Spring 5-10-2023

The Value of Zoos and Aquariums; A Perspective Via The Bronx Zoo and New York Aquarium

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Abstract

Zoos and aquariums have always been a controversial topic. The image of animals behind bars is synonymous with zoos and aquariums from all over the world and that's all most people see. Zoos and Aquariums go much deeper than that negative perception and the notion that we are “locking away” animals solely for our selfish entertainment clouds zoos and aquariums higher purposes. Chapter 1 focuses on the histories of zoological parks, it brings to light some of the environmental problems zoos and aquariums are striving to fix while revealing to us why zoos possess such stereotypes. Chapter 2 dives into an issue that gives modern zoos much backlash, even though amazing work like conservation and education are the higher purposes that justify their existence. The common issue brought up is animal ethics, whereas zoos and aquariums are focused on providing animals with the best animal welfare they can give. Chapter 3 focuses on the issue of conservation biology and how zoos remedy that problem. While of course using the Bronx Zoo and New York Aquarium as key examples of this. Chapter 4 talks about environmental education while again using the Bronx Zoo and New York Aquarium as references. Chapter 5 gives us some ways zoos and aquariums can help change their negative perception as to highlight their higher purpose of conservation and education. This will be done through bettering current initiatives performed by zoos as their is still much that can be improved upon. The chapter will also see the proposal of creating and improving current animal welfare laws, these proposals will be modeled by the standards mandated by AZA.

Keywords: animal ethics, animal welfare, conservation biology, ecology, education, species richness, diversity

Table of Contents

Introduction: A Higher Purpose

Have you gone to a zoo or aquarium and been awestruck by the amazing animals on exhibit? They all look so pretty and are fascinating to watch. But then you think to yourself, wait. That's kind of messed up how they are just behind restricted areas for us to just look at. Aren't they unhappy where they are? Shouldn't they be on a wildlife preserve somewhere away from us? Unfortunately, this is the way many people feel about zoos and aquariums. It doesn't help that the spark from animal activists, animal welfare groups, and documentaries contributes to the negative perception of zoos and aquariums. This negative perception nullifies and overshadows the higher purpose of zoos and aquariums. What are those higher purposes exactly?

Throughout history, zoos and aquariums have had an emphasis on the conservation of species in the wild and that has not changed. Thanks to many programs such as the species survival plan, zoos are making it clear that a main focus and reason for their existence is conservation. But the focus doesn't stop there. But how exactly do they get the point across that their focus is on conservation and also the importance of conservation itself? That is of course through education.

Many zoological facilities nowadays have a designated department for education. This alongside the many efforts and collaborations modern zoos are doing with their communities and guests are getting the point across that another higher purpose of zoos and aquariums is education.

But where do the negative viewpoints come from and why are zoos and aquariums still in this position of trying to change the public perception of itself? Chapter 1 focuses heavily on the history of zoos and aquariums, from the bad to the good. This history encompasses facts are far back as ancient times with the likes of the Byzantine empire and ancient Egyptians. The history

of both ancient zoos, as well as zoos from the 18th- 21st centuries, clarifies why zoos and aquariums have been seen in a negative light for so long and are under pressure to change it. This transitions well into chapter 2 as the discussion on the difference between animal welfare and animal ethics is what helps distinguish zoos take on an animal's well-being and also clarifies that the welfare they provide should not be a controversial factor. This is a major note and an important one as when this is brought to light, the public perception of zoos can shift in a more positive manner. Chapter 3 focuses on the Bronx Zoo's and New York Aquarium's efforts into the conservation and ecological higher purpose they perform , while chapter 4 talks about education in zoological facilities with references to the two previously mentioned parks. With some of my own personal insight from volunteer and internship work at the facilities in both of those chapters. Chapter 5 will give my takes on what zoos and aquariums need to do in order to shift the negative public perception. This includes both some new ideas as well as improving on efforts and laws that zoological facilities have already performed/operate under.

It is without a doubt that the negative public perception of zoos and aquariums nullifies the importance of their true higher purposes and their true nature. Some of those higher purposes being conservation and education of the masses. There is a silver lining. Just because those purposes are nullified, that doesn't make it impossible to disprove the false perception to highlight the higher purposes.

Ch1: The History of Zoos and Aquariums; Ancient to the Modern Zoo

The biodiversity of our planet is a major problem that continues to be affected by factors such as climate change, human interaction, and pollution. The *Ecosystems and Human-Wellbeing Biodiversity Report* (Agardy et al. 2005, 1-14) gives us an insight into this ongoing problem. Within the past 30 years; 35% of mangroves were lost, 20% of all coral reefs have been

destroyed, and the majority of biomes on our Earth have seen a switch to 20-50% human use. Many fish species have seen a decline in richness within the Caribbean and Indo-Pacific corals, just adding to the worldwide mess human impact has had on our world. *The environmental index* from Yale University (Yale University 2022, 1) is a great transition point as it has reported that although many countries have maintained or even improved their biodiversity index within this past decade, the number of countries that have negative biodiversity dramatically hurt worldwide biodiversity. Some countries with low EPI scores are Burundi at -13, Nepal at -10.3, the Philippines at -7.5, and Madagascar at -5.4. These are but a few countries and more importantly, once species are gone they are gone forever. At this time, between 200 and 2000 species go extinct yearly. According to the World Wildlife Foundation, we are losing about 69% of our fish, mammal, bird, amphibian, and reptile populations since the year 1970 (WWF 2022, 1). This problem is the unfortunate result of countless years of global warming, habitat loss, agricultural practices, and human expansion. This is a major selling point for the existence of zoos and aquariums and a problem that they attempt to remedy.

Zoos and aquariums have been a controversial topic throughout history as they have attracted the attention of many animal rights groups and welfare groups. But why exactly are they so controversial, and why exactly are there so many negative stereotypes?

The word zoo is used to represent an exotic collection of animals that are kept in captivity and on display for the public. Interestingly enough, prior to the 1800s, the word zoo did not exist as they were all previously private collections called menageries. These menageries were nothing more than a form of amusement kept by and for the wealthy. These menageries ultimately served no higher purpose. The opening of the Zoological Gardens in Regent's Park (1828) coined the

use of the word Zoo which was taken from its name. Going even further back than the 1800s, zoos have been present among mankind as far back as 4000 years ago.

As zoos are so controversial, it is imperative to look at the many definitions of zoos among different groups through points in history to get an idea of why zoos have been such a hot topic for debate for so long. The first example that will be given is commonly known as the harsher definition and has been accepted for so long because it has been seen in practice for equally as long. The harsher definition of a zoo defines it as a location where animals and humans are forcibly met. Seeing this definition and now going through the history provided by *Zoo Animals Behavior, Management Welfare*(Hosey and Melfi and Pankhurst 2009, 15-45), we can see why this is a commonly accepted definition.

Menageries were present in many ancient civilizations, the first being ancient Egypt. 2500 BC yields the earliest known records of exotic animals in this civilization. In the Saqqara cemetery, hieroglyphics show Egyptians keeping a variety of antelopes, baboons, hyenas, storks, cranes, cheetahs, and also falcons. There is also evidence to show that King Thutmose the Third kept many exotic animals in his temple gardens of Karnak. Menageries can be considered the first ever documented zoos. Menageries however, were indeed nothing more than a collection to look at for the royal Egyptian line and feeds into the stereotype that zoos existed only for human entertainment.

Fast forwarding a bit too ancient Mesopotamia, as early as 2000 BC saw evidence of the royal families keeping lions in their properties. Further evidence in the form of carvings in Assyrian royal palaces depicted the royal families had monkeys, elephants, and antelopes in their collections. It is also believed that King Sennacherib who is the person responsible for creating the hanging gardens of Babylon, also created artificial wetlands to showcase a variety of marsh

plants as well as marsh animals. Again, this ancient collection of animals definitely did not serve a higher purpose and only existed as collections for the royal family helping to attribute to the stereotype that zoos exist solely for our entertainment.

China; in particular the Zhou dynasty between 1000-2000 BC, made what looks more like what many people interpret a modern zoo to be. This dynasty created walled-in parks to house animals privately. The Han dynasty (200 BC) created the very first menageries to house exotic animals the likes that have never been on display before such as tigers, bears, alligators, and rhinos. Once more, showing us that menageries were in place to show off to other high-ranking people of the time and creating the modern-day stereotype of animals being nothing more than entertainment for people. This also tells us that this ancient dynasty did in fact steal exotic animals from the wild which the stereotype also transfers over to this day.

Greece kept animals for enlightenment, as well as studying purposes, but also for show. Even the ancient philosopher Aristotle had his own menagerie. Romans kept wild animals for slaughter which is even seen in many modern depictions in cartoons, movies, and stories. These depictions are not entirely fiction as the animals were kept and displayed in gladiatorial arenas for grand showcase aka grand slaughter among visitors. Visitors today can see the chambers for holding wild animals as well as gladiators. These “grand” showcase events led to many animals becoming rare or locally extinct like the hippo in Nubia and the Mesopotamian lion. These are some of the earliest records we have of mankind being responsible for the extinction and decline of biodiversity of species in the wild. Greece is a prime example of the stereotype of zoos hurting animals. The animals were stolen from the wild and made to fight for crowd entertainment which did indeed lead to animal suffering. Although animal suffering was very real in this society's

collection of animals, it is a dark root that has managed to falsely find relevancy in proper zoos today.

The last civilization prior to the 1800s that will be discussed is the dark ages. Although very few records exist of zoos in this time period, in the 13th century the holy Roman emperor Frederick the Second was the first person in several hundred years to establish a new zoo in Europe (which would be located in present-day Palermo Italy). Frederick would later establish 3 other zoos in different cities in Italy. Further expanding upon his fascination with his collection of animals, he would proceed to write books on birds and falconry using the animals in his collection as the basis for his research. These collections would last around 200 years where they would be destroyed and the collection animals slaughtered by those in the French Revolution. Although the zoos featured here started to show early signs of a higher purpose being education through research, it was also plagued with actual animal suffering which managed to stay relevant in talks about zoos today.

The modern zoo begins in the 18th century when Europe started to see a change in its audience for zoos. Gradually between the 18th and 19th centuries, zoos became public spaces. As well as the 19th century being known as the golden age of exploration for exotic animals to showcase in said public spaces. Frederick Cuvier is often considered the first curator of a zoological park. In Paris after the French Revolution, he created a public menagerie Jardin Des Plantes. Becoming a zoo was actually a complete accident for Cuvier and his park as many exotic animals were being confiscated in France and one of the only places to put them was in his gardens. Cuvier ended up taking the responsibility of caring for the animals for 30 years. Having a background in chemistry, Cuvier believed that Zoos can become the research equivalent for zoologists as a laboratory is to a chemist.

The first American zoological garden was inspired by the events going on in Europe. The U.S created its first zoo towards the end of the 19th century, that being the Philadelphia Zoo in 1874 followed by other iconic zoos such as the Cincinnati Zoo (1875) and Bronx Zoo in (1899). Prior to these facilities, the closest thing the U.S had to a zoo were circuses. Early on showing the focus zoos had, the Cincinnati Zoo was the last home of the iconic passenger pigeon showing that although it was a failed story, zoos had a purpose for conservation very early on. Zoos in the U.S built naturalistic and moated enclosures to display animals. However, the 1920s and 30s saw a step backwards as many zoos started to use cages as they were easier to clean but did not focus on an animal's quality of life. These were known as “sterile cages", consisting of bars, concrete floors, and tiled walls. These were used into the 1960s and 70s which would be known as the disinfectant/hygiene era of zoos. This era is also responsible for the rise of many animal rights activists disapproving of the existence of zoos. These activists shaped the public perception of zoos into a negative one. This perception was so bad that many facilities would try to shake off the label/ name “zoo”. The Bronx Zoo changed its name to International Wildlife Conservation Park in the 1990s but would soon give up this effort and reverted back to being called The Bronx Zoo and focus on embracing and rewriting the term zoo.

The History of Aquariums is a far more recent one as the technology for it was created in more recent history. Before the 19th century, the only form an aquarium took was colorful fish being displayed in ponds. The 19th century and onwards saw advancements in glass tank technology which would allow fish to be viewed from the side which could only be done from above previously from above. The London Zoo was the first facility to take advantage of the new tank technology and opened its Vivarium/ Fish House in 1853. The Fish House housed over 60 different fish species and over 200 marine invertebrates.

The first U.S aquarium was opened in 1856 and was a part of the American Museum of History located in New York. The first oceanarium opened in 1938 and was known as Marineland in St. Augustine Florida. It's classified as an oceanarium as it was the first place to showcase marine mammals. Aquariums would become more widespread in the 1970s and 1980s. The New York Aquarium opened its doors in 1896 in Battery Castle Clinton in Manhattan. The New York Zoological Society would take control of the aquarium in 1902 where it would then become accredited with the Wildlife Conservation Society. It would last in Battery until the year 1941 when it would be moved to its current location in Coney Island.

Upon moving on to the modern zoo it is important that a more modern definition of a zoo is paired with the transition. The Association of Zoos and Aquariums better known as AZA is the organization responsible for accrediting zoos and aquariums. AZA prides itself in upholding the highest standards for all zoos and aquariums which ensures all guests that they are visiting a high-quality zoo that upholds the highest animal welfare standards. AZA's definition of a zoo is as follows “A permanent institution which owns and maintains captive wild animals that represent more than a token collection and under the direction of a professional staff, provides its collection with appropriate care and exhibits them in an aesthetic manner to the public on a regularly scheduled basis. They shall further be defined as having as their primary business the exhibition, conservation, and preservation of the Earth’s fauna in an educational and scientific manner” (Association of Zoos and Aquariums 2023, Accreditation FAQs page). This definition establishes that the animals are held in captivity and there is a higher purpose for it rather than just being for show. Professional staff provide quality exhibits as well as animal care and present them to the public with the purpose of promoting the biodiversity the Earth has to offer while promoting conservation through an educational and scientific manner.

As we are touching on AZA, the many negative stereotypes of zoos and aquariums can be traced to the reality that there are two different types of zoos, being AZA and non-AZA-accredited facilities. In the year 1971, the world's concern was starting to grow for an increase in the quality of animal care. Due to this public outcry, AZA appointed a committee to create an established set of high-quality practices to improve zoological welfare, also leading to the first accredited zoo in 1974. The next question is pretty obvious, "well why does accreditation even matter? After all, isn't it just a fancy logo next to the name of the facility"? AZA accreditation is way more than just a logo that a zoo can stick on its name, it's something prestigious. The reason why the accreditation is prestigious as well as important is because they require facilities to uphold the highest standards of sanitization, nutrition, and welfare of all animals within their care. It is true that AZA exhibited a time where quality over quantity was not pushed like it is today. Once they made the important shift to do so in 1985 we have seen the constant growth and improvement of AZA standards of welfare and in turn the quality of zoological facilities. Although the quality-over-quantity shift originally caused a 75% decrease in memberships, this did not deter AZA's strong belief in pushing the boundaries of what a zoo should look like.

To form this standard of what a zoological facility should look like, AZA has collaborated with many U.S agencies like OSHA and the USDA to create what they refer to as the "national standard". The standards of today will not be the same 10 years down the line. As previously stated, AZA is always improving its standards and raising the bar for animal care as we learn more and more scientific knowledge about the wild animals and the care they are provided.

The process to get AZA certified is not an easy run-of-the-mill task that any facility can go and accomplish. Its exactly why we see so many non-accredited zoos and aquariums which many are referred to as roadside attractions. From their own words “AZA’s rigorous, scientifically, based and publicly available standards examine the zoo or aquarium's entire operation, including animal welfare, veterinary care, conservation, education, guest services, physical facilities, safety, staffing, finance, and governing body” (Association of Zoos and Aquariums 2023, About AZA Accreditation pg). With the complicated check that AZA does, it goes further than just assuring that a facility provides better animal welfare for their individuals and also ensures that a zoo is not just holding animals for monetary gain. The difficulty of the screening process goes into detail on aspects that many would not even consider such as public education and even the financing of the park to go the further mile and justify the existence of the facility desiring to be accredited. The accreditation that some people may find as just a logo next to a facility’s name is ultimately what differentiates what makes or break something from being classified as a great zoo like the San Diego Zoo vs a bad zoo that is only in the business for the profit.

An iconic example of what a bad zoo looks like and also promotes the negative stereotypes of zoos is the Greater Wynnewood Exotic Animal Park which was formerly known as Tiger King Park. This facility currently and never was AZA certified to begin with, showing what can become of a place when they aren't under strict regulations. The Netflix documentary featured Joe Exotic and predominantly showcased his life, but in doing so also showed off his practices in maintaining the zoo (Goode 2020, Season 1). The episodic series featured many scenes where the facility exploited infant tiger cubs by offering play sessions with them for nothing more than monetary gain. Joe Exotic even admitted in the show that he breeds tigers in

order to put on those shows to make extra monetary value to pay for his facility. Tiger King Park also did not feature a viable veterinary department and were also feeding their animals old meat from local supermarkets.

When seeing non-accredited zoos like the many featured in the documentary Tiger King, it is easy for those to become oblivious to the distinguishment that AZA gives facilities on what a good zoo should look like. Another example of a non-AZA zoo is the Dr. Juan A Rivero Zoo in Mayaguez Puerto Rico. It is a zoo that suffered immense damage from hurricanes Irma and Maria and closed its doors to the public ever since. As recently as March of 2023, the government of the island ordered the immediate closure of the facility with the remaining animals of the facility being relocated to sanctuaries. Officials from the sanctuaries had visited the zoo in which executive producer Pat Craig of The Wild Animal Sanctuary in Colorado stated "The zoo definitely has been degraded, you can imagine the facilities were overgrown and dilapidated to some degree"(Craig 2023, 1-3). The producer of the sanctuary also gave many other concerns about the animals of the facility, like a mountain lion that had a tumor on its back and a lone chimpanzee whose troupmates had perished as apes are social creatures.

This is just a sad case where AZA accreditation could have helped the state of the zoo and also help uphold the highest quality animal welfare for the animals of the park which have also suffered. AZA does help out it's members by offering grants such as the CGF (Conservation Group Fund) and also annual disbursements amounts which are based upon the decisions of the board of directors of AZA. The failure to become AZA certified led to the downfall of Dr. Juan A. Rivero Zoo and the look of the destroyed facility and the state of the animals that inhabited that facility do no justice to the negative stereotypes that plague zoos and aquariums, even if the zoo in the past may have not been an entirely bad facility in the past.

Throughout the chapter, we have mentioned them, but what exactly are the negative perceptions of zoos and aquariums? Zoos hurt animals, zoos kidnap animals, animals are only in zoos for our entertainment/ to look at, zoos are unethical/ animals suffer, zoos don't replicate their animal's wild habitats and zoos don't teach guests anything. These are many of the common stereotypes that undermine a proper zoo's higher purpose of education and conservation.

Ch2: The Difference Between Animal Ethics and Animal Welfare

As previously discusses, there were points in time when many facilities such as The Bronx Zoo were attempting to disassociate their existence from the word zoo. However, instead of trying to shake off this word, facilities are now trying to rewrite what it means to be a zoo. Jim Breheny from the Animal Planet Tv show *The Zoo* says it best"When you ask a child to draw a picture of a zoo, chances are they are going to draw a picture of animals behind bars. We got to take that image and change it" (Tarver et al. 2015, Episode 1). This negative perception of animals behind bars is something synonymous with the dispute between animal ethics and animal welfare.

Oftentimes, when a guest sees an animal in a zoo, whether they are realizing it or not, they are constructing a mental image of its essential needs and properties. They then determine whether the animal they are looking at on exhibit is a good representation of its species. This shows that people have an emphasis on species rather than an individual. Norton et al. in their book *Ethics on the Ark* (Norton et al. 1995, 13-52) emphasize this point and makes a distinct connotation that unlike those who preserve geological places where they are focused on the preservation of the individual place (as all environments are individually unique), zoos and aquariums are focused on wildlife preservation which focuses on the preservation of the species and doesn't particularly emphasize care for individuals. Norton et al. state that when an animal is

endangered, the individuals will be prioritized medically immensely, but once their population stabilizes, the concern and attention for the animal decreases. These are one of the misconceptions about animal welfare within zoological facilities that need to be distinguished. Although it is true that when a species of animal is endangered, their well-being is prioritized as they are a part of the species survival plan. The official definition of the species survival program from AZA is as follows. “An AZA SSP Program is identified through documented demand and potential sustainability within the AZA community; is selected by Taxon Advisory Groups (TAGs) through the RCP process; and develops a Breeding and Transfer Plan that identifies population goals and recommendations to manage a genetically diverse, demographically varied, and biologically sound population. Success is achieved when SSP animals are available to meet program goals and come from biologically sound populations as a result of a shared commitment to cooperative populations and program management” (Association of Zoos and Aquariums 2023, Species Survival Plan Program pg). Dissecting this definition, it again is common to see why people believe zoos are mainly focused on the wellbeing of endangered animals as those under the species survival plan are focused on maintaining gene diversity and creating a biologically sound population. This however is not entirely the case. The majority, if not all of the animals that enter zoos and aquariums are either a part of the species survival program (SSP) or rescue animals. Rescue animals are often in need of rehabilitation or have individual needs that are focused on their unique scenarios. Zoos balance their attention with their focus on maintaining the health of species apart of the SSP. As they are also concerned with the individual concerns of their rescue and ambassador animals (ambassador animals is a term used by zoos for all animals in their care, as they are representatives for their wild counterparts), it's not a valid excuse to say that zoos are only focused on endangered animals in their collection when they

also attend to the specific needs of rescue animals and when the majority of their animals fall under one of these two categories.

However, Norton et al. do get things correct in their book. The focus on the species rather than individuals causes mass conflict between environmentalists and animal rights activists. Those concerned with environmental ethics became concerned with the relationship between it and animal welfare ethics. This led to the concern of animal liberation due to the concern and treatment of many domestic animals in the 19th century and this concern would often be coined with the term "unnecessary suffering". On the flip side, species preservation in the 19th century was brought to attention out of the concern for species extinction. Another one of the forefront factors in the debate between animal welfare and ethics in zoos is the presence of animals in documentaries. Nature documentaries focus on giving animals stories and giving human emotion and attachment to their animal's actions that do not simply exist in nature. These also portray animals in zoos and aquariums as boring and show them in a negative light. Norton et al. ends their section with their belief in the zooless zoo, which are exhibits that embody Carl Hagenback's designs of barless enclosures that showcase animals in their natural habitats. Picture the Bronx Zoo's African Plains exhibit and Disney's Animal Kingdom exhibit. While that is the direction zoos are heading towards, *Ethics on the Ark* (Norton et al. 1995, 13-52) only scratches the surface of the battle between animal ethics and welfare.

Referring back to *Zoo Animals Behavior, Management Welfare* (Hosey and Melfi and Pankhurst 2009, 219-252), all accredited zoos recognize that animals that lie in their care need good welfare. This is where animal welfare science comes into play and animal welfare science is the study of an animal's quality of life. While we have gotten this far into the chapter, we have not discussed the proper definition of what animal welfare actually is. Animal welfare is the

subjective state of any given animal which is free of social/societal viewpoints on welfare. Animal welfare is indeed, focused on the individual as each individual interacts and requires different needs in their environment. For example, such factors are but not limited to age, sex, social rank, and disabilities. Another key factor to animal welfare is an animal's personality. This counts as an animal's reaction to environmental variables. An animal's personality is shaped by its past experiences in its environment as well as its genetics. Individuals will react to the same exact environmental factor differently which is why we classify them as having a personality. More research is needed, but animal personality does play a factor in animal welfare as it can help predict how an animal will react to scenarios in the future. People can also influence animal welfare. People have accomplished this by focusing on buying food from companies with high animal welfare. This is known as consumer pressure, but this has not seen much of an impact on zoos and aquariums. It can be said though that food is a necessity (being easier to shape as a result) while visiting a zoo is not, this causes zoos to tend to try to appease societal views towards them in order to not lose out on sales and funding.

Moving past the definition and influence one may have on welfare, there are three elements that can't be excluded when talking about welfare. Animal bodies are the stance that heavily dives into the idea of homeostasis (Hosey and Melfi and Pankhurst 2009, 219-252). For those unfamiliar with homeostasis, it is the ability for one to reach equilibrium or a stable state. Animal welfare is not met if homeostasis is not met or if any psychological or behavioral responses an animal will perform to achieve homeostasis is aberrant or stressful to itself. Unlike the psychological and emotional factors that animal ethics focuses on, this is on a measurable scale.

Animal minds is the next element and is addressed as the animal's emotions which cannot be measured (Hosey and Melfi and Pankhurst 2009, 219-252). Many visitors often believe they are measuring this concept by asking the question “is the animal happy”? The truth is, there is no set scale for happiness. Animals are mainly focused on meeting their survival needs and achieving homeostasis. Zoos and aquariums meet these goals, all the while building relationships with the animals through training sessions. The idea of “happiness” and emotions towards animals was developed during the Enlightenment and would shift to a focus on behaviorism in the 20th century. Behaviorism is the theory that human and animal behaviors do not need to pertain to emotions but rather can be explained through conditioning. The new question that is proposed nowadays with regard to animal welfare should be if the animal is suffering, rather than if they are happy.

Animal nature is the account that we judge an animal’s welfare based on its natural conditions in the wild (Hosey and Melfi and Pankhurst 2009, 219-252). A good example of this element would be the sterile cage talked about earlier and Carl Hagenback’s design of the cageless zoo. There are problems with this approach, however. Some animals may have naturally poor animal welfare and when asked the question if the animal is suffering, the answer would be yes. For example, many rams and non-domestic goats in the wild have horns that constantly grow, which if not taken care of properly will lead to ingrown horns that will cause the early demise of the animal. Other animals may exhibit aggression and flight or fight responses when stressors are put on them in the wild, which is a clear sign of stress in itself (can especially be seen in prey species). Distinguishing that animal welfare is the focus on maintaining homeostasis on an animal in a nonaberrant manner, animal ethics often tends to cloud judgment when it comes to understanding that concept.

A common go-to for many animal activists who advocate for animal ethics is animal rights theory believing that animals should be entitled to some form of protection for their lives and freedom. This is distinct from the impact on their welfare whereas rights are a more moral notion developed by and for humans. Generally speaking, the rights that are referred to are welfare rights and these should protect them from emotional and physical harm. A huge factor in this movement was Tom Regan's book *The Case for Animal Rights* (Regan 1983, Chapter 1) in which he gave the notion that animals should have the right to protection beyond our interest in their welfare. He argues that animals have the freedom to rights and animals act in ways and make choices that indicate they have a satisfactory level of self-consciousness. Another reason rights were associated with animals was to help mitigate their exploitation which unfortunately leaked its way into the existence of zoos and aquariums.

The underlying issue is then to clarify if animals are indeed eligible to have rights and there are two main arguments in this scenario which are gone into detail in the book *Zoo Ethics, The Challenges of Compassionate Conservation* (Gray 2017, 91-117). Will theory of rights states that rights are linked to those with the capability for conscious choices for their actions. If we were to think like this, then animals and children do not have rights as they lack the ability to make moral decisions. The way animals and children can have rights in this mindset is through a representative/ ambassador. The second theory is the interest theory in that based on the idea that rights serve to maintain the interests of individuals. The argument for this is that children and animals have an interest to avoid pain and suffering.

These two theories directly play into two types of rights being liberty and welfare rights. Liberty rights are based upon the will theory and are classified as the right to vote, marry, have access to education, or practice religion. Welfare rights are based upon the interest theory and

protect important interest areas such as life, avoidance of suffering, and a positive welfare state. Distinguishing the two rights, it's safe to associate zoos with granting animals welfare rights as animals who are in the captivity of a zoo are granted all the welfare rights listed above. Zoos often deny liberty rights as those are more so classified as human rights, but this ends up leaving many people believing that this denial is to keep the animals vulnerable. On the contrary, some believe that if the interest of the animal can be met in captivity, then there are no need for rights.

Other people question the ethicality of the very concept of a zoo. This debate is something that has spawned from the negative stereotype that zoos hurt their animals mentally and physically, therefore associating ethics with that notion. From the book *An Introduction to Zoo Biology and Management* (Rees 2011, 87-98), Rees argues that we have a moral responsibility to preserve species for future generations since after all we are a huge cause for the increase in the extinction rate. This of course would translate to the mission statement of zoos, therefore, justifying proper the existence of proper zoos. Rees also goes into detail on ethics and gives the definition that ethics is concerned with the morality of an individual's actions. Modern-day zoos that are considered by the standards mentioned earlier in chapter 1 to be a proper zoo, pass this assessment as some of their main goals are the conservation of species in the wild and the education of the masses. These two mission goals go to show that the morality for the existence of these facilities is there and equates to the ethical existence of the facilities.

Rees does also give his take on what else needs to be present in a zoo or aquarium to consider it an ethical facility. Zoos need to pass two tests in order to be considered ethical which are the basic needs test followed by the comparable life test. The basic needs test is fairly straightforward as it tests if a facility can provide adequate care for the physiological as well as psychological needs of all the animals in its care. As referenced in the previous chapter, AZA

accreditation is a huge factor for this as their rigorous process for accreditation matches this assessment and asks all zoos and aquariums that are members to provide plans which include individual and natural history (History of the individual and the history of the species itself) of the animals in their care to ensure they are adhering to protocols, etc.

The second test is the comparable life test which tests if a facility can provide the animals in its guardianship a life that is at least equal to the life that specific species can find in its natural habitat. This second test is what helps combat the notion that zoos don't replicate their wild habitats as both Rees and AZA both agree on this notion and AZA actually employs a process that tests for comparable life. While still disproving more stereotypes, Rees brings up the fact again that people consider keeping animals in a zoo to be disrespectful. In accordance with the book *Animal Rights: A Very Short Introduction* (DeGrazia 2002, 1-152) he agrees with the author's point that keeping animals in zoos is neither harmful to the animals nor is it disrespectful to them, effectively tying it back to the fact that once more we have a moral responsibility to conserve animals.

However, Rees and I both identify that DeGrazia starts to stray away from proper ethical protocols himself when he gives his idea that some animals have a higher value than others. DeGrazia singles out some species as intellectually and socially smarter than others like great apes and dolphins and due to their heightened intelligence, they should not be kept in zoos. This point of view again gives the idea that some species are not as high of a value to others which couldn't be farther from the truth and isn't ethical in itself. Proper zoos and aquariums avoid that prospect which is also known as speciesism, which effectively is a favoritism or prejudice to certain animal species over others.

Another huge point that regards the ethicality of zoos and aquariums is the concern of guest interactions on the wellbeing of zoo animals. It is true that the existence of visitors in zoological parks can have unexpected effects on the animals on exhibit. For example, many visitors in the past commonly feed the animals(whether or not it was against facility rules). This would lead to many animals often extending an arm or trunk to ask for food which is an unwanted behavior, but it cannot be taken as either good or bad behavior. Other species don't prefer visitor engagements like the illusive and shy Okapi which will hide from crowds, or gorillas being threatened by eye contact, or mandrills who get intimidated by red colors. In cases like these where the animal does not prefer visitor interaction, zoos have made efforts to reduce the extent animals are visible by obscuring windows and implementing screening perimeters. On the flip side, some species don't mind the engagement from visitors and find curiosity or even enrichment in it without any existence of a primary reinforcer (primary reinforcers are considered: food, water, shelter, and sex). Orangutans and lemurs have been recorded sitting close to windows to observe visitors, while other species like chimps throw feces at guests as a form of entertainment for themselves. Very few studies have been performed but the few that were performed have shown that visitor engagement can be both positively enriching and negatively undesirable. There is still no clarity to or outstanding information available that definitely proves visitor engagement is either directly positive or negative on the exhibit animals and in turn the ethicality of it. That being said, the acknowledgment that some species don't prefer visitor engagement is there, and zoo practices and technology continue to improve to better the welfare of the animals in their care.

Moving away from guests and towards the people that are more active in the lives of the animals on exhibit. Do the keepers have any effect on the well-being of the animals in their care?

Many animals have classically conditioned the keeper to their food and in turn show more signs of excitement around them. There have been few studies on keeper effects on behavior, once more however, Paul A. Rees gave his take on the manner on one study conducted in 2008 (Jemsvold 2008, 1-12). This study was conducted with chimpanzees and suggested that the relationship of chimps with their keepers can affect their welfare. The study showed a positive relationship as the chimps increased friendly behavior around keepers when the keepers communicated in native chimp behavior and vocalizations compared to keepers that only communicated with them in human language. This goes to show that proper zoos are dedicated to providing the best care possible for the animals in their care. Even going as far as to build connections with them through their own language system to better their psychological stimulation, showing how ethical proper facilities are when dealing with the care of their individuals.

Another deal that disproves the notion that zoos are not ethical places for animals is the use of enrichment. As defined by AZA, enrichment is " A process for improving or enhancing zoo animal environments and care within the context of their inhabitants, behavioral biology, and natural history"(AZA 2009, Enrichment FAQ's Pg). AZA requires all members to have an enrichment program that promotes a species natural behavior and requires it for all species in the care of the zoological facility. Enrichment is an important factor for animals in zoos as it also disproves the misconception that zoos don't replicate their wild habitats and in turn are unethical. Environmental enrichment is the enrichment type that is preferred and used by AZA-accredited zoos and aquariums. This enrichment can be seen in the form of feeding devices, freezing or hiding food to promote foraging, designing an exhibit to match one's natural and individual needs, training, and utilizing natural vegetation. Enrichment is known to have the positive effects

of providing mental stimulation, promoting natural behaviors, reducing stress, providing a sense of learning, and also promoting exercise. Categorized as either food, auditory/sensory, cognitive, or habitat enrichment, these different types of enrichment better the quality of life an animal receives and in turn improving the ethicality of proper zoological facilities.

All in all, zoos and aquariums are focused on providing animal welfare and do actually uphold the idea that all animals in their care are entitled to welfare rights (opposed to popular belief). There is a difference between animal ethics and animal welfare as animal ethics is more so focused on granting all animal rights but often people associate animals with having liberty rights which cause the ill will and public perception that zoos don't give animals proper welfare. Zoos are still constantly under fire with this perception, even as recently as the year 2020 with the ruling of Happy the elephant over at the Bronx Zoo (WCS Newsroom 2020, 1). It came to the ruling that Happy was not human, and so she was not entitled to the same rights as a person (a.k.a liberty rights that were distinguished). Once the public realizes and makes the distinguishment between animal ethics and animal welfare and also liberty and welfare rights, can we truly start to reshape the public perception of zoos and aquariums.

Ch3: Conservation Within Zoos and Aquariums

Although many may find conservation as a cover-up for the existence of zoos and aquariums, better understanding the definitions of conservation can help us remedy that idea. There are many definitions of conservation to begin with, for example; the careful use of natural resources. Once more the authors of the book *Zoo Animals: Behaviour, management, and Welfare* (Hosey and Melfi and Pankhurst 2009, 345-376) bring up the idea that embedded with this kind of definition is the idea of human interference to achieve a self-sustaining goal and thus could be another reason why zoos are criticized so much. A much easier and simpler definition

also referred to in their book is the continuance of wild habitats and species. This is a way better definition of conservation as it helps us realize that conservation of species in the wild is not solely for the interest of mankind but can also be shown as a more moral duty that we must perform to help contribute back to the biodiversity that humans are responsible for destroying.

Biodiversity is best defined as the variety of living organisms on the planet, as well as the diversity of said organism's gene pools. Biodiversity is often linked to conservation within regards to a zoological setting as it helps distinguish between the conservation of materials and the conservation of organisms. Cue in the creation of the term conservation biology and its association with all proper zoos and aquariums. Understanding that conservation biology is the study/practice of protecting the biodiversity of wildlife and wild places, can we truly come to appreciate the mission of zoos and aquariums. Not simply as places that are allowed to be operational, but as places that actually act as main influencers in a cause.

So why is conservation biology so important? William Conway (who was the former president of the World Conservation Society and also the previous director of the Bronx Zoo before our current Jim Breheny) stated in 2007 “we live in an age of extinction”. The First argument on if we should even be concerned about this to begin with, is that extinction has happened before. Yes, extinction is a naturally occurring process that has happened before in the past with notable instances like the wooly mammoth or saber tooth tiger. However, Hosey et al. give two points as to why that statement is of concern. Firstly, many species that we have claimed to have gone extinct actually evolved into new species like the titanoboa to modern-day boa constrictors and sarcosuchus to modern-day crocodilians. Second, the rate of modern-day extinction is alarmingly high! Hosey et al. reveal to us that the rate of extinction prior to humanity was about three species per year with an estimate of 25 considering that most species

that have existed on our planet have not been discovered. Since records started to be collected of extinct species in 1600, it was documented that 490 species have gone extinct up until the year 1994 when the book collected its data. The 490 number is comprised of mollusk bird and mammal species. However, when we include invertebrates and other organisism like plants (which dont see much recognition in historic records), we are looking at a total of 140,000 species.

Going back to the 490 benchmark previously mentioned in *Zoo Animals Behavior, Management, and Welfare* (Hosey and Melfi and Pankhurst 2009, 345-376). We have had almost thirty years of development since the original data used in the book was made in 1994. With that comes a disturbing reality. According to *Endangered Species International* (Endangered Species International 2023, 1), we now have a total of 905 extinct and 16,928 threatened to be extinct as of this year. Within three decades, we are seeing that the number of extinct animals have nearly doubled. In this recent time, we are experiencing the same amount of extinction that occurred in nearly 400 years in a nicely compact 30. It's no wonder that in between 200 and 2000 species go extinct every year now in recent times.

Now that we understand what conservation biology is and why it is important, we must acknowledge how zoos go about executing this mission goal. First and foremost, addressing a big elephant in the room, the answer is no. Contrary to public belief, zoos do not steal animals from the wild. All proper/ accredited zoos obtain their animals from; breeding within their own zoos, the movement and relocation of individuals within other accredited zoos, or in very rare circumstances as rescues from the wild (deemed as a rescue when the animal would not be able to survive on it’s own). Utilizing these factors, zoos create breeding programs in accordance with the species survival plan to help stabilize the population of their wild counterparts.

Hosey et al. bring up the point that the IUCN has identified that 5742 vertebrate species and 1601 mollusk and insect species are threatened as of the year 2007. The number has only worsened in recent times with the IUCN reporting 42,100 endangered species as of this year (IUCN 2022, Background and History Pg). Again showing us that in only a short amount of time, we have managed to increase our rate of extinction, as well as our species endangerment rate. With our need for conservation growing greater by the day, zoos are a great answer to help remedy the mass extinction going on in our world. Hosey et al. bring up in their book that around 1000 zoos worldwide are likely to be cooperative, which in their words "we can have room for 500,000 animals which equals about 2000 species able to be saved"(Hosey and Melfi and Pankhurst 2009, 345-376)

Although that may not seem like a big number, where the authors get things wrong is that they fail to take into account the fact that different animals have different welfare standards. For example, a beetle does not need the same amount of space as a crocodile, neither does a rodent compared to a primate. Another factor that was not taken into account is the reality that some zoological facilities actually collaborate with wildlife sanctuaries for conservation and relocation purposes. Thus, we can not get a true measurement of how many species zoos "can" save. But we can see that zoos do actually help save species from the brink of extinction and the proof is in the pudding. Two zoological facilities that have shown success in its many conservation attempts is the Bronx Zoo and New York Aquarium!

The Bronx Zoo and New York Aquarium are two facilities that are AZA accredited which starts them on a good path. Not only are they AZA accredited, but both facilities are a part of the Wildlife Conservation Society (WCS). WCS is dedicated to helping preserve wildlife and wild places and the Bronx Zoo and New York Aquarium are two of the five parks that are all located

in New York City that have the honor of being the only WCS-accredited zoos and aquariums. AZA-accredited zoos and aquariums are all amazing ambassadors of the higher purpose they pursue. However, the Bronx Zoo and New York Aquarium are some of the best examples of what these facilities are due to the double accreditation. Focusing on the conservation of species and ecological efforts, how exactly have these facilities met that goal?

The Bronx Zoo is one of the biggest urban zoos in the world and they take the mission goal of the conservation of species in the wild very seriously. It is even highlighted in the intro to their tv series Animal Planet's The Zoo "It's not enough to keep animals in exhibits just for people to look at. There has to be a higher purpose, and for us its conservation of species in the wild" (Jim Breheny 2015, Episode 1). The Bronx Zoo's television series highlights some of the more popular conservation work they have done and even acknowledges a negative perception that overshadows the importance of zoos being that animals are in zoos just for people to look at. But there are also some of its conservation work that they have not highlighted as much. One such example is the successful incubation of maleo eggs.

Within the Bronx Zoo's report *Artificial incubation of Maleo Macrocephalon* (Cornejo and Iorizzo and Clum 2016, 1-68), it is stated that the megapodidae family of animals is known to use other sources rather than their own body heat in order to incubate their eggs and generally do not provide much parental care for their chicks. Historically, only 4 species in the megapodidae/ megapode family have been known to breed in captivity and the maleo is one of the species that the Bronx Zoo is currently working with. Maleos are endemic to Sulawesi in Indonesia and are critically endangered due to unregulated egg collecting and habitat loss.

Since 1848, the maleo has been rare to find in its endemic habitat and has mainly only been found and seen by guests in captivity. By 1978, the Bronx Zoo would acquire its first two

pairs. The pairs would not be kept in the Bronx for long as they would be sent to various WCS facilities around the world for breeding. In 2005, the remaining birds that were originally taken in from the wild had died from old age and their descendants born and raised in zoos remained. Some individuals would be sent to the Bronx Zoo. The challenge with trying to preserve this species was the very difficult incubation process for the species. In the wild, maleos lay eggs in pits on communal nesting grounds in which the soil is heated by outside geothermal sources. WCS would replicate this process, using reptile incubation tactics in Sulawesi itself.

A revision of the reptile incubation method would be made where the egg would be placed without substrate and would not be rotated. This method would be adopted by the Bronx Zoo in 2006. 46% of total eggs produced that year or 11 total eggs would perish with the incubation method. The rack system would be implemented in 2011 but saw little improvement in the successful hatch ratio of eggs. 2012 yet saw another revision that is the current process the facility uses which yielded a 91% success rate as only 1 in 12 eggs perished. After all the funding and effort and years put into the challenge, the Bronx Zoo now has a successful and ongoing maleo breeding program that helps preserve the species. This is an excellent example of the zoo's higher purpose as their commitment and funding went on for many years to help us figure out the proper incubation protocols and share them with other conservationists. This effort ensures the future and preservation of the maleo species, but this good is often clouded by the negative public perception of zoos.

A conservation success story that the Bronx Zoo highlights in its show as well as it's website, is their pure breed bison herd at their facility. This story is heavily advertised as the zoo itself describes it as "The Bronx Zoo, the Wildlife Conservation Society's flagship zoo in New York City and Indigenous tribes effort to restore bison in the American west at the turn of the

20th century is credited as one of the first successful conservation programs and has become an important part of the Bronx Zoo's conservation legacy" (WCS 2022, Bison Homecoming). William Hornaday who was the Bronx Zoo's first director in the late 1800's determined that only around 1000 Bison from the original population were alive which would later lead to the creation of the American Bison Society in 1905. Nowadays, there are about 500,000 Bison alive but only 1% of the species are pure bison. The differentiation occurred when the early 1900s saw cross-breeding between the bison and domestic cattle both for repopulation and in an attempt to create stronger livestock.

Originally, the Bronx Zoo relied on embryo transplants in order to help preserve the pure bison population. Although the effort was successful, it would prove inefficient to create a large herd of pure bison. In 2016, the Assiniboine tribe from Fort Tech Montana gifted the zoo with a group of genetically pure bison which allowed them to breed naturally. This natural breeding was made possible of course due to the excellent care Bronx Zoo staff gave the animals. After years of successful breeding, the zoo was now ready to release 3 male and 3 female bison to the Osage Nation in Oklahoma. Thanks to the efforts of the Bronx Zoo, this was the first time in over 100 years that Bison would be released into the wild. Yet again the negative perception of zoological facilities tends to overshadow this amazing achievement the zoo has accomplished. The goal was not to keep these animals in captivity for guests to simply look at, but it led to the reintroduction of the once far more scarce population of pure bison in the U.S.

Speaking on the common misconception of animals being only on exhibit for people to look at. Many animals are not even on exhibit and are in off-exhibit holdings at the Bronx Zoo and are there for strictly conservation purposes. Such is the example with the Kihansi Spray Toads. The Kihansi Spray Toads are held off exhibit and were determined to be extinct in the

wild in the year 2005. The Bronx Zoo had come into possession of an insurance population in the year 2000. Ever since the year 2012, the Bronx Zoo has been responsible for maintaining and reintroducing individuals back into the wild. After years of successful breeding, the curator of herpetology at the Bronx Zoo Don Boyer, and senior keeper Avishai Shuter personally traveled to the waterfall basin in Tanzania. They boarded a flight, drove 12 hours, hiked a couple of miles, and then personally released the 1000 individuals in the basin they are endemic to. Thanks to the efforts of the zoo, the Kihansi spray toads are no longer extinct in their endemic land and have started to make a comeback. This again goes against the negative perception that animals are kept in zoos solely for our entertainment as we see with the spray toads, that conservation and reintroduction of species in and to the wild is a focus point.

Another animal that is off-exhibit and has a conservation story is the eastern hellbender. The eastern hellbender is one of the largest salamanders in the world and is native to New York state as well as the northeastern U.S. The Bronx Zoo highlights in its document *Bronx Zoo is Hellbent on Saving Hellbenders* (WCS 2021, 1), the year 2017 saw 124 individuals collected from different streams and brought over to the Bronx Zoo. Keep in mind that these individuals were not "stolen" from the wild, but were assisted as their numbers were so low they needed to be helped. Since they are a severely threatened species, the Bronx Zoo helped take care of them and assisted in them reaching maturity to help them reach the max chance of survival in their habitats. "Young Hellbenders are vulnerable to predation by fish and other wildlife that share their habitat… by raising them at the zoo they are able to grow to a size that greatly increases their survival rate" (Don Boyer, 2021). In 2021 on the day of August 10th, the same 124 individuals were transported from the Bronx Zoo to the Amphibian conservation laboratory in New Berlin, New York. The individuals would then be released into streams in the upper

Susquehanna river watershed on August 28th. Collaboration with Lycoming college and SUNY-ESF keeps this program going. This story disproves the notion that animals are kept in zoos for the sole purpose of our entertainment. Once more, some animals are off-exhibit animals and the eastern hellbender is one of those individuals who exist in the zoo for population sustainability purposes.

The New York Aquarium is the only WCS-accredited aquarium in the world and also has many conservation stories about its animals. However, animal conservation is not the only effort that zoos and aquariums focus on. Ecological conservation is another part of the deal as well. The Billion Oyster project collabs with many NYC communities and facilities, one of the most apparent contributors being the New York Aquarium since it heavily deals with restoring the Coney Island Creek. The goal of this project is to restore the quality of the New York harbors by planting oyster reefs along the many harbors. The project runs four oyster nurseries and the importance the oyster reefs have are that they offer storm protection for our shores via means of softening the impact of big waves, preventing the erosion of shorelines, and reducing flooding. Though this is a newer and more ongoing effort, it disproves a common notion that zoos and aquariums only have an interest in keeping animals in cages. Not only is the zoo reaching out to help solve a problem that isn't animal related, but also one that is helping the environment as well as the locals who inhabit the area.

The New York Seascape program is something that the New York Aquarium has even more of a presence in. The NY seascape is the marine environment that embodies the area of Montauk to Cape May, New Jersey, and is also referred to as the New York Bight. The seascape consists of many diverse ecological communities, a vast continental shelf, submarine canyons, and is home to many globally important marine species. The seascape is so important to conserve

as for many species, the New York Bight acts as migration routes, nurseries, spawning grounds, and also key commercial fishing for people/ ecosystem services for human wellbeing. The seascape has been threatened by unregulated fishing, shipwrecks, pollution, habitat loss, and climate change. To combat this, New York from the years 2012-2022 has been investing $7.5 million which helped enable WCS to get involved in the process. WCS via the New York Aquarium has helped secure habitat protection for a variety of sharks, rays, and other marine species like river herring, seals, horseshoe crabs, etc, and also ensures future projects don't have any long-term negative effects on the N.Y bight. Finally, the New York Aquarium's last responsibility is to educate the public on this matter which can be found both on its website, as well as educating in person. The duties of the aquarium do not just extend to the ambassador animals they have on exhibit, but to environmental factors outside of the facility as well.

All in all, proper zoos are facilities that are not in the zoological business because they can make a profit off of animals and people. Through the highlighted stories above, we see that proper zoos (not to be confused with those that are roadside attractions) are driven by the need for conservation of species in the wild. This includes breeding programs that have a focus on sustaining populations within zoological facilities, but also those that will release animals back into the wild. We also see proper zoological facilities participating in efforts that preserve wild places, as they too are essential for the maintenance of biodiversity on the planet. The conservation of wildlife and wild places is one of the higher purposes of zoos and aquariums, but a second one that also receives some criticism is education.

Ch4: Environmental Education within Zoos

Do you remember your first visit to a zoo or an aquarium? It probably went somewhere along the lines of you being awestruck by all the "pretty animals" and as a child telling your

family you want to go to a zoo in order to look at all the animals. The fact of the matter is, many people still take this experience at face value and conclude that zoos and aquariums are just places for people to look at animals. This however is overshadowing the higher purposes of zoos being the education of guests and educating them about the importance and conservation with the assistance of the magnificent ambassador animals within their facilities.

The first step of this comes from some of the acknowledgments the WAZA has made (which encompasses over 400 institutions). Alongside AZA, WAZA published a conservation strategy in the year 2005 that identified the main goal of all its institutions to be conservation. Further installments of the document would highlight the steps: Declare wildlife conservation as a higher purpose, pledge resources to that effort, and create a sense of culture within our staff and community on the importance of conservation. A big umbrella for this would be using animals to educate.

People have always liked to observe animals, and the modern zoo has always felt a sense of identity with the idea that they are an educational facility. In the 1950s, optimism about zoos as educational began to be replaced by a deeper understanding of animals and their needs. In the 1960s -80s, zoos faced heavy challenges with regard to public perception of animals in confinement and still often face it to this day. However, in the 1990s the massive loss of species, biodiversity, and habitats started to put more of a concern on endangered animals. As a result, zoos and aquariums were more clearly able to share and educate the masses on their mission purpose of preserving biodiversity.

Education is a much more important factor than many may think within proper zoological facilities of the world. Zoos in many other countries are required by law to have educational foundations in their facilities as well, showing its not solely an aza requirement here in the U.S.

A history of education in zoos: prior to the days of photography and film, zoos were mainly educational by existing since zoological facilities were the only place to see any kind of wild/exotic animal that was not in a painting. Once more from the book *An Introduction to Zoo Biology and Management* (Rees 2011, 313-342) Rees gives us a perspective on the different stages in zoo education. Starting in the pre-19th century mentality that animals are on display for public entertainment mainly. This mentality started to slowly change as curiosity and school curriculums became more integrated into zoos, it drove zoo education. By the beginning of the 21st century, zoo education reached a stage that is "holistic empowering" or in simpler terms, education becoming a core component of the existence of zoos.

Moving on to modern day, Rees claims that we can say we are in a more ethical-ecoliteracy stage. This is the case because we are constantly evolving and bettering their husbandry, welfare, and management tactics to improve the quality of life of their animals. Zoos are also starting to keep fewer and more rare species which also symbolizes a switch to a more conservation and education-driven focus.

How can we educate modern zoo guests? Zoos do face the issue of trying to educate their guests in a meaningful way. After all, the majority of guests do not go to a zoo to only read signs, or to sit in on a lecture. So far, the kind of learning that occurs within zoos and aquariums is cognitive learning (learning facts about the animals whether it be through a keeper or education department). Followed by affective learning which is changing the public focus to protect wild animals and the wild places they inhabit. Lastly, changing public behavior which is influencing the likelihood that visitors will donate and support organizations responsible for conservation and recycling efforts.

Zoos also incorporate learning aspects into their exhibits. Zoos understand that majority of people go to the zoo in order to be entertained but have shifted that focus to efforts in conservation and education. In order to accomplish that, zoos will structure animal habitats in a way that mimics the animal's native habitat. Focusing on exposing guests to environments they may have never seen before or even exposing guests to natural behaviors that they never knew existed. Interactive exhibits are also another form of education that zoos like to undergo. Rees lists three types of interactive exhibits that zoos will mainly focus on including in their exhibits.

The first type of exhibit is simple hands-on exhibits. These types of exhibits are aimed more so to a younger demographic but promote learning experiences by having people actually interact with certain animals which can draw closer connections between people and the animals and in turn spark a sense for conservation of species learned about. Common forms of this type of exhibit can be seen as children zoo feeding stations as well as touch pools in aquariums.

The second type of exhibit is participatory. Participatory exhibits as the name implies promote us participating in an activity that isnt necessarily with an animal. For example, assembling puzzles in the form of an animal skeleton or comparing human feats to those of what an animal can (for example; running speeds or jump distance).

The third kind of exhibit that zoos incorporate are interactive ones. These are in the form of interactive designs and features besides the enclosure. Having interactive games or touchscreen information panels beside the animal's enclosure to promote learning of the animal that is on exhibit. The most common types of exhibits that zoos nowadays tend to include in their facilities are zoo olympics (comparing human feats to animal feats), height charts and scales, as well as hinge boards with hidden answers.

Generally, what are the roles of the education department within zoological facilities? Of course the answer is dependent upon department size and budget but generally goes as follows: classroom sessions for schools, lectures for undergrad and post-grad students, public lectures, hands-on animal encounters, animal shows, context of exhibit signs, and information on a zoo's website. Animal rides and shows tend to receive some criticism in recent days.

Animal rides are not seen in proper zoos as they are deemed unethical and unacceptable by today's standards but used to be a form of guest interaction. Animal shows still have a presence in our zoos and aquariums of today, but have a greater education forefront. Many animal shows allow visitors to see an animal's natural behavior like a dolphin vocalizing or performing its bows (circular hops above the water's surface). Or an orca's ability to swim and jump out of the water at great speeds. Many zoological facility's most common type of show are their sea lion shows that portray their natural ability to swim jump and vocalize. While also showing off the natural anatomy of the animals in the show.

The next question that comes to mind is naturally if any studies have been done on the manner? Aza has investigated many of the educational efforts of zoological facilities and the studies performed by them show that there is a positive correlation and that zoos did raise awareness and guest connection to nature. Do keep in mind, the majority of visitors who are going to zoological facilities already tend to care about those ideals. In a sense, its reinforcing and building upon previously established perceptions in people. One thing that must be worked on however is the reality that the majority of these educational programs are geared towards children. As William Conway once stated, "Today's children will not be decision makers until billions more children have been born and much more wildlife has been lost".

The WCS parks once again are an amazing example of this and the New York Aquarium is not an exception to this. In the sea lion show in its aqua theatre, the behavioral husbandry staff put on a show for the guest in attendance where they take out one of their sea lion ambassador animals Bruiser, Osborn, Townsend, Marco, Erie, or Clark; and show off a lot of the behaviors they have taught them through the connections they made with the animal. Although a part of the appeal to the show is for entertainment purposes, the education factor is something that cannot be ignored and the aquarium in its show could not put it in better words "Just in case you're wondering yes, our jobs are as awesome as they seem. We are honored to work with all the magnificent animals you see here. We are also thrilled to share that connection with you. Here in the Aquatheater, Sea Cliffs, in Conservation Hall, Ocean Wonders Sharks, at Spineless, and now at the Playquarium. We work every day to bring our guests closer to the wonders in their own backyards. Because we believe that if someone can come to a zoo or an aquarium and meet amazing animals like (ambassador animals who performed the show), they too can be inspired to protect wildlife. At WCS we stand as a window to nature. We stand for wildlife, and we invite all of you to stand with us!" (NYC Aquarium winter 2021/22 show script). It is important to note that the animals that many may call display animals are actually ambassadors for wildlife conservation. The New York Aquarium strives to educate the public by as the show states, sharing the connection between the trainers and animals. The sea lions are never forced to do anything, in fact, they offer their behaviors. The amazing husbandry and the connection between the animal and trainer is one of the things the aquarium educates its guest. In fact, a lot of the foundations for training can be accredited to Karen Pryor's book *Don't Shoot the Dog* (Pryor 1982, 1-240) where many terms like positive reinforcement, clarifying what positive and

negative punishment is, and making sure what your asking of the animal is clear via the use of sd's, bridges, and the different types of reinforcement.

The New York Aquarium likes to educate its public with a display of these connections made with the various feed sessions around the park as well, but it also greatly educates its interns and volunteers as well. The internship and volunteer opportunities are offered at every WCS zoological facility and present those who receive them with an amazing learning opportunity on the inner workings of zoos and aquariums. These opportunities reveal information on how exactly animal husbandry is performed and maintained as well as educating the volunteer/internee about the higher purpose of conservation and education of guests on the manner. Speaking on a personal note, my time interning with the New York Aquarium has been nothing but education (See Appendix B: New York Aquarium Internship). WCS stresses the importance of its internships. Of course, as a gateway into the animal care field but also a learning point for the excellent work zoos perform. Within the behavioral husbandry department, I have learned the implementation process and importance of animal husbandry and animal training that is highlighted in the previously mentioned *Don't Shoot the Dog* (Pryor 1982, 1-240). The shows as well, as the training sessions are stimulating for the animals and can even act as a form of enrichment. I have learned that the animals choose to perform a behavior or not and their whole relationship is built off of trust, as well as the fact that zoos and aquariums act as a safe environment to witness an animal without impeding on its environment. This public awareness through these safe environments is the key to promoting worldwide conservation.

The Bronx Zoo is another excellent case of education within zoological facilities and I can say that I've taken part in many of them. The Bronx Zoo offers educational activities throughout the zoo as a part of its Discovery Guide program. This program offers many

educational interactions for all guests which covers many fields such as recycling and environmental awareness to the ones that focus on the zoo itself. Three popular activities involved guests spectating the bison (as referred to in the bison homecoming section) and drawing on a whiteboard the animals they spectated. This was then followed by the discovery guide volunteer explaining the story of the bison and the zoo's conservation work. The second activity involved guests spectating the sea lion pool and writing down the behaviors performed by the sea lions. Afterward, the discovery guide volunteers and leaders would see their results and talk about the sea lions. This activity shows the effort in the education of the animals as well as potentially inspiring conservation fieldwork for future generations. The third activity involved guest counting prop toads in a designated area and reporting back to the discovery guide their findings. Afterward, the discovery guide would use the activity as a segway into one of the conservation success stories talked about earlier the kihansi spray toads. The discovery guide education program is one of the simpler programs and yet its education efforts are very effective and cover efforts on and even beyond the importance of zoos.

The second education form that the Bronx Zoo takes is also in its internships. Interning with the behavioral husbandry department in the Bronx Zoo proved to be equally as educational as the New York Aquarium (See Appendix A: Bronx Zoo Internship). The position educates the importance of husbandry to the animals in its care to its interns, but on a grander scale compared to the aquarium. As the Bronx Zoo is one of the biggest urban zoos in the world, the position involved shadowing Melissa Nelson (the head behaviorist at the Bronx Zoo) and going through all the departments within the facility (mammalogy, ornithology, and herpetology departments) to witness the amazing training sessions performed with the animals. Memorable moments such as tiger weight scale training in an effort to confirm if the individual was pregnant, showcasing

their efforts in the species survival plan. Alongside enrichment-making, showcasing that animals are not simply just there to look at and need to be provided with an appropriate environment as well as proper mental stimulation. The internships within zoos serve as a way to educate those interested in zoological work that there is way more to zoos than just being a place to look at animals.

The third effort is the Bronx Zoo's show, *The Zoo*. The show has the Bronx Zoo taking a step in the right direction of zoo education and giving the public a behind-the-scenes look into its facility. This was a very uncomfortable step for the zoo as itself and many other zoological locations have been criticized and plagued by negative public perception for years. Thus, the creation of the show is a newer concept but an effective one. The Bronx Zoo's show highlights many of its conservation success stories and ambassador animals and is helping to highlight the higher purpose of zoos and aquariums from people's living rooms.

The fourth effort reaches out beyond the zoo and towards the youth within our universities. The Bronx Zoo being the flagship facility for WCS is partnering with our youth in order to advocate for environmental awareness and education which encompasses the importance of zoos. WCS has launched a brand new partnership this year with Fordham University called the Framing Our Future (FOF) Ambassador Program which I also have a part in (See Appendix E: Framing our Future Ambassador Program). The college is the first in this educational effort that has on-campus students recruit other students for both on and off-campus environmental advocation which encompasses zoo advocacy. For starting it's first year, the FOF program has already organized many environmental awareness events. Such examples include: inviting students to the Bronx Zoo's Run for the Wild event, getting students involved in the Billion Oyster Project, as well as many on-campus environmental awareness tabling events at the Rose

Hill and Lincoln Center campuses. Not only that, but it gives awareness to the importance of zoos and aquariums by exposing youth to the work opportunities within the zoo to help offset negative public perceptions of it. The FOF ambassador program again helps gets education out to the public through our youth itself, which is a huge milestone and innovative effort that is sure to help the perception of zoos and aquariums in the years to come. It is without question why all the WCS parks have an entire department dedicated to education.

Interviewing the head of the Youth Opportunities and Education department Emily Stoeth reinforced all the previously established efforts listed above (See Appendix D: Emily Stoeth Interview). Stoeth was very supportive of the Bronx Zoo's shows as she believes the show has increased transparency with their audience which had led to many opportunities where the guests had learned something new about the animals as well as zoo practices. Stoeth recalled seeing many Facebook and other social media comments as well as various guest interactions within the park saying "I had no idea" or "This is available" after seeing only small snippets of the zoo's procedures.

After asking Stoeth if there were any other efforts that she would like to be done, she reinforced the idea that continuing to build stronger connections with local colleges and universities much like the student ambassador program I myself was a part of and Project TRUE. She definitely would like to see more connections being made as both of those programs are exclusive to the local Fordham University.

As a bonus notion, The Bronx Zoo and New York Aquarium also perform their own studies to see how efficient/ effective their education initiatives are. The two facilities have performed many studies on themselves but two highlighted ones come from the zoo's Animal Encounter program and the aquarium's Ocean Wonders Sharks exhibit.

The New York Aquarium opened its Ocean Wonders Sharks Exhibit in 2018 and conducted research questions to the visitors of the exhibit. The major findings were that the exhibit was a memorable experience. Many guests answered that they were captivated by the immersive and fascinating design. This was backed by the observation of guests lingering by large multi-organism exhibits and interactive activities. An even better outcome that came from the study was that since the exhibit is a multi-organism tank, it changed many people's public perception of sharks showing a breakthrough in its education effort.

At the Bronx Zoo and its Animal Encounter program, 20 ambassador animal programs were observed. The animal program involves bringing an animal who is trained in interacting with the Bronx Zoo visitors. Important findings in this study showed that many participants asked many questions about the animal presented and continued to ask around the same amount of questions no matter what animal was brought out next. This finding showed that guests were intrigued and engaged with an animal regardless of the ambassador animal's perceived exoticness (example: Bronx Zoo would use porcupines and marmots compared to the generally perceived more exotic sloth or cheetah ambassador). Ultimately, the ambassador animals made guests feel more connected to encourage more conservation efforts.

I would like to end the chapter highlighting a point in the book *The social value of zoos and aquariums* "It remains to be seen whether learning experiences in zoos can and do connect visitors as change-makers" (Fraser and Switzer 2021, 63-83). Many people find it hard to believe that zoos have produced change-makers as their negative perceptions tend to sideline the educational experiences that they often produce. It has been seen; through my experiences, the current efforts from the Bronx Zoo and New York Aquarium, as well as the outside efforts of

WCS with the likes of FOF. The education experiences in zoos are definitely having an effect on people, inspiring them to advocate for and protect wildlife and wild places.

Ch5: Changing the Public Face

Understanding that the negative perception of zoos and aquariums nullifies the importance of their higher purpose of conservation and education is a great start towards remedying it. So how can zoos and aquariums change public perception in order to highlight their importance? Developing a suitable and modern conservation agenda that is readily available to the public is one of the first steps zoos and aquariums can take to achieve the mentioned goal. What this means is for a zoo to create a program that has an educational basis that is readily available to the public that helps them create a connection towards nature. It is essential for every zoo and aquarium to understand and explain what experiences are necessary to ensure people develop an emotional concern for nature and encourage engagement in conservation within publicly available agendas.

Conservation Agenda Through Education. This still proves as a challenge as many people are plagued by zoo controversies and will not accept conservation as a valid enough reason for a zoo's existence. According to *The Social Value of Zoos* (Fraser and Switzer 2021, 63-83), studies in the 20th century only concluded zoos as a place for middle-class individuals to enjoy. Many of the cases in the past have zoos only acknowledging conservation as their only stated goal, we must not forget that education is one of the forefronts of zoos and aquariums and should be highlighted as one of their purposes. The push for promoting conservation through more aggressive educational approaches has started to make way in more prestigious/AZA-accredited zoos. That being said, other zoos that are not AZAcertified must promote conservation through education as well. This is important as education about wildlife and wild places is a key factor

that was heavily discussed in this paper as to what makes a proper zoo. Requiring education as a focus for all zoos nationwide is a way to help non-accredited zoos step up to the plate and be classified as something more than roadside attractions.

Thats not to say the education agenda cant be improved upon in accredited zoos either. Previously talked about in chapter 4, WCS is another excellent example of this education agenda through its collaboration with Fordham University and its CCEL department. Together with Fordham, WCS via the Bronx Zoo is helping to recruit student ambassadors who will promote environmental awareness that includes zoos but also extends beyond their facility as well. The collaboration has the youth at the college creating environmental events and educating the masses themselves which is something that many other zoos and aquariums can take into consideration. To create a conservation education agenda, why not go to the places where education is being performed? More zoological facilities must improve upon providing affordable education means and collaborate more with other universities or other organizations that are open to educating the youth that will carry the message to the next generation.

Facility Exposure. The next change is a more current one that has been seen with cases like the Bronx Zoo in collaboration with the other WCS parks and facilities it works with. This is achieving perception change by increasing exposure of zoo practices. Referenced in chapter 4, the Bronx Zoo's show *Animal Planets: The Zoo* is a step in the right direction as they even state in the show that the general public would not get the access you're about to get by watching the show. This is a huge educational opportunity that reveals to us zoo practices and can help disprove negative perceptions by showing off the quality of animal welfare given as well as the show being a vessel for education and education for conservation. This exposure doesn't have to be done through a tv show as that will prove to be impractical for every zoo to do, it can be done

through their website and social media as well. In this day and age where everyone has access to social media platforms, this is a great way to expose your facilities. However, simply posting the ambassador animals and cool events you may have going on is simply not enough. Providing statements and insider views on your facility similar to how the Bronx Zoo's tv show went about things is crucial to not being plagued by negative viewpoints.

Employee Exposure: After addressing the exposure of procedures and behind-the-scenes protocols of zoological facilities, addressing the employees who work there can prove to be a similar yet effective tactic. During my time interning at the New York Aquarium (See Appendix B: New York Aquarium Internship), I was given two shadow days, meaning I am allowed to act as an intern for two other departments within the New York Aquarium. Shadowing the shark department, I was given the opportunity to talk with Hans Walter (Currently 62 years of age) who revealed to me his amazing story/journey within the marine biology field and WCS. The story followed his transition from being the lead singer of the rock and roll band ZToyz to his current supervisor position within the shark department. Before his start date at the New York Aquarium, the shark department would name their animals along the likes of sharks 1 2 and 3. But when he got there, he would start to give them all rockstar names which is what the aquarium uses now to identify its individuals. Another story that comes to mind from my internship at the Bronx (See Appendix A: Bronx Zoo Internship). This story was told to me by Diane who was a former \ zookeeper who now works at the administration building at the Bronx Zoo. Diane's story also proved to be equally as insightful, she was a former keeper at the Bronx who worked there before the implementation of the behavioral husbandry protocols that are now seen today. She explained to me how before this implementation, performing medical procedures on the animals would prove to be stressful on the keeper and animal as she equated it to a

"wrangling" experience at times. However, she noticed how much better the scenario got with the hiring of the head behaviorist at the Bronx Zoo Melissa Nelson Slater as she helped implement positive reinforcement training and behavioral husbandry tactics. Utilizing stories the likes of Diane and Hans Walter, especially more from the likes of those who worked with the facilities for many years can speak on how zoos and aquariums have changed for the better throughout the years.

Redefining Entertainment. Another way zoos and aquariums need to go about changing their public perception is by redefining the view on entertainment. We have to understand that there was and always will be an entertainment factor when it comes to zoos and aquariums, but the negative stereotype that zoos are here just for our entertainment can be combatted by redefining that word. Best described and explained within *The Social Value of Zoo's* (Fraser and Switzer 2021, 63-83), entertainment is often accredited with fun, but who says that fun has to be the opposite of education? Sociologists distinguish pleasure and enjoyment as personal positive feelings and fun as collective satisfaction (which is why some people don't associate it with learning). Happiness is tied to fun leisure experiences which people classify zoos with. However, as talked about within the education chapter, an excellent example that combines entertainment and learning is the sea lion shows at the New York Aquarium. This is an amazing showoff of the connection between trainer and animal as well as a showcase of some husbandry behaviors. The show also reminds you of the goals of the facility and which is to help educate and inspire those to protect wildlife and wild places.

Expansion of Program Initiatives: Once more speaking on my interview with Emily Stoeth who is the head of the education and youth opportunities department at the Bronx Zoo, I have learned of many more efforts that the WCS zoos and aquariums participate in. As

referenced in chapter 4, I asked Stoeth (See Appendix D: Emily Stoeth Interview) if there are any other efforts that she would like to see the Bronx Zoo and other WCS parks perform? She stated that she wanted to see the continued build-up of stronger connections between zoos and the local community, especially with our local universities. Stoeth then brought up two efforts that the Bronx Zoo connects participates in. Stoeth brought up the CUNY cultural core and CUNY Service Core. Students attending undergrad in any one of the City Universities of New York can apply for the program. The program involves students expressing interest in whatever areas of work calls to them. Through this process, those that express an interest in seeing how a zoo works are paired with one of the WCS parks in the city. The importance of this program was expanded upon when I asked the follow-up question "If there were any highlighted stories from people who interned with the organization"? Stoeth answered that the vast majority of people who intern already tend to have a great perception of zoos, but the previously mentioned CUNY Cultural Core is where she sees the most amount of "I had no idea" moments. This partnership goes to show that reaching out to programs in turn reaches out to people who are not directly passionate about zoos as working environments or facilities. This offers more of the exposure that zoos need in order to directly combat the negative stereotypes that plague them as the high amount of "I had no ideas" come from those who are outsiders.

Incorporating more research initiatives: Another project that Stoeth highlighted was project TRUE. Project TRUE is yet another collaboration between the Bronx Zoo and Fordham University that pairs select undergrads from the university to high school students in the city. The paired groups will then perform field research right on the grounds of the Bronx Zoo and perform a public presentation of their findings to wrap up the program. This is a crucial strategy/ program that the Bronx Zoo takes part in as it utilizes the surrounding land of the facility to give

youth learning and working experience with field research. This effectively shows that zoos can have field research as another reason for their existence.

Another example of field research going on within zoos is with Project Dragonfly via Miami University. This is a fully funded program that helps people interested in getting a Masters degree in a zoological-related field. The program is online-based but has its students working with the Bronx Zoo to perform field research within their facility instead of having to travel to a foreign country. The program helps elevate youth opportunities and helps zoos act as a place to develop future wildlife researchers. While as a bonus, the research performed may also bring to life new data and details never before established. Advertising zoos as places for research is going to be an essential part towards the future of zoos as it will bring us closer to Frederick Cuvier's original hope for zoos to become the equivalent of what a lab is to a chemist. The WCS parks of NYC have acted as excellent models for what other zoos must do in order to more effectively combat negative stereotypes affecting zoos.

Higher Purpose Act: A solid portion of this paper drew a line between what a proper zoo is and isn't, with a huge factor in that being AZA-accredited facilities. In reality, it is not possible for every zoo to become AZA certified, but how can those zoos catch up to those that are certified? A government policy that must take place should be a higher-purpose act. This is very similar to what AZA has mandated all of its members to follow with its species survival plan. A big draw to what makes a zoological facility ethical is if it contributes to the higher purposes of education and conservation of our planet's biodiversity. In correlation with our world's data for currently endangered species in the wild, all zoos must not take any animals from the wild (rescue scenarios are the exception) and switch to a higher purpose mentality by breeding with the intention of the continuation of the species. Again, mirroring what AZA does, these species

can then be transferred to and from other facilities without ethical concerns for their intentions and released back into the wild.

Animal Welfare Act Improvements(Captive Animals). If laws are to be placed that force all zoos and aquariums to switch to a higher-purpose mentality, it will definitely help move all zoos towards a golden age of zoo revolution. However, those laws must be paired with an improved version of the Animal Welfare Act. With regards to captive animals in zoos, the law only protects "warm-blooded" animals who are either, bred for sale, commercially transported, used in research, or publicly on exhibits. Some examples of protected animals under this act are elephants, marine mammals, and non-human primates while excluding many other animals that you may find in a zoo like rats, birds, reptiles, and fish.

Animal Welfare Act Improvements(Animal Welfare). The Animal Welfare Act also only provides us with a very low bar/ standards for animal care within zoos. The law only states that adequate housing, sanitation, nutrition, water, vet care, and animals must be protected from extreme weather. An easy way to fix this issue is to update this laws section on its animals for public display portion and make it more aligned with the standards that AZA has put forward and requires all of its members to enact. AZA is constantly updating and raising the bar on its sanitation and welfare standards with reference to the USDA and other appropriate U.S government organizations. Doing this will shift many of the negative public perceptions of zoos that are commonly referred to as "roadside attractions" like the infamous Tiger King Park which exposed what poor laws and regulations can do for a zoological facility.

Animal Welfare Act Improvements(Enrichment). The Animal Welfare Act does not currently speak on enrichment being a mandatory requirement. Proper zoos and animal rights activists may not have agreed on every point about zoo management, but what they both agree

on is the fact that all animals are entitled to enrichment. Enrichment is key to an animal's welfare as it gives animals an outlet for physical and mental stimulation as well as giving the animal the option of how they want to spend their day. Once more, using AZA as a guideline for the rest of the zoos in the world, daily enrichment must be made mandated for all animals in exhibits to maintain mental homeostasis of all animals in their collection. The enrichment must also be cycled through the categories: sensory, physical, cognitive, food, etc, in order to maintain the novelty of the enrichment at hand. To be clear, enrichment is more than just placing a toy in an animal exhibit. With the baseline for a new law given here, it is for the betterment of all zoos and aquariums to fight off the negative stereotype that zoos are unethical/ the animals suffer.

Introducing Research as a Higher Purpose. One last thing that zoos and aquariums need to get out to the public is that moated and barless exhibits are used today. They act as an excellent educational tool that promote people to bring their own cameras and support people's own field research. Remember, previously mentioned Frederick Cuvier stated his belief that zoos can become the research equivalent for zoologists as a laboratory is to a chemist. People today bring their own cameras and recording equipment to zoos to capture the amazing ambassador animal's behaviors or conduct their own research for school or one's own interest. The Bronx Zoo advertises this research opportunity already, but only to its employees as a means of getting their master's degree with the project Dragonfly program associated with Miami University. However, that isn't enough and every other zoo facility should take this naturally occurring process happening in their facilities and make it apparent to the public that this is yet another purpose for the existence of zoological facilities. Bringing Frederick Cuvier’s vision and making it apparent to the public is yet another key to shifting the public perception of zoos and aquariums.

A Place for the Critics: During an addtional interview performed, this time with Melissa Nelson-Slater who is the head of the behavioral husbandry department at the Bronx Zoo (See Appendix C: Melissa Nelson-Slater Interview). The question was brought up on how she believed zoos and aquariums can combat the negative stereotypes about them. The answer that was given to me stood out to me as she is one of the highest up in the zoo. Nelson-Slater responded saying that we need to incorporate animal critics into our zoological facilities as they are what constantly help keep zoos evolving.

This statement is especially true as there are few laws that actually regulate zoo practices and the critics who often see and reflect on zoo practices are what get the facilities to change their way of operation. An example in the past was the sterile cages previously discussed in chapter 1, which caused a huge uproar from animal rights activists (rightfully so) as the cages did not provide adequate welfare conditions. Nelson-Slater brings up towards the end of my interview with her, is the challenge of trying to have a conversation with a group of people who are not interested in having a conversation with yourself. In hindsight, she believes something radical needs to happen between the zoological facilities and animal rights activists. Something along the lines of a press conference between zoo officials and PETA was spitballed.

Although as Nelseon-Slater states “It could easily turn into a shouting contest”, something radical such as an annual meeting must be put in place between zoos and animal rights officials in order to address issues and concerns from both parties and meet in the middle.

The good news is that public perception is slowly changing as of the 21 century. WCS higher-ups have conducted research (sample research mentioned at the end of chapter 4) and found that many people are slowly starting to believe that zoos are a great place for education, offer good animal care, and are wonderful places for conservation. However, it has not totally

shifted in the right direction. Once more, we need not shy away from the negative perception that many offer about zoological facilities as that is what constantly pushes zoos to continue to evolve. Through the exposure of revealing the inner working of every zoo, not only to the public but also to other facilities. We create an environment for healthy criticism that will only improve not just the perception of zoos. But the welfare of the ambassador animals as well as preserving the higher purposes of zoos and aquariums being conservation and education. Zoos and aquariums are places that are constantly evolving and bettering themselves. Whether that will be through AZA affiliation or not is up to the facility's choice, but through these policies and the continuance and expansion of some of the WCS park's efforts to other zoos, can we see the negative stereotypes of zoos and aquariums diminish even more than we have accomplished.

Appendix

Appendix A

Bronx Zoo Internship

This internship was conducted over summer 2022 and was supervised by the head behaviorist Melissa Nelson at the Bronx Zoo facility. The internship introduced the principle of behavioral husbandry to the zookeeping field and proves to be an influential take on providing animal care and upholding animal welfare through the process of training many behaviors.

The internship had many highlights as some of the main duties were fish preparation for the sea lion ambassador animals on exhibit. Crafting enrichment items to provide mental stimulation for the animals on and off exhibit. As well as spectating the countless training sessions among the different departments in the park.

Appendix B

New York Aquarium Internship

This internship was conducted from August 2022 to January 2023 and was supervised by the marine mammal trainer Stephanie Graehling. This internship introduced even more behavioral husbandry skills to the internee and provided a focus on having the intern learn many training skills within the field.

The internship consisted of fish prep for all the sea lions and seals within the behavioral husbandry department and spectating the husbandry and training protocols that are done between the trainers and the ambassador animals. The internship also has a huge emphasis on the sea lion

shows which gives the intern the responsibility of narrating the sea lion show but also learning the impotence of education through the shows.

Appendix C

Melissa Nelson-Slater Interview

This interview was conducted on November 23rd, 2022 and involved many insightful questions and responses from the mind of Melissa Nelson-Slater. Nelson-Slater is the head and only member of the behavioral husbandry department at the Bronx Zoo, as with someone of such high prestige at the Bronx Zoo, her input proved to be very influential on the outcome of some recommended policies.

The interview had many highlighted portions of it, from some revelations that the head behvaiorist did not initially see herself working at a zoological facility to proposing conversation with those that are critical of zoos. The highlight of this interview was the shocking answer that Nelson-Slater believes that zoo critics have a place in our zoos and aquariums as they constantly keep zoos evolving and bettering their practices.

Appendix D

Emily Stoeth Interview

This interview was conducted on February 25th, 2023 and involved many insightful questions and responses from Emily Stoeth. Stoeth is the head of the education and youth opportunities department at the Bronx Zoo, her input yields much importance as her experiences within education helped shaped my chapter dedicated to it.

The interview had many highlighted portions of it, from information about project TRUE and Dragonfly to useful information on how other interns and youth have viewed their time with WCS. The highlight of this interview was the useful information about project TRUE and

Dragonfly, as well as the revelation of the existence of the CUNY Cultural Core and CUNY Service Core.

Appendix E

Framing Our Future Ambassador Program

This was a brand new initiative first brought to my attention during my internship at the Bronx Zoo. The Framing Our Future program started its first run ever during the 22-23 school year at Fordham University. The program enlisted recommended ambassadors to perform environmental awareness projects with guidance from a current Master's student Reece Brosco.

The program had many highlights as bi-weekly meetings were in place for the ambassadors to discuss alongside Reese Brosco future environmental initiatives that students can take part in on and off campus. The program also featured inviting other students to take on the role of ambassador

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