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# Analyzing Big Cat Behaviors in an Artificial Environment

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ANALYZING BIG CAT BEHAVIORS IN AN ARTIFICIAL ENVIRONMENT

By

Krystal L. Ostrowski

Honors Capstone Project

Submitted to the Faculty of

Olivet Nazarene University

for partial fulfillment of the requirements for

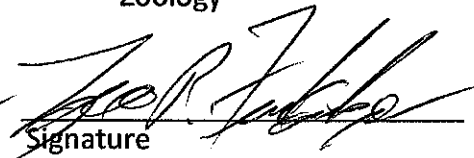
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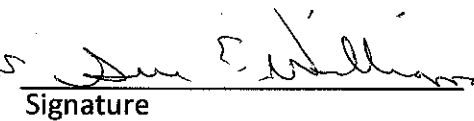
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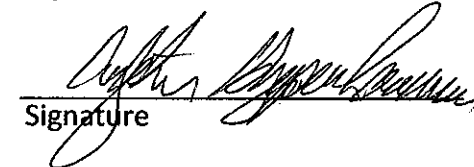
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in

Zoology

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To Dr. Finkenbinder and my mom, without their continued support this would not be possible.

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Me and Sheba (Female Cougar)

Photo credit: Rebecca Rizzo

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## ABSTRACT

The purpose of this research is, to observe big cat behaviors at The Exotic Feline Rescue Center, and analyze these behaviors in comparison to known behaviors, to see the affects an artificial environment has on these cats. In this study the term artificial environment refers to anything outside of the natural habitat. The behaviors studied include: aggressive territory behaviors, feeding behaviors and communication behaviors. The behaviors were studied in Tigers, Lions, Cougars and Bobcats. These cats were studied during feeding, while on tours, and while doing normal walk-arounds.

The results of this study show cats in captivity do exhibit similar behaviors to those exhibited in the wild, though the behaviors may be displayed for different reasons. The cats at the Exotic Feline Rescue Center rely on the keepers for food and other necessities and receive plenty of attention from volunteers and visitors. Because of this, these cats are used to interacting with humans and may use many of their behaviors to get attention.

### Keywords

Big Cats, Rescue Center, *Panthera tigris*, *Panthera leo*, *Puma concolor*, *Lynx rufus*, Conservation, Behaviors.

## INTRODUCTION

The Exotic Feline Rescue Center was founded in 1991 by Joe Taft; and started with three cats, two tigers and a leopard. Currently two hundred and thirty cats, nine different species, reside at the Exotic Feline Rescue Center. These species include: tigers, lions, cougars, bobcats, servals, leopards, lynx, ocelots, and an Asian leopard cat. The Exotic Feline Rescue Center is one of the largest USDA regulated facilities in the United States and gives a permanent home to abused, neglected, or illegally owned cats. Most of these cats come from roadside zoos, circuses, tattoo parlors, drug busts, illegal trading of cats over state lines, and abusive and neglectful situations. For this reason, the Exotic Feline Rescue Center does not breed, buy, sell, or rent any of the cats. It is also impossible to release any of these cats back into the wild. Many of these cats have been raised in captivity and have imprinted on people. It is also apparent that many of the cats cannot go back into the wild due to human implemented physical changes such as filing down the canine teeth and declawing.

The Exotic Feline Rescue Center also provides a high- degree of social interaction, enrichment filled enclosures, preventative medicines and prompt veterinary care. Many of the more serious surgeries are performed at the University of Illinois in Urbana- Champaign.



Figure 1: Lola at U of I for dental surgery and the removal of a hematoma.

Photo Credit: Jean Herrberg



Despite this, the Exotic Feline Rescue Center benefits from having an on-site clinic. Smaller procedures and also some emergencies can be performed here. These typically include tumor removals, spay and neuter, administering intravenous fluids, and blood work.

In a typical day, 3,500 pounds of meat are butchered and distributed to the cats. Each piece of meat is picked specifically for each cat and coated with powered vitamins before given out. Most of the meat that is fed out is cow or horse and comes from local farmers within the area. This benefits both the farmers and the rescue center.

The cats are taken care of by six full-time professionals. These six people are aided by six part-time employees, plenty of volunteers and interns. Volunteers help with tours, greeting visitors, special events, and some basic maintenance. Keepers and interns have a much more rigorous job description. Along with completing the above duties, interns receive their own set of cage keys and can then help the keepers fully. Daily tasks include cleaning water tanks and refilling them, cleaning enclosures, feeding, taking tours, enclosure maintenance, and butchering.



Figure 2: Jenna (keeper) and I taking a cow head out of a water tank.

Photo Credit: Tori Hoppkins

As the number of big cats in the wild declines, the number of these cats in captivity has increased drastically. Studying the behaviors of these cats in an artificial environment is significant because this problem is so prevalent within the United States. In this study the term artificial environment refers to anything outside of the natural habitat, or anything that changes expected behaviors when compared with wild cats. This research was completed in the summer of 2011; and consisted of observing four different species of exotic cat and comparing their behavior with that of cats found in the wild. The cats included in this study are *Panthera tigris* – tigers, *Panthera leo*- lions, *Puma concolor* –cougars, and *Lynx rufus*- bobcats. To better study these animals, three main behaviors were chosen to observe, these are: territory behaviors, aggressive feeding behaviors and communication behaviors.

## REVIEW OF LITERATURE

Many big cats are in danger of becoming extinct, and most of the cats we are familiar with will be extinct within ten years if nothing is done (Ellis). Many of these cats are kept in captivity and abused (McCloud 2). To better understand these cats in captivity it is important to understand some of their behaviors in the wild.

According to "African Lion," lions are the only cats that live in social groups, called prides. These prides have a specific hierarchy with a male as the lead and several related females and their cubs beneath him. Eventually young males must leave this pride and form their own. They do this by attacking a male from another pride; if they survive they are the new alpha male. At this point the male becomes the protector of the females and inherits the pride's home territory. The pride's home range can reach up to 100 square miles and although this is the area they will defend most viciously, they may hunt outside of this area. The members of the pride contribute to protecting their land. To defend this territory, many cats display behaviors such as pacing, scent-marking, roaring/growling, and in some cases, charging (Lehmann 12). These behaviors are considered territory defense. Although the males actively defend the home range and the other members of the pride, it is the females that go hunting. Once they obtain food, the lions protect their food by guarding it. They often lay in front of it, tense and ready to pounce. Vocalizations, such as growling and roaring, play a large role in deterring scavengers and other predators. This behavior is an example of aggressive feeding. Tying this all together is the communication behaviors of these animals. Roaring is the most known and loudest communication behavior for lions, they also communicate by scent and scratch marking. Scent marking consists of marking objects such as trees and plants with urine.

The fluid deposited is a mixture of urine and a whitish lipid that is also present in the bladder (Anderson). When sprayed on vertical objects, such as trees, the lipids stick to the surface and turn into a black tar-like substance. This substance becomes darker and lasts longer when the cats spray on the object at regular times (Anderson).

Lions could once be found in Africa and parts of Asia and Europe. Now they are only found in sub-Saharan Africa and a very small pride still resides in India's Gir Forest. Although the conservation status of lions is only "vulnerable," fewer than 20,000 remain in Africa. This is a drastic decline from the early 1980s when more than 200,000 resided within Africa and Asia (Shah).

Tigers are solitary animals that aggressively defend their home range by scent marking. This is similar to the lion's scent marking except tigers have a higher level of lipids within their urine (Anderson). This along with charging, roaring and growling all contribute to territory defense. Unlike lions, tigers must travel much further to obtain nutrients. Home range for these animals depends on resources, and can sometimes be over a thousand square miles (Mazak 4). Because of this they are much more aggressive when guarding food and are prone to attack much more quickly than other cats. Despite being solitary animals, many communication behaviors have been noted. As mentioned earlier, scent marking plays a large role in tiger communication, and this "scent" can deter enemies or attract potential mates. Tigers also use scratch marking to mark their territory. In addition to this, tigers use a lot of vocalizations to communicate. Growling, roaring, purring, chuffing, and chirping are all important

communication types (Walker 15). Body movements such as ear/mouth position, body posture and tail position are also indicative of the cat's mood (walker 15).

According to the IUCN Red List of Threatened Species tigers once ranged widely across Asia, over the past 100 years tigers have disappeared tigers have disappeared from southwest and central Asia, from two Indonesian islands (Java and Bali) and from large areas of Southeast and Eastern Asia. In addition to this, tigers are listed as endangered with only 4,000 left in the wild.

The cougar's geographical range varies dramatically and is the largest of any terrestrial mammal in the Western Hemisphere (Sunquist 254); because of this they are able to live in varying conditions and adapt easily. Depending on where they reside cougars can be called mountain lions, catamounts, screamers and pumas; and despite many frequent misunderstandings these are all names for the same cat (Sunquist 253). Cougars travel extensively for food and often leave their home ranges, and while they do scent mark and scratch mark, their territory defense is much less aggressive than the lion and tiger (Sunquist 256). In addition to this, Cougars are opportunistic predators and will prey upon anything they can kill. For this reason many hunting behaviors vary depending on the food source (Sunquist 257). The principal modes of communication are scrapes on the ground and mounds. Scrapes are made by pressing both hind feet into the ground and pushing backward, urine and feces are usually added for to bring more attention to the scrape. Cougars bury their feces and the resulting piles are what make up the mounds (Sunquist 262). In contrast with many of the other exotic cats, Cougars do not spray urine. They also communicate with a wide variety of

vocalizations. These include purring, chirping, meowing, hissing, growling and spitting. The most well known vocalization is the cougar “scream, “even though it is not often heard (Sunquist 262).

Cougars are only protected in the southeastern United States, and in many states it is a sport to use hunting dogs to chase them down (Sunquist 269). Despite this, Cougars are surviving and it is most likely due to their ability to adapt.

Like the Cougar, Bobcats are very adaptive and can live almost anywhere, but what sets them apart is their preferences. They prefer areas with dense cover or uneven terrain (Sunquist 186). With this type of habitat bobcats are able to escape from predators and catch prey readily. As for territory defense these small cats are fierce and will protect their home range, but only to a certain extent. If faced with the option to escape from a larger encroaching enemy, they will (Sunquist 188). Bobcat home range varies from 125 square miles to 35 square miles (Sunquist 191). Bobcats obtain their food in one of two ways, either by ambushing prey or by actively stalking it. Once they obtain their food, bobcats display a food guarding behavior, often growling and snarling at anything that comes too close (Sunquist 189). Similar to the cougar, bobcats use scraping methods for communication. They also spray urine onto objects. Bobcats also use a wide range of vocalizations including different variations of meowing, snorting, spitting, yowling and screaming (Sunquist 192).

Most bobcat populations are considered stable as their conservation status. This is a dramatic increase from being labeled as “could become extinct” because they were being hunted for their fur (Sunquist 195).

## METHODS

Four different types of observations were implemented to record the behaviors of the cats involved. The first type of observation was taken during tours. While walking guests through the facility, cat reactions were recorded. The second type of observation was recorded while doing normal, isolated walk-arounds. This was to gauge animal reaction to not only an individual, but also an individual with whom the cats are familiar. The third type of observational notes were taken while cleaning cages and were imperative while feeding. This included taking notes when food was initially presented and also included how the cats acted once they had the food. Lastly, data was collected during enrichment as well, which included giving the cats toys, different types of food, such as deer, spraying their existing toys with perfume, and giving the cats attention when they want it.

## RESULTS

### **Behaviors displayed while giving tours:**

- Wednesday June 1, 2011

Tao, a male lion, was charging the fence and growling at everyone that walked past. (Territory Defense)

- Wednesday June 8, 2011

This was a very hot day and many of the cats did not even get up to interact with people. (Territory Defense, Communication)

- Wednesday June 15, 2011

King, male lion, did not seem bothered by tours today; he came over to me and nuzzled the fence. (Communication)

Today I had a tour filled with little kids. Lauren, female lion, jumped off the tower and stalked them until we left the area. (Territory Defense, Communication)

- Friday June 17, 2011

Today King, male lion, urinated through the fence and all over my arms. (Communication)

Felix, male tiger, was looking for attention and kept jumping on the fence and stalking me as I walked past. (Communication)

- Friday June 24, 2011

Simba, male lion, roared when my tour walked past him. (Territory Defense, Communication)

- Monday June 27, 2011

Munchie, female cougar, was very interested in the little kids walking past her cage. She ran back and forth trying to catch up with them. (Territory Defense, Communication)

### **Behaviors displayed while doing isolated walk-arounds:**

- Monday June 6, 2011

Today I was able to give Sahib, male tiger, a protected touch through the fence. (Communication)

- Monday July 18, 2011



Cleo, female serval, finally came all the way out of her box, although she was lying next to the fence growling at people. (Territory Defense, Communication).

**Behaviors displayed while feeding:**

- May 31, 2011

Raja, male tiger, is notorious for being food aggressive. He guards his food and become very vocal when tourists stop to take a picture. (Aggressive Feeding, Communication)

- Saturday June 25, 2011

Simba, male lion, always moans and digs at the fence when you bring food near. If you take too long cleaning his enclosure he becomes angry and begins to growl. (Communication)

**Behaviors displayed during enrichment:**

- Friday June 10, 2011

Today I was able to spend some time with India, a blind female white tiger. She does not come up to the fence for everyone but today she let me pet her. (Communication)

Sahib, male tiger, came up to the fence when I called him. He was nuzzling the fence and chuffing. (Communication)

- Saturday July 30, 2011

Rocky, male bobcat, loves to be touched; he also likes to play with your hair when he is on the ledge above you. If you walk past him without stopping he often mews and sticks his paws outside of the cage. (Communication)

**Graphical Analysis:**

The numbers within each graph correspond to how many animals exhibited the action in question out of the total number of cats from each species studied (See Appendix A for tabulated data). The data below displays a typical day at the rescue center, and it is a representation of what can be expected from the cats. It should also be noted that only animals on the main tour route were considered for this research and only groups of three cats, or less, per cage were observed. The cats residing on the main tour route were chosen because they

have the most interaction with people and were the most easily observed because as an intern, the most time was spent with these cats.

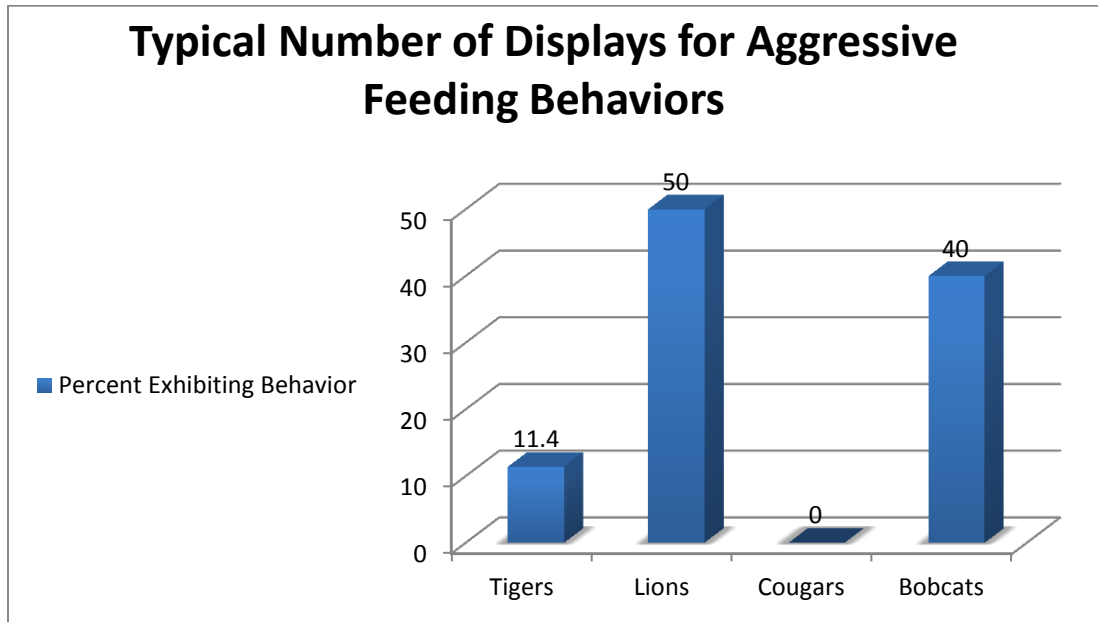


Figure 3: Displaying the typical number of cats that exhibited aggressive feeding behavior.



Figure 4: Trooper guarding his food.

Photo credit: Hollie Baldauf

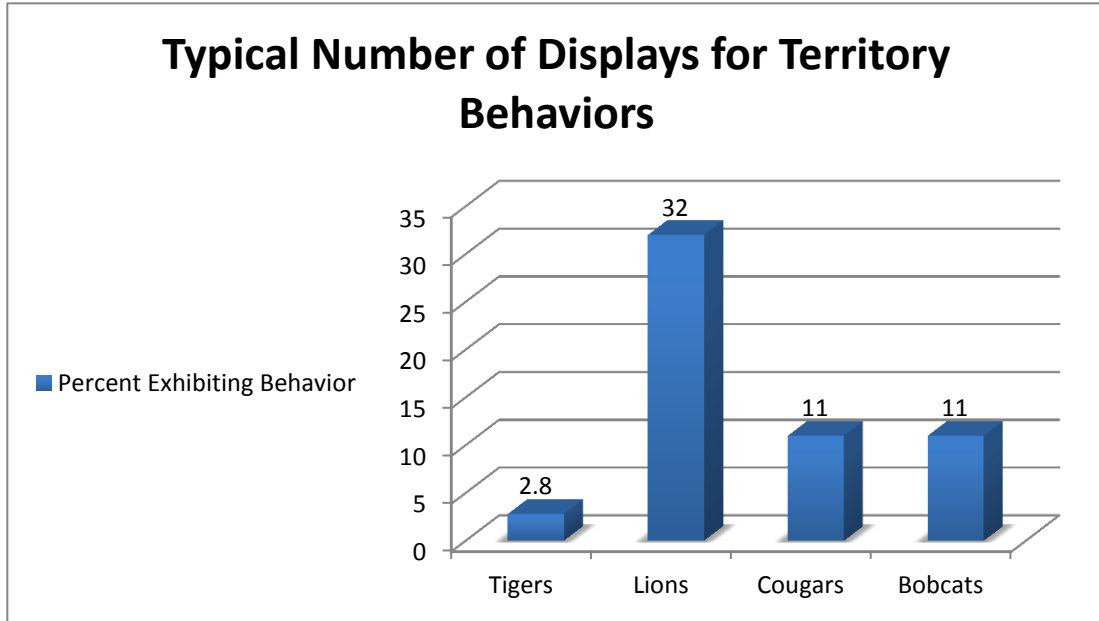


Figure 5: Displaying the typical number of cats that exhibited territorial behaviors.



Figure 6: King displaying territory defense when tourist got too close.

Photo Credit: Suzanne Ostrowski

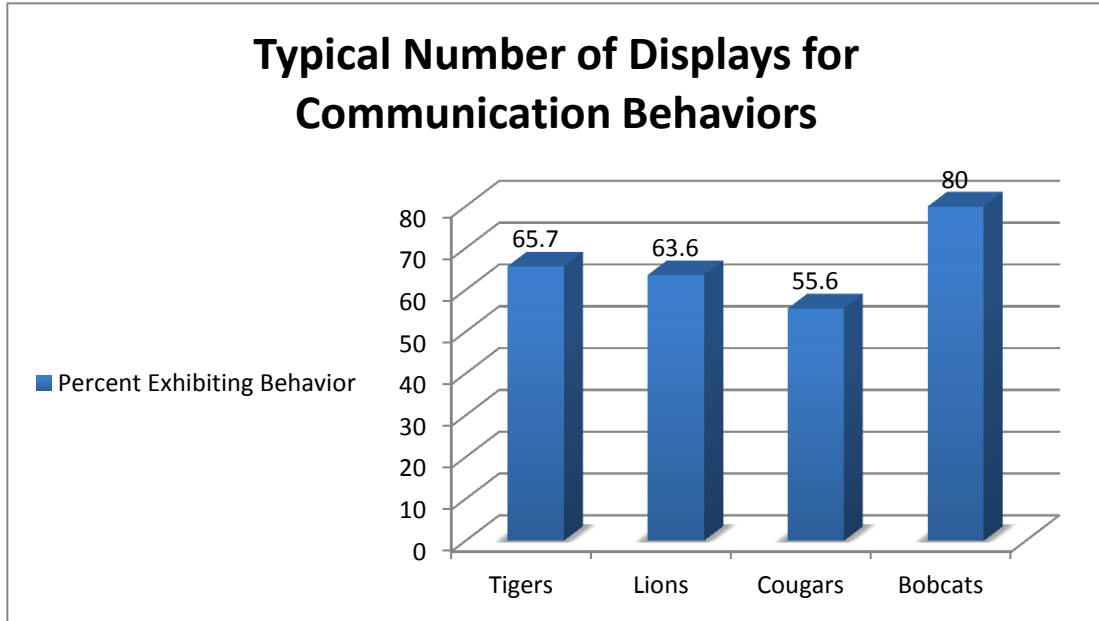


Figure 7: Displaying the typical number of cats that exhibited communication behaviors.



Figure 8: Kisa is rubbing against the fence for attention.

Photo Credit: Suzanne Ostrowski

## DISCUSSION

From the data collected, it is clear that exotic cats in captivity do exhibit similar behaviors to cats in the wild. After analyzing the data however, it can be concluded that captive cats may exhibit behaviors for attention from volunteers, visitors, and keepers.



Figure 9: Herman and I.

Photo credit: Suzanne Ostrowski

An example of this would be “chuffing.” This is a sound unique to tigers, and it is a friendly hello. In the wild tigers only exhibit this behavior towards cubs or mates (Wildcat Haven). At the Exotic Feline Rescue Center however, it is a very common noise.

Figure 3 shows lions and bobcats as being the most food aggressive. For lions this does coincide with the feeding behaviors that wild cats exhibit. Bobcats are normally not food aggressive due to their size compared with other predators. In an artificial environment showing food aggression may be due to the cat’s range constraints. Being in a cage limits how far a cat can move away from a threat, and because of this many of the smaller cats must defend their food. Many of the tigers and cougars at the Exotic Feline Rescue Center are also food aggressive. This is similar to the behavior exhibited by wild cats, but at the rescue center the reason may be attributed to the abusive past of some of the cats.

Figure 5 shows that lions, at the Exotic Feline Rescue Center, are the most active at defending their territory. This is also true for wild cats; they must defend their home range from neighboring prides and scavengers in the area. At the rescue center the only threat to the lions are tourists and from the data it is clear that lions displayed significantly more territory defense behaviors when tourists were around. While bobcats and cougars were somewhat territorial, they preferred to hide in their boxes or towers when threatened. This behavior is precisely what wild cats would exhibit, they only become overly territorial during mating times, while raising young or when extremely threatened (Sunquist 1988). Although tigers are aggressive in the wild, at the rescue center many have grown accustomed to human contact and even crave it. This does not stop tigers from scent marking their territory and more often than not marking a tourist.

Figure 7 shows that communication is very important to big cats. This is true for cats at the rescue center and cats living in a more natural environment. Lions and tigers communicate, vocally and using scent/ scratch marking, throughout the entire day. The smaller cats on the other hand are usually the most active at dawn and dusk, making them crepuscular. It is very typical to hear a bobcat or cougar scream when feeding begins in the morning and when everyone is leaving at night.

Although the results of this study show many similarities between captive kept cats and wild cats, there are always issues, such as, location, cat background and weather, to take into account. This study was conducted at one rescue center. To effectively analyze all possibilities of the impact of an artificial environment, more rescue centers and locations should be

considered. The background of each cat can also affect their behavior at the rescue center. This fact has had an impact on this research. If the cat was abused or kept in a group instead of solitary, it is expected that their behavior will be different. An example of this is, a cat that guards their food because they were not fed by a previous owner. Weather also played a factor in the behavior of the cats this summer. It was very hot and many of the cats did not move at feeding time or during tours, which is comparable to wild cat behavior, but does not give data for the behaviors studied in this research.

In conclusion, these cats do exhibit similar behaviors when compared with wild cats; although captive cat behavior may be displayed for different reasons, such as attention.

## SUMMARY

This research really pushed me to learn about the cats and their behaviors. I was also able to teach others about these cats. Olivet Nazarene University students, from the Animal Behavior course, took a field trip on October 1, 2011 to observe cat behavior and to observe me while I worked with the cats. At one particular time Dr. Finkenbinder asked the class to watch as I approached King, a male lion. King came up to me and began rubbing on the fence (communication). I stood next to him and played with his mane until the class began to inch closer. As soon as the students approached King, he began to snarl and growl (Territory Defense, Communication). Many of the students took a step back as King displayed his dominance over the area. Once they stepped away he happily returned his attention to me and began whining for me to pet him.

While doing this research I became close with a few of the cats. One in particular should be mentioned. India, a rather small white tiger has been at the rescue center for years. She always brought joy to tourists and was always willing to chuff for the crowd. She was also a wonderful education tool because we were able to explain why white tigers should not be bred in captivity.

At first she was very timid and in fact the first time I met her, Jean Herrberg had to sit on the ground and talk very quietly to get India to walk over. The more time I spend around her the more comfortable she became until she was running up to the fence at the sound of my voice and licking my hand. India was a testament to overcoming a past of abuse and being able to cope with a constantly changing environment.



India died March 22, 2012 at the age of 16.



India. R.I.P. (3-22-12)

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APPENDIX A

Typical Number of Displays for Aggressive Feeding Behaviors	
Animals	Displayed
Tigers	4/35
Lions	11/22
Cougars	0/9
Bobcats	2/5

Table 1: Depicting the number of cats that displayed aggressive feeding behaviors out of the total number of cats studied per species.

Typical Number of Displays for Territory Behaviors	
Animals	Displayed
Tigers	1/35
Lions	7/22
Cougars	1/9
Bobcats	1/9

Table 2: Depicting the number of cats that displayed territory behaviors out of the total number of cats studied per species.

Typical Number of Displays for Communication Behaviors	
Animals	Displayed
Tigers	23/35
Lions	14/22
Cougars	5/9
Bobcats	4/5

Table 3: Depicting the number of cats that displayed communication behaviors out of the total number of cats studied per species.

APPENDIX B



India licking my hand



D'Artagnan. He came to us when his owner died. I remember building his cage and helping him adjust once he arrived.



Kisa was fed cat food before she came to the EFRC, and because of that has brain damage that effects her coordination.



Sahib is a Golden Tabby tiger. This is a man made breed, and is not seen in the wild. For this reason there are only an estimated 45 in the world.



Lola on 11.5.11. She is completely healed from surgery and enjoying her new enclosure.