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From the Bronx into the Wild! My Adventurous Experience at the Bronx Zoo

Lauren Noll
Fordham University, envstudies12@fordham.edu

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By Lauren Noll

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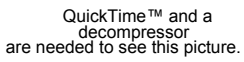

The History of Zoos

Zoological gardens have been around for thousands of years and are found all over the world. The world's first zoo dates back to the year 1500 BC in Egypt under the rein of Queen Hatshepsut. In approximately 1000 BC, an enormous zoo was built in China. Around the same time period, there were records of zoos developing in Ancient Mesopotamia as well. During these times, the collections of animals or menageries were developing due to the growing curiosity of animals. Owning animals was a mere collection, whereas today they are the subject of scientific study (Cannon, 2002). Possessing a menagerie of rare animals emphasized great wealth and luxury. Exotic animals and strange beasts, such as leopards, lions, elephants, crocodiles, and rhinoceroses were often given as gifts, which necessitated them to be cherished (Cannon 2002). In Medieval Europe, some monarchs and monasteries owned menageries of wild animals, while in Greek city-states, a menagerie was formed by Alexander the Great with rare animals that he collected on his military expeditions. Many of these menageries of animals were open to the public for a small fee; however, zoos were not officially established as installations until the eighteenth century. The first modern zoo was in the Imperial Menagerie, located in Vienna in 1752, but the first zoo in the United States, located in Philadelphia, was not established until 1874. Over the years, the idea of zoos have shifted the perception of animals from sheer luxury gifts to the perception of animals as fascinating creatures that attain centers for promoting conservation, environmental sustainability, and scientific research.

Many people defend zoos, claiming that they provide great opportunities in education, scientific research, and the overall preservation of wildlife worldwide. However, many people will take the opposing side, arguing that it is wrong to deprive animals of their natural habitats and lifestyles. One of the greatest controversies of our time pertains to the moral issues associated with keeping animals in captivity, such as in zoos and aquariums.

The first controversial matter regarding animals in captivity is the rights and wellness of these particular animals. It is a wildly accepted idea that all animals, whether human or non-human, are considered equal (Regan 20). This means that each individual is valuable in itself and deserves to be treated with respect. According to Tom Regan, in his influential article *The Case for Animal Rights,* "it is not an act of kindness to treat animals respectfully. It is an act of justice" (Regan 23). Any harm or infliction toward any individual human animal or nonhuman animal diminishes the quality of the individual's life (Regan 23). Peter Singer supports this argument stating, "the fact that beings are not members of our species does not entitle us to exploit them, and similarly the fact that other animals are less intelligent than we are does not mean that their interests may be disregarded" (Singer 36). Therefore, we should not keep animals in captivity. Animal rights advocates will also state that animal consciousness and animal emotion, two areas of fundamental importance in animal welfare science, should be taken into account when discussing the controversy involving animals in captivity (Mendel, Paul 72). Their main argument is that animals should be able to live in their natural lives and that their biological functioning should not be tampered with (Mendel, Paul 72).

Some people argue that zoos are under poor management and that zoos are only after the profits they receive from audiences (Eaton 499). An interesting comparison of a zoo to a pornography film emphasizes the fact that the zoo inhabitants, like pornography participants, are overexposed and degraded through the marketing and consumption of their visibility (Acampora 501). Many people argue that educational efforts of zoos are not substantial enough, leaving the public indifferent towards efforts. Zoo animals are simply visible objects that people come to see for pure entertainment and amusement. The unfortunate truth is that people "leave the zoo more convinced than ever of [human] superiority over the natural world" (Acampara 503).

On the opposing side, people find that zoos are very beneficial to the world in many ways. Not only do zoos help protect the animals that currently live in these installations, they

also participate in many programs aimed at helping wild animals in their natural environment. Zoos give strong financial contributions to conservation efforts, and they also raise public awareness of animals, their habitats, and destruction or struggles that may threaten the animals' existence. Zoos may serve as human entertainment, but in doing so, the public learns how they too can help conservation efforts for the friendly critters they see and grow to love while visiting a zoo.

Education is very important to zoos and has been for quite some time. In its 1898 annual report, the New York Zoological Society made it their goal to "inform the public of the great decreases in animal life, to stimulate sentiment in favor of better protection, and to cooperate with other scientific bodies [in] efforts calculated to secure the perpetual preservation of our higher vertebrates" (Jamieson, 508). Some of this information that is shared with the public are facts about physiology and behavior of various animals, attitudes toward the survival of endangered species, and how they can help contribute to wildlife and the environment. Zoos are very unique among conservation organizations because they have a direct connection with the public (Allard, Huchins, Smith 516).

As a branch of education, scientific research is also very important in the world of zoos. Zoo animals provide unique opportunities to study "animal behavior, physiology, reproduction, growth, and development of a wide variety of taxa under semi-controlled conditions (Allard, Huchins, Smith 515). Also, zoos can support scientific research by funding research projects in the fields and by making "otherwise inaccessible animals" available for study (Jamieson 509). Although it is very useful to study animals in their natural environments, it is argued that zoos provide scientists with more interesting research subjects (Jamieson 509). This is because the animals in zoos and aquariums are free from predation, so they therefore, "exhibit a wider range of physical and behavioral traits than do animals in the wild. Thus permitting researches to view the full range of their genetic possibilities" (Jamieson 509).

Another very important aspect about zoos is that they preserve species that would otherwise become extinct. A specific success story is seen with the American Bison, which was saved by the Bronx Zoo in the early twentieth century. Zoo animals play an increasingly important role as ambassadors for their species in securing a future for wildlife and their habitats (Allard, Huchins, Smith 519). It is a goal of most zoos to manage the breeding of specific endangered species in order to help maintain healthy and self-sustaining populations that are demographically stable and genetically diverse (How Do Zoos, 2009).

The controversy over animals in captivity has been very well debated for many years, and will continue to be one of the most controversial themes of the future. As both an animal lover and a volunteer at the Bronx Zoo, I can see where these two conflicting sides meet. I find that I am permanently stuck somewhere in the middle with my own personal views. Although I agree with animal rights and wellness, I can also say that from my experience of volunteering at one of these controversial areas, zoos are also very beneficial to animals, the environment, and the world.

The Creation of the Bronx Zoo

In 1887, Theodore Roosevelt and George Bird Grinnel formed the Boone and Crockett Club for the purpose of bringing together "worthy sportsmen" who appreciated the need for responsibility in hunting (Quail 2009). The rapid decline in animal populations due to unregulated hunting practices was their main concern. During his six years as president of the Boone and Crockett Club, Roosevelt established many scientific forest management laws and actively promoted fair hunting standards (Quail 2009). The club soon became a powerful advocate for the establishment of conservation laws as well. With the help of William Hornaday, Roosevelt created the first established zoo in New York, the Bronx Zoo.

The Bronx Zoo's grand opening was on November 8, 1899, featuring 843 animals in twenty-two exhibits (New York City Parks 2009). The zoo's first goal was to preserve the

nature in the Bronx. The land of the Bronx Zoo, as well as the land of the Botanical Gardens, was originally owned by Fordham University and was sold to New York City under the condition that the city keep it green (Fields 2009). One of the most important exhibits during this time was that of the Bison Heard, which included the endangered North American Bison. The Bronx Zoo's efforts to save this valuable and precious species is the main reason why we are still able to see North American Bison in the wild; they would have gone extinct otherwise (WCS). In 1940, the "lion island" exhibit made its first debut as well as the African Plains habitat (New York City Parks 2009). Soon after, the Skyfari opened, which provided visitors with an aerial view of the zoo, as well as a quick and enjoyable means of transportation (unfortunately, the Skyfari was recently shut down due to ongoing technical problems). In 1977, thirty-eight acres of previously undeveloped land was transformed into the zoo's Wild Asia habitat, which featured animals such as elephants, rhinoceroses, lions, and tigers (New York City Parks 2009). The forty-three million dollar Congo Gorilla Forest was constructed in 1999 and has rare animals, such as gorillas, okapi, mandrills, and red river hogs (New York City Parks, 2009). Tiger Mountain came about not too long after in 2003, and the most recent project was the Madagascar! building which was built in 2008. This building is one of the two green buildings located in the zoo (New York City Parks 2009). The Bronx Zoo was the first and largest zoo created by the Wildlife Conservation Society.

The Wildlife Conservation Society

The Wildlife Conservation Society was founded in 1895 and is affiliated with the Bronx Zoo, the Prospect Park Wildlife Center, the Central Park Wildlife Center, the New York Aquarium, and the Queens Zoo (WCS). For over one hundred and fourteen years in the making, WCS has made it their mission to save wildlife and wild places across the globe through scientific research, conservation projects around the world, education, and management of WCS facilities (WCS).

Scientific research gives the WCS the knowledge and information it needs to succeed in helping the animals of this world. Research is done in different countries, from as far as Asia and Africa, and as close as North America and South America (WCS). Scientific research is also done right in the five wildlife institutions in New York. Research is done so that scientists, conservationalists, and other WCS staff, as well as the rest of human population can learn more information about the precious animals that make up our world. Not only is it beneficial to study animals in zoos and aquariums, but it is also very beneficial to study animals in their natural environment. By combining this knowledge, researchers are able to see the full spectrum of behaviors that the animals' possess, both in the wild and in captivity. The more knowledge we know, the more we can help.

WCS has projects directed in sixty-four countries to help preserve the world's amazing diversity (WCS). Some of these projects include the Big Cats Program, which protects various cat species from the Himalayas to the Horn of Africa, the Elephant program, which works throughout elephant habitats on population management as well as human-elephant contact, and also Great Ape Conservation, which helps to protect all four gorilla subspecies, chimpanzees, and orangutans (WCS). These are just several projects among the five hundred plus programs that the WCS has already created. Not only do WCS programs aim to help animals on our lands, but they also set out to help animals deep within our oceans, such as humpback whales, Irrawaddy dolphins, and leatherback sea turtles (WCS).

WCS makes sure that their facilities live up to their mission towards the environment in terms of the way they are managed. Over 4,000 staff members in New York City and around the world work hard to change attitudes toward nature and help people try to imagine wildlife and humans living together in harmony (WCS). Along with seasonal jobs, part-time jobs, and full-time jobs, WCS also offers opportunities for interns and volunteers in the areas of animal care, guest relations, conservation programs, education, development, public affairs, and

administration (WCS). Conservationalists associated with WCS work across the globe to combat the effects of climate change on wild places (WCS). They help communities who are dependent upon natural resources find other mutually beneficial solutions to relieve stress on fragile ecosystems (WCS). Conservationalists also work with community leaders and members to develop ways people can use their land and water to generate income while promoting natural resource conservationalis. They also work with local government and corporations to reduce and offset carbon emissions (WCS). Every installation set up by the WCS is accredited by the Association of Zoos and Aquariums.

The American Zoos and Aquariums Association

The AZA is a nonprofit organization founded in 1924 that is dedicated to the advancement of zoos and aquariums in the areas of conservation, education, science, and recreation (AZA). The AZA is the only association in the world with an "effective accreditation program for zoos and aquariums that helps ensure quality animal care, a code of professional ethics that helps guide and regulate its members' actions, and a dedicated conservation vision" (Allard Hutchins, Smith 513). The AZA- accredited zoos and aquariums serve as conservation centers that are concerned wish ecosystem health and that take responsibility for species survival (AZA). The AZA has very strict criteria for the zoos and aquariums that they authorize. These zoos and aquariums undergo a thorough review that includes a detailed accreditation application, as well as a multiple day on-site inspection by a team of experts from around the country (AZA). Once a zoo or aquarium becomes accredited, it will undergo another inspection every five years to make sure the zoo or aquarium is still doing its part.

The potential candidates for AZA accreditation must meet AZA's standards for animal management and care, including living environments, social groupings, health, and nutrition. The AZA commission members who evaluate each zoo and aquarium look into the installation's "veterinary program, their involvement in conservation and research, education programs, safety

policies and procedures, security, physical facilities, guest services, and the quality of the institution's staff" (AZA). Also, the finances, governing authority, and the support organization of the installation are also taken into account. Fewer than ten percent of the approximately 2,400 animal exhibitors licensed by the United States Department of Agriculture are AZA accredited (AZA). Not only does the AZA make sure their accredited institutions follow their mission, the AZA also has many of their own programs that help their mission as well. Species Survival Plans, in particular, are programs set up to reintroduce animals back into their natural environments. Many of these programs have helped bring endangered species, such as black-footed ferrets, California condors, and red wolves, back from the brink of extinction (How do Zoos 2009).

Along with helping the missions of both the WCS and the AZA, the Bronx zoo does a lot to improve our environment in many other ways as well.

Bronx Zoo and Recycling

The Bronx Zoo has an extensively large recycling program that includes recycling and reusing paper, glass, metal, plastic, batteries, fluorescent lights, inkjet and laser printer cartridges, walkie talkies, computer components, and furniture (Libson). One such program is aimed at saving gorillas from the Congo and urges visitors to recycle their old cell phones. In the Congo, miners searching for coltan, an element used to make cell phone batteries, tear up the natural habitats of these gorillas and threaten their wellbeing. Recycling cell phones therefore, reduces the demand to mine for coltan in the Congo. The Bronx Zoo educates, recycles, and saves wild life and their habitats through many of these recycling programs.

When a person enters the Bronx Zoo, they are given a map. This map, which many people are unaware of, is printed on recycled paper and has eliminated gloss to make the maps themselves recyclable (Bronx Zoo: Saving Wildlife, 2009). There are bins located at the parks exits for guests to recycle their already used maps. This is another method of recycling that the

zoo uses. Nearly 5,000 gallons of used cooking oil from the Bronx Zoo's Dancing Crane Café and the Terrace Café, and some other dining facilities at the New York Aquarium, are sent to an outside company, where they are turned into soap (Wildlife Conservation Society Measures, 2008). Much of the animal waste from the Bronx Zoo is used by a number of city agencies, such as the New York City Parks Department for fertilizer (Bronx Zoo: Saving Wildlife, 2009). Also, the sea lion pool uses a closed filtration system that recycles water, saving over 500,000 gallons of water a year (Wildlife Conservation Society Measures, 2008).

Cans, cardboard, and plastic materials are also recycled at the zoo. In the monkey house alone, 21 cans of primate, marmoset, and feline food combined are used daily to feed the animals. When you do the math, there are over 7,000 cans just from the Monkey House alone that are being recycled annually. The cardboard boxes that were once used to hold supplies such as gloves, cleaning products, and cans of food, are always distributed into exhibits as a source of enrichment for the animals. Old baby toys, water bottles, tires, bottle caps, and newspapers are given to the animals as enrichment also (Refer to Figure 1 of Appendices). Instead of having all these objects pile up in the local dump, they are being used by the happy critters at the Bronx Zoo.

The Bronx Zoo's Eco-Friendly Toilets

Another eco-friendly feature of the Bronx Zoo is the Clivus Multrum composting toilets (Atler 2007) (Refer to Figures 2 and 3 of Appendices). These toilets, which are located in the Eco-Restroom outside the Bronx River Gate, are odorless and very low maintenance. The Bronx Zoo Eco-Restroom is the largest composting toilet in New York City, and is equipped with extensive sky lighting and a grey water garden. This greywater system reuses water that comes from sinks, showers, laundry, or dishwaters, which makes it ideal for fertilization and irrigation (Atler, 2007). Mixed with this graywater, is a biocompatible soap, which is made from linear alcohol ethoxylate that is non-toxic to the environment (Products & Services, 2004). This kind

of soap is used so that when the components are broken down, they are not harmful to plants. Instead, the components will actually benefit the environment and provide nutrients for the soil and plants. The toilets work on as little as three ounces of water per flush, and saves thousands of gallons of water a year. As well as conserving water, these toilets can also convert waste into fertilizer. Installing these toilets allows the Bronx Zoo to avoid the construction of a huge septic system or expensive sewer construction (Atler 2007).

The Bronx Zoo's Center for Global Conservation

On October 5, 2009, the Bronx Zoo opened its Center for Global Conservation, the home of more than one hundred WCS conservationists, researchers, and support staff (WCS Opens Center, 2009) (Refer to Figures 5 and 6 in Appendices). This building serves as WCS's command center for its conservation work worldwide and was built with WCS's commitment to sustainable practices in mind (WCS Opens Center, 2009). FXFOWLE Architects used renewable and recycled materials to build this state of the art, 40,000 sq ft center (WCS Opens Center, 2009). FXFOWLE is a design firm that is committed to design excellence, social responsibility, and sustainability (FXFOWLE). The significant use of natural lighting with floor to ceiling windows, the micro-turbine power plant, which generates electricity for the building, and all the other green aspects of this building, allows the center to use half of the energy that a different building of the same size would normally use (WCS Opens Center, 2009). The Center for Global Conservation has won the Gold level of LEED Certification (Leadership in Energy and Environmental Design) by the U.S. Green Building Council, as well as the Design Award from the Public Design Commission of the City of New York (WCS Opens Center, 2009).

The Bronx Zoo's Madagascar! Building

In 2008, what used to be the famous Lion House was miraculously transformed by the FXFOWLE into the very unique, and highly eco-friendly building that replicates the natural habitats of the world's fourth-largest island, Madagascar. (Refer to Figures 7, 8, and 9 in

Appendices.) 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. The island of Madagascar is a global conservation priority, mostly because all of the animals and plant life are not seen anywhere else. It provides a sanctuary for plants and animals that have long since disappeared from other parts of the world and continued to evolve uniquely. The creation of the Madagascar Building at the Bronx Zoo is one of WCS many programs that supports conservation in Madagascar. It gives audiences the knowledge and understanding about the unique creatures of Madagascar and the threats that unfortunately jeopardize their survival in the wild. Plant and animal life in Madagascar are becoming more and more rare as time goes on, and it is the mission of WCS to help save the wildlife and habitats in Madagascar while they still can.

Madagascar! was built with low-impact materials, including recycled steel, slag concrete, and FSC certified wood[1] (Wildlife Conservation Society Measures, 2008). The Madagascar building has a recycled grey water system as well, and it also uses a geothermal heating and cooling system rather than conventional natural gas, reducing the use of fossil fuels (Mays, 2008). Other uses of green technology in the Madagascar building are motion sensors, which switch lights off when they are not in use and a green roof that is equipped with storm-water retention and filtration devices (Wildlife Conservation Society Measures, 2008). Ethylene Tetrafluoroethylene skylights can also be seen in the Madagascar building, which are "capable of adjusting shading, thermal, and aesthetic characteristics as the sun moves" (Lion House Conservation). These skylights provide the ultra-violet light needed by the plants and animals but block excessive heat (Lion House Conservation).

There are also fluorescent light bulbs that use as little as a quarter of the energy as a regular light bulb and that last ten times longer. All of the construction waste that was not used

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[1] Forest Stewardship Council, or FCS is a non-profit organization that promotes the responsible management of the world's forests (Forest Stewardship Council 1996).

in the creation of the Madagascar building was recycled, providing raw materials needed for new construction (Wildlife Conservation Society Measures). In total, the Madagascar building uses fifty-seven percent less energy than a standard building of similar size (Lion House Conservation). For more information, see Appendices Figure 12.

Aside from being a permanent refuge for some of Madagascar's native animals, such as lemurs, fossa, ring-tailed mongoose, and Nile crocodiles, the building has won several awards for its environmental design. It has won the LEED Gold Rating by the United States Green Building Council, the Environmental Excellence in Design Award from the Public Design Commission of New York City, and the Green Building Award from New York City/Environmental Protection Agency (Kissel 2008).

Reducing the Carbon Footprint

The Bronx Zoo is taking serious steps to reduce its greenhouse gas emissions (Measures Carbon Footprint 2008). The Bronx Zoo currently produces much of its own power, cooling, and heating through its cogeneration facility (Wildlife Conservation Society Measures, 2008). The zoo is currently in the process of upgrading the engines of this facility from duel-fuel burning of both diesel and natural gas to only natural gas (Wildlife Conservation Society Measures, 2008). This project to reduce the WCS' carbon footprint is supported by the New York City Department of Cultural Affairs. It will reduce carbon emissions from the cogeneration facility by thirty percent, as well as oxides of nitrogen emissions by eighty percent (Wildlife Conservation Society Measures 2008).

My Volunteering Experience

For the past three school semesters I have attended Fordham University, I have been able to call myself a very proud volunteer of the mammal department in the Bronx Zoo, the largest metropolitan zoo in the United States. Of all the eight hundred and ninety-six hours that I have spent volunteering, there has only been one hour that I did not enjoy; this was the hour I spent

cleaning out the Madagascar Hissing Cockroach Breeding Shed, which was filled with thousands of cockroaches! Volunteering at the Bronx Zoo has been the most time consuming, filthy, amazing, and inspiring opportunity I have ever experienced. Although I always walk back to the Fordham University campus smelling horribly, I wear my "zoo scent" proudly. Not every person can say they work with gorillas, giraffes, and sea lions all in the same day in the middle of the Bronx.

My job as a volunteer is definitely not fit for everyone. It involves a lot of physical labor, cleaning dishes, preparing food, sweeping, moping, and picking up animal feces. Many people would wonder why I put myself in this situation, especially because I do not get paid for such a job. I find myself constantly trying to explain my passion for animals and the environment, but some people still just do not understand. However, this experience has been the best one in my life so far!

Since I have started at the zoo, I have put many volunteering hours into the Monkey House, Congo Gorilla Forest, Carter Giraffe House, the World of Darkness, the Yak House, the Bear Dens, Tiger Mountain, the Baboon Reserve, and Madagascar!. I have cared for and have come face to face with some of the world's most dangerous predators and carnivores, such as tigers, lions, and bears, the most lovable monkeys and lemurs, and the most elegant and graceful giraffes, just to name a few.

It is my job to assist the keepers in their everyday jobs and performances at the zoo. It may sound easy, but it takes a special kind of dedication and hard work to provide care to animals that require attention 24 hours a day, seven days a week, come snow, rain, or shine (AZA). In plain sight, I do everything that the keepers do. However, I am not allowed to touch the animals directly because volunteers are not under the insurance policy. In whichever installation I happen to be working, I usually spend my time washing and sterilizing food dishes, cutting up vegetables, preparing medication and diets, and making sure there is a clean water

supply for all the animals. I clean exhibits when the animals make them a mess, and I set them up afterwards so the animals have fresh food and a clean place to make dirty all over again. I also take part in several training sets with the certain animals, such as the sea lions, and I get to observe and study the animal's behavior, growth, communication skills, and even reproductive habits. Whether it is watching a baby Saki monkey nurse from her mother, keeping an eye on the curious lemurs in their open exhibit in the Madagascar! building, or making sure the baby sea lion Katie is eating her all of her fish, the information I tell the keepers seems to be very beneficial to their knowledge, as well as my knowledge and understanding of the animals we work so hard to protect. I also interact with the public many times a day, explaining what the keepers may be doing during training sets, answering any questions they may have, or just helping lost people trying to find the exhibits they would like to see next. By volunteering at the Bronx Zoo, I am also able to learn about the politics of the zoo and how it is able to successfully work as a whole.

For the past month, I have been asked to help out in a training session with the Bronx Zoo's adult male sea lion, Kiani. We are currently teaching Kiani new 'behaviors' that we will have him do during his training session. It is my job to hold what is called a "target stick," which keeps Kiani's attention and directs him to where we would like him to swim in the pool. This is done twice a day, at 10:30 A.M. and at 3:00 P.M. when the sea lions are being fed.

The main purpose of the behaviors is to keep the animal's attention so the keepers can properly examine the animal to make sure he or she is in good health. (Refer to Figures 9 and 10 in Appendices). Behaviors are taught to the animals for enrichment, to keep the animals active, and mostly for medical purposes. The training sets and the behaviors the animals learn allow the keepers to get a closer look at the animal. The keepers can analyze the animals' outer appearance and even their inner appearance through sonograms if they think an animal may be pregnant. Depending on which animal the keepers are looking at, the keepers can check the animals' tail,

skin, flippers, arms, legs, eyes, and teeth. Also, some animals are trained through their behaviors to receive injections and medications, and some will even give blood samples. All this is done to ensure the animals' health and safety at the zoo.

Sometimes, I assist the keepers in grazing trees in the zoo. This is not a specific job of the keepers, nor a job of volunteers, but it allows the keepers to retrieve branches, leaves, and sticks for the animals to eat and play with. Not only does grazing trees benefit the animals, it also has a positive impact on landscape condition and soil fertility (McAvoy Reid, Salmon, 2007). Thinning trees can result in increased tree quality and size, due to decreased competition for light, water, and nutrients (McAvoy Reid Salmon, 2007). It may not be much, but it makes our animals happy, and it makes our environment bountiful.

My Evaluation of the Bronx Zoo

Before conducting any of my research about the Bronx Zoo, I had very little knowledge about its impacts on the environment. I was aware that zoos take care of animals, and raise massive amounts of money for wildlife conservation, but that was the extent of my knowledge. Now, after many hours of research and speaking with officials at the zoo, I am more aware of the Bronx Zoo's mission and what they stand for as far as animal conservation and sustainable environments go. However, even though I now know a significant amount about their conservation efforts, I am certain that I will never know the full extent of it. There have been countless projects in the past and present, and there will be even more to come in the future.

With the help and support of the WCS and the AZA, and through programs aimed toward helping endangered species, sustainability, and conservation efforts, as well as a great education department, the Bronx Zoo is truly doing wonders for this world. For some people, it is hard to care for a pet goldfish, but the Bronx Zoo makes it their goal to care for all of the animals in their installations, as well as the animals in the world. Everything the Bronx Zoo contributes to

animals, as well as the environments in which they live, will continue to have a lasting impact worldwide.

When I stand back and look at everything the keepers, curators, veterinarians, architects, engineers, and everybody else who works at the zoo do for the animals, it is absolutely amazing. To manage and take care of more than 4,000 wild animals whose natural environments are located all over the world, and to take care of all of them in the Bronx is not a very simple job. It takes a lot of time, hard work, dedication, and love to be able to do what these people do every single day. It is a very demanding, emotional, and heartwarming job that many people who are not affiliated with the zoo pay much attention to. It can also be life threatening and often very dangerous when working with these wild animals.

I am especially impressed with the Bronx Zoo's outstanding educational department. Since its opening day, the Bronx Zoo has made learning fun and enjoyable for both children and adults (Refer to Figure 11 in Appendices). Not only are there creative signs and billboards with interesting animal facts posted everywhere around the zoo, there are also educational videos that play inside many of the installations at the zoo. Birthday parties and summer camps at the Bronx Zoo allows children to have a great time while learning about animals from all over the world and different ways children can protect animals and habitats. Special programs such as Working for Wildlife: The Bronx Zoo Guide to Wildlife Careers and the Animal Care Program for Teens teach youth who are interested in animals all about the variety of careers that are involved with maintaining and caring for the animals at the zoo and how to conduct field ecology studies (Wildlife Adventures, 2009).

For adults, the Bronx Zoo offers classes for teachers to learn techniques of professional development, videoconferencing technology that allows teachers to teach their class about the zoo without even leaving their classroom, and even classes taught at Fordham University for those interested in receiving their Masters in Science and Education (Bronx Zoo: Saving

Wildlife, 2009). Many retired zookeepers and officials work at the Fordham University as professors, teaching undergraduate classes as well.

Information in education and research that the Bronx Zoo gives to its audiences will remain with these people for the rest of their lives. Whether it is from the pure knowledge, or just happy memories, these people will always remember the Bronx Zoo and their goal under the rein of the WCS: saving wildlife in wild places worldwide.

Looking towards the Future for the Bronx Zoo

The Bronx Zoo is an amazing institution that certainly lives up to its mission of protecting wildlife and the environment. However, like person, place, and thing in life, there is always room for improvement. One thing that I would like to see happen in the near future is more advertisements for the Bronx Zoo. More television commercials, and radio and newspaper advertisements could be very beneficial to the zoo. It can bring in more audiences to visit, donate money, and learn about the different animals of this world. Having celebrities get more involved with the zoo could be very helpful as well. The money that the zoo receives from this could be used for more field research and perhaps even expansion of the zoo.

I think a great expansion idea would be opening a building that has animals that are native to the land down under, Australia. Kangaroos, wallabies, wombats, emus, koalas, and dingoes would all be amazing additions to the Bronx Zoo family. Snakes, rodents, and insects from Australia would also be very interesting for audiences to see. Many people have never seen these animals before, and I think it would be a great way to attract more people.

One thing that I have noticed about the zoo is that there is a substantial amount of volunteers who give tours all over the zoo, but there are not many mammal, reptile, and bird department volunteers. Yes, not everyone is eligible to work behind the scenes at the zoo for obvious reasons, but I do not believe people are making enough of an effort to get involved with actually caring for the animals. I am very disappointed in my fellow Fordham University

students for not putting in more time and effort to help the zoo with their mission, and I am also disappointed in the surrounding community as well. If the community did more to clean up the surrounding area of the zoo and to make it a nicer environment, I believe that the zoo would be more populated and bountiful.

How Volunteering at the Bronx Zoo has affected Me and my Future

I can honestly say that volunteering at the zoo has been the most amazing experience of my life so far. Every Wednesday and Sunday I walk to the zoo with a smile on my face, knowing that I will spend the day with the world's most fascinating creatures, and I always leave the zoo with memories that will last me the rest of my life. For some people, going to work everyday is a drag, but when you are working at the zoo and love animals as much as I do, everyday is an exciting adventure.

By volunteering at the zoo, I surround myself with what I love most in this world: wildlife. The zoo is my escape from the academic, tedious, and stressful world of school, and it allows me to come to an incredible place that makes me happier than ever. It is a chance for me to get more in touch with my passions and also learn about the world and about myself; it is as if volunteering at the zoo is a form of therapy for me. It gives me the opportunity to really think about my goals, dreams, and aspirations and get away from all the drama that might have been occurring during my life at the time. Being around animals that I love and people who have the same interests as me made me feel really great about myself as a person, and I have gained a lot from this unforgettable and amazing opportunity.

In any career that has to do with animals, experience is key; the more experience you have, the farther you will go. Through volunteering at the Bronx Zoo, I have spent many hours working with animals from all over the world. Having all of my volunteering hours under my belt will help me immensely in any career I wish to pursue, especially because the Bronx Zoo is such a world- famous installation.

Volunteering at the Bronx Zoo has been an eye-opening experience for me, especially in terms of my future. Not only have I gained a year and a half worth of experience from working with wild animals, I also now know the direction in which I would like my future to head. Speaking to zookeepers and officials about their experiences in working with animals has inspired me to get involved more directly with animals in their natural habitats. This upcoming school semester (Spring 2010), I will be attending the School for Field Studies in Africa, and I will be doing environmental research in both southern Kenya and northern Tanzania. I will be learning about the wildlife, the pastoralist lifestyle, and principles of wildlife management of each region; I will also be doing community service programs as well. (For more information about the School for Field Studies visit http://www.fieldstudies.org) I am certain that my zoo experience, as well as my study abroad experience will lead me to where I am supposed to be and what I am supposed to do throughout my life in order to really make a difference in this world.

Although I feel as though my volunteering played only a minute, indirect, role in helping the environment, I am very proud to say that I am a part of the Bronx Zoo, WCS, and the AZA's mission; it has truly been an honor. I will never know the full extent of my contributions to helping the environment, but knowing that I am making even a small difference towards helping animals and the environment can put a smile on my face at any time. I strongly encourage anyone who is interested in animals and the environment to get involved with the Bronx Zoo's mission. I never would have thought volunteering two days a week could really make such lasting impression on my life, but it truly has. I have never been more proud of myself or of my accomplishments, and I would highly recommend it to anyone who wants to make a difference in this world.

Conclusion

Despite the many controversies over keeping animals in captivity in zoos and aquariums, it is obvious that zoos are very beneficial to this world. Zoological gardens bring wildlife, nature, research, education, and happiness to the millions of people who visit such installations every year. Efforts toward conservation and sustainability are successively changing the world one step at a time, for endangered species are being protected and well cared for all around the world. Foreign countries receive the help they need to manage their wildlife and natural habitats, and field research is being directed daily to ensure safe environments for all of nature's diverse animals. Not only is the public learning about animals, they are also learning ways in which they can help with the zoos' missions to save animals. Ultimately, zoos are viewed as valuable assets to the conservation of wildlife, but they are also perceived as educational and enjoyable institutions.

Appendices

Figure 1: A squirrel monkey (right photo) playing with children's toys as sources of enrichment.

Figure 2 and 3: Clivus Multrilum Toilets, diagram (left photo), photo of actual toilet (right photo)

Figure 4: The front of the Center for Global Conservation

Figure 5: The back view of the Center for Global Conservation

Figure 6: A model of the Madagascar Building

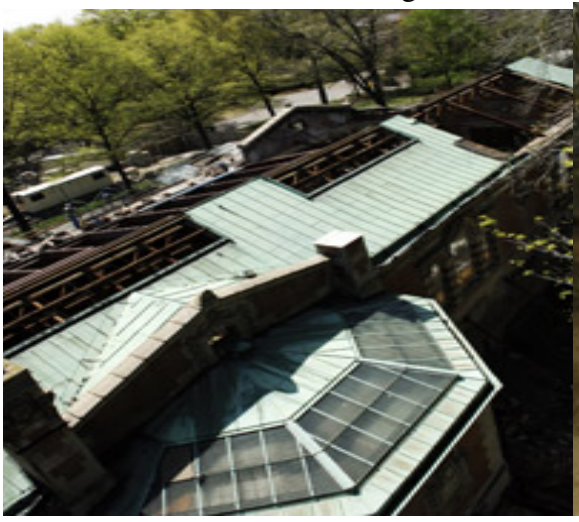

Figure 7:Madagascar's Green Roof

Figure 8: Horticulture building Madagascar's Spiny Forest Exhibit

Figures 9 and 10: Zookeeper giving friendly male sea lion, Kiani, his daily checkup during his feeding/training session.

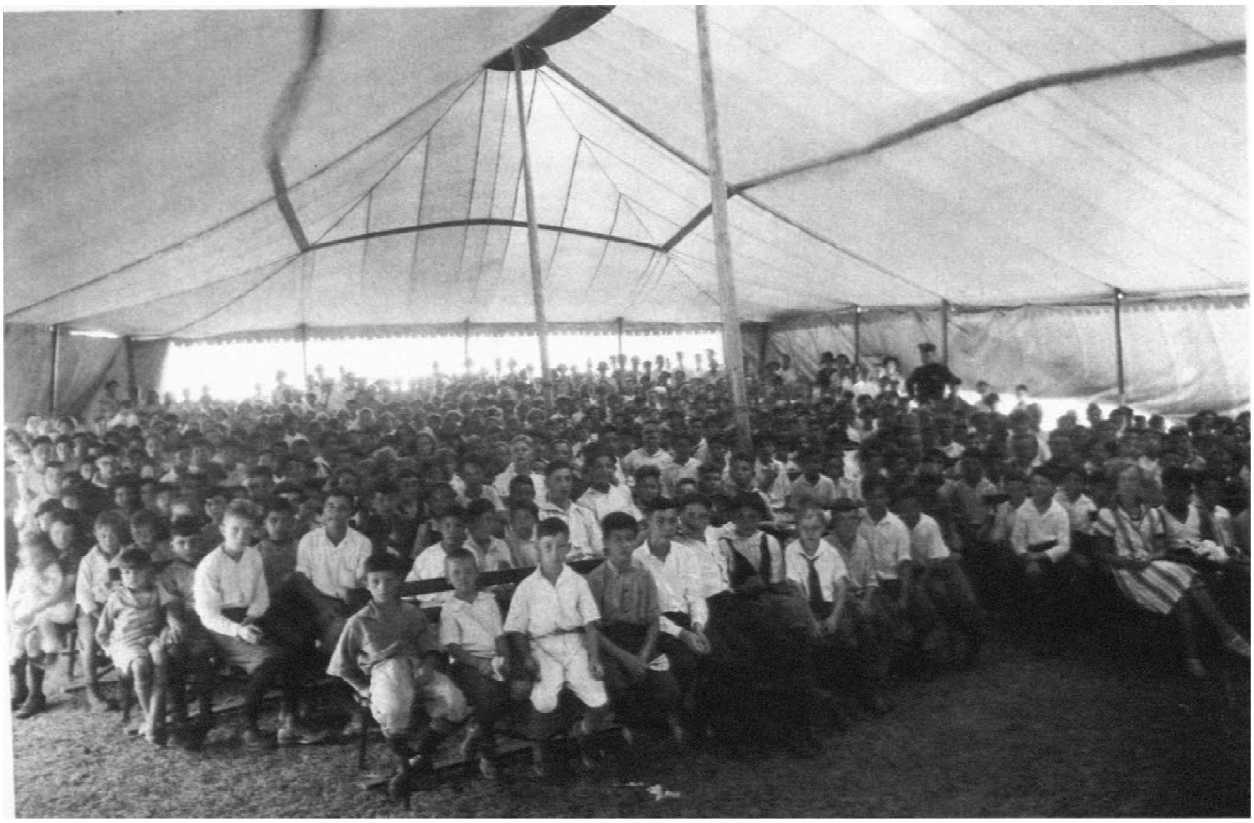

Figure 11: In the 1920's, children watched educational wildlife films while visiting the zoo (Goddard, D. L. 1995)

Figure 12: The Madagascar! Building's key strategies towards sustainability (Lion House Conservation).

Sustainable Site

Results

- Open space and surrounding historic structures protected
- Cultural enhancement of zoo experience
- Stormwater run-off reduced
- Alternate transportation encouraged
- Urban Heat Island Effect mitigated
- Nighttime light pollution reduced

Strategies

- Restored historic building revitalizes central zoo
- Site landscaping designed to decrease run-off
- Native, drought-resistant plants
- Landscaping and trees shade 30% of paved areas
- Designated carpool parking and charging stations for electric vehicles
- Urban setting near public transportation; designated carpool parking

- Bicycle racks and showers

Water Efficiency

Results
- Potable water use reduced in building – 53% over 1992 Energy Policy Act, saving approximately 80,000 gallons/year
- Waste water use reduced 21%
- Landscaping uses no potable water

Strategies
- Low-flow fixtures, flow restrictors
- Waterless urinals
- Grey water system reclaims wastewater for toilet use
- Native drought-resistant plants requiring no irrigation
- Building recycles water for adjacent sea lion exhibit

Energy

Results
- Energy use reduced - 57% over a baseline ASHRAE 90.1-1999
- Annual energy savings of $140,000 (2003); emissions reduced
- Payback – 6.3 years simple payback of energy conserving measures
- Renewable energy offset energy cost
- Fossil fuel use reduced; ozone depletion reduced

Strategies
- Geothermal heat pump system with six standing column wells
- Daylighting for exhibits and public areas
- Dynamic skylights – Ethylene Tetrafluoroethylene (ETFE) technology
- Fuel cell
- Sophisticated heat recovery protocol, prioritizing use of waste heat from condensers and fuel cell, steam from Zoo's co-gen plant
- High-performance lighting
- Envelope improved with insulation and high-performance glass
- Demand-based ventilation controlled by CO2 sensors
- High-efficiency variable-air-volume system, fans and pump motors
- Comprehensive commissioning of systems
- Toleration of larger swings in maintained temperature

Material Conservation

Results
- Building resources conserved
- Construction and demolition waste – by spring 2006, 96% diverted from

landfill (over 2,800 tons)
- Salvaged demolition materials reused
- Recycled materials constitute over 10% of materials
- Local products given preference, account for over 20%
- Rapidly renewable products used
- Forest Stewardship Council wood products required

Strategies
- Historic building adapted, rather than demolished
- Construction and demolition waste sorted at off-site facility
- Salvaged decorative tiles and stone reused here and saved for nearby building
- Major materials targeted for recycled content, including fly-ash in concrete, steel, gypsum board, carpet, and toilet partitions
- Local materials include concrete, bricks, rebar, miscellaneous metals
- FSC certified framing lumber, plywood, veneers and wood doors

Healthy Interiors

Results
- Optimized fresh air quantities
- Extensive daylighting, including ultra-violet light required for animals
- Building systems and occupants protected from construction contamination
- Reduced exposure to toxins, volatile organic compounds, urea formaldehyde
- Occupant-controlled lighting, heating, and cooling

Strategies
- CO2 monitors control fresh air
- HVAC system designed to deliver 100% outside air
- Low-velocity under-floor air distribution system
- Exhibit areas with UV transmitting skylights, and Low-E skylights elsewhere
- Air quality management during construction required; flush-out before occupancy required
- Low-emitting paints, carpets, adhesives, sealants, non-urea-formaldehyde composite woods

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