Institutional Identity and Conservation Momentum:

A Study of the Phoenix Zoo

by

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ABSTRACT

Over the past two decades there has been much discussion surrounding the potential of zoos as conservation institutions. Although zoos have clearly intensified their rhetorical and programmatic commitment to conservation (both ex situ and in situ), many critics remain skeptical of these efforts. This study was comprised of two parts: 1) an investigation of the general relationship between U.S. zoological institutions and the conservation agenda, and 2) a more specific single case study of conservation engagement and institutional identity at the Phoenix Zoo. Methods included extensive literature review, expert interviews with scholars and zoo professionals, site visits to the Phoenix Zoo, and archival research. I found that the Phoenix Zoo is in the process of consciously creating a conservation-centered institutional identity by implementing and publicizing various conservation initiatives. Despite criticism of the embrace of conservation by zoos today, these institutions will be increasingly important agents of biodiversity protection and conservation education in this century.

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Introduction

Over the past two decades there has been much discussion surrounding the relationship between zoological institutions and the broader conservation movement. Although zoos are increasingly positioning themselves as primary agents of conservation in society, this move continues to elicit skepticism. For example, many critics of zoo conservation claims assert that, for zoos, conservation is and will always be a secondary mission simply due to the wishes of the visitors they serve (Hyson, 2004). Others counter that zoos not only play a role in conservation but also are essential to the cause, given the housing and breeding of endangered species that occurs only in zoos (Tudge, 2003). This response draws criticism as well, with others claiming that zoo breeding programs target only those animals that are engaging to visitors, while ignoring less charismatic but highly endangered species (Hancocks, 2001). Zoos, in turn, argue that their value lies not just in preservation of individual species, but also in their power to connect the general public to nature. This argument emphasizes that if zoos can connect visitors more closely to the natural world, they will be more likely to be proactive, both in personal conservation initiatives and in support of global conservation organizations (Bruni, Fraser & Schultz, 2008).

Institutionally, however, zoos tend to be as diverse as the animal collections they display. Indeed, it would be remiss to claim that all zoos are enacting strong conservation programs, just as it would be wrong to say that none possibly could. The present study therefore attempts to carve out a middle path in this debate over zoo conservation and its significance within the broader mission of zoological parks. Key to this analysis, I argue,

is a discussion of institutional identity; the evaluation of whether or not a zoo is attempting to portray itself as a conservation organization.

I will discuss the formation of conservation identity among US zoological institutions by using the Phoenix Zoo as a case study and perhaps a model. It's an institution that has been recognized locally and globally for its conservation programs and initiatives, so it provides a good illustration of the dynamics of conservation identity formation within zoological parks. This case study will serve as a template to understand the more general relationship between zoos and conservation and to consider the development of conservation identity among zoos in the United States.

Below, I'll discuss the historical development of zoos, the emergence of conservation, and the relationship between the two. This discussion serves to contextualize my research and provide a basis for development of a distinct methodology meant to address my research questions. Results will be presented in two parts; the first will be a broad discussion of the general relationship between US zoological institutions and conservation, and the second will be an in depth discourse on conservation engagement at the Phoenix Zoo. Finally, the discussion section will explore conservation identity formation at the Phoenix Zoo, the concept of conservation momentum, and where the Phoenix Zoo fits into a critical discussion about zoo conservation involvement.

Background and Context

Significant Developments in the History of Zoological Institutions

The Egyptian and Chinese empires were the first civilizations to keep collections of wild animals in captivity, although evidence of domestication of wild animals for use as livestock can be found in some of the earliest written histories. The compositions of these collections were very different from the zoological parks of today, as was their purpose. The animals housed by the Egyptians and the Chinese were used mainly as tools of warfare, for intimidation and annihilation of their enemies. Later, Italian Serraglios housed wild animals not for fighting on the battlefield, but for entertainment (Baratay and Hardouin-Fugier, 2004). The animals were often hard and expensive to obtain and maintain, and owning them was a sign of wealth and power. Staged fights to the death (done for the pleasure of guests) were considered one of the highest forms of flattery (Hancocks, 2003).

By the late 17th century the widespread spectacle of fighting animals had fallen out of favor with the general public and with the upper class, leading to a new era in which there was a shift in the perception of wild animals from harbingers of violent entertainment to objects of scientific curiosity. This transition marked a significant change in the ways the animals were kept and used, and in the late 1600s, the first menagerie was built by King Louis XIV to peacefully display his magnificent beasts. King Louis XIV would invite guests to view his collection but also allowed scientists to study the animals in captivity. In many cases, animals would be donated to nearby

universities after the animal died (Hancocks, 2003). Zoological parks in the late 17th and early 18th centuries were privately owned by the elite, who no longer utilized their animals for displays of violence, and allowed for new and interesting scientific discoveries to be made about the inhabitants.

During the late 19th century, the zoological community experienced another significant transformation, the results of which have shaped most, if not all, zoos that exist today (Baratay and Hardouin-Fugier, 2004). This shift began when Carl Hagenbeck, the foremost name in animal trading at the time, opened the Hagenbeck Tierpark in Hamburg, Germany in 1874. Hagenbeck's Tierpark exhibit designs were instantly recognized as an innovative new way to display animals in collections; his designs focused on putting the animals back into a context in which you would find them in the wild. For example, Hagenbeck's tigers looked as if they were roaming through a small piece of the rainforest located in the midst of a bustling European city. To achieve this look, Hagenbeck removed the fences and bars between animals and the visitors who came to see them, implementing a series of moats and pits to separate animals from humans without impeding the view. The diffusion and adoption of the Hagenbeck style of exhibits was pervasive throughout the globe, and his legacy is evident in most modern zoological institutions (Rothfels, 2002). Zoo historians have argued that this was one of the most momentous developments in the paradigm of the zoological institution; the framing of animals within the context of their natural habitat and the display of animals as educational ambassadors (Baratay and Hardouin-Fugier, 2004; Hancocks, 2003; Rothfels, 2002).

Zoos' evolution from being places of entertainment to conservation organizations perhaps marks an equally significant transformation in the history of these institutions. The deliberate adoption of a more conservation-centered focus in many zoological parks around the world is reflected in both the professional and academic literature.

The shift to a more conservation-centered mission is especially apparent in the public relations and marketing materials prepared by zoological parks in the United States. For example, the National Science Foundation (NSF), in partnership with the Association of Zoos and Aquariums (AZA), funded a study in 2007 to determine if AZA institutions are successfully promoting conservation aims. They found that not only did visitors "experience a stronger connection to nature as a result of their visit," (Falk, 2007, p. 3) but also, notably, visitors "believe zoos and aquariums play an important role in conservation education and animal care"(Falk, 2007, p.3). Jim Maddy, President and CEO of the AZA responded to this study claiming that, "These findings enhance our goal to build America's largest wildlife conservation movement" (Falk, 2007,p. 4). The NSF study and other similar investigations focused on the perceptions, beliefs and value systems of the zoo visitor, and examined how informal education efforts impacted visitor knowledge about animals and conservation. Many studies have also focused on creating an understanding of how zoo and aquarium visitors understand ecological and conservation concepts, and the interest level visitors have in the role of zoological institutions as conservation hubs (Ballantyne &Packer, 2001; Balmford, 2007; Falk et al., 2007; Milstein, 2009; Moss & Esson, 2013; Rabb & Saunders, 2005). Likewise, when it comes to the role zoological institutions should be playing in conservation biology, there is a broad array of literature filled with recommendations for enhancing conservation

involvement through initiatives and financial support (WAZA, 2005; Fabregas, Guillen-Salazar, & Garces-Narro, 2011; Kitchener, 1997; Mazur; Miller et al, 2004; Rabb & Saunders, 2005; Smith, Shaw, Bettinger, Caniglia & Carter, 2007).

It is difficult to pinpoint a singular cause for zoos' current emphasis on conservation, but a historical socio-cultural examination of relevant events in the development of zoos' conservation ambitions in recent decades helps shed light on some of the motivations driving this agenda. Much like the species and habitats zoos claim they are intent upon preserving, zoos' understanding and interpretation of what constitutes a conservation initiative is ever changing. These changes have historically been driven by a variety of forces, including social and cultural changes around zoological institutions, responses of the general public and scientific community to the emerging idea of extinction, widespread habitat loss and the accelerating decline of global biodiversity and, more recently, the unknown, yet possibly catastrophic effects of global climate change for the planet's biota.

Early Conservation Movement

To contextualize and understand the present day relationship between conservation, conservation biology, and zoos in the United States, one needs to understand the history and emergence of the US conservation movement. The idea of conservation, as defined by the Oxford English dictionary as the 'actions of preservation, protection, or restoration of the natural environment, natural ecosystems, vegetation, and wildlife,' is predicated on the idea that a species, plant, or animal, can go extinct. Because

of this, and the significance of the goal of arresting species extinction for zoos operating as agents of conservation, it is important to discuss the discovery and acceptance of the concept of extinction in North America.

In the late 1700s, naturalists first began to document the disappearance of species that were previously abundant (Barrow, 2009). During this time, many in the scientific community discounted these disappearances, believing that if a species was no longer found in one area, it had simply moved to another region. Accompanying this was the widespread belief that nature was perfect and unchanging, created, as it were, by a celestial gardener. Naturalists, such as Frank Egerton and John Ray, insisted that the balance of nature was not only stagnant and unchanging, but was designed and maintained by God himself (Barrow, 2009). This was a period in which scientific minds of the time took great care to reconcile their findings with their theological stance. Carl Linnaeus, for example, father of biological classification and one of the first great naturalists introduced the theory of the chain of nature and attributed this to the wisdom of a creator. He concluded that God created nature for humankind, creating a delicate balance, and any disappearance of a species would unthinkably upset the natural balance (Barrow, 2009). Scientists and the general public alike were relatively unwilling to accept that species could disappear forever.

The first scientific discoveries of fossils in the late 17th century initially caused scientists to attribute the findings to biblical monsters that existed before the time of the biblical flood (Barrow, 2009). As time passed, however, many naturalists became interested in the similarities between fossils and living creatures. This, coupled with the growing interest in the sheer number of fossils in the fossil record, began to give credence

to the idea that there had been many species in existence at one time that were not currently alive. Georges Cuvier, a French zoologist, was particularly interested in the fossil record, examining fossils and describing many extinct species. His discoveries were an awakening within the community, illustrating that many of these creatures had lived and gone in a series of successive time steps.

By the early 1800s, the concept of extinction was difficult to ignore, even more so to disprove. Nearly as unthinkable was the fact that humans could play a role in the disappearance of myriad species. As evidence of anthropogenic environmental destruction began to accumulate in the mid- to late 1800s, extinction became an accepted and lamented reality. Rapid growth of civilization in North America caused the visible decline and destruction of a number of species prompting naturalists to produce the first outcries against extinction, eschewing their historical stance of passive observation (Barrow, 2009).

In addition to the decline of species, the emergence in the late 19th century of a new field of study, ecology, eventually gave rise to the ecosystem concept. It was an important development in the history of science and, eventually, conservation; a formulation that importantly emphasized the interconnectedness of all species and their environments. By the late 20th century, ecologists would emphasize the importance of biodiversity to the health of ecosystems. Ecologists and naturalists were not alone, however, in their appreciation for biodiversity; earlier in the 19th century the American transcendentalist movement embraced and disseminated ideas of harmony with nature, importance of species, and the delicate balance of nature to the general public through writings such as Henry David Thoreau's *Walden* (1854). Around that same time, key

elements of the intellectual foundations and practice of the American conservation movement were put in place with the publication of George Perkins Marsh's *Man and Nature* (1864), which emphasized the dependence of human wellbeing on the intelligent and careful management of the landscape.

The American public and policy makers eventually responded; President Theodore Roosevelt established the first federal wildlife refuge, Pelican Island, in 1903. This began a legacy of a presidency, and a nation, focused on the environmental wellbeing of the United States through a variety of means, from the creation of scores of national parks and forests beginning in the 1890s, to the increasingly stringent protection of wilderness and threatened wildlife and plant species in the second half of the 20th century.

In hindsight, the early 1900s ushered in a general awareness of the relationship between humans and the environment, and witnessed the growth of a national conservation movement. The publication of William Temple Hornady's *Our Vanishing Wildlife* (1913), passage of the Migratory Bird Act that same year, and the creation of a National Park Service a few years later (in 1916) to coordinate and manage the growing park system all indicate the beginning of the modern movement to safeguard species and landscapes for a variety of aesthetic, economic, and scientific purposes. During this time, Gifford Pinchot, a forester and early conservationist, coined the term 'conservation' to describe the view that the environment must be managed to ensure adequate supplies of natural resources for present and future generations (Pinchot, 1910). This is the first of

many iterations of the term conservation, and Pinchot's purpose for creation of the term was to call for careful management of North American forests to ensure that such natural resources would be economically viable and democratically managed for the country in the long term.

In 1933, President Franklin D. Roosevelt created the Civilian Conservation Corps (CCC) with that very purpose in mind. The CCC provided needed jobs for young workers during the Depression, and the young men were set to work building state parks with trails and campgrounds, planting trees, fortifying stream banks against erosion, and fighting forest fires and floods (Halbert, 2014). These initiatives fell directly under the scope of conservation at the time, as they were meant to protect and prepare US forests to meet the present and future needs of the American public.

By the mid 1900s, the US Government, along with the help of organizations such as the CCC, had created a series of protected areas across the country. But the end of the Depression resulted in quick economic growth. Many of the environmental successes of the earliest environmental initiatives were overshadowed by new challenges. The mid- and late 20th century marked the beginnings of what is now considered the modern environmental movement. Scientists and the general public were becoming more aware of not only the environmental degradation being caused by industrialization, but also the dangers to plant, animal, and human life. The publication of the first endangered species list in 1967, which included the Bald Eagle, our national symbol, doubtless played a role in elevating the awareness of environmental devastation in the general public. Deaths from smog 'episodes' in New York city in 1953, as well as the Cuyahoga River fires in Ohio caused by industrial pollution, the realizations about the wildlife and human health

risks of DDT and other pesticides set forth in Rachel Carson's *Silent Spring* (1962), the Three Mile Island affair in 1979, the Exxon Valdez oil spill in 1985, and the scientific and political discussion of global warming that escalated beginning in the late 1980s were all red flags that the earth and its inhabitants were facing a new and daunting environmental crisis (Gottlieb 2005).

Around this same time (i.e., the mid-1980s), a new scientific discipline began to organize in response to this growing set of ecological challenges. The new discipline, "conservation biology," was interdisciplinary and proposed to scientifically study and shore up the causes of rapid biodiversity loss and environmental degradation. It brought with it, however, a shift in the goals and interpretation of the idea of conservation itself. Whereas Pinchot previously intended conservation as an argument for the efficient management of natural resources for human benefit, a more ecological and multi-dimensional interpretation of preservation of biodiversity was adopted, including the idea that species and ecosystems were valuable for their own sakes (Meine, 2010).

David Ehrenfeld, one of the founders of the new conservation biology, claimed that in the 1980s, biologists were, "beginning to forge a discipline in that turbulent and vital area where biology meets the social sciences and humanities" (Meine, 2010 pg 12). As part of its status as a "mission-driven science," conservation biology is a discipline that is closely connected to the broader modern conservation movement; that is, the political, environmental, and social imperative to protect the environment, including plant

and animal species. The focus of conservation biology (and the wider conservation movement) was therefore on taking action to preserve threatened plants and animals, a focus that caused both scientists and the general public alike to turn their attention to zoological parks and the role they could play in preservation of species.

U.S. Zoological Institutions and Conservation

Like the national forests and national parks, many zoological institutions also claimed a relationship to conservation from their own earliest developments in the United States. The first North American zoo, established in Philadelphia in 1874, opened with three goals: "public recreation, wildlife preservation, and scientific and conservation education" (Stott 1981). A number of other zoos followed suit and, in 1897, the New York Zoological Society's (NYZS) annual report claimed that, "no civilized nation should allow its wild animals to be exterminated without at least making an attempt to preserve living representatives of all species that can be kept alive in confinement" (Stott, 1981 pg.52). The NYZS specifically called for zoos to take a leadership role in the conservation of native species. The conservation efforts of these zoos were primarily focused on assurance populations that could be kept and maintained in captivity even after all other individuals of a given species were gone from the wild. In these early cases, however, breeding for reintroduction to the wild was a secondary mission to that of the larger goal of preservation of the species in zoological institutions.

An example of an early initiative to preserve a population of native wildlife was the case of the American Bison. In the early 20th century, William Temple Hornaday, a

unique character in the annals of conservation who counted taxidermy, zoology, and conservation among his many interests, spearheaded the preservation of this disappearing icon of the American West. A bison calf, captured during a trip out west, became the inspiration for the creation of the National Zoo, an institution meant to preserve and conserve native wildlife (Barrow, 2009). Hornaday founded the American Bison Society in 1905 with the goal of not just preserving the disappearing American bison in zoos, but also reintroducing the animal into the wild (Freese et al., 2007). The American Bison Society sought to establish conservation herds and worked with the Bronx Zoo to create a captive breeding program for the species. The bison breeding program at the Bronx Zoo is considered to be one of the earliest successful cases of a zoo engaging in conservation and reintroduction.

Approximately seventy-five years later, the emergence of conservation biology would highlight the importance of biological diversity, creating an emphasis on preservation of species, and giving credence to the relevance of zoos and zoo captive breeding programs, such as that of the American bison in the early 1900s (Meine, 2010). Though zoos had, in some cases, been recognized as viable partners in achieving species preservation goals, many skeptics, such as animal rights activists and some wildlife biologists, remained unconvinced. Early on, a number of very vocal critics questioned the claims and motives of zoological institutions as well as the field of conservation biology as a whole. Scientists in other disciplines were also scrutinizing the legitimacy of conservation biology as a scientific discipline, because it was considered inherently value-laden (Meine 2010). Critics argued that it would be impossible for a crisis-driven discipline such as conservation biology to be grounded by traditional scientific principles

like impartiality and pure observation. Zoos, identifying closely with conservation biology, were also questioned about the legitimacy of their claims of engagement with conservation, particularly conservation with the help of captive animals. These criticisms will be examined in more detail below.

Furthermore, the relationship between conservation biology and zoological institutions was complicated by a lack of definition and scope. For many zoos, it was (and is) unclear what exactly constitutes a conservation initiative. Therefore, zoological institutions were faced with challenges not only in the implementation of conservation but also with its conceptualization. This led to a situation in which zoos were the targets of both criticism and praise within the conservation community, a mixed response which has complicated these institutions' articulation of their conservation goals and their self understanding as species-protection (rather than simply entertainment) institutions in recent decades.

Zoos, while endeavoring to engage with conservation biology, also responded to the growing public interest in not just the species themselves, but also the habitats in which they lived. Animal displays were reformed so that they were no longer taxonomically grouped, but were displayed by biome, complete with detailed habitats. These new groups helped to contextualize the natural world for zoo visitors, often emphasizing the importance of biodiversity and describing the interdependence of organisms within a given habitat (Kisling, 2001, Hanson, 2002).

The push for conservation initiatives within zoos continued steadily into the most recent decades. Conservationists had not only begun to look at zoos as locations for captive breeding, but also considered zoological institutions as having high potential as

research sites. Research in zoos opened the door to new avenues of investigation, allowing the acquisition of scientific knowledge relevant to *in situ* conservation as well as building upon the knowledge needed to improve animal husbandry techniques (Falk 2007).

Currently, a number of studies have shown that in general, zoos are evolving to deliberately emphasize conservation in their missions and that, over the last two decades, there has been a growing number of zoo and aquarium personnel actively involved in wildlife conservation (e.g. Soule´ & Wilcox, 1980; Wilson, E. O., 1988; Olney et al., 1994; Conway, 2003, Patrick, 2007). Many zoos are making it a point to speak out about their involvement in conservation, and global zoo coalitions such as the World Association of Zoos and Aquariums (WAZA) are also echoing this cry on a larger scale. Zoos claim that they have more to offer than edutainment and that they can be significant contributors in the conservation world (Hanson 2004). The WAZA states that zoos and aquariums have to achieve and promote a clearer view of their unique role and the contribution they can make as part of a global conservation coalition (WAZA, 2005). In addition, conservation has been designated a high priority for AZA-accredited zoos (AZA, 2014) and zoo biologists believe that zoos are a significant piece of a larger conservation strategy. Many conservation scientists also recognize zoos as having a role in the conservation movement (WAZA 2005).

Likewise, when it comes to the role zoological institutions should be playing in the science and practice of conservation there is a broad array of literature surveying the current institutional landscape and advancing recommendations for enhancing conservation outcomes and initiatives (e.g., WAZA, 2005; Fabregas, Guillen-Salazar, &

Garces-Narro, 2011; Kitchener, 1997; Mazur, 2001;Miller et al, 2004; Rabb & Saunders, 2005; Smith, Shaw, Bettinger, Caniglia & Carter, 2007; Fa, Funk, & O'Connell, 2011). The 2005 WAZA report on conservation (*Building a Future for Wildlife*) states that zoological institutions should be integrating conservation into their everyday operations, detailing that zoological institutions in different locations should be engaging with conservation in a myriad of ways, including investing time and resources in providing treatment and housing for wild animals in need, undertaking field conservation both locally and globally, and enhancing conservation education efforts.

Additionally, one of the drivers of this increased interest in zoos among conservation researchers, managers, policy makers, and advocates is the growing recognition that climate change, and rapid environmental change more generally, will increasingly require *ex situ* approaches (or perhaps a new hybrid form combining *ex*- and *in situ* models) to safeguard certain populations from decline and eventual extinction (Minteer & Collins, 2013). Increased participation in the *ex situ* housing of species threatened by global climate change would further augment zoos' role as members of a larger conservation coalition.

As the professional and academic communities have recognized, the face of zoo and aquarium conservation will likely be very different from institution to institution (WAZA 2005). The availability of resources, geographic location, and visitor demographics will, undoubtedly, play a role in determining the type and scale of conservation initiatives that a zoological institution will consider and ultimately develop.

While such diversity in conservation approaches has the potential to enrich the collective conservation engagement of zoos as a whole, the lack of uniformity and varied efficacy of individual conservation initiatives among different zoos has also opened the door to a number of criticisms.

Critiques of Zoo Conservation

Though there is evidence of a shift to a conservation-centered mission within the zoo community, critics of zoological parks claim that zoos' current and historical involvement in scientific research and conservation initiatives leaves much to be desired. In 1924, the American Association for Zoological Parks and Aquariums (AAZPA) was formed with a number of goals in mind, one of them being "to aid in the preservation of wildlife" (Kisling, 2001 Pg. 168). The AAZPA formed a Wildlife Preservation Committee to meet this goal. Yet, while the formation and membership of this committee is well documented, there is little evidence of any projects, programs, or initiatives enacted by the committee (Kisling, 2014). Many zoo critics and zoo professionals maintain that this is a problem still faced by zoological institutions: claims of conservation involvement are often either unsubstantiated or exaggerated.

Difficult trade-offs and decision making challenges, coupled with the influence of zoos' questionable ethical origins, wherein early zoos contributed to the large scale removing of animals from the wild (Ritvo, 2014), have led many critics to argue that zoos may not be as well positioned as conservation organizations as they believe. Zoologist and conservationist William Conway, a prominent figure in the professional zoo

community, argues that while improvements in animal husbandry management and techniques is admirable, zoological institutions still do not have the resources to sustainably manage captive populations (Conway, 2011). But societal expectations of zoos may also be playing a role in this broader challenge. Historian and zoo critic Jeffery Hyson, for example, argues that for many zoos, conservation remains purely a side project because visitors are not really interested in the idea of zoos as conservation organizations. Zoos are also confused about their institutional identity, he believes (Hyson 2004). Indeed, critics also claim that zoos are primarily interested in serving people rather than the conservation and preservation of endangered species (Hancocks 2001).

The deep history of zoological institutions provides some ammunition for this argument. As discussed above, the earliest collections of animals were, in fact, created for the amusement of the upper class. The Jardin de las Plantas, the Menagerie at Versaille, and even Hagenbeck's revolutionarily Tierpark all speak to this aim--to delight and to amuse (Rothfels, 2002). It was only until much later in time, especially in the United States, that zoos turned to environmental education and conservation. David Hancocks (2003), author and former zoo director, claims that zoos are, in a sense, attempting to atone for the past sins of the human race with their conservation claims, breeding programs, and educational experiences. He goes on to suggest that, on a smaller scale, they are attempting to provide redress for their role in the extrication of species from the wild, exemplifying the claim that even zoo conservation is done for the benefit

of humans. Furthermore, Hancocks claims that conservation breeding programs such as Species Survival Plans focus on conserving zoo collections rather than the world's rare and endangered species.

In addition to the lack of clarity regarding the efficacy of conservation efforts in zoos, the delineation of what constitutes a conservation initiative within zoological institutions is also not always obvious. As mentioned above, when zoological institutions become more active in the field of conservation, the distinction between *in situ* and *ex situ* conservation starts to blur (Minteer & Collins, 2013). This in turn leads to discussions centered on the depth of responsibility and capacity of zoological institutions to contribute to conservation efforts and the scale of conservation initiatives.

Many of the aforementioned criticisms leveled at zoos claim that zoos, ideologically, cannot be successful contributors to conservation, primarily because something about the zoo's very nature (it's history, visitorship, etc.) suppresses any supposed positive conservation contribution. While skeptics such as Hyson and Hancocks argue that, for zoos, conservation will remain a side project, one could counter that conservation-as-side-project is not actually an issue, but an undertaking to be applauded. In many cases, zoos with already limited resources are choosing to allocate funds to conservation, and this could be considered a noble endeavor, even if it conservation remains a secondary mission of the zoo.

Additionally, the critique that zoos' relatively new involvement in conservation and conservation education is due to a desire to atone for past institutional sins can be countered by a discussion of whether or not the motives of the zoo (atoning for past sins, responding to the fad-like interest of the public) really matters when discussing

conservation efficacy. It is questionable to claim that conservation done for conservation sake is inherently better than that same initiative being undertaken in response to societal pressure. Additionally, claiming that zoo conservation is being done simply to atone for past sins seems less of a critique and more of a possible praise of the malleability of the institution itself. Zoos, much like persons, seem to have experienced a learning process, letting both internal and external responses to past transgressions guide future decision-making. Zoos, as entities, may have arrived at more stringent regulations and animal care standards precisely because of their past faults.

The call for zoos to address and respond to amorphous ideological critiques is, quite possibly, one of the largest obstacles to zoo conservation itself. While the history of zoos as institutions, their focus on visitor engagement, and their relative lack of resources limit their engagement with conservation efforts, zoos are still the primary resource for knowledge about the care and natural history of exotic species. This expertise is precisely what positions them strongly as contributors to conservation, by being integral to the process of behavioral research, captive breeding and reintroduction initiatives. So while there is a place for discussion of whether or not zoos are shifting to become conservation institutions, there should be an understanding that even if zoos are focusing more primarily on education and entertainment they can still be strong partners in a larger conservation community.

Organizational Identity Formation

To further understand the role of conservation initiatives in shaping organizational identity in North American zoological institutions, a review of identity formation literature is helpful. Much work has been done discussing personal individual identity formation (Hatch and Schultz, 2002, Albert and Whetten, 1985, Lin, 2004) and, in recent decades, this has been scaled up to discuss the formation of identity within organizations (Hatch and Schultz, 2002). Understanding the process of organizational identity formation provides an important context for analyzing and understanding the enhanced emphasis on conservation by zoos generally, and in particular, is important to understanding the development of a conservation identity at my chosen case study, the Phoenix Zoo.

Organizational Identity has been defined as an enduring, distinctive and central statement perceived by an organization's members (Albert &Whetten, 1985), a formulation created to answer foundational institutional questions such as "Who are we?" and "What are we doing?" (Lin, 2004). The identity is formed by the continuous negotiation between organizational culture and organizational image, with identity formation being a continuous process over time (Gioia, 2010). Organizational culture is created from within the organization, and is the culmination of all tacit assumptions, beliefs and values that play a role in the meaning making and self-defining of an institution. Organizational image, on the other hand, is what organizational members believe others see as distinctive about the organization (Hatch and Schultz, 2002).

The process of organizational identity formation begins with self-exploration (Hatch and Schultz, 2002, Gioia, 2010). The members of an organization collaborate and discuss the collective values, beliefs, and assumptions that are held by the organization. These principles guide decision making within the organization and are used to define the culture of the organization. Organizational culture becomes an important piece of an organization's identity; it is the consciously created "self" of the institution (Lin 2004). Organizational members, through interactions with the public, media, and other feedback, will then begin to form an idea of their organization's image (Hatch and Schultz, 2002).

The two components, image and culture are often not synonymous. If opinions and reactions of outsiders about the organization differ from the way the organization perceives itself, the organization will be motivated by the discrepancy to change either its image or its identity (Hatch and Schultz, 2002). The above is the process of mirroring and reflecting; defining and redefining the identity of an organization based on the image of others through self-exploration of organizational culture.

While engaging in self-exploration to respond to aforementioned discrepancies, organizational culture may shift because of outside influence. This will result in a new organizational identity that is then expressed through a mission statement, logo, or other symbolic object (Hatch & Schultz, 2002). These symbolic objects become closely linked to the organization, creating distinctiveness in the eyes of others. "Symbolic material… can be used to impress others in order to waken their sympathy, by stimulating their awareness, attracting their attention and interest, and encouraging their involvement and support" (Hatch & Schultz, 2002, pg.1001). Essentially, expression of identity through calculated messages will leave an impression on others.

Impressions of others about an organization can also be influenced by factors outside of the organization itself. Negative press, other organizations, and other individuals can control the impression others hold about an organization (Gioia et al., 2010). Impression can also be influenced by the cultural heritage of the organization. Historical identity of an organization can influence the current reception of a specific identity by the public. (Hatch and Schultz, 2002). This component will be especially important in my discussion of the formation of a conservation organization identity at the Phoenix Zoo.

Understanding the development of a general institutional identity is crucial to understanding the process of how organizations consciously shift their identity in response to social, economic, and cultural changes around them. Zoological institutions are especially interesting cases to examine through the lens of identity formation; their earliest analogs had identities of violence, later on it was entertainment and early scientific discovery, and now a documented shift to focus on conservation. The Phoenix Zoo, my chosen case study, is a prime example of the latter; a zoological institution making a calculated choice to identify as a conservation organization. This will be explored in more detail below.

Conservation Identity and the Phoenix Zoo: A Case Study

I will examine the process of conservation identity formation by using the Phoenix Zoo in Phoenix, Arizona as a case study. The zoo is located in Papago Park, a large city park just outside of the center of the city of Phoenix. The Phoenix Zoo serves

1.4 million visitors annually; most of these visitors are families with young children. The Phoenix Zoo can house anywhere from 1,100 to 1,700 animals at any given time, within their 125 acres (Phoenix Zoo, 2014) with roughly 30 endangered bird, reptile and mammal species. The Phoenix Zoo is the largest privately owned not-for-profit zoo in the United States (City of Phoenix, 2014).

The Phoenix Zoo (referred hereafter as the "Zoo" or "PZ") was chosen as a case study for a number of reasons. First, it has earned AZA accreditation, meaning that the Zoo is complying with stringent safety and animal care standards[1]. In addition, the AZA requires that member zoos participate in conservation, though they do not specify specific initiatives. The Zoo has clearly made a conscious choice to display animals that are found in only a few specific biomes and has also been involved in high-profile wildlife conservation efforts in the field, such as the reintroduction of the Arabian Oryx and black-footed ferret. The PZ also has a stated dedication to conservation, and their participation in large-scale conservation initiatives reaches back to their opening year (1962) when "Operation Oryx" began. Another reason for selecting this particular zoo is convenience; the Zoo is close to ASU geographically, but also programmatically. The School of Life Sciences is currently developing a collaborative research and outreach program with the Zoo and so it provides an ideal case study site for this project.

In at least one way, however, the PZ isn't fully representative of those zoos currently seeking to develop a conservation mission, because the Zoo has had at least a minor focus on conservation from its beginnings in the early 1960s. Therefore, it is not

[1] By focusing on zoos that have earned this accreditation, I am eliminating some of the need for a larger discourse on the ethical implications of keeping animals in captivity. Therefore, an ethical discussion of keeping captive populations is outside of the scope of my research.

fully comparable to those zoos in the United States (especially smaller zoos) that are today attempting to build conservation programs from the ground up. What keeps the Phoenix Zoo relevant as a case study, however, is that it has obviously made a conscious effort over time to strengthen and to publicize its conservation engagement (Allard, 2014, Wells, 2014). This is manifest in changes in budget for field conservation over time, the Zoo's initiation of an annual conservation grants program, and also the building of a conservation center and creation of formal partnerships with state wildlife agencies. These activities all signal the Zoo's commitment to its conservation mission and to the development of conservation programs at the institution.

Primary Research Questions and Methods

This study has two parts, an investigation of the general relationship between U.S. zoological institutions and conservation and a more specific single case study of conservation engagement and institutional identity at the Phoenix Zoo. The driving questions of the research were therefore the following:

1. How is 'conservation' interpreted, implemented and prioritized at the Phoenix Zoo?;

2. What factors have, in both past and present, played a role in the development of conservation initiatives within this institution?; and

3. How does study of the development of conservation programs at the Phoenix Zoo inform our understanding of the process of conservation identity formation within zoological institutions more generally?

U.S. Zoological Institutions and Conservation

In order to contextualize my research, I first conducted a literature review and analysis. Topics of inquiry included: 1) the history of zoos (globally, nationally, locally); 2) the development of the U.S. conservation idea and conservation movement; 3) changes in conservation over time, including the emergence of conservation biology and ecology; 4) the historical and current relationship between zoological parks and conservation; and 5) the process of institutional identity formation.

In addition to this literature review and analysis, I also conducted standardized, open-ended interviews with five university-based and NGO-based scholars and professionals from a wide array of backgrounds who have worked on questions relevant to the wider discussion of zoo conservation. This helped to provide an important "external" perspective to aid my analysis of conservation interpretation and conservation identity within zoological institutions. Many of these scholars are historians and, as such, provided significant historical context for the varying involvement of zoos in conservation initiatives through time.

I completed this portion of data collection during May of 2014. The interviews were conducted during a weeklong seminar on the history of zoo and aquarium conservation at Woods Hole in Massachusetts (part of the ASU-MBL History of Biology Seminar Series, https://cbs.asu.edu/mbl). I initially reached out to the interviewees through email before arrival at Woods Hole to request an interview. All of the scholars and professionals I reached out to agreed to be interviewed and another was

recommended. I interviewed a total of five scholars: Pamela Henson (Smithsonian Institution), Nigel Rothfels (University of Wisconsin, Milwaukee), Vernon Kisling (University of Florida), Catherine Christen (Smithsonian Institution), and Harriet Ritvo (MIT school of Humanities, Arts, and Social Sciences). Interviews were conducted in common areas, most often in the dining hall, and consisted of a series of open-ended questions (see protocol below). Interviews varied in length from fourteen minutes to fifty-five minutes. The interviewees all have considerable academic and professional interest in zoological institutions' engagement with conservation and they represent a broad array of perceptions and beliefs on the topic. A complete list of interview questions is in Appendix 1.

Interviews were transcribed and then coded in a number of stages. The first stage was a quick read through of an individual interview transcript to identify major topics in each interview. The second stage was line-by-line coding; this method allowed for a more careful identification of the many topics raised by the interview subject throughout the interview. Topics were then labeled according to a standardized convention (i.e, budget, partnerships*, in situ* conservation, etc.). Similar topics were then grouped into categories, creating broader themes. Many topics were applied to more than one category, allowing a deeper understanding of the relationship between themes. These themes were also standardized across the interviews. Each interview was coded individually, and then topics from each interview were applied to the standardized themes, creating a list of themes that emerged from all the interviews. This allowed for both comparison between individual interviews as well as comparison with larger themes from the literature.

Phoenix Zoo and Conservation Engagement

My in-depth case study of the Phoenix Zoo has three components: 1) creation of a historical profile of the institution, emphasizing development of conservation programs, 2) analysis of the institution's *in situ* and *ex situ* conservation programs, including activities related to conservation education and public media, and 3) analysis of priority setting and resource allocation across zoo programs (to the degree these data are accessible).

To create a detailed historical profile, I conducted archival research with the goal of determining: 1) origins of the PZ (including the financial support that made this possible), 2) original mission of the PZ with respect to conservation, and 3) how this mission evolved over time (i.e., through the development of particular conservation programs and initiatives).

To investigate and understand the Phoenix Zoo's conservation programs, I interviewed two key experts at the Zoo, Ruth Allard and Stuart Wells. Allard is the Executive Vice President for Conservation and Visitor Experiences at the Zoo; Wells is its Director of Conservation and Science. Because of the prominent and thematically relevant positions they hold within the organization, both interviewees provided valuable data regarding the interpretation, prioritization, and implementation of conservation at the Phoenix Zoo.

The interview with Ruth Allard took place on April 18th, 2014 at the Phoenix Zoo in a conference room. The interview lasted approximately seventy minutes and was audio recorded. The interview with Stuart Wells took place on April 14th, 2014 at an outside

patio at the Zoo. The interview was audio recorded and lasted approximately forty minutes. Interviews were coded according to the same categorization schema used for the scholar interviews. A complete list of interview questions can be found in Appendix 2.

Results

U.S. Zoological Institutions and Conservation

Themes from Scholar Interviews

Five main areas emerged from the interviews with the five zoo scholars: 1) definition of conservation, 2) history of zoo conservation, 3) change in zoo conservation over time, 4) role of zoos in conservation, and 5) main challenges facing conservation in zoos. There were a number of sub-themes within each larger category. In general, each of the scholar's answers differed greatly from one another and collectively these interviewees provided a broad array of perspectives that I believe are representative of the major discussions found within the academic literature and professional culture surrounding zoos, conservation, and society.

Firstly, there are a number of varying definitions for conservation itself, leading to potentially discordant ideas about what zoos should be doing for conservation -- and how they should be implementing their conservation goals. This is highlighted in the discussion of the types of scientific research being conducted in zoos, such as animal behavior observations or research on reproduction of endangered species: "there's a lot of

things now that are called conservation…which are really reproductive endocrinology…physiology…because conservation is important and there is a kind of tendency to be calling it that" (Christen, 2014). Breeding programs for endangered species, conservation research, and similar programs are often embraced by the AZA as conservation (Rothfels, 2014, Christen, 2014). Conversely, many scholars and critics disagree that these initiatives are truly conservation (Rothfels, 2014); rather, they are seen merely as providing support for conservation. This may indicate that while zoos are claiming a newfound engagement with conservation, they are simply rebranding historical initiatives to fit a broader concept of conservation. The largest criticism, however, is that zoo conservation missions are, "actually a different mission from other organizations that also [claim to] have conservation missions" (Rothfels, 2014). Others are less sure of this critique, claiming that though research is being conducted within zoos, "field conservation is pretty much what everyone is doing" (Kisling, 2014), or at least, attempting to do.

When addressing the historical relationship between zoological parks and conservation, there were disagreements among my expert interviewees as to the depth and efficacy of early zoo conservation. Pamela Henson, historian for the Smithsonian Institution, believes that zoos "have historically played a role [in conservation]" and noted, "the impetus for creating the Smithsonian zoo was conservation…our beginning mandate was conservation" (Henson, 2014). Other scholars remain unconvinced of this history, however. Nigel Rothfels, for example, argued that zoos have not always played a role in conservation and that it would be a difficult to convince him of conservation engagement in zoos in the 19th century (Rothfels, 2014). Zoo historian Vernon Kisling

agrees with this point, claiming that during his tenure in the zoo community in the 1960s and 1970s, he wasn't aware of any "real or significant conservation in zoos." Kisling not only critiques the claims of conservation engagement, but makes the point that though zoos were claiming conservation involvement, no real work was being done, and conservation involvement was in fact something "like an image" rather than reality (Kisling, 2014). Along these lines, Harriet Ritvo, a prominent cultural historian of animals and zoos, claims that "Conservation….is a much more recent concern" of zoological institutions, and that, historically, "zoos were consumers of animals, not producers." (Ritvo, 2014).

These sentiments are mirrored in the literature, which reflects a similar disagreement in about the significance and timing of the shift to conservation awareness in zoological parks (Barrow, 2009; Stott, 1981; Hochadel, 2005; Wirtz, 1997; Rothfels, 2014; Hancocks, 2003; Hutchins, 1995). Though the deep history of zoological institutions does not reveal convincing evidence for an early relationship with zoos and conservation, some of my interviewees claimed that the transition to conservation engagement is not as recent as other scholars and professionals believe (Rothfels, 2014). Others recognized that there have been "huge changes over time in general" (Christen, 2014). Ritvo notes that, "The turn of zoos themselves as seeing conservation as the main objective is relatively recent" (Ritvo, 2014), and Christen claims that the change in conservation engagement has been accompanied by a willingness to work more closely with researchers from other fields, sharing resources and data more freely among institutions (Christen, 2014). This emphasizes that, regardless of historical engagement with conservation, zoological parks have undergone major changes in recent decades.

Interestingly, despite the disagreements on nuances of conservation and conservation engagement, many of the scholars I interviewed did agree that the zoo has some sort of role to play in the conservation of rare and endangered species (Rothfels 2014, Henson 2014, Christenson 2014, Kisling 2014). There was disagreement, however, about what those roles may be. There were claims that zoos have an opportunity to play a role in conservation (e.g., Christen, 2014) but concerns that the outcomes of the initiatives are often unclear, with ambiguity surrounding the measurement of conservation success by zoos (Kisling, 2014). At least two of the interviewees discussed the importance of public perception on zoo involvement in conservation; i.e., that zoos' "greatest influence is to get the public involved" (Kisling, 2014) and that, "broadly, the public seems to believe in zoos as a concept have a conservation mission" (Rothfels, 2014).

There are many challenges, however, facing any zoo's successful engagement with conservation. Though the largest obstacle is securing funding for conservation initiatives (Allard 2014, Wells 2014, George 1982, Henson 2014), there are also questions about the ability of zoos to focus on conservation as a matter of philosophy or institutional ideology. Christen raised this point: "Can zoos keep their animals and still [engage in wildlife conservation]?" (Christen, 2014). Among other things, this suggests that there may be difficultly reconciling an *in situ*-centered conservation mission with the keeping of captive populations of animals. In addition to ideological limitations, as Kisling (2014) notes, the matter of gauging success of programs and initiatives is, "almost impossible." This condition leads some to doubt that zoos can realistically claim successful engagement with conservation.

Strategies for Zoo Conservation Engagement

Results from the scholar interviews coupled with a review of both the historical and modern literature of zoos and conservation led to the identification of four main modes for zoo engagement with conservation: 1) *in situ* conservation, 2) *ex situ* conservation, 3) conservation education, and 4) fundraising for conservation aims. Furthermore, WAZA claims that, "Only zoos, aquariums and botanic gardens can operate across the whole spectrum of conservation activities" (WAZA, 2010).

In situ conservation translates to 'on site' conservation and encompasses all work done in the field. Field conservation falls under the umbrella of *in situ* conservation and is broadly defined by the AZA as, "directly contributing to the long-term of survival of species in natural ecosystems and habitats" (AZA, 2013). This definition includes all actions undertaken for the support of wild populations; for example, the AZA would define captive breeding as a type of field conservation. Other scholars and critics, however, disagree with this, emphasizing that field conservation can only be defined as conservation done outside of the zoo grounds, such as habitat restoration, monitoring of wild populations, creation of protected areas, etc. Regardless of disagreements on the scope of field conservation, the emphasis of *in situ* conservation is that all initiatives must be geared toward conservation of endangered species and habitats in the wild.

Conversely, *ex situ* translates as 'off site' conservation and encompasses all conservation initiatives undertaken out of the field and, most often, on zoo grounds. This often includes initiatives such as breeding of endangered species, research on animal

behavior, reproductive endocrinology research, and preserving genetic material in gene and seed banks. *Ex situ* conservation is often considered to be done in support of *in situ* conservation, which explains why the AZA has integrated *ex situ* initiatives into its definition of field conservation.

Conservation education is defined in many different ways. Members of the International Zoo Educators Association emphasize that, "conservation education isn't…just a philosophy, but more a very powerful means to achieving something tangible" (IZE, 2002), meaning that the end goal of conservation education is that the newly educated take actionable steps for the conservation and preservation of species. There are two widely accepted interpretations for conservation education, the first being that conservation education is the facilitation of learning about natural resource management and the second being, "the process of positively influencing people's knowledge, attitudes, emotions and behaviors about wildlife and wild places through the engagement and involvement of the audience" (Lehnhardt, 2014). The latter definition is more commonly used as the pedagogical basis for creation of educational materials in zoological institutions. In addition, conservation education reaches beyond education of visitors to the training of conservation volunteers and docents, the influencing of local and federal legislation, and the advocacy for local and global conservation initiatives.

The final mode for engagement with conservation is both the raising and donating of funds dedicated to conservation, often with the assistance of a partnership with an outside organization. Fundraising is undertaken on behalf of either the individual zoo or a larger conservation group. The Quarters for Conservation program implemented at many zoos in North America is an example of fundraising for conservation outside of the zoo.

The program allows zoo visitors to donate one quarter from the price of admission for the conservation of a species of their choice. At the end of the program, the money is given directly to a partnering organization for that purpose. In contrast, zoos often hold their own fundraising events to support the zoo's own conservation initiatives. Additionally, some zoos also participate in zoo conservation grant programs, where conservation researchers, zoo staff members, and students can apply for a grant from the zoo to conduct field research somewhere in the world.

The above are the four main strategies for zoo conservation engagement. Though interpretation and implementation of the four main strategies differ among institutions, all create an interesting look at the development of conservation engagement within zoos in recent decades. My case study, the Phoenix Zoo, provides a concrete example of a zoo that is consciously developing conservation strategies. The Zoo is unique in that it engaged with conservation early in its existence, yet is vocal about recent conservation development. The case is discussed in more detail below

Phoenix Zoo and Conservation

Phoenix Zoo History

In 1961, Robert Maytag, a wealthy philanthropist and amateur conservationist, met with a group of friends on his family estate in Phoenix to explore the idea of building a zoo in Phoenix, Arizona. There had been many attempts prior to 1961 to establish a zoological park for the city, but all efforts at gathering resources had failed and the

dedicated groups disbanded. The group of friends and colleagues agreed that Phoenix was in need of a zoo, because they believed that any great city needed a zoo. They sprung into action, contacting other members in the community who could be helpful in the building of a zoo or who had shown interest in the past. One such community member was Jim Sexton, a Phoenix native, who had previously started a movement to open a Children's Zoo in the city. Maytag reached out to Sexton and the two groups together formed the Arizona Zoological Society (AZS). Their first official meeting took place at the Maytag Residence in Phoenix on April 27, 1961.

There were a number of practical challenges that the AZS had to overcome, but the three most important were locating a place to build the zoo, creating a schema for what the grounds of the Zoo would look like, and, most importantly, raising the large amount of money that it would require to build a zoo. Maytag responded to the latter challenge, donating $100,000 of his own money and jumpstarting the funding of the Zoo. Maytag and the rest of the Arizona Zoological Society solicited donations from the community, but these requests were not limited just to cash. Maytag requested donations of materials, labor, and time from community members. While working to raise funds for the Zoo, Maytag refused to fully fund the building of the Zoo himself. He believed that, "…the project would succeed or fail according to the support from the community. Thus, the driving wedge was the question, 'Do you want a Zoo in Phoenix?'" (George, 1982, pg.7). From the start, therefore, the Phoenix Zoo was entwined with the local community. It would succeed or fail according to its involvement.

The community responded well to the idea of having a zoo. Local media featured the Zoo prominently in their reporting. A local news station, the KYND of Tempe,

brought Maytag in every Saturday morning to discuss the building of the Zoo (George 1982). The Zoo created a newsletter, Arizoo, which was circulated throughout the community. Two early arrivals for the Zoo, Heffalump, a young Asian elephant and Brummell, a wooly monkey, were taken to dinner parties, picnics, etc. to inspire donors. By the end of 1961, the Arizona Zoological Society had raised 284,000 dollars. The Zoo had also sold over a thousand family memberships in 1961, before the site for the Zoo had even been chosen.

In the fall of 1961, Robert Maytag's wife, Nancy Maytag, founded the Arizona Zoological Society Ladies' Auxiliary. The Ladies Auxiliary's initial goal was to assist in the fundraising for the Zoo and this continues to be their primary directive. The Ladies' Auxiliary has proved to be one of the most formidable fundraising groups on behalf of the Phoenix Zoo, raising more than $3 million over the life of the Zoo (PZ Women's Auxiliary, 2014).

While fundraising continued, the members of the Arizona Zoological Society searched for a location for the Zoo, deciding that Papago Park would be the ideal location. After the Arizona Zoological Society secured the site for the Zoo, the challenge of designing the Zoo began. Experts were brought in to assist in the design of the new Zoo, the first built in the United States in twenty years (George, 1982), and they settled on a unique circular design, organized by continent.

On January 3rd, 1962, the Arizona Zoological Society officially signed the contract to build the Zoo at Papago Park and ground was broken at the Zoo on the 20th of

that month. The Arizona Zoological Society leased the property for just a dollar a year. The first portion of the Zoo to begin construction was the Children's Zoo, designed by E. Logan Campbell, which housed a barn and would be the home of barnyard animals.

Arabian Oryx

In February of 1962, the Zoo was officially selected as a site for a captive breeding program for the Arabian oryx, an endangered antelope native to the Arabian Peninsula. Arabian oryx are large, primarily white antelope native to the Arabian Peninsula. Arabian oryx have dark brown or black coloration on their lower legs and also on their faces, they also have two distinctive straight horns that can be as long as 64 cm (a little over two feet). Arabian oryx are often found in herds of up to 10 individuals. They rest during the day and often graze at dusk. Though once abundant in its home range throughout the Arabian Peninsula, it was hunted to near extinction in the 1940s and 1950s. By the 1960s, the oryx were limited to only small parts of Oman (Treydte et al., 2001, IUCN, 2013).

Phoenix had been chosen because its climate matched that of the oryx's native habitat. The World Wildlife Fund (WWF) and the Fauna Preservation Society ventured to the Arabian Peninsula to capture candidates for the new captive breeding program at the Zoo. By June, the Phoenix Zoo had received five Arabian oryx, three from the wild, one from London and one donated from the 1st Emir Abudullah Al-Salim Al-Sabah, leader of Kuwait. The Phoenix Zoo's mission was to bring this species back from the edge; a directive the Zoo would hear many more times into the future.

The Arabian oryx arrived at the Phoenix Zoo in June of 1963 and the first calf (a male) was born in October of 1963 to parents that had bred in their enclosure at the Zoo. The next six calves would also be male, creating concern among those sponsoring the breeding program. In 1966 a female was finally born and the gender ratio evened out (relatively) since that time. The herd grew healthily and steadily; so much so that the Zoo notified Operation Oryx that they were running out of space and needed to transfer surplus animals to other zoological institutions.

But there was another reason to separate the herd. The animals that composed the population at the Phoenix Zoo were the last of the species and if something devastating (e.g., disease or natural disaster) were to happen to these animals that would spell the end of the species. Therefore, oryx were sent to San Diego Zoo, Gladys Porter Zoo in Brownsville, TX, Los Angeles Zoo, and the San Diego Wild Animal Park, East Berlin, Rotterdam, Zurich, Hannover and Jordan. By 1979, the Phoenix Zoo had sent over forty Zoo-born oryx around the globe. By February of 1980, the hundredth oryx had been born at the Phoenix Zoo. The breeding program was a relative success, and assisted in increasing the world's population of oryx from thirty in 1963 to over four hundred by 1982.

Though the Phoenix Zoo played a role in the recovery of the Arabian Oryx, it has been noted that during the 1980s, His Majesty King Khalid of Saudi Arabia was found to have a private of collection of oryx, originally kept as hunting stock (Islam, Ismail, and Boug, 2011). In 1989, a captive breeding program was created when 57 oryx from that collection were moved from His Majesty King Khalid's farm to the National Wildlife Research Center (NWRC) in Taif, Saudi Arabia (Greth and Schwede, 1993). This herd

was supplemented by oryx from the United States and the Middle East, making the herd at the NWRC the most genetically diverse herd (Islam, Ismail, and Boug, 2011) of all captive breeding programs, but also produced a number of offspring that were also integral to the survival of the species. This would indicate that the Phoenix Zoo, while playing a role in conservation of the species, were not the primary contributors to the success of the reintroduction of the oryx.

Stabilization and Growth at the Phoenix Zoo

After early financial trouble, during which the Wild Animal Propagation Trust thought the PZ was going to fold and threatened to take away the Arabian Oryx from the Phoenix Zoo, the zoo's financial situation became more stable. In 1969, the zoo had over $1 million in assets. By 1970, annual attendance was more than five hundred thousand and things were looking sufficiently good that the Zoo created a long range planning committee in 1971 to best manage the growth of the Zoo into the future.

In May of 1970, the building of the education center was completed with the support of the Junior League of Phoenix, who hosted popular summer classes at the Zoo. In 1973, the Auxiliary took charge over all educational activities. Seventy thousand school kids were visiting; thirty-five thousand were participating in programs run by one hundred volunteers. In1975, Phelps Dodge Corporation provided a van to be used as a Zoomobile and paid a driver's salary, while the PZ chose the driver and the animals and

set off to less often visited areas of Arizona. This program won an Outreach Award in 1978 from the AAZPA, what is now the AZA, marking a beginning to the Phoenix Zoo's legacy of strong outreach programs.

The Zoo continued to grow, adding new exhibits, educational programs, and conservation programs. In 1982, the Phoenix Zoo was the only zoo in the nation to be a private, self-supporting, non-profit entity without governmental support. As of 2014, the zoo is still privately owned and publically operated, with a majority of the operating budget supported by ticket sales, membership sales, and private donations.

Interpretation of Conservation at the Phoenix Zoo

As of 2014, The Phoenix Zoo emphasizes the importance of *in situ* conservation by de-emphasizing the usual claims of *ex situ* conservation. Ruth Allard and Stuart Wells (the core of the Zoo's conservation leadership) both mention that captive population management is not, in and of itself, conservation. Allard claims that it is "aggravating" to think of zoo animals as being merely captive populations; i.e., that they would be in the zoo without a 'higher purpose' (Allard, 2014). Wells is even more direct, "Zoo collection isn't conservation," he agues (Wells, 2014). Furthermore, while both discussed the dangers of thinking of zoo collections as purely captive assurance populations, both discussed the role of the animals as animal "ambassadors." Historically, this has been zoos' largest claim to conservation; conservation education through up-close encounters with animals serving as representatives of their wild counterparts. This is another point emphasized by Wells, "conservation education is different than field

conservation participation" (Wells 2014). He believes the focus of conservation is changing in zoos in general: "As opposed to having people come and learn about an animal by seeing them, zoos are actually actively involved in field conservation, actively involved in repatriating species back into the wild" (Wells, 2014).

This is especially true at the Phoenix Zoo, where local, *in situ* conservation initiatives are being undertaken. According the Phoenix Zoo's interpretation of conservation, initiatives can be undertaken *ex situ* if they are in support of *in situ* field conservation. An example is the case of head starting leopard frogs at the Phoenix Zoo. The head-starting program, in and of itself, is not field conservation, but it is in support of field conservation (Allard, 2014). This means that the Phoenix Zoo's *ex situ* contributions will be making an impact *in situ*; classifying the head-starting program as a conservation program, though not a field conservation program, under the Phoenix Zoo's interpretation.

Implementation of Conservation at the Phoenix Zoo

To evaluate the implementation of conservation at the Phoenix Zoo, results from interviews, archival research, and site visits will be categorized into one of the four modes of conservation engagement identified in the above general results section. The four strategies are *in situ* conservation, *ex situ* conservation, conservation education, and fundraising for conservation aims. In many cases, specific conservation initiatives can be classified into two or more modes of conservation, falling on a continuum of conservation engagement.

In situ

The Phoenix Zoo currently sets aside 3% of its operating budget towards field conservation (Wells, 2014, AZA FCC 2012). Additionally, the Phoenix Zoo partners with a number of local and international groups when engaging in field conservation initiatives. Locally, the Phoenix Zoo has formally partnered with Arizona Game and Fish Department (AGFD) and the United States Fish and Wildlife Service (USFWS), creating a Memorandum of Understanding (MOU) with each agency. The zoo has also created an MOU with the Buenos Aires National Wildlife Refuge in southern Arizona. An MOU details the working relationship between the Phoenix Zoo and these other agencies. Its creation signifies a certain level of trust between the two parties (Wells, 2014). Internationally, the Phoenix Zoo works with a number of conservation agencies. France-based Hutan, a conservation non-governmental organization (NGO) in partnership with the Sabah Wildlife Department, is currently working with the Phoenix Zoo to help conserve Bornean Orangutans. The Phoenix Zoo has also supported the Grevvy's Zebra Trust, Ruaha Carnivore Project, and the Thailand Hornbill Project, among other organizations and projects (Allard, 2014, PZ Global Conservation, 2014, Phoenix Annual Report, 2012, Phoenix Annual Report, 2013).

The Phoenix Zoo dedicates a number of resources to the above field conservation initiatives including funds, staff members, equipment, and expertise. This would indicate that the Zoo is, in fact, participating in field conservation. A majority of its support of *in situ* conservation, however, comes from research and husbandry done *ex situ*, from within

the grounds of the zoo. This is in keeping with one of the three main conservation missions set forth by the Phoenix Zoo, namely, "*ex situ* support of *in situ* conservation" (Wells, 2014, Allard, 2014). It's a mission indicating that while the Zoo is explicitly dedicated to field conservation the majority of conservation initiatives undertaken by the zoo are done so on zoo grounds.

Ex situ

In 2007, the Phoenix Zoo opened the Arthur L. and Elaine V. Johnson Foundation Conservation Center in an effort to centralize and streamline their conservation efforts. Prior to the building of the conservation center, communication between the Phoenix Zoo's conservation partners and the Zoo staff was strained by a lack of standard reporting procedures pertaining to conservation initiatives within the Zoo. In a couple of cases, animal keepers that had been the contact for a conservation program would leave the Zoo, taking all knowledge of the program with them. The conservation center was meant to mitigate those challenges and centralize conservation efforts; giving the Phoenix Zoo's partners one source of contact and the guests of the zoo a glimpse of the conservation work going on behind the scenes. Currently, the Zoo is engaged in the conservation of eight species native to Arizona: black-footed ferrets, Chiricahua leopard frogs, desert pupfish, Gila topminnows, California floaters, Mount Graham red squirrels, narrow headed garter snakes, and spring snails, all of which are housed on Zoo grounds. I'll be summarizing each of these conservation initiatives in more detail below.

The PZ began their black-footed ferret breeding colony in 1991 as one of four such facilities in the United States. Black-footed ferrets are small, carnivorous mammals native to the United States, Southern Canada, and Northern Mexico. Twice thought extinct, they are an endangered species. Their decline was caused by a number of factors, including the eradication of prairie dogs, a main prey item, from the prairie and introduced diseases that wiped out large numbers of them. In the 1970s, there was a failed attempted to bring the species back through breeding programs and they were thought extinct until a chance encounter with a farmer and his dog in 1981. By 1985, the US Fish and Wildlife Service captured eighteen black-footed ferrets that would become the founder group for the breeding programs that followed. In 1991, the US Fish and Wildlife Service asked the Zoo, in partnership with Arizona Game and Fish Department, to create a breeding colony on the zoo grounds. In October of 2010, the Zoo opened a new black-footed ferret breeding facility within the conservation center that can house up to thirty ferrets at one time. To date, the Phoenix Zoo has raised over four hundred black-footed ferrets (PZ Black Footed Ferrets, 2014), and, in conjunction with their partner organizations, have released a total of 3,500 black-footed ferrets back into the wild.

A second species that the Phoenix Zoo has partnered with Arizona Game and Fish Department (AGFD) and the US Fish and Wildlife Service (USFWS) to preserve is the Chiricahua leopard frog. The Chiricahua leopard frog is native to the Southwest. Chiricahua leopard frog egg masses and tadpoles naturally face high mortality rates in the wild due to infectious disease, which contributes to their status as an endangered species. The Phoenix Zoo was approached by the AGFD and USFWS and asked to create a program that would give the Chiricahua leopard frogs a head start in the wild. The Zoo

agreed and began their head starting program, where egg masses would be brought into the zoo from the wild, hatched and raised to tadpole and froglet stages, and then re-released into the wild (Allard, 2014). In the 1990s, the Phoenix Zoo created the Tadpole Task Force, a group of volunteers who assisted in the care and raising of each year's batch of tadpoles. In the last twenty years, the Zoo has produced roughly two thousand frogs per year, and released approximately eighteen thousand back into the wild. This particular program has been so successful that the local populations seem to be bouncing back, hopefully limiting the need for the PZ's intervention in the future (Wells, 2014, PZ Chiricahua Leopard Frog, 2014)

The Desert pupfish, a small fish native to Arizona and other parts of the southwest US and northern Mexico, is one of the most recent subjects of a Phoenix Zoo conservation initiative. Continuing the partnership with AGFD and USFWS, the Zoo set aside populations of desert pupfish in various ponds so that they could breed and raise fish for release to combat their dwindling numbers in the wild. The desert pupfish has been affected by a number of anthropogenic changes to the environment, including introduced fish species, habitat degradation, and habitat destruction. Once raised, the fish are released into the wild (PZ Desert Pupfish, 2014). The Zoo is also involved in the conservation of another small fish species, the Gila topminnow, which is native to Arizona, New Mexico, and parts of Mexico. This is a similar breeding program to that of the desert pupfish and the Zoo partners with AGFD to determine suitable locations for rerelease (PZ Gila topminnow, 2014).

In 2012, the Zoo became involved in the conservation of the California floater, an endangered freshwater mussel native to Arizona. The Zoo was tasked with aiding propagation of the mussel and developed the "Floater Float," a specialized enclosure that was then placed into a lake on the grounds of the PZ (Phoenix Zoo Annual Report, 2012). As of 2014, California floater glochidia, the larval stage of freshwater mussels, have been spotted in the lake (Allard 2014).

In 1987, the Mount Graham red squirrel, a distinctive sub-species of the North American red squirrel only found in the Pinaleno Mountains in southeastern Arizona, was listed as Endangered. This was after being rediscovered in the 1950s, after thought to have been extinct due to loss of habitat by wildfire, disease, and competition for resources with introduced squirrel species. The Zoo currently houses a group of Mount Graham red squirrels in the Arthur L. and Elaine V. Johnson Foundation Conservation Center. Partnering with the USFWS, the Zoo is developing a breeding program with the purpose of building a reintroduction program (PZ Mount Graham Red Squirrel, 2014).

The Zoo is also currently involved in the conservation of two species of springsnails, the Page springsnail and the Three Forks springsnail. Broadly, springsnails are small, short lived invertebrates that are found in small streams in the western US. Arizona Game and Fish Department "considers the Page springsnail a 'Species of Greatest Conservation Need'," (PZ Springsnail, 2014) and the Three Forks springsnail is listed as an endangered species. These species are threatened because of habitat destruction, groundwater depletion and loss of general water quality. In 2008, the Zoo partnered again with AGFD and USFWS to maintain a captive population of both species

of springsnail; this program is meant to provide both an assurance population but also a study population where the zoo can learn vital reproduction and life history information that assists conservation in the field (PZ Springsnail, 2014).

Narrow headed garter snakes are semi-aquatic, non-venomous snakes found in Arizona and New Mexico, and are a unique case of conservation by the Zoo. The species is not listed as endangered, but field biologists had begun to notice that the species was declining, by at least fifty percent over the last twenty years. The Zoo now houses a breeding group of five snakes and is part of a Gartnersnake Working Group that includes other institutions such as AGFD, USFWS, and Arizona State University, among others. Though having a stable breeding population is the ultimate goal, the Zoo has also been tasked with observation of the species, with the goal of learning basic information about the snakes, such as reproductive biology, longevity, feeding habits, etc. (Allard 2014). The Zoo has yet to have a narrow headed garter snake birth, but has seen a breeding event as well as a pregnancy (PZ Narrow Headed Gartersnake, 2014).

Though the Phoenix Zoo is heavily involved in conservation of regional biodiversity, their highest profile conservation initiative was also their first, the breeding and reintroduction of the highly Arabian Oryx. As discussed above, the Zoo was chosen as a site for the breeding of the highly endangered antelope. As of 2014, the Zoo is still involved with "Operation Oryx," and credits their early involvement with conservation through this program with shaping their current conservation mission. "Our current conservation mission of *ex situ* support for *in situ* conservation efforts is a continuation of

our commitment to species conservation worldwide." (PZ Rendezzoo, 2014). Therefore, the name of their conservation program, "Legacy of Conservation," pays homage to the Arabian Oryx conservation initiative and its success (Wells, 2014).

Conservation Education

The Phoenix Zoo also strongly delineates *in situ* and *ex situ* conservation from conservation education where, "conservation education is different than field conservation…that [conservation education] is not what our mission is," (Wells, 2014). This indicates that while the Phoenix Zoo offers educational programming, the emphasis at the zoo is on active engagement with conservation.

The Phoenix Zoo engages with conservation education and publicizes conservation programs within the zoo in a number of ways. Zoo members receive a Member Magazine that includes a section titled 'Conservation Corner,' that details the conservation programs happening at the zoo. In addition, the Conservation department publishes and circulates a Conservation Science magazine with more in depth information about programs at the zoo (Wells, 2014). Signage in and around the conservation center provide guests with information about initiatives being undertaken within the building, but conservation status of species is markedly absent on other exhibit signage throughout the park.

Outside of the Zoo, zoo staff members conduct public presentations within the Phoenix community. The goal of the presentations is to let the public know about all of the conservation programs happening at the zoo (Allard, 2014). In addition, the Phoenix Zoo recently began to host a conservation speaker series, in which conservation scientists from around the world describe their work. The series is open to the public and has been a relative success, attracting audiences that larger than expected (Allard, 2014).

Conservation education programs at the zoo are available for age groups from eighteen months up to adults. Eighteen month olds can participate in the 'Farm Tots' program and learn how to properly pet farm animals. Summer and winter camps are offered for young children through high school and are all have a specific conservation message as a theme. For young adults, there are two volunteer programs, the Zoo Teen program and the Zoo Teen Conservation Team. Zoo Teens often act as educational docents in the park, and members of the Zoo Teen Conservation Team conduct field conservation both locally and internationally.

Funding

The zoo supports a number of conservation initiatives internationally through their annual Conservation and Science grants, staff conservation grants, and partnerships with international conservation organizations. In 2009, the annual Conservation and Science Grant program was started as an effort to fund conservation programs internationally. Individuals can write proposals for a grant, which are then reviewed by the conservation committee (Wells, 2014). Proposals chosen must demonstrate a number

of things: practical research methodology, a capacity building component, *ex situ* support of *in situ* conservation, and involvement in local communities (PZ Global Conservation, 2014). To date, the Phoenix Zoo has awarded over $200,000 for over fifty projects in twenty countries (Allard, 2014). In addition to the Conservation and Science Grant program, the Phoenix Zoo has also initiated a staff grants program. This program is meant to provide an opportunity for zoo staff members to participate in conservation initiatives either locally or internationally (Wells, 2014). Additionally, the Zoo has created a zoo teen conservation team. This team, made up of 15-17 year olds, engages in conservation fieldwork both locally and internationally (Allard, 2014).

Prioritization of Conservation at the Phoenix Zoo

As mentioned above, the Phoenix Zoo dedicates 3% of its gross income toward field conservation, the minimum amount that the AZA requests of its member institutions (Wells, 2014). The Phoenix Zoo has goals to increase the conservation funds from 3% of the budget to 8 to 10% of the budget, but an increase of this magnitude seems unlikely (Wells, 2014). Bert Castro, the current president and CEO, has had a stated dedication to conservation throughout his years at the Phoenix Zoo. When hiring Ruth Allard, he made it clear that one of his biggest goals for her tenure at the zoo was to, "raise the profile, the awareness in the community of the Phoenix Zoo's role in conservation" (Allard 2014). This would indicate that the Phoenix Zoo prioritizes *awareness* of conservation highly.

As far as fundraising for conservation initiatives, the Phoenix Zoo sponsors a number of events. There is a dedicated field conservation fund where visitors can donate directly to field conservation (Wells, 2014). Also, RendezZoo, the Phoenix Zoo's top fundraising event for the black tie community is subtitled 'an evening of conservation and cuisine' and is themed around conservation both at the zoo and in the field (Allard, 2014). The Phoenix Zoo claims that, "the message of the zoo and the identity of the zoo has really come home to this conservation message and that is really important to us all working here and service to the zoo, so our volunteers and our staff, we are a conservation organization and we do all these other really great things in support of conservation and conservation education but we are really, our identity is a conservation organization," (Allard, 2014).

Development of conservation at the Phoenix Zoo

The conservation program at the Phoenix Zoo is named 'Legacy of Conservation' in homage to the fact that the Phoenix Zoo began doing conservation early in its history (Wells, 2014) indicating that the involvement with the conservation of Arabian oryx influenced the development of conservation within the organization. When questioned about how the Phoenix Zoo chooses which species to conserve, Allard mentioned that, in many cases, it is the partner organizations that approach the Zoo asking for their help.

This indicates that one of the factors that play a large role in the development of conservation initiatives within the Zoo is the partnership with local and international organizations and agencies (including Arizona Game and Fish Department and the US Fish and Wildlife Service).

One of the challenges internally about choosing which conservation initiative to pursue is whether or not it is a right fit for the Zoo both ideologically and practically (Allard, 2014). For example, a PZ staff member was interested in freshwater turtle conservation and there are many ponds on the grounds that could house a species of turtle. It did not quite make sense for the Zoo to have a population of Asian turtles on display on the African trail. Therefore, the Phoenix Zoo has not engaged in conservation of the Asian turtles because it is important to PZ to message in a way that is understandable for guests and consistent with the larger zoo conservation mission (Allard, 2014).

Another factor in the development of conservation initiatives at the Phoenix Zoo is determining whether or not the zoo staff has the skill set needed to address a specific conservation need. For example, when beginning work with the Chiricahua leopard frog, the Zoo was able to dedicate space, resources, and staff skill for the head starting of frogs (Allard, 2014), "So we got involved with that project because they asked us to, and they saw that the Phoenix Zoo is a place where information that is needed could be gathered" and "what is needed in terms of recovery that we are uniquely positioned to provide and so our role is to fill that unique spot, to fill in gaps that other partners can't" (Allard 2014).

Along those lines, another major factor in conservation program development and implementation is the limitation of resources at the Zoo. The main limitation is lack of finances (Allard, 2014), followed by time, and staffing (Wells, 2014, Allard, 2014). These limitations have existed for the Zoo from its earliest engagements with conservation (George, 1982). The Zoo also makes clear that their limitations are purely practical, and not ideological in nature, "the sky is the limit as far as what would be acceptable for us to do, but yeah, at some point we run out of funds," (Allard, 2014).

As mentioned above, there are many factors that dictate the development of conservation at the Phoenix Zoo. Over time, the zoo has made an effort to consciously engage with conservation, despite a distinct lack of funding and other practical limitations. This indicates that the Zoo is deliberately making an effort to shift their identity to that of a zoo that is making strides in both in situ and ex situ conservation initiatives on both a local and a global scale.

Organizational Identity Formation at the Phoenix Zoo

Self-Exploration

The first step to formation of an organizational identity is Self-Exploration, a process that began during the very first meeting of the AZS in 1961. As discussed earlier, during the fundraising for and building of the Phoenix Zoo, the Arizona Zoological

Society and Robert Maytag were explicit about their goals for the new zoo. Maytag emphasized community involvement with all aspects of the zoo, including the funding and building of the zoo, and therefore did not donate the funds needed to fully build the zoo.

After the creation of the Zoo, a period of time in which the financial situation of the zoo was tenuous (and the future of the zoo was uncertain) followed. By 1982, however, twenty years after opening day, the Phoenix Zoo had succeeded in becoming financially secure, and began to look to the future. James Savoy, then director of the Phoenix Zoo, publically declared the institution's beliefs and values:

> "We have already come a long way, but we still have a long way to go. We have met -with your help- the challenges of getting the zoo established and making it successful; now the time is coming when we will face even greater challenges. Wildlife is experiencing a terrible crisis worldwide; some species will survive the next few decades and others will not. Of the ones that do, in most cases it will be because zoos have taken up their causes. Whether we like it or not, more and more species will face two simple alternatives: survival in captivity -or extinction. Here at Phoenix -the zoo you built- we have an opportunity that makes us the envy of zoo professionals across the counter. We are a young, growing zoo with room for development and we have a climate in which most species can thrive. Put these two factors together and you will see that Phoenix is ideally suited for becoming a renowned center for the breeding of endangered species. Our only limitations are time and money. Will there be time to save as many species as we would like? Will we be able to muster the resources quickly enough to sponsor such ambitious programs? Will we take our place among the great zoos of the world? These are challenges of the future, the future for which we have no choice but to prepare." (George, 1982, pg. 42)

This indicates that early in the development of the zoo, the members of the organization engaged in self-exploration and decided that preservation of endangered species was a main mission of the zoo.

Organizational Culture

Organizational culture is created from within the organization, and is the culmination of all tacit assumptions, beliefs and values that play a role in the meaning making and self-defining of an institution.

Development of Organizational Identity is a continuous process, so at any given time the Phoenix Zoo will be in a process of negotiating and reforming its identity. As of 2014, the Organizational Culture of the Zoo includes an awareness and dedication to conservation aims. For example, the Zoo has a green team that spearheads energy saving, recycling, and other environmentally aware initiatives at the zoo. In addition, one of the internal tensions that arise within the Zoo is the perception that only the Conservation Department engages in conservation initiatives. As Allard told me, “We ran into some conversations about, well, you’re not the only ones who do conservation” (Allard, 2014). This, coupled with the availability of staff conservation grants, indicates that staff members outside of the conservation department also prioritize conservation engagement.

Organizational Image

Organizational image, on the other hand, is what organizational members believe others see as distinctive about the organization (Hatch and Schultz, 2002). The Phoenix Zoo has created a series of partnerships with other organizations that, the Zoo believes, view the zoo as a conservation organization. Stuart Wells states that, "We have developed a partnership with our local, state, and federal agencies that do field conservation, not just a partnership by handshake…a Memorandum of Understanding, which spells out how we'll work together…it takes a degree of trust for these agencies to enter into these MOUs, so we are proud of the fact that we've developed these." These Memorandums of Understanding are indications that outside organizations perceive the Zoo as being a viable partner in conservation initiatives.

On the other hand, the general public is less engaged in a discussion of the Phoenix Zoo as conservation organization. Wells claims that, "a lot of our guests and local community isn't aware of how much [the Phoenix Zoo] is involved in conservation." Allard agrees, mentioning that as she promotes conservation initiatives of the zoo, she is faced with visitors who are unfamiliar with their programs. This indicates that there is a discrepancy between the organizational culture (and self stated image) of the Zoo and the perceptions of the general public (organizational image).

Mirroring and Reflecting

The two components, image and culture are often not synonymous. If opinions and reactions of outsiders about the organization differ from the way the organization perceives itself, the organization will be motivated by the discrepancy to change either its image or its identity (Hatch and Schultz, 2002). Because the Phoenix Zoo perceived that the general public was not including conservation in their description (understandings) of the Zoo, it began the process of self-exploration over again. In recent years, the Zoo has increased its budget for offsite conservation (Allard, 2014, Wells, 2014), developed a Conservation Center, and engaged in conservation programs of a number of local species (Allard, 2014, Wells, 2014). This would indicate that the Phoenix Zoo is responding publicly in an effort to influence their Organizational Image to include conservation.

Historical Influences on Public Perception

Public perception of the institution can be influenced not just by organizational culture, but also by outside influences, such as the history of the institution or other organizations. The Phoenix Zoo claims a historical engagement with conservation (Allard 2014, Wells, 2014). Operation Oryx began at the zoo in the early 1960s and was the Phoenix Zoo's first attempt at breeding an endangered species for the purpose of reintroduction. Operation Oryx was "A first in many ways, first in multi-organizational and multi-national involvement in a conservation effort, and….the first time that a species that went extinct in the wild has been bred and reintroduced and then down listed

from…..extinct to endangered to threatened in the wild" (Wells, 2014). It was thus a high profile conservation initiative and led to the Zoo being noticed internationally for their involvement.

In addition to the conservation of the Arabian oryx early in the institution's history, the Zoo has "a long track record of saying, 'what can we do nearby?'"(Allard, 2014). This makes them a unique institution in that they have a strong regional focus on conservation (Allard, 2014) and are engaged in a number of conservation initiatives of local species. This would indicate the history of the Zoo's engagement with conservation plays a role in the development of a conservation identity at the PZ. Additionally, an example of an outside influence could be the lack of discussion of conservation at the Zoo in the media throughout its history. Apart from the Arabian oryx, there is very little evidence in the archives of frequent publication of conservation initiatives.

Phoenix Zoo Organizational Identity

The Phoenix Zoo includes conservation explicitly in its value and vision statements, as well as one of its strategic initiatives, in addition to naming its conservation program 'Legacy of Conservation' (Wells, 2014). Ruth Allard, notably, claimed that, "basically the message of the zoo and the identity of the zoo has really come home to this conservation message" (Allard, 2014) All of the above would indicate that the Zoo is in the continual process of creating an organizational identity that is centered on conservation engagement.

Discussion and Conclusion

The Phoenix Zoo is an interesting case of conservation program momentum. As I've discussed above, the Zoo began its engagement with conservation in 1962 with Operation Oryx. Its relationship with various conservation organizations and programs grew over time as it developed relationships with various organizations, such as Arizona Game and Fish, US Fish and Wildlife, and a number of other NGOs that are based out of other countries. As the Zoo continued to grow, the number of conservation programs grew as well. What is notable about this growth is that the Zoo didn't pursue a number of these conservation programs, in many cases outside organizations approached the Zoo with requests for its participation in some part of a larger conservation initiative (Wells 2014, Allard 2014). Whether it is head starting an endangered local frog species or breeding an endangered species of snake, many times the Phoenix Zoo holds a species because of the interest of another group. This would indicate that the Zoo has built a certain level of trust with these organizations and is known for its unique skill sets. This is an example of conservation momentum; the more a zoo participates in conservation programs, the more it is seen as a conservation capable institution, and the more it is approached by other organizations for help with their conservation initiatives.

Conservation momentum also ties in closely with the development of a more conservation-centered mission in zoological parks in the United States. Organizational identities reflect both the desires of the organization itself and the desires of outside entities. For zoos, these outside entities are the general public, donors, conservation organizations, and others. When a zoological park is heavily engaged with conservation

and is vocal about that engagement, stakeholders and the general public will be more likely to perceive the zoo itself as a conservation organization. This leads to more opportunities (through visitor donations, being approached by outside organizations, etc.) to engage with conservation.

U.S. zoological institutions, as mentioned above, are making a clear and calculated shift toward a more conservation-centered mission. This study has helped to shed light of some on the motivating factors for that shift, and also how the day to day operations of the zoo have changed to mirror that stated transition in mission. Challenges to zoo conservation still remain; zoos often face a shortage of staff members, funding, space, and other resources important for conservation, but they continue to take part in conservation partnerships and reform their identities to include conservation rhetoric, programs, and initiatives. Understanding the process of development of conservation missions, involvement, and identity in present day zoos can lead to a stronger forecast for what the relationship between zoological parks and conservation may look like in the future.

More specifically, the case of the Phoenix Zoo provides a glimpse into how zoological institutions are recognizing and responding to criticisms of zoo-based conservation initiatives. These criticisms, detailed above, include the argument that the claims of conservation involvement are often unsubstantiated, that decision-making challenges and trade-offs limit zoos' capacity for conservation, and that zoos do not have the resources to sustainably manage captive populations (Conway, 2011). The Phoenix Zoo has made a point to be transparent and vocal about its conservation engagement, documenting breeding programs, reintroductions, and outreach seminars extensively in

an effort to build a case for strong conservation engagement at the Phoenix Zoo. Though the Zoo does undergo internal negotiations when it comes to the choosing of conservation initiatives, the fact that the Zoo has outlined its own stringent guidelines for conservation projects allows for a standardized comparison for decision-making, streamlining the process.

Perhaps one of the largest criticisms, expressed by critics such as Hancocks and others, is that zoo breeding programs are inherently for the benefit of the zoo, not for the conservation of endangered species, and that, within zoos, there is often a lack of delineation between *ex situ* and *in situ* conservation. The Phoenix Zoo has responded to this by emphasizing that the Zoo will not house assurance populations, but instead is focused on breeding select species solely for the purpose of reintroduction (Allard, 2014; Wells, 2014). This ensures that the Phoenix Zoo is actively engaged with field conservation and not focusing on species preservation in captivity. Additionally, one of the Phoenix Zoo's conservation goals is *ex situ* support of *in situ* conservation (Wells, 2014), coupling the two approaches and, arguably, strengthening the efficacy of the conservation initiatives the Zoo chooses to pursue. Most notably, the Phoenix Zoo choses to focus on field conservation, elevating the importance of preservation of species in the wild over the management of assurance populations, education of guests or fundraising for other outside organizations.

To this aim, the Phoenix Zoo is in the process of developing a conservation-centered institutional identity. Understanding this identity is integral to understanding how the Zoo responds to challenges and criticisms that arise when engaging with conservation. As mentioned above, there are a number of barriers to conservation

engagement within a zoo and these challenges are also exacerbated by the fact that zoological parks face frequent criticism of their conservation programs. For the Phoenix Zoo, publicizing and reawakening the public's knowledge about their early involvement with the Arabian oryx and the more recent dedication to documentation and communication of its conservation aims all speak to the Zoo forming a response to a less-than-desirable institutional image.

Understanding the framework of identity formation allows for a stronger discussion around why the Phoenix Zoo chooses to be vocal about conservation; there was a perceived disparity between what the public viewed the Zoo as doing and what the Zoo viewed as its mission. This disparity still seems to exist, but in the minds of Allard and Wells, the gap in visitor knowledge is lessening. The Phoenix Zoo ascribes to an idea to which a number of other AZA accredited institutions ascribe, that zoos are (and can continue to be) places of simultaneous entertainment and learning, but that their primary mission is to conserve and preserve the wild counterparts of the species they house.

Moving into the future, zoological institutions are likely to continue, and even increase, their conservation rhetoric and programming. As the environment continues to change, compromising the habitats and lives of numerous species from around the world, zoos will be integral in the effort to slow extinction rates (Conde et al, 2011). Zoos are likely to become havens for populations dislocated populations, meaning that zoological institutions will be making difficult decisions about which species can be feasibly saved and which species will be left off of the ark. These decisions will, of course, be made

with a number of practical and ideological factors in mind; space, funding, and staff availability will all factor in, but, unlike the efforts of some other conservation organizations, zoos will also be considering visitor interest and engagement in their decision making.

Because of the above, zoos run the risk of becoming living museums, through housing and caring for species that can not only no longer be found in the wild and also have no chance of returning to the places from which they came. There are a number of species considered extinct in the wild, a designation that indicates that all living individuals in a given species exist solely in captivity, such as the scimitar horned oryx or the Guam rail (IUCN, 2014). Additionally, the Amphibian Ark (AArk), a consortium of zoos and aquariums working on the ex situ conservation of threatened amphibian species (largely due to the global spread of an emerging infectious disease) was formed with the express purpose to, "ensure the survival and diversity of amphibian species, focusing on those that cannot currently be safe-guarded in their natural environments" (Amphibian Ark, 2014). The AArk model has drawn criticism (see, e.g., Gewin, 2008) from some conservation scientists who worry that it lacks a concrete plan to integrate them back into the wild (given the persistence and lethality of the amphibian virus in their native ranges). Some have argued that housing species that are extinct in the wild could serve as a warning for the future, a symbol of the environmental cost of past mistakes. The flaw in this argument lies in the fact that museums already have centuries of evidence of environmental atrocities, housing skeletons and representatives of well-known lost

species like the dodo, Tasmanian tiger, and the passenger pigeon, and yet the earth is experiencing extinction at alarming rates. It may be that zoos, even unintentionally, become living museums simply because of the species they house but will still retain the same missions of entertainment, education, and conservation.

One way that future zoo conservation may become more impactful would be a focus on conservation initiatives of native and local species. Focusing on species that are local reduces the amount of resources necessary to enact effectual conservation initiatives, and allows zoos to become more vocal in the local community (also allowing community members to get involved and retain a sense of ownership over the ecological health of their local environment). A good example a zoological institution that has been successful with the native species model is the Arizona-Sonora Desert Museum in Tucson, which integrates display of local species with exhibits that highlight the history of the region, while encouraging community involvement through art programs and conservation opportunities.

At the same time, it is unlikely that the majority of future zoos will shift to a focus on housing primarily native species. Part of the success of zoological institutions is not just connecting people to animals they may never get a chance to see, but also exposing the public to the sheer ecological diversity of earth. Housing a diversity of species actually enriches zoos' missions of entertainment, education, and conservation, as their collections represent the current (and possibly past) biodiversity of life on earth.

More practically, there will most likely be a number of changes made to exhibits as zoos move forward into the future. There may be a shift to the safari concept; large exhibits housing a mixture of species within one ecological system, which visitors then

view from the perimeter or an enclosed vehicle. In this exhibit concept, animals would be relatively free ranging and humans, in a sense, would be the ones in enclosures, such as in the newly rendered re-design of Denmark's Givskud Zoo. Dubbed 'Zootopia,' the design minimalizes human presence with the strategic use of mirrors and would allow animals to live free-ranging, unimpeded lives (Hohenadel, 2014).

Additionally, zoos will increasingly become involved in extensive partnerships with outside organizations whose primary missions are conservation and wildlife preservation. They will continue their role as animal care experts and become increasing vocal about their conservation involvement, but will also remain open to the public and involved in educational initiatives. Zoos will be careful not to allow conservation involvement to compromise visitor experience, and will, conversely, work to use conservation engagement instead to enhance it. Therefore, zoos of the future will continue to be what they always have been, places for viewing animals, while becoming increasingly important partners in the conservation movement.

Epilogue:

As of November 4th, 2014 the Phoenix Zoo announced a campaign to include a 'more prevalent focus on conservation messaging,' (Phoenix Zoo, 2014). This will include changing the operating name of the organization that governs the zoo, currently the Arizona Zoological Society (AZS), to the Arizona Center for Nature Conservation. This change in name is meant to better reflect the core values and missions of the organization.

This change is relatively unsurprising, as the Phoenix Zoo has been in the process of making a calculated effort to become a conservation organization for a number of years. This rebranding effort came about after numerous surveys and studies conducted by the Zoo revealed that members of the community were not aware of the Zoo's conservation initiatives. Therefore, after a time of self-exploration, the Zoo then decided to influence their institutional image by expressing a new name, logo and mission statement. This change is evident of a conscious decision and effort to influence the organization's institutional image; the shift in name and a new logo featuring the Arabian oryx are meant to indicate to stakeholders, visitors, and conservation partners that the Phoenix Zoo is, first and foremost, dedicated to conservation.

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APPENDIX A

INTERVIEW PROTOCOLS

Interview Questions for Zoo Scholars:

- What institution are you affiliated with?
- What sparked your interest in the discussion of zoos and their relationship to conservation? OR How did you get involved with it?
- How do you define conservation?
- Do you think zoos, in general, have a role to play in global wildlife conservation? If so, how would you describe this role? If not, why not? Has that role changed over time?
- How do you feel about zoo's conservation efforts in general? How do you feel about the way that zoos discuss conservation? Have you seen a change in this over the years that you've been studying zoos?
- What are the most important components of a strong conservation initiative in Phoenix Zoo/Greenville Zoo?
- Is there a difference between conservation undertaken in the field and conservation in zoological institutions? If so, what are the differences?

Interview Questions for Phoenix Zoo Staff:

Intro/background questions:

- How long have you worked for the Phoenix Zoo? In what capacity- what kinds jobs have you held here?
- Why did you choose to work in a zoo? How long have you been working in zoos? Why this particular Zoo?

- In your mind what role, if any, does the Phoenix Zoo play in conservation?
  - (Conservation means different things to different groups), how would you define conservation?
  - Is there a difference between conservation undertaken in the field and conservation in zoological institutions? If so, what are the differences?
  - Has the zoo's engagement with conservation changed since your time there? If so, how has it changed?
- Does the Phoenix Zoo have any explicit conservation goals? If so, which do you consider most important? Why?
- What are the current conservation projects and initiatives being undertaken by the Phoenix Zoo?
- How and why does the zoo choose which conservation initiative to pursue? What concerns/factors are important in this process? Are there internal tensions that arise while making these decisions?
- What are the most important components of a strong conservation initiative in Phoenix Zoo?
- Are there plans for future conservation projects and initiatives Phoenix Zoo? If so, what are they?
- What limitations does Phoenix Zoo have as a conservation institution? Are zoos limited in how much conservation work they can realistically accomplish? How/why/why not?

- Does the zoo participate in any partnerships with other conservation organizations? What outside organizations and partners (if any) play a role in developing the zoo's Conservation program? Have these changed over time?
- How (by what avenues; social media, newspapers, etc.) does the zoo promote its conservation programs and outcomes? Who are the most important audiences for this information?