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# The Role of Modern Zoos in Wildlife Conservation: From the WCS to the Wild

John Scott

*Fordham University*, env12\_17@fordham.edu

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# **The Role of Modern Zoos in Wildlife Conservation:**

**From the WCS to the Wild...**

John Scott

Professor John van Buren PhD.

Fordham University – Environmental Policy

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## **Thesis Abstract:**

The reality of the modern world is that humanity is increasing its population rapidly, and demanding more resources than the earth can provide. Humans are utilizing resources like water and fossil fuels, and are in turn polluting and causing a shift in the global climate. Most importantly, humans are taking previously untouched land and utilizing it for living space or agriculture. Therefore there is very little “wild” left after human consumption, and this rapid consumption is adversely affecting all other animal species on this planet. With little food of their own or territory to roam, many species begin their dramatic decline towards extinction and their total disappearance from this planet. Almost simultaneously with the decline of the animal kingdom arose the existence of the zoo. Zoological parks did not start off with conservation being a primary focus, however as they evolved, the focus shifted from exhibition to preservation. The modern zoo has conservation as one of its main priorities, which also include education, entertainment and research – a focus that is more comprehensive and serves to guide the actions of the modern zoo. Their work is multi-faceted and includes elements of conservation biology, history and ethics – all which are present in this thesis. While their intentions are good, the modern zoo draws a great deal of criticism from many sources who claim their efforts only serve to imprison wildlife for humanity’s benefit. This argument implies only a superficial knowledge of the work that zoos do, and therefore is illogical. The work that organizations, like the Wildlife Conservation Society – headquartered at the Bronx Zoo - do is invaluable in the fight against species decline and extinction. Therefore the modern zoo serves as a vessel both for the conservation of the animal kingdom, but also to inspire and foster a new generation committed to the preservation of all species.

## **The History of the Modern Zoo**

The concept of a zoological park is not something that evolved along with the modern notion of environmental consciousness, but has instead existed for thousands of years. Keeping animals in captivity predates the Common Era, and existed previously as a menagerie, where animals were exhibited in little more than cages or pits. While the times and rulers may have changed throughout time, the ways in which they exhibited animals certainly changed little from the time of Cesar. Over time, the large cities of the Western world began to establish zoological parks of their own, each trying to outdo the grandeur of their rival states. While all major cities across the world had zoos at the turn of the 20<sup>th</sup> century, most were dismal examples of animal welfare and conservation. Animals were exhibited in cages made of little more than cement and steel bars, and made no attempt to educate the public or promote their collection's overall mental health and happiness. As time progressed, the attitude towards animals in zoos changed dramatically, and their contribution to the field of wildlife conservation became invaluable. Despite their dismal beginnings, the evolution of the modern zoo demonstrates their commitment to the preservation of species, and has helped to save numerous species throughout the course of history.

The lineage of zoos is almost as old as humanity itself, and it seems that mankind has an affinity to keeping wild animals in captivity. This desire to control the wild can perhaps be linked to humanity's origins as hunter-gatherers, or a deeper desire to control the uncontrollable. Regardless, the development of civilization has inevitably led to the development of the zoo as an institution. These primitive zoos- a word that did not develop until fairly recently – have existed since about 3,000 B.C. and began with the earliest of human empires (Croke 129). It is

difficult to estimate the exact century where the first instance of a zoo was recorded, however historians claim that the first zoo began in Mesopotamia at the royal estate during the Third Dynasty of Ur (Croke 129). However this primitive zoo was not well documented and is based only on educated hypotheses based on pottery fragments that were found depicting domestic animals and the occasional wild animal. The first true zoos came into existence after Mesopotamia but still before the birth of Christ, and began in ancient Egypt. Ancient peoples who inhabited Egypt considered many animals to be sacred, and therefore had an interest in protecting and keeping them. Animals such as lions, baboons, bulls, snakes, hippos and crocodiles were all considered holy, therefore pharaohs sought out these creatures through expeditions and built parks for them (Croke 129). They even embalmed many of these animals once they had become deceased, further demonstrating how important these animals were to Egyptian society and culture. Collecting wild animals for personal exhibition was not an interest solely of one particular pharaoh; rather both male and female rulers of Egypt send expeditions throughout the known world to collect various species of animal. Queen Hatshepsut sent an expedition out which returned with leopards and the first giraffes that Egypt had ever seen (Croke 130). While these expeditions and menageries were originally solely intended for royal use, over time the public was gradually allowed limited access. Eventually, “crowds were allowed in to watch the lions being fed live prey at the Temple of the Sun in Metropolis and to feed meats and cakes to the sacred crocodiles of Lake Moeris” (Croke 130). By allowing the public gradually into these menageries, the ancient Egyptians paved the way for the modern zoo that would evolve over the centuries.

The Egyptians were not the only ancient civilization to exhibit wild animals; rather there were other societies which kept animals in one form or another. The Chinese king Wen, of the

Zhou dynasty, established a “divine park” in which he housed all sorts of animals ranging from antelope to pheasants (Croke 131). In addition, the Greeks formed animal collections in their major cities to display their captive animals. These “were used to display power and wealth” much like the other ancient empires, however there was also a deep desire to learn more about nature and the environment (Croke 131). The study of animals as a discipline developed with the Greeks and their menageries, and demonstrated the intellectual capacity of this ancient civilization. Later in history, Alexander the Great brought all sorts of creatures back from his military conquests, and is credited with founding the world’s first public zoo. The Romans too also exhibited wild animals for both private and public pleasure, however their collections were immense compared to other early empires. While the Greeks were concentrated on the science and study of animals, the Romans were more concerned with pitting these animals against one another in duels to the death. When the Romans conquered the Egyptians, they utilized the animals that were in the Alexandria Zoo and brought them to coliseums across the empire to be utilized in fights against other animals and sometimes people (Croke 132). These menageries “existed simply as bullpens, warming up the beasts to be farmed for slaughter” and stretched across the known world at the time, from one end of the Roman Empire to the other. While Emperor Constantine briefly abolished these games, they were quickly brought back to the empire once his reign was over. While all of ancient empires had their own versions of menageries, what was constant was the fact that these animals were kept in inhumane and often cruel conditions only to serve the whims of the ruling elite or the blood-thirsty masses.

Much like the rest of humanity, the concept of a menagerie or zoo also declined during the period known as the “Dark Ages” which occurred after the fall of the Roman Empire. While the few that remained stayed popular among the masses, these collections were scaled down, and

were now only held by royal families or on the grounds of monasteries (Croke 133). Despite their dormancy for a period of a few hundred years, zoos surged back into prominence with King Frederick II of the Holy Roman Empire. He was a naturalist, ornithologist and author with a huge collection of animals that he kept in Palermo and elsewhere throughout his kingdom (Croke 134). Elsewhere in the western world, King Henry III of England moved the royals' menagerie from its former place in Woodstock to the Tower of London. This unusual place to exhibit animals "seems to have been a private collection for the king, a sign that he enjoyed good relations with foreign monarchs, who presented him with animals" as gifts or tributes to the monarch (BBC 1). Generations later, these animals would be moved to Regent's Park and out of the tower, however historians would later discover lion skulls in the tower – a testament that big cats were indeed kept in that historic building for a prolonged period of time. The concept of a zoo which housed captive animals is not a concept that stopped at the Atlantic Ocean; rather the civilizations of the New World also kept animals in captivity. When Cortez entered the Aztec capital of Tenochtitlan, he saw many wild animals being kept behind bars – including jaguars and monkeys (Croke 136). It is incredible that across the barriers of distance, geography, time and culture, humanity has kept exotic animals in captivity in facilities that span the globe. Since the beginning of civilization, mankind has been fascinated with the notion of controlling the wild, and it is evident by the amount of these primitive zoos that have existed throughout time.

The first major evolutionary leap in the development of zoos began with the multitude of European explorers sailing around the globe, and opening up new trading routes worldwide. While these new trade routes were primarily intended for funneling money and goods back to Europe, they were invaluable in bringing exotic animals back to Europe. Wherever there was a major port thriving because of the shipping trade, there also was a large menagerie that was

flourishing with these imports of wild animals from all corners of the globe (Croke 137). With an influx of new and “exotic” animals, zoos now became tools by which ruling monarchs displayed their power and prominence to others. A prime example of this phenomenon is Louis XIV of France, whose palace at Versailles was the first example in the Western World where flora and fauna were displayed side by side (Croke 138). Because so many foreign dignitaries visited the palace, “the zoological garden was seen by many and imitated in other countries”, especially other countries in surrounding European nations (Croke 138). Interestingly enough, this zoological garden lasted until the French Revolution when revolutionaries stormed the palace grounds, angered that the zoo animals were more well fed than the citizens of France. These revolutionaries then proceeded to “liberate” only the most edible members of the zoo, and left the more dangerous inhabitants (Croke 138). It is often discussed how the French Revolution impacted all areas of society, however it is interesting that not even the animals in the zoo were spared from the bloodbath that would become the Revolution. While the zoo may have suffered under the Revolution, wildlife was still considered to be extremely important to the French, and the Jardin de Plantes in Paris became the refuge for some of the animals who survived the Revolution. This zoological park would become a destination not only for eager tourists, but also a scientific Mecca where a great deal of behavioral research was conducted. The French system of zoological parks would become the standard for all future zoos, and would spur competition between other European nations to construct the best zoo with their available technology. These international competitions inevitably lead to the advancement of the zoological park and eventually the evolution of the modern zoo.

Not to be outdone by their French rivals, the English strived to create a zoo which would become the standard for keeping animals in captivity. This endeavor began with Sir Stamford



Raffles, who was the founder of the British colony of Singapore. His adventurous spirit led him to the aspiration of creating a zoo in England that would be primarily devoted to scientific exploration and discovery (Croke 140). It is no surprise that an explorer such as Raffles would be inspired to create a zoo; the concept of keeping animals in captivity is essentially an exercise of power. Much like colonizing foreign lands, keeping animals in a zoo setting involves a great deal of manipulation; everything from their exhibits to what individuals they can breed with is carefully controlled by humans. This gives mankind the illusion that they have control over the wild, something that would naturally appeal to an explorer whose profession is to gain control of the Earth. With Raffles at the helm, the London Zoological Society sought to open a zoo that, “brought from every part of the globe to applied either to some useful purpose, or as objects of scientific research, not of vulgar admiration” (Croke 141). This was unique at the time because previously zoos were established as areas where the rich could marvel at the natural world, not as scientific institutions. Despite this change in purpose, the London Zoo was just as restrictive as the royal menageries of past, and at first, visitors to the zoological park needed written permission to enter. With the success of the London Zoo, imitations sprung up around Europe, all with the intention of establishing these zoos as institutions of scientific research.

While European nations eagerly adopted the notion of zoological parks, America was rather slow and reluctant to join the new wave of zoos. Perhaps they were more preoccupied with their Civil War or other industrial aspirations, but the American government and public were several years behind their European counterparts. However once this new wave of zoos made the jump across the Atlantic the momentum was impossible to stop. American entrepreneurs often visited European zoos for inspiration, and continued the wave of innovation in the United States. While American zoos kept the new trend of zoos going, the next major development in the

evolution of zoos came from a European Zoo. Carl Hagenbeck of Germany created the first zoo that did not include the stainless steel bars that dominated the zoological landscape until that point. He used, “moats, hedges, artificial rocks and winding walkways to produce a zoo that had no bars and fabricated the illusion that predators and prey were side by side” (Croke 146). This illusion also included the fact that his zoo was designed to look like there were no barriers between visitors and the animals, even if a moat separated the two groups. His zoo was also revolutionary because it was the first instance where animals were displayed by geographic region instead of taxonomic group. Instead of having exhibits like the Monkey House, the captive collection was organized into exhibits like the African Plains exhibit at the Bronx Zoo. While Hagenbeck’s ideas caught on slowly because of the belief that the moats created too much of a distance between the visitors and animals, by the 1960s, “just about every zoo in the United States had at least one ‘naturalistic’ enclosure” (Croke 146). While the changes that Hagenbeck made were simply superficial, they set the stage for many changes that developed in zoos during the twentieth century, and his principles can still be found in most modern zoos.

While there were several advances in the field of zoological parks, the overall care for the captive collections remained much the same for centuries. Animals were seen as merely objects for either viewing pleasure or scientific research, and little thought was given to their overall wellbeing or mental health. Steel enclosures with bars dominated the landscape of zoos until Hagenbeck’s moats came into existence, however even these new advances still were crude and were only a cosmetic improvement over the cages animals were once kept in. Zoos advanced very little until the general public became interested in animal welfare, and striving towards exhibiting them in a way that was beneficial for both their physical and mental health. This regard for animal welfare caused the passage of the Animal Welfare Act of 1970 which

addressed the exhibition of animals in zoos specifically. This law included provisions which addressed all aspects of keeping animals in a zoo, making sure to regulate and enforce standards about all aspects of captive life. The law stipulates that, “Each research facility must have an attending veterinarian who is required to provide adequate veterinary care to the facilities animals” (Quick Reference Guides). This means that a veterinarian must examine and perform routine checkups of not only the zoo, but also the animals to guarantee that they are healthy and receiving the proper treatment. Also, the scheduled visits must be frequent enough to provide adequate veterinary care to all animals at all times (Quick Reference Guides). Therefore a larger zoo or other facility with more animals would most likely need a veterinarian to be on call more often than a smaller zoo, that way their large collection of animals would all receive the “adequate veterinary care” that the Act stipulated. In addition to veterinary care, the law also provides for standards in the daily husbandry of these animals. For Primates, “ambient temperature must be maintained at a level that ensures the health and well-being of the species housed”, which was something that was not considered before this law was enacted (Quick Reference Guides). In addition to the provisions stated in the law itself, the USDA was charged with promulgating regulations to address things like the diet, exhibit size and enrichment of all captive animals. Therefore the Animal Welfare Act was the turning point for zoos, which now had to consider the overall wellbeing of the animals in their collection, and had to make a dramatic break from the way zoo animals were exhibited in the past.

The concept of an animal theme park is one that has recently evolved in the history of zoology, and has been thrust into the national discourse over animals in captivity. These theme parks include wild animals alongside their rides and attractions, and use those animals to attract more visitors to their theme park. Prominent examples of these animal theme parks include

Busch Gardens, SeaWorld and Disney's Animal Kingdom. These do not fall into the category of "zoos" because their focus is more on entertainment and less on conservation – the primary role of the modern zoo as discussed in the next chapter. Disney's Animal Kingdom is the exception because of the conservation initiatives of the Walt Disney Corporation, specifically their Conservation Fund. This organization in conjunction with their theme park provides "financial support for the study of wildlife, the protection of habitats and community conservation and education" (Annual Conservation Grants 1). Their goal is to support conservation organizations focused on long-term positive impacts for wildlife and habitats (Annual Conservation Grants 1). While they may have noble conservation efforts, their main priority is to entertain their guests, and therefore would not be considered under the definition of a "modern zoo".

Zoos have evolved tremendously from their original inception, and the modern zoo stands as the product of centuries of development in the field of zoology and animal welfare. While zoos were originally intended to be symbols of a monarch's power, they now are institutions devoted to scientific research and the conservation of animals whose "wild" is quickly disappearing. And while animals originally were kept in tiny, barred cages, they now have evolved into large enclosures which try to replicate their natural environments. Some of these changes arose from the natural competition between European monarchs to determine who had the best zoological park, and therefore the best kingdom. Other advances in the field arose from personal innovation like Carl Hagenbeck, and some were legislated like the Animal Welfare Act. Regardless of their origin, these changes have helped transform the field and create what can be considered the modern zoo dedicated to conservation, research and education of all species of wild animal.

### **The Purpose of the Modern Zoo**

Throughout history, zoo may not have been the best examples of animal welfare, and instead were institutions where little regard was given to anything besides human desires. Their exhibition, treatment, and husbandry was all tailored to mankind, and the welfare of animals were never taken into consideration. While this may have been true in the past, gone are the days where animals were exhibited in little more than steel cages and put on display for the jeering public to poke and prod at. Zoos have instead evolved into organizations which are dedicated to zoological research, conservation of species, in addition to changing people's perceptions of the wild and the environment as a whole. Each of these points can be seen in all modern zoos, and each purpose is given a great deal of time and resources by these institutions. These main purposes of a zoo could only happen if visitors were truly entertained by their visit to the modern zoo, and the profit generated from their entertainment is devoted to conservation efforts. Therefore these four aspects are the main purposes of the modern zoo, and each contributes to how these institutions are the driving force behind wildlife conservation.

In an ideal world, the zoo would not be in existence; however the last remaining space for wild animals is quickly being consumed by mankind in order to make room for agriculture, cities and overall development. Species are becoming extinct at a rate that is unlike anything that has been seen throughout time. While species have always gone extinct due to natural causes or changes in the Earth, "the past 400 years have seen 89 mammalian extinctions, almost 45 times the predicted rate, and another 169 mammal species are listed as critically endangered" (Freeman 1). Scientists are quite alarmed at the rate of species that are currently undergoing extinction or are rapidly heading towards it, and some consider it to be another mass "extinction event". Throughout the course of history, species have gone extinct in large quantities during these mass extinctions, the dinosaurs being the most iconic example (Mass Extinctions 1). Some believe that

due to the rapid decline in species, that we are currently in a potential sixth mass extinction event due to how climate change is altering the planet and its chemistry (Mass Extinctions 1).

Conservation is therefore an extremely important issue because of the dire need to save species from extinction.

Because of rapid species decline, the most important function of the modern zoo is the preservation of species; wildlife conservation is the bedrock upon which zoos are founded and gives them legitimacy in the eyes of the public. All zoos in today's society have undertaken great measures to ensure the survival of many different species of animal. This dedication to wildlife conservation is not something that has evolved only in the past few decades, rather conservation endeavors by zoos is something that can be seen throughout the course of the past few centuries. For instance, the newly created field of wildlife conservation rose to the challenges facing the American bison and helped stop the eradication of the species. These efforts were spearheaded by the New York Zoological Society (which would eventually become the Wildlife Conservation Society) and the American bison Society. In a manner similar to Theodore Roosevelt's school of conservation, Dr. Hornaday of the Bronx Zoo believed that, "the only way to preserve and insure the species was by establishing a number of national herds, to be maintained by the Government on large areas of grazing grounds" (Garretson 203). Hornaday persuaded the federal government to let the Zoo establish a breeding herd at their facility in the Bronx in order to bolster populations eventually in the wild. This was one of the first examples of ex-situ conservation that world had ever experienced, and thereby set the precedent for future conservation endeavors. This early attempt at wildlife conservation was so successful that most wild bison herds today can trace their lineage back to the herd at the Bronx Zoo. Therefore it is clear to see that the concept of conserving species is not something that has spontaneously developed over the past

few decades, but can be seen with the way the Bronx Zoo handled the decline of the American Bison.

Wildlife conservation dominates a large part of the daily operation of a zoological park, and a great deal of their actions are governed by a desire to save and preserve species. A portion of American zoos – including more prominent zoos like the Bronx Zoo or San Diego – belong to an organization called the American Association of Zoos and Aquariums (AZA) which holds member zoos to a higher standard than is required by the government. As members of AZA, these zoos belong to an elite class of organizations which are extremely devoted to the propagation and repopulation of species that are considered to be endangered or threatened. These organizations are a part of what the AZA deems as a “Species Survival Plan” for certain species that are endangered in the wild, and could conceivably be saved. According to the AZA, “There are currently more than 300 SSP Programs... Each is responsible for developing... population management goals and recommendations to ensure the sustainability of a healthy, genetically diverse, and demographically varied AZA population” (AZA – SSP). In managing the captive population, the curators and keepers try to keep the species as genetically diverse as possible to ensure the best physical and mental health of a particular species. Genetic diversity is also encouraged in case that the species does indeed get released back into the wild, thereby ensuring that there are no genetic defects or issues being re-released into the wild population. These zoos trade individual animals for the purposes of breeding, so that one fertile individual’s genes do not come to dominate the captive gene pool. Therefore through the efforts of these Species Survival Plans, modern zoos strive to conserve as many species as possible through breeding efforts in captivity.

A popularity problem could seemingly arise when dealing with the conservation of wild animals; people are more likely to want to save a species of animal that they consider to be cute or cuddly. Humans have an affinity towards warm-blooded animals that resemble babies, therefore creating an attraction towards mammals like Pandas or Polar Bears. These “charismatic megafauna” constitute a great deal of the animals that visitors wish to see when they visit a zoo. The bulk of conservation funds also is allocated to saving these species and their wild habitats. However it is the responsibility of the modern zoo to ensure that their conservation endeavors are not focused solely on protecting animals like tigers, but also toads. Due to the efforts of modern zoos, successful reintroduction programs have been established for both larger, more “charismatic” species and also lesser-known species like Golden Lion Tamarins. When zoos began the breeding program with Golden Lion Tamarins there were only 83 individual Tamarins left, but due to the success of captive breeding their numbers now are at over 480 tamarins (Ballou 1). There are even some species that exist only in zoos because their wild homes are vanishing, and modern zoos provide the only safe area where they can breed and re-establish their population. One such example is the Kihansi Spray Toad, originally found in the rainforests of Tanzania, and now is considered to be extinct in the wild. Zoos like the Bronx Zoo are the only place where these toads still exist, because their existing habitat was destroyed by the construction of a hydroelectric dam (World of Reptiles 1). Through their breeding efforts, these toads are slowly being reintroduced into their former habitat, however they continue to exist in sustainable populations only in a select handful of zoos. Therefore it is clear that the main purpose of the modern zoo is to further conservation endeavors to save species because the wild is quickly being destroyed due to human activities.



While conservation is a main priority of the modern zoo, it is merely the tip of the iceberg in terms of initiatives that zoos undertake. All modern zoos have education as one of their main goals, and strive to make sure that every visitor that leaves after a day at a zoo has learned something about the animal kingdom. The first step towards educating the general public is simply by having signage regarding the animals present in each exhibit. Throughout history, zoos merely would post the name of the animal in front of their cage – giving the visitor little information regarding the animal’s natural or personal history. In a modern zoo, these signs give a great deal of detail about the species and often will weave a conservation message into the signage of an exhibit. For instance, the Bronx Zoo’s Tiger Mountain exhibit signage discusses in great detail not only the struggle facing wild tigers from poaching and other human activities, but also talks about the Bronx Zoo’s attempts at saving tigers both in captivity through SSPs and in the wild. Therefore the effective education of the public begins simply with the signs that are placed in front of a particular exhibit, and can effectively convey a conservation message to the public as a whole.

While the signs that a zoo places within its park can reach everyone, modern zoos also utilize more specialized means to influence visitors to be more conscious about their relationship with wildlife. AZA accredited zoos have education departments located at each zoo, and it is their responsibility to educate school groups, camps and other visitors about the animal kingdom. Education of the public is a crucial aspect in saving wildlife because it is the first step in conservation. People are only inspired to save animals if they develop a passion for wildlife – a passion that is inspired by educating oneself about the animal kingdom. In fact, an AZA report in 2007 reported that among zoo goers, “A majority (57%) of visitors said that their visit experience strengthened their connection to nature” (Falk 10). Education departments at AZA zoos like the

Bronx Zoo specialize in developing a passion for wildlife, and reach a vast number of children and adults each year. Some of these education endeavors are geared towards school children, and many zoos offer outreach programs where educators visit schools that surround the zoo to teach programs about animals. These programs cover a wide variety of topics relating to wildlife, including programs on different biomes, different adaptations that help animals survive in the wild, and specific taxa of animals. In addition to off-site programming done by educators, AZA zoos offer programming on-site which is tailored to the science curriculum of the state in which the zoo falls (Bronx Zoo – Educators). These programs are a way in which the zoo can effectively spread a conservation message to a large number of schoolchildren, and also serve as a source of income for the zoo. In the year 2011, the Education department at the Bronx Zoo brought in several thousand dollars of revenue to the zoo, which then was allocated to conservation efforts (WCS Annual Report 2011). Education departments at AZA zoos also utilize tools like Distance Learning or Professional Development courses in order to spread the conservation message even if a particular school cannot afford to visit the zoo or pay a program fee (Bronx Zoo – Educators). Through the efforts of education departments, children are hopefully inspired to become champions for wildlife conservation. Through education and motivating a new generation of conservationists, the education endeavors of modern zoos hope to make a positive impact on wildlife worldwide.

While education and conservation are two of the main purposes of the modern zoo, there is a third major priority of these institutions that often goes unnoticed by the general public: research. Modern zoos have become organizations which conduct a tremendous amount of research both ex-situ and in-situ. Major medical discoveries have happened at modern zoos, some with massive implications for the world at large. The deadly West Nile virus that gripped

the northeast at the turn of the decade was, in fact, discovered at a zoo. Dr. Tracey McNamara, “head of the veterinary pathology department at the Bronx Zoo, realized that crows were dying in the neighborhood around the zoo grounds” (Nagami 153). After several exotic birds in the zoo died unexpectedly, Dr. McNamara surmised that the deaths were no coincidence and that there were larger implications for the deaths of these birds (West Nile 1). Therefore with the help of the Center for Disease Control, this virus was carefully studied and found to be the cause of the birds’ deaths along with the illnesses of several humans. Research done in zoos do not simply have applications for human health, rather many important discoveries have been made concerning the health of wildlife.

While extensive medical research on the health of both wildlife and humans has been done at modern zoos, other types of research are conducted on a daily basis at these zoological parks. Behavioral observation is the largest component of research done at AZA zoos, simply because zookeepers must constantly be watching their animals in order to notice any maladies or issues with their animals. Unlike humans who will vocalize any health problems, it is innate in animals to hide health problems because in the wild, any visible sign of illness or weakness is seen as an opportunity for predators. Therefore keepers must constantly observe their animals for various reasons, often leading to new discoveries relating to particular species. Keepers in the Mammal Department studied the tail twining behavior by Bolivian Titi monkeys as a part of their daily observations. The results of their study suggested that the Titi tail twining may have many social purposes including aiding in pair-bonding and providing comfort and security to offspring (Mammal Department Newsletter). These observations have implications for the captive collection of animals, but also these results can be given to researchers in the field who can utilize this information to study and save animals in their natural habitats. Therefore, research is

an important function of modern zoos because it can help improve the quality of life for not just the animals who reside in the zoo, but also wildlife and humans all over the globe.

There exists a fourth purpose of modern zoos, one which is not often discussed publically, but is a major force in shaping the policy and goals of modern zoos. Entertainment has become a major focus of zoos over the past decades, and might seem contradictory to the institutional goals of these zoos. How can these zoos say that they are committed to conservation initiatives and preserving the dignity of wildlife when one of their motivators is making sure the public is entertained? The answer lies in the almighty dollar; zoos rely heavily on public funding from the government – something that can change at the whims of politicians. Therefore zoos need to acquire funding through other methods, including the money spent by visitors when they visit zoological parks. Visitors who are entertained by their trip to the zoo are more likely to spend money on their trip, and also more likely to return to the zoo in the future. Therefore zoos must ensure that visitors are entertained by their visit in order to gain money that the zoo needs for conservation, education and research. Unlike the zoos of the past which would often demean their animals in order to entertain the public, modern zoos utilize other means to entertain their visitors. Zoos will often use rides like the Bronx Zoo's "Dora and Diego's Wild 4D Adventure" to encourage visitors to spend money but also enjoy their visit. These rides do not contribute to the conservation efforts of modern zoos directly, but the money spent on the ride by the public can help fund efforts both at the zoo and internationally. Therefore, while entertainment is not a main priority of the modern zoo, it is increasingly becoming more of a focus because entertainment provides the funding that these zoos need to further their conservation initiatives.

Modern zoological parks have evolved tremendously from their rather crude origins, where goals were less defined and the focus was placed on acquiring as many animals as possible. As

time progressed, zoos shifted focus to the conservation of species and not simply displaying their collection of many random species. The modern zoo now has clearly defined goals and initiatives which relate to the four main purposes of these zoological parks. Conservation of wildlife has become the main priority of these zoos, and they have programs to protect the animals both in their collections and in the wild. Education is another priority of these modern zoos, and through their programs and educators, can hopefully inspire a new generation of conservationists dedicated to saving wildlife all over the globe. Research is done both on the behavior of wildlife, and also on the medical conditions of all animals which can have tremendous implications for humans – as shown by the Bronx Zoo’s work on discovering the West Nile virus. And all of these purposes are funded by the money generated by entertaining the public on their visits to zoos. Therefore these four main goals are each a facet of the work done by all modern zoos, and each of these aspects helps save animals worldwide.

### **The Moral Importance of Zoos**

The notion of keeping animals in captivity is not a recent phenomenon, but has instead existed throughout the course of humanity. The modern zoo has evolved to address many issues ranging from animal welfare to the disappearance of the wild all over the globe. Despite their progress, the criticism of modern zoos harkens back to their inhumane and crude origins, haunting their presence in the modern era. This growing resistance to the notion of keeping animals in captivity in a confined zoological setting has sparked a great deal of debate on the role of the modern zoo. Vocal critics including PETA and Peter Singer, believe that zoos are inherently harmful institutions that should be abolished entirely. While some points that these critics argue are valid, they fail to see the larger moral implications that zoos have on animals and their rights. Instead of acting as cruel prisons, zoos actually serve a fourfold purpose that

helps the plight of animals. Through conservation, research, education and entertainment zoos can fully benefit animals globally. While zoos throughout history traditionally were detrimental to animals, modern zoos are not only necessary for the survival and rights of animals, they are essential for the continued existence of all animals.

Philosopher David DeGrazia offered very concrete opinions on animal rights in his book Animal Rights: A Very Short Introduction, especially in regards to animals in captivity. He developed two principle arguments that either justified keeping animals in zoos, or supported the abolition of zoos. DeGrazia states that animals can be kept in captivity if their basic physical and psychological needs are met in a zoo. Furthermore he states that, “in taking on a pet or zoo animal, one assumes responsibility for the animal’s wellbeing”, meaning that since animals have moral status, then their needs must be accounted for at all times (DeGrazia 82). In addition to providing for their physical and psychological needs, animals need to have a life as least as good as they would have in the wild in order to be kept in captivity. If a zoo were to keep an animal in inferior living conditions, then they would be causing the animal “unnecessary harm” (DeGrazia 82). While he states that zoos vary in quality, DeGrazia goes on to state that in general animals kept in zoos become bored and listless as well as being under-stimulated in captivity (93). Animals in captivity who become bored often develop what is known as “stereotypic behavior”, which consists of animals repeating a movement or behavior often due to a lack of mental stimulation. If an animal was to develop stereotypic behavior, then by DeGrazia’s standard, that animal should not be kept in captivity. DeGrazia believes that in general, since zoos cannot fully satisfy his two main criteria for keeping animals in captivity – fulfilling mental and physical needs and providing a life as good as in the wild - then zoos are not morally justified.

While he makes some valid points about animals in zoos, DeGrazia's argument is inherently flawed because of the fact that his arguments are based on sweeping generalizations about zoos. DeGrazia admits that he has extremely limited knowledge about the quality of American zoos (88), and therefore is making unsupported judgments about them. While there is varying quality of zoos – like all other aspects of the world – they do provide for both DeGrazia's criteria mentioned in his book. Modern zoos' primary focus is on the physical and psychological wellbeing of the animals in their collection. Keepers not only provide for their basic needs – food, water and shelter – but every aspect is regulated to provide for the best care for the animals. The USDA requires certain size shelters depending on species, regulating these houses down to the inch. Not only do zoos account for only basic needs, keepers also provide behavior enrichment to stimulate the animals in captivity to prevent the development of stereotypic behaviors. Mandated by the Association of Zoos and Aquariums (AZA), “Environmental changes [enrichment] are made with the goal of increasing the animal's behavioral choices and drawing out their species-appropriate behaviors, thus enhancing animal welfare” (Enrichment 1). The second condition that DeGrazia mentions is also provided for, all animals have a quality of life that is equal or superior to their lives in the wild. Animals in captivity have longer life spans than in the wild, implying that medical care, a constant source of food, and a lack of predation provides animals in zoos a superior life and have a higher quality of living. However noble DeGrazia's intentions may have been, his argument is inherently flawed due to his limited knowledge on the subject matter.

A more mainstream critic of zoos would be organizations like People for the Ethical Treatment of Animals (PETA), who is an extremely vocal proponent of animal rights. Much like DeGrazia, PETA believes that zoos are inherently inhumane because “even under the best of

circumstances at the best of zoos, captivity cannot begin to replicate wild animals' habitats" (PETA 1). This relates directly to DeGrazia's second point that states that animals can only be kept in captivity if their lives are equal to or better than they would be in the wild. They state that since animals cannot participate in activities like, "running, roaming, flying, climbing, foraging, choosing a partner, and being with others of their own kind", then their lives are inferior to a life in the wild and therefore should not be kept in zoos (PETA 1). However this assumption is subjective and based on a human-centric view and it is impossible to judge the quality of an animal's life in captivity since the human mind cannot fully enter into an animal's conscious. Another point that PETA contends is that zoos focus primarily on exotic and more charismatic species of animal that increase media attention and draw larger crowds, instead of promoting the conservation of lesser-known species. This point is not necessarily true, for most modern zoos focus on the conservation of all species – and not just "famous" animals such as Giant Pandas. For instance, the Bronx Zoo recently undertook a conservation effort to mate the last two Yangtze Giant Soft-shell Turtles in China, a species that most of the world has never heard of (Relocation 1). Therefore, it becomes evident that PETA merely focuses on certain aspects of zoos, and does not take into account the conservation efforts that modern zoos undertake in the name of species preservation.

Another critic of modern zoos is the infamous Peter Singer, one of the most outspoken figures in the debate over animal rights. Much like DeGrazia, Singer argues that zoos are inherently immoral and should be abolished. Unlike the former, Singer attacks the fundamental purposes of zoos, making the bold claim that they focus more on humans than the animals they are said to be caring for. In his novel In Defense of Animals: The Second Wave, he states that entertainment – one of the four purposes of zoos – cannot "justify keeping wild animals in



captivity” (Singer 134). Singer does not elaborate much more about this argument, but instead attacks another purpose of zoos – to educate the general public about wildlife. He states that despite zoos’ best efforts; there is little evidence that zoos are successful in educating the general public about animals. Singer also states that frequent zoo goers often display the same prejudices as the general public, disproving any assumptions about the educational benefits of zoos.

Singer does not solely attack some of the purposes of zoos, but rather he further tries to disprove the notion that zoos significantly contribute to scientific research. The research done in zoos is broadly defined by Singer as either being behavioral studies or studies of the anatomy and physiology of animals. He states that, “nothing can be learned by studying animals that are kept in the unnatural conditions that obtain in most zoos” (Singer 136). Since animals kept in zoos are free from predation and many struggles they face in the wild, then their behaviors in captivity would not be natural and therefore useless to research. In addition, Singer argues that the anatomical research done by zoos could theoretically happen in a small number of zoos, instead of the large number present in the world. Finally, Singer tries to disprove the final purpose of zoos saying that conservation efforts are unsuccessful because they remove more animals from the wild than they return. In addition, captive breeding programs for the sake of conservation fail because after a few years in captivity, “animals can begin to diverge both behaviorally and genetically from their relatives in the wild”, making any reintroduction efforts useless (Singer 138). He also makes the bold claim in his book Animal Liberation that equal rights should be extended fully to animals. This claim is extremely controversial, and the notion that animals have equal rights to humans is something that is generally considered to be irrational to many who work in a modern zoo. Therefore Peter Singer makes the argument that there are no

redeeming qualities about zoos because their four main purposes are invalid, and consequently zoos are inherently inhumane.

While Singer makes some valid arguments about zoos, he does not fully comprehend the purposes of zoos. First and foremost, zoos are centers of conservation dedicated to providing both space and a genetic reservoir for animals in a world that is shunning them out of their natural habitats. Modern zoos participate in a species survival program (SSP), where animals are matched up with other members of their species for breeding purposes. Animals “raised or rehabilitated in AZA-accredited zoos or aquariums are released into their natural habitats” to combat issues like habitat loss and poaching (AZA 1). Due to the efforts of modern zoos, successful reintroduction programs have been established for both larger, more “charismatic” species and also lesser-known species like Golden Lion Tamarins. When zoos began the breeding program with Golden Lion Tamarins there were only 83 individual Tamarins left, but due to the success of captive breeding their numbers now are at over 480 tamarins (Ballou 1). In addition to providing a population boost for endangered animals, captive breeding programs provide a genetic reservoir for these species, to promote genetic diversity especially among populations with few individuals. Singer adopts tunnel vision with his arguments about captive breeding, and only focuses on the breeding of more popular species, instead of focusing on the positive impact that zoos have for all endangered species.

Singer also makes the argument that zoos do not contribute positively to the knowledge of the general public about wildlife and the environment. In a world where the remaining “wild” is quickly vanishing, many children are more exposed to suburban sprawl than the animals of the Serengeti. Zoos play a crucial role in exposing children to wildlife in a close setting, where they can interact with animals and foster a love and respect for the creatures of the earth. Critics of

zoos argue that children today – the future of conservation – can be exposed to wildlife through documentaries instead of zoos. However, “their direct knowledge of the natural world, and especially of local wildlife, is rapidly disintegrating” because there is less and less “wild” to be exposed to. Children cannot be exposed to wildlife through moving images; rather they need that direct contact with animals to garner a sense of responsibility towards protecting the environment. An AZA report in 2007 reported that among zoo goers, “A majority (57%) of visitors said that their visit experience strengthened their connection to nature” (Falk 10). Most modern zoos recognize this importance of interaction between children and wildlife, and therefore run educational programs aimed at fostering a new generation of conservationists. All zoos have education departments, where a trained staff of professionals who present educational programs to children and adults about wildlife, the environment, and the importance of protecting the planet. Due to these educational efforts, Visits to accredited zoos and aquariums prompted many individuals (54%) to reconsider their role in environmental problems and conservation action, and to see themselves as part of the solution” (Falk 10). Therefore the educational component that zoos provide is not only one important aspect of modern zoos, it is a crucial factor in changing mindsets about wildlife and the environment.

While Singer makes a compelling argument about research in zoos, he fails to recognize and understand the important medical discoveries made in zoos – for both the benefit of humans and animals. Major medical discoveries have happened at modern zoos, some with massive implications for the world at large. The deadly West Nile virus that gripped the northeast at the turn of the decade was, in fact, discovered at a zoo. Modern zoos have, “pathologists, technicians, and medical records specialists [who] work to detect and identify viruses, parasites, and harmful bacterial and fungal infections before they become big problems” and could

potentially infect wildlife both in zoos and in the wild (Wildlife Health Care 1). Although the bulk of research happens beyond the gates of zoos, the research done at modern zoos has an invaluable impact on both human and animal health.

While not being the primary focus of modern zoos, entertainment is one of the purposes of zoos. Singer himself mentions that the idea of animals in captivity providing entertainment is a “necessary evil” that curators and directors of zoos must deal with (Singer 134). The unfortunate reality is that in order for visitors to spend their money at zoos and eventually return back, they must be entertained. Unlike the zoos of the past, modern zoos reject the notion of animals exhibiting unnatural behaviors for show, and instead use other forms of entertainment to keep visitors coming back. Instead of having animal shows like in the past, modern zoos focus on other aspects of the environment that can draw visitors to the zoo, and also entertain them. For instance, the San Diego Zoo currently is having a “Garden Festival” that showcases the zoo’s grounds and flora instead of fauna. This event includes animals through environmental enrichment demonstrations, featuring them showcasing their natural behaviors (San Diego Zoo 1). While entertainment is one of the purposes of zoos, it falls the lowest on the priority scale and only serves to finance the other purposes of modern zoos.

Since Singer is the most vocal critic of zoos, one could use his self-professed philosophy of Utilitarianism to disprove his arguments about the moral importance of zoos. Utilitarianism states that an action can be considered good if it brings about the greatest amount of happiness to the greatest amount of people. Singer argues that this philosophy, created by John Stuart Mill, should be extended to animals and not simply just to human beings. In *Animal Liberation*, Singer argues that “in assessing the consequences of our actions, it is necessary to take the interests of animals seriously and to weigh any adverse affect on those interests from human actions as part

of the consequences of those actions” (Francione 1). Therefore zoos can be morally justified because in keeping animals in captivity, it provides benefits for animals all over the world. While a small number of animals are in zoos, the benefits they provide through research and conservation therefore justifies them being in zoos. Therefore Singer’s criticisms of zoos can be rendered invalid based solely upon his argument that the principle of utilitarianism should be extended to animals.

In a perfect world a zoo would not exist; animals would be free to roam the wild without fear of their habitat being destroyed, or a constant fear of being poached by hunters. However this utopia does not exist, rather the modern world is one where there is little “wild” left for wildlife and one where zoos are absolutely necessary and important. While some critics may argue against the four main purposes of zoos; in reality conservation, education, entertainment and research are all essential to the protection of wildlife. In addition, zoos more than adequately meet both the mental and physical needs of animals, as well as provide them a life comparable to a life in the wild. Therefore zoos in the modern age are of the utmost importance because they are essential for the continued existence of wildlife all over this planet.

### **The Bronx Zoo and Wildlife Conservation**

The concept of a modern zoo has not existed throughout time, and has instead evolved over the past century. Historical zoos were dismal organizations which kept animals in squalor and little regard was given to the mental or physical health of the animals in the collection. As time progressed, these zoos evolved into organizations committed to conservation of all species in addition to promoting the best possible husbandry of the animals in their captive collection. Several institutions were standard-bearers in the charge for reform in zoos, one such organization being the Bronx Zoo. This was one of the first American zoos, and was a pioneer in the field of zoo keeping and exhibit design. They continue to be leaders in the field of wildlife conservation,

and their programs in their zoos and internationally help drive the field of saving species. Through my various internships with the Bronx Zoo, I have witnessed firsthand the many conservation initiatives the zoo undertakes and their dedication and commitment to wildlife worldwide.

The Wildlife Conservation Society (WCS) has been committed to the preservation of wildlife and wild spaces all over the world for over a century and demonstrates its commitment to those principles through its activities in the field and in the living institutions. The mission statement of this organization is protect wildlife “through science, global conservation, education and the management of the world's largest system of urban wildlife parks”, led by the flagship Bronx Zoo (About Us 1). With its historic education department alongside its partnerships with organizations like Fordham University, the WCS strives to change the mindset of people towards wildlife. And through their research and conservation, they hope to learn more about the animal kingdom in order to save species worldwide.

Inspired by Theodore Roosevelt’s conservation movement, the New York Zoological Society – later the Wildlife Conservation Society (WCS) – was founded on the principle of saving wildlife only for the sake of using them for future use. Conservationists were concerned that if rampant hunting was allowed, that there would be little wildlife for future hunters. Therefore he joined forces with William Hornaday to bring a zoological park to New York City with the intention of being a force in the conservation movement. In fact, the declared objects of the “Society are three in number—‘A public Zoological Park; the preservation of our native animals; the promotion of zoology’” (Hornaday 1). While the mission of the zoo may have been set in stone, Hornaday wanted to ensure that New York’s zoo would be the best in the nation and rival the great zoos of Europe. In 1896, he “traveled around Europe, studying what the older zoos

had done right and thinking about what things could be improved” (Zoehfeld 3). At the time, most European zoos had an average size of about thirty acres – approximately the same size of fourteen city blocks – and therefore tried to squeeze as many animals as possible in that limited space (Zoehfeld 3). This demand for space meant that these zoos granted their animals tiny enclosures, something that Hornaday did not want in his zoo. Therefore he had the difficult task of obtaining a large quantity of land in a city that was already pressed for space. The city government agreed to provide a “large parcel” of public land where the zoo could be developed, something which made Hornaday extremely happy (Zoehfeld 4). While no trees were cut down to construct the zoological park, animals were still confined in tiny, barred cages much to the dismay of Hornaday. Nevertheless the Bronx Zoo was opened to the public on November 8<sup>th</sup> 1899 to the general public, with all 294 of its acres dedicated to the preservation of wildlife (Hornaday 2). The zoo was opened with the lofty goal of being the premier zoo in the world, and would continuously strive for excellence in exhibiting animals in captivity.

In keeping with Hornaday’s original intention for the Bronx Zoo to be the premier zoo in the world, the Bronx Zoo has continually made advances in the field of captive animal management. When the zoo was first formed, the animals in the collection were arranged taxonomically, therefore there was a Bird House, Monkey House and a Lion House. These buildings were incredibly ornate on the outside; in fact they have been declared landmarks by the city (NYC Parks). While the exteriors of these buildings continue to be stunning, the interior of these buildings represented the mindset of zoo keeping at the time of their construction. These enclosures made little effort to hide the fact that these animals were confined in little more than steel and concrete cages, and did little for the mental wellbeing of the animals housed in the building. As time progressed and standards for keeping animals in captivity evolved, the Bronx

Zoo also needed to reevaluate its exhibits and the way that they were portraying these animals to the public. The zoo underwent a great change with the election of Fairfield Osborn as president of the New York Zoological Society in 1941, because Osborn's focus was on helping "zoo-goers learn about animals' natural habitats", in particular focusing on a geographic approach to exhibition instead of the traditional taxonomic arrangement (Zoehfeld 44). One of the first things that Osborn accomplished during his presidency was to create the zoo's first barless exhibit; "The African Plains" was the first of what can be considered the "modern" exhibits at the Bronx Zoo. This exhibit uses carefully designed and concealed moats to separate predators like lions from their prey, all the while appearing like they would on the African savanna. Osborn was so detail-oriented that he had his designers "trim and crop the native shrubs and bushes to resemble acacia trees and other savanna plants" (Zoehfeld 47). This exhibit is still in use, and continues to be one of the most popular exhibits at the zoo. The "African Plains" exhibit was the first of its kind, and ushered in an era at the Bronx Zoo and throughout the zoo world where animals were exhibited by their geographic region and in a more naturalistic setting.

The Bronx Zoo over the past century continued to set the standard for exhibit design and animal care, and continuously pushed the boundaries of how animals could be exhibited in captivity. The revolutionary World of Birds exhibit contains no barriers that inhibit contact between visitors and the birds that reside in the installation. Instead of moats, "special lighting and the enticements of their stimulated habitats" keep the birds in their enclosures and not in the public viewing areas (Zoehfeld 68). This would later inspire the zoo's first immersion exhibit – Jungle World – where visitors can stroll through four different rainforest environments with few barriers separating the public from the animals in the collection. Since Jungle World opened in 1985, zoos around the world have used this installation as a model for jungle exhibits. It also was



used as a model for the zoo's wildly popular Congo exhibit, which opened in 1999 (Wolfer 1). This exhibit focused on a single geographic region, and highlighted both the conservation threats to Western Lowland Gorillas in addition to the work that the WCS is doing to help save the species. The Bronx Zoo continued its lineage of ground-breaking exhibits with its Madagascar building, which was a retooling of the old Lion House. The specific geographic focus highlights how the WCS has been “affiliated with Madagascar since the early 90’s and has participated in many programs to help save the island’s precious biodiversity” (Noll 12). In addition, this exhibit was environmentally designed so that building materials in addition to daily upkeep were “green” and lessened the building’s ecological footprint. Therefore it is clear that the Bronx Zoo has a history of cutting edge exhibits that continuously drive the field of zoo keeping evolving and designing new and innovative exhibits to display their captive collection.

### **My Experience at the Bronx Zoo:**

For the past three years of my time at Fordham University, I have been fortunate enough to view the work that the Bronx Zoo does firsthand through various jobs and internships within the park. Each of these positions has given me a greater understanding of the work that the zoo does, as well as the daily operations of a facility as large as the Bronx. I have had the opportunity to work in both a more academic role as a research intern at the WCS’s Center for Global Conservation in addition to being a Teaching Fellow in the Bronx Zoo’s education department as well as being a volunteer in both the Ornithology and Mammalogy departments. By working in such varied departments, I learned of both the scope of the work that the zoo does, in addition to the daily grind of working with wild animals. Therefore, I believe that I have a great appreciation for the work done at the Bronx Zoo, and have seen the greater picture of the work done by each of these different departments.

As an intern for the Center for Global Conservation, I was able to work with some of the best minds in international wildlife conservation and assist in their work to save species worldwide. I was part of a department called the WCS Institute, which was devoted to the research of many different conservation topics and publishing that research. Their work was then seen by the scientific community in addition to the scientists and researchers working for the WCS internationally. I was given a project during my tenure at the Institute, and it related to species decline of animals that were once considered to be “common”. This includes species like the Passenger Pigeon and Carolina Parakeet that were once extremely common, but underwent rapid and drastic declines until they were extinct. The goal of my research was to examine these trends and see if any patterns of species decline emerged, with the intention of using this research to prevent future decline of today’s “common” species. In addition to this research, I was able to attend meetings of the entire Center for Global Conservation about different topics that the center was focusing on both internationally and within the WCS parks. Meeting topics included the international efforts that the center was undertaking all over the globe, working with their field researchers and policymakers to preserve a particular species in a particular country. Within the Center itself, each conservation program has a department head which corresponds to the continent of their endeavors. For instance the Africa chair manages the conservation programs ranging all over the continent, from Gorillas to Lions. The opportunity to attend these talks and meetings granted me the opportunity to get a pulse for the work that the WCS does internationally, and the scope of their conservation endeavors. This internship was a great opportunity because of my ability to not only conduct my own research on species decline, but also to observe and work with conservation scientists who head programs all over the world trying to save species from their own decline.

Much like how a modern zoo has a focus on education, I too was able to focus some of my work at the Bronx Zoo on education initiatives hoping to inspire a new generation of conservationists. I worked as a Teaching Fellow within the zoo's education department, assisting with programs about wildlife and the natural world. I initially was hired during the summer to assist in teaching the zoo's summer camps "Pablo Python Looks at Animals" and "Animal Kingdom Camp". The former was designed for children aged 4-8 whereas the latter camp was created with children ages 8-12 in mind. Both of these camps were week-long endeavors and were focused on animals and in particular the work that the Bronx Zoo does to help save wildlife. Incorporated into these camps were programs on topics ranging from animal adaptations like camouflage to exhibit-focused topics like the Congo. Each day, the campers would visit two different exhibits in the park and learn about those particular species of animals and the threats they face in the wild. My role was not one of a camp counselor; rather I was responsible for teaching these campers, and running successful programs. I would be assigned a particular set of programs for the week to teach, and then I would lead the camp in a particular activity or presentation relating to animals or conservation. This requires a great deal of knowledge about the animal kingdom, as well as a bit of finesse to keep a room full of children both learning and entertained. Unlike most summer Teaching Fellows, I was asked to stay on for the fall season as a Teaching Fellow to assist in the zoo's "Overnight Safaris" which occurred monthly. These overnight programs allowed children and their families to camp at the zoo overnight, where the education department would plan several programs throughout the night ranging from animal encounters to programs about different animal-related topics. This was a great opportunity because it gave me the chance to positively impact a large number of children who will grow up to become the next generation of conservationists, hopefully inspired by the

programs they attended at the Bronx Zoo. It also allowed me to hone my teaching skills as well as refine my knowledge about the animal kingdom, and the work that the WCS does to save species.

The most interesting and admittedly enjoyable part of my work at the Bronx Zoo has been my work in the animal care department, specifically the departments of Ornithology and Mammalogy. These volunteer opportunities have given me the insight not only into animal behavior, but also have exposed me to a great deal of the animal kingdom and their specific husbandry needs. As a volunteer in the Ornithology department, I was primarily assigned to the World of Birds exhibit where I assisted keepers in all aspects of daily bird husbandry. Upon arriving to work in the morning, all exhibits need to be serviced and cleaned before the zoo becomes open to the public. This involves a great deal of sweeping, raking and overall exhibit maintenance – which is not glamorous to say the least. Each exhibit in the building has a different focus; most of them have a geographic area where all the birds in that exhibit would reside in the wild. Therefore each of the enclosures had specific needs relating to the biome that they came from, for instance tropical exhibits needed to have a particular level of humidity and water in order to properly replicate the wild. Once the exhibits were cleaned and all the birds morning diets had been feed out, then the diet-making process began. Each species of bird in the building has a distinct diet, therefore the preparation of these diets can be time consuming and often tedious. Careful consideration must be taken in regards to the medical needs and weight of each bird so that they are fed the proper amount, and receive the right proportion of nutrients. Once diets were made, the afternoon typically consists of various projects ranging from exhibit repair to capturing birds that needed to be examined by a veterinarian. During a portion of my time as a volunteer, I was responsible for creating a genealogy chart for the zoo's Lesser Birds of

Paradise. This chart was a visual representation of the lineage of all the birds in the collection, and showed who had bred with whom. This information is extremely useful because it was used for their SSP, and helped the keepers visualize how closely related some individuals were, and therefore helped them pair more genetically-diverse birds for breeding. In addition to this project, I would assist the keepers in whatever needed to be done for the benefit of the birds in the collection. Therefore this experience was incredibly valuable because it gave me the necessary insight into bird behavior and care, and allowed me to accurately assess the work done by Ornithology keepers in a larger zoo setting.

Birds were not the only animals I took care of during my tenure at the Bronx Zoo; rather I was also a volunteer in the Mammalogy department. This department is responsible for the vast majority of the exhibits in the zoo, and the majority of the “charismatic megafauna” that visitors to the zoo wish to see. A hallmark of this volunteer opportunity is that I was rotated throughout all the installations in the department, learning a variety of keeper routines and gaining experience working with a variety of species. I mainly was in the buildings of Jungle World, Carter Giraffe House, Wild Asia and Congo – therefore working with species ranging from mongoose to elephants and gorillas. The daily routine is similar to that of the Ornithology department; however the animals are on a much larger scale. Cleaning and diet preparation are similar, however the cleaning of the exhibits requires more time and often a team of keepers. Diets are often more complicated or easier depending on the species of animal – primates require more complex diets than hoofstock like Giraffes. The afternoons consist of various projects, and behavioral observation of the animals in the building is crucial to the care of the collection. The work in this department is a lot more physically demanding, simply because one is constantly required to lift and carry larger diets in addition to wheelbarrows and other tools of the trade.

This experience is invaluable because it exposes volunteers to a wide variety of species so that they can acquire the necessary experience for their careers. There has not been a day working with the animals at the Bronx Zoo that I leave feeling unsatisfied. And despite the often dirty, grueling and downright exhausting work that is required, working alongside the keepers is some of the most gratifying work that can be done.

The Bronx Zoo is an organization dedicated to the conservation of species in a world where there is little space for humans and animals to coexist. They have historically been pioneers in the field, consistently pushing the envelope and developing new exhibits that dramatically changed the way that animals were exhibited in zoos. I have been fortunate enough to work at the Bronx Zoo for several years in different departments and capacities, all contributing to my appreciation of the work that this organization does. No matter the department, the work done by this zoo is both rewarding and important to saving species worldwide. Whether in the “trenches” of conservation – the animal care departments – or the more glamorous Center for Global Conservation, all employees of this organization know that they are making a positive impact on the world through their work. Modern zoos like the Bronx Zoo have generated criticism from some sources, however they remain committed to their goals of conservation, education and research. And through their efforts, these modern zoos have a positive impact on the world and especially on wildlife conservation in a world where species are rapidly being displaced by mankind.

### **Conclusion:**

Because of the world’s rapid population growth and its insatiable demand for both resources and land, the earth is under increased strain to accommodate the billions of humans

that reside on this planet. This rapid growth is taking previously untouched land and utilizing it for living space or agriculture. The “wild” that was once left to the animal kingdom, is now being used for human needs, and is drastically affecting all other species on this planet. Almost simultaneously with the decline of the animal kingdom arose the existence of the zoo. These institutions have existed since the earliest of civilizations, but did not have conservation as a main focus. As time progressed and zoos evolved, they shifted their focus towards conservation, education, entertainment and research – a great deal more comprehensive than their original purposes. These modern zoos still draw a great deal of criticism from many sources who argue that zoos wrongfully “imprison” animals, however that shows only a superficial knowledge of the work that zoos do, and therefore is irrational. Organizations like the WCS – headquartered at the Bronx Zoo – do work that is invaluable in the fight against species decline and extinction. Zoos are an essential resource in the field of wildlife conservation because of their multi-faceted approach to saving wildlife worldwide. These zoological parks should be supported through political and financial means because the work they do saves species that are crucial to ecosystems across the globe. Therefore the modern zoo serves as a vessel both for the conservation of the animal kingdom, but also to inspire and foster a new generation committed to the preservation of all species.

## Historic Zoo Photographs:



Historic Bronx Zoo - Old Elephant House



Historic Bronx Zoo - Hyena in Lion House



Example of Historic Zoo Enclosure



Historic Bronx Zoo - Lion House



Historic London Zoo - Reptile House



## Bronx Zoo Exhibits:



Bronx Zoo - African Plains Exhibit



Bronx Zoo - Congo Gorilla Forest



Bronx Zoo - World of Birds



Bronx Zoo - Jungle World



Bronx Zoo - Carter Giraffe House



Bronx Zoo - Madagascar

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