living collection and the staff members directly responsible for their care. An historical account of living collections in museums will be given as well as an introduction to this research. Research included surveys designed to gain general knowledge about the living collection at three museums or zoos followed by interviews designed to get more knowledge. After the interviews were complete the data collected from the interviews was organized into three separate case studies. The three case studies examined were a zoo, natural history museum, and a hybrid of a natural history museum and a children's museum.

Living Collections in Museums

by

Bradley C. Roop, B.S.

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Approved by the Department of Museum Studies

Kenneth C. Hafertepe, Ph.D., Chairperson

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Approved by the Thesis Committee

Julie L. Holcomb, Ph.D., Chairperson

Kenneth C. Hafertepe, Ph.D.

Kenneth T. Wilkins, Ph.D.

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J. Larry Lyon, Ph.D., Dean

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CHAPTER ONE

Introduction

Living collections that is, collections of live animals – occupy a unique place in museums. They move, they eat, and they sleep. Living collections unlike other museum collections require special care beyond that given to inanimate museum objects. They differ from that of other museum collections because they also need time each day for proper care including feeding and cleaning. Living collections also require outside resources such as a veterinarian or animal expert, and a commitment by the museum's staff to come in to provide care even on holidays. Living collections are a type of collection that need care daily unlike that of the inanimate museum collections. While traditional museum collections need regular care, living collections are at greater risk because of their immediate daily needs. The living collection's survival is dependent upon the museum staff and their commitment to providing the necessary care. Many museums may find that this is a challenge, and it can be, especially if the museum does not have the time to devote to the collection. Living collections are a challenge because they have specific needs that collections professionals may not be trained to handle such issues as food preparation, proper habitat, and physical space for the collection.

Living collections are collections of live animals dedicated to educating the public either through formal programming or through unassisted or free learning. These animals are owned by the museum and thus are a part of the museum's collection. Museums place the care of their living collection in either the education department or their collections department. If the museum is fortunate to have a trained animal

professional on staff, then care will typically be assigned to this person. However this occurrence is infrequent and most museums have to rely on other staff members or have to outsource care to a local zoo or volunteer organization, which can place an animal at risk. Furthermore, given the unique nature of the collection many of the collections policies used by museums for other objects will not work for living collections. The standard collection literature that many museums use as references for care of their other collections, such as Buck and Gilmore's classic text on museum registration methods, is insufficient for living collections. Such text like Buck and Gilmore's offer explanations of laws pertaining to the collection of certain animals but do not give sufficient explanations on how to care for such animals¹. Living collections need more than that. They require a separate literature because they are a separate collection.

Museums have turned to zoos for help because a zoo has many of these living objects, but where a zoo differs is in its primary objective as an institution. A zoo, which specializes in the care of living collections, includes staff who are trained to care for the animals on a daily basis and educators who periodically handle live animals in their programming. In a zoo many of the animals are of an exotic species, which may require even further training. Other animals included in zoos that you do not find in museums are endangered animals or animals that can only be kept with a permit. By contrast, a museum can house collections of all kinds; therefore, the training their staff receives is primarily for the care of inanimate or non-living objects. Museum professionals, excluding zoos, need training that directly services the needs of that particular museum. Instruction needs to be sufficient enough to incorporate all requirements about a living

¹ Rebecca A. Buck and Jean Allman Gilmore, *The New Museum Registration Methods* (Washington D.C.: American Association of Museums, 1998), 333-335.

collection but the instruction also needs to address how the living collection will affect other collections in the museum. Furthermore, although a reliable source for guidance, zoos may not be the best source for museums to turn to for other sorts of assistance because they will not be able to address the other collections of the museum. Instead the museum needs to develop its own reference manuals and guidebooks, placing living collections within the professional context of museums and traditional museum collections.

The research in the pages that follow represents an attempt to gain a better understanding of living collections in museums. Chapter Two presents an historical overview and provides necessary background for my research. The origins of living collections in museums parallel the development of museums: both developed out of curiosity and a desire to explore the world. However, living collections did not fully become an integral part of the museum until the early 20th century, much later than the founding of the first zoo. The living collection became a focal point for museums to educate visitors about nature and the wildlife around them. Children benefitted greatly from these discoveries as many museums utilized hands-on activities during their programming. Despite this history, museum professional literature about living collections is practically non-existent. Furthermore, many museums lack clear understanding in how best to utilize their living collections in educational programs.

In order to understand living collections in museums today, surveys and interviews were used in order to better understand these collections. Chapter Three discusses the surveys and their results. The surveys were sent to twenty-two museums in Texas that had living collections. Chapter Four discusses the interview process. The

interviews were used as the primary source for the development of three case studies. Each museum was closely examined for details about their living collection. These details included things like display method, acquisition, and availability of additional resources. The case studies focused on three separate and distinct museums and furthermore provide three separate distinct areas for future study.

Six staff members answered the survey. Additionally, 7 interviews were conducted with other staff members. None of the staff members who were interviewed answered the survey. A total of 8 different museums took part in this research. These museums ranged from natural history museums to living history farms. One of the goals of the research was to try and obtain a sampling of a variety of museums. Figure 1.1 shows the different museum types that ultimately took part in this research. I defined each museum type by assessing how each museum used their live animals with the primary differences focused on educational programming and display methods.

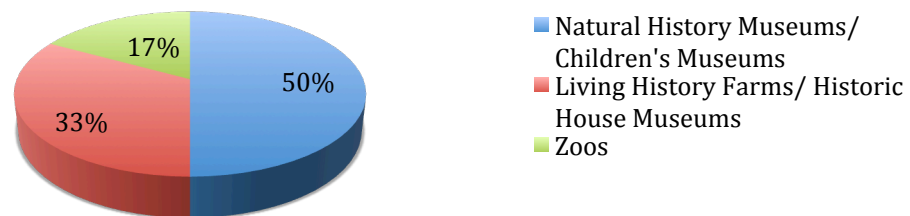


Figure 1.1. Percentage of Participants by Museum Type.

As mentioned above, one of the main goals of this research was to survey different types of museums. The reason for this decision was to compare how different museums were handling their living collections. Furthermore, studying different museums types and their living collections would pave the way for future research.

Based on my findings, recommendations are given in Chapter Five to aid those museums that have or wish to develop a live animal collection. Live animal collections require special care not just because they are living things; therefore a museum's staff needs training to properly care for these collections.

CHAPTER TWO

Historical Overview and Literature Review

The history of the living collection in the museum can be described at best as a hodgepodge of historical facts. Prior to the 20th century, very little information exists about living collections in museums. The timeline, then, must begin with the public's curiosity for the creatures living around them. During this time a person could visit a natural history museum or cabinet of curiosity, study a specimen in a jar, and begin asking questions about how it eats, moves, and breathes. Equally important was the notion of animals as entertainment spectacles. When the display of animals became part of the popular culture, recorded information about live animals and visitor interaction begins to pick up. Ultimately, it was the marriage of the specimen in the jar with the entertainment showpiece that led to living collections in museums. The historical account of living collections in museums does not follow one pattern. Instead bits and pieces are contributed from many different sources and in this text there are many. Natural history museums, circuses, the great world's fairs, and children's museums all contributed to this history.

Today, there is just as much information about living collections in museums as there was back then: very little. However, museums today are able to look at research in other fields to help them understand their living collection. Research in educational theory, collection practices, and discovery rooms have all contributed to the museums staff's understanding of the living collection. Zoos primarily have dominated the field with research regarding living collections. This is to be expected, but what about the

other museums? To begin to define the living collection in the museum, its history will need to be defined with the same curiosity from which it was first discovered.

Living Collections in America

According to Edward P. Alexander and Mary Alexander in *Museums in Motion*, the history of living collections goes back many centuries, back to the 15th century B.C., when exotic animals were sought after and collected by the wealthy.²

The origins of living collections may be found in natural history museums and cabinets of curiosity that were established in the 18th and 19th centuries in the United States. The Americans, like their European counterparts, became interested in the world around them and began studying nature. According to Joel Orosz, Americans were very concerned with learning about the outdoors and had a fascination with the anatomy of animals.³ It was not uncommon to find advertisements around town of discussions about taxidermy and how best to preserve animal specimens. Spurred on by the growing interest of nature and animals, Americans began the search for specimens both large and small. These collections were then brought in, cleaned up and displayed for all to see in their cabinets of curiosity. It is out of this movement that the natural history museum was born in America. The first permanent natural history museum in the United States was founded by the Charleston Library Society in 1773.⁴ While the museum had no living collections, the museum's establishment was pivotal because it was the first permanent

² Edward P. Alexander and Mary Alexander, *Museums in Motion: An Introduction to History and Functions of Museums* (New York: Alta Mira Press, 2008), 153-155.

³ Joel J. Orosz, *Curators and Culture: The Museum Movement in America, 1740- 1870* (Tuscaloosa: The University of Alabama Press, 1990), 13-15.

⁴ Edward. P. Alexander and Mary Alexander, *Museums in Motion: An Introduction to History and Functions of Museums* (New York: Alta Mira Press, 2008), 61.

museum to house scientific objects for the public. Natural history museums across the country suddenly became new educational centers with visitors flocking to their doors to see animal furs, colorful gems, and varieties of seashells.

In 1786 Charles Willson Peale opened his museum to the public and it quickly became a favorite attraction for the citizens of Philadelphia and dignitaries around the world. His collections included animal specimens, minerals, clothing, bones, and paintings of which he himself created. Located a short distance from the museum was a stable that housed a living collection of sorts. Many of the animals housed here served a more functional role for Peale, providing food and nourishment to his family. On occasion Peale would showcase an animal that had unusual deformities, which became a crowd pleaser. One such animal was one cow with 5 legs, 6 feet, and 2 tails. The more exotic animals housed here would eventually end up being preserved and placed inside the museum. Peale made it point to showcase every animal he could in his museum; most were stuffed and mounted in front of a scenic backdrop that suggested the environment in which they were originally found. The Peale Museum showcased nature. Museum visitors would flock to the museum to learn about the world around them and Peale was not the least bit hesitant about letting visitors get a closer look at his collection.⁵ His collection is important to the history of the living collection in the museum because it housed everything. Peale managed to collect the living animal, the preserved animal, and the weird animal. Visitors were just as happy to see a live animal that they have never seen as they were to see a specimen in a jar.

⁵ Charles Coleman Sellers, *Mr. Peale's Museum: Charles Willson Peale and the First Popular Museum of Natural Science and Art* (New York: W.W Norton and Company, 1980), 27-42.

Living collections owe a great deal to natural history museums because it is out of these museums that we have learned and continue to learn a great deal about nature. However, if visitors wanted to see a live animal, they needed to travel elsewhere. They needed to travel to the zoo.

Natural history museums developed simultaneously with zoos. The first permanent zoo in America was established in 1854, The Philadelphia Zoological Garden.⁶ Zoos unlike their natural history counterparts offered visitors study of living animals. However zoos during this time showcased their animals as a means of entertainment rather than education. According to Eric Baratay and Elisabeth Hardouin-Fugier, zoos were the first institutions to house living animals in significant quantities. This important development allowed Americans to discover and learn more about the world around them.⁷ However the public perception of zoos has not always been positive. As Alexander and Alexander note, the public perception of the zoo can be categorized in three phases: zoos as jails (1865-1900), zoos as art galleries (1900-1950), and zoos as conservation facilities (1950-present).⁸ This is critical because it may help explain why living collections took so long to gain a foothold in museums. Living collections in museums initially began their foothold as a permanent collection during the zoos as art galleries phase. Visitors to zoos during the early 20th century began to see the beauty of

⁶ Edward P. Alexander and Mary Alexander. *Museums in Motion: An Introduction to the History and Functions of Museums* (New York: Alta Mira Press, 2008), 155.

⁷ Eric Baratay and Elisabeth Hardouin Fuger, *Zoo: A History of Zoological Gardens in the West* (London: Reaktion Books, 2002), 10.

⁸ Edward P. Alexander and Mary Alexander, *Museums in Motion: An Introduction to the History and Functions of Museums* (New York: Alta Mira Press, 2008), 153.

the animals, but this perception did not immediately lead to a belief that live animals have educational value. A connection needed to be made between the visitor mindset at zoos and the visitor mindset at natural history museums.

Zoos and living collections in museums share a similar history, and it is a history that should not be ignored. Zoos have played an important role in the development of the living collection in the museum. I think visitors to museums in the late 19th century began to see the value of keeping live animals in a museum setting. I believe zoos did not fully embrace their educational role in society until the 1950s with the movement toward conservation and preservation of nature.

Zoos and natural history museums do not deserve sole credit for the development of the living collection in the museum in fact evidence can be found in other institutions. Two early examples of live animal collections were P.T Barnum's American Museum and the live animal collections at the 1893 World's Fair in Chicago. By 1841, Phineas T. Barnum and the American Museum had become a huge attraction in New York. Collections of the museum included live white whales, white elephants, orangutans, hippopotamuses, grizzly bears, wolves, and buffaloes. At different times throughout the day the museum would hold live feeding sessions with these animals in view of the public.⁹ Live animals were becoming a source of entertainment for the public. In their book, *The Chicago World's Fair of 1893: The World's Columbian Exposition* Norman Bolotin and Christine Laing talk of several exhibits at the fair where visitors were introduced to live animals. One such building was dedicated to displaying anything and

⁹ William Thomas Alderson, *Mermaids, Mummies, and Mastodons: The Emergence of the American Museum*, (Washington D. C.: American Association of Museums, 1992), 33-35.

everything relating to the world of fish. It was called the Fisheries Building and included many different aquariums with many different species of fish including sharks. Another building called the Children's Building housed an assortment of living birds meant to entertain children. Another area, Hagenbeck's Zoological Arena, showcased a live menagerie that featured animals doing a variety of tasks like walking tightropes and riding chariots.¹⁰

Places such as Peale's Museum, Barnum's American Museum and the Chicago World's Fair were important precursors to modern living collections in museums. These places showcased living animals in a way that entertained the public. Entertainment was a major incentive for visitors to come to museums and people like Phineas T. Barnum used this idea to attract visitors to their museum. However, in these settings living collections were primarily seen as entertainment and not as educational tools, a point that did not sit well with many naturalists of the late 1800s. In the book, *Mermaids, Mummies, and Mastodons: The Emergence of the American Museum* published by the American Association of Museums, the authors talk of a congenial relationship between the naturalists and the proprietors of several natural history museums. The naturalists wanted museums to be institutions of strict scientific observation and higher learning. However, the museum proprietors were looking for ways to increase visitor attendance and cater to mass audiences. Furthermore, these proprietors seemed to be developing entertainment centers as a means to attract the general public.¹¹ The natural history

¹⁰ Norman Bolotin and Christine Laing, *The Chicago Worlds Fair of 1893: The World's Columbian Exposition* (Washington D.C.: Preservation Press, 1992), 152.

¹¹ William T. Alderson, *Mermaids, Mummies, and Mastodons: The Emergence of the American Museum*, (Washington D. C.: American Association of Museums, 1992), 34.

museum was struggling to define its role and cater to both parts of society. The natural history museum needed a creative way to deliver both an educational and entertaining atmosphere to its visitors. The answer would remain somewhat allusive until a new kind of museum was established that helped lay the groundwork for living animals to be used in museums.

The Museum Educator Takes Hold

The defining moment in history of living collections in museums occurred in 1902 at the Brooklyn Children's Museum, when Anna Billings Gallup first introduced visitors to the living animal collection. Among the many innovative ideas Gallup had, was to utilize the museum's living collection as an educational resource to the visitors. Gallup would take children and lead them to the live animal habitats, opening cages and letting the children touch and hold the animals. The museum had a variety of animals of which included a rabbit, toad, owl, crow, frogs, rats, a spider monkey, various snakes, insects, and numerous species of fish. Gallup believed that the live animal collection was an important aid to educate the children about the environment around them.¹²

The popularity of the Brooklyn Children's Museum soon increased thanks in part to the work of Anna Gallup. The idea of animals being taken out of cages became immensely popular and proved to be very successful for the Brooklyn Children's Museum. More importantly was the idea that live animals could be used as tools to aid those looking to learn more about nature. Museum educators everywhere were beginning

¹² Edward Porter Alexander, *The Museum in America* (Walnut Creek: Alta Mira Press, 1997), 133-142.

to take charge of the museum and were beginning to use any and all means at their disposal including the use of their living collection.

Zoos were not so quick to support this idea. As already mentioned the first chartered zoo was established in 1854, 48 years before Anna Gallup began her work with the living collection at the Brooklyn Children's Museum. This is not to say that zoos did not have any educational value; in fact many zoos at this time were incorporating taxonomical design into the organization of the habitats. We can still find this design in zoos today, and this is the main reason we never see the snake habitat next to the lion habitat. However in the early 1900s such a design may not have been readily apparent to the public, and if not, then one may not have grasped the educational value. Children especially would not have been able to grasp such a complex learning scheme. During the late nineteenth century zoos were beginning to incorporate exhibit labels with more detailed information about the animal such as eating and social behaviors; however, they were still not taking the animal out of the cage. Furthermore, whatever information the visitor obtained visiting a zoo, they had to learn by reading the habitat label.

Children's museums of the late nineteenth century and the early twentieth century began developing new ways to teach children. Staff at children's museums knew that children do not learn the same way as adults do, so they began to incorporate new learning tactics such as hands-on objects to help the children learn. Hands-on objects were used in every possible topic and subject; including nature. Dead specimens of all kinds, feathers, eggs, etc. were used to help educate children. The use of such specimens had one major limitation, when it came time to teach children about animal behavior these specimens became inadequate. Soon it became clear that educators had to find a

new way to teach children about animal behavior. Zoos seemed to be the best place to teach children about animal behavior because children could observe a live animal, and while a zoo was certainly a plausible option, as mentioned above in the late nineteenth century it was not the best option. Instead, educators needed something else. Pioneers in museum education like Anna Gallup had the answer: they started to take the animals out of their cages. Children's museums and museums containing living collections were able to provide an educational link and educators like Anna Gallup became immensely popular.

Living Collections Today: A Museum Educator's Perspective

Museums today that have living collections are aware of the benefits they provide to learning. A prime example is the relatively new idea of using live animals to help educate those about conservation and the awareness of nature.

Zoos and natural history museums educate visitors about wildlife conservation; however, as Bill Street, Head of Conservation at Sea World and Busch Gardens notes, zoos can do more. Street emphasizes the importance of unstructured learning as a means to emphasize what children learn in zoos. Critics of zoo education, according to Street, claim that the education children receive does not actually help them understand important concepts like conservation of wildlife. Furthermore, critics claim that there is no attitudinal shift in visitors once they leave the zoo or finish their educational program. Instead visitors appeared to express the same attitudes before they began the educational program. Street writes that zoos respond to these criticisms by saying that the evidence exists for such attitudinal shifts despite not being able to directly measure the behavioral change. Zoos argue that there is in fact a way to measure a direct behavioral change,

however, such a method may not currently exist. Street gives examples of how families at home can help their children get more out of zoo programs. One of these programs involves families building backyard habitats using native plants. The program designed by the National Wildlife Federation (NWF) allows families to view native wildlife in their backyard encouraging both conservation and education. The NWF has a certification option for this program and as of 2010 has granted certification to over 100,000 backyard habitats.¹³

In their article, “Why Zoos and Aquariums Matter: Assessing the Impact of a Visit to a Zoo or an Aquarium” John Falk et al. provide an in-depth look at the educational programming currently residing in American Association of Zoos and Aquariums (AZA) accredited zoos and aquariums. More specifically, the research team examined educational programming that dealt specifically with conservation and the interaction between humans and nature. Visitors at 12 AZA- accredited zoos and aquariums across the United States were surveyed on their experiences with the educational programming at that particular institution. The primary focus of the research team was to detect any significant change that the educational program had on the visitor or the visitor’s emotional impact. The research team wanted to know if there was a way that a zoo or aquarium’s structured educational program could actually change a visitor’s viewpoint on important environmental issues such as conservation. The research started by examining the visitor’s motivations for coming to the zoo or aquarium.

These identity-related motivations were grouped into five categories based on research conducted by Falk himself in 2006. These motivations were explorers,

¹³ Bill Street, “The Roles of Zoos and Aquaria in Connecting Children with Nature,” *Journal of the International Zoo Educators Association*, (2010): 6-8.

facilitators, professional/hobbyists, experience seekers, and spiritual pilgrims. Next, the research team began surveying visitors at random at two aquariums and two zoos. They gave the visitor a pre-test and a post-test following their visit to the zoo or aquarium. After detailed analysis, the research team found that visitors came to zoos and aquariums with identity- related motivations and that these motivations directly impacted how they visited the institution and what kind of experience they would form. Also, 54 percent of the survey participants reconsidered their role in environmental problems and in conservation action. About half of the participants surveyed believed that visits to zoos and aquariums play an important role in conservation education and animal care. Of those that participated, 75 percent of the participants said their visit strengthened their personal bond with nature.¹⁴

The research team listed several implications about their conclusions. One of the most important and where it is pertinent to this thesis is that spending time in nature is critical for the development of a child and for the adult. Furthermore, learning about nature outdoors aids in child development. As mentioned above, zoos have not always known this, but have since become aware of this interaction and are doing their part to teach the child as much about nature as they can learn. More importantly what the article does is examine what accredited zoos and aquariums are doing to help their visitors achieve a more powerful experience while learning about nature. This research also provides further proof that the use of animals in educational programming can greatly benefit both the institution and the visitor. The visitor gets the added visual aid and

¹⁴ John H. Falk, Eric M. Reinhard, Cynthia L. Vernon, Kerry Bronnenkant, Joe E. Heimlich, and Nora L. Deans, "Why Zoos & Aquariums Matter: Assessing the Impact of a Visit to a Zoo or Aquarium," *Association of Zoos and Aquariums* (2007), http://www.aza.org/uploadedFiles/Education/why_zoos_matter.pdf (accessed November 3, 2010).

rather unique experience of seeing up close certain animals allowing for a more powerful learning experience. Many museum visitors are passive, and not active learners, meaning they will not stop to read a label or play with an interactive; they will not engage in an exhibit. Living collections, as shown above, can become agents for active learning.

Humans have always been aware of nature, but it is only recently that we have begun to get more educated in the role we play in our environment. Living collections help us with this transition and can provide a unique visual aid. For example, a number of different studies have been conducted inside the Australian Museum that examine this idea. One study provided research for Lynda Kelly, the Evaluation Coordinator at the Australian Museum in the article, “Finding Evidence of Visitor Learning.” The study looked at visitor learning in an exhibit called “Spiders!,” which among other displays contained habitats of living spiders. The researcher wanted to measure short-term recall to see if visitor learning could actually change a person’s thoughts about an animal with which negative connotations are often associated, such as spiders. These surveys were distributed upon immediate completion of the exhibit. Of those that were surveyed, 55 percent said their initial views about spiders had been changed by the exhibit. Those visitors whose views had changed because of the exhibit were then asked in what ways were their views changed. The researcher found that out of the 55 percent, 34 percent said that they had learned new things, which led to a change in views, and 32 percent said that they became more aware about spiders and respected them. Still 11 percent of that initial 55 percent said that they had become more fascinated with spiders and another 11 percent claimed that although their views had changed they still disliked them. It was also reported that 9 percent said they were less scared and 3 percent reported being more

scared.¹⁵ This example supports the idea that museum educators are able to use the living collection or living specimens to teach others about nature. In essence, the animals become agents for a visitor's transition to an active learning environment. It was the aid of the living animal that made the experience memorable to the exhibit's visitors.

The evidence above suggests that living collections can have a tremendous impact on visitors. While zoos were the focus of the study, it can also be extended to those museums with living collections. Museums can expect the same kinds of reactions and feedback that zoos and aquariums are receiving. Live animal programming in museums is primarily animal specific. Educators at museums will teach about one specific animal, and then discuss the environment in which it lives. A zoo on the other hand, will focus on the bigger picture, discussing topics such as conservation and preservation of a species and their habitats. However, in both cases live animals are being used. In my research I did not find one museum that cited they were using their animals to teach children about conservation; with zoos I found that the opposite was true; the primary purpose for educating visitors was to teach them about conservation.

Museum learning and the relation to visitor experience as described by John H. Falk and Lynn D. Dierking takes place in a model called the Interactive Experience Model. The model contains three distinct contexts that describe a visitor experience at a museum. They are the personal context, the social context, and the physical context. Although there are links between museum learning and zoo learning in all three contexts, the most relevant here is the physical context. This context strongly influences how

¹⁵ Lynda Kelly, "Live Animals in Exhibitions," Excerpts from two evaluation reports that looked at visitors' interests in live animals in exhibitions - Spiders! (1996, 1998) and Bats (1998), Australian Museum Audience Research Centre, 2007.

visitors behave, what visitors observe, and what museum visitors remember during their visit. A big part of zoo learning occurs in the physical environment that surrounds the visitor. In a zoo visitors may remember the odor of an animal habitat or they might remember a sound they heard. In a museum, visitors remember which species of animals they saw or they might remember how a particular animal moved, this is learning that takes place in the physical context. Thus emphasis on learning in the physical context in a museum is not placed so much on the animal in the habitat (as it is in a zoo), but instead on the animal itself.

Furthermore, the way museums use their living collections and the way they are presented to the public makes a difference in the visitor's experience in the institution. If the collection is used in a manner that best balances human interaction with minimizing animal stress then that museum is doing all that it can to foster positive experiences with its visitors. Living collections in museums are providing the necessary educational outlet that visitors may not otherwise receive elsewhere. A good example of this can be found at the Fort Worth Museum of Science and History. This museum has three classrooms and in each room there are about three to four live chicks, and depending the day of the week, children taking part in the program are able to see other live animals from a separate storage facility. The children are allowed to touch and pet the animals; once programming is complete the animals are transported back to the storage area. Furthermore, the Fort Worth Museum of Science and History maintains this balance of human interaction and animal stress. The animals are not left in the classroom but instead are returned to their "home" when programming is complete. Educating children and families about nature with the living collection it seems is working and is working

well. Living collections are important to museums, they may prove beneficial in increasing visitor attendance and they can play a role in the museum's responsibility as educators to the public.

Learning With The Live Animal: Learning Theory And Conceptualization

People learn in various ways. The way people conceptualize living things as their own helps them form closer bonds making learning easier. In order to find the best ways of learning it is necessary to evaluate the methods of the educator helping to foster this conceptualization. Testing recall abilities of both children and adults has proven to be the most accurate measurement.

In their article "Long Term Recollections of Environmental Interpretative Program," Doug Knapp and Gregory Benton conducted a study testing what participants recalled after two years of an interpretative program involving the study of white tail deer. The primary goal of the research was to evaluate interpretative programming by measuring long term recollections of visitors who visited Indiana State Park. The goal of the program was to make visitors aware of the natural history and life patterns of white-tailed deer. More specifically, "the program focused on animals' adaptations for survival and their impact on the region's food web. It included a 30-minute slide presentation, a 15-minute discussion led by the interpreter, and a 'hands-on' period at the end of the program that enabled participants to touch and feel white tail deer artifacts. The hour-long program took place inside the park's nature center." The participants were contacted for an interview about two years after attending the program and were asked if they could recall anything about what they had witnessed. The researchers were able to group the responses into four main categories: visual recollections, novel recollections, interpreter-

related recollections, and active involvement recollections. The researchers concluded that participants could recall extensive details of the program they attended.

Furthermore, it was concluded that environmental interpretative programs produce long-term memories and helps explain why museum visitors may remember so much about living collections and the animals they have seen. They are able to remember their experience with the living collection because they saw actual live animals and in some cases were able to handle them.¹⁶

Although similar to the Benton and Knapp article, a study conducted by Jared Bixby used four variables (including live animals) to test for recall in classrooms. Bixby hypothesized that the use of visual aids such as live animals and animal artifacts during a school lesson would improve recall abilities when taking a test on the same subject a few days later. The study utilized four different types of lesson plans with different types of visual aids. The first lesson plan contained only photographs and illustrations and no living animals or animal artifacts. The second lesson plan contained only animal artifacts and the third lesson plan only living animals. The final lesson plan contained both animal artifacts and living animals. Each teacher of the four lesson plans was given the same amount of time to teach their children. Before the lesson plans were given the students were given a pre-test and then were given post-test. Bixby concluded that the only difference was students receiving the regular lesson plan without the use of live animals or animal artifacts scored higher on the post-test than those who were taught with the use of live animals and animal artifacts. Although Bixby concluded that live animals did not in fact augment the teacher's lesson for that day, it must be noted that several variables

¹⁶ Doug Knapp and Gregory M. Benton, "Long-term recollections of an environmental interpretive program," *Journal of Interpretation Research* 10 (2005): 51-53.

influenced his study. One, all lesson plans given had a time limit of 45 minutes including the two that used live animals. Thus, those schools receiving instruction with the live animals had twice as many visual aids as those that did not. The second factor influencing the study was the socio-economic status of the students. Those receiving the lesson with live animals had a student body with 60% of its students coming from economically disadvantaged families. This variable could not be controlled statistically.¹⁷

As principal educators, museums are always looking for ways to help their local schools with standardized testing. Many museums have educational programs that help teachers and school children with their standardized tests. Live animals have begun to be used to help children with the science portion of their test. Bixby's article provides an example of this fact. More importantly the article shows that strides have been made to bring live animals into the lesson plans of teachers for things like standardized testing. I believe that museums that have living collections can provide a valuable asset to teachers that have the time to utilize these animals in their lesson plans.

Schools are considered places of formal education. They have a curriculum and this curriculum varies from grade to grade. Students attend, learn, and test to move on to the next grade until graduation. Museums on the other hand, are considered informal places of learning. Attendance and learning are voluntary and testing is non-existent. However students do learn at museums. In her editorial "Informal Science Education: Where We Were...Where Should We Go?," Leah Melber explains the important strides made in informal science education. She writes that museums and other informal

¹⁷ Jared Bixby, Gwen Carnes and Edwin Church, "The Learning Impact of Animals and Animal Artifacts," *Journal of the International Zoo Educators Association* (2010): 26-29.

educational centers have begun partnering with schools to provide better educational experiences when classrooms come to visit. Museums and science centers are looking into the requirements of standardized tests and have been changing their tours to reflect these requirements. The result is a much more beneficial learning experience for the student and teacher alike. Melber also comments that nationwide organizations such as the National Science Teachers Association have voiced their support. As museum educators think more and more about how to best educate their visitors, they will also begin to think more creatively at how best to use their collections. Granted, this approach may not justify having a living collection in their museum, but it does demonstrate the many benefits a living collection can provide if a museum already has one.¹⁸

One of the traits that make us human is our innate ability to feel emotion. This may be emotion that we feel about ourselves or that it may be emotion that we feel towards others. With live animals it is no different. However, the way we conceptualize animals may ultimately pose a challenge. How can the museum actively teach children and families about animals using the live animal collection without becoming too “close” to the animal itself?

In her book *Animals in Schools: Processes and Strategies in Human-Animal Education*, Helena Pedersen examines how students and teachers conceptualize living animals in the classroom and what roles these “caretakers” tend to assume. The book consists of three parts, the emergence of educational “animal stories,” educational encounters with animal practices, and processes and strategies in human-animal education. Students, especially young children, learn best by forming close personal

¹⁸ Leah Melber, “Informal Science Education: Where We Were...Where Should We Go?,” *Science Activities* 43, no. 2 (Summer 2006): 3.

attachments. In regards to animals a student would rather form a close emotional bond with an animal because they may see the animal as being part of a similar existence. In other words, the student sees the animal as having feelings similar to that of humans. Pedersen argues that this trait is common with domesticated animals like dogs, rabbits, and horses. An example of this is when students give names to animals that are not theirs. This occurs at places like museums that typically do not have names for the animals on display. When the child gives the animal a name the student is claiming a sense of ownership. Furthermore, the child has made a connection between himself/herself and the animal. When a child is learning about nature this conceptualization, of making the animal a personal one, helps the learning process. However, if a student were to go to a zoo this trait would not be present. In fact the student may practice a kind of detachment from these animals. The student may not see the animals as sharing a similar existence and thus it may be harder for the student to conceptualize the animal as his or her animal.

With regards to the teacher role, Pedersen states that they need to practice a sort of emotional detachment. The responsibility of the teacher is to try to turn the emotional relationship between animal and student into an educational one. The importance here is to have the student conceptualize the animal as a living thing rather than a best friend. When the student begins to conceptualize the animal as their own, attempts at rationalizing the student's emotions will need to be made by the teacher. However there are in fact times when emotional bonding may be necessary such as when the student is stressed. Animals can be therapeutic and can be especially helpful if the student is young. At times like these it is important that the student hold the animal or touch it. A

teacher can use a child's immediate conceptualization of the animal to the child's advantage by allowing it to occur in order to cater to the student's emotional needs. This bonding helps fulfill the student needs for attachment.¹⁹

One of the easiest ways children come to conceptualize animals is through media. The second part of Pedersen's book deals with how animals are portrayed in the media and what effect this has on children when such movies are displayed in the classroom. In the book, a special emphasis was given to the movie, *The Lion King*. Pedersen argues that there is a danger in such movies but does not completely discourage their use. She writes that conceptualizing animals in such a way or viewing animals in such a structured setting such as a zoo can be both beneficial and detrimental. Viewing animals in this way can be good because students and teachers are able to learn in this structured setting, how the animal lives. However this can also be bad, because the animal has essentially become a "lab animal." The animal has been taken out of its natural setting and placed in one that is foreign even though the animal shares similar traits of its original habitat. Furthermore, it would seem that the best way to view animals in their "natural" habitat would be to actually view them in their natural habitat. The final part of the book discusses various strategies, processes and techniques that the educator can employ in his or her curriculum when using living animals. She also ends with some implications that can be taken away from her research. Three key aspects she focuses on are boundary work, contradictions in human-animal relations, and strategies used in schools to handle potential conflicts emerging around these contradictions.²⁰

¹⁹ Helena Pedersen, *Animals in Schools: Processes and Strategies in Human- Animal Education*, (West Lafayette: Purdue University Press, 2010).

²⁰ Pedersen, *Animals in Schools*.

It has been tradition for most museums to display only preserved animals or specimens. However, only recently have museums begun to display live animals as well. One such museum is the Australian Museum. Recently the Australian Museum began examining their mission statement more closely and realized that there is in fact a benefit with displaying live animals in its museum. In their article, they identify several exhibits that have come to the museum that involve the display of live animals and they remark that these exhibits are often a success in terms of visitor attendance. Museums like the Australian Museum have decided to display its live animal collection in order to show visitors how the animal feeds, regulates body temperature, seeks shelter, and reproduces; something that the museum's specimens cannot show. Thus this allows the animals to become great visual aids during presentations and helps provide that necessary "wow" factor for families looking to learn more about the animals being held at the museum. Live animals on display tend to have a high "holding power," drawing visitors' attentions away from other parts of the exhibit.²¹ Living collections have proven to be very useful in keeping visitors in an exhibit. Some museums devote whole rooms to the display of its living collection while others devote only a portion of a room. Either way the power of a living collection to hold people in an exhibit cannot be underestimated.

The second part of the article poses the question of "who is the audience for live animal displays?" The answer the article gives is all ages. The article mentions that live animals provide an excellent bridge for people of all ages. Each member in a family can enjoy live animals and museums oftentimes have flocks of visitors of all ages looking at the living collection. Live animals are always guaranteed to evoke a response either

²¹ Australian Museum. "Why have live animals in a Museum?" Australian Museum. <http://australianmuseum.net.au/Why-have-Live-Animals-in-a-Museum> (accessed November 10, 2010).

negative or positive. The challenge here would be finding someone who is non-reactive to the animals. The ultimate goal would be to harness such reaction to where it influences the visitor's experience at the institution.²² Museums want their visitors to remember their visit because that oftentimes means a repeat visit. However more important than repeat visits is the idea that a visitor will tell others of their visit thus encouraging others to attend.

Beyond the Habitat: New Concepts Involving the Use of Live Animals

A museum educator is constantly looking for ways to impact a visitor's experience in a positive way. This can be challenging in some areas, like a living collection, where animal behavior can be a particular stressor on museum professionals. According to Lauren Plait and Bernard Krause in their article, "Learning and Listening in Natural History Exhibits" one area that museum educators can focus on is bioacoustics. The field of bioacoustics uses sound recordings that have been captured in various wildlife environments to help teach visitors about various wildlife habitats and thus "submerge" them in nature.²³ Plait and Krause concluded that natural history museums do a fairly good job at this, especially those museums where most of the objects are nonliving, while zoos and aquariums do a rather poor job at utilizing this field and thus are not doing their jobs as principal educators of wildlife and their habitats. Certain visitors like children, learn best when they have the opportunity to utilize their five senses. It is not just about looking at an animal but more importantly it is about the

²² Australian Museum, "Why have live animals in a Museum?"

²³ Lauren Dewey Plait and Bernard Krause, "Learning and Listening in Natural History Exhibits," *Journal of the International Zoo Educators Association*, (2001).

visitors submerging themselves in the environment. The field of bioacoustics can help with this transition. Plait and Krause also discuss the benefits of real world sound and the use of such sound in zoos and aquariums. The field of bioacoustics presents just one area that can be used to help improve the visitor experience when viewing a living collection. A museum educator is constantly searching for new ways to improve the visitor experience. This area is just one new avenue that museums housing living collections have yet to explore.

Collecting and Keeping Live Animals

Unlike their educator counterparts, collections personnel at a museum have to be conscientious of the dangers living animals can pose to the museum's other collections. The collections professional is responsible for the well being of the museum's collection. In some cases, this includes the care of the living collection. To collections professionals the mindset is different when it comes to the living collection. As a whole everything becomes more practical. Dr. Ellie Caston, Director of the Mayborn Museum in Waco, Texas said it best when she said that collections professionals are "...by nature much more methodical, organized, regimented and so I think it's just a natural use of their skills." The animals are no longer looked at as pets but instead as essential elements of the overall collection. Still, some elements of a living collection are not the same as with the non-living collection. A big one is stress the animal receives.

Legal Issues and Living Collections

Living collections are a different kind of collection in a museum. Living collections are living, breathing creatures and there are laws that protect their well being.

Many of the laws were designed to protect the animal and human alike making them easy to apply to the museum field. Museum collections policies have roots with laws enacted by the federal government and this includes laws pertaining to living collections.

Laws enacted by the federal government, protect the museum, the museum's visitors, the animals, and the museum staff. One of the first laws relevant to living collections enacted by the federal government was The Lacey Act of 1900. The Lacey Act, strictly "prohibits importation, transportation or acquisition, without a permit, of any wildlife (or their eggs) designated as injurious to the health and welfare of humans; to the interests of forestry, agriculture, or horticulture; or to the welfare and survival of wildlife resources of the U.S." ²⁴ If the animal is acquired for an educational, zoological, medical, or scientific purpose then a permit may be obtainable. A permit does not have to be obtained for dead specimens being used in the manners listed above.

The Lacey Act effectively eliminated collections of live animals in the early "cabinets of curiosities." Without a permit certain animals could no longer be acquired and transported across state and foreign borders, if it was on the list of injurious wildlife provided by the U.S government. Also, The Lacey Act of 1900 further clarifies the difference between a zoo's living collection and a museum's living collection. A museum maintains living collections of domesticated species and typically not those of exotic species. Thus a museum's educational need for a living collection is often fulfilled by acquiring animals that are living within state borders. For this reason, a permit is often times not required. A zoo on the other hand, needs these permits to obtain the exotic animals because that is what defines their living collections.

²⁴ Rebecca A. Buck and Jean Allman Gilmore, *The New Museum Registration Methods* (Washington D.C.: American Association of Museums, 1998) 333.

In 1944 the Public Health Service Act was enacted to prevent “the introduction, transmission, or spread of communicable diseases from foreign countries to the United States or between states.” Animals can carry diseases that can be harmful to humans and this is the reason why this law was passed. However permits can be obtained to engage in regulated activities for exhibition, educational, or scientific purposes.²⁵ This law is especially important to the caretakers of the living collection because of the risks associated with taking care of certain animals like turtles, rodents, and birds; animals that are common finds in museums that can carry diseases that are harmful to humans. Museum staff members also need to be aware of the potential dangers that such animals pose to the visitors of the museum. If these animals are used in the museum’s educational programming they should be utilized in a way that minimizes harm to the visitor.

Another law enacted by our government is the Animal Welfare Act of 1966. It was enacted “to regulate warm-blooded animals used for research, exhibition purposes, or as pets, ensuring that they are provided with humane care and treatment”.²⁶ The Animal Welfare Act also helps to regulate aspects of transportation, purchase, sale, housing, care, handling, and treatment of animals. This law is the only law that protects animals from exhibition and research. This is important to museums because this law provides the museum with guidelines on how to treat warm- blooded animals in a proper ethical manner. Many museums display their animals for the public, but this can soon pose a problem, as the animal can become stressed. A major hurdle for a museum with a

²⁵ Buck and Gilmore, *The New Museum Registration Methods*, 334.

²⁶ Ibid.

living collection is how to show off its living collection in a way that is least harmful to the animals. Some museums do not display all their animals. . If the animals are used as a purely educational resource then the collections professional needs to be mindful of the animals' well being on a daily basis. This is for two reasons: one, the animal will probably be on display at some point in which case the animal will be exposed to numerous visitors. Two, when the animal is taken to a classroom or is brought out of its habitat in the museum it will be touched by human hands making for a stressful situation for the animal. It is up to the collections professional to have knowledge of these laws in order to properly care for the museums animals. Ironically, the Animal Welfare Act does not protect certain warm-blooded animals like mice and rats. The law also does not cover cold-blooded animals and fish, although such animals are often found in a museums living collection.

Despite having laws that protect the use of live animals in programming, there is still a lack of information on how best to incorporate such laws in collection policies and collection management practices. Much of the literature that discusses museum collection policy does not discuss living collections even though federal laws exist for their protection. If museums are to better understand living collections then their collections policies and collection management practices must be updated to include living collections. Along with these texts not discussing living collections, many of these texts seem to focus on the legal issues with keeping and showing live animals. And although this information is pertinent for discussion here, these descriptions are still not nearly adequate enough for collections managers to take advantage of them. Museum collections policies need information that pertains to things such as the acquirement of

animals, the deaccessioning of animals, and the display of animals. Many museums look to zoos for advice on how best to handle living collections in their museum. While this is certainly sufficient it does not solve the problem of having little to no literature to turn to regarding collection policies for living collections in museums.

Live animal acquisition is unlike that of the typical museum artifact. Many museums will not take animals donated to the museum from families. When a non-living object is donated a museum will likely accept the object if it fits within the boundaries of the museum's mission. Most museums will get their animals from a trusted source like a zoo, or certified professional, like a breeder. If the museum is well funded then oftentimes a specialist that works for the museum will travel and acquire these animals out in the wild. The insects in living collections are usually collected in this manner. The scope of the collecting is limited by what the museum deems as having educational value. The typical animals found in living collections in museums are those that have been domesticated or those that are considered household pets. As with the non-living collections, collections professionals keep accurate records of each live animal. Museums will typically house these documents in a binder separate from that of their non-living counterparts.

The history of the live animal collections parallels that with the history of the establishment of the first museums. The same curiosity that started the "cabinets of curiosity" also brought live animals into the museum, becoming an integral part of in museum programming. Museum educators wanted a new way to teach their visitors about nature, and visitors wanted a new way to learn about nature. Today, museums that have living collections understand the importance they provide to the educational mission of

their institution. In understanding current research in education theory and collection policies museums will continue to learn more and more about live animal collections and educate those looking to learn more about them.

CHAPTER THREE

Surveys

To better understand the challenges and benefits of living collections in museums, I used a two-part research process. First I surveyed selected museums in the state of Texas about the living collections. I received a total of six responses from a variety of museums including living history farms, natural history museums, and children's museums. Survey results are discussed in this chapter. For the second phase of my research, I interviewed professionals at three institutions in Texas. The results of those interviews are discussed in the following chapter.

Methodology

In selecting potential participants, I chose Texas museums with live animal collections. Size of collection, size of the museum, and museum type were all part of the selection criteria though my initial search for survey participants did not include living history farms or villages, or zoos. To identify these museums, I used sources such as the Texas Association of Museums website and museums' individual websites.²⁷ Ultimately, I found 22 museums that met my criteria.

Using SurveyMonkey, an online survey database, I developed a 15-question survey to gain a general understanding of the living collection at the museum. I organized the survey into 3 sections. Questions 1 through 5 asked general questions about the museum's living collection. Questions 6 through 11 asked about the caretakers of the

²⁷ Texas Association of Museums, "Membership Directory," Texas Association of Museums, <http://www.prismnet.com/~tam/Membersonly/directory.html> (accessed September 2010).

collection. Questions 12 through 14 focused on attitudes toward living collections. The final question asked for contact information.

Once the survey was complete and loaded onto SurveyMonkey, I contacted the selected museums.²⁸ I was initially interested in hearing from someone in the collections department and education department at each museum. Ultimately, I contacted 25 individual staff members from the selected museums. My initial contact with staff members explained my research and requested their participation. Once they agreed to participate I provided a link to the online survey.

Five of the 25 museums professionals contacted indicated that they no longer had living collections. I sent another letter asking why they no longer had a living collection. One museum indicated that they had a living collection until the person responsible for the care of the living collection left. The other staff members, according to the participant, were unable to care for the living collection. Another utilized an outreach program provided by the Houston Museum of Science and Natural History.

I received 4 responses to the online survey. As a result, I decided to add zoos and living history sites such as farms and villages to the list of participants. Initially I did not want to include zoos because I felt their collections were thoroughly researched. Two zoos and 4 living history farms were contacted. This second set of participants yielded an additional 2 responses, bringing the total number of survey participants to 6.

Results

Each question had a varying number of responses, which are indicated in the Figure 3.2.

²⁸ Survey Monkey, online survey database, <http://www.surveymonkey.com> (accessed October 2010).

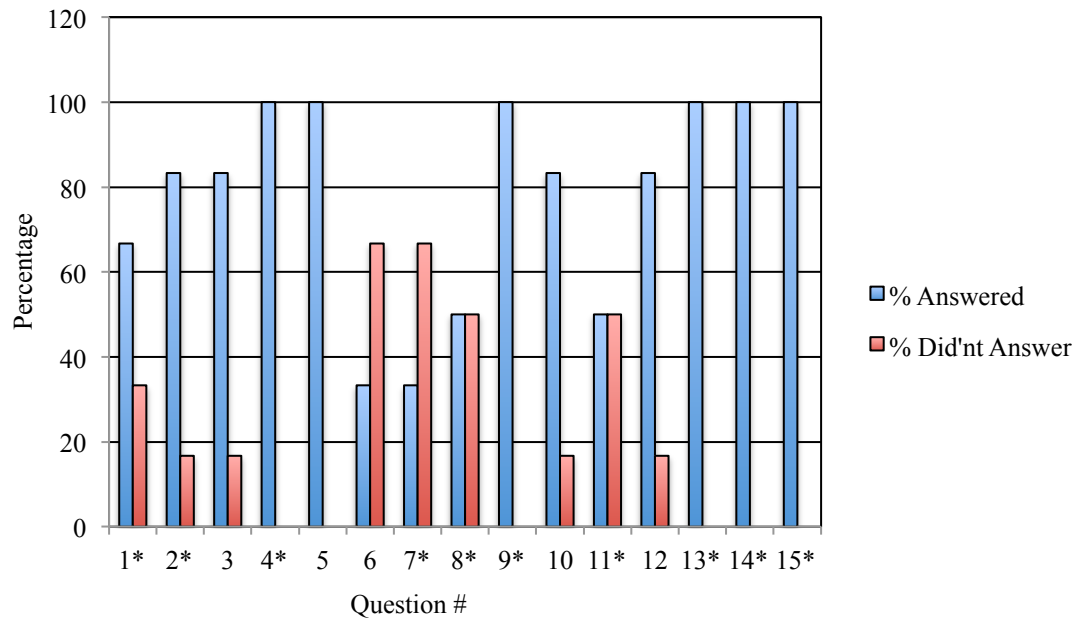


Figure 3.2. Percent of Responses vs. Survey Question #. * Indicates short answer questions.

Question 1: How many animals do you have in your living collection?

Collection size influences the institutional resources needed to care for the collection. Table 3.1 lists the number of animals according to each respondent that answered the question. Of the participants, 66.7% answered with the size of the collection ranging from 2 to 20 animals.

Table 3.1. Responses to Question # 1	
Respondent #	Number of animals
1	2
2	3
3	10
4	15 - 20

Question 2: Please provide a description of each animal in your living collection. For example, 1 rabbit, 2 turtles, etc.

As Figure 3.3 illustrates, reptiles are the most popular classification of animal found in living collections. Two primary causes can contribute to this occurrence. The first is that this class of animal is popular with visitors. When feeding the living animal collection at the Mayborn Museum Complex, I have noticed that visitors and staff wanted to watch them eat. In particular, the snakes were a big draw because they ate mice and because of their unusual technique for ingesting food.

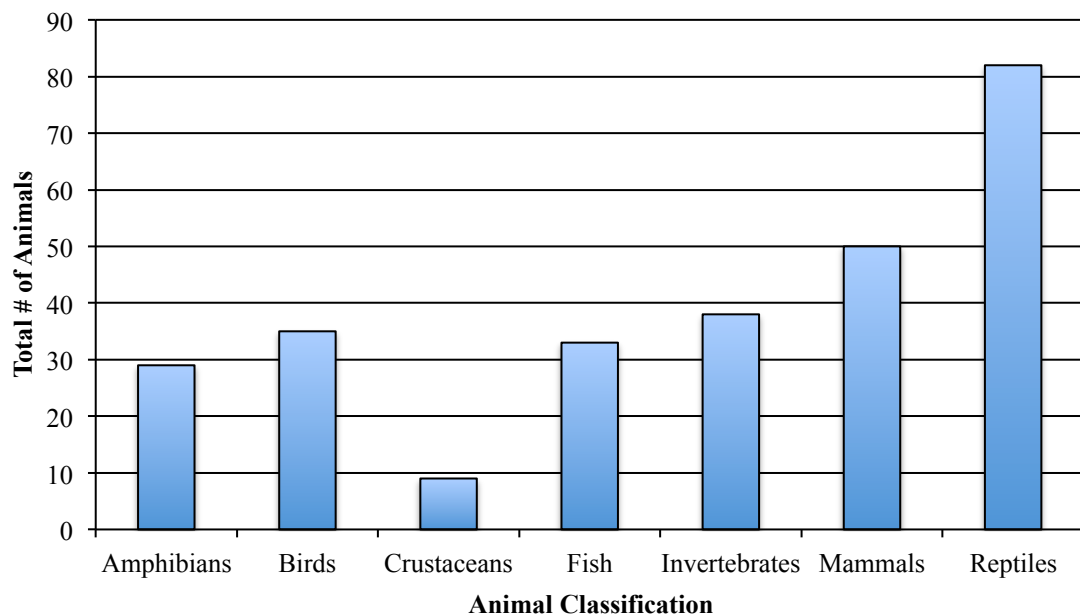


Figure 3.3 Number of Animals in Museums Surveyed and Interviewed by Classification.

What is included in the total animal count for each class, but what is not shown in Fig. 3.3 is the amount of exotic species within each group. I did not separate exotic species from the local species in my data set because museums will generally only collect species that are local. Museums, with the exception of zoos tend to shy away from acquiring exotic species. If the animal does not fall within the parameters of their

collecting scope, then the museum will not take the animal. For example, if the museum is dedicated to preserving and collecting native Texas species, then acquiring an animal from Africa would be out of the question. The exception here, of course, is zoos. Zoos practice a different set of guidelines and thus have a different collecting scope. Zoos are more concerned with genetics and conservation of the species, they are also looking to acquire species from around the world making their collection more exotic.

Generally, I found that museums that have multiple species also indicated that the animals are frequently involved in educational programming at the museum. The former was also important since it appears that only domesticated animals were collected. Five participants or 83.3% responded to this question.

Table 3.2. Responses to Question # 2

Respondent #	Animal Description
1	2 Mammoth Jackstock donkeys, 3 Ramboulet sheep, 23 chickens in 4 flocks, 2 flocks in heritage breeds
2	2 Mules
3	Native mammals, exotic mammals and birds, native and non- native reptiles and amphibians, native and non – native invertebrates
4	3 Morlett crocodiles
5	Snakes, spiders, turtles, fish, lizards, frogs

Question 3: How long has this museum had a living collection?

As Figure 3.4 shows, three participants indicated having a living collection longer than fifteen years. Surprisingly no one indicated having a living collection from ten to fifteen years. Participants may not have known the age of their collection and may have

assumed that if it was older than ten years then it might as well be older than fifteen years. Five participants or 83.3% of the participant pool responded to this question.

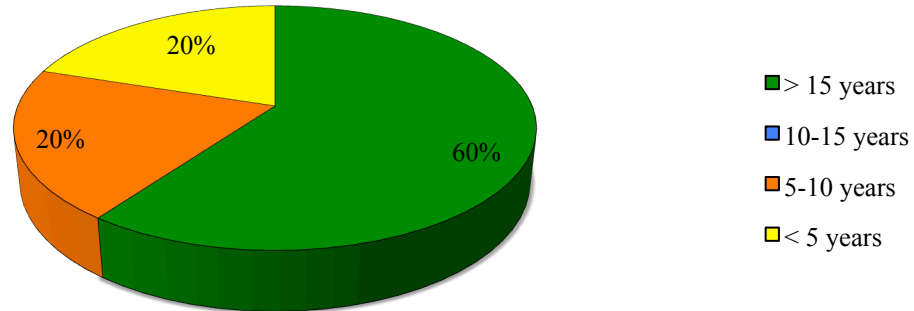


Figure 3.4. Participant Responses for Question #1

Question 4: How many staff members take care of the living collection?

Eighty-seven percent or three respondents to this question indicated that only one person took care of the animals. One respondent noted that more than five people took care of the animals which is indicated in Table 3.3. Participants were also allowed to comment further about staff members who cared for the living collection.

Table 3.3. Comments Section from Question # 4

Respondent #	Comments
1	"We have a wagon master who provides primary care assisted by maintenance or other personnel when a job takes 2 people. All staff members may be called upon to feed, and I, the curator often do so when the wagon master has a day off."
2	"One member assigned; others assist with pen cleaning, etc., when necessary"
3	"One full time curator, 4 part – time keepers, 30 + volunteers"
4	"I can't answer question 3 because I do not know the institutional history of the live animal/program use."

The first three participants mentioned that they have one staff member dedicated to feeding the animals; however, these same participants also mentioned that others cared for the living collection. Providing adequate care of a living collection affects museums regardless of size. Participant number three indicated that the museum employs one full-time curator, four part-time keepers, and thirty or more volunteers.

Question 5: Are you the primary caretaker of the living collection?

Most museums employ one staff member to provide care for the animals; however, most museums must rely on the help of other staff members to care for the living collections.

Question 6: If you are the primary caretaker, do you have responsibilities other than the care of the animals?

Question 7: If you answered yes to the question above, please explain those responsibilities below...

Question 8: If you answered yes to question #6, please indicate the department that you work in.

Two participants noted that they had other duties. Living collections require complex daily care for survival. When museum staff who are responsible for the care of living collections have other responsibilities, care of the living animals may be compromised. One participant answered, "I am the site director, so I have lots of duties! The staff member assigned to the care for the mules also does interp [sic] work and other duties as required." The other participant noted they had responsibility for "all management of support staff, volunteers, and inventory control, [and] interpretation." Museum staff members are faced everyday with challenges including caring for a collection that requires care daily.

Table 3.4. Responses to Question # 8

Respondent #	Department Indicated
1	“As noted I am the site director, the mule fellow is assigned within our interp section. We are large site (24 buildings/ 40 acres) with a modest staff (11 FT and 2 PT).”
2	“Natural Sciences”
3	“I am the Museum Director”

Question 9: If no, who is the primary caretaker and what department do they work in? What is their contact info?

Everyone who responded to the survey answered this question (See Table 3.8).

All of the participants answered this question or 100%.

Table 3.5. Responses to Question # 9

Respondent #	Response
1	“Our wagon master works for the education department as a history educator about the animals. He also works for the curatorial department as our historic preservation carpenter.”
2	“See above.”
3	“The Natural Science Curator (myself) oversees all aspects of acquiring and maintaining the entire collection.”
4	“We have our crocodiles as a partnership with a local business, Snake Farm and Animal World. They come every 10 days to clean the tank, and our staff is responsible for feeding the crocs three times a week as well as light cleaning.”
5	...
6	...

Question 10: Does your museum offer educational programs involving the use of the living collection?

Four participants or 80% of the participant pool stated that the museum offered educational programming involving its living collection. One participant stated that the museum did not have educational programming and one participant skipped this question.

Question 11: If you answered no to the question above, please explain why?

Three participants or 50% answered this question. Live animal programming at a museum can become a challenge due to the daily care animals require. Thus, many museums have found creative ways to use their living collection. According to Table 3.6, outsourcing living collections has become popular. The idea that one museum relies on another museum for their living collection to help with the recipient museum's programming. This can be beneficial to the museum receiving the living collection because they no longer have to devote the resources to caring for the living collection.

Table 3.6. Responses to Question # 11

Respondent #	Response
1	"The goal for the mules is to have them pull our military wagons. They also serve as a popular 'living history' display in our Living History Stables. We also run pre-school age children through the facility in the summer."
2	"The Outreach Coordinator for Snake Farm and Animal World comes to our Museum every other week to do a program on reptiles."
3	"We had trouble maintaining the collection. The primary care went to one person that didn't use the animals for programs. It was becoming a problem to properly care for the animals during holiday and vacation breaks, so this year we returned the care of the animals to ..., and if we want to use animals for programs, he will loan them to use. This does not happen with great frequency - maybe once or twice a month."

Question 12: If you answered “yes” to question #10, how would you rate the popularity with visitors of those programs listed above?

Participants were asked to answer this question on a scale from 1 to 5, 1 being well-liked and well-attended and 5 being not liked and not well attended. Three participants, or 60% of respondents answered that their educational programming was well-liked and well-attended. Two participants or 40% of respondents answered that their programming was well-liked and somewhat attended.

Question 13: What do you think are the advantages of having a living collection?

Question 14: What do you think are the disadvantages of having a living collection?

It is clear from the data in Table 3.7 that staff members have noticed an engagement between living collections and visitors at museums but this comes at a cost both in dollars and in resources. Museum professionals understand the impact living collections can have on their visitors. Many of the benefits noted below stem from actual interaction with the animals. Respondent number five indicated that live animals provide the opportunity for visitors to use their five senses while learning about their adaptations. Respondent number four indicated that kids love to look at the animals. Although staff members notice the engagement between living collections and visitors they are also aware of the resources these animals require. The time it takes to maintain the collection and the costs to guarantee proper maintenance pose significant challenges for any museum. Understanding the amount of time living collections require is important to understanding the affect a living collection can have on a museum. Each respondent below answered both questions, thus, each answer can be compared to the corresponding respondent number. Therefore, looking the tables this way it is easy to see that each

understands the costs of a living collection. Staff members need to be able to understand the costs and benefits of having a living collection. It becomes clear then that a balance must be set and it must be dependent upon the museum's own resources.

Table 3.7. Responses to Question # 13

Respondent #	Advantages Noted
1	"Visitors love them, our farmstead area and frontier and circa 1900 homes would not look complete without them, they serve as ambassadors and provide the best photo opportunities at every event."
2	"Animals (horses and mules) were a vital part of any army fort, and to interpret that effectively, we made the decision to have such a program. We also have a volunteer cavalry unit, and members provide their own animals. Our Living History Stables have hosted other events that the public has enjoyed, including the National Cavalry Competition in 2010 and two visits by the Budweiser Clydesdale Horses."
3	"Making emotional connections between humans and the other living creatures that fosters a more caring, proactive conservation effort."
4	"We are a children's museum, and kids love to look at live animals. Also, it is a rare opportunity for anyone to see a live crocodile up close."
5	"I think the advantages are numerous - it makes a big impact when visitors are able to see, hear, smell, and touch an organism while learning about their amazing adaptations. The problem is maintenance."
6	"As a nature and science museum they are great for illustrating animal adaptations, characteristics, etc."

As mentioned above the advantages to having a living collection can be numerous. The most visible advantage looking at Table 3.7 is the human-animal connection that staff members mention. However, just as there are advantages to the

living collection there are also disadvantages. Table 3.8 lists the responses to question # 14, which ask staff members what are the disadvantages to having a living collection.

Table 3.8. Responses to Question # 14

Respondent #	Disadvantages Noted
1	"They are costly for food, and even more so for vet care. They need care every day no matter what happens with weather and human vacations, and that can be hard with our small staff. Though located in a large city, we still battle threats to our small animals from stray dogs, racoons, and foxes. Because we take such good care of them and never send to slaughter, we have to deal with the health needs of geriatric animals."
2	"Cost, staff time, and the eventual misinterpretation by the public about animals being "penned up."
3	"Cost and time factors."
4	"Cleaning and maintenance, especially if the collection involves a lot of water."
5	"Maintenance responsibilities!!!!"
6	"I think they sometimes detract from the rest of the museum. Visitors come to see the live animals and are disappointed with what we have, when they should have gone to the zoo. As Collections Manager and the person in charge of pest control for the museum, I am not a fan of live animals in the museum."

Question 15: May I contact you for an interview?

All 6 participants or 100% of the respondents answered this question. Out of twenty-five contacts, I received a total of 6 responses. The lack of responses can be contributed to four factors. First, museum professionals often have multiple responsibilities. Staff members may have not had the time to answer the survey. Second, surveys were sent out to more than one staff member at some institutions, thus staff members may have worked together to complete the survey. These staff members may

have decided to answer the survey together. Third, follow-up phone calls revealed that several potential participants had forgotten about the survey. Fourth, distribution of the survey did not happen until November. The survey may have been overlooked or missed during the busy holiday season.

The surveys were a valuable component to my research because I was able to develop a basic understanding of living collections. Each museum that responded to the survey had a unique perspective to offer about their living collection. However, these surveys only covered the basic information. Initially, I had planned to follow the surveys by interviewing willing survey participants. By the time I sent out the surveys however, I decided to target specific individuals for my interviews and use these interviews as the basis for three case studies, focusing on every aspect of the living collection.

CHAPTER FOUR

Case Studies

Introduction

The second part of my research consisted of case studies that I developed from interviewing staff members at three museums. The Mayborn Museum Complex and the Fort Worth Museum of Science and History each have living collections; however, each institution uses their collection in different ways. My third case study, Cameron Park Zoo, is an institution traditionally associated with living collections.

My initial plan was to interview a select few of participants who answered the survey. By the time I had sent out the survey I realized that it was too late to request an interview. Thus, I began contacting museums to see if I could interview their staff members. Many of the museums I had contacted were already on my list for potential survey participants, but none of them answered the survey. Museum staff members were very receptive to the interviews. I interviewed 7 staff members from the 3 institutions. The information obtained in these interviews was invaluable even if they did not answer the survey. Although structured, the interviews became more of an open, guided conversation allowing for a greater amount of detail about the living collection to be obtained. I met each interviewee at their respective museum for the interview and this contributed greatly to my research. This was helpful for me because I was able to see their living collection and the environment in which it lives.

Mayborn Museum Complex

Institutional Sketch

The Mayborn Museum Complex located in Waco, Texas combines a natural history museum, an historic village, and a children's discovery center. The museum has a long history dating back to 1893 when the Baylor Museum was established and O.C. Charlton was named the first curator. In 1903 John K. Strecker became the new curator of the museum and held the position until his death in 1933. Subsequently, in 1940 the museum would be renamed in his honor. During this time, the museum was located in the basement of the Carroll Science Hall on the campus of Baylor University. It is believed that in the late 1950s to early 1960s the first living collection was established in the basement of the Carroll Science Hall. According to Anita Benedict, Collections Manager at the Mayborn Museum, previous living collections were controlled by the collections staff. However, the entire museum staff shared educational and cleaning responsibilities. In 1968 the John K. Strecker Museum moved to the Sid Richardson Science Building also on the Baylor campus. In 1983 the John K. Strecker Museum assumed responsibility for the operation of the Youth Cultural Center, later renamed the Ollie Mae Moen Discovery Center located in downtown Waco. Visitation to this location was predominately school groups unlike the general visitor attendance the museum receives today. In 2004, the Strecker Museum and the Ollie Mae Moen Discovery Center were combined into the Sue and Frank Mayborn Natural Science and Cultural History Museum Complex. The Harry and Anna Jeanes Discovery Center is the centerpiece of the Mayborn Complex. It is in this location that the current museum now resides. The museum receives slightly more than 100,000 visitors a year and those who visit can

explore a wide variety of exhibits. The museum is located on the Baylor campus in Waco, Texas between the Sheila and Walter Umphrey Law Center and the Alwin O. and Dorothy Highers Athletic Complex.

Scope of the Collection

The Mayborn Museum Complex houses many different collections. The collecting scope includes areas in history, bioscience, geoscience, and Baylor history. The living collections are exhibited in the discovery rooms in the museum. The animals are divided into two themed rooms: the vertebrate room and the invertebrate room. The vertebrate room houses all the animals in the collection with backbones with the exception of the fish, which are housed in the invertebrate room. The invertebrate room houses all the animals that do not have backbones. Currently, the museum houses 30 animals all of which are displayed in the discovery rooms.

Education and Programming

The living collection can be found in the discovery rooms of the museum, which are overseen by the education department. The education department is responsible for the discovery rooms, but they are not responsible for the well being of the animals inside the rooms. When animals are used for programming, they are not taken out of their habitats. Instead, the programs take place in each room where the live animals are located and the educators let students observe models and touch objects related to the animals. The students are allowed to walk around and observe the animals, but the animals remain in their habitat.

Before the Mayborn Museum moved into its current location, the museum did offer hands-on programming. The programs were taught by one or two staff members depending on the size of the school group. Staff members would introduce each animal being used in the program and would allow children to touch the animal once the lesson was complete. The students were to sit in a circle close together and on occasion the staff member would let the animal run around in the “circle.” On occasion, the museum would open a lid to a cage and let visitors touch an animal.

Hands-on programming ceased once the museum was moved into the current location. This decision can be attributed to two factors. First, visitor attendance greatly increased after the museum moved into its new location. As Dr. Ellie Caston, director of the Mayborn, mentioned in her interview, “...the animals began to show signs of stress, from the noise, from the visitors picking them up and touching them...”(See Appendix C). Before the move, the museum received about 30,000 visitors annually; after the move attendance more than tripled with nearly 100,000 visitors annually. This is significant because the museum, at both locations, did not have extra animals to place in a separate storage facility. Every animal in the museum collection was on the exhibit floor. Furthermore, as visitor attendance increased so did the number of visitors that wanted to handle the animals, which caused additional stress to the animals.

The second factor why hands-on programming stopped was the number of staff members that were involved with the living collection. Before the move into the new location, any staff member that knew how to handle the animals was allowed to handle them. During this time there were only a few staff members so the amount of people involved with the animals was insufficient to cause any harm to the animals. When the

move was made into the new building, the staff size began to increase in order to accommodate increasing numbers of visitors. The increase in staff size led to problems in handling the living collection because now the animals were being handled by a lot of staff members and not everyone was properly trained on how to handle the animals. In addition to the increase in handlers, the increased foot-traffic the living collection rooms received caused more stress to the animals. When I asked Lesa Bush, Assistant Director of Visitor Services at the Mayborn Museum about the decision to cut one of their most successful programs she was hesitant. Mrs. Bush said about the decision, “You know it was very scary, not only was it very scary you felt you were shooting yourself in the foot. ‘Why would I cut a really good program?’ But we have so many programs and so many people that come through and what typically happens is you start to do programming and you become known for it and people are used to that.” Ultimately, it was decided that all hands-on programming with the living collection would cease because the animals were becoming too stressed.

Since that time the Mayborn Museum Complex has developed a program that allows school groups to look at the animals but not to touch them. Children are instead given the opportunity to touch animal objects like feathers and turtle shells. Children are also able to look at anatomical specimens of animals similar in type to the ones in the discovery rooms. All programming with the living collection focuses on two classes of animal: vertebrates and invertebrates. For example, if a program is being taught in the Vertebrate Room all the live animals and animal objects in that room are used to help the students learn about vertebrates. Students are first instructed to sit down in front of the animal objects inside the respective room. Students are then taught about unique

characteristics of the animals being housed in that particular room (vertebrates or invertebrates). Once the lesson is complete, students are allowed to walk around and observe the live animals in the room. Students are not allowed to pick up, handle, or touch the animals.

Despite not allowing visitors to touch the live animals, the program is still very successful. In large part I believe this has to do with the diversity of programming the Mayborn Museum provides. The Mayborn Museum is a large museum and can accommodate many different exhibits and programs for children. I believe this is to the advantage of the Mayborn Museum because they are able to make up for the lack of hands-on programming with the animals by allowing for similar hands-on programming in other subject areas in the museum. Despite the hands-off policy Dr. Caston, director of the Mayborn, maintains that the vertebrate and invertebrate rooms are the most popular of all the rooms in the Mayborn Museum, which suggests that hands-on programming is not required for successful programs with live animals.

Care of the Living Collection

Care of the living collection now falls under the collections department. Prior to 2004, when the Mayborn Museum moved into its new location, care was given by the education department. As mentioned above the living collection back then was frequently used for programming and so the same staff that taught the programming was also responsible for care of the animals. This model of care worked well until the living collection was moved into the new building and more staff members were hired in the education department. When asked about the transfer of care, Dr. Caston said, “it was hard to modify the amount of hands touching the animals. So that is when we decided to

actually treat the animals like part of the collection and so we moved control of the animals and care of the animals moved away from the education department into the facilities department and under collections” (See Appendix C). Lesa Bush, the Mayborn’s Assistant Director of Visitor Experience, commented that since the transfer the level of care the animals receive has gone up. Mrs. Bush claims that this is because collections personnel could devote their whole time to animal care because that is a fundamental part of their job and that in itself makes a big difference in the way the animals were kept. The increase in staff size ultimately led to the care of the animals being transferred into the collections department and ultimately all lids were closed to the habitats and animal handling was restricted to just those responsible for care.

Soon after care had been transferred into the collections department, the museum decided to hire one full-time staff member whose responsibility was the care of the living collection. The staff member had been trained to work with animals and had a college degree. She was able to inform other staff members about correct habitats, correct lighting, correct temperatures, things that staff members needed to know but did not previously know. Besides care of the living collection, this staff member also built animal habitats and taught several programs with animals in her hands. Hands-on programming had ceased at this time, but animals were still taken out of their cages and used as visual aids. This one staff member was the only staff member allowed to take the animals out of their cages. After this staff member left the museum, the museum has employed numerous student workers to care for the living collection. Usually one student is responsible for feeding the animals during the week and another takes care of feeding the animals on weekends. I have personal experience with feeding the animals

on weekdays as this was my first job during my graduate studies at Baylor University. While care was adequate during this time none of us really had any professional experience handling live animals except for the occasional pets. After my departure the museum hired one part-time staff member who works weekdays assisted by another student worker who works on weekends. Like the previous full-time staff member this part-time staff member is trained to handle live animals.

Since living collections require care even on holidays when the museum is not open, at least one staff member will need to come in to feed the animals. On these days animal care responsibilities are typically passed to the collections manager or facilities manager at the Mayborn Museum. Since both staff members live near Waco it is easier for them to come in and take care of the animals. Furthermore, on holidays the animals must be fed, this means having someone who not only knows how to deactivate the building alarm but also someone who lives in the area.

Care of the animals is provided in the rooms where the animals are exhibited. The staff member in charge of care will feed, water, and clean habitats often times in view of the public. Feeding the animals in view of the public is not accidental; in fact the museum recognizes the importance of having a staff member caring for animals in front of visitors. This way the staff member is able to answer any questions the visitors may have about any of the animals in the collection. Food preparation, habitat building, and care of sick animals all take place in a separate storage area located elsewhere in the museum. Each day the animal care person makes the necessary preparations before wheeling out all food and cleaning items on a cart onto the museum floor where the live animals are displayed.

With the care of the living collection being provided by the collections department and with hands-on programming being stopped, the museum staff is confident that the animals are receiving the best care possible.

Animal Acquisition

Animal acquisition policies over the years have changed at the Mayborn Museum. When the living collections were at the Ollie Mae Moen Discovery Center located in downtown Waco, Texas, live animals were primarily acquired by donation from the public. Initially there were not any precautions about quarantine animals as many of the animals acquired were thought of as little pets with special needs. However, towards the end of their time at the Discovery Center these donations were more closely monitored and the staff decided that animals did have to come from a trusted source such as a breeder or donor. After the move into the current location, the museum began restricting donations to its living collections. All of the animals currently part of the living collection at the Mayborn Museum have all been acquired from trusted sources and no donations are currently being accepted from the public. Most of the animals that are acquired from trusted sources come with paperwork about the animal such as medical history, special needs, and birth date. All of this documentation is found in a binder organized with all the other animals information. Although the Mayborn maintains a strict set of policies regarding animal acquisition, these policies are not written down. Collections manager Anita Benedict is in the process of drafting a policy for animal acquisition.

Animals on the Living History Farm

The Mayborn Museum used to have animals living in its historic village located behind the museum. Animals in the historic village included both chickens and sheep. Chickens require a special place to live, but in an historic village that required building a period-correct habitat. The challenge here was that predators might be able to get to the chickens. Another challenge pertained to the eggs: what do you do with the eggs when they are laid? Sheep also posed a different set of challenges. Sheep needed to be sheared so that they can grow new wool coats. It was also necessary to keep sheep away from predators. Currently the Mayborn Museum does not have any animals living in the historic village. When asked if they would ever bring them back, collections manager Anita Benedict said that there were not any plans in the near future to add animals to the village. She said, “A living history place that is a farm or something like that, where you have full-time personnel they can do that sort of thing. You can’t do hooved animals just kind of on a whim, there is a lot more veterinary care, you have to do with their hooves, they need to be brushed, there is just a lot more maintenance (See Appendix E).”

Animals living on historic sites or farms make up a different kind of living collection because animals that live in such a setting have different needs in that care for them is slightly different than the animals being housed inside the museum. Staff members involved with the care of animals on historic houses or villages need to pay special attention to the security of the animals as some animals are left outside all day and night. Other potential concerns are animals like sheep, which will need to be sheared so that they can grow a new coat for the upcoming winter. Another issue that needs to be addressed with historic houses and villages is the care of pregnant animals.

Future of the Living Collection

The Mayborn Museum will always have a living collection. According to director Dr. Ellie Caston there are no plans to stop such a collection. She notes that the living collection enjoys immense popularity from visitors and for that reason there are no plans to phase the collection out. When asked about the possibility of bringing back hands-on programming Mrs. Lesa Bush claims that someday it may be a possibility but as for now there are no current plans.

The Mayborn Museum currently has 40 animals in its collection, all of which are displayed on the exhibit floor. Currently, there are no plans to acquire any more animals. The Mayborn Museum has to have at least two people staffed to the living collection (one on weekdays and one on weekends). If more animals were acquired then they would need additional staff members to help with care. Instead of acquiring additional animals, the Mayborn is looking to increase its diversity of animals. For example, one animal the Mayborn is looking to acquire is a chameleon. This animal would replace the iguana, which was removed from the exhibit floor and given to an anonymous recipient. While the new animal would provide some animal diversity, the chameleon was chosen primarily because it is a good display animal. Certain animals are better suited to display in a museum because of the way they live. An animal which is moving or is out in the open brings with it more educational value than an animal which is immobile and in hiding. More active animals fit perfectly with the Mayborn's model of display where all the animals are displayed on the museum floor and are able to educate visitors even if visitors cannot touch them.

Conclusions/Observations

The Mayborn Museum Complex has undergone many changes with their living collection. The Mayborn Museum has and continues to professionally maintain and care for a living collection. There are two staff members at the Mayborn who oversee the care of the living collection. This museum is a large museum and its living collection houses enough animals to keep its staff members busy but not exhausted. All of the animals are displayed on the museum floor. Duplicate animals are not kept in the back storage area in case one animal gets sick. Although hands-on programming has ceased, visitors still find the living collection enjoyable and programming still continues in the discovery rooms that house the living collection. The living collection at the Mayborn Museum provides an excellent example of a display model that emphasizes full animal display.

Fort Worth Museum of Science and History

Institutional Sketch

The Fort Worth Museum of Science and History is located in Fort Worth, Texas. The museum first began as the Fort Worth's Children's Museum receiving its charter on May 21, 1941 from the State of Texas. Although the museum had a charter it did not have a physical home until 1945 when the museum found a home in a local elementary school. After moving to a new location in 1947, the museum grew in size due to its immense popularity with the community. On January 25, 1954 the museum opened the building at its current location. The following year the museum opened the Charlie Mary Noble Planetarium, the first public planetarium in the Southwest. In 1968, the Museum changed its name to the Fort Worth Museum of Science and History so adults without

children would come and enjoy the museum. In 1983, the museum added the Omni Theatre one of the first to be installed in the Southwest and today one of the most successful in the world. In May 2006 the museum unveiled plans for major renovation and in May of 2007 started construction of a new facility. This facility has since been completed. Museum attendance is more than one million annually and continues to grow each year. Many of these visitors are families but more than half of the visitors visiting the museum are adults without children. The Fort Worth Museum of Science and History “is dedicated to lifelong learning and anchored by our rich collections, the Fort Worth Museum of Science and History engages our diverse community through creative, vibrant programs and exhibits interpreting science and the stories of Texas and the Southwest.”²⁹

Scope of the Collection

The museum houses more than 175,000 artifacts both historical and scientific with an emphasis on Texas and the Southwest. It is believed by many staff members that live animals have always been a part of the museum since its beginning in the early 1940s but the actual date the live collection began is unclear. The living collection has grown since its creation and now contains 108 species of animals. The museum houses a collection of 20,000 specimens that duplicate specimens in the museum’s permanent collection. These items are used for hands-on activities and are loaned out to schools on occasion.

²⁹ Fort Worth Museum of Science and History, “A Leader in Informal Science Education,” Fort Worth Museum of Science and History, <http://www.fwmuseum.org/about-us-history> (accessed January 12, 2011).

Education and Programming

The live animal collection at the Fort Worth Museum of Science and History is used extensively for programming. There are currently two types of programs at the museum. The first is Museum School, which caters to 3, 4, and 5 year olds and is taught at the museum. The second program is the distance learning program which uses a virtual classroom to teach school children who live in different countries about nature.

Museum School. Museum School is a year-long program that caters to 3, 4 and 5 year olds. Classes are held for each age group in the classrooms located in the museum. Each child who signs up for museum school receives one day of the week on which they are to show up for one class, which is approximately two hours long. There are two classes held each day and there is a different topic for each age group. Three year olds typically learn about one animal each week, four year olds learn about a group of animals each week, and five year olds learn about conservation and the environment. Each day the children will split up into their age groups by going to their respective classroom. There are three classrooms located within the museum that are designed specifically for the three age groups.

The live animals that are used in the program are documented on a spreadsheet (See Appendix J). The animals that are used are divided on the spreadsheet by age group and class time. The live animals that are used in the program that day are chosen primarily by the teacher with help from live animal biologist Susan Hammack. Before each program begins Hammack prepares each of the animals, placing each one in a separate non-breakable habitat. The animals are then taken out of the storage facility and transported into the classroom by cart. Some of the animals are too big to placed on a

cart; in this case the animals are taken to another classroom and the kids are taken to the animal. Students are allowed to touch the animals during the lesson. Museum staff members emphasize the “two finger rule.” Students are to sit in a circle and when they are allowed to touch the animal they can use two fingers. Once programming is completed the animals are transported back to the storage facility. There are some animals that can be found in the classrooms already. These animals such as baby chicks and fish will stay in the classrooms and will not be taken back to the storage room unless one of them is sick.

Distance-learning program. The second program taught at the museum that uses live animals is the distance-learning program. This program is taught inside a virtual classroom where live video-streaming takes place between the museum educator and the classroom. The distance-learning program is primarily taught by Leishawn Spotted Bear, the Assistant Curator of Science. The program uses live animals to show classrooms located in different countries the native species of the southwestern United States. Programs typically last from one to two hours. The room where the program takes place is located in front of and to the right of the Children’s Museum. Live animals used in the distance-learning program are prepared the same way as they are for Museum School. The animals are placed in a movable habitat and wheeled in before the class begins, and are used throughout the lesson. Once the lesson is complete the animals are wheeled back to the storage facility.

The live animal programming at the Fort Worth Museum of Science and History is available only for children and school groups. The museum does have one small display of animals on the museum floor, but it is located within the Children’s Museum

and contains six to nine different types of animals. These animals are not used in programming and operate only as display animals for the walkthrough patrons of the museum. Furthermore, the only way to view the animals in the storage facility is to be involved either in Museum School or in the distance-learning program.

Care of the Living Collection

The animals are placed under the care of the collections department, a department that Dr. Aaron Pan heads as the Curator of Science. The department employs one full-time staff member to handle care of the animals. Susan Hammack, a live animal biologist, oversees the care of all 108 species of animal in the museum. She receives additional help from Mrs. Leishawn Spotted Bear and a few volunteers. Like the Mayborn Museum care is provided to the animal based on a particular animal's needs. For example, each animal has a feeding schedule that Susan maintains and she knows which animals get fed on which days. Unlike the Mayborn Museum care for the animals is given behind closed doors in the separate storage facility. This facility is not open to the public. Since the animals are kept in a separate storage facility, the animals receive very little stress. The Fort Worth Museum does have multiple animals, which helps when that particular animal is chosen for a program. When the animals are wheeled out into the classrooms each day they are typically accompanied by the same species so the animal will not be alone and animals can be traded off during each session.

The storage facility can be found adjacent to the room where Museum School takes place. The location of the storage facility is ideal for programming because the classrooms are close to the facility. Before the museum underwent its renovation, the animals were located on the opposite side of the building from the classrooms making

animal transport to the classrooms difficult. The storage facility is accessible only to authorized museum staff members. The only animals that are displayed on museum floor are those found in the Fort Worth Children's Museum located within the Fort Worth Museum of Science and History.

Animal Acquisition

The Fort Worth Museum of Science accepts animals for the collection only from licensed rehabbers or dealers. Many of the live animals in the museum's collection are animals that have been rehabilitated for various reasons. These animals require humans to survive which makes them ideal for museums. Some of the animals in this living collection do not fit the typical "pet" model like those of the Mayborn Museum. For example, animals such as prairie dogs, an alligator, a raccoon, a barn owl, and a screech owl are just a few of the animals in this collection that are uncommon in typical living collections.

Future of the Living Collection

The Fort Worth Museum of Science and History has no plans to stop their collection of live animals. All the staff members whom I interviewed agreed that the live animals add something special to the museum's collections. The museum recently laid off staff members due to budget cuts, but none of the staff members who work with living collection were affected by these budget cuts. The museum currently has 108 species of animals in their collection and given their staff size that is enough to keep them busy for years to come. The storage facility where the live animals are kept is already full and the museum would need additional space if it were to acquire any more animals.

Furthermore, the museum's living collection appears to be operating at its full potential and while there are no signs of expanding the size of the living collection there are also no signs of stopping it either.

Conclusions/Observations

The living collection at the Fort Worth Museum of Science and History represents one of the best examples of how to use a living collection. Their "model" calls for restricting hands-on access to programming. When programming is complete the animals are transported back to their habitats in a storage area away from visitors. With this model stress to the animal is minimized, which makes for easier handling during programs. The only disadvantage with such a model is that the only visitors who get to see the animals are those involved in the Museum School and distance-learning programs. No other visitors get to see the animals except these two constituencies. There are some interesting animals in this collection and multiples exist of certain animals, so there is the potential for the additional animals to be used for things other than programs. The Fort Worth Museum of Science and History maintains a model that is both effective and beneficial to visitors and animals and many museums like the Mayborn Museum have taken notice.

Cameron Park Zoo

Institutional Sketch

The Cameron Park Zoo is 52-acre zoo located in Waco, Texas. It was originally established in 1955 as the Central Texas Zoological Park by wildlife enthusiasts who wanted to create an area for education and entertainment. In 1981, the zoo launched

plans for expansion into 52 acres of Cameron Park. In 1989 the zoo began construction and soon thereafter the old zoo closed. The new zoo officially opened to visitors on July 18, 1993.

Scope of the Collection

The zoo houses animals from North and South America as well as Africa, Asia, and Europe. The zoo also contains many animals native to Texas. In 2005 the zoo opened the Brazos River Country, an exhibit that offers a glimpse of different regions of Texas and the animals native to these regions. The inclusion of this exhibit nearly doubled the animal population at the zoo. When the zoo first opened they had 73 animals in their collection; today they have over 3000 animals.

In addition to these animals the zoo also has an education collection. The education collection is a collection of live animals used in the zoo's more intimate programming. The education collection can be found in the Ranch House, a building that is located on zoo grounds and is used only for programming. The building contains the vast majority of the education collection. Additional animals not located here, but still part of the education collection, can be found inside the zoo's offices. Both the zoo offices and the Ranch House are not open for visitor walkthroughs.

Education and Programming

The education department is made up of one full-time staff person, one part-time staff person, and a team of volunteers. The volunteers teach the programs, having been trained to work with the live animals in the education collection. The education

department teaches a variety of programs including an outreach program called Zoo Mobile.

Zoo Mobile is an outreach program that offers local communities a chance to view live animals from the zoo without actually going to the zoo. A zoo educator will drive the animals to the venue and then teach the program participants about the animals the educator brought. When a Zoo Mobile program is scheduled, the participants are asked what kinds of animals they would like to see and how many will be attending. If the program numbers more than thirty-five then participants are not allowed to touch the animals. If the number is less than thirty five then participants are able to touch the animals. The only animals used in the Zoo Mobile program are animals from the education collection.

The other programs are primarily animal presentations that take place on zoo grounds at the Ranch House. Some of these programs include Texas Animals, Reptiles, and Creature Feature. These programs cater to specific needs of the visitors, usually school groups, and every program involves live animal presentations. The zoo also provides more informal presentations with live animals, which are free for visitors. For example, if the zoo gets busy a staff member may stand outside with an animal near the front entrance letting the visitors ask any questions they may have as they pass by. This informal presentation has become more popular with schools, given the recent economic hardship. These informal “show and tells” are a way for school groups to see the animals without paying the price of an actual program. The Cameron Park Zoo does allow program attendees to touch the animals but only if the attendees do not number more than 35.

Programming at the zoo teaches visitors about more than just the specific animal. The zoo tries to incorporate broader concepts such as conservation and preservation of species. These same ideas that are taught with the education collection can also be found throughout the park. Many of the labels around the habitats discuss these topics in detail and how the particular animal is important for our own environment. This is different from the museums discussed in the earlier case studies because their programming is animal specific, discussing topics such as movement, physical traits, and behavior. The Cameron Park Zoo focuses on bigger concepts while still discussing individual animals with their education collection.

In addition to the live animals in the education collection the Cameron Park Zoo also contains objects that are non-living. This collection is housed with the live animals inside the Ranch House. These objects help school groups learn more about some of the bigger animals at the zoo. These objects, for example a lion's mane, and a hair from an elephant's tail, allow school groups to touch the object without touching the actual animal. These objects are often used in front of the habitats that the animal object represents. For example, a lion's mane would be used in front of the lion habitat. The staff member teaching the program will do this to enhance the program and provide a more positive experience for the students.

Educational trends. The educational trend at any zoo has been primarily about conservation. The ultimate goal of many of the educational programs is to teach visitors about the need for conservation and to teach awareness of the environment around them. At the Cameron Park Zoo, I asked Connie Kassner, Education Coordinator at the zoo, if she thinks we are in this movement, she claims museums are but educators have changed

their approach. She says that one has to approach conservation as education through entertainment. The number one reason why parents bring their kids to zoos, according to staff members, is because the zoo is a safe place. The visitors know that there is an entertainment and educational value about the animals. Kassner says that most visitors come to the zoo just for something to do and pass the time. Furthermore, it is important that zoo educators remember this and accept that that is the way visitors will learn about conservation is if they are entertained.

Care of the Living Collection

The care of the education collection falls under the education department. The education department at the zoo employs one full-time staff member and one part-time staff member. The rest of the staff is made up of volunteers. According to staff members, all zoo employees in the education department share feeding duties.

The education collection is housed in the Ranch House on zoo grounds and is kept in a constant state of quarantine off-limits to the public. The main reason for this is these animals travel off zoo grounds to schools and so they need to be away from the viewing public and in a stress-free zone. Traveling is very stressful for the animals because they are entering new environments and seeing new people. Reducing stress for the animals is important because it makes for easier time handling the animal during programming.

Animal Acquisition

Most of the animals that make up the education collection are pets that the public has donated. There are exceptions to this as the collection does contain species native to other countries that the zoo could only acquire from that specific country. Even though

the zoo does accept visitor donations the policies are very strict. Potential donations are carefully researched, each potential donation to the zoo must be approved by the general curator and then the director. Additionally, other policies govern the acquisition of exotic species such as the Australian mammals in the education collection.

The zoo bases their decisions on acquiring animals on three principal criteria. First, will the animal be used in education, or will the animal be on permanent display? The Cameron Park Zoo has essentially two live animal collections, one on permanent display for zoo patrons and one established specifically for educational programming. When the zoo acquires an animal it must be decided how the animal will best serve the public. Certain factors that contribute to this decision are size of the animal and the animal's behavior. Many of the animals in the education collection are docile yet active animals. These qualities make them ideal candidates for the education collection.

The second criteria for acquisition assesses the educational value of the animal possess. As mentioned above, certain animals possess qualities that make them great for the education collection; however, there are also animals that make for better display animals. Animals in the education collection offer distinct comparisons and contrasts with each other, traits that are brought out during programming. The education collection at the Cameron Park Zoo contains birds, mammals, reptiles, and insects. However, the zoo looks further within each category to the specific animal when acquiring animals. The zoo identifies specifics with a particular animal that can aid them in programming, thus deeming the animal has having educational value specific enough for the education collection.

The last criteria for selection assesses whether an animal fits with the zoo's mission, Kassner went on to say that the education collection has been largely built around what the needs are for the various programs that use the living collection.

Future of the Living Collections

Since 1955 the zoo has continued to increase the size of its collection. Although the zoo is small in comparison to other zoos, there is visible diversity of wildlife at the park. The main source of acquisitions in the collection, especially the education collection, has been animals that are rehabilitated, and if this trend continues the Cameron Park Zoo collection will keep growing.

Zoo staff members have received several requests from visitors regarding what animals visitors would like to see at the park. The two most popular are white tigers and polar animals. The Cameron Park Zoo recognizes that they do not have facilities to keep polar animals and that keeping such animals would be very costly especially during the summer months. The zoo cannot keep white tigers for genetic reasons and the need to control the white tiger population.

The zoo is currently looking to build a new education building towards the front of the zoo that will house the education collection in one location and will provide several classrooms within the same building. Currently, educators have to travel from one building to another to teach with the education collection. Once the new education building is complete, the staff in the education department will have easier accessibility to the animals. The new building will also contain all educational materials under one roof. The project has not begun yet, as a new pavilion is currently being built on the zoo

grounds. However once the new pavilion is complete, construction will begin on the education building.

Conclusions/Observations

This case study is unlike those discussed earlier. The Cameron Park Zoo maintains different guidelines in areas such as acquisition and display method. It is because of these and other differences that zoos are labeled distinctly from museums. My interview with Kassner focused primarily on the education collection and I was certainly impressed with the number of animals found in the collection. This collection possesses animals from different continents that are of great benefit for school groups looking to get an up-close interaction with animals not native to this country. This zoo displays animals according to a particular region or ecosystem, which is different than the other museums in these case studies. The Cameron Park Zoo serves as an interesting case study because it is different from other museums in its collecting scope but it shares similarities in other areas such as programming.

CHAPTER FIVE

Recommendations

Living collections are not the typical museum collections for two reasons. First, living collections are composed of living creatures, which require different levels of care than that of non-living objects. It will be necessary that when assigning a staff member or team of staff members to take care of the living collection that the duties be clearly defined and that special care and attention will be necessary. The job description should be written and explained such that the care is given not just to the animals but to their habitats as well. The staff may have to research appropriate habitats and various habitat components if a new animal is desired or acquired; care should also be this dedicated. An important note here is that a staff position created for the sole purpose of animal care may have with it a high rate of turnover. Simply put, an animal care position is not a position that someone stays in for the long-term. Second, because living collections are living creatures programming is also different. Museum professionals need to understand how living collections are different from their other collections before acquiring one. The education collection at Cameron Park Zoo is thought of as a separate and distinct collection. They do this for the well-being and safety of the animals. Moreover, the animals in this collection have different needs than that of the other wildlife. These animals make regular visits to various venues throughout the city of Waco. The same can be applied to museums that have living collections as well. Understanding that the living collection is a separate and distinct collection from other collections will help with care, handling, and treatment. If museums fail to make the distinction, then not enough

resources will be devoted to the living collection and the care of animals will suffer.

Museums looking to bring living collections into their museum need to bring with them the mindset that living collections are distinct and separate collections that require special care.

Once the museum has established the mindset that the living collection is a separate collection, I recommend that focus then shift to three areas of the living collection. The first is the structure of the living collection. Where will the living collection be placed in the museum? In this chapter I discuss three display methods used by my three case studies: the open model, the semi-open model, and the closed model. These models represent only three, this list is by no means exhaustive and many models museums use probably exist as hybrids of the models I discuss below. What is important here is understanding that each model is different and caters to the specific needs of the museum's living collection. It will be necessary to find what model works best for the museum by matching the model with the needs of museum programming and facility space.

Along with considering the structure, the prospective museum will need to consider how it will acquire its animals and develop a collections policy that takes note of such reasoning. The Mayborn Museum Complex, the Fort Worth Museum of Science and History, and the Cameron Park Zoo acquire animals from trusted sources only rarely accepting donations from the general public. The Mayborn Museum Complex works closely with the Cameron Park Zoo for possible acquisitions, which works well if one or the other has an animal they would like to acquire. Additionally, museums need a firm collections policy. Writing a collections policy for museum collections is standard for

non-living objects however the same procedures that apply for non-living objects need to be applied to collections of living animals. It is imperative that museums possess a collections policy on how to treat, acquire, and maintain a living collection. As mentioned before the living collection needs to be thought of as a different collection, as such a different collections policy needs to be established. All three case studies stated that they do not have a collections policy for their collections; however, each institution did say that a policy was being developed.

The third and final area that prospective museums should consider is resources. Does the museum have the resources to care for the living collection? In other words, does the museum have the staff, money, and time to properly care for the collection? Lack of resources is a big reason why many museums decide to deaccession their living collection. In my research I encountered 5 museums that no longer have living collections. Their reasons varied, but what was common amongst all of them was that when they no longer had the resources to adequately care for the animals they deaccessioned them. Each case study discussed in this text all contain living collections because they are able to provide for them, and they are reaping the benefits of having one. Living collections can be great additions to any museum looking to explore nature, but the museum must have the proper resources to care for the animals. In this chapter I focus on three areas of living collections: display models, acquisitions, and resources.

Three Types of Display Models

The display of living collections is directly related to the needs of each individual museum. Through my research I observed three different types of display models for living collections. These display models will use an approach similar to the work of

Stephen C. Bostock in his book *Zoos and Animal Rights: The Ethics of Keeping Animals*.

The models Bostock discusses are the natural, semi-naturalistic, enriched semi-naturalistic, enriched non-naturalistic, and fully naturalistic models.¹ There are 6 ways to keep animals: natural, semi-naturalistic, enriched semi-naturalistic, enriched non-naturalistic, and fully naturalistic. Each way is different but there is often an overlap as to what each one provides to the animal. The natural enclosure can be found in zoos and simulates closely the animal's natural environment with the exception of housing predators in the same environment. Examples of this include things like ponds and deer parks. The semi-naturalistic environment can be found at zoos where the habitat has a lot of similar qualities to the animal's original habitat but lacks in certain areas, mainly size and space. Enriched semi-naturalistic environments keep with the same arrangements as the semi naturalistic only this time there are additions that make for a well-rounded habitat. The difference between the two depends on what animal is being housed in the habitat. Some animals need only shelter and water and they can create the rest for themselves; other animals instead need additional enrichment such as swings or things found in the animals particular habitat like termite mounds in the case of chimpanzees. The best example of an enriched non-naturalistic environment is that of pigpens. The fully naturalistic enclosure is what is commonly found in places like wildlife refuges where the animal is free to roam simulating a complete natural environment. The animal may not need a simulated habitat but instead just the basics for survival.

¹ Stephen St. C. Bostock, "The Keeping and Display of Animals," in *Zoos and Animal Rights: The Ethics of Keeping Animals* (New York: Routledge, 1993).

The Mayborn Museum Complex uses the open display model, exhibiting all of the live animal collections in two rooms: the Vertebrate Room and the Invertebrate Room as shown in Figure 5.1. In Figure 5.2, is the Vertebrate Room, dedicated to teaching visitors, primarily children about animals that have backbones. The only animals not included in this room that have backbones are the fish, which are displayed in the Invertebrate Room.

Since the animals are on display all the time, the habitats that the animals are displayed in are more intricate than the other types of display models mentioned in this chapter. The habitats both in the Vertebrate Room and the Invertebrate Room are developed to that particular animal's needs. Details such as these are vital given the fact that the animal will always be on display floor in front of visitors and will need living conditions that make the animal more comfortable. The sometimes, intricate designs of habitats also provide additional educational opportunities for visitors. Visitors may have to look for an animal that may camouflage with his or her surroundings.

The Invertebrate Room is located next to the Vertebrate Room as shown in Figure 5.3. This room houses all animals in the Mayborn Museum's collection that do not have backbones with the exception being the fish. Towards the back of the room, located on the cube in the back are objects the museum uses to teach its programs. Since the visitors are not allowed to touch the animals these objects provide the necessary equivalent to the live animals. Among the objects used are posters, giant replicas of insects, and a special pair of glasses that allow visitors to look at an object like an insect would. The Invertebrate Room also houses a butterfly house, shown in Figure 5.4. In the back of the room and on the back of the butterfly house are the insect habitats visible in Figure 5.5.

The only animals not housed in these two rooms that are found in a separate storage facility are those that are sick or those that are being used as feeder animals.



Figure 5.1. The two rooms housing the living collection at the museum, the first room is the Vertebrate Room and the second room is the Invertebrate Room.



Figure 5.2. The Vertebrate Room at the Mayborn Museum Complex.



Figure 5.3. The Invertebrate Room. On the cube in the background can be found some of the non-living objects used in programming.



Figure 5.4. The butterfly house in the Invertebrate Room located across from the fish tanks in the Invertebrate Room.



Figure 5.5. The invertebrate habitats located behind the butterfly house inside the Invertebrate Room.

Figure 5.6 shows the separate storage facility. Along with being a place for storage this area is also where the food preparation occurs visible in Figure 5.7. This storage area actually shares space with the exhibits department at the Mayborn Museum.



Figure 5.6. Storage facility for the living collection at the Mayborn Museum Complex. On the shelving to the right, the second shelf unit down, inside the Plexiglas container with the cardboard tubes are “feeder” crickets.



Figure 5.7. The animal care station located directly across from the shelving units in the previous picture.

With this model everything is out in the open. Animal behavior can be observed on a constant basis, including feeding and social behaviors. Museums that utilize the open model of display typically feed their animals in view of the public not because the public is there, but rather because it is the time when the animals need to be fed. The open model is a big hit with visitors because it allows visitors to study animal behavior. Studying animal behavior is a big reason why zoos are such a major source of entertainment for families. However, this is also a reason why this model can prove to be difficult, with heavy foot traffic comes high stress levels from the animals. Furthermore, this makes handling the animals a challenge and which is why many museums may limit the amount of hands-on programming that is done with the living collection. Museums that use this model need to be careful and mindful of the behaviors of their living collection. Museums that have light foot traffic through the living collection displays

may find this model helpful and a museum that receives heavier foot traffic may find this model not so helpful. This model can act as its own educational tool without the need for any additional programming. Educational programming using the open model can be challenging especially if the museum limits the hands – on approach. Such museums need to be creative because the educators are not allowing the visitors to touch the animals. The only means of learning with the actual animal take place by just observing the animal. Doug Knapp and Gregory Benton, authors of “*Long term recollections of environmental interpretative program*,” highlight the importance of looking at live animals, but advocate the importance of using animal artifacts in teaching visitors about animals.² The open model of display provides a perfect setup for the use of animal artifacts. The visitor is still touching something tangible and characteristic of a particular animal without touching the actual animal. The open model of display can still be very educational with the use of animal artifacts, preferably of those animals actually housed in the living collection.

Another potential problem with the open model display is the potential for allergens to affect not only your visitors but staff members as well. If hands-on programming is allowed then there is real threat of someone having an allergic attack to any of the animals. This is a problem that I think is often overlooked but it is a very serious one. The open model display can be a very effective method of presenting a living collection but as mentioned above there are risks with such a display.

The Fort Worth Museum of Science and History utilizes a semi-open model. The museum may display animals that they have multiples of or they may display one group

² Doug Knapp and G.M. Benton, “Long-term recollections of an environmental interpretive program,” *Journal of Interpretation Research* 10 (2005): 51-53.

of animals like insects for the public's enjoyment. Typically though, these animals are not a part of the programming, but rather act as those in the open display model mentioned above, see Figures 5.8 and 5.9.



Figure 5.8. The live animal display inside the Childrens Museum at the Fort Worth Museum of Science and History.



Figure 5.9. Another view of the live animal display at the Fort Worth museum, this view is the opposite side of the view in the previous picture.

Museums that use the semi – open model of display typically do so because they utilize hands – on programming. These museums should limit the amount of stress the animals receive during the day allowing for easier handling in programs. This model allows for more educational freedom than the open model because not all of the animals have to come out of the separate storage facility; instead, one can select and choose what animal or animals would best serve the needs of the program. The visitors may not know how many animals the museum has in the backroom, which makes for a more appealing program for children and school groups.

The majority of the museum’s living collection is kept in a separate area of the museum, an area off limits to the public. The museum has 108 different species of animals and all of them with the exception of those displayed in the habitats above are kept in this storage area, different views are provided in Figures 5.10, 5.11, and 5.12.



Figure 5.10. A view of one area of the storage facility housing the museums living collection. Many of the museums collections of mammals reside here.



Figure 5.11. Another area of the storage facility, this area primarily houses reptiles and amphibians.



Figure 5.12. This view of the storage facility you can see the invertebrates being housed all the way in the back. In the tank to the right resides the museum's alligator and in the tank to the left houses the museum's snapping turtle.

The last model of display is the closed model. Museums that practice this model, practice quarantine rules, one can find this model in zoos that have educational collections. Quarantine rules mean that the animals are kept away from other collections in the museum. In this case the animals are kept away from other animals and the zoo and walkthrough visitors. The Cameron Park Zoo uses this model of display for their living collections. Their education living collection is located in the Ranch House located on zoo grounds and is not open to the public except for programming. Figure 5.13 shows an exterior view of the Ranch House while Figures 5.14, 5.15, and 5.16 provide visuals inside the Ranch House. As mentioned in Chapter 4 some animals in the zoos educational collection are in fact exotic species. The zoo has one Kookaburra, a bird native to Australia, in its living collection. Figure 5.16 shows the Kookaburra habitat located in the background.



Figure 5.13. The Ranch House at the Cameron Park Zoo. This building houses the education living collection and is not open to the public.



Figure 5.14. Inside the Ranch House at the Cameron Park Zoo. Notice the habitats along the back wall. These habitats are not open for the general public and are only made available to school groups.



Figure 5.15. Another view of the interior of the Ranch House. Notice the giant tortoise shell and the various other objects that sit atop the animal habitats; these objects are part of the non-living education collection.



Figure 5.16. Another view of the education living collection, the habitat located in the middle (the bigger of the two) houses the Kookaburra, a species native to Australia.

Typically these educational collections are not shown to the public because the museum staff frequently uses these animals in programs. Zoos may have several outreach programs, which require traveling with these animals to a separate facility, oftentimes a school, to give a program. Animals that travel to these locations require special attention because they are traveling to a new and unfamiliar environment, which can be stressful. The closed model helps keep the animals in a stress-free environment as much as possible.

The program, whether on zoo grounds or not, is designed to educate and entertain the public. In my interview with the Education Coordinator Connie Kassner, she mentioned that many of the zoo's programs are taught to change the way people view animals. In her article, "Finding Evidence of Visitor Learning," Lynda Kelly noted that visitors' views about spiders had changed after viewing an exhibit about spiders, often in

a positive way. While this phenomenon can be found in any type of display model mentioned here, the key here is in the presentation. The only time the visitors see the animals is when an educator brings the animal out to the visitor so what the educator says about the animal and the professionalism they present with the animal in hand all contribute to the visitors understanding of that animal. This may not be as easy to spot in other display models where some or all of the collection is presented to the visitors. Although this model may not be the most visitor-friendly due to its quarantined status, this model does ensure the most educational freedom and the health and safety of the animals.

Acquiring Animals

Live animals are acquired for the museum according to the museum's mission. Most museums try to maintain a variety of animals in their collection to cater to a wider range of educational programming. Many times, the museum is limited to what they have based off of what gets donated to the museum. Museums that have living collections may find they receive anonymous donations, and it will be up to the staff to decide to keep the animal or not. If not, the museum staff may decide to give the animal to the local department of animal control. When purchasing animals it is necessary to be sure they are healthy, easy to keep alive, and that they do not have any problems. Some museums try to acquire animals that are better display animals than others. Visitors want to see the animals and are disappointed when an animal is burrowed deep underground or hiding underneath a water bowl. When I asked Dr. Caston about any animals that became bad display animals she claimed the ferret was the worst one. She said about the ferret, "The ferret was about the most worthless display I have ever seen. It was

extremely expensive at the vet, and then he spent all his time under the blanket. So people would spend all this time looking for it and would just see a blanket” (Appendix C).

There are certain animals that are better than others and more suited for display and visitor enjoyment. According to Connie Kassner, the Education Coordinator at the Cameron Park Zoo what animals seem to be the favorites of the visitors she said that it was mostly the animals that were entertaining to watch. Different types of animals provide different types of entertainment. The Mayborn Museum has several amphibian enclosures where you actually have to look for the animals because they are either camouflaged with their surroundings or like to hide. These animals are in contrast to the Mayborn’s other animals in their collection including the rabbit, guinea pig, and turtles to name a few. Museums it seems tend to pick animals that have the most educational impact but also provide entertainment.

Other museums may not need to select animals because they are entertaining to watch, but instead select animals because of their functional role in society or in a previous society. Living history farms and historic villages have living collections that serve a function as part of their museums educational mission albeit historic in meaning. It would not do any good for a historic house to keep an emperor scorpion because this animal does not aide in the historical interpretation this museum is providing its visitors. Animals like mules, chickens, sheep, and goats are the common choices because these are the kinds of animals that aid in historic interpretation. Animals like these had a specialized function or role in their society much like the people living during that time period. Furthermore, the educational role of these animals is somewhat different from their natural history or zoo counterparts. Living history sites educate their visitors with

the animals by showing them the role the animals provided. Sheep, for example would have been sheared before the winter months in order to provide wool for trade and for making garments. Cows and chickens would have been used as food source. As mentioned earlier the other animals in zoos or natural history museums would have been used to educate the public primarily about that specific animal or about the environment or the habitat in which they live.

All of the institutions I researched had some sort of acquisitions policy regarding living collections. Some did not have a written policy but nonetheless had established the protocol for acquiring animals. For example, many museums will receive donations of live animals if the visitors know the museum has a living collection. If the museum, new or old, is looking to start a living collection then the mindset of the staff may be to accept the animals because all they appear to be are pets with special needs. The Mayborn Museum had this mindset for a time but soon realized they needed to change their policies. Dr. Caston, Director of the Mayborn Museum said of one such acquisition, “I think we took that alligator because it was injured, but we had no business doing that and I think you just have to be really careful and do your research. You know vet bills can be expensive too, especially for those animals that have special needs.” Both the Mayborn Museum and the Fort Worth Museum of Science and History will not take donations from the public, instead they accept animals only from licensed providers and trusted sources. The Cameron Park Zoo will take donations; however, approval for the acquisition is needed and this may take weeks or months depending on the animal. In my research it seemed that the acquisitions policies surrounding living collections were not that extensive, save for the zoo. A big reason for this occurrence is because a totally new

acquisitions policy has to be written for this collection. Issues need to be addressed that are not addressed for other museum collections, such as the acceptance by the museum of rehabilitated animals. Another item worthy of note is the various federal government laws regarding the collection of certain live animals; thus, an acquisitions policy for a museum needs to emphasize these laws if not present them as standards.

Although a different collection altogether, living collections do share similarities with their inanimate counterparts. The most significant similarity is documentation. Each animal acquired by the museum needs to have documentation that should be updated on a consistent basis. The information that is noted may be different, but like other museum objects thorough documentation is needed for museum records. A living collection should be documented as any other collection would be in a museum. As an example, the Mayborn Museum Complex still has binders of its past living collections, kept as permanent records, thoroughly documenting when the animal was fed and other information like birth date and species name.

Museum Animals as Pets

One of the many challenges facing museums that have living collections is the idea that the animals are treated like pets. This is true in a sense that most of the animals in a museum could in fact be house-hold pets. Some museums have names of the animals posted on the actual habitat. Museums do this to make the animal seem more like a pet making it easier to teach with during educational programming. Other museums utilize a different approach, either using the scientific name of the animal or the name of the animal instead of a chosen name. Zoos and museums that practice the open display model will typically use this approach to label their animals. Although there may

not be an immediate educational advantage to using this method it may prevent the visitors from thinking of the animals as pets. Thanks in part to videos and other forms of media, visitors, especially children, can come to a museum and have a misguided view of an animal. It is the museum's job to present the animal in unbiased view as much as possible just like they would with any other object in the museum's collection.

No Money, No Living Collection

Living collections just like any collection in a museum require money for their upkeep. During my research I encountered 2 museums who said they had living collections on their website, but do not have them anymore. The primary reason for their "deaccessioning" was they did not have sufficient funds to maintain their collection. Many museums also do not have the staff to dedicate to the living collection. Another reason I encountered in my research was that staff was no longer able to sufficiently take care of the animals given their other responsibilities in the museum. Living collections require commitment they need constant daily care. As Anita Benedict, Collections Manager at the Mayborn Museum said, "One of things is you have to feed them everyday. You know if your collection is non-mammal or non-reptilian based then you may be able to get away with not coming in on Christmas Day." Museums deaccession their living collection when they faced with staff and money shortages. I did notice in my research that those museums that had deaccessioned their living collection had an average of 15 animals. Such a large collection requires considerable time to feed each animal and clean its habitat. It seems that museums understand the benefits of a living collection, but also know that a collection of this type requires special care beyond that of

any regular museum object. If a museum were looking to add a living collection then careful planning and time should be given to accurately make such a decision.

Besides collections policies and laws, the literature regarding collections professionals and their attitudes towards living collections is scarce. In fact, most of what I encountered or read is how zoo professionals feel about their living collection and the benefits the animals provide to the zoo. It is important that a distinction be made between an educational collection at a zoo and one at a museum. One difference is the kinds of animals a zoo collects. A zoo's collection includes exotic species, endangered animals, and animals that require special permits. When asked about the fundamental differences in living collections between zoos and museums Dr. Caston, Director of the Mayborn Museum talked about size of the institution being a big factor, "I think zoos are kind of big places and for little bitty kids it is a lot of stimulus and a lot of distractions. And so I think bringing it down to a smaller size so they can have those experiences and relationships with the animals is key." A zoo does not encounter some of the problems that a museum faces and vice versa. However, there is a general sentiment that both institutions do encounter the same problems and therefore reference to the topic of living collections often falls into zoo literature. Thus, this is a big reason why museum professionals are not able to find a significant quantity of literature on living collections in museums.

CHAPTER SIX

Conclusions

One of my initial goals with this research was to uncover two perspectives regarding living collections in museums: a collections perspective and an education perspective. Instead, what I found was an area of museum professional practice that had yet to be researched thoroughly. Museums need professional resources to help them with the management of their living collections. Unfortunately, the literature regarding living collections is very scarce. So where does that leave museums? Museums will have to continue to search for the literature that best helps them understand their particular living collection.

The living collection needs to be able to fit with the museum's needs and, as the case studies have shown, museums must also be mindful of the time and energy living collections require. All of the professionals interviewed mentioned time as the biggest disadvantage to having a living collection. Even zoos consider time to be a significant difficulty in caring for living collections. In speaking with staff members at the various institutions it became apparent that the museum has to want to have a living collection. Many of the staff members I interviewed talked extensively about the time required to take care of the living collection. One thing all of the interviewees agreed on was that living collections are able to engage visitors for significant amounts of time. The popularity of living collections with visitors cannot be underestimated. Furthermore, the animals do not have to be handled for their engaging power to be effective. All of the museum professionals interviewed recognized the benefits that it brings to both the

education and entertainment of visitors and believed such a collection was essential to their museum's core mission.

Each institution highlighted in the case studies one practiced a different model of display; each using the model that best suited that particular museum's needs. All of the staff members I interviewed indicated that their living collection greatly influenced programming at their museum. The size of the collection, what animals were acquired, and how they were displayed fit these educational models of museums. Each museum featured programs that were specific to the animals in the collection. Some museums designed programs to feature specific animals in their collection, while others taught programs using a group of animals. Living collections should be a reflection of the educational needs of the museum.

Suggestions for Future Research

I recommend for future research that more surveys and interviews be collected and conducted. I had sent out 20 surveys and got back half of those with responses. However, half of those that responded said that no longer had living collections. I had better luck with the interviews, but I was no longer able to make the broad generalizations that I had intended to make earlier. Responses to surveys can be difficult to obtain and response rates of surveys are typically less than 50%. My particular survey was an online survey. I sent my participants a link that they could click on that would take them directly to the survey. One of the reasons why I had better luck with the interviews was because I was scheduling on their time instead of my own. Therefore what I recommend is sending out a lot more surveys thereby doubling your chances of getting more responses. I also limited my scope to just Texas, which is helpful but in

order to make broader generalizations perhaps a more comprehensive search will be required.

My initial goals for this thesis were to uncover two different perspectives on the living collection one from the education department and the other from the collections department. Instead of finding two different perspectives what I found was a common perspective, but hidden were small details that I had not noticed before. For example, the different types of display models for living collections, and the reason why museums acquire certain animals and not others. Furthermore, I would challenge future researchers to delve deeper in these details and perhaps uncover more patterns.

APPENDICES

APPENDIX A

Survey

You have been identified as having a living collection in your museum. Below you will find a series of questions pertaining to this living collection. Some of the questions will ask you to please circle one answer while others will ask you to write down your answer. There are fourteen questions total.

1. How many animals do you have in your living collection?

2. Please provide a description of each animal in your living collection. For example, 1 rabbit, 2 turtles, etc.

3. How long has this museum had a living collection? *Please circle one.*

Less than 5 years 5-10 years 10-15 years more than 15 years

4. How many staff members take care of the living collection? *Please circle one.*

1 2 3 more than 3

5. Are you the primary caretaker of the living collection? *Please circle one.*

YES NO

6. If you are the primary caretaker, do you have responsibilities other than the care of the animals? *Please circle one.*

YES NO

(If you answered **no**, please skip to question #9)

7. If you answered yes to the question above, please explain those responsibilities below...

8. If you answered *yes* to question #6, please indicate the department that you work in.

9. If no, who is the primary caretaker and what department do they work in? What is their contact info?

10. Does your museum offer educational programs involving the use of the living collection?

YES NO

11. If you answered no to the question above, please explain why.

12. If you answered yes to question #10, how would you rate the popularity with visitors of those programs listed above? *Please circle one number on the scale below, 1=well liked and well attended and 5= not liked and not well attended.*

1

2

3

4

5

13. What do you think are the advantages of having a living collection?

14. What do you think are the disadvantages of having a living collection

15. May I contact you for an interview?

YES

NO

APPENDIX B

Interview Questions

1. What kinds of animals do you have in your living collection?
2. Do you enjoy taking care of the living collection? Why or why not?
3. What kinds of programs involving the use of the living collection does the museum offer?
4. In regards to the number you picked on the scale (in question 12), why did you pick that particular number?
5. How many of your visitors are repeat visitors?
6. Would you care to comment any further on your answer regarding advantages on having a
living collection at your museum?
7. Would you care to comment any further on your answer regarding the disadvantages on
having a living collection at your museum?
8. Has care of living collections always been assigned to the education or collections area?

APPENDIX C

Interview with Dr. Ellie Caston

Caston: This would be Dr. Ellie Caston speaking from the Mayborn Museum, and I would like to make it clear that any statements that I make do not reflect the opinions or beliefs of Baylor University and cannot be held against me in a court of law. Thank you very much. Ok. Well what is your first question?

Roop: Well I guess I was going to get a background, um, of living collections and where it once started to where it is right now. Apparently there is a history...

Caston: There is a history, we always have a history here, um, probably the first living collection probably dates back to the 1950s, uh, maybe early 60s when Bryce Brown was director. And we had summer camps and um I know we had snakes and reptiles, especially because Bryce Brown was very interested in those things. And, um, I am not sure how exactly they were used but I think it was kind of a display vector and maybe having the kids being able to handle them during summer camps. It was always sort of apart of, as we began to merge out and become the Strecker Museum, so when I first came on board we had three separate entities. And, um, all under the umbrella of the Strecker Complex. And at that time we did not have any live animals in the Strecker Museum, we had moved almost all the animals and educational programming to the Ollie Mae Moen Discovery Center, which was located downtown. And we had a variety of bunny rabbits, guinea pigs, some snakes, bird-Tweetie, and um and the alligator, hamsters, hissing cockroaches and just a variety of things. And they were all used in education programming, they were all handled, messed with, touched and the care that they received was from the staff at the Discovery Center which was educators. So they had some knowledge of critters and of course of any of them were sick they would take them to the vet, but we did not have anybody on staff that was really um... um experienced working with animals. I mean we did a good job, but certainly not to the level they needed. And we had nice, easy-going operation, we probably had twenty or thirty thousand people a year over there. And but not what we do now...

Roop: Uh huh.

Caston: And so the animals really were not that stressed because we just did not have the huge crowds. When they were used in educational programming it was very controlled and you know like we do still. And we had a very loose policy, in the sense of...um, people would say, "gosh I have this hamster and my kids don't want it anymore, do you want it? Sure!" And that sort of thing. So we really accepted critter donations and you know and things like that, so not real great idea, but you know, we did. There weren't any precautions about quarantine animals, we just didn't think about, and it was just like more of a pet and a more involved little pet. So, um, when we moved over here it sort of

became of that same idea that they were part of the educational discovery center part of that operation. And many of the cages were open so you could reach in and touch the bunny and you know and all of this like we had. And they were used in programming, brought out and the kids were able to play with them and, uh, but what we found was that our numbers shot up so dramatically we were doing 100,000 people, we were three times more people or more than we ever had. So these animals began to show signs of stress, from the noise, from the visitors picking them up and touching them and whatever. And, so, then the idea of who could handle them. We had staff members, we had volunteers, in the summer we had our junior volunteers who loved to take the animals out and play with them, I mean why not. But again stressing the animals, not everybody tried to train people how to handle them, but you know stuff still got dropped, uh, and um so we began trying to tighten up the control over that. But it was...the problem was because we had this history of it being sort of all free, hands-on it was hard to kind of modify that. So what we decided at that point was we just had to stop it. Haha. There was no in between, you are either all out or not, you know. So that is when we decided to actually treat the animals like part of the collection and so we moved control of the animals and care of the animals moved away from the education department into the facilities department and under collections. And, um, what we found was that there was a little adjustment to that because we were still trying to figure out how to use them in programming and who would handle them. And then we would hire some people who didn't like to handle animals or some people who were allergic to animals and you know so we were all trying to figure that out. We did have a person that would be in charge of the animals and who would handle the habitats, feed and taking care of them. But it was sort of a separate thing they were taking care of them this way, but then the programming part was still who handled them and who didn't and then we tried to work together and it was just sort of a difficult time with the ability to moderate it and control it. Once we moved completely under collections, we removed the animals from the museum education program. You know we closed all the lids, put the lids on all of them so stuff didn't get petted and the turtle tank the last one that was open is now closed. But that was for the safety of the animals but also the salmonella issue with the turtles and kids touching them with their hands. So, um, I think when you have an operation that becomes this large with this many people coming in you really have to think about the safety of the animals, the safety of the people, and not having animals that are stressed. And even after we did that, Tweety-bird, you know the older it got the more it began to show signs of stress and you know it became time to take him off exhibit at that point. Examine whether we really wanted him at that point.

Roop: Uh huh.

Caston: And of course we very quickly stopped taking donations of animals and that helped a lot to because now we are very careful about purchasing animals and making sure that they are healthy, easy to keep alive, and that do not have problems and that that helps a little bit too. So and now we use them in educational programming but only to look at and not to handle.

Roop: Okay.

Caston: It solved our problems. I mean of course people were upset because they wanted to touch the bunny and hold the animal and all of that. You know, people get use to what you present and it took a little time for the transition, but now we have bigger cages and habitats that are eye level and so, yeah.

Roop: You mentioned um, that um, you went from 20 or 30,000 a year to closer to 100,000. Do you think the animals had a positive influence on the increased crowds, popularity wise, do you think, or was it just the new location?

Caston: Well I mean it was the whole operation, I mean it went from being a very modest sleepy organization to really full fledged operation with lots of staff and care given to you know, the education the staff at the Ollie Mae Center did everything from educational programming to feeding the animals to you know doing housekeeping and cleaning the toilets. I mean we, it was just a really small operation and when we moved into the new building in 2004 it was just a whole new level of operation. And so yes, that brought the crowds in, but I will say that, um, without a doubt our public loves the animals. I think without a doubt if we suddenly didn't have animals we would hear a whole lot from the public. And, um, um, and again we have a whole room devoted to and actually two rooms devoted them and a lot of programming so, it's a pretty big part of our program.

Roop: Did you feel like there is a need, I guess, to reinvent a program, I mean do you find that visitors often want to have a program back being a museum were so geared toward serving the public and if the public wants to have a program back with the animals, does this museum feel like it should look at that again? Or do you feel that your attention is better devoted elsewhere?

Caston: Um, I think that looking at the history of where we've been and where we are right now. I think we're at the best place we've been. And in terms of the animals being well selected and healthy and adjusted and our public still being very happy with what we do. Then I see no reason to, I mean we, I am sure we have people that still talk about "Gee, I wish I could hold the bunny" well that's not what is best for the bunny. And when you help people understand that it was just too much for the bunny, I mean I am sure that bunny got held 200 times a day. And you know people understand that, they really really do. And I think helping people understand that it was in the best interest of the critter and we haven't really had any problems...

Roop: Okay.

Caston: You know after the initial ordeal.

Roop: Okay. And...um I guess the next big chunk would have to do with advantages and disadvantages of having a living collection. I know that on the actual survey I emailed you, um, what would you say are the main big advantages, and what would say are the main big disadvantages to having a living collection?

Caston: Uh, I think advantage wise there is a human connectivity to animals. And so it is a huge motivator it is a draw, lots of people just run to that room. And uh, I think there are people who just love to watch critters and so I think there is just a human connection there that the public really responds too. So I think they are a big draw and without a doubt that when we have programs with animals people just respond well. So it's a crowd pleaser and we like that. And I also think that they are great teaching tools in that our whole program is based on people understanding that there are different kinds of animals. You know there are mammals, reptiles... and there are different characteristics. I mean, and when someone is excited about what they are looking at then they are more intuned to learn something. So I think there are great teaching tools, but I don't think you have to necessarily handle them to learn something. You know, now if they are in a dark little cage I think that is one thing when we put them in some sort of little habitat where they can behave somewhat normally, you know the bunny rabbit even having its little house will go and hide. And that is what bunny rabbits do. You do see some behavior if you can create an environment that can illustrate the animals natural ability to move. And so I do think there is human connection that then is very important. From our standpoint there are people that come here that um don't see um that aren't exposed to different things. We have grappled back and forth between native species and exotic and um we could have a regular Texas lizard or an exotic chameleon. And I think there are an awful lot of people who come here that may never see a chameleon of that nature. There is something about the animals to watch that and to really observe, that I love, because I think we can still help youngsters and even grown-ups do is to observe them. And, so I think I like the idea in having something very common and ordinary and regular stuff to look that, but also throwing in some of those other critters to look at. I mean even our frogs and toads and stuff I mean they hide and you really have to look for them. And you see kids in there with mom and dad saying, "we have to find it, we have to find it" and how excited they are when they find it. And so I think from an educational exposure stand point really that is the biggest advantage. The downside with the critters, um, you really need a paid staff member to take care of them. I mean I really really stress that and I know a lot of places don't I know a lot of them use volunteers. Volunteers are great volunteers can do very high quality work but there is something to said by the institution making the commitment. Its not that having a volunteer is a bad approach, its just if that volunteer moves away or something else you lose that continuity and commitment to the critters. So I think its very important to the institution that if they make a commitment to do this that they make a commitment to pay somebody whose job it is take care of the animals. And I don't think taking care of the animals can be listed with 14 other things, you really have to devote your time to the animals Even the small number of animals we have they all have to have there little carrots chopped up and misted you know. Making sure they have their heat lamps and you know. And making sure you are observing them so there is a cost. It comes with a cost it's a great programming issue it's a great crowd pleaser but you have to make a commitment to them. And the other thing is they need to eat 7 days a week, 365 days a year. So somebody has to come in on Christmas Day and feed those critters and make sure they are fed. There is a labor commitment. There are also liability issues. And also the humane treatment of the animals you have to be careful with them. So it's a commitment of cost and time, but, and I guess that's why I have a preference for

them being considered part of their collection because they need to be looked at as seriously as we take care of our other collections.

Roop: My next question was how you felt about the collections staff taking over, you being an educator at heart, I mean not to say that the education staff cannot be as dedicated as the collection's staff but we all know...

Caston: They are dedicated to the two-legged variety that we have over there. Their emphasis has to be on the visitor and maintaining that they see to the visitors and so that is their job and it should be. And I can't relegate that lower than the animals or vice versa and by nature collections people are much more methodical, organized, regimented, and so I think it's just a natural use of their skills. I mean I am an educator and I love the critters. I love playing with the bunny rabbit and getting the critters out and I love it when the kids touch and I love it when the kids get to do all those kinds of things. After watching them [Pause] with as many people as we had in here and with as many people who have no intention to harm them that just don't know any better about how pick up something or how you do this. I think it's a painful realization that this is what is best for our critters even though I personally think I would like to personally like to handle them. And I think it's a great educational tool but I also see that this is better. Because I have watched it go to kind of a unprofessional but it just did not have that serious polished professional feeling to it. But now I really feel like when you go in there you are looking at specimens in a professionally cared for situation. Luckily hopefully their living environment is as well kept as we keep our objects in collection storage. So I, I really have changed my attitude about it, "you know you've got to do this or you're not going to get that much out of it."

Roop: Hmm. Well I guess you've answered a majority of what I had. What has been your favorite animal that this museum has had and what has been your least favorite?

Caston: The iguana, hands down. Ew. Uh I think they are kind of creepy anyway. I must say that I was very fond of "Tweety" the bird. And because he was his own character and he was here as long as I have been here. But when we went to 20,000 to 100,000 you could just watch the guy pull his little feathers out. So um, he was my favorite.

Roop: Well "Tweety" was not my favorite. He sort bit the hand that fed him. Haha.

Caston: Haha.

Roop: I guess my last question has to do with the move the museum has made with the chameleon it sounds to me like you are not looking to increase the size of the collection and that two rooms is big enough...

Caston: I don't see us adding to the menagerie, I think we have a good variety and I think the animals have enough space. There are not overcrowded and they don't bother each other. So I think we are getting smarter about the kinds of things we have in the collection. And I think the iguana is a good example of this. "We always had an iguana

and so we needed to get another iguana” and I am so glad that Anita said you know I’ve done some research and you know they are pretty nasty critters.” And I was like “wow you’re right” you know I had no argument at that point. You know the turtle tank, the open design was ok because we wanted people to be able to touch the animals. Now that is no longer needed and so we have continued to try to change the habitats but also be able to see them. Now that the turtles are in the new tank and with the bottom part being reflected you can really see the movement of the turtles. You know so from an educators it’s a lot better and its better for the turtles and we do not have to worry about little kids getting sick. So hey it’s a win, win, win. So I think we are about where we want to be in terms of numbers of critters and also getting critters that are pretty easy to maintain not trying to obtain something more difficult. The other thing I want to avoid is endangered animals, or animals that are some watch list that you need a permit for. I think that zoos are much better equipped to do that.

Roop: And you still find it important, your response to my earlier question reminded me, do you still find it important, you mentioned zoos, one of the main criticisms I think I am going to run into with this thesis is why not look at zoos instead of, to me, well zoos have it down, zoos have the program down that is what they do. How important do you feel it is that museums have living collections of their own? I know this particular museum teaches science and educational areas of science what about other museums like this one, do you find it important to have living collections?

Caston: I think it depends on where that museum is, in the community I mean. I mean our museum is very well-attended by people but I think there is a different feel to a zoo than there is in a museum. And I know people will always look closely at critters and that sort of thing. You know I think zoos are really neat because they can show animals out there and all that good stuff. There is an intimacy with our room with the critters in it, you know you can really get up close, there is an intimate connection there that I don’t think you get in a zoo; even if there is a little area where their is more than that. And, uh, I think because it is so intrinsically tied in with our learning philosophy and there is a set of facts that go along with those critters. The day that our audience walks past that room is the day that I will have to say, “hmm, what is going on?” Maybe we have come to a point where we don’t need them anymore, but at this point you know you’ve fed those critters. There is some connection.

Roop: I know when I was in there the kids made me feel like I was Superman. The kids reaction was, “wow, you get to do that?” Any reaction you can get from a kid or student of any age in a museum is great because I think that typifies why museums exist and they will remember that.

Caston: That’s right. Yeah I don’t think we duplicate what the zoo is doing. At one point there was some discussion about us getting new enclosures, you know building a “dark” area for some animals. Well the zoo does that let them do that, that is there thing. What we have here is enough to where it excites kids about animals and that is enough. And I think another thing about zoos is that they are kind of big places and for little bitty kids is

a lot of stimulus, a lot of distractions. And so I think bringing it down to a smaller size so they can have those experiences and relationships with the animals.

Roop: Well that is actually all the questions I had. Do you have any comments or questions for me?

Caston: I am interested to hear what comes out of all this I mean so many places have had a similar journey. So it would be interesting to hear if there are similar stories.

Roop: It's an area that if utilized right, can bring a lot of visitors. I have been to a couple of museums that have them and they come in droves to these museums. Number of attendees means a lot in the museum world and animals help with that.

Caston: I mean I do think people make bad decisions about what types of animals they have, and we are a great example of that. I think we took that alligator because it was injured, but we had no business in doing that and I think you just have to be really careful and do your research. You know vet bills can be expensive too, especially for those animals that have special needs. Do you remember the ferret?

Roop: I don't. I think the ferret was before my time.

Caston: The ferret was about the most worthless display animal I have ever seen. It was extremely expensive at the vet, and then he spent all this time under the blanket. So people would spend all this time looking for it and would just see a blanket. This animal did not earn its keep. I mean they may be fine and great demonstration wise but if as display animals they are just not worth a flip. But that is a good thing to know.

Roop: No more ferrets?

Caston: Oh no, no more ferrets.

Roop: Well I would like to thank you for taking time out of your busy day to sit down for this interview.

Caston: Oh well thank you. I've enjoyed it.

APPENDIX D

Interview with Mrs. Lesa Bush

Roop: First, I wanted to ask you about the living collection up to this point...

Bush: How we got where we are?

Roop: Yes. Exactly.

Bush: Wow. This is going to be a long story. I have been here for a little over ten years. When we first started we were in the old Waco High building downtown and Jill was the only employee there and she would have volunteers that would come in on a regular basis. And we did have only one graduate assistantship at that time and one work-study position. So we started over there and we had the animals over there, we did programming and then we did the store, and then we took care of the animals, we cleaned because we did not have housekeeping over there. So scrub the toilets, gather the trash, so we would not stop working. And I know that over there we really did work hard to take care of the animals, I know my background was not in animals. I mean I like my dog, haha, I am just not an animal person, I just wouldn't describe myself that way. So, I was not as informed about the animals as I should have been in order to take care of them, now I learned a lot about them why we were doing the programming and I did learn about...[Pause]...some of the things we taught the kids but then we also learned in detail some other things and my predecessor taught me a lot and she did know more about the animals than I did. Um... and then when we moved from there all the way over to our interim home across from Ninfas. There we continued to do what we were doing before in terms of programming. We saw about 50,000 kids a year and we still did the museum store and we included birthday parties in the mix, so we started doing birthday parties. Still cleaning bathrooms and the like, we did not have the proper finances or resources to have the correct tanks and aquariums and we did make do, but granted it was probably not as good as it could have been for the animals and they would sometimes suffer for it but it wasn't intentional. I mean we really tried hard here. But the kids, parents, teachers would come back year after year for programming. They really wanted to get up close and personal with these animals and the kids, the experience of being able to get up and touch the tarantula was great. We definitely had a lot of school groups but we did not have the walk through patronage we have here which...so the animals there were not necessarily stressed all the time. The animals became stressed if anybody signed up for those programs, which they did in the spring a lot. Then for the couple of hours they were in there for the kids then it became pretty quiet, so they did not have the constant stress like they have here which makes a big difference. So, lets see we were over there for a few years then when we were transitioning over to this place the animal programming became so popular that we continued to do animal programming out in the village while we were trying move into the building here. We did a summer camp where every grade

level had a theme and Vertebrates and Invertebrates were a couple of the themes and kids loved that. Um...we did a lot of Scout groups that were earning badges and we did a lot of different kinds of programming typically with vertebrates and invertebrates. Then we went over to the historic village and started doing programming there and then we moved over here. And we started getting help with housekeeping at the interim home, they would come over in the afternoons. And then when we moved over into the 'mecca of museums' we had everything. We had housekeeping, we had a nice facility, we had facilities, we had collections people, for the longest time it was just Jill and I and work study and graduate assistantships and volunteers. And slowly but surely we were able to build the education staff we have now. But a lot of our backgrounds, the background of the people we hired, we were looking for people with education backgrounds or museum backgrounds because that was what our programming needed. Now, when we moved here vertebrates and invertebrates were only a part of the things we had here we never specifically hired somebody with education and animal experience and programming experience. So I think when we moved here it became a little bit harder to do animal programming. I think it works best if you are in a small museum that is based on natural science and people can assume that if I go to this museum that I will be handling animals or at least be outside in nature. Whereas the people that are visiting here have no idea that live animals were part of it and may be scared of the animals. That made it harder when we moved here. We had days when we had 500 people here so the animals would just be overwhelmed. We did try animal programming here, we did, thank goodness, hire an animal habitat person, and that was there background in animals; a person that would understand when the animals get stressed because a lot of people don't know when the animals got stressed. And that was when I started learning more about it from Megan and then you know we have Michael now. I mean wow, Megan new a lot about the animals and tell me things I never knew before about the animals. And so for me that was an education. And so she taught us about the correct habitat, the correct lighting, the correct temperature, all those things about animals that we needed to know but didn't previously know. Megan was also great about giving talks about the animals so on certain days she would take out one of the animals and show the kids and talk about the animals as visitors came through. But then we also had problems because some people thought volunteers could do that and other people felt strongly that yeah volunteers could do it but they do not have that animal background and then liability problems could result. Um and so we eventually came to the fact that we were doing so much programming and that was growing and we were having travelling exhibits now and were having programs with it, we really did not have the time or knowledge to really handle those animals. So then it was transferred over to Tom in facilities specifically under Collections and that's when the level of care really went up because they could devote their whole time to that because that is there job and that made a big difference to in the way the animals were kept. We still do programming in there but we do not take the animals out. Part of me thinks the programming is fine, part of me liked taking them out, but I think it really does need to be a smaller type museum where that is your main function. So I have been to a couple of museums that are like that and Megan took me to one in McKinney. So does that help, is that what you are looking for?

Roop: Yes! And that was kind of my next question about programming, one of the things I am looking for specifically with a person with an education background, I don't know too many details about it because when I got here the programming didn't exist anymore with the animals. I have seen many tour guides come through and teach with the animals but what was the programming like back then? Did you go out to the floor away from the animal rooms where there were benches?

Bush: Yeah and I even have videos upstairs if you want to watch them. We had a couple different types of programs. If we have school groups that booked a tour we would do three 35-45 minute rotations in different rooms. So we had a vertebrate/invertebrate tour where they would rotate from the vertebrate room to the invertebrate room and off the top of my head I can't remember the third area. But they would rotate amongst these three areas and um the after school groups loved that and in the spring it became very popular. And what they would do is we usually have 20-22 kids in the class and we would have them sit on the floor and we went through the basics of what is a vertebrate and what makes it a vertebrate. And if there were different categories, we had the bird, and then we had the fish, and the amphibians, and the mammals, and we would pull an example out of each of those areas and talk about what makes it a vertebrate and what makes it a mammal, and what makes it a bird, you know we go into those kinds of details and then take the animal out and walk it around where the kids could touch it. Um, and they absolutely loved that. Then we did have some programs called 'Museum Monday' where preschool parents would meet at the museum and we would lead them in stories, songs, and crafts and we always in the Spring time had a Vertebrate and Invertebrate Day. So again that would be more like a Free Sunday you never knew how many people were going to show up it could be 25 or it could be 300. And we would take animals out, some of that programming you have to check your audience, and check how the animal is and wing it. You have your basic plan or your logistics plan but sometimes you have plan A, B, and C. We at one point had volunteers that would be stationed in the rooms and we would help kids. We actually had at one point time, cages that didn't lock so volunteers would go in and actually take the animal out so kids could touch it. Again, that didn't work here because we had such high traffic but you know patrons would come in and try take animals out themselves because they were used to the way we used to do things at the old museum. Another thing about living collections is that everybody has the own idea about what 'best care' is for the living collection for the different animals and that is really hard. Sometimes visitors would not hesitate to walk up to you and tell you that that is not how you treat that animal. So that is hard too, but I think the better the habitats are and what you can pull out of the drawers to show them I think that helps.

Roop: Alright well cool, I guess the next question I have is do you think that when the Mayborn stopped doing the programming with the animals out of the cage, do you think that hurt the programming? You've said it was a really popular program and I would imagine it was hard to decide to cut that sort of programming.

Bush: Yes. You know it was very scary, not only was it very scary you felt like you were shooting yourself in the foot. 'Why would I cut a really good program?' But we have so many programs and so many people that come through and what typically happens is you

start to do programming and you become known for it and people are used to that. If you change anything on it you really have to think through it, because in the next 4 or 5 years people are going to come back and say, 'I remember when you did that and why can't we do that again?' So you have to really analyze it and we spent a lot of time thinking through this and thinking through all of the current programming we currently do. Every year we have meetings and we tweak, 'what's not working, what is working.' These programs were really hard because we had staff members that were very much for it and we had staff members that thought very strongly that we shouldn't do it. So, um, it was hard but I think it was the right decision for where we are now. In the museum field, you never say never because it changes minute by minute. I was worried about it hurting, but it really honestly hasn't and I mean we have had to continue to grow in certain areas but losing this kind of programming has not hurt our attendance. Our programming is constantly evolving. As far as the kids go they are really excited when they get to see and touch the animals. We've tried to supplement with some of the programs that do go in those rooms now we now have a 'Explorer Tour' its real short and it is geared toward the itty-bitty kids who do not sit for a long time and so the vertebrate and invertebrate rooms are two rooms among the five. In the rooms, we try to have things that they can get touch like the armadillo shell that has helped, but I still don't think it replaces the opportunity to touch live animals. However, I still think we have made the best decision, someday we may go back and create another hands-on animal program. Did that answer your question?

Roop: Yes. Perfect. I guess in broad terms and you kind of hit on this too, um, one of things I was trying to get at before with the collections and education perspectives, um, biggest disadvantage and biggest advantage of having a living collection?

Bush: The care of the animals is biggest disadvantage especially if the person caring for the animals is not properly trained. You know, we had so many people who are willing to do the programming in those rooms, but we had some people who just could physically not do the programming due to allergies and then we had some people who just didn't want to do it. So you are putting pressure on a small group of staff members at the museum who are willing to do that programming and the way our programming is booked, they may multiple school groups in one day, they may see 400 kids in one day. So there was lots of logistical concerns on top of the care, but the care would be my number one concern. You know, with the programming they probably were pretty taxed. The advantage of the animals is the people love them, the kids love them, it is a natural draw for programming and you can teach the younger generations an appreciation for nature and appreciation for animals and you just have to really watch how you get those messages across. If one of the goals of your program is to have kids earn a respect for nature and not to kill all the snakes in the world because snakes are good, then I think that is important. I think kids these days are losing so much about nature because they don't go outside a lot of kids that come here never have stepped outside. So I think this is great way to teach kids about nature who might not otherwise get to hear it. So in that regard it was great.

Roop: You mentioned the animals being a big natural draw. Of the programs you currently incorporate, how many actually use the living collection?

Bush: Um, as of right now we will pull them out mainly on the Explorer Tour and on some of the self-guided days but you know not a whole lot honestly.

Roop: Okay, and how many tours will actually visit those rooms was it just those two?

Bush: Um. The self-guided tour they will visit every room in the museum. The 'Explorer Tour' is only for five different areas of the museum.

Roop: Okay, and do you get a lot of requests about the animals and the use of the collection?

Bush: Yes. I can probably show you some evaluations where people say they want the hands-on programming to be brought back, typically only for those that remember it. But if you ever start it, they will want you to continue it. Haha. So it is popular. Logistically it is really hard.

Roop: Yeah. Well alright it looks all of my questions have been answered.

Bush: Yeah I was trying to think in the past I know Jill and I did it and then we would train the work-study students for when they were there to help with some of the stuff.

Roop: So when the move was made into the new building that is when the care of the living collection switched over to the collections department?

Bush: Right, and for a few years or so during the transition care was still given by the education department.

Roop: So how long has the care of living collection been under the collections department? Has the care been about equal in both departments?

Bush: It has probably been under the collections department longer than it has been under ours.

Roop: Okay. Well that is really all I had. Thank you for your time, I learned a great deal!

Bush: Well good, I am glad.

APPENDIX E

Interview with Ms. Anita Benedict

Roop: Okay, lets go ahead and get started, I guess if you would kind of give me a history of the living collection from when you started to kind of where it is now.

Benedict: Well first of all I wanted to mention, long before I ever got here, um, the Strecker Museum in the basement had a living collection, it was primarily reptilian groups and maybe some spiders and that was as far as I can tell from what paperwork I have come across was cared for by one staff member and/or any volunteers. I don't know if you ever saw the classroom downstairs?

Roop: Um no.

Benedict: I didn't realize this till after we had moved out and they were carrying out shelving and various other things that the classroom we were in, when you took down the bookshelves and the boards there were actually windows and I have seen pictures of the living collection but hadn't realized there were windows in the room so people could view the living collection. I thought that was kind of interesting. So that particular collection as far as I could tell was controlled by the collections staff such as it was at the time. I mean they were used for education but everybody kind of did everything at that point. When I got involved with it, um, I want to say it's probably been 4 maybe 5 years, when we first moved over here the animals had been at the Ollie Mae Moen Discovery Center. The staff at the Strecker Museum did not have anything to do with them until they merged here. Over there the animals had been a lot more accessible to the visitors, their visitors were predominately school group based as opposed to the general public visitation we get today. So the animals were in open cages as far as being able to be touched, from the alligator to the rabbit. When we came over here we knew we were not going to be able to do much of that but we did have more at the beginning the setup was a little more open cage and accessible to the visitors. I don't know maybe Ellie filled you in at some point they finally just decided 'animals are going to be living collection.' I really didn't have much to do with that...

Roop: Okay.

Benedict: I was just kind of told you are now in charge of the animals. We had been through a couple of people that were hired to take care of the animals, but I think actually Lesa may have overseen at that point I am not sure who was actually supervising at that point. I think part of the transition might have been helped by the fact that even as a student worker and then as an employee, one staff member had a lot of familiarity with the vertebrates and invertebrates. So, I don't even remember... when the transition took place as far as who was caring for the animals when I became responsible...it took a

while to get a staff member on board. I think I was doing a lot of it at that point. Um and because it took a while to get the job description written up and the processing that needs to occur when you hire someone and we wanted somebody who knew what they were doing and that point we were looking for someone who could look at the habitats more closely. And at that point we had some ideas at that point where the animals might go what direction. We ended up actually scaling back as opposed to expanding primarily because we stopped having specific animal programs, that made a big difference. When they were using animals in the programs, um, we were having to look a lot more about how much they were being used, whether or not we needed to be keeping two of everything so we could trade them out and there had to be training for all of the staff who were going to be handling all the animals. Logistically it was a lot more difficult and a certain staff member actually did a very good job she actually had something set up for employees, um, how to do the programs. It was a little hard to keep up with who was doing the programs as students would change every semester. We didn't have the multiples of animals and so she ended up with a checklist that said, 'if the rabbit was used Tuesday morning, then the guinea pig is to be used in the afternoon.' You know we were trying to give everybody a day of rest if we could. They still do animal programming in there but they don't handle anything and most of that is almost invertebrate based. When they do the more of the end of the school year, when the school groups are coming to visit the museum and not for specific class oriented things, um, they are just real simple in and out tour kind of stuff. We have progressed away from any of the animals being in open cages, um, fortunate in the fact that we were able to spend a little money but we also have a talented staff that can build...

Roop: Yeah I think I've met a couple of them, yeah...haha.

Benedict: Haha, and work with Plexiglas and a certain staff member did a lot of that when appropriate. So, when a certain staff member went on maternity leave and decided not to come back it did allow us the opportunity to change, you know we knew we weren't going to be doing programs anymore and we knew that we necessarily didn't need a full time staff member so instead we wrote the description as a part-time position. But we also took out anything that said, you know responsible for developing or designing any of the habitats, you know stuff like that...

Roop: Right.

Benedict: You know it was going to be strictly an animal care position. A certain staff member is responsible now for what is inside the habitat. Now we are working on the chameleon enclosure and so he is doing the research on the appropriate plants and buying the appropriate equipment, and getting things setup but its more of no programming and he is not expected to design completely new enclosures from the ground up. You have the experience I mean, I, have done a lot of the animal care I do not necessarily dislike doing the animal care it is just not my primary position and I did it for the better part of almost a year in between Megan and Michael with help, thankfully.

Roop: Haha.

Benedict: One of the things is you have to feed them everyday. You know if your collection is non-mammal based or non-reptilian based then you may be able to get away with not coming in on Christmas Day.

Roop: Yeah that was kind of my next question, what do you think is the biggest disadvantage and biggest advantage you can think of about the living collection?

Benedict: Constant is a big one. I am fortunate that I have been able to hold on to somebody for weekend care for at least a year usually. Obviously with a part-time position, one of the downsides with that is at some point a staff member will want more money or a full-time job. We just have to recognize that it is not a position that someone is going to stay in for the long term. I usually figure that if I can keep an animal care position particularly a part-time person for a year or two I am doing pretty well. The fact that we are open all except for seven days out of the year actually does make it easier for accessibility, because the days that the museum is closed only two people have access to the building and that is me and another staff member. We do have to coordinate our schedules especially around the holidays so the animals can be fed.

Roop: Okay. What would you say would an advantage to having a living collection?

Benedict: Well the kids and visitors love watching the animals being fed. Its good to have someone who can answer questions about the animals should the visitors have any. It's nice to be able to correct any misconceptions people have about animals. We are also trying to educate the visitors you know. Parents will walk in and see the invertebrates and then there is the whole 'ew' factor, you know there is a reason why the animals exist and that they do good. In the long run, I think everybody's job would be a little bit easier if we didn't have the live animals, but I think they add something special enough, you know something animate. One of the things that we really tried to do especially when it came under my purview was that we really wanted to get a way from treating the animals as props or as pets. You know we do not have the cute little names on the enclosures anymore. We have also try to retire animals before they die so they can have a little peace and quiet.

Roop: Is there a dynamic you think, in terms of the collections department and education department, I mean do you guys work together for programming?

Benedict: Depending on the programming, obviously yes we cooperate. We don't necessarily, you know if its something about the invertebrates or vertebrates they may ask a staff member to review what it is they are saying. Just as they would discuss with me things about the mammoth exhibit, because we are not letting them handle the animals anymore we are trying to provide them materials or we give them recommendations on things they might want to buy or can handle.

Roop: Okay.

Benedict: Things like a prepared fur, like a rabbit fur. Or things like a skull and shedding from the snake. So they can still have tactile objects. They have been a few circumstances where Trey has helped them put on programs that may only be a couple times a year. It typically occurs for a group that either has had that particular program or if its something very special about vertebrates. When we did have one of our traveling exhibits, um, there was one where every couple of months they were doing a different continent and so at that point a certain staff member was still here and for about a half an hour or so she would take an animal out that represented that specific continent. We have not had anything like recently. Nobody as far as I know as any hard feelings about being able to handle the animals anymore, I mean I think they all understand why, many of the staff members still talk to the animals if they happen to walk by the habitats during the day.

Roop: Okay. My next question has to do with defining specific models of display for live animal collections. Through my current research I have uncovered common methods of display, in fact it seems that many museums are practicing keeping the animals behind closed doors until programming begins at which time the animals are brought out and hands-on activities commence. Do you think the Mayborn Museum could practice such a model?

Benedict: Well we don't really have any place to put the animals if we were to put them behind closed doors. I know that if I remember correctly, the Cameron Park Zoo has a separate facility where they keep there animals they use in their programming. One of the things I wrote disadvantage wise was we do have one staff person who can not go near the animals because she is deathly allergic to them. So I mean there are some hazards and not just biting hazards you could have a little kid that stands over the rabbit and has an allergic reaction.

Roop: One of the other areas I am researching for this thesis is living history sites and living history farms and the living collections that they house. What are the similarities and what are the differences with the living collections in other museums?

Benedict: I have seen some of the paperwork that was involved with those kinds of animals. Those animals were a lot of work. I mean its one thing to brush the rabbit every couple of days it's another to sheer the coat of a sheep. Pregnant animals and animals like a donkey that require regular care. Since these animals live outside there is always the possibility that they could end up being stolen especially if the space does not have ample security.

Roop: Now I know the village is currently being renovated, is there a chance you could bring these animals back?

Benedict: Um, no. They are not currently any plans to bring back any animals to the village. There had been some talk although I don't think it's in the current plans to bring back chickens. What we would have to do is build a modern chicken coup on a concrete slab and then enclose it to make it period correct, between the rats, and the squirrels, and the birds, and the raccoons, and the skunks, and the feral cats, there are just to many

critters we would have to worry about with the chickens. You also have to worry about eggs, none of our chickens ever hatched any of our eggs we would normally take them away and destroy them. We typically bought chicks and raised them and incubated them. It would take a lot to convince me that we needed to do them again. A living history place that is a farm or something like that, where you have full-time personnel they can do that sort of thing. You can't do hooved animals just kind of on a whim, there is a lot more veterinary care, you have to do with their hooves, they need to be brushed, there is just a lot more maintenance.

Roop: Focusing on the broad perspective, do you have to switch 'mindsets' when working live animals as opposed to other objects? Does this pose any challenge?

Benedict: One of things that was decided was that what we do as far accessioning or deaccessioning animals? What we decided that was invertebrates unless we were accepting donation from the public, which we rarely ever do, we are not worried about accessioning or deaccessioning because many of the animals are purchases or collected by staff. We are however filling out paperwork for the vertebrate animals. Primarily so we have good record keeping as far as when we acquire them and when we dispose of them. Also, the authorities who do the animal inspections on campus, the only animals they want to hear about are vertebrates. They don't care about the saltwater tanks, they don't care about the invertebrates, we have been including them in inventory, but when they told us not to worry about them we deleted them to simplify things. There will be records on the invertebrates but those records will be kept in the animal care person's records not in the collections records.

Roop: Okay, cool. Well that about covers it.

Benedict: Oh, just as another disadvantage. I talked about donations from the public, when the public knows you have animals they want to give you animals. And usually they are nice enough to say, 'I have a rabbit, would you like to have it?' which we very politely say 'no.' We have had several instances where several people have just dropped the animal off. You know the only thing we can do is take them to animal control, you know, we can't keep them. So you have to watch out for that and occasionally you will get someone that doesn't like the fact that we have animals or that we have animals kept in cages or they are upset with the care and quality of the enclosure. Usually, you can talk to them, but sometimes they are never going to be happy and sometimes they have a good suggestion and we try to accommodate those ideas the best that we can.

Roop: Well, is there anything else you would like to include? Any questions, comments, or concerns?

Benedict: Um, I think that about it wraps it up for me.

Roop: Well thank you for your time I really appreciate it.

Benedict: Oh, no problem at all.

APPENDIX F

Interview with Dr. Aaron Pan

Roop: My first question is about the history of the living collection. Did this museum always have a living collection? If so, when did it start?

Pan: I can't go back when the museum first existed because that was back in the late 30's early 40's but its been for decades we have always had a living collection here. Um, living collection includes mammals and birds are those that were either rehabilitated or those small mammals such as rodents which we have a permit to collect them. Animals such as amphibians sometimes we get them from rehabilitators as well and collect them if necessary, but we have had these animals were decade. We have had bigger animals in the past such as bobcats, a wolf and porcupine that a certain staff member could answer for you.

Roop: What would you say would be the disadvantages and advantages of having a living collection?

Pan: First of all I think the advantages typically outweigh any disadvantages that you may have such as maintenance costs and personal costs. The animals require year round care, even when the museum is closed we have someone come in who cleans up the cages, feeds the animals, and things like that. The main benefit is that children and Museum School guests get to interact with the animals. The animals are not only used in Museum School, but are also used in distance learning programs. We have them on carts once or twice or week typically for such programs.

Roop: You mentioned the distance-learning program, are the parameters for the program located within the city of Fort Worth?

Pan: Distance learning is done, again its projected onto a screen but we have 'visited' places all over Texas, all over the country, and international. We have had, not necessarily with live animals, but distance-learning with Australia and Canada and I know with Canada we have used live animals before.

Roop: You also talked a little about the popularity of the animals, could you talk a little bit more about the popularity of the animals in the programs?

Pan: The animals are very popular and this is pretty evident in Museum School. Museum School caters to ages 3 to 5, it's a year-long program, and they come for 2 hours so we have 2 classes each day. Basically you are given one day of the week. For example, my son goes to Museum School on Friday afternoon from 12:30 till 2:30 throughout the year with the exception of a few breaks here and there. Typically for 3 year olds they learn

about a particular animal, for four year olds it's typically a group of animals, and 5 year olds it's typically communities and ecosystems.

Roop: Oh wow. So there is a nice variety...

Pan: Exactly.

Roop: That was really all the questions I had...

Pan: Yeah in terms of the number and kinds of animals, Susan could probably give you a better idea of those specifics. I believe there are approximately 60-80 animals here not including feeders.

Roop: Okay. I do have another question regarding Museum School.

Pan: Okay.

Roop: Where specifically does Museum School take place? Does it happen in the Children's Museum?

Pan: Well it depends.

Roop: Okay.

Pan: If it's something like lizards or frogs or something like that, typically we put them in non-breakable plastic cages, um, that are clean and those will stay in the classroom everyday. Once classes are complete they are taken back to the animal where they are placed back in their enclosures. When a larger animal is taken out such as our raccoon, barn owl, prairie dogs or ferrets or something like that typically we place them in an empty classroom called the Cardinal room. Children will walk in this room as whole classes and will sit down on the floor, um, we have procedures where the children all know to sit with their hands in their laps, either myself, Ms. Leishawn Spotted Bear, and Susan will teach the children about the live animal. Typically it is allowable for children to touch the animals with the 'Museum School finger' and then afterwards teachers will usually bring along some antibacterial gel that children can use after they touch the animals.

Roop: Do you find that this model that you have here works best? The Mayborn Museum practices a model that just displays the animals but does not allow the visitors to actually touch the animals. What are your thoughts about this particular method of display and then how does it affect the stress level of the animals.

Pan: Um, well we don't think it stresses the animals too much. We make sure that we monitor the animal's health very closely. Um, several of the animals we have here we have multiples of, for example the ferrets, we have 5 of them that we could use at

different times during programming thus minimizing their stress level. Even when we have both prairie dogs out typically only one is left in the cage.

Roop: This is the first museum I have encountered in my research that actually practices keeping the animals back in a separate area and brings them out to the kids.

Pan: Oh okay.

Roop: What department does the living collection fall in?

Pan: Um it's in the science department and I am the Curator of Science. I am the supervisor of the live animal collections, the science teaching collections, and the science permanent collections.

Roop: So those are all distinct areas?

Pan: Yes, so right here what you are looking at is the science teaching collection, typically specimens that we have duplicates of that do not have data for them. These we are able to use for teaching purposes. That way if something does happen to them it will not be detrimental to our other collections, we do have a permanent collection which is our research collection, um, and the teaching and permanent collection will typically be on exhibition depending on...

Roop: Okay.

Pan: And then we have our live collection.

Roop: Okay, good deal. Really the last question I got is about visitors, it seems like many of the exhibits are geared towards children...

Pan: Well we are typically children-family oriented, we try to do programs for adults as well, stuff like that.

Roop: And do you guys see a lot of repeat visitors?

Pan: We do, we also get a lot of school groups that come in through the door.

Roop: Okay great, and is there an education department here?

Pan: There is, the science department actually works closely with education. The science department falls within the programming side of the museum. The programming or programming centers includes things like the Omni Theatre, exhibitions, um, collections, which is science and history, and then the Planetarium. Education is a separate sphere, but we, um, our role is, a lot of it is support to other departments, um, as well as providing expert presentations, expert advice, as well as, we do some education things as well.

Roop: Okay.

Pan: So our Assistant Curator of Science does a lot of the distance learning programs and a lot of lectures for Museum School.

Roop: Okay cool.

Pan: And Susan Hammack is the Live Animal Biologist who actually oversees the live animal collection.

Roop: Alright. Well that is about all I have. Thank you very much for your time.

Pan: Well sure. Let me walk you over to Susan next.

Roop: Okay great.

APPENDIX G

Interview with Mrs. Susan Hammack

Roop: Good afternoon Mrs. Hammack.

Hammack: Good afternoon.

Roop: If I may, I would like to know a little bit more about this room and about the care the animals receive, and your role when it comes to programming.

Hammack: Well the room we are standing in, is the animal room where we keep all of our live animals that we use in our programming; mainly Museum School and the distance learning programs. There are 108 species total, not including insects, fish, and feeder animals.

Roop: Ah okay. What exactly are your responsibilities with the animals?

Hammack: Well first and foremost I see to the care of the live animal collection. This includes things like buying groceries and supplies and keeping records. I also arrange for veterinary care if need be, quarantines, inspections, licenses, and permits. I feed the animals daily, including holidays. I provide the animals not only food, but water, medications and clean cages. This includes the animals already located in the classrooms.

Roop: So there are two locations where live animals are kept?

Hammack: Well the majority of the animals are kept back here, but in the classrooms we have animals like fish, and baby chicks that will stay in those rooms for programming purposes. Care to those animals is given in the actual classroom.

Roop: Ah I see. Could you talk a little bit about your role in programs like Museum School?

Hammack: Absolutely. My role is to provide assistance wherever I can. I don't know if Dr. Pan mentioned how Museum School works...

Roop: He did.

Hammack: Okay so you know that we have three main groups. Well Monday through Friday my job is to make sure the animals that each group is studying that day are prepped and wheeled into the proper rooms. I put each animal, being used that day, in a display cage and take them to their location on time. There are a total of 5 classrooms that we use and one distance learning studio. Animals typically go to class at 9:30 and are

brought back around 2:30. Animals may also be used in lectures outside the usual programming. These lectures typically take place at 11 am and 2 pm and are typically taught by myself or Mrs. Leishawn Spotted Bear. Live animals are also used in special after hours events which I oversee as well.

Roop: Do you employ the aid of volunteers and part-timers to assist you with your work?

Hammack: Yes I am in charge of scheduling part-timers and volunteers to help me with the animals.

Roop: Oh okay. Well I have one last question for you, what do you think are the advantages to having a living collection, and what do you think are the disadvantages if any?

Hammack: Well I really can't say that there are any disadvantages because I love what I do. The advantages are that they are really popular with the kids.

Roop: Okay, well thank you for all of your help. I really appreciate it!

Hammack: Oh no problem.

APPENDIX H

Interview with Ms. Leishawn Spotted Bear

Roop: Hello Mrs. Spotted Bear, how are you?

Bear: I'm doing well, how are you?

Roop: Doing great thanks, well lets get started here, what is your role with the living collection?

Bear: Well I do many things. My primary responsibility is to teach the distance learning programs here at the museum. These programs are taught in the studio located right in front of the Children's Museum. The way it works is when a program is scheduled, animals are selected based off their specific needs. So for instance if a group wanted to learn about reptiles we would prepare reptiles for use in the program...

Roop: We?

Bear: Yes, Susan or I will usually get the animals ready for the program. In the studio I am networked with the school or group looking for the program. I can see the students on the monitor and they can see me on a monitor they have. I have taught children in places all across the United States and in places such as Japan and Canada. My favorite about this program is being able to the other kids in the classroom. The live animals are used for illustrating the actual lesson. They provide a nice touch and visual aid.

Roop: How long do these programs typically last?

Bear: They usually about an hour, but that typically depends on the institution.

Roop: And is this the only program you teach?

Bear: No, I also help teach Museum School when live animals are used. I don't if you know how Museum School works...

Roop: Yes, Dr. Pan told me.

Bear: Oh okay, well any time the classrooms bring in live animals and they need additional instruction on the live animals, they may ask me or Susan to help teach. We have a total of 6 different classrooms, but only 5 are used as actual classrooms. The other room is used for special presentations of bigger such animals such as the raccoon, barn

owl, and alligator. We put these animals in a separate room and let the classes come to them because they are bigger animals and they need more space for the habitats.

Roop: Does Museum School have their own teachers then?

Bear: Yes, each class has a different teacher. Susan and I just act as additional resources to these teachers.

Roop: My last question is do you think they are any disadvantages and advantages to having a living collection?

Bear: Well, I would say that big advantage would have to be the popularity the animals maintain with the kids. Really I would say that any advantages outweigh any disadvantages that we may have.

Roop: Well that about does it for me, thank you so much for your time I really appreciate it!

Bear: Oh no problem whatsoever.

APPENDIX I

Interview with Mrs. Connie Kassner

Roop: Well I guess one of the first questions I have is how long has this zoo had an education collection? Have you had one since the zoo opened? Did you guys decide to have one later down the line?

Kassner: I believe the zoo opened, well it first started over near the airport in '55. And shortly after that they have had animals used in educational purposes. They opened in this location in 1993 and we have been here since 1993 since that time they have had various education animals and an education curator and volunteers that also help take care of them. We have had education animals for that duration. And our education animals, since we are an accredited institution through AZA, our education animals are actually considered where they are housed in a constant state quarantine. They are kept away from the rest of the animal collection because they do go off of zoo grounds and they do come back. Whereas all the other animals when they arrive at the zoo are kept on a 30 day quarantine and till they are introduced with the other animals.

Roop: Okay.

Kassner: So we keep their health, so if one of my animals get sick it is only limited to that specific area.

Roop: Okay, and the size of the collection, has it grown?

Kassner: It has grown quite a bit. We have become more creative with our space. Here is a list of our animals, I don't know if you are familiar with our animals. The first is the number of males, the second is the number of females, and the third is unknown. So we have got two male ball pythons. And then, um, some of like our reptiles and our birds, since they are not in a breeding situation we really don't need to know their sex and so we have not bothered to sex them, because with birds either they lay an egg or you have to pull a blood feather which you have to send it off to DNA testing, which is quite possibly and it really makes no difference. We do know this is a male and this is a female just because they are sexually dimorphic with their colorations. The males are green and the females are red. Invertebrates we don't really, mammals of course are easier to sex than the birds and reptiles.

Roop: And with these animals are these all animals that you have acquired from a trusted source? I would imagine you don't take animals right off the street, maybe you do, I don't know.

Kassner: Our education animals are easily handled animals and I have heard another educator refer to them as throw away pets. People get them and think, 'oh a parrot makes a great pet, I love this bird' and then he begins the constant screeching or he repeats the profanity he hears in the room. So we get a lot of donations from the public for our education animals. The one and a couple of them, I know the kookaburra actually came from another zoo and the bird is native to Australia and laws governing animals from Australia are very strict and regulated. The screech owl is a rehabilitated animal and so he cannot be rereleased. The opossum was a rehab animal and also cannot be rereleased. It just depends on the animals, most of them though like I said were donated from people who said, 'oh, a parrot isn't that good of a pet he kind of stinks.' So, um, and then we look at, with all of our animals whether it is an education animal, birds, any of them it has to be approved by our general curator and our director whether or not we accept those animals. So its not just hey, 'I got this cool snake, do you want it? oh yeah sure bring it in' we have to go through the paperwork.

Roop: So there is protocol that needs to be followed.

Kassner: Right. And also any decisions made on euthanizing or serious medical conditions and stuff that is made up by a committee of people. So even with our parrot my recommendation is to you euthanize, that recommendation goes to the animal care managers, the vet, the curators, myself, so we make a decision based on the documentation.

Roop: And it looks like here you got a pretty good variety of animals in your collection, is it a policy of the zoo to try and not take too much of the same animal?

Kassner: Um, it depends on what are needs are for the program. For example, our ball python we have two of them, people have those for pets all the time because they are easy to keep. However we only have two in our education collection because we do not need anymore for the programs. Right now, we are limited, we have got one space to use on site for programs with kids, so we don't have the housing and we don't have the need to house 10 ball pythons, we wouldn't use them all the time. So we look at what they are going to be used for, what their education value is, and if the animal goes with our mission of how we are trying to teach people. All the animals we have in our education collection are chosen because we are able to handle them.

Roop: Okay.

Kassner: Yeah and I teach the programs. As far as the staff, there is me, Im full-time and we have one part-time person and we have volunteers. So in addition to space our staffing also limits what programs we can teach.

Roop: You mentioned programs, what kinds of programs do you offer here at the zoo?

Kassner: We offer an outreach program called the Zoo Mobile.

Roop: Okay.

Kassner: Then on grounds we do an animal presentation where they can bring their classroom up to the Ranch House and we get out three of our education animals either Creature Feature, Texas Animals, or um Reptiles. Um, we guided tours that didn't include the animals, we do informal tours meaning we just use our nonliving collection or someone stands outside the zoo with a live animal. Like the other day when we were busy I stood outside with the boa constrictor, and I talked to people as they came in, and answered any questions that they may have. And so, we are trying to go more towards informal because schools do not have money to pay for an actual program. So we want to do more customer service programs with the animals because there is no need to have this collection of animals if we are not going to use them for education purposes.

Roop: And typically with these classes is there a limit in terms of students and how long does a program typically last?

Kassner: Um typically like with, like if its groups of 35 or fewer the kids are typically allowed to touch the animals unless it's a bird. You know, birds do not like to be touched. So they are allowed to touch given the size of the group getting the program. If we do an outreach program in an auditorium, you know 100 or plus kids there is no touching but we do take the animals out, the most people we can fit up in the Ranch House comfortably is about 35-40 people.

Roop: Okay.

Kassner: And we practice a form of rotation with these programs. For example, if a school schedules an animal presentation for 110 kids, we will do five programs back to back. And so, here at the zoo, we are able to switch out animals and judge if their behavior is conducive to an educational environment. We let the animals kind of decide...

Roop: Okay, and this is you and the part-timers teaching the classes?

Kassner: Our volunteers do, we have adult volunteers that teach the programs and in the Summer we have teen volunteers that help out with our camps and some of them are trained to handle the animals. They are fabulous and sometimes they are more conscientious than our adults.

Roop: Well, um, I guess the next question I've got and we kind of already covered it, what do you think are the advantages and disadvantages to having a living collection?

Kassner: Well I don't really see a disadvantage, but there are some difficulties. There are difficulties in the care sometimes and making sure that the staff is properly trained to use the animals in programs and stuff and also that they are following the protocol. You know, our volunteers use the animals and sometimes they do an excellent job and

sometimes fire comes out of my mouth because they may be handling the animals as they should be. And so, that would be the major difficulties. I love using animals in programs, it is amazing. You can say the exact same thing, but if you are holding a snake you've got their attention. I have a parrot sitting on a perch and I am talking its just like a tractor beam, people just flock to you. And of course when you are doing a program with kids and when an animal uses the bathroom [Pause] that is what you are going to hear. You know, but they will remember what went and this and this, but you have got that hook. I see the animals as a hook to get people interested. You can stand there and say 'this is a picture of a tiger and their endangered, blah, blah, blah.' You bring them out to the zoo and you stand them next to the exhibit and you have a fur they can touch, a claw they can see, you see the animals interacting with each other, it literally brings the program to life.

Roop: Yeah, you know one of the phrases I have come across in my research is that animals are ambassadors of learning...

Kassner: Yep. Yes. Yeah we have used those words before and it is incredible. You know when I take the animals out on a program, I go ok these animals, it is their job, they are ambassadors to the zoo, so you have to be respectful of them, if you can't be quiet I'll just put the animals up and I'll stop and be respectful of their space. You know they are the ambassadors. And you know having the ones that are easily handled, you know you have that hook even with teachers, even with adults, even with college students you get in there and you're talking and then you get out an animal and then everyone has this expression of awe on their face. You know some kids have never seen a snake up close and so you have to educate them first. People are afraid of snakes and there is nothing wrong with that but you also get the crazy 'all snakes are bad,' which we are trying to get rid of.

Roop: And I guess too, you mentioned the use of the nonliving objects as well the live animals, do you guys house those here or are those in the Ranch House?

Kassner: Those are in the Ranch House. And what we've done is we have organized them in tubs and when I inherited the job it was just like buckets and bins that were not really well kept. You know and we worked with a certain staff member over at Mayborn who has helped us with preserving some of our materials. It's nice to have these objects because certain animals you will not be able to pet.

Roop: Okay. What do you think is the difference between your education collection and a living collection at a natural history museum or is there one?

Kassner: I think it depends on the institution and what their use for those animals are. You know some invertebrates make awesome display animals, but you would not take them with you because they do not travel well. So, um, I think it's a use issue. Our living collection of course is a big difference you can't house a tiger at a normal museum. So, um, we have tried to do you know if you go out and look at our exhibits a more natural looking habitat. But I still think its very similar and I think the biggest difference is in the use of the animals whether its in static displays, outreach, or ambassadors.

Roop: And its funny you mentioned the habitat part because that is the one thing I think that a zoo brings to the table that a museum does not necessarily. I use the Mayborn as an example because that is where I use to work, you know they basically have for lack of a better phrase ‘animals in boxes’ and I don’t mean to sound negative with that, but they do not have any habitats around the animals.

Kassner: Right, but at Mayborn what they are also trying to do there is look at vertebrates, invertebrates on a basic level. You know I don’t think what they are trying to do is divide their animals up by ecosystems like we do here. You know we try to divide our animals but areas or continents and we have graphics to help explain these differences. It just depends on how you use those animals.

Roop: Okay, awesome. How many animals do you have total including the education collection?

Kassner: We have, uh, well in 1993 we had 73 animals and now including fish and invertebrates we are over 3000. So that includes birds, reptiles, fish, invertebrates and then of course are mega fauna.

Roop: In terms of the overall collection, is there something different that you concentrate on with the bigger animals as opposed to the education collection? I mean to me all these animals would be educational what is it specifically that you target with the bigger animals?

Kassner: Well typically with camps we try to focus on different things and I try to incorporate all the animals in the different regions as I can. Um, our camps this summer are going to be Critter Twitter, which is how animals communicate. You know we are going to talk about how some animals use noise, some animals use scents, some animals use displays and how animals communicate in different ways. When I do the camps we will want to talk about the bigger animals in the zoo but we will also use the touchable animals in the collection. Um, another program is Colors and Pigments and we will look at why some animals have the colors they do. Is it for camouflage? Or is it for attracting a mate? So when I write curriculum I try to incorporate all the big animals.

Roop: Okay.

Kassner: And a lot of our focus if you look around we have fabulous graphics at the zoo, educational graphics that talk about the animals, um, we have got a few graphics that talk about conservation, and there a few graphics that talk about the plight of the orangutans. And yet we have another graphic that talks about fires in the savannah.

Roop: Okay, well this may be a tough question to answer, but I will ask it anyways, haha, what are the most popular animals with visitors?

Kassner: The cats. And right now also the orangutans. Large cats and I guess also the river otters, you know kind of the entertaining animals. And we typically get ‘why don’t you have any white tigers?’ Well then that opens up a whole other can of worms. And actually all the white tigers that have been bred are genetically inferior because they are inbreeding them like they do with dogs. As a result, they end up with a lot of health problems. Our mission with a lot of our animals, we participate in what is called the Species Survival Plan, and that is through AZA, the Association of Zoos and Aquariums. The SSP looks at which animals are endangered or threatened and need to be protected and one person in one of those zoos keeps a book and so then the animals that we house either are recommended for breeding or they are not, because we are trying to keep a good genetic diversity in captivity in case what happens is that when they become extinct in the wild we could use that genetic diversity in captivity to raise a population that could be rereleased.

Roop: Okay.

Kassner: So those zoos and aquariums that are not accredited will have babies just to pull people in to their zoo. Wherever there is a baby that is what they want to see and I agree that is so cute, but you have to also think about where are they going to go? You know is there a good place for them to go? So we help them by recommending to them places where the animal can go, places where the animal might have a possible mate. So it is really a complex issue...

Roop: Yeah it sure sounds like it.

Kassner: So people will ask us, ‘well, why don’t you have baby giraffes?’ Well we don’t need any and one of female giraffes actually has a deformity in her foot, and at this stage of her life if she were to actually get pregnant it probably cripple her permanently and neither her or her offspring would survive. So, you kind of have to look at the collection as a whole.

Roop: Right, in some of the research I have looked at it talks about movements in zoos, and I was going to ask your opinion on the current supposed conservation based movement. Topics include how to save the species for future years. Do you still feel that is what is going on here, or is there possibly a new movement that has been started?

Kassner: That is what is going on, but the way you have to approach it is education through entertainment. That is how, um, because people are not going to come here to find out about conservation. Um, a few years ago they did a survey on why people brought their kids to zoos. The number one reason was that it was a safe place, so people’s concerns are making sure that they take their kids to a safe place. Here you’ve got people taking their kids to a safe place, you know throw in the education with our graphics and people talking on zoo grounds with animal presentations and it makes for a good experience. People do not come to learn about conservation as a whole, they like to visit zoos and they like hear the conservation messages.

Roop: In the museum world, with the natural history museums especially you don't see that either it sounds to me like they would rather go to a zoo for that, but now you're saying that...

Kassner: Yeah, so like I said when people go to the zoo they don't say oh, 'lets go to the zoo we have not talked about conservation today.' No, they come to the zoo, a lot of times at the end of the school year because they do not have anything else to do and so we are trying to get the teachers to go, 'ok, this is what else we can do at the zoo in addition to having a fun day, you know do a scavenger hunt, learn about the different habitats at the zoo.' Teachers will call me and they will ask me when is the best time to visit and I tell come at the beginning of the week which will provide a kick off to the lessons for that week. You know we are trying to get more stuff online, for teachers to have those resources.

Roop: Okay. Well going forward are there any other animals visitors would like to see here? I know you already mentioned the white tiger.

Kassner: Visitors ask about polar animals, but we will never have polar animals here in Central Texas, I mean you know, also they do ask about Australian animals such as kangaroos and hyenas and that kind of stuff. Right now we are limited on space and right now up next we actually got our pavilion, which we are getting ready to build a new pavilion you know for programs and parties and stuff like that. And then the next major project will be a new education building and that will be located outside zoo grounds out front and it would be around 35,000 square feet. Right now we are limited by staff and by space as far as the education programs that we can do.

Roop: Okay. Well that is pretty much all of the questions I had, did you have any questions for me?

Kassner: No this is great!

Roop: Well thanks again for everything, I really appreciate it!

Kassner: Oh you are more than welcome!

APPENDIX J

Permissions from Fort Worth Museum of Science and History



8 August 2011

To Whom It May Concern:

The Fort Worth Museum of Science and History hereby grants permission to Brad Roop to use the following image, "Feeding Chart", as supporting documentation for his thesis on living collections in museums.

We request that a credit line is used in connection with this image – Courtesy of the Fort Worth Museum of Science and History, Fort Worth, Texas.

Sincerely,

Leishawn Spotted Bear

Leishawn Spotted Bear
Assistant Curator of Science
Fort Worth Museum of Science and History
1600 Gendy Street
Fort Worth, Texas 76107
(817) 255-9323
lspottedbear@fwmsih.org

Fort Worth Museum of Science and History Feeding Chart

This image and the next appear courtesy of the Fort Worth Museum of Science and History, Fort Worth, TX.

2011

Preschool curriculum

live animals:	THREE YR OLDS	FOUR YR OLDS	FIVE YR OLDS
Jan 10		live raccoon*	live screech owl
armadillo			live ground squirrel
ringtails* <i>SLA</i> • LECTURE <i>SH</i>			
mountain			
Jan 17	live prairie dog*		
prairie dog* <i>3¹2</i> • LECTURE <i>LSB</i>			
ungulates			
Texas ecology			
Jan 24	live chicks		
farm	live ducks		
cowboys	live goats*		
round up!			
Jan 31 - Feb 4 STOCK SHOW BREAK			
Feb 7		live crayfish	
rocks		live land hermit crabs	
crustaceans			
space I			
Feb 14		live fish	
earth, sun & moon			
fish, shark & ray			
planetarium			
Feb 21			
planetarium			
sea mammals			
space II			
Feb 28	live crayfish	<i>Snake skin</i>	live pack rat
crayfish			live Texas rat snake
fossils/prehistoric			live fern
cave I			
Mar 7	live raccoon*	live lizards	live frog
raccoon* • LECTURE <i>3¹2</i>		live snakes*	live salamander
reptiles I* • LECTURE <i>4¹2</i>		shed snake skin	live crayfish
cave II			live crickets
Mar 14 - 18 SPRING BREAK			
Mar 21		live box turtle	live cockroaches
dinosaur		live red-eared slider	live mouse
reptiles II* <i>gator</i> • LECTURE <i>4¹2</i>		live snapping turtle	live baby mice
urban I		live desert tortoise	live spider
		live alligator*	live Mediterranean gecko

2011

live animals:	THREE YR OLDS	FOUR YR OLDS	FIVE YR OLDS
Mar 28	live alligator*		live barn owl*
alligator* 8'2" * LECTURE			live screech owl
simple machines			live toad
urban II* 5'2" * LECTURE			live Colorado River toad
			live nightcrawlers (large)
Apr 4	live ladybugs		pond aquarium
ladybug	+ gallon jar & lid (2)		live minnows
backyard birds			live water snails
pond I			live land snails
			live crayfish
			live treefrogs
			live salamander
			live red eared slider
			live softshell turtle
			live desert tortoise
			live freshwater lilies
			duckweed
			* plexiglas
Apr 11		live owl*	live raccoon*
bee			pond water
birds of prey* 3'10" * LECTURE LSB			
pond II* 5'2" * LECTURE S11			
Apr 18		live tadpoles, small	
bird		live bullfrog tadpoles	
amphibians		live frogs	
wildflowers I		live toads	
		live salamanders	
Apr 25	live screech owl*	live silkworms (10)	
owl* 3'5" * LECTURE			
horticulture			
wildflowers II			
May 2	live tadpoles, small	live insects	
frog	live bullfrog tadpoles	live silkworms (10)	
insects	live frogs	live cockroaches	
field trip			
May 9	live box turtle	live spiders	live fish
turtle	live red eared slider	live tarantula	live toad
arachnids	live snapping turtle	live scorpion	live box turtle
favorite habitat			live kangaroo rat
			live crayfish
			live scorpion
			live sea star

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